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Sorgho, or Chinese Sugar Cane.

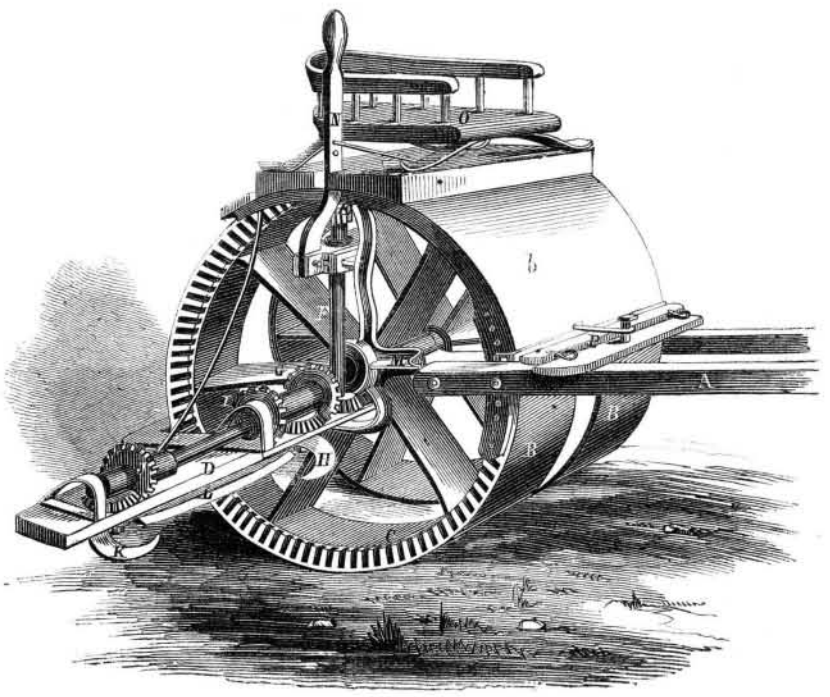
The Paris correspondent of the *Journal of Commerce* says that the sorgho, or Chinese sugar cane, which has attracted so much attention, formed a prominent feature in the late annual agricultural exhibitions of France. This plant is extensively and successfully cultivated in the south of France and in Algeria; and as an evidence of the extent and variety of the application of its material we may mention that at the late exhibition at Avignon, M. Prieur exhibited a group of samples illustrative of the metamorphoses to which he has subjected it. Nothing could be more curious than the succession of transformations there shown. In one corner could be seen the sorgho in stalk, such as it is when cut; a little further, were its fibres converted into thread, in skein; then a piece of linen woven with the thread; then a handsome cloak bordered with furs, which M. Prieur designs for the Prince Imperial.

The most curious and complete array of the products of the sorgho, however, at the same exhibition, was that of Dr. Sicard of Marseilles. With the pith he has manufactured excellent sugar, which will favorably compare with any other whatever. By grinding the seed he has obtained flour and fecula, of which he has made bread and chocolate, which the many tasters have found palatable. He extracts, moreover, from the plant an abundance of alcohol of superior quality, and besides, a most agreeable wine, containing in large quantity all the tonic and other salutary elements of the juice of the grape. In addition, he makes paper out of it, of which he showed evidence in superior samples; by chemical agents he gets from it gamboge, ginseng, carbon; skeins of cotton, wool and thread dyed with sorgho in those delicate and varying shades which hitherto have been found only in the stuffs and articles coming directly from China. We should add that the new derivations (as we may style them) from the cane are complete, and can be delivered to trade and industry at determinate prices.

Manufacture of Coke.

A patent was recently issued in England for an invention which consists in so constructing coke ovens that they shall be in communicating pairs, the waste gas and heat from each oven being made to surround, or partially surround, its fellow, by means of flues, before passing into a chimney or the open air, so that by charging each oven composing a pair alternately, neither is allowed to get cold, and it is said that by this process the operation of coking is carried on with greater economy and expedition. It is preferred that the ovens be placed in pairs, back to back, but this observance is not indispensably necessary.

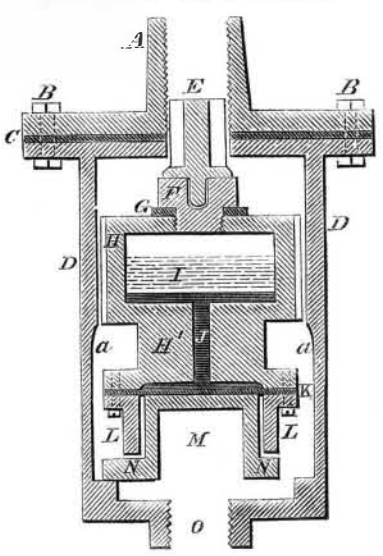
TILTON'S STALK CUTTER.



This machine is designed to cut standing corn, the center wheels passing between the rows, and there being a cutter bar on each side, it cuts two rows of corn at once. Our engraving is a perspective view of the machine, showing thoroughly the construction and arrangement of the parts, A being the shafts, and B the traction wheels which rotate as the machine is drawn along the ground, and by means of a cog wheel, C, on their outside edges, they give motion to the cutters. The shafts and cutter bar are attached and suspended from the axle of the wheels by the yoke, M, which is of metal and sufficiently strong to support the weight and strain upon it. P is the whiffle-tree to which the horses is attached. From the shafts, A, there extends up a cover, *b*, on the top of which is the driver's seat, O, from which, without moving, the driver can throw the cutters in and out of gear as desired by the lever, N, which is connected with the journal in which the vertical shaft, F, with its pinion, E, rotates. The lower end of this shaft, F, has a bevel wheel upon it that gives motion by another wheel, G, to a horizontal shaft carrying bevel wheels, I J. This horizontal shaft and gearing is on the top of the cutter bar, D, on the lower side of which cutters, H K, move by their axis passing through the cutter bar, and terminating in bevel wheels which are rotated by I and J. To the underside of the cutter bar, D, a stationary cutter, L, having a curved shape, is placed, and the moving cutters being sickle-shaped, they take in their rotation, as the machine is drawn along, a sickle-full of corn stalks and bringing them against the stationary cutter, L, cut them evenly and clearly off, which is the great advantage of sickle-shaped cutters. Two or more cutters can be placed on one shaft, so that each machine will have eight cutters, there being a bar and connecting pieces exactly similar to the one described on the other side of the wheels, B.

The machine works well, and it is remarkably simple and complete, compact and strong. The inventor is William S. Tilton, of Boston, Mass., from whom any further information can be had. It was patented June 17, 1856.

Hoard & Wiggins' Trap Valve.



The vast length of pipe which a building of any size requires when it is heated by steam, gives, of course, a large cooling surface, and the steam becomes at first rapidly condensed into water, which, if not removed, prevents the operation of the heating arrangement. To remove this water, and yet prevent the escape of any steam, and to allow all the condensed water to escape as fast as it is condensed away, so that it may not absorb any of the heat which should be employed in elevating the temperature of the building, has long been a desideratum, and has at last been invented by J. W. Hoard, of Providence, R.I. The device is small, being only six inches long by four in diameter, and it cannot freeze.

Our illustration is a section of one of these valves, which we will now proceed to describe. A is the cover, which is connected to the end of the heating pipes, and may be any distance from the building. It is attached to the cylinder by bolts, B, an india rubber packing being interposed between them. In the bottom of the case or cylinder, D, is an escape pipe, O. E is a feathered valve, stepped into a nut, F, and it does not rest on the step, but on the top of the nut. This nut, F, completely closes, by means of an india rubber packing, G, a box, H, which is smaller than the inside of D, so that plenty of water way is obtained between the inside of D and the outside of H, and it is prevented from shaking, and compelled to move steadily up and down D by three projections cast on its outside. This box is hollow, and contains mercury, J, which fills up the narrow tube, H′, and presses, in the extended hollow, on the diaphragm of rubber, K; above the mercury is a small quantity of alcohol, I. To the under surface of H is attached by bolts a cylinder, L, which fits loosely around a cap, M, that covers the exit, O. This cap, M, is supported over O by a trident base, N, so shaped that it is firmly secured over the opening, and yet admits of plenty of water way.

The operation is as follows:—When the steam is turned on it rushes through, A, (the valve being always open when steam is not in contact with it, so that all water can run out of the pipes when not in use for heating) and coming in contact with H, heats it, and vaporizes the alcohol. The alcohol vapor being confined, presses on the mercury, and causes it to expand the diaphragm, so that the whole of H is lifted up by the pressure of K upon M, and the feathered valve, E, closes A. It remains closed until water has accumulated, when the alcohol cools down, resumes its liquid state, and the water runs through. The case, D, is chamfered out at *a*, to increase the water way, and the device works, after once beginning, giving a regular stream of condensed water, and not by jumps, as would be supposed, no steam ever passing through. We have seen certificates from various manufacturing establishments where steam is used for heating and evaporating purposes, and where this trap valve is in use, and all speak in the highest terms of its operation, as it enables them to keep the steam in the pipes at the same pressure as in the boiler, and allows the escape of all the condensed water. It is a simple and useful little contrivance, and recommends itself for general adoption.

It was patented May 25, 1858, by the inventor, who has assigned the invention to himself and G. B. Wiggins, 20 Friendship st. Providence, R. I., either of whom may be addressed for further information.

Electrical Phenomena.

Mr. L. R. Breisach, to whom two patents were lately granted for ventilating chairs, has noticed that if any air be forced from bellows through tubes, electricity is developed. It is supposed that air so charged will be beneficial to nervous persons, and much easier of respiration by persons of weak lungs than the common atmosphere. We cannot see on what facts these suppositions are based, for if they be correct, persons living in a place where clouds that have swept over a mountain side, and that are full of electricity in a highly excited state, come in contact with them, should be very healthy indeed, instead of being, as they are, subject to epidemics and such diseases as *goitre* and the like.

Profitable Mining.

At the Freiberg mines, which are nearly the oldest in Germany, they have made a most lucrative discovery. In a mine which has been profitably worked for the last 120 years, large lumps of metallic silver have been found, each weighing from 3 to 12 pounds; the largest lump weighed 60 pounds, and was in the form of a side of bacon. This would seem to be a reward for scientific mining, as these mines are worked entirely on the results of scientific investigation conducted by the professors of the mining school in that place.

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 13, 1858.

[*Reported officially for the Scientific American.*]

KNITTING MACHINES—Nelson P. Aiken, of Troy, N. Y.: I am aware that it is not new to use a belt-shipping apparatus in a knitting machine, to move the belt from the driving to the loose pulley, when the yarn breaks or gives out, and therefore I do not claim broadly this as my invention.

But I claim the arrangement of the shipper or belt-shifter, G, in the manner substantially as described, and in combination with the movable stop, H, lever, M, and sliding bar, K, when controlled by a sinker wheel, or by any wheel gearing with and moved by the needles, for the purpose set forth.

[A notice of this improvement will be found in another column.]

SPOKE-SHAVE—Leonard Bailey, of Winchester, Mass.: I claim the improved spoke-shave, as constructed with its bearing surface in front of its cutter, applied to the stock by means of a lever having an adjusting screw, or its equivalent, or a screw and a spring applied to it, so as to enable the said bearing surface to be moved with respect to the cutter and the bearing surface in rear thereof, substantially in manner as described.

I also claim the arrangement and application of a protecting cavity or chamber within the lever, and to the spring thereof, in manner and for the purposes set forth.

KETTLES FOR RENDERING LARD—John J. Bate, of Brooklyn, N. Y.: I claim providing a means of communication between the exterior and interior of the heater, C, by the apertures, D D', so that the contents of the kettle and the heater can communicate with each other, as and for the purpose set forth.

SPRING PULLEY FOR WINDOW SASHES—Dana Bickford, of Westerly, R. I.: I do not claim either of these devices separately.

But I claim the combination of the friction wheel or its equivalent, and the bearings of the pulley with the lip, as described, in connection with other parts of the spring balance.

MACHINES FOR CUTTING PAPER—Milton B. Bigelow, of Boston, Mass.: I do not confine myself to the precise mechanical devices described, as they are susceptible of various modifications.

It is very obvious, for instance, that V-shaped rails might be employed for sustaining and directing the sliding carriage and cutting-board in their movements; also that a short shaft with a crank and pinion on it, might be attached to the frame, said pinion being made to engage in a gear wheel affixed to the rock shaft, O, for the purpose of moving the cutting board and paper.

But I claim the described mechanism, or any other essentially the same, by means of which the cutting board is prevented from moving in any other direction than a straight line, in its horizontal motions, said mechanism consisting of the guide rails y, y, and the sliding carriage, v v, constructed and operating in the manner substantially as and for the purpose specified.

I also claim actuating the sliding carriage, v v, and with it the cutting board, x, by means of the mechanism described, or any other essentially the same, said mechanism consisting of the levers, q and r, the rock shaft, o, and the straight lever, p, connected and operating in the manner substantially as and for the purpose specified.

DOOR PLATES—Jeremy W. Bliss, of Hartford, Conn.: I claim the perforated door plate, A B, bell arrangement, I J K P N O M, constructed and arranged to secure the three-fold object, substantially in the manner and for the purpose as described.

MACHINES FOR HULLING RICE—Joseph S. Bossard, of Sumterville, S. C.: I claim the employment or use of the arms, b b d, attached radially to the rotating shafts E, in connection with the projections, c c d, on the pestle shafts, C, the parts being arranged to operate as and for the purpose set forth.

[This is an improvement in that class of machines for cleaning and hulling rice in which pestles or pounders are used for effecting the purpose. The invention consists in a novel arrangement of arms attached to a horizontal rotating shaft for elevating the pestles, whereby the pestles or pounders are elevated the requisite distance by comparatively short arms, and consequently with a corresponding diminution of power.]

MACHINES FOR DRESSING HIDES AND LEATHER—John R. Bumgarner and Lyman White, of Davenport, Iowa: We claim, first. The combination, by means substantially as specified, of two carriages, B D, moving at right-angles to each other, one having an intermittent longitudinal motion, and serving to feed the hides or skins to the action of the dressing frames, and the other, D, having a transverse reciprocating motion, and serving to carry and move the dressing frames across the hides or skins, as set forth.

Second, The peculiar manner of constructing the intermittent carriage, B, in sections, and with long and short clamps, c c, whereby hides or skins of different sizes can be clamped and distended on the same, substantially as and for the purposes set forth.

Third, The automatic device, G, specified, for clearing the knives, x x, just after the completion of their movement from one edge of the hide or skin to the other, of all matter which may have accumulated on them, and which would be likely to clog their action, as set forth.

Fourth, The arrangement of the standards, q q q q, set screws, r r r r, levers, s s s s, cords, t t, and windlass shaft, u, substantially as and for the purposes set forth.

Fifth, The combination of the windlass shaft, u, with the dressing frame carriage, by means of the ratchet movement, S T, and the projection, U U', substantially as and for the purposes set forth.

[This machine is designed for unhairing, fleshing, scraping, dressing, and finishing hides, these several operations being performed successively. The hides are clamped upon a table which has a gradual longitudinal movement, and are continuously operated by the unhairing, fleshing, scraping, and finishing frames, which reciprocate across it in a direction at right angles to the movement of the table. This, we believe, is the first machine which has been patented for performing the whole operation of converting hides into leather, and if it operates well in practice, will be a great labor-saving machine.]

PROPELLER FOR CANAL BOATS—Abner Burbank, of Buffalo, N. Y.: I claim a propeller and shaft, movable in a longitudinal direction, in combination with a rudder having a notch or recess therein, to receive the propeller, and for the purposes and substantially as set forth.

ROCKING CHAIR—Isaac P. Carrier, of South Glasenbury, Conn.: I claim the arrangement of the frame or arms, E, rod, F, springs, stud, H, and the pin, c, holes, C, substantially in the manner and for the purposes as described.

MACHINE FOR CUTTING BARREL HEADS—A. H. Crozier, of Oswego, N. Y.: I claim first, The disk, M, constructed and operated as described.

Second, The method described of connecting the saw and cutter, so that both are controlled by the same winch or lever, substantially as specified.

Third, Attaching the saw to a sliding stock, as and for the purpose described.

BUSTLES AND SKIRTS—Handel N. Daggett, of Attleboro, Mass.: I wish it distinctly understood that I lay no claim to the invention of the adjusting cord, as applied to a bustle or a skirt.

But I claim the improvement or combination of the back strut with the bustle or skirt and the adjusting lacing, such being applied and made to operate as and for the purpose specified.

TOOL FOR CUTTING CYLINDRICAL OR TAPERING STICKS—George Davies, of Duquesne, Pa.: I claim the combination of the cylindrical stock, a, adjustable block, K, and bit, F, constructed and arranged as described, forming an improved tool for cutting round or tapered sticks for handles, &c.

FORCE PUMPS FOR FIRE ENGINES—John N. Dennisson, of Newark, N. J.: I claim increasing the capacity of the pumps of fire engines near the end of the stroke, by the expedients described, or their equivalents.

CLOTHES'-DRYING APPARATUS—Olonzo R. Dinsmoor, of Auburn, N. H.: I claim the combination of the endless clothes'-line, the sheltering shed or building, and the stretching apparatus, the whole being made to operate substantially as specified.

I also claim combining one or more travelers, K, with the endless clothes'-line applied to a building, and a stretching apparatus, and constructed so as to operate essentially as described.

METALLIC HUB FOR CARRIAGE WHEELS—Nathaniel T. Edson, of New Orleans, La.: I claim, first, The cone, H, when made and applied in the manner substantially as specified.

Second, The oil chamber, 5, in combination with one or more orifices, 4, when formed on the outside of the box by means of a nut, substantially as represented.

Third, The combination of the oil cup, B, with the cone, H, for the purposes specified.

Fourth, I claim the chamber, 5, substantially as described, in combination with the outer cup, B, for the purposes specified.

SAWING MACHINES—Henry Featherstone and Peter Engman, of New Orleans, La.: We claim, first, The lateral movement of the saw, as represented.

Second, The suspension guides, with their cups and balls, as applied here, to guide the saw and its connections with the saw shaft.

Third, The back-bone rack connecting the truck.

Fourth, The truck and dog, with their movement, by means of the sector and rack, all as shown.

RAILROAD CAR BOX CASES AND PEDESTALS—Jacob C. Grisendorff, of Cincinnati, Ohio. I claim the employment of the lugs, C C, formed on box case D, when used in connection with the notches, b b, (two or more) formed in the pedestal, E, substantially as described, for the purpose of readily detaching or removing the box from the axle, yet retaining the box case in a proper position in the jaws of the pedestal, in the manner set forth.

WASHING MACHINE—B. F. Ghormley, of New Frankford, Ind.: I claim the combination and arrangement of the fluted and grooved roller, B, and the cords, a a, and roller, C, with the hinged washboard, D, springs, c c, and temper screws, d d, all being operated and constructed in the manner and for the purpose fully described.

TRAPS FOR ANIMALS—Samuel Gibson, of Martic Township, Pa.: I do not claim the tilting floor and parts separately.

But I claim the chambered box, wire drop cage, and tilting bottom, when combined and operated substantially as set forth.

PRINTING PRESSES—George P. Gordon, of New York City: I claim, first, One or more sets of gripers or nippers, independent in themselves, which shall revolve upon their axes, and carry the sheet from its point of feeding to its place of deposit, whether operated in the precise manner described, or in some equivalent way.

Second, I claim the "stop," or its equivalent, for holding the said gripers, or their equivalent, in the desired position, for the purpose of insuring an exact and regular feeding, registering, and delivering of the sheet as fully set forth.

Third, I claim one or more sets of gripers, (which revolve upon their axes) having a movable base, with fingers to close upon said base, and hold the sheet, whether constructed in this precise manner, or in some equivalent way, to produce a like result.

Fourth, I claim the combined action of said gripers and the vibrating springs, strips or frisket, for the purpose of conveying the sheet to, and receiving and holding it in the proper position for the reception of the impression, and insuring its proper delivery after it shall have been printed.

Fifth, I claim the vibrating double cam for throwing off and on the impression.

Sixth, I claim two or more distributing rollers, having a lateral motion upon a main distributor, which shall move independent of, and in opposite direction to each other, and thus alternately cross and recross each other's distribution, for the purpose of giving an uniform inking.

Seventh, I claim the relative arrangement of the feed table, the fly board, the platen and the bed, substantially as described, in combination with the revolving gripers.

Eighth, I claim the two distributions given to the inking rollers upon one cylinder for each impression. (heretofore patented by me) in combination with the rotating reciprocating bed with its spring extensions, as fully set forth.

Ninth, I claim the fly board with its adjustable ledge in combination with the gripers, to insure the even piling of the sheet, whatever its size may be.

FIRE ESCAPE LADDER—Joseph H. Grimsley, of New Lexington, Ohio: I claim the wheels turning on the axles at the ends of the wings or steps, for the purpose set forth, of providing a space between the ladder and wall for the feet and hands of the individual when descending, to enable and aid the ladder to reach the ground, said wheels being placed at the axle at the ends of the rungs, especially for this important purpose and object, viz., that with the wheels so placed it is of no consequence or difference which side of the ladder is uppermost when thrown out, making no difference which side of the same rests against the wall.

Also the straps, which, placed substantially as set forth, combined with a ladder of the necessary strength and weight, as small, enables a person of ordinary strength to rescue the aged, infirm, young, and those too timid to descend alone, by lowering them to the ground by the hand.

SHINGLE MACHINE—Erastus Hall and Joel F. Stewart, of East Randolph, N. Y.: We claim the rack, J, pivoted to the carriage, I, in combination with the rod, L, plate, F, pinion, u, and lever, G, with weight, H, attached, the parts being arranged as shown, for the purpose of feeding the bolt to the saw and gigging back the same automatically, as shown.

We also claim setting the bolt of the saw by means of the bar, M, provided with the rack, k k, operated by the backward movement of the carriage through the medium of the wipers, m m, and boss or hub, O, on shaft, N, provided with spiral ledges, n, and the spring catch, p, the parts being arranged to operate conjointly and automatically with the carriage, I, as described.

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

METHOD OF COPPERING THE INTERIOR OF SHIPS, TO PROTECT THEM FROM LIGHTNING—Roswell W. Haskins, of Buffalo, N. Y.: I make no claim to lightning rods in any mode in which they are now used.

But I claim protecting vessels from lightning by means of metal linings, arranged substantially as described.

CHURNS—James Hatfield, of Falmouth, Ind., and Henry M. Goldsmith, of Burlington, Iowa: We claim, first, The manner and form of inserting the adjustable brakes, as described and shown.

Second, The basin or reservoir lid, with the glass slide attachment as described and shown.

Third, The quarter circle wings or dashers at each end of the shaft, in the form and position described and shown.

TAILORS' SHEARS—Bachus Heinisch, of Newark, N. J.: I do not claim elongating the upper blade of a tailors' shears, by means of an eccentric pivot.

Neither do I claim a stop set in one blade, and working in a curved slot in the other, as that is fully shown in Joseph Phares' improvement on tailors' shears, patented September 12, 1854.

But I claim the oblique rectilinear slot, C, in the elongated shank of the lower blade, A, in combination with the fulcrum, D, and lever, B, connecting the shanks, the whole constructed and operating substantially as and for the purposes set forth.

PUMP—George Hibsch, of Buffalo, N. Y.: I claim the two screw wheels, B B, constructed and operated as set forth, in combination with the bands, C C, when arranged in relation to the cylinder, A, in the manner and for the purposes described.

MACHINE PULLEYS—Caleb S. Hunt, of Bridgewater, Mass.: I claim the construction and use of machine pulleys with the bearing or band surface made of cork, as described.

SHOEMAKER'S EDGE PLANES—Freeman Killbrith, of Pembroke, Mass.: I claim the attachment to the edge now in use, and known as Dunham's patent, of the movable guard, C, with its screw, e, the guard being movable to and from the edge of knife D, and sliding on the face of the shank, B, and also the attachment to the shank, B, of the knife, D, with its screw, f, working in a slot, and raised or lowered to any desired gage for paring soles, and which knife, D, can be wholly removed from the shank, B, by unscrewing the screw, f, and so ground or sharpened, and be replaced by a new knife if necessary.

ADJUSTABLE PILE-DRIVER—T. W. Loveless, of Corning, N. Y.: I claim the frames, D E, connected by pivots or joints, c, and retained in desired positions by desired positions by the perforated segment plate, F, and pin, d, in combination with the bolster, H, and bars, h h, attached to the frame, D, as shown, and secured in desired position by the racks, J J, serrated plates, O, and bar or clamp, the whole being arranged substantially as and for the purpose set forth.

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

PAPER STOCK FROM REEDS—Henry Lowe, of Baltimore, Md.: I claim the prepared reed fiber, or new article of manufacture above described, as a substitute for rags, ropes, and other fibrous materials, for the manufacture of paper, said reed fiber or paper stock, being prepared substantially as set forth.

MACHINES FOR DRILLING AND SPLITTING STONES—John H. Lyon, of Baltimore, Md.: I claim the hammer stock, M, and hammers, N, arranged and operated as described, in combination with the drills, D, and removable slugs, E, for drilling and splitting blocks of stone, the whole being constructed and arranged for joint operation in the manner and for the purposes set forth.

CARRIAGE FOR SAWING MACHINES—A. C. Miller, of Morgantown, Va.: I claim arranging the head blocks in long mortises in the side pieces, F F, and connecting the outer ends of said head-blocks by overlapping arms or levers, H H, furnished with adjusting holes or an adjusting screw, so that any length of bolt within the capacity of the saw may be held and operated therein as set forth and described.

REAPING AND MOWING MACHINES—C. Moul, of Hanover, Pa.: I claim the combination of the truck frame, H, caster wheel, L, and lever, K, the whole being arranged and operated in the manner and for the purposes substantially as set forth.

ESCAPEMENT OF WATCHES—Jacob Muma, of Hanover, Pa.: I claim the escapement, consisting of a single escape wheel, A, and two geared balances, B B, with cylinders or cylindrical segments, h h*, engaging with the said escape wheel or opposite sides of its axis, when said escape wheel, A, and balances, B B, with their segments, h h*, are arranged in relation to each other, with their axes in the same plane, and the gear of the said single escape wheel, A, with the segments, h h*, serves the double purpose of escape and of giving impulse to the balances, as specified.

[A notice of this improvement will be found on another page.]

BOAT PROPELLER—Mortimer Nelson, of New York City: I claim, first, The vertical buckets, when arranged so that they shall be capable of folding against the side of the propeller frame, whether turned on their axis to the right or left, in combination with a reversible stop, which will, after being adjusted, hold the buckets in a position for acting against the water during the time the engine piston is making a stroke to effect the propulsion of the boat, either back or forwards, substantially as and for the purposes set forth.

Second, The arrangement of the buckets on the inner side of one of the propeller frames, and on the outer side of the other, in combination with the supporting slides, constructed and arranged substantially as and for the purpose set forth.

[This invention consists in arranging two longitudinal propeller frames set with vertical paddles on each side of the boat. The frames have a longitudinal movement in opposite directions to one another alternately, and the paddles of one frame, as said frame is moving forward, opening and acting as a resistance to the water, and the paddles of the other frame closing and presenting no resistance as said frame is moving backward. By this arrangement no loss of power by back water is experienced, as there is no expenditure of power in entering or leaving the water, as in the case of the common paddle wheel. The paddles are so arranged that they can be set to act as above stated, both when the boat is moving forward or backward, which is a result not heretofore successfully accomplished in side propellers. The invention is very ingenious, and we cannot see why it will not answer well for the purpose intended.]

HEMP BRAKES—George M. Newell, of Lexington, Mo.: I am aware that straight slats, in a horizontally reciprocating frame, in combination with similar stationary slats, have been used previous to the date of my invention. Also that a reciprocating whipper has been used in combination with a reciprocating gate, and other reciprocating devices for breaking hemp. Such devices and combination of devices, therefore, I do not claim broadly.

But I claim, first, Giving the slats of the pivoted frame a curve which is concentric with the axis on which the frame in which they hang reciprocates, and arranging said slats or swords so as to move in curved slots of stationary pillars as the frame reciprocates, substantially as and for the purposes set forth.

Second, The arrangement in the manner specified, below the breaking swords or slots, of two sets of stationary beaters or whipping rods and two sets of reciprocating beaters or rods, the latter being attached to pivoted rocking arms provided with curved slats, so that they shall reciprocate in the path of a vertical circle, and operate in combination with the stationary rods, substantially as and for the purposes set forth.

[By shaping the swords or slats of the reciprocating gates, and giving them a circular reciprocating motion, as defined in the above claims, they have a positive downward action upon the hemp or flax both in their backward and forward motion, and thereby cause the same to be continuously drawn down from the hopper, and to be fed down through the machine without the aid of any auxiliary feed devices; and by arranging reciprocating whipping rods or beaters below the breakers, all the shoves are removed, and thus the perfect operation upon the hemp before it leaves the machine, is ensured. This appears to be a most excellent arrangement for breaking hemp, and we are informed from authority that it works well.]

APPARATUS FOR CLEANING AND POLISHING COFFEE—William Newell, of Philadelphia, Pa.: I claim in combination with the cylinder which contains and furnishes heat to the coffee, the open wire diaphragms or partitions for furnishing rubbing surface, substantially as described.

I also claim in combination with the open wire rubbing surfaces, the flanges and heating tubes, as set forth.

ENDLESS CHAINS FOR THRESHING MACHINES—Job E. Owens, Clark Lane, and E. G. Dyer, of Hamilton, O.: We claim a chain composed of two different kinds of malleable cast iron links, when constructed in all their parts, as represented, for all the purposes mentioned in the specification, and when the alternate links of chains are the duplicates of each other throughout the series, and the two kinds of links united in the manner and for the purposes set forth.

MANUFACTURING KNIT GLOVES—James Peatfield, of Ipswich, Mass.: I do not claim to be the inventor of a seamless knit glove, as such are knit by hand.

But I claim the manufacture of seamless knitted gloves, by knitting the hand and the fingers and thumb separately, and uniting them in the manner substantially as described.

[The object of this invention is to produce seamless knitted gloves by machinery. This is done by knitting the hand of a glove and the fingers and thumb separately, each in circular form, and consequently without seam, and uniting them by knitting them together by hand.]

GOVERNOR FOR STEAM ENGINES—C. T. Porter, of New York City: I claim, first, In combination with arms and balls, or their equivalents, revolving at a much higher velocity than would be natural to them, considered as a conical pendulum, the employment of a counterpoise, applied substantially as described, and so proportioned in weight as to balance, or nearly so, the centrifugal force developed by the revolution of said arms and balls or their equivalents.

Second, I claim so applying the counterpoise to the governor that its effective load shall be lessened as the governor rises, or as the balls and arms thereof or their equivalents expand, for the purpose of rendering it constant, or as nearly so as desired, relatively to the power of the governor to sustain it.

Third, I claim the employment of the counterpoise applied to the governor in any manner substantially as specified, as a means of fixing or adjusting the exact speed of the engine, as described.

[A full description of this improvement appears on page 363.]

REFRIGERATOR—Henry Rehahn, of New York City I do not claim circulating the air through the ice, and through the refrigerating chamber, as that has heretofore been done.

But I claim, in combination with the ice-box and ventilator arranged near the top of the refrigerator box, the centrally located cold air tube for carrying the cold air from said ice-box down to or near the bottom of the refrigerator, and admitting it into the refrigerating chamber, and in between the inner and outer cases, thence it ascends and escapes through the register, substantially as set forth and described.

MEDICATED VAPOR APPARATUS—Alex. F. Rose, of Brooklyn, N. Y.: I claim, first, The construction of the mask, D, with a marginal cushion, a single or double back as passages, substantially as described.

Second, The construction of masks for encircling the neck or other part, in the manner substantially as represented in Figs. 3 and 4—that is to say, with a band of wire cloth or other sufficiently flexible, but yet sufficiently stiff material, a marginal cushion, g, a passage-box, H, and an enveloping cloth, I, of waterproof, the whole being combined substantially as described.

[By this invention heat or cold fumes or vapors, medicated or otherwise, can be applied as remedial agents to any part of the body which may be the seat of pain or disease. The apparatus consists of a heater or cooler for heating or cooling air or gaseous or æriform body, or a generator for generating steam and other vapor or fume, and a pair of bellows and pipes connecting the bellows with a proper mouthpiece or mask to be directed or applied to any part of the body for the purpose of bringing hot or cold air, vapor, or fume, in contact with the body, to act as a remedial agent.]

GAS GENERATORS—G. W. R. Seal, of Winchester, Va.: I do not claim the use of scraps of iron or of pebbles or pieces of stone in a gas retort to form an extensive heating surface.

But I claim the employment of a secondary movable diaphragm applied within the retort, so as to support a portion of the cellular packing, and to be capable of being raised and lowered with such portion of the packing, substantially as and for the purpose set forth.

[A retort divided into two chambers is employed, in one of which the substance to be converted into gas is made into vapor, and in the other the vapor is converted into permanent gas, by passing through a packing of cellular character, so that it comes in contact with a great amount of heating surface. The invention consists in the employment of this cellular packing of shavings or scraps of copper or its alloys by whose superior conducting powers the vapors are more rapidly heated and decomposed than when pebbles or scraps of iron are employed to form cellular packing in the retorts. An extra diaphragm is also employed in the second chamber to support a portion of the packing, and it is movable to vary the depth of the packing to suit the various materials that may be employed to make the gas.]

CHURN—N. H. Sherburne, of Campton, Ill.: I disclaim the mere rotation of the two parts of the agitator in opposite directions, and also the construction of agitators with movable parts broadly considered.

But I claim the combination of heads, H H', slides, B, blades, C C', and opposite rotating shafts, S S', constructed, arranged and operating substantially as and for the purpose set forth.

GRAIN CLEANING MACHINES—N. H. Sherburne, of Campton, Ill.: I claim the concentric and opposite moving fans, G G, constructed, arranged and operating substantially as described, in combination with the corrugated head of the upper screen, L, the whole operating as specified.

SCROLL-SAWING MACHINE—E. Sirret, Jr., of Buffalo, N. Y. : I am aware that revolving cranks have been directly connected to the upper and lower ends of reciprocating saws, for the purpose of driving the saws without a frame or sash, but I am not aware that reciprocating bent levers or bell cranks have been employed and arranged as shown and described, for the purpose of operating the saw, and also allowing it to be kept perfectly strained while at work, and readily relaxed when it is to be removed from the machine.

I claim, first, The bent levers or bell cranks, H I, attached to the crossheads, e m, of the saw, K, and operated by the eccentrics, E F, or their equivalents.

Second, Having the upper lever or bell crank, I, attached to an adjustable plate, c, operated by a screw, h, or its equivalent, for the purpose of readily and properly straining the saw and allowing the same to be relaxed and removed with facility from the machine.

[This invention relates to an improvement in that class of sawing machines in which no saw frame or sash is employed, and which are generally known as muley saws. The invention consists in the peculiar manner of hanging and driving the saw, so that it may be readily strained and kept while in operation at a proper degree of tension, and readily removed from the machine when necessary.]

ROLLING RAILWAY CHAIRS—J. H. Snyder, of Troy, N. Y. : I claim forming or turning the tip or lips, A, of the chairs, upon the collar or collars. O, of a roller, E, by means of another roller, D, substantially as set forth.

BUTTER COOLER—James H. Stimpson, of Baltimore, Md. : I do not claim, broadly, the placing of the ice above the butter.

But I claim as an improved article of manufacture a butter cooler made substantially as shown and described, to wit, with an ice receptacle, D, suspended over the dish, B, in the manner and for the purposes set forth.

[A notice of this improvement is given in another column.]

ATTACHING SLEIGH RUNNERS—Wm. W. St. John, of Lima, N. Y. ; I do not claim allowing motion to the hind runner at the bolsters, said runner being drawn along by a connection at its forward end.

But I claim the combination of the T-formed slide, 5, cap, 3, and joint, 4, for attaching the hind runner of sleighs to the body, when said runner is drawn by a connection to its forward end, substantially as and for the purposes specified.

COTTON GINS—Joshua Tetlow, of Taunton, Mass. : I claim the rollers, B B, one or more, grooved as shown, namely, longitudinally and parallel with their shafts, and grooved also in a zig-zag manner in connection with the adjustable stationary plates, S, and vibrating plates, b, arranged to operate as and for the purpose set forth.

[The gins in which this improvement is made are those such as are used for ginning Sea Island or long staple cotton, and the intention is to produce a machine which will gin long staple cotton more expeditiously, and at the same time work in a thorough manner without injuring the fiber in the least. Grooved rollers are used in connection with vibrating plates and adjustable feed boards, arranged so as to operate together and produce the effect desired.]

APPARATUS AS AIDS IN EXTRACTING TEETH—Chas. C. Thomas, of Natchez, Miss. : I claim a dental instrument having the adjustments, substantially as stated and adaptable to the purposes specified.

EARTHENWARE DISHES—Alson Vail and Tracy Vail, of Berlin, Wis. : We claim a new article of manufacture, to wit, a covered dish with an absorbent lining, perforated or unperforated, as specified, for the purposes set forth.

[This invention consists in making dishes porous on their inner surface, so that the moisture shall be absorbed from hot eatables, and the same kept in a dry and palatable condition. To accomplish this result the dish is formed of some porous argillaceous substance and only glazed on its exterior, or if the dish is of chinaware it may be rendered capable of absorbing moisture by being lined with a porous perforated substance. We regard this as a capital improvement; it avoids the deposit of condensed vapor upon vegetables confined, and saves the same from becoming sweaty and having a watery taste.]

REFRIGERATORS—Nathaniel Waterman, of Boston, Mass. : I claim the arrangement of the air supply and discharge pipes with respect to the case and its refrigerating chamber, in which arrangement the supply pipe or pipes are disposed within the refrigerating chamber, while the discharge pipe or pipes are disposed outside of the same in manner as specified.

I also claim the combination of a series of grooves or an auxiliary space or spaces, and a discharge pipe or their equivalents with the metallic bottom or lining of the refrigerating chamber, and arranged under the same and within the case or the stopping or bottom part of such case.

I also claim the arrangement of a space, H, within the cover of the refrigerator, as described, and around the odor discharge pipe, G, the same being to operate in manner and for the purpose set forth.

AUTOMATIC MECHANISM FOR OPERATING THE SURVEYOR'S GRAPHODOMETER—J. M. Wampler, of Baltimore, Md. : I claim the combination with a moving strip of paper, or other proper material, arranged on any suitable vehicle of automatic mechanism for taking and recording distances and courses or distances and levels, or distances courses and levels substantially as described and shown.

SMOKE STACK FOR STEAM VESSELS—Wm. Webster, of Jefferson county, Washington Territory : I claim, first, The arrangement of two or more pipes, D D D, &c., within an outer shell, B, as described.

Second, The application to a double shell smoke stack, of the registers, L L, &c., as and for the purpose described.

SAWMILL BLOCK—Hiram Wells, of Florence, Mass. : I claim operating the dog bar L of the block C, by means of the lever, K, fitted in the underside of said bar, the ribbed plate, D, connected with the bar, F, by the obliquely slotted plate, E, and pin, b, the whole being arranged and applied to the carriage, substantially as and for the purpose set forth.

[This is an improvement on a former patent granted to this inventor, June 9, 1857. In that invention the dogs of both the head and tail blocks were operated simultaneously by means of a rack bar connected to the dog bars by means of levers, racks, pawls, &c., arranged so as to form a comparatively complicated device. The object of the present invention is to attain the same ends by a simpler arrangement of parts less liable to get out of repair, and more economical to construct.]

TRIPOD-HEAD FOR SURVEYORS—Wm. J. Young, of Philadelphia, Pa. : I claim constructing the head of a surveyor's tripod in such a manner that the portion to which the instrument and plumbline are attached may be adjustable in any direction horizontally to the portion to which the legs are jointed, when the usual leveling screws serve the purpose of binding the two portions of the head together after adjustment, as set forth and for the purpose specified.

LEATHER SHAVING KNIFE—J. B. Wentworth, of Lynn, Mass. : I claim the described leather shaving knife, consisting of a stock, C C', with a bevel only on one edge, extending beyond the center from Y to Z, and provided with screws, e, combined with a blade, D, having slots, d, operating as and for the purpose specified.

SELF-DUMPING COAL BUCKET—John Wust, of Philadelphia, Pa. : I claim the employment of the handle, B B' B'', attached by pivots below the center of gravity of the bucket, in combination with the sliding rod, G H, and the spring bolt, L, or their equivalents, arranged and operating substantially as described.

FLOOR CLAMPS—H. C. Wight, of Worcester, Mass. : I do not claim, broadly, the employment or use of a toggle, for that is a well-known mechanical device.

But I claim the toggle formed of the levers, C D, connected with a screw, B, which passes or works through a pivoted nut, c, in combination with the claw-plate, E, and head or jaw, G, attached respectively to the levers, C D, the whole being arranged and connected with the frame, A, substantially as and for the purpose set forth.

[In this invention a toggle is employed in connection with a power screw, claw plate and jaw or pressure plate, the whole being fitted or attached to a proper framing or support, so as to form a powerful, portable and economical clamp suitable for laying floors, or other work in which clamps are usually employed.]

BOOT TREES—A. J. Wisner, of Homer, N. Y. : I claim the combination of shaft, G, bevel wheels, W W', screw, H, nut, I, screw, F, and yoke, b, with the thin shaft, E, and hinged sole, D, the whole constructed and arranged for joint operation, substantially as and for the purpose set forth.

DEVICE FOR SECURING LIGHTNING RODS—Victor Schrage, of Cincinnati, Ohio : I am aware of other attachments being made for the same purpose, and therefore do not broadly claim attaching and detaching rods after this manner.

But I claim the spiral spring, d, as constructed, and arranged to the insulator, a, in the manner and with the means represented for the purposes described.

RADIATOR FOR HEATING BUILDINGS, &c., BY COMBUSTION OF GAS OR ALCOHOL—I. H. Chester, (assignor to Wm. A. Chester), of Cincinnati, Ohio: I claim the radiator constructed with a central opening, C C, in its bottom to receive the flame and heated products of combustion from the burner, and with the surface of said bottom inclining downwards from said opening towards two openings, d d, at the ends and with the wire gauze cylinders or their equivalent, l l, k k, between the slides, by which means combined, provision is made for the condensation and free escape of the water of condensation, together with such carbonic acid as may be absorbed by it.

[The principal object of this invention is to provide for the condensation within the radiator of the water evolved by the combustion of the gas or alcohol, and its escape therefrom, together with a considerable portion of the carbonic acid evolved, which is absorbed by the water, and at the same time to provide for the construction of the radiator in such a manner as to provide for the equal distribution of heat therein.]

MANUFACTURING CHAIR BACKS—S. E. Foster, of Fitchburg, Mass., assignor to Walter Heywood Chair Company : I claim the described rest, consisting of two jaws, which are moved an equal amount on each side of a vertical plane passing through the center of the cutters, as the thickness of the stuff varies in the manner and for the purpose substantially as set forth.

ATMOSPHERIC REGULATOR FOR STOVES, FURNACES, &c.—B. Holly (assignor to himself, and J. T. Edwards) of Seneca Falls, N. Y. : I claim the employment of a pendulum or balance having a movable axis connected with the valve or damper, A, by the levers, C and D, or their equivalents, in such a manner that the gravitating force shall increase as the damper closes, and diminish as it opens, for the purpose of regulating the admission of air to the fuel, substantially in the manner set forth.

I also claim the method of hanging the damper, A, by means of the convex pivot bearing, C, arm, f, and sliding pivot, d, substantially as as and for the purpose described.

SPINNING FRAMES—Amasa Houghton, of Putnam, Conn., assignor to himself, E. D. Draper and George Draper, of Milford, Mass. : I claim the application of the cap to the upright spindle and the holster so as to operate therewith, substantially in manner as specified.

WATERWHEELS—D. K. Kraatz, of Ephrata, Pa., assignor to himself and I. S. Roland, of Bareville, Pa. : I claim the perforated fianch, a', which closes the spaces, between the upper ends of the series of buckets, d d, when the perforations in the said fianch are made to open into a close air chamber, substantially in the manner and for the purpose set forth.

HAND STAMPS—Wm. Morse and John Hughes, of Boston, Mass., assignors to G. H. Devereux, A. F. Devereux, O. W. Barrett and E. E. Barrett, of Salem, Mass. : We claim combining with the stamping mechanism, a cast off mechanism for discharging the letter or article to be stamped from the bed or the cast off over the same.

We also claim combining the pad or cushion, h, with or arranging it directly upon the cast off or plate, K, thereof, substantially as specified.

We also claim the combination for operating the cast off, the same consisting of the arm, r, the tripper, n', the arm, the shaft, L, and the spring, k, the same being arranged and made to act together essentially as specified.

MACHINES FOR CLEANING GRAIN—Wm. H. Orr (assignor to Wm. M. Griffiths), of Martin's Ferry, Ohio : I claim the application of the auxiliary shaft, K, constructed in the manner and employed for the purpose described and set forth.

COOLING CAR WHEELS—Robert Poole (assignor to himself and G. H. Hunt), of Baltimore, Md. : I claim the described process of regularly cooling car wheels, whereby all strain within the wheel is avoided, the chill uninjured, and the web of the wheel is without curve or corrugation, substantially as described.

MACHINERY FOR POLISHING THREAD—Britton Richardson (assignor to himself and the Hayden Manufacturing Company), of Haydensville, Mass. : I claim the construction of the dressing and polishing rollers, with ribs, a a, covered with flannel, felt or material of similar character and arranged relatively to each other, substantially as described to produce elasticity of surface.

[A notice of this improvement is given in another column]

FURNACES FOR MANUFACTURING ZINC OXYD—Joseph Wharton, of Philadelphia, Pa., and Nathan Bartlett, of Bethlehem, Pa., assignors to Joseph Wharton, of Philadelphia, aforesaid : I claim, first, The construction and arrangement of the furnaces of double the usual length, without any separating end wall, and with a charging door to each extremity, in the manner and for the purposes set forth.

Second, The construction and combined arrangement of the conduit, L L', the damper or valves, d and e', and the chimneys, g g g, in the manner and for the purposes substantially as set forth.

Third, The series of tweers, opening into the conduit, L L, arranged and operating as described.

RE-ISSUES.

SEWING MACHINES—John A. Ruckman (assignee of J. E. A. Gibbs), of Millpoint, Va. Dated June 2, 1857—Re-issued July 13, 1858 : First, In the single thread sewing machine, I claim a hook or looper, revolving in one direction only, being so constructed as to make a series of chain stitches, when operating in connection with a a reciprocating needle.

Secondly, I claim the peculiar construction, substantially as described, of a revolving hook, whereby, while one loop is taken from the needle by the hook, spread, twisted and held in the path of the needle until another or fresh loop is taken, the former loop shall be released and drawn up during the retreat of the needle.

DESIGNS.

BEDSTEADS—Heinrich Neidig, of New York City. Two cases.

COOKING STOVES—E. J. Delany, of Philadelphia, Pa., assignor to H. E. Marsh, and Jos. Johnson, of Lawrenceville, Pa.

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

Pressure upon Fish.

Mr. Pell, in his late address to the American Institute on the subject of fish, says that at ninety-three feet below the surface of the water a shad would be compelled to bear about the weight of sixty pounds to every square inch of surface on its body; at three hundred and sixty-one feet, one hundred and eighty-one pounds; at six hundred and six feet, two hundred and eighty-six pounds; at four thousand two hundred and six feet, eighteen hundred and thirty-one pounds to the square inch; at six thousand feet, over one tun. Whales sometimes descend into the depths of the ocean four thousand nine hundred feet, when they sustain considerably over the enormous weight of two hundred thousand tuns—nearly, if not quite, one hundred and thirty-eight tuns to each square foot of surface exposed. The fish do not, of course, feel this pressure, as it is exerted on all portions of their bodies alike.

How to make Soda Ash.

In an article on this subject a few weeks ago, we did not give credit to Leblanc, the French chemist, who first proposed the method at present adopted in manufacturing that substance. This has aroused the honest patriotism of a French correspondent, who requests us to do this justice to his countrymen. We never had any idea of ignoring the fact, which is so well known, that Leblanc's plan was the one adopted, but he cannot strictly be called "the father of modern alkali making," as the system now carried out by the practical makers is the result of many men's discoveries and inventions, and we still think that Tennant deserves some credit for his genius in adapting and bending to suit Leblanc's process, the resources of Britain, and making it the fountain of alkali for the world.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims :—

MACHINERY FOR POLISHING THREAD.—B. Richardson, of Haydenville, Mass., has invented an improved machine for dressing and polishing sewing thread and yarn. The invention consists in a peculiar construction and arrangement of flannel covered or felt covered rollers for rubbing down the fibres of, and polishing the thread or yarn after it has been sized.

BUTTER COOLER.—This is an improved article for the table, designed for keeping butter in a cool hard state during meal times in warm weather, and so is especially applicable to the present season. The invention consists in having an ice receptacle supported over a butter dish, so that the butter will be cooled by the cold air which descends upon it, in consequence of being of greater specific gravity than the surrounding atmosphere. James H. Stimpson, of Baltimore, Md., the inventor of the ice pitcher illustrated in our columns two weeks ago, is the patentee.

SHINGLE MACHINE.—E. Hall and J. F. Stewart, of East Randolph, N. Y., have produced an improvement in that class of shingle machines in which a circular saw is used to cut the shingles from the bolt. A peculiar means is employed for feeding and setting the bolt to the saw, whereby the machine is rendered automatic in its operation, or in other words, the bolt when applied or adjusted to the carriage and the machine put into action, is by a continuous operation, without attendance, sawed into shingles of proper taper form.

PILE DRIVER.—This pile driver is constructed in such a manner that the monkey guides may be adjusted in a vertical position in case the ground on which the machine rests is not horizontal, thereby allowing the machine to be expeditiously applied to its work without the trouble of grading. The invention is chiefly designed for driving small piles, fence posts, and the like, but it may be used for heavier work if constructed of proper size. T. W. Loveless, of Corning, N. Y., is the inventor.

IMPROVEMENT IN WATCHES.—In this improved watch the escapement consists of a single escape wheel and two geared balances, with cylinders or cylindrical segments, engaging with the escape wheels on opposite sides of its axis. There is also a compensating device, and the chain is arranged relatively to the barrel and fusee, so that the drag of the chain is on the same side of the axis of the fusee as the resistance to the transmission of the power from the latter, so that the friction on the fusee pivot is much reduced. The two ends of the fusee are arranged in a position the reverse of that heretofore adopted, for the purpose of equalizing, as nearly as possible, the friction in both ends of the barrel and on the two pivots of the fusee arbor when the watch is fully wound. Jacob Muma, of Hanover, Pa., is the inventor.

STOP-MOTION FOR ROTATING KNITTING MACHINES.—This invention consists in a certain mode of combining the sinker wheel or any toothed wheel gearing into and deriving motion from the needles with a movable stop, which is applied to the belt shipper to lock it in a position to hold the driving belt on the driving pulley of the machine as long as the knitting progresses properly, whereby, as soon as the thread breaks, or any of the loops miss, the shipper is caused to be unlocked, and allowed to be moved by a spring, or its equivalent, applied for the purpose, to a position to ship the belt on to a loose pulley, and thus stop the machine. It is the invention of N. P. Aiken, of Troy, N. Y.

GOVERNOR FOR STEAM ENGINES.—C. F. Porter, of New York City, has invented an improved centrifugal governor for steam engines and other motors, the object of which is to obtain the great requisites necessary for a perfect governor, which are as follows: Firstly, that it shall effect the whole of the movement necessary to enable it to open wide and close the regulating valve, or give the full range of variation which the regulator is capable of, with but an unappreciable variation in the speed of the engine or motor; and secondly, that it shall commence to effect the said movement instantaneously, upon the slightest variation of speed, and effect it very rapidly. Neither of these requisites are possessed by the centrifugal governor as ordinarily applied, although, notwithstanding its serious defects, it is generally admitted to be, on the whole, superior to any of the various governors hitherto devised. To obtain these results a centrifugal governor is constructed on any of the usual plans, with balls and arms, but made very much lighter, and instead of giving it only about the number of revolutions in a given time that would be natural to it, considered as a conical pendulum, as has hitherto been customary in the application of centrifugal governors. it is driven at a much higher velocity; and at the slide of the governor which connects it with the regulator, a weight much greater than the weight of the balls and arms is placed, and sufficient to balance, as nearly as possible, the great amount of centrifugal force developed by the revolution of the latter; and it is in the employment of this counterpoise, in combination with the arms and balls rotating at a velocity much higher than their natural one, that the invention principally consists. The invention also consists in so applying this counterpoise to the governor that its effective load on the governor shall be lessened in such a degree as the balls and arms of the governor expand, as to render constant, or as nearly so as desired, relatively to the power of the governor to sustain it. The counterpoise is also employed as a means of controlling the exact speed of the engine or motor.