W. M. SMITH.

COTTON OR HAY PRESS.

No. 106,417. Patented Aug. 16, 1870.

Fig. 1.

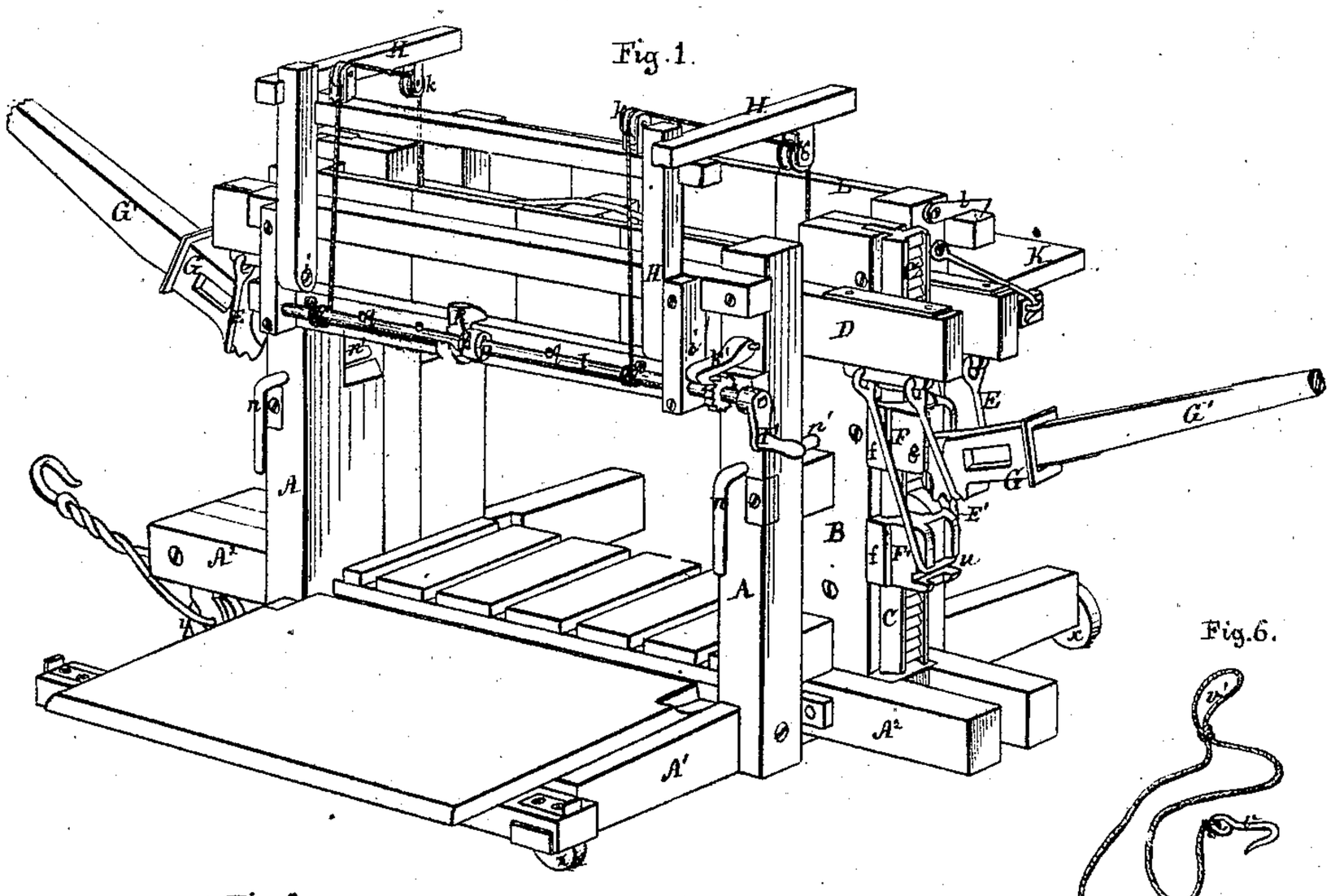


Fig. 3

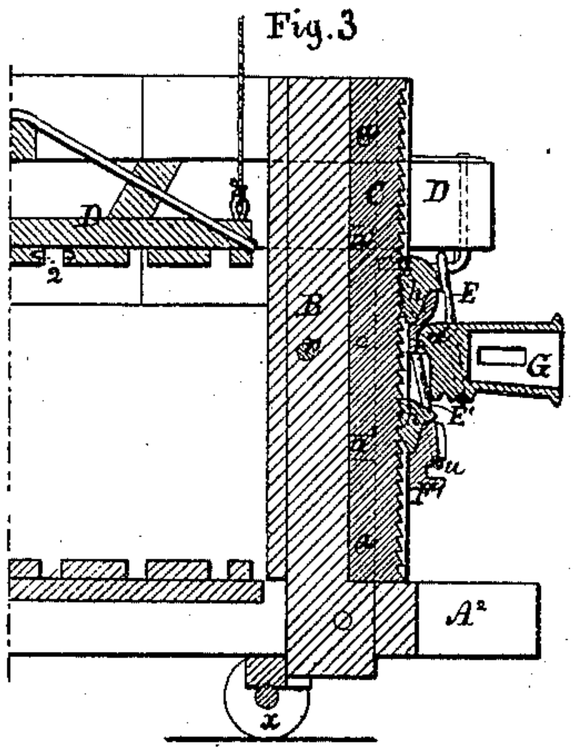


Fig 5

Fig. 4.

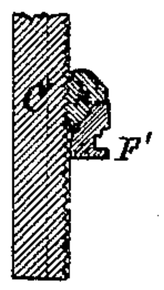
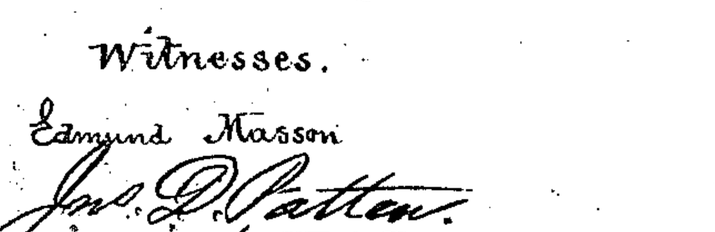


Fig. 6.

Fig. 2

Fig. 7.



Witnesses.

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WILLIAM M. SMITH, OF AUGUSTA, GEORGIA.

Letters Patent No. 106,417, *dated August* 16, 1870.

IMPROVEMENT IN COTTON AND HAY-PRESSES.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, WILLIAM M. SMITH, of Augusta, in the county of Richmond and State of Georgia, have invented certain new and useful Improvements in Cotton and Hay-Presses; and that the following is a full and exact description of the construction and operation of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 represents a perspective view of the press, with the doors thrown open.

Figure 2 represents an end view of the press, with the follower-block and crane, to which it is hung, in full lines, and also in dotted lines when it is swung out of the way to fill up the press.

Figure 3 represents, in section, one-half of the press, showing the operation of the rack and pawls.

Figure 4 represents, in section, a modification of the rack, pawl, and pawl-box.

Figure 5 represents, in perspective, one of the pawls detached.

Figure 6 represents a simple device for starting a bale of cotton out of the press.

Figure 7 represents devices for tightening and holding in position the bands of a cotton-bale while uniting the ends.

Similar letters of reference, where they occur, denote like parts in all the figures.

My invention relates to the manner in which I have arranged and combined the use of racks, pawls, and levers, so that I can produce a greater pressure with less expenditure of power than in other presses now in use, being able to bring the fulcrum of the levers in a line perpendicular with the pivoting point of the lever's sockets.

My invention relates also to the peculiar construction of the pawls and pawl-boxes. The pawls have a number of small teeth, which engage with the racks in such a manner that there will be little or no motion lost in operating the press, as the backs of the pawls have nearly the same incline as the one formed on the teeth of the pawls.

My invention relates also to the manner in which the follower-block is raised out of the body of the press, and is held out of the way by means of a hinged crane, so as to require less room to accomplish the operation of removing the follower-block and filling up the press.

My invention relates also to the manner in which the upright racks are made T-shaped, with the pawl-boxes sliding on them, so that the triangular-toothed pawls can freely operate on the racks, and yet be firmly supported by their boxes, which follow the ways formed on each side of the teeth of the racks.

My invention relates also to the manner in which the press-doors are held up in position by means of bent rods passing through the framing, so that they cannot get lost, but remain in position ready for use.

My invention relates also to the manner in which the platform is hinged to the side of the press, with one side of the press-box opening and folding on the platform, to facilitate the operation of filling the lower portion of the press.

My invention relates also to the devices used for tightening and holding the bands around the cotton-bale, while their ends are to be united together, whereby there is a saving in the length of the bands, and in the size of the bale, after it is relieved from the pressure of the press.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

The body of the press is formed of four upright timbers, A, securely bolted to the bed-pieces A^1, which are connected together by the timbers A^2. To each end of the timbers A^2 is securely dovetailed and bolted the uprights, B, to which the T-shaped racks C are fastened, by means of bolts *a* and lugs *a'*, formed on the sides of the tail-piece of the racks, thus relieving the bolts *a* of a great portion of the strain.

D is the follower-block, which is formed of two strong timbers, properly braced, and united together by slats, *d*, which form the bottom of the follower-block, and permit the introduction of the bands or ties around the cotton-bale.

From the under side, and near each end of these timbers, two iron links, E and E', are hanging, which are used in bringing the follower-block down.

F and F' are two pawl-boxes, which can slide freely up and down the rack C, but cannot move in any other direction, as they are formed with projections, *f*, which clasp the head of the T-shaped rack C.

To the box F is pivoted, at *e*, the lever-socket G, which has indentations formed on its under surface with which the link E engages, allowing the movable fulcrum to pass, at each stroke of the lever, beyond a perpendicular line drawn through the pivoting point *e*.

On the outer surface of the pawl-box F' there is a groove or indentation, *u*, which receives the link E', and retains it there until it is removed by means of the wedge *g*, fig. 2.

The pawl-box F carries loosely the triangular-shaped pawl *h*, which is furnished with a series of fine teeth, which correspond and engage with the teeth formed on the rack C. To insure this pawl *h* engaging with the rack C, it has its rear portion beveled off, and is furnished with projections, which clasp the head of the rack C, as shown in fig. 3, and a modification of the same pawl, simplified, is shown in figs. 4 and 5.

In this case the teeth of the pawl *h* are made with

their upper and lower faces beveled off at nearly the same angle with a vertical line, the upper face being slightly more horizontal, so as to take a stronger hold on the teeth of the rack C, which are cut with a bevel corresponding with the one formed on the pawl *h*.

The back of the pawl is beveled off with an incline, a fraction nearer a perpendicular than the upper side of the teeth of the pawl, so that, when pressure is applied, the pawl will be wedged between the pawl-box and the rack, without any possibility of its slipping off the incline of the pawl-box.

The great advantage gained by this arrangement is, that there will be little or no motion lost by the pawl, when dropping from the point of the teeth of the rack to the bottom, in taking a new hold on the rack.

This advantage may seem slight at first view, but, when considering the heavy pressure exerted, and the small descent of the pawl-box and pawl at each stroke of the lever, it will be seen that it is of the greatest importance that there should be no lost motion when the pawl slides home in the bottom of the teeth of the rack. The back of the pawl is also provided with a shoulder, near its upper portion, and the bottom is cut off horizontally, forming two square rests, which bear upon the pawl-box when the pawl is ready to act on the rack, thus relieving the pawl-box of nearly all the lateral pressure, which the rear incline of the pawl would otherwise produce on the incline of the pawl-box.

To oblige the pawl to slide down for a new hold at each stroke of the lever, it is provided with grooves, parallel to its bevel portion, as shown in fig. 5, which follow two short pins in the inside of the pawl-box. These pins may be carried by the pawl and the grooves cut on the inside of the pawl-box, without departing from the spirit of my invention.

The object of these pins and grooves is to oblige the pawl to slide down the incline, and take a new hold on the rack C at each stroke of the lever, and to prevent it from tipping out at the top.

The above description of pawl and pawl-box is applicable to the four used in operating the press, the two lower ones retaining the follower-block down, while the two upper ones slide down for a new hold on the rack. There are cheek-pieces formed on each side of the racks C, for the double purpose of strengthening the teeth and to form ways for the pawl-boxes to slide upon.

To one side of the press is pivoted, at *i*, the double crane H, which is used to lift the follower-block D out of the press. For this purpose ropes are attached to the follower-block, near each end. These ropes pass over pulleys, *k*, attached to the crane H, down to the windlass I, around which they are wound up in raising the follower-block D. After the follower-block has been raised enough to clear the upright timbers A of the press, the double crane H is swung on one side, and, in so doing, it raises the follower-block higher and out of the way.

The advantages of this device are, that the whole operation can be accomplished by one man, and it occupies less height than what is required generally to accomplish the same purpose.

The windlass I extends the whole length of the press, and passes through suitable bearings, securely fastened to the frame of the press. It is operated by means of the handle I', and carries a ratchet, with which the pawl *k'* engages. On the opposite side of the press to which the double crane H is pivoted, the platform K is hinged, so as to form an elevated stand, from which the press can be conveniently filled up.

The upper side L of the box or body of the press is hinged to the frame-work, so as to form a door, which can be opened, as shown in dotted lines in fig. 2, allowing the lower portion of the press to be filled with greater ease, without having to throw most of the cotton over the head of the party tramping it inside. When the press is partly filled, the door L is closed, and held in that position, with the hooks *l* fastening each end of the door.

The bed of the press is made of the ordinary slats, connected with strips, and resting on, but not fastened to, the framing of the press, so as to facilitate the operation of taking the press apart, and shipping the same.

The operation of packing a bale of cotton is as follows:

The follower-block D, being set free from its connection with the levers, it is raised up to the top of the press by means of the double crane H and windlass I, when the crane, and with it the follower-block, are swung to one side, and kept there by the stay-ropes *m*, of a proper length, after which the necessary bagging is placed on the bed of the press, and the two bottom doors are then closed and fastened with the bent rods *n*, which pass through the framing of the press, where they are kept in position, ready for immediate use. The upper door L is then opened, and the press is filled up to near the top of the bottom doors; then the upper door L is closed, and secured with the hooks *l*, after which the press is filled to the top. Bagging is then spread over the cotton, the crane H swung back above the press, bringing the follower-block in position; the pawl-boxes F are then raised up, and the the links E engaged in one of the indentations of the lever sockets G. The pawls of the retaining boxes F' are then removed from the boxes, so as to allow them to be raised up until the links E' can be engaged in the recess *u* of the retaining boxes, and then the pawls *h* are replaced in their boxes. The follower-block is then worked down by means of the levers G' bearing on the movable fulcrums formed by the links E, and operating on a progressive principle, so that the fulcrum can fully pass a vertical line drawn from the pivoting point *e* of the levers, thus using the full power of the stroke.

During this operation the retaining pawls and boxes F' will, by their own weight, slide down the rack one or more teeth, and retain, by means of the link E', the follower-block D in the position where it had been brought by the stroke of the levers, relieving them of pressure, allowing the upper pawls to take a new hold lower down the rack, and repeat the operation. These reciprocating movements are repeated until the cotton is pressed down to the required size, then the bent rods *n* are turned a quarter around, releasing the doors, which are then laid down. The ties are then passed around the bale, from the windlass side of the press. The pins 1, of the bent lever M, fig. 7, are introduced in recesses 2, fig. 3, between the slats of the follower-block.

The lever M is brought down, so that its point, 3, holds the tie firmly on the bale; then the tie is passed under the bale, to the windlass side, and its end bent, as shown at N, and the loop introduced between the fingers of the clamp O; then the rope *o* is passed over the hook *p* of the sleeve P. This sleeve P can be moved lengthwise of the windlass. It has a groove cut next to its center, so as to pass over the pins *q*, which are set on the windlass, opposite to the position occupied by the ties on the bale, and, when the sleeve P rests over one of these pins, it will be obliged to revolve with the windlass I when the windlass is turned around; and, by revolving it with the rope *o*, made fast to the hook *p*, the tie N of the bale will be pulled tightly against the bale; then the wedge Q is driven between the slats of the bed of the press, tightly against the tie, so that the tie will be held firmly in position, with the two ends free, and ready to be united together.

The operation is repeated for each tie by shifting the sleeve P over another of the pins *q*, shifting, at the same time, the movable rest R next to it so as to sup-

port the windlass I, and keep it from bending. In lieu of the clamp O the clamp S could be used; in this case, after introducing the loop N in the opening *s*, the key *s'* is passed through the loop, which keeps it from getting flattened out. After the ties have all been fastened, the pawls of the pawl-boxes F are removed, the follower-block being then retained down by the links E'. These are set free by driving the wedges *g*, fig. 2, between the pawl-boxes F' and links E', and the follower-block can be raised again by means of the crane H and windlass I. At the same time the cotton bale is started out of the press by fastening the two hooks *v*, fig. 6, in the sides of the bale, and passing the loop *v'* over the hook *p* of the sleeve P, when, by turning the crank I', the double operation will be performed, viz., removing the completed bale, and carrying the follower-block to the top of the press.

The whole press is mounted on three wheels, two of which, *x*, are connected to the bed-pieces A by an axle suitable for the purpose, and the front wheel *y*, which allows the press to be moved with ease, even when turning on the road or shifting from place to place.

Each rack C is secured firmly between two timbers B, rabetted out for its reception, the timbers B forming, at the same time, a guide for the follower-block D, and keeping it from tipping.

Having thus fully described the construction and operation of the press,

What I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of the T-shaped racks C, secured in the upright timbers B, as described, with the pawls *h* and the pawl-boxes F and F', constructed as and for the purpose specified.

2. In combination with T-shaped racks of a cotton-press, the pawl-boxes F and F', constructed with an inside incline, nearly parallel with the upper face of the teeth of the pawls, so that there will be little or no loss motion when the pawls enagage with the racks, substantially as and for the purpose specified.

3. In combination with the follower-block of a cotton-press, the double crane H, hinged to one side thereof, and the windlass I, substantially as and for the purpose set forth.

4. The arrangement of the rods *n'*, pivoted in and passing through the uprights A, and provided at each end with hooks *n n*, in the manner and for the purpose shown and set forth.

5. The arrangement of the hinged door L with the hinged platform K, provided with hooks, all in relation to the press-box, as herein shown and described.

6. The arrangement herein shown of the movable fulcrums, formed of the links E, with their lever-sockets G, pivoted to pawl-boxes F, so that said fulcrums can pass, at each stroke of the levers, a vertical line drawn from the pivoting point *e*, as and for the purpose described.

7. In combination with a cotton-press, the bent lever M, clamps S and O, and wedge Q, for the purpose of holding the bands N while being fastened, substantially as described.

8. In combination with the retaining pawl-boxes F' and the links E', the wedges *g*, for the purpose of releasing said links from the boxes, substantially as described.

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