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Geological Discoveries.

At a meeting of the London Geological Society, held in the 7th of last month, Prof. Owen, the eminent Zoologist, read a paper on the remains of a new species of mammal obtained from the Eocene tertiaries of the Isle of Wight.

The Professor founded his description of the animal chiefly on the jaw and teeth, which presented characters intermediate between those of the hog and the sheep. The Professor remarked on the immense void which existed between the pachydermata of Cuvier, and the ruminantia of the same author. Amongst animals of nearly the same size, the pig may be taken as a type of the pachydermata, thick skinned animals, and the sheep of the ruminantia, or ruminant quadrupeds. Although both these orders are hoofed, yet there are many striking distinctions between them, and judging only from the living creation, nature seems to have jumped at once from the sheep with its four stomachs, and harmless grass-eating teeth, to the pig with its omnicarnivorous habits and truly canine teeth. Many fossil forms which have been brought to light by Cuvier and others, from tertiary formations have supplied links which are wanting between these two classes of animals.

Professor Owen described this intermediate form under the name of *Dochodon arspidatus*. Several jaws of this quadruped had been found, one jaw being in the collection purchased from the Marchioness of Hastings, for the British Museum, and another having recently been discovered by Dr. Wright, of Cheltenham. The earlier specimens had caused the animal to be classed with the hog tribe, but the immature jaw discovered by Dr. Wright completed our knowledge of the dentition, and showed the animal to be intermediate between the pig and the sheep.

Hitherto no traces of a ruminant animal had been discovered in older strata than the Miocene, and Cuvier, in the Paris Basin, had brought to light no ruminant of a date so old as the Eocene or lower tertiary. Hence the interest of the present discovery, which affords ground for believing that animals closely allied to the ruminants were in existence in the lower tertiary period.

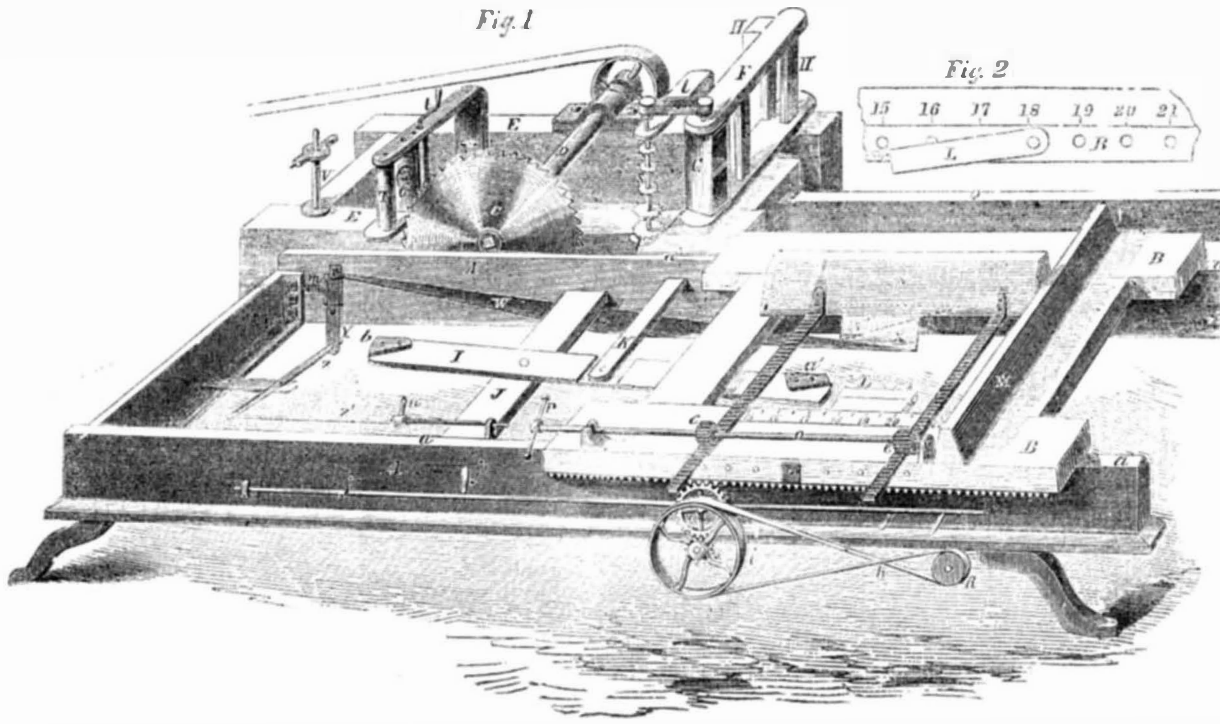
Steel from Oxyd of Iron.

At a recent meeting of the Cleveland, (O.) Academy of Natural Sciences, Colonel Whittlesy presented specimens of steel manufactured directly from pure iron oxyd, at the Sharon Iron Works, Mercer county, Penn.—This steel presented a finer fracture than that of blister steel. Col. W. stated that this article could be made at an equally low price with common wrought-iron, or nearly so.

Cultivation of Chicory.

Great quantities of chicory root, ground and prepared for use, are now imported from Europe. All the Germans in our cities use it in their coffee, and, it is said, to improve its flavor, while it is, at least, as healthy, and is much cheaper. It can be cultivated in almost every State, and no doubt would be a profitable crop.

MANUFACTURING AND MARKING HOOPS.



In the accompanying illustration, figure 1 is a perspective view of a machine for manufacturing sawed hoops from bolts of wood; and figure 2 is a section of part of the machine, representing the shipper arm, L, and a part of the carriage.

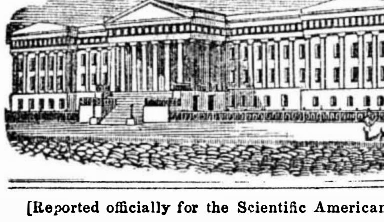
The hoops made in this machine are formed with a *chamfer* at each end. All kinds of hoops—broad, narrow, short, and long—can also be made by it, and they can be formed with characters, names, brands, and numbers printed on one side.

The machine consists of the following parts, indicated by letters of reference. A A is the carriage frame, which may be made of iron or wood. B B is the bolt carriage, and *a a* are ways on which the carriage B is placed, and moves freely back and forth. C is a circular saw on an arbor D, which runs in bearings on the saw frame, E E. F is a sliding frame on the saw frame, E; it slides back and forth thereon, and is kept in its place by brackets or studs, H H. G is an upright rotary planer, in frame F. I is a lever placed under the carriage, B, and pivoted near its center on the cross-piece J. K is an arm attached at one end to the lever, I, and passing through the frame, A, and is made fast to sliding frame F. On each end of the lever, I, a beveled or oblique projection is placed, seen at *a' b*. L (figure 2) is an arm attached to the inner side of carriage B. M is a cross-piece or head-block of wood, made fast to and across the carriage. N is a bar of wood placed on and lengthwise of the carriage, to which two transverse racks are attached at one side. O is a shaft, on which two pinions, *e e*, are keyed, and which gear into these racks. P is a lever or a hand wheel on the end of shaft O. Q is a rest placed in front and parallel with carriage B. This rest is hinged at the bottom, to admit of its being turned down out of the way, to facilitate the placing of the bolt on the carriage. R, *h*, *g*, *i*, and *f*, are pulleys, and gear wheels, with belts, for feeding up and running back the carriage, B. *j* is a rod on the side of frame A, with a handle, *j'*, by which a driving belt, under the machine, is shifted, to give a forward or reverse motion to pulley R, to feed or run back the carriage, B. S is a small upright arbor between the planer, G, and saw, C. On this arbor several small saws are placed, about three inches in diameter, and adjusted at any distance apart that may be desired. This arbor is supported in brackets, *l*, which are bolted to frame E. T is a small upright roller, placed in rear of the saw, C. Close to this is placed a larger roller or cylinder, U, having in its surface a recess, wherein are placed the dies or types of the characters desired. In rear of the cylinder, U, are placed three small rollers, for inking the dies or types, in the cylinder. On the top of these rollers is a small crank, *t*, to enable the operator occasionally to revolve the same and spread the ink; or a motion for this purpose may be given to them by a small band. V is a small upright rod, passing down through frame, E, to the upper end of which a socket, holding a pencil, is made fast. W is a small lever, placed snugly against the inside of frame A, and pivoted at or near its center. One end of this lever is bent at right angles, and passes through a slot in the frame A at *m*. On this end, so projecting, the pencil-rod, V, rests. X is an inclined plane, on lever W, and X' is a similar one on the under side of the carriage B. Y is a catch pivoted to frame, A, and pressed up by a spiral spring, *m*. *z* and *z'* indicate a small lever and rod attached to catch, Y. On the rod, *z'*, is a dog, *n*, adjusted by a set screw.

The operation is as follows:—The bolt from which the hoops are to be cut, is got out the proper thickness, and placed on the carriage, B—its rear end against the head-block, M, and in front of and against the bar, N. The rest, Q, being now turned upright, the operator moves the hand wheel, P, and by the action of the pinions, *e e*, on the racks, the bolt is moved snugly against rest Q. Feed motion being now given to the carriage, the bolt is moved towards planer G, and as the carriage is thus moved, the planer consequently makes a deep cut at its commencement; the arm, L, then immediately strikes against the projection, *a'*, and moves the lever, I, and—through the arm, K—the sliding frame, F, and the planer, G, are gradually thrown back a certain distance. This movement of the planer causes the inner end of the bolt to be cut of a taper form. The saw, C, now enters the bolt, and cuts a strip the necessary thickness therefrom; the planer, G, has now no lateral movement, but it rotates and planes the side or face of the bolt, which is, of course, the outer side of the strip when sawed off from the bolt. As the rear end of the bolt approaches the planer (and at the proper time) a pendant, on the front end piece of carriage B, strikes the projection, *b*, on the other end of the lever, I, and the planer is moved gradually inward, so as to cut the rear end of the bolt in taper form. As the cut strip passes the saw, C, it enters between the roller, T, and the type cylinder, U. This cylinder, by the forward movement of the carriage, and at the proper time, is caused to turn, bringing the dies against the face of the hoop, and thus impressing thereon the characters desired. When the hoop has advanced the proper distance, the arm, L, according to the point at which it is set (fig. 2,) strikes the dog, *n*, on the rod, *z'*, and throws back the catch, Y, when the end of lever W, with the pencil-rod, V, drops, whereby the pencil mark (which is requisite in bending the hoop to the size desired.) is made with the utmost exactness. The saw, C, finishes its cut, the hoop is removed, and the carriage, with the bolt, returns to its former position. As the carriage runs back, the type cylinder, U, is turned to its first position, bringing the dies against the inking rollers. At the same time the pencil-rod is raised by the action of the carriage on the incline, on lever W, and held up by catch Y. When narrow hoops are wanted, such as barrel hoops, &c., the arbor, S, is used, and as the bolt passes the planer, G, these saws cut a trifle into the side or face of the bolt, and when the saw, C, completes its cut, as many hoops as the width of the bolt will allow, are finished at once. When wide hoops for cheese boxes, bushel and other measures, sugar boxes, &c., are wanted, the arbor, S, with its slitting saws, is removed. A scale of the different sizes of hoops made is placed on the carriage, as a guide in adjusting the arm, L; and thus the tapering and marking is insured at the proper time to form a hoop of the size corresponding with the number on the scale at which the arm is set. The saw, C, is driven by the belt, A', and the planer, G, by a belt applied at the bottom or top, as may be most convenient. The little arbor, S, may be driven from the planer, G, as shown.

The machine is simple, and not liable to get out of order, and does its work in the most accurate and expeditious manner, and will work timber that cannot be used by the ordinary method. As these hoops are of equal thickness throughout, they are consequently of an uniform strength.

A patent was issued for this machine to C. H. Brown, of Forest Port, N. Y., on the 16th of December last, from whom more information may be obtained by addressing him by letter.



[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 3, 1857.

SEWING MACHINES—Elisa Alexander, of New York City: I claim combining the mechanism of the guiding and conveying rollers, a and c, with the mechanism operating a sewing machine having an independent feed, in such a manner that the said rollers shall guide automatically the finished work away from the machine in a straight line, by revolving in opposite directions with a speed regulated by that of the machine.

EXCAVATING AND DREDGING MACHINES—Jonathan R. Anderson, of Chicago, Ill.: I claim the so arranging of the dipper with a traveling carriage, as that they may be automatically moved in and out on the arms, for the purpose of ensuring the filling of the bucket when the material to be excavated is hard, as set forth and explained.

I also claim, in combination with the lever, p, the sliding piece, U, clutch bar, T, and pawl, r, with their several appliances, so that by a single lever the attendant has entire control of the machine, as set forth.

COUPLING FOR R. R. CARS—Edward H. Anderson, of Milford, Del.: I do not claim spring catches for couplings.

Nor do I claim the principle of self-separation when the cars get off the track.

But I claim the special mode set forth of effecting the self-coupling and self-uncoupling by the combined action of the following parts, to wit, catches, a a, b It, b, with its rounded end bolt, c, with its concave end, jointed arms, d d, and spring catches or jaws, e e, all constructed and operating as set forth.

FILING SAWS—A. M. Beardsley, of Constantine, Mich.: I claim the two files, H I, arranged as shown, and attached to the reciprocating bed plate, E, which works between guides on a movable or adjustable plate, B, the bed plate, E, being operated by the lever, F, or its equivalent, and the plate, B, by the lever, J, substantially as shown for the purpose specified.

[Two files are employed in this machine, one for sharpening the under, and the other—which is inclined—the upper sides of the saw teeth. The saw is sharpened by merely operating the bed to which the files are attached. Guides are employed to direct each file to operate correctly. This improvement is simple and good. Both sides of the saw tooth are rapidly operated upon at once, and with great precision.]

SEED PLANTERS—Levi Beemer, of Libertyville, N. J.: I claim a combination of triangular seed boxes located upon the sides of the drive wheel, as specified, with the measuring keys, E E E, operated by the cams, J J, to admit the seed into the depositing cups, G G G.

COUPLINGS FOR WAGONS—Jacob Boyers, of Grandville, Va.: I claim in combination with the ordinary coupling pole, C, of a wagon the rod, bar, or pole, H, connected to the front axle, and passing through the bow or hounds, G, and through the rear axle, for the purpose of causing the rear wheels to track after the front ones, and so that the two axles can be coupled shorter or longer, without in any way affecting the proper tracking of the wheels, as set forth.

LARD LAMPS—J. S. Brown, of Washington, D. C., assignor to Joseph Kent, of Baltimore, Md.: I claim the loose ring, d, in combination with the brush of wires, for the purpose set forth.

ANVILS—Otis Brigham and Seth E. Brigham, of Fitchburg, Mass.: We claim combining with the anvil the secondary movable grooved horn and mechanism for confining the latter to the former, the grooved horn being for purpose as specified.

CLEANING COTTON—Francis A. Calvert, of Lowell, Mass., and Charles G. Sargent, of Westford, Mass.: We claim, first, the described arrangement of the cylinders, D E and E, the guard, G, and the diaphragm, L, whereby the motes and dirt removed by the guard, G, are thrown back upon the first cylinder, in the manner and for the purpose set forth.

Second, the grating, P, beneath the brush, I, which takes the material from off the fine tooth cylinder when the brush is placed over the cylinder, E, whereby the fly is either again carded onto the cylinder, F, or is recovered upon the surface of the perforated cylinder, R, the dust all passing through this cylinder, in the manner substantially as set forth.

WINDOW BLINDS—Alexander M. Cochran, of New York City: I claim, first, the fitting of the tenons in one side of the blind to oblique slotted mortises, b b, and securing them all in place by a long rod or wire, d, substantially as and for the purposes described.

Second, effecting the connection between the slats, D D, and rods, E E, by making the rods of metal tubing, with slits, s s, providing ears, f f, to enter the said slits, s s, and passing a wire, g, through the tubular rods and the ears, f f, substantially as and for the purpose specified.

Third, the confining of the slats in a closed or open condition by means of bail-shaped bars, F F, applied and operating as described, in combination with notches, h i, in the backs of the rods, E E, as set forth.

[The object of this invention is the construction of iron blinds with movable slats, like those in common use.—Ingenious means are embraced in the patent for fitting and securing the slats in the frame for connecting the slats and rods, for locking them when closed, and securing them in an open position, also for putting them in and taking them out with facility for repairing. This useful invention applied to houses, while it has the same advantages as the common blinds, is superior to them, because these iron blinds are fire-proof, and have slats that can be easily repaired if injured.]

SHAKER BARS—George W. Gardner, of Troy, N. Y.: I claim the shaker bar, E, with the fulcrum, f, or its equivalent, as described, for the purpose of revolving the grate without the usual slot in the stove, and confining the ashes in the stove, as set forth.

SOWING GRAIN AND FERTILIZERS—J. C. Gaston, of Reading, O.: I claim the arrangement in machines for sowing grain and fertilizing materials, of a reciprocating feed bar, D, at the required distance from the bottom of the hopper, for equalizing the supply of grain or fertilizing substance to the escape valves, c, and securing to said bar, hooks or slides, by which the grain or compost is agitated and caused to escape, either in a continuous supply or at intervals, substantially as described.

SEED DRILLS—Oliver C. Green, of Worcester, Ill.: I claim the arrangement of the oscillating armed disks, F, concave, h, and guide ways, i, in combination with the aperture, g, of the hopper, in the manner substantially as set forth.

PUDDLING FURNACES—Jacob Green, of Philadelphia, Pa.: I do not desire to confine myself to any particular length of furnace, or to the number of openings, a a a, as four or even five on each side might be employed.

But I claim the constructing of puddling furnaces with any convenient number of openings or working holes on each side, and a fire place at each end, the bed of the furnace being common to both fires, and the whole being arranged and constructed substantially in the manner set forth and for the purpose specified.

FORGING GUN-LOCK SPRINGS—George P. Foster, of Bristol, R. I.: I claim operating the rolls by means of the cogged segment, D, wheel, C, and spring, F, in the manner and for the purpose substantially as set forth.

ADJUSTABLE SEATS FOR CARRIAGES—George and David Cook of New Haven, Conn.: We claim constructing, attaching, and locating the seats so as to preserve the perfect symmetry of the carriage whether it be used with one or two seats, without any necessity of securing the movable seat, when the whole is constructed and arranged and made to operate substantially as described.

CUTTING VENEERS—Peter Cook, of Tonawanda, N. Y.: I claim the swinging box or head formed of the plates, i i, said box or head working over concave beds, B B, and cutters, C C, when the above parts are arranged substantially as shown, to allow the bolt, F, to feed itself to the cutters by its own gravity.

[In this machine for cutting veneers the bolt of wood to be cut is fed to the cutters by its own gravity on a swinging frame, thus saving a great deal of power in feeding the timber, while at the same time it cuts out the veneers or thin boards with great facility.]

HARNESS HAMES—Homer Compton, of Wells' Corner, Pa.: I am aware that spring plates, catch plates, and bolts of various forms have been and are used on railroad cars for coupling the cars together, and I therefore distinctly disclaim such parts in themselves considered, or in combination with each other.

Examples of such devices may be seen in the rejected applications for patents of B. Joslin, V. Mitchell, and J. McCallum.

Neither do I claim the indiscriminate fastening together or coupling of objects by means of spring bolts, spring plates, and catch plates.

Neither do I claim the substitution of such devices for straps and buckles in harness.

But the combination with the hame of a spring bolt, a catch plate and a spring plate, as described, is, to the best of my knowledge and belief, a new combination, and therefore, I limit myself to the special combination with a harness hame, A', of a spring bolt, h, a catch plate, e, and a spring plate, m, substantially as set forth.

[This improvement affords greater facility for clamping and unclamping hames on horse collars. A spring bolt, catch, and a spring slide plate, are ingeniously so arranged as to effect the object stated.]

SMITH'S FORGE—John W. Crannel, of Olivet, Mich.: I claim the use of two hollow sectional nozzle pieces, H H, moving at right angles in a two-way groove formed by the chamfered ribs, G G G G, fig. 1, in combination with the two-wayed slotted opening, K, in the hearth plate, fig. 2, formed and bounded by the stationary rims, J J, and the chamfered corner block, L, whereby the moving nozzles can slide past each other and form a continuous joint in any position.

TENONING SPOKES—John J. Croy, of Caledonia, Mo.: I do not claim the use of a screw to hold the spoke against the interior of a tube or other surface.

Neither do I claim broadly the use of a revolving cutter head to cut tenons upon spokes, the spoke being held stationary.

Neither do I claim any portion of my device, as described, which is seen in John McCune's patent of June 6, 1837, or any part which exists in any other machine or instrument for cutting spokes.

But I claim, first, the employment of a tube, A, for holding the spoke while the tenon is being cut.

Second, the combination of an adjustable end-piece or bed, C, with the tube, A.

Third, the employment of an adjustable clamp cutter-head, F F', all the parts being constructed, arranged and operating as set forth.

[In this machine the spoke to be tenoned is held in a tube, which affords a solid bed, whereby the spoke is held firm to the action of the revolving cutter, no matter how small its diameter or how hard may be the timber. A proper dish-shape is given to the shoulder of the tenon by the adjustable end-piece. The improvement is an excellent one indeed.]

SHIRT BOSOM STUDS—John P. Derby, of Cavendish, Vt.: I do not claim the use of a single coil of wire with a single lock for the purpose of securing the stud to the bosom as that is well known.

I claim the side pieces, b and e, passing the one above and the other beneath the cross piece, d, forming a double coil and double lock operating in the manner and for the purpose substantially as set forth.

CUTTING TENONS ON BLIND SLATS—Seth C. Ellis, of Albany, N. Y.: I claim the arrangement of the rotating disks, H H, with their slots, a a, disposed in reference to and in combination with the saws, for the purpose of regulating the revolution of the slat so as to direct the saws in cutting perfectly cylindrical axis or tenons to it, substantially as set forth.

I further claim the feeding apparatus, to wit., the sliding box N, disks, M, with the wheels, L and R, lying within the jaws, J J, and the lever, P, with the eccentric on W, acting together and in combination with the disks, H H, and saws, substantially as set forth.

TILTING BUCKETS IN RAISING WATER FROM WELLS—Daniel P. Farnham, of Milton, Wis.: I do not claim attaching buckets to endless chains for raising water, for that is an old and well-known device.

But I claim the fastening formed of the rods, e, attached to the cross-pieces, d, of the links, C, and the loops, g, on the buckets, F, in combination with the pendent or swinging rod, H, placed within the framing or curb, A', the above parts being arranged as described and for the purpose set forth.

[By this arrangement of buckets on endless chains, in combination with the devices mentioned, the buckets are tilted so as to discharge their water in a superior manner to the Persian wheel, common chain pumps, and other hydraulic engines of the same class.]

HYDRANT—Wm Fields and Solomon Gerhard, of Wilmington, Del.: We claim, first, the combination of the lever, L, with the rods, R and r, operating the plungers, B and p, in the manner specified.

We also claim the plunger valve, V, when arranged in relation to the bent pipe, P, and constructed in the manner described, and when operated in connection with the plunger, B, and not otherwise, substantially as set forth.

SOWING SEED BROADCAST—George Hall, of Morgantown, Va.: I claim in a broadcast seed-sowing machine the combination of the hinged and adjustable dash-board with the working fingers, n, and exit openings, c, for the purpose of taking the grain from the hopper and scattering it broadcast, substantially as set forth.

FORMING FELT HAT BATS—Washington G. Hagaman of Philadelphia, Pa.: I do not claim the removal of the bat from the surface on which it is formed before hardening, such having been done by A. Rankin, as shown in his patent of October 3d, 1854.

Nor do I claim the mere employment of a flat surface on which to form the bat.

But I claim the combination of the flat rotary sieve, I, with the deflector, B, arranged and operating substantially as and for the purposes set forth.

GAS GENERATING APPARATUS—James Hansor, of the Wandsworth Road, England. Patented in England, March 21, 1852: I claim the pipes, I and J, and the dampers, L, as combined with the retorts, C and E, operating in the manner substantially as described, for the purpose of readily ascertaining and regulating the progress of the operation of gas making, as set forth.

DRESSING AND POLISHING STONE—David Hinman, of Berea, O.: I claim the combination of the disks, A and A', attached to hollow revolving shafts, B and B', with the supporting and vibrating rods, P Q, when the same are constructed and arranged as described, and for the purpose set forth.

SHINGLE MACHINE—Wm. Huey, of Columbia, Pa., I claim the particular method of adjusting the knives within a cylindrical or other-shaped case, that they may be made to rise and fall according to the thickness of the shingle or board.

And secondly, I claim attaching the sawing and planing machines in such a juxtaposition as to operate automatically as described, in manner and for the purpose set forth.

CORN PLANTERS—Samuel M. Perkins, of Fort Hill, Ill.: I claim the seed chambers upon the shaft with radial depositing apparatus, in combination with the wheels and the mechanism by which said wheels are adjusted relative to the shaft, arranged and operating as set forth.

FAN BLOWER—Chester P. Marshull, of Worcester Co., Mass.: I claim the application of fixed partitions in the conducting air tubes of fan blowers in the manner and for the purpose described, or in any other way which shall be substantially the same.

BOXES FOR PISE-WORK WALLS—Otis and Wales Needham, of New Haven, Conn.: We claim, first, the construction of the box with the movable end plates fitting to grooves in the side plates, and with a roller at one end near the top, and another at the other end near the bottom, the one to run on the finished part of a course of work which is in progress, and the other on a finished course, or on the foundation of the wall, to guide the box in a horizontal line, while the plates keep it from deviating laterally from a straight line, substantially as specified.

Second, We claim the plate, m, applied and operating substantially as described, in combination with the other parts of the box, to produce window caps, moldings, or other projections.

[Pise work consists of walls formed of stiff clay or a concrete composition, rammed down between parallel sided boxes of wood. The boxes hitherto used for this purpose have been rude affairs, and not calculated for neat work, or facility in executing it. This improvement in such boxes enables the work to be performed more expeditiously, and of a superior character, with a composition of lime and sand, for buildings of a superior class.]

HOLDING AND DISPENSING SYRUPS FOR SODA FOUNTAINS—James R. Nichols, of Haverhill, Mass.: I claim the described arrangement of a series of cans with their pipes and cocks, whereby they may be simultaneously charged with compressed air by a single pump, and any one of them may be isolated from the others, for the purpose of replenishing, as set forth.

COTTON SEED PLANTER—James T. Orr, of Orrville, Ala.: I claim combining an adjustable plate, E, with the seed cylinder, D, in the manner and for the purposes set forth.

GRINDING FILE BLANKS—Robert G. Pine, of Newark, N. J.: I claim, first, the reciprocating frame, E, attached to the frame, A', as shown, and having springs, t, connected with it, when said frame is used in connection with the grindstone, F, and patterns, j j, for the purpose specified.

Second, I claim attaching the frame, A', to the levers, m, bars, I, and shaft, K, having the roller, L, upon it, said parts being arranged as shown or in an equivalent way, for the purpose set forth.

[By a peculiar self-adjusting arrangement of the frame that feeds the file blank, the latter is presented to the grindstone accurately, according as the diameter of the stone is reduced, and thus file blanks are always ground in proper form in this machine. This is a valuable and important improvement.]

CULTIVATOR—Norman W. Pomeroy, of Meriden, Conn.: I claim the method of working the valve, c, by means of the spiral spring, f, and elastic disk or bottom, C, when the whole is constructed, arranged, and made to operate substantially as described.

SEWING MACHINES—Samuel F. Pratt, of Roxbury, Mass.: I do not claim the particular motions of the feed bar, K, in vertical and horizontal directions.

But I claim the combination with the arm, I, of the spring, f, the projections, i 1, the bent lever, L, and its projection, K, or their equivalents, the same being to produce the motions of the feed bar, in the manner as described.

I also claim moving the loop hook or looper, N, diagonally up to and away from the needle, substantially in the manner as specified.

And I also claim effecting the movements of the loop hook, N, at the proper times, substantially in the manner as described, that is to say, by means of the plate, u, attached to the arm, I, operating upon the arm, o2, of the looper.

LIFE PRESERVERS—Warren A. Simonds, of Boston, Mass.: I claim a life-preserving float, composed of separate and independent sectional chambers or air vessels, covered and surrounded upon all sides by exterior sectional floats filled with cork or other solid buoyant material, arranged in the manner substantially as set forth.

LADIES' RIDING SADDLES—Robert Spencer, of New York, N. Y.: I do limit my claim of invention to such special modes of application, as other equivalent modes may be substituted.

I claim placing the pommel or head, back of the front edge of the bars, and in a diagonal position substantially as described, whereby I am enabled to depress it to give ease of position to the rider, without interfering with the horse's withers as described.

I also claim connecting the near or short horn with the tree by a screw on the end fitted to a series of holes, so that its position relatively to the seat and pommel may be shifted at pleasure to suit the rider as described.

And, finally, I claim the arrangement of the stirrup leather, substantially as described, in combination with what are known as the Mexican bars, a b, substantially as above described, whereby I am enabled to make a secure ladies' saddle, without the use of the points heretofore employed for embracing the sides of the horse as set forth.

JOINING BOXES, &c.—James Stimpson, of Baldwinsville, Mass.: I claim the joining of boxes, drawers furniture, &c., by means of rounds, tenons and mortises, and a half lap or secret joint as set forth and explained.

PUMPS—Ambrose Tower, of New York City—Patented in England July 23, 1856: I do not claim the raised or projective valve seat and ebb water as new, when the water and other fluids, substances, &c., are not discharged from the ebb water way, L, below the surface of the top of the valve seat, as it will be perceived that foreign or heavy substances will flow over the valve seat, and soon fill the ebb water way, and then come in contact with and choke the valve, therefore—

What I claim is the raised or projective seat, K, and ebb water way, L, when the water, &c., is discharged from the ebb water way below the surface of the top of the raised or projective seat, thereby allowing all foreign or heavy substances that flow over the seat to be instantly forced out, consequently the valve at all times has free play and cannot become choked.

HANGING WINDOW SASHES—Wm. Webster, of Morrisania, N. Y.: I claim the constructing of window sashes with holes, c c, on their inner face, in connection with the holes and grooves, G G, in the manner described.

COTTON GINS—Lewis S. Chichester of New York City Assignor to Henry G. Evans, of same place: I claim, first, the employment or use of the vibrating feeder plate, C, having a movement towards and from the bite of the rollers, and provided with the curved ledge, b, at its upper end, the said ledge being serrated or provided with teeth, and placed at or near the bite of the rollers, substantially as described for the purpose set forth.

Second, I claim the feeder plate, C, with ledge, b, attached in combination with the plate or comb, c, the above parts being arranged and operating conjointly as shown for the purpose described.

[Whitney's cotton gin is not employed for ginning Sea Island cotton; but the old fashioned roller gin which consists of two small wooden rollers, placed in contact above one another, and revolved with equal velocity. The cotton is fed in between them and drawn as it were from the seed. The above process of ginning is very slow, as the cotton has to be fed in very small quantities, and very evenly, to prevent an accumulation of seed near the bite of the rollers. This valuable improvement increases the capacity of the roller gin; by providing a vibrating feed, plate, and a lateral reciprocating comb, the seed is not only prevented from accumulating near the bite of the rollers, but is fed in more uniformly, ginned more rapidly, and in a superior manner.]

SHINGLE MACHINE—Wm. A. Whiting, of St. Louis, Mo.: I claim giving an elastic bearing to its rest, c, or to the bearing boxes of the knife wheel, or to the equivalents thereof for the purpose described.

STUMP EXTRACTOR—Jason S. Wood, of Washington township, N. J.: I claim the employment of the cams, C C, and D D, in combination with the levers, F and G, and the chains H and I, the whole being arranged substantially in the manner and for the purpose specified.

BRASS KETTLE MACHINE—Mary A. Cannon, of Warren, R. I., Admx. of John Cannon deceased, late of same place, Assignor to the New York and Brooklyn Brass Company of New York City: I do not claim the spinning of vessels by hand pressure, when the spinning tool is both carried and pressed up against the metal by the workman, as this is the old plan, long known before any mechanism for carrying the tool was invented.

I distinctly disclaim those parts in my machine which are found in Hayden's patent, or in Miller and Whitehead's patent, or in any other machine for making brass kettles.

But the combination of a hand lever for effecting the spinning by hand pressure with a slide rest which is moved by mechanism, is to the best of my knowledge and belief a new combination, possessing great and important advantages: therefore—

Disclaiming movable slide rests in machines for spinning brass kettles, and also disclaiming hand pressure in itself considered for such purposes.

First, Elongating the handle of the tool, q, in the lever, P, to be operated by hand, when the said tool is moved up to the work by mechanism, in the manner and for the purposes substantially as set forth.

Second, The arrangement of the shaft, e, substantially as described, whereby it is made to serve for the driving of the sliding bed, I, and also as a pivot upon which the slide, H, which carries the said bed, is adjusted, thereby enabling the adjustment of the bed to be effected without affecting the driving gear.

[By the old method of spinning kettles from disks of brass on the slide lathe with patterns or forms, the tool was rigidly connected with the slide rest, and could not accommodate itself to inequalities in the hardness of the metal, or the least untruth in setting the forms. The results of this arrangement were, the frequent tearing of the sheets of metal, and the production of kettles thinner on one side than the other. This excellent improvement removes such defects, by giving to the operating to l, an elastic action on the slide rest, whereby the operator can accommodate its motion and action, to bear with a suitable pressure on every part of the metal, and thus form brass kettles of a superior character.]

SEWING MACHINES—Joshua Gray, of Boston, Mass., Assignor to himself and John Gault, of same place: I claim the combination and arrangement of the plate, G, and slide, H, with their slots and pins, operating in the manner substantially as described, for the purpose of giving the required motions to the hook as set forth.

BLAST FURNACE—Henry Weissenborn, of New York City: I claim the mechanical arrangement of feeder, B, in combination with a surrounding gas chamber D, with an open bottom placed above the furnace throat, whereby the gas is prevented from escaping from the throat of the feeder, B, without being covered, and then forced into the gas chamber by the dense body of coal and ore always contained in the feeder, and therefore delivers a regular supply of gas which can be carried descending to any heating furnaces placed on the bottom ground of the blast furnace, with the same advantages as if applied on the top of it for the purpose and in the manner as specified.

BRICK MACHINES—Wm. Wood, of Hartford, Conn.: I claim constructing the front of the press box, c, with the front of the grate, L, attached thereto, so that by means of slides S, and swing front, J, a portion or all of the front of both press, box and grate can be raised in the manner and for the purpose set forth.

WASHING MACHINES—Amos Jacobs, deceased, late of Ithaca, N. Y.: I claim the combination of an oblique beater or dasher with a tub, constructed substantially as described in such a manner that the stroke of the dasher or beater causes the tub or vessel to revolve for the purposes of washing, cleaning, stamping and rinsing clothes.

ACCELERATING FIRE ARMS—Azel S. Lyman, of New York City, Assignor to the Accelerating Fire Arms Company of same place: I claim the employment of the accelerators or additional charge chambers in the manner and for the purpose substantially as described.

I also claim covering the muzzle and exhausting the air through an appropriate aperture, whereby the atmospheric resistance is removed from the front of the projectile while passing along the bore, as set forth.

JOINER'S PLANE—J. F. Palmer, of Auburn, N. Y., Assignor to S. W. Palmer, of Detroit, Mich.: I claim the two plates, C D, and plane iron, E, arranged relatively with each other as shown, and used in connection with the screw rod, E, and rod, H, as described for the purpose set forth.

The method of setting the plane irons of common planes by wedges is very troublesome, and far from being accurate. In this improved plane, the planing iron is set by simply turning a screw. It can, therefore be adjusted with the utmost exactness and with facility. By the employment of a spring and plate combined with the plane iron, it (the iron) is kept up from the work while being drawn back, and its cutting edge thus prevented from being rounded and rendered dull.

CUT-OFF VALVES OF STEAM ENGINES—Geo. H. Reynolds, of Medford, Mass., Assignor to himself and D. B. Hinckley, of Bangor, Me.: I claim operating the cut-off valves, F F, in connection with an ordinary slide valve by the inclined sliding dogs, H H, or their equivalents, in the manner substantially as set forth.

PISTOLS—Wm. S. Butler, of Rocky Hill, Conn., Assignor to Butler, Suyden & Co., of same place: I claim constructing the pistol by casting the barrel, the frame or main part of the stock and guard all in one piece, when the whole is constructed, arranged, and made to operate substantially as described.

IMPROVED BRIDGE—Thomas W. H. Mosely, of Covington, Ky.: I claim, first, the compound arch constructed substantially as set forth.

Second, the saddle pieces in combination with the stirrups and said compound arch.

Third, The sliding suspension plate in combination with the chord, M, and radial suspension rods as set forth.

Fourth, The corrugated shoes, k k, as set forth.

RE-ISSUE.

DRIVING RECIPROCATING SAWS—Isaac Brown, of Baltimore, Md.: I claim the mode described of applying the power of the engine to the saw gate or frame without being permanently connected therewith, so that the piston shall be in a great measure relieved from any lateral motion which the gate may have, which causes it to bind or cut in the cylinder substantially as described.

I also claim driving one or more saws between two cylinders, as well as driving one or more saws on each side of a single cylinder, and the self adjustable piston rod or the self adjustable slides which accomplish the same result, as are before described.

RAKING ATTACHMENT FOR REAPERS—Moses G. Hubbard, of Penn Yann, N. Y.: I claim the combination of the jointed rake arms, b and c, with the disk, C, by which the arm, B, is actuated, when the above parts are constructed and arranged for joint operation, in the manner and for the purposes set forth.

A large steam frigate exploded recently in the harbor of Naples. The vessel went down almost immediately. Very few such explosions have occurred in naval history. This explosion was similar to that of the old frigate *Fulton*, which exploded at the Brooklyn Navy Yard in 1823, when all on board perished.

Burr stone has recently been discovered by Sir William Logan, the geologist, in Ottawa District, Canada, which is said to be equal to the French. Very doubtful if the quality will compare.

The Cause and Remedy for Steam Boiler Explosions.

MESSRS. EDITORS—The alarming frequency of the explosions of steam boilers has induced me to give the public, through the medium of your columns, my views of the cause of these explosions, and the necessary precautions to prevent them.

The causes of explosions are, 1st, a want of water over or against the fire surface; 2d, a want of proper construction of boiler to keep the water on or against the heated surface; 3d, sediment covering the fire surface and expelling the water therefrom; 4th, want of properly bracing all the surfaces that are not a perfect cylinder; 5th, using too great a pressure of steam in a large boiler.

Many boiler-makers think because a cylinder of two or three feet in diameter will stand a pressure of one hundred pounds on the square inch of 1-4 iron, that any size of boiler will stand the same pressure; but the increased strength of the iron should correspond with the increased diameter of the boiler.—For instance, a cylinder of two feet in diameter will bear double the pressure on the square inch that a four feet cylinder will of the same thickness of iron and quality.

It is very convenient sometimes to mystify explosions by attributing them to some unaccountable cause, when they were caused by gross carelessness, or a want of good material or judgment in the construction of the boiler; and the most convenient excuse for an explosion is that hydrogen or some other gas was generated, and took fire for the want of water in the boiler. Now I have been constantly employed in the construction and use of boilers for the last thirty years, and I never had an explosion of one of my construction, or of any one that I have used, and I have never known of an explosion that I could not satisfactorily show a plain unmystified cause that might have been prevented; and I challenge any man to show me any way that gas, or any other substance in the common use of boilers, can be more expanded than water.

I have used boilers for years, the greater part of the fire surface of which became red hot more or less every day, and which had an unobstructed opening with the reservoir of steam or water, but the pressure was inside of a strong tube, not on the outside of a thin flue which would have collapsed with an ordinary pressure of steam. As for water becoming more explosive by being retained in a boiler for a long time, or in other words, not drawn off, and a fresh supply pumped or let in, it is an assumption which the practical use of steam boilers with pure water cannot sustain, for in most boilers I presume every drop of water that is in the boiler in the morning is evaporated before night, and fresh water taken in its place—I speak of fresh water, not salt. I have used boilers in which the water was not drawn off for six months; and I have used boilers, or had the oversight and superintendence of them, that have been fed from gutter and with snow water, and the only bad effect this dirty water had—if the sediment was not often taken out—was the settling to the bottom of the dirt, covering the fire surface, and causing the iron to burn through and leak. The engine, however, worked well, and there was no perceptible difference in the kind of steam generated from it than from the purest water.

To prevent explosions in cylindrical boilers, avoid constructing or using them with large flues, or using too large cylinders with thin iron for high-pressure steam; brace well all flat or other surfaces that are not perfect cylinders, with socket balls, having large heads on both ends; construct such boilers in such a manner that the fire surfaces shall be so far apart that the currents of steam when generating rapidly shall not carry off the water and leave the fire surface to burn through.

Cleanse the boilers often. The locomotive boiler generally explodes in the fire-box, and does much damage. To prevent this, the legs should be made of sufficient width, so that the current of steam when generating rapidly shall not carry the water up and leave the fire surface to burn out. Hand holes should be placed between each row of socket bolts at each end, and at the side of the fire-box, for it sometimes happens that the sediment accumulates above the first tier of brace or socket bolts, and prevents the water from coming to the fire surface, the iron burns through, and there is an explosion.

The usual way of constructing locomotive boilers is to have one hand-hole below the first tier of socket bolts, and some builders only put in screw bolts with separate heads. It is a common thing to hear persons having charge of boilers complaining that their boiler "foams;" I have often inquired the cause of this, but have never heard the real one assigned. The real cause is, the fire surfaces are so near together that the currents of steam expel the water from between the surfaces, and of course the water is carried up to the gauge-cock; this may also occur in the leg of the boiler, or between the pipes.

This foaming or priming, as it is called, is most prevalent in new boilers, for this reason; the metal being new and clean, the caloric or heat passes through the metal more rapidly, and generates the steam much faster, and therefore the currents of steam upward have a greater velocity. To prevent this foaming, some engineers will throw in one substance, and some another, but for what reason they do not know. The real effect of that which they throw in is to coat over the fire-surface with a non-conductor of caloric, preventing the too rapid generation of steam. This, however, reverses the object for which the boiler was constructed. Now if the boiler makers would place their tubes a short distance further apart, and keep them cleansed, they would generate more steam with a less number of pipes, and these be less subject to burn out, and would not foam. It is not only the pipes that cause the boiler to foam, but other parts of the fire surface of the boiler may also be so near together that the water is expelled by the currents of steam, particularly the legs of the boiler.

The SCIENTIFIC AMERICAN of August 22d, 1855, page 381, quotes some experiments made in London by William Radley, chemical engineer, who had contributed an account of them to the London *Mining Journal* of June 28th. But what do Mr. Radley's experiments prove?

Mr. Radley had three boilers, numbers 1, 2, and 3; the water in No. 1 was much hotter than the water in Nos. 2 or 3; the water in either was hotter than the steam in either. This is very easily accounted for. The water in No. 1 is hotter than the water in Nos. 2 or 3. No. 1 being over the furnace, it receives its caloric at a much higher temperature than Nos. 2 or 3, and the caloric is at a much higher temperature as it passes from the furnace through the water than the steam on the inside of the boiler, because the caloric passes off rapidly from the top of the boiler. If Mr. Radley had continued his experiments a little further, and had applied the same heat to the top of the boiler that he did to the bottom, he would have equalized the temperature of the water and steam, but would not have equalized the temperature of the water in Nos. 1, 2, or 3, because the temperature is less at every foot as it passes from the furnace to the chimney.

There is no doubt but many a boiler has been exploded by pumping in fresh water, or by the moving of a boat surging water over the red hot surface of the flue, or other part of the boiler, thus causing a sudden expansion of steam.

Every Inspector of Steamboats should be a practical engineer or boiler maker, and he should first inspect the engineer in charge, and then examine the construction of the boiler.

At every explosion the coroner or Inspector should summon a jury of experienced engineers or boiler makers not in any way connected or concerned in the construction or building the boiler or furnishing the material, and this report should be published to the world. If this were done in every case, the public would soon find out that there is no mystery connected with steam boiler explosions. M. BATTEL.

Albany, N. Y., Feb., 1857.

Crawford, the eminent American sculptor, is reported to be suffering from a cancer tumor in one of his eyes, which threatens not only to deprive him of his sight, but life.

[For the Scientific American.]

The Right Whale.

These whales, being most sought after, are scattered over all parts of the ocean, and are sometimes found gathered in schools, rusticating in the waters of the torrid zone, where they are not generally looked for, and find rest from the untiring pursuit of the whalemen. Our ship was full, and homeward-bound, but we had not thrown over-board our tri-works, we neared the Island of Ascension to take in some turtle. Somehow we missed the Island in the night, and on the following day raised a school of Right Whales ahead; the sea was smooth, the sun hot, and the pitch boiled in the seams of the ship's deck. A consultation was had, and all agreed to go on short allowance of water, for the purpose of making room for the oil. We then lowered our boats and killed two of them, and had to prick several others to get them out of the way; the school then took a southerly direction, and showed "white water" to the horizon. These two whales yielded two hundred barrels of oil.

The Dutch whaling ship *Clementine*, of Bremen, describes, in her log, a difference between the native polar Right Whale and the common Right Whale. Those of the former are larger, having a small fin on the back, and one makes from two to three hundred barrels oil; by some it is called the "Great North-West Whale." Some Right Whales are black and white-spotted; some are all so white that snow would reflect a blue cast compared with them. The uniformity of the soundings of whales indicate a bottom not far off; and in going from ocean to ocean they double the capes as well as the most experienced seaman; they follow the curve of land about seventy miles from shore, and are then frequently taken by the knowing whalers on their track. ***.

Tempering Mill Picks.

MESSRS. EDITORS:—I have been in the milling business for a number of years, and have been very much troubled to get mill picks tempered so as to dress burr stone properly. I may safely say that hardly one blacksmith in five hundred, throughout the country can temper picks uniformly well.

I think it was Bayard Taylor who, when lecturing at Elmira, N.Y., in speaking of the "lost arts," said that there had been columns of stone found at the East, carved from top to bottom, and so hard that our best steel would not cut them; he also stated that they were said to have been carved with tools made of "tempered copper."

Be this as it may—it would be very desirable if there could be some information illicited through the columns of your paper in regard to tempering mill picks.

W. L. COLBORN.

North Hector, N. Y., Jan., 1857.

[Much has been said of the fine temper of ancient copper tools, and in the same style as that reported of Bayard Taylor, in the above extract. It is our opinion that the steel tools of the present age far surpass the best copper ones used by the ancients, for any purpose.]

Restoring Oil Paintings.

MESSRS. EDITORS—Perhaps the following is not known to the readers of your valuable journal:—Paintings that have been discolored by age or bad usage, may be restored to their original brilliancy without the slightest injury to the canvas, by being simply moistened with the liquid known to chemists as the deutoxyd of hydrogen. PRIAPUS.

[Deutoyxd of hydrogen is sometimes called peroxyd (H.O.^{2},) the common name for it is "oxywater;" it is not easily manufactured. When as free as possible from water, it is a syrupy liquid, colorless, and possessing a disagreeable odor. It is a very peculiar liquid, and there are many phenomena connected with it which chemists cannot explain. It is easily decomposed by contact with many metals and oxyds; the oxyd of silver decomposes it with an explosion.

A very safe and excellent method of cleaning oil paintings, is to wash them with a sponge dipped in warm beer, then dry them thoroughly with a soft cotton cloth. After this the picture should be treated with a thin coat of dilute gum arabic dissolved in soft water. It is very desirable that the deutoxyd of hydrogen should be prepared by some more simple method than is now known. It is believed by some physicians to possess valuable medical qualities, but at present it is not employed in medicine, owing to the great difficulty of obtaining it; and although it may be very useful for restoring old oil paintings, it is not easy to obtain it for this or any other purpose.

Cheap and Good Ink.

Take one gallon of soft water, and in this put 2 ounces extract of logwood; boil ten minutes, and then add 24 grains bi-chromate of potash, and 12 grains prussiate of potash, and stir them a few minutes while on the fire; now let it cool, and it will be fit for use. Pulverize the ingredients before putting them in the water. Ink made in this manner is equal to any in use. It is of a blue black color, but changes to a jet black after exposure. I have made considerable of it, and think it is better than most of the ink sold in stores. One gallon will not cost more than eight cents. Any of the materials can be bought in common drug stores. A. P. W.

[We have published various recipes for making writing ink; and, leaving out the prussiate of potash in the above, this is similar to one which we have already published. Prussiate of potash may render the ink more permanent but will not improve its color. While the above ink is easily made, is cheap, and will answer very well for common use, it is not so permanent as ink made of nut galls, logwood, and the sulphate of iron.

Balloons in Warfare.

The French correspondent (J. Nickles) of *Silliman's Journal* gives the following account of various efforts to employ balloons in warfare:—

"The Academy of Sciences in Dijon having asked of that in Paris aid and money for an aerostatic ascension *a ballon captif* which it proposed to try, a discussion arose in the Academy of Paris in regard to the utility of such ascensions for scientific purposes. Marshal Vaillant, Minister of War, mentioned on that occasion the trials made in the spring of 1855, at Vincennes, under the direction of artillery, engineering, and marine officers. The object was to ascertain if it were possible to maintain a balloon five or six hundred meters above a fortified town, and if so, to cause incendiary or fulminating balls to fall. Nothing was successful. The commission made two balloons, spent much money and gave up every thing. According to Vaillant, the force of a wind, even moderate, will always be enough to drive to the earth a captive balloon.

Biot, on the contrary, defended ascensions *a ballon captif*, having a scientific object. If the descent of the balloon is dangerous above a place of war, it is otherwise in an open plain.

Biot, who made, in 1803, with Gay Lussac, a celebrated ascension, recalled the many and fruitful experiments made by the school of *aerostiers* founded under the first Republic, and which rendered great service in the sieges of Charleroi and Fleurus by balloon observations.

Jomard, the geographer, who attended this school, stated that he had made and witnessed, since 1797, a great number of ascensions *a ballon cavtif*, and that Col. Coutelle, sub-director of the school of *aerostiers* never doubted the utility of such ascensions when well directed, which may not have been the case at Vincennes.

Photographing Old Manuscripts.

In the city of Berlin, Prussia, the application of photography in duplicating old and valuable manuscripts is carried on extensively and with success. An old copy of the New Testament in the Gothic tongue, written on parchment, and dating back to the fourth century, has been thus duplicated, and a great number of copies re-produced.

Cultivating Liquorice.

Several gentlemen have recently acquainted the Patent Office with their success in cultivating the liquorice plant, which is hardy as far north as Connecticut. It is employed not only for medicinal purposes, but they say is used in preparing ale and porter.

New Inventions.

Applying the Waste Gas of Blast Furnaces.

Within the past few years an immense saving of fuel has been effected in some iron-smelting establishments, by conducting the waste heat of the blast furnaces under boilers to generate steam for driving the machinery employed.

The venerable Dr. Nott, of Union College, Schenectady, N. Y., was the first inventor who attempted to save the waste heat of blast furnaces, and apply it usefully, and his invention has now come into very general use. Hitherto, however, the application of the waste gases of such furnaces has been defective, owing to the difficulty of making the hot gases descend from the top of the blast stack under steam boilers placed on the ground, thus rendering the system almost inapplicable to iron works built on level ground. This difficulty has been entirely obviated by the improvement in blast furnaces for which a patent has been issued this week to Henry Weissenborn, of this city, whose claim will be found on another page.

By Mr. Weissenborn's invention the hot gases of the blast furnace are stored up in a reserve gas chamber, and made to descend easily from the top of the blast furnace under boilers placed on level ground. This improvement is not merely theoretically good; it has been practically and successfully applied at the Eurioka Iron Works, Wyandotte, Mich. In a letter before us from D. Webb, the Superintendent of the Works, and Joseph H. Harris, chief founder, it is stated that the various blast furnaces in New York, Massachusetts, Connecticut, and Pennsylvania were visited to obtain the best plan for building the furnaces, and Mr. Weissenborn's was at last selected as being the most feasible for the situation, it being level ground.

The furnace was commenced in 1854, but many persons who professed to be acquainted with furnaces, pronounced the project impracticable during its erection, but when finished it operated perfectly, and with the most satisfactory results. The letter says:—"The hot gas came down without extra fans under the boilers, and into the hot blast, and during an experimental trial of twenty-two days, at no time was all the waste heat used for generating the steam and heating the blast." Thus the whole cost of fuel for driving the steam engine in these Iron Works has been entirely saved by this improvement. Every invention which economises waste in fuel is of vast consequence to the iron interests of our country.

Raking Attachment to Reapers.

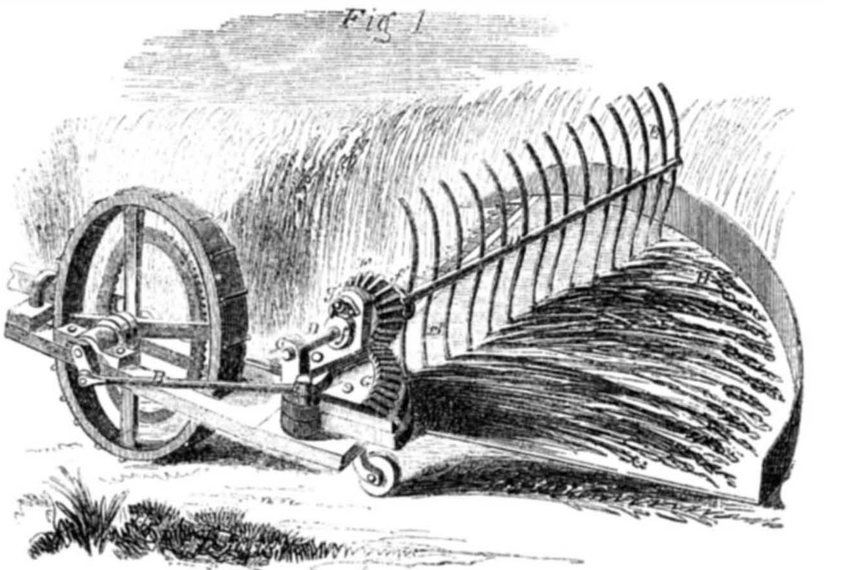
The accompanying illustrations are a perspective view (figure 1) and a side elevation (figure 2) of an improved raking attachment for reapers, for which a patent was issued to James H. Thompson of Newark, N. J., on the sixth of last month (January, 1857.)

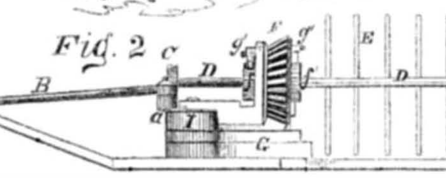
The rake has an intermittent vibrating and rotary motion, whereby it rakes off the cut grain in gavels, in a very simple and ingenious manner.

A is the driving wheel of the machine; on the outer end of its axle is a crank. B is the connecting rod, which is united by a crank pin, *a*, to the vibrating frame, C; this frame has two lugs, which form supports and bearing, S, to the spindle or shaft, D, of the rake; E E are the curved fingers, or teeth, of the rake; *f f* are two circular ratchets keyed to a shaft, D. Each of these has two notches on its periphery. *g' g* are two spring pawls secured on fulcrum pins; one is secured to the inner standard or support of the small sliding frame, C; the other is connected to the face of the bevel pinion, F, which is loose on the rake shaft. G is a segment of a circular rack with bevel teeth; it is bolted on a fixed block. The bevel pinion, F, gears in this rack, and receives a semi-rotary motion, back and forth, while being moved on it, with the vibrating frame C. H is the platform to receive the cut grain; it is of a semi-circular form, and has a side curb. The cutting knives are formed and operated in the usual manner. The vibrating frame, C, is secured on a center to a fixed guide block, I, below.

As the machine is drawn forward, the connecting rod, B, imparts a back-and-forth motion to the frame, C; it swings, as it were, on its vertical center pin in the block. The ratchets, *f f*, being secured to the shaft, D, of the rake; the pawls, *g' g'*, according as they are thrown out, and take into the notches of these ratchets, give the desired motions to the rake. When the rake is at the front end of the platform to rake back the grain, the front pawl, *g'*, takes into a notch, *f*; and as it is secured on the support of the frame, C, it holds the ratchet firmly, while the frame is moved backwards, thus allowing the bevel wheel, F, to rotate loosely on shaft D, which, being moved back on the bevel rack, G, the rake shaft is prevented from revolving. It is thus that the rake, with its teeth down, as shown, moves directly back to the hind part of the platform, gathering the grain into a gavel in its circular sweep, and discharging it at the

RAKING ATTACHMENT OF REAPERS.



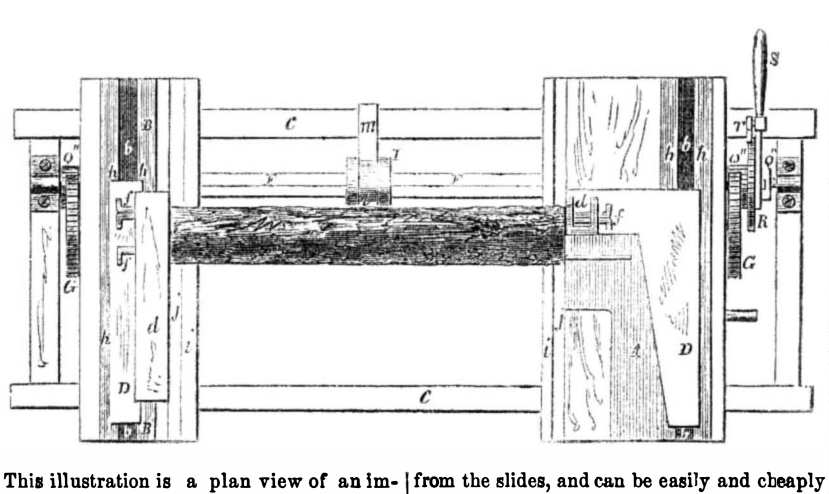


back end. Whenever the gavel is discharged, the pawl, *g'*, on the bevel wheel, is brought round to catch at that instant into the notch in the ratchet, *f'*, therefore, when the bevel wheel commences to revolve forward in returning, this pawl, gearing the ratchet to the wheel, gives a partial rotation to the rake which lifts its teeth above the platform, and then, when it carries the rake to the front end, it has revolved sufficiently to depress its teeth down to the platform, to rake backwards; the pawl, *g'*, on the support of the frame C, then takes into the ratchet, *f*, and holds the rake shaft firm while the rake is moving back, as has been described. The rake shaft has, therefore, a continuous intermittent rotary motion forward, in conjunction, with its reciprocating motion.

This improvement in the raking attachment of reapers appears to be excellent in every respect. The motions are correctly timed, and directed to effect the objects of raking in a complete manner, and by very simple but very ingeniously arranged devices.

More information may be obtained by addressing Mr. Thompson as above.

COMBINED HEAD AND TAIL BLOCKS FOR SAW MILLS.



This illustration is a plan view of an improvement in combining and operating the slides of the blocks of a saw mill, whereby with one motion of the lever the two slides are moved with ease, simultaneously to feed the log the exact and equal distance tranversely to the saw for each new cut.

A is the head block, and B the tail block, with a log represented as dogged between them, ready for sawing a new board, the saw being supposed to be hung and moving in the slot nigh the head of the log. *c c* are side timbers of the carriage which feeds the log forward to the saw; they support the head and tail blocks, which are moved on them to adjust them for logs of different lengths.

D D are metal slides to which the log is dogged. Those slides have racks secured on their under sides, and they move in grooves, *b b*; two pinions (one for each rack), on a single long shaft extending under the head and tail blocks, take into these racks and move them. These racks are cast separate from the slides, and can be easily and cheaply repaired or changed.

d d are posts cast on the top of the slides; the ends of the log are firmly dogged to these by the pins, *f f*, which are inserted through openings in the posts, *d d*, and forced into the ends of the logs. There are hooks underneath on the slides, which hook under parallel ribs, fastened to the head and tail blocks, thus keeping the slides firm on the blocks. The log thus secured on the carriage between the head and tail blocks may or may not touch the parallel ways, *i i*.

F is a horizontal shaft running under the head and tail blocks with its bearings in cross timbers in the carriage. It connects the head and tail blocks, and passes through two short hollow shafts or tubes attached to those blocks. I is a supporting box pulley for sustaining shaft F, when it is of great length, and whilst sawing long logs. This shaft passes through an opening in its center; it has a groove in its periphery to receive a semi-circular collar, *l*, which rests upon a sliding arm, *m*, attached to one of the side timbers of the carriage and can be slid to the right or left to move the supporting pulley. This support prevents the shaft sagging, and also from breaking if a log should fall down upon it.

G G are two cog wheels secured on two short transverse shafts, Q Q, on which there are pinions (not seen) for engaging in the racks on the under sides of the slides, D D and by which the log is set. On the two short hollow shafts mentioned—one secured to each head and tail block—are pinions, Q' Q', into which the large cog wheels, G G, gear. R is a ratchet dividing wheel on the axle of the pinion Q'. T is a pawl which takes into this ratchet wheel. S is a setting lever—the pawl T is attached to it. This lever is loose on the shaft of pinion Q', the shaft being its fulcrum in setting the log. By actuating the lever, S, motion is communicated simultaneously to the slides of the head and tail blocks through the shaft, F, by the pinions on the under side of the slides, D D. The log remains on the head and tail blocks until sawed up into boards, and the sawed boards remain on the blocks in single stack till removed in a body when the mill is stopped.

The two wheels, G G, are of the same size, with equal cogs and pitch; the two outside pinions, Q', are of equal size, cogs and pitch; the two pinions on shaft F, under the racks of slides, D D, are of equal size and pitch, and so are the racks. The ratchet or scale wheel R, is spaced off with 32 equal cogs 75 of an inch pitch. The wheels and pinions are of such a size and relationship to one another that the slides, D D, which feed the log to the saw, are moved one-eighth of an inch for each cog of the wheel, R, moved by the lever, S, and held in place by the pall, T. This result may be varied by altering the gearing but preserving the combination.

This improvement dispenses with the labor of a tail sawyer entirely; the sawyer sets both ends of the log with the lever, S, in an instant, and without leaving the back of the saw. By setting both ends of the log accurately together, boards are sawed exactly of an equal thickness throughout, which effects a great saving of lumber, as all boards of unequal thickness are held to be defective, and almost useless.

This improvement is adapted for circular as well as up-and-down saw mills. The logs are not hollowed out to sit on the log way, consequently no thick and thin combs are made at the center of the log. The arrangement of the lever, S, and the gearing, enables one man to exercise great power with ease in shifting the log.

A patent was granted to J. S. Snyder, of Lancaster, Ohio, for this invention, on the 5th of February, 1856, and the patentee informs us that it has already come into extensive use in Ohio, and has received first premiums at the late State Fairs of Ohio, Michigan, Virginia, and Pennsylvania. It is a labor and lumber-saving improvement. More information may be obtained by letter addressed to Mr. Snyder.

Iodurated Glycerine in Skin Diseases.

This preparation is recommended by Dr. Gage, of New Hampshire, and is made by dissolving one part of iodide of potassium in two parts of glycerine, and turning this liquid upon one part of iodine, which is thus completely dissolved. This solution has the advantage over alcoholic solutions of not drying. By this means the surfaces to which it is applied remain supple, and the action and absorption of the iodine remain for a long time. In employing it, the diseased parts to which the solution has been applied, are covered by paper of gutta percha, to prevent evaporation of the iodine.

[The above is from the *Druggists' Circular and Chemical Gazette*, published in this city—it appears to be a good recipe. Dr. Dixon, of London, author of an able work on diseases of the eye, recommends iodine in cases of chronic opthalmia, and asserts that the best method of applying it is to the outside of the eyelid. The above preparation of iodine and glycerine, is excellent for applying the iodine to the skin to prevent its rapid evaporation.

Scientific American.

NEW YORK, FEBRUARY 14, 1857.

The Construction of Chimneys.

Much trouble is experienced everywhere with smoky chimneys, but more in some parts of our country than in others. Thus we have been informed, by a practical mason residing in Illinois, that no part of his business has bothered him so much as the construction of chimneys for farmers' houses on some of the prairies in that State. He has tried various plans of constructing them, to improve their draft, but during high west winds none of them draw well, and he would like to know the reason why. A smoky chimney is certainly a great infliction, and we pity all those who suffer from such an evil.

One question to be considered in building a chimney is its hight. The principle involved in this is, "the greater the hight the better the draft." Why? Because, when the column of air is forced out of a chimney by the smoke, the vertical pressure against the ascending smoke, is removed in proportion to the increased hight of the chimney.

The testimony of mechanical and civil engineers respecting the chimneys of steamboats, and those of factories, is uniform in regard to an increased draft being obtained, with an increase of elevation, and this opinion is founded on scientific data.

But another principle is also involved in the construction of chimneys, namely, that of maintaining the heat of the smoke or combustion gases, until they make their exit at the chimney top. The ascending force of smoke or heated gas, in a chimney, is just according to the difference of density between it and the column of air outside—the elevation of the temperature of the smoke above that of the air.

By reducing the temperature of the gases in a chimney to that of the air outside, its draft may be entirely destroyed. This explains the cause of retarded draft in new and damp chimneys, and flues, also in tall factory chimneys, in wet weather; the moisture absorbs the heat of the gases rapidly, and reduces their ascension force. The advantages of a tall chimney, may therefore be nullified by the rapid cooling of the gases in it, during their ascent.

There is a variety of opinions respecting the relative area of common chimneys, in proportion to their hight, but not a single author that we have consulted gives a rule or rules positively reliable.

We do not know why the chimneys of farm houses, on the Western prairies of Illinois, render the houses smoky, but we suppose it must be owing to the cold and high winds which sometimes prevail in those regions, cooling the smoke rapidly while it is in the chimney. The chimneys in the West, we infer, are no better built than those in the East. In general their walls are too thin; their interior rather rough; they are not sufficiently protected from absorbing moisture, and they radiate their heat too rapidly. Brick—the common material employed in their construction—is a tolerably good non-conductor, but very porous. The sides of a chimney should be made as thick as possible, plastered smooth inside, and coated outside, to prevent the absorption of moisture. By thus constructing chimneys of the common hight and diameter, and using inverted conical cowls, or caps, on them, or any of the most common caps, we are of opinion that most of the smoky houses, not only on our Western prairies, but other regions, may be effectually cured.

A wash, containing one pound of the sulphate of iron to a bushel of lime, is very excellent for the outside of chimneys.

Steam Fire Engines.

This city has recently contracted with Messrs. Lee & Larned for two steam fire engines of large size, to be not only fire engines but also locomotives, capable of moving themselves by steam through the streets. This is taking hold too rank. The locomotive feature might be of some little service, especially in taking the machine home from a fire, when steam might be kept up without inconvenience, but it necessarily involves some additional machinery and will, we predict, lead to far more derangement and trouble than its assistance will be worth. It can at best be but an auxiliary power; men or horses must still be depended on to surmount any inclines or obstructions, and in the present snowy and icy condition of the streets, the assistance to be derived from connecting the rotary pump to the axles would be absolutely imperceptible. In the main point—that of running to the fire—the steam could not, probably, be raised in season to be of any practicable value. We object to making either children's toys or locomotive experiments of these powerful and expensive machines. Give us the simplest engines, the most active boiler, and the surest pump in the world, and make the whole as light as possible. If the steam fire engines of Cincinnati and Boston can be beaten in any of these points—as we believe they can in both the last named—let us do it as soon as practicable at a fair price, and let the machines be kept always in order for throwing water. Every additional device will involve more cost, more weight, and more chances for derangement and fracture of the whole.

The Preparation of Drying Oil.

If oils did not possess the property of combining with oxygen, and thereby losing their soft or greasy quality (in other words, become *drying*) they could not be employed in painting. One reason why linseed oil holds such a prominent place as a menstruum for paints, is the superior quality which it possesses of absorbing oxygen from the atmosphere.

Some oils are of such a fixed character that they cannot be employed in paints because of their limited affinity for oxygen. The very best oils, however, are slow dryers, hence they are treated chemically, to give them drying qualities. There are chemical compounds called "dryers," which painters mix with oil, to feed it with oxygen, or to separate its glycerine. Turpentine is nothing more than a drier; but the oxyds of lead and zinc, in the form of sulphates, boiled with oil, are the most common driers.

The nature of the action of *dryers* upon oil is of much interest to painters, especially as so little attention has been given to the subject by chemists.

A recent number of the London *Chemical Gazette* contains a brief account of experiments by the eminent German chemist, Professor Wagner, in this field of practical chemistry, a succinct but clear account of which will interest a large circle of readers.

He repeatedly prepared protoborate of manganese for driers, and effected its precipitation whilst hot, and thus obtained it of a coffee-brown color, and consequently containing much oxyd, and always of remarkable efficacy. He, however, endeavored to obtain it perfectly free from oxyd, and for this purpose effected the precipitation with borax cold, and obtained a snow-white powder, but this furnished no varnish. He therefore returned to the previous mode of preparation with the assistance of heat, and found that it was obtained of the darkest brown, and also of the strongest action, when both the solutions of sulphate of manganese and borax were diluted as much as possible and mixed boiling.—The siccative action upon the oil must, therefore, be ascribed to the oxyd, and not to the protoxyd.

By further experiments he found that the boracic acid is quite superfluous, and that free oxyd of manganese or its hydrate is as efficacious as the borate. The oil need only be heated for a very short time—about a quarter of an hour—with about one-eighth per cent. o the hydrated oxyd of manganese. The heat applied need not approach the boiling point by a long way; but no general temperature can be given, as new oil has a much higher boiling-point than old. The siccative quality, however, increases with the heat. But as the oil becomes darker and thicker in proportion to the heat to which it is exposed, it is the best plan in general to remove it from the fire as soon as it clears and begins to fume very slightly. Streaks of it now become firm in twenty-four hours. To obtain the drying oil of a very pale color, it must be heated still less. The drying is thus retarded several hours, but the color has scarcely become perceptibly brownish, whilst in the former case it always acquires a chestnut brown color.

He obtained a wine-yellow oil, quite unaltered, without heat, by mixing 1 per cent. of hydrated lime with a linseed oil four years old, which dried by itself in three days. After being frequently stirred for two days, a streak of it was perfectly firm in twenty-four hours. Oil of the same year, however, did not become siccative even by boiling with lime.

The oil dissolves very little of the small quantity of oxyd of manganese, and the salt when removed may be repeatedly used in the preparation of drying oil. When a drier oil is mixed with an equal weight of crude oil, it requires nearly twice as long to dry; but the time necessary for the solidification of the coating gradually diminishes with the age of the oil.

Safety of Life in Steamboats.

We are indebted to Benjamin Crawford M. E. of Pittsburgh, Pa., Inspector of Steamboats in the Seventh District, for a copy—just published—of the proceedings of the fifth annual meeting of the Board of Supervising Inspectors, held at Boston in October last. It contains matter of interest, not only to the engineering community, but the whole travelling public. A very striking feature in this report is the large number of boilers (134) found defective during the year. Twenty of these were condemned from further use; the others ordered to be repaired and strengthened. This large number of steamboat boilers proved defective, by the hydraulic test, and by which undoubtedly several explosions were prevented, leads us to demand the enactment of laws in every State for testing the strength of all steam boilers for locomotive and land and boat engines, before they are allowed to be employed for constant use.

On another page there is a communication on steam boilers from Mellen Battel, one of our oldest and most experienced steam engineers and inventors, in which he points out how boilers should be stayed and constructed and his opinions deserve general attention. He also gives his views regarding the cause of priming or foaming in boilers, and how it can be prevented. His theory is certainly original, and if correct, a remedy for this dangerous action in steam boilers can be easily provided. From the Inspectors' report, we learn, that of the two explosions which took place on steamboats, during the year, resulting in loss of life, one was caused by the boilers *priming*. This was the *Metropolis*, a steamboat on its first trip on the Ohio river, and the first explosion which has taken place on that river since the new steamboat law was rendered in 1852. In this case the engineers were deceived by the foaming of the water, a very unusual thing in high pressure boilers and on our Western waters; but a full investigation by the Inspectors at Cincinnati evolved the fact conclusively that the boilers were red hot in some parts from want of water, and that the metal was torn apart with a very moderate pressure of steam. By this accident eleven lives were lost. This feature in steam engineering demands further investigation, and for this purpose we direct the special attention of our engineers to it.

The most serious accidents during the year were caused by the burning of vessels—most of which occurred on the lakes—and no less than 177 lives were lost by them. The Inspectors have done much to render steamers more secure against accidental fires, but a great deal more is yet required, and not until all their entire boiler rooms are enclosed in plate iron will safety from fires be insured. The Inspectors recommend that all steamers be provided with pipes leading from the boilers to all parts of steamers, for the purpose of using the steam to extinguish fires should they occur. This is an excellent plan, and one which we have on several occasions recommended for the purpose.

A communication from Jas. H. McCord, Inspector of Boilers in the St. Louis District, related his experience with fusible plugs in boilers. Those made of alloy, he stated, were a source of trouble and annoyance to all those who were compelled to use them, and they were also unreliable, and he requested that their use be suspended. A few weeks since we directed attention to the character of these plugs in boilers, and the views of Inspector McCord accord with those we then expressed.

There are three points of peculiar interest to which we request Government Inspectors and all engineers to direct their attention during the present year, namely: priming in boilers, safety plugs, and the rendering of steamboats fire-proof. Much scientific and practical information on these three points have yet to be elicited.

A Turpentine Explosion.

For want of scientific knowledge a dreadful accident occurred near the village of Steuben, Pa., on the 21st ult. The Rev. E. H. Havens, a Wesleyan Methodist minister, was engaged in the preparation of a balsam, of which the principal ingredient was spirits of turpentine. He had about two gallons of this fluid and a quantity of rosin boiling together in an open vessel upon the stove. By some means fire was communicated to the inflammable mixture, and while he was endeavoring to convey it out of doors, an explosion took place, scattering the burning fluid over the persons of himself, his wife and three children who were in the room, and setting fire to the building. The father, mother and a daughter died soon after the explosion.

Turpentine is not explosive, but it is a very volatile hydro-carbon, and easily converted into gas by heat. If its gas be saturated with eight times its volume of the atmosphere, and a spark or light applied to it, the whole will explode instantaneously. This was the manner by which the serious accident described was caused. The turpentine was evaporated from the vessel on the fire; it became saturated with oxygen, and thus the contents of the room became combustible, and was ignited at once by the flame of the blazing rosin. If the preparation had been made in a close vessel on the fire, to prevent the turpentine evaporating into gas, this accident would not have taken place. All hydro-carbon volatile fluids, such as turpentine, alcohol, benzole, camphene, &c., should always be kept in close vessels. For the sake of preventing other accidents of a kindred character, we hope these facts will be made to reach every household in our land.

Pictures on the Retina of Deceased Persons.

It has been asserted that as images are impressed on the retina of the eye, the last scene or image pictured on the retina of a person suddenly deprived of life would remain upon it, and could be viewed, if the schlerotic coat (white of the eye) were removed. It was proposed by one of the Coroner's Jurors, in the case of the late Dr. Burdell, assasinated in this city, that an examination be made of his eye to find out some clue to the assassin, by the image impressed on the retina. No such examination was made. Prof. Doremus stated to the Court that no good authority had ever endorsed the opinion respecting impressed pictures on the retina of deceased persons: he believed such opinions to be erroneous.

Models! Models! Models!

We have several models in our possession which have come from sources entirely unknown to us, as there are no names attached, to them. This is very annoying to us, and must prove so to the inventor. In sending models, inventors should always prepay the charges, and forward us the express receipt without delay. This saves double payment in many cases.

Bituminous Shales for Making Gas.

The Toronto (C. W.) *Globe* states that Prof. Hind recently delivered a lecture in that city, before the Mechanics' Institute, on the above subject. He stated that a light illuminating gas was produced from a species of bituminous shale—a rock extending from Whitby and Oshawa on Lake Ontario, to Collingwood on the Georgian Bay, Lake Huron.

There is still a dearth of fuel in Cincinnati; crowds of people press forward to the coal yards, taking their turns in purchasing.

Carbon.

This is one of the fifty-three simple substances known at present as constituting the materials of our globe. It has long been known under a number of different forms, such as coal, diamond, and plumbago. It exists both in the and inorganic organic kingdoms of nature, but it especially belongs to the latter, for the great coal deposits, which constitute its great store-houses, are undoubtedly of vegetable origin. It has been ranked by some writers as the base of organic nature.

The purest form of carbon, as ordinarily procured, is charcoal, which is developed by exposing animal or vegetable substances to heat, and excluding the air. The means commonly had recourse to for the preparation of charcoal are illustrative of a leading chemical quality of this body—its complete fixity even at the highest temperature, provided the accession of air is prevented.

When prepared from wood of diff.rent species, the resulting charcoal differs as to its density, its power of electrical conduction and certain other characters; and on examining other forms of black carbon, such as anthracite coal, coke, and plumbago, other points of difference are recognized. Common bituminous coal is not carbon, but an association of many complex unions of carbon and hydrogen, from which heat expels the volatile parts leaving coke behind, which is a mixture of carbon with small quantities of metallic oxyds.

Amongst the most interesting forms of black carbon is plumbago or black-lead—formerly considered to be a carburet of iron—but the best specimens of plumbago are free from iron. Lead is never present in plumbago, hence the appellation "black lead" is a misnomer.

The employment of plumbago in the manufacture of pencils is too well known to require comment. For this purpose the best quality of plumbago was the produce of Borrowdale, in Cumberland, England, but this vein is now quite exhausted. Most of the ordinary pencils now used are manufactured from a factitious paste, made of powdered plumbago, antimony, and sulphur, fused together, cast into blocks, and these blocks sawn into bars of the required length and size. The great disadvantage of these pencils is their grittiness, and the difficulty with which their marks are effaced by india rubber. The best of pencils are made by subjecting the powder of plumbago to extreme hydrostatic pressure simultaneously with the abstraction of all remaining traces of air by means of the air-pump.

A material very much like plumbago in appearance, and which is formed, under certain circumstances, in gas retorts, is called *plumbagine*. Ivory and bone black are varieties of charcoal which result from the concentration of ivory and bones in retorts.—They are employed for a variety of purposes. Ivory black forms a constituent of the finer kinds of printing-ink—that used for copper and steel plates. Bone black is chiefly used in the decoloration of raw sugar in the operation of refining. For this purpose the bone black is prepared in the state of grain, packed into large cylinders, and the colored sugar solution allowed to percolate through.

The most extraordinary and beautiful, as well as the most valuable form of carbon, is the diamond, a gem which has been known and valued on account of its resplendent beauty, from the earliest ages.

Its composition is undoubtedly carbon, because the sole result of its combustion in oxygen is carbonic acid gas; but the origin of the diamond is a subject of much curious speculation. As its structure is crystaline, the diamond has been at some early period in a liquid or semi-liquid condition—a state which pre-supposes fusion by fire, or solution in some menstruum. Opposed to the first hypothesis is the circumstance that within the structure of many diamonds are seen remains of organic beings—appearances scarcely consistent with the assumption that the diamond was once in a state of igneous liquidity. Sir David Brewster inclines to the opinion that the diamond is a drop of fossilized gum.

The extreme beauty which this gem is capable of assuming can only be developed by a tedious process of cutting, unknown even to this day in its full perfection by Eastern nations, and of somewhat modern introduction to Europe, viz., in the year 1456 by Louis Berghen, of Bruges, who accidentally discovered, that by rubbing two diamonds together a new face was produced. The diamond is so hard that it can only be abraded by portions of its own substance; hence, diamond powder is universally employed for that purpose; such stones as, on account of their inferior color or their flaws, are valueless as gems, being broken down into powder for the purpose of cutting others. At present, and for a long time past, the head-quarters of the diamond-cutting operation are at Amsterdam, Holland, where the operation is conducted by Jews exclusively.

The weight of diamonds is estimated in carats, 150 of which are equal to one ounce troy, or 480 grains. These carats are subdivided into halves, quarters, or carat grains, eighth, sixteenth, and thirty-second parts. The rule for the estimation of the value of diamonds is peculiar, and supposing the gems under comparison to be equal in quality, may be expressed as being in the ratio of the square of their respective weights. Thus, supposing three diamonds to exist, weighing, respectively, one, two, and three carats, their respective values would be as one, four, and nine.

Farmers have not yet learned the value of charcoal as an agent in fertilization. In the form of a dust it absorbs and retains ammoniacal solutions; and on sandy and clayey soils is valuable for retaining carbonic acid, which is positively necessary to the growth of every plant. Charcoal ground into dust, and mixed with manure, or sown on sandy and clayey soils, has a most beneficial effect in promoting the growth of vegetables.

Crystallization.

We copy the following beautiful extract from an editorial in the Philadelphia *Ledger*:—

"Crystalization is found through all nature. There is not a substance, which, when allowed the free movement of its particles, does not exhibit a tendency to crystalize. Water at a low temperature crystalizes into ice. Metals slowly cooled after melting, crystalize. The gases, evanescent as they seem, may be made so artificially cold as to crystalize. Our children eat crystalized sugar under the name of rock-candy, and we ourselves use it in the loaf, crystalized in another form.

What is glass but a crystal? The sizes of crystals vary infinitely. There are crystals too small to be recognized except under a microscope; and there is one at Milan weighing nearly nine hundred pounds. The White Mountains of New Hampshire are a vast aggregation of crystals. The Mammoth Cave in Kentucky is an enormous museum of crystals. As yet, however, with all our knowledge, we are comparatively ignorant of the laws of crystalization. Under them, we see atom arrange itself by atom in mystic, myriad forms; we discover also, that not only magnetism, but light and heat exercise an influence in crystalization, but there our information substantially stops. The science of crystalization is almost a sealed book. Its mightiest curiosities still lie, like the virgin islands of the Pacific before the days of Cook, awaiting the skill and perseverance of some fortunate explorer."

Rosin Oil.

The following, from the New Orleans *Picayune*, affords evidence of the progress of the manufacture of rosin oil in New Orleans, and the use of rosin oil gas on plantations in Lousiana:—

"We some years ago announced the formation of a company in this city for the manufacture of oil from rosin, and now it affords us pleasure to be able to state that the undertaking has proved a complete success. The attempt to extract oil from such a substance was at first looked upon as simply ridiculous, for between rosin and oil there was nothing held to be in common. But there are more wonders between heaven and earth than ever was embraced in any man s philosophy; and the making of rosin oil is one of those recently developed wonders. The discovery was made and patented by Mr. Robbins some four or five years ago, and has ever since been slowly though surely working its way into popular favor. Last spring a company, under the title of the 'New Orleans Manufacturing Company,' was formed in this city, with a capital of $100,000; the patent right for this State was obtained; a site was purchased on the road side of the new canal, and now the works have been completed and are capable of turning out over 500 gallons of crude oil per day. To make paint oil, or the best description of lubricating oil, the crude article has to be twice refined, and altogether about ten per cent. of the original substance is dissipated in gases. Of the remainder, every portion is greatly superior in value, bulk for bulk, than rosin, while the greater portion of the product is worth from fifty to seventy-five cents per gallon. The oils produced by the various processes made use of are gas oil, paint oil, lubricating oil for machinery, tanners' oil, tallow oil for light-colored leather, bright varnish, naphtha, black varnish, cart grease, and pitch. The various kinds of oil are classed according to the number of distillations which they have undergone, and the residuum is pitch.

The success of the experiment thus far has been so satisfactory that the company has already determined to increase their works by the addition of two more stills. No fewer than two hundred planters have ordered sets of apparatus for the manufacture and use of rosin oil gas."

The Mesmerism of Machinery.

A Birmingham (England,) paper describes the following remarkable case, which is stated to have taken place in one of the large iron manufactories in that place:—

"One of the most singular instances in connection with material things exists in the case of a young man, who, not very long ago visited one of our large iron manufactories. He stood opposite a large hammer, and watched with great interest it perfect, regular strokes. At first it was beating immense lumps of crimson metal into thick sheets, but the supply becoming exhausted, at length it only descended on the polished anvil. Still the young man gazed intently on its motion; then he followed its stroke with a corresponding motion of his head; then his left arm moved to the same tune; and finally, he deliberately placed his fist upon the anvil, and in an instant it was smitten to a jelly. The only explanation he could afford was, that he felt an impulse to do it, that he knew he should be disabled, that he saw all the consequences in a misty kind of manner, but that he still felt the power within above sense and reason—a morbid impulse, in fact, to which he succumbed, and by which he lost a good hand."

This story may be true; as wonderful events as this have occurred before. It certainly has a Baron Munchausen look about it, but we presume all have at times felt more or less of a similar temptation to thrust the hand into shears, gearing, or the like.

Louisville Mechanics.

The best criterion by which to judge the intelligence of any people, is from the means they employ to acquire useful knowledge. There is no city in the Union that can claim a more intelligent class of mechanics than Louisville.

At the commencement of the present Volume of the Scientific American, the enterprising publishers offered to the persons who should send them the twelve largest Clubs of subscribers by the 1st of January, 1857, *one thousand dollars* in Cash Prizes. The last number of that paper that has reached us contains the commencement of the awards, and the mechanics of Louisville, through the agency of D. McPherson, Esq., stand at the head of the list, for the first and highest prize of $200. This is the second time this honor has been awarded to the mechanics of Louisville. First in 1855, and in 1856 they received the award for the second highest prize, and now again for the first. It affords us pleasure to make this announcement.—[Louisville Courier.

[Our cotemporary could not have paid a more just and merited compliment to the mechanics of Louisville, than it has done in the above paragraph. As we cannot have a better test of the character of a man than "the company he keeps," so the best criterion of the intelligence of any class of men, is just the means they employ to acquire useful knowledge; and, in this respect, the citizens of Louisville may well feel proud of their mechanics—they are not merely great readers, but *good* readers, and they have earned for themselves a noble reputation for intelligence and practical skill.

Genius under Difficulties.

The following case is one of such a rare and peculiar nature that we feel it our duty to present the correspondence, especially as the circumstances are therein explained in a very lucid and interesting manner. We copy, *verbatim et literatum*:—

Look out for Mistakes.

——, Pa. Jan 22it 1857.

Munn & Co Dear sir

your favour of the 17it inst At at one favour i Ask of you if you will Please to Come here i will inform you of My Improvemetnt And Should it be An unjust one as it is frequently the Case i am willing to go with you to Case New York and work for to pay your Expenc for Coming here And further i think i have as good an impovement and Better for the Purpose Designed for Cheapness and Durability and if you do Not want to go to the Expense of Coming here Please send the Money and and you will Not be the loss of or Regret of it

As i am No Seffisf kind of a Man the Reason i ask this Favour i have been on on a Deep Study for the Last 6 mo on different Plans Concerning the improvement to Find the Cheapest way of Puting the Machinery Where it is Designed My My Pocket Book beCame suoject of the sweeny i will Come to a close By say My Pen is Bad My ink is Pal My upright and Contrite heart to you Shall Never Fail

Yours Truly

G. W. L——.

I think We Can Come to terms for i Like to Live While i am Alive and i Like to See others Live too

yours truly G.W. L. ,

you Can find Me By Enquiring of David P Browns Coal works at Mount Laffe David Lives in Market Street Most any Body Can show you Where he Lives

Want of time and funds will, unfortunately prevent us from following up this promising case.

Growth of Coral Islands.

The reef building coraline will not operate in water of a mean winter temperature less than 68 deg., which circumstance confines it principally to the torrid zone. It is for this reason that corals do not grow on the coast of South America. On our own coast they grow to a greater distance north than elsewhere, owing to the presence of the Gulf stream. Their growth is also limited by the depth of water—ten or fifteen fathoms. Another condition is that the reef coral will not grow in fresh water, nor in turbid or muddy shores. Whenever rivers or muddy waters pour into the sea, there is a break in the coral reef. The washing of the waves is also necessary to its growth; consequently it will thrive on the windward side of an island when it will not on the leeward side. At first, when a coral island is formed, it gives growth only to the lowest order of vegetables, such as feed on air. These decay, and thus leave a little soil which by and by sustains a higher order of plants. These islands seldom rise more than ten or fifteen feet above the water, and are seldom more than half a mile broad. There is a vast area in the Pacific 6000 miles long by 3000 wide, without any coral islands.

Rise and Fall of Water in Lake Erie.

At a recent meeting of the Cleveland (O.) Academy of Natural Sciences, Colonel Whittlesey exhibited tables and diagrams of the rise and fall of water in Lake Erie, from the year 1796 to 1852, the maximum being in 1838, the minimum in 1819 and 1820, the variation being 4·55 feet. Rain gauges were kept for various periods in different places in the lake region. He also stated that, by a long course of observation he had discovered the existence of a short pulsating wave in this chain of lakes, and entirely independent of winds or currents. Its altitude does, in no case, exceed eighteen inches—more commonly four or five. Its periods of vibration are short.

The sum of $5,060.000 has been paid by our government to the Collins' line for carrying the mail.

A P. W., of Ill.—There are a number of plans for cutting down standing corn; some of them have been patented. Yours is not new or patentable; you will have to try again. You evidently possess the qualifications of a true inventor: you have constructiveness—that is shown in the sketch of your device; you have benevolence—that is evinced by the sending of your ink recipe you are sanguine (the most important of all qualifications for an inventor)—that is apparent from your remarks relative to the late elections.

A. L. B., of Vt.—We do not see that your electric engine has any advantages over others that are well known. Unless you could show some peculiar superiority, we think a patent could not be had. You would excite the electricity by a machine; but more power could be required to produce the current than you could obtain from the electric engine.

E. V., of Ind.—We do not remember to have seen or heard of any furnace feeder arranged like yours The idea of moving the saw dust to the proper points by elevators, is not patentable. But other parts of your plane probably, could be secured. Your theory is good; practical experiment alone can determine the utility of the device.

J. J, of Mass.—Safety floats in boilers for operating the valve when the water falls below a certain line, are old Your plan is not patentable.

E. O. A., of Ga.—We find nothing new in your breech-loading cannon and projectiles. Making the cannon smaller at the muzzle is old; making it in two parts, secured together, is also old. Goodfellow's (English) patent, described in "Newton's London Journal," shows this plan. There is nothing new in your segment lever. Projectiles substantially similar to yours, have long been known. Packing the projectiles, to prevent windage, is not new. $2 received.

R. W., of Iowa—Your paddle-wheel device is good in theory, but of no value practically; neither is it substantially new. You will find diagrams of paddle wheels whose buckets are held perpendicularly for the same purposes as yours, in Vol. 5, Sci. Am. Your arrangement of parts is a little different from any device of the kind that we remember; but it is not patentable.

E. H., of Cal.—It would require considerable power to move such a lengthy column of water, no matter how small the bore of the pipe. How do you propose to fill the pipe? We regard your scheme for a Transatlantic Telegraph as impracticable. For short distances perhaps it could be made available. Your instrument, if new, is patentable, But the idea of telegraphing by means of a tube filled with water, is not new. The subscriptions you speak of are all right.

T. D. J., of Mich.—Consult a doctor upon the medical properties of hemp, in diseases of the ear. Placed *under* the ear, it is an absolute specific for cut-throats and other pests of society. Cane heads are much in vogue in this city, to deprive people of hearing and other senses, so that they can be conveniently robbed; but we never heard of cane heads that were good ear-trumpets. Water conductors of metal, for chimnies, are old: so are portable towers, ladders, fire escapes, &c., drawn on wheels. None of your devices are new or patentable. Try again.

G. L. W., of Md.—The Office do not regard drawings or models which are sent to file as evidence, unless the whole conditions of the Office are complied with, *i. e.* specifications and drawings complete are filed, and the Government fee paid. Our charges for re-issues are the same as new cases. The Government fee is $15. You can get volumes at $2,75.

E. B., of Wis.—Soapstone is often used for stove pipes to pass through, and the substitution of a hollow brick for that purpose, would not be patentable.

N. S. P., of Ill.—We have not the engraving to which you refer, in our possession, and if we had, we could not get up the circulars for you; we have no facilities for doing job work.

W. D., of N. Y.—Your plan for preventing gutters and leaders from freezing, is good and practicable; but it is not patentable. Discharging the exhaust of engines into leaders for the same purpose has long been practiced. Preventing pipes from freezing by running a warm-water pipe along side, is common.

E. W., Jr., of Cal.—There is no treatise on the Steam Engine, issued very recently.

D. N. F., of Vt.—We perceive no special novelty in your carriage seat; it would not be of sufficient interest to our readers to compensate for the room it would occupy in our columns.

J. G. White, Perry, Ga, wishes to correspond with a manufacturer of thimble skeins for wood axles.

G. D. B., of N. Y.—It will be much easier for you to send us a description of your invention for examination, than for us to send you a description of all the hose couplings with which we are conversant. We wish our correspondents would always remember that it is easier for us to determine the novelty of their invention, whatever it may be, than for us to send them descriptions of all the machines in existence of a like nature.

W. H., of Mass.—There is nothing new or patentable in your heater. Heating the air by passing it through chambers, surrounded by the products of combustion, is quite old.

C. J., of N. Y.—Cooling liquids by forcing them through pipes that are submerged in cold water, is very old. Your device is not patentable.

N. R., of Pa.—Your plan of keeping rivers clear by warming the bottom of the steamboat, and thus imparting heat to the stream, is certainly novel, and doubtless patentable. Had Dr. Kane and other Arctic navigators been provided with your arrangement, it is probable they never would have been stuck in the ice. Why did you not bring out your improvement earlier? On a small body of stationary water it might operate; but in large rivers the warm water would be carried off as fast as heated.

P. P. J., of Pa.—Your plan for supplying children's carriages with fresh air, by means of a revolving fan, operated by the wheel of the vehicle, is a benevolent one for the rising generation, but it is not patentable.

H. P. J., of Mass.—Your compound bombshell, or big shell, containing a lot of little shells, is a very old device. It was invented several dozen times during the late seige of Sebastopol.

J. M. C., of N. C.—If your plan for preventing back-lash, in gearing is new, it could be patented. Yes, it would be better to join two ends of a rail on the same sill. A cannon ball, placed in water, would sink to the bottom. It is a popular error that bodies heavier than water will sink until they reach a point where the liquid is sufficiently dense, and there remain.

F. G. A., of Ga.—We do not think of any particular number of our paper in which engines and mills, similar to those you speak of, are described. But we presume we have many times published accounts of machinery that would suit you. Read the Sci. Am. carefully, and no doubt you will soon find what you desire. $2 received.

J, D., of Pa.—The great amount of space required for your method of propelling vessels would certainly be an objection to its employment.

E. C., of Iowa.—The water in a tube will expand just in proportion to the heat which it is submitted; the same in low pressure steam as in boiling water.

M., of Me.—An arrangement somewhat similar to yours for straining saws, was illustrated in the last volume of the Scientific American, page 57. It is the invention of Brown & Coffin. They use air instead of steam. We do not think your device is patentable. $1 received.

J. L., of Va.—Your water wheel is not new in principle. It is more expensive, and not so good for practical purposes as others which exhibit the same general plan, viz., buckets that alternately slide through a cylinder.—You will find a number of such devices in the fifth volume of the Scientific American. Your invention would serve for a pump or rotary steam engine just as well as it would for a water wheel. But it is better in theory than in practice. It is not patentable, nor usefully practicable.

S. D., of O.—Cast-iron mantel pieces are enameled with a frit of ground glass and borax, put on wet, in the form of a paste, allowed to partially dry in the air, and then fused in an oven. Don't know the temperature of the oven, nor any enamel that will stand an extremely high temperature.

G. W, F., of N. Y.—Artificial lights have been made of sufficient strength and purity to produce ambrotypes and daguerreotypes, but merely as abstract experiments, and not with a hope of improving upon daylight for such purposes.

F. W. E., of N. Y.—We could give you opinions about building a barn, according to our notions how a good and convenient one should be built, but not from practical experience. Probably you would find it profitable to steam your hay for feeding milch cows, at least for one meal per day.

Mr. H. G. Seeber will oblige us by sending his post office address without delay, as we wish to communicate with him.

D. E. W., of Conn.—You can make and sell an article two years before applying for a patent; but you run the risk of some other person taking out a patent on it during that period.

B. & B., of N. C.—Mr. F. S. Pease, of Buffalo, N. Y, manufactures and sells a good lubricating oil. The price of a suitable machine for mortising plow beams we do not know. Address some of the manufacturers.

N. W. C., of N. Y.—Christopher Hollingsworth, the inventor of the knuckle joint washing machine was a resident of Liberty, Ind, at the time his patent was granted—1352. A letter to that address might reach him.

S. & B., of Conn.—Your device for twisting twine is old.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Feb. 7, 1857:—

J. F. R., of Iowa, $25; D. R. A, of O., $30; J. M., of Miss., $60; A. E. W., of Iowa, $25; I. H. C., of Ill., $110; O. D. W., of Pa., $100, H. W., of N. Y., $30; B. S., of N. Y., $30; S. G. L., of Mass., $30; W. B., of N, J., $10; B. T. B., of N. Y., $35; I. P. S., of N. Y., $57; H. R., of N. J., $30; G. A. M., of N. Y., $30; A. R. H., of Pa., $25; T. P. S. D., of Me., $5; G. & F., of N. Y., $30; E. F., of Iowa, $30; J. B., of R. I., $30; N. B., of Ill., $30; L. W., of L. I., $35; N. N., of Pa, $30; F. W. W, of Texas, $25; E. B., of N. Y., $30; B. A. H., of N. Y., $10; R. W., of Mass., $30; G. W. F., of Pa., $50; J. P. R., of Pa, $150; E. F. F., of Vt., $25; J. M., of Ind., $50; R. S. J., of Conn., $25; W. W. D., of N. Y., $27; J. H., of N. Y., $25; L. W., of N. Y., $15; J. H. S., of N. Y., $27; J. C., of L. I., $60.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 7, 1857:

T. P. S. D., of Me.; A. R. H., of Pa.; W. L., of N. Y.; J. F. R, of Iowa; C. B. G., of Iowa; W. W. D., of N. Y.; E. F. F., of Vt. J. H., of N. Y.; L. W., of N. Y.; T. H. S., of N. Y., G. W. F., of Pa. (2 cases); F. W. W., of Texas; J. C. of L. I.

Important Items.

☞ Complete Sets of Volume XII Exhausted.—We regret that we are no longer able to furnish complete sets of the present volume. All the back numbers previous to January 1st (No. 17) are entirely exhausted.

Inventors Sending Models to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them.

Terms of Advertising.

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

☞ All advertisements must be paid for before inserting.

Science and Art.

New Transatlantic Telegraph.

The accompanying engraving is a view of a new plan for an Ocean Telegraph Line between New York and Liverpool, Eng. It is the invention of Professor A. Hall, No. 335 Broadway, this city, the inventor of the Telegraph Clock illustrated on pages 233 and 236, Vol. 9, SCIENTIFIC AMERICAN.

The particular feature of the plan of telegraph here presented is the Floating Stations, located and anchored securely at proper intervals to receive the ends of sections of the cable, and thus by shortening the circuits make the action of the current strong and quick. This is, unquestionably, a plan that can be made to work *effectively*, if at all, and demands at least, from the grandeur of the idea, the attention of the scientific public. The only question is as to firmly securing the Floating Stations, which does not seem impossible when we reflect upon the enterprise and genius of the present age. In the article annexed, communicated by Professor Hall, the subject is elaborately discussed, and he gives plausible reasons at least for the practability of his plan.

The only question of doubt as to its practicability is the securing of the Floating Stations represented, to prevent them drifting during storms; if this can be done, the project is practicable.

The telegraph cable, A, is represented attached to floating buoys, but it may be laid on the bottom of the ocean.

Professor Hall has alluded to the length of time required in signalizing through a long line of submarine cable, extending from New York to Ireland, amounting to six seconds from the period one signal is transmitted until the the wire is capable of being operated to send a second signal. From data in our possession, we make the period of time between two signals, seven seconds, and conclude that he is correct in his deductions respecting the small amount of work which can be accomplished by such a long submarine circuit. His plan, therefore, of making a series of short circuits is founded on scientific principles, for quick and economical working.

The reason why electric signals are so much retarded in wires encased in gutta percha, and laid under water, is owing to *lateral induction*. The insulated wire assumes the character of a vast Leyden jar, the copper wire representing the inner coating, and the water outside of the gutta percha, the outer coating. This *lateral induction* of the electric fluid in the cable, not only retards the current passing through it, but when one electric wave is sent through the wire, another wave or signal cannot be sent until the reflex, or return wave has escaped; and the time required for this is twice as long as for the direct wave.

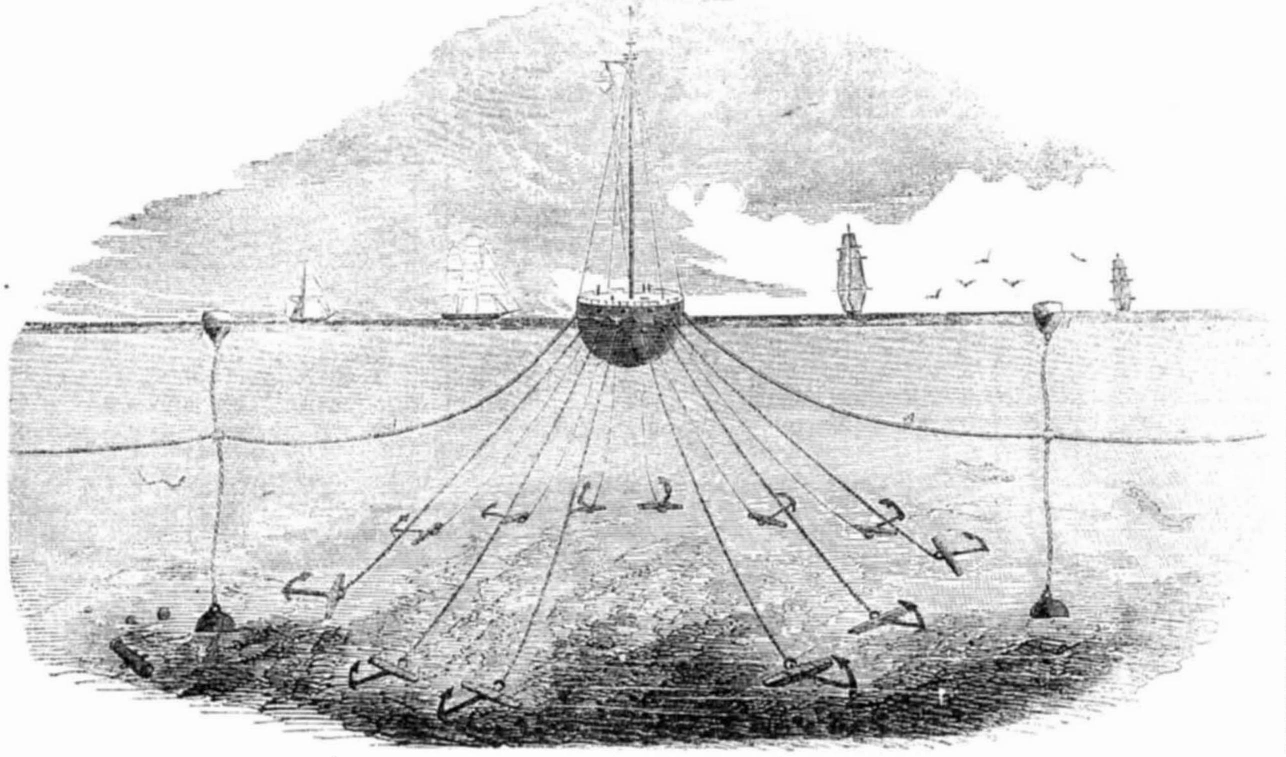
MESSRS. EDITORS—As a practical experimenter in Electricity I cannot agree with the general opinion as to the feasibility of the plan of a telegraph across the ocean, now in progress under the patronage of England and the United States, though I fully concur in the grandeur and magnitude of the enterprise.

My reasons for predicting its failure are as follows :—

1. There has never yet been transmitted a communication through a continuous wire the length of this cable—twenty-four hundred miles—so far as my information extends. But even had this experiment been successfully made on land, the managers of this enterprise are very much deceived if they assume a similar result with a submerged wire. It can be easily demonstrated that a coil of wire, ever so well insulated, if immersed in water, will not effect an electro-magnet with the same power as if tested out of water.—The proximity of so antagonistic an element produces a sensible effect upon the electric current, and would, in the length of cable proposed, entirely absorb the subtile fluid, especially all that could be forced through so small a wire as the one contemplated. But even admitting a communication possible, it is known to Electricians that in submerged wires a perceptible period of time elapses in the passage of the current, and that this period increases with the length of cable, and that it requires some seconds of time before the wire is uncharged after each signal. In the length of cable proposed, according to recent experiments, it would require over six seconds for each signal, making less than half a column in the New York *Herald* for 24 hours' work as its possible capacity—not one-twentieth the probable demand.

2. In the next place, leaving out of the question these radical and insurmountable obstacles in the way of the present plan of a Telegraph, the improbability,to use no stronger term, of securing a perfect insulation with so thin a coating of gutta percha for so many hundred miles of wire, when the slightest particle of damp—even the prick of a pin—through its delicate covering, would destroy the whole work, is of itself an important item in making up the chances of success.

HALL'S OCEAN TELEGRAPH LINE.



3. Then the almost impossibility of laying down so long and delicate a cord without an accident, from ships surging, perhaps, against heavy seas, when the slightest strain would damage either the central wire or its covering, and I can see but little margin for a successful result.

Now, supposing these objections well-founded, is there any plan to avoid these difficulties, and thereby achieve the greatest work that the enterprise and genius of man ever contemplated ? I beg leave to submit to the public the outlines of a plan which I have submitted to the inspection of competent parties with a favorable report, the leading feature of which is to shorten the telegra hic circuit, by constructing Floating Telegraph Stations, to be located and permanently anchored at suitable distances apart, directly on the line of vessels traveling between New York and Liverpool. These Stations would be constructed in a peculiar and substantial manner, with but a single story above the water, so as to meet any emergency of wind or weather, and to be secured to the bottom of the ocean by wire cables, such as suspension bridges are made of, radiating in every direction, attached to heavy anchors sunk in a circle around the Station.

It need not be here said hastily, as it doubtless will be, that it is impossible to locate permanently a Floating Station to receive the ends of telegraph cables, with suitable apparatus, material, and operators to transmit messages, &c. Whatever the apparent difficulty may seem at first, the thing is nevertheless entirely practicable, and is only a question as to the strength of the vessel, the number of cables, and the weight of anchors. If fifty cables and anchors of one tun weight will not secure it, let there be five hundred cables and anchors of ten tuns each. What would that be to the accomplishment of so great a work ? A Floating Station of this kind every five hundred miles, with suitable force and material, would make the electric circuits so short as to render them perfectly reliable, besides answering purposes of infinite importance to the shipping interests of the two great countries they connect. When located they would have their fixed places on ocean charts, and should any accident befall a ship in mid-ocean, it would, of course, make for the nearest station, when aid could be instantly telegraphed and sent from the nearest port. Besides answering the purpose of light-houses and ocean marks to the commerce of the world, they could report the progress of vessels plying between the two ports, to the great interest and satisfaction of friends, whereas now, the fate of thousands of lives and millions of property is hid in weeks and months of anxious suspense.

The Telegraph cable connecting these stations should contain at least *four* separate conducting wires, not only to provide against the chance of a single wire becoming damaged, but to allow a number of operators to transmit messages at the same time, as the amount of business will no doubt require it. There will be no difficulty in making the cable of any required size to insure perfect insulation, as the short sections can be conveyed to their respective localities in separate vessels.

In addition to Floating Stations, I propose suspending the cable below the surface of the water, a sufficient depth to be out of the way of ships, icebergs, etc., say eighty or one hundred feet, by means of buoys or floats. The cable should be made of such a specific gravity as to barely sink, so that there would be no difficulty in floating it with buoys, say one mile apart. Directly under the buoy would be attached an anchor or weight to prevent the cable from swinging from its direct line These buoys painted white and numbered would mark out a highway across the trackless deep, and would many times prove of great utility in determining the exact location of vessels, as well as prevent collisions, by each ship keeping its own side of the buoys. The most important object contemplated in the use of buoys, however, is the facility it would afford in case of a defect in the cable at any point, for finding and repairing it, as th cable could be lifted out of the water by aid of the buoys, and tested with the same facility as an operator will hunt for a defect in a wire along a line of poles, whereas, a single defect in the cable, according to the plan now progressing, would be equivalent to its destruction.

I do not regard the buoy feature of my plan essential to its success, as the cable can be sunk to the bottom between the Stations, and thereby lessen the first cost of a Telegraph ; but short circuits being, as I conceive, and as I think the scientific world will yet be forced to admit, a prac ical necessity in Submerged Telegraphs, I submit the plan of Floating Stations as the only practical system of connecting the two continents. ALEX. HALL.

New York, Feb., 1857.

Measures have been taken to secure patents in the United States and England.

American Life Boats.

W. B. Davis, of Brooklyn, the inventor of the life rafts before noticed in our columns, has just received an order for two cedar boats for the *City of Manchester*, to be made life boats on the same principle.