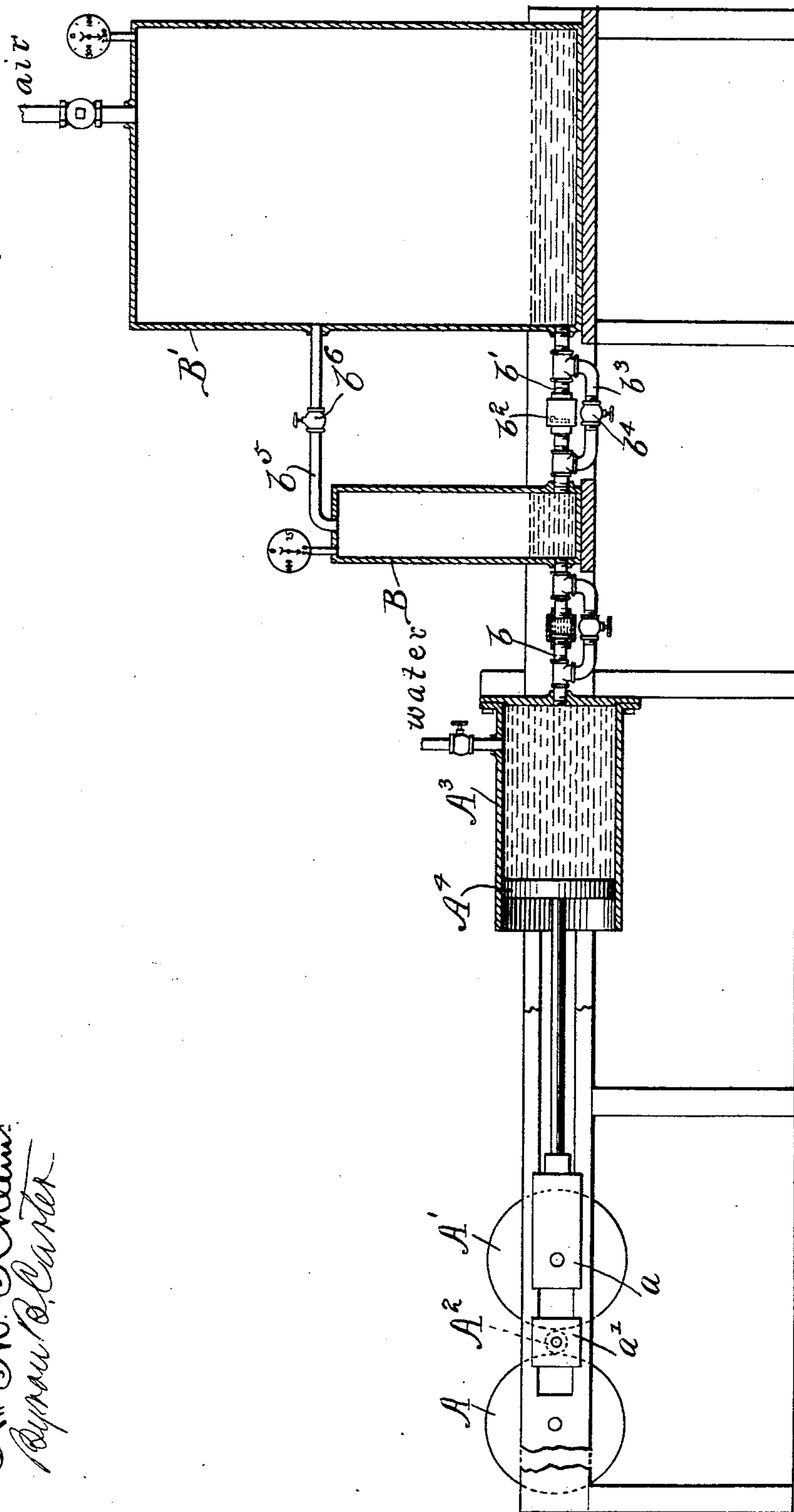


M. SWENSON.
COTTON PRESS.

Patented Aug. 3, 1897.



Witnesses
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UNITED STATES PATENT OFFICE.

MAGNUS SWENSON, OF CHICAGO, ILLINOIS.

COTTON-PRESS.

SPECIFICATION forming part of Letters Patent No. 587,618, dated August 3, 1897.

Application filed October 16, 1896. Serial No. 609,146. (No model.)

To all whom it may concern:

Be it known that I, MAGNUS SWENSON, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cotton-Presses, of which the following is a specification.

This invention relates to improvements in cotton-presses of the type adapted to wind a bat of cotton into a cylindrical bale, and relates particularly to improvements in presses of this type in which the pressure on the bale is created by means of compressed air confined in a closed chamber, the size of which air-space decreases as the size of the bale increases.

The object of the present invention is to provide a pressure mechanism of this type such that, starting with a desired initial pressure, the pressure on the bale will increase rapidly until a desired maximum pressure is reached, which will be maintained substantially uniform during the remainder of the baling operation. To this end a pressure mechanism embodying my invention consists of the various features, combinations of features, and details of construction hereinafter described, and pointed out in the claims.

In the accompanying drawing a press equipped with my improved pressure mechanism is fully illustrated.

This drawing is a side view of a press equipped with my improved pressure mechanism.

In the drawing I have shown my invention as embodied in the familiar type of press comprising a compression-roll A, mounted in stationary bearings; a compression-roll A', mounted in sliding bearing-blocks *a*; a bale-core A², supported in sliding bearing-blocks *a'* between said compression-rolls A A', and a pressure-cylinder A³, a piston A⁴ fitted to which is rigidly connected with the bearing-blocks *a* of the movable compression-roll A'.

The essential feature of my invention is the means employed for generating the desired pressure in the pressure-cylinder A³, which I will now describe.

A pressure mechanism embodying my invention comprises two closed tanks or chambers B B', the interiors of which communi-

cate with the pressure-cylinder. The connection between said chambers and pressure-cylinder may be direct by means of separate pipes or tubes, or, as shown, the tank or chamber B communicating directly with the pressure-cylinder by means of a pipe or tube *b* and the tank or chamber B' with the chamber B by means of a pipe or tube *b'*.

The pipe or tube *b'* is provided with a check-valve *b*², which closes automatically whenever the pressure in the tank or chamber B' exceeds the pressure in the cylinder A³ or in the tank B and which opens automatically whenever the pressure in said tank or chamber B' is less than that in said cylinder A³ or in the tank or chamber B. A run-around pipe *b*³ communicates with the pipe *b'* on both sides of the check-valve *b*², and said run-around pipe is provided with an ordinary valve *b*⁴, which may be opened and closed at will. Preferably, also, the pipe *b* is provided with a check-valve and a run-around in the same manner as the pipe *b'*, but this is chiefly for convenience in handling the movable compression-roll A' and is not essential to the successful operation of my improved pressure mechanism.

The cylinder A³ is filled with water or other inelastic fluid, and the tanks or chambers B B' both preferably contain sufficient water to cover the connections thereto of the pipes *b* *b'*, leaving air-spaces of desired size in both thereof.

At the beginning of the baling operation the air-space in the tank or chamber B is filled with compressed air under a pressure which will create a desired initial pressure in the cylinder A³, and the air-space of the tank or chamber B' contains air under a compression corresponding to the desired final pressure on the bale. With this construction and under the described conditions operation of the press in forming a bale by forcing the piston A⁴ into the cylinder A³ will discharge the contents of said cylinder into the tank or chamber B until the pressure therein is equal to that in the tank or chamber B', when the discharge will be into said chamber B'.

The size of the air-space in the tank or chamber B at the beginning of the baling operation is small as compared with the size of the cyl-

inder A³, a desirable size therefor being from one-fourth to three-eighths of the size of the space displaced by the piston in the formation of a bale.

5 The size of the air-space in the tank or chamber B', on the other hand, is large as compared with the space displaced by the piston in forming a bale, a desirable size therefor being about fifteen times the size of the displacement in the cylinder A³, or about twenty
10 times the volume displaced by the piston after the discharge into the tank or chamber B' begins.

The operation of a press of the type described and equipped with my improved pressure mechanism is as follows, the description starting with the press in condition for beginning the formation of a bale: Assume that the diameter of the pressure-cylinder is four-
15 teen inches and that the piston travels twenty-two inches in forming a bale. Also assume that the air-space in the tank or chamber B is one-third the size of the space displaced by the piston in forming a bale and that the initial pressure therein is fifty pounds per square
20 inch, and assume, finally, that the air-space in the tank or chamber B' is thirteen times the size of the space displaced by the piston in forming a bale and that the initial pressure therein is two hundred pounds per square
25 inch. As the size of the bale increases the contents of the cylinder A³ are discharged into the small air-space in the tank or chamber B, rapidly reducing the size thereof, causing the
30 pressure therein and the consequent pressure on the bale to increase correspondingly until the pressure in the tank or chamber B is equal to the pressure in the larger tank or chamber B'. With the proportion of parts assumed
35 this will occur when the piston has traveled about six (6) inches. Thereafter further increase in the size of the bale will discharge the contents of the said cylinder A³ into the large tank or chamber B', but said tank being
40 very large as compared with the quantity of water discharged therein the pressure in said tank and the consequent pressure on the bale will remain substantially uniform. With the proportion of parts and conditions assumed
45 the final pressure in the cylinder A³ will be about two hundred and ten pounds per square inch. The bale having been discharged from the press, the check-valves b² close, relieving the movable roll A' from pressure, and the
50 valves b⁴ in the run-around pipes b³ afford convenient means for securing desired distribution of pressure in the cylinder A³ and the tanks B B'. Said tanks are preferably provided with pump connection adapted to supply
55 air and water to said tanks to generate and maintain the desired pressures therein and are also, preferably, provided with gages to indicate the pressures therein.

In case it is desired to increase the pressure
60 in the chamber B without affecting the water-levels in the tanks this can be conven-

iently effected by means of a pipe b⁵, which connects said tanks above the water-levels therein, which is controlled by a valve b⁶.

I claim—

1. In a cotton-press of the type described, the combination with a hydraulic-pressure cylinder and a piston fitted thereto, of air-chambers connected with said cylinder, one of which is relatively small as compared with
70 the volume displaced by the piston in the formation of a bale, and contains air under a compression corresponding to a desired initial pressure on the bale and another of which contains air under a compression greater than
75 said initial pressure, and means to control the passages between the high-pressure chamber and the pressure-cylinder, substantially as set forth.

2. In a cotton-press of the type described, the combination with a hydraulic-pressure cylinder and a piston fitted thereto, of closed air-chambers connected with said cylinder, one of which is relatively small as compared with the volume displaced by the piston in
80 the formation of a bale, and contains air under a compression corresponding to a desired initial pressure on the bale and another of which contains air under a compression corresponding to the desired final pressure on
85 the bale, the aggregate volume of said air-chambers being relatively large as compared with the volume displaced by the piston in forming a bale and means to control the passages between the high-pressure chamber or
90 chambers and the pressure-cylinder, substantially as described.

3. In a cotton-press of the type described, the combination with a hydraulic-pressure cylinder and a piston fitted thereto, of closed
95 air-chambers connected with said cylinder, one of which is relatively small as compared with the volume displaced by the piston in the formation of a bale, and contains air under a compression corresponding to the desired initial pressure on the bale and the other of which is relatively large, as compared with the volume displaced by the piston in forming a bale and contains air under a compression corresponding to the desired final pressure on the bale and means to open and close the passage between said large air-chamber and the pressure-cylinder, substantially as described.

4. In a cotton-press of the type described, the combination with a hydraulic cylinder and a piston fitted thereto, of closed air-chambers connected with said cylinder, one of which is relatively small as compared with the volume displaced by the piston in forming a bale and contains air under a compression corresponding to the desired initial pressure on the bale and the other of which is relatively large, as compared with the volume displaced by the piston in forming a bale and contains air under a compression corresponding to the desired final pressure on the bale

and a check-valve in the passage between the large air-chamber and the cylinder, which opens, automatically, whenever the pressure in the cylinder exceeds the pressure in said
5 air-chamber and closes, automatically, whenever the pressure in said chamber exceeds the pressure in the cylinder, substantially as described.

In testimony that I claim the foregoing as my invention I have hereunto set my hand to this 26th day of September, 1896.

MAGNUS SWENSON.

Witnesses:

B. A. JOHNSTON,
J. H. GIBSON.