

*Cotton Press.*

*Patented Dec. 29, 1857.*





# UNITED STATES PATENT OFFICE.

RILEY SMITH, OF TOWANDA, PENNSYLVANIA.

## IMPROVEMENT IN COTTON-PRESSES.

Specification forming part of Letters Patent No. 18,995, dated December 29, 1857.

*To all whom it may concern:*

Be it known that I, RILEY SMITH, of Towanda, in the county of Bradford and State of Pennsylvania, have invented certain new and useful Improvements in Cotton-Presses; and I do hereby declare the following to be a full, clear, 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; Fig. 2, a vertical transverse section through the same; and Figs. 3 and 4 represent detached portions of the press not clearly seen in the other figures, and which will be specially referred to in the subjoined description.

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

In the patent granted to me on the 29th day of May, 1847, I used double weights to counterpoise or balance the levers and boxes, to regulate their motion, and to prevent their descent with undue force.

The nature of my present invention consists, first, in so combining rising and falling weights with the pressing-box and levers as that the lowering of the said box shall accumulate a reserve of power in said weights, which, when applied, shall start up the box, and draw down the points of the levers so that said levers shall be in better position for applying the first moving power of the press to them; and, secondly, it consists in slacking up one set of ropes or chains before the strain comes upon the other set, to prevent one set from pulling or straining against the other set, which is not only a loss of power, but endangers the breaking of them or of the press; and, thirdly, in making the device which holds closed the doors of the pressing-box, a windlass also for tightening up the bale-ropes while the cotton is being baled in said box.

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 press is intended to be suspended from the second floor of the ginning-room, and for this purpose a substantial top cross-beam, A, projects far enough to be framed into said floor or its supports, and to this beam the

press is suspended, which leaves it all clear underneath for the sweep of the lever B, by which the press is ordinarily worked. The press may, however, be supported by its own frame-work, and the power applied to it otherwise than by a long lever if the user should prefer it so. The follower C is connected to this cross-beam A by its arms D, which are hinged at the point a, so that the follower may be swung out of the way when the pressing-box is to be filled with cotton, and as readily swung back again when it is to be compressed into a bale.

E E are the vertical side pieces of the press. They are framed onto and suspended to the top cross-beam, A, and form the ways or guides for the cotton-box F as it is raised or lowered, said box being suitably secured in and to its surrounding frame G for this purpose. There are mortises cut through the side pieces, E E, in which are hung pulleys, as seen by the dotted lines to the left of Fig. 1, and over these pulleys pass cords or ropes, the ends of which are respectively connected to the frame G and to the weights H, said weights being arranged so as to slide just outside of each of the side pieces, E.

Over or on top of the weights H are another set of weights, I, (one only being seen in the drawings,) which are not connected to the cotton-box or its frame in any manner, but still act thereon at the first of their movement, and then their weight is entirely removed therefrom, so as not to act as a drag upon the press after all their usefulness is exhausted, which is accomplished as follows: The weights slide in a casement, and those H H are raised up by the dropping of the cotton-box through the cords or ropes which are connected to them, and pass over the pulleys heretofore referred to. There is a stud or pin, b, in each of the weights I, which projects through a slot, c, in the casement, and as the weights H are raised up they come in contact with those I, and carry them up also, so that when the cotton-box is at its lowest elevation the weights H I shall be at their highest elevation, and held there by the ropes or chains, which draw down the cotton-box, the lever B being braced or caught by a stop or catch to prevent it from moving. When the cotton-box is filled, the rope is slacked, and the whole weight of the double sets of weights comes upon the cotton-



box, starting it up and drawing in the points of the levers J J, which previous to this operation were in nearly a horizontal position, or so much so as that but little effective power could be applied to them. The box being thus started up and the points of the levers drawn down or in, the lever B may be advantageously worked, and the weights continue to add their power to the press until the pressure of the cotton added to the weight of the box exceeds that of the falling weights. Then, of course, the weights are of no further use, and should be dispensed with as far as possible. To effect this, and at about the time that the force of the weights is exhausted, the studs *b* arrive at the bottoms of the slots *cc*, and there hold the upper pair, I, while the lower pair, H, continue to descend until they come to their seats *d*, when their weight is also removed from the cotton-box. The weights I H, besides their aid in starting up the cotton-box and bringing the levers J J into available position, also hold up the box, and prevent it from falling or dropping down, which it is liable to do, with danger of accident to the attendants or to breakage.

To the bottoms of the side pieces, E E, is framed the bottom cross-beam, K, and through this passes a vertical winding-shaft or windlass, L, having its step or lower end supported in the sill M, and the sweep or lever B is permanently fixed on this windlass L, so as to turn with it. The top of the shaft or windlass L is supported by the transverse piece N, in which it turns.

J J are a pair of levers pivoted at *e* to the under side of the cotton-box F, and P P and Q Q are pairs of toggle-levers resting in blocks R, attached to the levers J, and in suitable supports, *f g*, one set, *f*, on the cross-beam K, and the other set, *g*, underneath the cotton-box F. These toggle-levers work in conjunction with the levers J J, as follows: A strong rope or chain, *h*, is passed through a hole in the upper part of the windlass L, and its ends are fastened one to each of the levers J J, and when this windlass is turned to wind up said rope upon it it draws in the lower ends of said levers. Now, as the toggle-levers P Q have their support in said levers J, and said toggles have their greatest power just before they reach the point where a right line would pass through their points of attachment, they are exerting their greatest force when the levers J are also exerting their greatest power, and thus the two sets of levers work advantageously together, those J doing the first of the pressing, while the toggle-levers come in at the close of it with their greatest possible power. As the rope *h* is wound around its windlass, the cotton-box, with its contents, is forced up against the follower until the cotton is pressed down into the bottom of said box, where it is baled up, as will be presently described.

There is a second drum or pulley, *i*, on the windlass L, around which the ropes *k k*, which

draw down the cotton-box F, are wound and unwound, said ropes having their lower ends attached to the pulley or drum *i* and their upper ends to the cotton-box F. It will be perceived that the diameter of the pulley or drum *i* is very much greater than that part of the windlass L where the rope *h* is wound. This is, first, that the box may be quickly drawn down, there not being much power required for that, while speed is desirable; but in raising up the box speed is sacrificed to power, and the drum for the rope *h* made small. Secondly, the speed or extent of motion of the levers J varies, while the lever B moves with a uniform motion or speed, because, as they become straighter or move under the box the slower they move it, and thus the two ropes *h k* do not wind and unwind alike, and unless some provision were made for this irregularity they would at times one draw against the other. To avoid this I have arranged that the slack of one shall always lead or be in advance of the winding up of the other, as follows: The pulley or drum *i*, as also the washer *m*, immediately underneath it, are loose on the shaft or windlass L, and there is a stud, *n*, on the sweep or lever B, which catches against a projection, *o*, on the washer *m*, and as the sweep goes around carries the washer around with it, and as the washer comes around it brings its projection *o* against a stud, *r*, on the drum *i*, and then the drum moves with the washer and lever; but before it moves, the shaft L has made almost two entire turns, and thus unwinding nearly two coils of its rope before the pulley *i* commences to wind up its rope, and when the lever B is reversed a similar unwinding of the rope *k* takes place before the other one, *h*, begins to wind on its shaft, and thus the unwinding being always in advance of the winding the strain of one rope can never come on the other one. In Fig. 4 I have shown how the ends of the ropes *k* are attached to the drum *i*—viz., by passing into and around a groove in the lower end of said pulley, as shown by the dotted lines, and thence out diametrically opposite its point of entrance, where a key or wedge, *s*, is driven in to hold the ends of said ropes. The direct line of draft being thus broken by the ropes passing around the drum or pulley, they are not so liable to break their fastenings. Besides, this makes an easy adjustment of the ropes, should they require taking up or letting out, or should one be a little longer than the other.

S S represent the doors of the cotton-box. They are hinged to the bottom of said box by the rods *t t*, and so made as that when dropped down, as shown on the right of Fig. 2, the whole of the pressed bale may be readily got at to bag and rope it. The bagging is previously laid into the box, and the rope passed around through the usual grooves made in the bottom of the box and under side of the follower.

A roller, T, is hung by its journals to arms



*u u*, (which may be part of the frame *G*,) and a lever, *U*, is pivoted to said roller, by which it may be worked, the end of said levers, when the doors are closed, passing behind a catch, *v*, which holds it firmly. At each of the ends of the rollers (for there is one to each door) there are cams or eccentrics *w w*, which press against the frame-pieces *v v* of the doors and hold them tight at their tops. The rollers *T* also serve as windlasses for tightening up the bale-ropes, they being furnished with studs or pins 1 2 3, &c., over which the loops in the bale-ropes are passed, and then by bringing down the lever *U* said ropes are drawn up taut, and this can be done a second or third time, until they are tight enough, and then the bale is rolled out and the press prepared for another similar operation.

Springs are in many cases but the mechanical equivalents of falling weights, and they might be substituted for the weights in my press. I should, however, deem them as the same thing, though not so simple, cheap, and effective as the weights. The object can be gained by either—viz., the reservation of a power in drawing down the box that will exert itself in again starting it up.

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

1. So combining a set of falling weights or their equivalents with a movable cotton or pressing box and its levers as that when the united force of said weights is applied to said box it shall start it up and draw in its levers, and admit of a better application of the first moving power of the press, substantially as set forth.

2. The so applying of the ropes or chains that draw down and force up the pressing-box to the follower as that the slack of one shall lead or be in advance of the winding up of the other, as herein set forth, and for the purpose explained.

3. The application of the roller *T*, with its eccentrics *w* and pins 1 2 3, for the double purpose of a fastening to said door and as a means of tightening up the bale-ropes, as herein set forth.

RILEY SMITH.

Witnesses:

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