Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS

VOLUME XII. NEW-YORK, APRIL 11, 1857. NUMBER 31.

THE

Scientific American,

PUBLISHED WEEKLY

At 128 Fulton street, N. Y. (Sun Buildings.)

BY MUNN & CO.

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

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Single copies of the paper are on sale at the office of publication and at all the periodical stores in this city, Brooklyn, and Jersey City.

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Trees on Farms.

Those parts of our country which were first settled, were originally covered with dense and noble forests. These had to be laid low with the woodman's axe, and consumed in his log fires, in order to reclaim the land for the plow, and fit it for receiving "the seed of the sower." The very superabundance of timber rendered it of no value, but for building houses, making a few implements, and for burning as fuel. To clear the soil of timber was the great object of the pioneer farmer, and trees were regarded by him as an incumbrance. Before such a spirit great forests have disappeared without a thought having been exercised, as to the natural uses of trees in the economy of nature.

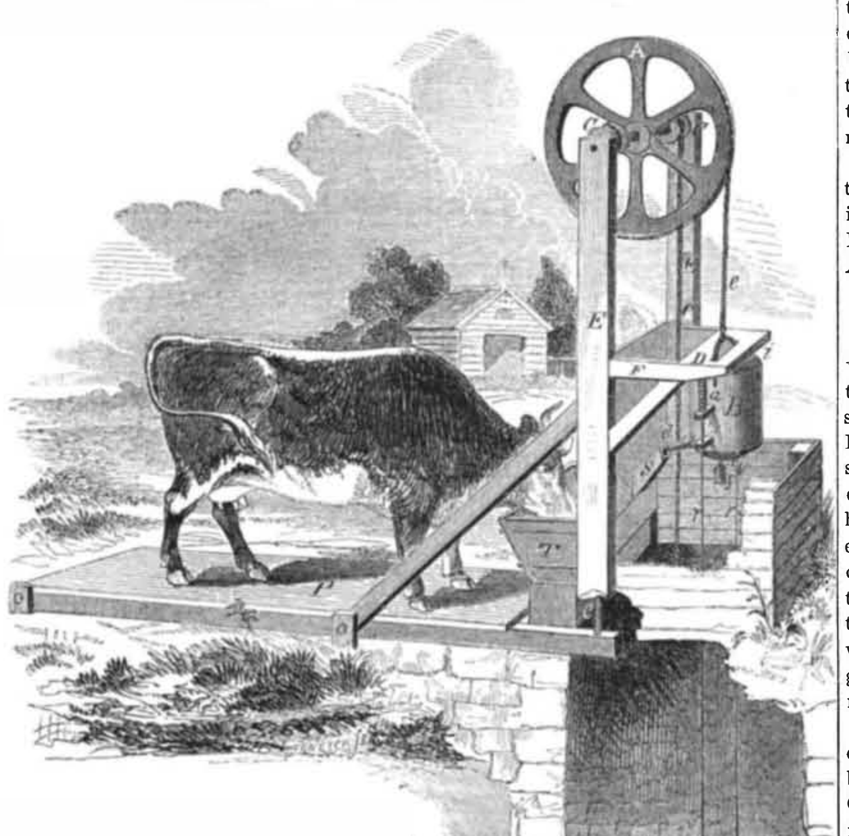
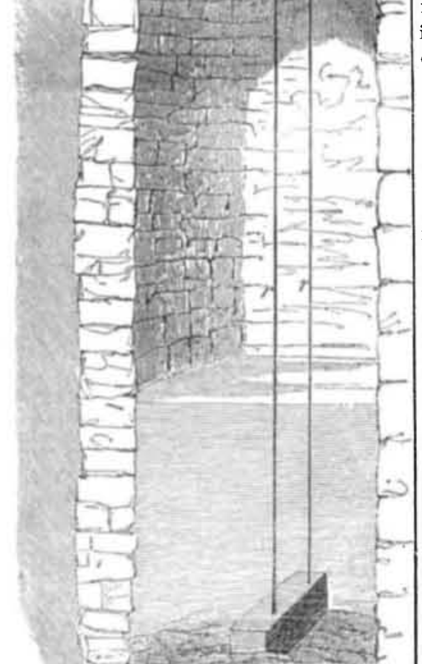
Trees, like mountain ranges, attract clouds and promote rains, without which the most fertile lands become barren wastes.

There are some parts of our country—especially western New York—that are now often visited with long summer droughts, where fifty years ago showers of refreshing rain were more frequent and regular; as a consequence the soil does not now yield so abundantly. Some streams that once rolled along in full swelling currents, driving busy mills throughout the entire year, are now almost dry water-worn courses during a number of months, at least, and the mills on their banks have fallen to decay. This has been caused by the destruction of the forests. They acted the part of reservoirs (by preventing evaporation) to the streams, and as conductors to the rain clouds.

In some parts of Asia and Africa the ruins of large ancient cities are found covered with the sands of the desert; around them there once bloomed fruitful fields. To those farmers who reside in districts and on farms where the timber has been almost annihilated, now is the season to put in practice a useful lesson, viz., to plant beltings of beautiful and useful trees around their farms. Trees equalize the temperature of climates, by attracting clouds in hot weather, to cool the atmosphere with showers; and they shelter houses and crops from high and cold dry winds. And this advice is not only useful for those residing in regions denuded of their forests, but more useful still for our farmers residing on the broad rich prairies of our Western States.

And trees are not only useful as agents of refreshing rains, but they promote health and beautify the landscape. It is a settled question, we believe, that they absorb miasma from the atmosphere; and certainly a treeless landscape is as dull as a tenantless house. Many of our farmers have an eye to the beautiful in the selection of trees for the grounds around their houses, but few of them seem to have paid proper attention to the laying out of their farms. In directing their minds to this subject at the present time, we hope that considerable good will be the result. We do not mean to suggest what kind of trees they should plant, as these should be varied for the locality, soil and climate, but we advise them not to fail in planting some kind.

AYRES' WATER ELEVATOR.

The utility of a device which can enable an animal, by slightly depressing the platform on which it approaches, to draw up from a well a plentiful supply of drink, is too obvious to require remark. The labor of pumping a sufficient quantity daily to supply a large amount of stock is very considerable, and may frequently prevent the location of wells in many pastures, where, with a self-acting device for raising the fluid by the weight of the animals themselves, such supplies of water would be highly serviceable.

The accompanying cut graphically delineates the general arrangement of a self-acting water elevator for this purpose, designed by J. A. Ayres, of Hartford, Conn., and its operation will be readily understood from a brief description.

The bucket, B, steadied by light guides, *r r*, is suspended by the rope, *e*, which latter is coiled on the large wheel, A. On the same shaft with A are mounted smaller pulleys, C C, on which ropes are coiled, which are attached to one edge of the platform, P. The opposite edge of this platform is hinged, so that it may rise and fall, to some extent, and the weight of the bucket is sufficient, by its descent, to raise the platform when unloaded, but when a large animal steps on P its weight is sufficient to revolve the wheel and raise the bucket, bringing up considerably more water than it can consume, and keeping the trough always full and running over, unless sheep, or other very light animals are supplied in addition.

The coiled spring, *a*, is provided as represented to check the ascent of the bucket, which might otherwise rise too suddenly against the frame, F, under the violent and irregular movement of heavy cattle. It is well also to place elastic material, such as turf, old straw, brushwood, or the like, under the platform, with a view partially to check its descent. We have represented the device in its simplest form, a small spout, *d*, being permanently open to admit the entrance and escape of the water, the flow being inward to fill the bucket when at the bottom, and outward into the spout, S, leading to the trough, T, when at the top of the well; but this arrangement allows the vigorous escape of the water through all the intermediate hights, so that much is necessarily lost; and Mr. Ayres' invention provides a self-acting faucet, (not represented) which is always open when at either the top or the bottom, but which remains closed in moving through the intermediate points. For this purpose the pipe, *d*, is made very short, or removed altogether, and a lever hung on a pin by its side, so that when freely suspended it will assume a nearly horizontal position, so as to stand across the mouth of the opening, and check the escape. This lever, pivoted in the middle, has affixed to one extremity a buoy of wood or cork, so that on dashing into the water in its descent, it will be raised at that end and uncoving the aperture will allow the bucket to be filled. The other extremity of the lever comes into play when the bucket is raised to the full hight required, as it then comes into contact with a fixed pin on the framing, and inclining the lever to the same extent as at the bottom, uncovers the orifice to allow the free discharge. By this simple device all the ends to be desired are effectually attained, so far as certainty of action by the weight of heavy animals can do this; and it will be seen, on a little further thought, than even an animal too light to raise the full bucket, will, by inducing a considerable pull on the bucket, and by consequently raising it a trifle in the water, induce the contents to escape freely through the open hole until it becomes light enough to rise rapidly to the top.

Farmers and others wishing further particulars can obtain circulars, etc., by addressing the proprietor of the invention, Henry A. Dyer, Hartford, Conn. The patent was dated April 15th, 1856.

Restoring Oxydized Bronze Figures.

Some ancient bronze statuettes, and other works of art, have become so oxydized as to be perfectly brittle, like the rotten brass sheathing of ships. Chevreul, the eminent French chemist, has succeeded in restoring such works to their original malleable condition, and has communicated an account of his experiments in a paper to the Paris Academy of Sciences. He placed a small but completely oxydized statuette in a porcelain tube filled with hydrogen gas, then raised it to a dull red heat, and took out the figure. It was found to be completely revived—the oxygen expelled, and the figure reduced to solid metal.

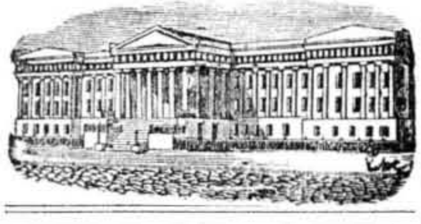
Some ivory figures obtained by Layard in old Ninevah were found to be brittle, (rotten) but in perfect form. They were sent to Prof. Owen, in England, who revived them by immersion, and then boiling in gelatine. The ingenious discovery of Chevreul reminds us of the important one of the English Professor.

Evaporation of Salt and Fresh Water.

Prof. Chapman, of Toronto, Canada, has made experiments on the evaporation of salt and fresh water, and has come to the conclusion that the great object of salt in the sea, is to regulate the amount of evaporation. He says:—"If any temporary cause render the amount of saline matter in the sea above its nominal value, evaporation goes on more and more slowly. If this value be depreciated by the addition of fresh water in undue excess, the evaporating power is the more and more increased. The experiments were made on weighed quantities of ordinary rain water and water holding in solution 2·6 per cent. of salt. The excess of loss of the rain water compared with the salt solution was, for the first twenty-four hours, 0·54 per cent.; at the close of forty-eight hours, 1·04 per cent.; after seventy-two hours, 1·46 per cent.; and so on in increasing ratio."

Wall Paper Poisonous.

Dr. Hinds, of Birmingham, Eng., has lately called attention, through the London *Lancet*, to a method of accidental arsenical poisoning which should be generally known, and from which he was himself the sufferer. He chanced to select, for the adornment of his study, a particularly bright tinted wall paper, the pattern of which was confined to two shades of green. About two days after it had been applied he first used the room in the evening, sitting there and reading by a gas light.—Whilst thus engaged he was seized with severe depression, nausea, abdominal pain, and prostration. The same chain of symptoms ensued on every subsequent evening when he occupied the room. This led to an inquiry into the cause. He scraped off a little of the bright coloring matter from his pretty green paper, and, by sublimation, produced abundant crystals of arsenious acid. The paper was colored with arsenite of copper (Scheele's green). Dr. Hinds remarks that the presence of the arsenical pigment may be recognised by its brilliant and beautiful hue, and by a little running of the color at the edges of the pattern, as though it did not take freely to the paper.



[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 31, 1857.

PLOWS—Elliot Andrus, of Geneva, N. Y.: I do not claim the invention of the plow, nor the iron beam, mold board, or shear.

Neither do I claim the cam wheel.

But I claim the frame, E E', for the purpose of holding the mold board, B, attaching the handle, P', and supporting the end of the wheel shaft, s.

I also claim the manner of attaching the mold board upon pivot points, in combination with the lock d d', and links, L L.

I also claim the combination of the wheel, W, cams, a a1 a2 a3 a4 a5, and friction roller, b, or their equivalents, to produce the oscillating motion of the mold board, in the manner and for the purpose substantially as described.

GRADE DELINEATORS—Geo. R. Clarke, and Samuel Adams, of Antioch, Cal.: We claim, first, the use of the pendulum, L, or its equivalent, operated upon by gravitation, in combination with the cones, C D E, and the friction wheels, G and H, or their equivalents.

Second, we also claim, in combination with the pendulum, L, and the cones, C D E, the arrangement of the arms, a b c, the bars, d e f, and slides M, to move the friction rollers along the cones, substantially as above described.

Third, we claim combining the pendulum, L, or its equivalent, with the paper rolls and grade pen, or either of them in such a manner that their respective motions, as set forth, may produce correct horizontal and vertical scales, or a profile of the ground traveled over by the carriage.

YARNS FROM MIXED COTTON AND WOOL—Geo. S. Bradford, of Sandlake, N. Y.: I do not claim the mechanism employed for covering a cotton drawing with wool.

But I claim carding through the finisher, as specified, the drawing made by covering an evenly prepared cotton drawing with wool, as described, thereby leaving most of the wool on the outside of the finished roving without carding the cotton through any wool carding machine but the finisher, and hence leaving the staple of the cotton straight in the finished rovings, as set forth.

BOATS—Robert C. Buchanan, of Baltimore, Md.: I claim the portable boat, as described, the same consisting of the portable skeleton frame work and unprepared canvas, secured to the frame work by lashings, in the manner set forth.

STEAM DRYING CYLINDERS—John Booth, of Pawtucket, R. I.: I claim the arrangement of the steam and waterpipes at one end of a drying cylinder, in the manner and for the purpose substantially as described.

[A portion of the steam employed in drying cylinders is condensed into water; this is commonly carried off by gutters, which only operate when the cylinder is in motion. The employment of a syphon in the journal of the cylinder (as here claimed) carries off the condensed water constantly; while by taking the heating steam pipe through into the syphon the use of one stuffing box is dispensed with—two being necessary by the old method. This is a good improvement.]

CORN CULTIVATORS—John B. Baker, of Onondaga, N. .: I am aware that cultivators have been made with adjusting bars before and behind, whereby the teeth may be adjusted in a manner similar to mine, and I do not, therefore, wish to be understood as making any claim to the adjustment.

But I claim the arc or fender, E', in combination with the adjusting bar, E, whereby the stalks are laid aside, and the said bar rendered much more durable, the whole constructed as set forth.

GANG PLOWS—Jesse Frye, of Springfield, Ill.: I claim the so hanging of a gang or series of plows upon their stock and beam as that the conductor upon his seat may, by a system of hand levers and connecting rods, substantially such as set forth, adjust said series of plows to any desired depth or width of furrow, as set forth.

BRICK MACHINES—Jas. A. Doer, Ira Hersey & Edward G. Oldfield, of New York City: We claim the combination of the cams, L L, eccentric, R, and slotted projection, P, attached to strap Q, with the rollers, K K, beam, I, and lower pistons, J J, when said parts are constructed and arrranged in the manner and for the purpose set forth.

LOCK—V. R. David, of Newark, Ill.: I claim the bar, E, with projection, e, attached, in combination with the slide, a, fitted within the slotted chamber, C, the above parts being arranged and used in connection with the bolt, G, as described for the purpose set forth.

[It is extremely difficult to convey an idea of this improvement without a diagram. Suffice it to say, that by the use of a stop applied to the lock—which stop is arranged and operated in a peculiar manner—the bolt of the lock is prevented from being moved till the stop is moved from it, and thus the lock is rendered very difficult to pick.]

SLEEVE BUTTONS—John P. Derby, of Boston, Mass.: I do not claim the movable arm, P, or the joint by which it is attached to the fastener, as I am aware that the eye of button or clasp has been constructed with a movable part which opened inward; such forms no part of my invention.

But I claim the lever, V, which is used by increasing the distance between the joint, R, and the face plate, K, by the means of a post, S, so shaped that the arm, P, can be raised and depressed, substantially as described, said arrangement allowing the fastener to be entirely operated from the face side, in securing it to and detaching it from the wristbands.

BULLET MOLD—Henry L. DeZeng, of Geneva, N. Y.: I claim the movable cam jaw, B, in combination with the cutting bar, C, constructed and operating substantially as specified, whereby the movable jaw is held to the stationary jaw while the bullet is being cast by forcing the handles apart, and on pressing the handles together the projection from the bullet is first cut off, and then the movable jaw is thrown back to discharge the bullet, substantially as specified.

SEWING MACHINES—James E. A. Gibbs, of Millpoint, Va.: I claim making a series of lock stitches, with a double hook reciprocating its motion of a single revolution or part of such revolution, substantially as set forth.

I also claim in combination with a sewing machine, the hollow thread case, of a spherical, oval, or any other similar form, for containing a ball of thread, having no fixed axis of revolution.

I also claim attaching to the globular thread case, a plate, or its equivalent, furnished with two hooks, which are placed symmetrically in the manner specified, and combining the whole with any suitable mechanism that will impart thereto a reciprocating motion of a single revolution, or part of such revolution, when the axis of revolution is fixed substantially as set forth.

DRY GAS METERS—Hyam Jacob Hyams, of Russia. Patented in England Feb. 16, 1856: I do not intend to confine myself to the exact form and arrangement of parts shown and described, as they may be varied without departing from the nature and object of my invention.

But I claim the connecting together the rigid parts of the movable diaphragms, substantially as specified, in order that they may act together, as described.

I also claim the construction and arrangement of the rotating circular valve, as shown.

ROTARY SHINGLE MACHINE—Edwin Edwards, of Oneida Lake, N. Y.: I am aware that devices have been employed for shifting the position of the bolt at each cut of the knives, so that the shingles can be cut in taper form, and the butts cut alternately from each side of the bolt. But the devices hitherto employed have been com licated, expensive to apply to the machine, and liable to get out of repair.

I claim the employment or use of the adjustable annular gages, G H, formed each of two parts, b c d e, and applied to the wheel B, as shown and described, for the purpose set forth.

[This improvement relates to rotary cutting shingle machines. Two annular and concentric gages are attached to the face of the wheel, and are so arranged and made adjustable that as they rotate they cause the bolt of wood to be presented angularly to the cutters, whereby the shingles are cut of a proper taper form from it. Each cutter acts alternately, and cuts a shingle from opposite sides of the bolt. It is an excellent improvement.]

CREASING PLATES FOR R.R CAR SPRINGS—Perry G. Gardiner, of New York City: I claim the use of the V-shaped roller, T, and flat faced roller, N, for creasing the plates, as described, when operating in connection with the carriage, W, the plates, S, and guide or stop plate, a, in the manner and for the purposes specified.

DISENGAGING R.R. CAR SPRINGS FROM MANDREL—Perry G. Gardiner, of New York City: I claim the peculiar construction of the disengaging tool, L, and the manner of constructing the platform, M, when operating in connection with spindle S, for detaching the coil, in the manner described.

SHOE LAST—Alanson and William P. Haskell, of North Brookfield, Mass.: We claim the use of the concave head in connection with the adjustable guides and rest, when constructed and operating substantially as described.

Second, we claim so constructing and hanging the bent lever, or its equivalent, as to allow the same pattern to be used for the different sizes, the position of the pattern governing the size, substantially as described.

Third, we claim the combination of the lever, J, plate, i, and cutter head, when constructed and operating substantially as set forth and described.

COMPOSITION FOR FLOOR CLOTHS—Jos. W. Harman, of Brooklyn, N. Y.: I claim the use of this compound or the application of the same to the making and manufacturing of floor cloth carpets, substantially as set forth.

STEAM CARRIAGE—John S. Hall, of Pittsburgh, Pa.: I claim, first, so combining and arranging the driving machinery and body of the carriage with the wheels and axles as described, so that the latter may be both swiveled, moved, or adjusted in any and all directions, without in the least changing the relation of all parts of, or otherwise affecting the said driving machinery, or body of the carriage.

Second, the stationary, universal driving bearings or boxes, H2 H2, or their equivalents, whereby the axles and wheels may be readily rotated or driven in all their variable relative positions, with the driving machinery and body of the carriage.

Third, the double ratchet wheel, i, in combination with the pawls, K and n, and spiral spring, constructed and operating as set forth.

HINGE—R. Hart, of Marietta, Ohio: I claim the employment of the arms or levers, D E, constructed, arranged and operating substantially in the manner and for the purpose set forth.

I also claim, in combination with the movable arms or levers, D E, the lever, F, constructed and arranged with a shifting pawl, and operating substantially as shown.

CORN HARVESTERS—Abram Heulings, of Philadelphia, Pa.: I claim the combination of the tilting platform, P, the gates, b c, curved arms, d, and swinging links, e, with the rock shaft and its operating lever and rod, when said parts are arranged for joint operation substantially as described.

CUTTING SLOTS IN CLOTHES PINS—John Humphrey, of Keene, N. H.: I do not claim the saw, the inclined spout, or the means of securing the pins for the action of the saw, separate from the holder.

Neither do I claim a sliding holder, irrespective of its construction.

But I claim, first, a holder so constructed that the pins may be received into a grove or chamber behind the part in which they are secured, for the action of the saw, and then driven forward by a driving rod, or its equivalent, to the proper position for the cutting of the slots, the same being stationary, or having a reciprocating motion, as described.

Second, I claim, in combination with the holder the saw, the inclined spout, and the dog, H, or their equivalents for the purposes set forth.

HUSKING CORN—Abraham R. Hurst, of New Cumberland, Pa.: I claim the employment or use of the sliding jaws or plate, C, lever, E, and plate or disk, F, the jaws or plates, C, being connected to the lever, E, by straps, D, and the jaws or plates, C, placed or fitted on on the bed piece or platform, B, the above parts being arranged substantially as shown, and used in connection with the knife or cutter, p, for the purpose set forth.

[In this corn-husking machine the ears are held between the self-adjusting spring plates, and their butts are cut off with a knife. When each butt is cut off the ear is forced out from between the plates, which hold the husks firmly, and thus the husks are stripped off cleanly. This is a very effective and ingenious husking machine.]

CARRIAGE TOPS.—R. S. Jennings, of Waterbury, Conn.: I do not claim having carriage covers to fold up into a smaller compass, or in a manner to reduce their length by falling back.

Neither do I claim having them to fold, so as to reduce their hight by means of a joint in the vertical portion of the front bows, as in Scripture's arrangement.

I claim the employment of a transverse hinge joint, b, on each of the bows, B C D, at the center of their top or horizontal portion, in combination with staples, d d, and two pairs of bars, c c c c, which are pivoted at one end to the front bows, and at the other end are each provided with a slot, e', and furnished with a hook, e, substantially as and for the purposes set forth.

[By this improvement a carriage top is so constructed that it can be readily put on and taken off a vehicle, and then compactly folded when not required for use. Such a top can also be expanded and adjusted to suit the seat of the carriage. It is a good invention.]

BEE HIVES—Albert Kelsey, of Westport, Mo.: I am fully aware that sash frames have been used in the working chambers of bee hives. These I do not claim.

But I claim in combination with the double chambers of sash frames, the two walls with communicating passages through them, when said walls or partitions are so arranged that a slide or cut off can be introduced between them, for the purpose of an entire separation, as set forth.

MAKING PASTEBOARD—Louis Koch, of New York City: I claim, first, the arrangement of the roller, E, in connection with the arm, G, and projection or screw, O, for the purpose of operating the lever, R, by which the slide P, is held fast or set at liberty when the board has obtained the required thickness, together with the arrangement of regulating, by means of said screw, o, the required thickness of the pasteboard, in the manner specified.

Secondly, I claim the movable slide, P, or its equivalent, constructed and operated as described, and for the purpose of cutting or tearing and lifting the pasteboard which was formed on the roller, A, from said roller after the same has obtained the required thickness.

Thirdly, I claim the arrangement of the movable frame, S, with leather, or its equivalent, attached, for the purpose of stripping off the cut pasteboard from the end of the slide, P, the whole being operated in the manner as specified.

PRESSING WATER OUT OF PASTEBOARD—Louis Koch, of New York City: I claim the combination of the pressing rollers, in connection with the rollers, N M and N' M' arranged with endless felts, in such a manner that the board shall be made to pass between the pressing rolls between two thicknesses of felting, to allow the water contained in the board to be pressed out of the same without injuring the board during the pressing process, the whole being arranged in the manner and for the purpose described.

PRAIRIE PLOWS—Jesse Frye, of Springfield, Ill.: I claim, first, supporting the after end of the plow beam, A upon a vertical journal at the left hand end of the axle, T, when the bearings at the opposite end of said axle are so arranged that the position thereof may be varied and adjusted, substantially in the manner and for the purpose set forth.

Second, I also claim arranging the bearings of the rollers, e e e f and g g g, in such a manner that their positions may be varied and adjusted, substantially in the manner and for the purpose set forth.

Third, in combination with the mold board composed principally of the series of adjustable rollers, as set forth, I also claim the adjustable triangular plate, w, for the purpose of making the whole conform to the position in which the furrow slice is to be laid or turned, substantially as set forth.

SEED PLANTERS—Geo. A. Meacham, of New York City: I claim, first, the box, B, provided with the elastic side, a, and the head, C, or its equivalent, for the purpose of distributing or measuring the seed.

Second, I claim the planter attached to the foot of the operator, and formed of the boards, F G G, connected by the elastic straps, e e', the boards, G G having the plates, H H, attached to them and the under side of the board, F, the plate, I, attached, the whole being arranged substantially as described, for the purpose of planting and forcing the seed into the soil by the pressure of the foot.

[This invention was illustrated on page 161, this Vol., Scientific American, and is the second patent issued to Mr. Meacham for such planters. A full description of this ingenious planter will be found on the page referred to.]

PREPARING YARN—Lucien E. Pratt, of South Kingston, R. I.: I do not claim the use of this or any other particular machine, for the purpose of forming the described muff or body of the yarn, as the same might be done on a reel, by having a suitable guide so constructed and arranged as to move a suitable distance along the reel alternately, or other different devices might be used for producing the same effect.

I do not claim winding a single thread in helices crossing one another, as is done in the formation of cops or balls of sewing thread.

But I claim in making muffs of thread or yarn to be dyed or otherwise treated, as described, my improvement consisting in winding a series of threads, each separated from, or at a distance from the other, in one helix band around a cylinder or drum, and so that the coils of each layer of such on the cylinder, may cross those of the next layer, substantially as described.

CORN PLANTERS—John Miller, of Bucyrus O.: I do not claim the perforated and reciprocating sides, f f, for measuring and distributing the seed and gypsum, or lime, for they are well known and commonly used.

But I claim the auxiliary compartment, d, having a slide, f', acting simultaneously with the seed slide, f, arranged and operating as described, for the purpose of designating the point of planting, as set forth.

[This improvement embraces the rendering visible of the places where the seed is deposited. Through an entire field the seed may be planted in parallel lines at equal distances apart. Two hoppers—one containing seed, and the other lime or gypsum, of a color contrasting with the ground—are operated at once, the seed is eposited in the furrow, and a little lime at the side of it, to render visible the spot where the seed is planted. The depositing device is under the control of the driver.]

SECURING BITS IN THEIR STOCKS—A. C. Moore, of Wilmington, Vt.: I claim the application to bit stocks of a plain socket with a screw cap to hold the bit in place by a pressure upon the shoulder of the bit head, thereby doing away with the necessity of fitting a bit before use, and gaining the advantage of a sure and firm fastening.

CENTERING AND HOLDING HUBS WHILE BEING BORED—Albert Moore, of Honeyoye Falls, N. Y.: I claim first, the construction of the chuck, consisting of the combination of the ring, R, and arms, d d d, said arms moving as described upon the fixed and movable points, P P P, and c c c.

Second, I claim the arrangement of the frames, E and F, in the manner and for the purpose substantially as described.

HARROWS—John E. Morgan, of Deerfield, N. Y.: I do not claim the connection of the two parts of the harrow, by means of the rod, F.

Nor do I claim the sliding or horizontal movement allowed upon this rod, as described, without the use of the vertical movement.

But I claim the providing for the vertical action between the two parts of the harrow, by means of the coupling formed by the use of the vertical enlongated links, E, operating on the rod, F, or its equivalent, as described.

ENEMA SYRINGE—C. H. Davidson, of Charlestown, and H. E Davidson, of Gloucester, Mass., assignor to C. H. Davidson, aforesaid: We claim the combination of the prolate spheroidal-shaped elastic sac, with flexible tubes terminating in valve boxes, containing valves, arranged for the purpose of eduction and ejection, when the sac tubes and valve boxes are in or nearly in the same axial line, the whole operating together, substantially in the manner and for the purpose set forth.

STEAMBOAT CAPSTANS—John Schaffer, of Manchester, Pa.: I do not claim the parts driving or driven, as separately considered.

Nor do I claim a capstan with a barrel divided into two or more drums, rotated upon a stationary shaft.

I claim a capstan, the shaft, C, of which rotates within the drums, D and E, which can be rotated separately or in conjunction with and by, or independently of, said shaft, substantially in the manner and for the purposes described.

TURNING IRREGULAR FORMS—W. D. Sloan, of New York City: I claim the series of rotating and shifting mandrels for rotating the blocks to be turned, and shifting them from one operation to another, substantially as described, in combination with the series of traversing cutters, guided by patterns, or molds, to determine the form to be produced, substantially as described, whereby a series of blocks are simultaneously subjected to the series of operations, and each in succession subjected to all the operations, as set forth.

I also claim the mode of operation, substantially as described, of the cutter, termed the finishing cutter, which said mode of operation consists in rolling the cutting edge along the surface of the block that is being turned, as described, by reason of which a small portion only of the cutting edge is cutting at any one time, and immediately relieved and followed by another portion of the said cutting edge, as set forth.

I also claim the sliding segment ring with its slots, substantially as described, in combination with the cutters and their appendages, substantially as described, for carrying the rangling cutters nearer to the axis of the blocks at each successive cutting action, as set forth.

STEAM PLOWS—D. B. Spencer, of Parkersburg, Va.: I claim, first, the use of the single wheel at the rear of the carriage, as the sole driving wheel, and running in the bottom of the furrow turned by the plow, substantially in the manner described.

I also claim hanging the two supporting wheels eccentrically on the same turning or rocking axle, so that whether the machine runs upon level ground or with one wheel higher or lower than the other, the frame and boiler shall still preserve its horizontal position, as set forth.

CONSTRUCTING BIT STOCKS—A. W. Streeter, of Shelburne Falls, Mass.: I claim the construction of a bit stock in sections, said sections being connected by joints in the manner and for the purposes substantially as set forth.

I also claim the mode of attaching the stock cap to the stock, by means of the box or tube, G, and cross pin D, or its equivalent, substantially as described.

FLUID METER—James Cochran, of New York City: I claim, first, in combination with a tilting measuring vessel or its equivalent, enclosed within an air tight vessel, a secondary air tight vessel, connected with the former, substantially in the manner and for the purposes described.

And I claim combining with a measuring vessel, treated in and combined with an air chamber, an apparatus substantially such as is described, which shall from time to time introduce portions of the outer air into the interior of the air chamber, the whole being and operating substantially in the manner and for the purposes specified.

STOVES FOR RAILWAY CARS—G. W. Thompson, of Bordentown, N. Y.: I claim the balanced valve, v, as hinged to the interior of the pipe, I, in combination with the lever, h, levers j and j', their disc, l, and the perforations in the cap, B, the whole being arranged and constructed substantially in the manner and for the purpose set forth.

SHAPING ENGINES—S. J. Wetherell and E. P. Morgan, of Biddeford, Me.: We do not claim, for the purpose of feeding the main carriage along on its ways, a long revolving male screw, turned by a pawl and toothed wheel movement, (arranged at one end of the machine,) and made to revolve in a female screw fixed and made stationary on the main carriage.

Nor do we claim, for the purpose of turning the revolving mandrel, a rotary splined shaft, and an endless worm or screw made to work in a worm gear fixed on the mandrel, all the same making parts of the well known Whitworth's patent universal shaping machine.

But we claim to make the screw, S, a stationary male screw, and the female screw, c (attached to the carriage D, and made to work on the screw, S,) a rotary screw, and to combine with them and the gear g, (by which and the gear, X, the shaft, T, is rotated,) the gears Y and h, (the latter being made to rotate on the shaft, i, and to be fixed to the former, as occasion may require, by a pin K, or its equivalent,) a rocker arm, r, and double pawl, u, (or mechanical equivalents therefor,) applied to the shaft, i, and operated essentially as described, the whole being to enable a workman to control the operations of the machine as stated, without being obliged to go to the end of the frame, or leave his work in order to adjust or change the feed motion of the cutting tool, whether it be planing either plane or cylindrical work.

RAKING APPARATUS FOR HARVESTERS—Jesse Urmy, of Wilmington, Del.: I am aware that rakes have been constructed and operated with a rake bar similar to mine driven by a crank, and having its rear end working around a stationary stud, and I do not lay any claim to such an arrangement.

I am also aware that the upper end of the rake bar has been governed by a connecting rod attached to a stationary point or fulcrum, and do not therefore wish to be understood as laying claim to any such arrangement.

But I claim operating the rear end of the rake, A, by means of a crank, D, when said crank moves with the pin that operates the rake bar, C, in combination with the connecting rod, b, and adjusting holes, v v, and y y, the whole being constructed and arranged in the manner and for the purpose set forth.

BABY JUMPERS—M. J. Wellman, of New York City: I claim the combination of the cross and corner springs attached to separate points of suspension at a distance from the center, and beyond the center of gravity with an infant's seat, constructed, arranged and combined in the manner and for the purposes set forth.

FEATHERING THE SAILS OR VANES OF WIND MILLS—J. C. and F. G. Wilson, of Cedar Hill, Texas: We claim the combination of the traversing screw, m, having stops e and f, as described, with the slide piece and rods leading to the wing, the construction and arrangement being substantially as and for the purposes described.

GUNPOWDER KEG—Jas. Wilson, Chas. Green and Wm. Wilson, Jr., of Brandywine, Del.: We do not claim the mere giving strength to metal by corrugating it, as that effect is well known.

But we claim the making the side or cylinder of corrugations, a a a, and bulge or swell B, when employed with the extra ring or boss, D, and head, C, for the purpose of greater strength and more convenient handling as set forth.

LIFE PRESERVING BEDSTEADS AND SOFAS—J. T. Garlick, of New York City: I claim the air and water tight bedstead, settee or sofa, constructed and arranged in the manner described, and for the purposes set forth.

COMPOSING AND DISTRIBUTING TYPE—W. H. Houston, of Belfast, Me.: I claim, first, the described machine for composing types, operating in the manner substantially as set forth.

Second, The method described of selecting the types from the cases by means of the springs, n, or their equivalents, operating in connection with the keys, O, in the manner substantially as set forth.

Third, The method of transferring the types to the stick by means of the plungers, R and T, or their substantial equivalents, as set forth.

Fourth, I claim raising the rule, Y, and throwing forward the line of type upon the galley by the means described, or by any means substantially the equivalent thereof.

Fifth, I claim the method of feeding forward the types in the cases by means of the slipping bands, E, rods j, and cylinder K, or their equivalents, operating in the manner substantially as set forth.

Sixth, I claim the wheel, F 2, with its ratchet wheel, M 2, and the connections, N 2, O 2, d 2, or their equivalents, whereby this wheel is caused to give motion to the shaft, C, whenever any one of the keys is depressed as set forth.

Seventh, I claim the described method of connecting the crank, U, with the pitman, W, by means of the springs, f, operating as set forth.

Eighth, I claim the distributing machine, constructed, arranged and operating in the manner substantially as described, by means of which a column of type when placed in the machine is distributed automatically in the manner set forth.

Ninth, The method described of forwarding the types to the trial case by means of the vibrating case, t 3, operating in the manner substantially as set forth.

MACHINE FOR WASHING GOLD—S. S. Lewis, of San Juan, Cal.: I claim the employment of riffles or bottoms, constructed in the manner substantially as described, so that an under current of water may be used between the ribs, in connection with that flowing over the surface of the bars of the riffles, in the manner and for the purposes set forth.

MANUFACTURE OF PAPER PULP—C. F. Sturgis, of Carlowville, Ala.: I claim the described process of manufacturing paper pulp from the bark of the root and the bark of the stalk of the cotton plant.

PAINT BRUSHES—J. T. Steer, of New York City: I claim the use of the binding ferule, C, for the purpose of effecting, as described, the introduction of the bristles into the cap ferule, E, the said cap ferule being made in one piece, with its cap and shank, as described, for the purpose of making an improved paint brush, as set forth.

GAS REGULATOR—C. J. Halstead and John Coeyman, of New York City, assignors to Decker, Godine & Halstead, of same place: We are aware that a double compensating valve, actuated through the pressure of gas on a flexible diaphragm, has been used in a regulator. This we do not claim.

But we claim a gas regulator, to be located between the meter and main gas pipe, and composed of the perforated plate, B, having a flange upon it provided with external and internal screw threads, and a plate, D, similarly perforated and provided with a screw which runs into said internal screw thread on the plate D, and adjustable therein by its stem, H, when said plates are combined with a single valve, C, and adjustable spring, E, and the whole arranged within the shell, A, substantially in the manner and for the purpose set forth.

PRINTING FROM ENGRAVED PLATES—Linus Stewart and Jno. McClelland, of Washington, D. C., assignors to David and John McClelland, of same place: We claim heating the plate from which the impression is to be taken, by means of a hollow bed plate, into which steam is admitted, substantially as described.

We also claim the cleaning of the plate by means of a horizontally revolving cleaning apparatus, in which a clean surface is constantly brought into contact with the plate, at every revolution of the cleaner, substantially as described.

We also claim, in combination with the fingers or nippers, the cam and spring, which alike hold them, whether open or closed, substantially as described.

BASKET MOLD—J. A. H. Ellis, of Springfield, Vt., assignor to Joel Woodbury, of same place, Trustee, &c.: I claim the basket mold, constructed substantially as described, viz., of a block or former, A, made with annular and top recesses, and provided with a shoulder ring, C, hoop catches, F F, and the bottom clamping plate and screws, or equivalents therefor, the whole being used in the manner and for the purpose as specified.

CUTTING THE THROATS OF CARPENTERS' PLANE STOCKS—Henry S. Dewey (assignor to himself and L. W. Newton,) of Bethel, Vt.: I claim the combination of the shaft path cutter, H, the plane iron and wedge throat cutter, I, the movable carriage, A, and the adjustable bearer, L, by which the inclinations of the ends of the throats may be obtained, as described, the whole being in manner and for the purpose as specified.

TABLE KNIVES—Conrad Poppenhusen and C. F. E. Simon, of College Point, N. Y. (assignors to Conrad Poppenhusen aforesaid): We are aware that German-silver knives have been made by fitting the rear end of the German-silver blade to a V-shaped groove in the forward end of the German-silver balance nut, and then uniting them by solder, and we do not wish to be understood as claiming, broadly, the union of the blade with the balance nut by either welding or soldering.

But we claim the mode of procedure described, by which we effect the union of the steel blade with the cast balance nut, whether of malleable or ordinary cast iron by preparing the rear end of the steel blade with cleansed parallel sides fitting a groove with parallel sides in the cast balance nut, preparing the surfaces with borax, or other equivalent flux, and then welding the same by heat and pressure, as described and for the purpose set forth.

RE-ISSUES.

WINDOW CURTAIN FIXTURES—S. S. Putnam, of Boston, Mass. Patented originally April 15, 1851: I claim attaching the curtain to its roll by a piece or strip which fits into a groove in the roll, and is secured thereto by caps at the ends, in the manner substantially as set forth.

PLANING MACHINES—J. A. Woodbury, of Winchester, Mass. Originally patented Feb. 7, 1854: I claim, first, the combination of the rotary disk cutter with the pressers and bed, substantially in the manner and for the purposes described.

Second, I claim the combination of the Bramah wheel, so called, with the rotary disk cutter and its accessories, for the purpose of planing, substantially as set forth.

Third, I claim the method of planing with a continuous drawing cut, substantially as described.

PLATFORM SCALES.—Thaddeus Fairbanks, of St. Johnsbury. Vt. Originally patented Jan. 13, 1857: I do not claim a combination of levers, wherein four platform bearing levers radiate from one common center, and are there suspended to a multiplying lever, connected with an equalizing lever, as I am aware that such is a common method of making a platform scale.

Nor do I claim the combination of a multiplying lever, an equalizing lever, and an equalizing and multiplying lever, as I am aware that such have been employed, and the platform thereof upheld by being made to rest directly on the first and last of said levers.

This differs essentially from my combination and arrangement, as by such I am enabled to employ an additional series of levers, viz., the transverse levers, C C C, whereby I gain an extra or manifest increase of leverage, and thus render the apparatus useful for determining the weight of railway carriages.

Nor do I claim the employment of a series of transverse and multiplying levers with a lever composed of a long longitudinal shaft, and an arm arranged transversely and projecting from such shaft, the transverse bearing levers of the platform being applied to the long shaft, with reference to its axis, as described.

But I claim my arrangement and combination of four bearing multiplying levers, C C C C. a multiplying lever, E, and a lever, F, made as described, so as to act at the same time as an equalizing and a multiplying lever, the whole being applied to a steelyard weighing lever by means substantially as set forth.

I also claim, arranging the suspension bridge, so that its arched standards shall extend upwards by the sides of of the platform, and between it and the sides of the pit, in manner as stated, in connection with arranging the transverse levers, C C, and their bearings below the platform, the same affording the necessary room for the vertical play of the longitudinal levers. while it secures an advantage as regards the depth of the pit, as stated.

FURNACES FOR BURNING WET FUEL—Moses Thompson, of New York City: I do not claim the described arrangement of a series of fire chambers to communicate with one common flue, irrespective of the purpose for which, and the manner which I employ the said arrangement.

But I claim using green bagasse, wet tan, wet saw dust, and other wet carbonacious or vegetable substances as fuel, for the production of intense heat by mingling the gases issuing from a highly heated mass thereof with those arising from carbonaceous combustion by the intervention of a flue or chamber, with which the chamber or chambers containing the fire and charge of wet substances communicate, and in which said gases meet, mingle and consume each other on their way to the apparatus to be heated, and to the stack.

I also claim the combustion, for the purposes of a high degree of heat, o bagasse, refuse tan, saw dust and other wet refuse substances, or very wet and green wood, by the employment of a series of fire chambers arranged in any manner substantially as described to communicate with one common flue or mixing chamber, when any number of said chambers are nearly closed to the admission of air when first charged as described; whilst the remaining chamber or chambers is in full communication with the mixing chamber, and has a proper supply of air admitted, and the ash pit of each chamber in its turn is nearly closed and then opened, and has air admitted whereby the heat required is rendered continuous and comparatively uniform, while the fuel in some of the chambers is being heated and decomposed, and its gases sent forward to the mixing chamber to any desirable degree, as set forth.

ADDITIONAL IMPROVEMENT

FIRE ARMS—Frederick D. Newbury, of Albany, N. Y., assignor to Richard Varick DeWitt, Jr., of same place. Patented Aug. 12, 1856: I am aware that two or more expanding rings have been used with a loose conical pin, and I do not claim this.

I claim the employment of a permanent cone combined with a ring lying between it and the chamber of the barrel, with a disk fitted upon the ring, the ring being divided on one of its sides by a cut, into which is fitted a pin or wedge, the cone or wedge being so shaped in reference to the ring as to expand it against the charge chamber upon the least re-action of the charge when fired.

DESIGNS.

LEGS AND POSTS OF BEDSTEADS—William Maurer of New York City.

[This new design of a castmetal bedstead is elegant and ornamental, evincing much good taste on the part of Mr. Maurer.]

Priming in Steam Boilers.

MESSRS. EDITORS—The foaming of water in boilers being the cause of much inconvenience, as well as danger, practical experience should be circulated far and wide in order to discover a remedy. Mr. Battell doubtless as signs a correct reason for its occurrence in some cases, but from my own experience I think it sometimes occurs from other causes.

During the summer of 1856 I had charge of the gang saw mill owned by Mr. Thornton, in the undernamed county, which was then driven with a tubular boiler. The feed water was taken from a stream, which was frequently muddy from rain, &c. We were always greatly troubled by foaming when the water was foul, and always stopped it as soon as the water became clear, by blowing off the water and pumping in clean. In my own mill, with a return flue boiler, I have never known the water to foam, though frequently very impure. A. N. R.

Peach Grove, Fairfax co., Va., April, 1857.

[We have known several cases of the very same kind as those described by our correspondent, of foaming being produced by foreign substances, like dirty water, being introduced into boilers. The introduction of indian meal, potatoes, &c., into a boiler, to stop leakage, causes priming in many instances.

Heating by Steam.—The Boiler.

MESSRS. EDITORS—The main edifice of the Ohio Female College is warmed by hot air radiated from steam pipes in chambers, and conducted in flues to the rooms and halls. One flue boiler 18 feet long and 42 inches in diameter is used to generate steam, which is taken from the boiler by two 2 inch pipes, and passed through 20,000 feet of pipe of various sizes, from 1-2 to 3-4 inch diameter, and then it is returned through a 1 1-2 inch pipe into a small receiver, from which it is pumped into the boiler while yet boiling hot, and converted into steam again. The circuit, as nearly as can be estimated, is performed from 10 to 12 times in 15 or 16 hours. The pressure by the gage is from 15 to 20 pounds.

Our flue boiler contains about 18 barrels of water, and the tubular boiler which we are advised to use, contains 10 or 12 barrels.

Please inform me if you know of any practical difficulty in the way of generating the quantity of steam in a tubular boiler necessary to keep up a circulation in the 20,000 feet of pipe, besides working a steam pump, warming water for baths, &c.

ELI TAYLOR.

College Hall, O., April, 1857.

[We present Mr. T.'s letter almost in full, because it details qnite explicitly one of the methods now in extensive use for heating by steam. There are many opinions on the whole subject, as also on every detail of steam heating. In manufactories driven by steam we are in favor of using large heating pipes—driving *a portion* of the exhaust steam through them. There is no need of compelling all the steam from a large quick-acting engine to blow through the long and narrow passages involved in an efficient system of heating pipes. So long as the p pes are kept filled with steam as fast as it condenses, *and a little faster*, so as to keep up a gentle circulation of pure steam through the whole, unmixed with air, the heating is just as efficient as if the steam were crowded through the pipes at a velocity of some 30 feet per second, to induce which a necessarily great pressure on the exhaust side of the piston must be endured. The quantity induced to flow through the heating pipes may be regnlated by a kind of throttle valve or damper, or by any other means which will partially prevent the escape of the exhaust steam through the direct channel.

Many of the large manufactories in the Eastern States are fitted with a light flap valve covering the exhaust pipe for this purpose. When working, the valve stands always a little open, pulsating with each stroke of the engine, but always serving as a check to the extent of about half a pound per square inch upon the escape of the steam, a pressure which is found amply sufficient to drive the steam through properly arranged pipes.

For buildings where heating alone is wanted we admire a system, now beginning to be quite extensively introduced, in which the boiler is in the basement, and the pipes are large, say 2 inches diameter inside, and wherever it is necessary to carry them along on or under a floor, they are laid inclined about 6 inches in 100 feet. The steam trickles back in these pipes as fast as it condenses, so that no special pipe or feed pump is required to return it to the boiler. In this system, also, the lever of the damper which controls the supply of air to the fire is connected to a flexible diaphragm, which latter is lightly loaded, so that whenever the pressure in the boiler falls too low, the diaphragm sinks and opens the damper, and thus quickens the fire; but whenever, on the other hand, the steam gets above the proper point, the diaphragm rises and shuts off the draft.

This matter of regulating the fire leads us back to the inquiry of our correspondent with regard to the relative merits of a flue boiler for this purpose. The general steam generating efficiency of a boiler depends mainly on the amount of fire surface or heating surface it presents to the water within. Either form is capable of being made equally desirable in this respect, or in otherwords, one is about as likely as the other to make steam in sufficient quantities, and at a moderate consumption of fuel. If anything, the tubular boiler will be most economical of fuel, other things being equal, but it will also require more calking and repairs, and will not last as long finally, so that the gain in this respect will probably be more than compensated; and unless little room can be spared, or some other peculiar circumstances exist to render the tubular boiler desirable, the plain cylinder or the plain flued boiler will prove most advantageous for general stationary purposes. But there is a special advantage in these latter varieties for ordinary steam heating, and this lies in the greater quantity of water contained. The water and the steam-room in a boiler are the reservoirs—the balance wheels, so to speak, which regulate and equalize the production of steam. The large quantity of water and great steam-room in the long flue boiler treasures up, the heat when the fire is extra intense, and yields it again when the furnace has been freshly fed with fuel. Were it possible to make a good boiler with no water in reserve, and no steam-room in which the elastic fluid might accumulate, the pressure would run down to nearly to nothing the moment the doors of the furnace were opened. This damper and diaphragm for automatically regulating the steam for heating in the system above referred to, works very well so far as we know, because the steam is kept at a very low pressure—about half a pound per square inch —but the devices which we have seen for attempting the same with higher pressures have failed, either from the great strength and stiffness of the diaphragm, or from its cracking and early rupture.

For steam heating, therefore, by all means employ a boiler with much water and much steam room. Protect it well from the escape of heat by radiation, and it will pour out the steam pretty evenly even if the firing be rather badly attended to. A small tubular boiler of equal power is better perhaps for steamboats, and is almost indispensable for locomotives and portable engines, but is not the thing for substantial, stationary work in general, and especially not for steam heating, unless a man can be actively in attendance to feed and regulate the fire almost continually.

Inks.

MESSRS. EDITORS—The complaints of poor ink is now becoming so universal that a remedy must be found. A few years since I bought some blank books from as respectable a house as there was in the United States, and ink from a house of nearly fifty years standing, and equally good reputation, and yet the writing fades, which on record books is a fault which can hardly be over estimated.

After a large amount of examination I am satisfied that the fault is neither in the ink or the blank book manufacturers, but in the *paper*. At the paper mills they use strong chemicals to bleach the rags, and before the pulp is suitably rinsed it is run into paper containing chlorine, oxalic acid, oil of vitriol, &c., in sufficient quantity to spoil any ink ever made. I know this to be so, having often sold oxalic acid for the purpose—a substance which, it is well known, will destroy the color of the salts of iron, a verynecessary ingredient in all black inks, and having examined the chemical effect of the paper afterwards.

It is my opinion that a blank book manufacturer who would obtain paper perfectly free from those destroying agents—which can easily be tested by any chemist—would command an amount of trade which would well repay the extra expense. H. A. S.

Hydraulic Cement for Tan Vats.

MESSRS. EDITORS—Your correspondent "J. V., of C. W.," asks what effect will tannin have in water lime, when used to make vats. It will have but little effect if the vats are allowed to remain with nothing but clean water in them until the mortar becomes perfectly hard. Ordinarily the plastering on the inside of the vat will last four or five years, when a new coat may be put on; the mortar in the wall remaining uninjured. I know of one instance where the plastering has remained in good condition for seven years, and bids fair to last as much longer, I speak understandingly in the matter, having built a great many. S. B. E.

Mansfield, Pa., March, 1857.

Sowing Flax Seed.

MESSRS. EDITORS.—In your notice to correspondents in No. 8, Volume 12, SCIENTIFIC AMERICAN, you advise "W. G. C., of Pa., to sow two bushels of flax seed per acre.

I am aware that in Europe from 2 to 3 bushels per acre is the quantity generally sown. In the counties of Rensselaer and Washington, N. Y., considerable quantities of flax are sown for the fiber as well as the seed, and from 1 bush. to 1 bush. and 2 lbs. per acre is found to be more profitable than a larger quantity, both as regards the quantity of seed, and quality and quantity of fiber. I am informed by reliable parties that the same holds good in Ohio; however, if your correspondent, F. G. C. intends raising flax, and the business is new to him, it would be well for him to experiment a little; say select an acre and a half, and divide it into three equal parts, and sow, respectively, one-half, three-quarters, and one bushel to each part. The experiment would not cost much, and may save him considerable if he means to make flax-growing a business in future.

GEO. ANDERSON.

Lansingburgh, N. Y., March, 1857.

[Mr. Anderson is an experienced flax manufacturer, and his advice is worthy of being followed, not only by W. G. S., but others who have cultivated flax. We advised the sowing of two bushels of flax seed to the acre—for fiber—because that was the quantity we had known to be employed with good results in one of the midland counties of New York.

Elastic Horn.

The London *Artisan* describes an invention for softening horn and rendering it elastic like whalebone. The horns are cleaned, split, opened out and flattened, and immersed for several days in a bath composed of five parts of glycerine and one hundred parts of water. They are then placed in a second bath, consisting of three quarts of nitric acid, two quarts of pyroligneous acid, twelve and one-half pounds tannin, five pounds bitartrate of potash, and five pounds sulphate of zinc, with twenty-five gallons of water. After receiving this second bath it will have acquired a suitable degree of flexibility and elasticity to enable it to be used as a substitute for whalebone for certain purposes.

Curves

There are means of mathematically drawing and of rigorously estimating the properties of various curves, which at first seem governed by no laws. There are arcs, elliptical curves, parabolic curves, hyperbolic curves, elastic curves, cycloidal curves, spiral curves, volute curves, catenary curves, and helical curves—each susceptible of being made in an infinite variety of proportions, yet differing from either of the others in fundamental properties. Mathematics is one of the most useful studies for mechanics. It can only be made attractive to some, by showing its application to such tangible subjects as computing forms and strength of materials, etc., and the properties of curves rank among the very highest applications of arithmetical and algebraical powers

The Amount of Air We Breathe.

By a machine constructed for the purpose, Dr. Donni, of Paris, has made a series of experiments to determine the amount of air required for breathing, by human beings. By these he, as stated, has ascertained that the average amount of air required by persons of ordinary form and good health, from the ages of 15 to 35 years, is from 183 to 198 cubic inches per minute; and from the ages of 35 to 60 years, from 122 to 153 inches—the amount being largely exceeded or diminished in exceptional cases.

Double-acting pumps do not discharge as much water by the motion in one direction as in the other, in consequence of one side of the piston or plunger being partially occupied by the piston rod.