



Fig. 2.

# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN STEAM COTTON-PRESSES.

Specification forming part of Letters Patent No. 5,730, dated August 22, 1848.

### *To all whom it may concern:*

Be it known that I, CORNELIUS HURST, of the city of New Orleans, parish of Orleans, and State of Louisiana, have invented a new and useful Machine for Compressing Cotton, Tobacco, &c., which is denominated the Sampson Press; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, which make a part of this specification.

The nature of my invention consists in the substitution for the ordinary single-acting steam-press cylinder of a double-acting cylinder with both heads closed, usually placed horizontally, and having piston-rods from the same piston passing through both heads, each connected with a traversing bar of a toggle-joint press.

It also consists in the manner of applying the steam in the cylinder, whereby a large proportion of that which is commonly thrown out by the exhaust-pipe is retained and made to pass to the opposite end to that into which it was at first admitted from the boiler.

In constructing the press I place my double-acting steam-cylinder A on a substantial platform, either above or below the place which the bale is to occupy when pressed, but commonly above it, as represented in the sectional drawings, Figure 1. I cause the lower extremities of the traversing bars B and B' to pass horizontally along the platform P, on which the cylinder A rests, and beneath which are the upper platens of the press,  $p p'$ . The upper extremities of the traversing bars move vertically against vertical guides  $g g'$ . Their motions along both the horizontal and the vertical planes are facilitated by friction-rollers, either alone or combined with planes placed above them in the usual manner of obviating friction in like cases. These rollers are seen at T T' and at  $t t t t t' t' t' t'$ .

Connected with the upper ends of the traversing bars B B' are straps S S and S' S', which pass down, one on each side of the traversing bars, and beneath the movable platens M M'. Through these straps the force of the press is transmitted. They are consequently to be made strong enough to sustain any force which the press can possibly exert. The movable platens are made very heavy, and as the

motion of the engine is reversed every time a bale is pressed, that platen which has been released from pressure and is descending to its lowest possible point, as M, acting by its weight on the traversing bar B, then in a very oblique position, produces a power fulthrust, tending to draw the piston-rod R outward from the cylinder-head H, and thereby to aid the effort of the steam in A, then acting on the opposite side of the piston O. In this situation of M the effort which its weight exerts in aid of the steam is many times greater than that which M' can at the same moment exert in opposition to it. Consequently the bale which is undergoing compression between M' and  $p'$  will be much more forcibly compressed than it would have been by the force of the steam alone. This advantage which the weight of the platens gives to the double press renders its use more economical than that of any single-acting toggle-joint press, which latter must depend wholly on the pressure of steam for its efficiency.

The manner in which I am enabled to use the elastic force, recoil, or spring of a bale of elastic materials which have been compressed and secured with cords is founded upon the fact that on relieving the pressure the materials will in spite of the cords resume in some measure the original form of the uncompressed mass. This recoil is often sufficient to cause the piston O to traverse nearly one-third of the length of the cylinder, overcoming the thrust of the oblique traversing bar B and partly elevating the platen M. This effect can take place only after the piston has been relieved from the pressure of steam, or at least when the pressure on the two opposite sides of it has been equalized.

In the position of the piston O, as represented in the drawings, Fig. 1, the right-hand end of the cylinder is supposed to have a full pressure of steam within. By means of the hand-gear C, Fig. 2, the slide-valve V is brought into a central position so as to place a cavity,  $x$ , Fig. 1, immediately over two separate cavities in the valve-seat, one leading to each end of the cylinder A. At the same time the passage between the induction-pipe I and the cylinder and that between the eduction-pipe E and the cylinder are both closed, so that the steam in A can only follow the course

pointed out by the arrows, and this motion allows the piston O to commence moving from H toward H' in obedience to the recoil of the bale supposed to have been just compressed on the platen M'. To whatever extent the piston is moved by the recoil of the material compressed, to the same extent will that end of the cylinder which is next to the head H be filled with steam from the other end, instead of requiring to be filled from the boiler. When the equilibrium has been formed on the two opposite sides of the piston, a still further movement of the slide-valve V closes the two ends of the cylinder from each other, opens at the same moment the full end to the exhaust-pipe E, and the partially-filled end to the induction-pipe I, and thence to the boiler, which completely reverses the positions of the two bars B and B', bringing the former into the erect and the latter into an oblique position,

enabling the platen M' to exert a powerful effort in aid of the steam acting on the piston upon that side which is next to the head H.

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

The saving of steam-power in the engine of my double-reciprocating compressing-press by allowing a part of the steam which has acted on one side of the piston to pass to the other side to replace a portion of that which would otherwise be required from the boiler, and I wish it to be understood that in this claim I do not limit myself to the exact arrangement of parts herein described, but shall vary them at pleasure, while I attain the same ends by means substantially the same.

CORNELIUS HURST.

Witnesses:

WALTER R. JOHNSON,  
A. STEINWEHR.