(No Model.) 2 Sheets—Sheet 1.

L. H. CONVERSE.

MACHINE FOR BUNDLING WOOD.

No. 302,895. Patented Aug. 5, 1884.

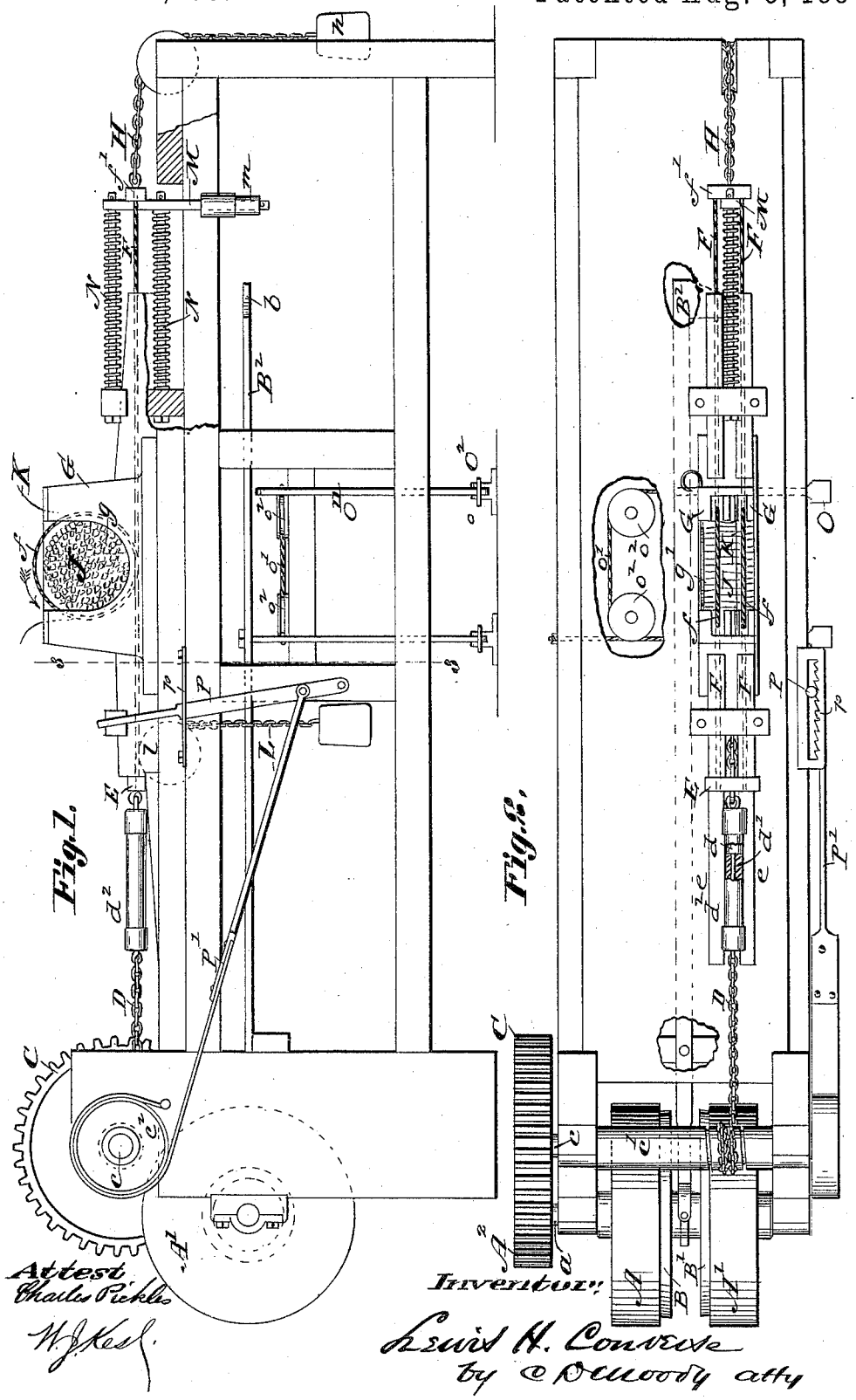

Fig. 1.

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

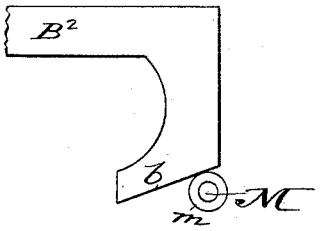


Fig. 3.

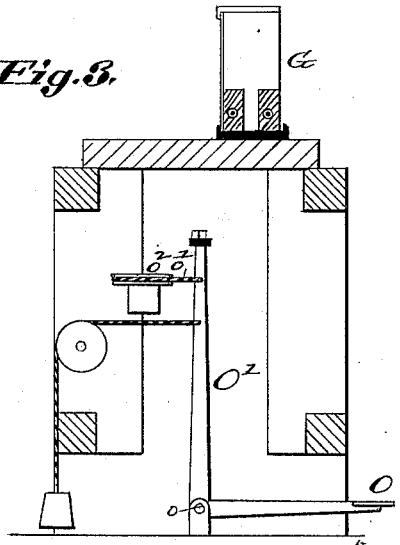


Fig. 5.

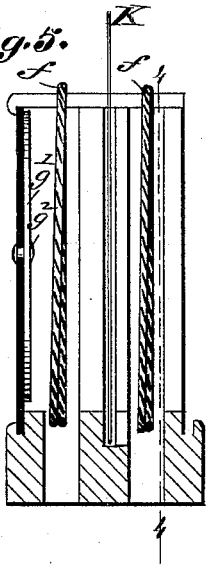


Fig. 4.

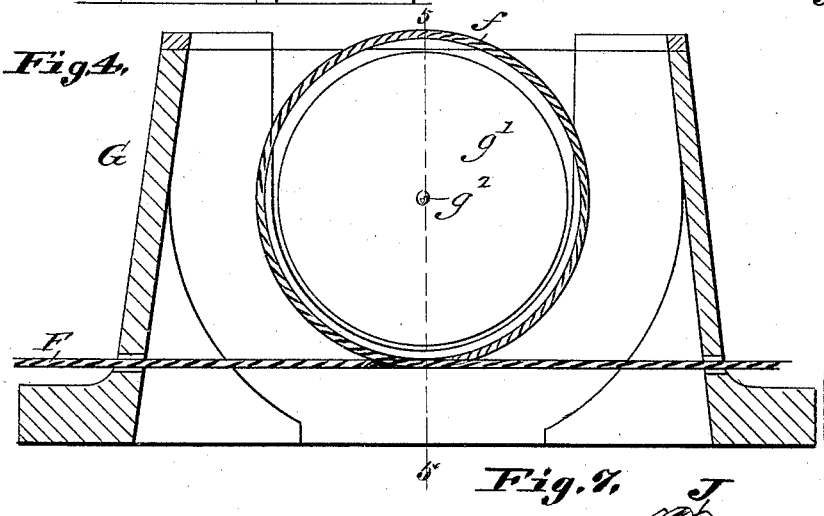


Fig. 7.

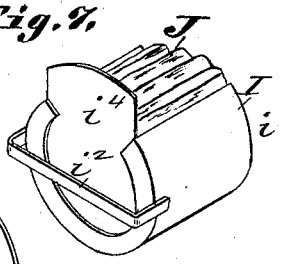
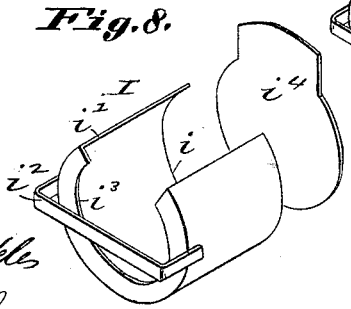


Fig. 8.



Attest:
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UNITED STATES PATENT OFFICE.

LEWIS H. CONVERSE, OF ST. LOUIS, MISSOURI.

MACHINE FOR BUNDLING WOOD.

SPECIFICATION forming part of Letters Patent No. 302,895, dated August 5, 1884.

Application filed December 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, LEWIS H. CONVERSE, St. Louis, Missouri, have made a new and useful Improvement in Machines for Bundling Kindling-Wood, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation, partly in section, of the improved machine; Fig. 2, a plan, portions being broken away to exhibit the interior; Fig. 3, a vertical cross-section on the line 3 3 of Fig. 1; Fig. 4, a vertical longitudinal section on the line 4 4 of Fig. 5; Fig. 5, a vertical cross-section on the line 5 5 of Fig. 4; Fig. 6, a plan of the end of the shifting-lever; Fig. 7, a view in perspective of the holder employed in placing the sticks in the machine, the sticks being shown in the holder; and Fig. 8, a view in perspective of the holder and end piece.

The same letters of reference denote the same parts.

Motion is communicated to the machine through the medium of the pulleys A A′, Fig. 2. These pulleys are upon the shaft *a*.

B B′ represent a double clutch adapted to be shifted in the ordinary manner upon the shaft *a*, so as to be thrown into engagement either with the pulley A or the pulley A′, as desired, and when thus thrown into engagement the motion is transmitted from the pulley in engagement through the clutch to the shaft *a*, causing the shaft to rotate in the direction which the pulley is being driven. The shaft *a* is provided with a pinion, A^2, which engages with the gear C upon the shaft *c*. This last-named shaft *c* is provided with a barrel, *c′*, upon which is wound the chain D, Figs. 1, 2. This chain leads to a cross-head, E, Figs. 1, 2, which is adapted to be moved forward and backward upon the guides *e e*. Ropes, preferably wire-ropes F F, are attached to the cross-head, and lead thence backward through what may be termed the "former" G. This former supports the sticks which are to be bundled, and is an aid in forming the bundle. The ropes within the former are coiled, as shown at *f f*, Figs. 1, 2, and from the region of the former the ropes F F are extended still farther in the machine, and are finally connected with a cross-head, *f′*, Figs. 1, 2. A chain, H, carrying a weight, *h*, is attached to the cross-head *f′*.

The operation of the machine as thus far described is as follows: The proper number of sticks to form a bundle are placed in what may be termed the "holder" I, Figs. 7, 8. This holder is adapted to receive the sticks J, substantially as shown in Fig. 7. To this end the holder is semi-cylindrical in its general outline, is open at its farther end *i*, and to enable the sticks to be readily placed in, the holder is open at the top *i′*. It is also provided with a handle, i^2. Its end i^3 can be closed by means of the plate i^4. The holder, filled with the sticks and having the plate i^4 inserted, as in Fig. 7, is inserted in the machine as follows: The holder is passed endwise through the coils *f f* in the ropes F F. The former G, Fig. 1, is suitably shaped out at *g*, to permit of the introduction of the holder into the coils. The ends of the sticks J come against the plate *g′*, Figs. 2, 4, 5. The holder I is then withdrawn from the machine, during which movement the end plate i^4 prevents the sticks from being held by friction in the holder as the latter is withdrawn—that is, while the holder is being withdrawn the plate i^4 remains in the former and keeps the sticks in place within the coils *f f* until the holder is entirely withdrawn therefrom. The plate i^4 may then be withdrawn or may be allowed to drop from the region of the former. The sticks J are now within the coils *f f* of the ropes F F, and are ready to be compressed and tied. The clutch B B′, by means of the shifting-lever B^2, Figs. 1, 2, is thrown into engagement with the pulley A, which pulley is driven in the proper direction to cause the chain D to be wound upon the barrel *c′*. As the chain is wound the cross-head E and ropes F F are drawn toward the barrel *c′*. The weighted chain H resists the action of the chain D, and in consequence the coils *f f* of the ropes F F are contracted upon the bundle of sticks, and the various sticks of the bundle are compacted together. As the coils are thus tightened upon the bundle the coils not only contract, but are drawn around the bun-

dle, as indicated by the arrow in Fig. 1. From this fact the various sticks composing the bundle J are rolled upon each other and in consequence worked closer together and the bundle made much more compact and solid than if the coils were simply tightened upon the bundle.

K represents the band used in tying the bundle. It is preferably a piece of wire, and it is placed in position in the former G, preferably before the sticks are inserted. After the coils have been tightened and the bundle suitably compacted, the ends of the wire are drawn around the bundle and tied. The bundle is now ready to be removed from the machine. To this end the clutch is shifted upon the shaft *a*, so as to be disengaged from the pulley A and to be thrown into engagement with the pulley A′. The pulleys A A′ are supposed to be rotated in contrary directions by means of belts suitably applied thereto. The motion is now transmitted from the pulley A′ to the barrel *c′*. The aim and effect of this is to slacken the chain D upon the barrel *c′*, and allow of the cross-head E being moved backward upon the slides *e e*. A weighted chain, L, which passes over the pulley *l*, Fig. 1, and is attached to the cross-head E, acts, whenever the cross-head E is free to be moved backward, to draw the cross-head backward upon the slides *e e*. This serves to move the ropes F F backward, and thereby to enlarge the coils *f f* sufficiently for them to become free of the bundle J, which can now be withdrawn from the coils and former. The weighted chain H at the same time acts to draw the farther ends of the ropes F F backward into their original positions. The main object, however, in attaching the rear ends of the ropes F F to this weighted chain is to thereby provide a yielding rather than a fixed resistance, for in compacting the bundle it has been found desirable to have the ropes at their farther ends yield somewhat. This end is further attained by allowing the cross-head *f′* to come against the upright bar M, which in turn bears against and compresses the springs N N as the ropes are drawn forward. Further, in order to prevent the chain D from suddenly jerking the ropes F F, the chain is not attached directly to the cross-head E, but, by means of the head *d*, Fig. 2, the chain is made to bear first against a yielding part—such as a piece of rubber, *d′*, held within the case d^2. The case d^2 is attached to the cross-head E, and when the chain D is drawn, the rubber *d′* yields to a limited extent before the strain comes upon the cross-head E. In this manner the force is applied gradually to the ropes F F.

Several details of construction will now be noticed. The bar M is extended downward for the following purpose: The shifting-lever B^2 is beveled at *b*, Figs. 1, 6. When the ropes F F are tightened, the bar *m* is drawn with them, and its lower end encounters the bevel *b* upon the lever B^2 and causes the lever to move and shift the clutch, and thereby arrest the winding of the chain D. In this manner the ropes F F are automatically prevented from being overtightened. The arm M is furnished with a friction-roller, *m*. The machine is started by means of the pedal, which causes the lever O′, Fig. 3, to turn on its bearing *o* and move the lever B^2. By depressing the pedal O^2 the lever O″ is caused to draw the cord *o′*, which passes around the sheaves o^2 o^2 to the lever O′. This causes the shifting-lever to be moved in the opposite direction—that is, in the same direction in which it is moved by the bar M—and the machine is stopped. When the ropes F F have been sufficiently tightened around the bundle, and it is desired to hold them in that position, the operator, by means of the lever P, operates a friction-brake, P′, upon a drum, c^2, upon the shaft *c*. The ropes are thus held tight around the bundle until the tying is completed, whereupon the operator throws the lever P out of the rack *p*, Figs. 1, 2, and releases the hold upon the shaft *c*. He then starts the machine again by depressing the pedal O, as described. The plate *g′*, against which the ends of the sticks of the bundle J press while in the machine, is pivoted at g^2, Figs. 4, 5. This enables the bundle to readily turn round with the coils *f f* as the ropes are being tightened upon the bundle.

The principal features of the above-described improvement are the contracting of the bundle of sticks by means of the rope-coils, the use of the frame or former in which the bundle is shaped as the coils are tightened upon it, the turning around or rolling of the sticks upon each other as the bundle is being contracted, and the employment of a yielding resistance at the farther end of the tightening-ropes. Each of these features can be employed without necessarily employing in conjunction therewith the other features; but the frame or former G is of use, first, in receiving the loose sticks as they are placed in the machine; and, secondly, in aiding and holding the sticks in place and shaping the bundle as it is being compacted by means of the ropes. It is also practicable to compact the bundle without rolling the sticks upon each other, as described. The bundle, however, is made more compact and firmer by rolling the bundle and the sticks upon each other as the coils are tightened; and to provide for this the farther end of the ends of the ropes should not be attached to a fixed bearing, but so that they can yield somewhat. The weighted chain H provides such an attachment, and it is also useful, as previously stated, in that it operates as a spring in preventing the ropes from being strained.

I claim—

1. In combination with a machine for bundling kindling-wood, the semi-cylindrical holder I, open at its end *i* and at the top *i′*, and provided with the plate i^4, as and for the purposes set forth.

2. The combination of a semi-cylindrical

wood-holder, I, open at its end *i* and top *i'*, and having handle i^2, with the end plate i^4, substantially as set forth.

3. In combination with the former G G and the ropes F F, having coils *f f*, operated as described, for the purpose of receiving and shaping the wood into bundles, the semi-cylindrical holder I, as described, whereby the wood is readily deposited in said frame, while the holder is easily removed therefrom.

4. In a machine for bundling kindling-wood, the former G G, adapted to receive the wood to be bundled, provided with encircling ropes operated at each end, as set forth, whereby the bundle is suitably shaped, and having end plate *g'*, against which the sticks come, all as set forth.

5. The combination of the barrel *c'*, the chain D over it, the head *d*, to which the end of said chain is attached, the rubber *d'*, and the head E, the bundle-former G G, and the ropes F F, whereby the binding force is applied gradually to the said ropes, all as set forth.

6. In combination with the former G and the chain D, and the ropes F F, having coils *f* and their operative mechanism, the head *f'* and the weighted chain H, attached thereto, whereby with yielding resistance the coils are tightened on the bundle, causing the sticks to turn around and compact together closely upon each other, substantially as described.

7. In combination with the formers G G, the pivoted plate *g'*, at the rear part thereof, against which the sticks of the bundle press while in the process of being formed.

8. In a kindling-wood-bundling machine, the weighted chain L, passing over pulley *l*, and attached to the cross-head E, combined with the bundle-encircling ropes F F, having coils *f f*, the bundle-former G G, whereby when the bundles are tied the ropes F F are moved backward and the coils *f f* are enlarged for the reception of a new deposit of sticks, substantially as described.

9. In a machine as described for bundling kindling-wood, the combination of the bundle-encircling ropes F F, having coils *f f*, and operated as described, and bundle-formers G G, whereby the bundle is shaped with the lever P, the friction-brake P', operating upon the drum c^2 on the shaft *c*, whereby the ropes F can be caused to hold tight around the bundle after it has been tied and until the tying has been completed, all as set forth.

LEWIS H. CONVERSE.

Witnesses:
C. D. MOODY,
C. E. HUNT.