2. Sheets. Sheet. 1.

J. P. Herron,

Cotton Press.

No. 107,371. Patented Sept. 13. 1870.

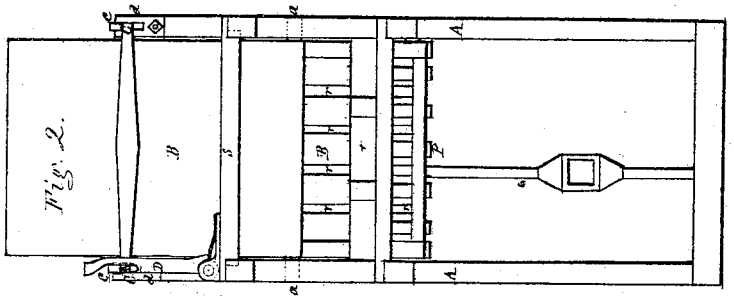

Fig. 2.

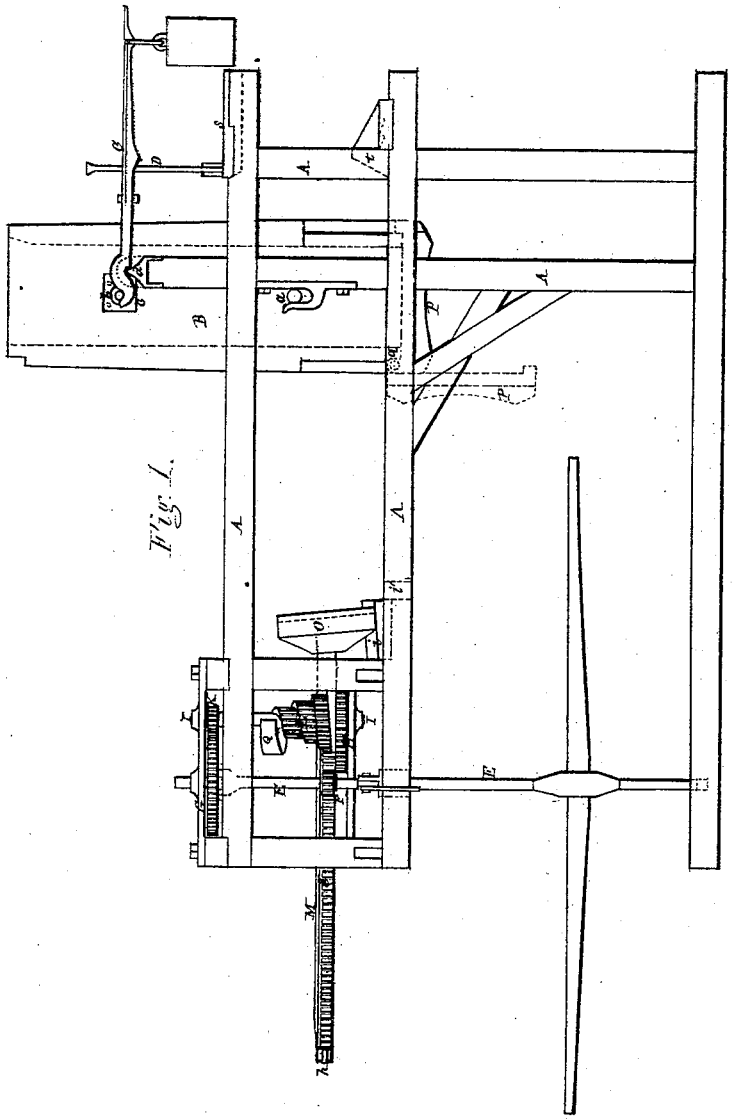

Fig. 1.

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2 Sheets. Sheet 2.

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Fig. 5.

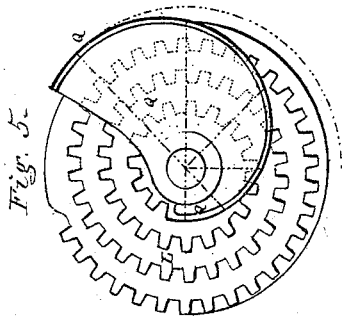

Fig. 6.

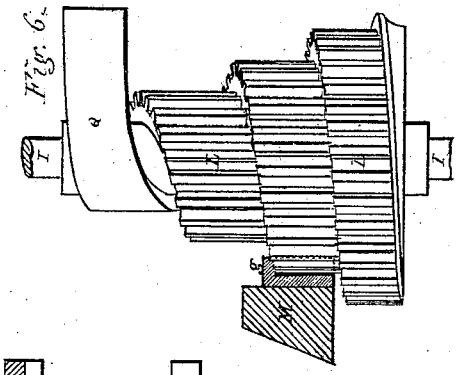

Fig. 3.

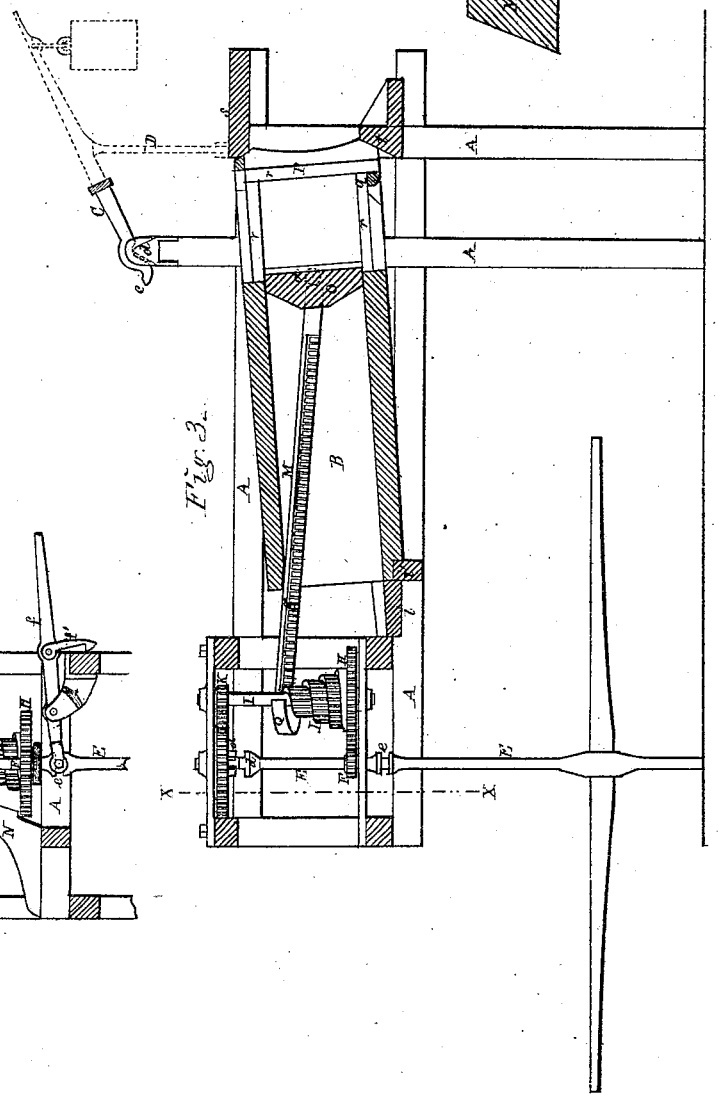

Fig. 4.

United States Patent Office.

JAMES P. HERRON, OF ATLANTA, GEORGIA.

Letters Patent No. 107,371, *dated September* 13, 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, JAMES P. HERRON, of Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Graduated Press for Cotton, Hay, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawing making part of this specification, in which—

Figure 1 is a side elevation, and

Figure 2 is an end view of my graduated press.

Figure 3 is a longitudinal section of the same.

Figure 4 is a section on the line *x x* of fig. 1, and

Figures 5 and 6 show a part in detail.

The nature of my invention consists—

First, in giving to the box or case, in which the bale is formed, a swinging or oscillating movement, on trunnions attached to its sides, by means of a change of the center of gravity of the box, effected by the process of filling and pressing, and in connecting the box or case with a scale-beam for the purpose of insuring uniformity in the weight of the bales.

Second, in giving to the follower a gradually-increasing degree of pressing force, without decreasing the rate of speed of the driving-wheel or pinion, and in saving time by retracting the follower at a rate of speed many times greater than that at which it was driven in to perform its office.

In the drawing—

A A is the frame supporting the working parts of my graduated press.

B is the box or case, which receives the matter to be pressed.

This box is hung upon trunnions *a a*, figs. 1 and 2, so that it may oscillate between the positions shown in figs. 1 and 3.

A latch-pin, *b*, also projects from each side of the box, near its receiving end, which will pass over and rest on hooks *c*, at the short end of the lever or scale-beam C, having its fulcrum on the knife-edges *d*, figs. 1, 2, and 3.

When the box B assumes the vertical position at first, the pins *b* will rest on the hooks *c c* while they are in the position shown in fig. 3, and the scale-beam C is up, as shown by dotted lines in this figure, being supported by the bar D, figs. 1, 2, 3. The trunnions *a a* are supporting the weight of the box B in their bearings.

The scale-beam C is loaded with a weight sufficient to balance the box, and the material required for a bale, and between this weight and the fulcrum of the lever is another and smaller weight, to compensate for the weight of the hand who packs the box.

When the bar D is removed from under the scale-beam, the weight on the beam lifts the box, so that its trunnions are clear from their bearings, as seen in fig. 1, and the box is suspended from the hooks *c*, the lever C being down on a shoulder of the bar D, as shown in figs. 1 and 2.

The bottom of the box B is provided with a door, P, hinged at *q*, which, with a portion of the two longer sides of the box, is constructed with openings *r r*, for the purpose of passing the bands around the bale while it is in the box, and before the pressure is removed. The door P, which is shown in its open position by dotted lines in fig. 1, may be held shut by a common latch, which will be readily disengaged when it is required to have the door open.

When the box B turns down, as in fig. 3, the bottom turns up, so that the door P comes up, with its edges against the bracing-beams *s t*, firmly attached to and crossing the frame A, so as to enable the door to resist the thrust of the follower. The upper brace *s* serves as a platform to stand on while the press is working.

The bar D may be so arranged as to be thrust out from under the scale-beam C, by the box B itself, as it rises to a vertical position, and to give way to the beam, and pass under it, when the weight of the box and its charge causes the scale-beam to rise, as seen in dotted lines in fig. 3, in a manner to be hereafter explained.

A vertical shaft, E, to be turned by horse or other power, carries a pinion, F, and one-half of a clutch or gland, *d*.

It passes loosely, so as to slide freely up and down, through the eye of the spur-wheel G, on the under side of which is the other half of the clutch *d*.

A collet, *e*, is also made upon the shaft E, by which it may be lifted to couple the clutch through the lever and yoke *f*, in a manner well known to machinists and mill-wrights.

The weight of the shaft E is sufficient to uncouple the clutch *d*, when the latch *f'* is unhooked from the bottom of the beam A, as shown in fig. 4.

The pinion F is so set on the shaft E as to engage with the spur-wheel H when the shaft E is down, and to be above and clear of this wheel when the shaft is up and the clutch is coupled.

The spur-gear H is fast on the shaft I, which also carries at its top the pinion K, which is constantly engaged with the spur-wheel G.

It will be evident that the relative degrees of speed at which the pinions F K and the wheels G H revolve, (that of the shaft E being constant,) will be greatly changed by coupling or uncoupling the clutch *d*. The two positions of the gears are shown in figs. 1 and 3.

On the shaft I is secured fast a volute or fusee, L, having teeth or gear-cogs formed on its winding face, as shown distinctly in figs. 5, 6, which are views at right angles with each other of the same device. The

teeth gradually increase in size and strength from the curve of greatest radius to the curve of least radius, at the top of the fusee, and the width of the spiral face, or the length of the faces of the teeth, also increases proportionately.

M is an arm, to one end of which is attached the follower O, in such a manner that the arm may be allowed a slight degree of vibration from the socket in which it is received by the follower. This arm has a rack on that side which is next to the cogged fusee L, the teeth of which gradually increase in size and strength, from the end next the follower toward the other extremity, to correspond with the teeth of the fusee L, with which they also agree in number. This graduation of the teeth is for the purpose of compensating for the increase of resistance to the follower, as the follower progresses in its work of reducing the bulk of the matter in the box B.

The opposite side of the arm from the rack is inclined, to correspond with a line passing from the lowest to the highest upper corner of the teeth of the fusee L, as seen in fig. 6; and the teeth of the rack are kept engaged with those of the fusee, as it rises, by an inclined beam or knee, N, shown in fig. 4, as attached to the frame-work of the press.

The teeth of the rack on the arm M are covered, on their upper ends, by a flange, *g*, extending the whole length of the rack, and which is intended to be the support by which the arm shall hang on the winding ends of the teeth of the fusee L, as it turns and drives the rack, (see fig. 6.)

The end of the arm M furthest from the follower O is provided with a friction-roller, *h*, for a purpose to be hereinafter set forth.

Q is a cam, attached to the fusee at its upper or smallest part, or it may be made in one piece with the fusee. This cam is so formed that, when its curve of least radius begins to act, it does so with considerable speed, which action gradually diminishes in its rapidity as the curve of the cam acquires a longer radius, and approaches a coincident relation to a circle having its center in the axis of the cam, which is in fact a curved wedge, the inclination of whose face is constantly diminishing until it is nothing, and the face is horizontal.

The friction-roller *h* in the end of the arm M is for the purpose of lessening the friction when the cam Q is brought into action against the follower O.

When this is retracted, and is in the position shown in fig. 1, it rests on a platform, *i*, extending across the frame A A, and the rack on the arm M is horizontal, or nearly so, and is engaged with the teeth of the lowest part of the fusee L.

As the follower is driven into the box, the arm M and its rack rise with the turns of the fusee until the follower is home. In its reach it has been made to rise a distance equal to half the perpendicular rise of the arm M at its line of contact with the fusee, and this is done by hanging the box B by its trunnions, so that it will have a corresponding slope when it is swung down, as in fig. 3, after being loaded and weighed. In this way the vibration of the arm M, in its socket in the follower O, is divided and lessened.

The cross-tie *i'* supports the end of the box B when down, as in fig. 3.

The operation of my graduated press is as follows, viz.:

The box B is brought to the position of fig. 1, its door closed and latched, and the support D moved from under the scale-beam C, which, with its weight for cotton and man, falls, lifting the box so that it hangs on the hooks *c c*, by the pins *b*. It is now filled with the material to be pressed until there is weight enough to pull up the scale-beam, so that it shall pass up beyond the end of the support D, which first yields to it, and then swings in under it to sustain it. The box is now resting on its trunnions, and is top-heavy, without the weight of the hand, who gets down as soon as the scale-beam is propped by the support D. The box turns by the preponderence of weight above its trunnions *a*, and falls into the position shown in fig. 3, while the follower is as seen in fig. 1. Power is now applied to the shaft E, which is down in its step, and uncoupled at the clutch *d*, with the wheel G. The pinion F turns the wheel and shaft H I, and, with them, the fusee L, driving the arm M and follower O at a rate of speed which decreases as the fusee turns and the radii become less, consequently increasing the power as the resistance becomes greater, until the bale is reduced to the size required for this operation. If it be desired to compress the bale after the follower O has gone as far as the rack on the arm M will permit, the cam Q is brought with its curve of shortest radius against the friction-roller *h* at the end of the arm, and is then revolved until (its action becoming less and less rapid till it ceases) the bale is reduced to the required size. The bale is now bound, and otherwise secured, and the door P is unlatched. The lever *f* is depressed and latched, throwing the pinion F out of gear, and the shaft E into gear with the wheel G, and the shaft E being revolved causes the wheel G to turn the pinion K, giving a rapid retrograde movement to the fusee L, which as rapidly draws the follower O out of the box B. The box is now heaviest at the bottom, where the bale is. It therefore turns on its trunnions as soon as it is free from the follower, and rises to a vertical position; the pins *b* pass over the hooks *c c;* the prop D is thrust out from under the scale-beam; the bale drops from the bottom of the box, and the scale-beam, with its weights, falls, lifting the box on the hooks *c c*, to receive a new charge after the door P is shut and latched.

It will be seen that, after the first bale is pressed, the action of the box in discharging the bale, and preparing itself for the follower, is entirely automatic, so long as the operation of bale-making is continued.

Having thus fully described my invention,

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

1. The arrangement, herein shown, of the oscillating box B, provided with trunnions *a a* and latch-pins *b*, in the manner and for the purpose set forth.

2. The oscillating box B, constructed and arranged as herein set forth, in combination with a scale-beam, C, and weights, substantially as described.

3. The graduated cogged fusee L and rack M, having teeth, which gradually increase in size and width from line of contact at the end of greatest radius of fusee to same line at the end of the least radius, as herein described, and for the purpose set forth.

4. The cogged fusee L and cam Q, in combination with the rack M, operating substantially as set forth.

5. The cogged fusee and rack, constructed as described, in combination with the pinions F K, wheels G H, shaft E, shipper *f f'*, and clutch *d*, or its equivalent, arranged and operating substantially as and for the purpose set forth.

6. The door P, in combination with the beams *s t* and pivoted box B, arranged and operating substantially as and for the purpose set forth.

JAMES P. HERRON.

Witnesses:

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J. H. HERRON.