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Prevention of Pitting in Smallpox.

The London papers state that Dr. Startin, the senior surgeon to the Gurney Hospital for Diseases of the Skin in that city, had communicated to the *Medical Times* a very important plan, which he had adopted for the last fourteen years, for preventing pitting in smallpox, and which, he states, has always proved successful. The plan consists in applying the *acetum cantharidis* or any blistering fluid, by means of a camel-hair brush, to the apex of each spot or pustula of the disease, on all the exposed surfaces of the body, until blistering is evidenced by the whiteness of the skin in the parts subjected to the application, when the fluid producing it is to be washed off with water or thin arrowroot gruel.

Liquid Manure.

This method of fertilizing crops has lately excited much attention in England, and has been adopted by quite a number of enterprising farmers. It is stated to be superior to solid manuring, producing the greatest quantity of crops ever attained by any other method of culture. J. Nelson, a farmer on the Earl of Derby's estate, about eight miles from Liverpool, raised 100 tuns of Italian rye grass, last year, on one acre of land, by liquid manuring. The soil was previously fertile and well-drained, but never had yielded anything to compare with this crop. This system of cultivation deserves the attention of our farmers.

Speed of Mill Stones.

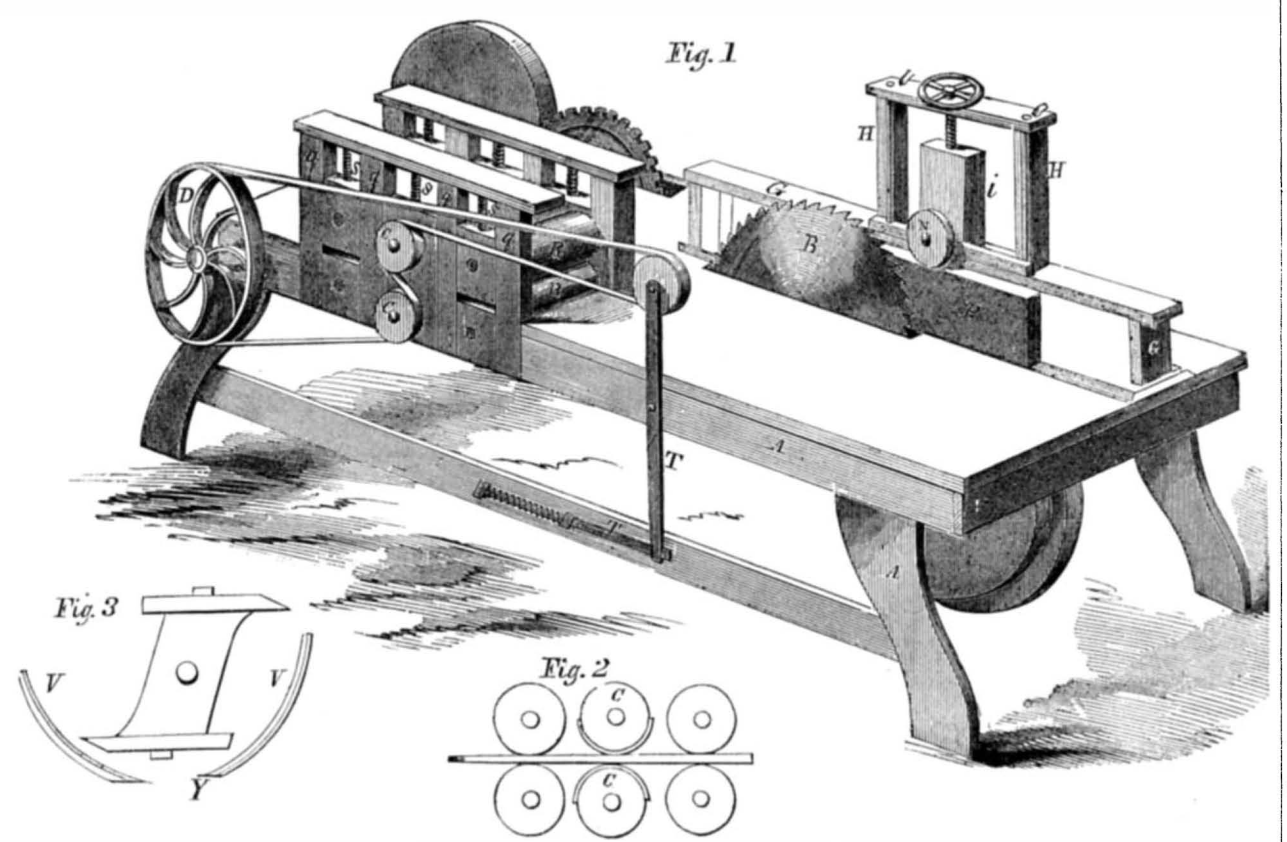
We are informed by Mr. R. B. Odell, of Fulton, N. Y., who has had an experience of more than twenty years in milling, that he never runs 4 1-2 feet stones at a lower velocity than 180 revolutions per minute. He says, "in grinding wheat in good condition, it is not uncommon to run such stones 225 revolutions per minute. In grinding coarse damp grain, it is sometimes necessary to run them below 180 revolutions."

U. S. Agricultural Fair.

The Fifth Annual Fair of this Institution is to be held at Louisville, Ky., during some part of the Fall, this year, not yet particularly fixed upon. Its officers, however, have already sounded their bugle, and given an early invitation to our inventors, mechanics, and farmers, to buckle on their armor and prepare for the onset. They have issued their card of invitation, and we like it much better than the one they issued last year, in which little attention was paid to encourage mechanical skill. There is to be a trial of reapers at Louisville, and proper awards made; also trials of several other machines. The Secretary of the Invitation Committee in this city is H. S. Olcott, American Institute.

All kinds of food should be sold by weight, and especially eggs, which are so various in size, and are sold by number, a most unfair mode. Of three dozen, taken promiscuously from a lot for sale in a store, one dozen weighed 18 1-2 ounces; one 25 3-4, and the last 27 ounces.

HUEY'S SHINGLE MACHINE.



The object of the machine here represented is to saw and plane shingles at one operation. The increased durability and value of shingles well smoothed is sufficiently well known, but the labor of manufacturing by splitting and shaving by hand, as also by most of the inventions for machine shaving, has, to a great extent, forbid their use.

Mr. Huey's machine first saws them into form by an ordinary saw, and then planes them on both sides by passing them between rollers of small diameter armed with cutters, which cutters are, by devices to be described, allowed to take each but a very thin shaving from the corresponding face of the shingle, and that by successive cuts in the direction *from* the butt, and never *towards* it, so that unless the wood is very cross-grained, the surface will always be left as smooth as that of boards or other lumber planed by the ordinary Woodworth planing machine.

A is the frame or bed of the machine, B is the saw, and G is a guide or surface parallel to the plane of B. P is a "model," or wedge-shaped piece, of the same taper as that of the shingles to be sawed, and the block is held against P, and slid forward with it. By this means—making the face of the block stand at a little angle with the saw as it moves forward—the shingle is properly tapered always in the same direction, and is presented butt end foremost to the feeding rollers, R R, which in turn urge it slowly forward to be acted on by the cutting cylinders, C C. As the shingles are always tapered in the same direction, the bolt must be turned end for end, either by hand or by machinery not represented, and thus the bolt will be consumed equally, one end just as rapidly as the other.

The feeding rollers, the cutting cylinders, and also the clearing rollers, further on in the train, are all mounted in boxes carried in the upright frames, *q q*, with liberty to rise and sink therein. The lower box of each pair is firmly supported on the foundation, while the upper box is pressed down with a proper amount of force by the coiled springs, S S S, so that when the butt of the shingle is received by either pair the upper roller may rise to a corresponding hight, and as the shingle passes through may gradually sink till the smaller end passes out.

The means by which the cutting cylinders, C C, are thus actuated and accurately gaged, so as to take just the proper thickness of shaving from each side of the shingle, is one of the main features of the invention, and is represented in figs. 2 and 3. The cutters are attached as in fig. 3, and are each almost enclosed on the sides toward the shingle by a case, V V, which case is firmly attached at each end to the carrying boxes. The point *immediately* in contact with the shingle has a narrow opening with its edges, as shown at Y, in fig. 3, so that the edges of the cutters at each revolution project to an almost infinitely small extent beyond the line joining the plane faces of the sides of the aperture. In other words, these cases, V V, protect the shingle from contact with the cutters, except to just the very moderate extent desired. As each shingle is fed forward by the feeding rollers, R R, its thick end or butt meets the case, V, and raises the whole. Next, sliding across the opening, Y, every point as it passes is successively acted on by the cutters, both sides at once, and the whole is finished as the butt end of the next one is received. The cutting cylinders may be driven in any of the ordinary methods, so as to secure a strong and rapid motion. In the cuts both are driven by the same belt from the large pulley, D, the belt being kept tightened by the action of the coiled spring through the medium of the lever, T, so that the movements of C C, in separating and again approaching, in planing each shingle, is of no effect in deranging the communication of power.

This invention was secured by patent dated Feb. 3d, 1859. For further information address the patentee, William Huey, Columbia, Lancaster co., Pa.

Light War Vessels.

The *Nautical Magazine* justly complains that our government does not devote attention to building war vessels of light draft, say 12 feet, provided with a few heavy guns. They would be of great service in pursuing pirates, especially about the coast of China, where these villians are very active, and would be important for defensive operations. The gun-boats built in such quantities by the English government, and now being hauled up for preservation at the British dockyards, are some of them of only six feet draft, and could, in case of war, with that power, penetrate our inland waters and bid defiance to all our present *naval* vessels though they would probably be somewhat troubled from other sources.

New Steamships.

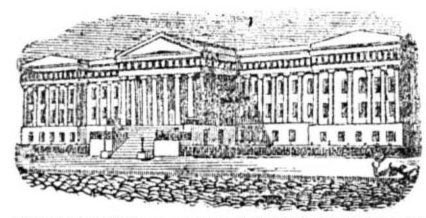
The work on the Steamship *Adriatic* is still continued, though the operations within the ship do not seem as active as at some former periods. Nothing new has occurred except another trial of the engines at the dock, which was highly successful for some hours, but terminated as in every other of the late trials, in the breaking of the valve gear. The condensers are tolerably perfect, and the engines themselves, with the exception of the usually minor details of the valve-gearing are faultless. It is impossible to say how long time will be required before making her trial trip.

The *Niagara*, (screw frigate,) is nearly completed, and has recently made a trial trip, but split the head of her cylinder.

Laying of the Transatlantic Cable.

We have before announced that the new mammoth steam frigate *Niagara*, has been selected to lay the American half of the great telegraph across the ocean, and that the side-wheel war ship *Mississippi* has been ordered to accompany her as an assistant in case of need; both vessels are now being put in preparation. The proprietor of the *Herald*, who had applied for liberty to send a reporter in each ship, has been answered in the negative by the Secretary of the Navy—that worthy having decided that such passengers would be incompatible with the interests of the service.

The Steamship *America*, built in this city last summer, for the Russian Government, has arrived at her destination—the Amoor River, on the Pacific coast of Siberia—and was put in commission and sent off on a cruise, the day after her transfer to the Russian Government, although she had but just completed a voyage of thousands of miles.



[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING APRIL 7, 1857.

HARVESTERS—Samuel S. Allen, of Bristol, Pa.: I claim the combination of the upper platform, Q, and sliding pole, V, with the main frame, C, and inclined draft rod or chain, when the same are constructed and arranged for joint operation substantially in the manner and for the purpose set forth.

CLINCHING SPIKES—Horatio Bates, of New York City I am aware that a clinching piece in the form of a small spike has been driven by the side of a spike, to lock the same by its action against a jog or offset on the adjacent side thereof, as described in the patent of J H. Wygant, but that mode of locking the spike requires the spike to be specially constructed for the purpose, and I consider it less secure, while it is a more expensive mode of confining the spike than my method, which is applicable to common spikes or wrought nails of any kind, and makes the clinch on the spike or nail itself. I disclaim any such method of locking the spike.

But I claim securing a spike or nail by boring a hole in the timber of less depth than the spike or nail itself, to receive it, and inserting thereinto, before the spike or nail, a ball, a, or lump of metal, of substantially similar character, to deflect the point thereof when it is driven, and thereby cause it to clinch itself, substantially as described

[This is a very ingenious method of self clinching spikes. A hole is bored in the timber somewhat less in depth than the length of the spike, and into this a ball or small piece of iron is pushed, before the spike. When the spike is driven in, and its point meets resistance from the ball or piece of metal it is deflected, passes through the timber at the side of the hole, curls up like a hook, and clinches firmly.]

STEAM BOILERS—Smith Baldwin, of St. Louis, Mo.: I claim the arrangement of the cylinders, a b, the water tubes, d d, flues, j j m and n, in the manner substantially as described, to operate as set forth.

[This boiler has an inside and an outside cylinder or shell combined with water tubes and water spaces in a peculiar manner, and provided with flues so arranged that a very extensive heating surface covered with a thin body of water is obtained, also perfect circulation of the water and dry heating of the steam, while at the same time the boiler is made both safe and durable.]

WINDOW CURTAIN FIXTURES—Ransom Ballou Jr., and Benjamin F. Hooper, of Albany, N. Y.: We claim a tightening button or pulley affixed at or near the circumference of a rotating disk or barrel, the said disk being combined either with the pawl and fixed ratchet, as described, or with other means within it for maintaining the necessary stress upon the cord, substantially as set forth.

TREATING MOSS—Samuel Barker, of New York City: I claim the method of treating or preparing the moss of commerce to serve as a substitute for curled animal hair, substantially as set forth.

EXHIBITING STEREOSCOPIC PICTURES—Alexander Beckers, of New York City: I claim, first, arranging the pictures at right angles to the endless belt, in the manner and for the purposes substantially as described.

Second, the described mode of securing the pictures in the grooved slides by means of the elastic bands, e e, and notches, f f, in the ends of the grooved portions of the slides.

[A series of photographic pictures has been arranged on an endless band in a stereoscopic case, but they were secured flat, and occupied a great deal of space. A case of three feet high was required for twelve pictures six inches wide each. According to Mr. Becker's arrangement of pictures, seventy-two stereoscopic pictures can be arranged on such a band, in such a case, to present a succession of views—a stereoscopic panorama in a very small space. The arrangement is such that more favorable light is also thrown upon the pictures than by any other plan.]

ROAD SCRAPER—C. Blakeslee, of Ashtabula, O.: I claim the grading blade, F, arranged as described, and combined with the runners, A A, with the draft forward of the edge of the blade, for the purpose of causing said runners to serve as guides or gages thereto, and preventing the blade from dropping into furrows or depressions substantially in the manner and for the purpose set forth.

SHINGLE MACHINE—John L. Brown, of Indianapolis, Ind.: I claim the construction of a self-feeding shingle machine, by the arrangement and combination of the wheel, L, upon the shaft, B, the wheel, M, the eccentric, N, the lever, O, the bolt, Q, and the oscillating table, R, when arranged and operated as set forth.

HOISTING WINCHES—Joel Bryant, of Brooklyn, N. Y.: I do not claim the invention of windlasses or winches for hoisting the sails of vessels, or for any other purpose.

Neither do I claim any of the parts separately or disconnected from each other.

But I claim the construction and use of windlasses or winches having a sheave pulley or wheel set on the axle of the said windlasses or winches back of their boss or head, and connecting and operating with other sheaves or pulleys operated by the said windlasses or winches, or by the tackle connecting therewith for hoisting the sails of vessels, and for such like purposes, substantially as described and set forth.

FOLDING WINDOW BLINDS—Sylvanius S. Clark, of Manchester, N. H.: I claim, first, the employment of movable upright pieces, E E, containing notches, c c, to receive and constitute bearings for the tenons of the blind slats, arranged to operate substantially as described, within the stationary sides, D D, of the blind or shutter framing, for the purpose of confining the tenons of the slats, when the blind or shutter is down, or of liberating the tenons to allow the blind or shutter to be drawn up or folded.

Second, I claim the guide plates, x x, for conducting the tenons of the bottom slat clear of the notches, c c, during the drawing up of the blind, such plates being attached to portions of the tenons of the said slat that extend beyond the ends of the tenons of the other slats into cavities that are made within the stationary side pieces of the blind, for the cords or chains, p p, by which the blind is raised or folded to work through, substantially as described.

Third, I claim the construction of the chains, G G, with stops, h h, on the links, arranged in such manner as to allow the links to fold freely inwards or away from the slats, and prevent them folding between the slats, substantially as described.

Fourth, I claim the application of the spring, z, and cord, y, to the upper slat, substantially as described, in combination with the connection of the slats by the chains, G G, at their inner edges, for the purpose of effecting the closing of the slats when the blind or shutter is down, and keeping them closed, unless held open by other means.

Fifth, the suspension of the top slat from fixed pins, w w, in the cap of the frame of the blind or shutter, by slotted plates, I I, of a form substantially as described, which admits of all the movements specified.

Sixth, the curved lever, 16, and sliding ratchet bar, 18, applied as described, to operate upon the lower slat and open the blind or shutter from the interior of the window.

Seventh, the hook, J, attached to the inner edge of one of the slats, and operating in combination with the spring, z, and cord, y, to hold open the slats of the upper portion of the blind or shutter while the lower portion remains closed, substantially as described.

[This improvement in exterior window blinds combines an arrangement of the Venetian corded blind with the common frame blind. The slats can be raised up and lowered down, and also operated like a common blind Any number of the slats can also be opened or closed at pleasure. The blinds are opened and closed entirely from the inside and adapted to metal and wooden shutters equally. Mr. Clark has secured his invention in Europe.]

MAKING RIVETS—Richard H. Cole, of St. Louis, Mo.: I claim, first, forming a successive series of die boxes of a double series of sections, d d, which are combined with the parallel peripheries of two equal sized intermittingly rotating wheels, B B', when the arrangement of the bearings of one or both of said wheels is such as to allow of a sufficient amount of lateral play thereof to enable a pair of said sections to be firmly pressed against each other at the termination of each intermittently rotary movement of said wheels, substantially as set forth.

Second, I also claim combining the curved gage plate, b, and the cutting plate, e, with each other, and also with the cam wheels, B B', substantially in the manner and for the purpose set forth.

I also claim the combination of the cam wheels, B B', with the gage plate, b, the cutting plate, e, and the header, a, substantially in the manner and for the purpose set forth.

CUTTING APPARATUS FOR HARVESTERS—Samuel Comfort, Jr., of Morrisville, Pa.: I am aware that springs have been used for the purpose of pressing the knives of harvesters together, and thereby increasing their cutting effect, so arranged, however, as to have an extensive frictional surface; I therefore do not claim exclusively the employment of such springs

But I claim as an improvement on the cutting apparatus of harvesters, for which a patent was granted to me on the 18th of March, 1856, the springs, B, with their twisted or bent projections, h, in combination with the endless chain of cutters, D and E, and stationary knives, F, when the said parts are constructed and arranged for operation in the manner and for the purpose set forth.

REEFING SAILS—Washington F. Davis, of Winthrop, Mass: I do not claim reefing at either the head or foot of a sail or top-sail.

Nor do I claim reefing at the foot of a top-sail by means of a series of bunt lines fastened to the reef band and extended downward through grummets or guides, thence underneath the foot of the sail, and thence upward on the front of the sail, and to and through blocks or sheaves applied to the top-mast, the said bunt lines extending from thence to the vessel's deck, for such is an old contrivance.

Nor do I claim the plans or methods of reefing, as recently patented by Wm. H. Foster and Isaac Boss, the top sail in them being reefed at its head, while all that part of the sail which is below the reef band is held up by lines of suspension passing upward through blocks or sheaves directly supported by the top-mast, the said suspension lines descending from thence to the deck. In these plans the upper yard is lowered down so as to reef the sail, the draft however, on the reefing lines, operates to a considerable extent to prevent the descent of the yard.

I am also aware that reef tackles have been run along the yard toward the mast, and thence down through the yard toward the deck, consequently I do not claim such, the reef tackles in such cases being used separately from the reefing lines, and for the purpose of drawing close up to the yard the outer edges of the sail after it has been reefed.

I claim arranging the ranges of folding eyes or grummets, and the reefing lines above the reef band, or with respect to the upper yard, as described, in order that the sail when reefed shall at the same time be folded or plaited against the upper yard, as specified.

I also claim the described arrangement of the lines of grummets or eyes, at unequal distances apart, in manner as set forth, in order that the minor part of each fold of the sail may come underneath the yard, or the yard project beyond it, as described, when the sail is reefed.

BASKETS—Joel A. H. Ellis, of Springfield, Vt.: I claim the described new or improved manufacture of baskets, as made of vertical splints, two bottom boards, top hoops, and staple connections, or their equivalents, the whole being arranged and secured together, substantially as specified.

I also claim the arrangement of the staple connections, viz., so that each one shall lap on the two next adjacent it, the same causing the fibers of the wood of the splint to be drawn together by the strain of the load of the basket.

REAPING MACHINES—George Esterly, of Heart Prairie, Wis.: I do not claim the use of an adjustable raker's seat or stand attached to a swinging platform.

Neither do I claim an adjustable rakers' seat or platform.

But I claim the combination of the common supporting beam, c, with an adjustable rakers' seat or stand, e, and platform, A, when said parts are constructed and arranged in relation to each other, so as to be easily adjusted to any desired position, there firmly held while the machine is in operation, and the raker on the platform, in the manner and for the purpose set forth.

FORMING SPIRAL SPRINGS FOR CHAIRS, SOFAS, &c.—John T. Foster & Jacob J. Banta, of Jersey City, N. J., and James H. Banta, of Piermont, N. Y.: We claim the spirally cut metallic plate spring, applied to sofas, chairs, and similar articles, substantially as and for the purposes specified.

FELTING HAT BODIES—William Fuzzard, of Cambridgeport, Mass.: I claim the employment or use of the roller, G, one or more attached or applied to the machine, substantially as shown and described for the purposes specified.

[This improvement is designed to produce a felt in hat bodies equal to that made by hand labor, which, it is stated, has not hitherto been accomplished by machinery. One or more corrugated rollers is attached to a vibrating frame, and placed within the apron, in which the articles are placed to be felted. The corrugated roller comes in contact with these, and subjects them to a pressure similar to that produced by the hand. This is an improvement on a former patent granted on such machines to Mr. Fuzzard.

CURRENT AND PADDLE WHEEL—James H. Hanchett, of Beloit, Wis.: I claim, first, suspending water and paddle wheels by means of radius bars, substantially as described.

Second the method of maintaining the planes of the faces of the floats of wheels that oscillate, as described, in a determinate relation to the radius of oscillation of the wheel, as described.

ROTARY PUMPS—Richard Gilbert, of Rochester, N Y.: I do not claim the annular piston of itself.

Neither do I claim a radial arm.

But I claim the vibrating link or arm, J, in combination with the annular piston, D, as described, and for the purpose specified.

ROAD SCRAPER—G. W. Thomas, of Wickford, R. I.: I claim the adjustable side scrapers, E, in combination with the front release scrapers, B, when so arranged as to throw the dirt inwardly towards the center of the road, and in a crowning form for the purpose of giving a natural drainage to the road, as set forth.

GATE POST ATTACHABLE TO FIELD FENCES—J. G. Hunt, of Cincinnati, O.: I claim the application of a portable post to a fence, whether portable or permanent, when arranged substantially as described for the purpose of hanging or fastening thereon a gate, as set forth.

PHOTOGRAPHIC TRAYS—D. J. Kellogg, of Rochester, N. Y.: I claim the employment of the movable bottom, D, said bottom being constructed and applied in the manner and for the purpose substantially as described.

LAMP BURNERS—A. H. Knapp, of Medford, Mass.: I do not claim any one of the features described separately considered.

But I claim the arrangement in a removable burner, so that it may be applied to a common glass lamp as described, of the perforated screen, B, apertures a a, small column c and cam d, provided with an eccentric slot, all arranged, combined and operating substantially as set forth, whereby I am enabled to produce a steady and even flame.

ARRANGEMENT OF STAGING BRACKETS—Joseph B. Latham, of Phenixville, Conn.: I claim the use or employment of the brackets, E, the strap D and dog B, substantially in the manner and for the purpose as set forth.

SMUT MACHINES—Israel Kepler, of Milton, Pa: I do not claim vertical ribs or openings of any kind.

Nor do I claim horizontal ribs or wires, nor the openings between the wires, as neither of these effects the object I have in view.

But I claim the construction of the stave, the horizontal ribs and openings, when said ribs are cut away on their inner faces, so as to facilitate and concentrate the blast of air that is to pass through them, to carry off the smut and other impurities, in the manner as set forth.

LIQUID METER—Otto G. Leopold, of Cincinnati, O.: I neither confine myself to the materials employed nor to the particular form or arrangement of the several parts of which the same consists, provided the wheel or drum is peculiarly adapted to the registering of the flow of liquids.

But I claim, first, suspending the wheel or drum in the manner described, and floating it so as to reduce the friction of its bearings to the smallest possible amount, and thus, in addition to the other means before described, rendering it peculiarly adaptable to the registering of the flow of liquids.

Second, Also the arrangement of dividing the inlet opening into an appropriate number of small apertures, so as to protect the wheel from the gross impurities of the water, and thus preventing its free motion from being disturbed.

HARVESTERS—Pells Manny, of Waddams Grove, Ill.: I claim the combination of the smooth elastic cap or sheath, c, connecting the divider, b, with the main wing, C, with the reversed hook or bent projecting end, d, of an automatic rake, when said parts are constructed and arranged for joint operation, essentially in the manner and for the purposes set forth.

HARVESTERS—Pells Manny, of Waddams Grove, Ill.: I claim raising and lowering the finger bar of harvesters by means of the adjusting stanchion, k, when used in combination with the elastic shoe, b, rigidly attached to the draft bar or pole and jointed to the main frame in front of the driving wheel and back of the finger bar, the whole being constructed for joint operation, substantially in the manner and for the purposes set forth.

ARRANGEMENT OF CARRIAGE SPRINGS—R. P. March, of Jeffersonville, Pa.: I do not claim the combination of wooden and metallic springs as new, nor do I claim the form of springs as new, as both have been known before.

But I claim the arrangement of the combination spring B C, axle A, slotted bar E, and guide pin F, for the purpose of supporting the spring and preventing lateral strain, and for making of equal strength a much cheaper and lighter carriage than usual.

SECTIONAL CORN AND COB MILLS—R. F. Maynard, of Baltimore, Md.: I claim the mode set forth of securing the legs and the parts of the concave together.

CORN AND COB MILL—R. F. Maynard, of Baltimore, Md.: I do not claim the form of the grinding teeth set forth.

But I claim the arrangement of these teeth so as to break points, and to form a series of interrupted screw threads by their inclined points as set forth.

WINDOW CURTAIN FIXTURES—Purches Miles, of Hartford, Conn.: I claim the arrangement of the springs, D, for the threefold purpose of keeping the band in place, supporting the shade at any required hight, and preventing the roller from having end play, in the manner substantially as set forth.

SOUND BOARDS FOR PIANOFORTES—Joseph Newman, of Baltimore, Md.: I claim in pianofortes and other musical instruments having two or more sounding boards making the bridges upon the lower sounding board or boards to protrude through or rise beyond the sounding board or boards above them, substantially as described for the purposes set forth.

TRIMMING JACK—G. J. Olendorf, E. R. Tripp, of Middlefield, N. Y., and Samuel Harper, of Cooperstown, N. Y.: We claim the construction of shaft, B, in connection with frame G and lever C, operating the dies as described and set forth for the purpose specified.

HAWSE HOLES FOR VESSELS, &c.—J. C. Osgood, of Troy, N. Y.: I do not claim arranging a series of pulleys in a circle.

But I claim beveling the edges of the pulleys in the manner and for the purposes substantially as specified.

PARING APPLES—J. J. Parker, of Marietta, O.: I disclaim any special peculiarity in the knife arm. I do not claim broadly the employment of a spring for allowing a yielding motion to the knife stock, an example of such use of a spring is seen in the patent of E. L. Pratt, April 29, 1856.

But the combination of the spring holder, H, with the arm D, is to the best of my knowledge and belief a new combination, possessing peculiar virtues, and productive of new and useful results.

Therefore, I claim the combination of a spring holder, H, with the knife arm D, in the manner and for the purposes described.

[In all apple paring machines the knife should be capable of quick and easy removal to prevent rusting by the acid when not required to be used. In this machine the knife is so arranged in a spring holder that it can be removed in an instant, and also replaced as expeditiously. This spring holder, by its elasticity, enables the knife to accommodate itself to the undulations and form of the apples; and when the knife requires to be sharpened, it can be honed in a superior manner held in the holder.]

FIELD FENCE—Samuel Rains, of Lancaster county, Va.: I claim the making of a fence without posts when the panels are fastened together in the manner described.

WRENCH—E. Ripley, of Troy, N. Y.: I claim making the levers, A B, combined together as described, with wrench jaws, c d, so arranged that the levers do not tend to spread open when used as an adjustable wrench, as set forth.

ARRANGING AND OPERATING SHUTTERS—D. Rohan, of Cincinnati, O.: I claim attaching the lower end of the shutter, D, to the slide, C, or its equivalent, which is fitted on the box, B, below the sill of the window casing, A, the bars, E E, being used in connection with the slide, and connected at the proper time to the slide by the catches E 1, which are actuated by the weights, f, and blocks, h, substantially as described for the purpose set forth.

[This window shutter is hinged at its bottom or lower end to a slide which is fitted in a box below the sill of the casing of the window, the slide being allowed to work horizontally in and out of said box. By this arrangement of a window shutter, it can be withdrawn from the box, swung upwards in front of the window, closing it perfectly in the evening, and can be removed and stowed away snugly in the morning by simply turning it down to a horizontal position. This is a very superior method to that in common use for the movable large windows of stores.]

GOLD SEPARATOR—E. L. Seymour, of New York City: I claim the use of the sections or frames, as described, when perforated or constructed so as to open or shut the communication between the upright tubes or compartments for the passage of materials containing gold or other substances of air or of water as may be required, the whole operating in connection with the hopper as described.

VETERINERY SYRINGES—Wm. Somerville, of Buffalo, N. Y.: I claim providing the syringe with the spring and catch described or their equivalents, in the manner and for the purpose set forth.

MACHINES FOR CUTTING FRINGES—Wm. J. Horstmann, of Philadelphia, Pa.: I claim the combination of the circular cutters, and the feeding rollers, H and I, arranged and operating substantially as described.

FIXTURES FOR CURTAIN ROLLERS—C. H. Wheeler, of Boston, Mass.: I claim perforating the block in which the curtain rod revolves so that it may be slipped back upon the pivot, and securing it to the bracket by the dovetailed ears, in the manner and for the purpose substantially set forth.

CYLINDRICAL BOXES—H. S. Smith, E. Hanson, and M. S. Richardson, of Rutland, Vt.: We are aware that boxes have been formed by cutters arranged in previous ways, but we are not aware that cutters have been so arranged as to cut the external and internal surfaces of boxes, and also the rim to receive the cover at the same time. We, therefore, do not claim the employment or use of rotating cutters for cutting boxes irrespective of the arrangement shown.

We claim the cutters, h, attached to or formed on the semi-cylindrical shell, g, the cutters, j, attached to the ends of the solid semi-cylindrical projection, i, and the cutter, K, attached to the inner end of the semi-cylindrical projection, I, the whole being arranged as described for the purpose set forth.

We further claim in combination with the cutters, h, i, K, arranged as shown, the saw, R, attached to the swinging bar, g, as described.

[A circular saw and cutters are so arranged in this machine for making round boxes that they are cut out direct from the bolt or plank, and then sawed off. The exterior and interior surfaces, also the rims of the boxes, are all finished at one continuous operation. By this machine boxes can be cut out of waste stuff, which does not require to be specially prepared for it, rough boards and planks having been used as stock for the boxes.]

SHIPS' STEERING APPARATUS—S. N. Smith, of New York City: I do not claim to be the first inventor of brakes for stopping the steering wheel, and holding it in any desired position an example is seen in the rejected application of E. G. Otis, where the wheel is held by a strap, which is connected with the deck of the vessel.

I claim locating both of the bearings, a, of the wheel shaft, D, upon the tiller, C.

I also claim locating the brake, I b, upon the tiller and wheel shafts, C D, all as described.

[By this improvement the tiller shaft is held perfectly firm, and no swivel is required as in other arrangements of steering by rack and pinion. The cost of a swivel, which is expensive, is thus obviated, and the apparatus is made both safer and cheaper. A brake has been employed in steering apparatus before, but not arranged in the same manner, which is believed to be a good improvement.]

RAILROAD CAR BRAKES—R. M. Wade, of Wadesville, Va.: I disclaim the application of the brake rubbers by springs, and the drawing up of the springs by means of rack and pinion.

I claim the wedge, i, lever k, and bar l, constructed, arranged and operating substantially as described, in combination with the rack, c, for the purposes specified.

I also claim the aforesaid wedge, lever and bar, in combination with the slack chain for effecting the simultaneous application of the brake rubbers throughout the train, substantially as set forth.

MAKING ROPE—Milton Wallwork, of Hoosick Falls, N. Y.: I do not claim pressing the rollers outward into contact with the ring by means of springs, as in Harris' patent

I do not claim the giving to the strand flyers a rotary motion on their own axes to produce a twist of the strands by means of rollers on the axes of the flyers running in contact with the inner face of a stationary ring

But I claim the construction of the stationary circle or ring with which the rollers on the flyers run into contact to produce the rotary motion that gives the twist, of a series of segments, one or more of which may be removed or withdrawn from the ring or circle, or replaced therein at pleasure for the purpose of varying the twist, substantially as set forth.

[In rope making machines it is requisite that the strands at one end should be twisted by machinery, the speed of which may be perfectly controlled, so as to give the strands any variable twist desired. This cannot be done by the positive motions in common use for heavy rope or other machines. By this improvement, as set forth in the claim, the speed of the strand flyers to vary the twist can be regulated with great facility.]

PAPER RULING MACHINES—C. L. Pond, of Buffalo, N. Y.: I claim the spring connected box and shaft, combined with the stop wheel, and the detachable rim, as described, constructed, arranged and operating substantially as and for the purposes specified.

STRINGS FOR MUSICAL INSTRUMENTS—Wm. Randle, of Florida, N. Y.: I claim the application of one or more springs applied to each string as described, or its equivalent, and for the purpose set forth.

PRINTERS' COMPOSING STICKS—Daniel Winder, of Cincinnati, O.; I claim the combination and arrangement of the several parts of the composing stick, as constructed, with each other, all as and for purposes specified and represented.

INVALID CHAIR—Ransom Wetherell, of Huntington, Mass.: I do not claim a chair provided with a swinging back and foot rest, irrespective of the mode of construction and arrangement shown.

I claim attaching the bars, E E, to one end of the bars, D D, by a joint, and attaching the bars, G G, in a similar manner to the opposite ends of the bars, D D, the bars E E, with their cross piece forming the back of the chair, and the bars, G G, with their rounds, the foot rest, the bars, D D, being pivoted to the opposite sides of the stationary chair seat, C, and perfectly balanced on their pivots, the whole being arranged as shown for the purpose specified.

[The invalid's chair is so constructed that it can be quickly changed from an easy chair into a horizontal couch, or inclined to suit any position an invalid may desire to be placed. It is nicely balanced, and all these positions may be given to the chair by the movements of the body of an invalid who is not too weak for a very slight exertion. The combinations and operations involved in the chair display originality and utility of thought.]

WORKING PUMPS—Wm. Wright, of Hartford, Conn.: I do not claim as the equivalent of my invention the use of two spiral cams, operating directly upon the heads of the piston rods in the manner shown in the aforesaid patent of Root & Dickinson, but inasmuch as that arrangement on a large scale is mechanically inoperative, and therefore useless.

I do claim to have devised the method referred to as in use at the Hartford Water Works, that is to say, I claim as my invention the described arrangement for working a double bucket pump, consisting of a cam centrally over said pump combined with the buckets thereof by bell cranks, so situated that one arm of each of said cranks bears at the same time upon opposite or nearly opposite points of the edge of the cam, whereby the necessary strength and stability may be given to the several parts, while preserving the regular throw of the buckets, the whole being arranged and operating substantially in the manner set forth.

IRON FENCES—Wm. S. Fuller, of Millbury, Mass., (assignor to D. Cutler, of Worcester, Mass.): I claim the manner of connecting the pieces and rods together by means of the lugs and collars, when constructed and operating substantially as set forth.

CONSTRUCTION OF A RETORT—Alfred Monnier, of Camden, N. J., (assignor to himself and Isaac Gatman of Philadelphia, Pa.): I claim the method described of preventing the rapid destruction of retorts by placing the same within a fire clay casing, and packing the space intervening between the retort and said casing with any substance or mixture of substances incapable of combining when heated, either with the clay or metal retorts, as set forth.

CAR LOCK—Henry Ritchie, (assignor to himself, Saml. C. Thompson, and Geo. W. Westerfield,) of Newark, N. J.: I do not claim separately the elastic or yielding jaws, D D, for they have been previously used.

Neither do I claim separately the tumblers, n, for they are well known.

But I claim the combination of the sliding plate, F, tumblers, n, and jaws, D D, arranged and operating in connection with the bolt, B, for releasing the hasp, H, as specified.

[This is an extremely simple and effective lock for railroad baggage and freight cars. Spring jaws are combined with a series of tumblers and a sliding plate, so as to secure the bolt in the casing in a very perfect and rapid manner. It is self-locking, but a key is required to open it. It is a very simple and convenient lock for the purpose.]

SPLITTING HOOP POLES—Joseph and Sylvester Sawyer, (assignors to the American Hoop Machine Co.) of Fitchburg, Mass.: We claim, first, moving the knife ba k from the rolls, in proportion as the latter are separated from each other, in the manner and for the purpose substantially as set forth

Second, we claim connecting the knife with the center of the shaft of the movable feed roll, by means of the arm, M, as set forth, for the purpose specified.

Third, we claim the friction rolls, q, in the knife stock, operating in the manner described for the purpose specified.

HEMP BRAKES—James Barkley, of St. Louis, Mo.: I do not claim any single member of my machine as such.

Neither am I unaware that a mode of shifting the speed and stroke in similar machines by hand levers has been used, for such is seen in the patent of M. Thompson, of Aug. 5th, 1856.

But I claim the hinged platform, arranged as described, in combination with the mechanism substantially as set form, and so that the attendant upon the platform may change the speed and stroke by merely changing his position, and thus leave his hands at liberty to manage the hemp.

PROPELLERS—Robert Griffiths, of London, Eng. Patented in England, Sept. 13th, 1849: I claim making propellers with an enlarged boss on the shaft to which the blades are secured, extending, say, to about one third of the entire diameter, substantially as specified, and this I claim in contra-distinction to the solid hub of a diameter merely sufficient for strength, as heretofore employed, whereby I avoid the centrifugal or broken action of the water near the center, which is known to be prejudicial to the propelling action of the blades, and by which also I avoid the resistance due to the action of the blades near the center, where they otherwise would be in a plane nearly coincident with the plane of the axis of the shaft

And I also claim, in combination with an enlarged boss, substantially as described, the method of connecting the blades therewith, by means of a shank or stem on the blades fitt d to and capable of being turned in the said boss to adjust the pitch of the blades, substantially as and for the purpose specified.

I also claim the adjustment of the pitch of the propeller by the connection of the propeller blades with the enlarged hollow boss or hub and the self-adjusting apparatus, subst ntially as specified.

And I also claim, in combination with the enlarged hollow boss or hub, the blades narrowed towards their outer ends, and the round shank attachment to the hub, as specified.

CLEANING CASTINGS—Henry R. Remsen, (assignor to himself and W. J. Noyes,) of Albany, N. Y.: I do not claim making a revolving mill for cleaning hollow ware or other castings.

Nor do I claim any particular external form, or any mode of opening or fastening the doors.

I claim the use in a horizontal revolving mill for cleaning castings or hollow ware of open work, lattice or grated partitions, parallel to or in a line with the axle, for the purpose of such compartments as I have described, substantially as set forth.

RE-ISSUE.

PORTABLE STEAM CROSS-CUT SAWING MACHINE—Samuel R. Wilmot, of Watertown, Conn. Patented Aug. 14th, 1855: I am aware that a saw has been connected directly with the piston rod of a direct acting steam engine, when the latter has been secured to a fixed support or basis.

I am also aware that a steam cylinder has been connected with its bed by means of trunnions, so as to permit the cylinder to oscillate as in the ordinary oscillating engine. I therefore make no claim to the invention of such apparatus.

But I claim the combination of a saw and a direct acting engine for driving it with an apparatus for securing the whole to the object to be sawed, in such manner that the latter forms the support or bas s by which the steam cylinder is maintained in the proper position.

DESIGN.

IRON RAILINGS—Robert Wood, of Philadelphia, Pa.

Comets, Meteors, and Heat of the Sun.

MESSRS. EDITORS—It is conceded by philosophers that the matter composing our world never increases or diminishes, and that it contains the same quantity that it always had, since its first introduction into the solar system, neither more nor less, in the aggregate, but that change of its matter is continually occurring: water displacing land, and land displacing water; water assuming the condition of vapor, and vapor condensing into water.

Metamorphoses are also active in the mineral and gaseous kingdoms: aluminum to-day, clay to morrow; trees in the forest, anthracite under the upheaved rocks; hydrogen and nitrogen set free to-day, to-morrow they are ammonia.

This philosophy of the world holding its own is very good, so far as our age, ability, and scrutiny is endowed; but this philosophy is even better sustained when applied to the great universe. Even there the scrutiny of man discovers change. The Equinoxes overleap their annual periods. Stars have appeared in vacant places, and stars have disappeared. Stars have burned up—evaporated, philosophers tell us. Spots come and go on the sun. A zodiacal ring is developing itself around our earth. Asteroids are coming to light yearly. Comets appear that we knew nothing of, and comets that have been seen have left us and never yet returned. Meteor showers have appeared as irregular as thunder showers, and indeed, we might amplify upon change in the universe in the same ratio that we behold change upon our planet.

Thus we may inductively reason that change is going on in the universe of matter connected with our solar system, and therefrom deduce that the sun is a globe of liquid fire, kept up by matter supplied from the unorganized masses that float through space in the condition of nebulous vapor, meteors, and comets. Nebulous vapor may be acting the part in the atmosphere of the universe that water and air are acting in the atmosphere of our earth.

Magnetic changes in the solar universe may bring about meteoric showers, and meteoric showers may produce comets. When these concretions are formed, like rain-drops in the earth's atmosphere, they will obey that active law of gravitation which *draws* them to, or towards an organic nucleus. Actively gravitating (*i. e.*, moving matter,) must move in curves hyperbolic, parabolic, or elliptic. Celestial bodies never partake of a purely circular motion, nor of a purely spherical form.

From these known laws of matter we can rationally deduce a hypothesis that will account for the sun's ability to light and heat her family of orbs without suffering a sensible diminution of its powers. The sun exhales on its orbs heat and light. This heat and light vivifies, fructifies, decomposes, and brings in its train change! change! change! And so with its whole family of orbs. These changes on the orbs exhale from them magnetic clouds, which are dissipated into the atmosphere of the solar universe, where they are wrought by magnetic storms into showers of meteors, which are rained into the sun, as rain drops fall upon our earth. These meteor showers may at times pass so near a planet as that some portion of them curve into its atmosphere, where, from their impact under high velocities they are ignited. A magnetic storm of meteors may be so intense as to consolidate its partially condensed matter into a cometic mass, sufficient to give said mass a momentum, and hence a gravitating property sufficient to give it organic system, so as to endow it with a quasi-planetary habitude. Comets may be formed of so rare a body as not to be sufficient in momentum to overcome the sun's attraction, and thus, instead of an elliptical or parolic sweep round the sun, fall into it as fuel. When the comet is dense enough to hold apace out of the sun, in his sweep round it, it may go to some other sun, and perform its curve around that, and so on, until its accretion, consolidation, and momentum bring it to that condition and order as to fit it for an organic orb in the family of a solar system, there to take the routine of change which the Creator has so impressively stamped on all matter.

JOHN WISE.

Lancaster, Pa., April, 1857.

Curing Back Lash in a Mill.

MESSRS. EDITORS—We are running a mill with an engine of nearly the same capacity and construction as the one described in the SCIENTIFIC AMERICAN two weeks since by Martin Terhune, of Swan Mills, Iowa. Our fly wheel weighs six tuns, and makes forty turns per minute; have no gears, but use two 24 inch leather belts from the fly wheel to shafting. We were greatly troubled with back lash, but stopped it entirely by altering the "lead" of the engine valves.

JOEL WHEELER & Co.

No' Dorset, Vt., April, 1857.

[We are much indebted to our correspondent for such useful and practical information.

Descriptive Index of Chemical Patents Issued by the U. S. Patent Office in 1856.

By Dr. Daniel Breed, of the United States Patent Office. Continued from Index to 1855, published by us 24th Jan. last.

Acid—Pulverulent phosphoric, mixed mixed with alkaline carbonates for liberating carbonic acid at pleasure by moisture or heat: Eben N. Horsford, April 22.

Alloy—Copper, 6 parts, tin, 4, zinc 90: John Fidler, Sept. 30.

Alloy—For cheese hoops; zinc, 70 parts, tin, 8, copper, 1, antimony, 1; or zinc, 56, tin, 18, copper 1, antimony, 1: Timothy Brown, Dec. 9.

Bone-black—Substitute for; use of precipitated phosphate of lime (mixed with bituminous coal and clay) as ingredient of compound: Francis Geran, May 20.

Cement—For roofs, walls, etc., various combinations of aqueous cement and bituminous liquid: W. H. Johnson, Dec. 9.

Cement—For roofs; mixture of pitch, rosin oil, ground plaster, and soapstone; or gas tar, rosin oil, turpentine oil, gum copal, mineral paint, and charcoal powder: C. C. Hoff, Feb. 12.

Cement—for roof; shellac (or seed lac,) rosin powdered steatite, and linseed oil: Horace Billings, July 8.

Charcoal—Wood charred in the open air, by being sawed into sticks one inch in diameter, laid in a conical pile, having a central draft, and then inflamed near the top of the pile: Andrew Grimes, Dec. 23.

Charcoal—Wood charred by heated air: S. S. Perry, April 8.

Clay—Calcined by charcoal, for use in tawing skins, calico printing, disinfecting, paper manufacture: Henry D. Pochin, Oct. 21. Patented in England Jan. 30, 1855.

Cork—Softening by steam: Bennet Potter, Jr., Nov. 18.

Corpses—Preserved by injection with arsenical pyroligneous acid, and then charging with a current of electricity until the limbs stiffen by coagulation of their fluids: John S. Gaussardia, Oct. 28.

Cotton Seed—Matured by artificial heat after separation from cotton, to render the hull brittle: A. A. Noyes, April 8.

Counterfeiting—Prevention of, by combination of fugitive indigo ink and oil-colored paper: C. D. Seropyan, Jan. 8.

Disinfection—Of fecal matter, by compound of soot and acetate of iron: D. E. Contaret Jan. 8.

Disinfection—Composition of nitrate of baryta, chloride of barium, and of potassium, oxalate of soda, oxyd of manganese, charcoal, and shellac, all powdered: Andrew Lanergan, July 1.

Dyeing—Protection of fabrics by resinous compounds applied cold, removed by alcohol, etc.: J. P. Derby, Oct. 21.

Dyestuff—Juice of buckberry (*Bacca Phytolaccoe decandriae*) expressed, boiled, and left two months with air excluded; for violet, admit air and keep one month at temperature of 60° Fah.: Frederick E. Schmidt, July 15.

Fats—Distilled with steam at 550° to 600°, so that the glycerine will pass over without decomposition: Wilson & Payne, June 17.

Fuel—Clay (or lime) and coal dust, pressed into a sort of brick, and dried, then saturated with coal tar, and baked: Robert Courtney, Sept. 9.

Fuel—Wet vegetable matter mixed with coal tar, bituminous substances, etc.: J. F. Manahan, Jan. 8.

Gas—Generation of; by mixing raw materials with substances which conduct heat slowly, placing in a perforated vessel, and then introducing into a retort having its escape at the bottom, near the fire: N. Aubin, Jan. 8.

Glass—Use of a specific clay slate as an ingredient of: John F. McCully, Sept. 2.

Hydro-carbon—Employment of heat set free in generating hydrogen, for heating the hydro-carbon, to impregnate the nascent gas: Davis & Cunningham, Jan. 15.

Incrustation—Loosened from boilers by the action of steam: Everett & Thompson, Feb. 12.

India Rubber—Crushed, washed, treated with potash, or soda, in vacuum, and washed to purify: A. G. Day, June 10.

India Rubber Sheet—With surfaces not vulcanized, united to cloth: Nathaniel Hayward, May 6.

India Rubber—Surface of vulcanized made rough, then coated with cement, and heated to 235° to render adhesive: Nathaniel Hayward, April 15.

India Rubber—Treatment of sulphured rubber with drying oils; or common rubber with sulphured oils: William F. Shaw, Aug. 12.

India Rubber—Treatment of vulcanized with nitric acid and fusel oil to purify and render adhesive: Henry Forstrick, Oct. 28.

India Rubber—Boiling in potash to remove sulphur from the surface of vulcanized and render adhesive: Richard McMullin, March 18.

Iron—Coating by immersion in concentrated acids, and passing immediately into metallic baths: Joseph Polenx, Oct. 21.

Iron—Conversion of pig iron into malleable, or into steel, without ordinary fuel, by forcing currents of air, oxygen, or steam into the molten mass: Henry Bessemer, Nov. 18. Patented in England Aug. 25.

Leather—Currier's shavings cemented and pressed together to form sheets of leather: Charles F. Crockett, June 19.

Leather—Stuffing while wet with a mixture of oil and melted tallow, either in a fulling mill, or by pounding: Francis A. White, Aug. 5.

Lime—Heat from slaking, employed for cooking apparatus: Wm. W. Albro, March, 4th.

Lime—Tannate of; made from bark, old leather, etc., by treatment with potash or soda, and decomposition of the resulting salt by cloride of lime: Obadiah Rich, Dec. 9.

Lubricator—Caoutchouc, elastic, bitumen, etc., dissolved in pyrogenic oils for lubricating: Downer & Merrill, July 29.

Mastic—Glazing rosin surface by naked flame: A. C. Moestue, Jan. 29.

Milk—Preserved by evaporation in vacuo without sugar: Gail Borden, Jr., Aug. 19.

Mirrors—Employment of tartaric acid with ammoniacal nitrate of silver, for silvering glass: Tony Petitjean, Oct. 21.

Oil—Having special properties obtained from bitumen, which does not afford paraffine, by use of chemicals and high temperature: Luther & Wm. Lockwood, Aug. 12.

Oil—With following properties, viz., colorless, boiling above 600° Fah., and fluid at 32° Fah., etc., etc., distilled from coal, which affords paraffine by temperature of 600° to 800° Fah.: Luther & William Lockwood, Aug. 12.

Oils—Treatment with the constituents (except acetic acid) of crude pyroligneous acid: Philo Marsh, Jan. 1.

Paint—Ground with flour, rosin, water, and fish oil: Isaac Gattman, Sept. 30.

Potash—Or soda, obtained from felspar by heating with lime or phosphate of lime: Charles Bickell, Nov. 25.

Powder—Mixture of gunpowder, chlorate of potash, powdered cork, and rags, for blasting: William Silver, Jr., July 1.

Powder—Blasting; mixture of nitrate of potash, (saltpeter,) charcoal, lycopodium, and white sugar; different proportions, according to use: L. Buchholz, July 19.

Salt—Common, as flux for iron, introduced into the furnace below the tunnel head Christian Skuunk, Feb. 12.

Silver—Separating by from other metals introduction of metallic copper into solution of the sulphates: William Ziervogel, Aug. 12.

Soap—Mixed with pulverized borax, flour, etc.: George C. Lawrence, Oct. 28.

Soap—Use of excess of alkalies with rosin, to produce a solid soap: Augustus Pfaltz, Oct. 21.

Stone—Artificial; from marl and lime, mixed when wet, and pressed: S. Y. Ravenal, Aug. 12. Re-issued Oct. 14.

Sulphuret of Carbon—Oil, and coal tar, in combination with liquefied carbonic acid, as a motive power: John C. Fr. Solomon, July 22.

Tallow and Fat—Bleaching and purifying by use of acids, lime, borax, alcohol, creta Gallica, camphor, egg-shells, oil of lemon, etc.: Francisco Garcin, March 11.

Tanning—Use of wood smoke instead of pyroligneous acid: George W. Hatch, Sept. 16.

Tanning—Use of solution of carbonate of soda and nitrate of potash, (niter,) and one of acid after the drenching, and preparatory to the use of tanning liquor: J. B. Williams, June 19.

Tanning—Use of meal, beeswax, rosin, molasses, and oil, for stuffing leather: John Rose, May 6.

Tanning—Use of catechu and then bark liquor, with sumac and alum: Samuel W. Pingree, Oct. 14.

Tanning—Use of catechu, alum, etc., in particular manner: Raselous Gould, March 11.

Wool—Neutral salts with alkaline carbonates and oleic acid, for treating: Andrew H. Ward, Jr., Jan. 1.

Zinc Oxyd—Cooled and purified by passing the products of the furnace over water: Joseph Wharton, July 29.

Zinc White—Vibration of the perforated bed of furnace, in combination with forced blast in jets: Samuel Witherill, Sept. 30.

[This is an exceedingly useful index, prepared and furnished by Dr. Breed, for which all those engaged in the chemical arts must feel deeply grateful to him.—EDS.

New Inventions.

Notes on Science and Foreign Inventions.

Case Hardening Iron and Steel.—It is a common practice to harden the surface of various articles of iron and soft steel, by coating them with the prussiate of potash ground into powder, and made of the consistency of thick cream with water, then heating them up to a dull red color, and plunging them into cold water. G. J. Farmer, of Birmingham, Eng., has secured a patent for what is stated to be an improvement on this old method. He employs a composition of the prussiate of potash, salammoniac, and saltpeter, in equal proportions by weight, and keeps it on his forge hearth in a state of powder. He then makes up a tempering pickle, composed of 2 ounces of prussiate of potash, the same quantity of saltpeter, and 4 ounces of sal ammoniac, dissolved in each gallon of water. Having thus prepared these compounds, the first in the form of a fine powder, and the second in a bath, the operator heats the article he is operating upon in a furnace or other fire, until it has attained a red heat. He then removes it from the fire, and if it be of a size and weight susceptible of such handling, he rolls it in the dry powder already described, until every portion of the article shall have taken up a sufficient quantity of the mixture, or until all such portions of the articles as he may require to be hardened shall be covered with the powder, which, when in contact with the heated metal becomes immediately fused. He then plunges the article into the bath before described, where it is to be left until cold. When taken out, it is stated that it will be thoroughly hardened, and not only on the surface, as in the common case hardening, but much deeper.

Corn Starch.—M. Watt, of London, has obtained a patent for making starch from indian corn in the following manner: He steeps the corn in water ranging in temperature from 70° to 140° Fah., for about a week—changing the water at least once in every twenty-four hours. A certain amount of acid fermentation is thus produced, causing the starch and refuse of the corn to be easily separated afterwards. The swollen corn is ground in a current of clean soft water, and the pulp passed through sieves with the water, into vats. In these the starch gradually settles to the bottom; the clear water is then run off by a tap, and the starch gathered and dried in a proper apartment for the purpose.

Casting Iron and other Metals.—A patent has been secured by H. Adcock, ——, Eng., for casting metal by a process which appears to embrace excellent features, and which can easily be carried out, on a small scale, at least. Sand molds are placed in an oven (or muffle) a few inches above its bottom, so that they may be properly dried and heated on all sides. After all the moisture is expelled from them at a low heat; the temperature of the oven is increased until the molds are brought to a high heat, and the metal is run into them. The oven and the molds, with the castings in them, are then allowed to cool gradually. This method of casting metal prevents the sudden chilling of one part of a casting before another, and thus fractures are obviated; it also combines the annealing with the casting process.

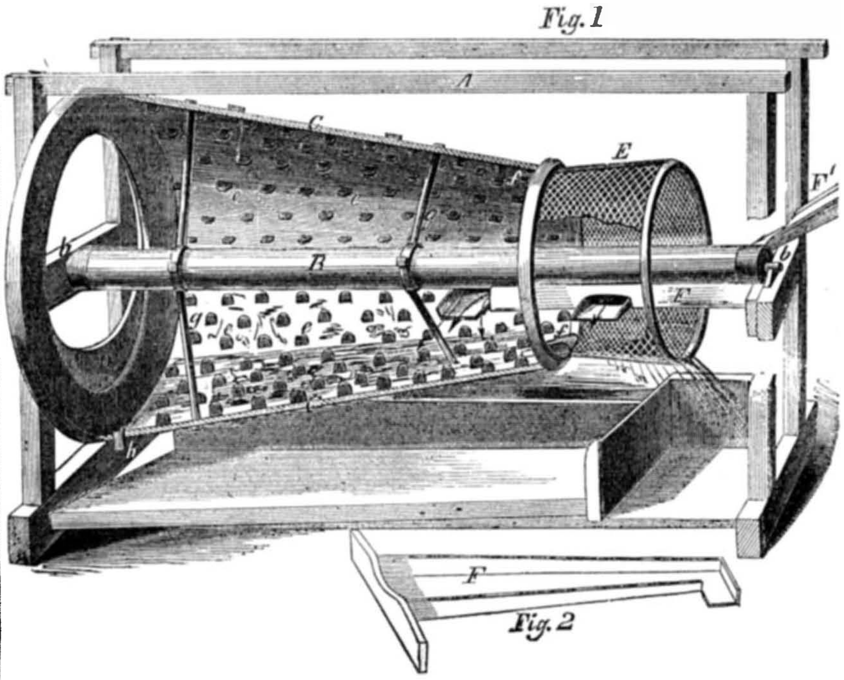
New Vulcanized Compounds.—C. Goodyear, who is now residing in London, has obtained a patent for a composition of gutta percha and asphaltum, or pitch, softened by the aid of hot water, and thus combined together and made comparatively fluid. They are then combined with sulphur, manufactured into articles, and submitted to a high heat, to produce the quality known by the name of "vulcanization," whereby the compound is not affected with common temperatures of the weather.

Lake Tonnage.

Few are aware of the magnitude of the tonnage of the freighting and passenger vessels, at this moment in use on our great chains of inland lakes. They consist of sailing vessels of every variety and size, the preference being for large and singularly rigged vessels—three-masted, with yards and square sails on the foremast, common "fore and aft" sails on the other masts, and the whole hull and rigging somewhat weaker than those employed on the ocean—large propellers, with little or no rigging, and magnificent side-wheel steamers. rivalling those on Long Island Sound and other partially exposed and well patronized seaboard routes. The tunnage of vessels in the whole world is estimated at 1,500,000 tuns, that of the United States alone is about 550,000 tuns, or a little more than one-third; while that of the Lakes alluded to, after deducting the very small quantity due to Canadian trade, is given at 45,126 tuns—about one-twelfth of the U. S. shipping, or one-thirty-sixth of that of the whole world. Excluding the foreign trade of the Atlantic ports, and estimating only the coasting trade, the commerce of the lakes is about one-fifth of the republic. The lakes are not stormy except during the autumn months, but at that season the weather is usually very trying to the mammoth and heavily loaded constructions. The trade is mainly in flour and grain.

The amount of the trade on the lakes in 1841, was estimated at $65,000,000. It is now swelled to $618,000,000.

CARTER'S ORE WASHER.



The separation of ores, either pulverized or in their natural condition, from soluble earthy matters may be accomplished by almost any means of agitating them in water; but to perform the labor expeditiously and thoroughly, and at a moderate expenditure of labor, steam or animal power, and of the solvent fluid, is a subject which has called out at different times a considerable display of inventive talent.

The device here represented is the invention of Mr. Wm. L. Carter, of Marietta, Pa., and was securcd by patent on the 11th of March, 1856. It is evidently capable of discharging the ores very thoroughly cleaned, and by discarding the wire screen, E, and the influx of water on that part, the device is made to use the water very economically, discharging, when proper care is taken in regulating the supply, none which is not very fully saturated with earthy particles, and thus enabling a very small stream, or a supply from a moderate pump to wash large quantities of the metallic matter.

The invention consists of a tight conical vessel, C, (either made solid of cast or plate iron, or constructed of wooden staves, held together by hoops,) mounted on the horizontal axis, B, so as to receive a slow rotary motion—from machinery not represented. The ore is fed in by shoveling, or otherwise, through the large end, the fixed piece, D, just outside, being adapted to sustain a curved lip or spout, the better to conduct the matter a short distance within C, if desired. The spout, F, represented separately in fig. 2, leads in a supply of water from the small end, and discharges it through one or more side openings as represented. Thus the ore is received at one end, and the clean water at the other. The interior of the conical shell, C, is armed with spikes, points, or shovels, *e*, which may either be alike in size and form, and disposed regularly in spiral lines, or may be of many and various forms, and irregularly arranged, the latter being preferred; but in every case, some or all of them must present flat surfaces standing oblique to the axis, so as to act like a screw in moving the ore along to a greater or less distance with each revolution toward the smaller end, from which it is finally dropped. This oblique position of the agitators, *e*, is not distinctly represented in the engraving, but is a very prominent feature in the invention, and will be understood from the description; the effect of the whole combination being continually to tumble and agitate the ore, and gradually to move it in opposition to gravity toward the small end. The water received through F accumulates in the vessel until able to flow over at the large end, that part being formed as represented, and guarded by the near vicinity of the fixed board, D, so as not to allow the accidental escape of any considerable pieces of the tumbling ore. It will be observed that the water received at the small end first encounters tolerably clean ore, but after mingling with the rest, and being agitated with that just received near the large end, flows out finally, loaded with earth. The hole stopped by the plug, *h*, is provided, to allow of draining off the remaining water when the work is stopped—a matter of great importance, for obvious reasons, in a cold climate in winter. The screen, E, which may be employed or not, acts as a seive in washing out and separating sand and other insoluble particles of small size.

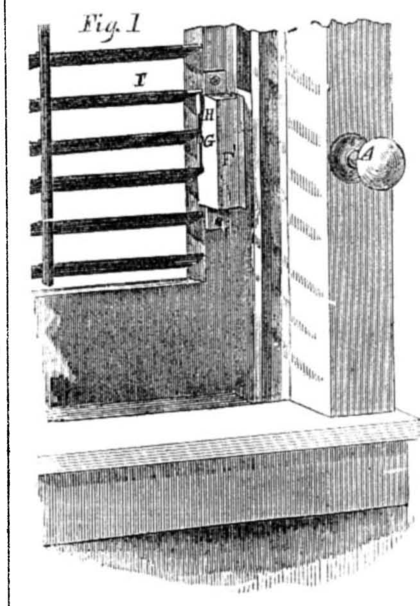
The whole is very simple, and little liable to derangement, and we commend it as a simple and beautiful application of correct principles. Further information may be obtained by addressing the inventor as above.

English's Rolling Slat Adjuster.

The inconvenience of opening a window to adjust the position of the slats of Venetian or rolling-slat blinds is overcome by this device, which is the invention of Mr. Benajah C. English, of Hartford, Conn. The slats being, of course, all connected together in the usual manner, the inclination of one, and consequently of the whole, is controlled by a knob on the side of the window frame, as represented, and a catch is pivoted which holds the whole in the position desired, instead of as is now too often the case, allowing them to roll by the action of gravity or other disturbing forces.

The knob, A, with its shaft, B, and crown gear wheel, C, are free to be drawn out to a moderate extent, but are urged inward by the constant tension of the coiled spring, D. The further extremity of B is squared, and passes through a square hole in the large gear wheel, E. This wheel meshes into the rack, F, and thus moves it up and down at pleasure. This rack, F, carries a small pin, G, which projects through a slot on the side next the window. This pin connects by a short link, H, to the

Fig. 1

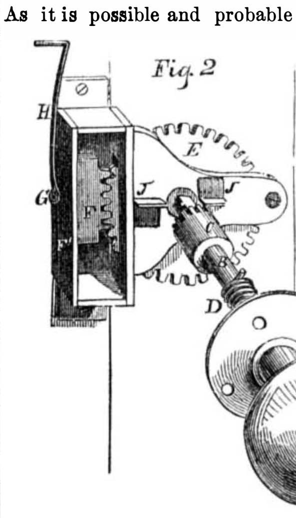


front edge of the slat, I, and thus to the whole series.

This shows how turning A rolls the slats, it now remains to show how the parts are locked in the position where left. In order to be able to turn the knob, A, when it is grasped, it must be drawn out somewhat, and so soon as the slats are in the desired position the knob is released, when, by the action of the spring, D, the shaft, B, and all its attachments move inward, and cause the teeth of C to catch on the fixed stops, J J, and which thus hold all the parts in position until the knob, A, is again drawn out.

As may be observed from the cut, the rack F, and its protecting and guiding case, F′, are carried on the stile of the blind, and F is consequently disconnected from E whenever the blind is swung or turned on its hinges. As it is possible and probable that F may

Fig. 2



change its position while the blind is open so as not to gear exactly when again presented to E, the parts are purposely fitted up with considerable elasticity, so that no harm can result, and the first effort to revolve A will cause the teeth to drop into gear.

This invention was secured by patent dated Sept. 23, 1856.

For further information with regard to the sale of rights, &c., address A. & J. T. Speer, 212 Broadway, New York, agents for the Middle, Southern, and Western States, or to J. L. Abells, Cummington, Mass., agent for the New England States.

The latest American enterprise is that proposed in a Baltimore paper, to establish steam tow-boats to aid vessels through the Straits of Magellan. The Straits are only 400 miles long, but the navigation is so bad under sail alone, that most vessels prefer to double Cape Horn, with all its horrors, rather than pass through it. Such steamers as some of the first class tugs in this harbor, would take large ships through in two days.

Two spars of New Zealand pine, each 100 feet long and 34 inches in diameter, were lately landed at Portsmouth, Eng. Neither of them had a single knot in it.

Be always as witty as possible with your last bow. It is your last remark which is remembered.

Scientific American.

NEW YORK, APRIL 18, 1857.

Rope Making and Hemp.

We are not personally fully acquainted with the extent of the rope manufacture throughout the various sections of our country, but persons well versed in the statistics of this business have assured us that nearly as much rope is manufactured in the Eastern District of the city of Brooklyn L. I., alone, as in all the other American rope factories put together. From a neighboring hight in the above-named locality, numerous large brick structures, with large wooden sheds attached to them (some are one thousand feet long) may be seen dotted over the sloping ground which stretches down into what is called the "Newtown salt meadows." Here, although there is no running stream, an abundance of fresh water is easily obtained for steam engines, and the other purposes required, by sinking wells to a very moderate depth. In the large brick buildings all the preparatory processes and operations of scutching, drawing, and spinning the hemp are conducted; in the long wooden sheds—excepting in one factory—the spun hemp yarns are formed into strands and *laid* into rope. Not many years ago most of the spinning and other operations were performed by hand labor; now machinery is more extensively employed for every operation, and it is fast superseding all kinds of hand toil. There are about seven or eight hand rope walks in this locality doing but a small amount of work, while there are eight large rope works using machinery, which unitedly consume not less than two thousand bales of hemp weekly, or one hundred and four thousand bales per annum, amounting to about thirty-one million pounds. The two largest factories—Thursby's and Wall's—require four hundred bales each per week, the other six from three hundred to one hundred each. A bale of hemp weighs about three hundred pounds, and a coil of rope half an inch in diameter and one hundred and twenty fathoms long, weighs sixty-five pounds. These eight factories, therefore, spin as much hemp every year as would make a line of this character of rope nearly sixty-six thousand miles long.

An immense amount of steam power is required to drive rope machinery. In the large factory of Messrs. Thursby, there are two splendid steam engines, estimated at 300 horse power—high pressure, expanding and condensing—employed for driving the preparatory operations; in the rope walk there is another engine of sixty horse power, and in the apartment for preparing tarred rope, there is one of fifty horse power, making a conjoint steam power of more than 400 horses for one company.

In one room the bales of hemp are spread out to undergo the first process in this business, and singular as it may seem, it is the same as that employed to prepare sheep wool for carding and spinning; it is oiling it, whale oil being employed. The second process which the hemp undergoes is scutching, to remove the dirt and impurities, and loosen the fibres. The scutchers are large revolving drums, having projections on their peripheries, and are encased in wooden shrouding, excepting a small hole or door at one end. Here the operator stands, and taking a bunch of long Manilla hemp in his hands, throws one end into the scutcher box, holds it for some minutes, takes it out, and submits the other half of the bunch to the same operation. When sufficiently scutched, it is taken out, doubled up, and the butt ends cut off by a large fixed knife; the same operation is performed with the point ends. These cut portions of hemp form qualities No. 2 and 3; the center or middle part of the stalks form No. 1 hemp, and is employed to make those strands that form the outside of the rope, the inferior being placed in the interior. The next process is lapping the hemp. The scutched bunches are placed between two cylinders or drums, the one larger than the other, where it is drawn or lapped round the whole circumference of the large one—twenty-five feet—forming a lap. The fourth process is drawing the laps and forming them into slivers on drawing frames similar to those in cotton factories for drawing cotton, but much stronger. The slivers are conducted from the frames into cans, and are now fit for the next operation, that of spinning. The spinning frames twist a number of slivers together into yarns or threads, and wind them upon bobbins. Each machine is composed of two spindles—which can be set in motion or stopped separately. The spindles—or "jennies," as they are sometimes called—are driven at a high velocity, and are attended by girls—one for every four spindles. It is calculated that one spindle will spin four bales or 1200 lbs. of hemp per week. This is an interesting part of the manipulations of rope-making. The next operation is that of making the yarns into strands, on *forming machines* in the rope-walk. Several of the spun yarns or threads are drawn through a circular plate full of holes (the best yarns being placed on the outside,) then drawn through tubes, and twisted into what are called *readys* or strands, ready to be *laid* into rope. The next operation is making the rope; it consists in twisting three or more strands together. The long wooden sheds or rope-walks are made of such lengths as is required for the longest ropes. The strands are run out, each attached to a revolving hook or flyer at one end, and the whole of them united to a single spinning head at the other end. Each of the *readys* receives a separate rotation in the direction of its former twist, (just to keep it in,) called the *fore-hard*, while the twist given by the single head at the other end, to lay all the strands into a rope, is contrary to the strand twist. Without such twist and counter twist, rope could not be formed. The twist of the strands in themselves, in one direction, and the twist of them into a single rope at the other end, in a contrary direction, cause the opposing twists of the fibers to press against one another, and thus bind or hold them firmly together. The rope-laying carriage is heavy, and moves on a railroad. The machinery required is strong, and it involves great friction to *lay* the rope properly.

A set of machinery calculated to spin about 100 bales of manila hemp into rope per week, consists of two scutchers, two lappers, two drawing frames, twenty-five spindles, and the "forming," and "laying" machines. To render the tow made by one set of machinery into useful products, one picker, one carder, and two spindles are used.

Beside the large steam rope factories alluded to, there are three other steam factories in the same neighborhood, which spin *Jute*, or Indian hemp. The color of this hemp is beautiful, being a light cream, but its fiber is weak in comparison with manilla and other hemp. About 200 bales of *Jute* are now used weekly, for making rope of various sizes. It is but a few years since this manufacture was introduced into our country, but from the low price of *Jute*—being about one half of hemp proper—it will no doubt come into more general use for many purposes, without interfering with rope making from other hemp. Hitherto much, if not all the machinery for its manufacture, has been imported from Scotland; but a new machine shop, by Young & Jamieson, has just been established in Flushing avenue, Brooklyn, to manufacture such machinery, the fiber of *Jute* requiring very different treatment from that of other hemp.

There is a great variety of hemp used; the White Italian is said to be the best that comes into the market, Russian and Manilla next. The latter hemp is of a strong fiber, and the best specimens are of a beautiful straw color. Much Russian hemp has lately come into our market, also Russian yarns. Sisal hemp, and West Indian hemp, are likewise used, but more Manilla, we believe, than any other kind. Our American hemp,—and we feel somewhat ashamed to say it—is the least esteemed. Rope manufacturers tell us that it is not well cured; nor is is cleaned equal to the hemp of other countries. We surpass the whole world in raising cotton, both in quantity and quality, but although our soil can raise hemp equal, if not superior to any other, we are indebted to other countries for the most and the best of the hemp employed by us to manufacture rope. For the rigging material of our ships, we are actually indebted to Russia and the Phillippine Islands. Why should the character of our hemp be so bad? Is it not a profitable crop? If not, can it not be made profitable? If it is worth raising at all, we think it is worth preparing in the best manner for market, and we are confident that if well prepared, it would bring a price sufficient to compensate for the labor bestowed upon it. The hemp rope manufacture is a growing business; the demand seems to be greater than can be supplied by common and ordinary means. The Rope Works of Brooklyn groan under the demands made upon them. During the long nights of last winter, (also at present,) the lights were seen flashing brightly in their windows, till near midnight, for several nights during each week. There is, therefore, an open and growing home-market for American hemp, if it could only be prepared equal to that imported. This is an important question for our farmers to solve.

Erie Railroad Management.

Mr. D. C. Mc'Callum has recently resigned the superintendency of the New York and Erie Railroad, and has returned to his original profession, that of bridge building. Mr. M. is a mechanic of the first magnitude, and has been a *live* Superintendent of the Erie Road from his first assuming the care of it in 1854. His management has been distinguished by a most rigid economy, great earnings, extremely minute accounts and reports, and by great favor with some and great opposition on the part of others.

Mr. McC. devised and carried out a system of railroad management differing from any other in the world, and although his successor has not yet been selected, it will, without doubt, remain in operation on the line. It is based on the assumption that a railroad management, unlike the government of a country, exists for other purposes than the benefit of the parties governed. In a wise Republic the majority rule, and the happiness of each depends much on the good behavior of his companion. But the system of railroad management referred to, is, on the contrary, that of an absolute monarchy, and each man is entrusted as far as possible with an individual part of the work, independent of the good or ill-will of any but his proper superiors in the performance of it. It may surprise some of our readers to know that the number of regular and permanent employees of the road after the number had been cut down by an economy held by some to be too rigid, was, in September, 1855, 4,715, of which 4,646 were under the control of the Superintendent—the remainder being attached to the offices of President, Secretary, Directors, etc.

The plan involves a novel system of supervision—one which enables the Superintendent, sitting in his office, to know, at any moment, the exact condition of every part of the road, the position of every car, and the fact of its detention at any place, unnecessarily or otherwise. Although the system and its results has been before alluded to in our columns, a very brief *resume* may, at this juncture, be interesting.

A daily report is received at the office from each conductor, and also from each station agent on the line. These reports are filled out with but little labor on printed blanks provided for the purpose. Both reports mention the cars taken and left at each station, and the time of stopping and starting. Thus these reports check each other, and correct the disposition always found among the employees, to linger a considerable time at the stopping places, and then to run at a greater speed, and necessarily with a lighter load, and at a considerable waste of motive power, to make up for the delay. It is well known that the consumption of fuel in hauling a given load over a given length of line, depends much on the speed, the highest speed being always more wasteful. It is, consequently, a matter of prime importance, to so arrange the business of the road that it shall be conducted efficiently at as moderate a speed as practicable.

To shorten the reports of freight cars, a simple number indicates a box car, one line beneath a number indicates a flat or platform freight car, a number with two lines beneath, indicates that it is a cattle car, and an additional line *above* any number indicates that the same is empty.

The employment of a telegraph to convey orders for the working of the road, is too well known to require remark. The reports are not, except in a very few points, conveyed through this medium; but in case of extra delays of any train, it is of immense service, in addition to the reports and the consequent cognizance of all that occurs. There also exists a system of monthly printed reports issued from the principal office, which conveys an exact account of the amount of business, and the cost of materials, so that there is a continual comparison of the economies of the general management, and that of every detail, each month with every other. The monthly reports have been the means of furnishing many important facts for the use of the engineering profession in general. Their most direct effect, however, has been, as intended, to stimulate the zeal of employees of every grade, and to sharpen the vigilance of all in any way connected with the details of the machinery. There may be strong objections to this system, but we have never heard such presented. Where roads are sufficiently extensive to make it, as in this case, impossible for one man to personally know the employees, we can imagine no method better adapted to develope the full capacity of every man and every item of material employed. This is a matter of no mean importance. Take the item of cars alone—a most expensive detail of railroad equipment. If a road is furnished, as is this, with three thousand freight cars, if one half only are kept in use, and of this portion half are running empty in either direction, only seven hundred and fifty are absolutely in legitimate use. If by the removal of freight on the journey at differents points many of these latter are run only partly filled, the amount of stock lying idle at stations, and of dead weight, (car bodies, wheels, etc.,) in the process of useless transportation, assumes a phase of the highest commercial importance. There has resulted from this system of surveillance, and from the reports alluded to, an increased degree of economy in the use of time and materials, almost each month, although the gain has, of course, been very slow since a certain degree, which we may consider very closely approaching the highest possible, has been attained. How high a degree of economy of fuel may yet be realized in railroad transportation of freight, we do not dare to predict. Theory indicates that the best modern steam engines utilize but about ten per cent. of the absolute power of the heat in steam, and few locomotives now in use approximate even to this low standard. The administration of Mr. McCallum will be long remembered and referred to as one which has done much towards developing the fullest employment of the machinery and means now in existence, and by his agency there has been put on permanent record, for the use of future engineers, the exact condition of railroad practice in this country, with the most approved appliances in use at the present day.

Half Launched.

The magnificent Steamship, the "*Queen of the Pacific*," of about 3000 tuns, intended to run between Panama and San Francisco, was to have been launched on the 8th inst. in this city, and the preparations having been completed, was duly started down the inclined plane prepared as usual for the purpose; but the motion was quite moderate, and when about half her length had crossed the water's edge diminished until she actually stopped. The excitement among the parties interested was, as may be supposed, immense; and jack-screws, steam-tugs, etc., were put in immediate requisition to persuade her farther; and powerful derricks, tugs, and other like contrivances have been since swarmed around her; but up to the hour of our going to press, without avail, and the expense in getting her off, will doubtless be very considerable. The misfortune is due partly to a too great hardness or consistency of the grease employed, and partly to neglecting to dig away the earth at one point, which was so high that it rubbed seriously against her bilge, as she attempted to pass.

Water and its Phenomena.

A drop of water which may be suspended on the point of a needle, is a world in itself, inviting the deepest scientific research, the most refined experiments, and the profoundest reflection. Our attention has been directed to this subject at the present time, by an able article in the last number of the *Westminster Review*, on "Boiling Water." Three of the illustrations accompanying this article are taken from it; the fourth we have added, together with such remarks as are not under quotation signs.

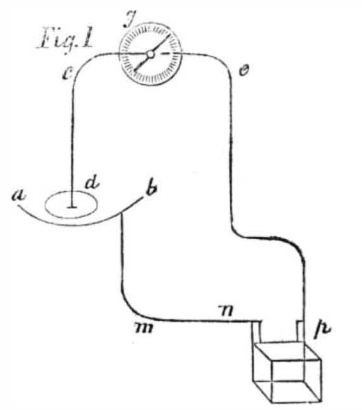
The ancients believed that there were four great elements in nature, viz: fire, earth, air and water; and we do not see how,—with their imperfect knowledge—they could believe water to be anything else. Modern science, however, has discovered that water is composed of two elements—that it is not a simple substance. If we take two parts (by measure) of hydrogen and one of oxygen gas, and place them in an india rubber bag, and force them among soap suds, so as to form bubbles,—if we apply a lighted match to one it will explode, and the gases which inflate it will be found resolved into a drop of water. If we take this drop of water and submit it to the action of a voltaic battery, having platinum points it will be resolved into hydrogen and oxygen again; and thus by synthetical and analytical chemistry it can be demonstrated that water is composed of two elements. It is a wonderful liquid, possessing numerous functions—is widely distributed throughout nature—and is intimately connected with vitality or life; it constitutes nine-tenths by weight of our bodies, and it actually enters into the very composition of our bones.

We live in the bottom of an ocean of air, the pressure of which at the level of the sea is fifteen pounds on every square inch of surface. A drop of dew on the leaf of a flower is 815 times heavier than the same volume of air, yet when the sun arises, notwithstanding the superincumbent pressure upon the dew drop together with its superior gravity, upwards it bounds into the bosom of the aerial ocean. Why is this? Heat is the cause of many phenomena connected with water. At all temperatures above the freezing point water is converted into vapor; but it is only when the tension of this vapor in an open vessel equals the pressure of the atmosphere that the action of ebullition, or boiling, takes place. The temperature of the water amounts then to 212° Fah., which is called "the boiling point of water." By increasing the pressure on the water in a close vessel, it will require a higher temperature to cause ebullition, while diminishing the pressure by an air pump, (such as is used for a sugar refiner's vacuum pan.) ebullition takes place at a temperature as low as 160° or 180°.

One of the most singular known phenomena connected with water when exposed to a hot surface is what is called its "spheroidal condition." If some water be poured upon a metal plate, heated to a dull red color, instead of flashing at once into steam or vapor as might be expected, it will roll about with a violent motion like a drop of mercury upon a table, and evaporate very slowly. While in this condition, if the plate be gradually cooled, the drop will spread out in a thin sheet, and evaporate rapidly. A drop of ether placed on the surface of water near its boiling point will also exhibit the same phenomena.

"With regard to the cause of this singular phenomenon," the *Review* says, "differences of opinion still exist among men of science. The appearance of the drop on the heated surface suggests the idea that the liquid and metal are not in contact with each other; such a breach of contact, however, has been denied, and to determine this point, Poggendorff devised the following ingenious experiment:—

Let *a b* be a section of the basin, *d* that of the drop; into *d* let a platinum wire descend, which is united with the negative pole. *p*, of a small galvanic battery; a second platinum wire, *m n*, communicates with the positive pole of the battery, and is placed in contact with the metallic basin, *a b*. Into the circuit thus formed is introduced a galvanometer, *g*, consisting of a magnetic needle, which swings freely within a coil of covered copper wire: the passage of an electric current through the coil being, as is well known, rendered manifest by the deflection of the needle. Let the drop, *d*, be rendered a good conductor of electricity, by slightly acidulating it; if it were in contact with the basin, the circuit would at no place be interrupted; the current would pass without hindrance from *n* to the basin, thence through the drop to the platinum wire, *e*, and thence through the galvanometer to the other pole of the battery. In its passage it would deflect the needle of the galvanometer, and thus give evidence of its presence.



sence. It is, however, found that when the basin is heated, and the drop has assumed the spheroidal state, no current passes; and this certainly indicates the existence of an interval which interrupts the circuit between the basin and the drop. Let the lamp which heats the basin be now removed; after a time the drop sinks, comes into contact with the basin, and at that instant the needle of the galvanometer flies aside, thus demonstrating the passage of the current."

The temperature of a spheroid of water on a red hot plate has been found to be much lower than 212°, and M. Boutigny, of Paris, and others, have demonstrated that if the hand be moistened with ether, it may be plunged with impunity into a crucible containing molten iron, and the iron scattered about with the fingers like drops of water.

The boiling point of water is not only dependant on a certain amount of heat and pressure, but upon the nature of the vessel containing it, (it requires a higher temperature to boil in a glass than a metal vessel,) and also on the amount of air in the water. If all the air is extracted from water, the cohesion of its molecules is increased, and it can then be heated without exhibiting ebullition up to 275° Fah. At this temperature it explodes instead of boiling. This has been demonstrated in chemical lectures, and it is believed by men of science that many boiler explosions have been thus produced, but some engineers deny that explosions ever take place from this cause. It would be well, therefore, that some experiments were made to set the question at rest.

(Concluded next week.)

John Tyssowski, L.L.D., of the U. S. Patent Office.

It is our melancholy duty to record the sudden death, by disease of the heart, at Washington, D. C., of Dr. John Tyssowski, an eminent Polish refugee. He took an active part in the struggle for freedom in 1830–31, though but a student, and was, in consequence, forced to leave Poland. In 1846, again, he was an active leader: was made President and Dictator of the Republic of Cracow, and conducted the retreat from its capitol. Afterwards he was compelled to fly to Dresden, and being discovered there by Austrian spies, was arrested and imprisoned. The personal intercession of the King of Saxony alone saved his life, but his banishment to America was at once decreed. Here, with his wife and children, the illustrious exile has lived and struggled during the last ten years; first as an editor, and for some years as assistant examiner in the U. S. Patent Office, where his strong intellectual power and remarkable executive talents were felt and acknowledged. He was an accomplished scholar, having received the highest honors of the University of Vienna, where he was educated, and he spoke fluently six different languages. In the prime of life and in apparent health he has been called away.

Credit to American Mechanics.

In some things our Government has shown an amount of good sense and wisdom, which does it credit. This is conspicuous in the system which was adopted quite a number of years since in the manufacture of firearms, &c. by machinery. The convenience and economy of this system are apparent over hand-made firearms. Each part of a musket thus made is an accurate counterpart of every other musket in a regiment; and every pin, screw, barrel, spring, or trigger, made in Springfield or Harper's Ferry, will fit any musket in the army; it is the same with rifles and pistols, according to their classes. This accuracy is impossible with hand-made fire-arms, like those heretofore manufactured for the British army, by private makers. In a whole regiment, it was difficult to find two pieces of separate muskets that would fit together, hence when a screw, pin, or hammer of any musket was broken, it required an armorer to fit in a new one.

As has already been mentioned on a former occasion by us, light at last dawned upon the British officials regarding the superiority of our national system of making fire-arms, and this has resulted in the employment of quite a number of American mechanics who are now in England; also the use of about 200 American machines. These have been in operation for more than a year, and have given great satisfaction. The last number received of the *London Artizan* contains part of a paper read on this subject, by J. Anderson, Inspector of Machinery at the Royal Arsenal, Woolwich, Eng., before the Society of Arts. in which he so exultingly alludes to our American mechanics and their inventive genius, that we cannot forbear quoting a paragraph. He says:

"The Small-arms Manufactory is now all but completed, and the specimens of its produce, which have been selected at random, are laid on the table for examination. In an economic point of view, this establishment will well repay the outlay which has been incurred in its erection, but it will be found of still greater importance and value as an agent that will afford a higher standard of accuracy and refinement, that will secure that minute degree of precision by which the several parts of muskets may interchange; and if the military gun-makers of England are wise in their generation, they will not despise this system of manufacture, but, on the contrary, adopt it, which will secure for them a high vantage ground in competing with other parts of the world. Nor are the peculiar advantages of this system confined to that branch of trade alone; it is capable of extensive application in other manufactures; and the American machinery which has been introduced into England by the War Department is so peculiar, and different from that usually made in this country, that it presents a rich mine of mechanical notions, worthy of being studied by our machine makers. The gunstock machinery, especially, is a positive addition to the mechanical resources of the nation.

An attentive examination will bear out this statement, and will show that our transatlantic competitors are not behind us in the race of machine-making; that they show an originality and a common-sense in many of their arrangements which are not to be despised, but, on the contrary, are either to be copied or improved upon."

Telegraph Wires.

Numerous experiments have been made in England by Mr Yarley, with gutta-percha covered wires. He states that if a wire could be suspended in an unbounded non-conductor, or atmosphere with no conducting body near it, the transmission of an electric current through it would be instantaneous, no matter what might be the length of the wire; that the approach of any conducting body to the wire, would, by induction, reduce the speed of the transmission. The conduction of telegraph wires is in proportion to their solid section; their induction according to their surface.

A Mr. Stocker has discovered at St. Austell, Cornwall, Eng., in an argillaceous formation, some mica-like scales of native aluminum.

Have you a choice Grape Cutting that you want to grow?

Then go to the woods, dig some roots of a wild grape vine, cut them into pieces of about six inches long, cut your choice grape vine or cutting into pieces of only one or, at most, two buds; insert the lower end by the common cleft-grafting method, into the piece of wild vine root; plant it in the earth, leaving the bud of the cutting just level with the top of the ground. Every one so made, will grow, and in two years, become bearing plants.—[Ohio Farmer.

How to Plant Trees and Shrubs.

Young trees and shrubs—such as rose bushes—if received from a distant nursery, and appear dry and withered, should be treated as follows:—Dig a trench in the ground, just as long as the trees or shrubs and roots, and lay them down in this; cover with a little dirt, pour on a pail or two of water, and then cover all over with six inches of earth. In forty-eight hours the buds will be swelled out full, and you can then plant them out. This was the method recommended by the lamented Downing, and we have found it to succeed perfectly.

Planting Young Grape Vines.

Dig the ground two feet deep, and at least a space of four feet in diameter, and also dig and mix in with the earth one bushel of *well rotted* barnyard manure for each vine. Cut off all the dry black fibres, and leave only two buds on the stalk. The ground should be kept well pulverized, and during hot dry weather it should be mulched—covered with straw.

Ohio River Suspension Bridge.

The construction of the towers for the great wire Suspension Bridge over the Ohio river, from Cincinnati to Covington, is reported to be rapidly progressing, the intention being to make the bridge absolutely safe, and suspended at such hight as to be positively above the highest steamer's pipes at all stages of the water. The towers are 86 by 32 feet at the base, will be 230 feet high, and 1006 feet apart. The cables will be anchored 300 feet back on each side of the river, pass over the tops of the towers, and thus be made to sustain the weight of the bridge.

Annual of Scientific Discovery for 1856.

Owing to unavoidable circumstances we have been prevented from noticing the above-named volume at an earlier date. It contains 400 pages of useful and well arranged information relating to the progress of science and art during the past year—an epitome of scientific history. Its editor, David A. Wells, A.M., has excellent facilities for the production of such a work, and he is careful, able, and judicious in his selections and criticisms. It is adorned with an excellent steel plate likeness of Prof. Jeffries Wyman. Published by Gould & Lincoln, Boston.

A Military Telegraph.

From our foreign journals we learn that M. Hipp, of Berlin, Prussia, has invented a very neat and said to be an effective portable telegraph for field operations. It prints like the Morse Telegraph, and weighs only twelve lbs. —battery and all.

Architecture ranks as a connecting link between the useful and the fine arts. As the former it advances the strength, economy, and comfortable qualities of buildings; while as the latter it has been beautifully defined as "frozen music."

A distinguished English manufacturer, a self-made and highly successful man, in a recent lecture, said that he had never known a servant to rise and succeed who was in the habit of drawing portions of his wages before the regular pay-day.

The New York Legislature has appointed a committee to inquire into the expediency of constructing a bridge or tunnel of some kind to connect this city with Brooklyn. The plan we published a few weeks ago has been highly complimented.

Artificial stone is now manufactured on a large scale in Paris.

CORRESPONDENTS to the Scientific American

I. A., of Md.—There is no reliable work upon the subject you name.

R. F. Cole & Bro., Montgomery, Ala.. wish to correspond with some one who can furnish machinery for making star candles

D. W. Baine, Hayneville, Ala., wishes to correspond with some one who can furnish apparatus for gymnastic exercises.

"Adriatic."—We have received a note from some cowardly correspondent, who attempts to criticise our remarks in the last number of the paper, in reference to this new vessel. Not having the manliness to write fairly and openly, he resorts to falsehood to back up his position. The author's communication is not worthy of notice, but we have thought it best thus briefly to speak of it.

H. B. S., of Iowa.—The publishers of Piesse's work on perfumery are Lindsay & Blakiston, of Philadelphia.

A. K., of N. 1 .—Your essay is very well written, but not suitable for our columns. We want new and practical information relating to the useful arts.

"Steam Music."—Correspondents who have inquired of us in regard to this subject are informed that the company are not able at present to supply the "Calliope."

J. B. C., of Tenn.—Your letter of the 23d is satisfactory, and we hope there will be no occasion for misunderstanding in future.

M. B., of Ky.—The most simple method of marking names on your agricultural implements is by good paint. You can bite in marks on the metal with nitric acid (aquafortis), which is the best for this purpose, or you can cut names on soft iron with a hard cold chisel, also on steel, but you must be as careful as a file cutter with your blows.

D. W. P. and J. G. S., of Ill.—You cannot procure a copy of the Acts of Congress relating to the safety of life on steamboats except through the member of Congress for your district, or the Inspector.

A. G., of Mass.—By boiling the walnut top of a faucet in linseed oil, and then drying it, it will not be liable to swell in contact with water. Solutions like those of an alkaline nature, however, will combine with the oil, and then the wood will swell. We still sell Olcott's lathe: price $25, boxed.

J. H. Moore, Northboro, Mass., wants a good mill for grinding bones.

Adam Wood, of Pittsburg, Pa., wishes to procure the best stave and heading machine for dressing stuff for ale and porter barrels.

B. C. Morrison, of St. Anthony, M. T., wishes to procure a machine for planing clapboards with the required bevel.

F. S., of Ky.—There are plenty of ovens in use in this State for making charcoal of wood. They are simply large, strong and close structures of brick. The doors are built up of brick and mortar when the wood is filled in, then they are pulled down when the charring process is completed; small holes at their sides allow sufficient air for ignition, then they are closed with bricks and mortar.

S. T. McC., of Geo.—Companies that manufacture saws can grind them with very thin backs, if such are desired. Address Hoe & Co., this city. See their advertisement in another column.

J. H., of Ill.—The Commissioner of Patents can supply you with the Chinese sugar cane seed.

R. M., of S. C.—We are not acquainted with the proof staff for bevelling mill stones to which you refer. The head and tail blocks illustrated on page 180, this vol. Sci. Am., are moved simultaneously by a lever connected with a graduated scale. We think there are several other methods in use for accomplishing the same object.

F. B., of Iowa.—You cannot obtain a patent for the application of a screw to propel a balloon, because a screw has been already applied for this purpose.

W. B., of Pa.—The water should be conducted to the floats of a flutter wheel on a very slight incline—nearly on a horizontal line—so as to free the bucket when it passes the centre of gravity. We would never employ a flutter wheel, if we had a fall, and could use an overshot breast or turbine wheel, as shown in the sketch which you have sent us

H. D., of Mass.—What kind of engine, 125 horse power, is best for a propeller, a river towboat? A direct-acting high pressure engine, with Stevenson's link motion.

T. M. L., of Mass.—The simple idea of opening two exhaust passages by one motion so as to release the steam more rapidly from the cylinder is certainly quite old.

W. H. B., of Pa.—You can order Buchanan on Mill Work or Bourne on the Steam Engine of Messrs. Wiley & Halstead, this city. Both are English and old, and would be almost useless for you to go by. You can order a good tract on the teeth of wheels of Mr. J. P. Pirrson, this city, for 25 cents. You can order a really good set of large lithograph drawings of American engines of H. S. Samuels & Co. for $27. Write to them for a circular

G. A., of N. Y.—The work on managing the flax crop to which you refer would be of service to us, if you could send it for our perusal for about three or four weeks.

J. E., of Wis.—It would be no difficult task to find short and good terms for new weights and measures.

W. G. L., of Pa.—We cannot give you any satisfactory receipt for restoring the faded printing of old books. You can remove names printed with printer's ink by a strong solution of potash put on with a hair pencil; but it will change the color of the paper, and make it yellow.

L. & H., of Mass.—We did not recommend the use of caustic soda lye but as a cheap and powerful washing fluid. Your washing fluid is very good, but no better than the cloride of soda, which is well known and used by many persons. The silicate of soda was employed in soap twenty years ago, but your combination of it appears to be new.

P. K., of R. I.—Copper-faced type is 25 per cent. dearer than common type. It endures much longer than ordinary type. Solid copper type would not be likely to come into use, because of its great price. The face of the type is the only part that requires to be made hard, for endurance.

A. N. S., of N. Y.—The articles you refer to can be obtained of Pike & Co., this city. Brewster's Optics, and Carpenter on the Microscope, will perhaps give you all the information desired, respecting optical instruments. They are published by Blanchard & Lea, Phila.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, April 11, 1857:—

S. & B., of Vt., $35; C. T. P., of Mass., $25; J. B., of Me., $30; E. D., of Wis., $60; J. G., of Ga., $25; W. Y. G., of Ky., $10; N. & W., of Pa., $30; W. S. R., of S. C. $25; C. P., of N. Y., $10; J. B. C., of Tenn., $35; V. & S., of N. Y., $30; J. S. T., of Md., $150; C. P. C., of Mass. $30; H. B. L., of O., $30; T. M., of Md., $30; R. S. & Co., of Me., $100; C. D., of N. J., $30; T. C., of N. Y., $30; S. Y. L., of L. I., $25; J. H. M., of Ill., $32; J. C., of Ill., $15; D. J., of Me., $30; E. C., of Mass., $55; T. M., of N. Y., $30; F. B., of Conn., $30; C. W. C., of N. Y., $30; J. C., of N. J., $25; T. W. Jr., of Conn., $20; C. J. F., of N. Y., $25; J. H. Jr., of N. Y., $55; B. F. R., of N. Y., $35.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, April 11, 1857:

J. H. Jr., of N. Y.; W. S. R., of S. C.; J. G., of Ga.; C. T. P., of Mass.; J. C., of N. J.; T. W., Jr., of Conn.; L. H. & Co., of Me.; C. J. F., of N. Y.; J. C., of N. Y.; V. & S., of N. Y.; L. W., of Mass.; J. H. M., of Ill.; S. Y. L., of L. I.; J. C., of Ill.; B. F. R., of N. Y.

Literary Notices.

WEBSTER'S DICTIONARY, is now the recognized standard, as it regards the meaning, orthography and pronunciation of words. The research, learning and good judgment displayed in its production, have made it *The* Dictionary of the English language. In our legislative bodies, courts of justice, and schools of learning, it is conclusive authority; and it has for years been our rule and guide. It is now essential to every student and necessary to every family. It is published by G. & C. Merriam, of Springfield, Mass.

BRITTANY AND LA VENDEE. Tales and Sketches, with a Notice of the Life and Literary Character of Emile Souvestre. 12mo. pp. 301. New York: Dix, Edwards & Co. This volume contains eight Tales translated from the French of the late Emile Souvestre—a writer of established reputation. These Tales have a reference to a part of France which has been neglected by other authors. They show an intimate acquaintance with the character and scenery of a region little known to us—as the American tourist ordinarily proceeds in the usual track of travel—for mere sight-seeing; and hence provincial life is scarcely thought or known much of. Messrs. Dix, Edwards & Co., are issuing some excellent publications—as their Catalogue shows.

LIFE OF "TAE-PING-WANG, THE CHINESE REBEL CHIEF.—The above named work has just been published by Dix, Edwards & Co., No. 321 Broadway, this city—edited by J. Milton Mackie. The present state of China renders this book exceedingly interesting. It contains an account of the Life and Adventures of the Chinese Mahomet, who appears destined to revolutionize the whole senile empire of the pig-tails and tea-raisers. It is illustrated with a number of good wood cuts, and is well printed.

THE KNICKERBOCKER for April is out—fresh as the gale of spring—with its usual variety of Tales, Songs, Stanzas, Essays, criticisms, and editorial musings and correspondence. A handsome tribute is paid to the memory of the late Dr. Kane, by the editor; and the general contributions maintain the high reputation for which "Old Knick." has long been distinguished. Published by Samuel Huestis, 348 Broadway, this city.

NORTH BRITISH REVIEW.—The number of this renowned Review for the present quarter, contains nine sterling Essays. The first is on the "Employment of Women," and is well written. One on Dr. Kane's Arctic Expeditions, is very flattering to the fame of our lamented countryman. It is an excellent number. Published by Leonard Scott & Co., No. 54 Gold street.

SMITH'S HOMEOPATHIC DIRECTORY OF THE UNITED STATES. By Henry M. Smith, 484 Broadway. Price 30 cents. It contains the Colleges, Dispensaries, Hospitals, Journals, Pharmacies, Publications, Societies and names of the practitioners in the Homeopathic School of Medicine, throughout the United States and South America. The list comprises about 1600 names. It will be of much service to the profession.

Terms of Advertising.

Twenty-five cents a line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

☞ All advertisements must be paid for before inserting.

Science and Art.

New Philosophy of Making Soup.

That most important philosophical question, "Why is the cook so fat?" has at length been answered in a late number of the *Life Illustrated.* It presents an engraving of a new "Soup Digester," the projector of which is a Professor Hume, whose opinions it endorses, asserting that it will save one half of the meat generally used in making soup. The apparatus consists of a common cast iron cooking goblet, furnished with a steam tight lid, clasped down, in which is a safety valve, to enable the soup to be boiled under high pressure—at a temperature above 212°.

But how can this apparatus save one half of the meat generally used in making soup? In *Life Illustrated* it is stated that by the usual method of making soup one half of the meat is wasted, or lost by evaporation; that is, one half of it escapes into the atmosphere of the kitchen. This at once solves the intricate question of the cook's obesity; she gets the benefit by inhalation of one half of the meat when making soup.

Our philosophical cotemporary also asserts that "the strength of beef cannot be extracted by a heat of 212°. This discovery lays the famous Liebig low in the dust. On page 418 of his Letters on Chemistry, he says:—

"If finely chopped flesh be slowly heated to boiling with an equal weight of water, and kept boiling for a *few* minutes, then strained and pressed, we obtain the *strongest* and *best flavored* soup which can be made from flesh."

To sum up all the virtues of this famous soup digester, *Life Illustrated* says:—

"What would we think of a steamship that was built with the top of the boiler loose, so that the greater part of the steam was constantly escaping? How would it be expected that a voyage to England could be performed when the motive power was nearly all dissipated? And yet the man who would do such a thing would be acting on precisely the same principle as the woman who makes soup in an ordinary pot, and lets it half evaporate up the chimney."

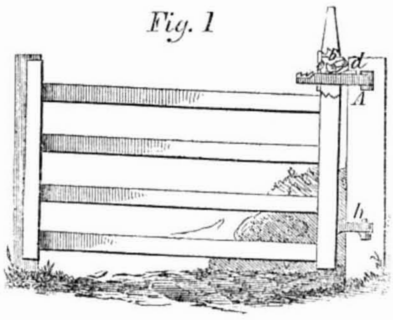
This is really a sublime comparison. It amounts to this: "As it would be absurd and wasteful to allow a steam boiler to blow off steam continually, so it is equally wasteful and absurd not to boil soup in a steam tight high pressure digester." Now this is all nonsense. The vapor which escapes in boiling soup is simple steam, not the meat; none of *its* solid matter is evaporated by common boiling.

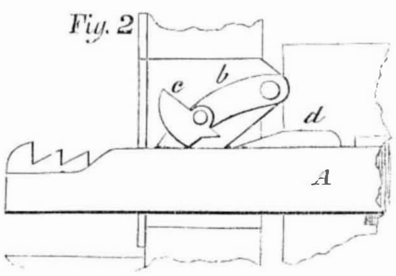
If the person who penned the above paragraph had exercised the most common-place reflection, he never would have put forth such stuff. The steam boiler of a steamship is supplied with salt water, and it is continually evaporating steam. But what becomes of the salt in the water? According to the soup-cooking philosophy of *Life Illustrated* it would be evaporated also. Why should not at least one half of the salt in the water be evaporated, as well as one half of the beef in cooking soup in any vessel? Upon the same principle of drawing such *digestive* conclusions as the above, there is no reason why it should not. But the salt remains behind in the boiler, none of it is evaporated; and it has to be run or pumped off, from time to time. And in making soup, the vapor which escapes from the vessel in which it is made is simple steam—not a particle of beef. One hundred pounds of beef may be boiled for a whole day in an open vessel, without the loss of an ounce of solid matter—beef.

Poisonous Gases of Combustion.

Anthracite coal combines with oxygen in combustion, and produces carbonic oxyd and carbonic acid gas. Perfect combustion of anthracite and common charcoal, results in carbonic acid gas; imperfect combustion produces the carbonic oxyd. The peculiar blue lambent flame, which plays upon ignited charcoal and anthracite, is produced by the combustion of carbonic oxyd. This flame is also often witnessed at the top of the smoke-pipe of steamboat chimneys, and playing over the ignited lime in kilns. Carbonic oxyd is too often allowed to escape into apartments, by improper draft in chimneys, or by throttling the pipes of stoves, by the damper. It is pretty generally known that carbonic acid gas is very poisonous, but it is not generally known that carbonic oxyd is more poisonous still. From experiments made by Dumas, the eminent French chemist, he has come to the conclusion that it is a hundred fold more poisonous than carbonic acid. This gas has a peculiar smell not belonging to carbonic acid. It is that odor which is often felt when entering close apartments, where anthracite coal and coke are used as fuel. Such an odor is a warning that there is a deadly poison in the atmosphere, and measures should at once be taken to obtain a supply of pure air. It is believed that this gas, more than any other, is often times the cause of many fevers during the cold months of the year, when persons are so much confined to warm rooms in cities.

Rolland's Patent Farm Gate.





Whatever may be the precise system on which a farm gate is founded, the whole is pretty sure in time to sag and drag on the ground—an evil to which the gates within our knowledge are so far subject as to render many stout and even comparatively new ones, almost incapable of operation without actually lifting and carrying the outermost end.

The accompanying engraving represents a device invented by Mr. Isaac S. Rolland, of West Earle, Lancaster county, Penn., for enabling a gate to be readily adjusted by the simplest possible motion, so as to stand and swing at any desired elevation. Fig. 1, shows the gate complete—a part only at the upper hinge being broken away; while Fig. 2 shows the peculiarity, which consists entirely in such hinge, on a larger scale.

The lower hinge, *h*, is of the ordinary kind. The upper hinge is peculiar only in its attachment to the gate. The main arm is not bolted to the gate as usual, but is inserted loosely in a slot or mortise, which mortise is lined or guarded, so to speak, with a stout casting which projects a little, as represented, to form the support or hinge of the pawl, *b*. This pawl takes into notches which are provided on the upper surface of A, for a large portion of its length, but are hid from view, except at the end, by a lip or ledge at the side. The notched portion, or rack, terminates in a considerable elevation, *d*, and by lifting at the outer or swinging side of the gate, the pawl clicks successively into the notches, so as to hold it into any position where it may be left, and thus any slight change of form, or sag, of the gate, may be readily corrected, and the construction readily induced to swing clear of the ground and at precisely the elevation desired. If, however, the gate should by any chance be raised too high, it becomes necessary to provide some means of lowering it. This might—with the simply notched hinge and pawl—be accomplished by the aid of an assistant, who, while the outer end of the gate was held up by one man, might go to the pawl *b*, and lift it out of the rack by the hand; but the admirable device represented, which was patented January 13th, of the present year, enables one man to accomplish all this by a simple movement, that of simply lifting the gate too far and then lowering it.

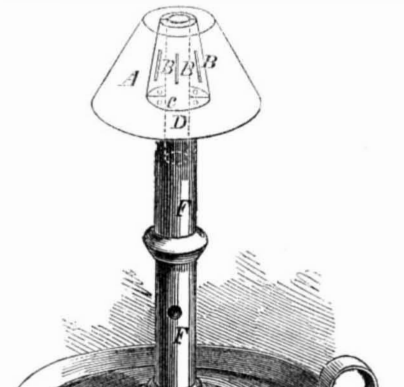
It is evident that to lower the gate, the pawl *b*, must by some means be lifted out of the notches and held suspended, while the gate is lowered. This is precisely what is done. To lower the gate, the operator, standing at the swinging end, as before, simply raises that end to the highest possible limit—a movement which brings the acting end of *b*, upon the inclined side of *d*, which latter lifts it out of the notches entirely, and suspends it for a moment so high that the cam, *c*, which is a piece freely pivoted on the side of *b*, drops by gravity into such position as, by rubbing along the top of the ledge or lip, to hold *b* entirely clear of the rack, and allow the gate to be lowered to its lowest position. The ledge not being continued quite to the end of the hinge, the pawl *b*, when the gate has arrived at its lowest position, again takes into the rack, and now as the gate is again raised, the cam *c*, shaped as represented, meets the inclined side of the ledge in such manner that it is tilted up into the position seen in the drawing, where it remains inoperative, allowing the pawl to act and hold the gate at any elevation where it may be set, until it is again lifted too high and the lowering process is repeated. Although apparently complicated, the device is really very simple, and may be worked by the exercise of a very inconsiderable amount of intelligence. All that is necessary is to lift the gate a little if it is too low, or if it is too high, to lift the gate as high as possible and then try again.

For further information concerning this improvement, the patentee may be addressed as above.

Davis' Patent Lard Lamp.

In the yearly increasing scarcity of oleaginous fluid for artificial illumination, every device tending either to improve and simplify the processes of gas manufacture, or to develope and render more convenient the employment of other substitutes, is entitled to much attention. The difficulties incident to the burning of lard are, to a very considerable extent, overcome by an invention patented on the 6th of May, 1856, and which is represented in the accompanying illustration.

A A is a metal cone-shaped feeder and lard heater, in two segments, with six slots, B, at top, and four circular apertures, C, below, and a tube, D, in and through its center. The tube, D, extends down into the stem, E,



of the lamp, and is soldered fast to the bottom of the globe of the lamp, before the stem, E, is attached to the globe. At the lower end of stem, E, is a round aperture, F, to admit air to pass up through the stem, E, and tube D, and the air, as it reaches the wick at the top of tube, D, causes the light to burn with increased flame and brilliancy. The light can be put out or extinguished by pressing the thumb against the aperture. The slats, B, are for the purpose of allowing the wick to be raised or lowered by a pin or wire. The round apertures, C, are for the purpose of admitting the lard against the wick to keep the wick saturated. The division in the cone is for the purpose of dividing the wick (two semi-circular wicks forming a circle) so that when one side of the wick becomes warmed, it assists in heating the other side, and the tube, D, becomes completely heated, and in case it becomes necessary to diminish the light, the wick of either side is picked down, leaving one wick burning.

The cone-shaped feeder, A A, is formed by having the two sides of one of its segments bent inwards, so that the bent sides form the divisions in the cone, and are soldered to the tube, D, and the soldering is less, and the feeder more substantial and prominent than if the divisions were inserted between the tube and the cone..

The patentee, Mr. Samuel Davis, resides in New Holland, Lancaster Co., Pa., where he may be addressed for any further particulars.

Imagination During Sleep.

Sir Benjamin Brodie reasons thus:—"In sleep there is an absence of volition. If it be not wholly suspended it is because the sleep is imperfect. The phantoms of the imagination are never stationary. They succeed each other with such rapidity that they never can be made the subject of contemplation; and very often there is no connection (that is, none that we can trace,) between that which comes first and that which follows. That there really are certain laws which regulate their production, I do not doubt, as there are laws which regulate all the phenomena; but whatever these laws may be, we know little and generally nothing of them."

A recent visit to Taylor's Saloon, (International Hotel,) in this city, revealed a fact quite important in connection with our notice of artesian wells, a few weeks since. It appears that the water from their well, although sunk nearly or quite to the rock, about 100 ft., is decidedly bad, and altogether unfit for drinking purposes, for which it was hoped to prove in some respects superior to the Croton. It has no perceptible smell, but has a flavor highly suggestive of putrefaction.