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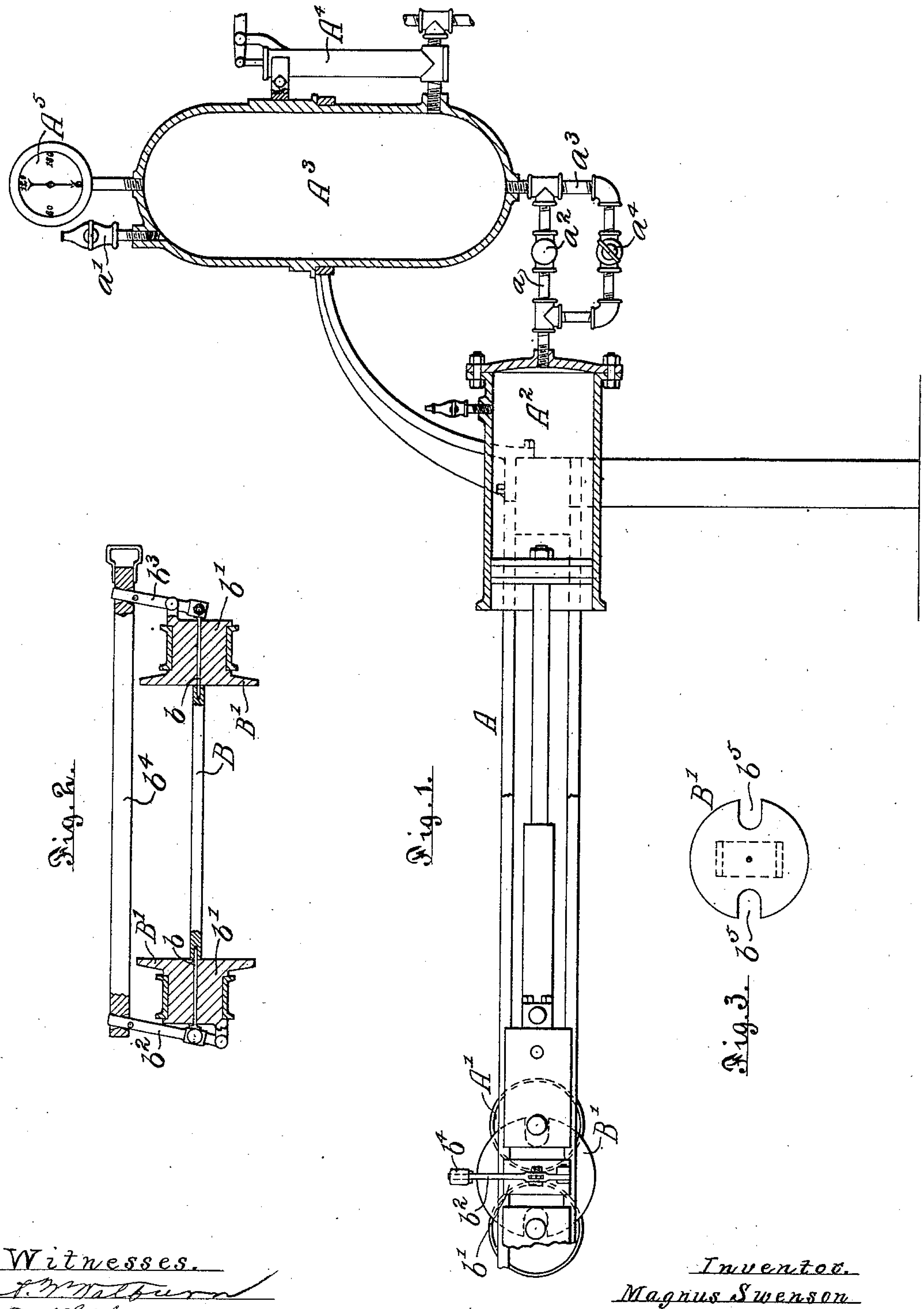
Patented Dec. 26, 1899.

M. SWENSON.

COTTON PRESS.

(Application filed Apr. 23, 1895.)

(No Model.)



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UNITED STATES PATENT OFFICE.

MAGNUS SWENSON, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN COTTON COMPANY, OF NEW YORK, N. Y.

COTTON-PRESS.

SPECIFICATION forming part of Letters Patent No. 639,950, dated December 26, 1899.

Application filed April 23, 1895. Serial No. 546,866. (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 "rotary" cotton-presses of the type in which the pressure is created by means of a cylinder, a piston fitted to which is connected with the movable roll or rolls; and a primary object of the invention is to provide improved means to generate the desired pressure in the cylinder.

In the preferable form thereof now known to me a press embodying my invention comprises an air-tight chamber or tank which is in direct communication with the pressure-cylinder, said cylinder and tank being preferably partially filled with water or other suitable inelastic liquid, so as to leave at all times an air-space in said tank.

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

In the accompanying drawings so much of a cotton-press of this type is shown as is necessary to illustrate my invention.

Figure 1 is a side elevation of a portion of a press embodying my invention, the cylinder and tank being shown in section. Fig. 2 is a transverse sectional view of the press, showing the means for withdrawing the spool-supporting centers; and Fig. 3 shows the construction of my improved baling-disks.

Referring now to the drawings, A designates the frame of the press, A' a movable compression-roll, and A^2 the pressure-cylinder, all of which may be of any desired or approved construction.

Connected directly with the cylinder A^2 by means of a pipe a is an air-tight tank or chamber A^3, which may likewise be made of any suitable material and constructed in any desired manner.

Supposing that the piston can be fitted to the cylinder A^2 so that there will be no leakage or air around said piston, it is obvious that starting with any desired initial pressure in the cylinder any desired final pressure can be obtained by making the cylinder of proper size relatively to the combined size of the cylinder and air-chamber. For example, assume that the combined size of the cylinder and air-chamber is one and one-third ($1\frac{1}{3}$) times the size of the cylinder proper and that the initial pressure in said cylinder is sixty (60) pounds per square inch, as the size of the bale increases the pressure in the cylinder becomes gradually greater and greater until at the end of the stroke the pressure will have increased to two hundred and forty (240) pounds per square inch.

It is obvious that the final pressure varies in any instance with the initial pressure and the size of the cylinder relatively to the size of the air-space.

Instead of using air in the cylinder in the preferable construction shown I fill the cylinder A^2 and partially fill the tank A^3 with water, leaving an air-space of desired size—say, for example, one and one-third ($1\frac{1}{3}$) times the size of said cylinder A^2 in said tank A^3. A force-pump A^4, which communicates with the tank, affords convenient means to fill said cylinder and tank, and by means of a pressure-gage A^5 in constant communication with the air-space in said tank the pressure in the cylinder can be readily ascertained, all in a familiar manner. A vent-tube a' is also provided, which is controlled by any suitable valve, and the passage of the water from the tank A^3 to the cylinder A^2 through the pipe a is controlled by means of a suitable check-valve a^2 therein, which closes whenever the pressure in the tank exceeds the pressure in the cylinder. A run-around pipe a^3 communicates with the pipe a at opposite sides of the check-valve a^2, as clearly shown in the drawings, in which is placed an ordinary valve a^4, which may be opened and closed at will.

While the desired initial pressure in the tank and cylinder may be generated in any desired manner, as by an air-pump or the like, I prefer to generate said pressure by compressing the air in the tank until the desired initial pressure is obtained. In order to obtain said pressure in this manner and leave an air-space of desired size in said tank, it is obvious that the size of said tank must bear a definite relation to the size of the cylinder. Assuming, for example, as before, that the desired initial and final pressures are sixty (60) and two hundred and forty (240) pounds, respectively, as before stated, the air-space will have to be one and one-third ($1\frac{1}{3}$) times as large as the cylinder, and in order to obtain the desired initial pressure by compressing the air in the tank at atmospheric pressure it will be necessary that the tank be ten and two-thirds ($10\frac{2}{3}$) times the size of the cylinder. With a cylinder and a tank of the above relative sizes, and said cylinder and tank being filled with air at atmospheric pressure, the air in said tank is compressed by forcing water into said tank by means of the force-pump A^4 until the pressure-gage indicates the proper pressure, which pressure will be sixty pounds (60) if the cylinder and tank are in communication or two hundred and forty (240) pounds if the valves controlling the passage to the cylinder are closed. Obviously in the latter case by opening the valve a^4, allowing water from the tank to run into and fill the cylinder, the piston will be forced forward to its initial position and the pressure will be reduced to sixty (60) pounds, the desired initial pressure, and will leave an air-space in said tank one and one-third ($1\frac{1}{3}$) times as large as the pressure-cylinder.

With a press of the described construction it is obvious that the water will be used over and over, and that the pressure will increase gradually as the size of the bale increases, and that in case of leakage around the piston the loss can readily be made good by pumping water into the tank until the gage indicates the desired initial pressure. It is also obvious that as the final pressure depends upon the initial pressure and the size of the air-space relatively to the cylinder said final pressure may be varied at will by properly varying the initial pressure or the size of the air-space, or both. In case, however, it is desired to materially increase the initial pressure this will of necessity have to be done by forcing air into said tank, for when the piston is at the rear end of its stroke there is, with the relation of parts described above, a space left in said tank equal to but one-third the size of the cylinder, which it is not practicable to reduce to any considerable extent. The pump A^4 can be so made and connected that it will deliver air or water into the tank, as desired. If, however, it is desired to start with a lower initial pressure, but leaving the final pressure unchanged or increasing it, this can readily be effected by pumping enough water into the tank to leave an air-space small enough to generate the desired final pressure, starting with the desired initial pressure and then opening the vent a' until the desired initial pressure is indicated on the gage.

The proper relation of the various controlling elements, the air-space, and initial pressure to obtain a desired final pressure, starting with a desired initial, may be readily determined by a simple application of the laws governing the compression and expansion of gases.

As a further improvement in presses of this type I have shown means whereby the spool-supporting centers may be withdrawn simultaneously, experience having shown that the weight of an unsupported bale will cause it to drop from between the compression-rolls if they continue to run.

As illustrated, B is the baling-spool of the press and is supported upon withdrawable centers b, which are freely movable in holes or bearings in the blocks b'. The outer ends of the centers b are pivotally connected to levers b^2 b^3, of which the lever b^2 is pivoted to a lug or bracket on one of the blocks b' below said center, and the lever b^3 is pivoted to a similar lug or bracket formed on the other block b' at a point above said center b. The upper ends of both of said levers project above the intervening parts of the press and are connected by a rod or bar b^4, which preferably projects at one side of the press to admit of convenient access. It is obvious that movement of said lever will impart a corresponding movement to the centers b, withdrawing or advancing them simultaneously. I also make the operating-bar removable, that it may not be in the way of operating the press. This feature is not essential in a single-acting press, but is essential in a double press in which the bat is delivered to different spools alternately.

As a further improvement in presses of this type the disks B' are made integral with the spool-supporting blocks b', and notches or recesses b^5 are formed in the sides thereof of sufficient size and in proper position to receive the shaft of the compression-rolls when they are in contact with the baling-spool. Heretofore the size of these disks and the fact that they have been supported so as to be revoluble have operated as a limitation upon the minimum size of the compression-rolls. With disks of my improved construction, however, the compression-rolls may be made of any size desired, large or small.

To avoid all possibility of mistake, I will state that where dimensions are herein expressed in terms of the size of the cylinder the displacement of the cylinder is meant and not the actual size of said cylinder.

I claim—

1. In a rotary cotton-press, the combination with a compression roll or rolls mounted in stationary bearings, a baling-core and a bodily-movable compression-roll, rotating in sliding bearings, a cylinder, a piston fitted to said cylinder and connection between said movable compression-roll and piston, whereby said piston is forced into the cylinder, as the size of the bale increases, of a closed air-chamber in communication with said cylinder, into which the contents of said cylinder are forced as said piston is forced into said cylinder, substantially as described.

2. In a rotary cotton-press the combination

with a compression roll or rolls mounted in stationary bearings, a baling-core and a bodily-movable compression-roll rotating in sliding bearings, a cylinder, a piston fitted to said cylinder and connection between said movable roll and said piston, whereby said piston is forced into the cylinder, as the size of the bale increases, of a closed air-chamber, a passage-way connecting said cylinder and air-chamber, and a valve in said passage-way, which closes whenever the pressure in the air-chamber exceeds the pressure in the cylinder, substantially as described.

3. In a rotary cotton-press the combination with a compression roll or rolls rotating in stationary bearings, a baling-core and a bodily-movable compression-roll, rotating in sliding bearings, a cylinder, a piston fitted to said cylinder and connection between said movable compression-roll and piston, whereby said piston is forced into the cylinder, as the size of the bale increases, of a closed air-chamber, a passage-way connecting said cylinder and air-chamber, a valve in said passage-way, which closes whenever the pressure in the air-chamber exceeds the pressure in the cylinder, a run-around pipe communication with the pipe, connecting the cylinder and air-chamber, at opposite sides of said valve, and a valve controlling such run-around pipe, substantially as described.

4. In a rotary cotton-press, comprising a compression roll or rolls, rotating in sliding bearings, a baling-spool and a bodily-movable compression-roll, rotating in sliding bearings, a hydraulic cylinder, a piston fitted to said cylinder and connection between said movable compression-roll and piston, whereby said piston is forced into said cylinder as the size of the bale increases, of a closed air-chamber in communication with said cylinder, so that the contents of said cylinder will be forced into said air-chamber as the piston is forced rearwardly, the size of said air-chamber being such that, starting with any desired pressure in said air-chamber, compression of the air contained therein, so as to generate a desired initial pressure on the piston, will leave an air-space in said air-chamber of such size, that further compression of the air contained therein, due to forcing the inelastic contents of the cylinder into said air-chamber, incident to the rearward travel of the piston in the formation of a bale, will create a desired final pressure on said piston, and means for forcing water, or other medium, into said air-chamber, substantially as described.

5. In a rotary cotton-press, comprising a compression roll or rolls, rotating in stationary bearings, a baling-core and a bodily-movable compression-roll, rotating in sliding bearings, a hydraulic cylinder, a piston fitted to said cylinder and connection between said movable compression-roll and piston, whereby said piston is forced into said cylinder as the size of the bale increases, of a closed air-chamber in communication with said cylinder, so that the contents of said cylinder will be forced into said air-chamber as the piston is forced rearwardly, the size of said air-chamber being such that, starting with any desired pressure in said air-chamber, compression of the air contained therein, so as to generate a desired initial pressure on the piston, will leave an air-space in said air-chamber of such size, that further compression of the air contained therein, due to forcing the inelastic contents of the cylinder into said air-chamber, incident to the rearward travel of the piston in the formation of a bale, will create a desired final pressure on said piston, a force-pump connected with said air-chamber and a pressure-gage in continuous communication with the air-space therein, substantially as described.

6. In a rotary cotton-press, comprising a compression roll or rolls, rotating in stationary bearings, a baling-core and a bodily-movable compression-roll, rotating in sliding bearings, a hydraulic cylinder, a piston fitted to said cylinder and connection between said movable compression-roll and piston, whereby said piston is forced into said cylinder as the size of the bale increases, of a closed air-chamber in communication with said cylinder, so that the contents of said cylinder will be forced into said air-chamber as the piston is forced rearwardly, the size of said air-chamber being such that, starting with any desired pressure in said air-chamber, compression of the air contained therein, so as to generate a desired initial pressure on the piston, will leave an air-space in said air-chamber of such size, that further compression of the air contained therein, due to forcing the inelastic contents of the cylinder into said air-chamber, incident to the rearward travel of the piston in the formation of a bale, will create a desired final pressure on said piston, a force-pump connected with said air-chamber, a pressure-gage in continuous communication with the air-space therein, and a valve in the passage-way connecting the cylinder and air-chamber, which will close whenever the pressure in the air-chamber exceeds the pressure in the cylinder, substantially as described.

7. In a rotary cotton-press, comprising a compression roll or rolls, rotating in stationary bearings, a baling-core and a bodily-movable compression-roll, rotating in sliding bearings, a hydraulic cylinder, a piston fitted to said cylinder and connection between said movable compression-roll and piston, whereby said piston is forced into said cylinder, as the size of the bale increases, of a closed air-chamber in communication with said cylinder, so that the contents of said cylinder will be forced into said air-chamber as the piston is forced rearwardly, the size of said air-chamber being such that, starting with any desired pressure in said air-chamber, compression of the air contained therein, so as to generate a

desired initial pressure on the piston, will leave an air-space in said air-chamber of such size, that further compression of the air contained therein, due to forcing the inelastic contents of the cylinder into said air-chamber, incident to the rearward travel of the piston in the formation of a bale, will create a desired final pressure on said piston, a force-pump connected with said air-chamber, a pressure-gage in continuous communication with the air-space therein, a valve in the passage-way connecting the cylinder and air-chamber, which will close whenever the pressure in said air-chamber exceeds that in the cylinder, a run-around pipe communicating with the passage-way connecting said cylinder and air-chamber at opposite sides of said valve and a valve controlling said run-around pipe, substantially as described.

8. In a rotary cotton-press, comprising a compression roll or rolls, rotating in stationary bearings, a baling-core and a bodily-movable compression-roll, rotating in sliding bearings, a hydraulic cylinder, a piston fitted to said cylinder and connection between said movable compression-roll and piston, whereby said piston is forced into said cylinder as the size of the bale increases, of a closed air-chamber in communication with said cylinder, so that the contents of said cylinder will be forced into said air-chamber as the piston is forced rearwardly, the size of said air-chamber being such that, starting with any desired pressure in said air-chamber, compression of the air contained therein, so as to generate a desired initial pressure on the piston, will leave an air-space in said air-chamber of such size, that further compression of the air contained therein, due to forcing the inelastic contents of the cylinder into said air-chamber, incident to the rearward travel of the piston in the formation of a bale, will create a desired final pressure on said piston, a force-pump connected with said air-chamber, a pressure-gage in continuous communication with the air-space therein, a valve in the passage-way connecting said cylinder and air-chamber, which will close whenever the pressure in the air-chamber exceeds that in the cylinder, a run-around pipe communicating with the passage-way connecting said cylinder and air-chamber at opposite sides of said valve, a valve controlling said run-around pipe and a vent-valve in continuous communication with the air-space in said air-chamber, substantially as described.

9. In a rotary cotton-press, the combination with withdrawable baling-core-supporting centers, mounted in sliding bearing-blocks, of a lever connected to each of said centers and pivoted to the bearing-block in which the center to which it is connected is supported, the points of pivotal attachment of said levers to said bearing-blocks, being on opposite sides of the axial line of said centers, and a rod or bar connecting the ends of said levers, substantially as described.

10. In a rotary cotton-press, the combination with withdrawable baling-core-supporting centers, mounted in sliding bearing-blocks, of a lever connected to each of said centers, and pivoted to the bearing-block in which the center to which it is connected is supported, the points of pivotal attachment of said levers to said bearing-blocks, being on opposite sides of the axial line of said centers, and a removable rod or bar connecting the ends of said levers, substantially as described.

11. In a rotary cotton-press the combination with a stationary compression-roll, a bodily-movable compression-roll and baling-core-supporting centers, supported in sliding bearing-blocks, of heading-plates, secured to the bearing-blocks of the core-supporting centers, so as to be immovable relative thereto, said plates being provided with notches or openings of sufficient size and in proper position to receive the shafts of the compression-roll, when said baling-core is in close proximity to said rolls, substantially as described.

12. A core holding and dropping mechanism for cotton-presses, comprising a pair of oppositely-located centering-pins adapted to revolubly support a core-rod on their contiguous ends, and lever connections with the centering-pins to provide for the simultaneous movement thereof in a longitudinal direction thereby disengaging the same from the core-rod, substantially as set forth.

13. A core holding and dropping mechanism for cotton-presses, comprising a pair of oppositely-located centering-pins adapted to revolubly support a core-rod on their contiguous ends, and lever connections with the centering-pins to provide for the simultaneous movement thereof in a longitudinal direction, thereby disengaging the same from the core-rod, substantially as set forth.

In testimony that I claim the foregoing as my invention I hereunto set my hand this 17th day of April, 1895.

MAGNUS SWENSON.

Witnesses:
A. W. WALBURN,
J. H. GIBSON.