2 Sheets—Sheet 1.

J. E. HANGER.

BALING-PRESS.

No. 190,852. Patented May 15, 1877.

Fig. 1.

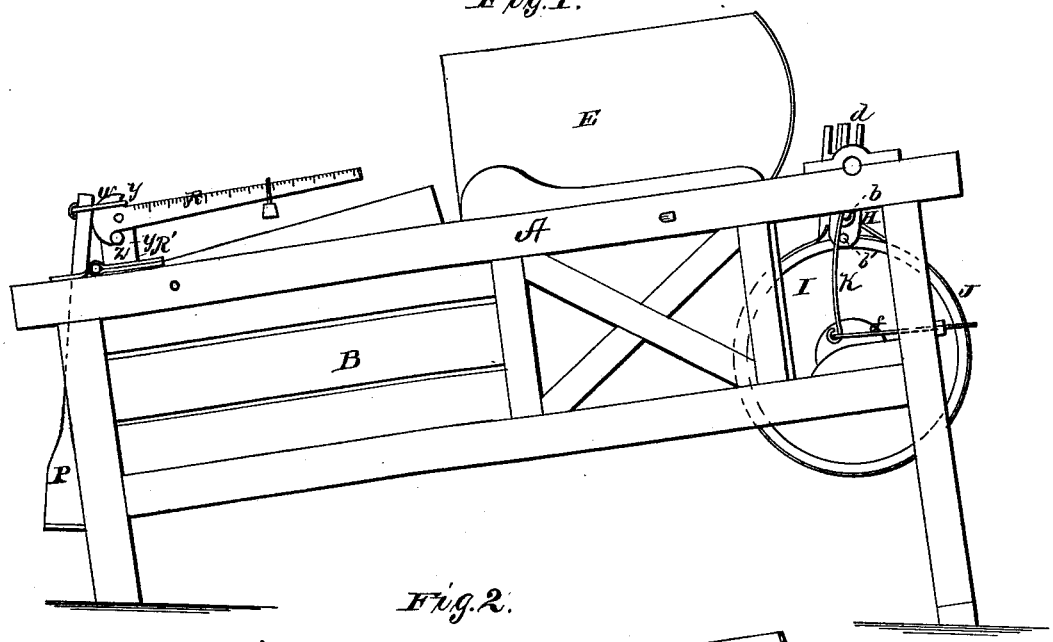
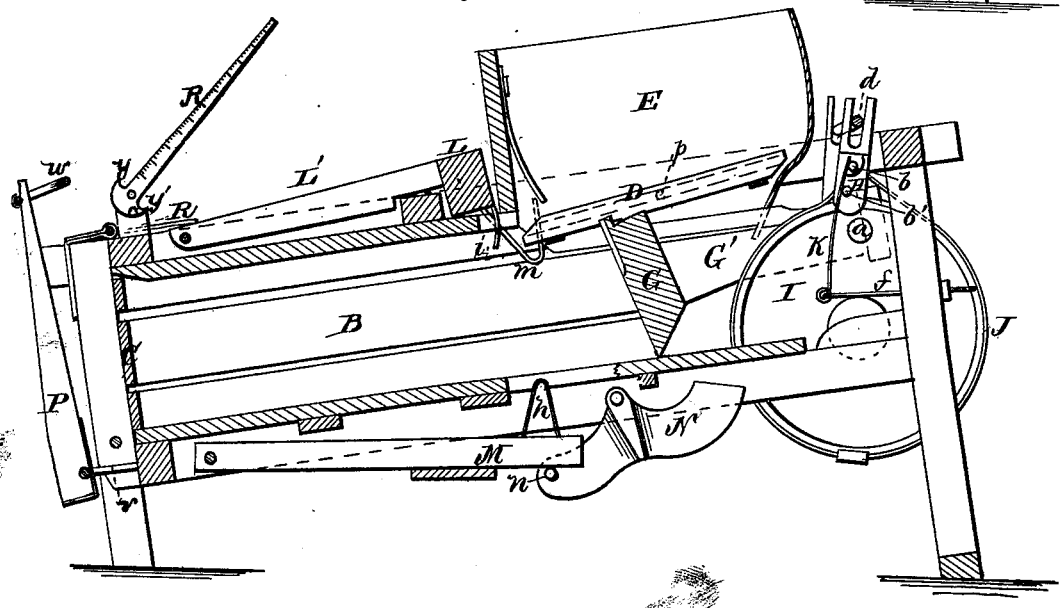


Fig. 2.



WITNESSES

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2 Sheets—Sheet 2.

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Fig. 3.

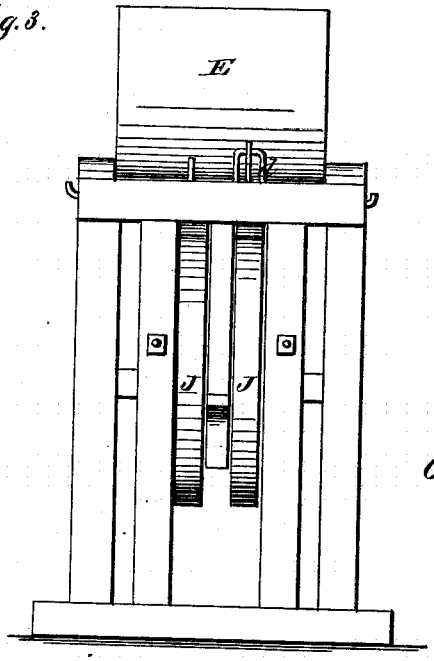


Fig. 7.

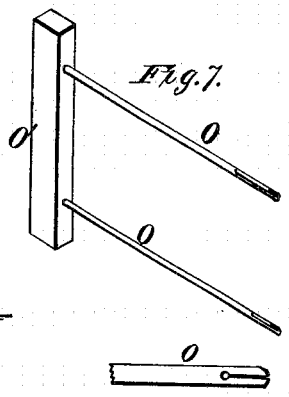


Fig. 4.

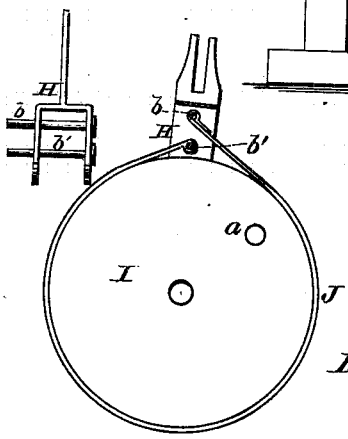


Fig. 5.

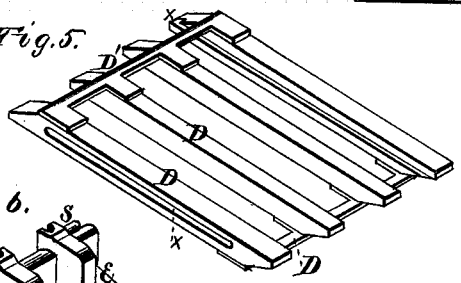
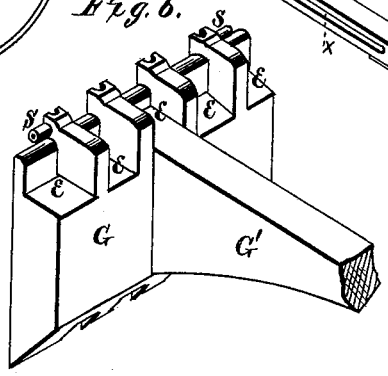


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES E. HANGER, OF RICHMOND, VIRGINIA.

IMPROVEMENT IN BALING-PRESSES.

Specification forming part of Letters Patent No. **190,852**, dated May 15, 1877; application filed April 11, 1877.

To all whom it may concern:

Be it known that I, JAMES E. HANGER, of Richmond, in the county of Henrico, and in the State of Virginia, have invented certain new and useful Improvements in Baling-Presses; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention consists in the construction and arrangement of a baling-press for pressing hay, cotton, and other articles that are usually put up in bales, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of my improved cotton or baling press. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is an end view of the press. Fig. 4 is a side view of one of the operating-wheels. Fig. 5 is a perspective view of the bottom of the receiving-hopper. Fig. 6 is a perspective view of the plunger or follower, and Fig. 7 is a perspective view of a device used in tying the wires around the bale.

A represents the frame-work of my press, arranged in an inclined position, as shown, and in said frame-work is formed the bale-box B. The lower end of the bale-box is formed of a door or gate, C, hinged at the top, and held closed by means that will be hereinafter described.

Over the upper or rear part of the bale-box is attached the hopper E, provided with a movable bottom, D, which, when in position to receive the hay or other material placed in the hopper, forms a continuation of the top of the bale-box.

G represents the plunger or follower working in the bale-box B, and provided with the stem or rod G′, the rear end of which is pivoted, by means of a pin, *a*, to and between two wheels, I I, mounted upon studs or shafts at the rear end of the frame. These studs or shafts are on a line with each other, and in the same inclined plane as the bottom of the bale-box. Each wheel I is surrounded by a flexible metal band, J, the ends of which are fastened to two pins, *b b′*, in a forked lever, H, above the top of the wheel, one of said pins being located above the other. The upper end of the lever is slotted, as shown, and in the slots of the two levers work two cranks on the driving-shaft *d*, to which the power is applied, said cranks projecting from the shaft in opposite directions, so that by the revolution of the driving-shaft the two cranks will be worked alternately back and forth.

The pins *b b′* project beyond the outer side of the lever H, and to said projecting ends is, in any suitable manner, attached one end of a spring, K, the other end of which is, by a rod, *f*, connected to the frame.

As the crank-shaft *d* revolves, the levers H H operate alternately in the following manner: As the upper end of the lever is turned backward by its crank the band J is loosened, and, at the same time, turned backward by the action of the spring K on the ends of the pins *b b′*, and when the upper end of the lever H is, by its crank, thrown forward, the relative position of the pins *b b′* is thereby changed, so as to tighten or bind the band on the wheel, and thereby turn the same on its axis. Now, when one lever is turned backward the other is turned forward, and hence the wheels I I obtain a continuous rotary motion, keeping the plunger or follower G continuously in motion. For one half of the revolution of said wheels the follower moves forward in the box, and for the other half-revolution the follower moves backward.

It will readily be seen that when the follower is moving forward and pressing the material a powerful pressure is obtained by this device, and the resistance of the material will not stop the motion of the wheels, while at the same time the expansion of the material when the follower commences to recede will not produce any jarring or shock of the operating parts, because then the pin *a* will have passed below the dead-center, and the expansion of the pressed material is exerted in the same direction as the motion of the wheels, and in that direction the wheels will move within the bands. This device or mechanical

movement for producing the motion of the plunger may be applied to other machines for other purposes, and hence I do not confine myself to its application to the follower of a baling-press.

The plunger or follower G is constructed as shown in Fig. 6, having in the back of its upper edge a series of square shoulders or offsets, *e e*, and the lower edge of the follower is beveled from the front upward and backward. The follower is so attached to its stem G′ that when moving forward in the bale-box its upper portion will be in advance of the lower part, and hence the upper part of the material in the bale-box is pressed at first more than the lower portion. At the time, however, when the pivot-pin *a* is passing the front dead-center, the lower part of the plunger is brought forward, pressing the material in the lower part of the box the same as that in the upper part, and the plunger or follower then tilts, so that its upper part will be withdrawn from the pressed material in advance of the lower part.

This action of the follower renders the pressing of the material easier than if the whole mass were acted upon at the same time at the time when the greatest strain is upon the operating mechanism, which, of course, is just when the follower completes its forward stroke. When the follower is completely withdrawn the mouth of the bale-box is wider than the bottom by the angular position of the follower.

As the follower recedes the material pressed in the front part of the bale-box is held from expanding too far backward by means of a series of teeth, *i i*, at the top, and a series of triangular lugs, *h h*, at the bottom. The teeth *i* project from the under side of a head, L, located across the top of the bale-box immediately in front of the hopper E, said head L being attached to two side arms, L′, pivoted to the frame A, as shown in Fig. 2, the teeth projecting downward through a slot in the top of the bale-box. These teeth are raised out of the box just as the plunger or follower G reaches them, by means of a bent lever, *m*, pivoted in one side of the hopper E, the follower striking one end of said bent lever, causing the other end thereof to raise the head L sufficiently high for the teeth to clear the advancing follower. When the follower recedes the head L descends again of its own weight, causing the teeth *i* to come behind the pressed material at the top, and prevent the same from expanding too far.

The lugs *h* at the bottom project upward from a hinged frame, M, and through a slot in the bottom of the bale-box. The front sides of these lugs, when thus raised, stand at or nearly at right angles with the bottom of the bale-box, so that the pressure of the expanding material will hold them up, and they, in turn, prevent the further expansion of the material at the bottom. The rear sides of the lugs *h* are at such an inclination that when the lower edge of the follower strikes them they will be forced downward by the same. When the follower commences to recede the pivoted end of the stem or rod G′ comes in contact with one end of a pivoted lever, N, turning the same on its pivot sufficiently far to cause a pin, *n*, projecting from the other end thereof, to raise the frame M, so that the lugs *h* will rise in the bale-box and get up in rear of the pressed material at the bottom.

When the follower advances again, pressing more material into the bale-box, the teeth *i* and lugs *h* are again forced out of the bale-box, either by the compressed material itself passing beyond them or by the follower, as above described.

The bottom of the hopper E consists of a series of parallel bars, D D, connected together and held suitable distances apart by means of cross bars D′, one at each end on opposite sides, as shown in Fig. 5.

The ends of the bars D are beveled in opposite directions, and the two side bars of the bottom have on both sides longitudinal grooves *x*. From each side of the press a pin, *p*, is passed through the hopper into the groove on the outside of the side bar, and in the groove on the inner side thereof works a small friction-roller, *s*, mounted on a stud at the upper front edge of the follower G.

During the forward movement of the follower the bottom D is held level, or in proper position, by means of said pins *p* and rollers *s*, and the front end of the bottom is held from turning upward by means of a spring, *t*, in the hopper.

As the follower G completes its forward stroke the beveled front ends of the bars D D drop down on the shoulders *e e* in the top of the follower; then, as the follower recedes, it slides or moves the bottom D with it, the rear end of the bottom at the same time turning gradually upward and over forward, so that when the follower completes its backward movement the bottom will turn completely over, depositing all the material placed in the hopper into the bale-box in front of the follower, and placing itself again in readiness to have more material placed upon it in the hopper. This bottom D thus answers a threefold purpose—as a bottom for the hopper, as a continuation or part of the top of the bale-box, and as a feeder to feed the material from the hopper into the bale-box.

The gate C, at the front end of the bale-box B, is held locked by the following means: To a staple, *v*, at the bottom of the frame is pivoted a lever, P, which extends upward close to and against the outer side of the door or gate C, in the center, and extends above the same for a suitable distance. At the upper end of the lever P is hinged a loop, *w*, which is thrown over and engages with a hook, *y*, on the inner end of a beam, R, pivoted to a standard, S, on the top of the press. This beam is thrown down over the press and held either by a spring or a weight; and the beam in a full-sized press will be graduated, so that

the weight or spring may be set for any desired weight of bale. When the beam R is thus held down a pin, *z*, is passed through the standard S, in advance of a hook, *y'*, formed on the lower edge of the beam.

It will readily be seen that the gate C and lever P act the same as ordinary scale-levers, and the beam R forms the scale-beam, so that when the bale has attained the desired weight the pressure will raise the outer end of the beam R till the hook *y'* strikes the pin *z*, when the bale is completed and should be tied. This is done by means of needle-rods O O, attached to a cross bar or head, O'. The wires are passed around the bale in the usual manner, and one end of each wire fastened or inserted in the eyes of the rods O. The rods, with the wires in them, are then passed through the slots in the sides of the bale-box from one side to the other, so that both ends of each wire will be on the same side of the bale, where they are tied in any desired manner. This is done at the rear of the bale, the rods remaining in the bale-box. The eyes in these rods are simply slots from the ends inward a suitable distance, and terminating in holes, as shown in Fig. 7.

The pin *z* is now removed and the loop *w* unhooked, when the lever P is thrown down and the baling or pressing operation continued. Each time the follower now advances to press new material the completed bale is forced out a certain distance until it can be pulled entirely out, when the gate C is again closed and locked, as before, and the rods O withdrawn without stopping the operation of the press.

It will be noticed that the press need not be stopped at any time, but continue in operation right straight along without stoppage, and as soon as a bale has the desired weight, by means of the needle-rods O, the division is made and the bale tied.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the wheels I I, the flexible bands J J, surrounding the wheels and having their ends attached to pins *b b'*, the forked and slotted levers H H, the revolving double-crank shaft *d*, and the springs K K, all substantially as and for the purposes herein set forth.

2. In a baling-press, a reciprocating follower, arranged to advance the entire length of the stroke at an angle, causing one part of the material to be pressed first, then, at the completion of the stroke, tilting to an opposite angle to press the other part of the material, and then recede at said latter angle back to the rear end of the box, by the means substantially as and for the purposes herein set forth.

3. The combination, with the rotating double-crank shaft *d*, of the slotted and forked levers H H, flexible bands J J, wheels I I, pivot *a*, stem G', and follower G, having its lower edge beveled, all constructed substantially as and for the purposes herein set forth.

4. The head L, provided with the teeth *i*, and attached to the pivoted side bars L', in combination with the follower G and bent lever *m*, substantially as and for the purposes herein set forth.

5. The triangular lugs *h*, attached to the pivoted frame M, in combination with the follower G, stem G', and lever N, with pin *n*, substantially as and for the purposes herein set forth.

6. The hopper-bottom D D', constructed as described, and acting as a feeder, by making one-half a revolution at each backward stroke of the follower, substantially as herein set forth.

7. The combination of the hopper-bottom D D', having longitudinal grooves *x* in its side bars, the pins *p p*, and the reciprocating follower G, formed with the shoulders or offsets *e*, and provided with the friction-rollers *s*, substantially as and for the purposes herein set forth.

8. The combination of the hinged door or gate C, the hinged lever P, with loop *w*, and the scale-beam R, having hook *y*, with weight and the pin *z*, substantially as and for the purposes herein set forth.

9. The bottom D D', constructed and operating as described, to act as a bottom for the hopper, a feeder for feeding the material from the hopper to the bale-box, and also as part of the top of the bale-box, to hold the material down in front of the follower, substantially as herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of April, 1877.

JAMES E. HANGER.

Witnesses:
J. M. MASON,
FRANK GALT.