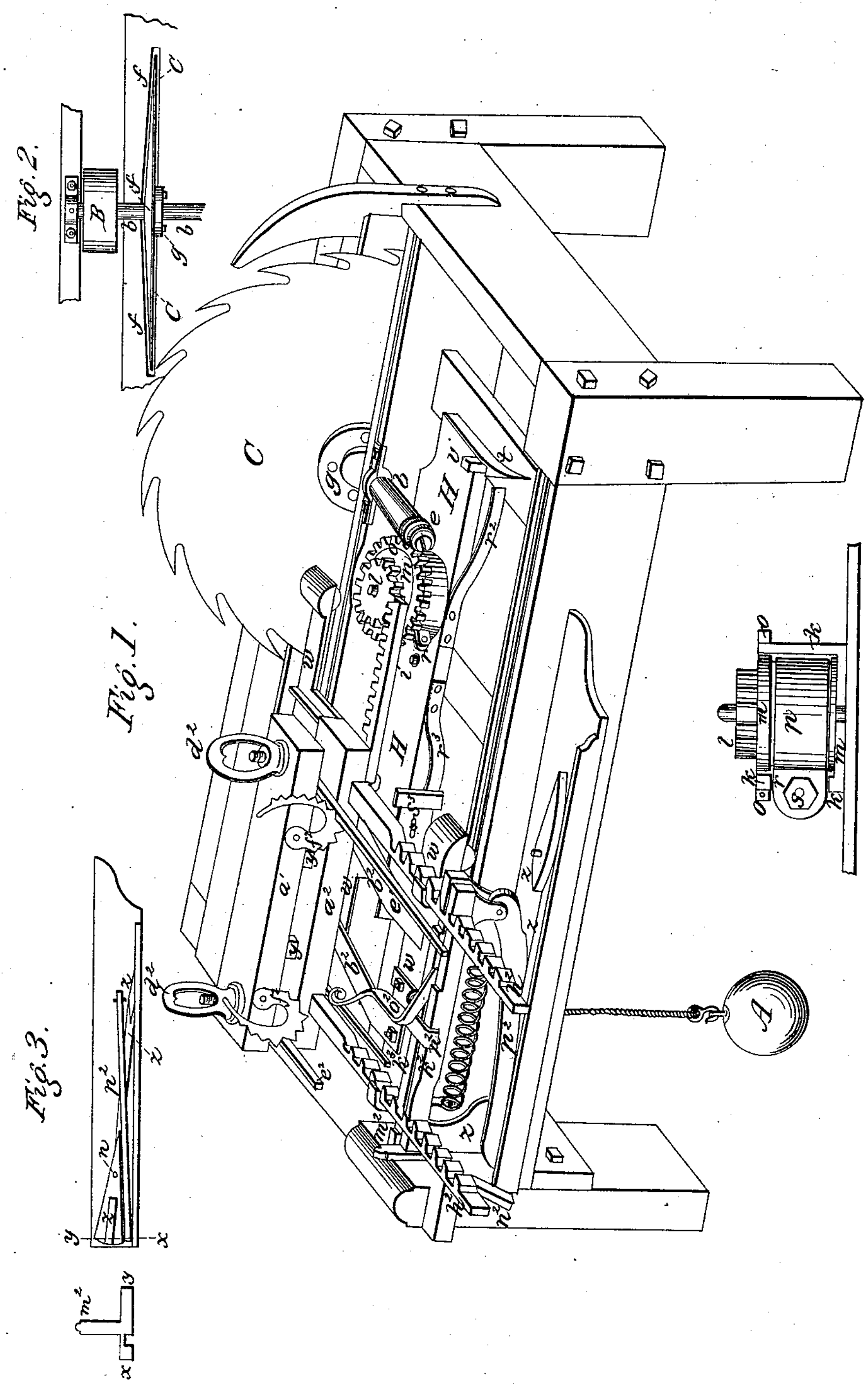
H. BURT.

Shingle Machine.

No. 6,822. Patented Oct. 30, 1849.



UNITED STATES PATENT OFFICE.

HENRY BURT, OF COHOES, NEW YORK.

IMPROVEMENT IN FEED APPARATUS FOR SHINGLE-MACHINES.

Specification forming part of Letters Patent No. **6,822**, dated October 30, 1849.

To all whom it may concern:

Be it known that I, HENRY BURT, of Cohoes, in the county of Albany and State of New York, have invented a new and useful Improvement in Machines for Sawing Shingles, Staves, and Headings, which I call "Burt's Improvements on Shingle-Sawing Machines," and of which the following specification, with the drawings thereto attached as part of the same, is a full and complete description.

Figure 1 is a perspective view of the machine from the rear; Fig. 2, a plan of the saw with its plano-convex collar or flange and belt-pulley; Fig. 3, a plan of the shelf with the switch and tumbler, the dogs and frame being removed; Fig. 4, profile of the driving-gear, the outer wheel being in vertical section to show the friction-cylinder within it with the friction-strap attached, the letters in each figure that are similar pointing out the same parts.

The general plan and arrangement of the machine are similar to that of others used for the like purpose and consists of a strong square frame of wood or iron. On the one side and near one end of this frame a circular saw C revolves on a shaft *b*. This saw is at once secured to the shaft and steadied and stiffened for its work by being riveted or secured to the plano-convex collar or flange *f f f*, Fig. 2, which is cast solid with the shaft *b*. The "bevel" (so to call it) of its outer edge serves to throw off the sawed stuff and to open the saw-kerf. The saw is further steadied by the washer *g* on the inside and is bolted or secured to and through the saw and collar. On the outer end of the saw-shaft is a driving-pulley B, Fig. 2, and on the inner end the endless screw *e*. The journals or gudgeons of the shaft run in boxes made of a peculiar metal, being composed of one-tenth tin and nine-tenths zinc, which I find to be free from heating and wearing when the shaft is revolving with great velocity. Below the range of the shaft there is a shifting-bar H H, of wood or iron, extending through nearly the entire length of the frame. This bar is stout enough to carry the driving machinery to be described and vibrates horizontally a small distance upon a center pivot *i*, placed some distance from the shaft, the pin being supported by a bracket fixed on the frame or a shelf-piece carried across it. Between this pivot *i* and the shaft a second pivot secured upon the shifting-bar carries the driving-gear—viz., a hollow cylinder or drum *k*, standing upright, with cogs *o* around its upper edge, fitted to and gearing into the endless screw on the end of the shaft. Inside of this drum and playing loosely therein lies a pulley or cylinder *m*, with a groove cut around its periphery, and this cylinder is surmounted with a cog-wheel *l*, cast solid with it and projecting above the outer drum.

To connect the outer and inner cylinders together the following device is employed: A thin metal collar P grasps the inner cylinder lying in the groove cut in its periphery. The ends of this collar are turned outward and pass through an opening or slit in the outer cylinder, where they are connected together by a screw and nut *s*, so as to be loosened and tightened at pleasure. It will be manifest that if by means of the screw the collar be closed tight around the inner wheel the outer wheel cannot move without carrying with it, by means of the projecting ends of the collar *r*, Fig. 4, the inner wheel, and it will be also understood that by increasing or diminishing the pressure of the collar upon the inner wheel or cylinder a regulated degree of pressure and friction between the collar and wheel can be produced to compel them to revolve together during the ordinary pressure of work; but whenever any unusual obstruction, as a hard knot, shall oppose itself to the operation of the saw the collar may revolve without carrying the wheel with it, or at reduced speed. I call this collar the "friction-strap," and *m* the "friction-cylinder." By turning the shifting-bar on its center a trifling distance the wheel just described can be thrown in and out of gear with the rack *x*. The bar is held in position (either in or out of gear) by two spring-catches, one to each end of the bar, and which hold to two pins attached to the frame for that purpose, the one at the right end of the bar *t*, with its pin *v*, being shown in Fig. 1.

Upon the top of the frame described there moves to and from the saw, on rollers and slides, a carriage *w w* to hold the stuff to be sawed. This carriage is moved toward the saw by the rack *x*, which gears into the pinion-wheel l. The carriage is moved from the saw by a weight A and a cord or chain attached to the carriage and passing over a pulley properly placed for that purpose.

Upon the frame of the carriage, guided and kept in position by slides, moves a compound movable head-block a' a^2, consisting of two stout bars of wood of similar dimensions placed one above the other, the lower one acting as a base for the upper one. This upper one is connected with the lower one by two tenons y y, which pass downward into mortises, reaching a few inches through the lower block, the lower end of the tenons resting upon two inclined planes b^2 b^2, which extend from the front to the rear of the carriage. This upper block carries on its under side two bars of iron e^2 e^2, moving horizontally on centers and terminating at their outer extremities in stout claws or dogs to hold the material to be sawed. These dogs when set are fastened by set-screws d^2 d^2, and are further secured by elliptic ratchets holding the inner ends of the levers from moving f^2 f^2. The head-block is moved from the front to the rear of the machine by means of two stout bars h^2 h^2, with ratchet-teeth on the edge, the bars being attached to the lower block and operated by the sliding dogs. These sliding dogs are two square bars of metal k^2 k^3 together under the ratchet-bars and at right angles to them. They have near each end an upward projection or lip with an oblique vertical face corresponding to the angle of the ratchet-teeth, so that when the lips or teeth of the dogs are forced against the ratchet-bar teeth the bars with the head-blocks must be forced forward. This forcing is effected by two springs fixed one underneath each of the dogs, one of which is shown in the drawings, the other lying behind it. It will be seen by inspection of the drawings that the dog k^3 is lying at the bottom of the notch made by two of the ratchet-teeth, but that k^2 is only half-way down between the next two teeth. It is plain that if by any means k^3 is forced out from the teeth the ratchet would be unlocked and permitted to move forward toward the range of the saw, which would be immediately done by k^2 being pressed by its spring into the bottom of the space between the two teeth, k^3 following it half-way down into the same space. If now k^2 be pressed out of the teeth, k^3 would be forced to the bottom and k^2 down into one-half of the space between the next teeth, each such operation being followed by the advance of the head-block by a distance equal to half the space between the teeth toward the range of the saw. By proportioning the space between the teeth to the intended thickness of the staves or heading the size of these articles would be regulated.

The apparatus by which the operation of forcing alternately these dogs back from between the teeth is done is a block of wood m^2 called the "bumper," placed between the dogs and the end of the frame of the machine, and is made to change its position from behind the one dog to the other every time the carriage returns to that end of the frame where it is placed. This change is effected in the following manner: The bumper is fixed upright on the extremity of a horizontal lever or switch z, turning horizontally a few degrees on a pivot n. This switch lies in a shelf or groove on the outside of the frame and under the dogs, with space enough to allow a bar to pass freely between it and the sides of the groove. To the carriage-frame w, moving with it, is a thin bar called a "tumbler" p^2, attached to it by one end, the other end hanging obliquely down and moving in the groove just spoken of freely, vertically, and horizontally. The bumper end of the switch is slightly elevated and wedge-shaped, so as to compel the tumbler as it moves with the carriage to force the left end of the switch (with the bumper) to one side or the other of the groove, as it (the tumbler) may be on one side or the other of the switch itself. The other end of the switch has a double wedge elevated above its surface to direct the tumbler to one side or the other of the switch itself, Fig. 3. The operation of this part of the apparatus is as follows: The tumbler being drawn by the carriage to the extreme right of the frame in its passage, its foot is drawn over the switch and drops into the groove on the side of the switch opposite to that in which it had been moving. As it returns with the carriage to the left of the machine the foot of the tumbler presses the left end of the switch across the groove, so that (moving on its center) it lies diagonally over its late position, shifting the bumper from behind one dog to the other. Another movement of the carriage backward and forward in a similar manner places the tumbler on the other side of the switch and shifts the bumper again, and so on alternately with every traverse of the carriage.

The method by which the carriage is made to traverse is this: The movement of the pinion l by the rack x draws the carriage toward the saw. On each end of the shifting-bar is fixed a stiff spring r^2 r^3, projecting back of the range of the pins v v. To the carriage is attached what I call the "carriage-rack adjustable trip," being two metal bars, the one s^2 being permanently affixed on the carriage and adjusted to its duty, the other s^3 lying over it and by means of screws in a slot adjustable by sliding to the right or left to suit the length of the stuff to be sawed. These bars are in range with the springs r^2 r^3. As the carriage progresses to the right the end of s^3 strikes the spring r^2 and bends it down till it passes inside of the pin v. The further progress of the carriage carries the end of the trip s^3 against the catch t, which it releases from the pin v. As soon as this occurs the pressure of the spring r^2 (it being attached toward the end of the shifting-bar) forces back the right end of the bar, thereby throwing the pinion l out of gear with the rack x. The shifting-bar is kept in its new position by the spring-catch at the left end thereof. Immediately the weight draws the carriage to the left end of the machine, where the trip s^2 detaches the catch corresponding with t and shifts the bar, putting the carriage rack and pinion in gear, when the operation is renewed as at first. The movement of the carriage, as already described, operates the dogs, which move the head-block forward with the material held thereon.

To prepare for work the head-block is drawn back. The block of wood to be sawed is dogged onto the upper bar a of the head-block firmly, (which bar by reason of the movement of the tenons projecting through the lower bar along the inclined planes or bars is, when drawn back, separated considerably from the lower bar of the block,) so that its bottom rests loosely upon these inclined bars. As the head-block advances forward the upper bar will have a tendency to settle as the tenons go down the incline. This allows the block of wood an opportunity to settle down and rest firmly upon the carriage-frame if, from irregularity of shape, as pieces are taken from it by the saw it diminishes in height at either end. This, it is manifest, will insure greater regularity of sawing than if the block were held by the dogs alone with the strain of the saw upon it.

In order to draw the head-block back from the front when it is required to dog a new block, the bunter-latch n^2 (being a small block hung conveniently to interpose between the slide-dogs and the bunter) is turned over behind the dogs, which forces both dogs out of the racks and prevents the carriage from completing its course and throwing the rack and pinion into gear when the carriage is drawn back by its weight A. This done, the iron latch o^2, which moves on a pivot in the one dog, is dropped down against the check p^2, and at the same time enters a notch in the other dog, and so holds them still till the block is put in place, when, the latches being withdrawn, the machine can be started to recommence operations.

I claim—

A self-adjusting feed-motion produced by the interposition of friction between metallic surfaces in the connections of the parts of the driving-gear, or any two of those parts, by means of a friction-strap, as described, or any analogous mode which shall allow the adaptation of the speed of the carriage holding the material to be cut to the resistance the material affords to the saw, especially in cases where unusual and temporary obstacles, such as knots, &c., interpose, which might otherwise cause the destruction of the teeth of the saw and other parts of the machine, a very important practical result of the adjustment being that it produces smoother sawing in stuff of irregular texture than machines now do.

HENRY BURT.

Witnesses:
P. F. DAW,
RICHD. VARICK DEWITT.