

Scientific American

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

VOL. VI.—NO. 26.

NEW YORK, JUNE 28, 1862.

NEW SERIES.

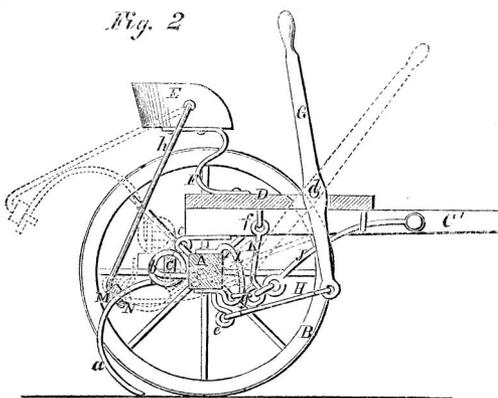
Improved Horse Rake.

The horse rake here illustrated is kept in position while in operation by the combined action of the driver's weight and the power of the horse when exerted to draw the machine. The construction will be understood from an examination of the drawings, of which Fig. 1 is a perspective view, and Fig. 2 is a vertical section. Similar letters refer to the same parts in both figures.

The axle, A, forms the rake head in which the wire teeth, *a*, are inserted; the teeth having a coil to increase their elasticity as usual, and the wheels, B, running loosely upon the ends of the axle. The driver's seat, E, is supported by an elastic rod, F, which is secured to the platform, D; this platform being bolted firmly upon the thills, C. The thills are attached at their back ends to the upper-back corner of the axle by hinges, *c*, and it will be seen that this position of the hinges causes the weight of the driver to prevent the axle from turning and releasing the teeth from their hold upon the load of hay which they may have gathered.

The turning of the axle is also prevented by the mode of attaching the horse to the machine. The whiffle tree, I, is connected with the axle by the rod, through the medium of the link, *g*, and long clevis, L; this clevis being secured firmly to the front side of the axle at its middle. As while the hay is being gathered the link, *g*, is at the lower end of the clevis, L, and below the level of the axle, the strain of the horse upon the rod, J, tends to prevent the axle from turning.

When the load of hay is gathered by the teeth and the driver wishes to deposit it in a windrow, he gives a turn to the axle by means of the lever, G. This



lever is pivoted to the platform, D, at *d*, and is connected at its lower end by the long link, B, with the pendant, *e*, which is firmly inserted into the axle at its lower side and near its middle. This turning of

the axle carries the parts into the positions represented in the dotted lines in Fig. 2; raising the teeth and depositing their burden of hay.

To prevent any portion of the hay from being carried up by the teeth as they rise, a bar, M, is supported by rods, *h*, from the driver's seat, and this bar carries an iron loop through which all but the two outermost teeth pass. As this bar and loop retain their position, while the teeth rise up between them, they scrape the hay from the teeth and hold it down upon the ground.

As soon as the windrow is past, the driver draws

will be paid out. Further negotiations are in progress, the result of which will, undoubtedly, lead to facilities for raising the additional capital necessary to complete this enterprise, the want of which has of late been so seriously experienced by both England and America.

A NEW IRON-CLAD TURRET SHIP.

The keel of a large new turret ship, on the *Monitor* principle, was laid on the 17th inst. in Jersey City. Its extreme length of armor will be 200 feet, extreme

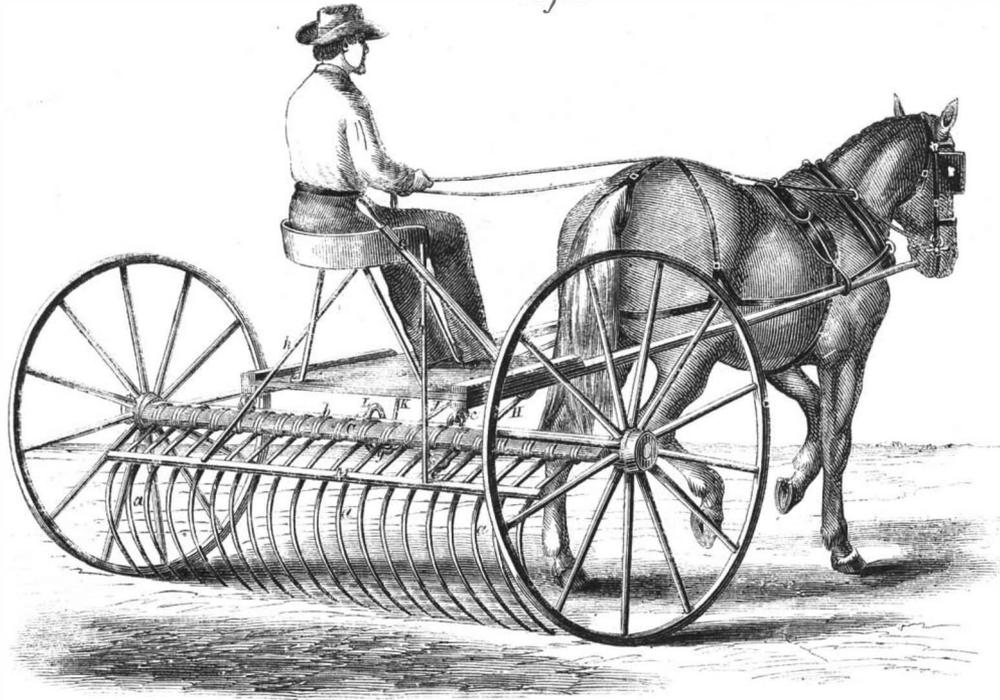
length on water line 190 feet, extreme breadth over armor 46 feet, breadth of molded beam 37 feet. The bulwark armor timbers are to be oak no less than 17 inches in thickness. The plating of the bulwark will be 5 inches in thickness, in layers of 1-inch plates planed at the edges and breaking joints. This armor will extend 3½ feet below the water line, and project 3 feet 8 inches beyond the hull proper. The deck beams are to be of oak 12 inches thick covered with pine planking 7 inches thick, and over these two courses of ½-inch plates will be fastened.

She will be provided with one revolving turret of 21 feet internal diameter and 9 feet high, and covered with eleven courses of 1-inch plates. The turret will rest on a flat ring of gun metal, and revolve on a central shaft 1 foot in diameter. This turret is

to be armed with two 15-inch Dahlgren guns—such as those which have been described in our columns as now being manufactured at the Fort Pitt Works, Pittsburgh, Pa. The pilot house is to be round like the gun turret, and in this respect is an improvement over the square pilot house first built for the *Monitor*. The smoke pipe is to be shot-proof—another good improvement; it will be 8 feet in height, 6 inches in thickness, telescopic in shape, and covered on the top with a grating to keep out shells. This vessel is to be propelled by a pair of horizontal engines, each having a cylinder 40 inches in diameter, with a stroke of 22 inches. Ventilating blowers will be used, and the cold air is to be drawn through the top of the turret. The propeller will be 12 feet in diameter with a pitch of 16 feet, and two of Martin's tubular boilers will be provided. She will be of prodigious strength and capable of resisting the most powerful guns yet made.

This large turret war ship is to be made entirely of American materials—no foreign iron must be used. Her cost is to be \$400,000, and she is to be completed in five months, to do which between 400 and 500 men are to be employed upon her in day and night squads. The contractors are Secor & Co., but the work is to be done by J. Colwell, of the Fulton Foundry, and the entire supervision of it will be under Mr. George Birbeck, Jr.

Fig. 1



MELLINGER'S HORSE RAKE.

back the lever to the position shown in full lines in Fig. 2; thus turning the axle and bringing the teeth again to the ground, ready to resume their operation of collecting the hay as the machine proceeds across the field.

This machine is easily operated, and it has no gears to become obstructed by catching the hay.

The patent for this invention was granted, through the Scientific American Patent Agency, May 13, 1862, and further information in relation to it may be obtained by addressing Mellinger Brothers, Mount Pleasant, Penn.

The Atlantic Cable Again.

The British Admiralty have granted to the Atlantic Telegraph Company the services of the ships and crews necessary for revising and extending the former surveys of the route along which the cable is intended to be submerged. The route westward from the Irish coast, for a distance of some five hundred miles, will be sounded at distances of about a mile apart, the previous soundings having been some thirty miles asunder. A good map of the bottom may, in this manner, be obtained, and thus facilitate the operation of laying the cable. Careful examination will also be made of the Newfoundland coast, and the English government have consented to send, free of cost, the ships necessary to attend as pilots, and assistants generally to the ships from which the cable

THE LONDON EXHIBITION.

On another page will be found a letter from our special correspondent, Mr. J. E. Holmes, about the London Exhibition. The following courteous and candid extracts are from the *London Mechanics' Magazine*. They corroborate the modest but conscientious views of our special correspondent on the utilitarian character of the articles in

THE AMERICAN DEPARTMENT.

The display of American products at the great Exhibition would, no doubt, have been greater but for the present unhappy conflict in that country. As it is, the American court is well worth a visit, and deserves a careful study. Scientific men will recognize in the varied and useful inventions which are there exhibited simplicity of construction and beauty of workmanship, and the unscientific will see much to admire in the appliances by which labor is made easy and toil pleasant. American "notions" are intensely utilitarian. Increased production at the smallest expense of labor is their maxim. Many of the machines here exhibited are adapted to field and farm labor, and it is no disparagement of our eminent agricultural engineers to say, that in regard to these implements the Americans have been able to hold their own, and maintain their position against all competitors.

On entering the court, which is at the southeast corner of the building, Wood's mowing and reaping machines occupy a prominent position. These are exhibited by Mr. Cranston, of King William street, and have attained a large sale in England as well as in America. During the last eight years 30,000 of them have been manufactured, 2,500 of which have been sold in England. It is at present set up as a reaper, but can be easily changed to a mower by removing the reel and platform. A self-acting rake can be adjusted to the reaper, which will deliver the cut grain in bundles at the side.

Here is also the mowing machine which gained the first prize at the Royal Agricultural Society's show at Leeds, last year. Apart from the ingenious construction of this machine, it really merits inspection for the beautiful style and finish of its workmanship. Notwithstanding the sneers of some finical and fastidious critics about this Exhibition being a huge puff and a vast advertising mart, we rather take it to be a school where all may learn much from each other. Our artisans and mechanics will get many a useful hint by comparing the workmanship of the various articles exhibited, and may emulate the excellence displayed by others without anything derogatory to themselves. These and other kindred machines are producing a wondrous change on the slow, rude forms of agricultural labor. The application of science to farming is making the land more productive.

Let the visitor walk straight across from these machines and inspect some hay and manure forks manufactured by Batcheller and Sons, and exhibited by Messrs. Smith, of Doncaster. These forks look more like elegant toys than implements for laborious work. They are made of the best American cast-steel, with two, three and four oval prongs, and are remarkable for lightness, strength and elasticity. They are about half the weight of an ordinary English fork, maintain their perfect shape till worn out, and enable the laborer to do his work with ease and rapidity. They are the most perfect agricultural instruments we ever saw.

In a case adjoining these are exhibited coopers' axes, chopping axes, and adzes, from the Douglas Axe Company, Massachusetts. These tools are of beautiful shape and finish; the steel is of the finest temper, and as specimens of American cutlery will, we think, be unsurpassed by anything of the kind in the Exhibition.

Drake's boring and spacing machine is exhibited by Mr. Wemple, of Albany, N. Y., and is a novel and very useful invention for boring blind stiles, or any other wood-work where a series of holes are required at equal distances apart, doing the work with great accuracy, and saving the labor of spacing and laying it out. The machine, though having the appearance of being complicated, is really very simple and effective, doing its work, which otherwise would be tedious, with great rapidity and precision.

On passing Ward's ocean marine telegraph we found him in the midst of a circle of inquiring visitors who were taking a lively interest in his invention.

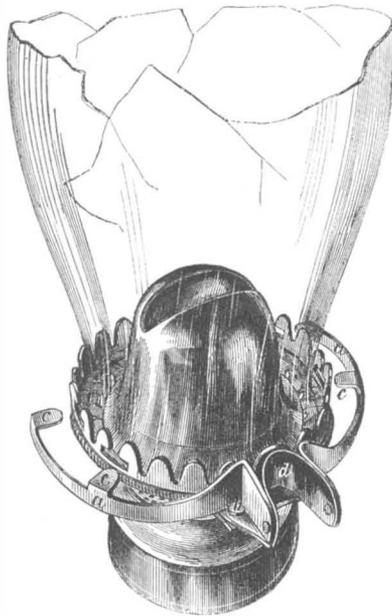
Mr. Beardsley, of Otsego county, N. Y., exhibits two machines of a very American-like appearance, which have attracted considerable attention in that country. The hay elevator is intended for unloading hay into the barn or on to the stack. The two arms move on a pivot, and are made to clutch the hay by tightening the chain. A trip hook is put into the ring of the chain, or to unload by horse power, a sheaved block is attached to the ridge and another on to the floor where the horses are hitched, and as they walk off on to the ground, up goes the fork with one-third of a wagon-load at once.

The earth elevator, by the same inventor, is on a similar principle. It is meant chiefly for drain cutting and ditching, and has the same object in view, rapid working and the saving of hard labor. For making embankments or draining on a large scale we think the machine merits attention.

We shall return again to this court, and would recommend those to visit it who are looking for the useful more than for the showy. There are some things here which will yet make themselves known in the old world as well as the new.

JACOBS'S MODE OF SECURING CHIMNEYS TO LAMPS.

The immense production of coal and rock oils has



so reduced the price as to lead to their extensive use in place of other substances for generating light, and as they are burned entirely in lamps, an enormous demand for these has sprung up; leading manufacturers and others to put forth great efforts to improve the article. Already many patents have been taken, and some of the inventions have proved exceedingly profitable. The most profitable of any that has come to our knowledge is a plan for holding the chimney in place by a spring, which not only facilitated the taking off and putting on of the chimney, but by the yielding of the spring prevented the chimney from being broken as it expands by the heat. One of the officers of a lamp manufacturing company told us that their company were paying the inventor \$300 per month for the right to use this little improvement. The plan which we here illustrate holds the chimney by a spring, but by peculiar, novel and convenient arrangements, which enable the chimney to be removed or replaced with great facility. It will be readily understood by a glance at the engravings almost without a description.

Two fingers, *a a*, are secured to the lamp top by pivots, *b*, which enter ears formed for the purpose upon the lamp top. The fingers, *a a*, have projections, *c c*, formed upon their inner edges, to pass through slots in the lamp top and catch over the rim upon the lower edge of the chimney. The short arms of the fingers, *a a*, which extend outward from the pivots are flattened so as to be readily grasped by the thumb and finger, and they are pressed apart by a curved spring, *d*, which forces the fingers inward, carrying the projections, *c c*, through their slots and securing the chimney in its place. When it is desired to remove the chimney, the outer arms of the fingers,

a a, are grasped by the thumb and finger of the operator and with the other hand the chimney is taken off. The chimney can thus be kept in a vertical position, preventing it from being soiled by the smoke or broken by the heat of the flame.

The patent for this invention was granted May 13, 1862, and further information in relation to it may be obtained by addressing the inventor, Thomas T. Jacobs, at Mount Carroll, Ill.

ADAMAS—SOAPSTONE.

We have had several inquiries recently in relation to the supposed new material which has received the name of Adamas, and respecting which we published some information, taken from the *London Artizan*, on page 340 of our present volume. This substance is simply soapstone under a new name. The *Artizan* states that it has lately come into very general use for gas burners. On page 124, Vol. XIII, SCIENTIFIC AMERICAN (old series), we gave a full description of the mode of making such gas burners. The *Artizan*, however, does describe a new application of it, namely, for journal boxes of machinery as a substitute for Babbitt metal. As very many of our present readers have not access to the former volume containing the description of the mode of treating soapstone and making it into gas burners and taps, we republish it because the information is very useful.

The soapstone is first cut into small slabs of such a size as will accord with the articles that are to be made of it. These small slabs are now put into iron boxes hermetically sealed, and placed in a low fire where they are heated very gently at first and then gradually raised to a red heat. They are now cooled very slowly by withdrawing the iron boxes from the fire and covering them with dry warm sand or ashes from the fire. (An annealing oven will answer the same purpose.) When perfectly cool these annealed soapstone slabs can easily be turned into the desired form in a lathe, after which they are boiled in oil until they acquire a deep brown color. When taken out of the oil and dried they take a beautiful polish by simply rubbing them with a woolen rag. The inventor of these gas burners is Mr. Schwartz, of Neuremberg, Germany. They were recommended by Prof. Liebig, and by the SCIENTIFIC AMERICAN, five years ago.

The *London Artizan* states that Mr. Leoni makes his gas burners, &c., of soapstone dust, molded into the desired form, then annealed. No description of the method of giving the dust cohesion has been published. Soapstone dust has been used to some extent for twenty years as an anti-friction agent in journal boxes, and soapstone rollers are used in the dressing frames of New England cotton factories.

A SAFE GUNPOWDER.

G. B. Wiesling, Esq., a civil engineer, at present residing at Van Nest Gap, in New Jersey, has invented a gunpowder of novel composition, which possesses some extraordinary and valuable properties. If ignited in an unconfined mass or in an open keg, it burns without an explosion, while if thoroughly secured by tamping, it explodes with as much force as ordinary gunpowder.

Mr. Wiesling has used this powder extensively in his large operations in the Van Nest Gap tunnel on the Warren Railroad—he being one of the contractors for this work, and having had the practical direction of it during the eight years in which it has been prosecuted.

A patent for the powder has been applied for through the Scientific American Patent Agency, and has been allowed by the Department, though the papers are not yet issued. By varying the proportions of the ingredients a powder is produced which is explosive under all circumstances, and this property may be varied to any extent desired. Besides its safety, the inventor says that this powder may be sold for half a dollar a keg less than ordinary blasting powder.

KNOWLEDGE is power, saith the familiar adage. Let him who would possess both knowledge and power become a constant, faithful reader of the SCIENTIFIC AMERICAN. This will infallibly enlighten the intellect, quicken the perceptions, and inspire a new interest in all that is good and useful. Remember, that a new volume commences next week, and do not fail to send in your name as a subscriber.

Improved Pitch Square.

It is only by long experience, and by having the attention directed to the subject, that any person, either performing work or having the direction of it, is able to appreciate the large proportion of time consumed in planning, measuring, and laying out. Instruments, therefore, which indicate the exact position for a cut or a hole, are valuable, not only from securing a greater accuracy in the work, but also from the saving of time which results from their use.

The accompanying engravings represent a simple implement for carpenters' and joiners' use, intended to facilitate the cutting of rafters, the laying out of stairs and many other operations. It consists merely in the combination of a carpenters' square with a graduated straight edge.

Fig. 1 is a flat view of the implement and Fig. 2 a view edgewise. A is a carpenters' square made of metal in the ordinary form with the outer edges graduated in inches and sixteenths, and the inner edges in inches and twelfths. The straight edge or stock, B, is in two parts, one upon each side of the square as shown in Fig. 2. These two parts of the stock are drawn together—grasping the square—by means of the bolts, C C, which are provided with nuts, D, having milled heads; dowel pins, e e, keep the parts in position. The bolts, C, pass through long slots, c c, in the square and f f, in the stock, allowing the relative position of those two pieces to be varied.

The outer edge of the stock is graduated in inches as shown in Fig. 2, the inches from 0 to 6 inclusive being subdivided into twelfths, and at each side of these points into sixteenths.

It would be impossible to give directions for the use of this implement in the great number of cases in which it may be employed, but a few of the more important will be sufficient to suggest the others as occasions arise. If it is desired to obtain the length of a rafter for a roof of which the span is 32 feet and the perpendicular height 16 feet; let one-fourth of an inch on the scale represent a foot in the roof; set the short arm of the square with the fourth inch—equal to 16 quarters of an inch for the 16 feet perpendicular height—even with the side of the stock; and bring the fourth division on the longer arm of the square—equal to 16 feet, one-half of the span—even with zero on the stock; then will the space on the stock between the two arms of the square represent the length of the rafter, and this space may be read off on the scale of the stock where this scale is cut by the short arm of the square.

When the implement is thus adjusted to determine the length of a rafter, the shorter arm, a, will give the bevel for the upper end, and the longer arm, b, of the foot, as shown in Fig. 5.

Fig. 3 illustrates the mode of adjusting the implement to be used as a miter, and Fig. 4 shows the manner in which it may be used for laying out stairs; one limb giving the angle for the treads and the other for the risers.

The patent for this invention was granted, through the Scientific American Patent Agency, May 6, 1862, and for the purchase of either the whole patent or territorial rights, or for any further information in relation to the matter, inquiries may be addressed to the inventor, John Iseman, at Rosston, Pa. [See advertisement in our next number.]

LARGE numbers of steam engines upon the plan of G. H. Corliss, of Providence, R. I., are now made in Silesia, Prussia, and two of them are shown in the London Exhibition.

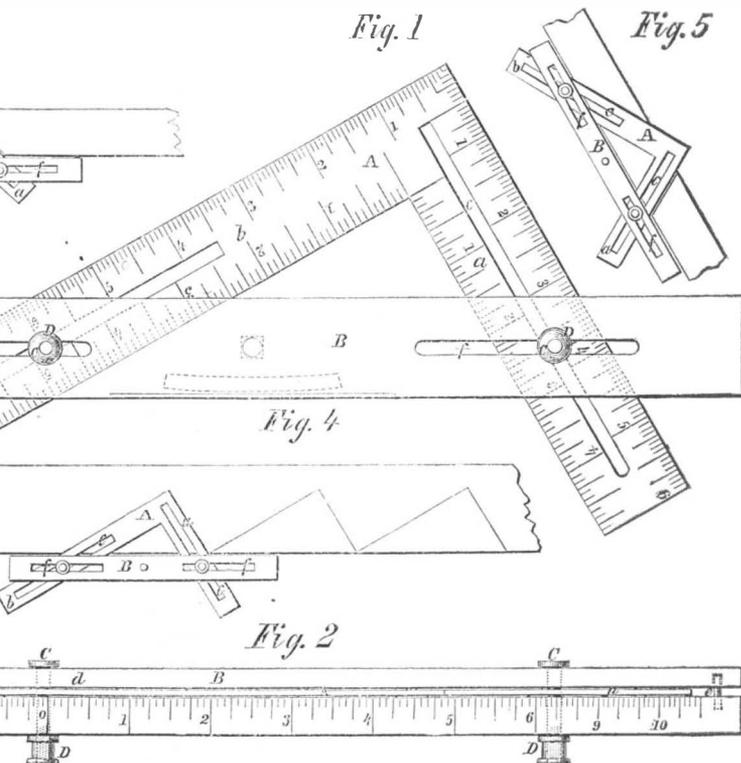
The Power of Sea Waves.

The following interesting extracts are from an article in the last number of the *North British Review* on the "Geological Changes in Scotland in Historic Times":—

Of all the agents of change that have modified the surface of the land, none arrest the attention more than the waves of the sea. One cannot witness the effects of a storm on an exposed coast without being impressed with the enormous amount of wear and tear which is there visible.

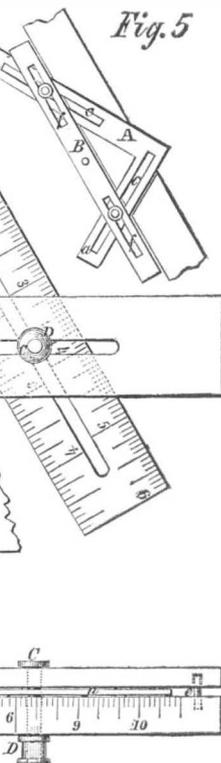
No written records of changes effected by the sea in Scotland go further back than four hundred years. It would be interesting if we could trace the gradual retreat of the coast line for the past two thousand years. The force with which the waves of the Ger-

man ocean fall on objects opposed to their fury has been measured with great care at the Bell Rock Lighthouse. This massive structure, rising 112 feet above the sea level, is literally buried in foam and spray during ground swells when there is no wind. Experiments were made from the middle of September 1844 to the end of March 1845 when the greatest pressure of the waves was found to be 3,013 lbs. on the square foot. When this lighthouse was building in 1807, a storm came on and six large blocks of granite, which had been landed on the reef, were thrown over the ledge to a distance of fifteen yards, and an anchor weighing nearly one tun was lifted out of the sea by the waves and thrown upon the rock. Stone measuring upward of 30 cubic feet and weighing two tons are frequently lifted from deep water and thrown upon the Bell Rock during storms. The lighthouse keepers call these boulders "sea travelers." The sea at a distance of 100 yards around the Bell Rock reef is three fathoms deep. The breakers in the north sea beating around the Shetland Isles, sometimes tear up masses of rock in the island of Whalsey, weighing 8½ tons, and these are frequently left heaped in a pile 62 feet high above tide-water mark. Rocks ranging in weight from 6 to 13½ tons have been quarried by the waves in a storm from their positions *in situ* at levels from 70 to 74 feet above the common level of the sea. One block of 7 ⁷/₁₀ tons weight situated at 20 feet above the sea level has been lifted from its bed and transported a distance of 73 feet, and in its progress it has been lifted over abrupt faces seven feet in height.



ISEMAN'S PITCH SQUARE.

On the west side of the Shetland islands, the violence of the Atlantic has produced scenes of devastation of which it is difficult to convey in words an adequate representation. We see the process going on still with a rapidity and magnitude which cannot but fill the observer with astonishment. In stormy winters huge blocks of stone are overturned and removed from their native beds to a distance almost



Polishing Metals.

A patent has been taken out by W. Clark, of London, for the following composition, which he calls brilliantine—to be used as a polishing powder for metals: First, an extract of guano is obtained by boiling that substance in water until a concentrated crystalline mass is formed on cooling. Of this extract he takes 100 parts, by weight; 25 parts of calcined tripoli; 12 parts of wheaten flour, and common salt 10 parts; these are all mixed together in a vessel over a moderate fire until a homogeneous paste is formed, which is allowed to cool and harden. It is then reduced to fine powder, and is used for polishing metals and cleaning glass by mixing it with dilute alcohol or any alcohol spirits. It is said to form a very superior polishing powder. The crystallized urates obtained from the extract of guano possess great efficiency in acting upon hard metallic surfaces.

PETROLEUM FOR FUEL.

A few years since—Dec. 24, 1859, page 415, Vol. I. (new series) *SCIENTIFIC AMERICAN*—we suggested the employment of crude coal oil as a fuel for steamers. At that period we stated that crude coal oil could be obtained at ten cents per gallon, and that one hundred gallons of it were equal to one tun of coal for raising steam. The method we proposed for the burning of the oil was to convey it from elevated tanks in tubes, and allow it to pass through minute perforations in blocks of fire brick or soapstone, in the furnace under the boilers. The great subterranean repositories of petroleum in Western Pennsylvania and Canada, were not then discovered; and if the reasons we then advanced for the employment of such oil as fuel were sound, they are far more so now, on account of the unlimited quantities of earth oil that can now be obtained at very low prices. The following, from the *Pittsburgh Daily Chronicle*, shows that a beginning has been successfully made to employ liquid fuel in the manner we had suggested:

It is stated that the firm of Clark, Rust & Walker, proprietors of an oil refinery in Erie county, are now using naphtha, or benzine, as a substitute for coal in heating their furnaces. The naphtha is introduced into the furnaces by means of pipes, constantly feeding the fire by a gentle flow, and keeping it up to any heat that may be desired. It saves the labor of two men, and also the cost of about eighteen dollars' worth of coal per week, making an aggregate in reduced expenses of some thirty dollars. There being no demand for naphtha, it has accumulated on their hands, and they are, of course, gratified at the discovery of a means of disposing of it in the prosecution of their regular business.

The business at Windsor Locks, Conn., which had been much depressed by the war, is beginning to revive and flourish. The paper makers and sewing silk manufacturers in this place are now doing a good business.

NOTES ON MILITARY AND NAVAL AFFAIRS.

OUR FORCES APPROACHING CHARLESTON.

Just south of the entrance to Charleston harbor, is Stono inlet and creek. On the north bank of the creek lies James Island, a considerable parcel of the sacred soil. It is a low, marshy tract, forming part of the westerly bank of the Ashley river, between that and the Stono, and is the only territory between us and the city. The enemy have fortifications here and are bringing reinforcements from Savannah *via* the Charleston and Savannah railroad. The precise nature of their defences is coming slowly to light with each day's advance. The Federal gun boats have succeeded in shelling out some batteries which were erected for the defence of that point and have made their way up the creek toward the city. Recent intelligence from southern journals state that the Federal forces under Generals Hunter and Benham are now on the Island and have had a spirited engagement with the enemy. No victory being claimed by them we may properly conclude that our forces did not get worsted in the fight. A Georgia regiment was cut up severely and one colonel mortally wounded. The Federal forces there are estimated at 16,000 and appearances seemed to indicate that the enemy was very strong. We shall be very happy to chronicle the capture of this stronghold of secession. The war began there, and if judgment should earnestly begin at this point few would complain. We are anxious to hear the result of the engagement from reliable sources.

The women, children, and household property are being removed from Charleston, by its residents, in anticipation of its early bombardment.

GEN. McCLELLAN AND HIS COMMAND.

The *Tribune* correspondent writing from the battle field of Fair Oaks, and with a full knowledge of the facts says, "it would have been economical, humane and politic to have given McClellan all the disposable troops north and west of the Ohio, when he commenced the invasion of Virginia," intimating that this policy would have enabled him to have reached Richmond weeks ago. If Napoleon left any legacy to the science of which he was a master, it was the concentration of forces, and the striking an enemy with overwhelming numbers, or with a rapidity of success in blows that stun while they surprise.

The intelligence which comes from Richmond, of McClellan's progress, leaves no apprehension of the result, for, as the veteran Spanish General Prim is reputed to have said, after a visit to the camp, "mortal man cannot do more than Gen. McClellan is doing at this moment, and success is certain if you only leave him alone." Gen. McClellan's military judgment, and comprehension of the situation, are confirmed by the military criticisms in Europe, which, supposing the disposition of the troops to be his, condemn him for cutting off his army on the Peninsula from McDowell's and Banks's divisions.

MISCELLANEOUS.

General Sumner's passage of the Chickahominy river, on the first day of the battle of Fair Oaks, was one of the most daring and successful operations of the war. The correspondent of the *New York World* says:—"If it astonished the enemy then to learn that he had crossed, it is equally surprising to us now to learn how he did it. His rearmost battery wagons had scarcely been hauled off the floating and perilous causeway of logs before the rushing waters swept the timbers away, making huge gaps in the work, and rendering that avenue of approach entirely useless."

Camp Douglas, Chicago, now embraces one hundred and fourteen acres. It contains 8,962 rebel prisoners. Five hundred and ten have died or have been discharged.

The rebels rate their own forces at Richmond at ninety-five thousand men and McClellan's at one hundred and twenty thousand. We presume they know all about McClellan's army as hundreds of spies are continually hovering about the camp.

HORCHKISS & Sons, of Sharon, Conn., are actively engaged in the manufacture of shot and shell for the government. They employ 300 persons, and make shells varying in weight from five to one hundred and fifty pounds for different guns.

THE Bangor (Me.) *Whig* states that 100 men are employed in the granite quarries near that place on a government contract.

SECRETARY WELLES AND OUR IRON-CLAD NAVY.

The Secretary of the Navy has recently made an important communication to the naval committee of both houses of Congress in regard to the construction of iron-clad war vessels, in which he states that a radical change has commenced in the construction and armament of war ships, which dispenses with such navies as have hitherto existed, and Congress is solicited to decide whether the government will promptly take the initiatory steps to place our country in the front rank of naval powers. The Secretary says:—

It is now generally conceded that vessels for fighting purposes must be heavily plated with iron if they are not built entirely of that material. In this, as in most costly fabrics, economy is reached through durability.

Iron ship building is new in this country, but few persons are engaged in it, and it is a novelty in our navy yards. Heavy iron beams, shafting and thick iron plates can be procured from only two or three parties, and then in limited quantities, and subject to great delay. Individuals have little use for iron of such magnitude as the navy must have, and there must unavoidably be great outlay to prepare for the execution of such work. With only the navy for a purchaser, there can be no competition, and the government will be compelled, under such circumstances, to pay almost any price the mills and forges may demand.

No inconsiderable portions of an iron ship can be made and procured at the ordinary mills, and, so far as it can be done, it may be the best policy to be so supplied; but the heavy and expensive portions cannot be so procured; and, unless the government is prepared to execute the work, it will be subject to imposition, and its vessels to marked inferiority.

The Secretary suggests that a million or two of dollars judiciously expended at present to improve the machinery, &c., in some of the government yards, for fabricating the heavy iron work for vessels, "may save hundreds of dollars and the honor of the nation." A number of gunboats are now being constructed on our Western waters, and a government navy yard and foundry is recommended to be established on some favorable point in the Mississippi Valley. Secretary Welles trusts that Congress will not adjourn without making appropriations for providing such workshops in our navy yards as will enable us to construct a first-class navy, and he enforces this suggestion by saying:

No nation can have an advantage over us if we avail ourselves of our means and opportunities, and it is no longer doubtful that our future safety and welfare are dependent on our naval strength and efficiency. It is a duty, as well as a necessity, that we make these United States a great naval Power. We owe it to ourselves to commence at once this work, and the present Congress should, in my opinion, take the preliminary steps at the present session for laying the foundation for the construction of a navy commensurate with the wants and magnitude of the country. The place or places, the shops and tools, and other appurtenances for this great work, must be provided in season.

It is rather mortifying to our patriotism to be informed that unless the government provides suitable work shops to manufacture the most important portions of iron-clad vessels, it will be "subject to imposition," and "compelled, under such circumstances, to pay almost any price the mills and forges may demand."

A very general opinion prevails in the community that it costs the government more to build steamers in the national navy yards than to obtain them from private builders. And it is also believed by many persons who have given this subject attention, that any kind of iron work for war vessels, may be furnished by several manufacturers of angle iron, shafting and rolled plates, at less cost than such work can ever be made at any national navy yard. But whatever decision Congress may come to on the subject, it is imperative that we should have an effective iron-clad navy at the earliest possible date.

LARGE profits on a small capital. This is what we are all striving to make. We cannot possibly suggest to our friends a surer or better way of realizing the above results than to invest the sum of 4 cents weekly in purchasing the *SCIENTIFIC AMERICAN*. For this trifling amount you can have our paper sent regularly to your own address or to that of any friend or neighbor. We believe that such an investment would be productive of greater profits, in money and mind, than a hundred times the sum spent in any other way. Our new volume commences next week.

A MANUFACTURER in Buffalo, N. Y., is filling a large order for petroleum oil for Mexico. The shipment goes to Acapulco, and a heavy business is anticipated all along the Mexican coast.

MEERSCHAUM.

This famous substance of which many tobacco smoking pipes are made is a hydrated silicate of magnesia. When pure it is white, but when it contains silicate of iron it is yellow. Good meerschaum can be indented with the thumb-nail, and is easily cut with a knife. It is found of different degrees of density—some kinds will float on water while others will sink. Those of medium density are preferred by pipe makers. Most of the genuine meerschaum obtained comes from Asia, but it is also found in Greece, Spain and Moravia. It is exported in the form of irregular blocks. In some cases meerschaum is fashioned into rough pipe bowls where it is dug, but it is mostly sent to Europe. The cities of Pesth and Vienna were formerly celebrated for their meerschaum manufactories. In forming a pipe-bowl the material is prepared for the operation by soaking it in a composition of beeswax and olive oil. The wax and oil absorbed by the meerschaum are the cause of the color produced in such pipes by smoking. The heat of the burning tobacco causes the oil of the tobacco to mix with the wax and olive oil in the meerschaum, and these gradually assume those dark tints so much prized by some inveterate smokers. In some cases the bowls of these pipes are stained artificially by soaking them in a solution of iron mixed with dragon's blood. The white meerschaums, however, should always be preferred.

The scrapings of the blocks of which the solid pipes are made, are triturated and reduced to powder, then boiled in soft water until a thick paste is formed, which is molded into blocks, that are dried, then cut out into pipes as from natural blocks. There are very many pipes sold under the name of meerschaum which are spurious compositions, but it is very difficult to detect the false from the true by mere inspection. Some fancy meerschaum pipes are very costly. These are mostly to be found in Austria. They are furnished with amber mouth pieces and studded with silver.

THE PATENT LAW AMENDMENT.

We regret not to have received the new Patent Bill in time to give it an intelligible review in this number. We have our suspicions that the amendments are designed in some degree to cripple the rights of applicants in their appeal privileges. We hope we are mistaken in this supposition, and that we shall get the bill in time to discuss it in our next number and before its passage through the Senate. A correspondent writing from Washington intimates that the amendment is the result of hasty and ill-vised legislation.

Wheat and Corn Export.

In the memorial of the Hon. S. B. Ruggles to President Lincoln, regarding the enlargement of the Erie Canal, he states that in 1861 no less than 6,712,233 barrels of wheat and flour, and 6,796,390 barrels of corn were carried on the Erie canal, all of which had come from the Great West. The total product of the wheat and corn of New York growth, carried on the canal in the same year, was only 955,532 barrels. The annual wheat crop of New York is stated to be now only 8,681,000 bushels, that of New England only 1,077,000. The former amounts to only one-third of that required by the State; the latter is only sufficient for three weeks' consumption in New England.

TO PRESERVE STRAWBERRIES.—To two pounds of fine large strawberries, add two pounds of powdered sugar, and put them in a preserving kettle, over a slow fire, till the sugar is melted; then boil them precisely twenty minutes, as fast as possible; have ready a number of small jars, and put the fruit in boiling hot. Cork and seal the jars immediately, and keep them through the summer in a cold, dry cellar. The jars must be heated before the hot fruit is poured in, otherwise they will break.

NIEPCE DE ST. VICTOR is now in Paris devoting his energies in making experiments for the purpose of solving the great problem of taking photographic pictures in their natural colors.

THE *American Agriculturist* states that the month of June is the best time to prune. A sharp knife should always be used, so as to make a clean cut.



EDITORIAL CORRESPONDENCE.

The Alleghany Bituminous Coal Field—Steubenville Mine—Coking Ovens.

STEUBENVILLE, May 30, 1862.

The distance from Wheeling, Pa., to Pittsburgh, Pa., is ninety five miles by the railroad which on the Ohio shore follows the windings of the river. The morning was fair, the sky was clear and the odors of flowers and tree-blossoms filled the breeze as I was wheeled along by the iron horse. The scenery was delightful, the ride exhilarating. This section of the country appears to have been a table land out of which the Ohio river has scooped its channel, leaving a series of rolling hills ranging from about five to six hundred feet on each side. The elevations resemble large mounds, separated by ravines. The soil is fertile, the hills are covered with verdure and cultivated to the summits. Planters mansions nestle among the trees on the hill sides, and cheerful villages stud both the Ohio and Virginia shores. The scenery is not grand, because no lofty mountains are seen towering in the distance, still it is certainly picturesque. The Virginia side of the river here is the celebrated "Pan Handle" track, and in spite of its uneuphonic name is a lovely region. The hills contain plenty of coal as this is a portion of the Alleghany Great Bituminous Coal Field. The top seam of this field is exposed along the Monangahela, Alleghany and Ohio rivers, and has been called the "Pittsburgh seam" because it comes out so near the top of the hills in the vicinity of this city. The superficial extent of this seam is about 14,000 square miles. In some places it is found about fourteen feet in thickness, at Pittsburgh, it is about six feet, then it diminishes gently to the west and northwest to five feet. It has a dip due south of about twenty feet to the mile. In proceeding up the valley, the mines may be observed in various places cut into the face of the hills, and by drawing a line through these from Wheeling up to Pittsburgh, an incline of several hundred feet will be described. The mines near the top of the hills contain little or no fire damp, the coal is more free from sulphur, is softer, and can be coked in open pits. About four feet of the top of a six-foot seam scarcely contains any sulphur and it is excellent for iron smelting. But we have arrived at Steubenville, about twenty six miles from Wheeling, and here we stop to examine the most peculiar coal mine in this section of the country. The place is pleasantly situated on the right bank of the river, and like many of the villages and cities on the Ohio, it resembles an English town. Most of the houses are of brick and are covered with a faithful coating of soot. The coal mine is located near its west end on the hill and belongs to L. Borland & Co. Instead of working in the common top seam of coal by driving a horizontal tunnel into the face of the hill, they have sunk a vertical shaft—a pit—240 feet deep, exactly like an English mine. In sinking this shaft, two other smaller seams of coal were passed, until the present one which is worked, was reached. It is about 4 feet thick, but its great virtue consists in being free from sulphur, and its coal, thus possesses qualities, which when coked, render it about equal to anthracite for iron smelting. It is shiny and somewhat harder than the top seam of this field, which lies about 600 feet above it. The shaft of this mine is 16 feet long by 8 feet wide, and is divided in the middle by a partition. A strong frame extends above the mouth of the pit, or rather it may be called two mouths. A wire rope passes from the windlass of the engine over sheaves on the top of the pit frame, and is attached to two hoisting platforms, one of which descends one division of the pit with an empty coal carriage, while the other is ascending the other division with a loaded one. Like two large dumb waiters, the hoisting platforms are guided in grooves in the pit framing, and the system of operating is simple, convenient and very safe. When a loaded carriage is raised to the top a few feet above the pit mouth, it is run off and tipped upon an inclined screen which separates the small from the larger pieces of coal. At present only about one hundred tuns per day are mined.

About three tuns per day are mined by each collier, who receives fifty cents per tun for the larger coal and fifteen cents for the fine coal. The mine is operated exactly like those in England; the working rooms are about thirty square feet in size and pillars of coal are left to support the roof, which is smooth sandstone—an excellent roof for the miners. Salt water filtrates through this seam of coal, and a saline effluence covers the ground around the engine house.

The mine is ventilated by a fire in an up-take side shaft. The fresh air passes down the working shaft, thence through the miners' room, and passages, and up the draft shaft to support the fire maintained in iron creel near the shaft top. A wagon lifts half a tun from the mine; the hoisting and lowering are performed by a horizontal steam engine and a reversible hoisting windlass. The engine is not stopped and reversed, as by the old-fashioned English giging method. The large coal sells in Steubenville for one dollar per tun, the small for 60 cents. The slack made at this mine is roasted in ovens, and converted into coke to be used for iron smelting. Twelve coking ovens, resembling large old fashioned brick ovens for baking bread, are employed by this company. It is roasted for about three days. This treatment expands 100 bushels to 125, but each bushel weighs 70 lbs. when it goes in, and only 38 lbs. when it is taken out of the oven. The coke made from this lower seam of coal is clean, hard and of a superior quality. The coals, shales and sand stones obtained in this mine contain well defined fossils. You can even trace the forms of antediluvian ferns in the coke as it comes from the ovens. When burning the printed leaf of a book, sometimes the letters appear more clearly defined, so in like manner the coking of this coal makes the more delicate organisms of which it is formed stand out more sharply. Near the rolling mill in Steubenville, a shaft has just been sunk, and this vein of coal reached, in order to use it for iron smelting. A shaft had been previously attempted within the precincts of this mill, but in sinking it, a bed of quicksand stopped the operations. In several instances we have known of quicksand closely adjacent to river bottoms, stop the operations of shaft sinking. We do not know how extensive the lower seams of this field are, but in all likelihood they cover as great an area as the upper seam, for they have been found at Pittsburgh sixty miles distant. Its superior qualities, however, were unknown until recently. This region is rich in useful minerals. Limestone and grindstone grit are found above the upper coal seam, and potters' clay, fire clay and petroleum and salt springs are found all along the Ohio valley.

This great coal field, extends into and over the eastern side of the Appalachian chain of mountains. Its greatest breadth is 100 miles, its longest diameter 225 miles. None of this coal comes to our eastern cities excepting moderate quantities of the Cumberland variety, through Maryland. It is the only coal however, which is used in Western Pennsylvania, Western Virginia, in many sections of Ohio, Kentucky and Indiana. Not only does the United States possess a far greater coal area than all the known world beside, but her coal seams are more easily worked than those of any other country. Our people cannot sufficiently prize the blessings conferred upon them in our vast and easily worked coal seams. No correct statistics have been kept of the quantity of bituminous coal that is mined annually, but it cannot be less than about 3,000,000 tuns, for half a million tuns are consumed yearly in Pittsburgh alone.

OUR LONDON CORRESPONDENCE.

American Inventions—Minerals and Oils.

LONDON, May 23, 1862.

MESSRS. EDITORS:—The Great Exhibition is now fairly open, and one can begin to study it as the living center of the world of industry, art and science. Nearly a month has passed since, at its opening, it was called "the most honored offspring of civilization." Since then all has been bustle and confusion, and the sounds of the hammer and the saw have been mingling daily with those of discordant organs, pianos and hundreds of other instruments. New wonders and beauties, however, have been gradually unfolded, and now the visitor may study almost every device under the sun, required for the use of man, while the most cultivated imagina-

tion may here revel in the displays of exquisite works of art. In this great depository of industry and art, lessons of the past are full of suggestions for the future. There is but little now in use in the mechanical and chemical arts which has not been invented within a life time. The lathes, engines, looms and agricultural implements in use thirty years ago, have mostly become relics of a past age. Perhaps the visitor to a like exhibition fifty years hence (1912) will judge our productions as we estimate those of the past century. That which we call the perfection of engineering and mechanical skill now may be estimated as crude efforts by the next generation. Such has been the case during the past—such will be the case in the future.

In looking (with a partial eye, I must admit), over this vast assemblage of man's productions, collected from almost every nation on the face of the globe, I am proud of our Yankee land. Though our direct contributions are as but one in two thousand, the impress of American ingenuity for saving labor is visible in all our machines, tools and implements. And I am vain enough to predict that, in the aggregate, the various nations represented here will be more benefited through the contributions of our 150 exhibitors, than by any 1,500 contributions in the whole list of 30,000 now entered. This may appear to be a boastful claim, but I do not think it is extravagant. I have waited for weeks that I might write advisedly, and in subsequent letters I will relate more fully what has been done by those of our contributors who have ventured here under very discouraging circumstances.

I will close by mentioning a few of our articles. Dr. Feuchtwanger, of No. 42 Cedar street, New York, has sent a splendid cabinet of minerals, consisting of more than 1,000 specimens, collected with great care from different States of our Republic. They attract much attention. T. D. Meads, of Michigan, has a choice collection of about 200 minerals, from the Lake Superior region. These are very beautiful. I have also a small cabinet collection from the mines of Col. Fremont, and another from Mr. Mosheimer, of the Washoe silver mines, California. The New Jersey Zinc Company exhibits some interesting specimens of the products of their mines and manufactures. In class No. 2, M. H. Bayley, of 61 Canal street, New York, exhibits samples of his crystal carbon oil, and F. S. Pease, of Buffalo, N. Y., has sent samples of his refined petroleum. These samples, I am sorry to say, have been ruled out of the building by the Royal Commissioners, from the wrong notion that they are explosive. I know them to be perfectly safe from explosion under all ordinary circumstances. A. Hale and Mr. Hotchkiss, of Lyons, N. Y., have sent samples of essential oils, and the Philadelphia College of Pharmacy has sent an interesting collection of American roots, herbs, &c. Yours, J. E. HOLMES.

Time is Money—Recollect That.

Anything which will give you a hint as to doing your work or accomplishing your ends in quicker time or with less labor, is equivalent to hard cash. We venture to say that there is not an honest trade or occupation known among the sons of men, in which its followers would not be benefited and enabled to save much time by faithfully studying the SCIENTIFIC AMERICAN. Farmers, mechanics, manufacturers, men of science and genius, see to it that the SCIENTIFIC AMERICAN is ever upon your table. Let it be your intellectual whetstone. Next week we commence a new volume. Be sure and send in your names as subscribers.

J. W. FAWKES is now in Illinois with his steam plow offering to plow the fields of the farmers by contract. The *Prairie Farmer* calls upon the farmers to give him encouragement, so that the relative economy of plowing by steam and animals may now lie fairly tested on the prairies.

FROM twenty counties in Illinois and Iowa alarming accounts have been received by the ravages of the wheat midge. From Kansas, Wisconsin and Minnesota, on the other hand, the reports of the wheat crops are most flattering.

THE address of F. B. Pierce, given in the list of patent claims in our issue of June 14, should have been Brockport, New York, instead of Brockport, Ill.

An Improved Pump.

The accompanying engravings illustrate the construction of a new pump, the invention of James Budd, of Sandy Hill, N. Y., which will draw water from either of two fountains or wells, or from both, and will discharge from either of two nozzles or from both, at the will of the operator; the adjustments to determine its action in any of these respects being very quickly and easily made.

Fig. 1 is a perspective view, and Figs. 2 and 3 are vertical sections at right angles with each other. In Fig. 2, only one induction pipe, F, is shown, and we will first describe the operation when drawing water through this pipe. A is the cylinder, and B the piston. The piston is of peculiar construction, being formed of two cup-shaped ends, *a a'*, connected by curved arms, *c c'*, to a hollow cylinder, *d*, and each containing a ball-valve, E, fitted to close an opening, *b*.

It will be seen that as the piston rod is drawn outward from the cylinder in the direction indicated by arrow 1, the valve in the cup, *a*, is closed, while that in valve, *a'*, is opened, forcing the water upward through the chambers, *h* and *e*, into the air chamber, I, while the return of the piston in the direction indicated by arrow 2 carries a current of water upward through chambers, *h'* and *e'*, also into the air chamber, I. Thus a constant flow of water into chamber I is maintained; the retaining valves, J and *g g*, preventing a reflux current downward.

From the chamber, I, the water passes by the pipe,

is situated midway between them, as represented in the engraving, the passages to both nozzles are open, and the water is consequently discharged through them both; but if the valve is lowered upon the seat,

valve may readily be changed at will. This is the explanation of the manner in which water may be drawn into the pump by one pipe, and discharged through either or both of two nozzles. The mode in which it may be drawn from one or both of two fountains, is shown in Fig. 3.

The induction pipe, F, is curved forward and connected with a chamber, G, which has a retaining valve, G', fitted to close the passage to one of the two fountains. From the upper part of the chamber, G', is a passage leading to the pipe, Q, which enters the second of the two fountains. This passage has a valve seat, *k*, to which is fitted a valve, S, and it will be seen that when this valve is drawn upward to its seat, no water can pass into the pump through the pipe, Q, and it must consequently be drawn from that reservoir alone with which the lower pipe communicates. But if the valve, S, is carried downward till it rests upon the valve, G, so as to keep the latter valve closed, then must all of the water to supply the pump come through the pipe, Q.

The valve, S, has a stem, J, passing through a stuffing box, U, and provided with a nut, V, for raising and lowering the valve. The engraving represents pendant arms, *l*, working in a spiral groove, *m*, in the cup, W, for working the valve, but any other plan may be adopted if preferred.

This pump is designed especially for fire engines, but the inventor claims for its superiority as a farm pump or for manufactories.

The patent for this invention was granted through



BUDD'S TWO-STREAM PUMP.

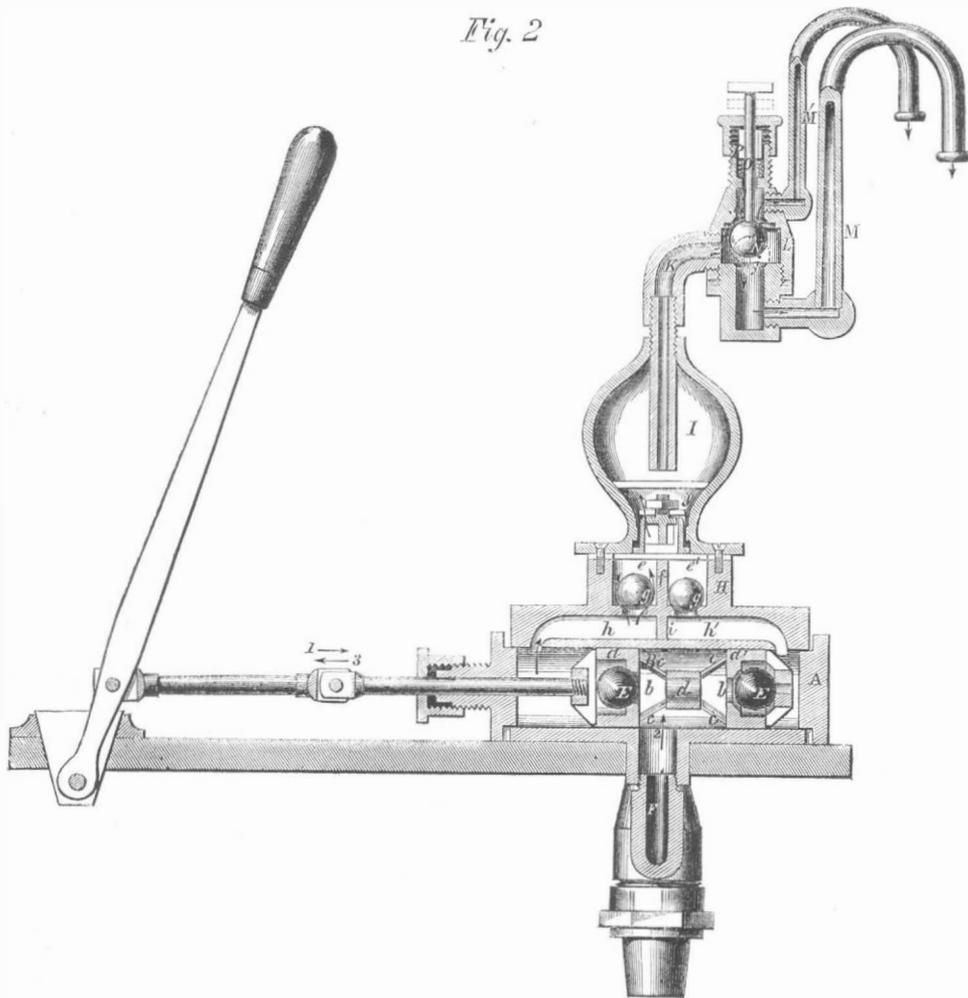


Fig. 2

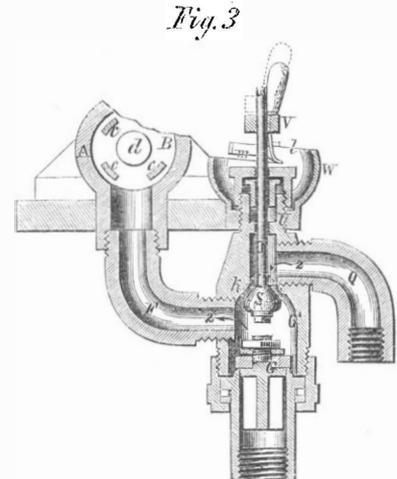


Fig. 3

K, into the chamber, L, whence it may flow through either or both of the vessels, M and M'; its course being determined by the position of the ball valve, N. This valve has two seats, *j* and *j'*, and when it

j, the passages to the nozzle, M, is closed, and the water can flow through the nozzle, M', only; while by raising the valve to the seat, *j'*, the passage to the

ly for fire engines, but the inventor claims for its superiority as a farm pump or for manufactories. The patent for this invention was granted through

the Scientific American Patent Agency, April 29, 1862, and further information in relation to it may be obtained by addressing the inventor, at Sandy Hill, N. Y.

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PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York

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

TERMS—Two Dollars per annum—One Dollar in advance, and the remainder in six months.
Single copies of the paper are on sale at the office of publication, and at all periodical stores in the United States and Canada.
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VOL. VI. NO. 26....[NEW SERIES.]....Eighteenth Year.

NEW YORK, SATURDAY, JUNE 28, 1862.

SIX GOOD REASONS WHY EVERY MANUFACTURER, MECHANIC, INVENTOR AND ARTIZAN SHOULD BECOME A PATRON OF THE "SCIENTIFIC AMERICAN."

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IV. No other paper or periodical published in this country contains the list of patents and claims issued from the United States Patent Office; hence, the SCIENTIFIC AMERICAN is indispensable to every mechanic, manufacturer or inventor who is desirous of keeping advised as to what new machines or novelties are being patented.

V. In subscribing for the SCIENTIFIC AMERICAN, the reader receives the latest foreign as well as home intelligence on all subjects pertaining to the industrial pursuits of the world. All the best scientific or mechanical periodicals published in England, France or Germany are received at this office, affording us facilities for presenting to our readers the very latest news relating to science or mechanics in the old world.

VI. Subscribers who preserve their numbers have, at the end of the year, two handsome volumes of 416 pages each, containing several hundred engravings, worth, as a work of reference, many times the price of subscription.

THE END OF OUR VOLUME.

This number will conclude the sixth volume, new series, of the SCIENTIFIC AMERICAN. The progress which has been made in most of the departments of science and art during the past half year has not been surpassed in any equal period of time within our recollection. Our columns offer abundant evidence of the reliability of this statement. No less than 120 new inventions have been illustrated in this volume of the SCIENTIFIC AMERICAN; and 217 cuts, containing 350 figures, have been employed in illustrating these and several other useful subjects. Among these are the Agassiz Lectures, Steam Surface Condensers, Submarine Torpedoes, &c. Thus, our present volume, is replete with evidences of inventive activity and improvement.

The past six months have been happily more prosperous for our mechanics and manufacturers than we could have anticipated, considering the momentous struggle in which our country is engaged. As the term of a large number of our subscribers expires this week, we anticipate and solicit a renewal of their subscriptions, and also hope for a large increase of new subscribers. The SCIENTIFIC AMERICAN is the only weekly periodical on our continent devoted to practical mechanics, inventions and manufactures as a speciality. It is really necessary at this day that all those whose tastes and interests are devoted to science and inventions, should read its pages regularly or they will fall behind the age in a knowledge of those numerous improvements which are now ushered in so rapidly. No less than 1,529 patents have been issued from the United States Patent Office since the seventh of last January, and their claims are all published in the SCIENTIFIC AMERICAN. It is therefore reasonable to conclude, that unless our columns are carefully and regularly consulted by mechanics, manufacturers and inventors, they cannot keep posted up in the improvements of this progressive age.

PATENT LAW AMENDMENTS.

The new patent law which went into force on March 2, 1861, although admirable in many respects, was, in others, somewhat crude; and we are therefore glad to see that efforts are being made to remedy the imperfections.

A bill for this purpose has lately been passed in the House of Representatives.

We will briefly state the nature of some of the defects in the present law, coupled with the proposed changes, as gathered from a meager telegraphic report of the bill, received just as we go to press:

1. The new law created within the Patent Office a sort of independent tribunal, called the "Examiners-in-Chief," for the review and amendment of the decisions of the primary examiners. The Commissioner of Patents, although rightfully and legally the head of the department, has no control over the decisions of the Examiners-in-Chief, and he cannot hear any appeal in person, unless a fee of \$20 is first paid to him; nor can an appeal be taken from the Patent Office to the District Court without first going through with the expense, formality, delays, and "red-tapeism" of two prior appeals, to the Examiners-in-Chief and also to the Commissioner.

The proposed amendment gives to applicants the right to take an appeal from the Patent Office to the District Court as soon as the case has been rejected a second time by the primary examiner. The formalities and expenses of the two intermediate appeals are thus saved. This is certainly a change for the better. We also infer, from the nature of the bill, as telegraphed, that appeals from the decisions of the primary examiners are to be taken to the Commissioner in person without any expense to the applicant, and that the Examiners-in-Chief will act as an advisory board to assist the Commissioner in deciding those appeals. We think that this will also prove to be a good change. As the law stands, there is a liability to conflict in the decisions of the various branches of the Office, when there ought to be the most entire unanimity.

2. Under the existing law, an applicant may wait two years after it has been decided to grant his patent, before paying the last installment of the fees, and the Letters Patent will date from the time of such last payment. But under the new bill, although the applicant will be allowed to wait two years if he wishes, still his patent must be dated back to a period not less than six months subsequent to the time when it was decided or passed for issue. This is also a good improvement.

3. The law now requires that when an application is rejected, the applicant shall go through the absurd form of swearing a second time that "verily he believes himself to be the original and first inventor," &c. There is no possible need of this formality; and it is a source of much delay and annoyance to applicants, especially to those who live at a distance. We are frequently compelled to send and procure these worthless pieces of paper, cycled *renewed oaths*, from clients who reside in California, Europe and other quarters of the world. Our readers will readily see that much time is thus lost. We are glad that it is

proposed to do away with this vexatious requirement.

ARM THE MISSISSIPPI FORTS.

We trust that Secretary Stanton will not, in the multiplicity of his duties, overlook the vital importance of promptly furnishing Forts Jackson and St. Phillip with heavy cannon. This matter has been urged for several years by the officers of the Ordnance Department, but has been neglected by the cabinet and by Congress. It is most fortunate for the nation that it was neglected, as it was owing to this neglect that Commodore Farragut was enabled to pass the forts and capture New Orleans. But it would be monstrous folly to allow this neglect to continue any longer.

The control of the Mississippi river is the great object for which the rebels are contending, but as long as the two forts below New Orleans are in our possession, we have the command of this great highway; that is, provided the cannon in the forts are able to prevent the passage of vessels. But Commodore Farragut has demonstrated the practicability of sailing up the river between these forts, without exposing vessels to any considerable danger from the guns which they now contain.

It is plain, from recent articles in the London *Times*, that the aristocratic party in England are still hoping for an opportunity to intervene in our affairs, and it is impossible to anticipate what freak of policy the Emperor Napoleon may adopt when he hears of his defeat in Mexico, and there is certainly danger that a fleet of French or English iron-clad ships may, at any time, attempt to pass up the Mississippi and wrest New Orleans from our possession. If we allow the forts to remain in their present feeble condition we hold out the strongest invitation to such an enterprise, while the most powerful argument that we could offer against the undertaking would be a knowledge of the fact that it was impracticable.

It seems to us that whatever else has to be postponed, not one day's delay should be permitted in the task of strengthening, to the very utmost extent, and arming with the heaviest cannon, Forts Jackson and St. Phillip. The whole fleet and army, too, should be searched for a garrison of artillerymen for these forts that are proof, by acclimation, against the attacks of yellow fever.

WHAT WE OUGHT TO DO IN RELATION TO IRON-PLATED SHIPS.

It is a curious fact that the long-continued and costly experiments in England, to test the question of the invulnerability of iron ships have taught us exactly nothing. These experiments have all been made with small cannon, and consequently furnish no demonstration of the effects of heavy ordnance.

Now, let our government, in the first place, ascertain the maximum charge which our 15-inch guns will safely bear, and then try the effects of both shot and shells thrown by these charges upon iron plates.

Having ascertained the thickness of iron required to resist hollow shells, and that required to resist solid shot, our inventors will be furnished with the proper data for their guidance in designing vessels to carry either class of armor.

It may be that no sea-going vessel can ever be constructed to carry plates which cannot be penetrated by solid shot, but if ships impenetrable by shells can be built, they will be safe against the most destructive element of naval warfare. Mr. Reid, of England, has designed a vessel which he regards as a good sea-boat, and believes to be absolutely invulnerable to the attacks of artillery. But it may be that, though his plates can not be penetrated by cannon shot, the side of his vessel will be crushed in by the impact of a 500-pound ball driven forward by the explosion of 100 pounds of powder. What the effect of such a missile would be we have no means of knowing, and the first step is to ascertain this fact.

The greatest horse show ever known, according to promise, is to be held at Chicago on the 2nd of September next. Fifteen thousand dollars are offered in premiums.

The Amaskeog (N. H.) Company have contracted with the government to furnish 10,000 rifled muskets of the Springfield pattern.

A GREAT SILVER WARE MANUFACTORY.

The Way Silver Spoons are Made—One Thousand Dollars a Day Changed from Coin into Plate—The Most Complete Silver-Ware Manufactory in the World Two Tuns of Silver in process of Manufacture.

During a recent visit to Providence, R. I., we made a visit to Gorham & Co.'s manufactory of silver ware, and were politely shown over the establishment under the guidance of the designer, a remarkably intelligent Englishman. This man says that he is acquainted with the large silver-ware establishments in London, and that this of Gorham & Co., is the most complete of any in the world.

This firm make only solid silver, using the silver coin as they find it, neither refining nor adding alloys. It contains a very small proportion of copper.

The first step in the process is to melt the coin. This is done in plumbago crucibles set in furnaces of anthracite coal. No reverberatory arrangement is employed; the heat passing through the walls of the crucible. The metal is cast into an ingot—say an inch thick, 10 inches wide and 2 feet long.

The ingot is then passed between rollers and rolled down to a thin plate. The rolling is performed while the metal is cold; no annealing being required during the process as in rolling gold.

By means of massive machines, blanks are then punched from the plates of suitable size to make spoons, forks, teapots, &c.

Then comes the process of fashioning the articles into the proper forms for use and ornament. Several methods are employed for effecting this. A portion of the articles are placed upon an engraved steel die, and a mass of cast iron is allowed to drop upon it from a sufficient height to press the silver into the die and mold it in correspondence with the engraving. The bowls of the spoons are formed by laying the blank upon a lead matrix of the proper form, resting the end of a rounded steel punch upon it, and giving the punch a powerful blow with a sledge. Tea pots and similar articles of hollow ware are fashioned, by cutting a thin plate of metal into a suitable form, bringing the edges together and soldering them, and then beating the metal with hammers, drawing it into the proper shape by the same process as that employed by a blacksmith in making a ladle. Many hammers of a great variety of forms are used in this operation of raising, as it is called. Round articles, as the covers of tea pots, are spun upon a lathe in the usual way.

There are several processes of ornamenting. The most interesting of these is by means of lathes. The lathes are quite as perfect in workmanship and more complicated in construction than the lathes employed in bank-note engraving. Very complex contrivances are employed to give the tool the various motions required. In marking concave surfaces, for instance, the tool is always kept at right angles to the surface, and when occasion requires a vibrating motion is imparted to it, producing the beautiful waved lines so often seen on napkin rings. The chasing is done with a steel punch and hammer, and to prevent the ware from being forced out of shape in the operation, the vessel is filled with pitch. After the chasing is completed, the vessel is inverted in a warm oven, when the pitch is melted and flows back into the kettle, from which it may again be dipped. Some engraving is executed by hand, and cast ornaments are soldered to urns, pitchers, &c.

After the ornamenting is completed, the ware is cleaned and polished. The first operation in this part of the process is to scour it with sea-horse hide covered with sand. I saw a piece of natural hide $1\frac{1}{2}$ inches in thickness. It is then scoured with rotten stone, and lastly with oxide of iron, called rouge. The rouge is applied first with a bob made of disks of woolen cloth fringed at the periphery, then with a similar bob of cotton, and lastly with that most perfect of all cushions, the human hand. The thumbs of the workmen engaged in this last labor become as thick and tough as leather.

One of the most interesting parts of the cleaning process is the pickling. The vase or bowl is placed upon a turntable so that it may be revolved, and is heated red hot by a flame; the rotation being for the purpose of heating the vessel on all sides equally and at the same time. The flame is formed by two currents,

one of illuminating gas and the other of atmospheric air, caused to mingle as they issue from the jet. The current of air is driven through its pipe by a fan and issues in a flaring flame a foot long, enveloping the ware and very quickly bringing it to a red heat. The heat oxidizes the alloy in the surface of the ware, and this oxide is then dissolved by placing the vessel in a bath of warm dilute sulphuric acid. This leaves the surface pure silver and of that soft lusterless white, which is sometimes left on the ware, and which is so beautiful. When a luster is desired this pure silver surface is rubbed down with a burnishing tool, or it is otherwise polished. Some of the burnishing tools are made of steel, and some of blood-stone.

The only remaining steps in the process are to pack the ware, send it to market, sell it and get the pay. Mr. Gorham told us that they received one remittance in gold from an old customer in New Orleans some time after the act of secession was passed in Louisiana.

Very few workmen are now employed in the establishment, but in ordinary times, 1,000 dollars in coin is melted every day, and more than two tuns of silver are constantly going through the process of manufacture. The designs are formed in clay and wax and are then produced in plaster or copper, and are preserved for publication in case that it is required. The designer's room is a large neat office, and contains a library of the most costly works on ornamental art.

RECENT AMERICAN INVENTIONS.

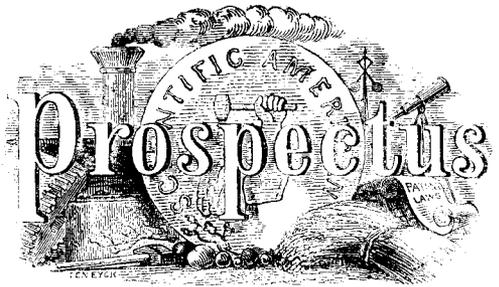
The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list on another page:—

Tension Regulator for Sewing Machines.—The object of this invention is to increase the tension of the needle thread of a sewing machine in the same measure as the diameter of the bobbin in the shuttle decreases, and consequently the tension of the shuttle thread increases. The invention consists in the arrangement of a pulley with a long conical hub, said pulley being rotated by the action of the needle thread, in combination with a screw spindle and spring pad acting on the conical hub in such a manner that, during its operation of sewing and consequent decrease of the bobbin on the shuttle, by the action of the screw, the pulley assumes a gradual downward motion, thereby bringing thicker and thicker parts of the conical hub opposite the spring pad and causing a corresponding increase in the tension of the needle thread. The inventor is Paul Trybil, of New York city.

Explosive Projectile.—This invention consists, first, in a certain arrangement of obliquely expanding wings, for the purpose of obtaining a rotary motion of a projectile about its axis by the resistance of the atmosphere to its flight when fired from a smooth-bored gun. Second, in a certain mode of combining one or more expanding wings and nipples or their equivalents, for the reception of percussion caps or other percussion priming, in an explosive projectile, for the purpose of making such wings constitute hammers by which the said priming is exploded on the projectile striking. The inventor is William E. Browne, of Valley Falls, R. I.

Hotel Indicator.—The object of this invention is to obtain a device by which the number of drinks dealt out at a bar may be registered and counted by the proprietor, thereby serving as a check to the bar-keeper through whose hands the money passes into the till. It consists in the employment of a box provided with a ball receptacle and having a series of compartments in it which are numbered and provided with a tilting bottom placed over a drawer. This drawer receives the balls inserted in the compartments by the customers and which indicate the number of drinks that have been dealt out by the bar-keeper. The inventor is James McNamee, of Easton, Pa.

If any one wishes to confer a lasting benefit upon some young friend, let him order a copy of the SCIENTIFIC AMERICAN to be regularly sent to that friend's address. Our new volume commences next week. There is no weekly publication more suitable for young men and lads than the SCIENTIFIC AMERICAN, and none that they can read with greater profit and instruction.



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VOLUME VII.—NEW SERIES.

The SEVENTH VOLUME of the NEW SERIES of the SCIENTIFIC AMERICAN commences July 5, 1862.

In announcing the above fact, the publishers embrace the opportunity to thank their old patrons and subscribers for the very liberal support they have hitherto extended to this journal; placing it, as they have, far beyond that of any other publication of the kind in the world, in point of circulation.

The SCIENTIFIC AMERICAN has the reputation, at home and abroad, of being the best weekly journal devoted to mechanical and industrial pursuits now published, and the proprietors are determined to keep up the reputation they have earned during the seventeen years they have been connected with its publication.

The SCIENTIFIC AMERICAN is indispensable to every inventor, as it not only contains illustrated descriptions of nearly all the best inventions as they come, but each number contains an Official List of the Claims of all the Patents issued from the United States Patent Office during the week previous; thus giving a correct history of the progress of inventions in this country. We are also receiving, every week, the best scientific journals of Great Britain, France and Germany; thus placing in our possession all that is transpiring in mechanical science and art in these old countries. We shall continue to transfer to our columns copious extracts from these journals of whatever we may deem of interest to our readers.

No person engaged in any of the mechanical pursuits should think of doing without the SCIENTIFIC AMERICAN. It costs but four cents per week; every number contains from six to ten engravings of new machines and inventions which cannot be found in any other publication. It is an established rule of the publishers to insert none but original engravings, and those of the first class in the art, drawn and engraved by experienced artists, under their own supervision, expressly for this paper.

TO THE CHEMIST AND ARCHITECT!

Chemists and architects will find the SCIENTIFIC AMERICAN a useful journal to them. All the new discoveries in the science of chemistry are given in its columns, and the interests of the architect and carpenter are not overlooked; but all the new inventions and discoveries appertaining to these pursuits are published from week to week.

TO THE MILLWRIGHT AND MILLOWNER!

Useful and practical information pertaining to the interests of millwrights and millowners will be found published in the SCIENTIFIC AMERICAN, which information they cannot possibly obtain from any other source. To this class the paper is specially recommended.

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Subjects in which planters and farmers are interested will be found discussed in the SCIENTIFIC AMERICAN; most of the improvements in agricultural implements being illustrated in its columns.

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Individuals of both these classes cannot fail to be interested in the SCIENTIFIC AMERICAN, which contains the latest intelligence on all subjects appertaining to the arts and sciences, both practical and theoretical; all the latest discoveries and phenomena which come to our knowledge being early recorded therein.

WAR! WAR! WAR!

Our summary of the war news, which has been so highly complimented by our readers and cotemporaries, will be continued in the coming volume so long as the war lasts, accompanied with copious illustrations of new war implements of various kinds, such as cannon, firearms, projectiles, &c., &c.

TO ALL WHO CAN READ!

Everyone who can read the English language, we believe, will be benefited by subscribing for the SCIENTIFIC AMERICAN, and receiving its weekly visits; and while we depend upon all our old patrons renewing their subscriptions, we would ask of each to send us one or more new names with his own. A single person has sent us as many as a hundred mail subscribers, from one place, in a single year! The publishers do not expect every one will do as much; but if the five thousand subscribers, whose subscriptions expire with the present volume, will each send a single name with their own, they will confer a lasting obligation upon us, and they shall be rewarded for it in the improvement we shall be enabled to make in the paper by thus increasing our receipts. The following are the

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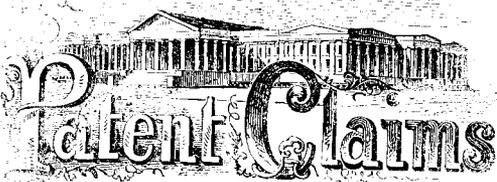
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ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 10, 1862.

Reported Officially for the Scientific American.

* * Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 2, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

35,497. James Adair, of Pittsburgh, Pa., for Improvement in Condensers for Oil Stills :

I claim the use of a worm chest, constructed substantially as described, immersed in a vat or vessel of water, for the purposes set forth.

Causing the oleaginous vapor to be condensed, to pass through a zig-zag passage one side of which is a water surface, in order to secure a more rapid condensation, and to enable the condensed fluid to be drawn off at different points, in the manner described.

So constructing the worm chest of the condenser as to separate the different qualities of oil by partitions, which the condensed fluid cannot pass, but which present no obstacle to the flow of the uncondensed vapor and gas through the worm, for the purpose set forth.

Admitting the cold water in a shower into the worm chest at its rear end by a perforated pipe, through which the gas and uncondensed vapor are compelled to pass in their exit from the condenser, substantially as and for the purpose described.

35,498.—J. R. Agnew, of Mercersburgh, Pa., for Improvement in School Globes :

I claim a globe made of textile fabrics either alone or combined with and strengthened, if desired, by wire netting or leather, substantially in the manner and for the purposes described.

[This invention consists in the employment or use of textile fabrics made either of mineral, vegetable or animal substances, or of leather, or such textile fabrics combined with each other or with leather, and strengthened if necessary by means of metal wire or other suitable material, for the purpose of manufacturing terrestrial, celestial, or terra-celestial globes.]

35,499.—A. G. Bradford, of Freeport, Ill., for Improvement in Chair Pumps :

I claim the combination of the buckets, with the handles and connecting rings, when used for the purpose of elevating water, or other fluids, substantially as specified.

35,500.—S. R. Brann, of Hillsboro', Ill., for Improvement in Dampers :

I claim the arrangement of the spring, E, in combination with double crank shaft, B, damper, A, rod, D, and stove pipe or flue, C, all constructed and operating substantially in the manner and for the purpose shown and described.

[This invention consists in connecting the expansion rod with the damper by means of a double crank shaft and spring, in such a manner that an expansion of said rod beyond a certain degree exerts no injurious influence on the connections or on the damper, and that when the damper is once closed and the rod contracts or expands, the entire strain exerted by the rod is thrown on the spring.]

35,501.—H. L. and C. P. Brown, of Shortsville, N. Y., for Improvement in Grain Drills :

I claim, first, The arrangement of the flanged disks, B C, circular chain, n, and adjustable gauging device, E, substantially in the manner and for the purpose described.

Second, The arrangement of the flat-sided shaft, D, disk, C, with inner hub, e, and stationary disk, B, with box, b, substantially in the manner and for the purpose described.

Third, The arrangement of the cut-off, F, and outer extension of the box, b, in combination with the inlet office, I, substantially in the manner and for the purpose described.

35,502.—N. T. Brown, of Ononwa, Iowa, for Improvement in Horse Rakes :

I claim the combination of the bars, B' B', with the straight rake teeth, c, rake head, a, slide, D, rod, E, slotted lever, G, and reversible lever, H, all in the manner and for the purpose shown and described.

[This invention relates to an improved rake of that class which are drawn by a horse or team, commonly termed horse rakes. The invention consists in the employment of a revolving rake and a stop attachment applied to a frame, and so arranged that the driver or attendant may, while either riding or walking, operate the stop attachment with the greatest facility to cause the rake to revolve and deposit its load, and then to stop the rake at the proper moment in order that it may load itself by the draft movement.]

35,503.—W. E. Browne, of Valley Falls, R. I., for Improvement in Explosive Projectiles for Ordnance :

I claim, first, The arrangement of the expanding wings, D D, to swing from recesses in the sides of the body of the projectile upon pins, c, c, arranged obliquely to planes passing through the axis of the projectile, substantially as and for the purpose set forth.

Second, The combination of one or more expanding wings, D D, attached to the sides of the projectile and one or more nipples, or their equivalents, provided on the said body for the reception of percussion caps or other percussion priming, whereby the said wings are made to constitute hammers for the explosion of the percussion priming, substantially as specified.

35,504.—T. J. Campbell, of Lincoln, Ill., for Improvement in Automatic Revolving Ordnance :

I claim, first, The application of the copying belt, operated by the action of the cylinder, B.

Second, I also claim the lubricating box, o, in combination with the reciprocating swab, m, and ramrod, n, substantially as set forth.

35,505.—P. S. Carhart, of Collamer, of N. Y., for Improvement in Cultivators :

I claim the means, substantially as shown and described, for regulating the depth of the penetration of the teeth, B, of the implement in the ground, to wit, the attaching of the draft pole, C, to the front bar, a, of the frame by a bolt, d, and having its back and connected to the back bar, a, of the frame by a rack plate, E, lever, F, provided with a toothed segment, I, and an adjustable pin, j, which fits in notches, k, in the plate, E, to operate as set forth.

[This invention relates to an improvement in that class of cultivators designed to be drawn by two horses, and be capable of being adjusted higher or lower, so that the latter may penetrate a greater or less distance into the earth, as circumstances may require.]

35,506.—Gardner Chilson, of Boston, Mass., for Improvement in Parlor Stoves :

I claim the separate grate rotator as made, not only with a grate attachment or device for connecting the grate with it, but with a head or its equivalent, for receiving a key or lever.

I also claim the construction of the ashpit mouth frame with a socket for the reception of the said grate rotator, made separate from the grate, and also in manner and so as to operate the grate, as specified.

I also claim the arrangement of the conical enlargement ring, the

fire chamber, the oven and the flue spaces about the sides and top of the oven.

35,507.—G. F. J. Colburn, of Newark, N. J., for Lamp Reflector and Chimney Protector :

I claim the arrangement and construction of a metal shield and reflector for lamp chimneys in the manner and for the purpose specified.

35,508.—Asahel Cooley, of Chicago, Ill., for Improvement in Pumps :

I claim, first, The manner described of felling the cylinder above the piston, to wit, by the employment of the induction ring valve, c, c, surrounding the bore of the cylinder at the top of the same, the posts, e, e, e, e, of which being so arranged as to direct the water underneath said valve, c, c, or be closed by the falling of the same, substantially as described.

Second, The eduction passages, I, r, s, t, or their equivalent, so constructed and arranged as to receive the water above the piston, and convey it underneath and through the eduction valve, I', substantially as described.

Third, The tubular piston rod, F, and eduction valves, i and s, arranged and operated substantially as described.

Fourth, The parts, G and d, d, arranged substantially as described, when combined with a pump cylinder and the tubular piston rod, F, for the purposes set forth.

35,509.—F. W. Dahne, of Swansea, Glamorganshire, Great Britain, for Improvement for Extracting Copper from Ores. Patented in England Sept. 26, 1860 :

I claim the roasting a mixture of copper ore with sulphate of iron so as to convert the copper sulphate and the iron into peroxide, and then separating the sulphate of copper by lixiviation, as described.

35,510.—J. S. De Haven, of North Springfield, Ohio, for Improvement in Grain Drills :

I claim the combination of the inclined and tapering metal tube, A, with the peculiarly-shaped cutting tooth, as represented, and the spreading bolt, I, constructed, combined and arranged in relation to each other, as shown and described.

35,511.—Henry Evans, Jr., of Baltimore, Md., for Improvement in Apparatus for Steaming Oysters :

In combination with a steam box I claim the cars and tracks constructed and arranged substantially as described.

35,512.—J. U. Fiester, of Winchester, Ohio, for Improvement in Cooking Apparatus :

I claim the combination and arrangement of the top plate, E, middle plate, D, lower plate, C, and baker, B, so as to form an improved apparatus for cooking before grates, constructed and operating substantially in the manner and for the purposes set forth.

35,513.—F. G. Ford, of New York City, for Improvement in Window Sash :

First, In the described combination with the movable beads, C, I claim attaching the suspension cords, F, to the sash by means of hooks, H, placed in cavities in the edges of the sash, admitting of the ready and complete removal of the sash from the window frame.

Second, I claim fastening the upper and lower sash together by means of a screw, M O P, guided by a pin, N, in the socket, L, so as to be retracted with the sash when the sash is to be raised or lowered, and protrude from the said socket and enter and bind within the nut, K, when the sash is to be raised or lowered and protrude from the said socket and enter and bind within the nut, K, when the sash is to be secured, all as explained.

35,514.—William Fradley, of Greenbush, N. Y., for Improved Cork Screw :

I claim the screw, K, and handle shaft, L, with their coupling heads, e and r, and their socket, a, the pin, p, in the shaft with its notch, f, in the top of the cylinder, E, the cylinder, E, with its groove, G, and a pin, of outer applicator, A, the whole operating together as a cork-screw, substantially in the manner set forth.

35,515.—John Gibson and Michael Heberger, of Cincinnati, Ohio, for Improvement in Hydrants :

We claim the combination of the elbow, C, screw-shanked cork, D, annular gasket, G, satchetion, E, e, and clamp nut, F, all constructed, arranged and employed in the manner and for the purposes set forth.

35,516.—Simeon Grover and Stephen Putnam, of Newton, Mass., for Improvement in Coal Sifters :

We claim the sifter, composed essentially of the inclosing and supporting rim, A, the suspension cross, or rim, C, and shaking handle, B, with their appendages, constructed and arranged so as to be used in connection with a common cask or barrel and coal sieve, substantially as specified.

35,517.—J. C. Hall, of Cincinnati, Ohio, for Improved Sofa Convertible into a Table, Trunk, Cot, &c. :

I claim the arrangement of box, A, a', seat, G, ledge, G', and hinges, E, hinged and folding back, B B', the whole forming a convertible cot, settee, desk and table, as described.

35,518.—A. G. Heckrotte, of New York City, for Improved Washing Machine :

I claim the combination of the rollers, b, the cylinder, D, and the spring bearings, i, when constructed and arranged substantially in the manner described and for the purpose specified.

And I also claim the arrangement of the revolving cylinder when constructed with fixed revolving rollers, as described, in combination with the concave of rollers, b, as set forth.

35,519.—V. W. Houck, of Buffalo, N. Y., for Improvement in Crozing Machines :

I claim, first, The endless revolving bed, composed of the jointed links, D, the said links being so constructed that a transverse surface line, which corresponds to an arc of the longitudinal curve of the barrel, or nearly so, for the purposes and substantially as described.

Second, Supporting the shafts, B', and hence the drums, B, in yielding journal boxes, b, in combination with the described endless revolving bed, for the purposes and substantially as set forth.

Third, Wheel formers made adjustable horizontally on the cross-pieces, G, and placed on a line corresponding to the longitudinal curve of the barrel, for the purposes and substantially as set forth.

35,520.—H. N. Houghton, of Halifax, and C. H. Denison, of Brattleboro', Vt., for Improvement in Shells for Rifled Ordnance :

I claim the employment of the screw bolt, F, applied as and for the purpose specified, as a fuse tube, substantially as described.

[This invention relates to the construction of the body of an elongated projectile of two or more pieces with interposed packing rings, the whole connected by a central screw bolt, which projects through the head of the projectile for the reception of a wrench by which it may be screwed up after the insertion of the projectile in the gun, for the purpose of drawing the said pieces together, and thereby so expanding the packing rings as to prevent windage in firing, and to make the packing enter the rifle grooves in case of the gun being rifled. The improvement consists in the employment of the aforesaid screw as a fuse tube by making it hollow for the reception of the fuse.]

35,521.—C. T. James, of Providence, R. I., for Improvement in Explosive Shells for Ordnance :

I claim, in combination with the conically-shaped base of the shot of hard metal, an expansible base piece of soft metal, arranged to operate substantially as described for the purpose set forth.

35,522.—E. A. Jeffery and J. D. Quackenbush, of Corning, N. Y., for Improvement in Pumps :

We claim, first, The combination and arrangement of the cylinder, A, with the parts constituting the valve chambers, D D, and with the packing chamber, H, so as to secure the suction and discharge pipes, G G and F F, in sockets in their respective parts, substantially in the manner and for the purpose shown and described.

Second, The india rubber rings, b, b, and perforated screw rings, d, d, so constructed and arranged as by their compression to pack not only the piston, but the joints, a, a, of the cylinder, substantially as shown and described.

Third, The passage, K, for admitting water to the stuffing box of the piston rod and maintaining it there under the discharge pressure of the pump, substantially as and for the purposes set forth.

Fourth, In combination with the foregoing, the perforated tube, p, and gasket, r, for excluding water from entering the cylinder from the stuffing box, substantially as set forth.

35,523.—George Jones, of Peekskill, N. Y., for Improvement in Sash Fasteners :

I claim the application of the yoke, swinging on a hinge, to the inclined plane, provided with notches, thus producing a perfect window-sash fastener and securing the effects described.

35,524.—Horatio R. Jones, of Addison, N. Y., for Improvement in Percussion-Cap Primer, for Firearms :

I claim the spring catch attached to the rear end of the capping tube to hold the trough or slide in its place, substantially as and for the purposes set forth.

35,525.—O. S. Judd, of New Britain, Conn., for Improved Means of Extinguishing Gas Lights :

I claim the sector, c, applied to the gascock and moved by a spring, or its equivalent, to shut off the gas, when the latch lever, g, is disconnected by the clock mechanism, as and for the purposes set forth.

35,526.—J. W. Kingman, of North Bridgewater, Mass., for Improved Mode of Making Buildings Waterproof :

I claim the new mode of rendering surfaces, (i.e., waterproof, the same consisting in applying, by rubbing to such surfaces, thin sheets of fibrous materials first coated with such a paste or cement as will permit waterproof liquids to pass through and then saturating them with such waterproof liquids as will pass through both the cloth and the paste, substantially as described.

35,527.—Sylvester Louis, of Rochester, N. Y., for Improved Mode of Treating Oils and Fats, for Rendering them more Useful for Burning in Lamps, Lubricating Machinery and other Purposes :

I claim the treatment of vegetable and animal oils and fats, by the use of benzole or naphtha and amoniac combined, substantially in the manner and for the purposes described.

35,528.—Lafayette Louis, of Buffalo, N. Y., for Improvement in Pianos with Melodeon Attachment :

I claim, first, The arrangement of a melodeon tube board, including reeds and swell, above the keys and below the sounding board of a pianoforte, in the manner and for the purpose and substantially as described.

Second, So combining and arranging a melodeon tube board with a pianoforte as that the performer can instantly and at pleasure disconnect the melodeon tube board from the pianoforte keys, in the manner substantially as set forth.

Third, The combination and arrangement of the tremolo, G, with the melodeon tube board, E, and pianoforte, substantially as described.

Fourth, The combination of a compound rotary bellows with a pianoforte and melodeon, the bellows being provided with a valve, I, for regulating the degree of air pressure upon the melodeon reeds, substantially as set forth.

35,529.—W. W. Lyman, of West Meriden, Conn., for Improved Fruit Can :

I claim producing the openings, e, in combination with the stopper, a, and ring, h, substantially in the manner and for the purpose described.

35,530.—E. A. McAleer and J. Shively, of Canton, Ohio, for Improvement in Weighing Faucets :

I claim, first, The combination with valve, C, of the platform, and peculiarly constructed weighing-scale beam, E, substantially as set forth.

Second, The combination of the rear valve, e, main valve, C, with the spigot, substantially as and for the purposes set forth.

35,531.—R. W. McClelland, of Springfield, Ill., for Improvement in Hubs and Journals for Carriage Wheels :

I claim, first, In connection with a cast-iron hub made in two sections, the driving in of the spokes radially into one of the sections, in combination with the shoulder, recessed flanges and screw threads, to receive and hold the two sections to each other and to the arched part of the spokes, substantially as described.

I also claim, in combination with a cast-iron hub, sectional, adjustable, and removable metal boxes to take the bearings of the journal, substantially as and for the purpose set forth.

I also claim, in combination with sectional adjustable boxes in the hub, the removable bearings on the journal of the axle, substantially as and for the purpose set forth.

35,532.—J. W. Merrill and J. H. Rowe, of Boston, Mass., for Improvement in Feet-Warming Apparatus :

I claim the separate foot case or cases as combined with and applied to the stand, and made substantially in the manner and so as to operate as described.

35,533.—W. O. B. Merrill, of Philadelphia, Pa., for Improvement in Coal-Oil Burners :

I claim, first, The smoke consumer composed of a metal plate with the flat projections, f, f, and turned-up projections, d and d', when arranged within the perforated casing, A, of a coal-oil lamp burner, as and for the purpose set forth.

35,534.—W. O. B. Merrill, of Philadelphia, Pa., for Improved Coal Oil Lamps for Railway Cars :

I claim the chimney composed of the hollow metal cap, B, glass tube, A, and metal base, C, with the projections, E, and E', or their equivalents, for the attachment or suspension of the chimney to the side or roof of a car or to any other object, in combination with the detachable reservoir, D, and its burner.

Second, The projections, s, s, on the reservoir, in combination with the openings, m, m, on the flange, i, of the base, C, the spring, c, its rod, b, and the stop, a.

Third, The combination and arrangement of the base, C, flange, e, perforated flange, i, and perforated cap, H.

35,535.—W. O. B. Merrill, of Philadelphia, Pa., for Improvement in Lamp Chimneys :

I claim a lamp chimney, composed of a metal base, A, with an annular projection adapted to the burner of a lamp, and two or more plates of plain glass confined by metal ribs or plates, substantially as and for the purpose set forth.

I also claim hinging one or two more of the said plates or ribs to the base, and confining the same at the top, by the attachable cap, G, as specified.

35,536.—Franklin Miles, of Rochester, N. Y., for Improvement in Fanning Mills :

I claim compounding the motion of the shoe or shoes when shaken horizontally, by the addition of the abrupt vertical vibration or jar, by means of the double bearing, H, of the rock shaft, c, and the sockets, g, g, substantially as and for the purposes described.

I also claim the combination and arrangement of the grass-seed box, h, hopper, S, sieve, m, and fan, F, substantially as and for the purposes described.

I also claim the feed board, L, provided with the guide stem, T, and spring, u, when used in combination with the hopper for adjusting and holding the same, substantially as set forth.

35,537.—N. W. Northrup, of Greene, N. Y., for Improvement in Railroad Chairs and Rails :

I claim a double-headed rail with the ribs or flanges and shoulders, with the chair composed of the two jaws, grooves, flanges, slots, and wedge shape movable jaw, combined as specified and for the purpose set forth.

35,538.—J. H. Norton, of Boston, Mass., for Improvement in Gas Regulators :

I claim the chamber, G, into which the gas is poured from the inlet pipe, H, in combination with the valve, f, communicating with the pressure chamber, D, when said valve is commanded by the quick-silver cup, M, suspended directly from the inverted cup, C, substantially as specified.

35,539.—M. P. Norton, of Troy, N. Y., for Post Office Way-Bill Envelope :

I claim a Post Office way-bill envelope, constructed substantially as and for the purpose described and set forth.

35,540.—Jonathan Parker, of Biddeford, Me., for Improvement in Churns :

I claim the dasher as made with perforations, arranged at an inclination to its faces, to operate in manner substantially as specified.

35,541.—Moses Pond, of Boston, Mass., for Improvement in Heaters :

I claim the upper joint of the pipe, consisting of the cup or its equivalent, with the sand and the collar, N, with its elongated slots, K K', and the rim projecting into the cap or its equivalent, all constructed substantially as above specified and operating as described, so as to allow the expansion and contraction of the pipe, and at the same time, by making the joint air tight to prevent gas and smoke from escaping into the hot-air chamber.

35,542.—Paul Prybil, of New York City, for Improved Tension Regulator for Sewing Machines :

I claim, first, The arrangement of the friction pulley, D, with the conical hub, E, in combination with the screw spindle, G, and spring pad, F, constructed and operating substantially as and for the purpose specified.

Second, The arrangement of the elliptical nut, d, on the spring, H, in combination with the screw spindle, G, and pulley, D, substantially as and for the purpose described.

Third, The recess, e, and shoulder, on the screw spindle, G, in combination with the lower part, g, of the nut, d, as and for the purpose set forth.

35,543.—M. A. Richardson, of Sherman, N. Y., for Improvement in Machine for Working Butter :

I claim the employment of the tub, G, worker, H, and shaft, D, with the arm, C, and hinged extension, C', the several parts being constructed and arranged to operate in the manner and for the purpose specified.

Second, The use of the lever, a, upon which the bottom of the shaft, D, is situated, for in which it has its bearings for the purpose of throwing out of gear the lower end of said shaft, as is fully set forth.

Third, The use of the bar, L, lever, M, and scale, N, when used with the standard, B, as and for the purpose specified.

35,544.—Michael Ritner, of Vincennes, Ind., for Improvement in Sabot for Projectiles of Rifled Ordnance :

I claim a hollow sabot of vulcanized india rubber, constructed substantially as described, and applied in the rear of a cannon ball or other projectile without enveloping the same or being attached thereto; constituting a cushion to receive the percussive force of the explosion, and adapted to expand by the pressure of the gases so as to effectually prevent their escape.

[The object of this invention is to permit the use of leaden projectiles in guns of large caliber. The sabot is made to act both as a cushion and a packing, and prevents the slugging of the ball either by the heat, friction or percussive force of the gases.]

35,545.—Henry Ruth, of Summerfield, Ill., for Improvement in Corn Planters :

I claim, first, In combination with the rollers, L, the toothed curved plates, M, arranged in a hinged frame as described.

Second, The cam, F, in combination with the valve, E, constructed and arranged as described.

35,546.—J. L. Sater, of Cincinnati, Ohio, for Improvement in Planting Machines :

I claim the combination of the hollow perforated open cylinders, B B, with the grain boxes, A A, when the said hollow cylinders are combined with the obliquely-perforated segmental blocks, D D, and the conducting tubes, E E, in the manner and for the purpose substantially as set forth.

35,547.—W. C. Shipherd, of Saratoga Springs, N. Y., for Improved Boot-Crimping Device :

I claim the notches, i, o, made respectively in the tree, E, and plates, k k, of the clamp, G, as shown, in combination with the clamp for m of the nuts, p, screw rods, p', and clasps, q, all arranged as shown for the purpose of securing the crimped leather to the tree.

[This invention consists in the employment of a boot-tree attached to a sliding frame, in such a manner that it may be readily removed therefrom when necessary, in connection with a crimping clamp and a series of tree clamps, all being so constructed and arranged that the uppers and legs of boots may be neatly crimped at a single operation, and then secured to the tree with great facility.]

35,548.—J. N. Smith, of Jersey City, N. J., for Improvement in Repeating Firearms :

I claim, first, Ejecting the charge case laterally from the bore of a gun, through an opening made in the side of the bore, in the manner substantially as described.

Second, The employment of the carrier, F, or its equivalent for opening the gun to introduce the charge, substantially as set forth.

Third, I claim the arrangement of the feed wheels, M, and N, the same being connected by the spring, j, and forming a compound wheel for bringing forward the charges automatically and with precision, as specified.

35,549.—J. N. Smith, of New York City, for Improvement in Coal-Oil Lamps :

I claim the flexible lifting cup, L, constructed and operating substantially as and for the purpose specified.

I also claim the combination of the flexible lifting cup, L, and disk, J, united and arranged with their apertures, i, and j, substantially as and for the purpose set forth.

I also claim the evaporating tank, P, with its open aperture, p, or its equivalent, substantially as described, and applied to the lamp for the purposes specified; and this I claim whether arranged and applied as described, or in any other way combined with a lamp to produce the effects, and for the purposes set forth.

I also claim the safety valves, F G, and K, applied to the oil passages, and operating substantially in the manner and for the purposes described.

I also claim the employment of a retort, for vaporizing the oil at the burner of a lamp, substantially as and for the purpose specified.

I also claim the separate oil chamber, r, in the retort, so arranged as to cut off or let on the supply of oil thereto from the oil reservoir at pleasure, substantially as specified.

I also claim the separate vaporizing chamber, X, in the retort, arranged so as to be cut off from, or connected with the oil chamber, r, substantially as set forth.

I also claim the retort cap, T, arranged so as to regulate or close the flame orifice of the burner, substantially as specified.

I also claim the rarifying chamber, V, substantially as and for the purposes set forth.

I also claim the chamber, W, arranged and operating substantially as and for the purpose specified.

I also claim the radiating cone, U, constructed, arranged and operating substantially as and for the purposes set forth.

I also claim the small auxiliary burner, situated within the rarifying chamber, V, substantially as and for the purposes specified.

I also claim the double cone, Y, arranged and operating in combination with the small burner, substantially in the manner and for the purposes described.

I also claim the register plate, Z, for controlling the introduction of the draft air and vapors into the rarifying and blaze chambers, V W, in combination therewith, substantially as and for the purposes specified.

35,550.—B. F. Southgate, of Bridgewater, Vt., for Improved Sawing Machine :

I claim the levers, N N, provided with the pawls, O, and operated from the saw gate or sash as shown, in combination with the ratchets, M M, shafts, L, and the cords or chains, K, or their equivalents, all arranged substantially as shown for giving the feed movement to the carriages, I, as set forth.

[This invention relates to a new and improved sawing machine of that class designed more especially for sawing small stuff, as for instance felloes for wheels, scroll work and the like. The object of the invention is to obtain a machine which may be used with either one or two saws in the same gate or sash, and be provided with a simple automatic feed mechanism, all being so arranged that both saws may be used simultaneously on different work, or either used separately, as may be desired.]

35,551.—James Spear, of Philadelphia, Pa., or Improvement in Stove Doors :

I claim the combination of the openings, b b', at the bottom of the door and the opening, a a', at the top of the frame when in connection with the mica and metal plate or wire gauze, constructed substantially as described.

35,552.—Albert Taplin, of Providence, R. I., for Improved Burner for Coal Oil Lamps :

I claim turning the rim of the cone upward at A A, and outward at B B.

35,553.—James Thierry, of Aurora, Ill., for Improvement in Machines for Turning of Grindstones :

I claim the combination of a circular cutting tool, C, a spindle, D, and a frame, F, together with the wedges, K K' K'' K''', or their equivalents, with a grindstone-turning machine so constructed that it will operate by the joint effects of its contact with a grindstone in motion, and the inclination of said spindle in relation to said grindstone, as described above substantially.

35,554.—G. M. Thomas, of New York City, for Improved Lemon Squeezer :

I claim a cast metal lemon squeezer, composed of two handles, A A', connected at their front ends by a fulcrum pin, a, and provided respectively with bowls, B C, one fitting within the other and below the handles, substantially as described.

[This invention consists in constructing the squeezer of cast metal and of such form or in such a manner that a very durable, economical and light implement for the purpose is obtained, and one that may be manipulated or operated with greater facility than the ordinary kinds in general use.]

35,555.—C. A. Wheelock, of Uxbridge, Mass., for Improved Steam Trap :

I claim my improved steam trap, as made substantially as before described; that is to say, not only with an abutment, E, and with the valve and stem separate from such abutment, and movable with the pipe as explained, but with the valve so arranged as to be closed by pressure of the steam, and opened by contraction of the pipe under circumstances, substantially as above set forth. And, furthermore, in connection therewith, I claim my improved arrangement of the valve seat or the same, and its exhaust passage relatively to the valve stem and its stuffing box, whereby the latter is separated or insulated from the pressure of the steam of the expansion pipe, as specified.

35,556.—E. A. Wible, of Georgetown, Cal., for Improvement in Preserving Grapes and other Fruit :

I claim the packing of fruit sprinkled with powdered alum in layers, between layers of dry sand, in air-tight boxes, substantially as specified.

[This invention is stated by the inventor to be capable of preserving grapes in their natural state for a year. The claim describes its nature.]

35,557.—G. G. Wolfe, of Troy, N. Y., for Improvement in Stoves :

I claim the combination of the partition, F, with the fire cylinder, B, substantially as described and set forth.

35,558.—W. A. Wood, of Hoosick Falls, N. Y., for Improvement in Harvesters :

I claim, first, Uniting the platform to the main frame by the bent rod, a, and hinged rod, e, and their appliances, so that the platform may be raised or lowered on the main frame, substantially as described.

I also claim the plate, d, as forming a hinged support to the rod, e, and a means of uniting the platform and finger bar, substantially as described.

I also claim the device for raising and lowering the outer side of the platform, namely, the sleeve and its adjusting holes on the arm or outside wheel supporter, E, and similar adjusting holes in the rod, c, and a pin or key passing through them, substantially as set forth.

35,559.—A. J. Bowen (assignor to himself, and L. K. Bowen), of Baltimore, Md., for Improvement in Tobacco Pipes :

I claim the two tubes or channels, a, and b, in the stem, in combination with the bowl, c, and cup or receptacle, d, as set forth.

45,560.—J. E. Everett (assignor to W. Everett and Co.), of Dedham, Mass., for Improved Wringing Machine :

I claim the above described water-conducting attachment for clothes wringers, consisting of the conducting box with its longitudinal partition, e, and trough, D, which may be moved to either side of the partition, substantially as specified.

35,561.—J. H. Fairchild (assignor to himself, and C. P. Stimets), of Highgate, Vt., for Improved Sap Bucket for the Manufacture of Maple Sugar :

I claim the combination of the cement and box for the specific purpose of catching sap or a sap bucket to be used in the manufacture of maple sugar.

35,562.—Hezekiah Conant (assignor to the Willimantic Linen Co.), of Willimantic, Conn., for Improvement in Machines to Label Thread Spools :

I claim, first, The combination of feeding, holding, punching, pasting, applying and ticket-presenting apparatus, all substantially such as described.

Second, I claim the combination, substantially as described, of feeding, withholding mechanism or apparatus, and I claim these in combination with applying mechanism, only substantially such as specified, or in combination with punching out and applying mechanism, substantially such as specified.

Third, I claim punching out and applying mechanism substantially such as described in combination with pasting mechanism, substantially as specified.

Fourth, I claim a ticket-presenting apparatus, substantially such as described, in combination with punching and applying mechanism, substantially such as specified.

Fifth, I claim the combination of punching with applying mechanism, each having a mode of operation, substantially as set forth.

Sixth, I claim in combination with ticket-presenting mechanism substantially such as described a holding mechanism, substantially such as specified.

Seventh, I claim in combination a rack, a bolt and a frame provided with projections, all substantially such as specified and operating as described.

Eighth, I claim in combination a carriage, a rack, and a bolt, substantially such as described, in combination with a frame having projections, all substantially such as specified.

Ninth, I claim in combination a rack, a carriage, and a bolt, and two pawls provided with proper mechanism, substantially such as described for causing them to act alternately, as specified.

Tenth, I claim a feeding trough adjustable toward and from a gate, substantially as described, in combination with a forked gate, whose range of motion is adjustable, whereby the same holding mechanism may be adapted to hold and center articles of different sizes.

Eleventh, in combination with a trough or lower support for a spool or similar article, I claim two forked gates, each having an independent downward motion substantially as specified, whereby articles of different diameter at opposite ends may be more accurately held, when acting in combination with proper mechanism for applying labels or tickets thereto.

Twelfth, I claim in combination ticket presenting, punching, applying and pasting mechanism, all substantially such as described.

35,563.—George Cook, of Bristol Station, Ill., assignor to himself and William Scarlett, of Aurora, Ill., for Improvement in Harrows :

I claim, first, Inclining the teeth of a harrow at the will of the operator, so as to discharge the obstructions accumulated therein, and restoring the same to their positions for working, without lifting the harrow, all substantially in the manner set forth.

Second, The arrangement of the teeth A, beams 1 2 3 &c., eyes C C' and D D', and a suitable force for extending and contracting the same, so as to operate as set forth.

Third, The employment of the lever, F, and links, H, as arranged relatively to the beam, 1 2 3 &c., and to the eyes, C C' and D D', and links, c and d, as to operate as set forth.

Fourth, The uniting or connecting of the rods, H, to an eye, G, which is higher than the eye or steeple, E, to which F is connected so that the extending and contracting force applied to the harrow by the elevation and depression of F, shall act diagonally in the vertical plane as set forth.

Fifth, I claim connecting the lever, F, and the drag link, B, to a point, E, forward of and lower than the center of the front beam 1, substantially as and for the purpose set forth when the parts are arranged relatively to the several other cross beams, 2 3, &c., and their connections, and to the links or bars, H, as shown.

Sixth, I claim securing the lever, F, in different positions by means of the notches, i i', in the posts 1, in combination with the other parts, substantially as represented, for the purpose of holding the teeth firmly in the several positions desired for working in various soils.

35,564.—J. R. Hyde (assignor to Charles Eddy & Co.), of Troy, N. Y., for Improvement in Stoves :

I claim the suspending of the said boiler, D, at the upper corners thereof next adjoining the stove, by means of the brackets, b b, in combination with the brackets, c c, projecting from the said boiler, D, into the recess, a, of brackets, b b; so that, by the weight of the water in the said boiler, it will be brought into close conjunction with and with the stove, thus connected with said boiler, substantially as described and set forth.

35,565.—Luke Kavanagh (assignor to himself, and Gage, Campbell & Gage), of Waterford, N. Y., for Improvement in Burrs for Knitting :

I claim a rotary knitting burr, having removable wings, A, held sta-

tionary within oblique radial slots, b, in a hub, c, by means of detachable rings or disks, D D, engaged with and clamped against the ends of the wings, substantially as set forth.

35,566.—James McNamee (assignor to himself and H. F. Steckel), of Easton, Pa., for Improvement in Registers for Bar Rooms :

I claim the box, A, provided with the numbered compartments, B, having a tilting or movable bottom, D', in connection with the drawer, E, also placed in the box, A, and arranged with the compartments, B, substantially as and for the purpose specified.

I further claim the passages, D, numbered as shown at the front of the box, A, and provided with the inclined bottoms, b, when said passages are used in connection with the numbered compartments, B, tilting or moving bottom, D', and drawer, E, for the purpose set forth.

35,567.—Stuart Perry, of Newport, N. Y., assignor to C. H. A. Carter, of New York City, for Improvement in Horse Powers :

I claim, first, supporting the end of the shaft, B, in or near the center of the main drive wheel, E, for the purpose substantially as described.

I also claim, in combination with a main drive shaft that has upon its outer end a wheel that may run over an uneven track, the hanging of the opposite end in a rocking or pivoted box, to yield thereto, substantially as described.

I also claim, in combination with a main drive wheel, E, and the bevel pinion, g, the compound pinion, F, composed partially of square and partially of beveled teeth, substantially as and for the purpose set forth.

35,568.—George Potts (assignor to himself, Joseph and William and A. and J. R. Potts), of Yocumtown, Pa., for Improved Washing Machine :

I claim, the combination and arrangement of the vat, A, links, G G, rock shaft, I, and levers, E E, firmly or rigidly fastened to the rubber, D, substantially as described, for the purposes set forth.

35,569.—J. M. Sanborn, of Hardwick, Vt., assignor to himself and E. M. Gifford, of Wolcott, Vt., for Improved Portable Milk Cooler :

I claim the new article of manufacture described, adapted to the filtering of milk or other liquid through water so as to change its temperature, and to be readily applied to and removed from an ordinary vessel, substantially as and for the purpose set forth.

35,570.—Rufus Sibley (assignor to Samuel Mowry), of Greenville, Conn., for Press for Photographs :

I claim, in combination with the bed and rails, the traveling truck or carriage, and the polishing roll, operating in connection therewith, substantially in the manner and for the purpose described.

35,571.—J. E. Smith (assignor to himself and C. T. and J. N. Chester), of New York City, for Improvement in Electro-Magnetic Telegraphs :

I claim, the combination of electro-magnets in a main telegraph circuit substantially as described, whereby the vibrating armature lever of the first or receiving magnet is made to discharge or neutralize the escape or abnormal currents flowing through the second or working magnets when the main circuit is opened in the operation of telegraphing, substantially as set forth.

35,572.—R. M. Treat (assignor to himself and G. H. Daley), of Morris, Conn., for Improvement in Horse Rakes :

I claim, first, The rigid bars, d d, or their equivalent, extending out from the back of the turning axle, A a b, beyond the rear of the circumference of the wheels, for supporting a long rake with short teeth, in the manner and for the purpose as described.

Second, The swinging, adjustable clearer or discharger, G, arranged and operating substantially in the manner and for the purpose described.

Third, The rake, F, in combination with the curved eccentric rods, g g, and discharger or clearer, G, constructed and operating substantially in the manner and for the purpose described.

Fourth, The arrangement of the wheels, C, axle, A a b, shafts, B B, seat D, bars, d d, and rake, F, with hand lever, H, in the manner and for the purpose described.

35,573.—W. H. Willard (assignor to Sarah E. Willard), of Cleveland, Ohio, for Improved Apparatus for Adjusting Propellers relatively to the Draft of Water.

I claim, the combination of the oscillating bed plate, A, rotating packer, B, and guard or fender, F, constructed substantially as described, and for the purposes set forth.

35,574.—Smith Groom, of Troy, N. Y., for Improvement in Stoves :

I claim the introduction of highly-heated steam into the fire chamber, by means of annular chambers or pipes surrounding the said fire chamber on the inside thereof, and having therein apertures through which such steam or hydrogen is admitted into the fire around the outside thereof, whereby combustion is greatly aided and the fuel economized, substantially as described and set forth.

35,575.—James McCholland, of Reading, Pa., for Improvement in Giffard's Injector :

I claim the chamber, A, with the branch, c, communicating with the boiler and branch, b, for the water, in combination with the nozzle, B, for the steam; the whole being formed and arranged substantially as and for the purpose set forth.

DESIGN.

1,604.—G. L. Kelly, of New York City, Design for Tassel Tops.

TO OUR FRIENDS.

NOW IS THE TIME TO FORM CLUBS.

The present number closes another volume of this journal. We appeal to its friends in all sections of the country where mail facilities exist to endeavor to form clubs for the coming year. We feel justified in asserting that no other journal in this country furnishes the same amount of useful reading, and especially at the extraordinarily-low price at which it is furnished. Ten persons can club together and get the paper at \$1 50 each for one year. Twenty persons clubbing together can have it at the rate of only \$1 40. Think of getting a volume of 832 pages of useful reading matter, profusely illustrated with between 500 and 600 original engravings, for such a small sum of money. Single Subscriptions, one year, \$2; six months, \$1. Even though the times may be hard, we must keep reading and thinking, and thus be prepared to overcome temporary difficulties and open new channels of wealth and prosperity.—Friends, send in your clubs; at least renew your own subscriptions promptly.

How's Queries

J. B. C., of Ohio.—On page 169, Vol. VI. SCIENTIFIC AMERICAN, you will find an instructive article on the subject of India-rubber rollers for washing machines.

W., of Lowell.—We do not think your improvement in torpedoes patentable. A similar water-proof joint has been applied to other uses, and its application to a torpedo would be a mere double use.

Maple Sirup.—A. D. Smith, of Danby, Vt., is the manufacturer of a most excellent quality of maple sirup. We speak from experience.

S. F., of Pa.—The 15-inch smooth-bore guns to which you refer are for the navy; the 12-inch rifled guns are for forts, one 12-inch rifled gun has been made already at the Fort Pitt works.

A. L., of Mass.—The chloride of lime is bleaching powder, and consists of dry lime in powder saturated with chlorine gas. It will not do to use it for whitewashing the walls of rooms.

C. R. B., of Kansas.—You will find that it takes but little, if any, more fuel to keep your boiler 15 lbs. above the working pressure in your cylinder. Fuel is always wasted when the steam is allowed to run down.

J. A., of Ill.—India rubber is not soluble in alcohol, but neither it nor gutta percha makes good vessels for containing alcoholic spirits. A small quantity of essential oil in these gums imparts a disagreeable taste and odor to spirits.

R. S. L., of Ohio.—The quantity of water, in pounds, falling in one minute, multiplied into the perpendicular height of your fall, and divided by 33,000, will give you its horse power, from which it is common to deduct one-third for friction leakage, &c.

J. H. F., of Kansas.—If you wish to keep steam up in your boiler at a working pressure all night, to start your engine in the morning without kindling a fire, of course you must expect your boiler to wear out somewhat faster than otherwise.

J. R. B., of N. J.—Dry loam or charcoal dust is superior to lime for spreading on the floor of a hen house. Old india-rubber shoes may be patched by the use of warm india-rubber cement, and patches of old rubber laid on and pressed down with a flat iron.

SPECIAL NOTICE—FOREIGN PATENT.—The population of Great Britain, is 30,000,000; of France, 35,000,000; Belgium, 5,000,000, Austria, 40,000,000; Prussia, 20,000,000, and Russia, 60,000,000. Patents may be secured by American citizens in all of these countries.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, June 18, 1862:—

- J. C., Jr., of N. Y., \$10; S. W., of Mass., \$25; J. H. & E. H. A., of Md., \$15; P. A. S., of N. Y., \$40; T. D. L., of N. H., \$15; J. McK., of England, \$15; J. J. E., of N. Y., \$75; J. W. S., of N. Y., \$15; H. S. & H., of Iowa, \$15; U. H. S., of Ill., \$25; T. & R., of Ind., \$20; J. F. D., of Ind., \$15; W. V. K., of Pa., \$12; L. H., of Me., \$15; A. H. E., of N. Y., \$250; W. J., of Minn., \$15; A. & M., of Wis., \$40; G. D., of

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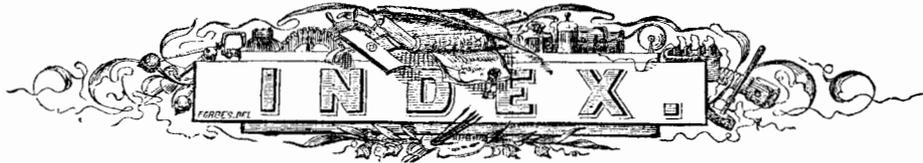
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ILLUSTRATIONS.

- Ammunition box for army officers (Hirschbuhl) 272
Annunciator, telegraphic hotel (Bennett) 97
Armor plates to war vessels, mode of fastening (Love) 176
Army chair, folding (Hardy) 400
Balance, compensating spring (Squier) 8
Beehive, patent (McGonnigle) 240
Blasting and splitting stumps with percussion cartridges (Norton) 212
Block, ship (Hussey) 304
Boiler and steam generator, combined (Friedle) 56
Boot patterns (Forrest and Wheeler) 33
Bread and pastry board and flour chest combined (McNamee) 72
Breech-loading cannon (La Boyteaux and Dangerfield) 112
Breech-loading gun (Berg) 344
Breech-loading rifles (Spencer) 49
Broom, home-made corn (Kauffman) 32
Burner, gas (Monier) 200
Burner, star (Pratt & Rosccrans) 32
Candle molds (Ryder and Leonard) 129
Candlestick, camp (Marsden and Burrell) 4
Cannon, mode of making (Yeake) 225
Cannon, mode of mounting (Hopkins) 116
Cartridge (Richard) 55
Cartridge (Mayberry) 277
Carbureting apparatus (Bassett) 280
Carbureting apparatus for street lamps (Shepherd) 181
Casting bronze ordnance or other articles (Revere) 256
Chair, rattan suspension (Leonard) 337
Chairs, improved railroad (Hall) 350
Chimneys, mode of securing lamp (Jacobs) 402
Clothes bar, portable (Willard) 152
Clothes dryer (McNeil) 288
Compass, army and travelers' (Hunter) 380
Coupling, automatic car (Birch & Noble) 224
Cranks (Bryant) 283
Cut-off, variable (Walbridge) 162
Detector, low-water (Blake) 113
Ditching and tile-laying machine (Foster & Chaffee) 136
Drains, forming cement (Watson) 53
Drawbridge for canals, &c., self-acting (Schneider & Montgomery) 180
Ericsson, Captain John (Portrait of) 209
Evaporator (Tufts) 264
Exhaust, variable (Lathrop & Co.) 260
Fagoting rails (Perry & Onion) 264
Fire alarm (Cooper) 332
Flywheels, mode of hanging, (Bryant) 114
Fractured limbs, relief for (Yerger) 148
Galena, iron-plated steamer (Corning, Winslow & Co.) 244
Grain separator (Higley) 104
Grate, vibrating (Brown) 376
Grindstones and turning them true, rotary machine for sharpening (Schuyler) 376
Gun, self-loading (Brady & Noble) 82
Guns, submarine (Page) 320

- Hammer roller for making iron plates (Beach) 370
Harvesters, sickle bar for (Smith) 368
Harvesters, self-raker for (Russell) 312
Hat and cap, army (Warburton) 200
Hay rack (Strive) 256
Hooks, safety (Beagle) 216
Horse rake (Mellinger) 401
Knife sharpener and scourer (Buckman) 88
Knife, budding (Gird) 160
Knife, fork and spoon for the army (Neill) 232
Lamp attachment for carriages (Scheeper) 16
Lamp burner, patent excelsior (Newman) 132
Lamp, patent kerosene (Mayhew) 112
Lamp, coal oil (Tritton) 120
Lathe, engine (Walbridge) 216
Lathe for turning irregular forms (Blanchard) 48
Lathes, centering chucks for (Keage) 1
Lock for the nuts of railroad bolts (Lawrence & White) 80
Merriman, the early prototype of the (Greig) 352
Mines, iron-plated rebel steamer, 192
Metallic packing for engine pistons (Horton) 184
Momentum cylinder brake (Ambler) 385
Monitor, steam battery (Ericsson) 177
Nutcracker, spring (Clark) 37
Nut cracker, patent (Smith) 136
Ordnance and gunnery (Van Nostrand) 308
Oyster dredge (Force) 37
Paddle wheels, feathering (Kepner) 344
Pitch square (Iseman) 403
Planing machine (Whitelsey) 193
Planter, hand-corn (Shores) 272
Press, toggle-joint (Oxston) 259
Projectile (Rippon) 384
Propeller, light-draft (O'Hara) 340
Protector and reflector for glass-lamp chimneys (Colburn) 373
Pump, two-stream (Budd) 406
Pumps, piston packing for 64
Rake, horse (Buckman) 8
Refrigerator, revolving (Ellicott) 184
Rotary engine (Cox) 257
Saw mill (Walbridge) 305
Saws, segmental circular (Hawley) 4
Scraper, road (Brooks) 243
Screen for flour bolts (Lands) 220
Screw machine (Browne & Sharpe) 321
Scrubber, combination map (Price) 53
Sewing machine improvements (Wheeler & Wilson) 1, 312
Sewing machines, order for (Brady) 69
Shingle and heading machine, combined (Trevor & Co.) 320
Silk-sorting machine (Atwood & Leigh) 65
Skate, spring (Goodyear & Sprague) 40
Sled, coasting (Brown) 296
Stamp for post offices, railroads, &c., band (Norton) 304
Stamp, hand (Spencer) 296
Stave machine, patent (Sisson) 368

- Steam boilers, safety guard for (Mann) 168
Steam engine, improvement in the (Carpenter) 354
Steam engine, portable (Walbridge) 40
Tapping machine (Browne & Sharpe) 321
Telegraph, light (Colvin & Gardner) 328
Tent, army (Rankin) 80
Tent, army (Townsend) 208
Ventilating apparatus for ships, hospitals, dining-rooms, &c. (Peteler) 120
Ventilator for houses (Williams) 336
Washing machine and planer (Gill, Palmer & Webb) 196
Washing machine and wringer (Smith) 24
Wheel, turbine (Russell) 273
Well curb (Shepherd) 292
Wool-washing apparatus (Turner & Robinson) 17
Wheel, water (Van Dewater) 232
Wrench and sawset, patent (Rawson) 88

MISCELLANY.

- Aceteline, artificial 312
Adamas—soapstone 402
Adamas, the new material 291
Advertisements 15, 31, 47, 63, 78, 94, 111, 127, 143, 159, 175, 196, 207, 223, 239, 255, 271, 287, 303, 319, 335, 351, 367, 381, 399
Agassiz, the life work of 23
Agassiz in Brooklyn, Professor 105
Agassiz and Oken dining on potatoes 53
Agassiz as a lecturer 137
Agassiz to Dr. Bache, a tribute by Professor 355
Air, purifying 197
Alcohol, its uses 3
Albert, Prince 86
Albert, death of Prince 9
Albert, medical treatment of the late Prince 39
Air, sunshine and health 119
Alleghany bituminous coal field, &c. 405
Alloy, a new 296
Alloy, a new fusible 211
Amalgam applications 336
Amalgamating system, Piedmont gold mining and 298
American machines in England 52
American enterprise and British jealousy 315
American steamer for China—her steam engine 170
Aniline, to prepare 81
Aniline color, painting with 117
Aniline a powerful remedy for nervous diseases such as St. Vitus's dance 49
Animal substances, preserving 388
Animals have daily exercise, let 311
Anchor ice 166, 214, 262
Annealing steel and hardening dental instruments 42
Anthracite fire, management of 70
Ants, scientific 187
Apple orchard, plant a 379
Arms plates, daily exercise of 281, 229*
Armory, Northwestern 38
Arms, curious collection of 187
Arms, rifled small bore—Enfield's condemned 91
Army uniforms 7
Army and navy, jealousy between the 201
Art, a splendid work of 163
Artillery, powerful—iron forts and improvements in iron and steel 167

- Artillery matches and signals 202
Artist, fortunes and misfortunes of an 87
Asteroid discovered, another 261
Astor library—resignation of the librarian 54
Atlantic cable again 401
Ball, the motion of a 312
Balls to the right, deviation of 293
Bank suspensions 27
Banquet in sewer, a 363
Barometer, the simple 70
Barometers, home-made 39
Barometers and hygrometers 150
Baskets, patent moss 313
Batteries, stationary and floating revolving iron-clad 274
Battery, new marine 280
Beauregard and the SCIENTIFIC AMERICAN, General 394
Bee, the queen 107
Bees, wintering 39
Beet root, cultivation and sugar of 313
Belt on a quarter twist, to set a 358
Benzine in varnish making, dangers of 193
Benzine, dangerous character of 116
Benzole for making varnish, to purify 55
Bessemer process, secrets of the 297
Bessemer steel for guns 11
Bevels, rule for cutting 37
Billiards, how to play 132
Birds causing alarm, destruction of small 359
Blasting and splitting stumps with percussion cartridges 212
Blasting, improvements in 293
Bleeding, to stop 91
Blood globules 247
Boiler, an improved farmer's steam 56*
Boilers, danger of some waters for steam 56
Boilers, priming in steam—its causes and remedies 107
Boilers in Rhode Island, inspection of steam 83
Boilers in cities, steam 43
Boilers, preventative of incrustation in 243
Bolt or projectile, coneave 326
Bombshell, a new 39
Boots and shoes 217
Bottle law unconstitutional, the 58
Boyden premium, the 261
Brain and the spinal cord, the 59
Brakes in England, American railway 387
Brass, lacquering 224
Brass, manufacture of 247
Bricks, tubular 384
Bridge, Victoria 90
Brine in Michigan—strongest in the United States 243
British and the Armstrong gun, the 275
British iron-clad navy, the 297
British navy iron vessels, the 196
British iron-clad fleet, the 195
British newspapers on the capture of New Orleans 355
British Parliament on the fight in Hampton Roads 282
Bugs from vines, to keep 395
Bronze, tempering 167, 192
Bullets, experiments with steel-pointed 342
Bunsby again 394
Business in general 393
Business, the pleasures of 330
Butter, extraction of 195
Butter in winter 108
Butter, preserving 388

- California, a kind word from 179
California, natural curiosities of 227
California, a statistics and progress 203
California, sheep in 266
California woolen manufactures—sewing machines—sugar grasses—grain cleaners 11
Cameo engravings 388
Camphor, uses of 116
Camphor on water, cause of the motion of 323
Canal dredging machines wanted 262
Canals in India, gigantic 363
Canals, steam on 400
Cannon, launch of the 233
Candle manufacture—descriptions of the operations 263
Candles, manufacture of—important patent case 323
Candles, improvement in 137
Candles for illuminating purposes, colored 159
Canes, why do men carry 90
Cannon, efficiency of rifled 2
Cannon, weight of 266
Cannon, American steel 227
Cannon, Dr. Yeake's mode of making 325*
Cannon, prevention of spiking 54
Cannon balls, the motion of 70
Cannon, a 1,000 pounder 282
Cannon balls, weight of 235
Cannon manufacture at Pittsburgh 163
Cannon, wrought-iron rifled 360
Cannon, strong—American built up guns 191
Carpets, manufacture of 379
Carpets, Oriental and French—French taste criticized 261
Carbonic oxide gas, poisonous effects of 387
Carbolic acid for wounds, &c. 148
Cartridge, Richard's improved 85
Cartridges, substitute for biting 310
Cartridges, their history 139
Cartridge manufacture, terrible explosion of a 235
Cartridges and shot, new 266
Cast-iron articles, tinning 280
Cast-iron, malleablizing 105
Carbureting process, the results of the 339
Cast-iron moldings 314
Cast-steel, newly made 267
Cement for the brass mountings of paraffine lamps 218
Cement for wood and glass 179
Cashmere shawls—their imitation 265
Cements for porcelain, marble, alabaster, glass, &c. 92
Central Park, conservatory in the 208
Cheese, varnishing 195
Chemical formulas, improvements in the 251
Chemical nomenclature 6
Chemical and physical modifications of the atmosphere consequent on habitation 231
Charcoal in medicine and as a disinfectant 90
Chemistry of iron 378
Chemistry to the military art, application of 84
Chimneys, Colburn's protector and reflector for glass 373*
Chimneys, the construction of 64
Cement drums, forming 53*
China, another steamer for 334
China, the new (Carnard steamer)—American condensers 250
Chloroform, danger of 37
Chloroform, a new method of giving 134
Chloroform, a substitute for 37
Chloride of lime as an insecticide 382

Note.—Articles with stars are illustrated.

Chlorine as a disinfectant 69
 Churning power wanted, new 326
 Claims, lists of patent 13, 29, 45, 60, 76, 93, 108, 124, 140, 156, 172, 188, 205, 220, 236, 252, 268, 284, 300, 316, 332, 364, 348, 380, 396, 409
 Cipher, ingenious plan for corresponding in 249
 Clothes wringers—squeezers 264
 Clover, cultivation of 135
 Coal trade at Baltimore for 1861 34
 Coal production of Pennsylvania 51
 Coal sifter, Pratt's 217
 Coal, machine for mining 7
 Coal, the chemistry of 58, 68, 85, 100, 116, 132, 149, 165
 Coal tar, the colors from 292, 300, 330
 Coal area of counties 7
 Coal beds, theory of the 72
 Coffee, to obtain the genuine flavor of 378
 Color chemistry, progress of 73
 Color, a new yellow 16
 Colors, printing in 361
 Colt, the inventor, death of Samuel 57
 Cotton coming forward 299
 Columbus, his public buildings, &c. 374
 Combustible agents, the grand jury and 155
 Commerce of Egypt—cotton 187
 Composition, welding and tempering 38
 Condensers for steam engines, surface 20*, 36*, 52*, 68*, 84*, 100*, 116*, 132*, 245*
 Conductor, Agassiz on the 327
 Contract, too large a 163
 Copper and phosphorus 149
 Copper and zinc, metallurgy of 99
 Comforts, old-fashioned 3
 Core boxes for casting, making 85*
 Corn, preserving green Indian 359
 Cosmetics, their use and manufacture 154
 Corn bread recipe, prize 125
 Copper, Lake Superior 148
 Copper mines, Lake Superior 232
 Coral reefs, growth of 101*
 Corruption in the Administration 9
 Cotton sold at auction, South Carolina 51
 Cotton seed, choosing 105
 Cotton in Europe 368
 Cotton arriving, Sea Island 9
 Cotton from Peru 43
 Cotton, ginning Sea Island 43
 Cotton, perennial 22
 Cotton, fall in the price of 137
 Cotton manufacture of England, the 260
 Cotton, companies in England for cultivating 85
 Cotton culture, Indian implements for 37
 Cotton and sugar at the West 86
 Cotton, facts about 23
 Cotton yarn and cloth, fine 358
 Cotton reservoir, the new 258
 Creation, the plan of 117*, 133* [251
 Currents, testing the electrical strength of Cyclopedia 339
D
 Death of a distinguished manufacturer 74
 Doctors taking their own medicine 178
 Defence of our harbor—prompt action needed 57
 Development, a curious 219
 Dictionary, Webster's great 339
 Dialysis applied to the arts—silica in tanning and preserving stone buildings 234
 Desert, the great American—a novel enterprise 400
 Diamonds, a man guarding three millions worth of 3
 Diphtheria 38, 68
 Directory City, May 1, 1862, the 387
 Distances, instruments for calculating 310
 Disinfecting agents 399
 Discoveries of 1861, the 276, 295, 311
 Dividends of manufacturing companies 86
 Dying cordovans 309
E
 Ear and cannon firing, the 147
 Earth, the age of our 316
 Earthwork, Warner's computation of 53
 Ear ache, treatment of 113
 Earth a burning cauldron, the 7
 Eclipses for the year 1862 39
 Eggs in the winter 3
 Electricity, motion of 163
 Electric phenomena 150
 Electric telegraph in Russia 178
 Embalming the dead 375
 End of our volume, the 407
 Engineer sold for \$3,750, an 56
 Engine improvement, marine 123
 Engravings, new mode of copying 266
 Engines, great pumping 400
 English iron plated steamer *Defence* 243
 Enterprise, new—steam wagon for the Western prairies 394
 Engraving, photographic 394
 England, our feeling toward 67
 Engravings, on the cleaning and preservation of 389
 Ericsson battery, splendid success of the 185
 Ericsson, biography of Captain 209*
 Ericsson battery, the 73
 Etching on glass or stone 263
 Ether and chloroform 144
 European armies and navies 134
 Evaporator, Colburn's hot-air 134
 Exhibition, the great London 169
 Exhibition, the London 395, 402
 Exhibition, matters of interest to the 372
 Exhibition management, the London 393
 Exhibition, opening of the great—defective building 346
 Exhibition, ordnance in the London 391
 Expansion question, the 102
 Explosives, one of the new 373
 Eyes, how to save your 118
F
 Factories in Lowell, additions to 219
 Feeding domestic animals 1
 Females in industrial operations, employment of 377
 Fight between the *Merrimac* and *Monitor*, the 181
 Figures on dress parade, the 390
 Files by machinery, manufacture of 243
 Files by machinery, cutting 218
 Fire, the great Troy—iron safes destroyed 345
 Fire engines in London, American 288
 Flax, the cultivation of 197
 Fish pond, how to make a domestic 379
 Flax culture at Illinois 131
 Flax and cotton machinery 249
 Flax, sowing 267
 Flax, American mode of raising 310
 Flax and linen trade of Ireland 7
 Flax culture in Illinois 131
 Flour, saving ten per cent of 19
 Fleet over a river bar, how to pass a 85
 Fortifications, appropriations for 147
 Frogs live in a stone, can 218
 Fruit borer, the 359
 Fruit, how to pack 2
 Fruits, amylaceous matter in 199
 Fuel in steam boilers, waste of 21
 Fulminating substances 163
G
 Gate, anecdote of a 146
 Gas bills, saving in 23 [374
 Gas companies, complaints against the

Gas explosion in Paris, great 171
 Gas, marsh 378
 Gas-burning poisons 187
 Galvanized wire rope, tests of 378
 Gas works, waste products of 394
 Geology of Michigan, the 153, 214
 Geological history of North America, lectures on (continued) 4
 Glass for chemists' bottles, blue and red 6
 Glass, water 22
 Gold fields of Nova Scotia, more about the 106
 Gold deposits of California were found, the way the 346
 Gold fields, the Nova Scotia, 230
 Gold, jewelers' 160
 Gold and silver, comparative value of 122
Grand Admiral, the Russian ship of war 7
 Grain separator, improved 103*
 Grain trade of Chicago 11
 Grain in store at the Lake ports 226
 Grain trade on the Lakes 39
 Grape vines for city gardens 197
 Graves, new use for 230
 Gravity and the pendulum 118*, 150, 166
Great Eastern, the 198, 218
 Great exhibition, the 299
 Great exhibition, the new building for the 42
 Great exhibition building, cost of the 70
 Great exhibition, Americans at the 361
 Grease and India rubber 361
 Great guns is made, the ore from which the iron of our 211
 Grease spots, removing 40
 Grease cakes, corn 135
 Gun cotton be used for army purposes, can 203
 Gulf Stream, extent of the 84
 Gun, another monster 259
 Gun powder, compressed 266
 Gunboats, proposed new iron 137
 Guns by means of mirrors, aiming 230
 Guns and iron plates, great experiments with heavy 91
 Gunpowder, the explosion of 105
 Gold mines of Nova Scotia 7
 Guns hollow, casting—their length 390
 Guns ordered, more large 259
 Guns and powder, large European 281
 Gunboats, Western 219
 Guns for the navy, the 171
 Gun barrels, rolling 24
 Guns, bronze 183
 Gun on board the *Naughtack* burst, why the 362
 Guns, manufacture of large 393
 Gunpowder, discussion on 101
 Gunpowder, safe 402
 Gunboats, new iron-clad 98
 Gun, the best 345
 Guns, revolving turrets for barbette 361
 Gun, the last phase of the 297
 Guns, submarine 320*
 Guns and shot—penetration and construction of war vessels 67
 Guns, shot for the big 309
 Gypsum and salt in Pennsylvania 262
H
 Hair snakes, the affection of 99
 Hair springs of watches, how to make 54
 Hairs, curing 51
 Harbor defences 203
 Harbor defences, New York city appropriations for 211
 Harbors, new plans for defending our 291
 Hay and corn, shrinkage by drying 240
 Hearing trumpets 69*
 Health, signs of 327
 Heat—working and superheating steam 153
 Heat and chemical combination, specific 267
 Heifers for milking, breaking 197
 Hen and how to preserve eggs, how to set a 247
 Heliographic art in Europe and America 103, 119, 135
 Height of vertical jets of water from fire engines or fountains 22
 Hints to our subscribers 406
 Hog crop, the 375
 Hog packing in Cincinnati 228
 Hopper, how to cut a bevel for a 52*
 Horn, white, yellow and in imitation of shell, mode of coloring 195
 Horses 147
 Horses, feeding and watering 356
 Horses falling in the street 90
 Horses, steam against 376
 Horse power of high pressure engines, actual 132
 Horse power 250
 Horse power of high pressure engines, nominal 149
 Horse railroads and snow 144
 Horses, culpable loss of army 105
 Horse couplings, excitement on 202
 Horses in war, mechanical substitute for 83
 Horse's scent, power of a 23
 House keepers, hint to 230
 How long has the sun shone, and how long will it continue to shine 186
 Human mind with the divine, affinity of the 149*
 Hungary improving 36
I
 Ice, saw dust for packing 118
 Ice houses and storing ice 16
 Indelible writing 154
 India rubber, vulcanizing, influence of the occupation upon health 69
 India rubber patent extension (Goodwin's) 152
 Infernal machines in the Mississippi 210
 Infringements previous to reissue 179
 Inks, gold and silver 114
 Injectors, Gilford's—the machine business in Philadelphia 378
 Insects, increase of 308
 Insurances, a good move in 361
 Invention of the Queen of France, an 379
 Invention wanted, an 5
 Invention of the camp, an 85
 Inventions, subjects for 204
 Inventions, trial of warlike 57, 102
 Inventions in time of war, value of—what they have done for England 27
 Inventions abroad, progress of American 251
 Inventions lost to the country, good—importance of encouraging inventors—what Congress should do 313
 Inventions, recent American 12, 28, 44, 59, 75, 92, 108, 124, 140, 156, 171, 188, 204, 220, 235, 252, 267, 283, 300, 316, 331, 347, 362, 378, 395, 408
 Inventions and discoveries, notes on foreign 28, 44, 59, 75, 92, 108, 140, 219, 298, 331, 395
 Inventions, Wisconsin—improvement in railroad brakes 347
 Inventions, commission on military 5
 Inventor and the national crisis, the 138
 Inventor of revolving or iron turrets for naval and land batteries, the 248
 Inventors, loyal 377
 Inventors, the greatest field for 317
 Inventors, English association of 352
 Inventors, renewed activity among 121
 Inventors relating their experience 378
 Inventors answered, two suggestions to 262
 Inventive genius at the South 73

Ireland, distress and impending famine in 19
 Iron, cold rolled 40
 Iron masts 55
 Iron, tinning 280
 Iron, case-hardening wrought 219
 Iron and steel by electricity, manufacture of 181
 Iron telegraph wires passing foundries 10
 Iron, great product of 208
 Iron, improvements wanted in 184
 Iron for ships, importance of good quality of 2
 Iron, strength of franklinite 279
 Iron and suspension bridges 152
 Iron and steel, improvements in 44
 Iron for ships, importance of good quality of 2
 Iron, strength of boiler 139
 Iron, enameling 106
 Iron, testing ship 37
 Iron clad river boats in battle, our 133
 Iron built and iron clad vessels 378
 Iron clad war ships—a patriot's suggestion 10
 Iron clad vessels for the navy—what is the best coating for their bottoms—a government inspector's report 74
 Iron clad war vessels 227
 Iron clad war vessels, classes of 265
 Iron clad fleet, progress of our 377
 Iron clad ships and big guns for the navy 226
 Iron plating, late experiment with 218
 Iron plating—is the *Warrior* a failure? 154
 Iron plating for ships 179
 Iron plated ships invulnerable, are 329
 Iron plated ships, Mr. McKay's letter on 217
 Iron plated ships, the excitement in relation to 297
 Iron-plated ship, the first 371
 Iron plated ships of small size, the new English 358
 Iron plated ships, what we ought to do in relation to 407
 Iron for the new 355
 Iron ships, English and French 52
 Iron sides and wooden walls 195
 Iron trade, Scottish 179
 Iron-clad turret ship, new 401
 Ivory, substitute for 331
 Ivory flexible, to render 145
J
 Jewelry, enameling 156
 Japanese and varnishing 388
K
Keenington, the iron-clad frigate 266
 Kentucky, a Tennessee, map of 115
 Kjoekkeumodding 170
 Knapsacks of the French and German armies 41
 Knapsacks, about 67
L
 Lake Superior iron mines 37
 Lamp, Platt and Rosecrans' 70
 Lanterns, painting the slides of magic 294
 Lead for, scientific 220
 Lead pipe, plumbing and soldering 199
 Lead pipe, practical mode of soldering 246
 Lead pipe, a substitute for 246
 Length, weight and measure 341
 Letters, to copy 244
 Life-saving association 91
 Life, statistics of human 293
 Light, improvement in the oxyhydrogen 357
 Light, some facts in relation to 23
 Linen, glossing 296
 Locomotive, new light 4
 Locomotive building 6
 Locomotives, mode of turning 55
 Locomotive correspondence 405
 Loris and locomotives 151
 Lubricating substances 248
 Lubricators for bullets 192, 195
 Lumber trade of Albany 98
M
 Madagascar, resources of 211
 Magnetic experiments, some 342
 Mail-clad vessels and American guns discussed in parliament 266
 Malaria, the causes of 17
 Malt in Germany, medical use of 390
 Manufacturing industry—census returns 147
 Manufacturing news, 11, 131
 Manufacturing news, Maine 232
 Manufacturing news, Massachusetts 100, 150
 Manure, saving 359
 Maple sap 118
 Mason and Slidell war fever, the 9
 Materials in their invisible state 178
 Mathematical mechanical scale, Chisholm's 52
 Metallurgy of copper and zinc 51
 Meclellan's report on the armies of Europe 2
 Mechanical productiveness, our 155
 Meerschau 404
 Meerschau mania 20
 Men on the future, influence of 35
Merrimac and *Monitor*, the fight between the 181
Merrimac, Armstrong guns on the 203
Merrimac, interesting facts about the 355
Merrimac, the armament of the 275
Merrimac, the iron-clad steamer 192*
Merrimac, patented 48 years ago, the 328
 Metals, valuable substitute for 340
 Metallic veins 40
 M.K. sickness, cause of 56
 Miller, another answer to a young 293
 Miller, still another answer to a young 279
 Millers, another answer to questions for 262
 Millers, practical information wanted from 358
 Millers, another answer to 246
 Millers, questions for 179, 230
 Military and naval affairs, notes on 2, 18, 34, 50, 66, 82, 98, 114, 130, 146, 162, 178, 194, 210, 226, 242, 258, 274, 290, 306, 322, 338, 370, 386, 404
 Military training in common schools 58
 Military commission to Europe, reports of our 329
 Mills, the backlash in saw 374
 Mill stones, American and English patent for 310
 Mines, Lake Superior iron 294
 Minks as insect catchers 293
 Mirror, ancient Roman 8
 Molasses, fresh maple 75
 Money received 14, 31, 47, 62, 78, 94, 110, 126, 142, 159, 173, 191, 206, 222, 238, 254, 270, 286, 302, 318, 334, 351, 366, 382, 398, 411
 Money receipts, the plan of taxing 342
Monitor, the concussion in the turret of the 198
Monitor, Captain Ericsson's remarks on the 94
Monitor for the lakes, a 299
Monitor, working of the 194
Monitor's wrought-iron shot, the 226
Monitor, the *London Quarterly* on the 330
 Moon's influence on rain, the 155
 Mortar fleet and mortars, the 128

Mortars, firing the 226
 Mortars at Cairo, interesting experiments with heavy 131
 Mother, a wooden 20
 Muskrats predict a mild winter 314
N
 Naphthalene colors 168
 Nails, cast-iron 122
National Quarterly Review, the 42
 Naval intelligence 162
 Naval department, imbecility in the 185
 Naval experiments, our—working steam expansively 294
 Navy a year ago, our 230
 Navy, defence of the secretary of the 214, 217
 Navy department and iron-clad war steamers 202
 Navy, our—who is to blame? 201
 Navy, secessionist complaint to our 171
 Navy yard, operations at the Brooklyn 314
 Navy yard, the Washington—testing heavy artillery, &c. 275
 Navies, the British and American 20
 Needle in iron ships, variations of the 341
 Newbern, the reason why the artillery was not in the battle of improvement in signals suggested 233
 New England manufactures 35
 New Hampshire factories 100
 New Year, thoughts for the 9
 New York, population and sanitary condition of 55
 New York, and inventors say, what 59
 Newspapers, British 11
 Norton and the SCIENTIFIC AMERICAN, Captain 377
 Notes and queries 14, 30, 46, 62, 78, 94, 110, 126, 142, 158, 174, 190, 206, 222, 238, 254, 270, 286, 302, 318, 334, 350, 366, 382, 398,
 Nut cracker, spring 37*
 Nuts, screwing on 98
O
 Oak and iron-clad ships—zinced bolts 267
 Ocean mail steamers, the French 136
 Ohio, the physical map of 219
 Oil in England, rock 88
 Oil in boxes 294
 Oil conflagration, terrible rock 371
 Oil, uses for light rock 84
 Oils, disinfecting 72
 Oldest house in Boston, the 6
 Omnibus, an India rubber 361
 Ordnance and gunnery 308*
 Overland mail, complaints in regard to the 262
 Oyster dredge 37*
 Oxen, quantity of food for 3
 Oxygen light—the magnesia light—a rhombic crystallization on photographic plates 343
 Ozone, restoring old books by 12
P
 Paint, rock oil for 54
 Paradox, the land of 227
 Paraffine 313
 Patent, does an error in the oath affect the legality of a 74
 Patent infringement—hat manufacturers in the court 307
 Patent law amendment, the 404
 Patent law reform, British 314
 Patent laws, benefits of 251
 Patent law, proposed amendment, new 296
 Patent office and seeds 91
 Patent office, revival at the 41
 Patent office, affairs at the 91
 Patent office illustrations 58
 Patent law reform in New Brunswick 346
 Patent office, operations of the Confederation 117
 Patent law system, proposed amendment to the Canada 345
 Patented articles, the proposed tax on 223
 Patentees, freewill offering of 134
 Patents, annual report of the Commissioner of 182, 185
 Patents issued, British 186
 Patent laws—the United States and Canadian reciprocity 201
 Peabody's donation to the poor of London, George 243
 Petroleum in granite 243
 Petroleum in London 266
 Penetrating iron plates, the best shot for 212
 Petroleum for fuel 403
 Petroleum, historical and scientific facts about 7
 Petroleum region, the—rock oil business—extent and sources of supply, the 122
 Phenomenon, curious 21*
 Phosphorescence 4
 Photographers, suggestions to 179
 Photographic albums 216
 Photographic art, recent progress of the 234
 Photographic discoveries, Chevreul on St. Victor's 90, 229
 Photographing in natural colors 216
 Physiologist who is not a 55
 Philosophy of 281, 326
 Planets, comparative size of the 3
 Plants when the dew is on, cultivating 394
 Plating porcelain and platinum 181
 Polishing metals 403
 Pork speculation, Western 150
 Posts, how to preserve telegraph and 200
 Potato, cultivation of the 230
 Potatoes at sea, how to preserve 6
 Potatoes, how to store a large quantity of 5
 Potatoes, setting sweet 326
 Polytechnic Association of the American Institute 228, 245, 261, 276, 292, 324, 341, 357, 372
 Polytechnic Association, a new leaf turned over in the 233
 Powder, tank bark explosive 8
 Poppler, new 68
 Prophecy of 281, 326
 Projectiles, philosophy of—large and small shot—shells and solid shot 278
 Projectiles, immense 230
 Providence, special correspondence from 389
 Publications, new 222, 235, 300
 Punch's chronology of future inventions in fire-arms, &c. 379
R
 Railroads in Ohio 183
 Railroads in the United States—what they will do toward paying the national debt 41
 Railroad, crossings—attention superintendents 70
 Railway in London, a subterranean 291
 Railway traveling, effects of 187
 Railway trains, light and heavy 3
 Railways, Canadian 291
 Railways, New York 314
 Railways of the world 90
 Railways in Chili—American engineers abroad 19
 Rats 375
 Reaping machines for the World's Fair, Chicago 240
 Reconnoissances, photographing from balloons in military 281
 Regulator, patent for steam and fire—fringement trial 155

Rebel obstructions on the Neuse river—plan of the battle ground in the vicinity of Newbern 241*
 Rensselaer Polytechnic institute—military education 43
 Revenue from taxation, estimated amount of 195
 Rice, Hawaiian 32, 249
 Rice hullers wanted in Mexico 70
 Rifle, the 283
 Rifle barrels, steel 289
 Rifle question, the 166
 Rifles and how to shoot 6
 Rifles, large and small bore 54
 Rockets, the motion of 38, 85, 134, 179
 Rooms, the sounding properties of 347
 Rooms, zinc wash for 387
 Rubber works burned, extensive 187
S
 Salt in Michigan, manufacture of 18
 Salt and horses' feet 136
 Salt peter, importation of 73
 Salt in Kansas 67
 Salt streets—the science of the question 107
 Sand stone from scaling off, to prevent 54
 Sanitary condition of our Western armies 35
 San Francisco steam rail cars 89
 Savages of Europe, the ancient 198
 Saw dust in manure 197
 Saws, practical hints for dressing 21
 School grounds, adornment of country 310
 Science a civilization 117
 Science and ballooning 267
 SCIENTIFIC AMERICAN, the first number of the 391
 SCIENTIFIC AMERICAN, result of having engravings published in the 9
 SCIENTIFIC AMERICAN, complimentary allusion to the 43
 Scientific knowledge, practical value of 363
Scotia, the new American steamer 377
 Screen, changeable fire 391
 Screw propellers 2
 Screw propellers, feathering 273
 Scrobbler, combination mop 53*
 Secretary of war, resignation of the 58
 Sea waves, power of 403
 Seeds, changing 37
 Sewing machines in England 291
 Shell, destructive fire 25
 Sheep skins with the wool on, to cure 100
 Ship building, notes—description of one of the new gunboats 11
 Ship building on the lakes 219
 Ship, raising a sunken 20
 Ships of war, Donald McKay on our 215
 Ships, French plan for sinking iron 355
 Ship and fort question, General Totten on the 345
 Shipping at New York harbor for 1861 34
 Shoot, learning to—Weisson's breech loading rifle 58
 Shot for light guns, too heavy 192
 Shower, a considerable 166
 "Shunt" gun, the 7
 Signals, Ward's semaphore color 291
 Significant fact, a 54
 Silk culture in America 178
 Silk, washing 387
 Silver smelting in San Francisco 102
 Silver in the arts, substitute for 33
 Silverware manufacture, a great 406
 Sink, a railroad 298
 Sleeping with the mouth shut, importance of 19
 Slide valves, the lead and cap of 267
 Skunk, a good word for the 388
 Small-pox, remedy for 373
 Snuff-taker, nicotine found in the viscera of a 211
 Solder, how to apply 244
 Soldiers bear the winter, how our 74
 Sole-cutting business, the 325
 Soldiers, pepper for 371
 Sorghum sirup 243
 Sorghum in Wisconsin 96
 Sorghum sugar 123
 Sorghum molasses, Illinois 243
 Sorghum, cost of raising 330
 Sorghum sugar manufacturers, convention of 229
 Spectrum analysis 147
 Spectrum analysis in lecture rooms 167
 Spectral analysis, new discovery by 23
 Spontaneous combustion, strange 362
 Spontaneous generator 343, 363
 Stalagmite, the age of a 113
 Stanton, Secretary—test of an invention 82
 Steam 283
 Steam expansion and the American experiments, Professor Rankine on 249
 Steam, a question in relation to 85
 Steam for locomotive boilers 362
 Steam and water power, comparative economy of 106
 Steam boilers, incrustation of 394
 Steam boilers in New York, important to those who use 328
 Steam experiments, criticism on 43
 Steam and other heat engines, theory of 53
 Steam, superheating 123
 Steam power, cost of 358
 Steam with and without expansion, experiments in using 83
 Steam and water power, cost of 215
 Steam floating battery 202
 Steam, elementary facts in relation to 37
 Steam on steep roads 43
 Steam, expansion of 5, 150
 Steam in England, high pressure 128
 Steam indicator cards, the science of 213*
 Steam engine on common roads in South America 170
 Steam engine, improvements in the 198
 Steam engines on common roads and for plowing 250
 Steam rams 121
 Steam rams and their qualities 202
 Steamships, French subsidies to 89
 Steamers, light and deep draft 55
 Steel pens, barbarism of 147
 Steel, Binks's experiments with 86
 Steel from iron with gas, making 97
 Steel, to make 358
 Steel blue, coloring—inlaying, gilding and etching 89
 Steel, extraordinary ductility of the Bersamer 98
 Steel, the composition of—French chemists 89
 Steel, modification in the process of making 147
 Steel steam sloop, a 7
 Steel at the World's Fair, English and German 211
 Stevens Battery, report on the 43
 Stevens Battery, experiments in relation to the 42
 Stevens Battery, the 41
 Stevens Battery for France 203
 S tills, cement for joints of petroleum 331
 Stimers, Chief Engineer 202
 Stone for building, brown 150
 Stone, the preservation of 23
 Stone blockades and humanity in war 71
 Strawberry, cultivation of the 197
 Strawberries, to preserve 404
 Strength, human 342

Strings for musical instruments, gut 167
 Study, hours of 138
 Submarine torpedoes, infernal machines 161
 Sugar 103
 Sugar from Northern cane 75
 Sugar, maple 245
 Sulphate of iron—copperas, how to make 5
 Sulphur and alum, California 22
 Sun, constitution of the 23
 Sulphuric acid as a disinfectant 106
 Surgery, curious cases in 55

T
 Tar, the colors of 292
 Tariff, the new—development of our iron interests—a field for inventors 123
 Taxation, a new and simple system of 207
 Tea, making 144
 Tea—theine 55
 Teeth, Indian method of fixing loose 242
 Telegraph and fence posts (see posts)
 Telegraph, new Atlantic 309
 Telegraph, the Atlantic 277
 Telegraph companies, liability of 215
 Telegraph again 295
 Telegraphs, the management of 217
 Tempering tools, remarks on 1
 Testimonials, significant 219
 Therapeutics, unexpected results in 235
 Those who live in glass houses should not throw stones 69
 Thread, machines for spooling 27
 Thrifty Scotch workman, a 151
 Timber preserving 229
 Time, maxims on 32
 Time is money—recollect that 405
 Time is up, the 393
 Tin foil, adulterated 151
 Tinmen and saltmakers, questions for 246
 Tin small articles, to 388
 Tobacco, cultivating 145
 Tools from rusting, to prevent 100
 Tomatoes, start your 211
 Torpedoes, submarine—infernal machines 164
 Torpedoes—harbor defence 38
 Torpedoes, magnetic 230
 Towed ship, British from 232
 T rail-shell-proof frigates—learning by experience 186
 Tracing paper, substitute for 155
 Traveling and gravitation 70
 Treasury notes by the cart load 163
 Trees, how the Chinese make dyewort 243
 Turkish bath in New York, the 69
 Turkish bath, criticism of the 260
 Turpentine, Northern 92

U
 Underground railway, the London 24

V
 Vaccination, early advantages of 262
 Ventilation of mines 327
 Vessels lost, grain laden 99
 Vessel, submarine government 315
 Vine, grafting the grape 359
 Vinegar and pickles, to make superior 214
 Volcanoes and whirlwinds in the sea 134

W
 Wall sided ships condemned 83
 War engines, general news about 23
 War steamer, new iron-plated 171
 War steamers, iron-clad 166
 War and taxation 169
 Wars with England, naval 39
 Warlike enterprise 65
 Watchmakers, diseases of 144
 Water and steam power, cost of 310
 Water gas—light wanted 203
 Water gas—letter from Professor Saunders 214
 Water for soldiers on coast islands, distilled 187
 Water wheels, history of 474
 Water, atmosphere from the 262
 Water as a disinfectant 53
 Water works, Philadelphia—donal wheels 379
 Water wheels, history of turbine 165, 196, 212, 278
 Water in the desert, how the Africans obtain 6
 Wheat and corn exports 401
 Wheat, bread from heated 196
 Wheat and savages 299
 Wheeling its manufactures, &c. 339
 Willows, cultivation and use of 199
 Wood rotting, prevention of 91
 Wool trade, the British 163
 Woolen manufacturers, our 89
 Woollens, washing 387
 Wingers, loths 314
 Winding machines, India rubber rollers for 169
 Wrought iron direct from the ore, manufacture of puddled—a new process 225
 Wrought-iron manufacture 279, 310

Y
 Yankee soldier, a 330

PATENT CLAIMS.

A
 Aerating liquids, apparatus for 269
 Aerial machines 336
 Air, carbureting 332
 Album case 333
 Albums, photographic 364
 Amalgamator, 61, 124
 Amalgamator and ore crusher 108
 Amalgamator and ore mill 349
 Amalgamator, gold and silver 60, 220
 Amalgam, device for straining gold and silver 221
 Anemometers 125
 Aniline colors, dyeing and printing with 253
 Ankle, design for a 333
 Annealing and cooling cast-iron car wheels 301
 Ammunition box, military 156
 Annunciator, hotel 12
 Apples, machine for packing 333
 Apple-parer 337
 Arastras 268
 Arm-chair, design for an 333
 Armor for water and land batteries defensive 285
 Armor plates, ships' 173
 Armor plates for vessels 381
 Armor plates, defensive 330
 Armor for ships, defensive 351
 Armor plates to vessels, mode of attaching 365
 Armor plates for marine or other batteries, means of constructing metallic 349
 Ascertaining position and direction on land and sea 124
 Ash-sifter 285
 Augers, hollow 172
 Augers, spoke tenon 76
 Automatic machine for weighing grain 172
 Axes 387
 Axes, locomotive 77
 Axes, mode of lubricating 221
 Axes, railroad 316
 Axes, splining bar for 93
 Axes for wheel vehicles 141

B
 Baggage check 396
 Balances 332
 Baling press 333
 Ball cartridges 221
 Ball furniture caster 253
 Balls, apparatus for casting Minc 365
 Balls, apparatus for compressing musket 351
 Balls for rifles, casting 29
 Banjos 269
 Bark for tanning and other purposes, extracting the strength of 268
 Barrel-making machines 253
 Base pin and rammer of revolving pistols 12
 Baskets 61
 Baskets, means for manufacturing 349
 Baths, douche 396
 Battery connected with a boat or other vessel, operating a submarine 349
 Battery, floating 254
 Battery or platoon gun, portable 29
 Beans, machines for cleaning and assorting 205
 Bed bottoms, spring 188
 Bed camp 12
 Bed for ships and hospitals 189
 Bedstead rails, attachment for 333
 Bedsteads, folding 29, 189, 300
 Bed frames, military and civic 284
 Bedstead, spring 172
 Bedsteads, metallic 381
 Bee hives 46, 61, 300, 381
 Bee hives, comb-frames for 76
 Beer-coolers 13
 Beer measures 284
 Bending corrugated plates of metal, apparatus for 397
 Belloves 141
 Bellows for blowpipes 172
 Bins, grain 76
 Blacksmith's tongs 349
 Blast generator 125
 Blocks, improved anti-friction bearing of holding 124
 Bleaching and cleaning fabrics, textile apparatus for 380
 Blind and shutter fastenings, 236
 Blind and shutter supporters 365
 Blinds for windows, &c., metallic 76
 Block, hoisting 124
 Blowers, rotary 125
 Boat, bridge or tent, convertible 220
 Boilers 380
 Boiler-feeder, automatic 348
 Boilers and tea-kettles 296
 Boilers, steam 188, 252
 Bolsters, spindle 35
 Bolting cloth in flouring and grist mills, mode of preventing the destruction of 29
 Bonnets 29
 Bonnets, machines for forming 237
 Boot crimping device 410
 Booties, manufacture of 109
 Boots and shoes 61, 220, 301, 317
 Boots and shoes, cork sole for 157
 Boots and shoes, heels for 46, 380
 Boots and shoes, insole for 221
 Boots and shoes, fender or sheath for 157
 Boots and shoes, India rubber 220
 Boots and shoes, India rubber heels of 301
 Boots and shoes, metallic plates for protecting the soles of 365
 Boots and shoes, process of sewing the soles of 332
 Boot-blacking stand 348
 Boot trees 23
 Bolts, machine for cutting 29
 Boring and rifling cannon, apparatus for 205
 Boring machines 76, 157
 Bottle, design for a 157
 Bottle for aerated liquids 221, 267
 Bottle stopper 236
 Bottling apparatus 140
 Box, letter 284
 Box for matches 93
 Box setters for wheel hubs 300
 Boxes for car axles 220
 Boxes, journal 29, 230
 Boxes, machines for making paper 93
 Boxes, passing 237
 Boxes, railroad car journal 205
 Brake, car 29
 Brakes, carriage 265, 300
 Brake for railroads, self-acting 316
 Brakes for wheel vehicles, self-acting 173, 332
 Brakes, reaction car 300
 Brake for railroad cars 253
 Brakes, railroad car 381
 Brakes, wagon and carriage 93
 Branding and stamping iron 121
 Breaching to shafts of carriages, mode of attaching 46
 Brick machines 188
 Brick, machine for making and pressing 364
 Brick molds 109
 Bridge, truss 230, 330
 Bridges 30, 61, 349
 Bridges, construction of 13
 Bridges, iron truss 77
 Bridges, truss girders for 93
 Bridges, wrought-iron 330
 Briddle-bit attachments 110
 Broiler, steak 125
 Broom 300
 Broom corn, machine for breaking 348
 Broom corn, machine for sizing 13
 Brush 61
 Brush, fountain blacking 364
 Brush, marking 29
 Buckles 268, 301, 381
 Buckles, harness 61
 Buckles, manufacture of 156
 Buckles, rings, &c. 332
 Buggies, 1 achines for boring the seats of Buildings waterproof, mode of making 409
 Bullets, apparatus for casting 364
 Bullets, machine for casting 349
 Bullet molds 284
 Burial cases 221
 Burners, coal oil 380
 Burner, gas 157
 Burners for coal-oil lamps 253
 Burner, kerosene oil 268
 Burners, self-regulating gas 381
 Burners, hydrocarbon 156
 Butter, device for purifying 189
 Butter, machine for working 410
 Button molds 380
 Buttons 268
 Button fasteners, 268
 Button holes, mode of making 332
 Button holes, stitch for 157

C
 Cab, brakeman's 253
 Cages, bird 396
 Calenders, portable 332
 Camera obscura 254
 Camera, photographic 237
 Camp candlestick 60
 Camp chest 13
 Campout and chest, combined 109
 Camp fire, design for statutory, the 381
 Canals, stop-dams for
 Cancellation notes, checks, &c., device for 285
 Canales, machine for making mold 380
 Candlesticks 236
 Cane chair and stool, convertible 61
 Cannon, breech-loading 109
 Cannon, mounting and maneuvering 13

C
 Cannon, manufacture of 125
 Canton 29
 Carbon and other oils, vessels for transportation of 141
 Carding engines, silver guides for 172
 Carding engines 13, 76
 Carding engines, condensing 317
 Card printing press, self-feeding 301
 Cards, design for the backs of playing 381
 Carpets, designs for 94, 221, 238
 Carpet-lifting machine 349
 Carpet patterns 142, 174
 Carpet pattern, design for 365
 Carriages 93
 Carriages, method of constructing 333
 Carriage gates 109
 Carumper and draw-head springs 333
 Car seats, head rests for 317
 Cars, locomotive 109
 Car wheels to axles, mode of attaching 60
 Cars, mode of propelling 109
 Cars, running gear of railroad 76
 Cars, starting apparatus for horse railroad 76
 Car trucks 348, 381
 Cartridge cases, metallic 221
 Cartridge adapted to breech-loading fire arms 188
 Cartridge, water-proofing 236
 Cartridge box 252
 Cartridge, skin 141
 Cartridges, metallic 285
 Cartridges, shot 237
 Cartridges for fire arms 189
 Cartridges, muzzle of fire arms for cutting off 108
 Cartridge boxes, fastenings for 188
 Cases for pictures, cards, &c., metallic 172
 Casks, oil-proof 221
 Casks for holding oil, quicksilver, &c. 60
 Cast-iron into wrought-iron and steel, converting 284
 Casters, spring 13
 Casters, from vulcanizable compounds, manufacture of 348
 Casting metals, preparing metallic molds for 173
 Castings, molds for 349
 Catamenial and uterine bandages and retractor 141
 Cattle, device for fastening 365
 Cement for roofing and other purposes 396
 Cement pipes, mold for molding 173
 Cement pipes, molds for 268, 348
 Centering implement 156
 Chain shot for ordnance 200 (2)
 Chandelier, design for 317
 Channelling tools for harness makers 156
 Chair backs, machines for cutting 220
 Chair, folding arm 83
 Chairs, railroad 124, 180, 316
 Chairs, manufacturing railroad 397
 Checker Players, design for statutory, the 381
 Cheese press 108
 Cheese vats 46, 172
 Chest of drawers 365
 Chloroform, apparatus for inhaling 349
 Churn and butter-walker 76
 Churn dashers 205, 247
 Churns 13, 60, 61, 93, 141, 156, 237, 281, 317 (3), 349, 409
 Churns, apparatus for operating 188
 Cigars and pipes, mouth pieces for 367
 Clink, machines for 396
 Clam shell 172
 Clocks 189
 Clocks, calendar 125, 189
 Clock case front, designs for 319
 Clock case, design for a 157, 174, 333 (2)
 Cloth bar 157
 Cloth bar, 141, 205, 380
 Cloth, method of producing diagonal 24
 Cloth-plaiting machine 380
 Cloth dryer, rotating 237
 Clothes-drying apparatus 172
 Clothes frame 300
 Clothes wringers 13, 77, 109 (2), 141, 157 (2), 189 (2), 205 (2), 237, 252, 269, 317, 348, 364, 365
 Clothes wringer, roller for 141
 Clover and hulling and cleaning the seed, thrashing 348
 Clover machine 236
 Clutches, friction 29
 Coal oil and other mixed liquids, apparatus for testing 333
 Coals, &c., machine for loading 364
 Coal oil and other substances, distilling 125
 Coal scuttles 396
 Coal sifter 285
 Coffee boilers 237
 Coffee pots 300
 Coffee-roasters 269, 284
 Collins 317
 Collins, handle, design for 317
 Combined house, bridge, boat and wagon 156
 Compasses, magnetic 332
 Composition for forming journal boxes, bearings, &c. 332
 Composition for the manufacture of emery sticks and wheels 221
 Composition for manufacture of moldings and other purposes 236
 Composition for the manufacture of flexible polishing sticks and wheels 221
 Composition for making oil cloth 157
 Composition for pavements, roofing, &c. 156
 Composition metal of iron, zinc, and copper 205
 Composition for water-proofing cloth, leather, &c. 381
 Concentrated food or beef tea 205
 Condenser for steam engines 13 (2)
 Condensers for oil stills 409
 Condensers for making potable water 364
 Cooking apparatus 124, 409
 Cooling beer and other liquids, process of 109
 Cooling and freezing, apparatus for 29, 300
 Cooling beer and other liquids, apparatus for 109 (2)
 Copalva, making capsules of 29
 Copper from ores 409
 Copper ores, mode of treating 189
 Copper ore 380
 Cork into strips, machinery for cutting 221
 Corks, machines for cutting 124
 Cork stoppers, cutting 236
 Cork stoppers for bottles and other vessels, cutting 365
 Corking bottles, apparatus for 364
 Corn planter and lime spreader combined 157
 Corn, preserving green 349, 365
 Corn planters 410
 Corn shelters, 29, 156, 237, 269, 317, 333, 348, 410
 Cot, soldier's 61
 Cotton, combing machines for 189
 Cotton, machinery for cleaning 141
 Cotton, machinery for ginning 317
 Cotton rovings, drawing car is for 332
 Counting machine 205
 Coupling, automatic car 109
 Coupling, railroad car 365
 Coupling shafting and rods 237
 Coupling for double plows 125
 Couplings, car 13, 76, 124, 141, 189, 380
 Couplings, hose 172, 268

C
 Couplings of shafting, mode of sustaining and protecting 285
 Coverings for the head 29
 Cradle, self-rolocking 173
 Cradles 364
 Crank and cross-head connection for steam engines 156
 Crinoline clips 316
 Croup, medicine for 260
 Crozing machines 409
 Crucifix, design for 317
 Cruet or decanter 268
 Cultivators 29 (2), 141, 156, 173, 188, 245, 236, 253, 348, 349, 381, 409
 Cultivators, hand 364
 Cultivator and potato digger 380
 Cultivator and seeding machine, combined 364
 Cultivator teeth 142
 Curtain fixtures 189
 Cut-off gear for steam engines 29
 Cutters, lead 76
 Cutters, straw and hay 60, 333, 396
 Cutters, vegetable and root 156
 Cutting garments, apparatus for 237
 Cutting marsh land, device for 284
 Cutting trees and logs, machines for 284
 Cutting twist moldings, machines for 157
 Cylinders for machine cards 236

D
 Daguerreotypes, mats for 46
 Daguerreotype cases, molds for making 140
 Dampers 269, 316, 333, 409
 Dampers in stoves, operating 157
 Dampers, ventilating 349
 Deck ballast boxes for vessels 141
 Demographic instruments 220
 Desk, school 125
 Desk, writing 125
 Digging machine 172
 Diggers, potato 173, 237, 361, 396
 Diggers, rotary 236
 Distributing grain in elevator bins, device for 141
 Discharging the contents of sugar kettles and other vessels, mode of 252
 Detector for steam boilers, high and low water 188
 Distilling coal oil and other substances 125
 Ditching machine 381
 Doors for pyroteratory and other furnaces 156
 Doors, device for closing 60
 Doweling 253
 Drain roller and molder combined 125
 Drawing apparatus for portable vessels for 141
 Dredging crane 13
 Dredging machines 364
 Drills, grain 409
 Drills and cultivators, seed 269

E
 Electric baths 156
 Electroplating iron and other metals with copper, process of 157
 Electroplating steel wire for piano strings and other purposes, mode of 205
 Elevator 188
 Elevating machine 157
 Elevators, hay 301
 Elevators and conveyers, water 333
 Elevators, of flouring mills, cups for 317
 Elevators, water 76, 141, 142, 189, 205 (2), 300, 317, 364, 380, 381
 Embroidery, imitation metal 269
 Enamel for leather 141
 Engines, hot air 76, 125, 221
 Engines, rotary 93, 141 (3), 156
 Envelopes, 269
 Envelopes, apparatus for drying pasted 125
 Envelopes of cartridges for fire arms 60
 Escapements, clock 29
 Escapements, watch 380 (2)
 Evaporating and distilling, apparatus for 60
 Extractors, stump 77, 141, 237, 396
 Extractor and elevator, stump and rock 157
 Excavating, plowing and grading machines 225
 Eyelet machines 285

F
 Fan, automatic 60
 Fan blower 46
 Fanning mills 172
 Fares on street railway cars, mode of collecting 77
 Fastenings for skates 189
 Faucets 156, 300, 316, 396
 Faucets, water 49
 Feathers, apparatus for renovating 284
 Feed bags 221
 Feed cutters 76
 Feed racks 237
 Fee-warming apparatus 410
 Fence, design for a 398
 Fence, portable farmer 13
 Fence, portable field 12
 Fences 108, 348
 Fences, mode of building and coating earth 349
 Fertilizers 46, 109, 381
 Fertilizing composition 252
 Fibrous waterproof fabrics, manufacture of 30
 Files 254
 Files, machines for cutting 254, 317
 Filtering liquids, centrifugal machine for 386
 Filters 205
 Filters, portable 172
 Fire alarm 301
 Fire arm, top breech-loading 316
 Fire arms 269
 Fire arms, gas check for breech-loading 365
 Fire arms, breech-loading 60, 125, 156 (2), 157, 188, 236, 253 (2), 300, 317, 348 (2), 349, 365, 397
 Fire arms, magazine 237
 Fire arms, percussion cap primer for 409
 Fire arms, projectiles for 309
 Fire arms, revolving 172, 269, 332, 410
 Fire arms, revolving 29, 46, 60, 61, 93, 125, 221, 237, 301, 316, 381 (2)
 Fire engines for locomotives 301
 Fire escape ladders 13
 Fireplace frame, design for a 397
 Fireplace, portable 29
 Fire-sca 284
 Fish cutter or bait mill 396
 Flax and hemp, machinery for breaking
 Flax or hemp, machinery for breaking and dressing 221
 Flax and hemp to make them resemble cotton, treating 189
 Flax and hemp, machines for scutching 237
 Floor cloths pattern, design for 157, 349, 365
 Floats with paddle wheels, feathering 381
 Flour packing machines 316
 Flour from bran, mode of separating 174
 Fluid, burning 237
 Forging apparatus 157
 Forging and crushing iron, apparatus for 189
 Frames, clothes 61
 Fruit baskets 237, 316
 Fruit cases 205, 409
 Fruit jars, covers for 284

F
 Fruit strainer 173
 Furnace, steam boiler 93
 Frogs for railroads 30
 Fuel, artificial 381
 Fuel, apparatus for economizing 268
 Fuel box and washing apparatus with screens, combination of 348
 Furnace for roasting ores 268
 Furnaces, air-heating 233
 Furnaces 221
 Furnaces for heating scythes, &c., 189
 Furnaces, hot air 29, 190, 221, 301, 333
 Furnaces for retorts, stills, &c., 348
 Fuse hood for shells 46
 Fuse or slow match for igniting powder under water, composition of 168
 Fuses, firing cannon by attached 60
 Fusible gage for temperatures 93

G
 Gauges 76
 Galvanic batteries, liquids for exciting 205
 Galvanic soles 205
 Garments, mode of constructing 157
 Gas, apparatus for carbureting 188
 Gas, apparatus for the manufacture of illuminating 237
 Gas compensator 189
 Gas lights, means of extinguishing 409
 Gas, manufacture of illuminating 365
 Gas meters, dry 157
 Gas, process of manufacturing illuminating 77
 Gigs mills 46
 Glass furnaces 364
 Glass, looking 365
 Glassware in bas-relief, manufacture of 396
 Glassware, manufacture of hollow 140, 396
 Glassware, molds for 188
 Globes, school 409
 Gold, machine for amalgamating 284
 Governor, hydraulic 60
 Governor connections for steam engines 268
 Governors for steam engines 189
 Grading and excavating machines 109, 205
 Grain and seed winnowers 189
 Grain cleaners 13
 Grain dryers 156
 Grain elevators and dryers, floating 285
 Grain machines for cutting the bands of 284
 Grain, machines for gathering and binding 254
 Grain, machines for raking and binding 255
 Grain and similar substances, drying 396
 Grain separators (see Separators)
 Grain sieves 380
 Grain, stirring, conveying, and cooling 349
 Grain weighing machines 364
 Grain scouring and thrashing machines 189
 Grain winnow 221
 Grapes and other fruit, preserving 410
 Grates, furnace 60
 Grates, sliding 173
 Grates, machines for making 76
 Grinders, machines for turning 410
 Grazing sheep and other animals, method of 268
 Grubbing machines 157
 Guides for creasing tucks and plaits preparatory to sewing 141
 Gun barrels, manufacture of 234
 Gun locks, cover for 396
 Guns, apparatus for using submarine 349
 Gun-nipple protector 381
 Guns, needle 221
 Gunpowder to form cartridges, treating 321
 Gun stocks 61

H
 Hames fastening, design for 349
 Hames, fasteners for 141
 Hammers, forging 364
 Harness, slide for 301
 Harpoon, rocket 396
 Harrows 173, 397, 410
 Harrows, rotary 29
 Harvesters, grain and grass 46 (2), 174 (2)
 Harvesters, cutting apparatus for 13 (2), 29, 301
 Harvesters, guard fingers for 109
 Harvesters 13 (2), 29 (2), 30, 61 (2), 77 (2), 83 (2), 109, 173, 189 (2), 236 (3), 237, 253, 284, 300, 301, 316, 364, 381, 397 (5), 410
 Harvesters, fuser beams for 301
 Harts, apparatus for felting 284
 Hats, sweat bands for 300
 Hats, men's 46
 Hats, ventilators for 306
 Hats, military 173
 Hat shell iron 253
 Hat bodies, felting 285
 Hay raking 365
 Heaters 172, 237, 301, 348, 364, 396, 410
 Heaters for passenger cars 109
 Heaters, sad iron 108, 332
 Heating skin without removing the hair or fur 29
 Hemp breaker 140
 Hibiscus moscheutos to the manufacture of paper and other purposes, application of the 348
 Hinges and hooks 188
 Hoe, horse 76
 Hoisting machines 221
 Hoop skirts 157, 172, 236
 Hook, design for a coat and hat 251
 Hoops to ladies' skirts, machines for classing 46
 Hop frames 364
 Horse powers 188, 301, 410
 Horse powers, circuit 301
 Horse powers, tread 301
 Horse powers, double geared 25
 Horse powers, &c., speed regulators for 301
 Horses' hoofs, tools for paring 301
 Horses, cribs for 269
 Horses to and from carriages, apparatus for attaching and detaching 109
 Horses to and from vehicles, apparatus for attaching and detaching 220
 Hubs and journals for carriage wheels 409
 Hubs, machines for turning and mortising 189
 Hulling machines 140
 Horse-spur 46
 Hulling and thrashing clover, machinery for 269
 Husks from corn, machines for removing the 46
 Hub mortising machines 381
 Hydrants 348, 396, 409
 Hydrocarbons, apparatus for vaporizing and burning liquid 350
 Hydrometers 332

I
 Ice, apparatus for making 285
 Ice boat, velociped 141
 Ice cars 221
 Ice creper 268
 Ice pitcher 93
 Ice shoe or calk 252
 Incrustations in steam boilers, mode of preventing 93
 India rubber mats for floors, &c., 29
 India rubber rolls to metallic shafts, fastening 252

India rubber, making hollow articles of 301
Indian corn preserved green 269
Indicators, railroad station 109
Injector, Giffard's 410
Injector, mode of operating Giffard's 13
Inkstands 124, 237, 396, 397
Iron, manufacture of sheet 124
Iron and steel, manufacture of 349
Iron and steel, process of making 13
Iron cutters or sleighs 93
Ironing and fluting machine 332
Ironing machine 300
Iron ships and other navigable vessels, means for covering and repairing 76

J

Jacks, lifting 60, 172
Journals, rolling or frictionless 284
Journal boxes 29
Journal boxes, composition for 381

K

Kettles, dies for manufacturing brass 141
Kitchen ranges 61
Knapsacks 109, 125, 188, 237
Knapsacks, hospital 61
Knapsack, slinging 109
Knife, fork and spoon, combined 60, 61, 221
Knife and fork, construction of 125
Knife, fork and spoon cleaning machine 236
Kne, budding 125
Knife cleaning box 365
Knives, hay 141
Knitting, burrs for 410
Knitting machines 93, 253

L

Ladder, step 61
Ladders and staging for artizans 124
Ladies' dresses, instruments for drafting 348
Ladies' dresses, springs for (see Springs)
Lamp burners, coal oil 409
Lamp chimneys 409 (2)
Lamp reflector and chimney protector 409
Lamps, burner for coal oil 409, 410
Lamps for railway cars, coal oil 409 (2)
Lamps 13, 46, 69 (3), 76, 109, 141, 156 (2), 173, 188, 205, 237, 269, 284, 333, 365
Lamps, coal oil and other 396
Lamps, coal oil 285, 332, 410
Lamps, miners' 349
Lamps, locomotive 269, 317
Lamps, mode of securing chimneys to 348
Lamps, burners for 332
Lamps for burning coal oil 253
Lamp chimneys, fastener for 268
Lamp cone, coal oil 332
Lamps, mica chimneys for 269, 349
Lamp chimneys, holder for 268
Lamp chimney, coal oil 332
Lamp chimneys, spring for 269
Lamps, chimney for 124, 236
Lamps, mode of attaching chimneys to 253
Lamps, reflectors for 13
Lamp burner 235, 300
Lamp, night 332
Lamps, shade for 253
Lamps, glass deflectors for 301
Lamp shades, clasp for 125
Lamp shade holders 237, 260
Lamp, vapor 60
Lamp, machines for marking and furrow- ing 316
Lantern 333
Lantern, design for a 221
Lanterns, guards for 157
Lantern lamp 330
Lanterns for marine telegraphs 364
Lapping, printers' 317
Lard and tallow, process of rendering 13
Laying stone, &c., under water 221
Leather, composition for dressing 173
Leather, machine for pricking 173
Leggings, saddle 29
Leathering tacks, machines for 172
Letters, device to prevent opening without discovery 365
Letters on street railroad cars, mode of collecting 364
Leveller, land 253
Lift or handle, design for 94
Lighthouses, piers, &c., construction of foundations for 172
Lights for locomotives, head 397
Link motion of steam engines 319
Liquids from kettles and other vessels, apparatus for discharging 285
Liquors from becoming flat, apparatus for preventing 221
Loading coals, &c., machine for 364
Locks 12, 157, 380
Locks, guard attachment for 12
Locomotive engines, mechanism of 316
Looms 157, 348, 380, 396
Looms, apparatus for operating shuttle boxes of 365
Looms, fancy 141
Looms, picker motion for 205
Looms, pickerstaff for 330
Looms, power 76, 109
Looms, design for top rail for weavers' 269
Loom heddles, apparatus for varnishing 13
Lunch box 108
Lubricating axles of wheels 332

M

Mandrel for loading case shot, &c. 46
Mangle 364
Manure, machines for spreading 287
Marble, imitation 236
Match box, pocket 109
Match safe 156
Matches, friction 205
Mattress 234
Measures, liquid 173
Measures, graduated glass 156
Measuring distances, instruments for 268
Meat chopper, rotating 300
Meat-cutting apparatus 173
Melodeons, &c. 300
Melodeons, coupling for octaves, &c., in 189
Meridian instruments 13
Metal, architectural sheet 93
Metallic molds for casting metals, prepar- ing (see Casting metals)
Metallic molds, wash or coating for 221
Meters, water 60, 76, 253
Meters, wet gas 220 (2)
Miasmatic diseases, medicine for 300
Microscopes 156
Milk, concentrating and preserving sweet 269
Milk cooler 410
Mills, apparatus for feeding 108
Mills, flouring and grist 76
Mills for crushing apples, sugar cane, &c. 124
Mills, fanning 396 (2), 409
Mills, wind 317
Millstones, machines for dressing 237
Mills, metallic grinding 301
Mills, operating grinding 396
Mills, alarm indicator for grist and flour- ing 76
Millstone dressing 60
Millstones, balancing 333
Millstone picks 284
Mining drills 284
Molding, weather strip 157

Moldings, machinery for making 365
Monument, constructor of 349
Monument, design for a 94
Mop head 220
Mortising machine 364
Motion, crank 236
Motion, mode of converting 180
Motion, mode of transmitting and arrest- ing 93
Motion, changing a rotary into a reciprocating 317
Mowing machines 29, 77, 236, 349
Mowing machines, track clearers in 93
Musket balls, machines for compressing 253

N

Nails for sheathing 173
Needles, knitting-machine 349
Needles, machines for polishing the eyes of 13
Night signals, mode of firing 316
Nutmeg grater 333

O

Odorizer of kerosene oil 188
Oil, apparatus for distilling coal 93, 141
Oil cans 173
Oils and fat for rendering them more use- ful for burning lamps, lubricating machinery and other purposes, mode of treating 409
Oils, method of storing 157
Oil presses 332
Oil tank 141, 156
Optical telegraph 76
Ordnance 205, 332, 396
Ordnance, breech-loading 20, 46, 109, 236, 316, 364, 380
Ordnance, construction of 124, 172, 285
Ordnance, canister or case shot for 189
Ordnance for use under water 301
Ordnance, hooped 332
Ordnance, hot projectiles for 93
Ordnance, mode of constructing 317
Ordnance, revolving 46, 77
Ordnance, revolving automatic 409
Ordnance rifled 46
Ore-crushing mills 333
Ore separator and washer 221
Ores, concentrating and cleaning 333
Ovens, portable 173, 221
Ovens, bakers' 157, 172
Oval moldings, framing 205
Oysters, steaming 409

P

Packing cans for transportation 173
Packing for steam and other engines 109
Padlocks 300
Pads, truss 77
Paneling machines 61
Pans for evaporating saccharine juices (see Saccharine juices)
Pantaloons 205
Paper, machine for folding 349
Paper, printing and cutting 189
Paper, machinery for making 205
Paper, machinery for drying sized 317
Paper pulp, machinery for cleansing 284
Paper, safety 205
Paper stuff, preparation of 237
Passenger cars, arrangement of steam engines for propelling street 61
Peat, improved mode of preparing 141
Pegging machines 77, 142, 235
Pegging machines for boots and shoes 125, 141
Peeling willow, machine for 93
Pencil sleeve and eraser 396
Pencils, means of attaching rubber to 365
Penholder 235
Pens, metallic 364
Pens, &c., boxes, cases and cards for 333
Percussion powder 397
Percussion caps, machine for varnishing 77
Photographs, &c., press for 410
Photographs, &c., roller press for 173
Photographic apparatus 384
Photograph preserver, design for a 125
Piano 172
Piano orchestra 397
Pianos with mclodeon attachment 400
Pianos, iron frames for 397
Pianoforte actions 125, 269
Pianofortes 61, 93
Picker motion (see Looms)
Pins, manufacture of dentists' 189
Pipes, composition for lining tobacco 61
Pistol with a sword, combining a 205
Piston packing 236, 295, 349, 390, 396
Pistons for steam engines 173
Pitchforks, horse 124
Plane stocks 109
Planing machine 77
Planter, foot corn 365
Planters, corn 77, 208, 349
Planting machines 410
Plastering surface 384
Plate-holder, photographic 348
Plow beam 332
Plows 60, 61, 93, 141, 301, 317, 349, 381
Plows, combined iron and steel 109
Plows, corn 396
Plows, cutter attachment to 268
Plows, reversible 396
Plows, rotary 348
Plows of concussion shells 237
Portfolio and writing tablet 29
Pontoon, iron 125
Post-office wax-bill envelope 409
Pot, culinary 93
Power spading machines 349
Powder, blasting 235
Presses 285
Preserve vessels 364
Preserve jar 13
Press, hand printing 76
Presses, hay 235, 269
Presses for compressing and baling 236
Presses, printing 61, 174
Preventing corrosion of steam boilers, vats, tanks, &c., mode of 157
Preventing jarring and jolting railroad cars and locomotives, mode of 173
Primer for firearms, automatic 29
Primer, percussion cap 269
Projectiles 142
Projectiles of rifled ordnance, sabot for 410
Projectiles for firearms, casting 76
Projectiles for ordnance, &c. 317
Projectiles, explosive 332, 349, 409
Projectiles for rifled ordnance 46, 61, 172, 189
Projectile for smooth-bored ordnance, rotat- ing 221
Propeller 301, 396
Propeller, marine 396
Propellers relatively to the draft of water, apparatus for adjusting 410
Propellers, adjustable and reversible 348
Puddle balls, compressing 77
Puddlers' balls, rolling and compressing 14, 46
Pulveriser and seed sower 60
Pumps 13, 60, 61 (2), 172, 205, 221, 252, 301, 316 (2), 317, 348, 349, 396, 409 (2)
Pumps for deep wells 157
Pumps, metallic molds for casting 237
Pumps, rotary 13, 380, 396 (2)
Pumps, chain 409
Punching boiler plates, machines for 29

Q

Quartz crushers, stamp head for 29

R

Radiators, steam 205
Rack and trough for feeding stock, com- bined 349
Raising or lifting weights 284
Raising carriages, machine for 156
Railroad cars, mode of collecting fares on 12
Railroad chairs and rails 409
Railroad cars, running gear of 173
Railroad joints or chairs 157
Railroad turntables 12
Railroad tickets, cases for 108
Railways, construction of 333
Railways, street 284
Ranges, cooking 93
Rakes for harvesters 268, 285, 349, 365
Rakes, hay 253
Rakes, horse 157, 188, 284, 349, 396, 409, 410
Reaping and mowing machines 62 (2)
Reflectors 46
Refrigerator 61, 93, 348
Refrigerators for steam engines 332
Registers, hot-air 237
Registers, grain 60
Registers, weighing 60
Registers for bar rooms 410
Regulator, car truck 108
Regulators, gas 172, 285, 332, 409
Retorts, gas 124
Retorts, casting gas 285
Rice-cleaning, hulling and pearing ma- chine 380
Rifle sights 13
Rocking toy 206
Roofing 93, 173
Roofing composition for railroad cars, &c. 109
Roofing, metallic 109
Roofing, tile 205
Rollers, composition for printing inking 332
Rolls for rolling piles of railroad iron 349
Rotary engines 255
Rubber, restoring waste 124
Rudders, apparatus for shipping spars 237
Running gear of cars for street railways 348
Running gear carriages 140
Ruts on highways, machinery for filling wagon 71

S

Sabot for explosive shells 284
Sabots for hot shot, expanding 284
Saccharine juices, apparatus for evaporat- ing 237, 295, 301, 397
Saccharine, hot evaporating pans for 157, 172, 205, 236, 365
Saccharine juices, evaporators for 316 (2), 348
Saccharine and other juices, construction of pans for evaporating 109
Saccharine liquids, evaporating pans for 13, 108
Saddles 46
Saddles, military or other riding 125
Safes, burglar-proof 381
Salt, apparatus for the manufacture of 140, 220
Salt, manufacture of common 221 (2)
Salt, purifying common 77
Salt fasteners 409
Sashes, window 364
Sash springs 141
Sash supporter and fastener 124
Sawing machines 132, 284, 410
Saw mills 220, 284
Saw gammers 46
Saws, scroll 60
Sawing wood, machine for 173
Scales, platform 156, 220
Scales, portable platform 365
Scissors, stationary counter 317
Scrapers, road 93
Screens, coal 124
Screw drivers 365
Screw wrench 172
Screws, threading wood 381
Screws, tool for making 108
Scroll saw mills 380
Scroll saw stocks 30
Scroll sawing machines 397
Scroll saws, guide and support for 380
Scythe the snathe 26
Screw for screws 29
Seats for wagons and sleighs 109
Securing carriage-wheel hubs on axles 29
Seeding machines 76, 236, 253, 284, 364, 396
Separators, grain 60, 109, 252, 285, 332, 381
Sewing machines 13, 60, 109, 125, 156, 236, 237, 269 (4), 285, 333, 349
Sewing machines, tension regulator for 410
Seed planters 301
Sewing machines, needle gage and ad- juster for 252
Sewing machines, thread tension 317
Sewing machines, setting and threading needles in 156
Sewing-machine needles 188
Sewing-machine frame, design for a 397
Sewing thread spool-holders, portable 284
Sewing-needle cases 285
Sewing thread, machinery for dressing 316
Sewing-work cases, portable 252
Shackles for connecting thills to axles 332
Shackles for railroad cars 348
Shade-holders for gas burners or lamps 365
Shafting, connecting and disconnecting 172
Shears, sheep 333
Sheet metal, architectural 93
Shells for ordnance, explosive 60, 237
Shells for ordnance 124, 285
Shells for rifled ordnance 108, 109
Shells for rifled ordnance, explosive 409, 410
Shingle machines 141, 221, 349, 364
Shield for iron-clad vessels 397
Shells, defending redoubts by 93
Ships, casting metal for 157
Ships or other substances under water, chipping 93
Ships of war and other navigable vessels, construction of 76
Ship building 141
Shirts 300
Shoe tacks, machinery for rolling metal for 125
Shot-hole stopper 172
Shovel, scoop 93
Shot for ordnance, canister 60
Shoulder-straps, fasteners for 12
Shovel-case, design for a 301
Shutter fastenings 389
Shutters for the port-holes of vessels, &c. 317
Shuttles, 109
Shuttle boxes of looms, apparatus for operating 365
Sifters, coal 172, 409
Silicates, preparation of soluble 284
Skates 13, 189, 284, 300, 380
Skate fastening 268
Skins, depilating and bating 364
Skirt protectors 300
Skirt supporters 13
Skirt, skeleton 77
Skirt, loop 93
Skirts, ladies' 188
Sleds, boys' 268

Sled and sleigh runners 317
Sleigh bells to straps, mode of attaching 269
Slide valves of steam engines 316
Slide valves of pressure, relieving 109
Slides of steam engines, method of oiling 268
Sliding grates (see Grates)
Sling for carrying blankets and overcoats 285
Smoothing iron 172
Smut machines 221
Snow from railroad tracks, mode of clean- ing 109
Snow plow 301
Snow plows for railroads, 316
Soap 332
Soap, benzole 380
Soap, manufacture of 284
Soap, silicated 185
Soap cups for washstands, &c. 364
Soda used in the manufacture of paper stock, process of recovering 13
Soda water apparatus 252
Sofa convertible into a table, trunk, cot, &c. 409
Sofa and bathing tub, combination of 364
Soldering irons 237
Spindles for spinning 332
Spirit levels, combined 364
Splints, extension, 364
Splitting kindling wood, machines for 252
Splitting stumps of trees, timber, &c., mode of 15
Spoons, machines to label thread 410
Spools for sewing thread 397
Spool-holding device 142
Spoon, camp 125
Spoons, sheet metal 109
Spoons, manufacture of 253
Spoon, design for 349
Spoon, of fork handles, design for 190
Spring ester 157
Springs, car 205
Springs, corrugated spiral car 284
Springs for carriages, wagons, &c. 173
Springs for vehicles 316
Springs, omnibus 76
Springs, wagon 253
Springs for ladies' dresses 173
Spring balances 317
Spur, spring 396
Squares, joiners' 332
Squeezer, lemon 410
Stacking machines for 172
Stair case and ladder, folding 125
Stalls for horses 76
Stamp for post offices, hand 77
Stands, machines for 396
Statuette group—the "Picket Guard" (design) 254
Statuette group—"Camp Life" (design) 254
Stave machines 332
Stave machine, bedplate of 141
Steam boilers 109
Steam boilers, mode of preventing incrus- tations 93
Steam boiler furnace 93
Steam engines 29, 94, 301
Steam fire engines 61
Steam engines, oscillating 76
Steel, process of making 61
Steeple 236
Stills and still bottoms, constructing of 13
Stills for coal oils 252
Stirrups and their covers 12
Stitching machine 284
Stoppie, bottle 93
Stopper, bottle 13
Stoves, camp 14, 157, (2), 173
Stove, cooking 125 (2), 205, 268, 269, 285, 332, 349, 397
Stoves 61, 173, 220, 236, 237, 269, 284, 332, 348, 398
Stoves, hot air 237
Stove dampers 205
Stove grates 236
Stoves, parlor 409
Stoves, parlor hot-air 125
Stove, design for a parlor 393
Stove, design for a 125, 142, 285 (2)
Stove plates, design for 254
Stove, design for plates of a 62
Stove, design for a cook's 62 (8), 233, 255, 317
Stove doors 410
Stove, design for a gas burner 285
Stove linings 333
Stove carriers and grain separators 349
Straw carriers and grain separators for thrashing machines 29
Straw cutters 188, 317
Straw cutter and corn sheller, converti- ble 173
Sugar juices, apparatus for evaporating 205
Sugar, apparatus for manufacturing cube 125
Sugar molds, carriage for 220
Sugar, refining and crystallizing 29
Sugar, refining animal charcoal for re- fining 332
Sugar, sap bucket for the manufacture of maple 410
Sun dials 348
Supporter, female 253
Sweeping machines 220
Sweeping machines, tread 380
Sweet potato, articles of food made of 141
Swine to prevent them from rooting, cut- ting the noses of 141
Sword and pistol combined 236, 316
Switches, railroad 60, 61, 141, 173

T

Table, extension 76
Table and camp chest 60
Table and sink, combination of 332
Tablet, writing 29, 205
Tanks, vacuum 333
Tanning 189, 220
Tanning, apparatus for 253
Tanning composition 93
Tanning for morocco and other grain- finished leather 252
Tassel tops, design for 410
Tea and coffee pots 396
Teeth, manufacture of artificial 93, 317
Teeth, setting artificial 189
Teeth, setting artificial 172
Telegraphs, electro-magnetic 255, 410
Telegraphs, pneumatic 381
Telegraphs, instruments for 364
Telegraph apparatus 188
Telegraphic cables 233
Telegraphic cables, laying 317
Telegraphing by colors 60
Telegraphing by light 205
Telescopes for measuring distances 159
Tenoning machines 253
Tenoning machines, hand 220
Tents 13, 29, 188, 189, 221, 348
Tents, iron, rack 269, 390
Tents, mode of attaching beds to 109
Tent fixtures 13
Terra-cotta roofing 332
"The Town Pump," design for statu- ary 381
Thermometers 13
Thrashers and separators, grain 76 (3)
Thrashing clover (see Clover)
Throstles for spinning cotton 236
Ticket recorders 284
Ticket stamp, railroad 141
Tips for fishing rods 365

Tires, apparatus for bending 172
Tires, apparatus for shrinking 124
Tire-upsetting machines 76, 316
Tobacco cases 333
Tobacco holders 124
Tobacco pipes 76, 93 (2), 189, 236, 301, 410
Tobacco pouches 364
Tompon for fire-arms 156, 221
Tools 156
Tools to their handles, mode of fastening 317
Tool posts for holders 205
Top-sail rig 269
Tourniquets 61
Trace fastening 896
Tractor motive engines 157
Trade-mark on sword blades, design for a 157
Trade-mark, design for a 62
Train or fuses, construction of 60
Trap, steam 410
Trap, fish 268
Trap, rat 157
Tree protectors 396
Trellis frame 125
Trucks, car 300
Trucks for locomotives 141
Trunk stays, device for drawing in 236
Truss girders for bridges 124
Truss pads 29
Tubes for condensers, method of setting 13
Tubing, wooden 333
Type-setting machine 109
Turret for war vessels 316

V

Valve for air, gas, &c. regulator 317
Valve gear for steam engines 316
Valve regulators 124
Valves for steam engines, slide 172
Valves, governor 173, 349
Valves, variable cut-off 252
Valves, means of operating cut-off 220
Valves for steam engines 255, 333
Valves to heaters for cheese vats 380
Valves of steam engines, method of open- ing and closing the 109
Valves of steam engines, device for oper- ating 252
Vapor, apparatus for generating 141
Varnish, coach and furniture 93
Varnish, Japan 282
Vats, cheese 365
Vehicles, wheel 220, 300
Vehicles, construction of 173
Veneers, machines for cutting 141, 188, 365
Vent holes for ordnance 300
Ventilator, tent 13
Ventilator for petroleum oil lamps 301
Ventilators, car 333
Ventilators for railroad cars 29, 268
Ventilation 333
Vessels, navigable 348
Vessels, apparatus for bracing the yards of 29
Vessels, apparatus for submarine attack on enemy's 61
Vessels, &c., grappling and raising sunken 332
Vessels, arming war 333
Vessels, iron-clad 221
"Village Schoolmaster," design for statu- ary of the 381
Vinegar, apparatus for making 156
Vinegar by the quick process, apparatus for making 173
Viols, all-piece for 349
Vise for holding and swaging horse-shoes 237

W

Wads for ordnance and other fire-arms 349
Wagons 380
Wagons, pleasure 140
Wagon wheels white loading, apparatus for holding 173
Wagons, running gear 109
Wagons, shifting hinge, joint or coupling shafts of 173
Walls of buildings, construction of 124
War vessels, arming 333
Washboard 60
Washer, window 316
Washers for paper pulp 93
Washer, gold 236
Washing machines 61 (2), 124, 125, 141, 172, 173, 189, 220, 236, 252, 253 (2), 268 (3), 300, 301, 332, 333, 348, 364, 380 (2), 381, 409, 410
Watch and locket cases 188, 285
Water by steam, device for raising 252
Water closets 61
Water condensers, portable 300
Water filters 156
Water-proof coating for cloth, felt, &c. 284
Water-gas, apparatus for making 205
Water-proof fabric 156
Water meters 77
Weather strips 348
Weather strips for doors 381
Weighing apparatus 141
Welts for boots and shoes, machine for cutting 77
Whales to the surface of the water, ap- paratus for raising sunken 396
Wheel-press 317
Wheels, wagons 60, 76 (2), 172 (2), 221, 253, 317, 348, 380
Wheels and grinding surfaces, forming emery 61
Wheels, water-current 189
Wheels, cast-iron 284
Wheels to axles, mode of securing 172
Wheels, machine for cleaning emery 61
Wheels, paddle 237, 284
Wheels, horizontal water 77
Wheels, wind 348
Whiffletree attachment 46
Whiffletrees to the tow-lines of canal boats, attachment of 261
Winder, cord 284
Windlass, vertical 253
Window-sash adjuster 284
Window sash 409
Window sash and setting glass therein 108
Windows, double 173
Wire, machine for binding 349
Wood-saw frames 284
Wool, machinery for spinning 348
Wool, &c., machines for drying, 253
Wood screws, machines for threading 381
Wrench 317
Wood-bending machines 381
Wood and other substances for the man- ufacture of paper pulp, process of separating the fibers of 188
Wool, machinery for drawing and spin- ning 348
Wringing machines 268, 410
Wringing machine cylinder 316
Wringing machines, rollers for 76, 125, 349
Writing desk and checker board 77
Writing desk (see Desk)

Y

Yarns for warps 349
Yarns to the action of liquids, submitting 172

Z

Zinc, method of working silicious and other calamine ores of 76