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Disasters on the Western Rivers.

The St. Louis *Democrat* contains a report, apparently very carefully prepared, of the principal disasters which have taken place during the past year on the western rivers. Of steamboats sunk there were 47; burnt, 19, and explosions, 9. Lives lost by these, 259; property lost, $1,924,000—an enormous amount. Of the forty-seven steamboats sunk, no fewer than thirty-six were lost by snags and obstructions in the rivers, and it is calculated that by the expenditure of $30,000 in removing these, more than one-half of the accidents would have been prevented. A number of minor accidents, not involving loss of life, but much valuable cargo, also occurred, the amount being estimated at $1,000,000. A great many lives, beside the number given, were also lost by persons falling overboard off steamboats and small boats. The current of the mighty Mississippi is so resistless that when a person falls overboard into it he sinks to rise no more.

It is high time that a large sum was expended in removing obstructions on our western rivers; a million of dollars per annum for the next three years would be economically laid out for this purpose.

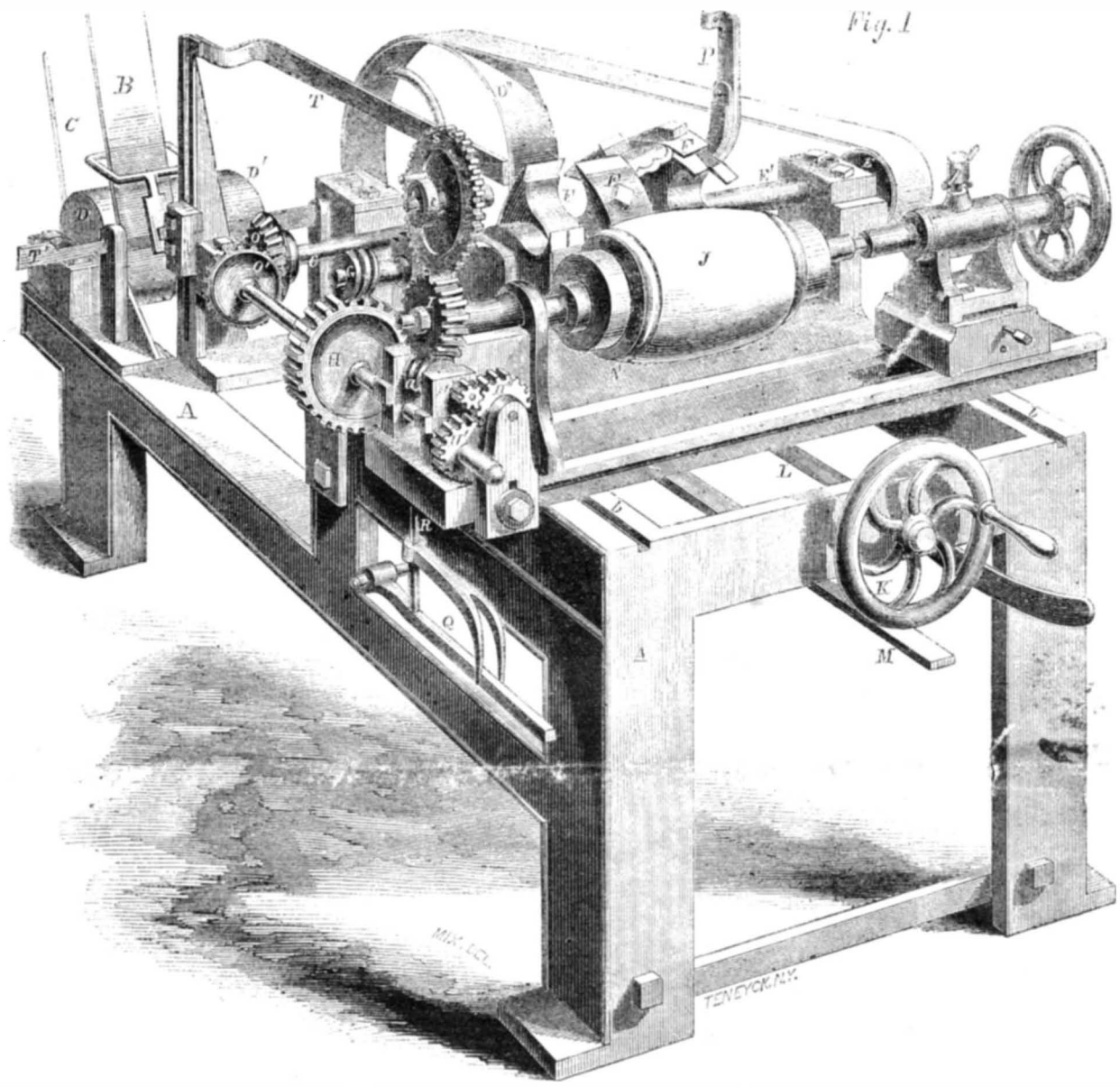
New Automatic Lathe.

We are often surprised that the metaphysicians, generally so acute and so ready in discovering any new development of the human mind, have not already described and catalogued with mathematical exactness the processes of reasoning which lead to, on the one hand, and which result in, on the other, invention—the production of means capable of attaining a definite and required end. This, specifically, has not been done; and it would form an interesting study for any tyro who wished to acquire distinction in the fields of analytical reasoning. We are led to these remarks by the engravings now before us, which illustrate a machine, the production of which has cost knowledge, skill, and genius. It is the invention of John McNary, of Brooklyn, N. Y., and was patented May 4th, 1858.

Fig. 1 is a perspective view of the machine, with cutters arranged for cutting hubs. The whole is placed on a frame, A. B is a belt or prime-mover passing through a belt-shipper, C, and giving motion to a fast or loose pulley, D D′, the shaft of which carries a wheel, D″. This wheel by a belt moves a pulley, E, on whose shaft, E′, the cutters, F, are placed. Outside the bearing of shaft, E′, and on it, the spiral, G, is fixed, so that by the rotation of the cutters it gives motion to the gear wheel, H, that in its turn moves the gearing, H′ H″ H‴. On the shaft of H″ is another spiral, *a*, that moves the wheel, I, and so rotates the stick, J, which is to be

McNARY'S AUTOMATIC LATHE.

Fig. 1



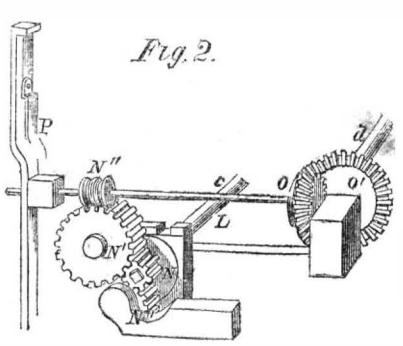
turned into a hub. This mechanism that rotates the stick is mounted on a movable bedplate, A′, which slides in ways, *b*, in the frame, A, and which can so be fed to the cutters to shape the hub from the stick. This bedplate, A′, has the ordinary means of supporting the stick (as seen), and which are also adjustable, and A′ is capable of being moved by the hand wheel, K, on whose shaft. L, is a screw, that passes through a nut cast in the bottom of A′. The common belt-shipper for starting the machine is shown at M. On the opposite end of the shaft, L (seen in Fig. 2), is a cog wheel, N, that is moved by the gearing, N′, from the spiral, N″, on the shaft, *c*, of the bevel wheel, O, which in its turn is moved by the bevel wheel, O′, on the shaft, *d*, of H.

Thus far we can see how, motion being given to B, the cutters may be rotated, and the stick also fed to the cutters and be rotated while being shaped or cut, and the whole of this automatically. But when the hub is finished by this means, it is not a true circle, but partakes in a great measure of the spiral form, from its rotating and forward movements combined, and it has now, therefore, to have the "spiral" taken from it and a true circle given; and this is perfectly done by the automatic mechanism we will now proceed to describe.

The bedplate, A′, is set to travel a certain distance, and so produce a hub of any given diameter. When this point has been reached a rod that is secured to the plate, A′, presses against the spring catch, P, and releasing it so that by the force of another spring the spiral, N″ is thrown or elevated out of gear with N′ and the bedplate ceases to advance, at the same time the arm, Q, on a shaft that

operated by a cam under A′, is allowed to fall, and the rod, R, drops with it, bringing

Fig. 2.



down the gear wheel, S, that is on its other end, into gear with I, it becomes rotated until a peg which serves as a cam comes round and elevates the automatic belt-shipper, T, that releases the bar, T′, which carries, by the belt-shipper, C, the belt, B, on to the loose pulley, D′, and so when the hub is perfectly turned, the machine is stopped, and the hub can be removed. When by rod, M, the machine is again set in its original state to commence a fresh hub, all the parts resume their original position, ready to go through the same automatic operations. A spring, *e*, is coiled on the axle of S, which, when S is released, brings it round to such a position that it will allow the hub to be rotated once, and so cut it perfectly round before it throws the belt on to the loose pulley, and so stops the machine.

From this enumeration of the parts and their uses, it will be seen that this is a most perfect automatic lathe; and we have seen it turn hubs with astonishing rapidity and regularity. It is a compact and excellent machine, and requires but little power; it is not confined to turning hubs, of which it can make thirty an hour, but is equally applicable for the manufacture of balusters, newels, table legs, &c.

Any further information or particulars can be obtained by addressing the agent, N. D. Fisher, 339 Gold st., Brooklyn, N. Y., who is prepared to supply machines, county or State rights, or to negotiate for the sale of the whole patent. A working machine can always be seen be seen at No. 3 Stanton st., Brooklyn, N. Y.

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FOR THE WEEK ENDING JANUARY 4, 1859.

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*** Circulars giving full particulars of the mode of applying for patents, sizes of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

AUTOMATIC BOILER-FEEDER—Henry B. Adams, of Brooklyn, N. N.: I am aware that oscillating chambers have been used for the purpose of gaging or supplying water; therefore I do not claim, broadly, the use of oscillating chambers for the purpose of supplying water to a steam boiler.

But I claim the arrangement and combination, substantially as shown and described, of the chambers, L L, shell, K, and adjustable weight, O, for the purposes set forth.

I also claim the combination of the valves, P, with the chambers, L, as and for the purposes shown and described.

[For more information regarding this invention, see another column.]

MANUFACTURE OF UMBRELLA RINGS—Jonathan Ball, of Elmira, N. Y.: I claim as a new article of manufacture, an umbrella ring having the ends of the ribs or the stretchers and the wire to confine them, cast within, as set forth.

GRINDING MILLS—Thomas Bennett, of New York City: I do not claim, broadly, a grinding cone, H, placed within a conical shell, D, for this is a well-known grinding device, and is employed in a great variety of mills,

But I claim the adjustable conical shell, D, in combination with the grinding cone, H, placed or secured upon a shaft, C, having no end play or longitudinal or adjusting movement, the parts being arranged substantially as and for the purpose set forth.

I further claim, in combination with the adjustable shell, D, and cone, H, the cob-cutter, D', permanently attached to the shaft, C, and having its shell, I, fitted over the end of shell, D, for the purpose set forth.

[This invention relates to an improvement in that class of grinding mills in which a rotary grinding cone is placed within a similar shaped shell. The invention substantially consists in having the conical shell adjustable, instead of the grinding cone and shaft, as hitherto arranged in this class of mills, whereby several important advantages are obtained.]

ELASTIC SADDLES—Lewis Bishop, of Talladega, Ala.: I am aware that elastic saddles have been previously constructed; but so far as I am aware a vertical play or spring has only been given the seat, no provision being made for a rocking movement. This rocking movement is an essential feature of the invention: it eases, to a great extent, the sudden jar attending the gait known as a trot; and as the motions of the animal can only be transmitted to the seat through the loops, a, and elastic bars, B B, it will at once be seen that the seat, C, will neutralize or ease, to a very great extent, the sudden jars, concussions, &c., attending the movement of the animal.

I do not claim, broadly, the employment or use of a spring or elastic seat attached to a saddle, for such device has been previously used.

But so far as I am aware, a rocking movement in connection with a vertically-vibrating one has not hitherto been given the seat.

What I claim as an improved article of manufacture is, a saddle having a seat, C, suspended on springs, B, by means of loops, a, and eyes, b, and otherwise made as shown and described.

[The seat of the saddle is suspended over the tree by springs, whereby the seat is allowed to rock or swing freely, and also have a certain requisite degree of elasticity vertically, so that it will yield or give to the motions of the horse, and render riding on horseback far more agreeable than by the use of an ordinary saddle.]

CORN SHELLERS—Michael Bomberger, of Hummelstown, Pa.: I claim so arranging the rollers, E E (provided with helical springs, as described), in combination with the loose rings, h h, as to operate in the manner and for the purposes as set forth.

I also claim the employment of the loose bar G, when arranged with rollers, E E, helical springs, f, adjusting bars, D D, and shelling cylinder, B, substantially as and for the purposes described.

HORSE RAKES—William H. Brown, of Middletown, N. Y.: I claim the arrangement and combination of the segment rack, e, toothed sector and arm, g h, rod, i, lever, j, and frame, E, as and for the purpose shown and described.

[The rake-head is attached to the machine in a novel way, whereby the rake is allowed to rise and fall, to conform to the inequalities of the ground, and still admit of being operated with the greatest facility, in order, when full, to discharge the grain or grass, and when empty to be placed in a suitable position to collect it.]

HARVESTERS—A. C. Brownlick, of Buffalo, N. Y.: I claim the axle, F, in combination with the pinions, o t v D, shaft, H, and pillow block, N, constructed, arranged and operating substantially in the manner described, for the purpose specified.

SEED PLANTERS—Joel Bryant, of Brooklyn, N. Y.: I disclaim the use of all other cultivating plows and seed-planting apparatus.

I claim in connection with the cultivating plow, A, the seed-planting apparatus, P, consisting of the drill plow, c, seed box, d, seed slide, e, driving rod, r, covering wheel, o, and sod-clearer, k, the same being constructed and operating substantially as described and for the purposes set forth.

APPARATUS FOR HOISTING AND DUMPING COAL—W. B. Culver, of Scranton, Pa.: I claim the arrangement and combination of the rod, G, bars, f E c c i j, bail, H, and inclined guides, e, as and for the purpose shown and described.

[The object of this invention is to facilitate the raising and dumping of coal and other substances from mines and pits, and consists in raising bodily within a shaft of the mine, loaded rail cars from a track within the mine, the cars being placed on a rising and falling frame working within guides, so that the cars when at the desired hight will be tilted, and their contents discharged in an upright position, the tilting of the cars being performed automatically by the rising and falling of the frames.]

ROCKING CHAIR—David Buzzell, of Charlestown, Mass.: I do not claim an extension foot-rest, or one so applied to a chair as to be capable of being moved toward or away from the seat of the chair, and whether such foot-rest be sustained by cords or weights or not, as such a foot-rest is very old, and has been in use many years.

Nor do I claim a chair constructed as shown in the United States patent No. 19,352.

But I claim in combination with the chair-stand or frame the movable leg-rest, and the sliding foot applied to such leg-rest, essentially as described, a mechanism by which, when the leg-rest is moved or swung upon its fulcrum or bearings, the sliding foot-rest shall be moved on its supports either toward or away from the seat, substantially as specified.

I also claim the combination of the foot levers and the rockers applied to the chair or seat frame, and so as to operate together, substantially as described.

I also claim the combination of the toggles, the lifting levers and their connections with the foot levers and rockers, the same being for the purpose of so operating the said rockers and levers as to cause the chair to be supported on the ground or floor either by the two rockers or the four foot levers, as set forth.

I also claim so combining a foot-rest with a movable or turning leg-rest, that the former shall be movable relatively to the latter, as specified.

COTTON CULTIVATORS—Calvin Cannady, of Indianapolis, Ind.: I claim, first, The two shares or blades, E E', when placed obliquely with each other, pivoted to their respective standards, c c, and adjusted by the rod, G, nut, g, and fork, F, substantially as and for the purpose set forth.

Second, The employment or use of the reciprocating hoe, L, attached to the bar, K, which is connected with the rod, I, the hoe being operated substantially as shown, to wit, through the medium of the cam, J, and spring, j, in connection with the pin, l, and springs, n n, so that the transverse movement of the hoe relatively with the row of the plants will be obtained, and also a vertical movement, to allow the hoe to clear the plants when passing over them previous to each thinning out strokes, substantially as shown and described.

Third, The lever, N, when applied to rod, I, and used in connection with the thinning hoe, L, substantially as and for the purpose set forth.

[By a peculiar arrangement of the shares or blades of the implement, they are prevented from being choked or clogged, and also rendered capable of being adjusted to suit the forms of the ridges of the rows of cotton plants. The invention also consists in a thinning hoe peculiarly arranged and operated automatically, so as to thin out the cotton plants in the drills the required distance apart as the implement is drawn along.]

CARPET FAN SWEEPER—Augustus C. Carey, of Lynn, Mass.: Thus far I have spoken of my improved fan as particularly applicable to sweeping carpets, but it is evident that it may also be employed upon machines for sweeping walks or even streets, and for gathering leaves from the surface of lawns. I do not, therefore, confine myself to its use simply as a carpet-sweeper.

I do not claim the employment of a fan in a sweeping machine, for the purpose of conveying the dust to the receptacle after it has been swept up by a revolving brush.

But I claim the use of a fan, F, for the purpose of sweeping the carpet or other surface, in place of the revolving brush heretofore employed for the purpose.

COOKING RANGE—Gardner Chilson, of Boston, Mass.: I lay no claim to the arrangement of ovens, elevated chamber or shell and flues, as claimed in the United States patent numbered 11,295, as my invention or arrangement of flues and the mode of carrying the heat about the ovens differ essentially therefrom.

What I claim as my improved arrangement of flues against the bottoms, the outer sides, the tops, the inner sides, and in rear of the two ovens, whereby the smoke, after passing over the tops of the two ovens or either is made to descend between them, and pass out into the back flue in manner as described. And with the said arrangement of flues or the parts thereof to which the same specially belong, or in other words, the top and diving flues of the two ovens, I claim the arrangement and application of a curved valve, N, and its arched recess, M, the whole being made to operate substantially in manner described.

I also claim the protector plate, H, as combined and arranged with reference to the fire-place, the two ovens, and the flue between the two ovens, and so as to support the ovens, as set forth.

I also claim the described mode of making the upright flue, D, leading from the fire-place or boiling chamber to the flue space about the oven, such being made with a reflecting back and tapering sides, and in other respects substantially as specified.

I also claim the expansion safety plate, t, as arranged with respect to the fire-place, and applied on the top plate of the boiling chamber, in manner and for the purpose substantially as specified.

SMUT MACHINES—Everard M. Clark, of Lancaster, Pa.: I claim the diagonal grooved wings or beaters, S, the upper and lower grooved wings or beaters Q the two sliding valves, O O, on the bottom of the machine, for regulating the draught, when combined substantially as set forth.

BILLIARD CUE TIPS—H. W. Collender, of New York City: I claim the new article of manufacture named, to wit, a cue leather or cue tip, coated on its flat surface with a soluble gum or cement, as described, for the purpose set forth.

CONSTRUCTION OF SPECTACLES—John Burt, of Hartford, Conn., and William W. Willard, of Syracuse, N. Y.: We claim the employment of the link joint, A, to the nose piece, X, for the purpose as described.

We also claim the construction and arrangement of the short bows, F, springs, H, cup, E, or pads, substantially in the manner and for the purpose as set forth and described.

BANDBOXES—Geo. H. Dickerman, of Boston, Mass.: I claim the combination of a removable standard with the paper bandbox, arranged substantially in the manner described, for the purpose set forth.

CULTIVATORS—John B. Duane, of Schenectady, N. Y.: I claim the arrangement and combination of the frame, D, having wheels, g, bar, F, wheel, G, bar, E, and frame, A, as and for the purpose shown and described.

[This invention consists in a novel way of mounting the frame in which the gangs of plows are placed and secured, so that the plows may be raised and lowered, and retained at any desired hight within the range of their movement, for the purpose of enabling the plow to pass over obstructions that may lie in its path, and also for the purpose of graduating the depth of the furrows as may be desired.]

ESCAPEMENT FOR TIME-KEEPERS—John W. Einhaus, of New York City: I claim the use of a triangular-shaped pallet lever for an escapement pallet for clocks, watches, &c., with an escapement wheel constructed in the manner set forth; but irrespective of such use of my block pallet, I make no claim to the construction of the escapement wheel of itself, as my invention relates exclusively to the use and application of the block pallet, substantially as set forth.

SPADING MACHINES—George B. Field, of St. Louis, Mo.: I claim propelling the shovels, H, by means of single cranks, G, attached to handles, X, and guided by adjustable arms or levers, L, so that the lower end of the shovels when in motion shall run in separate lines or furrows, the whole being constructed arranged and operating substantially as described.

WASHING MACHINES—Micah Gillam, of Alba, Pa.: I claim the beaters or lifters arranged upon the rocker shaft within the half cylindrical tub, lined with anti-friction rollers, the rocker shaft being operated by the lever, vertical shaft and connecting rods, and the whole being constructed and operated as set forth.

MEANS OF OPERATING CARRIAGE BRAKES—William Gourley and Isaac Krebs, of Winchester, Va.: We claim the construction and application of the compound or double lever, d d e e, as described, and the crank-shaped rubber rod or brake bar, g h i, and T-shaped spring, L, when combined and operated, substantially as set forth and described.

MACHINE FOR SAWING LATHS—E. H. Hancock, of Augusta, Ga.: I claim, first, The combination of the peculiar spirally-toothed feed rollers, G G', ordinary toothed or fluted feed rollers, H H', and obliquely set guide or gage, O, when the whole is arranged as described and relatively to the saws for the purposes set forth.

Second, The combination of the rollers, G' H, swinging frames, L' L', shaft, J, pinions, K K, spur wheel, L, and cog wheel, D, substantially as and for the purposes set forth.

Third, The arrangement of the swing table, B, bearing a portion of the machinery with respect to the frame, A, and the rest of the machinery thereon, as set forth.

BEE HIVES—J. S. Harbison, of Sacramento, Cal.: I claim, first, The graduating chamber, B, in combination with the curtain, C, and ventilating passages, E and F, whereby air is admitted without light into the hive, arranged substantially as and for the purpose described.

Second, Providing the adjustable sectional comb-frames, K, with the flexible metal clamps, b b, when the frames are constructed and arranged in the manner described for the purposes specified.

While not claiming, broadly, the removal of a tier of boxes at one operation, nor the boxes of a tier separately, by means of a clamp, irrespective of the mode of construction, I do claim—

Third, The device composed of the parts, L f d c, in combination with a horizontal tier of boxes, arranged and operated as and for the purposes described.

COFFEE POTS—J. W. Hedenberg, of St. Louis, Mo.: I do not claim the condenser or reservoir as these have been used before.

But I claim the application of the chimney or pipe to the open space between the coffee pot and the condenser, for the purpose of causing a current of cold air to pass between the coffee pot and condenser, as set forth.

ROTARY HARROWS—Charles Howell, of Cleveland, Ohio: I claim, first, The arrangement and combination of three rotary harrows, when the axis of each is inclined in the manner and for the purposes substantially as described.

Second, The arrangement of the hook, c, in relation to the front harrow, when combined with two harrows in the rear, arranged to operate in the manner set forth.

METHOD OF OPERATING THE VALVES OF PUMPING ENGINES—L. J. Knowles, of Warren, Mass.: I am aware that steam valves have been operated by means of the exhaust steam as it escapes from the cylinder, but such device will manifestly not answer in an engine that is required to start automatically at any instant when steam is admitted, and whatever may be the position of the main piston, as after a short stop there will be no exhaust steam to actuate the valve.

I am also aware that the slide valve of direct action engines has been moved partly by a tappet arm upon the main piston rod and through the balance of its throw, by an auxiliary piston actuated by steam admitted through a secondary valve, which valve was opened by the tappet arm which started the main valve, and I therefore lay claim to neither of the above devices.

But I claim controlling the motions and positions of the plunger, G, exclusively by steam admitted from the steam chest, and by suitable exhausts as set forth, for the purposes specified.

Second, I claim the described arrangement of the induction ports, a and p, with respect to the exhaust ports, z and h, and with respect to the throw of the plunger, G, for the purpose specified.

Third, I claim admitting a quantity of steam before the advancing plunger through the passages, s h and i r, for the purpose of arresting its motion, as set forth.

Fourth, I claim the secondary exhaust ports, v v 2, operating as described, for the purpose set forth.

Fifth, The peculiar construction of the main valve, F, whereby the pressure upon the same is relieved, as it passes the center of its throw, and the piston is caused to start more gradually as set forth.

MEANS OF OPERATING CARRIAGE BRAKES—Isaac Krebs, of Winchester, Va.: Having described the nature, construction and operation of my improvement, and being fully aware that rubber blocks and brakes have been applied to the hubs of wheels, and operated also by draw rods and levers, therefore such devices in themselves I do not claim.

But I claim the levers, h I J, with movable fulcrum, g g, the sliding adjusting connection rod and tap, n n P, the slotted clip or fulcrum support, d e f, and the spring rubber, r s, when constructed and arranged in combination as before set forth and described.

MACHINES FOR SOWING GUANO AND OTHER FERTILIZERS—J. H. Leach, of Oakville, Md.: I claim, first, The arrangement of the covering section of the drill within the frame of the roller section, as and for the purposes set forth; and in connection therewith—

I claim the arrangement of the box, between the hopper and distributing spout, the box being attached to the hopper by pliable or elastic material, and being vibrated with the spout by the toothed wheel upon the axle, as described.

RAILROAD SLEEPING CARS—T. Luce and J. H. Morrison, of Detroit, Mich.: We claim the folding berth bottoms, C, attached to each side of a central partition, B, within the body of the car in connection with the double row of single seats, E E, at each side of the car, with a passage way, n, between them, the innermost row of seats at each side of the car being provided with falling backs, and the whole arranged substantially as and for the purpose set forth,

[This invention consists in attaching a series of folding berth bottoms to each side of a longitudinal central partition placed within the car, and using in connection with said partition and berth bottoms, double rows of single seats at each side of the car; the parts being arranged, so that, in the same car, seats are obtained for day and berths for repose at night, and a passage way is allowed through the car at each side of the partition by night or day, or when either the seats or berths are used.

RAILWAY ALARM—Henry Maule, of Philadelphia, Pa.: I claim the employment of the lever, C D, or its equivalent, in combination with an extra rail, I I', and with the steam whistle, the whole arranged and operating substantially as described, for sounding the steam whistle at any desired part of the road.

CUTTING AND PUNCHING IRON—A. J. Peavey, of South Montville, Me.: I do not claim the universal die box as such.

But I claim the cylindrical die box, B, in combination with the circular punch socket, D, both punch and die being by their means capable of revolution upon their axes and adjustment to the required angles of the teeth of the saw to be gummed, as specified.

I do not claim the dividing plate and the parts necessary for its convenient operation, nor operating the punches by lever and cam, separately considered.

But I do claim the combination of the dividing plate, O, and its appendages, substantially as described, with the punching apparatus, in the manner and for the purpose specified.

SPOKE MACHINE—N. Olney and C. H. Kellogg, of Amherst, Mass.: We are aware that expanding cutter heads have been previously used, and we therefore do not claim, broadly, such device.

But we claim the expanding cutter heads, D, in connection with the guides or patterns, G G I, attached to the reciprocating carriage, F, in which the stick, A', to be operated upon is placed; the guides or patterns G G I, actuating the cutter heads respectively by means of the mechanism, substantially as shown and described for the purpose set forth.

We further claim, in combination with the expanding cutter heads, D, and the guides or patterns, G G I, on the carriage, F, the circular saws, Y Y, fitted in the frame, V, operated automatically by the carriage, F, substantially as set forth.

[A full description of this invention will be found on another page.]

CORN HARVESTERS—R. C. Mauck, of Conrad's Store, Va.: I claim, first, The bearing wheel, G, arranged substantially as and for the purpose set forth.

Second, The combination of the bearing wheel, G, and the rest block, a, for submitting the stalk to the knife in the best manner to effect the cut.

Third, Guiding the machine by the passage of the groove, I, over the stumps of the cut products.

REVOLVING FIREARMS—C. S. Pettengill, of New Haven, Conn.: I claim, first, Combining the hammer and the rotating dog, with the trigger, by means of a forked tumbler, H, and a cam, L, working on the same pin, the said cam being formed with a notched tail, m, to engage and operate in combination with a horn on the trigger, substantially as and for the purpose set forth.

Second, The bent dog, I, applied as described, on a fixed conical steed on the center of the rear of the breech, supported and combined with a cam, L, on the tumbler pin c, to operate substantially as described.

Third, The arrangement of the helical main spring upon a bolt, which is jointed to the hammer, and which slides through a fixed guide in the rear thereof, substantially as described.

[This invention relates to that kind of revolver which is in most common use, having its chambered cylinder arranged to rotate on an axis parallel with the bore of the barrel. It consists in certain novel combinations and arrangements of parts of the lock for the purpose of effecting the cocking of the hammer, the rotation of the cylinder and the locking of the cylinder with its chambers in position for firing, all by the movement of the trigger.]

MACHINE FOR DITCHING GRADING, &C.—Wm. Provines, of Columbia, Mo.: I claim the arrangement and combination of the elevators, I, rods, K, shaft, f, disk, H, and shaft, G, substantially as and for the purpose shown and described.

[Rotary elevators, an adjustable scoop, and rotary colters are placed in a suitable frame, which is mounted on wheels these parts being constructed and arranged relatively with each other, whereby the desired work, whether ditching, grading, or excavating, may be performed expeditiously and in a perfect manner

MACHINERY FOR POINTING THE TEETH OF HAIR COMBS—C. B. Rogers, of Deep River, Conn.: I do not claim, broadly, a wheel, B, placed on a rotary shaft A, provided with a screw thread on its periphery, and recesses to form cutters irrespective of the form of said recesses, for such device is in common use.

But I claim forming the recesses, c, at the center and from the edges of the periphery of the wheel, B, toward its center, so that each recess shall extend only partially across the periphery of the wheel, and still cutting surfaces be formed entirely across it, without breaking or dividing the screw thread, b, entirely across the wheel at any one point, substantially as and for the purpose set forth.

[By this improved manner of arranging the cutting portion of the device, the feed movement is not interfered with in any way, and the teeth of the comb are rendered less liable to be broken while being operated upon than by the usual devices.]

SIFTING SHOVELS—Paul A. Sabbaton, of Albany, N. Y.: I claim, as an improved article of manufacture, a screening shovel, composed of malleable cast iron and otherwise made as shown and described.

[A description and engraving of this shovel was published on page 120 of the present volume of the SCIENTIFIC AMERICAN.]

GRINDING AND CRUSHING MILLS—Gelston Sanford, of Poughkeepsie, N. Y.: I claim first, The arrangement and combination of a conical grinding surface with a concentric shell composed of stationary and adjustable wedges or staves, which are provided with a means of adjustment, substantially as described, and substantially for the purposes set forth.

Second, The arrangement of the projecting surfaces, C', of the cone, substantially as described and shown, so that by reversing the direction of the rotation of the cone, small or large bodies may be crushed and ground in the mill.

LAMPS—William F. Shaw, of Boston, Mass.: Thus far the foraminous deflector has been spoken of as particularly applicable to lamps, but it is obvious that it may, with equal advantage, be employed in connection with gas burners. I do not therefore intend to confine myself to its use in the peculiar lamp above described, but intend to apply it wherever it may be found to be useful. I am aware that deflectors have been perforated with holes near their base, the body of the deflector being of unperforated sheet metal; but I lay no claim to such a deflector, as it would not accomplish the ends which I have in view.

But I do claim the foraminous deflector described, operating in the manner substantially as set forth.

Second, I claim the foraminous deflector, in combination with the perforated bottom air chamber, as set forth.

SEWING MACHINES—Isaac M. Singer, of New York City: I claim placing the spool within the shuttle, without any attachment, so that the heads thereof shall run in contact with the case of the shuttle, to give the required drag substantially as described.

I also claim, in combination with the shuttle case, and the spool placed therein without any connection, substantially as described, the employment of the spring plates, substantially as described, to form spring bearings for the pivots of the spool as set forth.

And I also claim the shuttle case and spool placed therein, without any attachment, as described, in combination with the enclosing plate and the face of the shuttle race, substantially as described, by means of which combination the spool is held in place by simply placing the shuttle in its race substantially as described.

FRANKLIN STOVES—David Stuart, of Philadelphia, Pa.: I do not claim forming an air space or chamber in which air circulates behind, or in contact with the fire-backs of stoves, and passes thence in a heated condition into the apartment, as that has long been known and used.

But what I do claim as my improvement in Franklin stoves is forming the fire back of such stoves by the front wall of a cell or chamber, around or on both sides of which the draught passes, and through which the air circulates as set forth, said cell or chamber being constructed and connected with the stove in the manner set forth.

LITHOGRAPHIC PRINTING PRESS—William Herrmann Stuble, of Boston, Mass.: I claim the cylinder of rollers, m, in combination with a revolving tympan and scraper, operating as set forth for the purpose described.

Second, I claim the method of interrupting the motion of the gears, f2, and of again engaging them with the rack by means of the cams, f2, lever, F2, and pin, a2, operating in the manner set forth.

Third, I claim hanging the parts which operate the scraper on springs, 17, in the manner substantially as specified.

CULTIVATORS—George W. Tolhurst, of Liverpool, Ohio: I claim the arrangement of the flanged quadrants, F, pivots, D, clamp hook, E, braces, C and C', teeth, A B, and rigid frame, G, in the manner and for the purposes sot forth and described.

CATCH FOR HANGING DRAPERY—Alonzo Warner and Cyrus A. Warner, of Bristol, Conn.: We do not claim the device of S. R. C. Denison, patented Aug, 5, 1856, or that of D. A. B. Coffin, June 9, 1857.

But we claim, for hanging drapery, the spring catch, B, as a new and improved article of manufacture, constructed as and for the purpose specified.

MODE OF OPERATING DRAIN PLOWS—Daniel Watson, of Newport, Ohio: I claim combining with the crab or anchor, H, and the plow, a, traveling capstans, J, which are connected together by a rope or chain, as herein represented, for the purpose of working said plow as described.

CORN SHELLER—William Wells, of Boston, Mass.: I the arrangement and combination of the shelling wheel, A, guide, B, clearer, D, and weighted or spring presser, C, constructed and operating in the manner described for the purpose specified.

COPYING PRESS—Alonzo Whitcomb, of Worcester, Mass.: When the screw is arranged to pass through and traverse a nut in the cross-bar, I claim connecting the screw and platen with each other in presses, by means of a cap on the upper side of the platen, with a spiral thread in its interior, to correspond with the thread on the lower end of the screw, substantially as described and for the purpose as set forth.

SCREW PROPELLER—Benjamin F. Bee, of Harwich, Mass, (assignor to himself and James A. Woodbury, of Boston, Mass.): I claim the combination of the cylinder, a, with the longitudinal plates, e, substantially as described.

HORSE RAKES—B. Bridendolph, (assignor to himself and O. K. Borey,) of Clear Spring, Md.: I claim the arrangement, substantially as shown, of the handles, c c, rake head, A, shafts, D D, runners, F F, and links or rods, E, for the purpose set forth.

[This rake is constructed in a novel manner, so that the implement, even when in motion, may be readily unloaded or emptied of its contents, the teeth of the rake being capable of adjustment to the desired hight from the ground, and the implement, as a whole, is rendered extremely simple and efficient, readily manipulated, of light draught, economical to manufacture and not liable to get out of repair.]

ATTACHING HANDLES TO CUTLERY—Mathew Chapman, (assignor to the J. Russell Manf'g Co.,) of Greenfield, Mass.: I do not claim making handles for cutlery by compressing the same into the proper form by means of dies, for this has been previously done, horn and other substances having been thus compressed for similar and analogous purposes.

But I claim placing the handles in the rough on the tangs of the implements, with or without the rivets, and compressing the same, while on the tangs, into proper form by means of dies, substantially as and for the purpose set forth.

[A description of this invention will be found on another page.]

MANUFACTURING WEBBING—James C. Cooke, (assignor to the Russell Manf'g Co.,) of Middleton, Conn.: I do not claim the double hose, but my described improvement or new fabric.

I claim, as a new manufacture, a fabric or belting made not only of two or more sets of body warps, and a single filling thread passed through the decussations of the said warps, alternately or otherwise, but with confining warps arranged and crossed on the filling, and between the body warps and at various or numerous intervals between the two edges of the fabric, so as to bind together the cloths made by the body warps, and form them with no straight or continuous parallel ridges.

METHOD OF BENDING WOOD—Robt. Fitts, of New Ipswich, N. H., (assignor to C. and G. C. Winchester, of Ashburnham, Mass.): I claim bending a piece of wood around a fixed form by means of the series of blocks, levers and connecting bars, arranged and operating in the manner set forth.

Second, And, in combination with the above, I claim the spring face plate, u, attached to the blocks, E, substantially in the manner and for the purpose specified.

BRIDGE WALLS IN BOILER FURNACES—William G. Hamilton, (assignor to John C. Hamilton,) of New York City: I claim the hanging of the bridge wall upon an axis, in the manner described, or equivalent, by which it is made capable of being folded down out of the way, as set forth, and also the making of the axis hollow, terminating with an opening forward, as described and shown, for the purpose stated.

ELECTRO-MAGNETIC TELEGRAPHING—David E. Hughes, (assignor to the American Telegraph Company,) of New York City: I claim introducing into that portion of the electric current which passes to the opposite pole of the machine at the station where the operator is working, a retarder, such substantially as herein described, whereby said portion shall not reach the near ground plate until after the other portion of the same current shall have passed over the line wire and reached the distant ground plate, whereby said current is enabled to flow through the machine situated at the place of the operator, as aforesaid, without setting said machine in motion substantially as described.

MANUFACTURING CORSETS AND BUSTLES—Damase Lamoureux, (assignor to Alexander Douglas and Samuel S. Sherwood,) of New York City: I do not claim making a bustle of hoops, either wholly or partially encircling the body of the wearer, and forced back away from the body upon the back side by means other than the combination of the bustle with the corset.

What I claim is the new article of manufacture constituting a corset and bustle, when constructed in the manner described for the purpose set forth.

LOOMS—Stephen C. Mendenhall, (assignor to Isaac Lamb,) of Richmond, Ind.: I claim first, The treadle roller, G, carrier, E F, and spring, H, in combination with the scroll cam, I, arranged in the box, D, for the purpose of operating the treadles substantially in the manner described.

Second, The hook, J, having an adjustable and hinged attachment to the breast-beam, when combined with a set screw to determine its position, and operating in the scroll cam in the manner set forth.

Third, The combination with the treadle of the graduated series of mortises, Z, and pin, Y, for the purpose of regulating the width of the shed.

Fourth, The combination of the picker spring, P, sliding catches, O, triggers, U, and straps, Q T, for the purpose of throwing the shuttle as set forth.

Fifth, The combination of the double eccentric pulley, R S, and straps, Q T, with the set screws, 6, arranged substantially in the manner described, for the purpose of expanding the picker spring, P, in such a manner as to equalize the power at each forward motion of the lay or batten,

LASTS—Goodloe H. Taylor, of Shelburne, Mass., (assignor to himself and William Sherwin, of Shelburne Falls, Mass.,): I claim so pivoting the hook or lever, c, as that the strain shall come upon said pivot and not upon the spring, by which means I effect a better and more certain fastening, as set forth and explained.

SEALING CANS AND BOTTLES—James D. Willoughby, of Carlisle, Pa., (assignor to C. M. Alexander, of Washington, D. C.): I claim, first, The arrangement of the disks, B and E, screw, F, and top, C, with the rubber, D, in such a manner that when the rubber is compressed its periphery will press tightly against the insides of the can or bottle mouth, while its center presses against the rod or screw, F, for the purpose of effectually excluding the air as fully described.

Second, I also claim the subject of the first claim in combination with the neck of the bottle or can, as constructed for the purposes set forth.

BURNERS FOR VAPOR LAMPS—Ephraim D. Rosencrantz and Willard H. Smith, (assignors to said Rosencrantz and Barton E. Clark,) of New York City: We claim the employment of a tube, A, for holding the wick, when provided with a plate, a, and perforations, f f, for the purpose set forth.

We claim the employment of a cap, D, or heater having perforations, b b, tangential to its periphery, substantially as set forth, when used with a wick tube, A, in the manner and for the purpose set forth.

COFFINS—Charles E. H. Richardson, of Philadelphia, Pa.: I claim the construction of a coffin or casket, made air and moisture tight by a double lining of cloth and cork, prepared and combined in the manner and for the purpose substantially as described.

RE-ISSUES.

REGULATING THE FLOW OF OIL TO THE WICK IN CARCEL LAMPS—Abraham Coates, of New York City. Patented March 25, 1856: In lamps in which the oil is forced to the wick so as to overflow, I claim regulating the supply of oil to the burner by means of the self-employing drip cup, operating upon the supply valve.

I claim also placing the fountain or reservoir for the oil above the lens, with its draught opening, and its supply pipe within the barrel or chamber of the lens.

MACHINE FOR MAKING HAMES—Henry Burt and James Y. Hedden, of Newark, N. J. Patented Feb. 17, 1857: I claim the forging of metal into useful forms by the employment of two or more pairs of rolls having their surfaces cut away; and combined and rotating and pressing the metal progressively into shape, being conducted from one pair of rolls to another through the agency of the guide.

MACHINERY FOR DRESSING SCREW HEADS—H. A. Harvey, of New York City, assignee (through mesne-assignment) of Thomas W. Harvey, late of said New York. Patented August 18, 1846: I claim, first, The employment of a pair of spring pincers which receive the blanks one at a time, and presents them to the jaws point foremost.

Second, In combination with the mandrel and jaws, or equivalent means for receiving and holding the screw blanks, the employment of a punch or driver for inserting the blanks to the required distance.

Third, The combination of the movable rest with the movable cutter head, and for the purpose of giving support to the blank and get out of the way so soon as the cutting operation is completed, and is claimed, whether the cutting operation be perforated on the head, or any other part of the blank.

Fourth, The particular manner of constructing the adjustable turning head, the slide or seat piece, the tool holder, sliding on the piece, between the check pieces, with the respective adjustments thereof, combined, arranged and operating so as to effect the setting of the tool: the manner of operating the griping dies, and of separating the blanks in the hopper and conveying them to the feeding fingers, being similar to those described and used in the machine for cutting the threads.

SEWING MACHINES—Anthony W. Goodell, of Brooklyn, N. Y., and Nelson R. Scovell, of Albany, N. Y., assignees (through mesne-assignment) of Wm. Lyon, of Newark, N. J. Patented December, 1854: I claim first, the combination of a feeding foot pressed on to the cloth and moved to feed the cloth, and then released from said cloth and returned to its former position, with a clamping foot, that is raised when the feed of the cloth takes place.

Second, The vibrating bar, feeding foot, arm, and vibrating studs, arranged and acting to communicate motion to the feeding foot.

Third, A looping instrument constructed with a cavity or notch, and an eye carrying the second thread, and receiving a sideway movement after the said looper has passed through the loop of needle threads, for the purpose of carrying the second thread across and beyond the descending path of the needle, when said looper remains in a position for the needle to enter said cavity, or notch, as it descends between the looper and second thread, and then said looper receives a sideways movement to its original position to clear the needle in drawing back.

Fourth, The reciprocating looper, formed with the cavity, and with an incline, in combination with a stationary screw, or its equivalent, to communicate the required movement to the looper.

Fifth, The arrangement of the segmental spring looper and arm on the rocking shaft, for the purpose of adjusting and securing, by the screws, the looping point in the desired position with great ease and accuracy.

DESIGNS.

DINING-ROOM STOVES—Conrad Harris and Paul W. Zoiner, (assignor to Harris, Zoiner & Co.,) of Cincinnati, Ohio.

COOK'S STOVES—Conrad Harris and Paul W. Zoiner, (assignors to Harris, Zoiner and Co.,) of Cincinnati, Ohio.

EXTENSIONS.

COAL STOVES—Henry Stanley, of Poultney, Vt. Patented January 4, 1845: I claim the manner in which I have combined and arranged the two stories thereof, consisting of two cylinders, with the eight triangular radiating flues, arranged around and in contact with them, said flues communicating with the flue space in the pintle, with the intermediate chamber, and with the corner space—the two latter being divided by partitions into anterior and posterior portions, and there being also openings through the upper end of the upper cylinder into the cornice space: it being distinctly understood that I do not make any claim to either of the individual parts, taken separately and alone, but that I limit my claim to the combination and arrangement thereof as a whole; not intending, however, by this claim, to confine myself, in constructing my stove, to the particular form of the respective parts, but to vary these as I may deem expedient, whilst I attain the same end.

SAW COTTON GIN—Eleazer Carver, of Bridgewater, Mass. Patented January 4, 1845: I claim the combination of a cylinder brush, having fans on the end thereof, with a cotton gin.

Railroads in the United States.

For the benefit of those inventors who have turned their attention to the improvement of railroads, either in rolling stock or permanent way, we condense the following information from the New York *Herald*, of the total number of miles of railway in the various States up to the close of 1858:—

	Total Length of Road.	*Length of Road Completed.*
Maine	631	554
New Hampshire	594	560
Vermont	557	537
Massachusetts	1,480	1,378
Rhode Island	86	63
Connecticut	809	654
New York	3,476	2,695
New Jersey	645	553
Pennsylvania	3,735	2,971
Delaware	119	91
Maryland	873	792
Dist. of Columbia	3	3
Virginia	1,776	1,410
North Carolina	836	760
South Carolina	1,077	779
Georgia	1,554	1,177
Florida	730	198
Alabama	1,504	679
Mississippi	371	246
Louisiana	1,039	393
Texas	2,229	205
Arkansas	701	38
Tennessee	1,511	1,035
Kentucky	724	399
Ohio	4,278	2,988
Michigan	1,627	1,032
Indiana	1,692	1,290
Illinois	3,177	2,714
Wisconsin	2,403	822
Minnesota	1,058	—
Iowa	1,346	343
Missouri	1,164	547
California	170	22

We have purposely omitted fractions of miles in our table, but adding them in, the totals are as follows:—

Total length of roads, 44,417 miles; total length open, 28,238.

Science made Popular.

MESSRS EDITORS—I cannot permit the year that is now passing away to roll out of existence without doing myself the honor and pleasure of telling you how much enjoyment and profit I derive from your valuable and truly interesting paper. By your noble effort you have given that dignity to the mechanical professions, North and South, which they deserve, both on account of their utility and the variety of scientific applications required to keep them in motion. Your paper is indeed invaluable, and has no equal in this or any other country.

M. McK.

University of Virginia, Dec., 1858.

[The above is but a fair sample of hundreds of letters received by us every year; and were we disposed to do so, we could occupy nearly one half the available space of the SCIENTIFIC AMERICAN, in making public the good opinion entertained towards it by the press and the people. Few papers now published have received more praise from all classes than this.

New Motive Power Engine.

Old and exploded theories and inventions frequently come sailing round on the pages of our cotemporaries, astonishing the uninitiated. The following is one of these, which appeared in one of our exchanges last week:

"An invention is described in the English papers of a new or improved motive power engine, in which a mixture of hydrogen and atmospheric air is exploded, and the partial vacuum thereby produced, is made to bring into operation the pressure of the atmosphere, so as to obtain therefrom motive power. The engine consists essentially of three parts. In the first of the three parts, hydrogen is generated by the action of zinc on diluted sulphuric acid. The hydrogen gas is transmitted to the second part of the engine, where it is mixed with a certain quantity of the atmospheric air. The mixture is exploded by a small flame, fed from the generators."

In principle this is similar to Dr. Drake's detonating gas engine described on page 61, Vol. XI of the SCIENTIFIC AMERICAN. Common gas was employed in it, mixed with the atmosphere, and this is all the difference between the two.

How Corn is Preserved in Russia.

At a late meeting of the Academy of Sciences, held in Paris, a letter from M. de Semchoff—a Russian land-holder—was read, describing the manner in which corn-pits are made in that country. The pits are dug in a dry soil, and instead of masonry, the earthern sides are hardened by a long continued exposure to a wood fire. Before the corn is introduced, the air in the pit is rarified by burning straw in it, after which the grain is thrown in, packed close, and the pit is tightly enclosed. Corn has been preserved in such pits for forty years. Some of our western farmers, who raise large crops of wheat and corn, should try this method of preserving grain during years when there is a great harvest, in order to lay up a store for seasons of an inferior yield.

Patent Laws.

In the Senate of the United States, on the 17th ult., Senator Dixon, of Conn., submitted following resolution, which was considered by unanimous consent and agreed to:—

"*Resolved*, That the Committee of Patents and the Patent Office be instructed to inquire what legislation is necessary to enable the Commissioner of Patents to compel the attendance and examination of witnesses, and the production of books, contracts and vouchers, and a full disclosure by patentees of all facts upon which any claim for the extension or re-issue of a patent may be claimed, and that said committee report by bill or otherwise."

Handles for Cutlery.

This is a novel invention. It consists in forming the handles by pressure, by means of dies, from the rough. The rough stuff as it comes from the saws is placed on the tang of the implement, secured there, and then pressed into a beautifully finished handle, that is almost part and parcel of the implement itself in point of stability. Any material capable of compression can be used. The inventor is Matthew Chapman, of Greenfield, Mass., and he has assigned the invention to the J. Russell Manufacturing Co.

Spoke Machine.

Nathan Olney and Charles H. Kellogg, of Amherst, Mass., have invented a machine for cutting spokes. It consists in the employment of expanding cutters in connection with a reciprocating carriage provided with guides or patterns and the "stuff" or stick to be acted upon, whereby the stick may be cut at one operation into the desired shape to form a perfect spoke. The machine was patented this week.

Enduring Perfumes.

Among the curiosities shown at Alnwick Castle, in England, is a vase taken from an Egyptian catacomb, and which contains a mixture of resins, that send forth an agreeable odor, although said to be three thousand years old.

The mosque of Omar in Constantinople, is highly perfumed with musk, which was mixed with the mortar in its walls during the time of their erection several hundred years ago.

A GREAT IDEA.—A correspondent of the Easton (Pa.) *Daily Times*, and who signs himself "Inventor," proposes to keep the Pacific Railroad out of the way of Indians, buffaloes, and other inconveniences, by suspending it from balloons, and holding it in its place by large magnets buried in the earth at regular intervals. A telegraphic wire could, he thinks, pass over the tops of the gas-bags, and the expense of the whole be less than the common plan by about $400,000,000. A sanguine inventor, this!

THANKS, GENTLEMEN—I received yesterday from the Patent Office the patent for which I applied through you. Please accept my thanks for the promptness and dispatch with which you have conducted the business.

DAVID WELLS.

Lowell, Mass., December, 1858.

New Inventions.

New Tubular and Flue Boiler.

A rather novel boiler, which is stated to possess some advantages over others, has recently been introduced by William Fairbairn, C. E., F. R. S., Manchester, Eng. It has two furnaces, the same as in the Cornish boiler, with double flues, but these instead of running the entire length of the boiler, are united at about eight feet from the doors, where they form what is termed a "mixed chamber," which has a plate at its back end containing a series of flue tubes that run to the end of the boiler. The flues and tubes thus form a combination boiler affording more complete combustion than the tubular boiler of itself, and better absorption of the heat than the flue beiler of itself. In a boiler 22 feet long, the flues and furnaces are 8 feet, the mixing chamber 5 feet, and the tubes 8 feet to the back draught. If the boiler is 7 feet in diameter, about 120 three-inch tubes are employed.

Improved Extension Table.

The extension table has become quite a feature in our houses, and is one of the most convenient articles of furniture, capable as it is of expanding with our hospitality, and of contracting with the hardness of the times or the numerical diminution of our families. The table that is the subject of our illustration is a good one, and is the invention of Adolphus Bader, of 211 Third street, New York, who obtained a patent December 7, 1858. It was noticed on page 111 of the present volume of the Scientific American, and we now give a full description and views.

Fig. 1 is a vertical longitudinal section of the table, showing one side extended wholly, and the other half. Fig. 2 is an underside view of the table, when the whole is closed

The top, A, of the table is placed on the frame, B, and it is kept in the proper place by means of guide pins, *a a*, which fit into sockets in the central cross braces, C, on which the top rests. The frame, B, is strengthened by two longitudinal braces, D D, which serve as guides for the arms, E, on which the additional plates, F and G, F′ and G′, rest. These arms slide in notches, *b*, in the frame, and they are guided by means of pins, *c*, which fit into grooves, *d*, in the sides of the braces, D, and flat springs, *e*, are attached to these braces in such a position that they keep the inner end of these arms constantly depressed. The arms are provided with notches, which fit over projections, *g*, at the under side of the cross brace, C, when the arms are drawn out half way, and hooks, *g′*, are attached to the inner ends of the arms which fit over projections, *h*, at the inside of the frame, B, when the same are drawn out entirely.

The plates, F F′, are rigidly attached to the arms, E, and the plate, G G′, are hinged to the same in such a manner that they fold over them, or that they may be unfolded and brought in the same plane with the first plates, F, as represented on the right hand side of Fig. 1. Additional legs, H, are hinged to the plates, F F′, so that when these plates are wholly drawn out, they drop down by their own gravity, and that they form a proper support at the ends of the table in an extended state; and to prevent these legs from being displaced by accident, folding stops, I, are hinged to the underside of the plates, F F′, which fit into recesses, *h′*, and which turn down and form steps behind the legs, as soon as the legs are dropped.

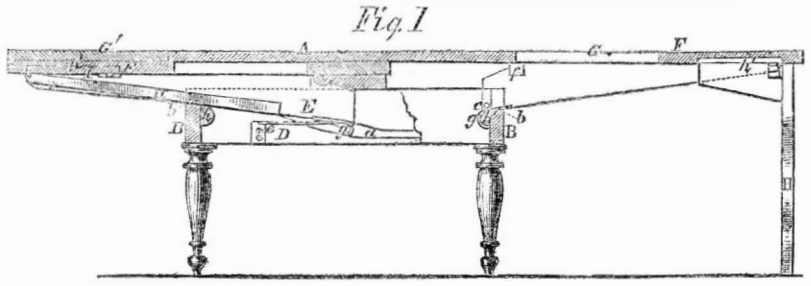
The width of the arms, E, is increasing toward their inner ends, so that the additional plates, G G′, are brought up to the same level with the table top, A, when the arms are drawn out half-way, as represented on the left hand side of Fig. 1, and so that the plates, F F′, are brought up to the same level with the stationary top, A, when these arms are drawn out altogether, as represented on the right hand side of Fig. 1.

In order to extend this table, the top, A, is raised a little, and the additional plates are drawn out. If drawn out half way, the notches, in the inner ends of the arms, E, fit over projections, *g*, at the under side of the cross brace, C, and the plates, G G′, are now in the same level with the stationary top, A. By this operation, the area of the table is doubled, or nearly so, as a plate of nearly one-half the size of the stationary top, A, is added to the same on two sides.

If the arms are drawn out entirely, the

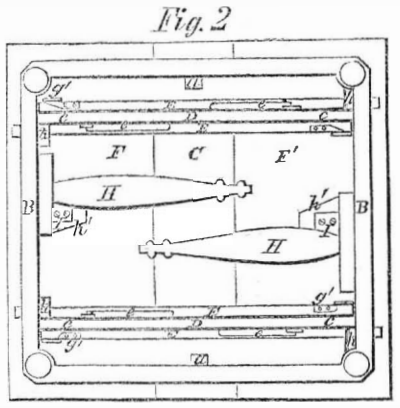
BADER'S EXTENSION TABLE.

Fig. 1



plates, F F′, are brought to a level with the top, A, and the hooks, *g′*, fit over the projections, *h*, which are attached to the inner side

Fig. 2



of the frame, B. As shown, as the arms are drawn out to the proper distance, the legs, H, drop down and support the plates, F F′ and if the plates, G G′, are now unfolded, the area of the table is rendered nearly three times as large as its original area. In order to push in the additional plates, the legs, H, are turned up, the plates, G G′, are folded over the plates, F F′, and the arms, E, are pushed in. In this motion they are guided by the pins, *c*, and by the notches, *d*, after they are pushed in half way, it is necessary to depress the inner ends of the arms a little, by raising the plates, F F′, so that the notches, *f*, clear the projections, *g*, and at the same time the table top, A, must be raised sufficiently to allow the plates, G G′, to pass under its edge.

It will be seen that this is a most useful and compact table, suitable for any house and operated with ease. Any further information can be obtained by addressing the inventor as above.

Automatic Boiler Feed.

H. B. Adams, of Brooklyn, N. Y., has invented an improved automatic boiler feed, for which he has procured a patent this week. The invention consists in arranging two oscillating chambers in combination with a certain arrangement in such relation to a steam boiler and to a water-tank, that one of the chambers is always in communication with the steam boiler, discharging water into it if needed, while the other is receiving water from the supply tank. The whole is so constructed that when one of the chambers is full, the other one has a portion of its contents discharged, and that the empty or partially empty chamber is raised by the overweight of the full one, assisted by an additional weight, which is arranged on a rod extending from the lower part of the shell, and that by this motion of the chambers, the required change in the corresponding parts and openings of the valve is effected. The inventor has assigned the invention to S. C. Hills and J. H. Darlington. Any information can be had by addressing S. C. Hills, No. 12 Platt street, New York.

Another New Ship.

A Mr. Torell, of England, proposes to build ships divided horizontally into two parts, the upper portion being provided with a flat bottom. The rudder is also capable of being separated into two portions, to coincide with the halves of the ship. When a perfect ship is required, the halves are secured together by capstans; but when divided, the upper portion forms a flat-bottomed boat of large dimensions and light draught, in which much of the cargo can be floated into shallow water or up rivers into the interior of a country without being displaced. The under portion may be used as a separate vessel for coasting or other purposes.

HOFFMAN'S BEDSTEAD AND BUREAU.

Fig. 2

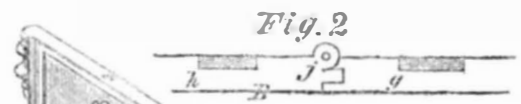


Fig. 1

That article of domestic economy, on which we all spend one quarter of our time, should surely be an object of some consideration and attention, and whatever can be added to a bed, in the way of comfort, convenience or utility, truly deserves our care. It is one of the foundations of home, and the amily "four poster" has often been recollected by the wanderer when all the other scenes and impressions of home have faded into dim obscurity. One of the features of a well-furnished house is the presence of plenty of beds, and it is therefore convenient that they should be able to be placed in as small a space as possible when not in use. Many persons, too, are actually compelled, for want of room, to have what are called "portable bedsteads."

The subject of our illustration is a bedstead that can accommodate two persons at night, and be so folded up in the daytime as to appear like a bureau, and this change is capable of being effected with very little trouble or labor.

In our view, Fig, 1 shows the bed opened out, A being the box or body of the bureau, B the bottom of the bed, and *a* the front of the bureau, ornamentally painted, with handles and drawers. The bottom of the bed is formed in three parts, *g h i*, joined together by the hinges and joints, *j k*, and supported in the center by a supplemental leg, *l*. One of these joints is seen in outline in Fig. 2. When it is desired to close the bed up, the leg, *l*, is folded behind the side, *h*, and the bedding removed. The front, *a*, is then pushed in, and *h* folds over *g*, and *i* over *h*, so that they lie inside A, on the top of each other, and *a* is held in its place by the catches, *b*. The bedding, mattress, pillows, &c,, can be put in by lifting up the top, C. It is economical, comfortable and neat, and is the invention of F. Hoffmann, of this city, and was patented Oct. 26, 1858.

Any one wishing further information concerning this useful and ornamental piece of furniture should call on or address Hoffmann & Menzel, 289 Spring street, New York.

We have to thank the Hon. S. A. Cox, of Maine, and Professor Henry, of Washington, for Smithsonian Reports for 1857.

Scientific American.

NEW YORK, JANUARY 15, 1859.

REMOVAL.

On or about the 1st of February next, the Publication Office of the SCIENTIFIC AMERICAN, and the Patent Agency Department connected therewith, will be removed from 128 Fulton street to the spacious offices in the new building, Nos. 37 Park row and 145 Nassau street; the principal entrance being on the eastern side of the City Hall Park. This change we find necessary in order to meet the continual growth of both departments of our business; and we shall expect, at the time above specified, to show our friends, and such of the public as may feel disposed to call upon us, the most complete and thoroughly organized establishment of the kind in the world.

Endosmose.

Some time ago, a correspondent asked us "how the sap ascended through the tubes of plants?" We replied in our "Notes and Queries" column, "by capillary attraction, light and heat," and we now proceed to give a fuller account of the process, to explain the action of capillary attraction in this process of nature. Dutrochet paid much attention to this subject, and discovered the phenomena of *endosmose* and *exosmose*, which are the terms now usually employed to explain the ascent of sap in trees.

Whenever two liquids capable of being mixed with each other of different densities are separated by a membraneous or porous partition, two currents become established, one a current of fluid proceeding from within to without, and the other in the contrary direction. If a glass tube closed at one end with a piece of bladder be partly filled with a solution of sugar, salt or any other substance, and immersed in a vessel filled with pure water to the same level, the fluid will rapidly rise in the tube, the water having entered through the bladder by endosmose, and adding to the contents of the tube, causes it to be much above its former level. If, now, the conditions be reversed, the sirup or salt solution being placed in the larger vessel and pure water in the tube, exosmose will occur, by which the tube will be nearly emptied.

The general rule may be thus stated. That fluids of a less specific tendency have a tendency to pass through a membrane and to mix with those of a greater density, and consequently dilute them. This is exactly the process by which plants are fed and the circulation of the juices carried on. This phenomenon is capable of a very simple explanation founded on the capillary attraction and repulsion, exerted by the porous diaphragm exposed to its influence.

In the case of a piece of bladder, this is readily moistened by water, but not by alcohol. Let the tube be partly filled with alcohol and then immersed in water. Endosmosis occurs and the fluid rises in the tube. The first action in this case is the attraction of the membrane to the water, whilst it repels the alcohol. A portion of water permeates the bladder, is immediately mixed with the and is no longer attracted by the bladder. A great portion enters, and this is continued until the alcohol is considerably diluted.

The endosmosis or influx of fluid is always attended by an exosmosis or exudation of a portion of the liquid confined by the porous diaphragm, being infinitely less than the endosmosed portion, the denser fluid being always placed in the tube. This may be illustrated by placing in the tube a solution of sulphate of iron, and immersing it in water. In a short time the solution will rise in the tube from the entrance of water; and if then a few drops of tincture of galls be added to the water in the external vessel, the purple color which is produced will satisfactorily prove that a portion of the solution of iron has really exuded through the membrane.

Combinations of Sulphur.

This most useful substance, the adjunct of the volcano and the testimony of the extinct fires of earth, combines in some shape or other with every other element, and is an active agent in producing the mutations of matter that are ever going on around us. With the metals it combines freely, and is so found in nature, the compound being called pyrites. When it combines directly with metals, one equivalent of sulphur for one of metal, they are called sulphides; and when two of sulphur for one of metal, bi-sulphides. These combinations are easily made by heating the two together, or by passing a sulphurous gas through a solution of some metals, such as lead, mercury, bismuth or copper. The compounds of sulphur with oxygen are seven in number: the first is called hyposulphurous acid, and is represented by the symbols, S^2 O, or two equivalents of each element, or thirty-two parts by weight of sulphur, and sixteen parts by weight of oxygen. It has a powerful solvent action on the bromide, iodide and chloride of silver, and hence is largely used in photography to remove from the picture those portions which have not been changed by light.

Sulphurous acid is found issuing from cracks in the rocks in volcanic districts, in the gaseous state, and being soluble in water, it is found in various springs. It is also formed whenever sulphur is burnt in the air. It is represented by the symbols S O_2, or sixteen parts, by weight, of sulphur (one equivalent) to sixteen parts by weight of oxygen (two equivalents). All its combinations with the metals are called sulphites, and they are used extensively as bleaching agents, and for reducing or de-oxydising some metals, as gold silver and mercury. The interior of wine-casks are purified by this gas, and it is a powerful disinfectant. The bi-sulphate of lime has recently been applied in the process of refining sugar.

Hyposulphuric acid, called also dithionic acid, contains two equivalents of sulphur and five of oxygen ($S_2 O_5$). It is a very unstable compound, being easily decomposed into sulphuric and sulphurous acids, by exposure to the air or by heating.

Sulphuric acid, or oil of vitriol, (of which a full account will be found on page 13, Vol. XIII., SCIENTIFIC AMERICAN,) contains S O_3, or as more correctly written, H O S O_3, *i. e.*, one equivalent of water combined with one of the anhydrous or dry sulphuric acid. It has been discovered in the uncombined state in a hot spring in New Granada, which is the only instance of the kind known, as its corrosive action is so great that it quickly combines with some substance or another, and forms a sulphate. Its uses are too numerous to mention, suffice it to say that it is the key of chemical manufactures, and the corner-stone, or nearly so, of all chemical technology.

Trithionic acid, ($S_3 O_5$,) tetrathionic acid, ($S_4 O_5$,) pentathionic acid, (S O_5,) are three compounds not much known at present, and for which no uses have been found.

With hydrogen, sulphur combines firstly as the pentasulphide of hydrogen, the use of which is chiefly in the laboratory for the purposes of analysis; it has both a sweet and bitter taste, and is represented by the formula, H S^5.

Hydro-sulphuric acid, or one equivalent of hydrogen combined with one of sulphur, is found in many mineral springs, in all decaying animal matter, and in marshes as a product of vegetable decay. It smells exactly like bad eggs, whose peculiar odor is due to this gas. It combines with nearly all the metals forming sulphides, and is symbolized by the letters, H S. It has an acid reaction, and reddens litmus paper. A light green solid substance can be formed by a combination of the chloride of sulphur with ammonia, which is the only compound of sulphur and nitrogen known; it is composed of one equivalent of nitrogen with three of sulphur, and is written N S.

There are, however, two or three compounds of sulphurous and sulphuric acid, with nitric and nitrous acids. With chlorine, sulphur forms a sub-chloride, or two equivalents of sulphur to one of chlorine; it dissolves large quantities of sulphur, which, when evaporated, it deposits in beautiful crystals, and it is used in one process of vulcanizing caoutchouc.

There are also the chloride of sulphur, a bi-chloride, and a ter-chloride, for which, however, there is little use in the arts.

Bromine acts like chlorine in combining with sulphur, and there is one union of iodine with sulphur, in single equivalents, which has found an application as a cure for cutaneous diseases.

A peculiar substance, liquid at ordinary temperatures but very volatile, is formed between sulphur and carbon, it is called the bi-sulphide of carbon, and is symbolized by the letters, C S_2. It is a powerful solvent of gums and resins, and quickly dissolves rubber, for which purpose it is much used.

Thus we have enumerated the combinations of sulphur with the other elements, so that when any of the compounds mentioned are used, our readers will be able to know at once its exact composition.

Canals and Railroads.

During the last winter a powerful influence was brought to bear upon the New York Legislature to pass a bill for taxing railroads for the benefit of the State canals, and attempts will be made during the present winter to carry out the same unjust policy. A convention of about four hundred delegates interested in the State canals met last week at Syracuse, and among a number of resolutions (some of them very good) passed by them, we must condemn one which calls for the taxation of our railroads. Without giving the whole of that resolution, the substance of it is, *that legislation is called for to subject railroads to the payment of tolls for carrying freight.* The canals are State property, the railroads are not. Tolls are charged on freight on the canals, because this is the source of revenue for the payment of those expenses necessary to keep them in repair; but the State incurs no expense for railroads, therefore is is the very reverse of justice to charge tolls on them. Those who have exercised political influence in New York in favor of the State canals have not always been actuated by high and just motives, but the most selfish interests. Thus boats which at one time passed through Oneida Lake into Lake Ontario were charged the same tollage as if they passed through the whole canal to Lake Erie. They were taxed for the use of the greatest portion of the canal, on which they never floated, upon the same principle as dissenters are taxed to supply the national religious establishments of Great Britain; and now this same one-sided policy is sought to be imposed on our railroads as it once was before. We hold to the axiom that *whatever is unjust is impolitic*; and as it is unjust, it would, therefore, be unwise to tax our railroads in the *manner* recommended by the convention referred to.

The Will of Hon. Henry L. Ellsworth.

The will of this gentleman, whose death we noticed last week, appoints Yale College residuary legatee. After paying three sums of $25,000 to his children and grandchildren, his wife an annuity of $1,500 per annum, and five charitable societies $1,000 each, the rest goes to Yale College, the sum being variously estimated at from one to four hundred thousand dollars. The estate of Mr. Ellsworth, which consists principally in western lands, is roughly calculated at $900,000. His liabilities amount to about $80,000, which it will take some time to settle.

New Cable for the Atlantic Telegraph.

By the latest news from Europe, it appears that a meeting of the stockholders of the Atlantic Telegraph Company was recently held in London and a report of the finances of the association submitted. The receipts and expenditures were very nearly balanced, the total amount being $1,720,000. It was proposed to raise a new capital of $2,675,000, and to lay a new cable, and the British government has been solicited to guarantee 4½ per cent on it.

Another company has also been formed in London to lay a telegraph line by the route of the Azores, and half of the capital for this purpose has been subscribed, but we think it will proceed no further, as propositions have already been made to fuse with the old company. These operations are "signs of the times," indicating the probability of another ocean cable being laid at no distant day.

Iron Floating Batteries Useless.

During the late war with Russia, the British government constructed quite a number of floating batteries, or small steam-frigates encased with iron plates four inches in thickness. It was supposed that these would resist the most powerful shot within point blank range, and that the balls would be broken into fragments upon coming into contact with these war turtles. One of these iron batteries, called the *Eurebus*, supposed to be the best yet constructed, was recently tried at Portsmouth, with a rifled cannon at 200 yards distance. The shots of this gun penetrated freely through the iron plates, thus proving that these floating batteries are not proof against powerful cannon, and that they cannot attack bomb-proof forts with impunity.

Improved Paddle Propeller.

John May, of Columbus, Ga., has recently made an improvement in propellers, designed to obtain a greater propelling effect from the motive power than by the ordinary methods. It consists in placing in the water, near the stern of the vessel, two wheels, each moving on a center and having projecting through them, on one side, a series of floats secured to a stationary eccentric inside the wheels. As the wheels are rotated, the floats are caused to project against the water on one side, and by being carried round with the wheel propel the vessel. This invention was patented Sept. 7th, 1858. Another invention has been made by the same gentleman, which consists in so connecting the eccentric with the frame that supports the whole propeller, that it can be operated from the deck and place the projecting floats at any desired angle with the vessel so that they will steer it with greater certainty than a rudder; and should the bow become fast on a reef or bank, the propellers will be able to work her off. The motion of the vessel can also be changed without reversing the engine, and the propellers give a smooth even surface to the water. A patent on this has been applied for, and foreign patents have also been secured for both. Any information can be afforded by Mr. May, on being addressed care of Sammis & Rooney, 47 & 49 Elizabeth st., New York.

Discovery of Fossil Remains.

The *Quebec Mercury* relates the discovery of some fossil remains discovered in a quarry about five miles from that city. On raising a portion of the rock that had been loosened by blasting between the strata, and imbedded in the upper layer, was found the form of a large fish perfect as to outline, but without any trace of organs or anything more than the mere form to show that it was fossil remains. The head is somewhat like that of the porpoise and about one foot in length. The entire length of the figure is six feet. Its depth at what may be called the shoulder is about one foot, with a gradually tapering fish-tail. It was found at a depth of about fifty feet below the surface of the rock. The stone is a grey-wacke, dipping at a high angle to the south-east. It does not resemble in form the fossil remains of the Icthyosaurus.

Useful Information about Timber.

FELLING TIMBER.—In Silloway's little work (noticed by us on page 119, present volume of the SCIENTIFIC AMERICAN) on "Modern Carpentry," we find some very useful information on the treatment and care of timber designed for building purposes. As such knowledge is of great interest to our people in every section of our country, their attention may very properly be directed to it at any time. We will, therefore, present the substance of what the author referred to says in regard to three topics, namely, felling, seasoning, and preserving timber.

Ancient architects paid great attention to the periods for felling timber, and old Vitruvius gives the sage advice never to cut down a tree but during the waning of the moon. His opinion on this head may be nothing better than moonshine; but agreeing with him, it is generally conceded by all those skilled in timber, that trees designed for building purposes should never be felled before they have reached maturity; still it is not easy to decide when they have arrived at this stage. It is considered, however, that oak and chestnut should never be cut before they attain to one hundred years; and spruce and pine seventy years. When a tree is observed to cease increasing the diameter of its trunk, and when it loses its foliage earlier in autumn than previously, it is a sign that it has attained to maturity, and is of sufficient age to be felled. The season of the year most favorable for this is another important question. In New England, August is held to be the best month in the year, as at that period the sap has been exhausted in forming the leaves and new wood, and the trunk is then much drier. The period when the wood contains the least sap, in whatever part of the year this may take place, is, undoubtedly, the best time for cutting timber.

It was the custom with the early architects of our country, in order to obtain durable framing timber, to bark the trees near the butt, while standing, in the spring, and cut them down in the succeeding winter. By this means the sap-wood became hard, and as strong as the heart-wood; and timber so treated was much better than that cut down and dried with the bark on. By barking the trunks of standing trees in winter, and making incisions just above the root, then allowing them to stand till August before being felled, they make very superior timber, both as it regards strength and durability, in comparison with trees not so treated. In felling trees, all the branches on the side of the trunk which is to fall on the ground should be removed, if possible, because when these strike the ground they wrench the timber of the trunk, and cause it to become shaky, by splitting the grain.

SEASONING TIMBER.—Nothing tends to improve the usefulness and durability of timber more than thorough and proper seasoning. The object of this treatment is to remove the free moisture and sap. For this purpose trees should be sawed soon after they are felled; but if this is impracticable, the logs should be barked and laid upon scantlings above the ground, to let the air circulate under them; or else they should be rolled into the mill pond. Logs should not be exposed to the hot sun in drying, as they are liable to split; they ought, therefore, to be kept in the shade, or be covered with brushwood. As soon as planks, boards, or scantling are sawed, they are to be piled up in the shade, and allowed free circulation of air through them. It is also recommended that they be immersed in a running stream of water for about a week to wash out the vegetable albumen; but some assert that timber so treated is not so strong as that in which the albumen or sap is coagulated by steam heat or warm air. Care should be exercised not to dry timber too rapidly, as it is liable to crack by the rapid expansion of the moisture and the sudden contraction of the fibers. In piling timber, it should be laid in such a position, when green, that it will not *wind* or twist, as it is liable to keep the position it assumes when drying, after it is seasoned. The strips of wood placed between boards in a pile should be laid as close together as possible, and be of equal thickness, so as to have each tier perfectly level, to prevent them bending. It is also found essential to keep stacks of boards, while seasoning, out of the reach of strong winds in the hot days of summer. These directions are given for the common method of air-seasoning. Artificial heat and steaming will facilitate the operation, but special apparatus is required for this purpose. Large sticks require longer time to season than boards, but no exact period can be laid down as a rule; all depends on the weather. It is only by an examination that a decision regarding the quality and seasoning of timber can be arrived at.

PRESERVING TIMBER.—In common seasoned timber there remains a certain portion of sap, which, when the stick or board is shut up in moist stagnant air, is liable to become heated, especially in summer, and to ferment, by which action the wood rots. In no instance, therefore, should a piece of framing be so enclosed that fresh air cannot come into contact with it. To every roof, spire, and dome there should be holes at such points as will insure a continual circulation of air about the timbers. Wood should also be protected from alternate moisture and dryness, as these changes induce rapid decomposition and decay. A piece of timber immersed in water at the bottom of a river will continue unchanged in its nature for centuries; and we have really seen logs taken from the bed of a stream, in which they must have remained for hundreds of years, and the timber was apparently as fresh as when first submerged. Wood exposed to continuous heat, such as over an oven, loses its elasticity in a comparatively short space of time, and becomes very brittle.

If the surface of timber is entirely protected from the action of the oxygen of the atmosphere, it endures for a very long period. This is the reason why wooden pipes buried in the ground in a compact soil do not decay for many years, and why logs immersed in water remain fresh for centuries. A thin solution of coal tar and whale oil applied warm to the surface of timber which is to be placed near the ground, makes an excellent protective; and if this is put on in three successive coats, and sifted dust from a blacksmith's forge then strewed over the entire surface, the timber is rendered scarcely susceptible of decay. This preparation can be easily applied to fence posts and sills of houses by any person, as it requires no special apparatus for the purpose. In all framing exposed to the weather every mortise hole capable of retaining rain should be closed up with tar, or some repellant of moisture. It often occurs that the wood at the lower ends of posts and rafters of roofs and church steeples is found to be decayed while the other parts of the structure are perfectly sound. In almost every instance of this kind it is found that rain has passed down and filled up the bottom mortises. A solution of one and a-half ounces of corrosive sublimate dissolved in every gallon of water, and applied warm to wood intended for framing, is also an excellent preservative. Good timber, thoroughly seasoned and washed with corrosive sublimate, and afterwards properly painted, is very durable. It often happens that paint is applied to timber before it is thoroughly seasoned; this is wrong, as it tends to promote decay by preventing the evaporation of the sap.

Some persons suppose that large timbers endure longer than small ones, but this is a mistake. The small spokes of a wheel will generally be found sound after the tongue of the wagon to which they belonged has become completely decayed. Every portion of a beam or post of timber in a frame should be carefully protected, for if rot commences at any exposed place, the whole stick is injured thereby, as the decay spreads in all directions; and the strength of any beam is just equal to that of its *weakest* part.

Science and the "Scientific American" in California.

MESSRS. EDITORS—The reliable information obtained in the SCIENTIFIC AMERICAN is worth far more than two dollars per annum to any person. I have always recommended it to young men, and do assert that one number of it is worth more than a whole volume of various other popular papers.

Science is much needed in California; nature has provided this State with an abundance of crude material to repay the labor of any man; but besides gold and mercury, but few of the other minerals are mined or worked. Not a week passes by without my laboratory being enriched with some new mineral, and I have obtained not only a great collection of these, but have commenced to work some of our native products into useful articles of commerce. I have several petroleum springs which yield from five to ten barrels each in summer, and I have made machinery oil, naphtha, &c., from the crude products. I have also commenced to work California copper ore, and manufacture about 1000 pounds of blue vitriol every day, which article is much needed for agricultural purposes.

Sulphur has also been found in great abundance, and I have taken from sulphur ore near the surface of the ground, from 50 to 75 per cent. of the pure article. I am now making preparations for working it extensively, as sulphur is indeed the *key* to all chemical manufactures.

J. M.

San Francisco, Dec. 4th, 1858.

Sewing Machines—Stitch Claims.

MESSRS. EDITORS—The SCIENTIFIC AMERICAN of a recent date contains a statement that the *stitch* known among those interested in Sewing Machines as the "Grover & Baker stitch," was *not patented*.

We beg leave to call your attention to the claims contained in one of the patents issued to W. G. Bates, of Westfield, Mass., owned by us, bearing date February 22, 1853, which are as follows, viz.:—

"*First*, What I claim as my invention, and desire to have secured to me by Letters Patent, is the making of the double loop stitch having the loops upon one side of the cloth, by means of two needles, combined and operating substantially as herein fully described."

"*Second*, I also claim the *making a seam, or uniting two pieces of cloth, by means of the double loop stitch*, herein fully described, consisting of a plain stitch, from a single thread on one side, and on the other, of a continuous chain, formed of a succession of double loops, from two threads."

Lest any should be led, on the authority of your valuable journal, to infringe upon patents which will assuredly be enforced, we have thought it not too much to ask for this caution a place in your columns.

Very respectfully,

GROVER & BAKER S. M. Co.

New York, Dec. 31, 1858.

A New Coal Bed in Virginia.

A new coal-bed has recently been discovered in the vicinity of the South Fork of Hughes river in Ritchie county. From such examinations as have been made, this bed is supposed to be inexhaustible. This coal is something new and peculiar. The crystals are small and flat and easily separated; the specimen which we have seen is much softer than anthracite coal, and is found to be very rich in oil and gas. This new coal is said to be the best yet discovered for the use of the steam-engine—especially for ocean steamers. A natural spring of petroleum has been found near the same coal-bed, in which it doubtless originates.—*Richmond Enquirer*.

Notes and Queries

*** PERSONS who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

S. K., of Ky.—There is no one book published on the "Art of War;" and to gain the information you require you would have to go through an extensive course of reading, for which purpose the books which have been suggested to you are about the best. We cannot reform the method of sending out the British magazines with their edges uncut; you should write to the publishers and remonstrate with them.

G. A. R., of Pa.—The stone you sent us is a piece of a vein of quartz, and it does not in any way improve the value of rock through which it runs. Chloride of lime is a compound of lime and chlorine gas, and it is used for bleaching and disinfecting purposes.

J. M., of Cal.—We thank you for your interesting letter. Let us hear from you as often as you have anything practical to communicate.

E. T. S., of Cal.—Your letter has been sent to Mr. Fawkes for his attention, and we will see Mr. Hicks in reference to the gas-burner.

D. E. R., of N. Y.—The only way to bleach tallow is by exposure to the weather.

A. B., of Texas.—We are not acquainted with any work on mathematics which gives rules for cutting the figures for patterns or guides to tinsmiths, but a knowledge of geometry will enable you to draw the figures for yourself.

J. W. P. J., of Mass.—Mix tar with spent tan bark or sawdust, and you will be able to burn it perfectly; if you cannot do this, build a chamber between the fire and chimney into which the lampblack can fall.

E, E. W., of N. H.—All oil varnishes are darkish. You cannot make amber varnish by any better method than melting, and pouring boiling oil on it, then stirring well. Perhaps your amber was a little burnt, and appeared darker than usual.

C. H. A., of N. J.—No premium has been offered for a perpetual motion. A perpetual motion means a machine which has the power within itself to cause its own motion. We do not believe you have accomplished such a feat, although you seem to be very sanguine of the result.

M. L., of Mass.—We should not feel willing to publish your statement unless a more minute description is given of the alleged discovery. The mere announcement of your invention would only subject you to many annoying letters. Go on with your experiments, and when they are completed give us the result.

H. & E., of N. Y.—Small saws require hammering after being hardened, to straighten them. They are hardened in a bath of oil, and by flaming the oil on their surface afterwards, they are rendered elastic. Large saws are hardened in a bath of oil and dissolved resin. About 50 parts of oil to one of resin makes a good bath.

M. B., of N. Y.—By our patent law the inventor who proves priority of invention is entitled to a patent, and will obtain one for his invention at any time, if it has not become public property by free public use for more than two years.

A. M. A,. of N. Y.—There is not a single good work on millwrighting (according as it is practiced in this country) in print. The power of a windmill is just in proportion to that of the wind. It is not regular, therefore such a mill would not suit your business, which requires a steady power. A one-horse power should drive your small circular saw, turning lathe, and sash machine.

L. M., of Ga.—We do not attend to the practical analysis of substances. We have not the time necessary to devote to this species of scientific research. We suppose that the lowness of the water in the middle boiler results from the manner of feeding. When boilers are connected, the water will often be much higher in that boiler to which the feed is introduced than the other. The best stove polish we know of is made by Mr. Quarterman, 114 John st., this city.

W. M. D., of Ohio.—Your article explanatory of the "law of visible direction," is too long. It may be briefly expressed thus:—As the retina of the eye receives impressions in the direction in which the lines of light from objects fall upon it, the sensations of the position of these objects must be in the same direction.

J. V. W., of Pa.—A boiler 10 feet long, with an under fire surface 38 inches diameter, and a return flue of 20 inches, is 7·41-horse power; that is allowing, as we understand your statement, that it has 66·70 square feet of effective heating surface. Your engine with seven inch bore and one foot stroke, carrying fifty pounds pressure, and having a speed of 280 feet per minute, is 6·99 active horse-power. We think you can obtain a patent for a combination of the parts in the machine you have described for making hand rails.

C. J. W., Jr., of Pa.—Your sketch simply represents an inverted image on the retina; and you state that "objects are seen in a direction perpendicular to the retina." This is only the statement of a well-known fact, not an explanation of the "law of visible direction." The phenomena of vision is rendered obscure by many who have attempted to write on the subject.

H. W. A., of Mass.—Bourne's treatise on the screw propeller (a London publication) will afford you the information wanted. There is no treatise published on windmills.

E. G. H. & Co., of Ill.—The recipe to which you refer (on page 97, this Vol., SCI. AM.), was given for the benefit of all who choose to practise it. We are not acquainted with any establishment in which the process of making steel castings referred to is carried on.

G. A. H., of Vt.—Continual vibration causes iron to become magnetic; and as you suggest, rails may become magnetic by the rolling action and friction of the car wheels. Hydrogen gas is capable of great compression, like every other gas, and its buoyancy is diminished as its density is increased.

J. S. S. & Son, of Conn.—All wooden articles intended for bending by machinery require to be steamed, to soften the fibers. To prevent bent plow handles from becoming straight when exposed to the weather, they should receive a good coat of hot linseed oil. We do not know where you can obtain plow handles ready made.

C. H. W. A., of Mass.—There is no American work on gas-lighting. The articles published in former volumes of the Sci. Am. may answer your purpose.

S. R. K., of East Saginaw.—The pressure of gas is determined in the same manner as that of steam; all gases come under the same law. A steel-yard can weigh this pressure when attached to a valve in the gas vessel. Parnell, on the manufacture of gas, is published by Wiley & Halsted, this city; it is not full on building gas-works, but it is a very excellent treatise.

J. H. N., of Md.—We have seen water-wheel shafts running on hard limestone bearings many years ago. A tube forced through the water will not allow the water to pass through it freely; the resistance will be in proportion to the length and velocity of the tube. Your objections to the practical character of Winans' steamer were noticed by us last week.

N. R., of Iowa.—Steel files are re-cut by Messrs. Rotherie, file manufacturers, Matteawan, N. Y.

J. W. M., of Boston.—The pressure on most slide valves varies at different points in their movement. The way to estimate the pressure on the valve in any position is to multiply the pounds pressure of steam per square inch by the number of square inches area of the back of the valve, minus the number of square inches area of the face which is exposed to the steam, either by projecting beyond the seat or by being over the port through which the steam enters the cylinder.

H. A., of N. Y.—The poor man whom you have described as having been swindled out of his invention, by another party obtaining a patent for it through deception, can only obtain full redress by applying for a patent in his own name. When the application comes to be examined in the Patent Office, it will be rejected, an interference may then be declared, and he will have the opportunity of proving that he is the original inventor; and if he does so, he will obtain a patent, by which he can institute proceedings in the United States District Court to have the patent of the other party declared null and void.

L. B., of Ohio, and B. B. S., of Ill.—If you own the exclusive right in a certain patented invention for a county, no other person can come into that county and engage in the manufacture or sale of the article without infringing your rights. Neither can the article be purchased elsewhere, and brought to your territory for use.

J. S., of Ind.—There is no patent for building gravel wall that we know of.

F. A. K., of N. H.—Four parts of alcohol of 95 per cent proof, and one part of camphene (refined turpentine) make good "burning fluid." Be careful in obtaining good materials, or you will not be able to make a good article. Shake the mixture thoroughly for some hours, and use only the clear for burning.

M. J. B., of Tenn.—There are direct-acting and geared propellers used in steamers; the latter, generally, has two revolutions for one of the crank shaft. The speed of propellers is from nine to fourteen knots per hour. You can only embrace one invention in a patent. If the stern of a vessel with a propeller exhibits your invention in a model, that is all the Patent Office requires.

S. J. H., of N. Y.—When we say that a microscope is of a power of 1,000 diameters, we mean that an object will appear proportionably 1,000 times wider than it really is; but you cannot see the whole of the object, as the more powerful the lens becomes, the smaller space will it take in what is called "its field;" but that space, though diminishing in actual size, is shown with the clearness and distinctness of an object magnified 1,000 diameters.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, January 8 :—

O. D., of Md., $25; W. L. H., of Tenn., $35; C. W. R., of Vt., $55; T. F., of Pa., $25; J. J. D., of N. Y., $55; R. W., of Vt., $30; E. K., of Mass., $5; L. H., of N. Y., $30; L. & B., of R. I., $55; M. C. H., of N. Y., $60; J. J., of Ohio, $30; H N. DeG., of N. Y., $30; M. C., of N. Y., $60; P. C. F., of N. Y., $12; J. G., of Ky., $35; S. B. G., of Conn., $25; J. S., of Ga., $55; P. & S., of Md., $400; G. & G., of Pa.: $40; H. R. K., of Vt., $50; H. H. B., of N. J., $30; N. T., of Conn., $30; C. P., of Ohio, $55; E. A. S., of Pa., $55; A. C. G., of N. Y., $50; N. C. S., of Conn., $25; L. K., of Pa., $30; F. C. T., of Conn., $35; W. R. T., of Pa., $30; J. L., of Ind., $30; B. B., of N. Y., $30; M. & C., of N. Y., $27; H. D., of N. Y., $25; D. F. S., of N. H., $30; J. G., of Pa., $40; N. P., of Pa., $30; W. H. B., of Mass., $30: J. E. A., of Conn., $30; J. C. K., of Ark., $20; A. G. B., of Ohio, $30; L. L. H., of N. Y., $30; J. A. A., of Conn., $25; T. A. D., of N. Y., $100; E. M., of Mich., $32; E. B. W., of Ill., $25; L. M. W., of N. Y., $50; J. B., of N. Y., $35; J. S., of Conn., $32.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, January 8 :—

N. W., of Wis.; E. E. M., of N. Y.; A. & B. N., of N. Y.; J. A. A., of Conn.; J. H. M., of N. Y.; P. C. F., of N. Y.; J. S., of Conn.; O. D., of Md.; S. B. of Conn.; E. K., of Mass.; N, C. S., of Conn.; E. A. S., of Pa. (two cases); E. B. W., of Ill.; J. B., of N. Y.; T. F., of Pa.; J. S. S., of N. Y.; H. D., of N. Y.; E. M., of Mich.; F. C. T., of Conn.; W. A. McD., of N. Y.; J. G., of Pa.

Literary Notices.

The Gewerbe Zeitung is the name of a new German paper, intended to promote the interests of the German manufacturing and industrial classes. Our Teuton brethren are, we are happy to see, waking up; and the first number of this paper does credit to them as their representative, and to the publisher, Mr. Gerhardt, 81 Nassau st., New York.

The Constellation. That well-known author and lecturer, Park Benjamin, is editing a new paper with this title. We have seen the first number, and it fully bears out the reputation of the editor. It is published by G. Roberts, 12 and 14 Spruce st., New York.

The Musical World. This pleasant periodical commenced its twenty-first volume with the new year, and it starts upon its annual journey as a dispenser of cultivated enjoyment, with a good first number. The music "When Shades of Evening," by Kaufmann, is a simple and tender song.

Science and Art.

Polishing, Blueing and Annealing Iron and Steel.

Alfred Vincent Newton, of London, Eng., has recently secured a patent for a process for accomplishing the above objects. After rods, plates, bars, or sheets of iron or steel have been rolled out in the usual way, and have become cool, they are steeped in a bath of sulphuric acid and water to remove the scale, in the same manner as is now practised with different kinds of castings in foundries. After the scale is removed, they are washed to carry off the free acid. This part of the process leaves the surface somewhat honeycombed, but bright. The articles are now submitted to great pressure between smooth iron rollers, which gives them a perfectly polished, bright and smooth surface. Chilled rollers are employed for this purpose, and their acting surfaces must be perfectly true, so as not to leave any marks upon the polished articles. These polishing rollers may be of any shape for which the bars or plates is designed. By subjecting bars and plates to this compressing and polishing process, the fibers of the metal are packed very firmly together, and their surfaces become very hard, and capable of withstanding corrosion in a superior manner. If it is desired to give sheets of iron or steel, thus polished bright, a blue appearance, they are plunged, one by one, into a bath of molten lead, in which they are held for five minutes; this bath may be made of any metal or alloy that melts at such a low temperature as will not stick to the iron. This treatment not only imparts to them a blue color, but also anneals them. It is stated that sheets of iron thus treated resemble those of Russian iron, and the quality of the metal is greatly improved.

Management of Boats in a Broken Sea.

Advice on this subject is now in good season, as storms are frequent on our coasts during winter, and boats are frequently swamped quite near the shore owing to bad management. The Royal National Life-boat Institution, England, has recently published a circular on this topic, which deserves general attention. It states that the cause of a boat's "broaching to" in a broken sea is by propelling it rapidly before the sea, instead of checking its speed, and allowing each successive wave to pass by. The safer management of a rowing boat, in a really heavy sea, is to back her, stern foremost, to the shore, keeping her bows pointed to the seas, and propelling her slightly against each sea until it has passed her or is under her stern. If a boat is rowed to the shore with her stern to seaward, her oars should then be regularly backed, so as to stop her way on the approach of each wave; and way should not again be given until the wave has passed to the bow, and her position thereby retained on the outer or safe side of the wave. This treatment runs exactly counter to the general desire to get quickly over the apprehended danger: but it is the only safe mode by which a boat can be taken to the shore before a heavy, broken surf.

New Incrustation Preventive for Boilers.

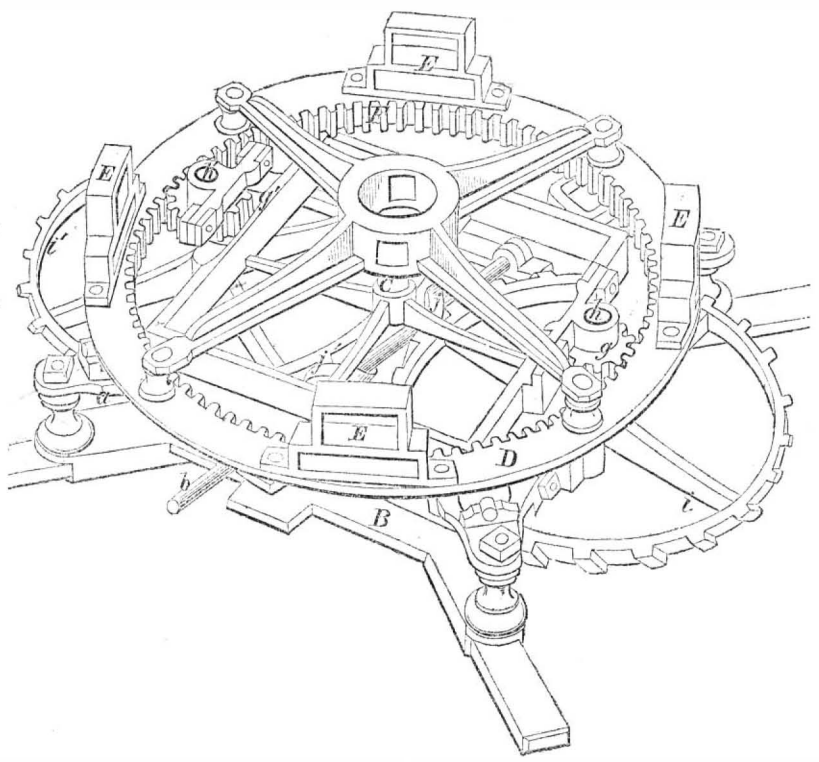
A patent has recently been taken out by Eugene Coulon, of Croisset, near Rouen, France, for preventing the formation of scale in steam boilers by the use of plombates of lead, potash, and chloride of zinc.

For boilers in which hard fresh water is used, the following is the composition which he employs:—Oxychloride of lead, 100 parts; clay, 92 parts; chloride of zinc, one part; hydro-chloric acid, 2 parts; red ochre, 5 parts. The three first named substances are mixed together, then the acid and the ochre. The proportion for a boiler is one-third of a pound for each horse per month.

For salt water in marine boilers, the composition employed is sulphate of lead, 100 parts; oxychloride of lead, 5 parts; clay, 10 parts, and hydro-chloric acid one part. The dry substances are mixed together, then the acid is stirred in. One-fifth of a pound per horse power is fed into the boiler of a steamer at sea every twenty-four hours.

It is stated that the sulphate of lead will of itself prevent incrustations. It should be fed direct into the boiler at intervals of twelve hours. A sediment is caused by the use of these substances to fall to the bottom of the boilers; this must be blown off frequently, and in every instance before a fresh quantity of the mixture is introduced. Whether these scale preventives are better than others which have been described in former volumes of the Scientific American, it is difficult to say. We have given the compositions, and their merits can easily be tested by those who are obliged to use hard feed water for steam boiler purposes.

RIDER'S HORSE-POWER.



The convenience of having a machine that will readily transmit animal force, is appreciated by all who have occasion for the employment of power, and yet, have not enough work to pay for a steam-engine. The subject of our illustration is a horse-power, constructed so as to work with very little friction, and transmit the requisite degree of speed from the driving shaft to that from which the power is taken. The principle and operation of the machine will be understood from the following description:—

The whole is secured to the ground by pieces projecting from the lower frame, B. On this frame, B, are placed small friction rollers, *a*, on which rests the wheel, D, provided with teeth, F, and carrying the sockets, E, of which there may be any convenient number, depending on the number of horses employed. Through these sockets, E, are placed long levers, their ends resting in the center of the strengthening frame of D. To the ends of these levers the horses are attached, and as they move round, they cause the wheel, D, to rotate, and so give motion to the gear wheels, *g g'*, that are placed upon the shafts, *h h'*, of the worm-wheels, *i i'*. These worm-wheels gear into the right and left screws, *j j'*, on the shaft, *b*, from which the motion is communicated to the machine that has to do the work. The whole of the work of this horse-power is cast on a chill, and is, of course, very hard. The total weight will not exceed 1,100 pounds, and at some trials of its working capabilities, the results have been eminently satisfactory.

The inventor is Mr. W. Rider, of Almont, Mich., and he or J. B. Sweetland, of the same place, who has an equal interest in the patent, may be addressed for any further information. It was patented July 20th, 1858.

What use is a Comet?

Among the ingenious speculations of philosophers concerning what at present seem to be the mysteries of nature, the question of the utility of comets has always held a conspicuous place. As every one is aware, they are composed of a light etherial and luminous matter concentrated in one bright spot, forming the head, and gradually receding with a misty or hair-like appearance, spreading out as the luminosity decreases, forming the tail. Their name is derived from the Latin *coma*, hair. S. W. Fullom, well-known as the author of some pleasant books, suggests a use for comets in his "Marvels of Science," which is ingenious and worthy of perpetuating. Descartes, Euler, and many others, believed that there is a subtle media pervading all space, which they called "ether," and which forms the ocean in which the planets and fixed stars swim. To this media the comets act as scavengers, preventing any accumulations of ether, and keeping it in such a proper and equable state of tenuity that the forces of nature, as gravity, electricity, and light, always act with regularity and precision. In fact, Mr. Fullom supposes them to be, in their eccentric paths, the regulators of our solar system.

Manufacture of Russia Sheet Iron.

Messrs. Editors—The number of the Scientific American of December 4th last, contains an article upon Russia sheet iron. During a residence of some months in Russia a short time ago, I had the pleasure of making the acquaintance of a proprietor of an extensive sheet iron works, who informed me that the rolling mills of polished iron were located in a very small district, and all obtained the ore from one locality; but while the ore from this locality produced the polished iron, ore obtained at a short distance from it did not. There was no secret in the mode of manufacture, as any one could have access at all times to the mills or furnaces. I had hoped ere I left Russia to have had the pleasure of visiting the works, but knowing nothing of the manufacture of iron, it is probable I could not have added anything to the above facts. M. S. Wickersham.

Philadelphia, January, 1859.

Northern Pacific Railroad.

A company of engineers, under the pay of the British government, has been surveying the northern part of our continent, going westward for the purpose of locating a route for a railroad to extend from the Pacific Ocean to the Gulf of St. Lawrence. They have already principally explored the valley of the Saskatchewan, and report a mild climate to the Rocky Mountains, with but little snow during winter. Early in the spring, another party of engineers will start from Victoria to meet those coming from the east. Coal has been found on the route already surveyed, and the country seems to be quite practicable for a railroad. A company of British capitalists in London originated this scheme, and the object is to construct a great northern railroad, for the purpose of attracting the trade from China, by Vancouver's Island, through Canada by the Grand Trunk Railroad to the Atlantic Ocean.

The Facial Nerve.

The nerve which gives the physiognomy its different expressions, and indicates to the outer world the emotions of the soul, is called the "facial nerve;" and should one side of this become paralyzed or injured, the features on one side the face remain perfectly immovable while the other or active part, is capable of every contortion. This was the case with a comic actor, who made money and reputation by setting "the town in a roar" by his unavoidable peculiarity. Sir Charles Bell proved this experimentally. He took a lively monkey, and divided its facial nerve on one side; excited by pain, the poor animal made faces with redoubled energy, but only with one side of his face, the other remaining perfectly still.

A Good Example.—The mayors of several British cities are immortalizing their terms of office by presenting gymnasiums and public fountains to the people. Are there no American mayors public-spirited enough to follow suit?