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### Improved Tile Machine.

This engraving represents a new and well-arranged machine for making drain tile. These are so universally adopted for carrying off waste water that a great demand exists for them.

The principal idea of this machine is to deposit the cement or material from which the tiles are made in a chamber or pug mill, A, where it is subjected to the action of a series of blades on the shaft, B. These blades are in form something like a screw propeller,

no preparation previous to being placed in the pug mill, except watering. The wires in cutting off pass between the rollers, so that no waste in the material is made, and the ends are left perfectly square.

The inventors are practical tile makers for upward of twenty years, and have tested this machine for two seasons at their works in Smyrna, Del., where it has proved satisfactory. It is strong and durable, and not liable to get out of order.

It was patented through the Scientific American'tint required by different portions of the picture.

secured without any such translation; the picture is produced with every gradation of a continuous tint, and by mechanical printing, sufficiently rapid to compete with copper-plate or lithography. To do this, however, it has been necessary to introduce a distinctly new principle into printing operations, and to prepare a plate which should apply or give up to the paper different proportions, in different parts, of a semi-transparent ink, according to the depth of



EVANS, COLLINS & SMEDLEY'S TILE MACHINE.

and act similarly, forcing the material down toward the chamber, C, at the bottom. In this chamber there are two plungers worked by a crank shaft. D. said shaft being driven by gearing, E; one crank is out of sight. The cranks are set in line with each other, so that both are not forcing at once. This reduces the strain on the machine, as one plunger is commencing its stroke while the other is complete ing it.

The shape of the tile is given by the mold apertures, F, at the end; the clay is forced through these and receives the tile form in that manner. The core. G, is supported by a bar inside, applied at its center; this is again attached to a transverse rod called a bridge bar. The latter is some distance from the core. so that the clay, after it has passed the bar, is enabled to close up again as it approaches the mold, thus forming a smooth, unbroken pipe.

As the tiles issue from the molds, they are received by the rollers, H, in connection with which there is a cutting-off apparatus, I. This consists of an iron frame with wires, J, on it. The frame is capable of being turned by a bearing, so that the wires will be brought over the tiles, thus cutting them off. When not in use, the frame and wires remain as shown in the engraving. The machine is intended to be driven by horse power through a sweep, as usual, but any power can be attached to the vertical shaft.

It will make 750 tiles or bricks per hour, with the labor of three men and two horses. The clay requires

Patent Agency on Sept. 26, 1865, by Josiah D. Evans, | This is the problem which Mr. Woodbury has solved, Thomas' A. Collins and Thomas J. Smedley. For further information address them at Smyrna, Del.

## New Photographic Process for Printing.

In all the ordinary methods of mechanical printing, gradation from light to dark is obtained by the use of lines or dots, which, having finer or broader surfaces, and being ranged in close proximity or spread wide apart, the spaces between being absolutely white, give the effect of the lightest tints or the deepest shades. This is the case whether the ink be applied to the portions in relief of a woodcut, to the hollows of a copper-plate, or to the portions of a flat surface for which it has affinity on a lithographic stone. The ink is, in each instance, opaque, and gradation is only obtained by breaking its continuity of surface with small spaces of white. In photographic printing, gradation is obtained by different depths of a continuous tint, resembling in effect, successive washes of a transparent pigment in water-color painting. The difficulty of reproducing this by mechanical means has been the obstacle in all attempts at photo-engraving, photo-lithography, or photo-block printing, and it has been for some time past admitted that the only means of success in this direction would consist in a method of translating the half-tone of gradation of tint into the halftone of grain or stipple.

In Mr. Woodbury's photo-relief printing, the end is

and we may remark, in passing, that we see no reason why the same principle might not find valuable application in the ordinary process of printing from engraved intaglio plates.

Mr. Woodbury's photographic intaglio is very simply obtained. The image in relief having been produced by the action of light through a negative on a film of bichromated gelatin, this gelatin relief becomes the matrix from which an indefinite number of metal plates, in intaglio, may be produced. The metal used resembles type-metal. A plate of this metal, about a quarter of an inch thick, with a perfectly plane surface, is placed in contact with the gelatin relief, and subjected to hydraulic pressure, by which a perfect transcript of every gradation in the gelatin is produced on the metal. Notwithstanding the softness of the metal, but slight trace of wear or deterioration is observed after some thousands of impressions have been taken from a plate. If the plate needed to be cleaned for each impression, like the copper-plate, or if it were necessary to submit it, in printing, to a heavy or rolling pressure, it would doubtless be necessary to subject it to some hardening process; but the pressure being light and steady, this is not necessary. The process, moreover, of producing a new plate from the gelatin relief is just as simple and easy as producing a print on paper.

The method of printing is easier than any other

with which we are familiar. In the various modes of photographic printing-except the collodiochloride-several operations are necessary to render the paper sensitive to light, and several others are required to tone and fix the image when obtained. In the various mechanical printing processes, some skill and care are requisite to keep the ink properly distributed on the roller, and to transfer it from the roller evenly to the surface of the plate or stone. But in the new method of printing, a little of the ink-which consists of a warm solution of gelatin and lamp-black, with a little crimson lake-is poured on the surface of the plate, where it stands in a little pool in the center; upon this the paper is placed; the platen is brought down, giving the slight pressure necessary, which at once spreads the ink over the surface and drives off at the edges all that is not required to form the picture. In a few seconds the gelatin has congealed, and the paper, being lifted up, brings with it all the ink from the depressions on the plate. The printing is indeed rather a process of casting than of printing as ordinarily understood, and the picture is a relievo in colored gelatin, taken from a very shallow metal intaglio. As the gelatin dries, it of course contracts, and the finished picture shows very little effect of relief or impasto. As the coloring matter is carbon, the permanency of the pictures is tolerably certain.

If the picture were left in this state it would be readily liable to injury from moisture, although not more so than a water-color drawing, which is not usually regarded as a very unstable form of art. But it will be obvious that there are various modes of rendering a film of gelatin insoluble. Mr. Woodbury has, during the last few months, tried several of these, but has not found any so simple and effective as immersing the print in a solution of strong alum. This at once renders the film insoluble, and, when dried, it is impervious to moisture, and little hable to mechanical injury.

The possible rate of printing remains yet to be absolutely determined. With the mechanical ap-pliances improvised for experiment, and the amount of manual skill obtained in the prosecution of experiments, Mr. Woodbury has been enabled to produce, single handed, one hundred and twenty prints in an hour. In the production of several thousands required for our readers, all the experience and skill necessary in the successful working of any proces had to be acquired, and the last two or three thousand are not only better in quality, but have been produced with more ease than the first two or three thousand. In each day's work with one pair of hands there are necessarily many interruptions, in preparing fresh ink and paper, clearing away accumulated prints, etc., but we find the smallest number produced in a day's work of six hours and a half to have been 403 prints, and the largest number in the same time 560 prints. With a little practice and a large number of presses at work, which might easily be managed, we see no reason why the rate of production should not be at least doubled. London Photographic News.

# **Record of Boiler Explosions.**

Explosion of three boilers at Columbia, Pa. Two men killed and three wounded. "No cause known !" Jan. 9th.-Locomotive New Jersey Central Railroad exploded. Three men killed, two wounded.

"No cause assigned !"

Jan. 19th.—Boiler exploded in Baltimore, Md. Three men injured. "No cause !" Jan. 29th.-Boilers of Carhart & Needham's Melo-

deon Manufactory, 23d street, New York. "Boiler overheated by sudden falling of water-flues expanded, forcing out heads and breaking many rivets."

Jan. 30th.-Locomotive Boston and Lowell Railroad exploded while at rest. One killed and two wounded. "No cause ascertained !"

Jan. 30th.-Terrfic explosion on Ohio Riversteamboat Missouri destroyed. One hundred killed. "No cause determined !"

Jan. 30th —Awful explosion of steamboat Miami. sunk in Arkansas River. Two hundred and twenty five killed! "No cause known!"

Jan. 31st.-Explosion of locomotive on the New Orleans and Jackson Railroad. Three killed and four wounded. "No cause ascertained!"

Feb. 2d.—Fearful explosion of steamboat W. R. at intervals of thirty minutes.

Carter, on the Missouri River. One hundred and fifty killed. "No cause known !"

Feb. 3d.-Steamboat Baltic exploded boiler while leaving dock at New Orleans. Three killed, seven wounded. "Nobody to blame !"

Feb. 3d.-Explosion of boiler in mill at Petersburg, Va. Six killed, seven wounded. "No cause known !" [Some friend has forwarded this record with a remark at the head-"Continued from Jan. 5, 1866." We have not received any previous account.-EDs.

# MISCELLANEOUS SUMMARY.

THERE are now two daily papers at Denver and two more in the mountain region. The section in which lumber is found in Colorado has twenty-five saw-mills, and ten flour mills have been set up within the past few years. The quartz mills in the State are counted at over 150, costing \$40,000,000. They should average, if all were running on medium ores, not less than \$23,000,000 per year. Wages rule at \$5 per day. Mr. Loveland, a resident of Golden City, is soon to erect a blast furnace and rolling mill at that point. The mill is to turn out rails for the road that is to be constructed between Denver and the towns of Central and Empire, passing through Golden City, and probably furnishing one of the many links in the overland railway to the Pacific.

AT a recent meeting of the Royal Society of Edinburgh, Sir David Brewster exhibited a piece of amber from the Kingdom of Ava, weighing about two pounds and a half. The specimen is remarkable in that it is intersected in various directions by thin veins of a crystallized mineral substance. These veins are, in some parts of the mass, as thin as a sheet of paper, and in other parts about the twentieth of an inch thick. An examination of a portion of the thickest vein has proved the mineral to be carbonate of lime. Pieces of amber of two and three pounds weight are rare. A specimen in Prussia, weighing one pound, is valued at fifty dollars. The largest piece yet found is in the Royal Museum at Berlin; it weighs eighteen pounds, and is said to be worth upward of several thousand dollars.

VANILLA .-- A successful effort, it is said, hes been make to raise this plant in France. The experiment was made in the public gardens of the St. Bruno, and the quality is affirmed to be equal to the best imported from the West Indies. The seed of the vanilla is remarkable for its fragrant odor, and yields an oil which is much used as a flavor. It is also employed in medicine in place of valerian, all the virtues of which it is supposed to possess, while it is at the same time far more grateful to the taste.

TO BLACKEN ZINC STATUES, ETC.-Make a solution of six parts of chloride of antimony in one part of alcohol and four parts hydrochloric acid, and ap ply it to the object with a brush. Wipe the figure over with a wet cloth, and then apply the solution a second time. Now dry the object as quickly as possible in a warm place. When it is perfectly dry rub it all over with oil.-Deutch. Illust. Gewerbzig. 1864.

THE commerce of the Mississippi river employs 910 steamers, with a capacity of 272,144 tuns, valued at \$24,556,600. St. Louis has 210 steamers, with a capacity of 110,769 tuns, valued at \$8,830,000. The next principal port is Cincinnati, 150 steamers New Orleans, 81; Pittsburgh, 78 steamers and 81 tugs; Louisville, 66; Memphis, 60; Wheeling, 44; St. Paul. 39.

THE AGINCOURT'S ENGINES. - Probably the greatest indicated power ever yet exerted in a single pair of engines, was that attained on the recent trial of the Agincourt. With a nominal power of 1,350 horses, the indicated horse-power was 6,867. With half boiler power, 3,115 indicated horse-power was obtained. The full piston speed, with 611 revolutions per minute, and 4 feet 4 inch stroke, was 533 feet per minute.

SURGEON C. W. WALSH, in a jletter to the Medical Times and Gazette, states that he has found two grains of oxalate of cerium and one drachm of compound tincture of valerian invariably gives great relief in sea sickness. The dose may be administered

THE great Cincinnati bridge about to be suspended across the Ohio River will be the longest in the world, being over 2.000 feet longer than the Suspension Bridge over the Niagara River, and 540 feet longer than the Menai Bridge in England. Its total span will be 1,057 yards. The massive stone piers tower 110 feet over the floor of the bridge, and 200 feet above their foundations. One year is the period allowed for building it.

THERE are nine establishments in Massachusetts for the manufacture of spool cotton-three in Bristol County, four in Essex, and one each in Hampden and Plymouth. The value of stock used and of spool cotton made, capital invested and hands employed for the year ending on the 1st of May 1864, was as follows:-Stock used, \$865,538; value of cotton made, \$1,336,098; capital invested, \$990,500; hands employed, 867.

THE Gazette des Hopitaux points out a method of curing coryza (cold in the head) with rapidity. It consists in inhaling the tincture of iodine, a vial of which is to be held in the hand and placed under the nose. The warmth of the hand causes the vaporization of the tincture. The inhalations are to be made every three minutes, and soon all symptoms of the malady will disapear.

THERE are in operation in Windham and New London Counties, Conn., 57 cotton mills, having a capacity of 426,881 spindles and 8,094 looms. During the last year the said mills manufactured into goods 20,485,540 pounds of raw cotton. There are now in the course of erection six new mills that are to have a capacity of 112,468 spindles and 2,872 looms.

THE velocity of sound in common river water, at a temperature of 15 deg. Centigrade, is 4,700 teet a second, while at a temperature of 30 deg. Centigrade it is 5,000 feet a second. In solids, the velocity is generally much greater than in liquids. In fire wood, for example, it is 15,000 feet a second; in iron, it is 17,000; in lead, however, it is only 4,000 feet a second.

M. PLEATEAU's experiments show that the muscular force of insects compared with that of the vertebrates is enormous. The common cockchafer is capable of exerting a tractile force equivalent to fourteen times the weight of his body, while the drawing power of a horse is only .67 of his weight.

THE Meriden Recorder states that Elliott Savage of Meriden, lately received a patent for a new process of hardening iron, which he sold to Jedediah Wilcox for \$500,000, and that Mr. Wilcox has sold it for \$2,000,000.

The Boston Traveler states that E. M. Stephens has sold his patent rubber heel stiffening to a company now organized under the laws of Massachusetts tor the manufacture and sale of them, for the large sum of \$300,000.

THE large bolt factory of the S. Stow Manufacturing Company, at Plantsville, Conn., has been destroyed by fire. A large number of persons are thrown out of employment.

LAST year 6,924,168 gallons of malt liquor, were manufactured in Chicago. Thousands of barrels were shipped to Wisconsin, Michigan and Iowa, and tens of thousands to various parts of Illinois.

HERR KRUPP, the cast-steel manufacturer at Essen, Prussia, is about to set up a steam hammer of 2,500 cwt. Of the thirty-four steam hammers at work upon his premises, the heaviest is not above 1,000 cwt.

SMEATON ascertained that the effective power of a windmill with sails of the best form, and about  $15\frac{1}{2}$ feet radius, with a breeze of 13 feet per second, is about 1 horse-power.

THE whole of the sewerage system of Woolwich is to be connected, for ventilating purposes, with the tall shaft of the steam factory department, and remarkable sanitary results are expected.

THE velocity of the sound wave in air of the freezing temperature is 1,090 feet a second. The velocity of sound in air increases 1.6 feet for every degree Centigrade of temperature.

THE presence of ozone in the atmosphere is a subject of dispute. A commision has been appointed by the Academy of Sciences to decide the question.

#### Liebig on Coffee,

To the Popular Science Review Baron Liebig contributes a highly suggestive article on coffee, from which we take the following extracts:

"If the raw berries are boiled in water, from 23 to 24 per cent of the soluble matter is extracted. On being roasted till they assume a pale-chesnut color, they lose 15 to 16 per cent, and the extract obtained from these by means of boiling water is 20 to 21 per cent of the weight of the unroasted berries. The loss in weight of the extract is much larger when the roasting process is carried on till the color of the berries is dark brown or black. At the same time that the berries lose in weight by roasting they gain in volume by swelling; '100 volumes of green berries give, alter roasting, a volume of 150 to 160; or two pint measures of unroasted berries give three pints when roasted.

"The usual methods of preparing coffee are, 1st, by filtration; 2d, by infusion; 3d, by boiling.

"Filtration gives often, but not always, a good cup of coffee. When the poring of the boiling water over the ground coffee is done slowly, the drops in passing come in contact with too much air, whose oxygen works a change in the aromatic particles, and often destroys them entirely. The extraction, moreover, is incomplete. Instead of 20 to 21 per cent, the water dissolves only 11 to 15 per cent, and 7 to 10 per cent is lost.

" Infusion is accomplished by making the water boil, and then putting in the ground coffee; the vessel being immediately taken off the fire and allowed to stand quietly for ten minutes. The coffee is ready for use when the powder swimming on the surface falls to the bottom on slightly stirring it. This method gives a very aromatic coffee, but one containing little extract.

"Boiling, as is the custom in the East, yields ex-cellent coffee. The powder is put on the fire in cold water, which is allowed merely to boil up for a few seconds. The fine particles of coffee are drank with the beverage. If boiled long, the aromatic parts are volatilized, and the coffee is then rich in extract, but poor in aroma.

"As the best method, I adopt the following, which is a union of the second and third:-

"The usual quantities both of coffee and water are to be retained; a tin measure, containing half an ounce of green berries, when filled with roasted ones, is generally sufficient for two small cups of coffee of moderate strength, or one, so called, large breakfast cup (one pound of green berries, equal to sixteen ounces, yielding after roasting 24 tin measures [of one-half ounce] for 48 small cups of coffee).

"With three-fourths of the coffee to be employed, after being ground, the water is made to boil ten or fifteen minutes. The one-quarter of the coffee which has been kept back is then flung in, and the vesse immediately withdrawn from the fire, covered over, and allowed to stand for five or six minutes. In order that the powder on the surface may fall to the bottom, it is stirred round; the deposit takes place, and the coffee poured off is ready for use. In order to separate the dregs more completely, the coffee may be passed through a clean cloth; but generally this is not necessary, and often prejudicial to the pure flavor of the beverage.

"The first boiling gives the strength, the second addition the flavor. The water does not dissolve of the aromatic substances more than the fourth part contained in the roasted coffee.

" The beverage when ready ought to be of a brownblack color; untransparent it always is, somewhat like chocolate thinned with water; and this want of clearness in coffee so prepared does not come from the fine grounds, but from a peculiar fat resembling butter, about twelve per cent of which the berries contain, and which, if over roasted, is partly destroyed.

" In the other methods of making coffee, more

weak, but these were at once inclined more favorably directly I gave it a dark color by means of burnt sugar, or by adding some substitute.

"The real flavor of coffee is so little known to most persons that many who drank my coffee for the first time doubted of its goodness, because it tasted of the berries. A coffee, however, which has not the flavor of the berry is no coffee, but an artificial beverage, for which many other things may be substituted at pleasure. Hence it comes that if to the decoction made from roasted chicory, carrots, beetroot, the slighest quantity of coffee be added, few persons detect the difference. This accounts for the great diffusion of each such substitute. A dark mixture, with an empyreumatical taste, most people fancy to be coffee. For tea there are no substitutes, because every body knows what real tea is like."

# PATENT-OFFICE DECISIONS.

### BEFORE THE EXAMINERS IN CHIEF, ON APPEAL.

BEFORE THE EXAMINERS IN CHIEF, ON APPEAL. Elisha Foole, for the Board.—The invention of G, patented in September. 1856, was one of several devices that have been produced to lower and raise the cutters in harvesting machines, and make them convertible into either reapers or mowers. The general form of his frame may be compared to a triangle, with the main driving wheel at the base and the finger bar ex-tending out from its apex. That part of the frame which immediately supports the driving wheel is made separate from the rest, and may be attached to it at any desired angle, so that when the apex is raised or lowered the wheel may be set in a perpendicular po-sition. sition. At the outer end of the finger bar is a smaller wheel

At the outer end of the nnger bar is a smaller wheel connected with it by two arms with slots and bolts, by which the hight of the finger bar may be adjusted. And at the inner end of the bar at the apex of the frame is another joint by which the cutter bar may be made horizontal, whatever may be its hight. These three joints are essential to the invention. One to adjust the hight of the finger bar, another to make it horizontal and another to set the driving wheel per-nendeular and without them.

pendicular, and without them, all combined, no im-provement would have been effected. It is manifest that these several parts constitute but

provement would have been enected. It is manifest that these several parts constitute but one invention and effect but one object, to wit, the ad-justment of the cutters. Separate and by themselves they are of no practical importance. By the reissue it is sought to surrender the one orig-inal patent for the invention, and have four issued in its stead. And the first question that is presented to us is, whether it is legal and proper to thus divide the invention into four separate parts and issue a patent for each? By the patent A is chaimed the combination of the cutting apparatus and that part of the frame, that supports the driving wheel; by patent B the cu-ting apparatus and the driving wheel; by patent C the cutting apparatus and the two parts of the frame, and by patent D the two parts of the frame. Different parts of the joint at the apex, in two patents, and thus different parts of a simple invention are divided into altogether four patents and thirty-six claims. claims

divided into altogether four patents and thirty-six claims. There may be and often are, several and distinct in-ventions relating to the same subject matter. The dif-ferent parts of a steam engine, for example, the valves, pistons, pumps, etc.. may all be subjects of distinct in-ventions, each of which may be used without any de-pendence on the others. And should the same person make two or more such inventions he may, as he pleases, have one patent for them all. or a separate patent for each. But for a single invention our patent laws never contemplated more than one patent. The statute directs that the applicant shall fully set forth his invention, explain its principle and the several modes of its application, point out the part that is new, and for that, if sufficiently important, he is to receive, not patents, but a patent. A practice of dividing pat-ents has of late grown up which, it is believed, is neither sanctioned by law or conducive to any public interest. The present case is perhaps an extreme one, but it strongly illustrates the impropriety of such a course. A person might purchase a patent professing to be for an invention and acquire no right to it. In-deed four different persons might each of them do so course. A person might purchase a patent professing to be for an invention and acquire no right to it. In-deed four different persons might each of them do so and none of them obtain it. The owner of A would ac-quire the right to combine the cutting apparatus with a part of the frame; but of what use would that be unless he could also combine the driving wheel- the exclu-sive right which would be secured to B, and the other part of the frame which would be exclusively secured to C? And what would be the value of B's right to the combination of the cutting apparatus and driving wheel without a right to use the frame also by which they are supported? C's right would be but an absurdity without the parts that would be secured to others; and all united would be entirely useless without the details exclusively claimed by D. A patent for that which is of no value—a patent that is not for an invention, but for some of the parts only of which an invention that a reissue in the form proposed should not be allowed.

than the half of the valuable parts of the berries remains in the 'grounds,' and is lost. "To judge as favorably of my coffee as I do my-self, its taste is not to be compared with that of the ordinary beverage, but rather the good effects might be taken into consideration which my coffee has on the organism. Many persons, too, who con-nect the idea of strength or concentration with a dark or black color, fancy my coffee to be thin and

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idea that the patent may be found by an adequate

earch. As the conclusions to which we have arrived will re-ultre a remodeling of the application and considerable hanges of the claims we have not deemed it necessary o go into a consideration of the numerous questions bet arise upon them to go that arise upon them.

The decision of the Examiners is affirmed.

Application of Albert Seymour for a reissue of the patent granted to him Nov. 15, 1864, for a Tree Protector.

Protector. The Board, by S. H. Hodges and Elisha Foote.—Upon filing his present application the petitioner described his invention as a trough extending around the tree, and a shed extending over and beyond it. In the first letter of rejection he was told where such troughs were in common use, embracing all he claimed. He did not deny this, and it must be taken as true. But he amended by claiming the same thing when made in sections of cast metal. Netther of these expedients involves our invention

made in sections of cast metal. Neither of these expedients involves any invention. The change of material has repeatedly been held not to be of itself entitled to a patent. (Hotchkiss vs. Greenwood, 11 How. R., 248.) Dividing a fabric into sections is what every one is entitled to practice, and no one has a right to monopolize it. The decision of the primary Examiner is affirmed.

#### SPECIAL NOTICES.

Moses G. Farmer, of Salem, Mass., has petitioned for the extension of a patent granted to him on the 4th day of May, 1852, for an improvement in electromagnetic alarm bells.

Parties wishing to oppose the above extension must appear and show cause on the 16th day of April next, at 12 o'clock, M., when the petition will be heard

William Southwell, of West Cambridge, Mass., has petitioned for the extension of a patent granted to him on the 4th day of May, 1852, for an improvement in machinery for grinding or polishing saw blades, etc.

Parties wishing to oppose the above extension must appear and show cause on the 16th day of April next, at 12 o'clock, M., when the petition will be heard.

Peter Dorsch, of Schenectady, N. Y., has petitioned for the extension of a patent granted to him on the 15th day of June, 1852, for an improvement in castiron car wheels.

Parties wishing to oppose the above extension must appear and show cause on the 28th day of May next, at 12 o'clock, M., when the petition will be heard.

#### An Oil Well on Fire.

The Meadville Republican says that an oil well ecently caught fire near that place and thus describes its appearance:-

"Imagine a space perhaps forty feet square sending up a solid sheet of flame nearly sixty feet in hight. It lights up the country for miles around, so that one can see to read a newspaper at a distance of four or five miles. The heat of the fire has started vegetation to growing, and grass can be plucked there as green as that found in summer time. The well is owned by parties at Rochester, N. Y., and was struck some four years ago. It commenced flowing oil and water with a very strong force of gas, and the owners were confident that they had a good well, but two weeks ago, the men going to supper, the well took fire-it is supposed from the engine-and has been burning ever since. The flame when first discovered was coming out of the driving pipe, and was not more than three or four feet in diameter; but, after burning two or three days, the driving pipe was melted off two or three feet, and thus allowing the gas and oil to separate before reaching the top spread over a surface thirty or forty feet square. has burned ever since without cessation.

"Sometimes the flame will reach to the hight of one hundred feet, enlivening the trees which crown the summits of the surrounding hills, and the reflections against the sky produce an effect which no pen can describe or pencil do justice to."

MR. DONALD MCKAY, the Boston ship builder, has just returned from a tour in England, and has published an article in the Boston Commercial Bulletin, wherein he states that, after having examined all the English and French iron-clads, he has come to the conclusion that our vessels, especially the Dunderberg, are superior to all.

WORK on the Hoosac tunnel, which was suspended last fall on account of the flow of water, has been resumed again. The new shaft has been sunk forty feet, and the central shaft two hundred and twenty-

### LOCOMOTIVE FOR THE MONT CENIS RAILWAY.

In the line of railway communication between France and Italy there at present exists a break, about forty-eight miles in length, between St. Michel on the French, and Susa on the Italian side of Mont Cenis. Between these towns the entire traffic, both of passengers and merchandise, is now carried on by horse traction, there being a very good road from 30 to 32 feet wide between the two-places. The pas senger traffic is carried on by diligences, which are bound by contract to perform the journey in nine hours during the summer, and ten and a half during the winter months. The tunnel which is now being made through Mont Cenis is intended, by directly connecting the French and Italian lines, to obviate the necessity for a passage over the mountain; but the difficulties which have to be surmounted before it can be constructed are such that it seems scarcely probably that it can be completed in less than eleven years and a half from the present date. This being the case, it has been proposed by Mr. Fell to carry a line of railway over the mountain, and to form it upon the road already existing. The French Government, when applied to, consented to grant a concession for the construction of that portion of the line which was to be situated within the French dominions, on condition that the practicability of the scheme should be satisfactorily proved; and the Italian Government also promised a concession for the line constructed within their territory, provided that the French should be satisfied with the experiments. In consequence of this, an experimental line has been constructed, 1,960 meters, or about one and one-fourth miles in length, over the most difficult and exposed portion of the road, the site having been chosen by the French Commissioners. It commences at Lanslebourg, at an elevation of 5,322 feet, and terminates near the summit at a hight of 5,815 feet above the sea. The average gradient is therefore about 1 in 13, while the maximum gradient is 1 in 12. On about two-fifths of the length of the line the curves are very sharp, varying from two to five chains' radius; the curve of two chains' radius being necessary to bring the railway round the elbow formed by the junction of the third and fourth "zig-zags " of the present road upon which the line is formed.

The cylinders, of which there are in this engine one pair only, are fixed between the frames under the smoke-box, and are furnished with pistons, the rods of which pass through both back and front cylinder covers. That part of each piston rod which passes through the front cylinder cover is attached in the ordinary way to a crosshead, working between guides fastened to the front cylinder cover and the leading buffer plate. Through the cross head there is a vertical slot, which receives a pin fixed at the end of an arm, which is, inturn, fixed upon one of the rocking shafts already mentioned. The portion of each piston rod which is carried through the back cylinder cover is also attached to a crosshead, but in this instance the guide bar between which the crosshead works are placed on each side of, instead of above and below it. To these crossheads are attached connecting rods, the other ends of which are coupled to cranks placed at the upper ends of the two vertical shafts on which the hind pair of horizontal wheels are fixed. Below these connecting rods, but attached to the same crank pin, are placed coupling rods connecting the cranks just mentioned with others fixed at the upper ends of the vertical axes of the front pair of horizontal wheels. The shafts upon which the hind pair of horizontal wheels are placed, have also fixed upon them pinions gearing into other pinions, turning on pins attached to the underside of a strong stay, carried across the engine between the frames; these two last pinions gear into one another. The horizontal wheels, being driven by the same cylinders as the bearing wheels, are, of course, of the same diameter as the latter, viz., two feet three inches, and they are placed at a distance apart longitudinally of 2 feet 4 inches from center to center. The shafts of the horizontal wheels revolve in bearings carried by sliding frames, of which there are two, one to each of the engines. These frames work between guides fixed to transverse stays between the engine frames, and they are pressed towards the center of the engine by six volute springs bearing on the back of each. The amount of the pressure exerted results.

by these springs is regulated by bars bearing upon them, which bars are capable of adjustment by means of a shaft extending across the engine, and furnished with right and left handed screws. This shaft carries at the end of it a worm wheel, into which gears a worm connected by shafts and bevel gear, with a hand wheel on the foot plate, and the pressure put upon the horizontal wheels can thus be regulated by the driver.

The slide valves are driven by eccentrics fixed upon the leading axle, the eccentric rods being coupled to the lower end of arms or levers working on a shaft, carried across the front of the engine between the cylinder and the large rocking shaft to which the piston rods are connected. The valve spindles are carried through the front end of the steam chest and coupled the upper ends of the arms just mentioned. The boiler is 8 feet  $4\frac{1}{2}$  inches long, and 3 feet 2 inches in diameter; it is made with a "fiush " fire-box casting, and contains 158 tubes  $1\frac{1}{2}$  inches external diameter. The total heating surface of fire box and tubes is 600 square feet, and the fire-grate area is 10 square feet. The boiler is worked at a maximum pressure of 120 pounds. The water is carried in a pair of tanks fixed upon the foot plate, and the engine is furnished with a brake of the ordinary description, acting on the trailing wheels only. The total weight of the engine in working order is about 17 tuns, and its net weight 13 tuns, of which about two tuns 13 cwt. is due to the extra \_machinery for working the horizontal wheels. The pressure upon the horizontal wheels is, as we have already mentioned, adjustable; during the experiments it amounted to  $2\frac{1}{2}$  tuns or ten tuns altogether, but this pressure can be increased if necessary to six tuns on each wheel, making the total pressure 24 tuns. It is found to run very steadily, and to pass round the sharpest curves without any jolting or grinding of the tire flanges, being perfectly guided by the pressure of the horizontal wheels against the center rail.-Egineeriag.

#### BROUGHTON'S OILER.

In cold weather the contents of oil cans congeal so that they cannot be used until thawed out. Of



course a stove, if convenient, is the first resort in such an emergency, and the oil cup is immediately placed on it. As a consequence the bottom, which is spun in and soldered, gets leaky, with disagreeable results. Moreover, as spring bottom oil cups are usually made, the bottom is often "set" or dished by unnecessary pressure, so that in a short time it is useless for its office.

In this invention, as shown by the engraving, these evils are effectually overcome. The first one, by placing the cup within a false bottom, A, as shown in the broken-out part, and the second by inserting a button or cap, B, in the false bottom, so that it bears on the true bottom, as at C, but is prevented from springing it in too much by coming in contact with a shoulder turned on the false bottom. This cap is flush with the said bottom, and does not interfere with it in any way. It will be seen that, by its rotundity, it tends to preserve an upright form, so that the nozzle is always erect when the can is full; when it is empty it makes no difference how the cup stands.

These improvements add to the durability and efficiency of the utensil. Application for a patent is pending through the Scientific American Patent Agency by John Broughton. For turther information address Broughton & Oatman, No. 41 Center street, New York.

## EXTENSION OF THE PHOTOGRAPHIC ART.

We have in previous numbers of our paper fully described the simple and beautiful process of  $\mathbf{k}$ . Woodbury, of England, by which photographic pictures may be transferred to metallic plates and then printed—much in the same way that copper-plate engravings are produced.

We have lately had the pleasure of receiving, from the editor of the London *Photographic News*, a speci men of this new art of printing, which, in its details of light and shadow, softness and artistic finish, is all that could be desired.

This new process is exceedingly simple, and there is hardly any limit to its application. It is admirably adapted to book illustrations, and for many purposes will supersede wood and plate engrayings. Natural objects can be photographed and then reproduced upon metallic plates for printing with a fidelity and harmony in the gradation of tints which hand work cannot possibly imitate.

We publish an interesting account of the process, from the News, in another column.

#### The Proposed Channel Ferry

The phrase "London to Paris in ten hours" is on which is familiar to most of us, yet, notwithstanding the well known shortness of the time in which a trip between the two capitals can be performed, there are many people who regard the journey with a certain amount of dread, arising in a great measure from the discomforts attending upon the passage across the Channel. We are sure, therefore, that the proposal for forming a Channel ferry, which is now before Parliament, is one which, if properly carried out, will meet with great public favor. It is intended that the steamers forming the ferry shall be one-third longer than those now running between Holyhead and Kingstown; that they shall be roofed over, and the trains-coming, say, from London-shall be run bodily on to their decks, carried across the Channel, and transhipped to the French lines on the other side. The new boats are, under ordinary circumstances, to perform the passage in one hour, during which time the passengers may either remain in the carriages or avail themselves of the waiting and refreshment rooms with which the steamers will be furnished, The Custom House officers can also examine the luggage during the passage; and it is expected that the whole journey from London to Paris can thus be performed in eight hours. Owing to the great size of the steamers, it is expected that little inconvenience will be caused by the short chopping seas of the Channel. It is expected that the ferry may be brought into operation in two years' time.-Mechanics' Magazine.

MANUFACTURERS of Leather and Rubber Belting will do well to advertise in the SCIENTIFIC AMERICAN. We have inquiries for such goods from various parts of the country from our readers.

THE Yorkshire Locomotive Works, England, are announced as capable of building 400 locomotives per annum, or over one a day.

## Mont Cenis Tunnel.

In a communication from Pico Mulera, Italy, dated Jan. 4th, Mr. H. Hoskings writes to the London Journal: " The mortality among the workmen employed in the Mont Cenis Tunnel is so great, in consequence of powder smoke and bad ventilation, that they have refused to work any more. The work is now at a stand still;" and the statement is especially interesting, from the precise manner in which it confirms the opinion expressed in the Mining Journal of Jan. 2, 1864, by our esteemed correspondent Mr. Nicolas Ennor. in the account of his visit to the tunnel. He then stated-"I next turn to the air department. The moment I came to the tunnel I looked to its mouth, and to my suprise I could not discover the least sign of smoke or gas emerging from it, which instantly convinced me that something was wrong. I had not entered the tunnel 200 yards before I met a still, dense, smoke; it soon become so dense that I could not see a lamp on the opposite side, which, of course, was only twenty-six feet dis-

### SHAVER'S PATENT PENCIL SHARPENER.

The accompanying engraving represents a convenient, durable, and desirable pencil pointer, just introduced into the market. It is made from the best cast steel, hardened, tempered, and finely polished. The file groove is finely cut at its small end for pointing lead pencils after the wood has been cut away, or more particularly adapted to pointing the leads of any of the well-known extension or propelling pencils, which do not require the cuttirg away of the wood, but can be easily adjusted and brought up to any kind of a point to suit the user. The wide end of the groove is coarser cut, which is intended for sharpening slate pencils, which it does quickly and without breaking the point.



tant. The horses and wagons passed but I could not see them. This continued up to within 100 yards of the end, where a light could be seen for twenty yards. Here air was liberated sufficiently to support the men with the machine, but as it passed back, where the sidemen were at work, it was all devoured by the men and lamps. I took the mallet to strike the man's borer, to say I had helped to drive the tunnel, but I could not see the head of it; so I threw down the mallet and took a pick and worked out a little. I now leave it for practical men to say what they think of working in such a place as this, and they are now in only three-quarters of a mile, and have nearly three miles more to drive. I was in about an hour, and when I came out I spit as black as though I had dined on lampblack-so did the gentlemen who accompanied me. I think I have had over 55 years' actual mine practice, and I have come to the conclusion that this work will never be accomplished without other means than the present be adopted. I am satisfied that there is nothing deserving or eulogizing to the French' or Italian engineering for what is doing to carry out this undertaking, notwithstanding that they have an abundance of water-power at command, and machinery that, I should judge from a momentary glance, cost £40,000. I will not, however, stop here to describe the machinery already erected." Mr. Ennor contended that there was not a quarter air enough, and a man without that would decline and die; but beyond this he proposed a remedy. He said that there is water-power sufficient in the valley to drive in a 3-foot tube full of compressed air: this would drive out all the smoke and contaminated air. or, if exhausted, by this tube bringing out the foul air, and let the fresh supply go in through the tunnel. The same machinery could be tried each way, to prove which is the most effective. The work could not go on well till there was an effective circulating current in and out. He next suggested as a second means to bring a large tube down from the mountain top, and carry it into the tunnel end. This would produce a rapid current, or, if this be found sufficient: but a furnace to it. as used in coal mines. Air in that situation can be carried, he said. to an unlimited extent. The first thing to be looked after is to have a circulating current of air-this attained, the tunnel would go through, but not other-

A TERRIBLE disease is raging in some parts of Germany. An insect called *trichina* infests pork, and eaters of this flesh uncooked, or only partially cooked, take it into the system, where it speedily causes death. The sufferings of the patients are most horrible. But one case is known to have occurred in this country—that of a young lady at Detroit—but several instances where parties have been supposed poisoned by eating ham were from this insect. Avoid raw or half-rawpork, such as Bologna sausage.

wise.

This pencil sharpener is adapted for the countingroom, artist's studio, and is especially useful in the school room, as it will relieve the teacher from that oft-repeated request, "Please sharpen my pencil."

We are informed that this article is already in the hands of the largest wholesale and jobbing stationers of New York and other large cities, and, no doubt, will soon find its way into banks, insurance, and other offices, academies, and schools throughout the United States. They are sold at 25 cents each; a liberal discount to the trade.

This invention is covered by patents in this country and in England and France. For further particulars address the inventor, A. G. Shaver, New Haven, Conn.

REYNOLDS'S HAY FORK.

This fork is one that has lately been introduced at the West, where it is said to have proved satisfactory in its operation and otherwise become popular. In



construction it is quite simple, having two tines, A, connected to a circular shank, B, which contains the tripping apparatus to discharge the load. This is simply a latch, C, so arranged that, by pulling a line, D, the latch is released and the load discharged—the parts reconnecting themselves again in the act of reloading the fork.

This implement is made of iron and has only two tines, but these are found quite as efficient as any greater number. The fork can be used for stacking as well as for loading, and the inventor sends directions to do this work in his circulars. The weight of the fork is twenty-five pounds, and it is sold very low. Many certificates of its utility have been shown us, but we cannot publish them here. The proprietor wishes to sell rights.

It was patented through the Scientific American phureted hydrogen,



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formation address the patentee, E. Reynolds, Hartwellville, Mich.

#### Extraordinary Discoveries of Oil,

The Pithole region, where oil has been found in large quantities, has lately been the scene of extraordinary excitement. The *Record*, published at that place, says:—

The whole ground seems saturated with oil. One man dug a hole in the ground about a foot deep, and in a few minutes got a pailful of oil for his trouble. The ground is now being riddled with shallow holes in which large quantities of oil ooze up, and the scene forcibly reminds us of gold digging.

At one of the springs belonging to the Buffalo House the proprietor had gathered four barrels of oil with a tin dipper, and there are many others who have been equally fortunate.

Oil was found in a great many cellars yesterday. Mr. Bernand Morahan filled a large washtub with oil from his water ploe; a number of others have done the same.

A well belonging to the Confer Hotel (late Hubbs's House) has been found to have oil on it; another oil spring has been found in the rear of Fifth street, so that we may presume that every man will be able to dig his own oil before long.

Many ludicrous incidents are narrated of the manner in which some of them took their sudden accession of fortune.

Yesterday morning, men, women and boys could be seen with tin pails, wooden pails, teakettles, etc., in their hands, vainly searching for pure water. Oil might buy coffee and tea, but not make it, so that urchins who had to be water-carriers appeared to think there might be too much of a good thing, even if it is oil! Nor are they alone in their grief, for a cow walked up to her accustomed watering place smelt the oil, and evidently thought petroleum would make butter taste bad.

At the first discovery of the wells the excitement began to increase, and a man who has heard of the various fractions used in the oil trade, offered to pump all day for one-thirty-seventh of the oil; others were more selfish, for they would pump all the time but wanted half the oil, and were willing to take the washerwoman into the bargain.

An Irishman, who had a small spring, was highly elated at the turn fortune was taking. Said he, "Yesterday, I wasn't worth a cint, and, be jabers, to-day I'm worth thousands upon thousands."

GAS PURIFICATION.—Experiments are being now made at the Crystal Palace District, and other gasworks, to test the practical value of a recent discovery by Dr. Letheby, who, besides his many other engagements, is now consulting engineer to several gas companies. He had found that the waste material of the soda manufacture, and known as "soda waste," is unexpectedly effective in absorbing the sulphur compounds in crude coal gas, and especially the obstinate bisulphide of carbon. The soda waste is employed in the purifiers in layers, as much as oxide of iron is now generally employed to arrest the sul-

reted hydrogen,



#### The Patent Beer Question.

MESSRS. EDITORS :- The daily and weekly press have of late been much exercised debating opinions relative to patent beer and claims to public favor. It will suffice to say, that some time ago, a number of leading New York lager-beer brewers obtained licenses to brew under the Hammer patent, and as soon as they brought their new beer in competition with the old they encountered all the reverses incident to the introduction of every new invention. Professional jealousy and a stereotyped prejudice against reform helped wonderfully to debar the road of progress, and compelled the licensees to issue their card and the chemical record.

It is not intended to advert to the various views indulged in, but I propose to expose the more important part of the chemical testimony, i. e., the comparative analyses.

We see by the same, that in comparing the old and new method of brewing an immense amount of extract and starch-sugar is wasted by one and saved by the other, while converting malt into wort, the acknowledged base of either beer or spirit.

The figures of the published analytical report demonstrate that wort made in the usual way contains in one gallon of 282 cubic inches and ounces avoirdupois at 60° Fab. :-

Dry malt extract 19.807 ounces, starch sugar 6.005 ounces, while the new, or Hammer wort, at the same temperature, shows the excess of dry malt extract 32.219 ounces, starch-sugar 11.620.

It is not the object of this communication to enlarge upon the pecuniary proceeds resulting from the working of this improvement, but to call attention to another fact passed over altogether by your cotemporaries. Brewing and distilling are two very nearly related vocations; both branches of industry employing nearly the same material under the same circumstances, although different products are rendered, but both trades consume a quantity of grains, which amount to, if correctly reported, a stupendous figure.

Both professions commence their respective operations by mashing the grain preparatory to converting the starch contained in the malted or raw grain into sugar, to be further transformed by fermentation into alcohol and carbonic acid. and here their common path separates. The brewer has now essentially done his work, but not so the distiller. He now sets to work to separate or distil the alcohol from its connection with the wort by converting the former into vapor, and condensing this vapor, which produces what is called alcohol or spirit. When we left the brewer's wort, it contained all the components of beer, requiring but the separation and settling of the yeast, or, in other words, to become clear, in order to be ready for market. It will now be pertinent to examine two brewer's worts prepared under the methods at issue. The old school wort containing (as per analyses) less starch-sugar and a marked surplus of dextrine, which latter ingredient must be looked upon as detracting from the quality and keeping tendency of the beer; the new school wort, on the other hand, showing a very large excess of starch-sugar, the base of alcohol and carbonic acid, with an entire absence of dextrine-and must, under such circumstances, possess a large proportion of the main features of champagne (alcohol and carbonic acid), which impart to the liquid not only that pleasant taste and flavor, but also insure its keeping quality. The distiller's wort, however, prepared after the old recipe, has other disadvantages, for the absence of so large an amount of starch-sugar, imperatively required for the tormation of alcohol, necessarily reduces the yield of alcohol; and the presence of so much dextrine, which this impertect mode ot mashing is not qualified to convert into starch-sugar, only serves to enrich the swill or residue. The defects of the old school mashing are thus clearly shown, and sum up as follows :- The old school distiller, failing to convert all the starch entirely into sugar, loses, consequently, in the quantity of his alcohol, and also, what he retains as

fares worse still; he is likewise unable to transform find the ratio in case the ratio of increase is not reguall the starch into sugar, and natural y the dextrine lar. For instances, commencing with 20, 25, 30, 36, remaining thus unconverted, is not connected with 40, 44, 45, 48, 52, 56, 60, 64, 70. There are not the swilf, as in the case of the distiller, but is held in- many lathes on which the gear increases by any parseparable in the beer, the result of his labor, where it forms the radicle for the disintegration of the liquid, it impairs the quality and predisposes acidity of the beer, and, as a matter of course, he is a loser both in quality and quantity.

Now, as the purposes of the brewer and distiller are, as far as mashing is concerned, so nearly related, it is but proper to suppose that a certain saving in one branch must be economy for the other; and if, therefore, a given quantity of barley or corn is saved in brewing, the same quantity of superior beer is produced, why cannot the same rule apply to the producer of whisky or alcohol when the object of economizing an enormous amount of grain, useful for other purposes, is at issue?

The patented process also shows the remarkable facility with which starch-sugar is developed, and thereby that much-sought-for base, for alcohol and carbonic acid, gained, but at a reduced expense; and the obvious fact of a perfect exhaustion of the fundamental grain, added to the list of advantages, must still turther lessen the cost of production, and infallibly show that whisky, beer, or alcohol can henceforth be furnished at figures widely in contrast with present rates; and causes, at the same time, a simultaneous saving of grains, reserved to be absorbed by the various channels of the market.

It may be safe to state that 100 lbs. of barley will yield about 60 lbs., and 100 lbs. of corn about 70 lbs. of starch, from which the common plan of brewing and distilling does extract but two-thirds, leaving the balance to become a deleterious component of beer in the form of dextrine, or, as in the case of distilling, the remaining one-third forms part and parcel to increase the bulk of the swill. Aside from the benefits of the process, I will now illustrate by figures an approximate estimate of the saving of malt. Take, for instance, a brewery producing per annum 10,000 barrels; here are used under the old rule  $2\frac{1}{2}$  bushels of malt and over, for every barrel of lager beer, making a total of 25,000 bushels for the year's supply; the new process, for the same number of barrels, requires about 14 bushels of malt per barrel, but let it even be two bushels, consuming in this way 20,000 bushels in all, showing a difference of nearly 5.000 bushels in favor of the agitated reform.

In order not to overtax the reader's patience, it must be stated, in conclusion, that in 1863 there were in the loyal States about 1,800 breweries, all of which produced then no less than seven millions barrels of ale and lager beer, unconscious, perhaps, that they lost at the same time 5,250,000 bushels of malt; and that same figure will, beyond a reasonable doubt, also represent the loss, from the like cause, on the part of our old school distillers. PROGRESS. Brooklyn, N Y., Feb. 7, 1866.

## Of a Large and a Small Pulley.

MESSRS. EDITORS:-In your usually correct journal of the 16th of January, I observed the following question. "Has a large pulley any more purchase than a small one aside from friction?" Your answer was-"" A large pulley has more power than a small one in proportion to the difference in diameter." I need not tell you, after you take a second thought. that there is no difference in the power of a large and a small pulley except the additional friction. I should have written you before, had I not waited to have you or some other person correct it. It being such a popular fallacy that I did not like to have it pass without correction, particularly in a journal we Americans are so justly proud of. С. Н.

New Haven, Conn., Feb. 10, 1866.

[A pulley has no power at all, strictly speaking, but it is easier to drive a machine with a large pulley than with a small one. It is easier for a horse to draw a carriage with large wheels than with small ones. A wheel is a continuous lever and the longer the arms of the lever, the easier the work is done. -EDS.

#### Gears for Screw Cutting.

MESSRS. EDITORS:-Having seen in your valuable paper of Feb. 3d, D. Booth's rule for finding the gear dextrine in his swill; but the old-fashioned brewer for cutting screws, I would esk him how he would dial, and to which an intermittent motion is imparted

ticular ratio. I would like to have Mr. Booth give an explanation. S. V. EASTMAN, Machinist.

Waterloo, C. E, Feb. 4, 1866.

[Rules for cutting screws of any pitch by gears can be found on page 295, Vol. XI.-EDS.

#### Cold Iron Floating on Molten.

MESSRS. EDITORS:-If into a ladle of molten cast iron a piece of cold cast iron is dropped, the piece of cold iron will float, although its specific gravity is the greatest, as is evident from this, that in cooling iron always shrinks. Please tell us why this heavier cold iron floats in the lighter melted iron.

A SUBSCRIBER.

Watertown, N. Y., Jan. 30, 1866.

[This matter was discussed a good deal in Vol. XII, but no explanation that was offered was entirely satisfactory. Indeed, we have never seen an account of observations of the phenomena that were thorough. Will our correspondent try the experiment of pushing the cold iron under the surface of the molten, and seeing if it will return to the surface ?- EDS.

### NEW INVENTIONS.

Paper Socks.-The nature of this invention consists in producing a new article of manufacture, viz: socks made of paper, or paper and muslin combined. It is well known that paper is one of the best materials for keeping in or causing the body to retain its natural heat; in other words, it prevents cold air from reaching such parts of the body as may be enveloped in it. The inventor designs his paper socks particularly for use under or over an ordinary pair of socks or stockings, to be worn in cold weather; but it is obvious that they can be made of a kind of paper which will last as long as an ordinary pair would keep clean, and they can be made so cheaply that their cost will not equal the price of washing. These socks are intended to bear the same relation to knitted or woven socks or stockings that paper collars do to linen or muslin collars. J. W. B. Covington. of 37 Park Row, New York City, is the inventor.

Sugar Cleaning Machine.—This improvement relates to that class of machines in which the sugar is cleaned by centrifugal action. The moistened sugar is thrown into a tub which has its sides perforated with fine apertures. Rapid motion being given to the tub, the moisture and dirt are expelled by centrifugal action, and the dry, clean sugar remains in the tub. The present improvement consists in driving the sugar tub from below, thus giving free access thereto. Prior to this invention, the driving shaft passed up through the tub, and cumbersome framework, gearing, etc., was required around and above the machine, which greatly interfered with convenient operation. These improved machines are now in general use. Hartson & Woolsey, New York City, are the patentees.

Water Wheel.-This invention relates to a new and useful improvement in water wheels of that class which are placed on a vertical shaft, and inclosed within a scroll, commonly termed turbine wheels. The object of the invention is to obtain a simple means for varying the capacity of the wheel according to the power required from it or to the supply of water, so that the wheel may operate and give out any amount cf power less than its maximum without consuming any more than a proportionate amount of water. It is well known to millwrights that a turbine water wheel, when running under a diminished supply of water, and consequently giving out less than its maximum power, consumes or draws a proportionately greater amount of water than when giving out its full or maximum power. Hence, there is à great loss of water in running a wheel of this class under a variable head or under a diminished supply of water-a difficulty which is fully obviated by this improvement. John Tyler, of West Lebanon, N. H., is the inventor.

Watch.-This invention relates to a watch which shows on its face or dial, besides the hour, minutes, and seconds, also the day of the month, or the date, which appears through a small aperature in the dial, being marked on a disk, which revolves under the once in twenty-four hours, so that the date changes automatically at the proper time, and a watch is obtained which, with a trifling additional expense, will prove to be of great convenience for business men, clerks, and, in fact, for the public in general. E. Oppenheimer, of 8 Maiden Lane, New York City, is the inventor.

Steam Valve.—This invention relates to a plug valve, which is provided with a steam passage, extending transversely through the plug and bell-shaped at its end, leading to the induction port, in combination with a shell, having three apertures, one of which serves to admit steam to the shell, while the other leads to the exhaust pipe, and the third to the cylinder, in such a manner that the induction port in the aperture leading from the shell to the cylinder is always open, and by turning the plug it is alternately made to communicate with the steam supply pipes, and these with the exhaust pipe, and consequently acting metion imparted to said plug valve changes the steam instantaneously. Wm. H. Akins, of Dryden, N. Y., is the inventor.

Well-Boring Instrument -The object of this in vention is to produce an instrument by means of which a well may be bored and reamed rapidly, cheaply, and efficiently, without the use of sand pumps or reciprocating drill. A borer, having some thing of the character of a brace and bit-iron reamer is provided with three or more curved cutting faces placed at equal distances around its point, and is connected with the base of a hollow cylinder by a socket joint. Its curved cutting aces take a spiral form, and are continued up to the top of the cylinder, thereby forming parallel spiral grooves on the outside thereof. The burr cutters reduce the rock below it and along its sides, while the edges of the spiral grooves act as reamers, the grooves themselves performing the office of elevators, and raising the silt or reduced rock nearly to the top of the cylinder, where the grooves are intersected by openings which admit the silt and reduced rock to the inside of the cylinder, from which they are discharged, when it is full, by raising the instrument from the well and removing the borer. The hollow cylinder may be made long enough to hold all the silt that will accummulate while the burr is being worn dull in boring ordinary rock. . The burr and cylinder should be made of a combination of Franklinite or crystalized iron, so called, for the purpose of obtaining a hard and tenacious substance. A water pipe runs centrally through the hollow cylinder and through the burr, branching, however, before reaching its oint, so that a branch issues in each of the sunken aces that occurs between the cutting edges of the urr and as near its point as the strength required bo be given to that part will admit of. A column of water is allowed to descend this tube (the tube being connected with a hollow drill rod) and issue at the end of the burr, so as to clear it of accumulations of

reduced rock. The pressure of the water will cause it to ascend around the cylinder and thence to the top of the well, the heavier portion being received into the interior of the cylinder through its lateral openings, and the residue being carried with the current of water to the surface of the ground. Samuel H. Whittlesey, of Appleton, Wis., is the inventor.

Buckle or Belt Clasp.-This invention, by I. N. Plotts, of New York City, consists in certain improvements in buckles or belt clasps, which improve ments are particularly applicable to a buckle or belt clasp, for which letters patent were granted to said Plotts on the 7th of November, 1865, in which patent the buckle was shown as being constructed of a rectangular or other shaped frame, and slightly curved or bent transversely, having one or more cross bars, provided with lips on their outer edges to insure a better hold upon the straps, the object being to avoid the use of the tongues or teeth employed in ordinary buckles, which perforate the strap or band and soon weaken it so that it is liable to break, or at least so injure it as to render it useless. The invention, which is the subject of the present patent (the claims may be found in the list published this week) consists in the manner of setting the bars of the buckle so as to produce a sharp bight or bend of the straps; and in attaching lips to the inner edges of the under side of the buckle; and also in milling or serrating the lips as well as the raised or depressed edges of the bars or frame of the buckle-

by which improvements the inventor claims that the possibility of the strap slipping is entirely precluded, and this effected without in the least impairing the qualities of the buckle for permitting the strap or band to be quickly and easily tightened up or loosened or released from the buckle. We are informed that Messrs. Wests, Bradley & Cary have adopted the buckle for use on the bands of their Duplex hoop skirts. These buckles are very simple in their construction, and can be manufactured and sold very cheaply. Mr. Plotts may be addressed at 24) Broadway, Room 19, or 97 Chambers street, New York City.

Tubing Oil and other Wells.—This invention consists in surrounding the well tube of an oil or other deep well, through which oil or other liquid is usually raised from the bottom of the well, with an outer, supplementary tube extending downward from above the surface of the earth to a point below the place for applying the usual water packing, and applying such packing around the said outer tube, instead of the well or pump tube. James D. Bryson, Petroleum Center, Pa., is the inventor.

Machine for Treating Peat.-The object of this invention is the preparation of peat for fuel in a condensed state, with or without coal dust or other fine concentrated combustible matter, so that it can be handled with convenience and transported with ease and economy, to be used at a distance from the place where it is dug. It consists in a combination and arrangement of devices, by means of which the peat is reduced to a suitable condition and form for being handled and dried, the crude peat being elevated by mechanical means to the top of the machine and delivered to the action of knives or arms which revolve between fixed knives or arms so as to break it up. This action on the peat is had beneath a hopper, from which is delivered continuously a supply of fine coal dust or other fine concentrated combustible material. It is next passed between smooth cylinders of unequal diameters, or between cylinders which are revolved at unequal velocities, whose action is to destroy the natural organization of the peat and to destroy the tubular character of the undecomposed fibres which are interlaced through it, rubbing and grinding the mass so as to reduce it to a very fine plastic state. From thence the peat descends or is carried against molders, which consist of rollers, upon whose peripheries are formed triàngular depressions, which are arranged on one roller conversely to their arrangement on the other, so that when the depressions meet or articulate in the revolution of the rollers, a cavity is formed whose sides are parallel. The peat mass presses by gravity against the faces of the rolls and fills the depressions as fast as they are presented, and is atterward delivered upon the other side of the rollers, on a travelling belt or platform, which carries it to the drying ground or to workmen who remove it to the place where it is to Thomas J. Wells, of 35 Pine street, New dried. York City, is the inventor:

Coloring Meerschaum Pipes .- The object of this invention is to give to smoking pipes, known as meerschaums, the peculiar color which has hitherto been slowly and imperfectly imparted to them only during a long time of constant use in smoking tobacco in them; and it consists in covering the bowl of the pipe with a close fitting cover, penetrated by a tube through which, when the pipe is used, tobacco smoke may pass and enter the pipe on its way to the mouth of the person who is engaged in smoking. The tobacco to be smoked is contained in any ordinary receptacle or bowl placed at the outer end of, or otherwise connected with, the tube, or it may be fixed on the tube itself, according to the mode of using tobacco cartridges, shown in the patent granted to the inventor November 1, 1864. The treatment herein set forth may be applied to other pipes besides meerschaums. Holman J. Hale, of 16 Beekman street, New York City, is the inventor and manufacturer of this unique improvement.

Compression Gage Cock.—One of the objects of this invention is to arrange and construct a gage cock in such a manner that while it is simple, both in construction and operation, its valve may be reground to its seat when it becomes leaky without disturbing the joint connecting it with the boiler, and without the use of tools of any kind or description. Another object is to construct a compression gage in England.

cock in such a manner that while its valve is free to move in a longitudinal direction, so that it may at any time be withdrawn, and while it is also free to rotate on its axis, so that it can be reground, yet the said valve will not rotate on its seat in the act of closing. Another object is to construct a compression gage cock provided with a metal valve and valve stem, in such a manner as to dispense with the use of a stuffing box or gland to pack the said stem, at its outer end, and admit of the cock being operated under high pressure without the possibility of scalding the hand of the operator. John Broughton, of 41 Centre street, New York, is the inventor.

American Pirate Beehive.-Important improvements are claimed in this hive, based on the recent discovery, that cera alba is elaborated into hexagonal cells by a law inherent in the substance itself, and not by the mechanical or artistic skill of the bee. The improvements consist in combining walls with air-chambers in such a way as constantly to secure that mediocrity of the temperature necessary to the formation of an amount of comb equal to the working capacity of the swarm. Such is the form of the hive that seams and windows for ventilation are excluded. The top and sides of said hive are, at the will of the operator, rendered air-tight. In the brood chamber, a number of comb guides are so arranged as to secure uniformity and rapidity of growth. The inside improvements consist in making brood chamber and honey box of slats of convenient size, and surrounding said slats with varnished paper, which may be separated at pleasure. To protect the bees against the ravages of the moth, an apparatus, made of tin, and resting on the bostom board, is closely fitted to the inner surface of the hive. This apparatus somewhat resembles the letter U inverted, the interior shank of which is so shortened as to place it out of the reach of worms on the bottom board, while a slight coat of soft grease, on its inner surface, prevents their reaching it by that route. Messus. Lemuel and Minor Taylor, aud Edwin Cox, of Jordan, Wis., are the inventors.

THE NAVAL RACE.

The last scene of all in this vexed question took place on the 13th and 14th inst., culminating in the race previously alluded to in this journal as about to occur. We were not on board either of the vessels but take our account from the daily papers.

The Winooski beat the Algonquin 70 miles in in 390—a very bad beat. The Winooski is a naval vessel, with an ordinary inclined engine; the Algonquin is also a naval vessel, with an engine designed by Mr. E. N. Dickerson. The point of dispute was the ability of the Algonquin to run further and faster than the Winooski, and to tow her back over her course after the latter's coal gave out. This programme was slightly changed in the actual performance, as the Algonquin was behind, and not the Winooski.

It is impossible to tell the actual performance of the engines from the daily press reporters' accounts, as they print anyming told them—as for instance this ludicrous statement:—" About an hour after starting, the main feed pipe, which conveys the condensed water to the boilers, got out of gear, and soon after ceased working altogether; thus obliging the use of the auxiliary engine to supply the boilers. with salt water, which was, of course, highly detrimental to the workings of the engine, inasmuch as salt water clods or chokes the flues."

Clods the flues !

The Algonquin carries high steam, 65 pounds, and cuts off short. The Winooski carries low pressure, and cuts off at  $\frac{1}{10}$  ths of the stroke in "Engineering Precedents," but at less than half-stroke in practice. The average revolutions in the race of the Winooski were  $21\frac{1}{2}$ ; of the Algonquin 18. Although the latter vessel was beaten, it is contended that her engines comply with the terms of the contract, and are therefore to be accepted by Government.

A LOCOMOTIVE passed over the Hudson River Bridge at Albany, for the first time, on Thursday, the 15th inst.

MORE than 1,000 farm engines are built annually n England.

## Improved Paddle Wheel.

The novelty of this wheel consists in so feathering the buckets that they will, during their entire revolution, radiate from a point at the summit thereof. The mechanical construction is extremely simple and embodies great strength and durability. The principle upon which the wheel is designed may be briefly stated as follows, reference being had to the diagram, Fig. 4:-

If two circles, x-y, of unequal diameter, be drawn eccentric to each other, but tangent at a point, o, and each circle be divided into the same number of unequal parts, 1, 2, 3 and 1a, 2a, 3a, etc. (numbering from the common point, o), and lines 1-o, 2-o, | mersion, makes this wheel, the inventor states, spe-

power from plunge and lift on the entrance and exit of the buckets from the water. The angle of the buckets of this wheel and its efficiency are the same as would be obtained by a common central radial wheel of double its diameter-that is, a wheel on this plan, of saysix or twelve feet diameter, has the same propelling angles, respectively, as a common central radial wheel of twelve or twenty-four feet diameter. This is at once made evident by an inspection of Fig. 4. As compared with the screw propeller it possesses the advantages of direct over oblique action of its buckets to the water. This ability to work effectively under any degree of im-

At Mr. Simonson's yard, near the Novelty Works, we found several new ships for the Norfolk and Richmond line under way. These ships are to be sidewheel vessels, 260 feet long and 40 feet wide. One of the ships is to have a feathering wheel on Manly's patent.

The Sound boats for the Merchants' Steamboat Co., of Bristol, R. I., are building here, and are to be magnificent in design and proportions. They are 374 feet long and 50 feet beam, with heavy timbers and frames.

Several other ship yards are doing a good business.

Since the close of the war the ram Dunderberg,







#### HAIGHT'S RADIATING PADDLE WHEEL.

-o, etc., be drawn from the points of division of the larger circle, x, to the common point, o, these lines pass through the corresponding points of division of the smaller circle, y. Now, if the circles are supposed to revolve each upon its own center and with equal angular velocity, the point of tangency, o, will remain fixed, and the relative position of the points of division of both circles, x and y, with reference to each other and the common point, o, will not, at any time, be changed; a line drawn through a point of division of one circle, and the common point, o, will always pass through the corresponding point of division of the other circle.

To apply this principle to the construction of a paddle wheel, the rims of the side frames which support the buckets are made to perform the functions ot the circle, x, the points of division becoming the bearings in which the buckets are supported by central axial journals; and the rim of an auxiliary or "feathering" side frame is made to perform the functions of the circle, y, the points of division becoming studs which enter grooves formed in the ends of the buckets, parallel to the plane of their surfaces, so that each bucket is supported at two points in the plane of its surface. These two points, as has been shown, bear such relation to each other and the summit of the wheel, that a line or plane passing through both, must pass through the summit of the wheel. It follows that each bucket must, during the entire revolution of the wheel, radiate from a fixed point at the summit thereof.

Fig. 1 shows a sectional elevation of the wheel, and Fig. 2 a cross sectional elevation of the same; Fig. 3 is a perspective view of one of the buckets, showing clearly its grooved end. A A represent the wheel rims or side frames proper, in which the buckets, B, are supported by their axial bearings, b. C represents the feathering side frame revolving on an eccentric trunnion, C', and driven from the adjacent wheel frame by the connecting links, D, so that both frames revolve with equal angular velocity.

This wheel, the patentee says, possesses great advantages over some of the central radial and feathering float wheels now in use; also over the screw propeller. As compared with a central radial wheel of equal size and dip, it avoids entirely the loss of cylinder 105 inches diameter and 12 feet stroke.

cially adapted to sea-going steamers, the paddles of which, from various causes, are subject to great variations of dip. It is also especially adapted to war steamers, as by full immersion it is entirely protected from injury from the enemy's shot, and is claimed to be specially adapted to propelling canal boats. For this purpose it may be made of small diameter so as to occupy little room, and will fully meet the requirements of shallow water and the necessarily great variations of immersion.

The inventor, having business connections with a ship and boat building business and a machine shop, is prepared to contract for wheels of any dimensions or steam canal boats or steamboats of any size, with machinery complete.

This wheel is the invention of Edgar Haight, and was patented through the Scientific American Patent Agency, on Nov. 7, 1865; further information may be obtained by addressing him at his residence, Buffalo, N. Y.

#### OUR SHIP YARDS.

The shipbuilders are active now, and a walk through the yards will reveal many frames going up and keels being laid, where but a few weeks ago there was nothing but chips.

At the present time more steam vessels and fewer sailing vessels are being constructed than ever before. All the coasting trade is being done by screw steamers and a few side-wheel vessels, ranging from 800 to 1,500 tuns, and the few sailing vessels building are small craft of no great burden.

The Pacific Mail Steamship Company have an immense fleet of magnificent ships. None finer or swifter are to be found on the globe, but they purpose adding to these several others, two, at least, to trade between California, Japan, and China.

These vessels are essentially the same as the Constitution and Golden City, now in service. They are building by William H. Webb, Esq., and Henry Steers.

They are to be 360 feet long and 50 feet beam, and are to be built of the best materials. The engines are building by the Novelty Iron Works, and are of the same patterns as the other ships named, viz:

not being needed, has laid alongside the dock, receiving her machinery. The lower hold presents a deep and darksome sight, and all is at present chaos. The parts generally-cylinders, condensers, guides, shafts, etc.-are in place, but the details, which always consume the most time, are far from perfect.

#### NEW SAFETY APPARATUS FOR LOWERING SHIPS' BOATS.

On Friday, February 2d, a large number of gentlemen connected with the merchant marine of this city, and also others representing foreign interests, witnessed a trial of a new apparatus for lowering boats from ships while under way.

The experiment was conducted op board the revenue cutter Cuyahoga, and was a complete success. At a given signal, a boat manned by a full crew was launched from the davits, and under way in a few seconds. The ship's way gives an impetus to the boat, and by putting the rudder over, it is steered off from the vessel, and is free to go in any direction. It is asserted that this apparatus can be used in all weathers, and is specially valuable in a heavy sea when the ship lurches, as the boat can be detached instantly instead of being unhooked prematurely or lifted at one end, as is sometimes the case. Many deaths have been caused from the defective block and fall arrangement commonly used.

Foreign patents are being taken out on the invention through the Scientific American Patent Agency. In a few weeks we shall be able to present our readers with an engraving of it.

#### How to Circulate a Newspaper.

Another new scientific newspaper has been issued in London, called Engineering. It is edited by Zerah Colburn, and is devoted to mechanical and scientific matters in general.

As an illustration of the way English manufacturers go into business, the publishers of the journal announce that sixty-five thousand copies have been printed of the first number, and that of these, sixty thousand have been taken by one firm alone. Mr. Colburn's paper promises to be an interesting and valuable record.



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#### Contents:

(Illustrations are indicated by an asterisk.

### ANOTHER HUGE LOCOMOTIVE.

Another huge locomotive is building in England, intended to surmount moderately steep inclines, re lying upon the mere weight of the wheels for its adhe sion. No central rails or other gripping devices are used, but the inventor makes his engine of eightytwo tuns weight; assuming that the wheels will hold under this load for any ordinary amount of work. It is also claimed that from the huge proportions the machine must prove economical-not a necessary se quence by any means.

The general plan of the engine is much the same as Fairlie's locomotive, described on page 54 of the current volume-that is to say, the fire box is dupli cated, and occupies the center of the engine, the same as if two boilers were set furnace to furnace one set of flues running forward, the other aft. The boiler is 59 inches in diameter, length not stated; the total heating surface of the tubes is 5,177 feet. that of the fire boxes, 355 feet.

There are to be four cylinders,  $23\frac{3}{4}$  inches in diameter by  $23\frac{1}{5}$ -inch stroke, and twelve wheels 47 inches in diameter, all drivers. The cylinders are outside connected, but in other respects not peculiar.

The total power of this machine is estimated to be 1,282 horse-power, under the condition of allowing 620 inches heating surface per horse-power.

Some of the details of the machine comprise novel ties-which seem quite unnecessary-indeed, absurd. It is proposed to sand the rails in ascend ing very heavy grades, but instead of carrying a sup ply on top of the boiler, and letting it out as required through a pipe, the engineer who designed this loco motive proposes to manufacture it in lots to suit. To do this he has a quantity of gearing, consisting of saws, ratchet wheels, etc., driven by the engine The saws work against blocks of sand, previously compressed by machines for the purpose, and, as a foreign cotemporary phrases it, "It is thus gradually disintegrated, and the triturated particles subsequently applied to the tires of the wheels by an appa ratus resembling the inking rollers of a printing machine "-which means that it falls under the wheels

As an improvement on this plan, the same journal urges that the sand blocks be applied direct to the rims of the driver, so that they can grind their own sand; that is to say, when a heavy engine is going up grade with all the load it can drag, we are to in crease the adhesion by putting on the brakes.

The diameter of the cylinders is so great that the crank pins are immoderately long; so much so that the connecting rods have to be slightly bent in order to shorten the pins.

Another remedy for this is suggested by our cotemporary, to wit: "The cylinders should be made oval; they could be easily bored, and the construction of the piston would not present many difficulties."

There are some who would object to these conclusions. Lastly, we are told that this style of engine represents the most advanced opinions of the day, and that it indicates a style of practice to which we are rapidly drifting. If this be so, it would be better to try and stem the tide instead of drifting into such erroneous ideas and follies as this class of engine represents.

Every conceivable defect of adjustment and detail is crammed into an engine, and we are told that it is an advanced idea. What advancement is there in building two engines in one? and what progress is represented in planning an engine with cylinders so out of place that the connecting rods have to be bent? Why does economy necessarily spring from size and weight, and how much cheaper shall we get power out of locomotives by putting on machinery to make them grind their own sand, or applying gritty brakes to the wheels?

It is one advantage in favor of a central rail for surmounting steep inclines that a portion of the work on the main line is taken off and thrown on the central one, and it is a matter of some curiosity to know what weight of rail per yard would be required for the daily duty of a locomotive weighing 82 tuns, and exerting a thousand horse-power, and also the expense of keeping itin repair.

Some persons have a queer passion for doing absurd things, and then trumpeting them forth to the world. "Now I will invent a machine." says the schemer to himself, and without first ascertaining whether there is any need of such an one, and without the least idea of value, he proceeds to make locomotives grind their own sand, and "apply the triturated particles to the wheels."

Unhappily these impracticable persons do not spend their own money, but impoverish others. It is not strange that men should project monstrous locomotives on the plans here alluded to, but it is singular that they find supporters in journals that profess to lead scientific and practical men.

## SECOND-HAND MACHINERY.

The great demand for machinery of all kinds has taxed the energies of manufacturers severely, and we hear from many dealers that their stocks of some kinds are sold to arrive. When new machines are not to be had, there is a demand for second-hand, and in this line also we find dealers asserting that business is brisk. Persons who buy second hand machinery are often disappointed. They expect to get something which has been slightly used, but is for all purposes just as good as new, at a trifle. When these expectations are not realized they blame the dealer, and feel that he has misrepresented the goods. The safest way in such transactions is to hire an experienced person, if the buyer is not capable of judging, to examine the articles and pay what they are really worth. If repairs have to be made, the expense of making them should be taken into account, and the purchaser will then be able to judge whether it is worth while to buy, or wait until he can get a machine built. A few hints to those inexperienced in purchasing may be of service.

In buying steam engines have the cylinder cover taken off, the piston taken out and examined, and the valve and its face inspected. If the cylinder is badly scored it will have to be bored out, which is costly work. The piston will require new rings, the heads will have to be made larger, and other expenses not necessary to enumerate will be entailed. If the valve face is cut or rusted, as the case may be, both it and the valve will have to be repaired. This will take time and cost considerable, sometimes more than the machine is worth. The brasses should be examined, also the bolts and the bearings. It is not to be expected that these details, or any others will be at all equal to new, but the question to be considered is whether they are so far worn as to be useless. It often occurs that good second hand-steam engines can be purchased at a low rate, but it does not follow that all offered are good.

Second-hand boilers are dangerous property. It is better to engage the services of a practical engineer to inspect them, or a boiler-maker who has plenty of nel,

In purchasing lathes there are many points to be looked at. The feed gear of second-hand lathes is almost always out of order, and the leading screw is worn so much near the head stock, where it is most used, as to be worthless. The gears are generally more or less damaged as to their teeth, and some of them are apt to be missing. Gears for screw lathes generally run from 10 to 120, varying by 5 teeth. The spindles are apt to be badly cut, and the cones to run untrue. The shears are frequently cracked and bruised so as to need refitting, and the face plates so cut by careless workmen as to be useless to good ones.

In second-hand screw-cutting machines, the dies are often destroyed or missing.

Tools offered in lots should be examined to see if they can be used to advantage. Many people buy trumpery because it is cheap, when the room it takes, and the bother of having it around, amounts to more than the articles cost.

Pulleys are apt to be found cracked in the hub or the rim, and shafting to be so crooked and irregular in size as to cost more than new would to make it straight.

In all cases, the purchaser of second-hand machines must expect more or less repair to make them fit for use, and he must be the judge whether his needs justify him in paying the prices asked.

# THE BROADWAY SUBTEBRANEAN RAILWAY.

The engineer of the Croton aqueduct has made a report objecting to the construction of a subterranean railroad in Broadway on account of its serious interference with the sewers and water pipes. Whether this consideration will stop the prosecution of the enterprise remains to be seen.

As the business of New York is nearly all concentrated in the lower portion of the city, while the residences are in the upper part, most of the business people come down town every morning and return every night, making a great deal of travel in the streets running northeast and southwest. Though Broadway is crowded with omnibuses, and the side streets are occupied by railroads, the travel, even in the present size of the city, is very imperfectly accommodated, and far more ample provision must be made for it as the city increases in size.

Among the plans proposed, the subterranean railroad commands respect and confidence, from its practical success on a large scale in London, and if the sewerage difficulties can be overcome, it will probably be tried in this city.

It seems to us that a combination of the best elements in the several plans for an elevated railway is well worthy of consideration. One objection to an elevated railway is that it must be high enough to allow loaded wagons to pass under it at the cross streets, and this makes it necessary for the passengers to climb long flights of stairs to get into the cars. This objection is overcome by hanging the cars below the rails, as proposed by Mr. Andrew, of Cincinnati, Ohio, and illustrated on page 159, of our last volume. With this arrangement the rails may be twenty feet or more above the street, while the passengers are obliged to climb only eight or nine feet.

Perhaps Mr. Lyman's plan of supporting the rails by two lines of posts directly over the sidewalk may be better than that of Mr. Andrew, who hangs his two tracks on a single row of pillars set along the curbstones.

Mr. Andrew proposes to propel his cars by a series of endless ropes, driven by stationary engines. It has been suggested that a better plan would be to have each car carried by a light locomotive running above the rails. Manifest objections to this plan are the large cost of so many locomotives, and to the fuel to drive them; as well as the danger of dripping oil and dust down upon the passengers. These objections may, however, be less than those that rest against the subterranean plan; and certainly it would be much pleasanter to ride eight or mine feet above the ground than through a long subterranean tun-

The enterprise is of so great magnitude and importance that every plan which seems in any degree plausible should have a thorough examination.

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ISSUED FROM THE U. S. PATENT OFFICE FOR THE WEEK ENDING FEBRUARY 13, 1866 Reported Officially for the Scientific American

B Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other in formation useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

52,509.—Apparatus for Bleaching Oil, Parafine, Wax, Etc.—Charles Adams, Philadelphia, Pa.: First, I claim the vessel, A in combination with the pump, F, still, E, steem boller, G, pipe, H K, valve, B, pipe, C, and worm, D, for the purpose specified. Second, The pump, F, pipe, e, pipe, h, and valve, L, when used for forcing oil in a state of vapor into the vessel, A, for the purpose specified.

specified. Third, The valve, B, when used for regulating the pressure in the ressel. A, where oil in vapor and steam, or parafine or wax and steam, are kept, for the purpose specified.

52,510.-Hoe. - Sherman W. Adams, Wethersfield

52,510.-110C. ISTERMENT TO A STREET, CONN.: Conn.: I claim the combination of the pivoted blabe, B, segmental arm c, and handle, A, with devices or scuring the said arm at a d sired angle of obliquity with the handle, substantially as describe [Ihis invention consists in making the blade of a hoe adjustable so that it can be set to any desirable angle with the handle as to hoe deep or shallow according to the requirement of the soil or of the crop under cultivation, and that by setting the blade well out from the handle it may be easily ground upon its inner edge (this

being the proper edge to be ground), thus obviating the difficulty experienced with common hoes of grinding them upon that edge.]

52,511.—Plug Valve for Steam Engines.—William H. Akins, Dryden, N. Y.: First, I claim a plug valve, B, provided with a channel, f, flaring shaped, in combination with a shell, C, provided with three aper-tures or ports, a b c, substantially as and for the purpose set forth. Second, The arrangement of two valves, B b, with flaring shaped channels, f P in combination with shells, C C, having ports, a b c a'b'c', and with a steam cylinder, A. constructed and operating substantially as and for the purpose described.

substantially as and for the purpose described. 52,512.—Flat Iron.—John Alexander, Brooklyn, N. Y. 1. laim a single-spurred tennon on the handle, in combination with a suitable carty in the body or base and with a spring ar operate logenbar as represented, so that the handle may be united to and separated from the bases will be a pressing down and partial rotation of the handle, substantially as herein set forth

52,513.—Sad Iron.—Charles Barry and O. W. Preston, Corning, N. Y.: I claim the neater, F, provided with plates or doors, G G, at its ends, and fitted within the shell, c, of the iron, substantially as and for the purpose herein set forth.

[ This invention relates to a new and improved sad iron and heater whereby the iron may be heated by gas, and a very portable and convenient arrangement obtained, both as regards the heating and the use or manipulating of the iron.]

52,514.—Stove-pipe Damper.—Joseph Barton, Battle Creek, Mich.: I claim the combination of the hinged ring sections, D D, with a circular damper plate, B, constructed and operating substantially as described.

52,515.-Cultivator.-Charles Belden, Middleburg, Ohio: First, I claim the frame, B F, in combination with the change-able and reversible blades, H K, when constructed and arranged as and for the purpose set forth. Second, I claim the herein-described cultivator, with changeable blades, H K, when constructed and arranged as and for the purposes set forth.

52,516 -Shirt Collar.-Sumner A. Bemis, Springfield

Mass.: I claim the collar band extended so that its ends will reach be hind the collar fold when the collar is buttoned around the neck their lower edges shaped so as to conform together, substantially as and for the purpose herein specified.

52,517.—Apparatus for Reefing Fore-and-aft Sails.— George A. Bigelow, New Braintree, Mass.: I claim the combination of the rotary boom, C. the detachable mast hoops, c, and the means of supporting and revolving the boom. And I also claim the combination of the same and the gim-bals, 1 or their equivalents, applied to the boom and mast, the whole constituting an apparatus for either reding or turking a fore-and-a sail, substantially in manner as specified.

52,518.—Egg Beater.—Alfred Robert Blasse, Westmin-ster, Md.: I claim the combination in the vessel, A, of the smaller vessel, B, and its rotating beater, with the planetary system of revolving beaters, the whole being arranged and operating substantially as described and represented.

uescribeu adu represented.
52,519.—Brazier for Cooking Stoves or Banges.—N. O. Bond, Hyannis, Mass.:
I claim the brazier, A B, when constructed as herein described, with ribs, a a, which adapt it to receive vessels of various diame-ters, or of the same diameter as the stove hole, without obstrucing the draught.

the draught. 52,520.—Stove-pipe Elbows and Dies for Producing the Same.—Frederick Boshert, New York City: First, I claim an elbow for stoves and other short metal pipes, constructed of flat plates cut in the form of quarter rings of the re-quired with and then swaged trans.ersely in semicicalar iorm, with the radial recesses, to comprise the longitudinal halves of a tubular cylindrical ring, substantially as set forth. Second, Tue dies, A and B, for preparing hard sheet metal plates or stove-pipe elbows, or other curved pipes, having projections, g, and corresponding recesses, h, by which to take up or absorb the scribed and for the purpose set, forth. S2,521.—Steam Gage Cock.—John Broughton New

52,521.-Steam Gage Cock.-John Broughton, New

York City: First, In combination with the body and shank of a gage cock

provided with a suitable outlet passage, I claim a detachable valve, when said valve is supported by and has its bearing in said body, independent of the operating handle or screw, substantially as sei

forth. Second. In an impression gage cock provided with a detachable and mdependent valve, supported by and having its bearing in the body thereof, I claim the tubular cap whereby to oper ate the valve, F, substancially as set forth. Third, The combination of the body, A, detachable valve, F, and tubular cap, G, when arranged and constructed substantially as set forth

52,522.-Ocean Telegraph.-Geo. W. Bowlsby, Monroe,

52,522.—Ocean Telegraph.—Geo. W. Bowlsby, Monroe, Mich.:
First, I claim the flying telegraph stations, B l. consisting of ships or steamers, when used for the purpose spec fled, and in com-binat on with the permanent stations, B 2, and the partially sub-merged electric cable sections.
Second, The electric cable sections.
Second, The electric cable sections, Using for the most part upon the bottom of the sa, and the ends coming to the surface of the "mater and supported by buoys, substantially as described.
Third, The combination of moving Figs. 2 s and 4 sheets. 2, with-buoys, B. and B2 cables, D D and anxinaries, I I P P K K H 4 and of, sheet, 1, and made substantially in the manner described and for the purpose specified.
Fourth, The water-proot packing cheets, Figs. H and 17, with its appurtenences, for the joining of the ends of the cables, or any me-chanical modification of the scame object, and sub-stantially similar.
Fifth, The combination of the great buoy, Fig. 1, with its traveler.
F2, bell buoy, n, detachable signals, E E. separate water-proof com-partments, u, joining danges and fastenings, a p i; but I do not claim any of them specially and separately.
Sixth. The hollow-i ked mooring cable, Figs. 5 6 7 14 18 19 20, with the nelosed water-proof chambers, m for self support in the water.

with the inclosed water-proof chambers, m, for self support in the water. Sevenin, The flanged and s'aked moorings shown in Figs. 2 3 and 4, for the purpose of adding to the weight of the mooring, by taking hold of the earth by means of their own weight, and gradually settling into the bottom, instean of taking hold in dragging, like an anchor, nor by any other artificial means or force. Eight, The interior br toing of the deepwater buoys, as shown in Figs. 8 and 9, for the purpose of overcoming the pressure of the water and the prevention (f leakage. Ninth, The holdow-link-d chain cable, Figs. 6 14 20, when used without the inclosed air chambers, m, shown in Fig. 6, and absent in Fig. 20.

52,523.—Tubing for Oil Wells.—James D. Bryson, Petro-leum Center, Pa.: First, I claim the combination of the pump tube, B, the shorter supplemental tube, A, and steady pins, d d, adapted to operate substantially as and for the purposes set forth. second, I claim the arms, e e, hinged around the tube, B, so as to operate as described.

52,524.-Drying Kiln.-Henry D. Bulkley, Kølamazov,

52,524.—Drying Klin.—Henry D. Bulkley, Ksiamazoo, Mich.: I claim the use of a sawdust top or its equivalent, and of such varied thickness, as to retain so much steam generated from the drying substance or otherwise as shall expel the ar, convert the heat, and protect the substances from scorching, and allow all surplus steam to pass out through the saw dust, with small waste of heat, and with the slightest pressure, substantially as specified.

of heat, and with the slightest pressure, substantially as specified. 52,525.—Cover for Fruit Jars.—F. A. Bunnell, Sy-racuse, N. Y.: First, I claim, in apparatus for closing fruit jars and other ves-sels, the combination of the clamp, A, and cam lever, F, with a metallic bearing surface placed on the cork or stopper, when the cam acts directly on such surface, or on the stopper, without the use of an intermediary slide, substantially as described. Second, I also claim making the fiange of the stopper which rests on the mouth of the jar concave in cross section on its under sur-face so as to retain the packing ring in a mass, and prevent if from flattening out, substantially as described. Third, I also claim the extension of the stopper within the mouth of the jar, in combination with the flange, d, substantially as sectived. Fourth, I also claim forming inclined planes below the rim of the mouth of the jar, for the purpose of drawing the clamp down on the stopper, substantially as described. 52,526.—Harvester.—William H. Burkhart, Bucyrus,

52.526.-Harvester.-William H. Burkhart, Bucyrus.

Ohio: Ullo: claim the adjusting belt in combination with the spring dant pulley support for regulating the tension of the reel band stantfully as described. I claim

substantfally as described.
 52,527.—Ventilator.—Benajah J. Burnett, Mount Vernon, N. Y.: First, I claim a ventilator having its air passages composed of turbes arranged around the interiors of surrounding trunks, and furnished with caps and deflectors, substantially as herein specified.
 Second, The arrangement in one ventilaror, ot two or more series of tubes with separate surrounding trunks and caps for ven-tilaring different floors or stories of a house or other structure, substantially as herein specified.
 Third, The sliding external sleeves or shutters in combination with the trunks, tubes and caps, substantially as and for the pur-pose herein specified.
 Fourth, The periorated air distributors constructed with de-flectors, and combined with the lower ends of the tubes of the ven-tilaror, substantially as herein set forth.
 52 528. System of Ventilating Houses Ete B. J.

52,528.—System of Ventilating Houses, Etc.—B. J. Burnett, Mount Vernon, N. Y.: First. claim the conical deflectors, a, situated at the lower ends of the vertical air shaits, B, substantially as set forth, for the pur-

of the vertical air sharts, by accounting the second, I claim cold air chamber, c, with its air passages, h, in combination with the vertical air shaft, B, substantially as set forth, ior the purpose specified. Third, I claim the chamber, D, inclosing the funnel-shaped deflectors, a granged with reference to the vertical air shafts B, space, d, and air passages, d', substantially as set forth for the purpose specified.

52,529.—Flat Iron.—Thomas Butters, Concord, N. H. Iclaim a box flat iron, provided with an internal removable heater, and with means for removing the same consisting of the lever, A, supported upon the box and the spring, B, attached to the handle, b, airanged and operating in the manner described.

52,530,—Medical Compound.—William Cawein, Louis-ville, Ky.: I claim a compound produced by mixing the above-named in-gredients together, about in the proportion and substantially in the manner specified.

This invention relates to a compound which will speedily and

urely cure diseases arising from a disturbance of the stoma 52,531.—Adjustable Tollet Glass.—George Chappel, Peekskil, NY.: I claim the adjustable mirror, A, in combination with the tu-bular extension rod, G, chain, b, and weight, D, as and for the pur-pose described.

[This invention consists in the arrangement of a looking glass or mirror at the end of an adjustable rod, which is fastened to the ceiling or to any other convenient place in a room, in such a man-ner that the position of said mirror can be adjusted at pleasure, and a person standing before an ordinary toilet glass, is enabled to see the back and front of his or her head and neck at the same time.]

52.532.—Quartz Mill.—Thomas J. Chubb. Brooklyn.

52,532.—Quartiz Mill.—Informas of Outputs, Ercourg., N. Y.: First, Iclaim the employment of corrugated rings, arranged one within another, for the purpose of disintegrating universal sub-stances, substantially as described. Secon, The arrangement of a series of grinding surfaces within a chambered cylinder, the chambers of which communicate with each other, substantially as described.

52,550.—Washing Machine.—John and Jacob Ehart,
Fort Madison Iowa:
I claim the shaft. C, made adjustable. vertically within the tub,
A, by means of the sleeve, H, when used in combination with the disk, F, provided with arms, E E, the several parts being used as and for the purposes herein specified. 52,533.—Head Block for Saw Mills.—Gilbert H. Clemens, United States Army. Antedated Aug.

13, 1865: J claim the head block, A F, knee, D E, and setting screw, C, when constructed and arranged substantially as and for the pur-oses set forth.

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52,534.-Musical Staff.-John C. Clime, Philadelphia,

Pa.: First, I claim a musical staff consisting of the lines 12345, of the ordinary staff, combined with the supplementary lines, x, substantially as and for the purpose specified. Second, The diagonal lines, w. arranged in respect to the staff, and to the letters designating the notes on the staff, substantially as and for the purpose set forth

52,535.—Heating Stove.—James C. Cochrane, Roches-

ter, N. Y.: I claim the air chamber with wire cloth or perforated metal facing the fire, and so near it that gas passing through will be ignited, and through which the draft riom to e fire will pass, and with horizontal or perpennicular flues communicating between the air chamber and the air of the room, the whole constructed as and for the purposes above described.

52,536.—Bridge.—L. K. Cole and Howard Soule, Jr. Syracuse, N. Y.: First. We claim the shop, C D E F G, constructed and operating substantially as described. Second, The continuous chord, B, and nut, A, in combination with the shoe. and brace, V, or other equivalents, substantially as and for the purposes described.

52,537.-Straw Cutter.-James Conner, Richmond, Ind.

Ind.: First, I claim the construction of a straw cutter in such a manner as that the box or straw receptacle shall have a vibratory or os-claing motion as set forth. Second. The spring. M, with the guard, P, attached, constructed and operated in the manner and for the purpose as described. Third, The lever, J, arm, H, and the connecting rod, G, in com-bination with an oscillating box in straw cutters.

52,538.—Horse-shoe Vise.—Emmett Coon and Nathan Hill, Comstock, Mich.: We claim a vise for sharpening the calks of horse-shoes, having the slutted standard, a, with the adjustable bolt nut and screw therein, a curved lever. B, spring, C, elbow lever, D, and hanging stirrup, E, constructed combined and arranged substantially as herein specified.

tirrup, E, erein spe

52,539.—Plow.—Thomas Cottman, Cincinnati, Ohio: I claim the extension or addition, C' to the block or head, or patented by A. Gardner, October 26th, 1852, so as to receive the share, A and the landside, D. made in separate parts, substa-tially as set forth and described. 52,540.—Paper Socks.—J. W. B. Covington, New York

City: I claim a paper sock or stocking as a new article of manufac-ture.

52,541.—Tightening Rod.—S. D. Cushman, New Lis-bon, Ohio: First, I claim the ribs, a and b, in combination with the rod, when constructed and arranged substantially as and for the pur-

when constructed and arranged substantiany as and rot the par-pose set forth. Second, The section, A and B, when constructed and combined in the manner and for the purpose, substantially as described.

in the manner and for the purpose, substantially as described. 52,542.—Cultivator.—Calvin B. Deyo (assignor to him-self and Edgar B. Rinner), Marengo, Ills.: First, I claim the combination and arrangement of the tri-angular frame, B C, draft pole, A., etandards, D, and braces, E, Second, I claim in combination with the said draft pole, tri-angul r frame, B C, standards, D, and showls D', the arrangement of the inclined posts, F F, provided with the pulleys, c c, the pulley, G, and cord or chaint, I, operating substantially as and for the purposes specified. Third, I claim the arrangement of the toothed plates, L M, slot, m, bolt, n and o, with the loops, a, all arranged and operating sub-stantially as herein set forth and described.

52,543.—Apparatus for Making Paper Pulp.—John W. Dixon, Philadelphia, Pa.: First, I claim the combination of the circulating pump and re-volving boiler Second, The combination of circulating pump, heating coil, and poler.

evolving boller. Third, The combination of one or both perforated diaphragme, and a revolving boller and pump, p.

and arerolving boller and pump, p. 52,544.—Apparatus for Making Paper Pulp.—John W. Dixon, Philadelphia, Pa.: First, I claim the combination of the digester, A, the perforated diaphragms, D, and the lateral pulp passage, E, arranged and operating as described. Second, The combination of the digester, A, and circulating tubes, M'N " M." extending from the lower to the upper part of the digester for causing a circulation of the digesting liquor by the effects of the head on these tubes. Third, The combination of the digester, A, the tube, C, and the lateral pulp passage, E, arranged and operating as described.

52,545.—Making Paper Pulp from Wood, Straw, Etc.— John W. Dixon, Philadelphia, Pa.: I claim the process of treating wood or other vegetable sub-stances, by bolling in a solution of silicate of soda under pressure as a process or preparatory process for making pulp in the manu-facture of paper from wood, steam or other vegetable substances, substantially as described.

substantially as described. 52,546.—Process for Making Paper Pulp from Wood, Straw and Other Vegetable Fibrous Substances.— John W. Dixon, Philadelphia, Pa.: I claim the process of treating wood or other vegetable sub-stances by boiling in a solution of carbonate of potash, under prosaure, as a process, or preparatory process, for making pulp for the manufacture of paper from wood, steam or other vegetable substances, substantially as described.

52.547.—Breeching-loading Fire-arms.—W. C. Dodge, Washington, D. C.: I claim, First, The breech block, A, provided with the notch or shoulders, n, for locking it in position, and the bridge. K, for enabling it to bas the cartrages in the magazine, substantially as shown and described. Second, I claim giving to the rotating breech block, A, when so constructed that all its parts shall move together, a vertical move-ment, for the purpose of locking it substantially as herein de-scribed.

scribed. Third, I claim uniting the lever guard, B, to the breech block, A, as shown in Fig. 4 or in any equivalent manner, by which the lever, B, is permitted to move longitudinally for the purpose of elevating the block, A, substantially as set torth. -Revolving Grate for Stoves.-Ellwood Draper, 52,548

52,948.- Revolving Grate for SLOVCS. - Eliwood Driper, Oskaloosa, Iowa: I claim, First, The combination of a revolving cylinder grate, constructed substantially as described, with a cooking or heating stove, for the purpose set forth. Second, The combination of the piece, G, with the grate, D, sub-stantially as described, and for the purpose set forth.

vibrating and jarring motion of cars.]

52,549.—Roofing.—O. Eaton, Troy, N. Y.: I claim the combination with the wooden boards, c. and raised ribs, g. of the wooden cap, h, and spaces, n, when the parts are constructed and arranged in the manner and for the purpose here-in described and represented. [This invention relates to a certain new and useful improvement, in roofs for buildings, etc., but which are particularly applicable and more especially intended to be adapted to railroad cars, and

iected to violent vibrations, the principal object being to obtain a roof, which shall be perfectly impervious to rain and moisture, and nstructed and arranged as not to be effected in the least by the

52,551.—Hand Mirror.—John E. Faris, Éaltimore, Md.: I claim a hand mirror, having a plane surrounding the same adapted for inscriptions and ornamentation, and protected by fianges, all substantially as shown and described.

52,552.-Cutlery.-Daniel Fitzpatrick, West Winsted

Conn: I claim forming or securing a half-bolster upon or to cutlery, by indenting one side of the piece of steel of which the tang and blauk are composed, and welding the half-bolster piece to such side, and forming the half-bolster upon the opposite side by swaging substau-tially in the manner described.

52,553.—Manufacture of Artificial Non-inflammable Wood.—Anthony L. Fleury, Pittsburgh, Pa.: I claim, First, Treating florous materials in the way and for the purposes above specified. Second, I claim also the improved material which I denominate "artificial non-inflammable wood," the same being produced by the process above-described or by a subs antially equivalent pro-cess. "artificial the proces cess. 52,554.-Mode of Utilizing Coal Dust.-Anthony L

52,554.—Mode of Utilizing Coal Dust.—Anthony L, Fleury, Pittsburgh, Pa.. I claim, First, The utilization of refuse coal gast ar and petroleum, by compounding them with the slag or cinder of puddling, reheat-ing and steel furnaces, or with iron ore, and making from said com-bound a metaillierous coke. Second, For utilizing tue slag or cinder of puddling, reheating and steel furnaces by compounding them with refuse coal-gas tan or petroleum, and making of said compound \* metalliferous coke. Third, For compounding iron ore with refuse coal-gas tar or pe-troleum, for making therefrom a metalliferous coke, as and for the purpose above specified.

52,555.— N. Y -Window Curtain.—Harry Foster, Port Jervis T clain

N. X.: I claim the combination of rolier, A A, curta in, C, and cords, b h as to operate in the manner herein described for the purpos ecified.

52,556.-Valve for Steam Engines.-James Gallatin, Jr. I clai

New York City: claim the valve,  $C_s$  with cavities, a a', in combination with the seat, B, provided with ports, b b' c c', and with a secondary pis-, D, all constructed and operating substantially as and for the pose described. (This invention relates to an oscillating or rotary valve with a fla

face, which is ground down upon a corresponding flat seat, and which is provided with two segmental cavities, which alternately form the communication between the supply and exhaust ports of the seat.]

52,557.-Neck Tie.-J. B. Gardiner, Springfield, Mass I claim as a new article of manufacture a neck the or bo of paper, thin metal, or other suitable substance, and emb struck up substantially in the manuer and for the purpose hereit struck u set forth

52,558.—Gang Plow.—Roland R, Gaskill, El Paso, Ill.: I claim hinging the tongue, A. to plow beam, B, at the middle thereof, or directly above the sh are, H, in combination with brace, L, singe, x x, bars, F F, brace, K, and axletree, G, the several parts being arranged as and for the purpose set forth.

L. inige, X. X. bais, F. K. inace, in an extense est, one several parts being arranged as and for the purpose set forth.
52,559. — Apparatus, for the Manufacture of Iron and Steel. — William Gerhardt, Pittsburgh, Pa.: First, I claim the furnace, C, with one or more chemical injectors, introduced in the manner and for the purpose specified. Second, The combination of the pipe, T. box, S.", pipe, S. valve, K. pipe, Q. pipe, O', double valve, P, pipe, O, and funnel, N, forming a chemical injector as described and for the purpose specified. Third, The funnels, n n n" n", in combination with the funnel, N, for the purpose specified. Fourth, The combination of the counting and recording instrument and dual, V. with the mechanism, M and U, and the valves, P and R, of the chemical injector for the purpose specified. Fifth, The funes, p as described and for the purpose specified. Sixth, The fune, p p, as described and for the purpose specified. Sixth, The fune, p p. as described and for the purpose specified. Sixth, The fune, p p, as described and for the purpose specified.

eventh, the specified

52,560,-Manufacture of Iron and Steel,-William Ger

52,500.—Manufacture of 1ron and Steel.—William Ger-hardt, Pittsburgh, Pa.: First, I claim running the melted pig-iron from a blast furnace cupola, or air furnace, Jirectly, or by siank, into the puddling fur nace for treating it in the manner specified. Second, Injecting by blast of air directly into and under the sur-face of molten iron, in a puddling, scilde of iron, iron ore, carbon izing or purifying agents, in the manner and for the purpose speci-

face of molten iron, in a purpose face of molten iron, in a purpose face of molten iron, in a purpose face of the purpose of the molten iron, as specified. The purpose of the molten iron, as specified. The purpose of the purpose of the start of the slag, by the injection, by blast of air, of oxide of iron, iron ore, and purifying agents, without letting the iron come in cont. et with the sulphurous flame of the furnace, in the manner specified.

52,561.—Axles for Vehicles and Journals for Ma-chinery.—R. P. Gillett, Sparta, Wis.: I claim the collar, B. on the axle, A. constructed with a recess, a, for the insertion of the butt end of the boxing, e, substantially as and for the purpose described.

The invention consists of a new and improved mode of coating the arm of the axis, the portion in which the wheel runs, with Bab bitt metal or other similar composition, and also in a mode of forming a lubricating passage for axles thus coated whereby it is be d that a very superior axle is obtained, as well as superior jour nals for machinery.]

52,562.—Washing Machine.—W. H. Greer, Chicago, Ill. commentations and the nubling board of a washing machine of series of conical, radial cogged rollers, whose operative faces or e-nt a flat surface to the vibrating rubber acove, substantially as d for the purpose described.

This invention relates more particularly to the rubbing poards of ng machines, composed of a series of rollers, either arrange radially from a common center or parallel with each other, the ob ject being to prevent the clothes from being wound around and out them as they are in any proper manner rubbed upon them it consisting in forming the rollers with a series of grooves or cor rugations extending around their peripheiles, which corrugation mesh into each other, and thus accomplish the desired end.]

563.—Seeder and Fertilizer Combined.—Spencer Guild, Milford, N. H.: 52,563

Guild, Milford, N. H.: First, I caim the combination of a manure or fertilizer distrib-uter with a hand seeding machine, substantially as described. Second, The place or covere: H. applied o a hand-seeding ma-chine, either with or without the manure distributor, to operate in the manner substantial was seed to be a seeding to be a sub-trained, without the second second second second second Thiud, The lever is ubstantially as described. Second the combination of the levers, E. D. slides, B, one or more plate, F, and the coverer or plate, H. all connected and ar-more substant in the manner substantially as and for the pur-table of the coverse of the substantially as and for the purmcre plate, F, ranged to open nose specified.

(This invention relates to a new and improved implement for wing or planting seed by hand, and distributing a fertilizer at the same time. The invention consists in a novel mechanism employed

whereby all the parts necessary to effect the result or perform the work above specified may be operated by a single lever and with the greatest facility.]

52,564.-Tobacco-smoking Device.-Holman J. Hale, New York City: First, I claim coloring meershaums by subjecting them to the ac-

tion of tobacco smoke inhaled or passed through them, substantially as above set forth. Second, I also claim the cover or cap. C, fitted on the bowl of a pipe by means of a porous stopper or oth-i convenient device, and perforated by a tube which eners said bowl substantially as and for the purpose above set torth. Third, I also claim in combination the cover or cap. C, the tube, E. and the heat disperser, or the radiating device, G, substantially as shown.

52,565

s shown. 2,565.—Apparatus for Washing Tumblers.—Albert Hallowell, Lowell, Mass.: I claim one or more cups, E, jet pipes and tubnlar annuli, d, ar-anged and combined together substantially in manner and so as to perate as and for the purpose specified. I also claim the combination and arrangement of the basin, D, nod its discharging tube, B, with the conduit, A. its branch pipes and cups, or the same and one or more tubular annuli, d, as speci-ied. nea. I also claim the combination and arrangement of the receiving cup, E, with the tubes. A B, the basin, D, and the branch pipes and cups on the same, and the annuli, as explained.

52,566.—Tailors' Measure.—Geo. W. T. Harley, Freder

52,505.-1allors' measure. GeV. w. 1. narley, Freuer-ick, Md.: First 1 claim the combination of the graduated extensible strips, A. with the slides, B. and the intermediate sliding protrator, b, and pivoted scale blade, c, with the perpendicular rods, G. Sub-stantially as described. Second, The combination of the adjustable b'ades, E. E, and pro-tractor putset, D.D., with the central protractor plate, b. aid blade, and the extensible graduated strips, A. A, substantially as de-scribed.

52,567.-Weather Strip.-Mortimer S. Harsha, Syca-

more, Ill.: I claim the combination and arrangement of the strip, D, the pindle, d, and box, c, when arranged with respect to the bearing , pin, b, and cleat, E, as and for the purpose herein specified and lescribed.

52,568.—Buckle.—Sheldon S. Hartshorn, New Haven

52,505.-Buckle.-Sheldon S. Hartshoff, New Haven, Conn: I claim the combination of the bow part, figure 2, with the tongue part, figure 3, when the tongue part is so formed that two portfolse of it lag, 4s at b, and the tongues rest on and across the shanks of the bow part, and the whole is constructed isubgrantially shere in described.

52,569.—Centrifugal Machine.—George B. Hartson and E. J. Woolsev. New York City

52,559.—Centrilugal Machine.—George B. Hartson and E. J. Woolsey, New York City: We claim the method of constructing the centrifugal separator with a holiow hub in the center of the lower plate thereof, as de-scribed, the said hub being provided with a pulley for the driving belt below the bottom plate, and fitted to run on, and combined with the stud of the base plate, in the manner and for the purpose specified.

specified. We also claim the said centrifugal separator, in combination with the cap or cover provided with holes or channels covered with funnel-shaped hoods, as described, to force currents of air in and through the said apperatus, to aid in effecting the separation, as described.

52,570.-Bolt.-George Havell, Newark, N. J.: I claim the bolt, figure 1, constructed substantially as

52,571.—Beehive.—Henry Hodgson, Tremont, Ohio ;

52,571.—Beehive.,—Henry Hodgson, Tremont, Ohio: First, 1 claim suspending the comb frames from removable bars, MN, in combination with the vertical partition, IJ, substantially as and for the purpose abeve set forth. Second, I also claim dividing a hive by means of a partition, IJ, made substantially as shown in connection with making entrance ways, provided with perforated movablecovers on two opposite sides, or ends of each division, so that when one division is isolated from the other the entrance to each can be established on opposite sides, substantially as described. Third, I also claim, in beehives, which have a lower main hive, and a surplus upper box. a perforated movable metallic sheet or plate, F, on the top of the main box or hive, and a perforated me-talke bottom, on the surplus box, the perforations in which are made to coincide or are made no to coincide, for the purpose above explained, by changing the position of the surplus box, substan-tially as described. [This invention is to enable one to rear a queen bee in a separate

[This invention is to enable one to rear a queen bee in a separat part of a beehive without disturbing the old swarm, and to provide mode of promoting that condition in a colony of the bee known as " swarming."]

52,572.—Evaporator for Hot-air Pipes.—Jesse L. Hutch-inson, Baltimore, Md.: I claim the combination with an appropriate enlargement of the hor-air pipe of a water reservoir so placed]within as to expose a sur-face for evaporation and capable of beins supplied with water from the outside by automatic device, or otherwise, as may be desira-52,573.—Braiding Machine.—Otis M. Inman, Provi-

52,573.—Braiding Machine.—Otis M. Inman, Providence, R. I.:
First, I claim guiding and directing the bobbin carriers from one sircular passage to another by means of projections or switches, c, formed on the frame plate. C, acting upon a rudder, g3, on the Second, Constructing the bobbin carrier with the shoulder suports, fg2, and an intermediate recess for receiving the teeth on he carrier wheels, substantially as described.
Third, The manner, substantially as described.
Third, The manner, substantially as herein described, of arranging the contrivance which controls the delivery of the thread from he bobbin. ρι the ι Th

74.—Burning Fluid.—John Jann, New Windsor, Md.: 52,574.

I claim the combination of benzine, sweet and linseed oil in about he proportions mentioned.

he proportions mentioned. 52,575. — Metallic Packing for Stuffing Boxes. — C. F. Jauriet, Aurora, Ill.: First, The construction and arrangement of the follower, D, sub tantially in the manner and for the purpose described. Second, The construction and arrangement of the ring, plate, C. ubstantially in the manner and for the purpose herein described. Third. The arrangement of the cylindric springs, k, with the turn-ng follower, D, compressible packing and iteam admission pas-ages of the stuffing box. E and A, substantially as described. Fourth, The combination of the packing, ring plate, springs and ollower, with a stuffing box, substantially as and for the purpose lescribed.

blower, with a stunding  $\cos_4$ . Second secon

and steam passages, as desined, for the perpendicutor of the perpendicut

Standard as and the purpose meter described. Jacob F. Landis, Harrisburg, Pa.: I claim the construction of the screw, D, with its eye, E, in com-bination with its thumb screw, G, and slat. c, for holding the cur tain when arranged and combined as herein described and for the purposes set forth. 52,578.-Water !Wheel.-Leroy M. Larsh, Richmond

52,578.—Water ; Wheel.—Leiby and Lancer, Jund.: Ind.: First, I claim the termination of the scroll, C, in a saddle shaped apex effecting a division of the current, as desired. Second, The combination of the saddle, A, and plates, B B', with the trunk, D, and scroll, C, operating as set to the 52,579.—Spirit Level,—Rudolph Ledig, Newark, N. J.: First, I claim the combination, in a spirit level, of the vibrating screw, k, with the arm, G, the nut, J, and the frame, A, substan-tially as described and for the purpose set forth. Second, The combination, in a spirit level, of the arm, C, with the frame, A, arms, FG, index, H, and clamp, L MN, substantially as described and for the purpose set forth. (This is an exceedingly useful invention, and consists of a spirit

level, of which the arm that carries the spirit bottle is pivoted at

one end to the frame of the level, and at the other end is connected with an index and scale, so that the workman, by the use of this instrument, not only knows whether a piece of work is level, but also how much it varies from a level at any given point and for ny given distance.]

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52,580.—Bugle, Horn, Cornet, Etc.—Henry G. Lehnert, Boston, Mass.: I claim the construction of any side of their tuning pipes with a tapering bore. which, when in place in the instrument, becomes a prolongation of the taper of the said passage.

52,581

32,581.—Supplementary Seats for Water Closets.—L. H. Sondheim, New York City : I claim a supplementary seat for water closets so constructed as o be folded up, substantially as described.

In hotek, public buildings, or large establishments where the vater closet is for public or general use, and also so metimes in private dwellings, much embarrassment is often felt by finding the eats in a condition not fit to be used, and the object of this invenion is to provide a reliable and portable supplementary seat, which may be conveniently taken by the person intending to use the water closet, and by him readily placed upon the seat thereof, its construction being such that the person of the sitter is prevented from coming in contact with the privy or water-closet seat ]

52,582.- Revolv ng Fire-arm.—Benj. T. Loomis, New York City: First I claim, in combination with a part of a pistol stock at tached to the barrel and containing a lock, as described, a swinging piece that may be opened and shut and grasped in the act of discharging the pistol, the combination being substantially such as described. Second, The slotted chamber piece, U, constructed substantially as

lescribed. Second, The slotted chamber piece, U, constructed substantially as lescribed. Third, In combination with a pistol stock, one part of which whogs upon the other. I claim the trigger and springs, so combined oxether, as described, that the trigger protrudes when the stock is pened and returns to its place after the discharge.

Solution and relations to the place and the discussion of the second state of the place and the second state of the second st

purpose herein specified. 52,584.—Press.—George Mathewman, Brooklyn, N. Y.: First, I claim the arrangement of the lever, G. links, H. and arms, A', or their equivalents, the lever, G. being operated in front of the machine and at a low point, substantially in the manner and for the purposes herein set forth. Second, I claim the shaft, m, wheel, M, and nut, D. adapted to raise and lower the spindle, C, and its connections, substantially as and for the purposes herein set forth. Third, I claim the within-described combination and arrangement of the connection, L, or its equivalent, the gear wheels, L' L', and the frame, I, or its equivalent, adapted to and arrangement of the springs, PP, spindle, C, and three ded wheels, T' 1', adapted to increase and diminish the force with which the plate. I, is pressed down in advance of the spindle, C, substantially as and so as to realize the advantage of requiring little hight for the entire mechanism, as herein set forth.

52,685.—Bedstead.—J. B. McLanathan, Horicon, Wis.: I claim the componition and arrangement of the slats, D, rails B, springs, C and F, pegsor pistons, E, and shanks, c, as and for the purpose specified. This invention consists in a novel arrangement of the cross rails

and slats of a bedstead, whereby a very easy and springing frame on which to place the bedding is produced.]

on which to place the bedding is produced.] 52,586.—Thill Coupling.—John McDermott, Washing-ton, D. C.: First, I claim the use of the anti-friction facings or bushing pleces, e.g. as described, in combination with the head of the third shank and the jaws of the lug, to increase the extent and durability of the rubbing aurice. Second, Coupling the head of the thill shank in the jaws of the lugby the use of bushing pieces, e.g. so made and arranged in re-spect to said bushing pieces, e.g. so made and arranged in re-spect to said bushing pieces, e.g. so made and arranged in re-spect to said bushing pieces, e.g. so made and arranged in re-spect to said bushing pieces, e.g. so made and arranged in re-spect to said bushing pieces, e.g. so made and arranged in re-spect to said bushing pieces, e.g. so made and arrange and the ald of a bolt. Third. The use of bushing pieces, e.g. made with a flange on their inside surfaces to lap over and hold the ends of the thill suank, and a tubular socket or projection on their outside surface to fasten in the jaws of the lugs, and to receive the bolt, substantially as de-scribed. 52,587.—Knife Sharporer

52.587.-Knife Sharpener.-William Nash, New Britain.

Conn.: I claim the knife sharpener herein described, the same consisting of the screw-threaded rollers, C C, frame, A, and handle, B, ar-ranged and combined substantially as set forth.

[This invention relates to the production of a new article of man ufacture, the same being an improved device for sharpening knives in which two screw-threaded rolls are let in a suitable frame cured in a handle, between which rolls the knife is to be drawn for sharpening it. The whole device, in general appearance, resemble: and matches articles; of table cutlery, and can be placed on the ta ble with equal propriety.]

52,588.—( N. Y -Curing Sorghum.-William Nevins, Lyons,

N. I.: I claim the described method of stacking corn, sorghum, etc., by means of the frame, a b c c, substantially in the manner and for the purpose herein set forth.

52,589.—Stirrup.—Barak T. Nichols, Newark, N. J.: I claim the stirrup, A. figures I and 2, substantially in the n ner and for the purposes described.

52,590.—Shovel and Tongs Combined.—Harrison Og-born, Eichmond, Ind.: I claim constructing a combined shovel and tongs having the leg, a, attached to the handle of the shovel by means of the hinge joint, C, pivoted substantially as set forth.

c, prvoted substantially as set forth.
52,591.—Calendar Watch.—Edward Oppenheimer, New York City:
I claim a watch provided with an additional dial, i, under the main dial, said additional dial being marked with figures from 1 to 31, and so arranged that it receives an intermittent motion once every twenty-four hours, whereby said figures are successively brought opposite an aperture in the main dial, as and for the purpose described.

pose described. 52.592.—Car Coupling.—John H. Parsons, Quincy, Mich.: First, I claim the arrangement of the draw head. A, with its sec-ond V shaped hole or opening on the bottom. The grooves, d d, in connection with the pin-sustaining, bars, H G, and rods, E F, sub-stantially as shown and described, Second, I claim the arrangement of the top beveled pin or catch, y, and the spring, m, substantially as described and set forth.

y, and the spring, in, substantially as described and set forth. 52,593.—Foot Warmer.—J. H. Parsons, Quincy, Mich.: I claim a foot warmer formed by connecting the drum or box, A, of he warmer with an ordinary stove-pipe by means of the small pipes, C and D, substantially as described and for the purpose set forth

[This invention consists of a box or drum resting on the floor of

nished with dampers, by means of which the heated smoke and

gases may be made to pass through the drum, so that the feet may

be warmed conveniently and comfortably without any danger

burning the soles of the boots or shoes while warming the feet. ]

the room

m and connected with the stove pipe by small pipes fur-

52,594.—Mode of Securing Pipes and Bolts in Oil Wells.—William Parsons, Cleveland, Ohio : I claim the eccentric or cam, B, as described, constructed and op-erated upon substantially and for the parpose set forth.

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52,595 -Wagon Brake.-L. C. Percivai, Philadelphia

(This invention relates to a self-acting brake for wagons and other wheel vehicles which are drawn by horses, and it consists in a novel arrangement of a rod-brake lever and levers to which the breast straps of the team are attached—211 being arranged in such a man ner as to operate automatically when the vehicle is descending an

eminence.]

52,596.—Lifting Jack.—Job W. Pettengill, Rocktord III.:
I claim the adjustable link, D, and pawl, C, in combination with the slide. C D, lever, D', and head, A, the whole being constructed and arranged so as to allow the slide. C, to be raised to or near to the top of the head, A, by changing the pawl, C', to the upper par of the head, a, securing the link, D, substantially as set forth.

52.597.—Buckle.—I. N. Plotts, New York City: First, I claim setting, twising, turning or stamping the bars, B, side strips, A', of the buckle at any desired angle or angles, sub-stantially as described. Second, I claim attaching to or forming upon the inner edges of the under surface of the side strips. A', of the buckle lips, i, sub-stantially as and for the purpose specified. Third, In a buckle of substantially the character described, I claim milling, serrating or otherwise roughening the edges of the side strips. Substantially as and for the purposespecified. So the side strips, substantially as and for the purposespecified.

52,598.—Furrowing Device for Corn Planting.—Joseph Plumb, Clarksville, N. J.: I claim the marking sled with the mold boards or shoes attached to the runners, substantially as described and represented,

52,599.—Button-holes for Paper Collars.—B. F. Porter, Nashua, N. H: I claim the improved button-hole as made with the openings, a and c, and the lip or fly, b, arranged substantially as specified.

and c, and the np of ny, b, arisingen substantially as specified. 52,600.—Vehicle.—T. W Porter, Bangor, Me.: First, I claim the socket A, figure 3. made of malleable iron, with the projections, d d and b b, as an article of manufacture and sale for the uses and purposes set forth. Second, I claim as an article of manufacture and sile, the mal-leable-iron cibo or shaft coupling as shown in Fig. 10, with the lips, I I, and tube, d, cushton, n. plate, r, and, wrought-iron clasp, e', substan ially as shown and described. Third, I claim as an exticle of manufacture and sale the mal-leable-iron tup or coupling, k, Fig. 10, substantially as shown and described and for the purposes specified. Fourth, I claim as an article of manufacture the pole end, H, of malleable iron, with the straps, b b, and doubletree pivot, a, and purposes specified.

propose specified. It is the purpose specified and arranged as described and to the mallea-ble-iron precided.

the purposes specified. 52,601.—Machine for Raking and Loading Hay.—John S. Preston, Mechanicsville, Pa.: I claim the endless toothed apron, R, when used in connection with the endless elocated apron, R, when used in connection or with the withdrawn from the sevator at a certain point, in combination with the rake G, all being applied to a mounted frame and arranged to operate substantially as set forth.

This invention relates to a new and improved device for raking d loading hay directly upon a wagon from the field. The devic designed to be attached to the wagon and drawn along with i ong with it and it consists in a frame mounted on wheels, provided with an in clined endless toothed, apron, and inclined endless elevator and a rake.]

52,602.—Hoop skirt Frame.—A. Raffel, New York City: I claim the adjustable frame constructed with movable ribs, sub-stantially as described, in such a manner that it may be expanded or contracted without changing the form of the skirt at the upper

end. 52,603.—Method of Attaching and Lubricating Car Wheels.—William R. Reece, Tremont, Pa.: I claim the oil chamber, B, in the wheel, A. closed at its ends by plates, C C', which are connected by bolts, D, and arranged as shown, so as to secure the wheel on the axie, a communication be-ing formed between the chamber, B, and the interior of the wheel hub, b, and all arranged substantially as and for the purpose speci-field.

fied. I further claim the spring, F, applied to the opening, d. in the oil chamber, B, substantially as and for the purpose set forth. [This invention relates to a new and useful improvement in at-taching car wheels to their axles, with a view of keeping the same

in a properly lubricated state, and to prevent the admixture of dirt dust, etc., within the center of the wheel.]

52,604.—Dust Screen for Stove and Furnace Doors.— Jesse Reynolds, Philadelphia, Pa.: I claim the dust screen, G. constructed and adapted to a furnace, heater, or stove, substantially as and for the purpose herein set forth.

-Oven for Annealing Iron.—Samuel Reynolds, 52,605.

52,606.—Cultivator.—Harrison Rice, Springfield, Ohio 2,006.—Cultivator.—Harrison kice, Springrield, Ohio. First, I claim the combination of the three-sided double frame, a a a, and a' a', with the removable seat, g, and adjustable axic egrins; in the manner described, for the purpose specified. Second, The combination of the main frame with the vertical ame, p, windlas, e, chains, f, and joints, c c, arranged and operat-ig conjointly. In the manner substantially as described, for the urpose specified.

purpose specified. 52,607.—Paper Collar.—Celius E. Richards, North At-tleborough, Mass.: I claim my improved turn-down collar, as constructed, with its inner fold, c, of a less width than its outer fold, d, and with the back button hole formed in the outer fold, as specified.

button hole formed in the outer fold, as specified. 52,608.—Button.—Celius E. Richards, Attleborough, Mass: I claim, First, Fastening the collet or neck of the button into a concavity and a central perforation, combined substantially as de-scribed, for the purpose specified. Second, The mode described of fastening a button with a collet or neck, as described, by means of a shield having a number of spurs that pass through the button from the back side of the rabric, and are secured in front of the button in a manner to conceal their ends substantially as specified. Third, In combination therewith a soft washer, as described, be-ween the shield or its equivalents and the fabric, substantially as and for the purpose specified.

52,609.—Balanced Slide Valve.—Frank H. Richards, Lansingburgh, N. Y.: First, I claim the arrangement of the two slide valves, F and G,

in the same chest, opposite each other, and having the pressure of the steam upon their under sides, as herein described, so that their respective pressures shall be mutually compensatory. Second, the wedge nut, d, operated as herein described, for ad-justing the valves to their respective seats.

52,610.—Piano.—Chandler Robbins, Chicago, Ill.: First, I claim hanging the sounding box or board to the iron frame, substantially as specified, allowing of the most complete vibration, as is herein set forth. Second, The combination of the lever, G, the strap, e, and the hammer, I, as and for the purpose herein specified. Third, The strings, F, made flat, as and for the purpose set forth.

Third, The strings, F, made flat, as and for the purpose set forth. 52,611.—Fence.—Smith Sanders, Fort Plain, N. Y.: Furst, I claim the combined construction and arrangement of the fence, as herein set forth, the same consi-ting essentially of the standards made up of the parts, a b c, sections made up of the rails, f, and cleats or battens, g g, the wire loops, K K, and pins, i, and the tightening bolt, i, the whole operating substantially as and for the purpose specified. Second, I also claim the particular construct on of the skeleton standard composed of the flexible vertical. strips, b b, for camping and holding the sections, the brace boards, c, bracug part way up the strips and having the grain running with the hypothenuse of the angle, and the base pieces, as, the whole being arranged as set forth.

set forth. 52,612.—Process of Annealing Steel and Other Metals. —Elliot Savage, West Meriden, Conn.: I claim, First, The method of ann aling steel and other metals substantially as hereinbefore described, that is to say, by heating the same in a substance which shall form upon its surface a pro-tecting coating or film, soluble in water or metallic cooling solu-tiors, as set rorth. Second, The use or cyanide of potassium for the purpose of heat-ing steel or ther metals in the process of annealing. Third, The use or metallic solutions for the purpose of cooling steel or other metals in the process of annealing. Fourth, The employment, in the process of annealing, of cyanide of 1 coassium as the heating medium, in combination with a metal-lic solution as the cooling medium.

52,613.—Roof.—Michael Simmons, Howardville, Ill.: I claim the winged sections, AA, constructed and arranged to gether as and for the purpose herein specified.

52,614.—Eyelet.—Charles D. Smith, Washington, D. C. I claim an eyelet which is slit, nicked, or indented, substantially as and for the purpose specified.

as and for the purpose specified. 52,615.—Roll for Clothes Wringers.—Hamilton E. Smith, Cincinnati, Ohio.: I claim, First, A clothes-wringer roll composed of sections, C, of rubber, or its equivalent, with interspersed disks, D, of cloth or other fibrous favric, and rigd washers, B, positive rotation with the shaft, substantially as set forth. Second, A pair of rolls formed in sections, so arranged as to break joints, in the manner and for the purpose explained. 52,616 Dorelled Purlow? Unich Smith Bottle Grack

52,616.—Parallel Rulers.—Uriah Smith, Battle Creek,

2,010.—r atomic access Mich.: I claim the slots, e f, or their equivalents, in the parallel arms of he ruler, A B. the cross arms, C D. the points, 1 m, thumb screw, shank, j and scale, k, all combined and arranged substantially as nd for the purpose herein set forth. Calvanic Battery.—Henry

52,617.—Connection for Galvanic Battery.—Henry Splitdorf, New York City: Iclaim a clamp for connecting the elements of a galvanic bat-tery, said clamp pelang made ot a plece or wire bent so as to form loops at both ends, and provided wich screw threads and nuts which serve to tighten up said loops, substantially as and for the purpose set forth.

[This invention relates to an improvement in the clamp which serves to connect the elements of a galvanic battery, and it consists in a clamp made of one piece of wire bent to the desired form, and provided with screws and nuts at both ends, in such a manner that by they have many states are been entered to take a firm hold of the carbon, or zine or of any other elements or elements used, and a clamp is obtained which is cheaply made and readily connect and disconnected.]

52,618.—Lamp-wick Adjuster.—C. C. Stansell, Middle-boro, Mass.: I clam a new mode of rawing and adjusting the wirks of lamps. by the use of a metallic, concave, pen-shaped spring-pointed silaring clasp or any similar device, which may be introduced into the wick, or between the wick and inside of the tube for the purpose of com-pressing and stiffening the wick, thereby rendering it susceptible of easy adjustment.

or easy adjustment. 52,619.—Attaching Shafts to Vehicles.—J. L. Snes-serott, Chambersburg, Pa.: I claim, First, Constructing the shaft box, A, with a step, D. for supporting an india-rubber block, and the recess, a, for holding it in place when used in combination with a block, E, constructed substantialy as and for the purpose set forth. Second, The box, A, having a bar, b, step, D, and india-rubber block, E, arranged as set forth when used in combination with the hooked termination of the shafts, C, substantially as and for the purpose set forth.

52,620.-Shoe Lacing Cutter.-Francis C. Sumner,

Stoughton, Mass.: I claim the above new or improved shoe lacing cutter or machine, as composed of the two knives and the tablet or plate arranged to gether substantially as described. I also claim the combination and arrangement of the tablets, the two knives and the screw clamp, the whole being substantially as described.

52,621.—Pole and Thill Coupling.—H. L. Taylor, Fredo-nia, N. Y.:

52,621.—Pole and Thill Coupling.—H. L. Taylor, Fredonia, N. Y.: First, I claim the combination of the hook, E e, and draft bolt, g, with the follower block, K, india-rubber sprine, i, or its self-locking key, o, arranged and operating in the manner and for the purpose shown and desorbed. Second, I also claim constructing the block, K, with its lips, 11, and cheeks, m m, in combination with the hook, E e, and rubber, j, substantially in the manner and for the purposes described. Third, I also claim the employment of the lever, S, provided with the hook, t, and spur, u, in combination with the extension, q, and hole, r, for inserting and removing the key, o, substantially as described.

described. 52,622.—Beehive.—Lemuel and Minor Taylor, and Ed-win Cox, Jordan, Wis.: We claim, First, A sealing strip or frame, G, in connection with the band or claim, I, constructed and applied to the top of the hive to render the same air-tight, substantially as described. Second, The moth guard, C, constructed in the form described, costed with grease and applied to the bottom of the hive, substan-tially as set forth. Third, Constructing the broad chamber, V, and spare honey box, E, of slats and paper, in the manner substantially as described.

52,623.-Organ and Melodeon.-Simeon Taylor, Worces

ter, Mass.: I claim, First, The combination with hinged rods, m, of the slot-ted levers, E, as shown and described, whereby the levers and valves can be readily connected and detached, as set forth. Second, The combination with frame, D, arms, D' D', and levers, E, of the eleverating piece, H, ith its cam-like projections, 1 I, sub-stantially as set forth.

standard as set lotti. 52,624.-Skate.-J. R. Tempest, Philadelphia, Pa.: I claim the employment of the sliding bolts, C C, in combinewith the staples, D D D'D'. In the sole plate, A, of the skate,with the slotted plates, B B, fixed to the bottom of a boot or sithe said parts being arranged to operate together as and forpurpose described.the

52,625.—Turbine Water Wheel.—John Tyler, West Leb-anon, N. H.: I claim the cy inder, E. encompassing the wheel B, and provided with a rim or flange, a, at its lower end, to fit within the scroll, A, substantially as shown and described, varying simultaneously or by asingle manipulation the capacity of the wheel and scroll, as set forth.

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I also claim connecting the gate, D, with the cylinder, E, by neans of the flange, a, and thus permitting the gate and cylinder to be moved simultaneously and enabling the supply of water to the theel to be commensurate with the capacity of the wheel and the croll, substantially as described.

52.626.-Hand Loom.-Clemens Unverzagt. Richmond. 25,020.— Hand Loom.—Clemens Univerzagt, Richmond, Ind.: I claim, First, The cam block, e, with its collar, f, and the jaws. 4, ionstructed and operating as and for the purposes described. Second, The stepping bar, 12, in combination with the jaws, 4, and oldar, f

Second, the suppling bas, as, as the commendation of the suppling bas, as, as the supplication of the supervised set forth. Fourth, The combination of the compound wheel, 2, arms, 6 and 7, and ratchet wheel, 8, operating substantially as set forth and decomined

scribed. Fifth. The elastic band upon the head of the shaft, b, in combina-tion with the set screw, x, and compound wheel, and its connections for operating the take up of the cloth, for the purposes set torth and described. Sixth, The short levers, s s'. in combination with the picker taffs, q q', and the spring, t, arranged and operated as described.

52,627.—Machine for Cutting Bread, Soap and Black Lead.—William B. Vincent, Boston, Mass.: I claim the combination and arrangement of the cutting wheels, W W W: W: W: with the sliding trough, C C', made substantially as and for the purpose set torth. 52.628.-Faucet Measure.-Addison Vrooman, Kokomo,

Ind.

Ind.: I claim the arrangement of the double orifices near the top and octom of the faucet when the latter is used in combination with the measures, a and b, constructed and operating in the manner lescribed, whereby liquid may be drawn and discharged, measured at the same time, substantially as specified. I also claim the faucet and measures, a and b, in combination with the vent indicators, c d, constructed, arranged and operating sogether in the manner described for the purpose specified.

52,629.—Fence.—J. F. Warner, Oskaloosa, Iowa: I claim the construction and arrangement of the braces and cross-bars applied to the boards or panels of the fence, substantially as herein shown and described.

[This invention relates to a new and improved fence of that class which are constructed of boards or slats arranged horizontally and parallel with each other. The invention consists of supporting the boards of the fence by means of cross braces with notches in said braces, and connecting the panels by lapping the boards clasping the ends between the braces, thereby dispensing with the use of nails, the whole being self-supporting and fastened together by means of pins of wood or other material.]

52,630.—Machine for Rolling Metal.--Hervey Waters, Northbridge, Mass.: I claim the rolls with their spiral dies and fence or guide, when constructed and operated substantially as described. Also the carriage and grasping holder. when constructed and ope-rated in combination with rollers, substantially as described, whether the dies upon said rollers be spiral or otherwise.

52,631.—Screw and Bolt.—William Weaver, Nashua, N. H.:

N. H.: I claim perforating the heads of screws and scrow bolts of all kinds that are made with a screw thread and operated by a lever power applied to their heads, substantially as described, and for the pur poses set forth.

[The invention consists in perforating the heads of screws and bolts, and driving them by means of a driver inserted in said per forations; thus avoiding the difficult yso often caused by one-half of the screw head breaking off, or the slots becoming so worn that the driver will not take hold of it to drive the screw.]

driver will not take hold of it to drive the screw.] 52,632.—Well Borer.—Samuel H. Whittlesey, Appleton, Wis: I claim the burr or borer, D, constructed substantia ly as above described, with curved cutting adges, J, which spring from the point of the instrument. Second, I also claim in combination with the burr or borer, D, the hollow cylinder, A, having spiral grooves which are continua-tions of the grooves between the cutters. I of the burr or borer, and which terminate at openings, G, at the top of the cylinder, and baving also spiral reaming edges, J K L, substantially as above de-scribed.

scribed. 52,633.--Plow.-Joseph Widman and French Mullica, El Paso, Ill.: We claim the attaching of the plow beam, E, to the axle, A through the medium of the bounds, G C', in combication with the draught pole, F, and oar, K, attacned to the plow beam and all ar ranged to operate in the manner substantially as and for the pur pose set forth. We further claim the arrangement of the cord or chain, I, pulleys, G H, and lever, J, arranged and applied to the plow beam, E, craught pole, F, and bar, K, substantially as and for the purpose specified.

Specing.
Specing.
52,634.—Self-adjusting Pulley for Fishing Boats.—William Woodbury, Chelsea, Mass.:
I claim the combination of a block or pulley with a circular bracketunder such an arrangement as to allow of the pulley revolving upon its axis, while the latter is free to move within the plane of the bracket, substantially as set forth.
Second, The employment of a block when made with an opening at the top, and provided with aguard in combination withla bracket, as and for the purposes herein set forth.
Second Planter Laws of the harder (admining the purposes)

as and ior the purposes herem is to forth.
 52,635.—Seed Planter,—James H. Alexander (administrator of the estate of Thomas K. Alexander), Decatur, Ill.:
 First, I claim the combination of the oscillating plate, A, having four seed cells in it, with the reciprocating, plate, B, having two delivery holes, substantially as described.
 Second, In combination with an upper oscillating and an under reciprocating plate, the grooves and cam projections on one and the button and stop on the other, so that four oscillations of the opper plate alall produce but two reciprocations of the hopper, and twice under the cut-off for each and every of its dropping operations, substantially as a dor the purpose described.
 Second, In combination with a four cell oscillating plate, a double spring cut-off, so that each cell shall past wice into the hopper, and twice under the substantially as and for the purpose described.
 Fourth, In combination with the spring cut-off and turned lip thereon, the sloping out of the tops of the cells as at E, so that the scease of protruding grains may be swept or brushed back without breaking or injuring them, substantially as set forth.

52,636.—Block Disengaging Hook.—Samuel Brown (assignor to himself and Leon Level), San Fran-cisco, Cal.; I claim the piece, J, with jaws, I I, and the segments, E E, operating by the slide, F, with recessed arm, G, and lever, L M, or their equivalents, substantially as and for the purposes herein specified as set forth.

specined as settorta. 52,637.—Hoop Skirt.—John P. Buzzell (assignor to himself and Henry Hemmenway), Clinton, Mass.: I claim a hoop skirt provided with an opening, a, in its back part, produced by cutting out portions of the hoops, B<sup>9</sup>, whether said (pening is left empty or file d with netting er other flexible material, substantially as and for the purpose herein described.

This invention consists in a hoop skirt provided with an opening n its back part, at about the middle of its hight, said opening being produced by cutting out portions of the four, more or less middle hoops in such a manner that the skirt will readily bend in.

and the wearer thereof, in sitting down, has no trouble to adjust the skirt, as the same will adjust itself without difficulty. The

opening thus produced may be filled by netting or other flexible

52,638.—Saw Set.—Bennington G. Chase (assignor to himself and Robert T. Lucas), Alexandria, Va: claim the construction of the devices, A B C E H and J, when

material.]

arranged and combined as herein described and for the purposes set

52,639.—Clasp for Skirt Hoops.—George W. Chees-man (assignor to himself and J. W. Osborne), Ansonia, Conn.: I claim clasps for skirt hoops. notching their ends, substan-tially as and for the purpose above set forth.

52,640.—Rendering Apparatus.—Charles J. Everett (assignor to \*Lockwood and Everett), New York (assig

City: I claim consuming the noxious gases, steam or vapors as they issue from the apparatus while in operation, or after the fire has been withdrawn, therefrom by the use of a separate consuming furnace connected to, or in communication therewith. Second, The use of a superheater in combination with said con-suming furnace and in connection with the apparatus for the pur-pose specified. Third, Passing the superheated steam, gas or vapor through a coil of pipe placed in the digester for the purpose of raising the tem-perature in the digester, and to dry or crisp the scrap as set forth.

perature in the digester, and io dry or crisp the scrap as set forth. Fourth, Carrying the heat directly from the furnace through a coil of pipe placed in the digester, and so arranged as to discharge in the chimney, muking said coil a flue from the furnace to the chimney, for the purpose of raising the remperature of the digester, and to crisp or dry the scrap as set forth. Fifth, Avoiding the condensation of the noxlous vapors and gases against the uncovered part of the digester, by carrying the steam and water jacket all the way around it so as to entirely envelope the digester as set forth. Sixth, The use of a dedodrizer filled with chloride of lime or its chemical equivalent for this purpos', in combination with a digester tor rendering and refining lard, tailow and other fatv or oleaginous matter for the purpose of dedorizing and disinfecting the noxious gases as they issue therefrom.

53,641.—Stamping Head.—P. W. Yates (assignor to himself aud R. D. Frazer), Chicago, Illinois: I claim the compound hard and soft metal shoe, A B C, constructed and produced substantially in the manner described. Second. Constructing the stem, A, with a flange, B, which has intersecting dove-tail grooves in is lower face, so that the metal which forms the part, C, of the shoe shall be united to it by the acting said part. C, substantially, as described. Third, The intersecting dove-tail grooves formed in the underside of the soft metal stem, A, of a compound hard and soft metal shoe, substantially as described.

52,642.—Well-boring Apparatus.—S. J. Goncher (as-signor to Wm. Foreman), Philadelphia, Pa.: I claim the shait, c, with its permanent pulley, I, and loose pulleys, ', and J. combined with the driving shait, H, adjustable shait, c its pulleys, J, the drum, C, and walking beam, F, all substantially as and for the purpose described.

52,643.-Darning Spool.-Joseph H. Greenleaf (as-signor to John M. Marlin, and Geo. H. Snow), New Haven, Conn.: I claim the darning spool above described as a new article of manufacture. laim the

(The object of this invention is to produce an article which will serve to hold, as on a spool, several varieties of daming vara and se ends shall serve to distend the parts of a stocking to be mended or darned

52,614.—Piston Packing.—Thomas J. Jones, Summit, New Jersey, assignor to C. J. Eames, New York City

Oily. I claim as an improvement in springs, for piston packing, the ouble, M, shaped spring closed in front, and open at the back in he manner herein specified and represented.

the manner herein specified and represented.
52,645.—Lacing Device.—E. C. C. Kellogg, Hartford, Conn., assignor to himself S. F. Bennett, and D. H. Burrill, Little Falls, N. Y.:
I chaim the punch, k, knife blade, h, needle, m, and awl, n, arranged with reference to each other upon the pivoted levers, A B, substantially as set forth for the purpose specified.

I claim the punch, I ranged with reference substantially as set for e specified

52,646.—Sewing Machine Henmer.—George C. Over-hiser, Ionia, Mich., assignor to himself and Jacob C. Robie, Binghamton, N. Y. Antedated Feb. 5, 1960 1860:

1860: claim the combination of the hemmer, N, sliding gage, K mp, L, pressure spring, H, smoothing spring, I, hinge i, d, bas frame, A, arranged and operating in the manner and for pose set forth herein. and fra

purpose set forth herein.
52,647.—Method of Treating Sheet Iron Plates.— Charles H. Perkins (assignor to the Perkins Sheet Iron Co.), Providence, R. I.:
I claim giving to common sheet iron, the luster finish and color of Russia sheet iron, by the process, substantially as described.
52,648.—Hot Air Furnace.—Jacob H. Schwein, Cin-cinnati, Ohio, assignor to himself and Christian Rummel: cinnati, ( Rummel:

kummel: claim the fire pot, A B C, slab, D, smoke passages, E F G, and iducts or ventilating passages, K L M, the whole being arranged d operating substantially as described.

52,649.—Hinge,—Samuel Selden (assignor to John C. Selden,) Fairview Township, Pa.: I claim the movable pintle constructed with the fixed washer or enlarged center, q, in combination with the two leaves of a hinge constructed substantially as described.

52,650.—Preservatory.—Addison Smith, Perrysburg, Ohio, assignor to himself David M. Mifford, and

52,650.—Preservatory.—Addison Smith, Perrysburg, Ohio, assignor to himself David M. Mifford, and Giles Boalt, Norwalk, Ohio:
I claim, First, A receptacle compartment or box for fruit or other edibles having two oridees or series of orides communicating respectively with opposite ands of a deoxygenating chamber, the following elements, to wit, the closed preserving chamber, A, whether subdivide or other editor with one another, the following elements, to wit, the closed preserving chamber, A, the communication with one another, the following elements, to wit, the closed preserving chamber, A, the combustion circuit, D, and the mechanical circulation, G."
Fourth, In the described communication with one another, the following elements to wit, the closed preserving chamber, A, the combustion circuit, D, and the mechanical circulation, G."
Fourth, In the described communication with one another, the following elements to wit, the closed preserving chamber, A, and the deoxygenating chamber, G."
Fourth, In the described communication with one another, the following elements to wit, the closed preserving chamber, A, and the described deoxygenating chamber, A, communicating the desiced preserving chamber, A, and the described deoxygenating combined and operating substantially as and for the purpose set forth.
Seventh, A close preserving chamber having the meandering rentilating ducts, Li 11", in which a circulation with the combustion is maintained by alternative connection with the combustion is described.
Bighth, A closed preserving chamber in which a circulation, deoxygenation and described.
Seventh, A close preserving chamber in which a circulation, deoxygenation and cestored.
Seventh, A close preserving chamber in which a circulation, deoxygenation and cestored connection with the combustion set forth and described.
Seventh, A close preserving chamber in which a circulation, deoxygenating chamber, G', and a coording apparatas,

52,651.—Gang Plow.—John E. Travis (assignor to him-self and Elon Francisco), Grenville, III.; I claim, First, The sliding bar, C, when used in connection with the axle, B, and bolster, D, and regulating bolts, a a', as and for the purpose set forth. Second, I claim the hinged braces, H H, the levers, H" H", and posts, p' F', for the purpose of attaching the plow frame of gang plows to the bolster thereot, when such parts jare constructed and employed as described and set forth.

52,652.—Buckle.—Julius Waterman, New York City, assignor to himself and Joseph Mayer, Brooklyn, N. Y.: Iclaim the buckle forshirt bands, etc., formed of two rectangular loops, one over the other, as specified.

52,653.—Machine for 'Determining the Load of Car Axles.—J. H. Ehrhardt, Dresden, Saxony: I claim, First, The supporter, A B, with lip, a, and leg, d, in com bination with the scale beam, C, and steelyard. D, or its equivalent constructed and operating substinitially as and for the purpose de-scribed.

bination with the scale beam, C, and steelyard. D, or its equivalent constructed and operating substinially as and for the purpose de-scribed. Second, The adjustable wedge, i, in combination with the slides, f, bearings, g, scale beam, C, and supporter, A B, constructed and op-erating substantially as and for the purpose set forth. Third, The index, m, in combination with the steelyard, D, sup-porter, A B, and scale beam, C, constructed and operating substan-tially as and for the purpose described. [This invention relates to an apparatus which is intended to bal-erace the weight of a locomative tender or railroad (car, so as to

ance the weight of a locomotive, tender or railroad car, so as to bring an equal pressure to bear on each of the wheels.]

bring an equal pressure to bear on each of the wheels.] 52,654.—Breech-loading Fire-arm.—Alexander Henry, Edinburgh, Scotland: I claim, First, The construction of the curved face of the extract-or with a dovetail and pin for fixing it to the extractor bar, sub-stantially as hereinbefore described and shown. Second, The employment of a lever for actuating the morable bolt for locking the barrel in combination with the hammer under the arrangement hereinbefore shown and described, so as to prevent the barrel from being unbolted until the hammer shall have been moved to half-cock and to secure the complete locking of the barrel before the piece can be discharged, substantially, as set forth. 50 655 52.655

52,655.—Process for Tanning Hides and Skins.—Bar-thelemy Picard, Paris, France : I claim the process of tanning hides and skins by the employment of essence of turpentine with sumac, catechu, or other vegetable or mineral coloring essence, in combination with the movement of the hides or skins in a fulling tun or under a fulling hammer, sub-stantially as and for the purposes herein set forth.

52,656.

52,656.—Manufacture of Iron.—Anton K. Kerpely, Or-avitza, Hungary, assignor to A. L. Fleury, New York City: I claim freeing pig iron from subbur, phosphorus, arsenic, copper and zinc, by blowing chlorine saits with a blast of air into the neiting chamber of a blast iurnace, into a cupola furnace or into a Bessemersmelting pot, substantially as herein specified.

52,451.—(Heretofore Suspended.)—Steam Engine.— Edvart Lavoradl, New York City : First, I claim the frame, A, constructed with a hollow column, f, for supporting the cylinder and attached to the boiler and the hull of the vessel, substantially as herein specified. Second, I claim the combination and arrangement of the sup-porting column, the single cylinder trunnion, the valve disks, g and p, spring, r, and nut, s, substantially as and for the purpose herein set forth.

#### REISSUES.

KEISSUES. 2,168.—Machine for Cutting Splints.—Jonathan C. Brown, Brooklyn, N. Y. Patented June 21, 1864. I claim cutting forms from wood in the manner described, when the knives on the revolving cylinder are set at different angles as and for the purpose set forth. I also claim combinin: the knives, rotating and stationary, in one frame, as herein set torth, so as to cause the two cuts that are at right angles to exactly meet, so as to cut the form off perfectly, and at the same time avoid scoring the wood deeper than the part re-moved, all as above specified.

moveu, an as above specified.
2,169.—Making Hollow Articles of India-rubber.— Charles Goodyear, Jr., New York City, executor of estate of Charles Goodyear, deceased. Patented April 25, 1848. Extended 7 years: What is claimed as a new article of manufacture and trade are hollow, vulcanized india-rubber articles, the external shape of which is produced by internal pressure derived from an clastic fluid.

2,170

fuid. 2,170.—Making Hollow Articles of India-rubber.— Charles Goodyear, Jr., New York City, executor of estate of Charles Goodyear, deceased. Patented April 25, 1848. Extended 7 years: I claim the above-described process of making hollow spheres, va-rious hollow toys or other hollow articles of caoutchouc, the same consisting in the employment of a mold, and heat and air or its equivalent, substantially in the manner and under the circum-stances above set forth.

2,171.-Machine for Making Kettles.-Hiram W. Hay-

2,171.—Machine for Making Kettles.—Hiram W. Hay-den, Waterbury, Conn. Patented Dec. 16,1851. Extended 7 years: First I claim the combination of mechanism constructed and ar-ranged substantially the manner set forth. Second, The construction of the mandrel, f3, part of which is cyl-indrical and part fitted with a short screw, 13, to take the screw of the hand wheel, f2, so that great pressure may be made at the point desired, while at the same time the mandrel can be easily and quickly moved through a long distance for the purposes and as described and shown.

reschoed and shown. 72.—Horse Shoe.—J. Wilson Hodges and P. De Murquionds, Baltimore, Md., assignces of J. Wilson Hodges. Patented July 4, 1865: claim the attachable and removable roughing bar, C, provided h calks and countersunk or let into the face of the shoe, sub-vielux as described.

stantially as described. Ev, adapted to occupy the groove, B, in the absence of the roughing bar, and secured in a similar manner within the groove.

within the groove.
2,173.—Wood-bending Machine.—John Philip Lelzelter, Lancaster, Pa. Patented Feb. 21, 1865:
First, I claim the winged or framed side levers, E, held by a pivot or hinge affixed by a bolt or plate on each side of the drum, sub-stantially in the maneer shown and specified.
Second, I also claim the binding straps, M, when they are firmly united to a slotted hook, affixed to each end of the same, in the manner and for the purpose specified.
2,174.—Roller for Wringers.—Joseph F. Pond, Cleve-land, Ohio. Patented April 5, 1864:
I claim the application of canvas, cloth, or other similar material, for the purpose of covering, repairing, and protecting elastic india-rubber or compound rollers. and to preven the shait getting loose or turning in the roll, as and for the purpose specified.
2175.—I antern. Wm Westleke Chicacon III Pate.

2,175.—Lantern.—Wm. Westlake, Chicago, Ill. Pat-ented Sept. 26, 1865: First, I claim the band, d, in combination with the band, b, for the purpose set forth. Second. The band, 1, in combination with the band or upright portion of the bottom, e, for keeping the bottom of the globe in place, as herein described.

Third, The means described, or its equivalent, for securing the ends of the upright bars to the horizontal bars of the guard.

#### DESIGNS.

2,263.—Door Lock.—John H. Barnes, Brooklyn, N. Y. 2,264.—Plano Stool.—Charles Zeuner (assignor to M. Greenwood & Co.), Cincinnati, Ohio.

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night, and is divided into two periods of 12 hours each. The first hour of the day is from midnight to 1 o'clock in the morning. In astronomy the day begins at noon, and the hours are numbered from 1 to 24.

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#### Improved Corn Harvester,

This engraving represents a machine for harvesting corn in the stalk, or for cutting it as it grows, so that it can be gathered and stacked with but little labor. It is intended to cut two rows at once, and the driver has merely to sit still and guide the team or the horse while the machine does the work.

In detail, the machine consists of two knives, A, between the guide bars, B. These guides are, practically, two forks, which go between or on each side of the hills, so as to bring the stalks within them.

There are, further, two reels, C, one at each side, which receive rotary motion from gearing, D, in the center. The object of these is to bring the stalks up as they are turned over by the advance of the team, so that, as they strike the knives and slide laterally along the edges, they will be cut off. On each side are two guides, B, having two bows that catch the stalks and bring them gradually to the rear, where there are two carriers, E. These revolve at the will of the driver, and consist of arms on which the stalks fall until a quantity have gathered there. This load is then discharged by the machine itself-the mechanism for the purpose being merely a wheel, F, in front of the driver, armed, with pins projecting at certain intervals, which are operated by others in the gear, G, and cause the arms of the carrier to revolve a quar-

The main wheels carrying the machine are fitted with ratchet teeth and a pawl, so that they only operate when going forward. This arrangement aids the machine in turning a sharp corner, for one of the wheels is stationary while the other revolves. It is claimed that a man and one horse can cut twelve acres of corn a day in a perfect manner with this machine.

Patented through the Scientific American Patent

gears can be quickly adjusted so as to always

run true. The details are as follows: The frame,

A, the gears are fitted to, has two lugs on the

upper part; through one of these lugs a bolt passes

Agency on Feb. 6, 1866, by Theodore Butterworth. Parties desiring Stats rights or manufacturere having facilities may address the inventor tor further information at Shelbyville, Mo.

## Gearing for Thrash ing Machines.

The engraving published herewith, shows an improved method of adjusting gearing on thrashing machines, 80 that it is always kept in line, and thereby runs easier and longer without adjustment or repair. This refers particularly to the cylinder shaft, and the bevel wheel shaft. The former wears downward, while the latter wears upward. This causes the gears to jam or run out of mesh, making the parts run stiffly and entailing loss of power.

slot. so that the whole frame can be moved to accommodate the wear. In the lower part of the frame, as at B, there is a curved bar, C, which has a bolt and nut. By turning this nut, when the other parts above are slacked off, the frame can be adjusted as stated.

If the bevel wheel is out of mesh with the pinion aforesaid, or does not mesh deep enough, the difficulty can be remedied by a set screw, D, at the end, which allows the shaft it is on to be moved in or out as circumstances may require. The engraving shows only

course, upon the cheapness with which the manufactured article is produced, and thus the Bessemer process has proved much more successful than the great Sheffield armor-plate maker had expected; for not long since the Metropolitan Railway Company were obtaining Bessemer rails at £17 per tun, and we have lately heard of quotations as low as £12. As for prime cost, it is difficult to see why Bessemer rails should cost more than, if as much as, those rolled of iron.

The pig iron required for the pneumatic process is of a costlier quality, but

## BUTTERWORTH'S CORN HARVESTER.

ter round and drop the load, as before described. | the gearing of the cylinder shaft, the rest of the madred or more rounds before requiring to be relined. chine being omitted as not essential.

The invention was patented on Jan. 16, 1866, through the Scientific American Patent Agency, by L. B. Hubbell, of Alton, Ill.; address Hanson & Co.,

# HUBBELL'S GEARING FOR THRASHING MACHINES.

The trouble is obviated by this arrangement and the | paper, read before the Mechanical Engineers at Sheffield, in 1861, Mr. John Brown, of the Atlas Works, expressed the opinion that the cost of Bessemer rails was not likely to become diminished to much below what he then sold them at, namely, £22 per tun. The into the frame; in the other there is a curved value of a manufacturing process depends greatly, of

THE address of Mr. Snell, the inventor of the

-Engineering.

# INVENTORS, MANUFACTURERS,

The SCIENTIFIC AMERICAN is the largest and most widely ulated journal of its class in this country. Each number of tains sixteen pages, with numerous illustrations. The numbers for a year make two volumes of 416 pages each. It also contains a full account of all the principal inventions and discoveries of the day. Also, valuable illustrated articles upon Tools and Machinery used in Workshops, Manufactories, Steam and Mechanical Engin ering. Woolen, Cotton, Chemical, Petroleum, and all other manufacturing and producing interests. Also, Fire-arms, War Implements, Ordand proteining in track many fachinery. Electric, Chemical, and Mathematical Apparatus, Wood and Lumber Machinery, Hydraul-ics, Oil and Water Pumps, Water Wheels, Etc.; Household, Horticultural, and Farm Implements—this latter department being very full and of great value to Farmers and Gardeners. Articles embracing every department of Popular Science, which every body can understand and which every body likes to read.

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THE STEAM PRESS OF JOHN A. GRAY AND GREEN



in puddling and reheating; the proportion of waste at the Bessemer works of the London and North-Western Railway Company, at Crewe, not exceeding, we believe, 15 per cent, while much of the so-called waste is really workable metal. In South Staffordshire a consumption of 1 tun 5 cwts. of pig iron to 1 tun of finished bars is reckoned good work, and with other kinds of iron, in Wales, from 28 cwts. to 31 cwts. of pigs go to the tun of railway bars. The Bessemer plant is costly also, but its power of production is enormous. It takes but 12 minutes or so to blow a charge of almost any weight—say 5 tuns to to  $7\frac{1}{2}$  tuns—and the converters, although the ganister requires a little mending as the work goes on, bear one hun-

there is less waste than