

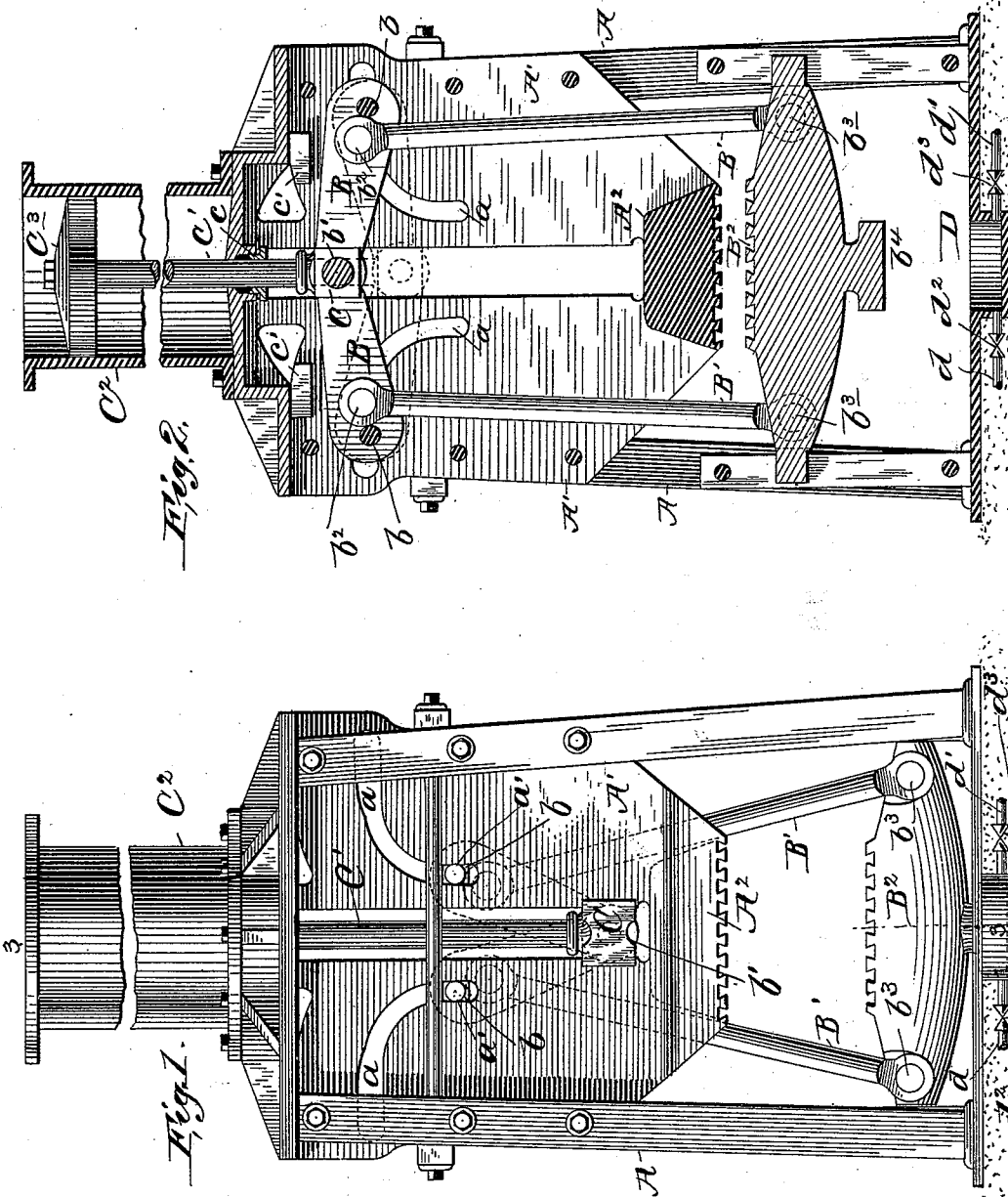
(No Model.)

2 Sheets—Sheet 1.

L. BLOCK.
BALING PRESS.

No. 553,827.

Patented Feb. 4, 1896.



WITNESSES:

C. W. Benjamin
Louis Baron

INVENTOR

Louis Block,

BY

Hubert A. Bauman,

ATTORNEY

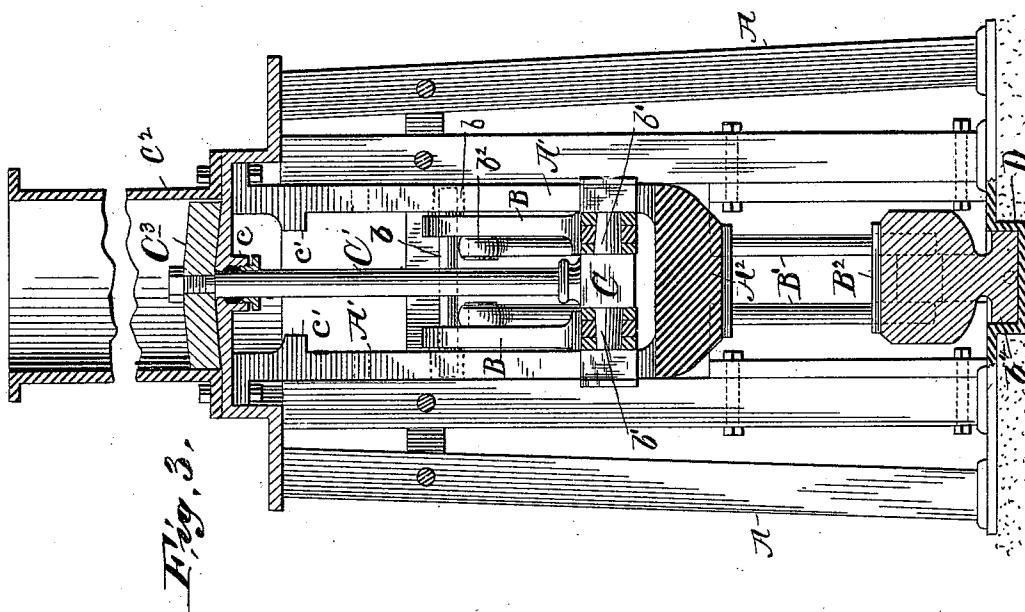
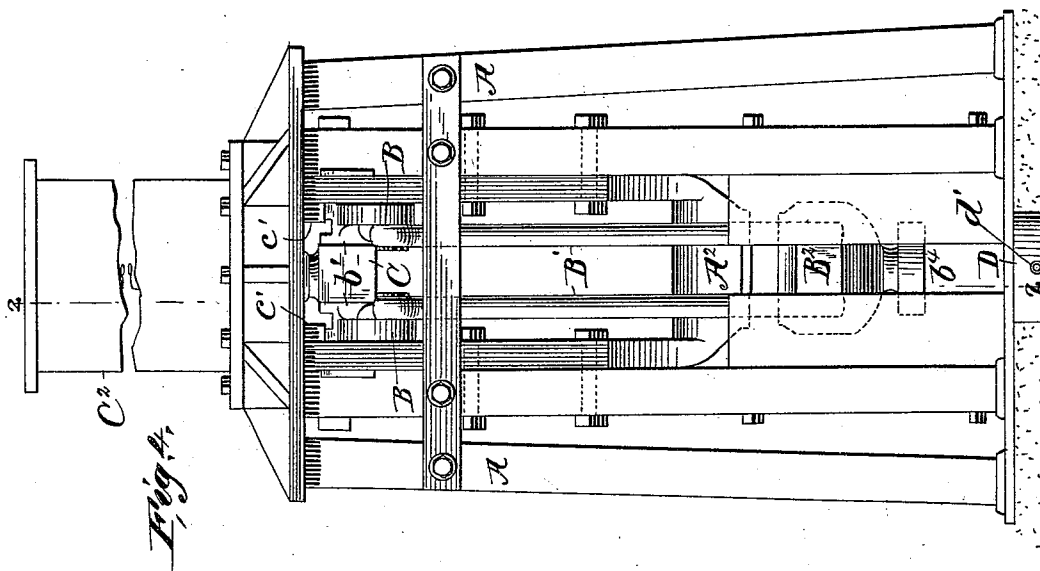
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UNITED STATES PATENT OFFICE.

LOUIS BLOCK, OF NEW YORK, N. Y.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 553,827, dated February 4, 1896.

Application filed September 12, 1895. Serial No. 562,259. (No model.)

To all whom it may concern:

Be it known that I, LOUIS BLOCK, a citizen of the United States, and a resident of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Baling-Presses, of which the following is such a full, clear, concise, and exact description as will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The improvement, though applicable to steam-presses for various purposes, relates more especially to that class of presses which are used for compressing cotton, and it will be described with reference to that subject and the prior art relating thereto as at present understood.

The moving parts of the mechanism for cotton-compressors, as heretofore constructed, have comprised among other things a rack on the piston-rod which operated geared sectors with axes on the frame or stationary parts at the sides of the press, and pivotally connected near their gearing with pitmen or intermediate links leading to a movable platen, which, with a stationary platen, made the necessary connections for operating the press when steam was admitted to the cylinder; or, as in some presses, a pair of toggle-levers were employed, each of which had one arm connected with the cross-head of the piston-rod and the other jointed thereto, and also pivoted at its outer extremity to the frame or some stationary part at the sides of the press, the connections with the movable platen being made by pitmen or intermediate links, as in presses where sector-gears were used. It is obvious that in either case the press would be subjected to a continuous, and at times to a very great, strain at the fixed points on the frame or stationary parts, and that in such constructions no means could be provided for relieving the wear and tear by distributing the weight of load and strain over the stationary parts of the press. There were also in most of such presses an objection arising from the want of sufficient length of stroke with an increasing or uniform high pressure during the latter part of the act of compression. This is desirable in order to adapt the

press without blocking or wedging to bales of cotton which, as they come from the plantations, vary greatly in thickness and weight, as the press is required to prepare the cotton for shipment by a compression not only reducing the volume, but also securing, as far as possible, a practically uniform density in the various bales compressed, of whatever size or weight.

In certain presses a number of struts were hinged to a column extending up from a piston beneath the platen, which column contained grooves and was guided by ribs or slides upon the interior of the movable platen above. The struts so hinged were pivoted to link-levers, having their other ends secured by a cross-pin to the lower part of the movable platen, and a number of arms were hinged at one end to such link-levers and at their other end to the main frame of the machine. The construction and arrangement were such that as the piston moved upward the struts and link-levers would cause the platen at the first part of the upward movement of the piston to rise at a greater speed than the piston, and this would continue until the arms hinged to the main frame reached a horizontal position, after which time the relative movement of the platen in comparison with the movement of the piston gradually decreased until at the last part of the stroke the piston moved at a much faster rate of speed than the platen, and the pressure force of the platen upon the bale was proportionately increased.

The object of my improvement is primarily to construct a baling-press in which the necessary movements are secured by the direct action of movable arms connected with the cross-head of the piston-rod and with the pitmen, which arms at their outer ends are connected with trunnions or slides made to move and act camwise on ways formed upon stationary portions of the machine, thus securing a positive action which distributes the pressure and weight of load over different portions of the stationary parts during the act of compression, and secondarily to so pivot the pitmen upon the movable arms as to secure a long stroke during the period of greatest pressure, whereby the press is adapted to the compression of bales of various size and weight to a practically uniform density.

To these ends the invention consists in the construction of a baling-press having a stationary platen, a movable platen, a piston-rod with cross-heads thereon, lever-arms operated by piston-rod, trunnions or slides carried by said lever-arm and operating upon ways or tracks adapted to give a cam action thereto, and connections with the movable platen, all as hereinafter more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of a baling-press constructed with my improvements, and shows the steam-cylinder and connecting mechanism to be thereby operated. Fig. 2 is a vertical section on the line 2 2 of Fig. 4, while Fig. 3 is a vertical section on the line 3 3 of Fig. 1, and Fig. 4 is a side elevation.

In Figs. 1 and 4 the parts are shown in their normal position, or as they would be before the press begins to act, and in Figs. 2 and 3 the position of the working parts is that which they assumed in some cases, though not in all, at or near the completion of the act of compression.

In the drawings, A A represent the supports for the fixed framework, of cast-iron or other suitable material. The stationary parts A' are fixed to the supports and the lower portions of these parts are either integrally united or joined by a separate piece, which is downwardly faced and serves as the stationary platen A² for receiving the upward strain due to the compression. The parts A' A' are each provided with two ways or tracks or cam-surfaces *a a* to take the downward strain received from the movable parts and platen on which the bale is placed. The main portion of each of the cam-surfaces should have a carefully determined or disposed curvature, so that suitable bearing-blocks *a' a'*, (or trunnions, if preferred,) connected by pivots or pins *b b* to stout lever-arms B B, may be caused to traverse the same and serve by a camwise action to lift the movable platen in proper ratio to the motion of the piston-rod in the early and middle part of each compression movement. These cam-surfaces are shown as being formed on the outer and under walls of slots in the stationary part A' A'; but as the inner or upper walls of such slots act simply as guides, not being required to carry the load or take the strain, it is obvious that the parts A' A' may be so shaped as to permit of the formation of the cams on the upper surfaces thereof and separate guides made and attached should they be required.

The lever-arms B B are connected at their inner ends by pivots *b' b'* to a cross-head C of the piston-rod C', which passes through a stuffing-box *c* at the bottom of the steam-cylinder C² and connects with the piston C³ inside of such cylinder. The upward movement of the piston-rod and parts which it is made to actuate may be limited by buffers or lugs *c' c'* cast on the part A' or by any other suitable means. The lever-arms B B also

have connection by pivots or pins *b² b²* with pitmen B' B', which extend downward and are connected by pivots or pins *b³ b³* with the movable platen B². I prefer to provide the movable platen B² with a plunger *b⁴* formed on the under surface thereof, so that as the platen descends it may enter a recess D in the bottom of the framework or made in the foundation, and to connect air inlets and outlets therewith, so as to form an air-cushion for the purpose of arresting the parts without undue jarring. To accomplish this two air-pipes *d d'* are made to communicate with the recess D, the pipe *d* being provided with a self-acting valve *d²*, which admits air freely but prevents its return, and the other pipe *d'* is to be provided with a stop-cock *d³*, which may be adjusted at will, so as to permit the air when compressed by the descending plunger *b⁴* to escape. It is not deemed necessary to show the detail of the valve and cock for the purposes mentioned, as they may be of well-known form and construction.

The drawings show, as already explained, the position of the parts at the beginning and at the end of the act of compression; but since the bales of cotton vary so greatly in thickness and weight the position of the parts, as shown in Figs. 2 and 4, must be understood as representing the same after having acted upon a bale not of the extreme thinness for which the machine is capable, nor yet one of extreme thickness. As shown in these figures the lever-arms B B have passed slightly above a horizontal position, but are capable of a still further movement upward until they reach the buffers *c' c'*, and such movement would occasion very slight, if any, decrease in the force or pressure applied. So, too, it must be understood that if such lever-arms are required to move upward until they come within a horizontal plane, or if the ends thereof which are connected with the cross-head should be even below a horizontal plane, as indicated by the dotted lines in Fig. 2, there would not be in all such positions very much, if any, variation in the pressure or force applied to the bale. Hence it follows that while the press is capable of acting upon bales of various thickness and weight it is also capable of exerting a pressure which would leave such bales when taken from the press of practically uniform density.

The pitmen B' B', being pivoted to the lever-arms at the points *b² b²*, are permitted a free movement upon their pivots at a point between the trunnions or slides *a' a'*, which turn upon and are moved by the pins or pivots *b b*. During the early portion of the movement, therefore, the arms B B will cause the pitmen to rise with a speed somewhat more rapid than that of the piston-rod itself, for the reason that the lever-arms as moved from their point of connection with the cross-head are also revolving on the pins *b b* which give motion to the slides *a' a'* and form a constantly-moving fulcrum for the lever-arms,

the arc or path of travel being different, however, from that which the pitmen describe in their movement.

When a bale of cotton is placed upon the 5 movable platen and steam is admitted to the cylinder the piston will rise and stretch the lever-arm to the extent permitted by the course of travel defined by the cam-surfaces on which the slides or trunnions are made to 10 move. This of course lifts the movable platen and its load of cotton against the stationary platen and in the early and middle stages of compression the movement will be somewhat rapid, but the pressure will not be very great, 15 being estimated sometimes at from one hundred to two hundred tons; but after the first stages of the movement the pressure increases enormously, reaching ultimately a pressure estimated as high as four thousand tons. 20 When the necessary pressure has been exerted and the cotton compressed to the density required the bale ties or bands are properly set and secured and the parts are relieved by discharging the steam from the cylinder, 25 when they will descend and permit the bale to be removed and another placed in position.

Modifications may be made without departing from the principle or sacrificing the advantages of my invention. I can, for example, use sufficiently stout rollers or trunnions 30 in place of the sliding blocks, as already indicated in the previous description, or I can use blocks equipped with a series of rollers on their under face, or otherwise make connections by which the lever-arms are made 35 to traverse their intended path without being attached to an arm or part which is obliged to move on a center fixed on the stationary part and to which the weight of load and strain would ultimately have to pass. In my 40 improvement the strain is transferred to the stationary parts at successive points, varying practically, though not absolutely, according to the amount of rise which is given to the 45 lever-arms. It is apparent also that while I secure the advantage of rapid movement of the bale of cotton during the early and middle portions of the act of compression I also secure great length of stroke during the final 50 movement and under the highest or greatest volume of pressure. This is all done without subjecting my machine to the wear and tear

occasioned in other forms of presses as heretofore constructed. I do not wish to be understood as making the air-cushion at the 55 bottom or the buffers at the top of the press a necessary part thereof or essential to my invention, although I deem them of advantage in connection therewith.

Having thus described my invention, what 60 I claim as new, and desire to secure by Letters Patent, is—

1. In a baling-press, the combination of a motor, a reciprocating rod with connections for its actuation by said motor; movable lever-arms the inner ends of which have connections for causing the same to be lifted by 65 said rod and exert leverage on other movable parts; slides or trunnions forming fulera for the outer ends of said lever-arms; rising stationary ways or cam-surfaces over which said fulera may be moved as said lever-arms are 70 lifted; pitmen pivoted at their upper ends to said lever-arms; a movable platen to which the lower ends of said pitmen are pivoted; and a stationary platen, whereby a bale may be 75 compressed between the platen and the strain upon the stationary parts of the press transferred on different points thereof as the fulera are moved. 80

2. In a baling-press, the combination of a motor, a reciprocating rod with connections for its actuation by said motor; movable lever-arms the inner ends of which have connections for causing the same to be lifted by 85 said rod; slides or trunnions forming fulera for the outer ends of said lever-arms; rising stationary ways or cam-surfaces over which said fulera may be moved as said lever-arms are 90 lifted; pitmen the upper ends of which are pivoted to said lever-arms inside of the fulera; a movable platen to which the lower ends of said pitmen are pivoted, and a stationary platen, whereby a bale may be compressed between the platens, the lifting movement of said lever-arms continued beyond 95 their horizontal position, and the strain upon the stationary parts of the press transferred on different points thereof as the fulera are moved.

LOUIS BLOCK.

Witnesses:

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