W. M. SMITH.

COTTON AND HAY PRESS.

No. 184,113. Patented Nov. 7, 1876.

Fig. 1.

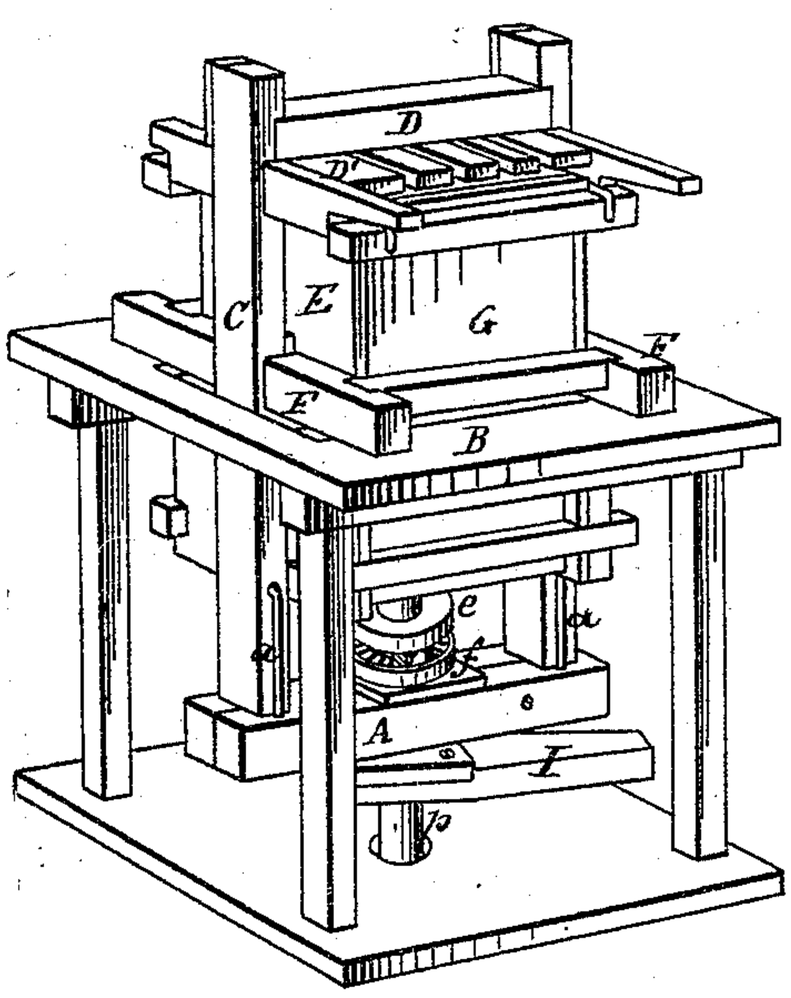


Fig. 2.

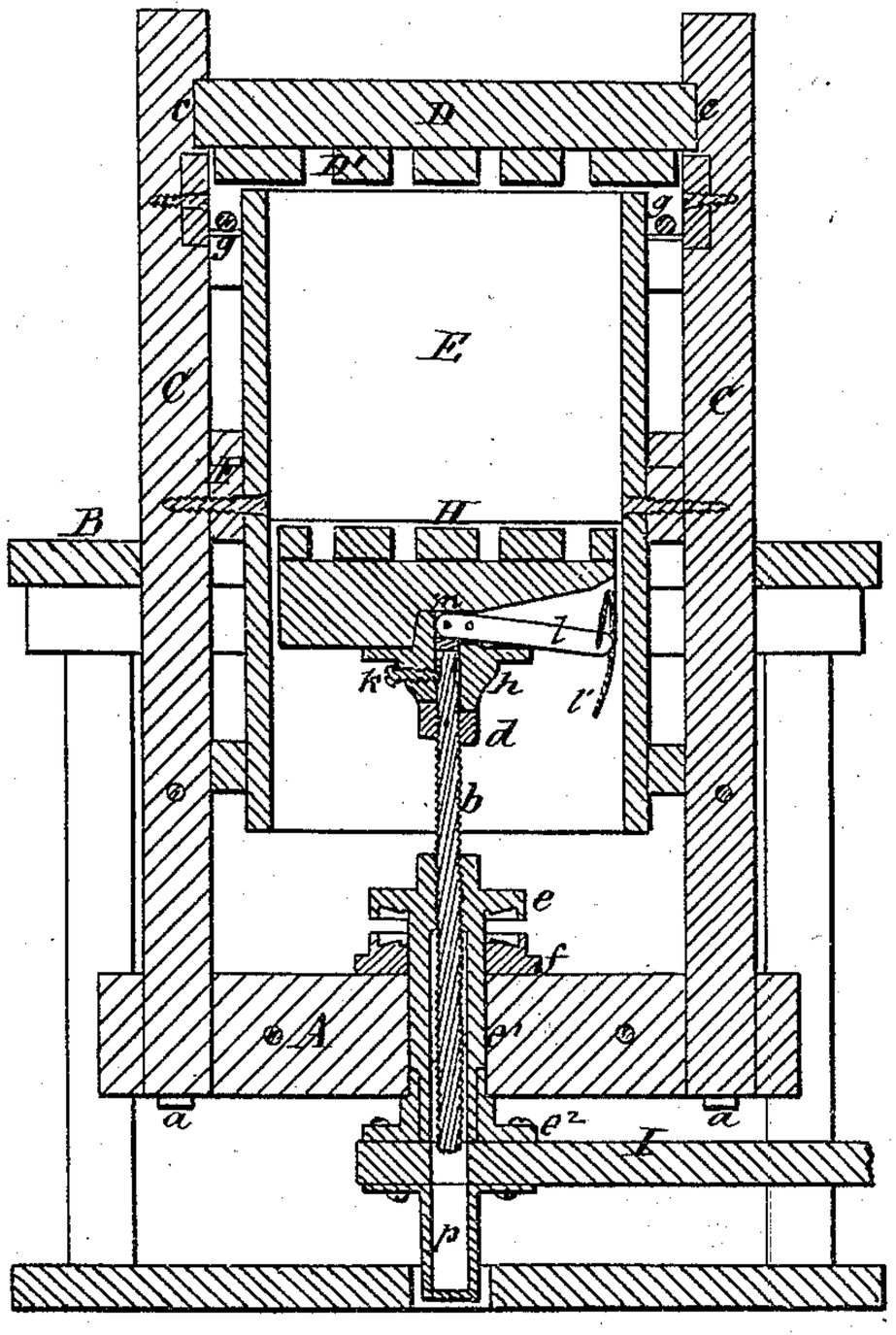


Fig. 3.

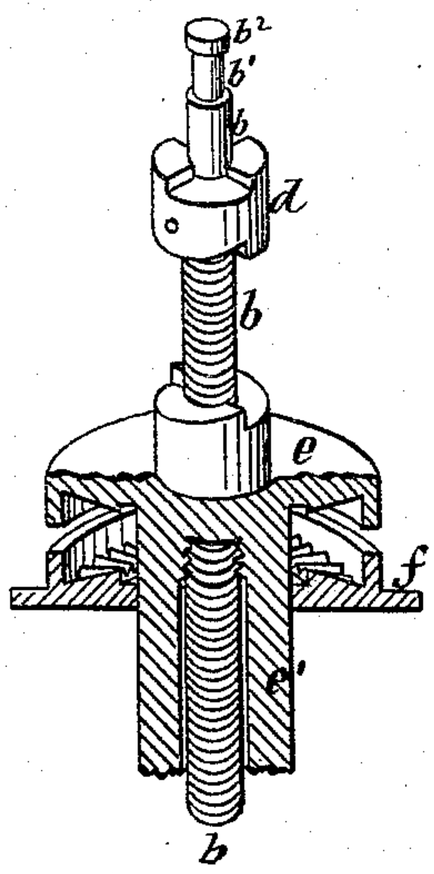
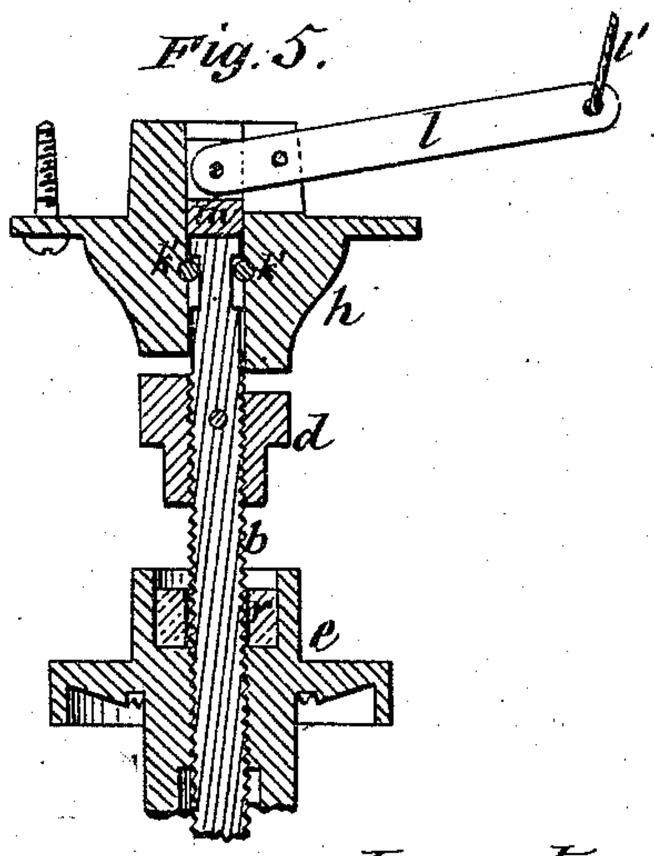


Fig. 4

Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM M. SMITH, OF AUGUSTA, GEORGIA.

IMPROVEMENT IN COTTON AND HAY PRESSES.

Specification forming part of Letters Patent No. **184,113**, dated November 7, 1876; application filed July 13, 1876.

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, clear, and exact description 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. Fig. 2 represents a vertical central section of the same. Fig. 3 represents a view, in perspective and partly in section, of the double clutch, nut, and base-plate encircling the operating-screw. Fig. 4 represents one of the anti-friction pinions used to support the main screw-nut. Fig. 5 represents, in section, the brake and socket-plate, the upper clutch disconnected, and a modification of the lower clutch.

My invention relates to that class of presses in which the platen or follower that supports the cotton to be pressed and baled is elevated from below by means of a screw, operated by a revolving nut and beam, or capstan, and, while the power of a screw operated in that manner is very great, much time is generally lost in running the screw and platen down preparatory to filling the press for a new bale, as when the beam or capstan is revolved back it requires a horse to travel about nine hundred yards for that purpose after each bale has been pressed.

Many devices have been tried to save the time and labor thus employed; but most of them are too expensive or complicated to be used by unskilled laborers.

My invention relates, first, to a double-clutch mechanism and brake in connection with the elevating-screw and the platen of the press, whereby the platen and screw can be disconnected, and the latter quickly revolved down by its gravity without danger of breaking or straining any of the parts.

It relates, also, to the manner in which the operating-nut is provided with a bevel-clutch, and is supported by conical anti-friction gears and serrated bearing-plate, to retain the gears in proper relation with the operating-nut.

It relates, also, to an oil well or receptacle in connection with the operating beam and screw, to keep the latter well lubricated and submerged in oil at each descent of the screw, and prevent all grit and dust from adhering to the same.

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

The frame of the press can be constructed in any convenient manner. In the present instance the lower beam A is suspended from the floor above, B, by means of the uprights C, the beam A and uprights C being securely connected by bolts *a*. These uprights are recessed near the top, at *c*, to receive and retain the upper transverse beam D. The box E, in which the cotton is packed, is connected to the uprights C, and is suspended with them, by beams F, within an opening in the floor B. This box E is provided with the ordinary slatted top D′ and hinged doors G, the latter being retained in position by hooked bolts *g*. The slatted platen or follower H is sustained and elevated by the screw *b*. For this purpose the platen is provided with a pendent socket-plate and boss, *h*, having projections upon its lower end, to engage with corresponding depressions in the top of a double clutch, *d*, attached to the screw *b*, near its top, so as to remain in clutch and keep the screw from rotating while elevating the platen by means of the revolving nut *e*. This nut *e* is provided with a long extension, e^1, passing through the beam A, and a base-plate, e^2, to which the long sweep or actuating-beam I is attached. The nut *e* is supported by a plate, *f*, fastened to the top of the beam A by means of a series of intermediate serrated trunco-conical pinions, *i*, located in a circular recess, formed between the nut *e* and base-plate *f*. The under side of the nut and upper side of the base-plate have corrugations corresponding with those of the pinions, to retain the latter at equal distances apart without danger of crowding one against the other, as smooth cones or balls are liable to do, the latter soon becoming flattened by the pressure and sliding motion to which they are subjected, while corrugated pinions will always rotate, and for

that reason retain their anti-frictional properties much longer than smooth cones or balls. The top of the screw *b* has a groove, b^1, cut out of its periphery, to receive loosely the end of a retaining-screw, *k*, Fig. 2, or a key or bolt, *k'*, Fig. 5, to connect the operating-screw *b* with the socket-plate *h;* but the groove *b'* is of such length as to allow the screw *b* to be unclutched from the socket-plate *h* by the brake-lever *l* and plunger-brake *m* when it is desired to lower down the follower, ready for the reception of the cotton to form a new bale.

When the operating-screw is lowered until the double clutch *d* engages with the clutch-boss of the nut *e* it is entirely out of sight, and inclosed in the hollow extension e^1 of the nut *e*, and in a pipe, *p*, closed at its lower end, and attached to the under side of the sweep I.

In using the press, the screw is run upward, and this pipe is filled with oil, so that in descending the screw will displace the oil and force it up the whole length of the screw, thus keeping the latter perfectly lubricated and free from grit.

In a full-size press I generally make the operating-screw four inches in diameter and three inches pitch, to form a suitable incline to elevate the follower, and allow the screw, when released from the upper clutch socket-plate *h*, to rotate by its own gravity.

The operation of baling cotton with this press is as follows: Supposing that the follower H and screw *b* have been run down until the double clutch *d* engages with the corresponding clutch of the boss on nut *e*, and the boss *h* of the socket-plate is also in clutch with the double clutch *d*, the box E is packed with cotton until it is filled, and the slatted top and transverse beam D are placed over it. The long sweep or beam I is then revolved, carrying with it the operating-nut *e*, that lifts the screw and follower against the cotton in the box until it is sufficiently compressed to form a bale; the doors are then opened, and the bands passed around the bale and tied, the nut *e* is turned back a couple of turns, so as to descend the follower about six inches and relieve it of the pressure of the expanding cotton, and the cotton-bale removed from the press. The outer end of the brake-lever *l* is then elevated by means of the rope *l'* and the plunger-brake *m* depressed upon the head b^2 of the screw, releasing the latter or its clutch *d* from the clutch on the lower end of the socket-plate boss *h*, until the head b^2 rests upon the bolts *k'*, where it is pressed against them by the plunger-brake *m*, as seen in Fig. 5. The screw *b*, being thus out of clutch with the follower, is free to revolve and descend by its gravity, and its speed is regulated by the pressure applied through the brake-lever.

If the revolutions were too rapid, and the lower face of *d* and the top of the boss of the nut *e* were plain surfaces, the strain caused by the wedge power of the thread of the screw upon the nut would be so great as to destroy the latter in a short time; but by means of the lower inclined clutch of *d* engaging with a corresponding one upon the end of the boss of the nut *e*, the latter is revolved and relieved of all strain.

To accomplish a similar result, I also use the modification shown in Fig. 5, in which the boss of the nut *e* is recessed, to receive an india-rubber spring or washer, *r*. The lower part of the clutch *d* is then turned off, so as to readily enter into the recess of the nut *e*, so that when the screw is run down it will compress the spring *r* against the thread of the screw, and receive the shock that would otherwise have been transmitted to the nut *e*.

Having thus fully described my invention, what I claim is—

1. In combination with the socket-plate *h* of the platen H and the boss of the operating-nut *e*, the double clutch *d*, attached to the elevating-screw *b*, to connect the latter alternately to the platen and to the nut *e*, substantially as and for the purpose described.

2. In combination with the head b^2 of the elevating-screw *b* and the double clutch *d*, the brake-lever *l* and plunger *m*, resting upon the head of the screw *b*, to disconnect the clutch from the socket-plate, and regulate the speed of the screw *b* while descending, substantially as described.

3. In combination with the operating-nut *e*, having its under face recessed and corrugated, and its upper boss formed with inclined planes and projections, to engage with the double clutch *d*, the recessed corrugated base-plate *f* and pinions *i*, to reduce the friction between the parts, substantially as described.

4. In combination with the screw *b* of a press, operated in the manner shown and described, and the nut *e*, having a long extension, e^1, attached to the revolving beam I, the oil-pipe *p*, attached to said beam I, and forming, with the extension e^1, an oil-well for the perfect lubrication of the screw, substantially as described.

5. In combination with the platen H and head b^2 of the elevating-screw *b*, the socket clutch-plate *h*, provided with a retaining screw or key, *k*, brake-lever *l* and plunger *m*, substantially as and for the purpose described.

6. In combination with clutch socket-plate *h*, provided with retaining screw or key *k*, brake-lever *l*, and plunger *m*, the elevating-screw *b*, recessed at b^1 above the double clutch *d*, and the head b^2 for the brake to act upon, substantially as and for the purpose set forth.

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Witnesses:
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