P. G. Gardiner.

Cotton Press.

No. 29,874. Patented Sept. 4, 1860.

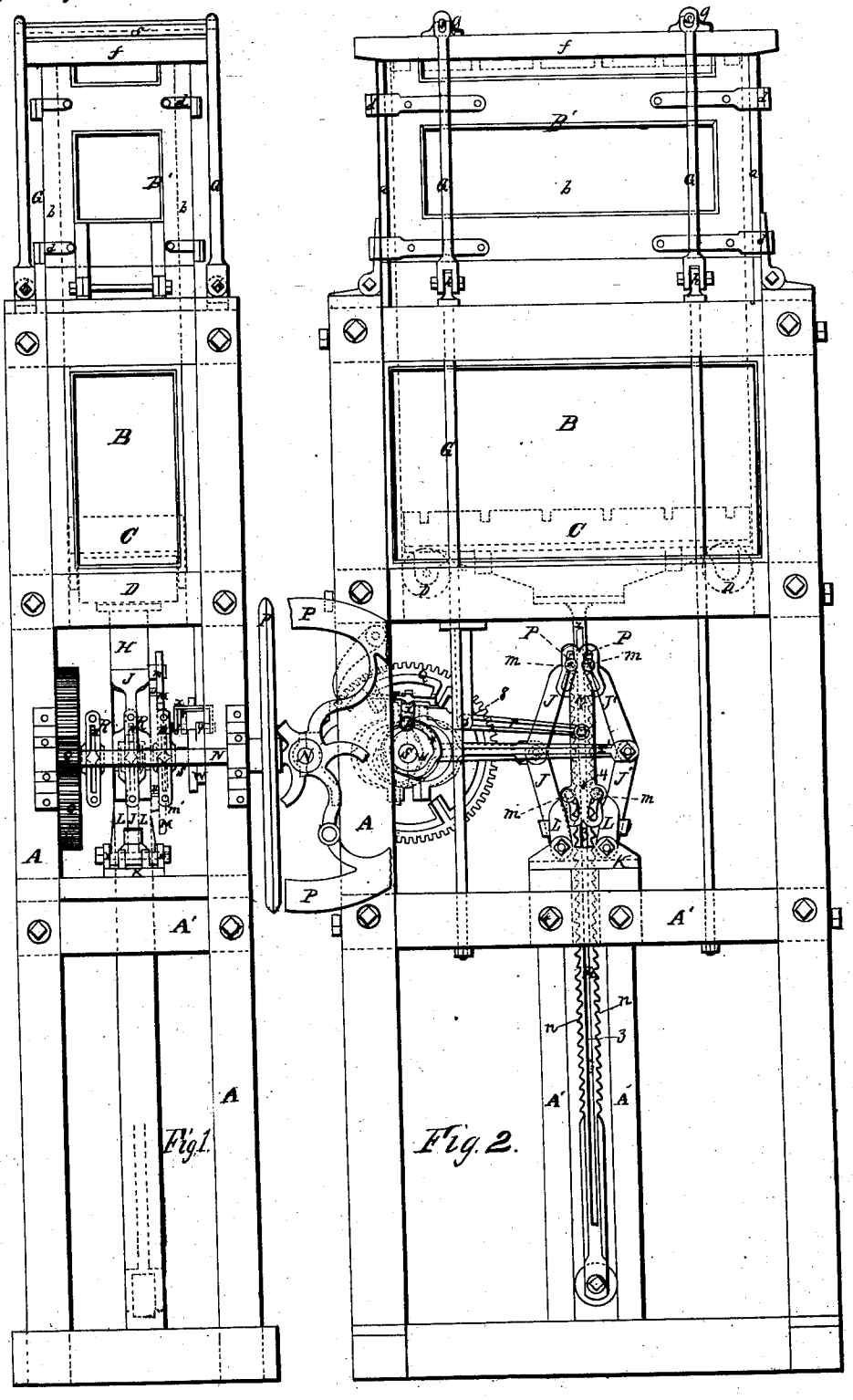

Fig. 1.

Fig. 2.

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PERRY G. GARDINER, OF NEW YORK, N. Y.

IMPROVEMENT IN COTTON-PRESSES.

Specification forming part of Letters Patent No. **29,874**, dated September 4, 1860.

To all whom it may concern:

Be it known that I, PERRY G. GARDINER, of New York, in the county and State of New York, have invented a new and Improved Cotton-Press; and I hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure I represents a side elevation, and Fig. II a front view, of my improved cotton-press.

Similar letters represent similar parts.

The nature of my invention consists in the arrangement and construction of a cotton-press in which the lower platen is moved upward at stated and equal intervals, and only a short distance each time, thereby allowing sufficient time for the air to escape out of the cotton, and in the same manner reducing the pressure on the bale, whereby the bursting of the cords, bands, or hoops, resulting in most cases from the sudden release of the pressure, is prevented; further, in arranging and combining with pawls and toggle-joints a guiding-plate acting on the double toggle-joints in such a manner as to direct the ends of the same to act always in a direct line with the line of motion of the platen, said guiding-plate being operated by a double eccentric cam-wheel in such a manner as to change thereby the motion of the press from upward to downward, or vice versa, without changing the direction of the motion of the driving-shaft; and, further, in the construction and arrangement of the cotton-box in such a manner that the same shall form part of the framing, and allowing at the same time either sides or ends of said box to be easily removed, to have the bale perfectly clear on all sides to be sewed up and tied while under pressure.

In the accompanying drawings, A represents the frame of the press, in the upper part of which a box, B, is built, closed on four sides, and in which the piston or lower platen, C, works, being guided by friction-rollers D D, attached to the under side of said platen. Above the frame A a box, B′, is arranged, forming a continuation of the box B. The two ends *a a* of this box B′ are hinged on the top of the frame, while the sides *b b* are fitted between both ends *a a* and fastened to the same by means of hooks *d d*, or any other suitable contrivance. The top *f* of this box, and which forms the top platen of the press, is fitted loosely between the sides and ends, and is provided with strong cross-bars *g g*, on the ends of which the top ends of the bolts G G are hooked. These bolts G are made with a joint, *h*, above the top of the frame, to allow the upper part of said bolts to turn downward when the pressed cotton-bale requires to be removed. The lower ends of these bolts are fastened to the tie-beams A′, which carry the machinery, securing thereby, by means of these bolts G, the two extreme ends, between which the strain is exerted, firmly together. To the movable bottom platen, C, the rod H is firmly attached, the lower end of which is provided with a friction-roller, *k*, working between two upright posts, A″, to guide said rod. This rod H is provided on two opposite sides with teeth or notches *n n*.

J J′ are toggle-joints turning on fixed centers 2 2 in the frame-plate K, and situated on opposite sides of the rod H. The upper ends of these toggle-joints work against the teeth or notches *n n* fast on the rod H.

L L are pawls turning on the fixed centers 2 2, and work likewise against the teeth or notches *n n* on the rod H alternately with the ends of the toggle-joints. On the upper ends of the toggle-joints J J′ and on the top ends of the pawls L L pins or projections *m m* and *m′ m′* are provided, working in slots *p p* and *p′ p′* of a guide-plate, M, by which means the top ends of the toggle-joints, as well as the top ends of the pawls, are guided in the desired direction, and are thrown alternately in and out of gearing with the teeth *n n* on the rod H, as will be hereinafter described. On the side of the rod H a groove, 3, is made, in which pins 4 4, fast on the guide-plate M, work, for the purpose of guiding said plate M in its up-and-down motion.

N is a shaft running in bearings fastened to the frame A, on which a pinion, O, is fixed, as well as a fly-wheel, P, to which the power is applied; or a pulley may be placed on said shaft, if desired, to operate the press by steam or horse power. The pinion O gears into a wheel, Q, fast on a shaft, S, running in suitable bearings attached to the frame. On this shaft S eccentrics R R′ R′ are fastened to work

the toggle-joints. The eccentric R is connected through the rod T with the toggle-joint J in the middle of the joint, and the eccentrics R′ R′ are connected through the rods T′ T′ with the toggle-joint J′ on the outside of the joint. By this arrangement the toggle-joints work in a reversed way to each other, while their line of motion on the teeth on both sides of the rod H is in one and the same direction. Instead of eccentrics placed on this shaft, as above described, cranks may be provided in said shaft to give the required motion, and connected through rods with the toggle-joints.

W is a cam-wheel fast on the shaft S, and provided with eccentric grooves Y, or cams on each side similar to each other in shape, but reversed in position. A lever, V, is connected with one of the grooves Y, the other end of which is connected with the guide-plate M, and through which said lever V the desired motion is communicated to the guide-plate M. This lever V turns on a center, 8, fast to the frame-work, and is forked at the end next to the cam-wheel W. Over this forked end another forked piece, X, is placed, operated by a lever, Z. Into the ends of the forked piece X pins 7 7 are firmly fastened, passing through the ends of the fork of the lever V. These pins 7 7 fit into the eccentric grooves Y, and are of such a length that while one pin is working in one of the grooves Y the other is altogether clear of the other groove. As before described, these pins are firmly fastened to the fork-piece X, which latter is operated by the lever Z. Consequently by the motion of said lever Z either the one or the other pin is thrown into one of the eccentric grooves Y, and which, being placed exactly reversed on the wheel W, will therefore operate the guide-plate M in such a manner that the action of the toggle-joints will work the press either upward or downward, as will be hereinafter described.

The operation of the press is as follows: The box B and B′ being filled up with the required quantity of cotton, the the platen, *f*, is put on and the bolts G locked on the ends of the cross-bars *g*, whereby this top platen, *f*, is firmly secured to the tie-beam A′, when the press is set in motion. Motion being communicated to the shaft S, the toggle-joints will be moved through their respective rods. The pins *m m* on the top ends of the toggle-joints are now (as shown in Fig. II in the accompanying drawings) in the straight part of the slots *p p* of the guide-plate *m* and as this guide-plate does not move during this part of the revolution, the ends of the toggle-joints, which by a former part of the revolution have been moved so as to gear into the teeth *n* on the rod H, are guide by means of said slots in such a manner that they will move in a direct line with the motion of the rod H. The same former part of the revolution of the shaft S, during which the ends of the toggle-joints have been moved into the teeth *n*, the ends of the pawls L have been moved away and clear of the teeth *n* by means of their pins or projections *m′* working in the slots *p′* of the guide-plate M. A further motion being communicated to the toggle-joints forces their upper ends against teeth *n* on the rod H, and consequently forces said rod, together with the platen C, upward a distance equal to the length of one tooth from the other, or as much as is due to the motion of the toggle-joints, thereby compressing the cotton in the box between the movable platen C and the top platen, *f*, in the same proportion. The eccentric groove Y on the cam-wheel W acts now on the lever V, so as to move the guide-plate M in such a manner that through the slots *p′*, acting on the pins *m′* on the top ends of the pawls L, said pawls are moved into the teeth *n* on the rod H, so as to support thereby the same and keep it in the position the toggle-joints have moved it. The slots *p* act then upon the pins *m* on the top ends of the toggle-joints J J′, so as to throw said top ends out of the teeth or notches *n* and keep the same clear of the teeth *n* during the downward motion of said top ends, resulting from the motion of the toggle-joints, until said top ends have passed below the next lower set of teeth or notches, when a further motion of the cam-wheel W will act upon the guide-plate M, so as to bring the top ends of the toggle-joints again into gear with the teeth, and then act likewise upon the top of the pawls, so as to bring the same clear of the teeth or notches, and the same operation will be repeated. Thus alternately moving the rod H, and consequently the platen C, some distance, equal to the distance of one tooth or notch from the other, or equal to the amount of motion due to the action of the toggle-joints, and then supporting the rod and platen in that position by the action of pawls until the toggle-joints have moved so as to be in a position to act upon the next or lower set of teeth or notches provided on the rod H.

The object of the above-described arrangement of toggle-joints acting against teeth or notches is not only to obtain a powerful multiplification of levers—such as resulting from the action of toggle-joints—but to obtain throughout the whole length of motion of the press a continual and equal pressure, at the same time confining the mechanism in as small a space as possible.

I am fully aware that toggle-joints have heretofore been applied and used for the purpose of compressing cotton, hay, and similar substances; but in every case the toggle-joints have then been made of such a length as to compress the substance in one continued motion, requiring therefore not only a very great space for the levers and general mechanism, as well as great power to operate the same, but exerting a continually-increasing pressure on the cotton, not only unnecessary but of an undue proportion, and requiring consequently an undue expenditure of power. In my arrangement, as has been above described, the

platen is moved, and consequently the cotton or other substance is compressed, at stated intervals and only a short distance each time, giving nearly a uniform pressure throughout the whole motion, and allowing during the intervals the press is at rest sufficient time for the air contained between the cotton to escape out of the same. When it is required to lower the press or to take the pressure off from the cotton, the lever Z is moved so as to act upon the fork-piece X, to pull the pin 7 out of the eccentric groove Y, and to bring the opposite pin 7 into the other groove Y, fastened on the wheel W in a reversed position from the other groove, as has been above described, thereby reversing or changing the motion of the guide-plate M, and by which operation, although the motion of the driving-shaft, and consequently the motion of the toggle-joints, is not changed, the top ends of the toggle-joints J J′ will be acted upon by means of the slots *p* in said guide-plate M, guiding the pins *m* on the top of the toggle-joints in such a manner that said top ends will be kept in the teeth or notches *n* of the rod H and pressed against the same while the top ends move downward, or while the toggle-joints open, exerting therefore a tight grip on the teeth, so as to pull or move thereby the rod H, and consequently the platen C, downward. The pawls L, the upper end of which have previously been acted upon by the slots *p′* of the guide-plate M, are then again acted upon, through said slots *p′*, so as to be brought now into the teeth *n*, and thereby support the rod H and platen C in this position, when the slots *p* will act upon the top ends of the toggle-joints so as to bring the same clear of the teeth and allow the same to pass the ends of said teeth or notches while said top ends move upward by the action of the toggle-joints. The guide-plate M acts then upon said top ends of the toggle-joints so as to bring the same again into the teeth, and acts afterward likewise on the top of the pawls so as to guide the same clear off and out of the teeth or notches, when the above-described operation will be repeated and the rod and platen be again moved downward a certain distance.

By the action of the guiding-plate M and the connection of the top ends of the toggle-joints, as well as the top ends of the pawls, with said guiding-plate, a positive motion is communicated to the ends of the toggle-joints, as well as to the ends of the pawls, for the purpose of working the press either upward or downward, and at the same time guiding the ends of the toggle-joints in such a manner as to produce the motion of the toggle-joints in a direct line with the line of motion of the press.

By the arrangement of constructing the upper box, B′, in the manner described either one or all of the sides or ends may be taken off or moved away, so as to leave the cotton free on all four sides while still under pressure, to facilitate the sewing up of the sacking, as well as the tying of the ropes or hoops around the cotton-bale.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement and combination of toggle-joints and pawls acting alternately on teeth or their equivalent, provided on a rod connected to the movable platen of a cotton-press, and operating so as to move and support alternately said rod and platen at stated intervals, whether the motion of the platen be upward or downward, in the manner and for the purpose substantially as described.

2. The guide-plate M, provided with slots or guides, and operating the ends of the toggle-joints and of the pawls, in the manner and for the purpose substantially as specified.

3. The lever V, in combination with the fork-piece X, operated by the lever Z, acting on eccentric grooves Y, attached to a wheel, W, in the manner and for the purpose specified.

4. The arrangement of the upper part, B′, of the cotton-box, with its movable sides and ends, for the purpose and in the manner substantially as described.

5. The combination of double toggle-joints working in reversed motion to each other on teeth or notches attached to a rod fast to the movable platen, in combination with a guiding-plate operated by a grooved cam-wheel, and in combination with pawls, the whole being arranged and combined to work together in the manner and for the purpose substantially as set forth and described.

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Witnesses:
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