(No Model.)

M. SWENSON.

COTTON PRESS.

No. 574,121. Patented Dec. 29, 1896.

Fig. 1.

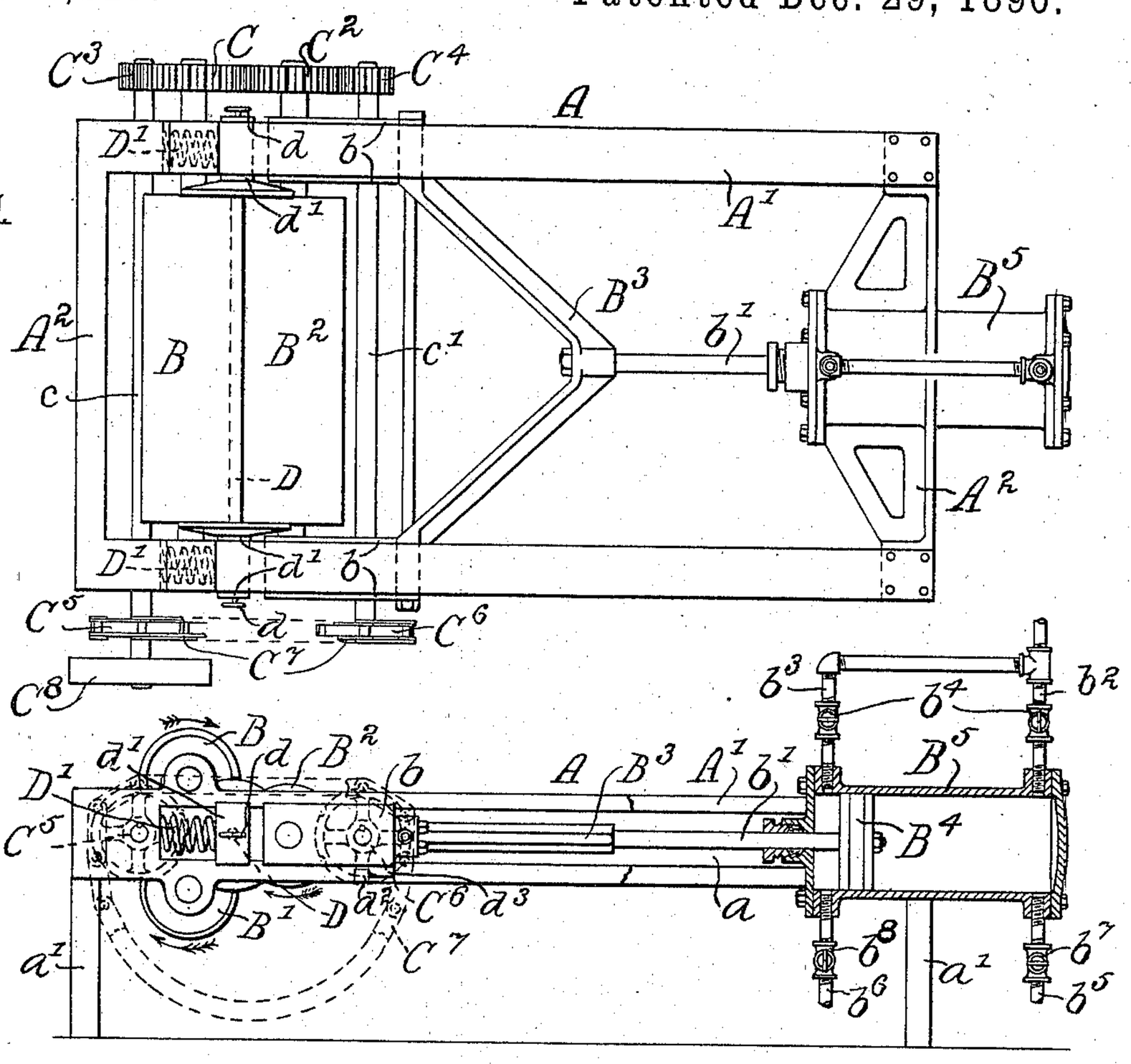


Fig. 2.

Fig. 4.

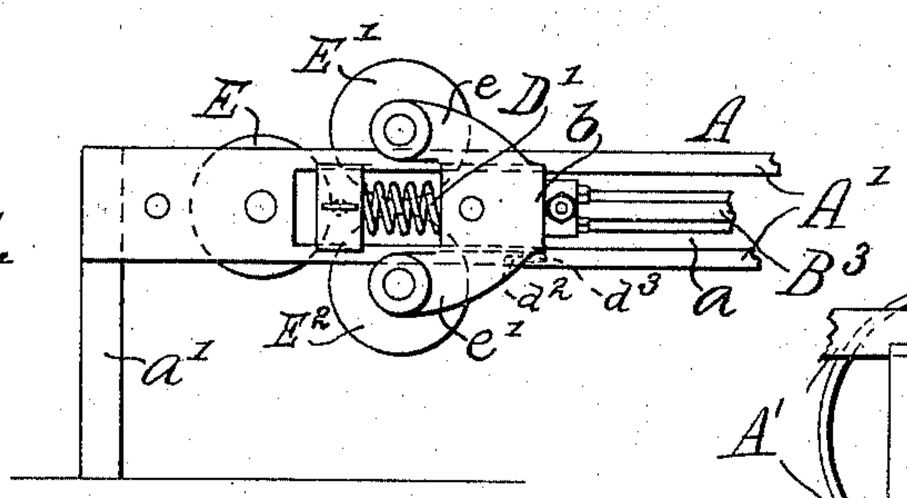
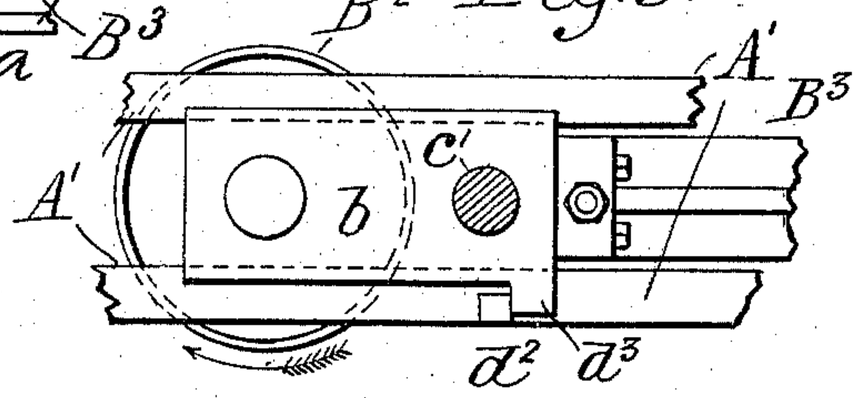


Fig. 3.



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UNITED STATES PATENT OFFICE.

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COTTON-PRESS.

SPECIFICATION forming part of Letters Patent No. 574,121, dated December 29, 1896.

Application filed August 24, 1895. Serial No. 560,384. (No model.)

To all whom it may concern:

Be it known that I, MAGNUS SWENSON, a resident of Chicago, in the county of Cook and State of Illinois, have invented an Improvement in Cotton-Presses, of which the following is a specification.

This invention relates to improvements in cotton-presses of the type in which the cotton delivered thereto in the form of a continuous bat is wound into a cylindrical bale; and the invention relates, primarily, to presses of this type comprising three compression-rolls arranged about the bale-core. As heretofore constructed presses of this particular type, which for purposes of convenient reference may be termed "three-roll" presses, have comprised two stationary compression-rolls arranged with their axes substantially in the same horizontal plane and a vertically-movable compression-roll arranged symmetrically above and between said stationary compression-rolls. Such presses have heretofore been impracticable for the reason that if compression-rolls of suitable size are used it is necessary, in order that the compression-rolls shall bear upon the bale-core and thus create the desired pressure at the beginning of the formation of the bale, that said bale-core be much larger than is desirable.

The object of the present invention is to adapt presses of this type to use a small bale-core, and to this end means are provided, in combination with one of said rolls, whereby at the beginning of the baling operation and until the bale attains such size that the compression-rolls will all bear thereon said bale will be subjected to a desired pressure independently of the other two rolls. In the preferable form thereof now known to me a press of this type embodying my invention comprises, in addition to the compression-rolls, springs or other suitable means to create a yielding pressure applied to the movable bearing-blocks of the bale-core, whereby said bale-core will be held yieldingly in contact with one of the compression-rolls with a desired pressure until the bale formed thereon becomes sufficiently large so that all of said compression-rolls will bear thereon simultaneously. Preferably, also, stops are provided to arrest the forward movement of the movable roll or rolls when in desired position relatively to the stationary rolls or roll, respectively, and thus to relieve the springs applied to the bale-core from the thrust due to the pressure tending to force said movable roll or rolls forward.

The invention also consists of the various other features, combinations of features, and details of construction hereinafter described, and pointed out in the claims.

In the accompanying drawings a press embodying my invention is fully illustrated.

Figure 1 is a top plan view of my improved press. Fig. 2 is a side elevation thereof, the sprocket-wheels and chain belt being indicated in dotted lines. Fig. 3 is an enlarged side view of a portion of the press, showing the stops which limit the forward movement of the movable roll or rolls; and Fig. 4 is a side elevation of a portion of a press embodying my invention in a modified form.

Referring now to the drawings, A designates, as a whole, the frame of the press, consisting of side frame-pieces A′, in which are formed longitudinal guides or ways *a*, cross frame-pieces A^2, rigidly connecting the side frame-pieces A′ and legs *a*′.

Referring now to Figs. 1 and 2 of the drawings, B B′ B^2 are the compression-rolls. The rolls B B′ are revolubly mounted in stationary bearings and are located on opposite sides of the guides or ways *a* symmetrically with reference to the roll B^2, which is supported so as to rotate freely in suitable bearings formed in bearing-blocks *b*, secured so as to be longitudinally movable in the guides or ways *a*. The bearing-blocks *b* are attached to a cross-head B^3, rigidly connected to a piston-rod *b*′, secured in a piston B^4, fitted to a double-acting hydraulic cylinder B^5.

Pipes b^2 and b^3 connect the cylinder B^5 on opposite sides of the piston with a source of supply of water under pressure, which pipes are controlled by valves b^4, so that pressure may be applied to either side of said piston, as desired. Discharge-pipes b^5 b^6 likewise communicate with the cylinder B^5 on opposite sides of the piston B^4, and are controlled by valves b^7 b^8, respectively.

The pressure at the source of water-supply is sufficient to subject the bale, in process of

formation, to desired pressure. During the formation of a bale the valve in the admission-pipe b^2 is open and the valve in the discharge-pipe b^5 closed, so that as the size of the bale increases the water is forced out of said cylinder and is returned to the source of supply. The valve in the admission-pipe b^3 is closed and the discharge-valve b^8 is open. The formation of a vacuum is thus prevented. When, however, it is desired to move the movable roll in either direction by the action of the piston, the admission-valve at the proper end and the discharge-valve at the opposite end of the cylinder are opened, both of the other valves being closed.

Positive rotary movement in the same direction, the direction of rotation being indicated by the arrows, is imparted to all of the compression-rolls in the following manner: Rigidly secured to the shafts of the compression-rolls are spur-gears C C^2, of which the gears C, secured to the shafts of the stationary rolls B B', mesh with a pinion C^3, rigidly secured to the shaft *c*, revolubly mounted in stationary bearings between said compression-rolls, and the gear C^2, secured to the shaft of the movable compression-roll B^2, meshes with a pinion C^4, rigidly secured to the shaft *c'*, revolubly mounted in the bearing-blocks *b*. Sprocket-wheels C^5 C^6 are secured to the shafts *c c'*, respectively, to which a chain belt C^7 is adjusted. Power for driving the press is imparted by means of a pulley C^8, secured to the shaft *c*, and driven from any suitable source of power.

In order to provide for necessary movement of the movable roll B^2, the chain belt C^7 will have to be made considerably longer than is necessary at the beginning of the baling operation; but this is immaterial, as the duty comes on the upper section of said chain, and the lower section can hang slack without interfering with the operation of the other parts of the press.

The bale-core D is removably secured in the press by means of withdrawable centers *d*, longitudinally movable in suitable bearings formed therefor in bearing-blocks *d'*, secured so as to be longitudinally movable thereof in the guides or ways *a*. Secured to a rigid portion of the frame of the press are coiled springs D', the position of which is such that the free ends thereof will be in the path of the bearing-blocks *d'* as the bale-core D moves forward, and the relation of the parts is such that said bearing-blocks will come into contact with the free ends of said springs before the bale-core D and the movable compression-roll B^2 reach their initial position in the baling operation, and will subject said springs to a sufficient compression to hold the bale-core in contact with said compression-roll with a desired initial pressure. Preferably, also, rigid stops are placed in the path of the bearing-blocks *b* of the movable compression-roll, which are so located that they will stop said roll just before it comes into contact with the stationary rolls B B'. Said stops will likewise take the thrust due to the pressure in the cylinder and relieve the springs D' therefrom. As shown, said stops consist of lugs d^2, rigidly secured to the press-frame, one to each side thereof and located in the path of travel of lugs d^3, rigidly secured, one to each of the bearing-blocks *b*, and preferably made integral therewith. It is obvious that the springs D' will hold the bale-core D, or the bale formed thereon, in contact with the movable roll B^2, and, the strength of said springs being properly regulated relatively to the pressure in the cylinder B^5, that said springs will be compressed, as the size of the bale increases, until the surface of the bale comes into contact with the surfaces of the stationary rolls B B'. After the bale comes into contact with the stationary rolls further increase in the size thereof will not further affect said springs, but will force the movable compression-roll B^2 rearward.

After the bale, being formed, attains contact with the stationary rolls, it will be supported in position independently of the centers *d*, which may then be withdrawn at any time preparatory to removing or discharging the bale from the press.

Owing to the positions of the compression-rolls relatively to the bale, it is necessary, in order to discharge said bale from the press, to retract the movable roll until the distance between the surface of the movable roll and the stationary rolls is equal to or greater than the diameter of the bale. For this reason the cylinder is made double acting.

In Fig. 4 of the drawings I have shown a modified form of my improved press, the modification showing the application of my invention to a press of this type in which two of the rolls are movable instead of one, there being but one stationary roll.

Referring now to Fig. 4 of the drawings, E is the stationary roll, revolubly mounted in suitable bearings formed in the main frame A of the press, and E' E^2 are the movable rolls, which are mounted so as to rotate freely at the ends of arms or webs *e e'*, secured to and preferably made integral with the bearing-blocks *b*, supported in and longitudinally movable in the guides or ways *a*. The springs D' are secured to the front side of the bearing-blocks b^2 in position to strike the adjacent sides of the bearing-blocks *d'* and force the bale-core against the stationary roll. In this form of the press the stops d^2 d^3 are formed on the inside of the press-frame, but in other respects the modified form of the press is, substantially, identical in construction with the form thereof shown in Figs. 1 and 2 and heretofore described and will be fully understood without further description.

In both forms of the press it is obvious that the bale-core, or the bale forming thereon, will be held against the roll B^2, or the roll E in the case of the modified form of the press, with a force represented by the strength of the spring

D′, which can be made as strong as desired. As the size of the bale increases the surface thereof will gradually approach the surfaces of the other compression-rolls and finally come into contact therewith. Any further increase in the size of the bale will operate to force the movable roll or rolls rearward until said bale attains the desired size.

To remove the bale, the movable roll or rolls are retracted until an opening is formed equal to the diameter of the bale, whereupon the bale drops out.

While I have shown and described my invention as embodied in a press in which the movable roll or rolls are advanced and retracted horizontally, it is capable of universal application and use regardless of the arrangement or direction of movement of the movable parts.

I claim—

1. In a rotary cotton-compress, the combination of three compression-rolls, a bale-core, about which said compression-rolls are arranged, said bale-core being smaller than the space between said compression-rolls, when in the positions they occupy at the beginning of the baling operation, and means to hold the bale-core, yieldingly, in contact with one of the compression-rolls at the beginning of the baling operation, with desired force, independently of the other compression-rolls, and until the bale becomes large enough to acquire contact with all of the compression-rolls, substantially as described.

2. In a rotary cotton-compress, the combination of three compression-rolls, a bale-core, about which said compression-rolls are arranged, said bale-core being smaller than the space between said compression-rolls, when in the positions they occupy at the beginning of the baling operation, and springs applied to said bale-core, whereby it is held, yieldingly, in contact with one of the compression-rolls, at the beginning of the baling operation and until the bale becomes large enough to acquire contact with all of the compression-rolls, substantially as described.

3. In a rotary cotton-compress, the combination of three compression-rolls, a bale-core, mounted in sliding bearing-blocks, about which said compression-rolls are arranged, said bale-core being smaller than the space between said compression-rolls, when in the positions they occupy at the beginning of the baling operation, and springs applied to the bearing-blocks of said bale-core, whereby said bale-core is held, yieldingly, in contact with one of the compression-rolls, at the beginning of the baling operation and until the bale becomes large enough to acquire contact with all of the compression-rolls, substantially as described.

4. In a rotary compress, the combination with three compression-rolls, comprising a roll or rolls mounted in sliding bearing-blocks, a bale-core, likewise mounted in sliding bearing-blocks, about which said compression-rolls are arranged, said bale-core being smaller than the space between said compression-rolls, when in the positions they occupy at the beginning of the baling operation, springs applied to the bearing-blocks of said bale-core, whereby said bale-core is held, yieldingly, in contact with one of the compression-rolls, at the beginning of the baling operation and until the bale becomes large enough to acquire contact with all of the compression-rolls and stops to arrest the forward movement of said movable roll or rolls, when in desired initial position, relatively to the stationary rolls or roll, respectively, substantially as described.

5. In a rotary cotton-compress, the combination of three compression-rolls, comprising two compression-rolls, mounted in stationary bearings and a compression-roll, mounted in sliding bearing-blocks, a bale-core likewise mounted in sliding bearing-blocks, about which said compression-rolls are arranged, said bale-core being smaller than the space between said compression-rolls, when in the positions they occupy at the beginning of the baling operation, springs applied to the bearing-blocks of said bale-core, whereby said bale-core is held, yieldingly, in contact with the movable compression-roll, at the beginning of the baling operation, with desired force, independently of the stationary compression-rolls and until the bale, in process of formation, acquires contact with all of said compression-rolls, and stops to arrest the forward movement of the movable roll when in desired initial position, relatively to the stationary rolls, substantially as described.

In testimony that I claim the foregoing as my invention I hereunto set my hand this 1st day of August, 1895.

MAGNUS SWENSON.

Witnesses:
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