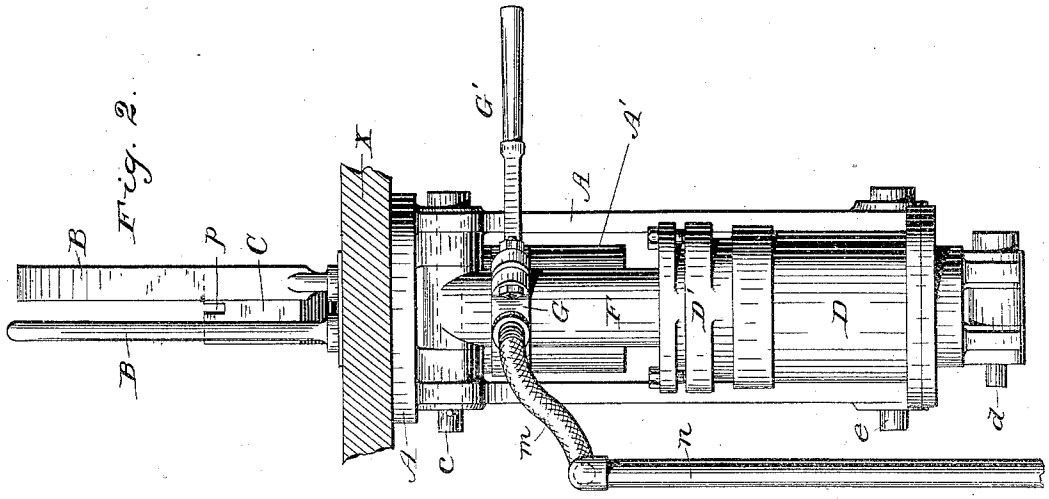
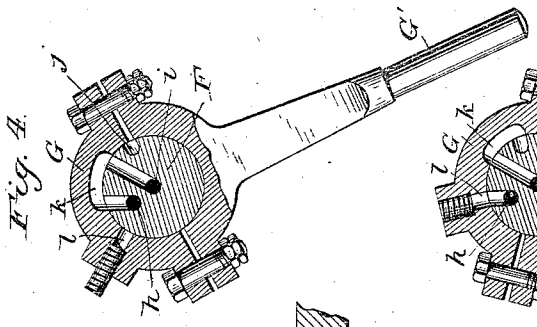
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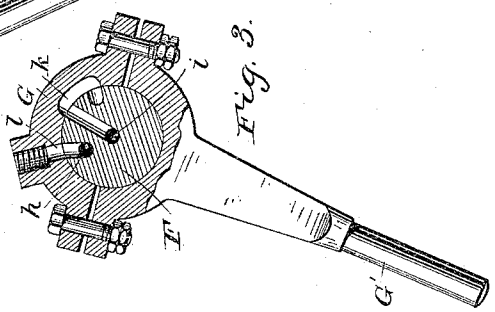
J. C. EVERETT & R. HARDIE.

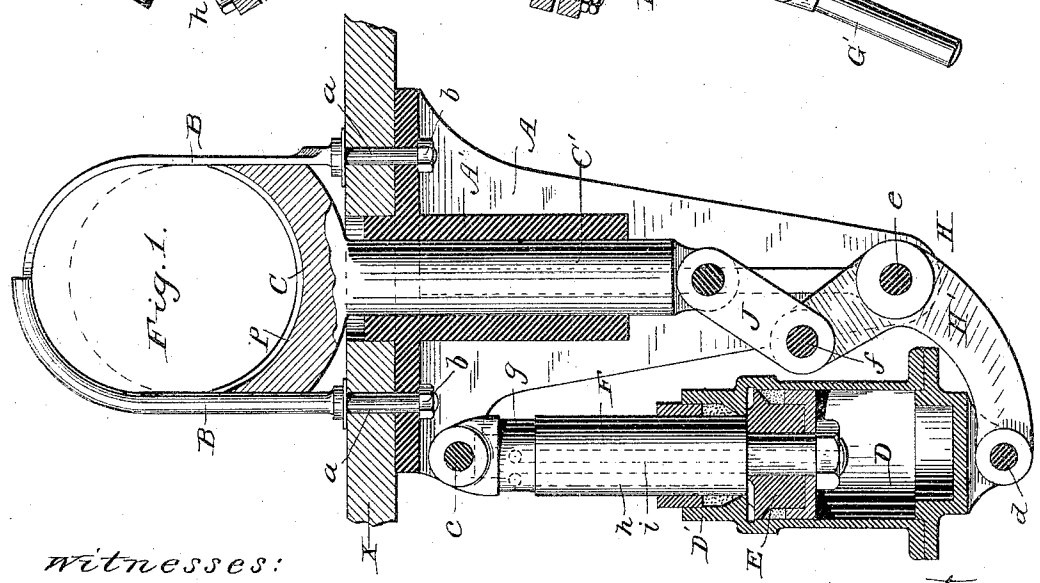
MACHINE FOR BUNDLING KINDLING WOOD.

No. 311,424. Patented Jan. 27, 1885.









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UNITED STATES PATENT OFFICE.

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MACHINE FOR BUNDLING KINDLING-WOOD.

SPECIFICATION forming part of Letters Patent No. 311,424, dated January 27, 1885.

Application filed October 14, 1884. (No model.)

To all whom it may concern:

Be it known that we, JOHN C. EVERETT, of Williamsport, in the State of Pennsylvania, and ROBERT HARDIE, of Hoboken, in the State of New Jersey, have invented certain new and useful Improvements in Machines for Bundling Kindling-Wood, of which the following is a specification.

Our invention has relation to that kind of wood-bundling machinery in which a receptacle for holding the wood is combined with a follower or presser which acts to press the bundle into small compass and to hold it until it is tied.

Our improvements mainly have reference to the means for operating the presser, and they also relate to the general arrangement and organization of the working parts of the machine.

The mechanism for operating the presser is arranged beneath the bench where the wood is bundled, and its supporting-frame is held to the under side of the bench-top by means of binding screws and nuts, which also serve to hold in place the hoops that form the wood-receptacle. We operate the presser through the instrumentality of an engine consisting of a valve, a piston, and a cylinder (to which a suitable motor-fluid is admitted) in conjunction with a toggle-lever which is intermediate between the engine and the presser. We prefer compressed air as the motor-fluid. With it the operation is more rapid than where hydrostatic pressure is used; and it is to be preferred to steam because its use is not accompanied by the annoyance and inconvenience due to high temperature and condensation. By the use of the toggle-lever in conjunction with the engine, we are enabled to materially reduce the size of the latter, and to employ a comparatively small cylinder for the work; and we further gain in economy by utilizing the same charge of air to effect both the compression and the release of the bundle, this result being attained by an arrangement of the valve ports and passages, which will be hereinafter explained. On the score of simplicity, convenience, and enhanced efficiency, we prefer to connect the cylinder to the toggle-lever and to joint the piston-rod to the frame, the valve being mounted on and the inlet and outlet passages being formed in said piston-rod. Under this arrangement it is the cylinder and not the piston that has reciprocatory movement, while at the same time the cylinder can play laterally on the joint of the piston-rod as an axis to accommodate itself to the varying positions of the toggle-lever.

We will now more particularly describe our invention by reference to the accompanying drawings, in which is represented a machine embodying our improvements in their preferred form.

Figure 1 is a front sectional elevation of so much of the machine as required for purposes of explanation. Fig. 2 is a side elevation of the same. The valve and its handle are shown in Fig. 2, but are omitted in Fig. 1. Figs. 3 and 4 are horizontal sections of the valve through the neck of the piston-rod, showing the valve in the two positions which it assumes.

A is the frame which supports the working parts. B are the hoops or straps which form the wood-receptacle. C is the presser or follower, and C′ is its stem, which fits and is adapted to slide up and down in a tubular guide, A′, forming part of frame A. H J are parts of the toggle-lever. D is the cylinder. E is the piston, and F is the piston-rod. The frame A supports all of the before-mentioned parts excepting the hoops or straps B. The latter are arranged above the bench X, and are made fast to the latter by being provided at their lower ends with shouldered stems *a*, which pass down through the bench and receive binding-nuts *b* upon their projecting screw-threaded ends. The devices *a b* serve also to hold frame A to the bench. The top plate of the frame is fitted up against the under side of the bench, the stems *a* extend down through holes in the top plate, and the binding-nuts *b* are screwed up against the plate, thus clamping both the hoops and the frame to the bench. The piston-rod F, which is unusually large or thick, is hung at its upper end on a pivot, *c*, between ears in frame A. It passes down into the cylinder D through a proper stuffing-box, D′, and is made fast to a

piston, E, of any proper construction. The cylinder at its lower end is jointed at *d* to the arm H′ of the lever H, which latter is pivoted at *e* to the frame A, and is jointed at *f* to the toggle-link J, whose other end is jointed to the presser-stem C′. Under this arrangement it will be seen that, according as pressure is upon one side or the other of the piston E, the cylinder D will move up or down, and in so doing will cause the toggle-lever to raise or lower the presser C. During these movements the requisite lateral play of the piston-rod and cylinder is permitted by the pivot *c*, on which as an axis they can move.

The means for regulating the admission and escape of the motor fluid to which the reciprocatory movements of the cylinder are due will now be described. Near the upper end of the piston-rod F is formed a neck or annular groove, *g*, which constitutes the valve-seat. In the valve-rod are formed three passages, *h i j*, all of which open into the valve-seat *g*. Passage *h* leads through the piston-rod to the upper face of the piston E. Passage *i* leads through the piston-rod down through piston E to the under face of the latter, and passage *j* leads to the atmosphere.

Encircling closely the valve-seat *g* is an annular valve, G, which at the proper point has formed in its inner face a D cavity or recess, *k*, and at another point has formed in it a passage, *l*, leading from its inner face to the outside, where it communicates through a flexible pipe, *m*, Fig. 2, with a main pipe, *n*, which is in communication with the source of supply of the motor-fluid—compressed air in this case. The valve is adapted to turn on the piston-rod as an axis, and is for this purpose provided with a handle, G′, so placed as to be within convenient reach of the hand or knee of the workman. When the cylinder is as represented in Fig. 1, the presser or follower is lowered and the valve occupies the position shown in Fig. 4. In this position the ports *h i* are in communication through the D-cavity *k*, the port *j* is open to the atmosphere, and the passage *l* is closed. Suppose, now, the receptacle B be filled with wood which is to be compacted into a bundle. As soon as the receptacle contains the requisite quantity of wood the valve is shifted from the position shown in Fig. 4 to that shown in Fig. 3. The result of this change of position is that the supply or inlet passage *l* is thrown into communication with port *h*, thus admitting the motor-fluid to the cylinder above the piston, and the port *i* is (through D-cavity *k*) thrown into communication with exhaust-port *j*, thus opening the cylinder below the piston to the atmosphere; consequently the cylinder will at once rise, and in so doing will straighten out the toggle, thus lifting the follower and causing it to powerfully compress the wood into a compact bundle. The compacted bundle, before pressure is removed, is tied by a cord which, before placing the wood in the receptacle, was laid in the cross-groove *p* in the follower. This cord is now by its ends drawn up around the bundle through the interval between the two hoops B, and is tied fast around it. This having been done, it becomes necessary to lower the follower and release the bundle, which is done by shifting the valve back to the position represented in Fig. 4, thus closing the supply-passage *l* and putting ports *h i* into communication. This permits the charge of confined air to distribute itself on each side of the piston; but as the piston has a much greater exposed area below than above, the air-pressure will act with proportionately greater force from below, thus acting to release the bundle by pushing down the cylinder, in which operation it is assisted by the weight of the cylinder itself. We thus utilize the same charge of air for effecting both the compression and the release of the bundle, and consequently effect a considerable economy in the motor-fluid.

In practice there will be in rear of the receptacle B an adjustable back or gage plate, to determine the distance the sticks of wood shall be inserted in the receptacle. Such a device, however, we have not deemed it necessary here to show, inasmuch as it is a thing in common use and forms no part of our invention.

We have described what we believe to be, on the whole, the best embodiment of our improvements. We do not wish, however, to be understood as restricting ourselves to the special details of construction and arrangement heretofore stated, for manifestly the same can be varied considerably without departure from the invention.

What we claim as new and of our own invention is—

1. The combination of the wood-receptacle, the reciprocatory follower or presser, the toggle-lever, the cylinder, the piston and piston-rod, and the valve for regulating the admission and escape of the motor-fluid to and from the cylinder, the combination being and having the mode of operation substantially as hereinbefore set forth.

2. The combination, with the piston, piston-rod, and cylinder, from which motion is imparted to the follower or presser, of the valve and valve-ports and passages arranged and operating to deliver the charge of motor-fluid to the cylinder upon one side of the piston, so as to effect the compressing movement of the follower, and subsequently to distribute the charge in the cylinder upon both sides of the piston, substantially as and for the purposes hereinbefore set forth.

3. The combination, with the presser or follower and the toggle-lever, of the cylinder jointed to one arm of the toggle, the piston, and the piston-rod jointed to the frame or stationary part of the machine, substantially as and for the purposes hereinbefore set forth.

4. The follower-actuating cylinder, in com-

bination with the piston-rod provided with inlet and exhaust passages, and the annular valve mounted on and carried by said piston-rod and adapted to operate in connection with the ports and passages therein, substantially as and for the purposes hereinbefore set forth.

In testimony whereof we have hereunto signed our names.

JOHN C. EVERETT.
ROBT. HARDIE.

Witnesses:
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W. H. MAYNARD.