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Durable Wooden Water Pipes.

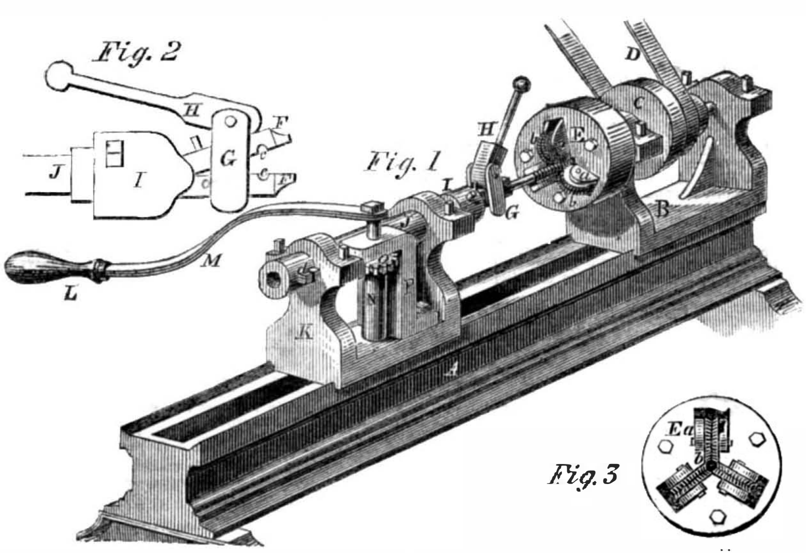
Some wooden pipes laid down for conducting water at Springfield, Mass., by Charles Stearns, Esq., appear to demonstrate the fact that they are more durable in certain situations than pipes made of lead. This plan is to lay them at such a depth as to prevent atmospheric action upon them. In sandy or porous earth, he lays them six feet deep; in compact soil four feet deep, and in peaty or swampy soil three feet deep. In one place heavy lead pipe was laid through a wet meadow, and it required repairs in four years, and had to be lifted in ten. It was replaced by wooden pipes which have now been twenty years in use, and are in good condition yet. The aqueduct pipes which supply Springfield with water have been in use fourteen years, and are still in good order. They are bored logs, the opening being seven inches in diameter, and charred on the inside surfaces by forcing flame through them. The charring of the surfaces of wooden pipes or boards has a wonderful effect in preserving them from decomposition.

It is undoubtedly true that timber sunk deep beneath the surface of the earth, and kept from contact with the air, endures for centuries. We have seen an oak log taken from the bed of a river, in which place it must have remained for hundreds of years, owing to the depth of sand which covered it, and yet it was as fresh as when first submerged. Cedar logs taken from the Jersey swamps, in which they have reposed for a thousand years, are found to be fresh and strong. Wooden pipes are cheaper than those of metal, and are preferable if they can be rendered as durable.

Ginning and Spinning Cotton.

In a letter received from G. S. Yerger, Esq., of Jackson, Mississippi, he informs us that he has put up on his plantation one of Henry's machines for spinning the cotton as it comes from the gin, and that it has been eminently successful. It has now been in operation for two months, and spins No. 5 and No. 10 yarns equal to any in the United States. This combination of the spinning frame with the cotton gin on plantations, whereby the cotton is made into yarn in the ginhouse, saves the expense of packing the cotton, and in the state of yarn transports it to market in a more compact form. If this method of operating cotton is found to be profitable on plantations, we shall soon see it extended so as to embrace the weaving of coarse cotton goods also for the market. This is simply a question of economy with planters. It has appeared to us that it would not be economical unless upon large plantations, where the machinery could be kept running the year round, because we know that machinery in factories deteriorates nearly as rapidly when standing idle as when running.

EVART'S SCREW CUTTER.



The utility of the screw is never to be too highly estimated, as it enters into the construction of nearly everything we use, and is a most essential aid in the manufacture of all machinery. For wood-work they are almost indispensible, and from the vast number which are used, any process or invention which can lessen the cost of their production must in the end, prove a public boon. Such an invention is the subject of our engraving, Fig. 1 being a perspective view of the machine.

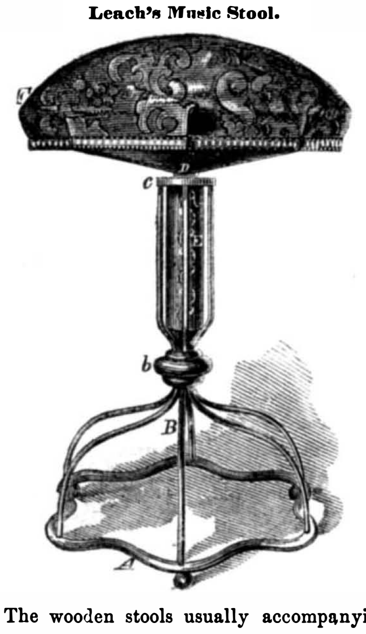
A is the bed, exactly the same as a common lathe, on this slides a head, B, capable of being secured in any desired position by a clamp and screw underneath. In this head is a belt pulley, C, receiving motion from a belt, D, and on the mandrel, the cutter, E, is screwed in the position usually occupied by a chuck. This cutter is a circular block of metal, having three grooves in it, placed radially from its center, and it can be adapted to any hand or power lathe. In the grooves slide bearings, *a*, that can be brought nearer together or further apart by screws, to accommodate any (within certain limits) sized bar. These bearings support cutter wheels, *b*, of cast steel, which can freely rotate on their axes, and they have angular grooves cut on their peripheries, so that when the three meet together they exactly form one thread of a screw.

The rotation of these cutters enables them to last much longer than the ordinary ones, and as they are easily replaced, here lies the economy, namely, in the substitution of rotary cutters for the common dies, which are soon injured by the hard scale on the rod, and have to be frequently replaced; and moreover, when the screw is cut it can be immediately withdrawn without stopping the machine, thus effecting a great saving of time.

The screw is placed between a pair of jaws, F, seen enlarged in Fig. 2, and held tight, with its head in the groove, *c*, by the link and clamp, G H. These jaws are secured in a piece, I, attached to a sliding bar, J, that can move freely back and forth in the head, K. The screw blank being fastened in the jaws, it is fed between the cutters, which are rotating, by the operator pulling the handle, L. This handle is at the end of a lever, M, attached to a small upright shaft, N, that carries a cog wheel, O, and supported in a suitable bearing, P, on the head, K. The cog wheel, O, gears into teeth, *d*, on the sliding bar, J, and so when L is pulled, J is moved in its bearings, and the screw fed to be cut. When it is cut, by operating L in a reverse direction, the screw can be withdrawn, and another blank placed in the jaws. Fig. 3 is a front view of the cutter, E.

This valuable machine is the invention of James M. Evarts, of Westville, Conn. Any further information can be obtained from him, or M. Merriman, Jr., & Son, of the same place. The rights for all the States except Connecticut are for sale. It was patented June 16, 1857. Mr. Evarts had this operating machine on exhibition at the Crystal Palace, from which our engraving was taken. The machine was, of course, destroyed by the late fire.

Leach's Music Stool.



The wooden stools usually accompanying a piano are, as every one knows, expensive, and far from being a firm and secure seat, therefore to provide one which is at once light, elegant, cheap, and strong, this inventor —Edwin Leach, of Norwich, Conn.—has produced the subject of our engraving. An elegantly shaped iron rim, A, stands on three knobs or castors, and from it rise six or more light wrought iron rods, B, which are bound together by a hub, *b*, and from it they again slightly expand, and then pass quite straight to the piece, *c*, in which they are firmly secured. This piece, *c*, is a nut in which the screw, D, that supports the seat, F, works, so that by turning the seat round it can be raised or lowered to suit the comfort of the person who is about to sit down. The screw, D, when between the rods, B, is covered with an ornamented case, E, so that the appearance of the stool is always graceful, tasty and convenient. They can be made much cheaper than wooden ones, and are in every respect preferable, as being capable of enduring infinitely more wear, and present an elegant piece of furniture as an accompaniment to a musical instrument.

It was patented August 24, 1858, and the inventor will be happy to furnish any desired information upon being addressed as above.

Glycerine.

A correspondent asks us if there is any cheap process of obtaining glycerine, asserting it would reduce the price of soap, by turning the soapmakers' waste to some account. There is such a process in extensive operation at Price's candle works in London, England, and it is so simple and cheap that any soapmaker may put into practice. A continuous current of steam of 600° Fah. is led into a distillatory arrangement containing neutral glycerine fat, and in due time produces the decomposition of the latter into fatty acids and oxyd of glycerine, which distil over in combination with their constitutional water. The glycerine, from its greater density, forms the lower stratum of the distillate, and therefore may be easily separated from the supernatant fatty acids. In this state it is very dilute, and must be concentrated by evaporation until it reaches a specific gravity of 1.240 at 60 Fah., when it is ready for the market.

Shaving Soap Powder.

Most of the soaps in use for shaving may with justice be found fault with. They either do not lather freely, or else they excite an unpleasant sensation, arising from an excess of caustic alkali used in their manufacture. The alkali acts upon the skin as well as upon the beard; and to obviate these inconveniences, or at least to mitigate them, the following process has been invented:—Take about a quarter of a pound of the finest white Windsor soap, cut it into pieces the size of a walnut, place them in a dry and warm situation for several days, until perfectly hard. Now grate the soap up to powder with a nutmeg grater. Place the soap powder in a shaving dish, and pour over it just as much alcohol as will cover it; next day it will be fit for use. Thus prepared, the soap has lost all action hurtful to the skin, and has acquired a remarkable mildness and unctuousness. Instead of plain spirits of wine, any perfumed spirit, such as Hungary water, adds the charm of fragrance. Brown soap does not answer so well as white, because all the brown soaps are of commoner quality than the white, and are artificially colored with burnt umber, &c., which is not only dirty on the towels, but is used purposely to hide by its color other imperfections in the soap.

SEPTIMUS PIESSE.

African Cotton.

Recent intelligence has been received from Dr. Livingston's expedition up the river Zambesi, in Africa. They are now going up that river slowly, and have discovered a peculiar kind of cotton growing in a deserted garden. Its staple is longer than Angola cotton, and the seed does not adhere to it like that of American short staple. A sample of this cotton has been received in Manchester, England; it is clean, and looks very well, but is not to be compared to even the middling quality of South Carolina cotton.

Issued from the United States Patent Office

FOR THE WEEK ENDING OCTOBER 5, 1858.

[Reported officially for the Scientific American.]

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

STEAM BOILER FURNACES—James Alcorn, Jr., of Charlestown, Mass. : I do not claim returning a portion of the gaseous products of combustion to the fire.

But I claim, first, the arrangement of the chambers, C' C2 C3, with their respective passages, I C4 C4 I' I', communicating with the smoke-stack, and the passages, T G G, and the chamber, B, communicating with the ash pit, substantially as and for the purpose set forth.

Second, The arrangement of the cone pipe, D, with its deflecting cover, V, and the pipe, H, in combination with the chamber, B, arranged in rear of and communicating with the ash pit, substantially as and for the purpose described.

[By a novel arrangement of passages for the purpose of causing the return from the back part of the furnace and from the lower part of the smoke stack to the ash pit, of considerable portions of the smoke and inflammable matters escaping from the firebox, and causing them to pass over and through the fire, with the fresh air necessary to support combustion, a saving of fuel is effected by this invention.]

GATE—Silas Allington, of West Dresden, N. Y. : I claim the lever, D, with its self-shifting weights, and its connection to the gate in the manner set forth.

FLY TRAP—Bryan Atwater, of Berlin, Conn. : I claim as a new thing or manufacture a fly-catcher, constructed with the notch or passage, a, arranged with respect to the upper edges of its side and two ends, and so as to operate substantially as described under circumstances as specified.

ANIMAL TRAPS—Moses H. Biddle, of Mount Carmel, Ill. : I am aware that traps have been hitherto made with revolving platforms, which would set themselves in the act of entrapping the animals.

And I do not claim, broadly, all traps with these distinctive features.

But I claim the combination and arrangement of the pivoted bar, c, spring detent, l, and the spring catch, d, for the purpose set forth and as described.

I also claim the arrangement of the spring pulley, g, cord, f, and axis, e, of the revolving platform of a rat trap in combination, for the purpose of effecting a prompt revolution of the platform as soon as the detent is disengaged.

ROLLING WINDOW BLIND—S. W. Bidwell, of Hartford, Conn. : I claim, first, So hanging the roller, C, upon which the blind is hung, that it shall traverse in a horizontal plane (or nearly so) by means of the racks, k k, and toothed journals, i i, or their equivalents, substantially as and for the purpose set forth.

Second, In connection with the above, the combination with a rolling blind of a weighted cord, b, arranged with a helically grooved pulley, E, on the end of roll c, or in any other way substantially the same, for the purpose of counteracting the weight of the blind, as described.

Third, The combination with the traversing roll, c, of a weighted self-adjusting "friction fixture," consisting essentially of a weighted case, e, and inclosed pulley, m, the whole constructed and operating substantially as described, for the purpose set forth.

Fourth, So arranging the tapes, a a, of a rolling blind with the shaft, c, on which the slats are wound, that the slats may be shifted by the partial rotation of said shaft, as described.

SLATE PENCIL SHARPENER—William Burnet, of New York City : I am aware that instruments have befor been made for sharpening slate pencils, as plane and hollow files; therefore I do not claim to be the first inventor of a slate pencil sharpener.

But all the instruments with which I am acquainted have no means of renewing the cutting surfaces after they are worn, except by re-cutting them, while in mine it is merely necessary to turn the rods a little in the plate, and a new cutting surface is brought into action. Again, there is no method of making perfectly regular cutting surfaces with such facility as by the process I have described.

I do not confine myself to the exact method of cutting teeth upon these wires, as it is evident that a toothed cutter may be used, and the teeth chased upon the wires in the turning lathe.

Neither do I confine myself to the exact method of fastening the wires upon the plate, as it is obvious that various means may be used to effect the same.

But in the description I have set forth the way which, in practice, I have found the simplest and most economical for producing the instruments.

My claim, therefore, is to the manufacture of a pencil-sharpener made of inclined cylindrical rods having raised teeth upon them, either in the form of screw threads or sharp parallel ridges, and the attachment of these to any suitable plate or framework of metal for securing the cylindrical bars or rods in their proper position, and for securing the whole to the framework of the slate, made and arranged substantially as described.

SCREW PROPELLER—Oliver Byrne and J. G. Elliott, of New York City : We claim the device and method described, or their equivalents, for conducting useless or superfluous water to the rear of a screw propeller in immediate contact with the blades aft, not for the purpose of giving a rotary motion to the propeller, but for the purpose of diminishing what is termed "slip," by the operation and methods described, or by their equivalents.

DEFLECTING PLATES FOR CIRCULAR SAWS—J. D. C. Carpenter, of Cincinnati, Ohio : It is obvious that the details of my saw may be somewhat varied without departing from the spirit of my invention, and therefore I do not confine myself to the exact construction described.

I am aware that a stationary convex deflecting plate is an old device, and that a central convex flange armed with segments to form a circular saw has also been made; but I believe that my invention of a rotary convex deflecting plate separate from the saw proper is new, and very different from those devices in its operation.

I claim, first, The rotary deflecting plate or spreader, A, provided with an adjustable friction bearing, S, substantially as set forth.

Second, I claim the cutters, i, placed near the margin of the deflecting plate, A, substantially as set forth.

CARPET-STRETCHER—W. S. Cowant, of New York City : I claim a carpet-stretcher made by combining the clamp and wedge, D and E, with the other necessary parts of a carpet-stretcher, as set forth.

LUBRICATING CAR AXLES—John W. Cochran, of New York City : I claim in connection with the spring and wheel, the inclined diaphragm, g, having the space for the play of the wheel, and access to the wheel and spring as described.

WASHING MACHINE—Samuel W. Cole, of Millington, Md. : I am aware that two rubbing surfaces moving in contrary directions have been used in washing machines; this I do not claim.

But I claim the combination of the lever, E, shaft, C, and hinged levers, b b, with each other, and with the rubbers, D F, for the purpose of moving said rubbers in contrary directions at the same time, and allow the upper rubber to rise and fall, to adapt itself to the clothes, the whole being arranged and operating as set forth.

CAM FOR THROWING BOLTS IN LOCKS—Henry W. Covert, of Rochester, N. Y. : I do not claim the cone and socket or friction joint.

But I claim the combination of the cone or wedge-shaped center with the socket or outer rim, to form a cam for throwing the bolt to the lock, substantially as described and represented.

FOG SIGNAL MACHINES—Jacob D. Custer, of Morristown, Pa. : I disclaim the ancient retaining power alluded to (called "the drunken fusee") and all its internal gearing, as it is old and well-known.

I claim the application to fog-signal machines, magnetic telegraph registering machines, &c., of my improved retaining power, including pinion, I, wheel, J, shaft, K, pinion, L, wheel, Q, click spring, o, and balance piece, H, when arranged and combined as above described, to form an adjustable and durable retaining power, substantially as set forth.

KNIVES TO CUT PAPER BAGS, &C.—Henry R. David, of New York City : I do not claim a serrated edge knife in itself, as the same has been used with a reciprocating motion for cutting the edges of books, &c.

Neither do I claim a serrated shear or blade for cutting paper, as this has before been used.

I claim the serrated knife, a, having a vertical movement, in combination with the narrow slot in the bed plate, f, for sustaining the paper while several thicknesses are being cut for bags or other irregular forms, as set forth.

I also claim forming said serrated knife with alternate long and short serrations, for piercing and cutting several thicknesses of paper, in substantially the manner and for the purposes specified.

RAILROAD SWITCH—Charles C. Dodge, of Marshall, Mich.: I claim the application and use of the combined arrangement of the grooved or threaded cylinder, C, lever, L, guide pin, P, pivoted target staff, S, and pin tie bar, I, and box, A, for the purpose and constructed substantially in the manner as described and set forth.

FOLDING GUIDES—Alexander Douglas, of New York City : I do not confine my invention to the sewing of any particular material, but only to such work as requires both edges of the material to be turned under and protected from wear. I do not know or believe that it is practicable to produce bindings similar to mine by any means previously known. Bindings have been folded along the middle by means analogous to mine, but the edges of the binding were left exposed. Various hemmers have also been invented for folding under the edges of cloth; but they are not capable of being crowded into so limited a space as is required for this purpose, nor of being constructed so cheaply as mine, beside which they offer more resistance to the passage of the cloth, and bend or fold the same in a manner which impairs its stiffness, and gives it a disposition to curl, which renders it impossible to produce so evenly folded and evenly sewn work as mine, if, indeed, it is possible, as I doubt, to accomplish the object at all, by such means. To enable the work to go on continuously and smoothly, the work must be delicately and gently supported on all sides, and carefully preserved from any deranging influences, among the worst of which influences would be severe pulls in any direction, and the curling and limbering effect produced by being drawn through hemmers.

I claim the peculiar flattened tube, B, folded upon itself, as described, so as gradually to fold the enclosed material along three lines, and at the same time to support it on all sides, and preserve its stiffness at all other points, substantially as described and for the purposes set forth.

CARPET-SWEEPER—Jacob Edson, of Boston, Mass. : I claim, first, The arrangement described of hanging the brush at or near one of its journals in a bridle, and attaching the opposite end of the said bridle at a point on the case of the machine between the center of the driving wheel and the other journal of the brush, whereby the machine is made self-adjusting, so as to adapt itself to heavy or light sweeping.

Second, Attaching the handle of the machine to the bridle, e e, at a point near the driving wheel instead of in the center of the machine, as set forth, and for the purpose specified.

Third, Forming the entire machine of a tapering shape, as described, whereby the brush can work successfully in the corner of an apartment to be swept.

Fourth, The combination of the revolving brush, having the bristles arranged spirally thereon, with the tapering shaped dirt-receiver, so as to sweep and convey the dirt into the larger end of the receptacle.

Fifth, Combining in one the door for removing the dirt and the irt-receiver, by constructing it as described.

STEAM PLOW—James W. Evans, of New York City : I claim, first, The combination and arrangement of the main shaft, G, and cranks, H I, forming part thereof with the main axle, E, and driving wheels, D, by means of screw shaft M, and the bevel, K and L, and the screw thread, N, upon the axle, so that by the action of the piston rod, 15, attached to crank, H, the reciprocating action is communicated to the plows, Y Y, and at the same time the machine is moved forward in due proportion to the stroke of the plows by the rotation of wheels, D, and thereby cutting a continuous furrow by a rectilinear and direct thrust of the plow or plows.

Second, The construction and arrangement of the supports or guide pieces, P P, the pairs of vertical rods, Q Q Q' Q', operating by means of the eccentric, V, and the lever and arm, T W, in the manner described, for guiding, securing, elevating and lowering the plow.

GRAIN-CLEANING MACHINE—W. T. Fisher, of Cleveland, Tenn. : I do not claim separately or irrespective of arrangement or adaptation, any of the parts shown and described.

But I claim the oscillating blast and screen spout, J, scourer, G, blast spouts, E Γ, and fan, C, combined and arranged relatively with each other, substantially as and for the purpose set forth.

[In this invention an oscillating blast spout and screens are employed, together with a scouring device, stationary blast pipe, and a fan, so that the grain may be perfectly scoured or cleaned, and separated from all impurities.]

ROLLING RAILWAY IRON—John Fritz, of Johnstown, Pa. : What I claim is the so arranging of "three high" rolls for railroad rails, bars or beams, as that said rails, bars or beams may be rolled or reduced as they pass both forward and back, and so that each succeding pass shall roll down the fire formed at the preceding pass, and avoid any necessity of turning the bar as heretofore done, substantially as described.

I also claim, in combination with the top roll of the series, or with any roll of a series which performs its duty, the yielding clearer or guide, or its equivalent, for preventing the bar, rail or beam from winding on said roll.

COTTON SCRAPERS—C. A. Gaines, of Watson, Miss. : I claim giving a hollow or concave form to the bottom, E, of the block, from the rear and side edges inward, and forward to the moldboard or scraper, D, substantially in the manner and for the purpose specified.

GAS METERS—Joseph E. Fisk, of Salem, Mass. : I do not claim the employment of two flexible bellows in two separate chambers.

Nor do I claim the mode of constructing the flexible bellows, as exhibited in the United States patent numbered 9,591, wherein such bellows is made of two metallic shallow dishes or partitions joined at their edges by a flexible connection. This differs essentially from my invention, wherein a sack, I or J, separate from and arranged within a flexible enclosing case, M or N, is employed, as in my invention the sack alone constitutes the gas-receiving chamber, and can be readily removed from its flexible case whenever necessary, without requiring the enclosing case to be removed from the meter.

I claim the described improved arrangement of the partition, K, and the shaft, D, the cranks, valve, C, and valve seat, B, with respect to the chambers, E H and A, and the pipes or passages, a b c d, the same enabling one shaft, D, only necessary to the operation of the valve by the two sacks, I and J.

I also claim combining with each flexible sack I J, a flexible enclosing case, M or N, arranged so as to operate therewith, as specified.

I also claim the arrangement and application of the pipe, F, with respect to the valve, C, and the case of the meter, the same being in manner and for the purpose as specified.

HAY RAKES—Peter Fitzgerald, of Constantina, O. : I do not claim attaching to a wheeled vehicle rakes to be used to rake hay; nor the construction of the rake teeth, or their attachment to the rake heads.

But I claim the combination of the shafts, J and N, and the clutch, M, and brake, O, with the levers, Q Q', bar, d, handle, e, and cam, T, for the purpose of putting the brake and clutch in operation, as described, and for the object set forth.

WASHING MACHINE—John Fordyce, of Morgantown, Va. : I claim in combination with the reciprocating plunger, D, the tipping rack, and the stationary rack teeth, the three parts operating together in the manner and for the purpose set forth.

GEARING FOR CUT-OFF VALVES FOR STEAM ENGINES—P. W. Gates, D. R. Fraser, and Thos. Chalmers, of Chicago, Ill. : We claim working the cut-off valves, D D, in combination with a main slide valve, C, or separate main slide valves of the character described, by means of the palls, k k', to lock the cut-off valves with the main valve or valves in an open condition, the variable or adjustable slides, p p', to disengage the said palls, the stops, 3 3, to stop the said cut-off valves in a closed condition after their liberatien, and stops, y y y y', to stop and open them by the completion of the stroke of the main valve or valves, the whole operating substantially as described.

[This invention consists in certain improved mechanism for operating two cut-off valves which are applied to the back of a slide valve, which effects the induction and eduction of the steam to and from an engine, and which is capable of liberating the cut-off valves at such point in the stroke of the engine piston as may be determined by the operation of a governor or permanent adjustment, as to allow them to be closed instaneously to cut off the steam from the cylinder either by the pressure of the steam in the valve chest, or by other suitable means.]

SEWING MACHINES—Wm. O. Grover, of Boston, Mass: I claim, first, The combination of a cylinder and plunger and needle of a sewing machine, substantially in the manner and for the purpose specified.

Second, I claim a slot, or its equivalent, for the purpose specified in combination with the guiding mechanism of a sewing machine needle, substantially as described.

SEWING MACHINES—Wm. O. Grover, of Boston, Mass: I claim, first, The combination, with a curved needle or hooker-on, or looper, of an irregularly shaped spiral shaft, and a reciprocating driver, both substantially such as before specified, and constituting an apparatus for imparting the required motions and pauses to a crooked needle, substantially in the manner specified.

Second, I claim mounting a driver, combined with and acting upon a spiral shaft, both substantially such as described, with a spring or springs, substantially in the manner and for the purpose specified.

Third, I claim combining such springs with layers of raw hide, leather or similar material, when acting upon and in combination with a spiral shaft, substantially in the manner and for the purposes specified.

Fourth, I claim an actuating surface, substantially such as is specified, so formed as to surround or embrace an irregular screwed shaft, and at the same time free to slide in a driver, in planes perpendicular, or nearly so to such a shaft, substantially in the manner and for the purposes specified.

SEWING MACHINES—Wm. O. Grover, of Boston, Mass: I wish it distinctly understood that I am aware of the fact that there are now in common use a variety of devices for giving and permitting the motion of presser feet slides, and that among them is a bent lever attached by a hinge to a slide which is pressed upon by a coiled spring, I therefore claim as my own invention the combination of a spring, a bar attached to or making part of a slide and resting upon a cam, and a cam shaped substantially as specified, when these parts are held in working position and connection by the spring, as there is no attachment between the bar and the cam, all these parts being substantially such as are before described, and acting severally and in combination, substantially in the manner and for the purposes before specified.

SEWING MACHINES—Daniel Harris, of Boston, Mass.: I claim driving the needle arm, and the apparatus for effecting the feed and for forming the loops in sewing machines by means of a pulley provided with an india-rubber ring or its equivalent, and hung in brackets cast on to the bed plate, substantially as described, in combination with a fly wheel also hung in brackets, but which are attached to the table, said pulley and fly wheel being arranged in relation to each other, so that they may be readily thrown into or out of working contact, as set forth.

I also claim the peculiar construction of the hollow goose neck, when so shaped as to admit of the insertion of a bent needle arm, and the vibration thereof upon a fulcrum within said goose neck in the manner and for the purpose specified.

I also claim for feeding the cloth, or other substance in sewing machines, the feed hand connected by means of a yielding joint with the slotted plate containing the slide, l, and forming therewith a parallelogram opening in combination with a vibratory needle stock having a pin projecting into said slot, so as to operate in the manner and for the purposes described.

CARPET SWEEPER—Daniel Harris, of Boston, Mass. : I claim the arrangement of a revolving brush driven by means of a padded driving wheel from one side only within a semi-cylindrical casing, provided with stationary pockets and deflectors in front and rear of the said brush, substantially in the manner and for the purpose of acting together, as described.

HALTERS AND BRIDLES FOR HORSES—S. C. Hawkins, of Patchoque, N. Y. : I do not claim simply attaching the straps to the ring by rivets, because straps have been previously attached for similar or analogous purposes.

But I claim forming the ring, A, with a flanch, a, and securing the straps, B, to the ring by rivets, b, which pass through the straps and flanch, substantially as and for the purpose specified.

MACHINE FOR CUTTING LATHS—Reuben Haynes, of Oberlin, Ohio : I claim the arrangement of the curved slot, I, and lever, Γ, in combination with the revolving sliding shafts, c m, and gears, t o p and n, when arranged as described, for the purpose of raising and giving a throw to the log conjointly and acting with the immediate gearing in the manner described.

CONSTRUCTION OF ANIMAL TRAPS—Edmund Hill, of Cincinnati, Ohio : I claim the ridge or step, K, in combination with the door, F, and lever, G, for the purpose of re-setting the trap.

BAGGAGE CHECKS—Edmund Hoole, of Mount Vernon, N. Y. : I do not claim, broadly, stamping or engraving the names of the different stations on one plate or check, one at each side, for it is quite common to employ both sides of signs, slates, &c., for analogous purposes, and the mere employment of both sides of a baggage check for directory surfaces, even if practicable, would not be invention. Therefore—

I claim stamping, engraving or otherwise marking on the plate or check, A, the names of two different stations, one at each side, when said plate thus stamped or engraved is used in connection with a strap, B, attached to the plate, and rendered capable of being adjusted as shown for the purpose specified.

PACKING PISTONS FOR STEAM ENGINES—Hanford Horton, of New York City : I claim the application of the figure 8, or other appropriate spring between the upper and the lower set of metallic cylinder rings as described and set forth, by which an upward and a downward pressure is obtained on said rings. I do not claim the application of springs to produce an outward pressure, said springs acting on a single or spring ring which keeps out the two cylinder rings, as that has heretofore been in use by others as well as myself.

But I do claim the combination of the six rings, a 1 2 3, b 1 2 3, with the figure of 8, or other appropriate spring between them to produce an upward and downward pressure, in combination with the figure of 8, or other appropriate spring acting on the two spring rings producing an outward pressure on the four cylinder rings, thus making a steam tight joint on the upper edge of the upper cylinder ring, as well as on the lower edge of the lower cylinder ring, and also on the cylinder surface of the cylinder rings.

PHOTOGRAPHIC BATHS—Bernhard Hufnagel, of New York City : I claim the construction of a silver bath for photographic and ambrotype purposes, made out of two plates of glass, with india-rubber between, and fastened together between wooden or other framework in the manner described and for the purpose substantially as specified.

HEMP BRAKES—Wm. C. Hutchinson, of St. Josephs, Mo. : I claim the tooth described and illustrated in the drawings as constructed to be used in the drums of cylinder hemp brakes, as set forth.

I also claim the combination and arrangement of the pendant scalloped edge swingle, P P P, q q r r, with the sliding or reciprocating double jaw hatchel, s s s s, t t, arranged and operated substantially in the manner as set forth and described.

HARVESTERS—G. F. Jerome and Moses Jerome, of Mineola, N. Y. : We claim the guard, F, formed with an oblique portion, c, in combination with the seat, I, placed relatively with respect to each other and the platform, D, as shown and described, and for the purpose set forth.

[By this improvement in harvesters the rakes may, with the greatest facility, rake the cut grain from the platform in such a manner that it will fall on the ground nearly in a line with the driver's seat at right angles with the path of the movement of the machine, and at a sufficient distance from the standing grain to allow abundant room for a clear unobstructed space for the team at the succeeding round, and at the same time leave the grain so that the butts will be in a right line, and in such a state that it may be readily gathered and bound by an attendant.]

VALVES FOR STEAM ENGINES—Joseph Jobin, of St. Maude, France. Patented in France, April 13, 1858 : I claim the sliding balance valve, constructed as described, of a prismatic or partly prismatic form and guided in its reciprocating travel by and within a steam chest open or closed at its ends, but surrounding in a close manner the sides of said valve, substantially as and for the purposes set forth.

APPARATUS FOR RAISING DOUGH FOR BREAD—Josee Johnson, of New York City : I claim the double brake, a and a', in combination with the conical shield, b, operating as described and for the purposes set forth.

BALLOT BOX—S. C. Jollie, of New York City : I do nor claim, broadly, the use of glass in the construction of ballot boxes.

But I claim the employment of a glass globe in the construction of a ballot box by mounting the globe as described, so that it shall be simply held in place without concealing the contents, and having a hole at top of sufficient size for the hand, which hole is to be provided with a hinged cover with a hole of the required size to drop the ballots through, substantially as and for the purpose specified.

CARD CLOTHING—Richard Kitson, of Lowell, Mass.: I claim constructing the teeth, so that when in place their points are below or less prominent than and protected and guarded by their thick parts or heels, substantially and for the purpose specified.

[This invention consists in so forming the pointed teeth of "card clothing" for cotton gins and wool-burring machines, that when the clothing is wound upon a cylinder or fastened to an endless belt, the points will be below the thick parts of the wires, and the thick parts of the wires will form smooth surfaces for the feeds or burrs to roll upon, and thus prevent them from coming in contact with and being broken by the points, and also the teeth from being damaged. By this invention the only objection to the use of toothed surfaces for ginning cotton and burning wool, namely, the b eaking of the seeds or burrs, and the liability of damaging the teeth are overcome.]

WATER ALARM FOR STEAM BOILERS—Levi E. Lincoln, or Lowell, Mass. : I claim, first, The application of an alarm whistle exclusively to the water space of a steam boiler to obtain controlling motive power, in conjunction with an application exclusively to the steam space of said boiler, to obtain warning or acoustic power.

Second, The application of a self-adjusting valve to the stem of a steam whistle in manner such that a current may be intercepted thereby.

Third, The application to a whistle of a metallic tube or pipe in such manner that unexpanded it shall be pendant from the whistle, and that by expansion and contraction it shall have the office to effect the operation of the whistle.

Fourth, The application of a set screw or mechanical equivalent to an expansive tube in such manner that the effective expansion and contraction of said tube may be prescribed thereby.

Fifth, The application of a whistle to its support, standard or framework, in such manner that the whistle shall be suspenned from said framework by that portion of itself which extends upward from its bell.

Sixth, The holding of a valve seat in position for its valve by pendulous attachment by suspension.

Seventh, The operating of a valve seat upon its valve by the expansion and contraction of a metallic tube, or by the expansion and contraction of any mechanical equivalent thereof; all substantially as described and set forth in the specification and drawing.

SPARK ARRESTERS—Joseph Marks, of Boston, Mass. : I claim the combination of the petticoat pipe, the surrounding wire net work and the smoke pipe, whereby, while a free exit passage is secured for the exhaust steam, an intermittent draft is produced upon the outer surface of the wire net work, which pulverizes the sparks and retains them until they are consumed, as set forth.

MODE OF TRANSMITTING MAGNETIC SIGNALS ON RAILROADS—Henry Maule, of Philadelphia, Pa. : I am aware that plans for transmitting telegraphic signals on railroads from one train to another have been heretofore devised, as in the rejected application of Joseph Baker, December, 1855, and the plan of Bonelli, described in the Mechanics' Magazine, vol. 63. I therefore limit my claim to the arrangement described, that is to say :—

I claim securing to a railroad a series of conducting rails independent of those of the track, and placed in pairs, one pair being disconnected from the next pair throughout the series, and each pair of conducting rails being arranged to connect with a galvanic battery on the train by the devices described or their equivalents, one rail of each pair to one pole and the other to the other pole of the said battery, and the latter being connected to any suitable indicating apparatus situated on the train as set forth and for the purpose specified.

BANK LOCKS—L. H. Miller, of Providence, R. I.: I am aware that slotted sliding tumblers have been used in various forms of locks, and arranged relatively with bolts and bolt latches in various ways, and I therefore do not claim, broadly, the slotted tumblers.

But I claim, first, A series of slotted sliding tumblers, M, within a sliding box, L, arranged in such relation with the bolt or a bolt latch, C, that each tumbler will require to be adjusted separately, in order to allow the bolt to be shoved back, and the lock unlocked.

Second, The arrangement of the hollow arbor, E, rod g, lever, G, and tube, l, with projection, n, attached, in connection with the notched disk, H, and click, H', and a key, O, constructed as shown, or in an equivalent way, whereby the tumbler box, L, is moved the correct distance for the several tumblers to be brought in line with the projection, n, and the several tumblers adjusted at each movement of the box as described and for the purpose set forth.

Third, Operating the sliding tumbler box, L, from the arbor, E, by means of the part pinion, I, and the rack, p, of the plate, J, arranged in such relation with the dogs, d e, slide, D, and bolt, B, that by the time the tumblers, M, are all properly adjusted, the dogs, d e, will respectively raise the latch, C, and throw back the bolt, B.

[In this lock a series of slotted tumblers are placed within a sliding box, which is connected with the bolt arbor and arranged in such relation with a bolt latch, that each tumbler requires to be adjusted separately in order to allow the bolt latch to release the bolt and enable the latter to be thrown back and the lock unlocked. The object of this invention is to prevent the lock being picked by obtaining a knowledge of the position of the tumblers by the pressure of the bolt latch upon them, and also to prevent a person ignorant of the position of the tumblers from opening the lock, even with the proper key.]

CULTIVATORS—B. S. Morgan, of Delhi, Iowa : I claim the arrangement of the bars, E, with share stocks, F, attached, the levers, I, with links, J, fitted in the triangular shaped openings, f, in said levers, and attached to the colter bars, K, which are connected to the levers, N, substantially as and for the purpose set forth.

I claim, in combination with the above, the brace rods, H, attached to the share stocks, F, by means of the springs, a, and fitted in the recesses, b, in the stocks, and arranged substantially as and for the purpose set forth.

[This is a peculiar arrangement of levers and share stocks by which the shares may be raised above obstructions with the greatest facility, and also be allowed to yield or "give" to obstructions in case they are brought in contact with them, so that the parts cannot be injured thereby, and the shares also rendered capable of being adjusted to suit the width of the spaces between the rows or hills of the crop under cultivation.]

TRIP HAMMER AND ANVIL—D. A. Morris, of Pittsburg, Pa. : I claim the arrangement of a gang of trip or tilt hammers, substantially as described in connection with the movable anvil, constructed in the manner and for the purpose specified.

ROLLS FOR MAKING SHEET IRON—D. A. Morris, of Pittsburg, Pa. : I claim the employment of mottled chilled iron rolls for rolling sheet iron, when constructed substantially as described.

DISTILLATION OF FRESH WATER FROM SALT WATER—A. Normandy, of London, England, a citizen of France : I claim the process set forth by which aerated and non-aerated fresh water are obtained by distilling sea water.

STEAM WATER TANK—S. H. Yocum and J. O. Byrne, of Shelbyville, Ind. ; We claim, first, The extension of pipe, B, above the bottom and inside of tank, A, in combination with valve, C, and gage, U, or their equivalents in the manner and for the purposes set forth.

Second, The flexible pipe, D, and stop cock, G 2 and M, in combination with the plexus, O O, and air-tight tank, A, as set forth.

APPLE-PARING KNIFE—Adam Oat, of Minetto, N.Y.: I claim the combination and arrangement of the curved blade with its projecting end, and the guard or stock, substantially as and for the purpose specified.

WINDLASS FOR MOVING CARS AND LOCOMOTIVES WHEN WITHOUT STEAM—Charles Page, of West Meriden, Conn. : I am aware that the windlass and its gearing is old and that jaws or clamps to bite on a stationary form have been long used, and that double levers have often been expanded longitudinally by the double joint. I therefore do not claim either of these as such as my invention.

But I claim the combination of the windlass, A, with the jaws, g g, and the levers, i and i, when connected, arranged, and made to produce the result, by the means and in the manner substantially as described.

TOOLS FOR MANUFACTURING GOODS OF CAOUTCHOUC—D. D. Parmelee, of New York City: I wish to be understood as not limiting myself to the precise form and construction of the parts described, as these may be varied, without affecting the principle of my invention.

But I claim the instrument or tool for cutting sheets of india-rubber, or its equivalent, constructed substantially as described, consisting essentially of two jaws provided with cutting edges shaped according to the form intended to be produced ; when one jaw is to operate within the other so as to effect shear action, for cutting forms at one stroke and leaving edges thereon, which are capable of being united in a more perfect and expeditious manner than has ever been done heretofore.

HAY RAKES—M. Raezer, of Reading, Pa. . I claim the spring bar, z, the foot lever, e, and the gearing, n n, arranged and combined as described for the purpose set forth.

WATER INDICATOR FOR STEAM BOILERS—M. Robbins and J. L. Frisbie, of Cincinnati, Ohio : We claim, first, In the described combination, with a customary steam alarm, the steam pipe, B, provided with a central screw, stem and swivel, F f I, supporting the fulcrum of the float arm, in the manner and for the purposes set forth.

Second, In this connection, we claim the small steam dome, A a, inclosing the branched pipe, B C, valve, K, and lifter, L, substantially as and for the purposes set forth.

MACHINES FOR CUTTING ROOT GRAFTS—S. S. Rockwell, of Vermontville, Mich.: I claim the arrangement of the shanks, L L, and blades, a a, and movable blades, x x, in the manner specified and for the purposes set forth.

CARPET SWEEPER—Stephen P. Rowell, of Reading, Mass. : I claim, in combination with the brush and its main operating gear, devices substantially as described for adjusting the brush and maintaining its axis at the same or at its proper distance from the axis of the gear, in order to maintain the gear in engagement with its pinion, as specified.

I also claim the application of the rear dust receptacle to the frame, so as to be capable of being swung or turned upward and outward therefrom, substantially in manner and for the discharge of dust as specified.

COOKING BOILERS FOR RANGES AND STOVES—Joseph Schmadel, of Dayton, Ohio : I claim the new manufacture of cooking boiler for stoves and ranges described, to wit : a cooking boiler, provided with perpendicular tubes or flues around its sides, from the bottom upward, and opening into a horizontal flue or chamber around the top of the boiler, for the blaze and smoke to pass through, substantially as described.

TICKET HOLDERS—Ira W. Shaler, of New York City : I claim the combined construction and arrangement of the body, A, holding bar, B, spring, C, and catch, D, substantially as set forth for the purposes stated.

WRAPPERS FOR CIGARS—James S. Suter and George M. Palmer, of Baltimore, Md. : Being aware that the stems and refuse tobacco have been before used for making a material similar to paper and for like purposes, by John Adcock, in England, we desire to disclaim the use of said stems and refuse tobacco.

But we claim taking pearl ash, powered sal ammoniac, lobelia or Indian tobacco, oil of anis seed, oil of caraway, alcohol, grass, rope, rum, cascarilla bark, opium, sumac, and stems or refuse tobacco, and converting it into sheets for wrapping woolen goods to prevent moths from eating them, lining for cases for the same, covering for carpets, and wrappers for cigars or tobacco.

APPARATUS FOR TANNING—A. C. Taggart and Alexander Gray, of Alleghany, Pa. : We wish to be plainly understood, that we do not claim the use of pipes placed on a level with the bottom of the vats ; as such device is found in the patent of Abraham Conwell, patented Nov. 4th, 1831.

But we claim, first, the arrangement of pivot, y, and links, x, as herein described, and for the purpose set forth.

Second, The use of the pipes, n, when placed near the top of the vats and used in connection with the pipe, o, as described and represented, and for the purpose specified.

MANUFACTURE OF CANDLES—Joel H. Tatum, of New York City : I do not claim, broadly, coating or covering tallow or inferior candles with a composition or material of superior quality, to form a hard, smooth surface, for this has been previously done.

But I claim coating or covering candles, manufactured of tallow or other inferior substance with a plurality of compositions formed of stearic acid and tallow in varying proportions, together with proper fluxes to give different degrees of fusibility, and also certain degrees of hardness and smoothness to the same, substantially as described, the candles being dipped into the several compositions in the order of the sequences, as set forth.

LINING FOR COAL STOVES AND FURNACES—Wm. B. Treadwell, of Albany, N. Y. : I am aware that siliceous sand has been used in certain arrangements and combinations for the lining of fire or hot air chambers, and therefore I do not claim sand as an article wherewith to line fire chambers.

But I claim the employment of hollow blocks of metal, filled in with siliceous sand, as a new article of manufacture, to be used as a substitute in the place of fire-brick for the lining of the fire chambers of stoves and furnaces, substantially as set forth and described in the specification.

MACHINE FOR NUMBERING THE PAGES OF BOOKS—Edward Town and Calvin E. Town, of Jersey City, N. J. : We claim the use of type blocks, containing a limited number of types constructed as above described, with the ratchet teeth at the side or any equivalent device to secure their uniform motion.

We also claim the level bed pieces, as described, in combination with type blocks.

We further claim the mode of delivery of the type blocks by means of the discharge boxes, as described.

We further claim the general combination of these parts with each other, and with the other parts of the machine.

SLIDES FOR SKIRT HOOPS—William M. Warren, of New York City : I do not claim to be the first inventor of a slide to be attached permanently to one end or part of the lap of the hoop, and applied to slide on the other part ; neither do I claim any slide composed of a single piece of metal, or constructed in any other way than substantially as described.

I claim the slide composed of the two parts, A B, formed as specified, and combined by a lock, a b c, between the lapping portions of the hoop, substantially as described.

[This slide is composed of two separate pieces of metal plate, one of which clasps either end of the hoop, and the other the portion of the hoop against which the end laps, and the two being united between the hoops, by the locking of their edges in such a manner that, except at its extremities, the clasp presents no edge upon the portion of the hoop upon which it slides, and, therefore, permits the adjustment of the hoops, with less danger of tearing their covering.]

MACHINE FOR TRIMMING THE EDGES OF PAPER HANGINGS—John Waugh, of Elmira, N. Y. ; I do not claim revolving shears or knives, wooden hand lever or spindle rod, other than in connection with the sliding ways, x w, and the peculiarly (adjustably) constructed hopper, K.

But I claim rotating, concave, self-sharpening circular knives, whose shafts do not revolve in the same line, but at an angle to each other, giving the knives a pressure against each other, at the point of contact only ; the reverse sliding motion of hopper and reel spindle in combination with wooden roller, I, pulleys, U S T, and band and hand crank, z, in the manner and for the purpose substantially set forth.

APPARATUS FOR MANUFACTURING FATTY ACIDS—M. Werk, of Cincinnati, Ohio : I do not claim the use of the boiler as new, or the use of a furnace for superheating steam as new, nor yet the use of a tank as new.

But I claim the combination of boiler, superheating furnace and tank for the production of fat acids without distillation or direct application of fire, as set forth.

FURNACES FOR HEATING BUILDINGS—John Plant (assignor to himself and George H. Plant), of Washington, D. C. : I claim the mixing of all the heated products of combustion both below and above the fire cylinder by an arrangement of diving and ascending flues leading into common chambers, where they cross each other, and are forced to commingle substantially as described and represented.

COTTON GINS—A. Q. Withers, of Byhalia, Miss. : I claim the curved spring board, C, situated in the "roll box," and provided with teeth projecting from its lower edge, arranged and operating substantially as specified.

I also claim the employment of the additional brush, E, and carrying saws, G, situated between the ginning saws, E, and discharging brush, H, and acting in combination therewith substantially as described. In combination with the additional brush, F, and carding saws, G, I also claim the concentric screen, i i, and "break currents," g g, when arranged in close proximity to said brush and saws, and for the special purposes set forth, in connection with their action.

ROACH TRAP—Alexander N. Shell (assignor to William S. Wood and Thomas N. Shell), of Richmond, Va.: I claim the center bait pan, D, in combination with the annular ring, B, when located as shown and described for the purposes set forth.

HAY RAKES—George Whitcomb, of Port Chester, N. Y. : I do not claim the wire teeth, F, attached to the head, E, as shown, for such device mounted on wheels, is in quite common use, and known as the wiretooth horse rake.

But I claim the arrangement of the treadles, J K, lever, I, rake head, E, arms, G H, bar, F", joints, C, and adjustable rope, L, substantially as and for the purposes set forth.

[This invention relates to an improvement in that class of horse rakes, known as the "wire tooth rakes," in which curved metal rods are used for teeth, and are attached to the head with a coil to give them the requisite degree of elasticity. The invention consists in a novel way of attaching the rake head to the machine, whereby the head is made to act as a partial centerpin, and assist in elevating the teeth as the hay is discharged, and also serve to prevent the casual rising of the teeth from the ground, and at the same time allowing them to conform to the irregularities of the ground. The invention also consists in a peculiar arrangement of levers connected with the rake head, and so arranged that the rake may be readily operated by the driver, a rope is also attached to the teeth to prevent the hay from rising too far up the teeth to hinder its free discharge.

SEED DRILLS—W. Irvin Willitts, of Milton, Ind. : I claim nothing for the mode of feeding, as I am aware that similar devices are in common use.

I claim the arrangement and combination of the corrugated roller, A, the adjustable frame, z, t c receding drill plows, t, the supporting chains, c c, and the books, h h, all arranged and operating substantially as described, for the purposes set forth.

MACHINE FOR STAMPING TRADE MARKS ON CLOTH, &c.—Algernon S. Wright, of Lawrence, Mass. : I claim the arrangement and combination of the reciprocating carriage or table, the stamping mechanism, the inking apron, and its vat or trough, as made to operate together substantially in manner and for the purpose as described.

I also claim the combination of the stamp connection bar, and the spring as applied to the lifter rod, and the stamp as specified.

I also claim the peculiar means or combination for operating the stamps, viz. : a mechanism for lowering them gradually toward the apron, a mechanism for allowing the stamp to fall by the force of gravity upon or toward the table, mechanism for elevating the stamp off the table as well as off the apron, as described, and mechanism for maintaining the stamp at rest during each movement of the bed or carriage, the whole being in one cam, as applied to a lifter bar as described.

ICE PITCHER—James H. Stimpson, of Baltimore, Md., executor of James Stimpson, deceased, late of said Baltimore : What is claimed as the inventor of James Stimpson is the treble wall for ice pitchers, as set forth.

MACHINE FOR CROZING, CHAMFERING AND BEVELING BARRELS—William M. Arnall, (assignor to himself, O. P. Smith and A. C. Jordan,) of Sperryville, Va. : I claim, not the employment of several tools, but the arrangement of the adjustable croze and howel blade, with the stationary beveling blade and chamfering tool, when the same are constructed and operated in the manner and for the purpose specified.

CONSTRUCTION OF AQUARIA—John Chilcott and Jas. Scrimgeour, (assignors to themselves and George F. Taylor,) of Brooklyn, N. Y. : We claim the combination of the dovetailed tenons or tongues, C, and acute angular plate, D, sliding over the same, with the outer triangulate plate, A, and ends of the plates of glass, B, for forming a space or well between the same for the reception of the cement, and thus enabling a perfect water-tight joint to be formed at the corner of aquaria and other vessels, substantially in the manner and for the purpose set forth.

[The aquarium has now become an ornament in almost every drawing room, where it gives a taste for the study of nature, and brings the objects within our easy observation. This is an invention designed to improve and simplify their construction, and join together the plates of glass of which they are composed, so that the box will be perfectly waterproof, incapable of leaking, and at the same time light and elegant. Cheap and convenient as it is, we have no doubt but that all aquarium makers will adopt it.]

MACHINE FOR PLANING WOOD—C. B. Cottrell, (assignor to himself and Nathan Babcock,) of Westerly, R. I. : I am aware that rotating cutter heads have been previously used and arranged in various ways, I, therefore, do not claim broadly such device.

But I claim the rotating cutters, b b, and central stationary gage, D, in connection with an adjustable gage, F, or its equivalent, arranged to operate as and for the purpose set forth.

[This invention consists in the employment of rotating cutters and a stationary central gage used in connection with an adjustable gage, whereby the plaining of wood may be performed in a very perfect manner.]

ARTIFICIAL LEATHER—William K. Hall of West Hoboken, N. J., assignor to Amos Broadnax, of St. Louis, Mo. : I claim the combination of the chemical constituents of leather, or their equivalents, substantially as described, for the purpose of forming a substitute for leather.

SEWING MACHINES—Joseph E. Hendrick, (assignor to himself, W. H. Nettleton and George Stevens,) of Bristol, Conn. : I claim the shears' handles or bowls, a' b', in combination with the upper part or blade, a, acting as a needle carrier, and the lower part, b, formed as a bed, as specified, whereby the sewing and feeding mechanism is actuated by a motion of the hand similar to that of cutting with shears, as set forth.

ROLLERS FOR CALICO PRINTING—John Hope, (assignor to himself and Thomas Hope), of Providence, R. I. : I am aware of the jewelers' rollers which forms the subject of the United States patent No. 21,039. My invention differs essentially therefrom, because the outer shell of my roller is not to be hardened by being heated and afterwards suddenly cooled on its cast iron carrier or cylinder encompassing the arbor or shaft, for the great heat of the outer shell would so heat the shaft connection, composition or shell as to either injuriously soften or melt it. Furthermore, another material difference is in the nature and character of the shaft connection, as well in the mode of effecting the same, it being not only formed by the process of casting it within a shell or tube, and around a grooved and slightly tapering cylindrical shaft, but made of a caoutchouc composition, or a material suitable for the purpose, and such as will admit of being cast or molded between the arbor and tube, so as to form a proper connection, therefore, of the kind described.

I claim my said new manufacture of calico printing roller made substantially as described, viz., of the copper shell, a, cast metal foundation tube, b, and with a mandrel connection cast in the metallic shell or tube, and on an arbor or mandrel in manner and of a material substantially as described.

SEWING MACHINES—Joseph White, of Troy, N. Y. : I am aware that two motions have been given to a looper and its shaft, but not simultaneously : this I do not claim.

But I claim giving the looper its motions for catching, spreading, and holding open the loop, and then delivering it up to the needle, without putting any twist in the thread, by means of a shaft having two motions at the same time, and given to it by mechanism substantially such as described.

MACHINE FOR FORMING BARRELS, &c.—Jacob Rees, (assignor to Jonah L. Rees), of Elkhorn Grove, Ill. : I claim the construction of the cylinder, S S S 2, with the radial arms, U U U U, and segmental parts, W W W W W, and disks, X X X X, the circular clamps, Z Z Z Z, and guide hands, & & & &, the suspension devices, I I J J Y Y, arranged and operated as described.

RAILROAD CAR SEATS—Draper Stone, of Milwaukie, Wis., assignor to himself and E. S. Turner, of Grafton, Wis. : I claim, first, Providing the back frame, D, of the high back seats with hinged cushioned frames, F F', at different or the same points of elevation, and jointing the front ones, F, of them, to horizontal bars, E E', secured to the back frame, D, and attaching and combining therewith bracing or supporting bars, Z, and slotted bars, J, in which their curved ends move, in such a manner as to enable the said cushioned back frames, F F', to be folded together with the back frame D, between them, to form comfortable reversible seats, as represented in Fig. 3, or raised and extended to the high back seat frame next in advance to form sleeping berths or couches on different horizontal planes, as represented in Figs. 1 and 2, as described.

Second, I also claim the combination and arrangement of the double hinged cushioned back frames, L L', of the low back seats, with and in the relation to the double hinged cushioned bottoms, N N', curved bars, K, and spring notched bars, M, attached thereto, and horizontal ledges or ribs, I, on the sides of the uprights, A, of the frame, substantially in the manner and for the purpose set forth.

Third, I also claim giving a greater elevation to the hinged cushioned double back and bottoms, N2, of the low back seats, by combining therewith the pins or studs on the edges of the former, lugs or projections in which they rest, and rock shaft, P, and bars or arms, o, attached thereto, and spring notch bars, Q, and lugs or projections in which they rest, and rock shaft, P, and bars or arms, o, attached thereto, and spring notch bars, Q, and lugs or projections, R, on the high back seat frame next in advance, the whole of these parts being operated and arranged as described.

[The nature of this invention consists in constructing the reversible back frames of every alternate seat in the car of a greater elevation than the intermediate ones, and so jointing and bracing their cushioned frames as to enable them to be raised forward and extended in a horizontal position over the seat-back frames in advance, and to be converted into distinct sleeping couches or berths at different hights, and in so forming and jointing the lower cushioned double backs and bottoms of the intermediate seats as to enable them to be opened and extended to form two other sleeping couches, also at different planes of elevation, so that four comfortable couches can be obtained from every pair of seats in the car.]

GAS BURNERS—Junius F. Tozer (assignor to George W. Gregory), of Binghamton, N. Y. : I claim the application to the common gas burner of the two or three way turning cock, for the purpose set forth.

SAW-GUMMER—Harvey R. Wolfe, (assignor to himself, David Staples, and W. H. Watson), of Consolation, Ky. : I claim the arrangement and combination of the stone, E, adjustable beams, D, screws, b, slots, c, and carriage, D, as and for the purpose set forth and shown.

[This invention consists in the use of an adjustable rotating grindstone and saw carriage, arranged so that circular saws may be ground with great facility in a perfect manner, and by a person with but little skill at such work.]

RE-ISSUES.

MANUFACTURE OF PAPER FROM WOOD—William F. Ladd, of New York City, and Morris L. Keen, of Philadelphia, Pa., assignees (through mesne-assignment) of Charles Watt and Hugh Burgess, of London, England. Dated July 18, 1854. Ante-dated August 19, 1853 : We claim the pulping or disintegrating of shavings of wood and other similar vegetable matter for making paper, in the manner substantially as described, according to the nature of the vegetable substance to be treated.

WEAR-IRON FOR CARRIAGES—I. George Lefler, of Philadelphia, Pa. Dated September 8th, 1857 : Disclaiming the formation of "goose-necks," or recesses in the bodies of vehicles, and disclaiming the use of metallic guards, or "wear irons"—

I claim, without limiting myself to any precise form or exact proportion, the construction of carriage or other bodies with a metallic recessed guard, constructed and arranged in the body of the vehicle, substantially as described, for the purpose set forth.

CLEANSING SUGAR—Francis P. Hurd, assignee (through mesne-assignment) of Joseph Hurd, of Stoneham, Mass. Dated October 3, 1844 ; extended October 2, 1858 : What is claimed as the invention of Joseph Hurd, deceased, is, first, The process of separating sugar from any liquid matters with which it may be mixed, by filling the mixed mass into a vessel constructed substantially as described, and then acting upon the same by centrifugal force, substantially in the manner specified.

Second, The washing of impurities out of the sugar, by admitting a liquid into a vessel, substantially such as described, in which sugar is being exposed to the action of centrifugal force, as specified.

Third, The process described of obtaining a mass of sugar free from liquid impurities, by filling the mixed mass into the top of a vessel constructed substantially as described, and having a closed bottom, and there exposing the mass to the action of centrifugal force, and then withdrawing the sugar out of the upper end of said vessel when separated ; the whole as specified.

Fourth, The process of obtaining a mass of washed sugar by charging sugar into the top of a vessel constructed as specified, with a closed bottom, and then exposing such sugar to the action of centrifugal force, and while so exposed, admitting currents of liquid to wash the sugar.

Finally, Withdrawing the washed sugar out of the top or upper end of the vessel ; the whole process being substantially such as specified, and being claimed by me as the invention of said Joseph Hurd, deceased.

DRY GAS METERS—Alexander A. Croll, of London, England. Dated February 22, 1853 : I claim fastening the diaphragms to the partition plate, and on either side thereof, in contradistinction to attaching them by separate flange rings to the sides of the meter, and at or near the front and back thereof.

I also claim the arrangement of pendant rods or levers, with suitable guides, near the outer edges of the disks on opposite sides of their axis, to steady and direct the motion of the movable partitions, as shown and described.

I further claim continuing the inlet and outlet pipes down the sides of the rectangular case, below the points required for the passage of the gas to and from the meter, to form separate condensation chambers, as specified.

I likewise claim enclosing, by a separate interior cover or case, the valves of the meter, for protection of the operating and registering gear from gas, and to facilitate adjustment, substantially as set forth.

DESIGNS.

CAST IRON FENCES—Martin Briggs, of Rochester, N. Y.

TRADE MARKS—Richard P. Bruff, Charles Bruff and George A. Seaver, of New York City.

COOKS' STOVES—N. S. Vedder, of Troy, N. Y., assignor to G. W. Eddy, of Waterford, N. Y.

New Inventions.

Rapid Sawing.

At the Penn Mills, near Clarion, Pa., no less than 21,072 feet of boards was recently turned out in ten hours by a circular saw of 4½ feet in diameter. The power employed is a steam engine of excellent workmanship, made made by N. Myers & Bro., of Clarion. It is of 16-inch bore, 20 inches stroke, and makes 150 revolutions per minute (500 feet velocity of piston). Two boilers, each 24 feet long, are employed to generate steam; they are 42 inches in diameter, have two 16-inch flues each, and the fuel used is sawdust and waste slabs.

Safety Chemical Matches.

A Frenchman, named M. A. Meunons, has secured a patent in England for an improvement in lucifer matches, with a view to obviate the risks of accidental ignition. To attain this end, the matches are first cut by known means from cubes of wood, the cut being stopped at a short distance from the end of each cube, so as to leave the lower extremities adherent. The upper or free extremity of each packet of splints thus formed, being coated with wax or sulphur, is dipped in one of the following preparations:—Chlorate of potash, two parts; pulverized charcoal, one part; umber, one part: or, chlorate of potass, sulphur and umber in equal parts, thoroughly mixed with glue. The opposite extremity or "cut" of each packet is then painted over with amorphous phosphorus blended with size, so that on separating the matches, the phosphorus is only found on the top of each. The matches thus prepared are ignited by breaking off a small piece of the phosphorized end and rubbing it on the opposite extremity covered with the inflammable preparation.

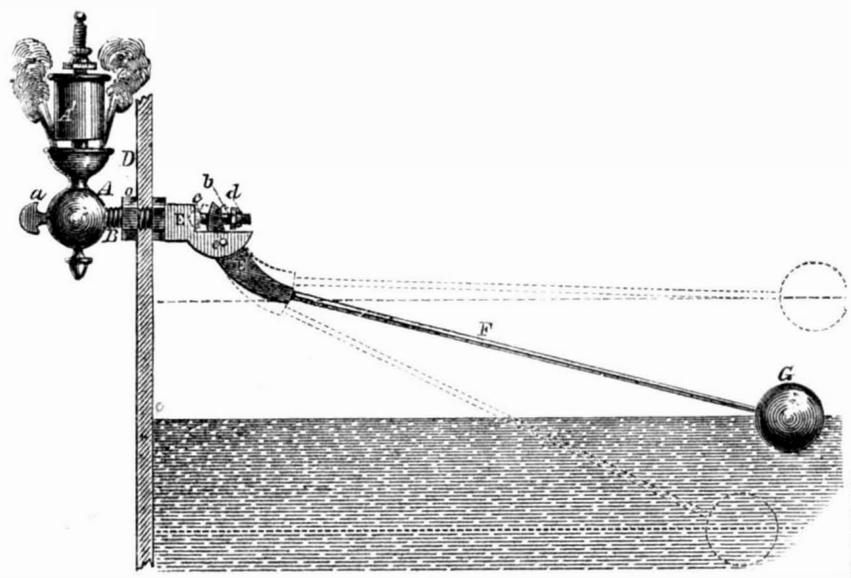
New Boiler Alarm.

This is an ingenious and simple device for the purpose of calling attention by a whistle, when the water falls to so low a level as to endanger the bursting of the boiler by the water falling below the tubes, the introduction of cold water then being very liable to produce an explosion.

This little apparatus consists of a block of metal, A, to which is attached a whistle, A′. D is the front plate of the boiler, through which the invention is secured by the screw, B, and nut, *o*. Through the solid part, E, inside the boiler, a passage is bored, corresponding with one in A, and this is flared out to form a valve seat on the inner surface of E, which is closed by a conical valve, *c*, upon the rod, *b*, the valve being kept home by the pressure of the steam behind it. The other end of this rod passes through a piece, E′, which is hinged by the pivot, *e*, to E, so that it can turn freely round, and by pressing against the nut, *d*, on the valve rod, *b*, bring out the valve, *c*, from its seat, and allow the steam to pass to the whistle, and call attention to the fact that the water is low. To the lower part of E′ a long bar F is attached, having a hollow ball, G, at its end, which floats on the surface of the water.

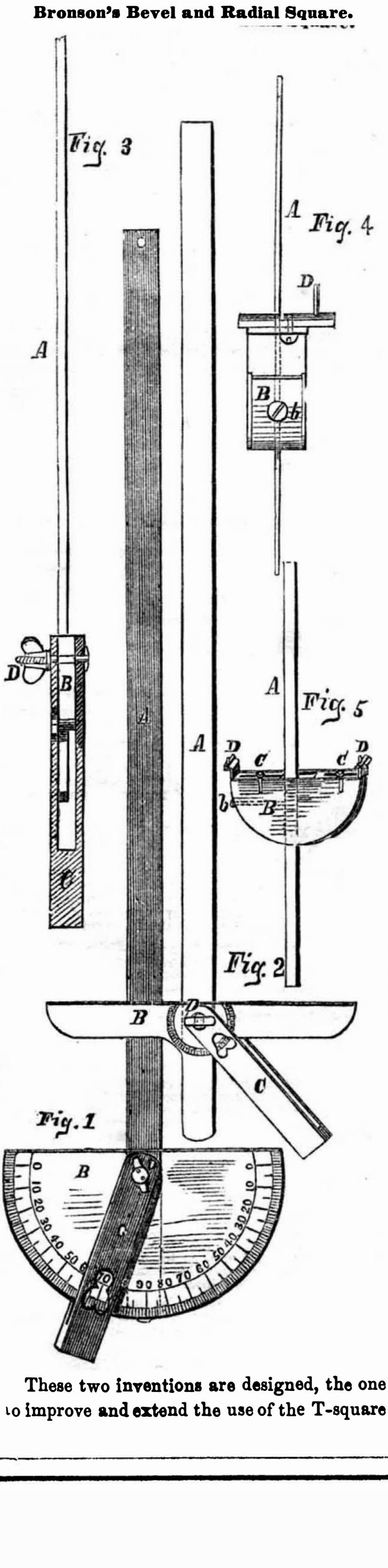
As the water rises and falls in the boiler within proper and safe limits, the ball rises and falls with the water, moving the piece, E′, upon the pivot, *e*; this piece is so shaped that the moment the water approaches the dangerous point, the weight of G and lever, H, is sufficient to force back E′ upon its pivot, *e*, and pull the valve, *c*, from its seat, thus allowing the steam a free passage to the whistle, and it will continue so to do until more water is supplied to the boiler, or the defect in the pumps, if there be one, remedied. Much of the water used for boilers contains a great quantity of solid matter, and this is liable to be deposited around, *c*, and prevent the proper action of the alarm. This has hitherto been a great defect in boiler alarms, but in this one it is provided against, by the addition of the screw, *a*, outside the boiler, so that when the stoker suspects that there is any matter collected at *c*, or at regular intervals, he can, by moving the screw, *a*, force *c* back, and either grind it in its seat, or permit the steam to blow the solid matter away. The ball and lever in the positions indicated by the dotted lines show the range which they have before operating the valve, the lowest position being that in which the ball allows steam to escape and produce a whistle.

MILLER'S BOILER ALARM.



This most valuable device, which is also an ornament to a boiler, is the invention of Alexander Miller, of Cleveland, Ohio, and was patented by him June 29, 1858. Any more particulars that may be desired can be obtained by addressing the inventor, care of Dr. Seelye, at the above place. We have seen certificates from some Steamboat Inspectors, who speak highly of the invention.

Bronson's Bevel and Radial Square.



These two inventions are designed, the one to improve and extend the use of the T-square and make it more completely the *vade mecum* of the draughtsman, and the other to provide a simple instrument by which shafts may be centered with greater facility.

Fig. 1 is a front view of the bevel square. It consists of a straight rule, A, and a semicircular head, B, the lower part of which projects slightly below A like a common square, so that it can be put against the side of a drawing board to rule horizontal lines along the side of A. A pin and nut, D, secures the piece, C, to the square; this piece has a perforation at its end, and a point which allows it to be placed at any angle, and at which it can be secured by tightening the nut, D. This piece, C, being rested against the side of the drawing board, a line at the same angle can be drawn on the paper, guiding the pencil by A, and by turning the square round to the other side of the board a line can be drawn at the same angle in a reverse position. Fig. 2 shows another square on the same principle without the extended semicircle, and with the graduations on the point where A and B join. Fig. 3 is a side view of the same.

Fig. 4 is a side view, and Fig. 5 a front view of the radial square, which is as simple as anything for the same purpose could possibly be. It is often necessary to find the center of the end of a round shaft or piece of wood to "center," as it is called, for turning, and this little instrument does it immediately. A block of wood, B, bound with brass for protection, has a piece of metal, A, passing through it, and A can be fixed in any position by a screw, *b*. Two small projecting pieces, D, are attached, so that they can slide to or from A, and be secured in any position by screws, C.

The method of using is very simple. These pieces, D, act as callipers, and being properly adjusted in relation to A, they are placed on the outside of the shaft with the flat part of A resting against the end of the shaft, a line is then drawn along A, and the whole turned into another position, the pieces, D, still being pressed against the periphery, and A still being kept flat against the end of the shaft, another line is then drawn, and the point of intersection is the center of the shaft. Its principal use, however, is the marking out the teeth of bevel gearing.

These two convenient instruments are the invention of Austin Bronson, No. 102 Elm st., New York, who may be addressed for further information.

Method of Preventing Seasickness.

Of all the ills that human flesh is heir to, there is none so nauseating and thoroughly odious as seasickness, and we have no doubt that all of our readers who have ever been afflicted with it, and again contemplate "going down to the sea in ships," will hail a preventive as a boon more highly prized than a princely diadem. An alleged preventive for seasickness, and illness arising from similar causes, has recently been patented in England by an Italian residing in France, named P. Molinari, which consists in the use of a composition prepared in the following manner:—First, soak in a pint and three-quarters of vinegar for about twelve hours, rue, ½ oz.; turmeric, ½ oz.; green husks of walnuts, ½ oz.; rocon (annatto), ½ oz.; potash, ½ oz., and a poppy head. Then boil the whole for half an hour, and strain through fine linen. Pieces of filtering paper in four or five thicknesses, measuring about ten by seven inches, are to be soaked in the solution, and when dry, sewn around the edges to pieces of some light fabric, wadding being placed between the paper and fabric (or the wadding itself may be soaked in the solution), and tapes attached to the fabric, to attach it to the person. By applying pieces of paper or wadding prepared in the above manner to the pit of the stomach, it is assumed that seasickness, and illness of an analogous character, such as that caused by the shaking of railroad cars and other carriages, will be prevented.

Wearing Apparel.

The London *Medical Times* contains an article on the above subject by Dr. Collier, who has been investigating scientifically the nature of different habiliments as agents for protecting soldiers against high heat. By placing a thin layer of white cotton over a soldier's red woolen cloth coat, exposed to the sun in India, a fall of seven degrees in its temperature soon took place, hence he recommends that the colored clothing of soldiers should be covered with white cotton cloth when they are marching in the hot sunshine. All kinds of clothing he found were capable of absorbing a quantity of moisture from the body. Woolen cloth absorbs the greatest amount, and cotton the least. From this we should conclude that cotton flannel was better than woolen flannel for under garments, an opinion quite contrary to the one generally entertained. The color of clothing has very little sensible influence in reference to the heat of the body, leaving solar heat out of the question. Black, white, red, blue and brown clothes are equally warm, their composition and texture being equal in all other respects.

Cost of Electric Light.

M. Edmond Becquerel, a French *savant*, has been recently engaged in some experiments with a view to determine the comparative cost of electricity as an illuminating agent. He used a battery of zinc and platinum, made with strict attention to economy, and the results were as follows:—

The standard is the light of 550 candles of the best quality, and the cost of

Coal gas, at $1 60 per 1000 c. feet, was	$0 35
Oil (Rape seed), at 17 cents per lb......	0 60
Stearine candles, at 32 cents per lb.....	2 52
Wax candles, at 52 cents per lb..........	3 12
Electric light..................................	0 58

Thus showing that although the electric light is cheaper than candles, it will not at present compete with coal gas, at least until some cheaper battery power be found.

Lac Varnish.—This is made by dissolving gum lac in alcohol, or in a solution of the carbonate of soda or potash. It is easily made, and is used for many purposes. Oil varnishes are the best for coating iron utensils exposed to the weather, especially the sulphur varnish, which is exceedingly useful for farmers. These varnishes may be made of different colors by adding pigments. Verditer blue is mixed with copal varnish for polished iron work that is to be exposed to the atmosphere.

Scientific American.

NEW YORK, OCTOBER 16, 1858.

The Crystal Palace in Ruins—Fair of the American Institute Closed.

The Crystal Palace, which has been so much admired for its architectural beauty and a source of so much litigation for the past five years, is now a mass of ruins! It was totally destroyed by fire—lighted probably by the torch of an incendiary—on Tuesday, the 5th instant, between the hours of 5 and 6 o'clock in the afternoon.

This structure was erected in 1853, for the purpose of an exhibition of the industry of all nations. From the fact of so many of our citizens having visited London during the World's Fair in 1851, and witnessing with some regret the limited display of American art on that occasion, they were led to take steps for an exhibition in this city, where such a display could be made as would do justice to American skill and genius. In March, 1852, the Legislature of New York granted a charter, and the city of New York granted a lease of Reservoir-square to an association for carrying out these objects. Theodore Sedgwick, Esq., was its first President, and it was incorporated with a capital of $300,000. Measures were early taken for the erection of a proper building, and among the several designs sent in for this purpose, that of Messrs. Carstensen & Gildemeister was selected and carried out into execution, C. E. Detmold being superintendent and engineer. We published illustrations and full descriptions of the building in Volume VIII. of the SCIENTIFIC AMERICAN, but its cost far exceeded all early expectations, amounting to more than $700,000. It was to be opened in May, 1853, but it was not ready in time, and the inauguration was postponed till the month of July following. On that occasion President Pierce was present and graced the assembly. National Commissioners from all the European governments took part in the ceremonies, and the display was grand in every respect. The exhibition which followed was a good one—the best ever held in our country—but it turned out an unprofitable enterprise for the stockholders, a dividend never having been declared from the time it first went into operation until the building fell into the possession of the city authorities.

In about nine months after the Fair opened, the finances became very embarassed, and Mr. Sedgwick resigned. In 1854, P. T. Barnum was elected to fill his place, under the idea that he could render it a more successful enterprise, but it also failed under his management. The building and all its contents afterwards passed into the hands of a Receiver, and was occasionally let out for concerts and balls, and to the American Institute for their annual exhibition. The five years' lease of the property upon which the Palace was built having expired, the city authorities, without unnecessary circumlocution, ousted the Receiver and entered possession. Its destruction by fire consummates a series of troubles and vicissitudes of no ordinary character.

The Fair, at the time of the fire, had attained to completeness in its arrangements in some respects superior to all its predecessors. Twenty-five per cent more articles were entered than during the Fair of 1857, and a large number of these were meritorious improvements.

We were engaged in the building all the afternoon of the day on which the fire took place, in examining into the novelty and merits of various machines and articles on exhibition. At five o'clock the face of all things bore the appearance of confident safety; in fifteen minutes afterwards the flames had ascended from basement to roof, and were whirling round in terrible eddies inside of the dome. In twenty minutes after the fire was first observed, the lofty dome surged and fell with a crash like thunder, and the entire roof soon came down, together with nearly the whole of the outer walls. Never was destruction more complete. The whole space on which the Palace once stood is now but a heap of confused pieces of broken iron, embracing all kinds of machines, from the ponderous steam engine to the watchmaker's lathe.

The heat caused by this fire was very intense, and a whirlwind was thus generated which carried up some of the roofing plates, and bore them to a distance of three miles on Long Island. The glass of the roof was melted like wax, and among the ruins was found a case of artificial teeth, perfectly sound, but enclosed in a ball of the vitrified roofing. There were over three thousand contributions, upon exhibition, few of which were saved.

The fire was so unexpected and sudden that nearly all present were either stupefied or appalled. One act of heroism performed by Sarah Stevens, a factory girl from Manchester, N. H., deserves to be especially mentioned. She was attending the knitting machines noticed by us last week, and succeeded in saving three of these machines by three separate runs into the burning structure, and she carried off the last one when the case on which it stood was in flames. The two brothers Aiken saved other four of these machines, thus making seven in all—a greater number proportionably than was saved by all the other exhibitors.

We cannot find language adequate to express our sympathy for them in the sad affair. Suffice it to say that hundreds of honest and industrious mechanics, manufacturers and inventors have lost valuable property, and had their cherished plans and hopes frustrated. The average loss to exhibitors is estimated to amount to about $300,000, and if sympathy has any value in such a case, it is extended by the community generally. There is one consideration in connection with this calamity which affords cause for gratitude: no life has been lost. There were more than a thousand persons in the building when the fire broke out, and quite a number of women and children among them; but all got out in safety, although the conflagration was terribly rapid in its results. Had the accident occurred two hours later in the evening, when several thousands would, in all probability, have been thronging the building, hundreds of lives might have been sacrificed.

Fires on Land and Sea—What Can be Done to Suppress them?

We have on so many occasions directed attention to the best means of preventing and extinguishing fires in ships and buildings, that it almost seems like repeating an old story to recur to the subject again. But while fires of a most disastrous character are still frequently taking place, we feel called upon to allude to them; and will endeavor to present such information and considerations as are applicable in such circumstances. It is a self-evident fact to most minds that carelessness and the absence of provident forethought are the causes of a majority of the accidents which occur; but these considerations can afford no reason why we should not urge the most efficient preparations for such contingencies. On board of the ill-fated steamer *Austria*, neither forethought for preventing fire was displayed, nor were there any sensible means prepared to meet such an emergency. There was one fatal error connected with the management of that vessel, which seems to have been overlooked by most persons, namely, the unsafe position of the powder magazine. At a very early stage of the fire it exploded, and this, we believe, caused the magnitude of the disaster, by creating universal consternation on board, and suffocating the engineers by "after-damp": hence the subsequent mismanagement and all the well-known dreadful circumstances which ensued. On the recent trip of the steamer *Hammonia*—the *Austria's* consort—her powder magazine exploded, injuring several persons, and proving incontestably, that the magazines of these vessels were located in dangerous positions. Commanders of all vessels are bound to consult safety rather than convenience, in regard to the position of their magazines and every other explosive and combustible material on board.

It appears to be a plausible conclusion, that by having ships and buildings constructed of a fire-proof material, such as iron, it would be a means of preventing fire. But the *Austria* was an iron ship, and the Crystal Palace an iron building; yet neither the hull of the one nor the iron frame of the other prevented their destruction by fire. It is, however, folly to expect that the incombustible materials of which any such structure is composed can prevent combustible materials within from being consumed; but in all such cases the proper course to pursue is to provide all possible means of extinguishing fire.

We are aware that it is no new doctrine that steam can be usefully employed as a fire-extinguisher—not only in steamers, but also in factories and all buildings where boilers are used; yet, such is the almost criminal neglect in not providing to take advantage of it, that we feel called upon to sound the alarm once more.

The Engineer at the Crystal Palace, taking advantage of this agent, and to save the probable explosion of the boilers, promptly threw open their valves, and thus allowed the steam to escape into the burning building. Now, on board of a steamship, this decision of character in like circumstances might save it from destruction; but in a building covering such an extensive area as the Crystal Palace, it produced no useful result in suppressing the conflagration—the quantity of steam being insufficient to fill the exposed parts of the building.

Steam acts as a fire-extinguisher, principally by its greater expansiveness than air, whereby it penetrates through all the space adjacent to the burning materials, and thus excludes the oxygen from supporting combustion. In the rooms of factories, and in the compartments of steamers, sufficient steam may be supplied from the boilers to dispel the air and arrest combustion, in cases of fire; and we are greatly surprised that this means is not provided, as its efficiency is of no dubious import.

On page 52, Vol. VIII., SCIENTIFIC AMERICAN, an account is given of a cotton factory, in Douay, France, which was saved from destruction by the prompt application of an axe to a steam-pipe running through the room in which the fire originated. We have also a letter now before us from Mr. T. Sault, of Seymour, Conn., who, while engineer of a steamer, a few years since, saved it from being consumed, by the same agent. A tin can containing turpentine had been accidentally overturned in the boiler room and having taken fire, the flames spread with fearful rapidity while no water could be brought to bear upon them. There was a small pipe leading from the boiler to the smoke-stack: this the engineer promptly wrenched off, and the steam escaped in volumes, quickly filling up the entire space, and extinguished the flames, as if by magic. As the vessel was built of wood, and the place where the fire took place contained a great amount of combustible materials, its entire destruction would probably have resulted, but for the timely application of the steam jet. On page 368, Vol. IX., SCIENTIFIC AMERICAN, Mr. A. Walker, superintending engineer of the ninth district, recommended that all steamboats should be fitted with iron pipes leading from the boilers to the several apartments, for quenching fires by steam; and although his suggestions were excellent, we are not aware that they have been applied to a single steamboat in our whole country. In 1852, a large British steamship, called the *Amazon*, was consumed by fire on her first voyage. Previous to going to sea, it was proposed to arrange steam-pipes through all her rooms, for extinguishing fire; but this suggestion was not carried out, although the cost would only have amounted to about $1000.

In making arrangements to meet dangers, a penny-wise and a pound-foolish policy seems to govern, and we suppose that, however much may be said by the press, the same indifference will still continue; but this shall not deter us from urging every consideration that shall act as a preventive of such terrible disasters. In all steamships and manufactories where steam can be employed for extinguishing fires, means should be arranged to attain this object. Pipes leading from the boiler into every apartment could be provided, each having a valve or cock, in order to concentrate the steam upon the point of pressing danger, and thus made to expend its action in the most scientific manner. We do not, however, advise the use of such means to the exclusion of water, as a most efficient agent for quenching fire. In all vessels and buildings where this is possible, a stationary pipe leading from an efficient pump, should be in every apartment, even where there is also a steam-pipe, as no useful means for critical cases of danger should ever be neglected. And although we exposed the incompetency of Phillip's Fire Annihilator for extinguishing most of the fires which occur on land, we always admitted that it was a valuable safeguard when used in confined places, like the holds of ships, for arresting fires in an incipient stage.

Our object is to urge the adoption of all known means and measures of safety for preventing and extinguishing fires. In doing this, we are well aware that without decision of character and presence of mind in cases of danger, the most efficient means provided for safety may be rendered nugatory; but this is no argument against the prudent preparation of all such means, but rather in favor of them, because provision made for safety tends to dispel those fears which are so liable to paralyze effort in cases of great danger. We are confident that, with the exercise of provident forethought and the adoption of well-known efficient measures for preventing and extinguishing fires on land and sea, ninety-nine out of every hundred of such disasters may either be prevented or so mitigated as to be rendered comparatively harmless. This is a subject that concerns every one. We intend, in our next number, to present considerations which we deem of great consequence in the saving of life in cases of fire and shipwreck at sea.

English Patents.

It is not an uncommon occurrence that useful American inventions are secured by patent in England to parties who have no moral right to them. The English law does not protect the inventor against the introducer of an invention, hence inventors in this country should, if they intend to take patents in England, use the utmost diligence in securing their rights. As examples in point we may mention that Robjohn's ingenious inkstand—illustrated on page 160, Vol. 13, SCIENTIFIC AMERICAN—has been recently patented in England by a British subject, and is heralded in the papers there as "ingenious, and well calculated to prove a great acquisition to the library table." Kurth's improvement in umbrellas, patented last April, was patented in England in July, by parties other than the inventor. Inventors who wish to consult with us in reference to taking European patents, are assured that we have the very best facilities for its careful prosecution. It is unsafe to trust an English case with any other than an agent of experience and integrity, and who is familiar with the law and practice of the British Patent Office. Our agents in London have had nearly forty years' experience in this business.

We learn that Mr. R. D. Clark, of Pennsylvania, has been appointed Chief-examiner of Class V (Calorifics), at the Patent Office. Mr. Clark was for a short time Assistant-examiner in another class. The appointment is a good one.

Hardening Iron.

Every improvement in the manufacture of iron, which is to us the "King of Metals," is to be hailed by the productive world as a positive blessing; and however slight those improvements may be, they deserve the attention of the chronicler's pen; how much more so, then, when they are important and practical, as are those we are about to mention.

The first is the invention of a French clergyman—Chas. Pauvert, of Targe, France—and consists in purifying iron by chemical means. He places the iron in the cementing furnace with 33 parts by weight of finely powdered charcoal, 33 parts of highly aluminous clay, 33 parts of carbonate of zinc or wood ashes, 1 of carbonate of soda, and 1 of carbonate of potash. This produces an iron which has all the properties of the best steel, and it will not lose any of its properties by being heated or drawn out. These substances by chemical action, when heated together, present the carbon in the best possible state to combine with the iron. The method of producing cast steel from this is by melting it in a crucible with about 5 to 6 per cent of the following mixtures:—4 parts of dry carbonate of soda, 3 parts of dry carbonate of potash, 3 of wood ashes, 2 of borax, 3 of oxyd of manganese, and from 4 to 7 parts of charcoal, or some highly carbonaceous body. The 4 parts of carbonate of potash may be replaced by 2 parts of caustic potash. This produces a steel of superior quality, and with more certainty than by the old method. M. Pauvert patented his invention in this country March 23, 1858.

The next invention is that of an Englishman—G. J. Fanner, of Birmingham, England—which consists in using ferrocyanide of potassium, hydro-chlorate of ammonia, and nitrate of potash in equal proportions. These are reduced to a fine powder and incorporated, and a bath made of the same substance dissolved in cold water, the prussiate of potash two ounces, the sal-ammoniac four ounces, and the saltpeter two ounces to every gallon of water. Having now the powder and the bath, the article to be hardened is heated in an open fire or furnace, and rolled in the dry powder until the surface is covered with a pellicle of fused powder, and then it is plunged in the bath where it is left until cold, and when perfectly cooled the mass is hardened. Large masses can be thus rendered extremely hard, but it seems to us to be especially applicable to the hardening of tools, journal bearings, and the like. This process was patented in the United States, April 6, 1858.

Last, but not least, comes an American invention, that of Horace Vaughn, of Providence, R. I., and patented by him March 30, 1858. He employs two pounds of bi-chromate of potash, twelve pounds of chloride of sodium, and four pounds of prussiate of potash; these ingredients are powdered and mixed together, and they are placed in an iron box, where they are covered with powdered charcoal, and heated in a proper furnace. The articles to be hardenened are then placedin the mixture, and the whole heated until the mixture is in a state of igneous fusion, when they are removed and dipped into water, oil or certain solutions in the usual manner. The proportions for hardening wrought iron are different, being 25 per cent of prussiate of potash, 65 per cent of chloride of sodium, and 10 per cent of bi-chromate of potash; bone ash or animal charcoal or both are then added, and the whole is reduced to a state of igneous fusion, and the articles to be hardened are then put in,

Nearly all the inventions of late for hardening iron have been the result of chemistry, and we think that the more perfectly the chemical changes which occur in the transmutation of iron into steel are understood, the nearer we shall be to that great desideratum, making steel directly from the ore, which is the end to which all improvements in iron manufacture are tending.

Telegraph Conductors.

[The following is the first of two articles on this deeply interesting subject. The author is a thorough practical electrician, whose name stands very high as an inventor and electric engineer.—Eds.]

Messrs. Editors—I propose to compare the Atlantic Telegraph Cable with some other conductors more familiar to telegraph operators, and to explain some terms used in works on electrical science; also to give some simple *formulæ* and constants to enable others to verify my conclusions.

In order to establish a current of electricity, peculiar substances, called "conductors," in which it can flow, must be employed. Suitable substances are also required to be placed in such relationship to one another that there must be a chemical reaction between them. For example, if a plate of zinc and another of copper united together by a copper wire, be dipped into a vessel containing a mixture of one part of sulphuric acid and twelve of water, the zinc will be dissolved by the action of the acidulated water, while the copper will scarcely be acted upon. The chemical actions going on in the galvanic cell while the two plates are thus united, are as follows:—Water is composed of two gases—oxygen and hydrogen. The oxygen of the water in the battery having a greater affinity for the zinc than for the hydrogen with which it is associated, leaves the latter, and unites with the former, producing the oxyd of zinc. The hydrogen makes its escape by way of the copper plate, on the surface of which it appears in bubbles, that pass off after bursting. The copper plate is, therefore, called an "electrode," or electric way. The chemical action described would very soon cease in a battery by the accumulation of oxyd on the surface of the zinc plate, were it not for the presence of the sulphuric acid, which unites with the oxyd, forming sulphate of protoxyde of zinc, commonly called sulphate of zinc. This oxyd is very soluble in water, therefore it is taken up by the water in the battery as soon as formed, thus leaving the surface of the zinc tolerably clean, for the continued action of the oxygen, until the water is saturated with the sulphate. Hydrogen escapes more freely from a rough than from a smooth surface, and for this reason the copper plates of batteries are all roughened. But what is going on in the connecting wire of the zinc and copper plates while the chemical action described has been going on in the battery? If some short sections of the copper wire which connects the two plates be replaced with thin platina, or iron wire, these latter will become red-hot, thus indicating that electricity is flowing through the wire, and that its free passage is resisted in the iron or platina, and this is attended with the evolution of heat.

Again, if we place the two plates about a foot asunder in a glass vessel containing the acidulated solution described, and if we unite them by a wire running north and south—the copper being at the northern end—the electricity is said to flow from the copper to the zinc plate. If we now suspend a magnetic needle above and near the wire, it will not point, as it usually does, to the north, but will declinate to the west. This declination will be great according to the diameter of the wire, the size of the plates, the nearer they are together, and the proximity of the needle to the wire. The declination of the magnet will also be greater if the wire is made of silver or copper than if of lead, iron, or platina; also if the battery is more intense in action, such as by substituting nitric for sulphuric acid in the solution. From this it is inferred that chemical actions have much to do with the production of electricity, and that all bodies offer a certain amount of resistance—some more and some less—to the flow of a current of electricity. It is found to be rigorously true that the quantity of electricity flowing in the conductor of an electric circuit is directly proportional to the intensity of the chemical action, and necessarily proportional to the total amount of resistance offered to its passage through the conductor. The following equation will, perhaps, convey this idea more clearly:—Let E represent the intensity of the chemical action, R the amount of resistance offered by all the conductors through which the current passes, and Q the amount of electricity passing at any given time—then we have $Q = E \div R$. The quantity of electricity or strength of current flowing in the wire at any given time being equal to the intensity of the chemical action in the battery, divided by the amount of resistance.

The phenomena presented by electricity when at rest belongs to the science of electrostatics; the phenomena of electricity in motion belongs to electro-dynamics. The latter must be chiefly considered in the study of the telegraph. Bodies are usually divided into two classes in connection with the flow of electric currents; these are called conductors and non-conductors. These terms are merely relative, as it is difficult to specify the dividing line between them. The best conductors are silver, copper, and gold. Gutta percha, glass, and india rubber are the best non-conductors. As all bodies offer resistance to the passage of an electric current, that body is the best conductor which offers the least, and *vice versa*. The resistance offered by each body is called its "specific resistance." The resistance of copper being considered unity, that of silver is ·67; iron, 5·625; mercury, 50·; distilled water, 79,000,000. The resistance to the flow of a current of electricity also depends on the dimensions and form, as well as the nature of a conductor; but of this we shall treat in the succeeding article. * * *

Boston, Mass., October, 1858.

Marking Ink for Linen.

Messrs. Editors—Those who intend to prepare marking ink according to the recipe in No. 49, Vol. XIII, would do well to dissolve the nitrate of silver in rain water instead of liquor of ammonia, or else they might expose themselves or others to great danger.

Whenever a salt of silver comes in contact with ammonia, it is apt to form with it a compound more dangerous than the fulminate of silver, because more liable to detonation by the most trifling circumstances, and more terrible in its effects. The ordinary way to produce fulminate of silver is this:—Oxyd of silver is mixed with common liquor of ammonia, and left to itself for several hours, when a black powder, this identical compound, will be formed. Another way (and the one so closely resembling the recipe for the marking ink that my fears were instantly aroused) is this:—To a solution of nitrate of silver add strong liquor of ammonia. The dangerous compound in question being thus formed and in solution, is precipitated as a black powder by an alkaline solution—soda or potash. I would warn your readers not to meddle with this substance at all, for I know cases in which the death of the experimenter was caused by a drop of water falling on the preparation. The rule for guidance, therefore, in experimenting with silver is, keep the ammonia (and its salts) out of its way.

Savannah, Ga., October, 1858. L. K.

A Novel Steamer.

Some of our cotemporaries announce that Messrs. Winans, of Baltimore, Md., have just constructed a steamer which is intended to surpass in swiftness every craft that skims the seas, because she is designed to plow through the waves, and not take the trouble of rising and falling with them. This vessel is 170 feet long, and tapers to a wedge edge at both stem and stern. It is to be driven with one large center wheel having diagonal paddles, and to have very powerful engines in proportion to the tunnage. Diagonal paddles and center wheels are not new, and unless it be in the model of this steamer, we cannot perceive from the descriptions published concerning her, anything novel, or any point on which to base conclusions for greater speed than is attained by other steamers.

Useful Receipts.

Oil Varnishes.—No. 1.—Every person should know how to make these preparations for rendering objects waterproof. Linseed oil is the best to use for this purpose; but as it dries with some difficulty, and is liable to become sticky, it requires to be treated in such a manner as to partially oxydize it, after which it dries quickly, and forms a most excellent varnish. Take a gallon of pure linseed oil, and boil it over a gentle fire for about one hour, adding gradually four ounces of sugar of lead, or litharge, or the oxyd of manganese, or the sulphate of zinc—any one of these will answer—but they must be added cautiously, and the oil stirred well while the oxyd is being fed in. The clear of this is the varnish, the sediment should be mixed with paint. Silk or cotton cloth receiving several coats of this varnish becomes completely waterproof.

No. 2.—Take a gallon of pure linseed oil, and add to it two ounces of sulphuric acid; stir well, put it over a gentle fire in a proper vessel, and boil it for one hour. When cool it is fit for use. The sulphuric acid renders the oil quick drying, and removes its *tacky* character. This is a good recipe for painters, and manufacturers of oilcloth.

No. 3.—Take one gallon of linseed oil, and add to it about one pound of the flowers of sulphur, and boil for one hour. This is, perhaps, the best oil, or any other kind of varnish of waterproof coating, for outside work, such as porous stones or bricks which imbibe moisture. It will also render statues or other works of plaster of Paris impervious to moisture, and enable them to stand exposure to the weather. It is an excellent preservative oil varnish, and one of the most simple to make.

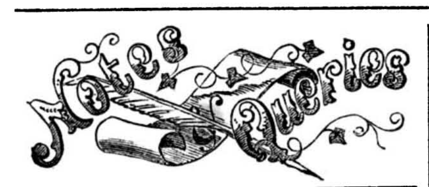
During the time any of these varnishes are boiling, fine shreds of india rubber may be added, and will be dissolved, and render the varnish much thicker, and superior for some purposes. In boiling oil care must be exercised not to allow the fumes to come in contact with flame, or they will take fire. The oil is also liable to fume over when the sugar of lead is added, hence the necessity of stirring well at that particular period. Turpentine renders oil *drying*, but it also injures, in a great measure, its durable qualities, by imparting to it a partly saponaceous character. The smallest amount possible of turpentine should, therefore, be used in oil varnishes or paints.

Copal Varnish.—Take one pound of gum copal, fuse it in an iron vessel over a fire, then add one pint of hot drying oil, like No. 1 varnish, and stir all well until the gum is dissolved among the oil, and the varnish becomes stringy. When cool it is thinned with turpentine. All varnishes improve with age when kept in close vessels. Copal varnish is employed for japanning tinware.

Crystal Varnish.—This beautiful varnish, which is used for maps, prints, and drawings on paper, is made by dissolving pure Canadian balsam in rectified spirits of turpentine. Equal parts of the balsam and turpentine are mixed together in a bottle or stoneware vessel, which is set in hot water, and kept in a warm situation for about a week. During this period it should be frequently agitated.

A Black Japan Varnish.—Bitumen, 2 ounces; lampblack, 1 ounce; Turkey umber, ½ ounce; acetate of lead, ½ ounce; Venice turpentine, ½ ounce, boiled oil, 12 ounces. Melt the turpentine and oil together, carefully stirring in the rest of the ingredients, previously powdered. Simmer all together for ten minutes.

Hair Lotion.—Take one pint of alcohol and two ounces of castor oil, and shake them together for fifteen minutes in a bottle. It will then be found that the alcohol has dissolved the oil, and the combination of the two makes a very excellent lotion for the hair. It can be perfumed with a few drops of the essential oils.



** 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.

W. H., of N. Y.—We have no formulary for calculating the horse power of belts, and we believe it will be difficult to find any reliable rules for the purpose, because any belt can be made to transmit more or less power with the same velocity according to the pressure of the tightening pulley.

S. W., of Iowa.—You can keep up your window sash without the ordinary lines and pulleys by boring three or four holes in the sides of the sash, into which insert common bottle corks projecting about the sixteenth of an inch. These will press against the window frames along the usual groove, and by their élasticity support the sash at any required hight.

G. C. T., of Pa.—The only way to clear a cellar of water which cannot be drained is to pnmp it out, then you should make a floor of hydraulic cement, and also coat the walls so as to prevent the future ingress of water. The anastatic process of printing would take up too much space to describe in this column.

G. B., of N. T.—When a magnetic needle is placed above or below a telegraph wire, it immediately deviates from its meridian, according to certain laws, and tends to place itself at right angles to the wire. This was discovered by Oersted in 1819. The person to whom you refer, who pretends he has just made such a discovery, is a Rip Van Winkle.

A. D. S., of Fulton.—The plan you propose for improving axle boxes is novel to us, and we believe a patent can be secured for it, if you can demonstrate its utility. We intended to write you, but know not the State in which you reside, as there are sixteen Fultons in the United States.

Pittston.—A letter from this place cannot be answered for want of the writer's name.

M. S., of N. Y.—You had better go to Auburn and examine Hutchinson's portable saw mill. We believe it is a good mill, and that it will answer your expectations.

INVENTOR.—The first patent granted by the United States of which there is any record was issued April 20, 1796, to Thos. Bidwell, for an improvement in forming yellow color. It was signed by Washington, Jefferson and Charles Lee. The next is dated Feb. 11, 1808, issued to Christian Jacob Hutter, for "a method of making brandy out of all kinds of grain or fruit equal in flavor, taste and color to the best imported French brandy."

R. C. S., of S. C.—You suggest that the difficulty with the Atlantic cable may be the pressure of the ocean through the pores of the gutta percha, thus injuring the insulation. We pointed out the possibility of such a contingency on page 29 of our last volume. At the depth of two miles the pressure on the square inch is over 4,000 pounds.

R. L., of S. C.—A tubular hydraulic telegraph is an old idea; it is inapplicable for ocean or land telegraphing.

B. S., of Md.—Your articles are ready to be set up, and we have prepared the engraving for the last one. In a week or two, at farthest, we shall commence their publication.

J. McB, of Mo.—Backlash is a technical term employed to denote counter resistance in machines, such as the back pressure of steam on a piston. It is not applied to the simple leakage of pistons, or loose parts of machinery, which merely cause increased friction or a loss of steam. It is not in any of the dictionaries known to us.

N. W. W., of N. Y.—The information received from those connected with the Atlantic Telegraph makes it appear that the currents sometimes pass very regularly for hours; then again they will cease entirely for days; and again they will be very feeble, and anon very strong. It is not easy to account for these phenomena; not as you suggest by a break of the conducting wires.

A. W., of Ill.—A "result" is not patentable except as "a new article of manufacture." A patented machine which embraces the means, devices or arrangements, for producing a certain result, does not cover the result itself; therefore a machine accomplishing a similar result in an entirely different manner is patentable, and does not infringe the rights of the other patentee. The second patent must not be a colorable evasion, but a substantially different invention.

SEA WATER.—Wherever there is shallow water, green will be produced by the underlying yellow sand, which, even in the absence of verdure on the shore or seaweeds beneath, always imparts a greenish tinge to the sea. The blue of the sky and the yellow of the sands meeting and intermingling in the water, form the green of the sea; the water acting as the medium in which the mixing or fusing of the colors takes place.

W. C., of N. Y.—Phosphorus is an animal production, and iodine a vegetable one. Phosphorus is the base of an acid found in bones, and the oxygen is detached by charcoal at a red heat. Iodine is procured from sea-weed. It is of a violet color, and evaporates very easily. It changes vegetable blues to yellow: is valuable as a medicine, and is much used for scrofulous complaints.

F. H., of Conn.—The Supreme Court of the United States, in the case of Hotchkiss vs. Greenwood cited in Howard's Reports, has clearly decided that the substitution of one material for another, even if the new material be better adapted to the purpose than the old, is not patentable.

D. B. C., of N.J.—You must be your own judge as to the propriety of paying $15 for a superior engraving of your machine, and having it appear in a paper of 20,000 circulation, or to paying $10 for an inferior one, and have it published in a journal of only one or two thousand circulation. We do not insert engravings which have appeared in other American journals.

E. B., of Ohio.—If, according to your theory, the neucleus of a comet is a translucent sphere, and the tail produced simply by the sun's rays passing through the meridian, the same as through a lens, what is to become of the various comets which have no specific nucleus? Of course, if you were correct, there could be no such comets as that of Bruhn's.

H. J., of Ill.—Many persons injure their skin by applying cosmetics prepared by ignorant and dishonest persons, therefure you should beware. Spirits should not be applied to the skin as a practice. You can make a safe and excellent cosmetic where the skin requires a gentle stimulant as follows:—Take one ounce of scraped horseradish, and infuse for four hours in one pint of cold milk. Strain through muslin and settle, and apply with the hand or a piece of soft toweling.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, October 9, 1858:—

A. L. B., of Vt., $30; M. & E., of Ill., $25; W. T., of Ill., $25; P. B., of N. Y., $30; J. T., of N. Y., $45; W. D., of N. J., $20; I. R. & H. M. B., of N. Y., $55; J. L. W., of Ohio, $25; S. & B., of Ind., $30; A. L., of N. Y., $25; F. W., of ——, $15; J. O., of Pa., $25; C. M., of N. Y., $45; J. L., of Ind., $11; J. C., of Mo., $30; J. H. F., of Vt., $30; J. H. T., of N. Y., $100; W. H. R., of Fla., $250; P. B., of N. Y., $30; A. W. L., of Mass., $25; T. H. M., of La., $30; A. A., of N. Y., $30; J. B. S., of Conn., $30; H. H. G., of La., $35; J. A. E., of N. Y., $25; B. F. S., of Pa., $25; F. B. N., of N. Y., $250; W. H. B., of N. Y., $30; McD. & M., of N. Y., $32; W. & B., of Iowa, $25; W. Van D., of Pa., $60; S. M. B., of La., $25; O. B. T., of Ohio, $35; A. H. G., of N. Y., $25; J. A. W., of Iowa, $25; D. V., of Ohio, $25; W. & T. S., of N. J., $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, October 9, 1858:—

W. T., of Ill.; J. A. E., of N. Y.; M. B., of La.; J. L. W., of Ohio; S. M. B., of La.; C. M., of N. Y.; J. A. W., of Iowa; J. L., of Ind.; J. W. H., of L. I.; McD., & M., of N. Y.; D. V., of Ohio; J. E. S., of Me.; J. W. S., of Ohio; W. & T. S., of N. J.; A. H. G., of N. Y.; J. E., of N. Y.; M. & E., of Ill.; W. H., of Mass.; W. & B., of Iowa; W. Van D., of Pa. (2 cases); P. L., of N. Y.; O. B. T., of Ohio; A. W. L., of Mass. J. J. H. B., of France; J. T., of N. Y.

Literary Notices.

BLACKWOOD'S MAGAZINE—Published by L. Scott & Co., No. 54 Gold street.—The number for this month of this able magazine contains Bulwer's tale, "What will he do with it?" continued; and a very scientific essay on "Respiration and Suffocation." It contains several other articles of more than ordinary merit, among which is a new tale called "The Light on the Hearth."

THE DEMOCRATIC AGE—Edited by C. Edwards Lester, No. 40 Park Row. New York.—This new magazine and review contains many excellent articles, and the first number promises well. It is published monthly, each number containing about 80 pages, and the terms are only $3 per annum.

THE AMERICAN JOURNAL OF PHOTOGRAPHY AND THE ALLIED ARTS.—The title of this publication fully indicates its nature and character. It is edited and published semi-monthly by Charles A. Seely, practical chemist and manufacturer of materials employed in the photographic art. It contains all the useful information to be had in reference to the progress of this beautiful art. Terms, $1 50 per annum. Office, No. 424 Broadway.

VALUABLE HINTS TO OUR READERS.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fifteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

BINDING—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

Science and Art.

Peculiarities of Color and Temperature of the Ocean.

It is a commonly observed fact that the usual color of the ocean is a bluish green, of a darker tint at a distance from land, and clearer towards the shores. According to Dr. Scoresby, the hue of the Greenland sea varies from ultramarine blue to olive green, and from the purest transparency to great opacity. The surface of the Mediterranean, in its upper part, is said to have, at times, a purple tint. In the gulf of Guinea the sea sometimes appears white, about the Maldive islands black, and near California it has a reddish appearance. Various causes must, of course, co-operate to produce this diversity of tint. The prevailing blue color is generally ascribed to the greater-refrangibility of the blue rays of light, which, by reason of that property, pass in greatest abundance through the water. The other colors are ascribed to the existence of vast numbers of minute animalculæ—to marine vegetables at or near the surface—to the color of the soil—the infusion of earthy substances—and very frequently the tint is modified by the aspect of the sky. The phosphorescent, or slimy appearance of the ocean, which is a common phenomenon, is also ascribed to animalculæ and to semi-putrescent matter diffused through the water.

The temperature of the ocean also exhibits some peculiar and interesting phenomena. Within the tropics the mean temperature at the surface is about 80° Fah., and generally ranges between 77° and 84°. At great depths the temperature is probably nearly the same under every latitude. In the torrid zone it is found to diminish with the depth, while in the polar seas it increases with the depth; and about the latitude of 70° it is nearly constant at all depths. But the small number of observations which have yet been made on this subject do not indicate any uniform law, according to which the variations of temperature at different depths is regulated.—*Ex.*

Improved Carriage Shafts.

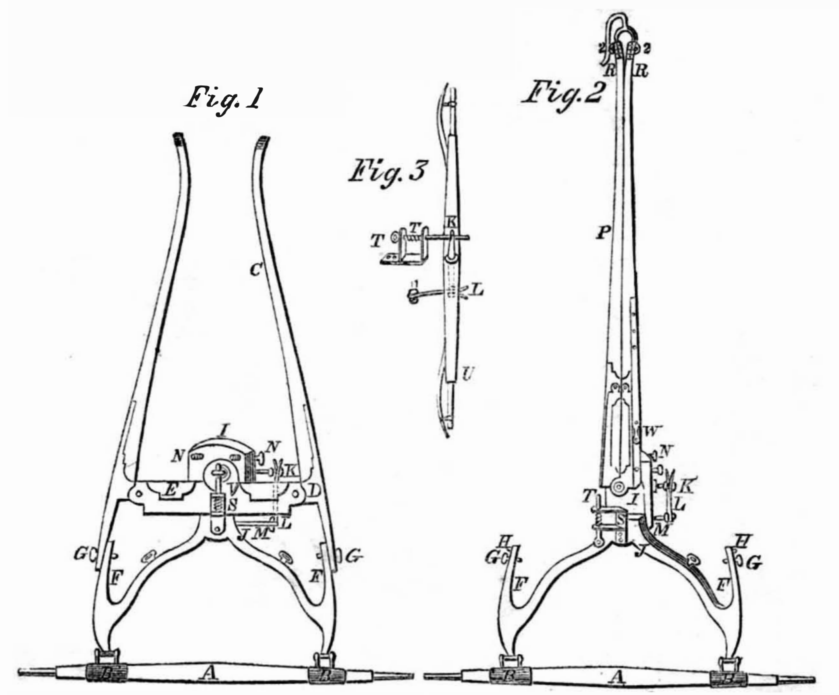
This invention is designed to enable one or two horses to be attached to a vehicle, the shafts being capable of being made into a pole by simply closing them.

Our illustration and description will fully elucidate the invention, Fig. 1 being the arrangement as shafts, and Fig. 2 as a pole. Fig. 3 is the shaft and pole attachment detached.

A represents the carriage axle, and B the clips, to which the shafts are usually attached. C are the shafts, having an iron knuckle joint, D, at each side, by which they are connected to the cross piece, E. The front end of joint D, is permanently screwed to the shaft, and the other end extends back to the pole bar point, F, where it is attached by a thumb screw, G, and pin, H. I represents the iron plate, which is fastened to the front end of pole bar, J. Through the center of the plate, I, is a main bolt, K, which is held down at its lower end by a forked spring, L, the spring being attached at its back end to the pin, M. N N are two thumb screws near the front of the plate, for the purpose of being screwed up against the shafts, C, to tighten them when they are closed together and form the pole, P. At the front end of the pole is a hook, having two eyes, 2, and its points, R, fitting into the ends (in a socket) of pole or tongue, with a shoulder on each, so that the horses can be hitched by the pole straps to the eyes, 2, to hold back the carriage, but in case of the horses becoming unruly and running off, they are detached from the swiveltree behind, and in moving forward the hook slips out, and frees the horses from the pole.

S represents a plate with two uprights, through which a disconnecting pin with a spiral spring, T, passes. This pin, T, is intended to hold the swiveltree, U, in its place. The bolt, K, is pressed upwards by the operator through the center of the swiveltree, U, and then the pin, T, is forced forward by its spiral spring through an eye in the upper end of bolt, K. The swivel or doubletree, U, is thus fastened, but in the event of the horse or horses running off, the driver pulls a strap which is attached to the head of the pin, T, and as the pin, T, is drawn back, the bolt, K, falls down, and the swiveltree is instantly disengaged, and the horse is at once loosed from the carriage. The cross-piece, E, has a joint, V, in its center, and the bolt, K, passes through the joint, V. When the ends of the shaft at its connection, F, with the pole bar, J, are unscrewed by the screw, G, the shafts will operate and close at the joint, V, and the ends of shaft will hook on to the thumb screws, W.

HOFFMEIER'S SHAFTS FOR VEHICLES.



They are the invention of A. K. Hoffmeier, of Lancaster, Pa., and were patented by him September, 7, 1858. He will be happy to furnish any further information upon being addressed as above.

Wells' Belt-Shipper.

The ordinary belt-shippers are by no means secure, and the belt which drives machinery from a main pulley has often become changed from a "fast" to a "loose" pulley by accident, thus causing serious consequences to the piece of wood or metal being operated upon, and the machine tool then in use. To prevent any future accidents of this kind, Morris Wells, of Brooklyn, E. D., in this State, has invented the belt-shipper which is the subject of our engraving, and at the same time to furnish a cheap and sure belt-shipper, that can be depended upon in all cases. It is simple, small, and compact.

Fig. 1

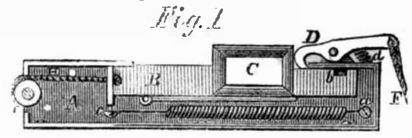
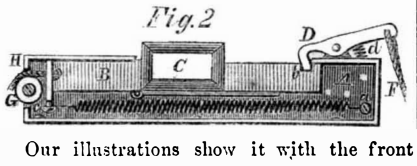


Fig. 2



Our illustrations show it with the front plate off, that its working parts may be seen, Fig. 1 being as it would keep the belt on one pulley, and Fig. 2 as it would keep the belt on the other.

It consists of a cast iron box, A, in which the bolt, B, is free to slide back and forth on a projecting piece cast with A, and seen under it. The case, A, can be secured by screws to any beam or piece of metal or wood over which the belt may pass, at any angle, or in any position to suit the direction of the belt. In B is a square slot, C, rounded on its interior surface, so as not to cut the belt which passes through it.

The operation is simple. Suppose the belt to be on the loose pulley, and the shipper in the position seen in Fig. 1, the bolt, B, would be held securely in that position by the spring which is attached to it at *c*, and to the box at *a*. When it was desired to run the machine, the cord, H, which may be of any length, and conveyed any distance, and which passes over the small pulley, G, in the box, must be pulled, and the spring would be distended, while the bolt would assume the position shown in Fig. 2, and there it would be held by the end of catch, D, being forced into slot *b*, of the bolt by the spring, *d*; this brings the belt on to the fast pulley. Should it then be convenient to stop the machine, the cord, F, must be pulled. This depresses one end of the catch, and elevates the other, releasing the bolt, which the spring draws back, and with it the belt, on to the loose pulley of the machine.

This is an addition to the machine shop that has long been wanted, and we are happy in being able to recommend this invention. It was patented February 2, 1858, and the inventor will furnish any further information upon being addressed as above.

Curing Hams.

As the time is at hand for preparing these useful stores of rich and savory food, a few words will not be out of place in regard to them. The legs of hogs, short in the hock, are the best for hams, and should be chosen in preference to lanky legs. They may be salted by immersion in a clean pickle, containing a little sugar and saltpeter dissolved, or they may be salted by rubbing ground solar evaporated salt over them, turning them every day, and giving them a good rubbing. A little sugar and ground black pepper added to the salt will much improve the flavor of the meat. It requires about a month to salt hams by the wet process, and three weeks by the dry system. At the end of this period, they should be hung up for a few days to drip, and then they are ready for smoking. Much depends on the kind of material used for smoking them, so as to secure a sweet flavor. Whatever fuel is used for this purpose, one condition should never be overlooked; it should be perfectly dry, or else it will be liable to impart a bitter taste to the meat. Dry corn cobs, and some dry sweet hay are superior to all other agents that we have seen employed for smoking beef and hams.

Mutton hams may be prepared in the same manner as those of pork, and they are exceedingly palatable when the meat is good, and care exercised to smoke them slowly.

First Employment of Coal as Fuel.

As an evidence of the vast difficulty experienced by introducers of new articles, from the prejudices of a community alone, we may mention a fact in relation to the employment of the useful material of coal as a fuel. When coal was first introduced into England as a fuel, the prejudice against it was so strong that the Commons petitioned the Crown to prohibit the "noxious" fuel. A royal proclamation having failed to abate the nuisance, a commission was issued to ascertain who burned coal within the city of London and its neighborhood, and to punish them by fine for the first offence, and by demolition of their furnaces if they persisted in transgressing. A law was finally passed making it a capital offence to burn coal in the city, and only permitting it to be used in the forges in the vicinity. It is stated that among the records in the town of London, a document was once found purporting that in the time of Edward I. a man had been tried, convicted and executed for the crime of burning coal in London! It took three centuries to entirely efface this prejudice.

SPONTANEOUS COMBUSTION.—A material much used for flooring and roofing in Europe, and called "asphalted felt," has on various occasions been found to be on fire. All such materials as are composed of organic fibers mixed with hydro-carbons should be carefully used, as they are all liable to become ignited from chemical decomposition.