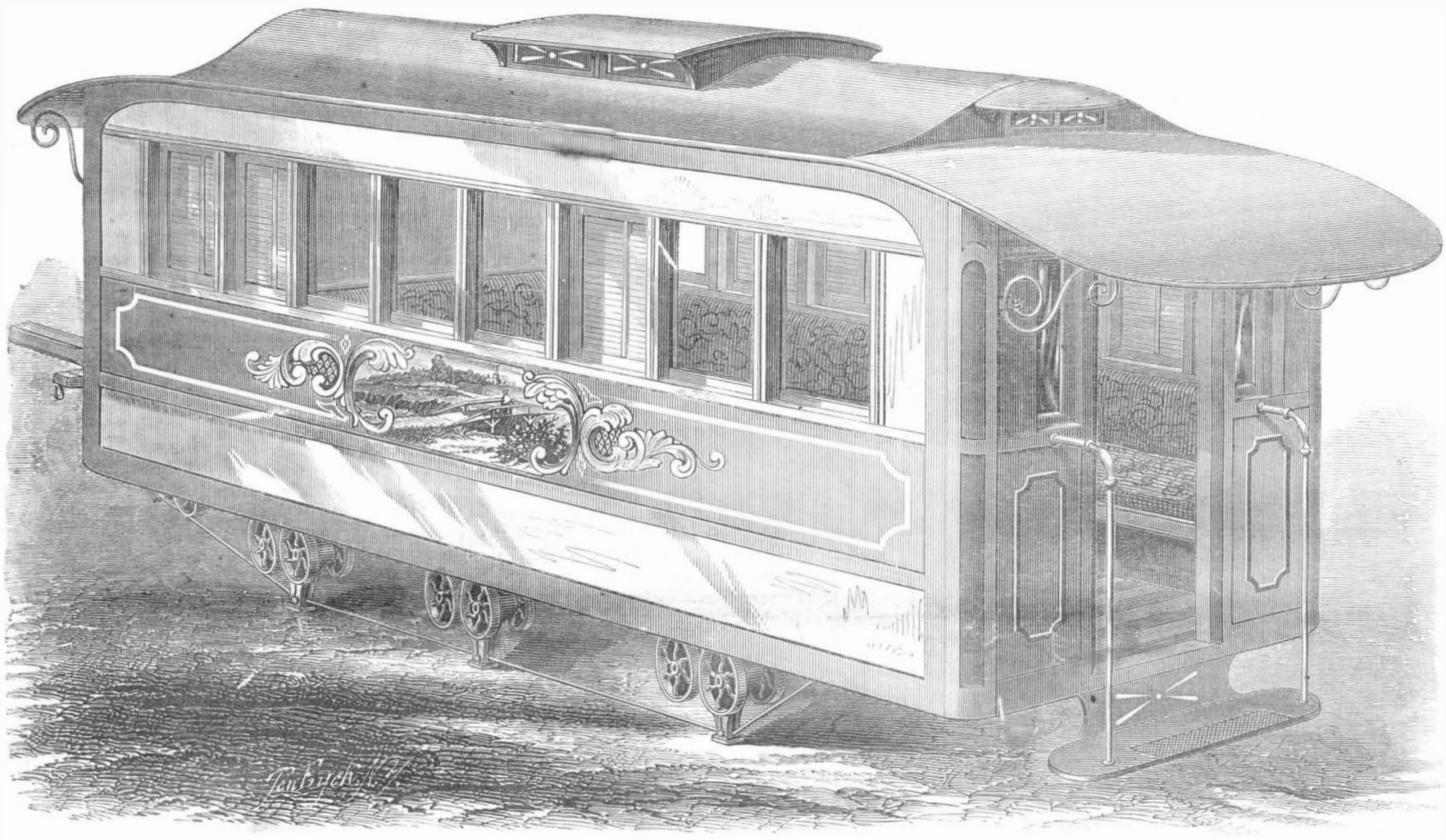
SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XIX.---No. 6. [NEW SERIES.] NEW YORK, AUGUST 5, 1868. $3 per Annum. [IN ADVANCE.]



GLENN'S PATENT DEVICE FOR THE PROPULSION OF LAND VEHICLES AND FOR VESSELS.

Improved Portable Railway.

The main principles upon which depend the movements of all wheeled vehicles are the same, whether like the locomotive and wheelbarrow the wheel is secured to the axle, or runs freely upon it as in other vehicles; the rotation of the wheels takes the carriage forward. But in the device illustrated in the accompanying engravings everything is reversed; the carriage moves forward on its wheels, the latter turning against the carriage instead of against the ground. The contrivance is very simple and quite unique.

The principal engraving represents a perspective view of a street car built on this plan; it has a very strong frame and is really elegant in form. The sides of the frame are of parallel rails meeting at the ends in a curve, so that the form of the continuous rail is a flattened oval. The rail, A, which is of a double angle section as seen in Fig. 2, is of steel and is firmly bolted to a rim of wood, B, thus making a side framing of unusual stiffness. To this the sides, roof, and floor may be secured in any manner desired. Running on this endless rail are a series of trucks placed at equal distances apart and connected by steel rods, C, Fig. 3, thus forming an endless chain. As those on each side of the car are separate from those on the other side, their action is independent; this is important in turning curves. The large wheels, D, have their peripheries in bearing with the outside of the rails, and are held in close contact by means of the small or keeper wheels, E. The frames of these trucks extend some distance beyond the outside rim of the wheels, D, and form a series of feet, F, which, as the trucks move over the rails or the rails and car are moved over them, come alternately to the ground and support the weight of the vehicle. The bottom of the feet may be made of any width to adapt them to the nature of the ground over which the carriage may pass; if it is of a soft and yielding nature the feet should be proportionably broad.

Fig. 2

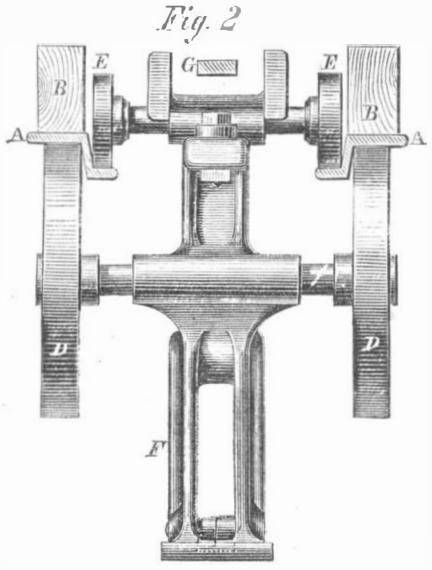
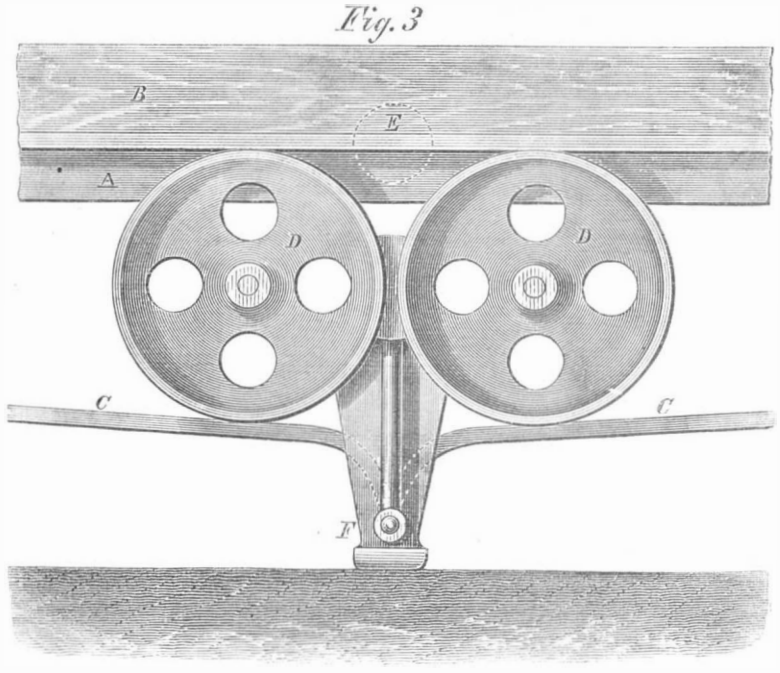


Fig. 3



From the foregoing description the operation of the machine may be easily comprehended. Whether the power is applied by turning one of the wheels, D, or by drawing the body of the vehicle forward by a span of horses, the result will be the same. As the wheels revolve the carriage moves forward, each truck with its foot coming down from the top portion of the rail and seating itself on the ground in front of and under the vehicle, and it thus remains upright supporting the load until the body of the car or wagon has been borne over it, when it is taken up at the rear over the curve and goes forward over the top to repeat the movement.

For the purpose of turning curves the spindles upon which the wheels, D and E, revolve are made longer than the bearings so that the body of the carriage may slide or be steered to one side or the other. This steering is effected by means of guide rods—a section seen at G, Fig. 2—which when operated bear against the sides of the recess in the caps of the journal of the small or keeper wheel. This operation is done by the side movement of the pole or shafts to which the draft animals are attached. There is no more cramping or binding of the wheels in turning curves or corners than with an ordinary carriage, as the wheels on either side are entirely independent one of the other. For public carriages in place of omnibuses or street cars this plan is intended and seems capable of being adapted, no permanent track being required. The carriage may be built very light or as strong as the heaviest freight wagon. It is believed by the inventor to be specially adapted to agricultural purposes on moist or swampy ground. Steam power can be easily applied in place of animal power; for water navigation the inventor claims that paddles may be substituted for the feet and operate the whole length of the boat. A boat on this plan is already in process of construction to be tested on the Erie canal for towing canal boats at high speeds.

Patented through the Scientific American Patent Agency, Oct. 22, 1867; another patent is pending on improvements. All communications for information, etc., to be sent to J. K. Glenn, 141 Broadway, New York city. Foreign patents are already secured.

Car Illumination.

As a precaution against fire in case of accident to the cars, many of the railroad companies have discontinued the use of petroleum oils for illumination and have returned to the dingy candles. We suggest to our inventive readers that they study up the subject of candles and try to produce something new in this line which shall yield a bright and steady light suitable for railroad purposes. Such a device is needed, and we believe it to be within the compass of invention.

SUNLIGHT AND MOONLIGHT.

The following interesting report of a lecture by Prof. Morton, at the Academy of Music, Philadelphia, we copy from our esteemed cotemporary, the *Philadelphia Photographer* :

Assuming that his hearers were acquainted with the general laws governing the emission and reflection of light. Prof. Morton proceeded to explain the difference between regular and diffused reflection, illustrating this point by an original and singularly pleasing experiment. A large mirror was set midway in the stage, facing the audience, who could see themselves reflected on its ample surface. Over this mirror, an assistant, at a signal, let fall a delicate white veil, when at once there appeared, as if just within the surface of the glass, a phantom-like figure, which was then seemingly wrapped up in the veil, as that was rolled together, and appeared to fall with the falling tissue, as it was dropped to the floor. The appearance of this experiment was most beautiful and excited much attention. The lecturer then explained the method of its arrangement, in which a lantern, with a glass photographic picture placed at one side, and throwing an image obliquely on the mirror, played of course, an important part.

Various illustrations projected on the screen, from photographs of statues and mirrors, and landscapes with still water reflecting the adjacent objects, were then used.

To give such things due effect in such a building, is no easy task. The front of the stage is fifty feet in width, and the most distant of the audience more than one hundred feet from that point. An immense screen and powerful illumination are therefore necessary. The screen employed was of wet muslin, forty feet square, lowered into its place at the moment when required. To cover and illuminate brilliantly such a surface (sixteen hundred square feet), no ordinary lantern would suffice, and, accordingly, Professor Morton has had one constructed by Mr. Zentmayer, with condensers eight inches in diameter, and of three-inch focus, with which pictures of corresponding size are used. Thus, an objective of low power may be employed and loss of light avoided, as also a larger ignited surface of lime utilized without injury, on account of the corresponding increase of size in all parts. Most of the pictures used on this occasion were made by Mr. O H. Willard, photographer, who also operated the lantern, and whose skil was equally well illustrated by the pictures produced and the style of their projection. Some of the transparencies were, however, made by Mr. O. G. Mason, of New York, from Mr. Rutherfurd's negatives, and others again, by Mr. J. C. Browne, of Philadelphia, all gentlemen whose skill is well known to our readers.

After the illustrations of reflection above mentioned, came a series of moon photographs, intermixed with copies of lunar maps, and a number of admirable imaginary views of lunar scenery, from drawings prepared by Mr. James Hamilton, our eminent artist, who is so widely known by his marine pieces, and who can produce more apparent motion and commotion on canvas than any one living, we believe. These views were of the most impressive description, especially one of the lunar volcano, Copernicus, and its vicinity.

The direct lunar photographs by Mr. Rutherfurd, were also most effective. Thus, we beheld, to our great delight, a moon, round and full-orbed, as bright as the original luminary, but rolling on to the screen as a globe of thirty-five feet in diameter, her mountains and volcanic cones, and extended plains distinctly visible. And this was not a mere picture skilfully painted, but a veritable reflection of that orb. The moon's own face *photographed* by powerful lenses, and magnified by Mr. Rutherfurd, whose skill in this department is unrivaled.

The lecturer described and named the various plains, and peaks, and hilly ranges, as though he had just returned from an exploring expedition to these Rocky Mountain regions. We had the Ocean of Tempests, and Seas of Showers, of Serenity, of Vapors, and of Clouds (still called seas, though now known to be arid land wastes), defined and designated, while the heights of the peaks, the depths of valleys and volcanic craters, were indicated as clearly as those of any earthly elevations or depressions accessible to the foot of the surveyor

The planet Mars appeared, not as a brilliant speck or point of light, but as a vast round silver shield, with the marks of seas and continents distinctly traced. Another photograph, taken an hour later, and lo! the aspect of the planet had altered. A great snow-storm had been sweeping over it. Its majestic mountains and plains had been draped in a winding-sheet of frozen rain, and the dark wastes had become white, and the deep seas alone retained their original sombre hue. Think of a snow-storm in a distant planet, watched, and followed, and fixed on glass plates, and presented to an audience sitting comfortably in the opera-house of the city of Philadelphia.

The magnetic telegraph can tell us what is happening in distant parts of our globe, but here is a messenger who comes to us, and tells us what is happening in the planet Mars, more than thirty-five millions of miles away! The storm signal is hoisted on the coast of England, and mariners know that a tempest is up and at work on the broad Atlantic, and may soon be looked for, howling along the chalk cliffs of the island, and thundering into its bays ; but the telescope, and the photographer with his baths and plates, here reveal how a tornado of sleet and snow is sweeping across the plains and oceans of the *planet Mars.*

Attention was next directed to the sun. His spots were, by means of photographic art, shown to be gigantic rents made in the robe of fiery cloud masses which compass the orb ; just as wild cyclones or great rotary storms might tear and rift the rain clouds which cover our sky, twirling them round and making tempest circles, with radii of thousands of miles. The rotary motion of these sun-storms could be distinctly traced in the several photographs made at different periods of their progress, and the laws which regulated their motion investigated and determined.

To illustrate the effect of such a temperature as that shown to exist in the sun upon some familiar elements, and to explain why these should occur as *vapor* in his atmosphere, the lecturer placed himself with a powerful oxyhydrogen blowpipe upon a platform secured to one of the stage straps, and was raised to a considerable height, from which point, by burning a thick rope of steel wire in the jet, he caused to pour down a broad sheet of scintillating sparks and minute globules of boiling iron, which spread over the floor and rolled toward the footlights with an effect never to be forgotten by one witnessing it.

The fixed stars as suns of other systems were next noticed, and in connection with some of the peculiarities which they exhibit, the subject of persistence of vision was introduced and illustrated by several beautiful experiments, among which the most remarkable was a large wheel, five feet in diameter, carrying six Geissler tubes of great size, through which, while in motion, flashes of electric light were passed from an induction coil, made by Mr. Ritchie, of Boston, (probably the most powerful in the world, having produced sparks twenty inches in length), belonging to the University of Pennsylvania. This apparatus produced the appearance of a star with countless colored, vibrating and ever-changing rays.

The final and perhaps most impressive experiment of the lecture was, however, that illustrating the [illegible]te character of white light and the difference betw[illegible]effect as an illuminator and those of monochromatic light.

The drop curtain was lowered for a few moments, to allow of some scenic changes, and during this time the lecturer explained the subject in hand to the audience, and by aid of two large groups of chromatic burners, fed with spray of chemical solutions, produced lights of contrasting colors on opposite sides.

The curtain then rising displayed a brilliant palace scene, illuminated by several lime lights, judiciously placed. At a signal there then marched in a troup of brilliantly costumed masks (consisting of students of the University, who had volunteered for the occasion), bearing banners with appropriate colored devices.

The effect of this march was most striking, the tramp of the advancing columns, the rushing flutter of the banners crowding the stage, and the blaze of gaudy colors in the bright white light, formed a spectacle as pleasing as it was novel and unexpected. The masks having grouped themselves around the stage, at a signal the white light was turned off, and from six large sets of chromatic burners a flood of yellow light was emitted. Instantly the brilliant array became a troup of ghastly phantoms, clad in gray, and bearing banners with black and white devices.

The amount of yellow light was so great as to illuminate the entire house and reduce the audience to a concourse of sombre-clad spectres. The lights were then changed several times. This experiment was by far the most impressive thing we have ever seen, and by the precision with which everything was managed, reflects great credit on all concerned in its production

MANUFACTURE OF MALLEABLE IRON IN SCOTLAND.

In No. 1, of the current volume, we gave a condensed account, from the *Ironmonger*, of Cast Iron Working in Scotland. We herewith give, from the same source, a description of the manufacture of malleable iron, as conducted in that country.

The conversion of pig-iron into malleable by the "puddling" process was commenced in Scotland about forty years ago, when a number of workmen from England and Wales were brought into Lanarkshire for the purpose of instructing the Scotch ironworkers. The first attempts, however, to establish this branch of trade, were not successful, and it was not until 1836 that it was fairly started. There are now nearly 400 puddling furnaces and 50 rolling mills in operation, which, in 1867, produced 143,000 tuns of malleable iron, valued at £1,006,600.

THE PUDDLING PROCESS.

The places in which the process is carried on are nearly all constructed on the same plan. The mill consists of a vast roof supported on iron pillars, so that the sides are quite open. The puddling furnaces are built at intervals along one or two sides of the mill ; and the floor, which is paved with iron plates, is crowded with machinery, a powerful steam-engine occupying the centre. The work of the puddlers is probably the severest kind of labor voluntarily undertaken by men. The puddling furnace is a compact structure of fire-brick cased in iron. In consists of three parts—the fireplace, the hearth, and the flue. The fireplace is on the left hand side, and is separated from the hearth, which occupies the central place, by a low wall or ridge. To the right of the hearth is the flue, the entrance to which slopes downward from the hearth, so that when a fire is lighted in the fireplace, the flame is drawn close over the hearth in its passage to the flue. Each furnace requires two men to work it. One of these is the puddler, who has all the responsibility, and the other his assistant, who performs the portions of the work in which only slight skill is required. The quantity of pig-iron operated upon at a time is about four hundredweight, and is called a charge. One charge is got out of the furnace every two hours, and the work goes on night and day, from one week's end to the other, Sunday excepted—the men taking the night and day shifts by turns. After a charge is withdrawn, the furnace undergoes some slight preparation before another is put in. A coating of "bull dog"—a material prepared from the slag of the furnace—is laid upon the hearth, to fortify it against the intense heat. The pig iron, which has previously been broken into pieces of convenient size, is then thrown in, and the doors of the furnace are closed and sealed up with cinders. Intense heat is then generated. In about a quarter of an hour after the furnace has been sealed, the iron shows signs of melting, and an aperture in the hearth door about six inches square is opened. The puddler looks in at the opening, and determines whether it is time to disturb the iron. So soon as he sees the finer angles of the iron begin to melt, he thrusts in a stout rod of malleable iron, and moves the lumps of metal about, so that the entire mass may be equally heated. The puddler's assistant takes a turn at this part of the work ; and during its progress the heat is occasionally moderated by means of the "damper," or by dashing small quantities of water upon the iron. At frequent intervals, the puddling bar is withdrawn and cooled by being dipped into water. The iron dissolves gradually on the hearth, and after a time begins to heave and bubble, innumerable jets of flame bursting forth all over its surface. The desired chemical change is now going on. The hot air from the furnace sweeps over the iron and carries off a great part of the carbon, sulphur, phosphorus, and silicon contained in the pig iron. Care must be taken to prevent the metal from becoming too fluid ; and as soon as it attains a pasty consistency the heat is moderated. Meantime, the puddler uses his rod vigorously ; and as the metal now begins to "dry," the labor of moving it about is increased. The metal at length seems to curdle and become granular. As it then ceases to give off carbonic oxide, the heat of the furnace is again raised, and the particles of metal begin to adhere together. From this point the chief puddler undertakes and completes the operation. As the metal agglutinates, it becomes very difficult to move. The puddler has to exert himself to the utmost ; and he dare not relax his efforts for a single minute, else all the previous labor would be worse than lost. Though the perspiration trickles from his face and arms, and oozes through his scanty clothing, he must toil on. His eye is never removed from watching the contents of the furnace ; and the expression of anxiety on his face indicates that the operation has reached a critical point. When the metal has attained a certain degree of consistency, the puddler divides it into five or six heaps. He then works each heap into a "ball" or "bloom." The door of the hearth is opened, and one after the other the balls are drawn out with a large pair of tongs and dragged over the floor to the "shingling" hammer. As the balls are drawn from the furnace they have a spongy appearence, and slag and other impurities trickle from them. The operation we have described occupies, on an average, about two hours, and the quantity of unrefined pig-iron required to make a tun of puddled iron may be stated at from 22 to 23 cwt

SHINGLING AND ROLLING.

It is the puddler's duty to convey the "balls" from the furnace, and to place them one by one on the anvil of the "shingling" hammer. Before the invention of the steam hammer, a somewhat clumsy contrivance was used for squeezing the slag out of the puddled iron, and beating it into shape. Now the steam hammer is everywhere employed for that purpose. When a puddler lays a "ball" on the anvil, he waits to see the result of the first blow, and from it he is enabled to judge of the quality of his work. The "shingler" then steps forward and takes charge of the "ball." His feet and legs are encased in iron armour, his body is covered by a stout leather apron, and he wears a mask of the same material. One stroke of the hammer makes apparent the use for this warlike attire, for it sends out in every direction jets of liquid fire, which patter against the legs of the workmen, and would inflict fearful injuries were they to come in contact with the skin. The manipulation of the ball under the hammer is severe work, and requires great expertness. The "shingler" uses a pair of tongs about four feet in length, and with these seizes the ball and turns it on the anvil every time the hammer ascends. He so manages that it assumes the shape of a brick, and the operation occupies only two or three minutes. The "shingler" passes the metal, yet at white heat, to the "rollers," who pass it through a series of grooves in a pair of solid iron cylinders. By this means it is drawn into bars of the required size.

The iron produced by the above process is called "puddled bar," and it has to go through another operation before it is suited for even the commoner purposes of the blacksmith. In order to produce what is known in the trade as "common iron, the puddled bars are cut up into short lengths, and a number of these are laid in a heap of sufficient size to make a bar of any stated dimensions. They are then placed in a "re-heating furnace," and exposed to a free circulation of heat. In about half an hour the iron becomes heated to what is known as the welding point, and is then removed and passed through the cylinders as before. When the rolling is completed, the bars are taken away by boys, and cut to the desired length by means of a circular saw, which passes through the metal with astonishing rapidity and with a hideous noise. The bars are then straightened on an iron plate, stamped with the maker's name, and allowed to cool. From the moment the iron is taken out of the re-heating furnace until the bars are ready for the market, the utmost expedition is required on the part of the workman ; and their operations, especially when witnessed at night, form one of the most interesting sights connected with the manufacture of iron. When a finer quality of iron is required, another welding and rolling are given to it. These repeated heatings however, entail a considerable loss of material—equal, we believe, to eight or ten per cent for each heat. In making

the best quality of malleable iron, it is usual to refine the pig-iron before putting it into the puddling furnace. The refining is done in a furnace especially constructed for the purpose, and the process consists in fusing the iron with coke, and thus ridding it of a large proportion of its impurities.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents

The Microscope.

MESSRS. EDITORS:—The microscope has revealed in nearly every department of science, much that before its invention and present high degree of perfection, was entirely concealed from the most careful observer. It has opened new fields of thought, has disclosed new truths, and has unlocked many of nature's mysteries. Its revelations of the character of the earth's crust, of the wonders of the vegetable kingdom, and of the marvelous structure of animal organisms are grand and imposing. Information so valuable should be rendered more popular and generally useful; and is it not important to consider the best means of accomplishing this desirable result, and of creating a taste and love for the investigation of nature by this valuable instrument? While the present mode of study, each individual pursuing his own investigations or giving individual instruction, is well adapted for the few it is not applicable to large classes. It is evident that could the microscopic representations be of such a character as to admit a simultaneous view by all present, their usefulness would be greatly enhanced.

What means are there, then, of exhibiting to audiences the results obtained by the microscope? Photography has recently come to the aid of the educator and has enabled him to faithfully represent many natural objects and phenomena. It has enabled the microscopist also, to a certain extent, to make his observations more public. The stereopticon, which has of late years become indispensable to the lecturer on scientific subjects, has developed a new use of photography as it has been made to enlarge the photographic views, and has adapted them directly to class illustration. It is an aid also to the microscopist, but as it mainly exhibits the external appearances, and the microscope reveals not only these, but the more minute and delicate internal structure, it is inadequate to faithfully show the full capabilities and manifold uses of this noble instrument.

Something more is needed. The earnest educator is not content to stop here but desires a more satisfactory arrangement to illustrate microscopic objects, something that will not only enlarge the views, but will enable an audience to see them simultaneously. Can not some of your numerous inventors devise an instrument to be attached to the stereopticon, to subserve this important purpose by projecting upon a screen a greatly magnified image of any transparent specimen which has been prepared for the microscope, in the same manner that the stereopticon exhibits the photograph. J. G. M.

Philadelphia, Pa.

Opaque Glue.

MESSRS. EDITORS:—I see, page 39, a recipe of a correspondent for making opaque glue, which is as injurious to the glue as the bone dust proposed for that purpose in a former number. Bone dust being gritty and not uniting with the glue, spoils it entirely. I find by analyzing a specimen of very white opaque glue of excellent quality, that the white substance is nothing but carbonate of lime very finely divided, probably introduced in the form of the so-called Paris white. I find in trying the mixture of this substance with glue, that it has two effects beneficial to the manufacturer: first, in giving a dark colored glue a lighter shade and thus presenting an appearance of a higher priced article, and, second, in adding to the weight of the glue by the addition of a substance only about one tenth of its value. The beauty of this adulteration is that the sticking qualities—which are of course the only ones the consumer cares for—are not in the least deteriorated, but on the contrary seem improved.

P. H. VANDER WEYDE, M. D.

New York city.

Western Archæology.

MESSRS. EDITORS:—Your reference in No. 1, current volume, to the researches of Dr. W. De Hass, in the rich mound field in Illinois demands a more lengthy notice. These explorations are the most important and extensive yet made in the West. They promise results of the utmost value to the science of archæology. Dr. De Hass has prosecuted these researches with great zeal and industry. His present field of operation is one of the most extensive in the United States. It incloses several groups of mounds numbering in all over 200, arranged with system, care, and judgment. The mounds have been regarded by some scientific men as natural, but these investigations have determined beyond a doubt their artificial character.

The relics of art discovered are numerous and interesting, and embrace a great variety of stone implements, weapons, and ornaments. Among them are some of an agricultural type, unlike any similar implements discovered in this country or Europe. These prove that the original occupants of the fine alluvial opposite St. Louis were agricultural as well as hunters and fishermen. These implements, of which quite a number have been secured from mounds and other ancient depositories, and the adjacent plains, are of flint. Two types prevail, one from five to fifteen inches in length and three to four inches in breadth; the other shaped like our domestic hoe. These are well and artistically made. The cutting edges of all show fine polish by attrition in the soil. One of them which I have examined is of a fine variety of quartz almost approaching chalcedony.

These early inhabitants of the West had attained great proficiency in working stone. The fictile art also flourished in much perfection, among them. They manufactured a great variety of utensils. They were all hand-made and generally sun-dried.

The collection of relics from mounds made by Dr. De Hass, is very extensive, and is a valuable acquisition to the archæological collections of this country.

Agricultural Machinery for South America.

MESSRS. EDITORS.—Our farmers in this part of the world are not satisfied with either the Sickle Cradle, Reaping machine, or Header; but they want a machine which will thrash, winnow, and bag the grain at one operation.

We have some of Mr. Fowler's agricultural machinery here; some of them are on the two engine arrangement, each having the power of self-propulsion. They move over the headlands one on either side of the land under operation; the plow being pulled alternately back and forth by the engines which are 14-horse power each. I am told there are similar machines used in Australia, but worked by horses. We want, in this case, a machine which can be worked by such engines as above mentioned.

I think no land could be imagined more suitable for the use of agricultural machinery than this country. The surface is slightly undulated with hardly a break to interrupt the rapid progress of the implement. The climate is also very favorable to produce abundant wheat crops. But the greatest advantage perhaps we have here is that the berry gets quite seasoned in the fields, so that it can go at once into the elevator without the risk of heating.

I presume that taking into consideration what has been said about our farmers, the engines, the machines in Australia, the climate, the formation of surface, and the seasoning of the berry, you will have a very clear idea of what we require here.

If you can inform me through your valuable paper or otherwise, of any similar machine already invented, or present the idea to your inventors for consideration, you would confer upon us here a favor and open a market for your manufacturers. THOS. THOMAS.

Rosario, Argentine Republic,
South America.

Boiler Foaming.

MESSRS. EDITORS:—Please find inclosed our subscription for renewal. We find your paper of invaluable service, and do not think we can too highly appreciate its known merits, containing, as it does, many valuable suggestions of no small importance to our business. We beg to lay before you one of our troubles, in the hope and belief you may aid us.

We have two boilers horizontally set, having each two fifteen-inch flues and connected by a steam cylinder or cross pipe about fifteen feet from the front of the boiler. From the center of this, or from a point over the space between the boilers, rises a pipe with a safety valve attached and a branch pipe leading steam to an engine cylinder twelve by twenty-four inches making eighty revolutions, placed eighty feet from the boiler, and having a very regular motion.

From the end of the cross pipe over the boilers leads a steam pipe of the same diameter as the other—two and a half inches, to a steam cylinder of the same dimensions, twelve by twenty-four inches—placed ninety feet from the boiler, and making one hundred and fifty revolutions per minute. The steam or leading pipe in both cases being boxed and packed with sawdust to prevent radiation of the heat and condensation of the steam.

These are the conditions; now for the facts. The first engine works water occasionally, three or four times a day; but stopping the engine will stop this trouble for some time; but the other—that at ninety feet distance—works water from the boilers in such quantities as to make the engine almost useless and this whether the water is high or low in the boilers. Water comes out freely from the exhaust pipe even when the lower gage barely shows water in the boiler, and water blows out also from the safety valve in large quantities even when the upper gage cocks are perfectly dry.

We have always used water from one source, an open well, the water of which is also used for drinking purposes; it appears to be clear spring water.

[From the statements given above we should judge that the water was changeable, as the overflow is intermittent. Another point for consideration is that the steam is taken off from the boiler at about over the first bridge wall, the hottest point, or where steam is made most rapidly; hence the water is carried up with the steam mechanically. If the cross connection or steam drum was placed immediately over the front end of the boiler or some eight feet further back than its present position, we think the condition of the steam would be improved and no water would be carried off with it. A float of wood or metal suspended in the boiler would probably be effectual in preventing foaming. It should be some two inches less in diameter than the diameter of the boiler at the water line. It should be secured by wires directly within the connections, the wires being of sufficient length to allow it to float on the surface of the water on the line of the lower gage cock.—EDS.

How to get the Right Shape of the Moldboard of a Plow.

MESSRS. EDITORS:—Many years ago I used to run a cast-iron plow that "wouldn't scour" through the mucky soil of our western prairies. I had to carry along a wooden paddle for cleaning off at the end of each furrow, and I found the moldboard encumbered with a coating of dirt varying in thickness, but assuming curvilinear concave and convex lines that were always the same in the same soil. The thought occurred to me, that if the plow had been shaped like this clod of dirt upon it, it would have scoured, and saved me the trouble of carrying the "spatula"

Let the plow maker make any kind of rough plow; take it to the kind of soil adapted to his market, and run a furrow; then mold his patterns from this, with the dirt on and I think he will "get a fit." C. B.

Lyons, Iowa.

TRENTON, N. J., Box 136, July 20, 1868.

MESSRS. EDITORS:—I am a young, unmarried man, active, energetic, used to business, with good references, etc., and a cash capital of about $10,000.

I would be glad of an opportunity to purchase whole or part interest in a really good thing. If, therefore, you ever give me a list of your patents, and such information as I may ask for, I shall be obliged to you, and shall be ready to make a fair offer, if anything suits. Yours, etc.,

WM. H. HIGBEE.

[The proprietors of this paper don't engage in the sale of patents, therefore the above writer cannot be accommodated at this office. We presume, however, that some one of our 35,000 subscribers has a patent he is willing to part with for ten thousand dollars.—EDS.

How to Engineer a Claim through Congress.

The Washington correspondent of the *Cincinnati Times* says:

"Another widow lady has been pressing her claims before Congress, and has also been successful. Her name is Martha M. Jones, and she is the administratrix of Samuel J. Jones, her husband, who obtained a patent some years ago for an improvement in zinc paint, which patent his widow desires to have extended. She is possessed of indomitable perseverance, is good-looking, intelligent, and highly educated. She stated her own case to the House Committee on Patents, and the bill she was interested in passed the House and went to the Senate. She knew if it was not attended to quickly, it would go over to the next session, and perhaps might not be acted upon for a year or two. Consequently, on Wednesday afternoon, she took a position in the marble room, and sending her card to various Senators, succeeded in gaining an interview with each one, for as one would come out to converse with her she would request him to send out another, and in this way she stated her case to all personally. She was a lady of winning ways, and worked upon the susceptibilities of the grave and dignified Senators till she succeeded in gaining all in her favor except Senator Willey of West Virginia, who stoutly opposed the bill. He was alone in his glory, however, for when the vote came to be taken he was the only one opposed, while all the rest were in favor of the bill, which of course passed, and the lady went on her way rejoicing. In the course of the debate Senator Willey 'twitted' his fellow Senators for being captivated with the intelligence and vivacity of the lady who had so eloquently pleaded her own case, which little piece of sarcasm caused quite a laugh among the 'the grave and dignified' legislators, all of whom 'acknowledged the corn,' and Reverdy Johnson frankly admitted that he felt a great admiration for the lady. The most amusing part of the debate was Senator Willey's effort to prove inconsistency upon the lady in her statements before the Patent Committee, of which Willey is a member. In her written statement she set forth that her beloved husband, Samuel Jones, was deeply distressed in mind one night, and could not sleep. About midnight he jumped up, exclaiming, 'I have it! I've got it!' meaning he had solved the problem of his invention. She begged him to come to bed, but he walked the floor all night, and in the morning made a practical test of his invention, which succeeded even beyond his expectations. This was all very pretty, but Senator Willey insisted upon it there was a material discrepancy in the statement, inasmuch as the Samuel Jones aforesaid had applied for and obtained a patent in England for the same invention two years before this affecting incident occurred. It was no use talking, however, against the appeals of a good-looking and interesting widow; so the worthy senator had all the opposition to himself, and came off 'second best.'"

TELEGRAPH LINES.—In the report upon the Universal Exposition of Paris, prepared by M. Neumann, in the name of the Austrian Commission, it is shown that the telegraphic lines of the whole world have a total length of 47,255 geographical miles. There are in Europe 8,000 telegraph offices, and 4,000 in the other continents. No less than 1,300,000 hundred weights of metal have been used for the conducting wires, and the expenses of establishing all the lines are estimated at nearly $42,000,000.

AURORA WORKS THE TELEGRAPH.—During the recent displays of the magnetic storm, or Aurora Borealis, which was an object of wonder and admiration, the telegraph operators at Valparaiso and Fort Wayne, Indiana, curious to test its effect in working telegraph lines, disconnected the batteries from the line and put in ground wires, when they got magnetism sufficient to work the instruments quite well, enabling them to communicate with each other.

THERE will be another concession of prices for dispatches over the Atlantic cable after the 1st of September. The rate will then be $12 50 in gold for ten words between any part of Great Britain, and New England and New York.

THE AMERICAN CERVUS.

We are in receipt of a copy of an interesting paper read before the Ottawa Academy of Natural Sciences, May 21, 1868, by Hon. J. D. Caton, late Chief Justice of Illinois, upon the different species of Cervus in America. Dr. Caton remarks that "having had considerable facilities for the last six or eight years to make careful observations upon the common or Virginia deer and the Wapiti deer or elk, he has yet made but a beginning in the observations necessary to an exhaustive scientific comprehension of the subject. From this we may appreciate how great is the work to be done before the scientific world shall have accomplished the task of laying before mankind a full knowledge of the quadrupeds of America.

"The most approved work we now have on this subject is that by Audubon and Bachman. They accomplished, perhaps all they promised—that is, a clasification of the quadrupeds, with a few anecdotes of the most important to amuse us. Wherever they have attempted to go beyond this, (at least in the cases of the two species named,) they have fallen into many errors, some of which, it will be necessary to notice and correct.

"The most marked difference in physiology between the deer and the elk is found in the coat or outer covering of hair. The deer, unlike most other animals, sheds its coat twice a year; and it is a little remarkable that Audubon and Bachman have neglected to mention this interesting characteristic, which is so well understood by every frontiersman, and must have been well known to them. In the spring, about the time other quadrupeds shed their winter coats, the common deer is divested of the costume of heavy, tubular hairs which has protected it through the winter season, which is succeeded by a thin, rufus colored coat, much firmer, shorter, and more solid than the one of which it has just been divested. As he parts with his winter coat, his fat also leaves him. He has less spirit and vivacity, is more solitary in his habits, and altogether seems to be in poor health. These characteristics are observed while he continues to wear his red coat, as it is called. This is not confined to either sex or any age, but is universal, as well with those which have been emasculated as to the perfect animal. It is not attributable to the parturition of the female or the growth of the horns of the male. It is observed equally with the wild deer of the forest and those partially domesticated in parks.

"The characteristics of the hair of the elk are almost identical with that of the deer, but the most striking distinction between the elk and the deer is the fact that while the latter has two coats a year, as already described, the former, like most other quadrupeds, has but one peelage. The fawn of the elk, however, which, when young, has a spotted coat, something like the fawn of the deer, though much less brilliant and beautiful, when about three months old, like the fawn of the deer, sheds this more ornamental coat, and takes on one of the hue which he is always after to wear, except that it grows a shade darker each year, until it is two or three years old.

"Until very recently the horns of the cervine group have been supposed to be distinguished from those of other ruminants by two striking characteristics: first, that the horn is perfectly solid; and second, that it is deciduous. It has been recently proved by Mr. A. D. Bartlett, superintendent of the Gardens of the Zoological Society of London, that we have in this country, an intermediate link between the solid horned and the hollow horned ruminants. This is the Prongbuck, or Rocky Mountain Antelope, of which I have hitherto been able to procure but one specimen for my parks, which I unfortunately lost after about six months, and before I had time to make those careful observations upon it which are necessary to a proper comprehension of the subject. This beautiful animal has long been known to have a hollow horn, but Mr. Bartlett, by observations upon the buck in the Society's gardens, discovered that the membrane between the shell of the horn and the core, at the proper season. commences to grow, lifting the shell from its seat, until finally it drops off, leaving the pith covered with a thick vascular membrane, coated with a coarse hair, not indeed at all resembling the soft, delicate velvet on the growing horn of the Cervus family, still precisely answering to it. This membrane continues to grow until finally it matures into a new and perfect shell, becoming divested of its coat of hair and vascular appearance. In London the horns were dropped on the 7th of November. Probably in their native wilds this operation is deferred until the spring, else the frosts of winter would destroy the new growing horn.

"From some cause, not yet thoroughly investigated, there is great diversity among the deer as to the time of shedding the horn, ranging from the first of December to the first of March. It is not so with the elk. They all shed during the month of April, or as soon as they are able to crop a little fresh vegetation, when the new horn immediately commences its growth, scarcely three days elapsing before it has made a suitable start. About the same time, also, the horn of the deer commences its growth. The description of the progress of the one will answer for that of the other, only the horn of the elk usually matures, so far as to disengage the velvet, a few weeks earlier than that of the deer.

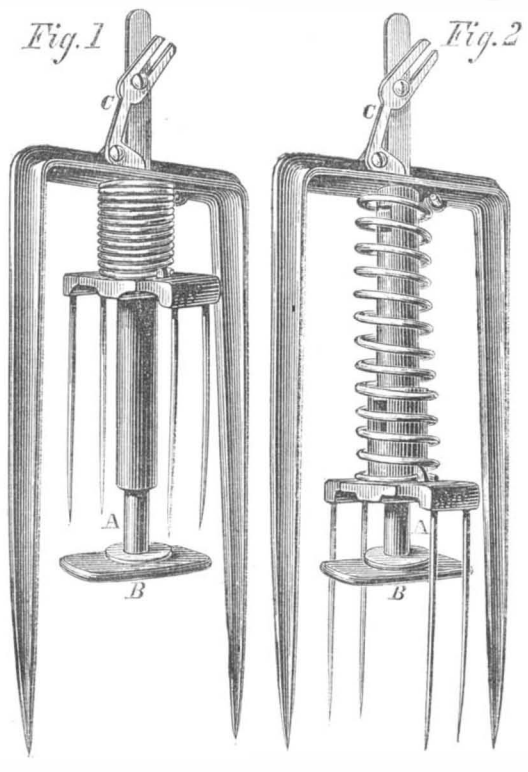
In both species the first horn appears when they are about one year old, and usually the first horn is what is called a spike—that is, it has no prong or antler. In specimens which are dropped early in the season, the first horn attains a considerable size, and so far matures as to shed the velvet before winter sets in, and, in some cases, more commonly with the elk, a prong puts out, frequently four or five inches in length. Judge Caton states that the number of branches upon the horns of the deer are not an index to his age as has been supposed. He also disputes the assertion of Audubon and Bachman, that the castration of a buck will preserve his horns for many years, and that when they are finally dropped there is no subsequent growth. On the contrary if the operation be performed on either species when the horn has become hard, whether immediately after the velvet is shed or in midwinter, invariably the horns drop off within thirty days, and the seat of the horn remains naked till the following spring, when a new horn commences its growth at the same time that the growth of the horn commences on the perfect animal.

We have not space to notice in detail many other interesting facts contained in this paper. We will however add the remarks of Judge Caton in regard to the splendid elk which was presented by him to the Commissioners of the Central Park, New York, and which attracts such universal attention from visitors.

"When I presented him to the Commissioners his head was ornamented with two large protuberances two and a half inches in diameter, covered over with points, some of them nearly one inch long, while on one side two shafts projected nearly four inches long, and on the other was one not more than five inches long. What changes have taken place with this interesting specimen since, I do not know, but I am sure it would have been an interesting study for a naturalist to have watched them carefully. This specimen was exceedingly domestic, docile and playful, and was never happier than when two or three children were hanging about his neck, scratching his head or smoothing down his soft, glossy coat. He would never allow me to take a stroll by myself in the park. Yet he was ever a welcome companion; although, if I sat down in the deep shades of the glen to enjoy the silent solitude and the perfume of the wild flowers, he was soon searching my pockets for a bit of cake or a crust of bread, or a nubbin of corn. I have seen him but once since, and then at a distance, for the gentlemen in gray uniforms would not allow me to approach the fence for a near interview with my old pet, but he still remembered my voice at a distance of sixty feet, and came as near to me as the enclosure would allow. I know not if two years and a half of separation have destroyed his taste for human society. It is to be regretted that his fitness and manifest fondness for it could not have been more indulged than is probably practicable where he now is. It may be I did Billy a great wrong in sending him to the Metropolis, where his many excellences, I fear, have not been duly appreciated."

POLLEY'S PATENT MOLE TRAP.

It is a common belief among gardeners and farmers that the mole is destructive to seeds and the roots of growing plants, at least they claim with more show of truth, that his burrows admit water to the roots, which rots and destroys them. The inventor of the trap here shown believes he has secured a perfect preventive to the mole's devastations by the utter destruction of the animal.



It consists of a fork supporting between its tines the operative device; this is simply a fixed inner tube forming part of the cross bar of the fork, over which slides a shorter tube having a cross piece attached to its bottom containing a number of points or spikes for transfixing the animal. A spiral spring, bearing at one end on the cross piece and at the other against the inside of the cross bar of the fork actuates the cross piece with the sharp spikes, sending them down with great force, when the catch which holds them in a set position is disengaged.

Traversing in the inside tube is a stem, A, having at the bottom a rest, B, that remains on the surface of the mole ridge when the trap is set, as seen in Fig. 1. This stem extends up through the top of the trap where it is connected by a sliding pin with a slot in the angular catch, C, the lower end of which is held by a similar pin in the internal pipe, and pivoted to the cross piece of the fork.

In operation the forks are pressed into the ground on each side of the mole path, and the trap set, the rest, B, remaining on the upper surface of the path. A slight pressure of the animal as he passes to or from his nest will disengage the catch and release the spring, when he will be impaled on the spikes.

Patented through the Scientific American Patent Agency, by C. Polley, May 19, 1868. Communications may be addressed to the inventor at Sinking Spring, Highland Co., Ohio, or to the manufacturers, Bell & Marlay, Hillsboro, Ohio.

The Age of Bronze.

Mr. Thomas W. Kingsmill, Sec. of the North China Branch of the Royal Asiatic Society, states that the use of bronze for cutting instruments still obtains in China and Japan. He says:

Without entering on the vexed question of whether or not there ever was a Bronze Age in any part of the world distinguished by the sole use of that metal, it is a fact that in those two countries, to the present day, in the midst of an Iron Age, bronze is in constant use for cutting instruments, either alone or in combination with steel. The principal seat of the manufacture is in the Canton province, where every schoolboy may be seen with a clasp knife made of a sort of bronze; case, spring, and blade being all made of this material. To form the cutting edge of these clasp knives, a thin piece of steel is let into the bronze blade; but knives made entirely of bronze, and occasionally ornamented and riveted with copper are not uncommon; I have met with them as far north as Shanghai. In Japan I have seen similar implements. But though the use of bronze in these countries has thus survived to the present day, there is abundant evidence that that at a former date it was much more prevalent. Thus up to the Han dynasty, about the Christian era, the ordinary coins of the country were made of brass or bronze, in imitation of knives and swords; showing, apparently, that in the earliest ages, when the use of some medium of exchange was found essential, the weapons in common use presented themselves as the readiest currency. The word in use by the Chinese for their copper, or rather bronze currency (the alloy being properly a mixture of copper, zinc, and tin), which is the only actual coin in circulation, is T'sien, a precisely similar sound to the verb "to cut;" the phonetic in the written character in both cases representing two spears. Nor is historical evidence of the prevalent use of an alloy of copper for weapons of war at an ancient date wanting. Thus Woo, the founder of the Chow dynasty, B.C. 1121, reviewed his army on the plain of Muh; in his left hand he is represented as carrying a weapon of yellow metal. Although Dr. Legge supposes this means ornamented with gold, the simpler interpretation seems the best. About the same time, among the precious articles displayed at the funeral of King Ching, we find red knives, and cloths ornamented with *foo*, explained in the "Urh-ya," a book of Confucian date, as denoting figures of axes, from the wooden handle being black when "compared with the glittering head and edge"—a comparison which seems unlikely to have suggested itself were the axes formed of iron or steel. In "The Tribute of Yu," however—a book to which a high antiquity cannot be denied, however we may differ about its authenticity—we have a glimpse at a still earlier stage of civilization; but it is strange that here, as well as at the present time, no material seems to have been in exclusive use. Among the articles of tribute from the several provinces, we find constant mention of stone arrowheads and other implements, of the three grades of metals supposed, with good reason, to be gold, silver, and copper, and, in one place, of iron and steel. I have once or twice seen in China socketed bronze weapons, like the Celts' of Europe, stated to be very ancient, but have only succeeded in obtaining one as yet. I have seen no stone axes, though possibly the present scepter of official authority derives its traditional shape from the Stone Age.

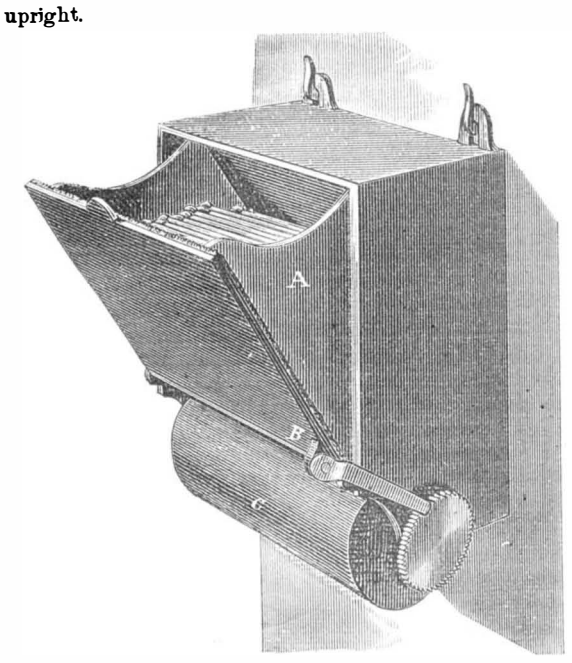
Manufacturing Ozone on a Large Scale.

We mentioned, page 38, that one of Wilde's electro-magnetic machines is used in a large sugar refinery. It indeed bleaches the sirup, but does this not by the direct power of the electric current but by the formation of ozone, which is a most powerful bleaching agent; being, according to Faraday, oxygen in a peculiar, active condition, or according to Bunsen a compound of hydrogen with 3 or 5 atoms of oxygen, in which compound, following a universal chemical law, the oxygen is very loosely combined and enters more readily into new combinations than simply uncombined oxygen. The apparatus is made by a steam engine of 15 H. P. The coils are four feet high, ten inches thick, and contain each thirty pounds of copper wire. The armature makes not less than 15,000 revolutions in a minute, and the light produced is so strong that the unprotected eye cannot look at it; concentrated with a lens at a distance it ignites combustible substances like sunlight, and the heat may be felt at a distance of one hundred and fifty feet. The working expense, including that of the steam engine, is said to be from fifteen to sixteen cents per hour. In Manchester it is successfully used for photographing at night. Such a powerful source of electricity, producing a large quantity of ozone from the moist atmosphere can be used for many other manufacturing purposes. Besides ozone is a powerful disinfectant, and such a machine may be useful in places inhabited by a great number of persons, as hospitals, asylums, and the like.

THE MARYLAND INSTITUTE EXHIBITION.—The Twenty-first annual exhibition of the Maryland Institute for the promotion of Science and Art, will be held at Baltimore in October next. The spacious Institute building has been refitted and will be used for the display. These exhibitions have always been very successful, and the coming one will no doubt sustain their former reputation. See advertisement in another column.

HOYT'S PATENT MATCH BOX.

Match safes are not always correctly designated; some of them are not safe. Beyond this, some of them are not handy in using, and hold so few matches that they require very frequent replenishing. Matches have become so much a common necessity and so cheap that we use them without a thought as to their value—except when we are deprived of them—when one or two matches under some circumstances are worth almost their weight in silver. But when matches are plenty many are wasted for want of a proper frictional surface on which they may be ignited. The little device shown in the engraving is designed to obviate these difficulties. It can be hung against the wall or secured to anything upright.



The match receptacle, A, is pivoted at B to the body of the safe, opened by means of a thumb piece at the top of the lid, and closed by a spring concealed inside. When the thumb or finger releases the lid after opening, the spring promptly shuts it. The outward and inward action of the lid partially rotates a roller, C, at the bottom of the device, coated with quartz or emery, and turned by a pawl attached to the lid and a ratchet on the axis of the roller. This partial rotation presents perpetually a new surface to the end of the match for igniting purposes. The receptacle may be made large enough to contain the contents of several boxes of matches, and the roller will last for years with constant use without re-covering.

The patent for this improvement was issued June 31st, 1868, through the Scientific American Patent Agency, to Alfred Hoyt, and all communications on the subject should be addressed to him at 199 East 26th street, New York city.

The Torpedo Trade of Long Island.

Few people, even of those residing where the work is carried on, have any adequate idea of the extent to which the business of torpedo making (not the contrivances which blow up ships, but the little explosive pellets which delight the souls of children) is prosecuted in the town of Southold, L. I. During the past month, preliminary to the great national holiday, which is always a season of extreme activity in the torpedo trade, the steamer *Escort* has taken to New York, on almost every trip, a large number of barrels packed full of torpedoes, put up in packages of one hundred. On several occasions she has had on board, shipped by makers in Greenport and Southold village, over 10,000,000.

It is estimated, says the *Greenport Watchman*, that the total number manufactured in the town during the past year is between 110,000,000 and 120,000,000. They are sold to wholesale dealers, who ship them to all parts. So long as they are kept dry, torpedoes do not deteriorate by age, but, on the contrary, the volume of sound is increased. They range in price from thirty cents per thousand, or under, at which they are sometimes sacrificed by poor and needy makers, in the winter season, to forty and fifty cents in the summer. Formerly the Southern States used to be one of the best markets for the sale of torpedoes, but the war changed all that.

The manufacturers in Greenport consume annually a large amount of silver, mostly American coin, in preparing the fulminating powder which explodes the torpedo on coming in contact with any hard substance. The premium on silver, joined with the high price of alcohol, tissue paper, and other material, at one time reduced the profits of the business to so low a figure as to cause a partial suspension, but it has since improved considerably. The makers are mostly Germans, and are an industrious, frugal class, whose labor adds constantly to the wealth and prosperity of the town.

Drooping Ears of Animals.

Darwin, in his treatise on animals and plants, under domestication says:

"Our domesticated quadrupeds are all descended, so far as is known, from species having erect ears; yet few kinds can be named, of which at least one race has not drooping ears. Cats in China, horses in parts of Russia, sheep in Italy and elsewhere, the guinea pig in Germany, goats and cattle in India, rabbits, pigs, and dogs in all civilized countries, have dependent ears. With wild animals, which constantly use their ears like funnels to catch every passing sound, and especially to ascertain the direction whence it comes, there is not, as Mr. Blythe has remarked, any species with drooping ears except the elephant. Hence the incapacity to erect the ears is certainly in some manner the result of domestication; and this incapacity has been attributed by various authors to disuse, for animals protected by man are not compelled habitually to use their ears. Col. Hamilton Smith states that in ancient effigies of the dog, 'with the exception of one Egyptian instance, no sculpture of the early Grecian era produces representations of hounds with completely drooping ears; those with them half pendulous are missing in the most ancient, and this character increases, by degrees, in the works of the Roman period.' Godron has also remarked that 'the pigs of the ancient Egyptians had not their ears enlarged and pendent.' But it is remarkable that the drooping of the ears, though probably the effect of disuse, is not accompanied by any decrease in size; on the contrary, when we remember that animals so different as fancy rabbits, certain Indian breeds of the goat, our petted spaniels, bloodhounds, and other dogs, have enormously elongated ears, it would appear as if disuse actually caused an increase in length. With rabbits, the drooping of the much elongated ears has affected even the structure of the skull."

Prevention of Disease.

Dr. A. L. Wood, in the *Herald of Health*, makes the following excellent remarks upon the prevention of disease:

Disease consists in the obstruction, depression, or perversion of those vital changes and transformations throughout the system which, in their normal condition, constitute health. Disease is simply disturbed physiological or healthy action caused by non-observance or disregard of the laws which govern the human organization in respect to diet, air, exercise, rest, water, clothing, sleep, etc., and may be prevented by obedience to those laws. This being an incontrovertible fact, how necessary is it that people should understand these truths, that they may obey the laws of their being, and thus escape the penalties of their transgression. The principal means by which this knowledge must ultimately be diffused among the masses, is through the common schools—by placing Physiology and Hygiene among the principal branches of education, and thus early impressing upon the youthful mind a knowledge of himself, of the uses of the different parts of his body, and of the means which he must take to preserve its health, strength, and vitality. When this is done, sickness and premature death will rapidly diminish throughout the and; apothecary shops will not occupy, as now, the most desirable corners, and by day and by night, and on Sundays, dispense their deadly drugs to a deluded people, but will be converted into fruit stores to furnish to all who wish the purest, best, and most healthful food to nourish and strengthen "the human form divine;" doctors of all the different schools, whether regular, irregular, or defective, whether Allopathic, Homeopathic, Hydropathic, Eclectic, Botanic, Spiritual, or what not, will find their occupations "passing away" and will soon see the necessity of their learning some other trade by which to earn their bread. When Physiology and Hygiene are taught as thoroughly in our schools as Reading and Arithmetic are now, people will seldom be sick, and when they are, they will know enough to treat themselves, without the aid of doctors or drugs.

Manufacture of Artificial Diamonds.

The French publication, *La Propagation Industrielle* publishes a description by M. Caliste Saix of his method of producing colorless, colored, or black diamonds. The system is based on the principle that when a current of chlorine or of hydrochloric gas passes through cast iron in a liquid state perchloride or protochloride of iron is formed, both of which vaporize, the carbon contained in the cast iron remaining in both cases perfectly intact, because the chlorine cannot directly unite with it. The crystallization of the carbon is then within the general rule, for in a body which is dissolved and capable of crystallization, crystallization takes place each time that the dissolving agent evaporates, the size of the crystals depending always on the slowness of the operation. 1st. To obtain colorless diamonds, a current of dry chlorine must be brought to the bottom of the crucible, containing the cast iron, by means of a bent tube of china or fire-clay. No organic coloring matter resists the action of chlorine, so that the perchloride of iron in evaporating leaves the carbon to become a colorless crystal. 2dly. When it is desired to give the crystal a blue, green, pink, or yellow tint it is only necessary to mix with the cast iron certain metallic oxides in sufficient quantity, such as those of chromium, cobalt, and others, or their salts, which will give these colors. 3dly. To obtain black diamonds, hydrochloric gas must be brought to the bottom of the crucible in the same manner as for colored or colorless diamonds. Protochloride of iron will be formed, which is volatile, but in this case the carbon will remain black, in consequence of the presence of hydrogen. This explains the fact of all diamonds having the same chemical and mineral properties, and why in nature the black diamond is found in the greatest quantity, because its formation in alluvial soils requires only the presence of sulphuric acid and marine salt, whereas the others require the presence of particular oxides which are often wanting. To obtain all these varieties of diamonds special furnaces are not necessary; the crucibles must be covered to prevent the oxidization of the cast iron, which might change the carbon into carbonic oxide, and diminish, in consequence, the yield of the operation; these crucibles should be provided with a small tube, reaching outside the furnace, which will enable the chlorides resulting from the reaction to be gathered. When the liquid cast iron has been almost completely evaporated out of the crucibles, the diamonds can be removed without disturbing the crucibles, and by means of solvents any cast iron which might be adhering to them can be removed; the operation of cutting will thus be shortened for there will be no more oxidized particles to remove, and the crucible will be ready for a fresh operation. According to M. de Saix one kilogramme of cast iron will yield at least sixty grammes of diamonds. The cost price of the colorless diamonds will be about 20f. per sixty grammes, which, at the current price, would be 75,000f. The cost of the black diamonds will be under 5f. per sixty grammes, representing a value of 14,200f.

PIERCE'S DEVICE FOR FASTENING UMBRELLA COVERINGS.

The covering of umbrella and parasol frames is usually secured at the tip of the stay rod by sewing, which is not always neat and seldom effectual, the umbrella often giving

Fig. 1

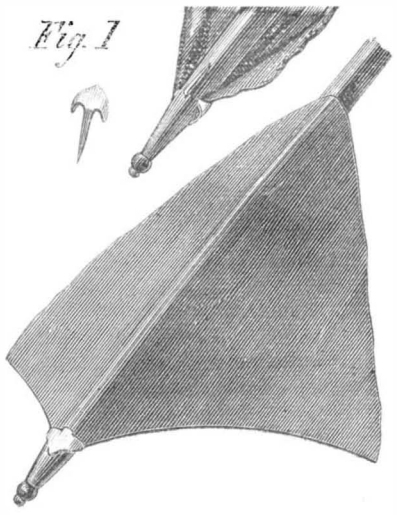
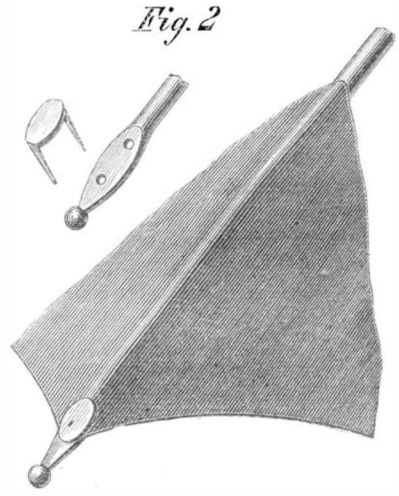


Fig. 2



out at this point before being otherwise much worn. The object of the little device herewith illustrated is to afford a cheap, secure, and ornamental fastening of the covering to the tips of the stay rods. It is of two forms; Fig. 1 showing a clasp with one point passing through the covering and the rod and clinched on the inside. Fig. 2 gives a more elaborate form of the stay with two points, both passing through the material of the covering and the rod, which is flattened for ease of workmanship. When in place the clasp presents an elegant appearance on the outside, as it may be silvered or lacquered to any color to suit the shade of the cover.

The patent was issued to G. Willis Pierce, June 16th, 1868, who may be addressed Box 10, P.O., Charlestown, Mass.

Curious Incident.

A very pretty and curious incident illustrative of the reasoning powers possessed by inferior animals, recently occurred in the case of a canary bird. The door of the bird's cage was occasionally left open, that he might enjoy the freedom of the room. One day he happened to light upon the mantle shelf whereon was a mirror. Here was a new discovery of the most profound interest. He gazed long and curiously at himself, and came to the conclusion that he had found a mate. Going back to his cage he selected a seed from its box, and brought it in its bill as an offering to the stranger. In vain the canary exerted himself to make his new found friend partake, and becoming weary of that, tried another tack. Stepping back a few inches from the glass, he poured forth his sweetest notes, pausing now and then for a reply. None came, and moody and disgusted he flew back to his perch, hanging his head in shame and silence for the rest of the day, and although the door was repeatedly left open, he refused to come out again.

Alaska.

Humboldt tells us that in Siberia, as for example at Yakoutsk, lat. 62½° N., at Bosgolowsk, lat. 60°, N., the soil remains continually frozen to a great depth, the surface only thawing in summer to the extent of three or four feet. In one case diggings were carried down 350 feet without passing through the frost. Now, as nearly one half of our recently acquired possessions of Alaska are situated above the latitude of 60°, it becomes an interesting question whether the soil is not a mass of perpetual ice, like the Siberian lands. If so our miners will have a tough time of it in digging for precious metals, sinking wells, etc.

MELTED alum mixed with burr stone reduced to the consistency of sand, is the cement used for filling holes in burr stones. If the holes are large coarse pieces of burr stone may be used at first, finishing with the finer material.

ALGEBRA—MATHEMATICS FOR MECHANICS.

Horace Greeley, in his "Recollections of a Busy Life," says of one of the schools which he attended in early life, that "he was glad that algebra had not been introduced into it to clog the brains and occupy the time of pupils which might otherwise be better employed."

This remark, published in a medium having so large a circulation as the *New York Ledger*, will reach the eyes of thousands of young men, and may, perhaps, be the means of creating in them a distaste for this important branch of mathematics. It is a common error with men whose attention has been long fixed upon any particular field of mental effort, to disparage, and under estimate the value of any branch of science which does not immediately bear upon their favorite pursuits. We can readily appreciate Mr. Greeley's views upon the subject of algebra when we call to mind that his life has been elevated to the study of political, agricultural, historical, and statistical science, and those collateral subjects immediately connected therewith.

To advise any young man at the outset of his career, not to look to anything higher than mediocrity in his profession or occupation, would be evil counsel. To teach him that the means of distinction, approved by the experience of all the eminent men in that profession are over estimated, and are to be neglected by him, is equivalent to just that advice. Mechanics and chemistry are the main motors in the machinery of modern civilization and progress, and algebra and geometry can no more be dispensed with in the acquisition of a proper knowledge of mechanics in the present state of that science, than a knowledge of the English language could be in the acquisition of that kind of information which is Mr. Greeley's *forte*. In fact, the symbolic language of algebra needs first to be mastered before the student can read the standard text books which relate to mechanical subjects.

We do not intend to here attempt the demonstration of the value of algebra, as applied to the study of mechanics, or to show in what way algebraic language, on account of its symplicity and power, aids in the attainment of a true conception of the laws of nature. It is enough that the fact is sustained by universal experience.

The age in which uneducated genius could achieve distinction in engineering is past. A Trevethick or a Stevenson would, in this age, as surely remain in obscurity as they arrived at eminence in the past, and no young man who has an ambition to become anything more than a mere operative can afford to neglect study, especially the sister studies of geometry and algebra. It is true that there is "no royal road" to knowledge, and that the aid of a good instructor can remove many difficulties; yet these sciences can be, and have been mastered by young men unable to procure the aid of competent teachers, and in hours which are too often devoted by young mechanics to frivolous and unprofitable amusements. The writer has, in his own experience, to attribute as much of whatever success he has been able to reach to an early knowledge of geometry and algebra as to any other cause—a knowledge attained in spite of its exclusion from the very poor educational facilities afforded by just such a school as Mr. Greeley describes.

AMERICAN MECHANICS ABROAD---THE HAVRE EXHIBITION.

A correspondent of the *New York World* gives some of his views of the marine exhibition at Havre, France, from which it appears that but for the contributions from the United States and Great Britain, the marine portion of the show would be rather insignificant. Among the American contributions are Massey's leakage alarm gage and his boat-detatching apparatus. A description with illustrations of the first may be found on page 249, Vol. xvi, SCIENTIFIC AMERICAN, and of the other on page 260 of the same volume. Both had been thoroughly tested in actual use in this country before being exhibited in France, and with the most satisfactory results. The *World's* correspondent says:

"One of the most interesting and useful articles of its kind exhibited here is also an American invention, known as Massey's leakage alarm gage. This article is a most valuable appendage to any vessel, for it is important to know betimes that the vessel in which some hundreds of passengers are sailing is leaking, and it is very much to know that something is going wrong as early as possible then. The sooner the better, as there is the most hope of a remedy, if it is possible one can be applied. It is valuable in a small vessel as well as a large one, for though there be only a few lives on board they are precious. In this apparatus a float is actuated by the water in the hold, and its movements are indicated by a pointer on a dial face, which is graduated from one foot up to as many feet as is desirable. As the water rises from a leakage the float is elevated, and with each degree the hand moves and a bell is automatically rung The warning is thus made audible as well as visible, and even in actual distress, when the pumps are set to work in earnest, there is a certainty in the knowledge thus afforded of whether human effort or the adverse element is gaining the victory, and which assurance cannot be otherwise than of the highest value, either as an encouragement to continue exertions or as a paramount indication of the necessity of quitting the wreck at all hazards. This is, as we said, a valuable invention, and worthy of an American brain. A French attempt to develop the same idea is a century behind it in detail.

The same parties exhibit Massey's boat-detatching apparatus, which for its simplicity and certainty of action, and the benefits derived from its use in time of peril enabled the Congressional Committee to place it at the head of the list of forty-eight competitors. Forty-three were thrown out together, and of the five remaining Massey's was classed first."

Chlorine for Rats.

A correspondent of the *Turf, Field and Farm* gives the following: "At the commencement of this season I had a number of very choice and valuable pigeons in a large loft situated over a coach-house and stable. The flooring was very old, and numerous rat holes communicated with the space under the flooring and above the ceiling of the stabling below. Attracted by the corn, the rats came and took possession of this space. My choicest birds were eaten alive by these most carnivorous of the rodentia. I was in despair. I had tried poison, traps, etc., with only partial benefit, and I had serious thoughts of selling off my stock of Columbidæ and taking to eagle owls, bull terriers, skunks, opossums, or some animals to which rats are not obnoxious. At last, after deep cogitation, I determined to try a chemical remedy—namely, chlorine, a gas so potent and destructive to animal life that I knew that, if I could apply it advantageously, it must necessarily prove effectual Fortunately, it is much heavier than atmospheric air, so there was every probability of its flowing down the holes if it once entered into them. I therefore took a Florence oil flask, adapted a piece of glass tubing to its mouth by means of a perforated cork, and to the glass added a short length of india-rubber tubing. In the flask I put an ounce of manganese and an equal weight of common salt, poured on a wineglass of water, and then added gradually an equal quantity of strong oil of vitriol (sulphuric acid). The cork and tubes being adjusted, the apparatus was ready for action. A spirit lamp applied to the flask liberated a stream of chlorine, a gas which, if breathed, except when diluted with many thousand times its bulk of air, is absolutely irrespirable.

"All the rats' holes having been covered over, one after another was opened, the india-rubber tube introduced, and a stream of Chlorine directed down each. The space between the floor and ceiling must have been filled with a mixture of chlorine and air that no could have breathed and lived. Since that time I have seen no rats. Old and young have alike disappeared. Should a stray adventurer make his appearance I shall repeat my inexpensive remedy, and am now congratulating myself on having, for the present at least, extirpated the enemy.

"I would suggest that in those instances in which crickets, ants, cockroaches, etc,, are concealed in places where they are difficult of dislodgment, the chlorine treatment might be applicable.

"I am aware that the weak odor of chlorine given out by chloride of lime has been successfully employed in driving away insects; but no animals of any kind could withstand the action of the gas liberated in quantity as I have described. I may state that chlorine is prepared with equal readiness from a mixture of manganese and hydrochloric acid (spirits of salts), salt not being required when this acid is used. It may also be liberated in large quantity without the necessity of applying heat, by pouring any acid on chloride of lime; but in this case the evolution of gas is sudden and unmanageable, so that the plan is not as well suited for the purpose as either of those in which manganese is used."

Bees in Mexico and Honduras.

The famed bees of Olancho are kept round the farms houses in hives, which are only hollow logs of wood which the swarm has occupied in a wild state, which is cut off and suspended in the corridors of houses with a hide thong, a small hole at one end giving ingress and egress. The honey of this bee is contained in little bags or bottles, two inches in length, ranged in rows along the hive; but the cells for the young occupy the central parts. Fourteen distinct species of the apis are known in Olancho, one of which (*oljoveritas*) makes a small nest, or hive, of capsules, with a waxy covering like isinglass, filled with a delicious fluid generally used in medicine. From Wells' Notes we judge this last species of apis is the same as that producing the fine honey of the Island of Jamaica, which never cloys, and is of such aromatic flavor as to be in special demand for presents to Europe, and that the common domestications in the *parials* of Honduras appear to be the same as the Yucatan *apis* or *angelitos* mentioned by Humboldt, and nearly agree with that described at large in Beechey's California Voyage of 1824-7, known in science as *melipona beecheei*, and brought by the California Admiral from the vicinity of San Blas to England, a hive of which was presented to the great Swiss aparian, Huber, in 1828.

These bees are smaller than ours, and the hives contain a smaller number of the insects; but the Mexican insect, which is stingless, is raised with very little trouble, and all the honey can be taken out twice in the summer without disturbing the bees, as they are widely separated from the brood cells and honey sacks or bottles, and the active little workers continue on in their labors as if nothing had happened. The Mexican bee masters assert that their species have a sentinel always placed over the entrance of each hive, which is relieved every few hours, to keep a lookout for the armies of black ants, their worst enemies. Several of the hives of the Angel bees were carried to San Francisco from Mexico, in 1853, but we know not what was done with them, though bee swarms were then selling from a $100 to $200 a piece.

NEW METHOD OF CHARGING RETORTS IN GAS WORKS.—A machine has been invented in England by which a large system of retorts may be charged by a number of scoops operating at the same instant. The plan has been practically tried at the Alliance Gas Works in Dublin, and it is well spoken of. A new retort house has been built capable of working 300 tons of coal in a day, and containing 270 double retorts, or 540 mouth pieces, the charging and discharging of which is done by two of these machines.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

BOGUS GOLD DUST.—Mr. H. M. Raynor, manufacturer and dealer in platinum, 748 Broadway, New York, has kindly submitted to us a specimen of counterfeit gold dust, made from grains of platinum, coated with gold or bronze. He has taken from Mr. H. G Torrey (son of the Chief Assayer) at the United States office, Wall street, some 500 ounces within four months. For a year and a half past, small parcels have occasionally been offered for coinage at the office, and been examined and their character detected by the experienced assistant, Mr. Charles Graham. The grains are small and flattish, an excellent imitation, seeming to be made by crushing or stamping the cuttings or scrap platinum under heavy mill power. It is alloyed with copper and a small amount of silver. The coating when gold is not at once removed by aqua regia, requiring to be boiled for an hour or more. The analysis by Dr. John Torrey, gives 60 to 65 per cent platinum, A banker in Kansas City, was recently victimized to the amount of $6,000 (gold) for a lot of 300 ounces, which as platinum was not worth over eight or nine hundred dollars (gold). It is surmised that this counterfeit finds its way into this country from France, *via* Mexican ports. Its appearance being so perfect as to deceive experts, the greatest care will be necessary to avoid imposition.

MINERAL WEALTH OF NEW HAMPSHIRE. Professor Hitchcock, of Amherst College, in a recentlecture expressed the opinion that the mineral wealth of New Hampshire was fully equal to any of the New England States. The results obtained by the use of Stevens' flux in working for gold were alluded to, and its use commended. He also alluded to the silver in Gardner's mountain, and to the soapstone, limestone, tin, lead and other minerals of the State. He stated that there was copper enough in Gardner's Mountain to supply the United States for 200 years, the vein being five miles long and 200 feet in depth.

A special train ran from Pittsburgh to Chicago, over the Pittsburgh, Fort Wayne & Chicago Railroad in twelve hours, on the 10th inst. The distance is 468 miles.

A factory 500 feet long, and estimated to need 3,000,000 bricks in its walls, is now being built at Suncook, N H. The iron tubes employed to carry water to its wheels are one set five feet nine inches, and the other six feet and two inches in diameter.

PETROLEUM IN SWEDEN.—Shafts are sunk on the Osmund Mountain in Sweden for the working of certain petroleum springs which have been discovered. A depth has been reached of 238 feet. The materials dug out are impregnated with that species of petroleum known in America as surface oil, and which is of a deeper color than that generally used in Europe. It has been determined that the boring shall be carried to 600 feet, where the real petroleum is presumed to lie in great abundance.

An exchange suggests that the alkalies contained in the waters of the western wastes in the vicinity of Bridgers Pass, might be utilized in the manufacture of soap. These waters are so alkaline that in order to wash in them the skin has to be protected by a coating of grease which is converted into a species of soap during the operation.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the most prominent home and foreign patents.

TABLE FOR COMPRESSES.—Henry A. Burr, Brooklyn, N. Y.—The nature of this invention consists in so constructing and arranging the table or platen of a compress, that with it cotton and other goods that have been previously pressed or put up in bales, can be again compressed without removing the hoops or bands of the bales.

ROAD SCRAPER.—E. B. Driskell, Paris, Ill.—This invention is an improved road scraper which can be operated more conveniently and is cheaper and more simple in construction than those in common use.

LOW WATER REPORTER.—Lorenzo Fulton, Edinburg, Ind.—The object of this invention is to furnish a simple, cheap, and accurately operating device which will indicate the fall of the water below its proper and safe level in the boiler, and which will also indicate the careening of the boat to such a degree as to improperly heat the sides of the boiler, and which, besides sounding an alarm at the time, will correctly record the fact that an alarm was given by means of a dial index and marking pencil.

SPARK ARRESTER.—James C. Rhodes, Stillwater, Minn.—This invention has for its object to furnish a neat, simple, and effective device for attachment to draft orifices of stoves, furnaces, heaters, etc. to prevent the sparks from snapping out and setting fire to the carpet or house.

WAGON BRAKE.—William B. Morgan and J. H. Terrell, Antioch, Ind.—This invention has for its object to improve the construction of wagon brakes so as to adapt them for use with different kinds of loads.

DRAIN PLOW.—Phillip Ballard, Texas, Ohio.—This invention has for its object to furnish an improved plow for opening tile drains, which shall be simple in construction and effective in operation.

TOBBACO BOXES, ETC.—George M. Bull, New Baltimore, N. Y.—This invention has for its object to improve the construction of round or oval tobacco boxes, spectacle cases, etc., in such a way that they may have no sharp corners, edges, or projections to cut or wear the pocket of the person carrying them.

ATTACHING CARRIAGE TOPS TO THE RAILS OR BODIES.—Wm. Horrocks, Poughkeepsie, N. Y,—This invention relates to the manner of securing the carriage slat irons to the rails or bodies of carriages and consists in pivoting each slat separately to a disk or knob by a separate pin or pivot.

MOWING AND REAPING MACHINE.—Wm. O. Harrison, Chittenden, Vt.—This invention relates to the manner of operating the cutter bar of a mowing or reaping machine without the use of a pitman connection, and consists chiefly in hinging the finger bar to a revolving shaft which carries at its end a crank pin, that works in a slotted projection of the cutter bar and that imparts the desired reciprocating motion to the said cutter bar, in whatever position the finger bar may stand.

COMBINED SQUARE PLUMB AND LEVEL.—A. F. Ward, Marietta, Ohio.—This invention consists, first, in providing in the main portion of the body of the frame conical sockets, and providing the swinging frame with corresponding conical projections fitted to the said sockets, and a bolt and thumb nut, whereby a more durable and reliable axial joint is formed for the same; second, in forming the metal frame in two parts and providing them with the recesses for the glasses, one on each part; and, third, in the manner of fastening the protractor.

SAW SHARPENING MACHINE.—Hymen Clendenen, Beverly, Ohio.—This invention relates to a machine for filing or sharpening saws, and it consists in a novel construction and arrangement of parts, whereby the desired work may be done with the greatest facility and accuracy.

GAME TABLE.—Wm. Keil, Hastings, Minn.—This invention consists of a circular table having a conical center, and a raised rim around the edge between which and the base of the conical center is an annular groove divided into sections. In the center of the table a hollow stud is arranged having a concave recess in the top and a plunger running through it, which may be raised by a series of levers suspended from the underside of the table in radial positions, the outer ends projecting through the rim of the table sufficiently to be operated by the fingers of the players. The top of the table is provided with several circular rows of vertical pins at regularly recurring distances from the center, each row having the same number, the pins of every alternate row being set in the same radial line. In the second row of pins, each alternate pin is enlarged and provided with conical recesses.

SUPPORTING STOVE PIPES.—G. W. Bradford, Brooklyn, N. Y.—This invention relates to a means for supporting stovepipes, and is designed to supersede the pieces of wire which are now used for such purpose, and are wrapped around the pipe one or more times previous to having their ends connected to the ceiling or other fixture. Those exclusive wire supports do not have a very neat appearance and besides they are very liable to be shifted in position.

STEAM VALVE.—R. A. Filkins, North Adams, Mass.—This invention relates to a steam valve which is so arranged that it can easily be worked up and down with perfect ease, while it closes the ports perfectly steam and air tight. The invention consists of a plug or valve which is made of two sections fitted around a tapering stem that is smallest at its lower end, and of two fingers grooved between the sections. The fingers catch under a shoulder of the stem; but when the valve is on its seat, they release the stem and allow it to be forced down between the sections so as to spread them laterally apart. The port holes will thus be most effectually closed,

WATER WHEEL.—William S. Place, Charleston, Maine.—This invention relates to a water wheel of simple construction whereby the power of the water is obtained both by impact and gravity or by a simultaneous downward and lateral pressure.

PESSARY.—C. R. Gorgas, Brooklyn, N. Y.—This invention consists of an india rubber bag or cap provided with a rubber tube, which is to be distended by a flat spiral spring when inserted into the vagina; also of an implement provided for inserting the spring within the india-rubber cap.

SELF-LOADING CART.—G. W. Whitson, Ashville, N. C.—This invention has for its object to furnish an improved cart, which shall be so constructed and arranged as to be self-loading, and which can be easily operated.

NUTMEG GRATER.—H. H. Barstow, Chicago, Ill.—This invention consists of a grating plate placed within a case and sustained by springs which press the plate against the nutmeg held between it and the top of the case. The nutmeg is affixed in a rod which passes through the case terminating in a handle by which it is actuated to and fro in the operation of grinding.

APPARATUS FOR LOADING AND UNLOADING WAGONS.—Selah S. Brewster, Manchester, Mich.—This invention consists in providing within the building used for the purpose, near the top, an axle or windlass having ropes at each end and a pulley over which a rope works, which is connected at one end to a winding-up crank shaft conveniently arranged at the side of the building near the floor, whereby the said windlass is operated to raise the box or rack from the wagon, when it may be suspended till required for use again, by fastening the crank shaft so as to hold it.

CLOCK ESCAPEMENT.—J. V. D. Patch, Brownville, Nebraska.—The object of this invention is to obtain an equable and easy action of the pallets of a clock escapement or verge, so-called, and with the minimum power and friction.

PICK AX.—John C. Conklin, Yorktown, N. Y.—The object of this invention is to provide a socket for the insertion of the handle of pick axes.

WATER WHEEL.—D. W. Case, Garden City, Minn.—This invention relates to an improvement in water wheels, and it consists in a novel arrangement of chutes and gates, whereby the gates may be readily operated, opened and closed, and rendered self-regulating when desired, so as to obtain an improved speed of the wheel.

BOLT AND RIVET HEADING MACHINE.—Wm. Melville, Paterson, N, J.—This invention relates to a machine for cutting the blanks and for forming the heads of bolts and rivets, and consists in such an arrangement and combination of dies, holders, punch, and cutter, that the desired results can be attained with simple mechanism and in a short time. The whole machine operates perfectly automatically, as, after the various parts have been adjusted for the production of certain kinds of rivets or bolts, the end of the bar has only to be inserted in the machine when it will be cut and the separated blank will be held and headed in the desired manner.

SHEEP SHEARS.—Hermann Wendt, Elizabeth, N. J.—This invention relates to the construction of sheep shears, and is an improvement on a process of construction previously patented by Hermann Wendt and Henry Seymour. The object of the present invention is to obviate the wearing of what are commonly termed the "stops," which are employed to prevent the blades of the shears from passing each other. Hitherto these stops have been formed entirely of iron, but by this improvement they are formed of steel and iron combined and in such a manner that the process of construction of Wend & Seymour, above alluded to, is not interfered with in the least. Henry Seymour & Co., 52 Beekman street, New York, assignees.

CLOTHES WASHING MACHINE.—John Phillips, Jr. Georgetown, Mo.—This invention relates to a clothes washing machine of that class in which a reciprocating rubber is employed for subjecting the clothes to the necessary pressure and rubbing action.

CLASP FOR JOINING BELTS.—Benjamin D. Randleman, Port Louisa, Iowa.—The object of this invention is to provide a simple and effective clasp for joining the ends of belts. It consists of the combination of forked and straight links with a pair of hinged plates. The links serve to provide a flexible connection for the hinged plates, which latter serve to secure the ends of the belt.

MINCING CLEAVER.—Samuel J. Tongue, Philadelphia, Pa.—This invention consists in combining a mincing knife or cutter and a cleaver in such a manner that one and the same implement may be used either in the capacity of a cleaver or a mincing knife as may be desired.

CUTLERY.—A. L Taylor, Springfield, Vt.—This invention relates to an improvement in cutlery and is more especially designed for table cutlery knives, forks, etc, The object of the invention is to avoid the difficulty attending the loosening of the handles on the tangs, which is caused chiefly by the washing of the cutlery in warm water and also to avoid the loss occasioned by the breaking and checking of the handles, a contingency of frequent occurrence when horn, bone, and ivory are used as the stock or material.

COMBINED CIDER MILL AND PRESS.—Eli Wangaman, Blairsville, Pa.—The object of this invention is to combine grinding and pressing mechanism in the same general machine whereby apples, grapes, and other fruit may be ground, and the juice of the same expressed immediately by conveying the pomace from the grinding mechanism to the pressing rollers located at some point in the frame conveniently below.

POTATO DIGGER.—Arthur Van Norman, Detroit, Mich.—This invention relates to a potato digger, and it consists in the employment of a cylindrical revolving screen provided with an internal screen, the above parts being used in connection with a scoop and a reciprocating cutter.

COOKING STOVE.—Evan O. Thomas, Jersey City, N. J.—This invention relates to a cooking and baking stove, which is provided in the oven with a suspended shelf that can be rotated from the outside without requiring the oven to be opened. The above is of oval shape, with a cylindrical or nearly cylindrical baking oven, which is on one end of the stove so that the crescent shaped fire-place fits around half of the oven.

SPARK ARRESTER.—A. F. Smith, Ellsworth, Maine.—This invention relates to spark arresters, to be applied to the smoke stacks of locomotives, chimneys, etc, for the purpose of preventing escape of sparks therefrom. The invention consists in the peculiar construction of the device, whereby a good or efficient draught is obtained, to ensure the escape of smoke and cinders, at the same time prevented from passing out of the device.

MACHINE FOR SPLITTING WOOD.—Leonard Tilton, Brooklyn, E. D., N. Y.—This invention relates to a machine for splitting wood, and it consists in the employment of fixed cutters, a reciprocatory hopper and a vibrating bed all arranged to operate in such a manner as to effect the desired end, in an expeditious and perfect manner.

BEE HIVE.—Joseph Chase, Ripley, Ohio.—This invention relates to the manner of constructing a bee hive, whereby the contents of the hive may be readily seen, the best protected from the ravages of the moth, and the interior of the hive kept at a uniform temperature, or nearly so, being warm in winter and cool in summer.

SHEARS.—Hermann Wendt, Elizabeth, N. J.—This invention relates to an improvement in shears for general use, and it consists in forming the thumb piece of the eye or loop in the handle, through which the thumb passes in such a manner that the shears may be operated with far greater facility than hitherto; also, in a certain means, whereby the holes, through which the rivet or screw passes to hold the two parts of the shears together, may be formed by punching instead of drilling, which is now a necessity, At present rivet holes cannot be punched in consequence of the drop, which welds the steel to the malleable cast iron portions, coming in contact in its descent with the portion of the malleable cast iron through which the rivet or screw passes, and compressing or hardening said portion to such a degree as to preclude punching. This difficulty is fully obviated by this improvement.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

A. A. S., of Boston.—Why is spruce better than other woods for sound-boards? Because on account of peculiarities in its texture it is more sonorous at first and tends to become more so by use, its resinous matter probably being eliminated to some extent by continued vibration.

W. M., of Minneapolis.—What is the object of thumbing the vent while loading cannon? It is to prevent fragments of cartridge remaining in the gun, from being fanned into flame by currents of air.

E. H., of Mo.—All other things being equal the conductive power of lightning rods increase with the areas of their cross sections. Your conductors are not of the proper shape to insure the greatest efficiency, and they are not properly insulated.

L. H. S., of N. Y.—Your idea is not new and it is for many reasons impracticable.

A. F. A., of Albany, N. Y.—The water line of a vessel, in order to secure the greatest speed with the least expenditure of force, should form such a curve that the closing together of the water after displacement should tend to accelerate its motion, rather than to retard it. A water line of the shape you propose, would not admit of such acceleration.

W. A. E., of Va.—What is the object of making the hind-wheels of a wagon higher than the others? To bring the hind bolster to a level with the front one, and to raise the box so as to let the fore wheels under in turning. The question would be more to the point if you asked the reason why the fore wheels were smaller than the hind ones.

G. H. P., of N. Y.—To tin small castings, clean them and boil them with scraps of block tin in a solution of cream of tartar. To copper them, clean and dip in a solution of blue vitriol.

R. A., of Pa., says: "In your reply to J. B. F., of R. I., page 39, current volume, you say, in a suction pump the pressure of the atmosphere can raise the water about 30 feet without mechanical power; the conclusion is obvious. What do you mean by this? Will the lift pump require the necessary force to raise a column of water 30 feet high and the suction pump require no force to do the same work if the bucket is 30 feet above the water? Would it not require the same power to lift a column of water 30 feet high whether the pump is lifting or suction?" If our correspondent would read carefully the paper he would find that his inquiries are fully answered. On page 23 of the same volume to which he refers a complete answer is given to his query. Sometimes it is necessary to answer twice on the same subject to meet the demands of correspondents.

S. H. of Pa.—The increase of the pipe at the upper end would increase the flow, but to calculate the percentage of increase would take too much of our time. You should apply to a hydraulic engineer.

A. S. P., of Ohio.—After you have exhausted the air from an air-tight box, it would rise providing it was lighter than the atmosphere,—not otherwise.

C. H. H., of Mass.—We have not kept the address of the party who made the inquiry, therefore we cannot comply with your request.

J. S. M., of Me.—We are not responsible for the statement to which you refer. You will notice that it is credited to the Times' correspondent.

J. B., of Mass.—We are of the opinion that the device by which you propose to regulate the expansion and contraction of the balance wheel of a watch, possesses knowledge of a patentable character.

J. O. B., of Ohio, says that in railroad repairing much labor and money is uselessly expended in packing the gravel as closely midway between the rails as at the ends of the sleepers, where the weight and wear come. As the gravel is shaken out from under the rails the sleepers are supported mainly at the middle and the road becomes uneven.

J. B. S., of N. Y.—There is no foundation whatever for the statement that the notes of birds and insects, the rippling of brooks and waves, the sound of the wind, etc., follow the intervals of the minor scale. It is one of those assertions repeated by some by reason of some supposed authority. Every good musician, with a sharp well cultivated ear, knows that it is utterly untrue, and those familiar with the science of acoustics declare it absurd.

P. D., of Ohio, answers, in regard to the inquiry as to the cause of the variation in the watches of railroad men, that the reasons are, 1st, the want of perfect equilibrium in the balance wheel; 2d, deficient adjustment of lever fork, roller jewel, and plate; 3d, escape wheel and pallet lock too hard or too easy. He states that these defects are more common in the fine English escapements than in the American or Swiss watches. When these parts are well adjusted a watch will keep time almost under any circumstances. A thickening of the oil, which may also affect the motion, is also mentioned by this correspondent as being caused by the steam, gas, and heat to which the machinists are exposed.

P. C., of Ill.—The sample of copper you sent us was found to contain no traces of silver. Of gold there were traces, but in so small a quantity that it would not pay to take it out. There is no premium offered for the finding of a large mass of copper. Eight pounds is a very small piece.—much larger pieces are frequently sent to this market.

B. F. H., of Ind.—It is a fact known to all who have had experience in handling heavy glass tubes that they frequently break, when they have been rubbed on their interior surface. Glass tubes for steam gages should only be cleaned by washing, using hydro chloric or nitric acid, or any other substance that will clean them without the necessity of rubbing. The reason of such fracture is that the glass of these tubes is in state of great tension; the inside surface being stretched, and ready to crack when the least scratch or abrasion is made on its surface. Some standard experiments in natural philosophy illustrate and explain the same thing; for instance, the so-called Bolognese flask and Prince Rupert's glass drops, a description of which may be found in some good text book on physics.

Business and Personal.

The charge for insertion under this head is one dollar a line.

NEW PUBLICATIONS.

ENGINEER'S AND MECHANIC'S POCKET BOOK.

This valuable handbook, edited by Chas. H. Haswell, office No. 6, Bowling Green, New York, has reached its twenty-first edition. We do not hesitate to say that we have never before seen so much valuable information compressed into so small a compass. There is scarcely a subject in the entire range of mechanics, hydraulics, hydronamics, steam engineering, and the collateral sciences, that is not practically treated of, in clear and perspicuous style, without those abstract formulas and demonstrations which render larger works of no avail to the ordinary mechanic. By the use of its tables a great saving of labor and time in any kind of work in which the principles of mensuration, strength of materials, or ordinary arithmetical computation are involved can be made. Mr. Haswell brings to bear upon his work a knowledge and judgment ripened by experience, and a stock of information gathered from the best sources both in this country and in Europe. The work is bound in flexible morocco covers, with a receptacle for loose memoranda, and a clasp. It should be carried in the pocket of every mechanic. We give it our unqualified commendation.

METALLURGY OF IRON. By H. Bauerman, F.G.S. A Treatise, with an Appendix on the Martin Process for Making Steel from the Report of Abram S. Hewitt, U. S. Commissioner to the Universal Exposition at Paris, 1867. First American Edition, revised and enlarged. New York: Virtue & Yorston, 12 Dey street, and D. Van Nostrand, 192 Broadway.

This is an important addition to the stock of technical works published in this country. It embodies the latest facts, discoveries, and processes connected with the manufacture of iron and steel, and should be in the hands of every person interested in the subject, as well as in all technical and scientific libraries.

THE CRACK SHOT, or the Young Rifleman's Complete Guide, being a treatise on the use of the rifle, with rudimentary and finishing lessons, including a full description of the latest improved breech-loading weapons, profusely illustrated, and containing rules and regulations for target practice, and directions for hunting game found in the United States and British Provinces, has just been issued by W. A. Townsend & Adams, New York. It will find a welcome place in the knapsacks of many sportsmen who at this season are exchanging the dust and noise of the city for sylvan shades and forest sports.

The ECLECTIC MAGAZINE for August is at hand, with its usual amount of rich literary entertainment. The elegant portrait of Hiram Powers, with which it is embellished, is by no means the least of its many attractions. E. R. Pelton, publisher, 108 Fulton street, New York.

ATLANTIC MONTHLY.—Ticknor & Fields, Boston. August number just out. For sale by all news dealers.

PATENT OFFICE ILLUSTRATIONS.—We are indebted to Messrs E. R. Jewett & Co., publishers, Buffalo, for advance sheets of the Patent Office illustrations from 62,847 to 64,986. This brings the work up to May, 1867.

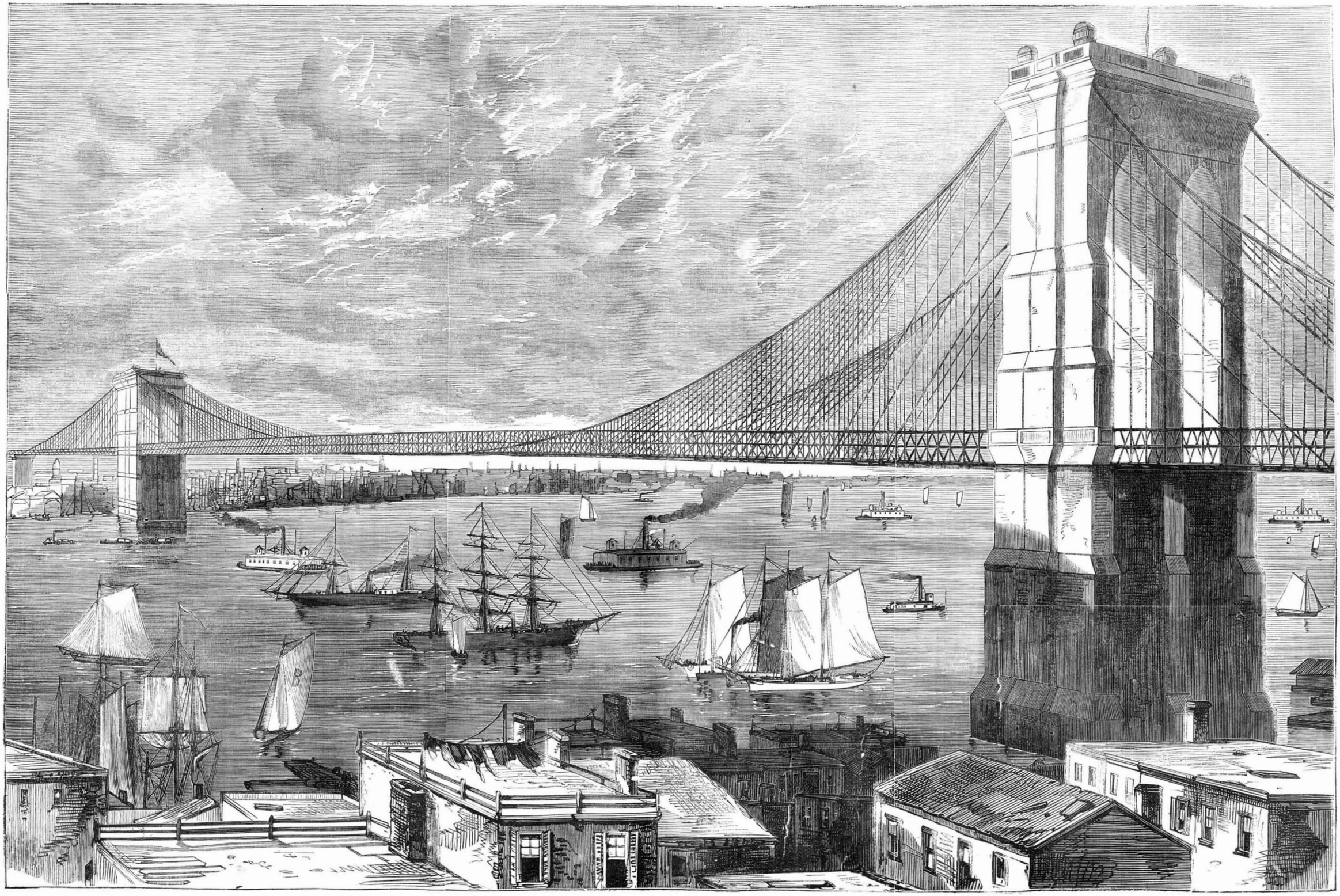
The sixth number of the WORKSHOP is received. We should do violence to our sense of the sterling merit of this publication did we fail to heartily commend it to all lovers of art. The splendid engraving of the Pulpit of the Church of Santa Croce, Florence, by Benedetto da Majano, and its accompanying description, are alone worth the price of the number. Published by E. Steiger, 17 North William street, New York.

EXTENSION NOTICES.

John Ross, of Brooklyn, N. Y., administrator of the estate of Charles Ross, deceased, having petitioned for the extension of a patent granted to the said Charles Ross the 17th day of October, 1854, for an improvement in grinding surface in mills, for seven years from the expiration of said patent, which takes place on the 17th day of October, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 28th day of September next.

Abigail L. Webster, of Binghamton, N. Y., administratrix of the estate of Benjamin B. Webster, deceased, having petitioned for the extension of a patent granted to the said Benjamin B. Webster the 3d day of October, 1854, for an improvement in musketo curtains, for seven years from the expiration of said patent, which takes place on the 3d day of October, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 21st day of September next.

Samuel Van Syckel, of Titusville, Pa., having petitioned for the extension of a patent granted to him the 31st day of October, 1854, and reissued the 9th day of June, 1868, for an improvement in grate bars, for seven years from the expiration of said patent, which takes place on the 31st day of October 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 12th day of October next.



PROPOSED SUSPENSION BRIDGE ACROSS THE EAST RIVER, NEW YORK. [SEE PAGE 90.]

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York
☞ "The New York News Company," 8 Spruce street.
☞ Messrs. Sampson, Low, Son & Marston, Booksellers, Crown Building, 188 Fleet street, London, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XIX., No. 6....[NEW SERIES.].... *Twenty-third Year.*

NEW YORK, WEDNESDAY, AUGUST 5, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

INSTRUCTION AND AMUSEMENT COMBINED.

Within a few years the business of toy making has assumed considerable proportions in this country; and it is not strange, considering the utilitarian character of our people, that the style of toys made should be different from those made by poor Caleb in Dickens' "Cricket on the Hearth." Our toys are either artistic or mechanical—perhaps both. Certainly they are incomparably above our imported toys, especially when they simulate life. They are not repulsive exaggerations, nor caricatures, but life like Even our dolls are pleasant to look at; almost instinct with life. All our toy representations of animal life are of a similar character. This taste, this striving after the actual, even in these little things, as some would call them, is very encouraging. Our young derive their knowledge of the world from things rather than from their representatives, words, and first impressions are lasting. Toys during the period of childhood are their constant companions, and from them, as models of the real, they derive their only actual knowledge. For this reason their toys should be reasonable.

But in mechanical toys particularly the Americans excel. Walking dolls, running steamboats, fire engines, carriages, etc., with many other similar contrivances, worked by simple clock work and driven by a coiled spring are both common and cheap. Some of them beautifully illustrate mechanical movements and may be made a means of instructing children in the principles of mechanics, while at the same time amusing them. The same may be said of chemical toys which illustrate some of the most important principles of chemical science.

But we think there is room for still further attempts, and successful, in this direction. It seems strange that the simplest of machines—the steam engine—has not been presented to the public as a toy. Miniature steam engines are common enough; but they are usually more than necessarily elaborate in finish and therefore costly in price. They are built either by amateurs as specimens of their mechanical skill and regarded as curiosities, or constructed by machinists or model makers to fill orders from educational institutions to be used to illustrate problems in natural philosophy. The amount of finish put upon these miniature specimens places them beyond the reach of the mass, or the vagaries of their builders in adopting unheard-of plans for their engines deprives them of practical use as means of instruction. Beside this, many otherwise sensible people believe that the steam engine with its necessary boiler is simply another form of a gunpowder magazine, ready at the touch of a match to blow their house into "flinders" and themselves into eternity. Perhaps the discussions in the SCIENTIFIC AMERICAN in regard to steam boiler explosions and the records of accidents in our daily papers conduce to this feeling of insecurity. But really a toy steam engine standing on the table or the mantel and running at lightning speed is much less dangerous than a common kerosene lamp.

Probably few machines are simpler in principle or easier in construction than the steam engine Of course a large machine, with all its appurtenances and its exactions, appears to be complicated, and it is so in one way; the larger the engine the more accurate must be the fit and working of the parts to hedge in and control the subtile element of steam. But a small engine, such as would be appropriate as a toy, may be built by the most ordinary mechanic; and it may be made plain, light, and cheap. The mechanic who shall introduce this as one of our mechanical toys may be assured of a handsome return for his outlay, while the public will be gainers in a familiarity with what is now thought by many to be a mechanical mystery and a dreadful agent of evil.

ENCKE'S COMET.

This celebrated comet is now expected to make its appearance again, and it is not improbable that it will be observed before this article is printed. As it will probably be much talked about, a few words in regard to it may not be uninteresting to our readers. Encke's comet was discovered by the astronomer Pons, at Marseilles, in 1818. Encke, however, was the first to calculate its elliptical elements, and hence his name has been given to it. One of the results of Encke's calculations was to establish its identity with the comets observed in 1786, 1795, and 1805. After its observation by Pons, Nov. 26, 1818, it remained in view until 1819, since which time it has been regularly observed at each return. Its period is approximately three and one fourth years. It can rarely be seen by the naked eye, and it then appears as a star of the fifth or sixth magnitude, exhibiting, under favorable circumstances, a faint nebulosity.

This comet is remarkable not only on account of its periodicity—many comets having no periods—but also on account of the fact that its period is shorter than any other known periodical comet. It also exhibits a peculiarity in its motion which has given rise to much speculation. Observation has shown that its period is constantly diminishing, at the rate of about two hours and a half for each revolution. A similar retardation has been discovered in the motion of other comets having short periods. It is argued from this fact that the orbits of these bodies are constantly shortening, and that they are gradually approaching nearer to the sun, upon the surface of which they must ultimately fall. The cause for this retardation is attributed to a medium existing in the interplanetary spaces, of such tenuity that it does not perceptibly affect the motions of the denser heavenly bodies, but which opposes resistance to the attenuated masses of comets, the amount of resistance being assumed to increase with the square of the velocity of the moving body. Herschel and many others have dissented from this hypothesis, and have attributed the retardation of its motion to the gradual loss of its tail. However, it has only twice been observed to present the appearance of a tail. In 1805 it was observed by Prof. Huth, of Frankfort, when it exhibited a tail three degrees in length. In 1848 Professor Bond, at Cambridge, also observed a tail extending toward the sun. It appeared like a faint brush of light. This discovery attracted great attention, as it is very unusual for comets to exhibit any appearance of a tail in the direction of the sun. Some weeks afterward another tail was discovered extending from the sun, also very faint and about two degrees in length, the one first discovered still remaining visible. The same peculiarity was also presented in the appearance of the comet discovered in December, 1823. The projection of the tails of comets toward the sun completely upset many ingenious hypotheses which were supposed to approximately account for both the material and the direction of these singular appendages, and after ages of observation and speculation we are still in the dark as to the real nature of cometary matter. It is probable, however, that the spectroscope will hereafter be used to great purpose in the solution of this problem. Indeed some facts have been already added to the former stock by its use, although nothing has been attained that can be considered a sufficient basis for a complete and satisfactory theory.

The orbit of Encke's comet lies wholly within that of Jupiter, and it performs nearly four revolutions to one of that planet. Its frequent proximity to the planets of our system, and its small relative weight, give rise to marked perturbations in its motions, which have furnished valuable data for the determination of the masses of those bodies. By the use of these data important corrections have been made in previous computations of the respective masses of Jupiter and Mercury.

The observation of this comet has confirmed the truth of the assertions of Hevelius and Newton, that the volumes of comets contract as they approach the sun, and enlarge as they recede from it. This is accounted for by the supposition that the heat of the sun disperses the exterior portions until they become invisible from their extreme attenuation. As the comets pass into colder regions, the reverse takes place.

We have said that the period of Encke's comet is shorter than any other known. The comet of 1264 is supposed to have the longest period of any known, it being over three hundred years, making some allowances for imperfect data and calculations. The distance traveled by one of these bodies in such a period, flitting through the heavens at rates far exceeding any other of the heavenly bodies, is beyond all human conception. What wide and obscure regions are visited by them after they have disappeared from human observation, to what unknown systems and mysteries of space they penetrate, must forever remain a subject of doubt and speculation to the human mind. We may in a future article say something in regard to other remarkable comets, and the hypotheses to which we have alluded.

SHOULD THE PATENT LAWS BE EXTENDED TO HORTICULTURE.

Under the above caption the *The Horticulturist* discusses the value of the Patent Laws and suggests an extension of their benefits so that they may do for the farmer, the florist, and the horticulturist what they have already done for the mechanic. Our cotemporary says, let there be, in connection with the Agricultural Bureau, an office of record, where the name, character, quality, description, etc., of new varieties of fruit and grain, originating in this country, shall be entered and secured to the originator. Let specimens be sent to trustworthy correspondents of the bureau in various sections of the country, so that its value for general cultivation may be determined. Let the result thus arrived at be publicly announced under authority of the bureau, and the right to vend the article be vested in the originator and his licensees for a term of years. Something of this kind would wonderfully stimulate to continued improvement in the production of choice varieties of plants and grains to the great advantage and profit of the country. While it would secure to the originator the just reward of his skill and labor, it would protect the public from the thousand impositions now put upon them by the venders of new varieties of untried and doubtful value. As this business is now conducted, we have no hesitation in asserting that many thousands of dollars are annually thrown away in the purchase and planting of fruits, for example, which, however valuable they may have proved in their original locality, are totally unprofitable and useless for cultivation in other sections under an altered condition of soil and climate.

We know of many instances where other deserving horticulturists and agriculturists, who have devoted their best years to the public good, have had only their labor for their pains; other persons, to whom they have sent specimens of their plants, in various sections, to test their value, having stepped in to rob them of their reward. Every year the nurserymen of the country are mulcted in large sums of money for the purchase of new and professedly valuable plants, which too often prove of little or no value. These being sent out at extortionate prices, for general cultivation, and failing to answer the expectations excited by the glowing descriptions published of their merits, tend to discourage cultivators and bring the profession of Horticulture into disrepute. Were some such system adopted as we have suggested, however, the honest experimenter would be protected in the product of his labor, and the prices of new plants would be set at a more reasonable figure, so as to be within the reach of all, because the originator would, instead of, as now, being compelled to realize his profits out of his first season's sales, be secured in their enjoyment for a term of years.

We know it may be urged that such a provision as this has never yet been incorporated into the Patent Laws of any nation; but of its necessity, its justice, there can be no question. As the United States, by its greater liberality to inventors, has stimulated the arts and sciences, and added to the industrial wealth and resources of the people more than any other government in the world, let it go one step farther and by judicious legislation, stimulate the husbandman to take rank among the highest order of productive agents, and elevate and dignify that profession which, however much lauded by poets and extolled by politicians as an ennobling one, has heretofore been of the earth, quite too earthy.

THOUGHT AND EXPRESSION.

The eyes have been called "the windows of the soul." They are not only windows, but they and all the other organs of sense are doors by which impressions and ideas obtain ingress to the mind. The organs of speech, the hands, the muscles of expression, and the eyes, are the doors through which thought passes out of one mind to enter another. The perfection of these mind-valves has, probably, as much to do with what is commonly called mental vigor as quality of brain or its size. We think in language, and the more limited our language, the more limited must be our thinking power.

It is not essential to thought, however, that we should think in language of our own. We may think, in the language of another, thoughts which our limited means of expression are inadequate to utter. This is the case with mutes who possess the sense of hearing. They know and think in a language which they cannot speak. The same is true of animals to a very limited extent. If the mind of man were only accessible through such channels as that possessed by the dog, and if his means of expression were equally limited, it may well be doubted, whether the texture of his brain would enable him to exhibit higher mental manifestations than that animal.

It is possible that in the search for the causes of man's mental superiority to animals, too much stress has been laid upon the differences in the constitution of the brain, and too little attention has been paid to the effect upon mental development produced by his vastly superior physical organization.

We once heard an eminent professor, in a lecture upon the brain, make the statement, that the proportion of gray vesicular nerve matter which is found upon the surface of the white substance which forms the largest portion of the mass of the brain, was an index of the intelligence of animals, and that as the depth of the convolutions upon the brain increased its surface, such animals as possessed deeply convoluted brains would be found to possess a higher degree of sagacity than those having brains of more even surface. As an instance, he mentioned the horse, and declared that on account of his deeply convoluted brain, he possessed greater intelligence than any other animal.

We think the majority of our readers will hardly believe that the horse is more intelligent than the dog, or the elephant. We feel certain, however, that a dog will express such ideas as his limited powers permit with greater facility than the horse. As to how far physical organization influences mental manifestations, it is difficult to say, but that it it has more effect than is usually attributed to it seems probable.

MEASUREMENT OF HIGH TEMPERATURES.

We have lately received several communications requesting information in regard to the best means of measuring high temperatures in kilns and furnaces. We reply to these queries, that Daniell's Pyrometer is undoubtedly the best instrument for the purpose. The well-known Wedgewood's Py-

rometer was the first used, and its operation depends upon the fact that clay, when highly heated, parts with some of the water which it always contains, and new chemical combinations take place which result in its permanent contraction. Wedgewood assumed this contraction to be in a ratio to the degree of heat employed, but this has been found by subsequent experiments to be erroneous. The amount of contraction corresponds to the time the clay is exposed, rather than to the degree of heat, and is found to vary also with the character of the clay used.

Daniell's Pyrometer consists of a bar of platinum inclosed in a sheath of black lead (graphite). The expansion of the platinum is indicated on a graduated arc. From the known rate of the expansion of platinum, the degree of heat may be computed. Platinum expands .000884 of its entire length from 32° Fah., to 212° Fah. It will be sufficiently accurate for ordinary purposes, to consider the rate of expansion as having the same ratio to the increase of heat for high temperatures, although not absolutely correct. There are other pyrometers in use, but for practical purposes we prefer Daniell's.

THE PROPOSED SUSPENSION BRIDGE BETWEEN NEW YORK AND BROOKLYN.

The islands of Manhattan and Long Island are separated by an estuary connecting the waters of Long Island Sound with those of the harbor and bay of New York. It is generally but incorrectly designated a river—the East River. The connection between the two cities is by a series of ferries, which during the most of the year afford sufficient accommodation, but when the estuary is encumbered by ice, are entirely insufficient for the convenient accommodation of the people. The The subject of a bridge between the two great and growing cities is not new, having been discussed for many years. Only lately, however, have any steps tending or looking to a decisive result been taken. A charter from the legislature, preliminary surveys, and estimates sum up the work done and exhibit the present condition of the project. The city of Brooklyn in its short-sightedness, has unwisely refused to make any appropriation for carrying forward the enterprise, and the work at present remains in abeyance. The engraving gives an excellent view of the proposed bridge, which will eventually be erected by private enterprise, even if municipal aid is not furnished. The following succinct description we copy from *Leslie's Illustrated :*

The engineer, Mr. John A. Roebling, a Prussian by birth, is a resident of Trenton, New Jersey. His reputation as a bridge builder has been established by the most successful practical illustration of his abilities in this country. Under his direction were built the suspension bridges at Niagara and that triumph of engineering skill, the bridge across the Ohio, at Cincinnati. The more stupendous enterprise in contemplation can be safely entrusted to a man whose credentials are the massive and beautiful structures already reared by his master hand.

The terminus of the bridge on the Brooklyn side, by the terms of the company's charter, must be at or near the junction of Main and Fulton streets.

The New York terminus : The Park line commences opposite the Registrar's office, on Chatham street, then crosses North William, Rose, Vandewater, Cliff, Franklin square, Cherry, Water, Front, and South; thence to the end of the end of the old Pier, No. 29, now broken down, the line continues in a straight course across the river, and passes on to the Brooklyn shore, nearly through the centre of the spare slip of the Fulton Ferry Company ; thence passing over Water, Dock, and Front ; a part of James street, near Garrison will be occupied by the Brooklyn anchorage. Leaving the anchorage, the line continues to pass over James, and then crossing York and Main streets obliquely, deflects toward Fulton. After crossing Prospect, near its intersection with Fulton, it terminates finally in the block which is bounded by Fulton, Sands, and Washington streets.

The total length will be 5,862 feet. The central, river span, will be suspended on one swing of 1,600 feet from centre to centre of tower. Those parts between the anchor-walls and the respective termini are technically called "approaches." The streets will be crossed by iron girders at such elevation as will leave them unobstructed. The iron framing forming the floor of the bridge will be 80 feet wide This will be divided into five spaces. The two outside spaces will be 15 feet feet wide between the chords, and will form a roadway for all kinds of common travel. The next spaces will be 13 feet wide. On it will be laid steel rails for running cars back and forth alternately. These cars are proposed to be operated by an endless wire rope, impelled by an engine under the flooring on the Brooklyn side. The degree of speed attainable by these cars is put at twenty miles an hour as the minimum rate. Twice that speed is declared to be perfectly practicable and safe.

The fifth division of the bridge is called in the plan proposed the "Elevated Promenade." It is intended exclusively for walkers. At each terminus, the bridge floor is widened out to 100 feet; this central promenade will be 17 feet wide. The carriage of the bridge is based upon the carriage of the Union Ferry Company. This corporation officially figures its passengers at 40,000,000 yearly. This averages 109,539 per day. It is plain at least this number can be passed over the bridge and many more.

The dimensions of the towers will be a base of 134 feet long, measuring on the water line, and a width of 56 feet in the extreme part. Below the upper cornice, at the top of the tower these dimensions will be reduced to 120 and 40 feet. One of these towers is shown well in the foreground of our picture, and the architectural details will be apparent. The elevation of the flooring of the tower will be 118 feet above high water; the height of the roofing above the floor will be 150 feet; thus the total height of the towers will be 268 feet from high water to top of roof, not including balustrade and ornamental blocks. The towers will be built hollow. The impression of the whole will be that of massiveness and strength.

The cost of the bridge will be between $6,000,000 and $7,000,000. The engineer's estimate is $6,675,357. Great as this amount, there can be no doubt that it would be advantageously and profitably applied in the construction of this grand hanging thoroughfare between the two great cities.

HYDROPHOBIA.

It is customary to regard the midsummer as tending to increase the prevalence of hydrophobia, and extra care is taken at this season to prevent danger from this cause by confining and muzzling dogs, if they are not otherwise finally and summarily disposed of. The practice of killing dogs upon the arrival of summer heat is of ancient date, and has the sanction of custom to reccommend it. Some have, however, expressed the opinion, that dogs are no more liable to attacks of rabies at this season than at any other, and no doubt there have been enough cases which have occurred in colder portions of the year to justify in some measure such an opinion. If, as has been stated, this terrible disease originates in the first instance from excitement consequent upon the ungratified sexual instinct of the male dog, it is hard to see how the excessive heat of July and August, in this latitude, could fail to aggravate such excitement, and thus assist the development of the disease.

Whatever may be its cause at the outset, its propagation by the contact of the saliva of the diseased animal with the mucous membranes, or the abraded skins of man and animals, is certain. Some have, however, been so bold as to regard the sequences of bites from rabid animals, as the result of an imagination over excited from the terror which usually accompanies such occurrences, rather than as the results of infection. We were, however, personally cognizant of a case which could not thus be accounted for. A young man of our acquaintance, upon returning to his home one evening discovered a strange cat upon the steps of his house. He playfully ordered it away, accompanying his speech with a gesture as if about to strike, upon which the cat seized and bit his hand, not, however, very severely. The next day he went about his usual business, scarcely incommoded by the wound, and without the least suspicion of the real condition of the animal, or of the terrible consequences that were to follow. Weeks after, the wound having entirely healed, and the circumstance being nearly forgotten, he suddenly manifested symptoms of hydrophobia, and died after three days of terrible agony. We deem this case as conclusive, that rabies is the consequence of infection. There may be, and undoubtedly are, cases where terror induces an hysteria, which strongly resembles genuine hydrophobia, but this is not by any means the rule in a large majority of cases. The disease is so appalling in its nature, that such terror is not to be wondered at especially among people who are unaware that the bite of a mad dog does not produce hydrophobia in more than about one in twenty-five instances. When the disease is developed, it may be regarded as fatal, good authorities inclining to the belief that in cases of supposed recovery, the disease is simulated by hysteria accompanied with tetanic symptoms.

The muzzling of dogs, by the use of a strap tightly buckled around the jaws, is a bad practice. It causes the dog a great deal of unnecessary suffering, and, by preventing him from cooling himself by thrusting out his tongue, adds greatly to any febrile condition of the body, which he may chance to be laboring under. If any muzzle at all be used, it should be one of reticulated wire, and sufficiently large to admit of his opening his mouth wide, and permit his drinking as freely as he could do without it. Such muzzles are not only safer, but more comfortable to the dog.

The only certain preventative of ill results from the bites of rabid dogs, is to cut out completely the wounded part, before the poison can be absorbed. It is recommended in order to do this quickly and thoroughly, that a stick be whittled to a shape resembling a dog's tooth, and inserted in the wound. This supports the part and renders the cutting more easy and certain. This should be followed by cauterization, either by the use of a hot iron, or some strong caustic substance.

Dogs, if they must be kept, should not be over-fed upon a stimulating diet of meat, and bones especially should not be given them, as the phosphate of lime they contain greatly stimulates the sexual instinct. Indian meal, made into a pudding, is eaten, when cold, with relish by most dogs, and used with thickened sour milk, it contains so much of what is required for the proper sustenance of the dog, that meat will be seldom required. A dog kept in this way will rarely become spontaneously rabid. A large majority of the dogs now kept are, however, a nuisance, and would be much better out of existence.

THE HORSE AND APPLIANCES FOR HIS USE.

So far as is known the earliest employment of the horse was for purposes of war. The ancient Egyptian chariot was drawn by two horses, attached to the chariot by a yoke suitably supported by straps, to which the pole of the vehicle was secured. To this harness were appended a breast strap and girth fastened to an ornamented saddle, a head stall with frontal, cheek-straps, a noseband, a bit with cheek-pieces, and reins for the guidance of the animal. The whip consisted of a wooden handle and a double thong, with a loop whereby it might be suspended from the wrist while the warrior was using his bow, the reins being often tied around the body.

It is impossible to determine when the horse was first used for riding. There is reason, however, to believe that it was at a very early period in the world's history. It is referred to in some of the most ancient books extant. Xenophon mentions a double bridle and bit in his work upon Horsemanship. One bit was smooth and flexible, the other was armed with sharp points. The original method of guiding horses was, however, by means of a cord passed through the mouth and around the lower jaw—a method still practiced to some extent, under circumstances where bits of iron cannot well be obtained. Horses were anciently ridden bare-backed, or supplied with a cloth thrown over the back.

The invention of the saddle for riding purposes has been ascribed to the Persians, but there is probably room for some doubt as to its true origin. It is not certain that it was used before the fourth century of the Christian era. The first accounts of stirrups date from the fifth century. Spurs were early used among the Romans, but their precise origin has not been ascertained. The ordinary stable equipments, including the currycomb, brush, scraper, rake, sieve, and shovel, are also of ancient origin, although they, like other things, have been much improved in their form and materials in modern times. It will be seen from these facts, that appliances for the management and use of the horse, are mostly of ancient origin. We believe there is still room for improvement in means for the more efficient use of this noble and often ill-treated animal.

DEATH OF MOSES Y. BEACH.

We record with regret the decease of Moses Y. Beach, Esq.—father of Mr. A. E. Beach, of the Scientific American—at Wallingford, Conn., July 19th, in the 69th year of his age. He was a man of generous impulses, quick perceptions, great industry, and superior ability. He was in every respect a self-made, self-educated man. At fourteen he was an orphan, and learned the trade of cabinet maker at which he worked for many years. He was one of the builders of the first stern-wheeled steamboats on the Connecticut river at Springfield, Mass.

Afterwards he became the proprietor of a paper making establishment up the North River, supplied paper to the newspapers here, which finally led to his purchase of the New York *Sun* establishment. When Mr. Beach carried on paper making one of the large items of cost was that of cutting the rags. This was done by hand, the rags being spread on benches along which ranks of women were employed, each with a large knife fastened horizontally in front across which the rags were one by one drawn. It was a slow and tedious operation. Mr. Beach very quickly overcame the difficulty by inventing a rag-cutting machine, somewhat on the principle of the straw cutter, for which he received a patent. One machine does the work of a thousand hands and this plan of cutting is now used in all paper mills.

Moses Y. Beach was extensively known throughout the country in connection with the New York *Sun* newspaper, of which he was the sole proprietor for nearly twenty-five years, and which under his administration became very popular, rising from a small edition to a circulation of over 50,000 copies, at that time the largest edition of any daily newspaper in the world. This was before the days of telegraphs, or many railroads, when the newspaper folks had to work hard to obtain news ; and the rival publishers often resorted to strategy to get ahead of each other, employing horse expressmen, steamboats, and carrier pigeons. Mr. Beach was most energetic and successful in this respect, and the *Extra Sun*, containing important intelligence, hours in advance of other newspapers, used to be a familiar cry, in the streets of New York. Mr. Beach acquired a handsome fortune and retired from business several years ago.

During the Mexican war at the request of the President he went to the City of Mexico as Commissioner to negotiate for peace. This was an exceedingly delicate and hazardous mission.

Rigorous Apprenticeship.

Few persons have looked into the lives of so many remarkable men as I have, yet I cannot call to mind one of the acknowledged kings of business who did not in early life serve a long, rigorous apprecticeship to some occupation akin to that which he afterward exercised, and in which his great success was made. All my acquaintance with business men teaches me that the fundamental secret of success is KNOWLEDGE—*real* knowledge—such knowledge as is only practically acquired by becoming practically familiar with methods and processes—such knowledge, in fact, as a man gets by taking hold of work, and doing it until he can do it easily and perfectly. I should be sorry to say any thing to disparage our institutions of learning. Nevertheless, I feel confident that an intelligent youth, who remains at school until he is sixteen or seventeen, and then apprentices himself to a good trade, can get a better education out of his shop (with an hour's study of principles in the evening) than it is possible to get in any college in existence—that is to say, a better education for *this* new and forming country, where, for at least fifty years to come, no man can hope to play a leading part, except in wielding material forces.—*Parton, in Packard's Monthly.*

THE Commissioner of Patents has refused to grant to the heirs of the late James A. Cutting an extended term of the so-called Bromine patent. Photographers will readily perceive the importance of the action of the Commissioner in this matter.

Editorial Summary.

BUTTER MAKING.—It is as easy to make sweet butter as that which is rank and offensive. Sweet cream and ordinary care in the processes of churning, working, and packing can produce but one result—good butter. One common fault is keeping the cream too long, for the sake of accumulating a sufficient quantity for a "big churning." Another is in raising the cream in a place where offensive exhalations or otherwise impure atmosphere can reach it, and another in churning in a room too warm. Sixty degrees Fahrenheit is the proper temperature for churning. Clean pans, pails, tubs, etc., are absolutely necessary to sweet butter, and one ounce of salt to one pound of butter is ample.

TRANSPARENT METAL.—From one of our German exchanges we copy a statement that a transparent metal has been discovered, the component parts of which are water-glass and copper: "It is of a deep orange hue, can be melted and cast, wrought under the hammer, and rolled. Files will not scratch it; it is translucent, and capable of being wrought into ornaments of rare beauty." Evidently a chemical canard, unworthy of serious notice.

AN exchange recommends as a preventive of the adulteration of drugs an increase of price, and claims that this would not prove burdensome to the poor, as the number of public dispensatories and the benevolence of practicing physicians, afford them ample relief. The profits on the retail drug trade are already sufficiently large, and we fail to see how its increase would affect the purity of the drugs sold. It is quite possible, also, that there are many poor people who prefer paying for what they need rather than to become the recipients of either public or private charity.

THE connection of Mobile Bay with the Mississippi River, *via* Bayou Manchac is being agitated by the citizens of Mobile. The expense of the work in order to make it practicable for large steamers is estimated at nearly $4,000,000. Only one lock will be necessary. The feeling of the citizens of Mobile as indicated in resolutions adopted at a meeting held on the 11th inst. is highly favorable to the undertaking and it is probable that it will soon be commenced.

AN examination of the statistics of death from sunstroke in the city of New York, gives the following exhibit: In August, 1853, 224 persons died from sunstroke; in 1863, there were 135 deaths from the same cause; in 1866 there were 230 deaths from sunstroke, and during the present year up to Saturday, the 18th inst, there were no less than 833 deaths from heat alone, as reported by the papers.

PROF. TYNDALL concludes his memoir of Faraday with the following beautiful tribute to his memory: "You might not credit me were I to tell you how lightly I value the honor of being Faraday's successor compared with the honor of having been Faraday's friend. His friendship was energy and inspiration, his mantle is a burden almost too heavy to be borne."

PRUSSIA has shown her determination to become a first-rate maritime power, by making an extraordinary appropriation of $7,152,374 for the year 1869, to be expended in the construction of fortifications at the sea ports she has just obtained, and in manufacturing heavy artillery and armored vessels. The amount to be expended at Kiel alone, is stated to amount to $4,411,124, or $2,514,842 more than in 1866.

THE *Courier Medicale*, of Paris contains an able article upon infant mortality. It attributes it largely to the insufficiency of bone tissue, and says that the milk of a healthy nurse ought to contain more phosphate of lime—the basis of osseous tissue—than is often the case. Scarcely one in ten women come up to the proper standard in this respect, and as a consequence infants necessarily perish or grow up sickly or deformed.

SILK MANUFACTURE.—The silk mills of Paterson, N. J., are nearly, but not quite fully busy. The season for fringes is past. Some of the mills are engaged on trains. Paterson contains the largest silk manufactories in the country, capable of making anything from threads to trimmings. Some of them are now engaged on ribbons. We propose shortly to visit these mills, and to give our readers a more extended account of the silk manufacture as at present conducted in this country.

EXPENSIVE MATERIAL FOR MODELS.—One of our correspondents from Central City, Colorado sends us, as a model of his patent for deposition in the Patent Office, a horse shoe of solid silver, beautifully finished and elegantly engraved. It is made from native metal obtained in Colorado and is a solid specimen of the treasures now being revealed by the hardy miners in that region.

THE German philosophy is beginning to re-act upon the popular taste. According to recent statistics, novels and other works of light literature are much less called for than formerly, while the demand for works upon science is largely increased.

ACCORDING to the recently issued Register of the United States Navy it appears that we have now in the navy, two hundred and twenty vessels, of which fifty-two are iron-clad.

WE are in receipt of several interesting communications upon the subject of tides. We regret that owing to the pressure of other matter we cannot make room for them.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 21, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

80,046.—BRICK KILN.—Henry W. Adams, Philadelphia, Pa.

I claim, 1st, The peculiar arrangement of the numerous and narrow heat distributing flues, y, at right angles to and in combination with the covered fire places, C C, for receiving, dividing, and conveying their heat underneath the entire bottom of the bricks, when set in the kiln to be burned, substantially as described.

2d, The air flues, H H D D, in combination with the openings, G G F F, into the fire places, C C, substantially in the manner and for the purposes set forth.

3d, The steam pipes, R S T T, in fig. 1, and passages, F F, and flues, E E, in fig. 2, in combination with the fire places, C C, for the objects indicated, and substantially in the manner shown.

4th, The arrangement of the pipes, p, o2 o2, o1 o1, o3, and o, in combination with a covered brick kiln, for exhausting the smoke and gaseous products of combustion and superheated steam, in an equal and uniform method, from all parts of the kiln, for the objects described, and substantially as represented.

5th, The use of a jet of steam to create a draft at the top or end of the brick kiln, substantially as shown and for the ends proposed.

6th, The combination and arrangement of the exhaust pipe, o, when supplied with a jet of steam, the fireplaces, C C, and with the air flues, H H D D, and with the openings, G G F F, and with the steam pipes, E E, in fig. 2, when they severally supply those vehicles of heat to the bottom of the kiln, which the steam jet, issuing from, o, pumps from its top, as herein substantially shown and described.

7th, The construction and operation of the brick kiln, substantially as shown and explained, and for the purposes set forth

80,047.—HAND-LOOM.—James Albertson, and Sample C. Byers, Richmond, Ind., assignors to James L. Haven and James L. Branson, Cincinnati, Ohio.

We claim the combination of the driving shaft, having the sprocket-wheel, B, mounted thereon, and having the batten connected thereto by pitmen, E, with the cam shaft, having the sprocket-wheel, C, and the cams, n, secured thereto, when said parts are all constructed and arranged to operate substantially as described.

80,048.—ARTIFICIAL LEATHER BELTING.—Stephen M. Allen, Woburn, Mass.

I claim, 1st, The attaching, cementing, gluing, stitching, or uniting together of sheets for artificial leather belting or banding made from pulped animal fiber, tanned or untanned, used alone or in combination with other vegetable fiber or with other further combination with resinous or gelatinous substances.

2d, Attaching, cementing, gluing, riveting, or stitching sheets or strips of artificial leather paper for belting, made from pulped animal fiber, tanned or untanned, alone or mixed in further combination with other pulped vegetable fiber, to sheets of common leather for belting, whether the sheets of leather are laid upon either one or both sides, or between sheets of artificial leather.

3d, The combination of sheets of artificial leather for belting, with sheets of leather, canvas, cloth, wood, yarn, iron, or wire, when properly attached together for the purpose, by gluing, cementing, riveting, or stitching the same.

4th, The overlapping and strengthening of joints in leather, artificial leather, or other belting, by the use of artificial leather sheets, set on and over the laps or joints in belting, by cementing, gluing, riveting, or stitching the same, substantially as within described.

5th, A belting made of pulped artificial leather, as described, by combining sheets made of the same to the other substances named, or any of them, as described, such as leather, canvas, cloth wood, yarn, iron, or wire, properly set together, in the manner and for the purposes substantially as described.

6th, The application of artificial leather paper to veneer and increase the thickness and strength of leather belting by applying the same to the softer and thinner parts of leather belting, making them of uniform thickness, and nearly non-elastic, either when applied outside or between strips of leather, and confined substantially as herein described.

80,049.—KEY-BOARD FOR TELEGRAPH INSTRUMENT.—Wm. B. Allyn, Boston, Mass.

I claim, 1st, The wheels, E, the uprights, D D, one or two to each key, the roller, H, when constructed and operating as herein shown and described.

2d, The rod, M, in combination with the arms, N, or their equivalent, substantially as described for the purpose set forth.

80,050.—MACHINE FOR SHARPENING HOP POLES.—Truman S. Angel, Watertown, N. Y

I claim a tool for sharpening sticks, stakes, and poles, consisting of the hollow frustrum of a cone, having inserted longitudinally in its shell conical rollers, and an adjustable oblique cutting knife, all constructed and arranged to operate substantially as described.

80,051.—CHRONOMETER.—Philip Bantel, New York city.

I claim, 1st, The combination of the shafts, B and O, one or both, and large gear wheel, D, said parts being constructed, as described, with the ordinary clock work of a chronometer, substantially as and for the purpose set forth.

2d, The combination of the self adjusting screw pulley, G, and stationary screw, H, with cord, C, and shaft, B, substantially as herein shown and described, and for the purpose set forth.

3d, The swiveled pulleys, I and K, in combination with the cord, C weight bar, J, and pulley, L, or its equivalent, substantially as herein shown and described, and for the purpose set forth.

80,052.—PORTABLE FENCE.—Benjamin F. Brattain, Noblesville, Ind.

I claim the yoke herein described, when the same is constructed as aforesaid, in combination with a panel of fence, the rails of which are notched, as described and for the purpose specified.

80,053.—MODE OF MULCHING STRAWBERRY BEDS.—Joseph Brett, Geneva, Ohio.

I claim the mode of mulching strawberry beds by sowing thereon the seeds of plants, the stalks or blades of which are intended to serve as mulch therefor, substantially as set forth.

80,054.—FENCE.—R. W. Brockway and Henry Frederick, Akron, Ohio.

We claim, 1st, A crooked or angular rail fence, the joint of which rests upon a bed piece, A with the uprights, C C, fastened at or near one end of the bed piece, while the long end of the bed piece projects into the hollow of the angle of the fence, substantially as shown and described.

2d, The combination of the bed pieces, A, uprights, C C, braces, G H, and stubs or legs, B B, substantially as and for the purposes set forth.

80,055.—POLE FOR VEHICLES.—Edmund D. Brown, Battle Creek, Mich.

I claim the arrangement and combination of the spring bow, C, and slotted arm braces, B, with each other and with an ordinary vehicle pole, A, substantially in the manner and for the purpose of adjustability, as set forth.

80,056.—MACHINE FOR SINKING SHAFTS.—John Dickinson Brunton, London, England. Patented in England, January 5, 1867.

I claim the construction and application of machinery of apparatus for sinking shafts and pits, and for driving or excavating tunnels, galleries, or adits, wherein one or more cutting disks are caused to revolve on their own axis or axes, such axis or axes revolving round a center, which also revolves round another fixed center, substantially as hereinbefore described.

80,057.—APPARATUS FOR DRAWING MEDALS.—Louis Christoph, Paris, France, William Hawksworth, Gartness, North Britain, and Gustavus Palmer Harding, Chiswick, England. Patented in England, April 10, 1862.

We claim the combination of the hydraulic or hydrostatic press, the collars or flanges, K G, thereof, and drawing apparatus, substantially as hereinbefore described.

80,058.—CORN PLANTER.—Z. T. Clagett, Washington, D. C.

I claim, 1st, The diagonal shaft, F, and scraper, F2, in connection with the cog wheel, E, constructed as described, the lever, O, spring, O', slide, A2, axle, D, wheels, D2, H', D1, C, and H, and also the bar, B, constructed as specified. Also, in connection with the wheels, H' and H, the support, f, with lever, K, and catch, K', and spring, T, attached, working in the manner and for the purpose described. Operating together with slide, A2, slide, R, and lever, S, arranged as and for the purpose set forth.

2d, The arrangement of the arms, L, constructed with the wheels, L2, bars, L3, wheels, M, and cranks, M1, substantially as and for the purpose set forth.

3d, The levers, Q, with cords or chains, as described, in connection with the drill teeth, P1, tube, P2, and corn coverers, P3, joined to bars, P, by a joint, as shown in drawings, and supports, U, substantially as and for the purposes set forth. In combination with lever, O, the catches, Q', arranged for the purpose set forth.

70,059.—BORING MACHINE.—A. M. Connett, Madison, Iowa.

I claim the locking sleeve B, having the inner side of its under face beveled to receive a bit, D, in combination with the arm of a bit stock, constructed to operate substantially as and for the purpose herein specified.

80,060.—THREE HORSE EQUALIZER.—Giles Cramton and Pratt A Spicer, Marshall, Mich.

We claim providing the sheave, A, with a polygonal or other suitably shaped shifting eye plug, said plug to be inserted in a position either concentric or eccentric with the equalizing rims of the sheave, and perforated with either one or all of the pivot holes, l m n, substantially as and for the purpose herein set forth.

80,061.—SHAFT COUPLING.—Wm. Crandall, Philadelphia, Pa.

I claim, 1st, A coupling, composed of two halves, connected together on one side of the shaft by bars or links, B and B', or their equivalents, and on the opposite side of the shaft by set screws or bolts, all substantially as set forth.

2d, Arranging the said bars or links, or their equivalents, nearer to the shaft than the said screws or bolts, as and for the purpose set forth.

3d, The bars, B and B', embedded in the coupling during the process of casting the same, as specified

4th, In combination with a griping coupling, set screws, F, applied to prevent the end play of the shafts, as set forth.

80,062.—CUTLERY.—Edwin Day, Chicago, Ill.

I claim the handle, B, with the tang, a, inserted therein, and having the locking recess, e, or its equivalent with the molten metal cast on them, so as to form the bolsters, m, straps, n, and the cross bar or tie, l, of greater diameter than the slit in which the tang is inserted, all at one operation, substantially as described.

80,063.—MANUFACTURE OF ICE.—R. S. Egbert, Colfax, Cal.

I claim forming artificial ice in houses or receptacles by spray, sprinkling or dropping water through a pipe or pipes, C, or vessels, pierced with holes, a a a, or their equivalents, substantially as described.

80,064.—STOCK-GUARD GATE.—W. C. Gault, Ruggles, Ohio.

I claim the weight or float, H, rope or chain, G, lever, F, and hook, I, as arranged in combination with the gate, A, substantially as and for the purpose set forth.

80,065.—FURNACE FOR ROASTING AND TREATING ORE.—R. George, Mineral Point, Wis.

I claim, 1st, An oxidizing, desulphurizing, chlorifying, and disintegrating furnace, as shown in the drawings, and detailed in the specification.

2d, A stirring machine, with all its parts, as illustrated and specified.

3d, A water and heating apparatus as illustrated, and for the purpose described.

4th, The substitution of fire-clay or porcelain tubes, or their equivalents, for the purpose of converting water into steam, and superheating the same.

5th, The cooling of the stirring machine by air, steam, or water, used separately or combined, in the manner and for the purpose as described and set forth

80,066.—VALVE COCK.—John B. Gibson, Cincinnati, Ohio.

I claim, 1st, The rubber rings, G and J, as arranged in combination with the valve, H, stem, E, and cap, D, as explained.

2d, The arrangement of stem, E, valve, H, recessed screw, N, and rubber disk, L, as and for the purpose set forth.

80,067.—HOISTING MACHINE.—Henry T. Goodling, York, Pa.

I claim the construction of a hoisting machine, arranged with a central post, B, turning cross-head, K, provided with pulleys, I, windlass, and a pivoted side lever, L, to base of post, B, combined substantially in the manner and for the purpose specified.

80,068.—MACHINE FOR CUTTING OFF NAILS.—M. Gormley, Wilna, N. Y. Antedated July 7, 1868.

I claim the shank, B, having arms, H H, flanges, C C, and opening, E, in combination with the sliding cutter, D, rods, G G, and springs, all constructed, arranged and operating substantially as and for the purpose specified.

80,069.—MACHINE FOR BENDING PIPE.—Thomas J. Harrison (assignor himself and Geo. Allin) New York city.

I claim the arrangement herein described of the formers, C C, rollers, E E, and bifucated levers, D D, on the platform, A, in the manner substantially as and for the purposes described and set forth.

80,070.—POTATO DIGGER.—Michael Henderson, Detroit, Mich.

I claim, 1st, The scoop, A, connected with the bars, J and B, provided with transverse runners, O, and openings, 4, when arranged and operating substantially as and for the purposes set forth.

2d, The cylinders, H, bars, K, and belts, I, when operated by belts, F, from pulleys, D, substantially as described, and for the purposes specified.

3d, The combination of the above named parts with frame, G, bars, K, brooms or brushes, 3, secured to endless belts, I, axle, N, and wheels, D, when constructed, arranged and operating substantially as and for the purposes set forth.

80,071.—INSOLE FOR BOOTS AND SHOES.—Robert Heneage, Buffalo, N.Y., assignor to himself and Ira R. Amsden.

I claim an insole for boots and shoes, attached or otherwise, consisting of an air-cushion or chamber with suitable attachments, as a new article of manufacture.

Also, constructing the sole with a perforated base plate, or stiffener, a, an overlying air-cushion, b, and an outer covering, c, the cushion being united with the plate by cement or glue that passes through the perforations and holds on the opposite side, the whole arranged as described, and operating substantially in the manner and for the purpose specified.

80,072.—CLAW BAR.—Michael Hennasy (assignor to himself, and John Adams) Crawford, N. J.

I claim the claw bar, B, and fulcrum, E, in combination with the claw bar, A, substantially as and for the purpose specified.

80,073.—PIANOFORTE.—Hiram Herrick, Boston, Mass.

I claim the improved arrangement of the sounding board, "the wrest-pin" block, and the bridges with respect to the iron frame and the strings, such sound-boards strings, wrest pin block, and bridges, under such an arrangement, being placed underneath the iron frame and above the strings.

Also, the combination of the two separate cases, A B, hinged together as described, with the action arranged on the lower one, and the sounding board and strings placed in the upper one as set forth.

Also, the combination of the auxiliary adjuster with the string, the tuning pin, and bridge.

Also, the improved arrangement of the tuning pins with the strings and the wrest pin block, or the same and the iron frame, the tuning-pin, under such arrangement, having its head to extend from one side of the said block, and having the string applied to the part which projects from the other side of the block, the whole being substantially as set forth.

80,074.—HORSE SHOE.—John A. Heyl (assignor to himself, and John H. Wiggins) Boston, Mass

I claim the connector, B, as described, that is as consisting of the jaws and toe and heel catches, arranged, constructed, and combined substantially in the manner and to operate with a hoof and with a shoe constructed essentially as set forth.

Also, the shoe as made or provided with toe and heel catch recesses to receive the catches of the jaws of the connector, B, constructed as described.

Also, the combination and arrangement of the standard, f, and its screw, g, with the shoe provided with toe and heel recesses to receive the connector, B, made substantially as described.

Also, the combination of the standard, f, and its screw, g, with the shoe, A, and the connector, B, made in manner and so as to operate together substantially as specified.

80,075.—APPARATUS FOR TOWING VESSELS—James Maze Kilner, Chester, England. Patented in England, April 4, 1867.

I claim, 1st, The combination and arrangement of the cleaver and its trunk with the hull of a vessel, so that the cleaver may be operated as described.

2d, The cleaver, constructed as represented in fig. 6, and as hereinbefore described.

3d, The arrangement of the tow chain, viz., so as to be fastened to a vessel near or below its keel as set forth.

4th, The combination and arrangement of the tow chain and the cleaver of a vessel to be towed, such chain being passed through and out of the cleaver as set forth.

80,076.—STOVEPIPE DRUM.—J. A. Lakin, Thompsonville, Ct.

I claim the arrangement of a number of radiating chambers, A, connected to the main pipe by means of the pipes, B and C, and operated by means of a damper, D, the parts being combined and arranged together in the manner herein shown and for the purpose set forth,

80,077.—MEASURING LUMBER.—Clement Littlefield, Kennebunk, Me.

I claim the application of logarithms to a circular movable form, with a double radius mathematically divided, so that one part works in conjunction with the other, substantially as and for the purposes specified.

80,078.—MACHINE FOR SAVING CREAM WHILE CHURNING.—Milton Love, Corry, Pa.

I claim the combination of the air chamber, a a and b b, with the inverted tunnel, d d d d, and the ring, g g, for the purposes herein mentioned.

80,079.—FLOOR CLAMP.—Frederick S. Mack, Galesburg, Ill.

I claim the arrangement of the coiled spring, H, for forcing the slide or driver, G, back, and the roller, g, for relieving the driver of friction when operated upon by the lever, F, in clamping the flooring, in the manner as herein shown and set forth.

80,080.—REFRIGERATOR.—John Martin (assignor to himself and Jacob Jamison) Philadelphia, Pa

I claim the ice-box or refrigerator, A, having the ice trough, B, arranged along its center, with an open space on each side, with the drip spout, D, located thereunder, and both connected with the reservoir, G, and having the receptacles, C, all arranged substantially as shown and described.

80,081.—MACHINE FOR PUNCHING LEATHER STRAPS FOR FLY NETS.—John Matheis, Ottawa, Ill.

I claim, 1st, The pulley, D, the brass rim, E, the hollow punches, M M, the rod, L, the pitman, J, and the crank, I, when combined with each other in a machine for punching straps for fly nets, and constructed substantially as and for the purpose described in the foregoing specification.

2d, The ratchet wheel, O, the pawl, P, the lever, Q, the rod, R, the crank, H, the pawl, S, and the eccentric, T, when combined with each other in a machine for punching leather straps for fly nets, substantially as and for the purpose described in the foregoing specification.

3d, The elastic guide, V, when applied to a machine for punching leather straps for fly nets, substantially as and for the purpose described.

80,082.—VALVE GEAR FOR STEAM HAMMERS.—F. B. Miles, (assignor to Bement & Dougherty) Philadelphia, Penn.

I claim the slotted lever, G, arranged to slide and vibrate on an adjustable fulcrum, and constructed and operating in connection with the ram of a steam hammer or with the piston rod or other reciprocating part of a steam hammer or engine, substantially as and for the purpose set forth.

80,083.—MACHINE FOR ROLLING HOES BLANKS.—S. A. Millard, Clayville, N. Y.

I claim, 1st, The construction of the projecting dies, o o, together with their arrangement on the projecting portions of the revolving rolls, B C, as described, said dies being for the purpose of spreading the blank laterally in the manner described.

2d, The construction of the projecting dies, f f, together with their arrangement on the projecting portions of the revolving rolls, B C, as described, said dies being for the purpose of spreading the blank laterally and giving form to the rib on the surface of the hoe, in the manner described.

3d, The construction of the projecting dies, t t, together with their arrangement on the revolving rolls, B C, as described, said dies being for the purpose of spreading the metal to form the ears of the hoe, in the direction and in the manner described.

4th, In combination with the rotary rolls, B C, a set of plaiting dies, m m2, constructed as specified, the whole arranged to operate as described for the purpose set forth.

5th, The employment, in combination with a set of rotary dies, of adjusting guides, arranged on the face of the roll, and operating to effect the adjustment and retention of the blank, substantially as hereinbefore described.

80,084.—ROOFING CEMENT.—J. A. Moore, Providence, R. I.

I claim the manufacture of a roofing cement, by mixing with coal tar, or other similar substance, alumina, plumbago, asbestos, carbon, silica, iron, lime, and magnesia in the proportions substantially as described, in the manner and for the purposes specified whether found in nature or prepared by art.

80,805.—APPARATUS FOR CHECKING HORSES ATTACHED TO VEHICLES.—Maurice O'Connell, Boston, Mass.

I claim the combination and arrangement of the two gears, 11, the two pinions, 2 2, the shaft, 4, the barrel, 3, the yoke, 5, and the slide, 6, as applied to the two wheels and their axle, and as provided with a chain and hook, the whole being as and for the purpose specified.

80,086.—COMPOSITION FOR COATING METALS, &c.—Bartholomew Oertly and Xaver Fendrich, Washington city, D. C.

I claim a composition for coating stone, brick, iron, or wood, or for floor tiles, or similar articles, composed of soluble glass and marble dust, substantially as described.

80,087.—SCOOPS, SHOVELS, &c.—James T. Page, Rochester, N. Y.

I claim the scoop, A, or equivalent, made from a single sheet of metal and combining with the blade, a, the tubular socket, o, at the rear, constructed and arranged as described and for the purpose specified.

80,088.—LAMP EXTINGUISHER.—James H. Prentice, Ashtabula, Ohio.

I claim, 1st, The pendulum, E, disk, b, in combination with the stem, a, yoke, D, and extinguisher, C, substantially as and for the purpose set forth.

2d, The screw pendulum, E, stem, a, and lever, K, in combination with the yoke, D, extinguisher, C, spring, I, and tube, B, substantially as and for the purpose set forth.

80,089.—CURD MILL.—William Ralph, Utica, N. Y.

I claim the box, a, cylinder, B, armed with teeth, as described and semi-circular grate bars, C, so arranged as to form the bottom of the box, A, all in combination as specified.

80,090.—HEMMER FOR SEWING MACHINE.—George Rehfuss, Philadelphia, Pa., assignor to American Button Hole, Overseaming, and Sewing Machine Company.

I claim the within described hemming device, consisting of the plate, A, and the spring, d, constructed as shown, and arranged and operating substantially as and for the purpose herein set forth.

80,091.—BEE HIVE.—S. B. Replogle, Martinsburg, Pa.

I claim, 1st, A beehive, consisting of a triangular box, having one side removeable at pleasure, and otherwise constructed substantially as described.

2d, In combination with the above described hive, the triangular comb frame, B, made of bars having their inner edges beveled from each side to the centre, as shown at fig. 3.

80,092.—DITCHING MACHINE.—W. Reynolds, Selfridge, Greensburg, Ind.

I claim, 1st, In combination with the excavator, E, the wallower or earth remover H, substantially as set forth.

2d, The combined arrangement of the gravitating frame, D, excavator, E, conducting scoop, G, wallower, H, and screen, O, with the frame, A, and windlasses, K K', Substantially in the manner and for the purpose specified

80,093.—ATTACHMENT FOR LAMP CHIMNEYS.—Patrick M. Shea, Chicopee, Mass.

I claim, 1st, the combination and arrangement of the continuous band, A, slotted at a, and having the stud, s, and thumb nut, s', fingers, f, extending outward, and small fingers, f', extending radially inward, substantially as and for the purpose specified.

2d, An attachment for the tops of lamp chimneys, composed of two or more jointed sections, B, arranged so as to be adjustable in diameter, and having projecting fingers, f, and the small fingers, f', extending radially inward substantially as set forth.

80,094.—CULTIVATOR.—J. H. Skelly (assignor to himself and J. C. Danworth), Aroma, Ill.

I claim, 1st, The beam, C, in combination with the pivot rod, E, brace, F, and arm, D the latter being arranged to swing with the beam, C, and to travel on the track, N, by means of the roller, M, substantially as shown and set forth.

2d, The combination of the beam, C, chain, c, arm, d, and the elbow lever, H I, the latter being pitoted to the arm, and having a projecting nib for locking against its top, substantially as and for the purpose set forth.

80,095.—HAY RACK—Asa T. Soule, Savannah, N. Y.

I claim the crooked bolts, c c, and pins, c' in connection with the eye bolts, d, box, A, and rack, B, substantially as and for the purpose described.

80,096.—STEAM ENGINE GOVERNOR.—Joseph H. Springer, (assignor to himself, John M. Hess, and Smith Bowen), Philadelphia Pa.

I claim, 1st, the arrangement of the regulating discharge valve, K, intermediate between the reservoir, G, and the receiver, A, and in the relations specified to the supply pipes, E, of the force pump, F, whereby the fluid or air which flows into the receiver is made to escape therefrom faster or slower than the supply, as the case may require, and pass back into the reservoir, to be used repeatedly, all substantially in the manner herein described.

2d, The arrangement of the receiver, A, with reference to the connections of the throttle valve of the engine, central hollow column, D H, intermediate valve, K, pipes, E E, valves, j j, and force pump, F, substantially as set forth.

80,097.—HORSE RAKE.—Charles Starrett, (assignor to himself and Edward Prescott), Chicago, Ill.

I claim the springs, E E, applied as shown, in combination with solid wooden blocks, D D, having each a rigid inclined face, the whole constructed and arranged to operate as and for the purpose set forth.

80,098.—MACHINE FOR CUTTING LEATHER FILLING, AND FOR OTHER PURPOSES.—Reuben C. Turner, Mendon, Mich.

I claim, 1st, The roller, E, when attached to the frame, F, in connection with the concave knives, C, plate, D, screws, B, frame, A, the rod, G, the set screws, H, and the lugs, I, when arranged and operating substantially as and for the purpose herein set forth.

2d, The spring, J, when operating as and for the purposes specified.

80,099.—KNITTING MACHINE.—Alfred John Wale, Philadelphia, Pa.

I claim the cylinder, B, with its slides and its needles, some which project outward beyond the others, in combination with supplementary thread guides, F, and cams, d, the whole being constructed, arranged and operating substantially as and for the purpose described.

80,100.—DISH CLOTH HOLDER.—James T. Walker, Albany, N. Y.

I claim the three rods, c c c, the ring, B, and grooved handle, A, in combination with the sliding rod, C, with the hook, D, and loop, E, the whole formed substantially as and in the manner shown and described for the purpose set forth.

80,101.—BALM.—Samuel Guy Wallis, Waterford, Pa.

I claim the improved magic balm, when composed of the above ingredients in the proportions above mentioned, for the purposes set forth.

80,102.—SULKY CULTIVATOR.—Isaac Welty, Olney, Ill.

I claim, 1st, In combination with the outer shovels or plows, H J, the lateral branches, H', rendered adjustable by means of the slots, h3, and bolts, b2, in the manner shown and described for the purpose set forth.

2d, The combined arrangement, with the inner shovels, G I S, of the perforations, e e', for the reception of their attaching eye bolts, g, the pulleys, n n', for the reception of their elevating ropes or chains, K, and the perforated bars, T U U, as and for the purpose specified.

80,103.—ELEVATOR.—John Westover, Taylor, Ill.

I claim, 1st, The extension arms, R1 and R2, in connection with any suitable hay rack or wagon box, when used for the purposes herein described and set forth.

2d, The combination and arrangement of the frame, A, platform, B, standards, C, provided with sheaves, D, and guide pulleys, O, the side timbers, E, pedestal, K, wheels, J, and pins, L, the shaft, F, drum, G, pawl, H, stop I, horizonal bars, M, guides, N, elevator ropes, P, and drag ropes, Q, in connection with the extention arms R1 and R2, when constructed arranged and operating substantially as described, and for the purposes herein set forth.

80,104.—HOP POLE.—James G. Wilbur, Kilburn City, Wis.

I claim, 1st, A hop pole, consisting of a stationery post, A, with removable diverging poles, B mounted in foot staples, a and held in position by cross boards, E, and pins, f and g, substantially as herein described.

2d, A hop pole, consisting of a stationery post, A with removable diverging poles, B, and removable upright pole, D, mounted in foot staples, a b, the former held in place by the cross boards, E, pins, f and g, and staple e, substantially as herein described.

80,105.—MANUFACTURE OF PAPER FOR COLLARS.—James M. Willcox, Glen Mills, Pa.

I claim the employment of strips, B, of stronger material, applied to the paper after it is couched, and while it is soft, and embedded therein by subsequent pressure, at proper distances asunder, to impart greater strength to the required parts of the articles to be cut from the sheets or rolls.

Also, locally strengthening paper for collars, by applying, either in the sheet or roll, strips of strong material, in such positions as to protect the ends of the fold.

80,106.—SCHOOL SEAT AND DESK.—L. C. Abbott, S. D. Tuttle, and M. L. Holt, Eaton, Ohio.

We claim the standard, A A, provided with grooves, substantially as described arranged in combination with seat, C, desk, F, and shelf, D, with these projections operating as and for the purpose set forth.

80,107.—AERIAL CAR.—Onofrio Abbruzzo, St. Margherita, Italy. Antedated July 15, 1868.

I claim, 1st, The reservoir, B, and pumps, a b, arranged in relation to the body, A, so as to increase or decrease the pressure of gas therein, all substantially as and for the purpose described.

2d, In arrangement with the car and safety rocket discharge, the propeller, D, mounted on the crank shaft, e, and applied to the body, A, substantially as and for the purpose described.

3d, In combination with the balloon, a breach loading rocket chamber attachment, with safety guard, substantially as and for the purpose described.

4th, The wings or oars, F, having valves, g, operated by the engine, all substantially as described, for the purpose described.

5th, The combination of the conical or acutely formed body, A, propeller, D, rocket chamber, H, and wings, F, substantially as described, for the purpose specified.

6th, An inclined parachute, arranged to co-operate with the screw or rocket, as and for the purpose specified.

80,108.—MACHINE FOR MAKING NUTS.—Edwin R. Addison, Wheeling, W. Va.

I claim, 1st, The combination of several punches herein described, and the dies on the periphery of the wheel, B, with the cavity, B1, for the discharge of the punchings, all arranged and operating substantially as described.

2d, The arrangement in a die wheel or shaft, which rotates in a vertical plane of the cavity, B1, passages, b, and dies, C c c1, all substantially as set forth.

3d, The combination of the disk, O, having a cam-periphery, o1, and a friction roller, o, the radial arms, P, notched disk, Q, and pawl, R, with the table B, substantially as and for the purpose specified.

80,109.—FASTENING FOR BOOTS AND SHOES.—Benjamin F. Allen and J. R. Ryerson, St. Albans, Me.

We claim the heel, consisting of the drum, C, the adjustable bottom, K, with the staple, d, for fastening on the heel, all constructed substantially in the manner described.

80,110.—MALT KILN TILE.—Thomas G. Arnold, New York city.

I claim cast iron malleable malt kiln tiles, having a marginal ledge and cross bars or ribs on their under sides, as a new article of manufacture, constructed substantially, as hereinbefore set forth, and for the purpose described.

80,111.—LAMP.—Lewis J. Atwood, (assignor to himself and Holmes, Booth, and Haydens), Waterbury, Conn.

I claim, 1st, The draft plate, e, formed with a flame slot and springs around its edges, in combination with a foraminous casing, that extends from said draught plate to the coupling, g, or ratchet cap, d, substantially as set forth.

2d, The coupling, g, removable from the wick tube, b, and ratchet, cap, d, in combination with the foraminous casing, f, draft plate, e, spring, i, and chimney holder, l, substantially as set forth, whereby the entire draft regulator and chimney can be removed from the wick tube or ratchet cap, and replaced as specified.

3d, The coupling, g concave clips, 5, and notch, 4, in combination with the wick tube, b, and ratchet cap, d, substantially as and for the purposes set forth.

4th, The spring hooks, l (figs. 1 and 2), receiving and sustaining the chimney, and clamping said chimney both inside and outside, in combination with the draft plate, e, and spring, i, as and for the purposes specified.

80,112.—DROPPING PLATFORM FOR HARVESTERS.—Ephraim Ball and Milton Ball, Canton Ohio., assignors to John F. Seiberling.

We claim combining a ball or rod with a tilting platform of a reaping machine, in such manner that when the front edge of the platform is elevated above the plane of the finger beam, said bail will simultaneously become elevated above the finger beam and platform, for the double purpose of arresting the falling grain and facilitating the discharge of the gravel, substantially as described.

80,113.—DRAIN PLOW.—Philip Ballard, Texas, Ohio.

I claim, 1st, The cutters, C and D, share, B, and adjustable wings, E, constructed and arranged substantially as herein shown and described, in combination with the beam, A, as and for the purpose set forth.

2d, The combination of the gage wheels, F, curved arms, G, lever, H, support, I, and curved adjusting arm or bar, J, with each other and with the beam, A, substantially as herein shown and described and for the purpose set forth.

80,114.—WASHING MACHINE.—Silas Barker, Hartford, Conn.

I claim the double wash board, G G, connected over the top of the partition, E, when constructed and operating substantially as described.

80,115.—SAW GUMMING DEVICE.—D. J. Barnett, Albion, Ind.

I claim the sam gumming device consisting of bed plate, A, bed, B, slide, C, die block, D, removable dies, E, removable slotted plates, H I, screw plates, F G, and cam, J, constructed arranged and operating substantially as represented and described.

80,116.—NUTMEG GRATER.—H. H. Barstow, Chicago, Ill.

I claim, 1st, Supporting an abraiding or grating plate, A, upon one or more springs, b, substantially as shown and described, in combination with the case, B, as and for the purpose set forth.

2d, The stem or wire, m, or other equivalent device for holding the nutmeg or article to be grated, substantially as shown and described, in combination with grater, A, springs, b, all as and for the purpose set forth.

80,117.—CAR COUPLING.—David S. Beals (assignor to himself and John J. Young), Adrian, Mich.

I claim, 1st, The combination of the hinged jaws or bars, G G H H', the spring draw bars, I J, springs, K L, and cams, M, all constructed arranged, and operating as described, for the purposes specified.

2d, The combination with the cams, M, for operating the spring couplings, G G' and H H', the arms, n n', for holding said cams in their different positions, and the pins, Q R, and cam arms, S, for returning the couplings to their closed position as the cars separate, all arranged and operating substantially as described.

3d, The buffers, D, stems, d d' thimbles, C, springs, E, and rods, F, all constructed and arranged substantially as described, and employed in combination with a self-locking car coupling, for the purpose set forth.

80,118.—PLOW.—Henry T. Beam, Palestine, Ill.

I claim, 1st, The cast iron sheth, made as shown and described, with scarfs formed thereon for the reception of the bar of the share and the land side, as seen at C and D, fig. 1, and the mold board, as seen at fig. 3, substantially as and for the purposes set forth and specified.

2d, The share as constructed by turning up a small triangular piece to the anterior part thereof, as seen at fig. 7, which is an end view of the share at 1, fig. 2, which piece forms a support, for the mold board, B, and also welding on a small triangular piece on the top of the share, as seen at r, figs. 1 and 3, which protects the anterior part of the sheth, substantially as and for the purposes shown and described.

3d, The landside formed of the part, D, of the share, and the cast iron anterior part, C, all constructed and attached as shown in figs. 1, 2, and 3, and described and for the purpose specified.

4th, The cast iron head on the front end of the beam, with its pins, m, key, n, clevis, o, and groove, t, all as shown and described and for the purposes specified.

80,119.—APPARATUS FOR CUTTING ICE.—C. Beatty and G. Beatty, Portsmouth, Va.

We claim the case, A, plane, B, spring, C, hopper, D, with cover, d, block, E, with rod, e, the whole being combined and arranged substantially as described.

80,120.—MANUFACTURE OF TILE FOR FLOORING, ETC.—Wm. Berner, Pottsville, Pa.

I claim, 1st, The mosaic inlaying of the tile, of whatever color or design they may be, each of the different parts being cast into a mold or molds at the proper time, so as to unite and form into a solid mass, substantially as and for the purposes above set forth.

2d, The composition, both white and black, or whatever color may hereafter be given to it, one of which, when burned, partakes of the hardness of iron, substantially as and for the purposes above set forth.

80,121.—KNITTING MACHINE.—Dana Bickford, Boston, Mass.

I claim, 1st, A longitudinally grooved needle cylinder, in combination with a rotary cylinder, having an endless cam groove with two equal and similar bends, and two sliding cam pieces, one for each bend, and each supported in side bearings or walls, so that proper adjustments may be made to tighten or loosen the stitches, and yet which will permit the revolution of the machine in either direction to knit either a tubular or straight fabric at will.

2d, The combination with a needle cylinder of a ring nut and detents or projections, d, for raising or lowering and sustaining in position the needle cylinder relatively to the cam cylinder, substantially as and for the purpose set forth.

3d, The combination in the same machine of devices substantially such as described, for varying the cam groove, with devices substantially such as described for raising or lowering the needle cylinder.

80,122.—AFGHAN.—Dana Bickford, Boston, Mass.

I claim an afghan, blanker, or similar article, composed of tubular knitted strips, united together edge to edge, and with the seam concealed by a knitted or other cord or welt, and the whole finished with a border or fringe, substantially as shown and described.

80,123.—COMPOUND FOR DESTROYING PAIN.—Samuel T. Bond, Edenton, N. C.

I claim the combining the ingredients named in the specification, substantially as therein described, or in any similar proportion to produce the same results.

80,124.—HARVESTER.—Olpha Bonney, Jr., San Francisco, Cal.

I claim, 1st, A helper of substantially a triangular form, having the upper inclined edge, c, and ribs, d, for elevating the grain or stalks, as herein recited.

2d, The wheel, j, adjustable bar, k, and box, l, for the purpose set forth.

80,125.—BROILER.—Sylvester Bowers, Penn Yan, N. Y.

I claim the hoop, A, the annular rim, B, the grate, D, and the reflector, E, all constructed and arranged substantially as herein shown and described and for the purpose set forth.

80,126.—STOVEPIPE SUSPENDER.—Geo. W. Bradford, Brooklyn, N. Y.

I claim the flexible band, A, provided at its ends with the slot and set screw, or other equivalent fastening, for securing the band on the stovepipe, and also provided with loops or eyes, f f, at opposite sides, to receive wires by which the stovepipe is suspended from the ceiling or other fixture, substantially as shown and described.

80,127.—APPARATUS FOR REMOVING BOXES FROM WAGONS. Selah S. Brewster, Manchester, Mich.

I claim the described arrangement in the frame of a building, of the shaft, D, drums, C E, and cords, D F, all as herein shown, for the purpose set forth.

80,128.—SCRUBBING BRUSH.—R. M. Brooks, Griffin, Ga.

I claim the head, A, of a brush, when constructed as described, so as to form two chambers, a and b, for the purpose of holding sand and water, and a recess, d, for inserting the brush, substantially as and for the purposes herein set forth.

80,129.—COMBINED WASHSTAND AND WATER CLOSET.—Andrew J. Brown, New Castle, Del.

I claim the box, C, divided into separate apartments, each having its appropriate lid or cover, with the central stool pan, H, having conical sides, h, neck, h1 flaring saucer top, h2, stopper, h3, constructed and arranged with the washstand, A, having slide grooves and doors, all substantially as and for the purpose described and shown.

80,130.—TOBACCO BOX.—G. M. Bull, New Baltimore, N. Y.

I claim the hinge, D E, constructed and connected with the swaged hoop, C, and cover, B, substantially as herein shown and described and for the purpose set forth.

80,131.—FENCE.—Thomas L. Burk, Greensburg, Ind.

I claim the arrangement of the notched rails, E, strips, F, beveled posts, A, and wire, G, all constructed, arranged, and operating substantially as and for the purposes set forth.

80,132.—TABLE FOR COMPRESSES.—H. A. Burr, Brooklyn, N. Y.

I claim the combination of the bottom piece, A, having the inclines, a a a, with the bearing pieces, C C C, having the inclines, c c c, when the parts are constructed to operate substantially in the manner and for the purpose set forth.

80,133.—LAMP.—Charles W. Cahoon, Portland, Me.

I claim, 1st, In combination with a lamp burner to which the chimney is held by interior chimney fastenings, a chimney having an interior shoulder, substantially as and for the purposes described.

2d, In combination with a lamp burner, to which the chimney is secured by means of an interior shoulder, the horizontal joint, n, as and for the purposes described.

3d, A lamp chimney as described, with an interior shoulder in the same, for the purpose of fastening it to the burner, substantially as set forth.

80,134.—MACHINE FOR MAUFACTURING CHENILLE.—Wm. Canter, New York, assignor to Samuel Bernstein and Alexander Bernstein, Brooklyn, N. Y.

I claim, 1st, In chenille machines, the alternate raising and sinking motion of the knife or cutter, G, substantially as herein specified.

2d, In chenille machines, the traversing twister herein described, having the belt or cord, T, running on the change pulleys, R1, R2, etc., arranged to impart both the rotary motion and the requisite draft or tension under all conditions, substantially as herein specified.

3d, The alternate cut and uncut chenille, Y Z, constructed substantially in the manner and for the purpose herein set forth.

80,135.—ARTISTS' STRETCHING FRAME.—Joseph F. Carroll, South Boston, Mass.

I claim spreading or expanding artists' frames by a right and left hand screw, substantially in the manner herein shown and described.

80,136.—WATER WHEEL.—D. W. Case, Garden City, Minn., assignor to himself and John S. Smith.

I claim the fixed rim, D composed of a series of sockets or chambers, d in combination with the gates, E, provided with flanges, f, and attached to the ring, F, all arranged to operate in connection with the wheel, B, pinion, g, and the teeth, h, of the ring, substantially as shown and described.

80,137.—LAMP.—L. Chandor, St. Petersburg, Russia, assignor to Cassius M. Clay.

I claim in combination with the reservoir, A, the tubes, B C, and G, constructed and arranged substantially as shown and described, for the purposes set forth.

80,138.—BEEHIVE.—Joseph Chase, Ripley, Ohio.

I claim a beehive constructed with a double case, the exterior one being provided with a door, C, at each side, and the interior one provided at each side with a glass plate, D, all being constructed and arranged in the manner substantially as and for the purpose set forth.

80,139.—DOUBLE BUCKLE.—E. W. Clark, Tallahassee, Fla.

I claim a double buckle with double tongues for each end formed of four pieces, arranged substantially as herein shown and described.

80,140.—PEN RACK.—Wm. E. Clarke, Attleborough, assignor to Henry F. Marsh, Boston, Mass.

I claim the device, B, or its equivalent, for an adjustable pen rack, as and for the purposes specified.

80,141.—SAW FILING MACHINE.—Hymen Clendenen, Beverly, Ohio.

I claim the arrangement of the adjustable pivoted frame, C, clamp base, A, adjustable way, G, slide, K, plate, L, and bars, M, for holding the file, all constructed to operate in the manner and for the purpose substantially as herein set forth and shown.

80,142.—SUSPENDER.—C. H. Cleveland, Selma, Ala.

I claim a suspender or shoulder brace composed of two single straps, B B, each passing from the attaching strap on the side over the shoulder to the attaching strap on the reverse side of the body, when the shoulder straps are provided with the slides, C and C', having a catch and hook, c and c', substantially as described and for the purpose specified.

80,143.—HYDRANT.—Zebulon E. Coffin, Boston, Mass., assignor to Boston Machine Company.

I claim, 1st, The combination of the base or bottom of the hydrant with the body of the hydrant, hook bolt, waste pipe or pipes, and the waste valves, hydrant valves, and outside case, all constructed in the manner and for the purpose set forth.

2d, The hook bolts, L L, in combination with the body, A, and bowl, C', having an annular projection, a, when the parts are constructed substantially in the manner and for the purpose set forth.

3d, The nut, G, in connection with the rod or valve stem, K, and body A, when the parts are constructed and arranged to operate substantially as described.

80,144.—STEAM GENERATOR.—H. S. Cole, Pawtucket, R. I.

I claim the perforated pipe, F, at or near the water line, substantially as described, for the purposes specified.

80,145.—PENCIL SHARPENER.—J. L. Coles and D. H. Coles, New York city.

I claim, 1st, The arrangement with the sharpening tube, A, of the jaws, d, at the receiving end thereof, and communicating with each other so as to act as a support and guide for the pencil while it is being sharpened, and also form a holder to protect its point while being carried, as set forth.

2d, The button, b, in combination with the movable side of the tube, A substantially as and for the purpose set forth.

80,146.—PICK AX.—John C. Conklin, Yorktown, N. Y.

I claim a pick ax, D E, having a socket, A, and shank, C, substantially as described and for the purpose set forth.

80,147.—PERFORATED BAKE PAN.—C. M. Cooney, Washington, D. C.

I claim a pan or vessel perforated in its lower part or bottom with holes, and open or perforated with holes in its upper parts or sides, in combination with a smaller pan or vessel, substantially as and for the uses and purposes herein described.

80,148.—MANUFACTURE OF STEEL, AND CONVERTING IRON ARTICLES INTO STEEL.—Frederick C. Curie, Lancaster, Pa.

I claim converting cast malleable or malleableized iron into steel by the process substantially as described.

80,149.—APPARATUS FOR EVAPORATING LIQUIDS.—J. P. Dake, Salem, Ohio.

I claim, 1st, The movable and close fitting cover, A, when used upon she evaporating pan, tank, or kettle, G, in combination with the hot air chambers, C D E, and the elevated flue or chimney, F, as set forth and described.

2d, The hot air chambers, C D E, when used in combination with the evaporating pan, G, and the close fitting cover, A, in the manner and for the purposes set forth and described.

80,150.—NAIL MACHINE.—F. Davison, Richmond, Va.

I claim, 1st, The combination of the channeled plate holder, M, slotted angular bar, E, and vibrating arms, N N, all constructed, arranged, and operating substantially as and for the purposes herein set forth.

2d, The combination of the sliding inclines, X X, adjusting screws, f f, vibrating arms, N N, and angular bar, E, to adjust the plate at different angles, substantially as and for the purposes herein set forth.

3d, The combination of the channeled plate holder, M, slotted angular bar, E, vibrating arms, N N, and knives, C c, to produce a wedge-shaped blank in the manner specified.

80,151.—FISHING TACKLE.—A. A. Dennett, New Brunswick, N. J.

I claim, 1st, The socket block, D, and the screw, g, in combination with the fishing tackle, substantially as shown and described.

2d, Fastening or adjusting the hook in the fishing tackle represented, by a screw instead of a rivet, substantially as shown and described.

80,152.—THILL COUPLING.—Lyman Derby, New York city.

I claim the combination of the elastic safety strap, H, with the clip, A, and thill-iron, F, substantially as described and operating as hereinbefore set forth.

80,153.—UTERINE SUPPORTER.—Alexander Dickson, Meadville, Pa.

I claim a uterine supporter constructed in five parts, the same being joined together by the elastic bands, C C C C, in combination with the pads, B B and A, constructed as described for the purposes set forth.

80,154.—MACHINE FOR CUTTING HOOPS FOR BARRELS.—Jacob Dobbins, Litchfield, Mich.

I claim the arrangement of the inclined knives, I J, and the flange, f, of the feed roller, F, substantially as described, for the purpose specified.

80,155.—ROAD SCRAPER.—E. B. Driskell, Paris, Ill.

I claim the combination of the axle, F, having the bent arms, I I, with the wheels, H H, the handles, J J, the pivoted draft pole, A, and the scraper, B, when said parts are constructed and connected, so as to operate together substantially in the manner and for the purposes set forth.

80,156.—WASHING MACHINE.—James K. Dugdale, White Water, Ind. Antedated July 15, 1868.

I claim, 1st, The knob, K, and wire, c, in combination with pins, a, and spring, b, as and for the purpose specified.

2d, The bolt, g, in combination with the spring, i, notches, f, and clothes-holder, L, as and for the purpose described.

80,157.—CYLINDRICAL FILTERING PRESS.—Pierre Du Rieux and Edouard Roettger, Lille, France.

We claim, 1st, The construction and arrangement of the grated circular frames and end plates, and the mode of introducing the semi liquid substance to the filtering chambers, through apertures made in the rims of each frame, the said apertures forming a continuous channel throughout the length of the press, in communication with each filtering chamber, substantially as described and represented.

2d, In combination with the removable frames, B, and movable head, A2, the pivoted back, D3, and central screw, d, all constructed and arranged to operate in the manner and for the purpose substantially as herein set forth.

3d, The arrangement of cocks, H M, the latter having removable plug, M', at the opposite ends of the channel formed by the squares, I I, in the frames, B, as herein shown and described, for the purpose specified.

4th, The provision of each frame, B, with a channel, N, having a cock, G G1, at its outer end, and a movable plug, N1, at its opposite extremity, substantially as described.

5th, The side supports, C C', and cross bars, D D1, arranged as described, with relation to the stationary end piece, A1, movable piece, A2, and removable circular gratings, B, substantially as represented.

80,158.—CHEESE PRESS.—Milton B. Fraser, Steuben, N. Y.

I claim, 1st, The employment of a series of separated hoops, in combination with a series of removable bottoms, J J1 J2 J3 J4, a series of removable followers, K K1 K2 K3 K4, and a screw or other press, the devices named being applied within and upon a frame, A B B B', or any equivalent frame, all substantially as and for the purpose described.

2d, The combination of an adjustable piece, C, with said cheese hoops, their bottoms and their followers, and with the screw or other well known pressing device, and with a suitable frame, A, B B B', substantially as and for the purpose specified.

3d, The combination of the adjustable nut, G, with the cheese hoops, their bottoms, their followers, and with the screw, F, substantially as and for the purpose described.

80,159.—LOUNGE, BUREAU, AND TABLE.—Adolph Faller, New York city.

I claim the combined lounge, table, and bureau specified, the same being formed with the inclined cushioned end, e, against the bureau portion, with the table, E, above the bureau, and with draws in and below such lounge substantially as set forth.

80,160.—STEAM ENGINE GLOBE VALVE.—R. A. Filkins, North Adams, Mass.

I claim, 1st, A sectional valve, E, fitted around a stem, C, and provided with pivoted fingers, d, d, substantially as herein shown and described, all made and operating as specified.

2d, The valve, when made in sections, as described, and when provided with swinging fingers, d, which work in grooves, e, e, in combination with the conical reciprocating stem, C, carrying the head, c, all made and operating substantially as herein shown and described.

80,161.—SHOEMAKERS' TOOL.—William. T. Fisher, Roane county, Tenn.

I claim constructing the sides, A A, with jaws or projections, b b' and d d', for the purpose of combining with the pliers any suitable tool or device, substantially as described.

80,162.—LOW WATER INDICATOR FOR STEAM GENERATOR.—Lorenzo Fulton, Edinburg, Ind.

I claim 1st, The combination, with a low water indicator, or any equivalent therefor, of a marker, of any suitable form, and recording plate, or its equivalent, when all combined and arranged together, substantially as and for the purpose described.

2d, The combination of the dial, J, index, K, pencil, p, pawl, n, and ratchet-wehel, m, whereby to register successively the occurrence of an inadequate amount of water in the steam generator, substantially as set forth.

3d, The combination of the pipes, A and B, with the valve, b, water space, C, pipe, D, vessel, E, piston, F, rod, G, lever, H, pawl, n, ratchet wheel, m, index K, and dial, J, substantially as described.

4th, The combination of the vessel, E, having the ledge, L, and the glass walls, e, e, with the piston, F, substantially as described.

80,163.—PESSARY.—C. R. Gorgas, Brooklyn, N. Y.

I claim, 1st, The herein described improved pessary, consisting of the wrapper, A, provided with the tubular portion, B, and the spring, C, substantially as and for the purpose described.

2d, The improved inserting instrument, consisting of the parts, b and c, provided with the pins, a and a', ratchet, d, spring pawl, e, and recess, d, and otherwise arranged substantially as and for the purpose described.

3d, The combination of the spring, C, with the inserting instrument, D, substantially as described for the purpose specified.

4th, The method herein described of inserting the spring, C, within the pessary, substantially as described for the purpose specified.

80,164.—HORSE POWER.—Michael G. Groff, Vogansville, Pa.

I claim the peculiar arrangement of the main wheel, A, and jack, O with the horizontal or inclined shafts, T B, having each two pinions, the gear connected by the shaft, M, which is provided with universal joints, substantially combined in the manner and for the purpose specified.

In combination with my arrangement in the gearing aforesaid, the stationary platform, support d substantially in the manner specified.

Also, attaching the spokes or arms, z, on the outer circumference of a wheel, O, which wheel has cogs on both sides when said spokes or arms are co curved as to admit the free action of a pinion, t, on each side of the face of said wheel, in the manner shown and for the purpose specified.

80,165.—STEAM GENERATOR.—Geo. Guy, Bay City, Mich.

I claim, 1st, The aperture, f, in the crown sheet, n, and the valve, J, when arranged and operated substantially as and for the purpose described.

2d, In combination with the valve, J, arranged as described, the valve, k, substantially as and for the purpose set forth.

80,166.—CHAFE IRON.—Ephraim Hacket, (assignor to himself and R. West) Concord, N. H.

I claim a chilled iron chafe iron for vehicles, substantially as set forth.

80,167.—MELODEONS, &c.—Emmons Hamlin, Winchester, Mass.

I claim, in combination with a tremolo attachment and an exhaust bellows, a regulator valve or gate, operating substantially as and for the purpose set forth.

80,168.—MANUFACTURE OF WHITE LEAD.—Henry S. Hannen, Philadelphia, Pa.

I claim, 1st, Subjecting metallic lead, after it has been treated in a chamber with acetic acid, to the action of carbonic acid gas, introduced near the bottom of the chamber, and at such a temperature that the proper degree of heat is maintained within the chamber without the use of heating apparatus.

2d, Subjecting metallic lead, during the process of its conversion into carbonate of lead, to the action of solutions of soda and carbonate of soda, substantially as and for the purpose described.

80,169.—WEIGHING SCALE.—Sandy Harris, Philadelphia, Pa.

I claim, 1st, The beam, D, constructed substantially as described, in combination with the platform, E.

2d, The platform, E, provided with the connecting rod, j, in combination with the swinging frame or bail, J, operating substantially as and for the purpose set forth.

3d, The pedestal, A, constructed substantially as and for the purpose described.

4th, The platform, E, beam, D, pointer, F, weight, G, connecting rod, j, frame or bail, J, pedestal, A, neck, B, and plate, L, all combined for the purpose of forming a responding scale.

80,170.—HARVESTER.—Wm. O. Harrison, Chittenden, Vt.

I claim the arrangement of the gear wheel, G, constructed as described, hinged block, g, extension, i, bearing, h, pinion, f, and shaft, H, pivoting the finger bar to the machine, all constructed and operating as herein described.

80,171.—MILLSTONE DRESS.—Andrew C. Hartstock, Douglas, Ill.

I claim the millstone dress, composed of the distributing teeth, A, grinding teeth, B, circle furrows, a, and short angular furrows, b, constructed and arranged in relation to each other, in the manner and for the purpose, substantially as described.

80,172.—APPLE CORER.—Moses M. Hatch, Portland, Me.

Antedated July 8, 1868.

I claim the corer, b, when attached to the knife, a, substantially as and for the purposes set forth.

80,173.—GOVERNOR.—John W. Hayes, Kittery, Me, assignor to himself and John G. Crockett, Portsmouth, N. H.

I claim, 1st, In combination with a governor spindle, the sleeve, K, when constructed with the inclined planes, m, m, and wings, o, o, substantially as described.

2d, The interior cylinder, R, with its inclined bottom and the balls, p, p, arranged substantially as described, in combination with the sleeve, K.

3d, The transverse bar, i, on the spindle, C, in combination with the inclined planes, m, m, substantially as and for the purposes set forth.

80,174.—CHURN.—William H. Henderson, West Point, assignor to William H. Snider, Lena, Ill.

I claim the combination of the vertically reciprocating cross head, F, and end boards, f, with the oscillating perforated dasher leaves and steps, g', all these parts being constructed, arranged, and operating as described.

80,175.—STRAW CUTTER.—S. B. Hiles and J. B. Danner, Sallilloville, Ind.

We claim the combination of the obliquely placed serrated knives, E E, in the sliding frame, D, with the horizontal stationary knife I, in the frame, A, and the rake, F, all constructed and operating as shown and described.

80,176.—BED BOTTOM.—Philip Hinkle, San Francisco, Cal.

I claim the combination of the rod, m, in the recess, bands, l and k, suspenders, j, bridge, b, wires, h, and slats, e, as herein set forth

80,177.—METALLIC PAINT.—Franklin G. Holland, Washington, D. C. Antedated July 8, 1868.

I claim the combination of the within named ingredients, mixed in the several proportions as herein described, and for the purposes set forth.

80,178.—WATER WHEEL.—Franklin Hoyt and Aaron Denio, Montpelier, Vt.

We claim the adjustable inlet chute, B, and the extended outlet chute, C, provided with regulating vents, k, g, and arranged in relation to each other, and to the wheel, A, substantially as described, for the purposes specified.

80,179.—MACHINE FOR DRYING AND SCOURING SHEET METAL.—Charles E. L. Holmes, Waterbury, Conn.

I claim the arrangement, in a machine for grinding, scouring, and drying sheet metal, of the rollers, f h, revolving in a direction opposite to the direction of the passing sheet metal being operated upon, and rollers, g i, having a vibratory motion, and all the rollers acting upon the surface of the metal while in a curved position, substantially in the manner described.

Also, operating the reciprocating brush, l', by means of the lever, m, cord, 13, spring, 14, and pivoted lever, l, substantially in the manner and for the purpose set forth.

80,180.—MODE OF ATTACHING CARRIAGE TOPS.—William Horrocks, Poughkeepsie, N.Y.

I claim securing the slat irons of a carriage top to the supporting pin, A, by means of the separate pivots, a a formed upon either of the disks, b, c, which fit over the pin, A, both disks being clamped together upon the slat-irons by means of the nut, d, as herein described, for the purpose specified.

80,181.—MACHINE FOR PRESSING HATS.—Samuel Howard, Luton, United Kingdom of Great Britain and Ireland.

I claim the pump, h, acting directly upon the diaphragm, g, of the dome, e, and pump, l, which fills the cistern, a, in combination with cisterns, a b, and their connecting pipes, the whole being arranged in the manner and for the purpose described.

80,182.—FLY NET FOR HORSES.—Daniel W. Hurst, Petersburg, Va.

I claim connecting the ribs of a fly net by lashes, each of which passes twice through one hole in each of the ribs, and forms two loops on the central rib, and one on each of the others, substantially as described.

80,183.—KNITTED FABRIC.—George Jelly, Roxbury, assignor to Charles W. Griffiths, Boston, Mass.

I claim the arrangement and combination of the series of ground yarns, a b c, and the series of stripe yarns, e e e, in the manner substantially as described, so as to produce a knit fabric, on which the stripe yarns will appear on one side of the fabric, in right line parallel ranges as set forth.

80,184.—SLEEPING BERTH FOR RAILROAD CARS.—Agur Judson, Newark, N. J.

I claim, 1st, The combination, with the lower plate, M, and its guide, of the upper plate and its guides, substantially in the manner and for the purpose herein described.

2d, The combination, with the berths, of the fixed hanging pieces, F, having an opening, f, to receive the bolts which lock the berths to place.

3d, The arrangement, substantially as described, of windlass, cords, and pulleys in combination with the berths, whereby the latter may be raised and lowered.

4th, The arrangement, substantially as described, of springs within the berths, when supported and held in position by the plates, C C and M M.

5th, The combination, with a car berth, of a folding case or closet, substantially as and for the purpose set forth.

6th, The combination, with a car berth, of a hinged or pivoted curtain frame and self acting springs and catches, to hold it in position for use, substantially as set forth.

80,185.—GAME TABLE.—William Keil, Hastings, Minn.

I claim the improved game table herein described, when constructed and arranged substantially as and for the purpose set forth.

80,186.—WATER WHEEL.—William Kennedy, New London, Pa.

I claim the above described water wheel, having an upper and lower rim, and two sets of buckets, arranged in relation to each other substantially as described.

80,187.—SHAWL PIN.—William Knowles, Rockville, Ind.

I claim a shawl pin constructed of the bent arms, A B and C, attached to the band, D, substantially as described.

80,188.—HARVESTER RAKE.—Israel Lancaster, Baltimore, Md.

I claim, 1st, The spring O, rake head, m, pin, n, and strip, T, acting in combination, when used to regulate the movement of the rake head when passing over the cutter bar, and when constructed and operating substantially as described.

2d, The arm, g, provided with the pin, h, in combination with the pin, k and block, i, which supports the rake, m, constructed and operating substantially as described and for the purpose mentioned.

3d, The arm, g, provided with the pin, h, the block, i, provided with the pin, k, and the guide bar, s, acting in combination when used to effect the purpose mentioned, and when constructed substantially as described.

80,189.—PLOW.—John Lane, Chicago, Ill. Antedated March 31, 1868.

I claim, 1st, Forming a dove tail, tapering, open groove matrix on the side of a removable slip plow point, substantially as described and for the purpose shown.

2d, The particular form and construction of the slip point, as arranged and described, and for the purpose shown.

3d, Forming and constructing a slip point, as shown and described, and claimed above, with a fin cutter, as arranged and shown.

4th, The particular arrangement of the share, C, flange, E, and landside, D, as shown, in combination with the above described and above claimed slip point, either with or without the fin cutter, as described and for the purpose shown.

80,190.—CURRY COMB.—John W. Latcher, Albany, N. Y. Antedated July 18, 1868.

I claim forming a series of rows of teeth, b, from one block, substantially as shown and described, and for the purpose specified.

80,191.—CAR REPLACER OR GUIDE RAIL.—John P. Lipps assignor to himself and Henry Guyer), Newark, N.J.

I claim a railway guide rail or car replacer, constructed with a portion which embraces and clings to the rail, a groove for the car wheel, and a pin or pins for securing the device to the cross-tie, substantially as shown and described.

80,192.—STILL.—Henry C. Lloyd Cincinnati, Ohio.

I claim, 1st, The arrangement of chambered still, A B C and D, doublers, O and Q, condensers, U U', and vapor pipes, N P H and E, substantially as and purpose set forth.

2d, The condenser, U U', or its equivalent, having the discharge cock, X, into the doubler below the inlets of the escape pipe, V, as and for the purpose explained.

3d, The provision of exhaust and live steam injection pipes, I and J, in the lowest chamber of series, A B C and D, with their described or equivalent accessories, as set forth.

80,193.—WASHING MACHINE.—Lucius M. Lull and Philander C. Bowen, Altoona, Ill.

We claim the arrangement of the open frame, A, provided with the screw bolt, B, to which is connected the block, C, with the frame, E concave bottom, F, rollers, H H, which are provided with pins, K K, and spiral springs, I I, the whole being used with the cylinder, D, as and for the purpose herein set forth.

80,194.—COOKING STOVE.—John Magee, Chelsea, Mass., assignor to Magee Furnace Co.

I claim a warming closet, B, placed under the hearth of a high-hearth stove, substantially as and for the purpose set forth.

Also, the warming closet, B, the top of which is provided with a movable lid or door, in the manner and for the purpose described.

80,195.—SKATE FASTENING.—Edward C. Mayloy, Rochester, N. Y.

I claim, 1st, A clamp made with a flange on the upper edge, turned inward, and adjustable to any thickness of sole, by means of the screw or its equivalent so that the flange will press tightly upon the upper edge of the sole.

2d, The combination of the segmental arms with the T-headed bolt, t, and clamp slide, b, with the thumb nut, constituting the sliding bar, by which all the clamps are adjusted and tightened at the same time, as shown in fig. 2, or the two T-headed bolts shown in figs. 2 and 3, and thumb nut, constituting a sliding bar, and connecting the segmental arms by which all the clamps are adjusted and tightened as before.

3d, Forming a sliding bar, connecting the segmental arms by means of a bolt and nuts, as shown in fig. 5.

80,196.—DRESS AND SATCHEL HOLDER COMBINED.—George McFadden, Thomaston, assignor to himself and Richard Austin, Plymouth, Conn.

I claim, as a new article of manufacture, a combined dress and satchel holder, consisting of the hook, G, eyes, D, spring arms, a, rings, b, and sliding clasp, E, all arranged and operating as set forth, when all said parts, excepting the slide, E, are made of one piece of metal.

80,197.—PAPER SACK KNIFE.—L. H. Mealey, Alpha, Ohio.

I claim the within-described device, consisting of a bobbin or spool-formed handle, C, upon which the cord is wound, in combination with a cutting blade B, operating in the manner described.

80,198.—MACHINE FOR HEADING BOLTS.—Wm. Melville, Paterson, N. J.

I claim the improved bolt and rivet heading machine, consisting of the oscillating holder, L L, carrying the cutter, N, of the stationary die, G, and reciprocating die, E, and of the reciprocating punch, I, all made and arranged substantially as herein shown and described, and combined with the two cam shafts, B and C, and springs, g F and e, respectively, in the manner set farth.

80,199.—HORSESHOE.—G. B. Milligan (assignor to T. Poultney), Baltimore, Md.

I claim an expanding false shoe, provided with interlocking projections, adapted to suitable depressions in the permanent shoe, or the equivalents thereof, for the purpose of firmly securing the roughing or false shoe and the permanent shoe together, as and for the purposes set forth.

Also, the employment of an interlocking lip or hooks, in combination with the false shoe, and adapted to operate in the manner and for the purposes substantially as described.

80,200.—BUREAU TRUNK.—A. L. Mora, New York city.

I claim the bureau trunk, constructed as described, its top, A, being hinged at its back to the body of the trunk, and provided with interior compartments and a flange around its lower edge, when the doors, B, which cover the drawers, are hinged to the front sides of the ends of the trunk, and are held closed by the flange of the cover, which said cover is locked at two points by means of one lock, all arranged as described for the purpose specified.

80,201.—WAGON BRAKE.—William B. Morgan and J. H. Terrell, Antioch, Ind.

I claim, 1st, The combination of the arm or lever, M, connecting box, N, and pivoted lever, O, with the rock bar, J, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the stationary bar, D, short levers, F, rock bar, J, arms or levers, K L M L, connecting rod, N, and pivoted lever, D, with each other, substantially as herein shown and described and for the purposes set forth.

80,202.—STUMP JOINT FOR CARRIAGES.—F. B. Morse, New Haven, Conn.

I claim, 1st, A stump joint, consisting of the two parts, A and B, joined by the plate, C, and pivots, d d, when the said plate, C, is arranged and fitted into the parts, A and B, so as to operate in the manner specified.

2d, In combination with a stump joint, the buttons or plates, D D, arranged upon opposite sides of the joints, substantially in the manner herein set forth.

80,203.—COAL SCUTTLE.—Orrin Morse (assignor to C. H. Morse & Co.,) Rochester, N. Y.

I claim a coal scuttle having the bonnet cut away on both sides in such a manner and to such a degree as to enable the devices to pack and to discharge coal properly in a side opening, as specified.

80,204.—CIGAR MACHINE.—C. Muller, Albany, N. Y.

I claim, 1st, The combination of trough, O, with the curved metallic plate, W, or its equivalent, substantially as and for the purpose set forth.

2d, The scoop, S, in combination with the trough, O, and curved plate, W.

3d, The combination of drum, A, hoppers, D D' P P' and R R', scale pan, E, ratchet wheel, B, levers, H and I M and N, substantially as and for the purpose set forth.

4th, In combination with the subject matter of my third claim, the trough, O, metallic curved plate, W, and cord, f, and weight, g, substantially as shown and described.

5th, The within-described process of manufacturing cigars, substantially as shown and in the manner set forth.

80,205.—LIGHTNING ROD.—G. W. Otis, Lynn, Mass.

I claim the lightning conductor described, consisting of several strands of angular metallic wire laid into a rope, all as and for the purpose described.

80,206.—SELF-PROPELLING VEHICLE.—O. D. Padrick, Shelbyville, Ind.

I claim, 1st, The application of springs S, spring cases, G, spur wheels, g', and spur wheels, h, to shafts, n, which are supported upon standards, P, upon the axle, C, in combination with the spur wheels applied to the hubs of wheels, B', and with means for winding up said springs, S, substantially as described.

2d, The arrangement of propelling devices, which I have described, on both sides of the center of the rear axle, C, upon standards, P, which can be readily removed from said axle, in combination with the winding-up rod, E, applied to and supported by a removable plate, F, substantially as described.

3d, In combination with driving spurs, h h, and the devices which operate these spurs, brakes, t t, applied so that they can be caused to act upon said spurs at pleasure, for stopping and starting the vehicle, and regulating the speed thereof, substantially as described.

4th, The lever, a1 a2, applied to the rod, a, on the front axle, C, and arranged as described, in combination with a catch plate, R, and a vehicle which is adapted for being propelled, substantially as described.

80,207.—MANUFACTURE OF WATER-PROOF TEXTILE FABRICS. Alfred Paraf, New York city.

I claim the asphalte cloth hereinbefore described, consisting of the combination of a textile fabric with albumenized asphaltum, substantially as before set forth.

80,208.—BUREAU BEDSTEAD.—Andrew Parker, New York.

I claim a bureau bedstead composed of a head piece, A, and foot piece, C, united by a hinged frame, D and provided with a hinged flap, B, which, when folded up, is retained by lips, a, on the head piece, and which, when folded up, is retained by lips, a, on the head piece, and which when folded down, catches over V-shaped projections, e, on the foot-piece, as shown and described.

80,209.—ESCAPEMENT.—J. V. D. Patch, Brownville, Neb.

I claim the laterally acting pallets, a and b, spring d, and pendulum rod, A, all substantially as shown and described, in combination with the verge wheels, B, and pendulum, C, of a clock, all as and for the purpose set forth.

80,210.—STOVEPIPE SHELF.—John Perham, Rockton, Ill.

I claim, 1st, An improved metallic extension stovepipe shelf, A A, constructed and arranged with the extension device, as shown, made in one or more parts, to operate substantially as described.

2d, An improved metallic stovepipe shelf, provided with and operating by means of grooved or sliding ways, to allow of an extension of the size of the shelf by elongation or lateral enlargement.

3d, The peculiar shaped adjustable grooved or slotted collar, B B C c, in two parts, when constructed and arranged to operate substantially as set forth, for the purpose described.

4th, In combination with the foregoing, the screws or bolts and nuts, D D, and radial arms and circular ribs, substantially as shown, with guard stops, of the shelf, A A, when the whole is constructed and arranged substantially as herein set forth and described, to operate as specified.

80,211.—WASHING MACHINE.—John Phillips, Jr., Georgetown, Mo.

I claim the zigzag groove, a, in the wheel, B, and the pin, c, of the arm, C, to which the rubber is attached, fitting in said groove, in combination with the sliding table, E, all arranged to operate in the manner substantially as and for the purpose set forth.

80,212.—SHAFTING.—L. F. Pitcher, Salina, N. Y.

I claim the non-revolving bent shaft, S, when made and applied for the purpose aforesaid, substantially in the manner above described.

80,213.—HORSESHOE.—I. R. Potter, Dartmouth, Mass.

I claim, 1st, The shoe, A, as described, with raised edge, C, and studs, E2.

2d, The removable calks, B1 B1, made in sections or continuous, with edge continuous or indented.

3d, Forming and applying the calks so that the bearing edge will be flush with the wall of the hoof.

4th, Curving the calks at the heel and toe, as shown.

80,214.—THILL COUPLING.—I. R. Potter, Dartmouth, Mass.

I claim making the clip, C1, with projection, c1, and slot g1, on and in one jaw of same, and the thill iron, D2, with projection, a2, and arbor, d2, made and operating substantially as and for the purpose specified.

80,215.—MOVABLE WINDOW BLIND.—Niels Poulson, Washton, D. C.

I claim, 1st, The pivoted bars or links, A A2, for elevating or lowering a pivot slat blind, and permitting the tilting of the slats, B, when lowered, substantially as and for the purposes set forth.

2d, The arrangement of two or more slats, B, on each of the bars, A, to adapt the blind to fold within a smaller vertical space, as explained.

3d, The combination of the hinged bars, A A2, pivoted slats, B, connecting bars, I, and tilting cords, chains, or rods, K K1 K2, substantially as described.

4th, The combination of the inclosed elevating cord or chain, L, hanger, N, guide pins, F', vertical grooves, G, and fastening, C P O, with the bars, A A2, and slats, B B, for the purpose of raising and lowering the blind, and locking it securely in its extended or closed position.

5th, The plate, E, in combination with the hinged bars, A A2, and with the box or recess for inclosing the folded blind out of sight, as described.

80,216.—SPINNING MACHINE.—J. M. Pusey, L. Pusey, and E. Pusey, Wilmington, Del.

We claim, 1st, The combination with the spindle of the spring bearing on the spindle, to hold and steady the same, substantially as described for the purpose specified.

2d, The combination of the spring, G, the connecting rod, F, the adjustable support, L, the division plate, I, and the brake, H, with a ring spinning frame substantially as described.

80,217.—EARTH-BORING MACHINE.—J. E. Race, Chicago, Ill.

I claim, 1st, The bar, H, in combination with the rod or post, I, rope, g, and shaft C, when constructed and operating substantially as and for the purposes specified.

2d, The combination and arrangement of the gear wheels, F and G, shaft E, and lever, L, with the rocking beam, K, substantially as specified.

80,218.—LOCK LABEL HOLDER.—J. S. Ramsey, Baltimore, assignor to himself and W. G. Hillman, Lonaconing, Md.

I claim, 1st, The combination of the bolt, D, staple, B, and side fastening, C arranged and operating substantially as described.

2d, The compartment, E, containing address labels, which are protected by a sheet of mica, isinglass, thin horn, or similar substance, in combination with a side fastening, which closes the opening through which the same are introduced, and which is locked by a bolt within the case, as set forth.

80,219.—CLASP FOR JOINING BELTS.—B. D. Randleman, Port Louisa, Iowa.

I claim a belt clasp, composed of straight and forked links, d and a, and hinged plates, C and D, all substantially as and for the purpose shown and described.

80,220.—GATE.—H. R. Raub, Pymatuning, Pa.

I claim, 1st, The combination of the sliding part, E, and the stationary part C, of the gate, with each other, substantially in the manner herein shown and described and for the purpose set forth.

2d, The combination of the lever, F, and connecting bar, G, with the stationary part, C, and sliding part, E, of the gate, substantially as herein shown and described, and for the purpose set forth.

80,221.—SULKY PLOW.—S. J. Reed, Camden, Ohio.

I claim, 1st, The beam, A, pole, A', caster wheels, B B, arms, b b, cross bar b1, lever, C, and foot piece, C', the whole being combined and arranged substantially as described.

2d, The plow beams, E E, constructed and arranged as described, in combination with lever, F, crank, f and guides, f', as and for the purpose set forth.

80,222.—HAY LOADER.—F. M. Reynolds, Mile Strip, N. Y.

I claim, 1st, The slide, S, of the draft pole applied to the permanent or fixed part, P, thereof, substantially as shown, in combination with the bolt, Q, connected with the cord, K, of the brake lever, L, all arranged to operate in the manner substantially as and for the purpose set forth.

2d, The spring, W, applied to the bolt, Q, when said bolt is used in connection with the side of the draft pole, and connected with the brake-actuating mechanism, substantially as and for the purpose set forth.

3d, The combination of the lever, L, adjustable rod, M, rope, K, pendant bar, Bx, and rear brake shoe, Ax, as herein described for the purpose specified.

4th, The connecting of the front brake bar, Bx, to the slide, S, of the draft-pole through the medium of the lever, G, and the tackle rope, Cx, arranged in the manner substantially as and for the purpose set forth.

5th, The sheaves, R R' in combination with the lever, G, sliding pole, S, rope, Cx, front and rear brake shoes, Ax Bx, and derrick, whereby the wagon is stopped and the load elevated at one operation, as herein shown and described.

6th, Constructing the derrick, B, with a jointed standard, the two parts, axx, each of which have oblique abutting ends, connected by a strap hinge or joint, provided with a socket, and having the arm, D, of said derrick, connected to the standard by a metal strap, bx, and supported or braced by a bar, d, the lower end of which is attached to the lower end of the upper part axx, of the standard, substantially as shown and described.

80,223.—DAMPER.—J. C. Rhodes, Stillwater, Minn.

I claim, 1st, The spark arrester, constructed, as described, of the pivoted plate, B, having openings, and closing against the lug, a', upon the plate, A, the plate, C, having the gauze-covered openings, D, and pivoted centrally to the plate, B, and moving with it upon the plate, A, all arranged and operating as described for the purpose specified.

2d, The combination and arrangement of the plate, A, the swinging plate, B, wire gauze D, and pivoted plate, C, as herein shown and described and for the purpose set forth.

80,224.—BUTTON FASTENER.—Ezra Ripley, Troy, N. Y.

I claim a new and improved button fastener, consisting of a suitably-shaped piece of leather, or other suitable material, A, having a tongue, B, and slot, C, constructed and arranged substantially in the manner and for the purposes herein fully described and set forth.

80,225.—EXCAVATING MACHINE.—Jas. Robertson, Glasgow, Scotland.

I claim, 1st, The mouth piece, B, forcing pipe, A1 A2, etc., and exhausting pipe, C1 C2, etc., in combination with a pump, for forcing a strong current of water through the apparatus, as and for the purposes herein specified.

2d, In combination with the above, the rotating spike cylinder, E1, arranged to operate therewith, as and for the purposes herein specified.

3d, The mouth piece, B, with a pump forcing pipe and exhausting pipe, substantially as specified, connected to and arranged to operate from the floating structure, H, as and for the purposes herein specified.

80,226.—CARVING FORK AND KNIFE SHARPENER COMBINED. E. S. Scofield, Rochester, N. Y.

I claim the peculiar construction and arrangement of the guard, a, when in connection with a fork, in the manner and for the purpose specified and described.

80,227.—BELT HOOK.—E. F. Sherman, Chicopee, assignor to himself and A. W. Kellogg, Pittsfield, Mass.

I claim the four hooks, a i i a, all connected longitudinally by means of the central bar, e, and the two end bars, c c, the whole constituting a belt hook, and constructed substantially as herein described and for the purposes specified.

80,228.—HORSE POWER.—A. Smith, Dayton, Oregon.

I claim the shaft, d, in the frame, E, arranged so as to be capable of being adjusted in two different directions by means of the screws, J G, connected respectively with slides, H, and bearings, e, as indicated by the arrows, 1 2, in combination with the frame, A, containing the driving belt, D, and rollers, c c, and the belt, N, with the shaft, K, in frame, E, all arranged for joint operation, substantially in the manner as and for the purpose set forth.

80,229.—SPARK ARRESTER.—A. F. Smith (assignor to himself and Lewis Friend), Ellsworth, Me.

I claim, 1st, The two parts, A B, the shell, C, cap, E, and the wire grate chamber, F, with the openings, b, in shell, C, and the openings, g, in the upper part, B, covered with wire cloth, all combined and arranged substantially as and for the purpose set forth.

2d, The draught tubes, B, placed in the lower part, A, of the device, and the openings, b, in the shell, arranged to operate substantially as and for the purpose specified.

3d, The shield I, attached to the vane, H, and arranged in relation with the wire gauze chamber, F, substantially as and for the purpose set forth.

80,230.—COOKING STOVE.—C. W. Smith, Hornellsville, N. Y.

I claim the base, A, cylinder coal fire box, at one end, and a wood fire box, F, elevated on arches, h h, at the other, as constructed and arranged, in combination with the top, H H, dampers J J, and oven K, operating in the manner as and for the purpose herein set forth.

80,231.—BRICK MACHINE.—F. H. Smith, Baltimore, Md.

I claim the adjustable bed plate plate, Z, when vertically adjusted by means of the set screws, e, the mold carrier, O, provided with its open mold and lugs, d, and the jointed lever arms, M L, and wooden arms, J, all arranged together and operated as and for the purpose herein set forth.

80,232.—ROCK DRILLING MACHINE.—J. C. Smith, Troy, N. Y.

I claim, 1st, The jaws, J J', and K, constructed as described, and joined to the head piece, L, in combination with the crank shaft, c, and stationary rod M, for the purpose of giving an up and down motion to the drill shaft, N, substantially as and for the purposes herein set forth.

2d, The wheel, R, constructed as described, with lugs, m m, working in the screw threads on the shaft, C, and connected by means of rods, k k, with the flanged collar, O, in combination with the lever, h, and lug, o, on said collar, and the groove, p, on the drill shaft, N, for the purpose of giving said drill shaft a rotary motion, substantially as and for the purposes herein set forth.

3d, The arrangement of the driving wheel, G, pinion H, crank shaft, c, and fly wheels, I I, when constructed as described, and used, in combination with the jaws J, J', and K, for the purpose of giving motion to a drill shaft, in drilling rock, substantially as herein set forth.

80,233.—STOVE GRATE.—John C. Smith, Troy, N. Y., assignor to Wager, Fales & Co.

I claim the arrangement of the bridge C, and arm, D, when constructed as described, and used in combination with the grate, B, which is provided with pins, c, d, and e, substantially as and for the purposes herein set forth,

80,234.—FRUIT JAR.—Hiram Stone, Cleveland, Ohio.

I claim, 1st, The stem, I, and spring, A', as arranged, in combination with the auxiliary jar, D, in the manner and for the purpose set forth.

2d, The stem, I, and auxiliary jar, D, in combination with the jar, A, for the purpose and in the manner substantially as set forth.

80,235.—STOVE PLATE.—David Stuart and Alex. Wemyss, (assignors to Stuart, Peterson & Co.,) Philadelphia, Pa.

We claim, 1st, A guard plate, having deflecting shields and open spaces, arranged substantially in the manner and for the purpose set forth.

80,236.—JAPPANNING METAL.—George J. Sturdy and S. W. Young, Providence R, I,

I claim, 1st, The use of plumbago, or its equivalent, in the process of jappanning, substantially as described.

2d, Immersing the article jappanned in a water bath, thereby setting free the naptha, or other volatile liquid, and throwing off the excess of japan, substantially as described, and for the purposes set forth.

3d, The black lead coating, or its equivalent, in combination with a hot water bath, in the process of jappanning, substantially as described.

80,237.—George C. Taft, Worcester, Mass. Antedated July 11, 1868.

I claim the sliding jaws, B and D, held on the bar, A, by means of the rosset, c, fitted in the recess, d, of the bar, A, all constructed and arranged to operate substantially as described.

80,238.—CUTLERY.—Albert L. Taylor, Springfield, Vt.

I claim a spiral handle for cutlery, constructed or formed out of the same piece of metal as the blade or either portion of the implement, substantially as shown and described.

80,239.—PROPELLING VESSELS.—O. Tenny, Littleton, Mass.

I claim the combination, with the cylinders, a, of the beads or followers, c, and disks or pistons, f, all arranged and operating substantially as described,

80,240.—COOKING STOVE.—E. O. Thomas, Jersey city, N. J.

I claim the arrangement within the stove of the curved portion, a, bottom plate, b, and top plate, f, whereby a crescent shaped fire box, G, is formed upon one side the oven, B, a combustion chamber, c, above it, and a hot air chamber, d, beneath it, as herein described for the purpose specified.

90,241.—WOOD SPLITTING MACHINE.—Leonard Tilton, Brooklyn, E. D., N. Y.

I claim, 1st, The bed, F, made V-shaped in its cross section, and provided with the journals, c, and shank, b, said bed being arranged to oscillate in connection with the rock shaft, F, so as to alternately close the bottoms of the hopper, D D, substantially as herein shown and described, for the purpose specified.

2d, The arrangement of the V-shaped cutters, J J', K K', with relation to the slotted hopper, D, and oscillating bed, F, as herein described, for the purpose specified.

80,242.—MINCING CLEAVER.—Samuel J. Tongue (assignor to himself and Jabez Jenkins), Philadelphia, Pa.

I claim the cutting edge, b, of the cleaver, formed at one edge of the blade, A, in combination with the cutting edge, d, of the mincing knife, formed on the outer end of said blade, all constructed substantially as and for the purpose set forth.

80,243.—CLOTH PLAITING ATTACHMENT FOR SEWING MACHINES.—Sydney D. Tucker, Troy, N. Y.

I claim 1st. The folding guide C, hemmer, D, plate, A, having the slot, B, therein, the whole being constructed, arranged, and combined in the manner herein contained, described and set forth.

2d, The arm, W, supporting plate, X, plate, J, adjustable plate, I K k, and the plate, G, all and each constructed and combined and arranged substantially as herein set forth.

3d, The devices constructed as herein described, and forming a plaiter in two parts, and in which the cloth moves under the plaiter, as shown the whole arranged in the manner substantially as herein contained described and set forth.

4th The folders, K and L, constructed and operated substantially as and for the purposes herein fully described.

5th, In combination with a plaiter, the guide, M, and slide, N, substantially as hereinbefore described and set forth.

6th, The guide, T, and guide-bar, S, in combination with each other and with a plaiter, substantially as and for the purposes herein fully described and set forth.

80,244.—CORN AND COB MILL.—Thomas Ucker and Andrew Hutchins, Amanda, Ohio.

We claim the upper end and lower circles of toothed staves forming the grinding surfaces of both the revolving cone and the surrounding case, the upper circle of both revolving cone and the case being composed of perforated staves, which are capable of being applied to either said cone or case, the whole banded together at top and bottom, and at the junction of the upper and lower parts of the mill, substantially as and for the purpose described.

80,245.—APPARATUS FOR CUTTING AND MITERING PRINTERS' RULES.—William W. Ustick, La Crosse, Wis

I claim, 1st, The combination of the file-formed cutter, b, with the stock, B, when arranged to operate substantially as described and for the purpose set forth.

2d, The improved apparatus herein described, when its several parts are constructed and arranged with relation to each other, in the manner and and for the purpose set forth.

3d, The combination of the file formed cutter, e, with the stock, B, when constructed as and for the purpose specified.

80,246.—HORSE COLLAR FASTENING.—A. Van Fleet, Ashton, Ill.

I claim the herein described double loop, B, applied to the collar, substantially as described, in combination with adjustable hooks, as and for the purpose set forth.

80,247.—POTATO DIGGER.—Arthur Van Norman, Detroit, Mich.

I claim, 1st, The rotating screen, G, provided with the internal flange or screw, J, in combination with the reciprocating cutter, P, all arranged substantially as and for the purpose specified.

2d, The scoop, K, with the apron or bearing piece, i, underneath it, in combination with the screen, G, and cutter, P, all applied to the frame, F, and arranged to operate in the manner substantially as and for the purpose set forth.

3d, Connecting the shaft, b, by a rod, f, to a crank, g, on shaft, H, substantially as shown and described, for the purpose of rendering the screen and the cutter operative and inoperative simultaneously with the rising and lowering of the scoop and cutter.

80,248.—APPARATUS FOR DRYING GLUE.—Christian Wahl, Chicago, Ill.

I claim, 1st, The employment of earthy surfaces upon which to expose the glue, substantially as and for the purposes herein set forth.

2d, The combination of the revolving disks, B, with the endless belt, A, or its equivalent, for transporting them for a considerable period through a drying current of air, substantially as and for the purposes herein set forth.

3d, The adjustable pulley, C', arranged as represented relatively to the endless belt, A, and to the glue exposing surfaces, B, carried thereon substantially as and for the purposes herein set forth.

4th The deflectors, F, arranged as represented, and to plates or glue presenting surfaces, B, which are transported past them, substantially as and for the purposes herein set forth.

80,249.—MACHINE FOR DRYING GLUE.—Christian Wahl, Chicago, Ill.

I claim, 1st. Removing the thin glue adhering to the surfaces, B, by means of a brush, R, against which the surfaces are presented after drying, and before being again immersed in the glue, for the purposes herein set forth.

2d, Revolving the brush or clearing device, R, so as to actively rub the surfaces of the drying plates, however slowly they may be moving substantially as herein set forth.

3d, The deflecting pulley, C3, arranged to cause the carrying chain to turn partially around it in its descent, substantially as and for the purposes herein described.

4th, The employment of rigid links, A, polygonal pulleys, C1 C2 C3, tank or caldron, D, and means for impelling dry currents of air in connection therewith, as and for the purposes herein set forth.

5th, The gauze chamber, J J, arranged as represented, relatively to the air-currents and to the traveling plates, B, carrying the glue to be dried, substantially as herein set forth

6th, In connection with mechanism for drying glue as specified, chemically drying the air previous to its introduction to the apparatus, substantially as and for the purposes herein set forth.

80,250.—MACHINE FOR DRYING GLUE.—Christian Wahl, Chicago, Ill,

I claim, 1st. The within described combination and arrangement of the passages in a glue drying apparatus, so that the glue drying surfaces shall be presented to the warm or chemically dried air for a longer period than to the cold air, for the purposes herein set forth.

2d, Revolving the disks, B, or their equivalents, two or more times when the glue is being received thereon, and chilling the glue at each revolution, substantially as and for the purposes herein set forth.

3d, Actively revolving the disks, B, by means of the pulleys, N, or their equivalents, at the period when the glue is being removed, as herein specified.

4th, The partitions, T, arranged as represented, and adapted to serve the double purposes of deflecting the air currents and retaining the glue, substantially as herein set forth.

5th, The combination of the partial partitions F and T, arranged as represented relatively to each other and to the glue exposing surfaces, B, and to the currents of air traversing the same, substantially in the manner and for the purposes herein specified.

6th, The combination of the revolving disks, B, with the wheel, A, for transporting them through drying currents of air, substantially as and for the purposes herein set forth.

80,251.—BAND PULLER.—H. M. Wait, Woodstock, Ill.

I claim the lever, A, with curved end, and face, A', in combination with hook, B, the whole being constructed as described, and combined and operated as and for the purpose set forth.

80,252.—COMBINED PLUMB, SQUARE, AND LEVEL.—A. F Ward, Marietta, Ohio, assignor to W. S. Batchelder & Company, Pittsburg, Pa.

I claim, 1st, The swinging frame, B, provided with the conical projections, b b, and jointed to the frame, A, provided with the conical sockets, a a, substantially as and for the purpose described.

2d, The part, a1, provided with the flange, d2, and the part, d, provided with lugs, as described and both parts otherwise constructed as and for the purpose described.

3d, The projector, c, provided with the lip, e, connected to the frame, A, substantially as and for the purpose described.

80,253.—CIDER MILL AND PRESS.—Eli Wangaman, Blairsville, Pa.

I claim, 1st, The rollers, a, b b, perforated sheet, R, box, G, chutes, E E and H, arranged substantially as shown and described, within a frame, A A A, &c., and operated in the manner substantially as herein set forth.

2d, The arrangement, herein shown and described, upon the frame, A, and with relation to the grinding and pressing mechanism, of the drive wheel, B, shafts, P S, pulleys, M D N V, and belts, C L O, all as herein set forth.

80,254.—SHEARS.—Hermann Wendt, Elizabeth, N. J., assignor to Henry Seymour and Robert H. Seymour, Brooklyn, N Y.

I claim casting the circular recess, i, in the shear blade, for the purpose of preventing a drop hammer from compressing or hardening the metal at the point where the rivet hole is to be made, whereby the metal within the recess is left soft, in order that the rivet hole may be formed by punching, as herein shown and described.

80,255.—SHEEP SHEARS.—Hermann Wendt, Elizabeth, N. J. assignor to Henry Seymour and Company, New York city.

I claim the combination of the projection or ears, a a', formed respectively at the inner ends of the iron and steel plates, C D, of the blades, and welded together to constitute the stops of sheep shears, substantially as herein set forth.

80,256.—SLEIGH BRAKE.—Benjamin F. Wheeler, Calais, Vt.

I claim, 1st, The combination of the bent lever dogs, K, equal armed lever, I, chains, J, parallel side bars, E, sliding reach, H, and rear bob, B, all arranged as described, for the purpose specified.

2d, The combination of the short chains, J, with the equal armed lever, I, the side bars, E, or bolster, D, as herein shown and described, and for the purpose set forth.

3d, The combination of the cam lever, L, with the connecting bar or reach, H, and with the rear bolster, D, as herein shown and described, and for the purpose set forth.

4th, The arrangement of the slotted bolster, C D, parallel side bars, E, sliding reach, H, metallic plate, G, equal armed lever, I, chains, J, and bent lever dogs, K, all operating as described, for the purpose specified.

80,257.—ENVELOPE.—John B. Wheeler, Neville, Ohio.

I claim, 1st, The piece or device, A, with its mortise, c, and notch or catch, e, in same, in combination with the piece, B, and its spring, g, substantially as shown and described.

2d, The manner of fastening the pieces, A and B, to the envelope, and securing the same from being opened without mutilation, substantially as shown and described.

80,258.—HARVESTER.—William N. Whiteley, Springfield, Ohio.

I claim, 1st, The loose sleeve, I, in combination with the spindle, H, fastened permanently to the arm, E, substantially as and for the purpose set forth.

2d, Reversing the taper of the bearing of the grain wheel, substantially as herein described, so that, while the arm which supports the wheel is on the outer side of said wheel, the large end of the bearing on which the wheel turns will be next to the divider.

3d, The sleeve, I, with the chambered head, K, which will partially enclose one end of the hub, to retain the same in place, and to exclude dust and dirt from the frictional surfaces, in connection with a corresponding chamber made in the arm, E, or spindle, H, to enclose the other end of the hub.

80,259.—SELF LOADING CART.—G. W. Whitson, Ashville, N. C.

I claim the combination of the plow, P, standard, R, support, J, axle, B, toggle bar, U, lever, V, and false shafts, J, substantially as described, for the purpose specified.

2d, The combination of the toggle bars, U, and lever, V, with the plow standard, R, and false shafts, J, substantially as described, and for the purpose set forth.

3d, The combination of the plows, L, standards, M, arms or supports, N and draft and adjusting chain, O, with the false shafts, J, and wheels, C, substantially as herein shown and described, and for the purpose set forth.

4th, The combination of the cam levers, K, with the shaft bar, H, and false shafts, J, substantially as herein shown and described, and for the purpose set forth.

80,260.—PAVEMENT.—J C. Williams, New York City.

I claim the arrangement and formation of spaces, d, between and around the blocks, A, by means of grooves, b, and keys, B, in combination with the rabeted sides, a, of said blocks, substantially as set forth.

80,261.—PAVEMENT.—C. Williams, New York City.

I claim, 1st, The inverted wedge shaped keys, a or a*, in combination with the blocks, A, substantially as and for the purpose described.

2d, The intermediate elastic bed, C, in combination with the "sub-bed," B, and the blocks, A, substantially as and for the purpose set forth.

80,262.—CARRIAGE THILL COUPLING.—H. B. Willcox, Philadelphia, Pa.

I claim, 1st, The block, B, with its recesses, d, e, and x, and the block, f, of rubber, fitting the recess, x, in combination with the bar, A, and its projection, b, substantially as and for the purpose described.

2d, The combination of the above, the flap, k, and disk, l', substantially as and for the purpose specified.

80,263.—FELTED FABRIC.—Henry Hayward, New York city.

I claim the within described felted fabric, compounded of the two layers of felt, A and C, with a layer or partial layer of open worked horse hair cloth enclosed between, the whole being firmly confined together by the interlaced fibers, a and c, of the felted material, substantially as and for the purposes herein set forth.

REISSUES.

22,681.—COOKING STOVE.—Dated January 18, 1859; reissue 1,684, dated May 31, 1861; reissue 3 041, dated July 14, 1868.—Division B.—Philo P. Stewart, Troy, N. Y.

I claim, 1st, The employment and arrangement of the top plate of a cooking stove, having a flue or flues immediately thereunder, and extending over and beyond the rear end and upper portion of the vertical flues, back of the oven thereof, in such mannner as to receive and support a reservoir or water tank upon or over a suitable opening therein, and with a heating chamber immediately below or underneath the same, in the manner and for the purposes substantially as herein described and set forth.

2d, The arrangement and employment of the heating chamber, D, or its equivalent, in combination with the rear vertical end flues of a cooking stove, and with the reservoir or water tank, P, in the manner and for the purposes sunstantially as hereinbefore fully described and set forth.

3d, The combination of the chamber, D, extending beyond the rear end of a cooking stove, and situated under or immediately below the reservoir or water tank, C, with the flue H extending from the fire chamber or chamber of combustion, and over the top plate of the oven, and with the vertical rear and flues of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

4th, The arrangement and employment of the reservoir or water tank, C, in or upon and with the extended top plate A and A', of a cooking stove, and heating chamber, D, in combination with the heating or warming closet, S, in the manner and for the purposes substantially as herein described and set forth.

5th, The arrangement and combination of the heating or warming closet, S, or any equivalent thereof, upon the rear end of a cooking stove containing vertical flues, in the manner and for the purposes substantially as herein described and set forth.

6th, An opening, O, in and through the rear end vertical plate of a cooking stove, of sufficient capacity to allow the passage of hot air, or of the heated escaping products of combustion, through the same, and into a chamber underneath a reservoir or water tank, so as to warm or heat the water therein in the manner substantially as herein described and set forth.

7th, The combination of an exit chimney pipe or flue with the heating chamber, D, underneath the reservoir or water tank, C, in the manner and for the purposes substantially as herein described and set forth.

8th, The arrangement of a reservoir or water tank upon the extended top plate of a cooking stove, and supported over or beyond the rear end vertical flues of a cooking stove, in the manner and for the purposes substantially as herein described and set forth.

9th, The vertical end plate of a cooking stove, containing the opening, O, or any equivalent therein, for the passage of the hot air or escaping heated products of combustion into a suitable chamber underneath the reservoir or water tank, the same being regulated or controlled by a suitable damper, L, and all combined with a cooking stove, in the manner substantially as herein described and set forth,

10th, The combination of the chamber or flue, P, with the vertical flues between the oven and the rear end plate of a cooking stove, and with the chamber, D, and with the flue or flues in the bottom of the stove, in the manner and for the purposes substantially as herein described and set forth.

11th, A reservoir or water tank, for the warming or heating of water therein, or for other purposes, arranged and combined with a cooking stove having vertical flues in the rear end thereof, and in the rear of the oven of such cooking stove, substantially as herein described and set forth.

66,004.—GAS APPARATUS.—Dated July 25, 1867; reissue 3,042.—Charles Deaves, New York city.

I claim 1st, The connecting couplings, D and K, in combination with the retorts, when fitted with plates, E G 1, to facilitate the cleaning of the retort substantially as described.

2d, The use of two or more retorts, connected together in pairs, so that the first shall volatilize the oil or oily substance, and the second shall complete the conversion thereof into a fixed gas, suitable for illuminating purposes, the said retorts being constructed and arranged substantially as and for the purposes herein above set forth.

3d, The combination, with the conducting pipe, K, of a cooling trough, L, the water from which supplies the wash box, substantially as and for the purpose set forth.

4th, The combination, with the discharge end of the conductor pipe, K, of a perforated or reticulated disk, h, substantially as and for the purpose set forth.

73,519.—MACHINE FOR COLLECTING AND CONDENSING METALLIC VAPORS.—Dated January 21, 1868; reissue 3,043.—Ferdinand Formhals, San Francisco, Cal.

I claim, 1st, In combination with the furnace, A, the screw or submerger, F, formed by a covered spiral flange or blade, H H, around a central shaft or axis, substantially as and for the purpose described.

2d, Drawing the volatile substances from the furnace into the submerging tank, E, by the screw, F, from thence along the spiral opening to the chamber, I, and out through the pipe, J, to the condensing tank or tanks, substantially as described.

44,719.—BASE BURNING STOVE.—Dated October 28, 1864; reissue 3,044.—James Gray, Albany, N Y.

I claim, 1st, A furnace, with a fuel magazine, which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, so constructing such furnace that the products of combustion rising from the fire chamber will be conducted toward the top of the furnace through flues which are formed by cylinders, D and E, and partitions, h, and which are arranged around an ascending warm air passage, substantially as and for the purposes described.

2d, In a furnace, with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, the outer case, c, constructed with horizontal openings, d, and air-passages, e1, substantially as and for the purposes described.

3d, In a furnace with a fuel magazine which is sustained free from the grate and so arranged that the inflamed gases may burn in a free space, the construction of case, c, with horizontal openings, d, vertical openings, e, and horizontal openings, e1, through it, substantially as and for the purposes described.

4th, The outer case, c, constructed with openings, d, and horizontal air-passages leading from the same into the annular air-chamber, e2, in combination with a fuel magazine, which is supported free from the grate, and so constructed that the inflamed gases may burn in a free space, as they are evolved from the entire outer surface of the incandescent pile of coals, substantially as described.

5th, The arrangement of the damper, g2, in combination with the vertical chambers formed by the walls, C D, and E, and a depressed fire-pot, B, substantially as described.

6th, In a furnace with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, jacketed diaphragm, c1 c2, applied at the base of the fuel magazine, substantially as described.

7th, In a furnace with a fuel magazine, which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, air-passages, b e e1 e2, in combination with flues, b' 1, and G, operating substantially as described.

8th, In a furnace with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, case C, in combination with the jacketed diaphragm, c1 c, c2, and fuel magazine, C, substantially as described.

9th, In a furnace with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, the combination of the fuel magazine, C, the intermediate cylinder, D, and the outer cylinder, E, substantially as described.

10th, In a furnace with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, the cylinders, C D, and E, in combination with air escape pipe, J, and smoke-escape, G, arranged and operating substantially as described.

11th, In a furnace with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space the combination of the fuel-magazine, C, and the intermediate cylinder, D, with the jacketed diaphragm, c1 c2, and openings, e1 e2, substantially as described.

12th, In a base-burning, air-heating furnace, the annular flue, i, surrounding and over the supply-cylinder, C, in combination with the combustion chamber, b, and jacketed diaphragm, substantially as described.

13th, In a furnace with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, the manner substantially as described, of introducing and passing cool air into the periphery of the case, c, and across the flue space or annular combustion chamber, b', substantially as set forth.

14th, In a base-burning air-heating furnace, having its magazine free from the grate, the window or doorway opening leading into the combustion-chamber, through which the condition of the fires can be seen and regulated substantially as described.

15th, In a furnace with a fuel magazine which is sustained from the grate, and so arranged that the inflamed gases may burn in a free space, constructing the top plate, F, of the same, with a central opening for the escape of heated air, and also with a feed door or passage leading to the fuel magazine, substantially as described.

16th, In a furnace with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space the combination of the annular combustion chamber, b', the jacketed diaphragm, c1 c2, and the horizontal openings, d, through the case, c, the latter being covered with mica for the purpose of illumination and radiation, substantially as described.

17th, The central opening, J, for the escape of heated air, in combination with a fuel magazine which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, as they are evolved from the entire upper surface of the incadescent pile of coals, substantially as described.

18th, In a furnace with a fuel magazine, which is sustained free from the grate, and so arranged that the inflamed gases may burn in a free space, the central opening, J, in combination with the jacketed diaphragm, c1 c2, substantially as and for the purposes described.

19th, In an air-heating base-burning furnace, having its fuel magazine sustained free from the grate, a door-opening, d, leading into the fire chamber above the fire pot, B, substantially as described.

20th, Making the jacketed diaphragm smaller at its base or lower end than it is at the upper end, substantially as shown.

21st, The arrangement of a jacketed diaphragm over a gate, a', which is of a larger area than the bottom of said diaphragm, substantially as described.

67,512.—FERMENTING AND OXIDIZING MASH, MALT, ETC.—Rudolph D'Heureuse, San Francisco, Cal. Dated August 6, 1867; reissue 3,045.

I claim the improved mode of facilitating fermentation or germination by the introduction of air or other gaseous substance of proper temperature and moisture, with mash for distillation, vinous or other substances subject to fermentation or germentation, at or near the bottom of the same, substantially as and for the purpose described.

68,454.—MODE OF MANUFACTURING HEADS FOR ELLIPTIC SPRINGS.—Joseph Palmer, Concord, N. H. Dated September 3, 1867; reissue 3,046.

I claim, 1st, The right and left dies, constructed substantially as and for the purpose herein described.

2d, As an article of manufacture, the ears, as by them manufactured.

3d, The application of the ears to the main leaf of elliptic springs, substantially as and for the purpose herein described.

71,649.—HARVESTER RAKE.—John L. Rohrer.—Upper Leacock township, Pa. Dated December 3, 1867; reissue 3 047.

I claim, 1st, A series of reel blades, revolving round an inclined axis, in combination with a rake revolving simultaneously with the blades, but round a vertical axis, and which is elevated and depressed during its revolution, substantially as and for the purpose described.

2d, A series of reel blades, revolving round an inclined axis, in combination with a rake revolving round a vertical axis, and with the within described devices, or their equivalents, whereby the motion of the rake may be arrested without interfering with that of the blades.

3d, A shaft, Q, bent as described, and carrying revolving sleeves, D F, a rake-bearing jointed to the sleeve on the vertical portion of the shaft, and a series of arms being connected to the sleeve on the inclined portion of the shaft, substantially as and for the purpose specified.

4th, The plate, Q, with its strait and curved slots, in combination with the arms and rake shaft or blades, as described.

76,831.—LAWN MOWER.—Dated April 14, 1868; reissue 3,048. Samuel W. Sears, New York city.

I claim, 1st, A lawn mower so constructed that the cutter bar may be operated either by a driving wheel connection or by hand power, substantially as and for the purposes herein described.

2d, In a hand power, the combination of the roller or driver, C, with the concentric gear, F, supporting the frame, A, the crank shaft, d, the shifting sleeve gear, the shaft, E, and the reciprocating cutter bar, D, constructed, arranged and operating substantially as and for the purposes herein described.

34,496.—HARVESTER.—Dated Oct. 15, 1861; reissue 1,699, dated June 14, 1864; reissue 3,049.—Division B. John F. Sieberling, Akron, Ohio.

I claim, 1st, The combination in a harvester, substantially as set forth, of a platform oscillating on an axis parallel with the finger beam, with a device operated by the foot of the driver, for inclining the platform to discharge the gravel.

2d, The combination, substantially as set forth, in a harvester, of two main wheels, a frame to support the gearing, a finger beam suspended from the frame by flexible connections, an oscillating platform, and a device operated by the driver for inclining the platform.

3d, The combination, substantially as set forth, in a harvester, of two wheels, a main or gearing frame, a laterally projecting finger beam suspended from the main frame by flexible connections, a platform oscillating on an axis parallel with the finger beam and connected with the main frame through the medium of the finger beam only, and a device to operate the platform from the driver's seat.

4th, The combination, substantially as set forth, with a harvester platform, of a double cranked rocking lever and a treadle, operated by the driver, for the purpose set forth.

5th, The combination, substantially as set forth, with a harvester platform, of a treadle, P, a rod, p3, a lever, P', a connecting rod, p, and an arm, O, for the purpose set forth.

6th, The combination in a harvester substantially as set forth, of a cut-off with a rod, m', arms, o o', a rod, p, a lever, P', a rod, p3, and a treadle, P, whereby the cut-off is operated by the same devices as those which operate the platform

22,310.—MACHINE FOR MAKING NUTS.—Dated Dec. 14, 1858; reissue 3,050. The Union Nut Company, Unionville, Conn., assignees of Julius B. Savage.

I claim, 1st, The combination of a shears with a table, transferrer, and edge swages, the whole constructed and operated substantially as described.

2d, The combination of a shears with a table, transferrer, and face swages, substantially as described, in such manner that the transferrers do not hold or compress the sides of the nuts while its face is being swaged, the whole constructed and operated substantially as described.

3d, The combination of a shears with both face and edge swages, by means of a supporting table and transferrers, the whole constructed and operated substantially as specified.

4th, The combination of edge swages with face swages, by means of a table and transferrer, the whole constructed and operated substantially as described.

5th, A combination of face swages with a punch, by means of a transferrer and supporting table, acting to transfer the blank, between the two operations, the combination being substantially as described, and the above parts in combination with edge swages, the whole constructed and operated substantially as set forth.

6th, The combination of a shears and punch, edge swages and face swages, by means of transferrers and a table, the two latter acting to transfer the blank so that it is operated upon by the former in different localities, the whole constructed and operated as described.

7th, The arrangement in succession of, first, a shears; second, swages; and, third, a punch, substantially as herein described, so that a blank is first cut off, then swaged, and finally punched, the whole constructed and operated substantially as set forth.

8th, In combination with a supporting table, a transferrer with a notched or angular acting face, operating both to turn and move a blank, the whole constructed and operated substantially as described.

DESIGNS.

3,113.—TRADE MARK.—Henry Albers (assignor to C. Albers & Co.), Warsaw, Ill.

3,114.—FRAME OF A GYROSCOPIC TOP.—C. P. Arnold (assignor to the Gyroscopic Top Company), New York city.

3,115.—SHIRT COLLAR.—Chas K. Brown (assignor to himself, Chas. A. Brown, and Franklin Field), Troy, N. Y.

3,116 and 3 117.—COOKS' STOVE.—Wm. C. Davis (assignor to W. C. Davis & Co.), Cincinnati, Ohio. Two patents.

3,118.—TRADE MARK.—Henry M. Myers, Allegheny City, Pa.

3,119 to 3,123.—CARPET PATTERN.—Elemir J. Ney (assignor to Lowell Manufacturing Company), Lowell, Mass. Five patents.

3,124.—GASOLIER.—James F. Travis (assignor to Archer, Pancoast & Co.), New York city.

3,125 to 3,127.—PICTURE FRAME.—Geo. L. Underwood, Boston, Mass. Three patents.

3,128 and 3,129.—INK TRAY.—G.L. Underwood, Boston, Mass. Two patents.

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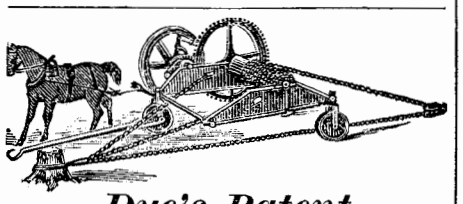

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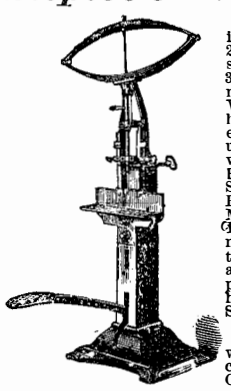

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PATENTS

The First Inquiry that presents itself to one who has made any improvement or discovery is: "Can I obtain a Patent?" A *positive* answer can only be had by presenting a complete application for a Patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After a season of great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning.

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The model should be neatly made of any suitable materials, strongly fastened, without glue, and neatly painted. The name of the inventor should be engraved or painted upon it. When the invention consists of an improvement upon some other machine, a full working model of the whole machine will not be necessary. But the model must be sufficiently perfect to show, with clearness, the nature and operation of the improvement.

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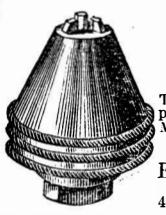

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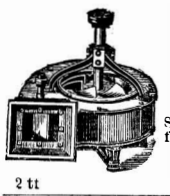

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