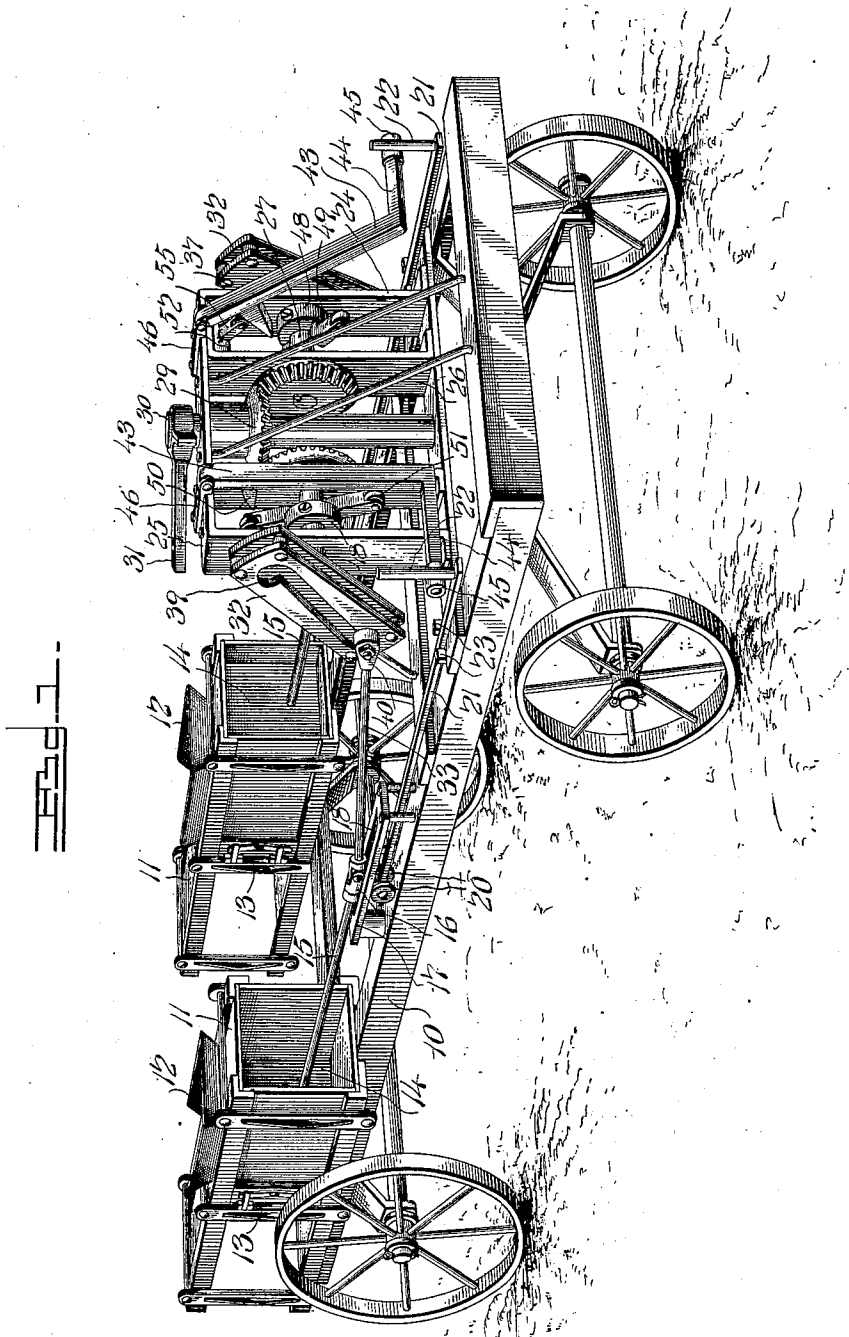
No. 628,001. Patented July 4, 1899.

C. HARRINGTON.

BALING PRESS.

(Application filed Jan. 3, 1899.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses
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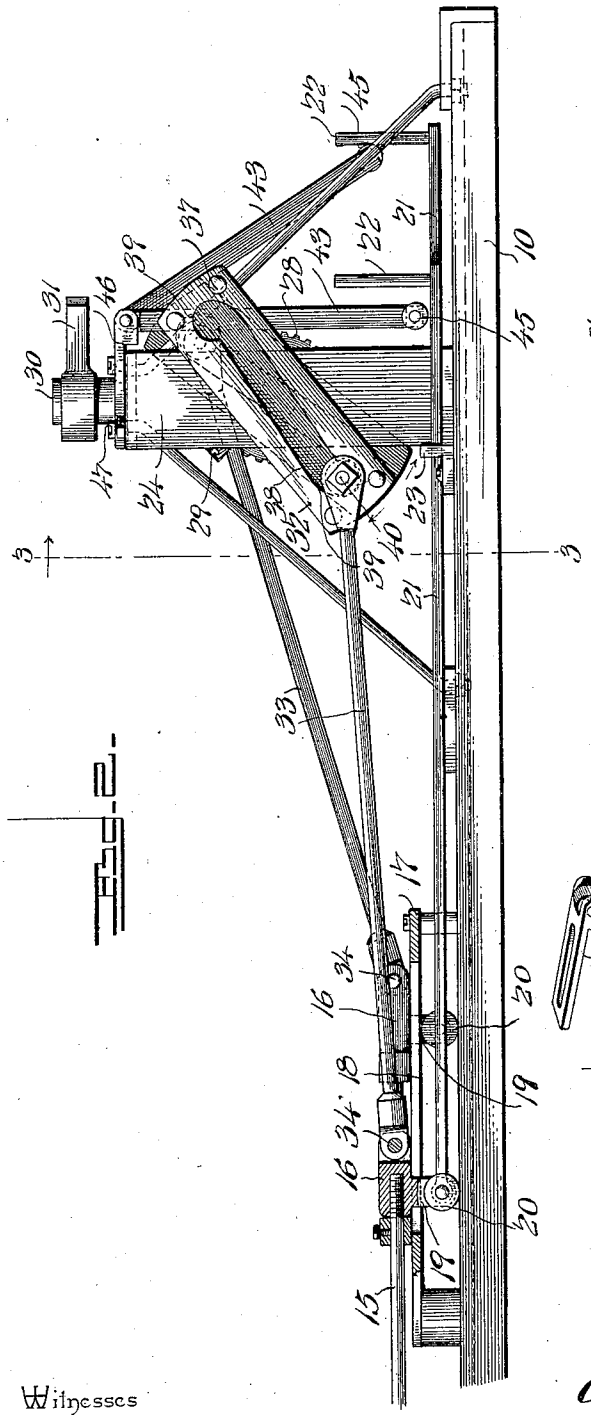


FIG. 2.

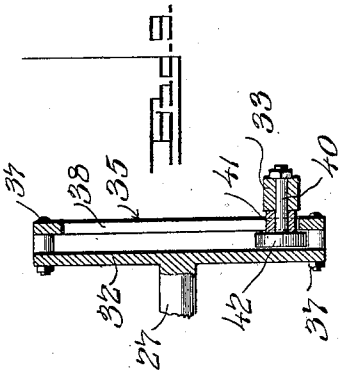


FIG. 3.

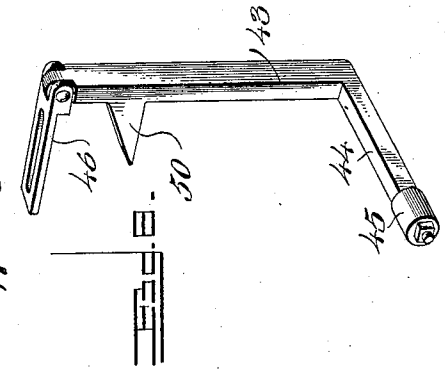


FIG. 4.

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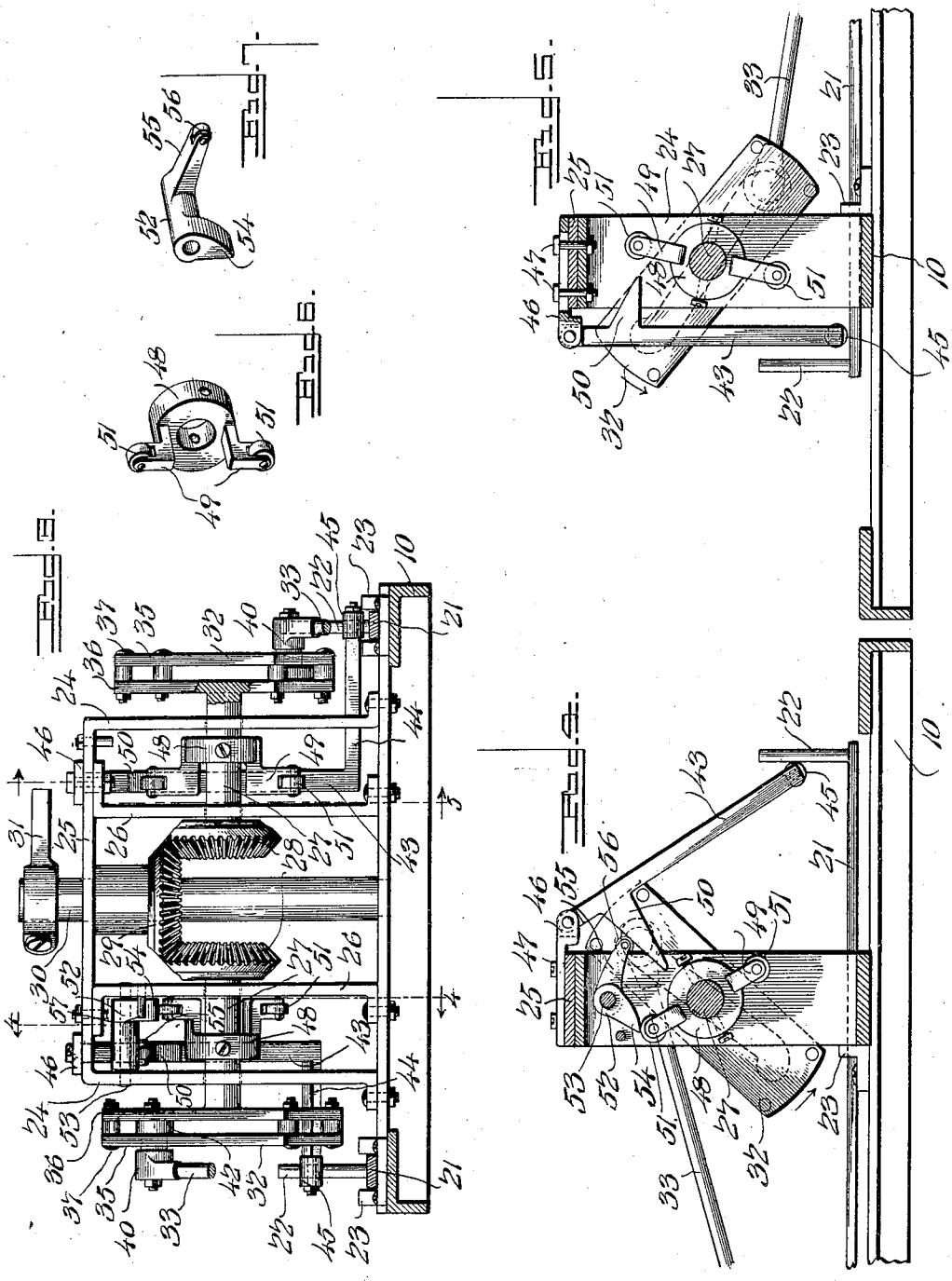
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UNITED STATES PATENT OFFICE.

CHARLES HARRINGTON, OF BARTLETT, TEXAS, ASSIGNOR OF ONE-HALF TO EDWARD ROWNTREE, OF SAME PLACE.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 628,001, dated July 4, 1899.

Application filed January 3, 1899. Serial No. 701,006. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HARRINGTON, a citizen of the United States, residing at Bartlett, in the county of Williamson and State of Texas, have invented a new and useful Baling-Press, of which the following is a specification.

My invention relates to baling-presses of that class especially designed for baling hay and also adapted for use in baling other analogous materials; and the object in view is to provide a simple, compact, and efficient plunger-operating mechanism or power adapted for driving a plurality of plungers in a corresponding number of baling-chambers, such driving mechanism being so constructed as to accomplish the full rebound of each plunger preparatory to a forward or baling stroke irrespective of the rebound of the plunger due to the expansion of the baled material, the parts being so constructed and related as to reduce the factor of friction to the minimum, and thus attain efficiency of operation with the minimum power applied to the drive-shaft.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a baling-press of the plural or double chamber type constructed in accordance with my invention. Fig. 2 is a side view of the plunger-operating mechanism, one of the plunger-rods being shown approximately at the limit of its forward or operative stroke and the other approximately at the limit of its rearward or return stroke. Fig. 3 is a transverse vertical section of the machine upon the plane indicated by the line 3 3 of Fig. 2, showing the plunger-operating mechanism in rear elevation. Fig. 4 is a vertical longitudinal section of the plunger-operating mechanism on the plane indicated by the line 4 4 of Fig. 3. Fig. 5 is a similar view taken upon the plane indicated by the line 5 5 of Fig. 3. Fig. 6 is a detailed view in perspective of one of the main trip-cams detached. Fig. 7 is a similar view of the auxiliary trip-cam which is used in connection with one of the trip-levers. Fig. 8 is a detail view in perspective of one of the trip-levers detached. Fig. 9 is a detail sectional view of one of the plunger-operating crank-heads with the sliding wrist-pin arranged in operative relation thereto.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

Supported by a suitable frame 10, which may be mounted upon trucks, as illustrated in Fig. 1, are baling boxes or chambers 11, having feed-hoppers 12 and suitable detents 13, and mounted for reciprocatory movement in said chambers are the baling-plungers 14, all of the ordinary or any preferred construction. The plunger rods or stems 15 are provided with cross-heads 16, mounted upon guides 17, which may be slotted, as shown at 18, to receive a depending tongue 19, upon which is mounted a bearing-roller 20 to traverse the adjacent side beam of the supporting-frame, whereby the friction due to the thrust of the operating members, as hereinafter explained, is reduced to the minimum. Pivotally connected to the tongue 19 and preferably mounted upon the spindle of the antifriction-roller 20 is a return-rod 21, provided at its extremity with a projection or pin 22, the return-rod extending through a suitable guide 23, supported by the frame 1, and being adapted to reciprocate with the plunger rod or stem and also being adapted through its pin 22 to receive a return impulse for withdrawing the plunger after each forward stroke thereof preparatory to the succeeding forward stroke.

Erected upon the supporting-frame, preferably near the front end thereof, is a power-frame having main uprights 24, connected by a cross-bar 25, and also including auxiliary uprights 26, which are parallel with the main uprights and are spaced inward therefrom, as shown clearly in Fig. 3. Mounted in transversely-alined bearings in the uprights 24 and 26 are crank-shafts 27, provided at their inner ends with bevel-gears 28, with which meshes the drive-gear 29, carried by a drive-shaft 30, which is mounted vertically in a bearing in the cross-bar 25. Any suitable means may be employed for communicating rotary mo-

tion to the drive-shaft 30, but in the drawings I have deemed it sufficient to illustrate an operating-lever 31. It is obvious that the rotation of the drive-shaft 30, which is adapted for continuous motion in a uniform direction, will communicate rotary motion in opposite directions to the crank-shafts 27, and through crank-heads 32, carried by said crank-shafts at their outer ends, motion is communicated to the pitmen 33, which are pivotally connected, as at 34, to the cross-head 16, it being understood that the cross-head, guide, return-rod, and coöperating parts are duplicated to correspond with the number of baling-boxes employed in the machine.

Each crank-head consists of parallel outer and inner cheeks or plates 35 and 36, connected by transverse bolts 37, and the outer cheek or plate is provided with a cam-guide 38, which in the construction illustrated consists of a slot disposed obliquely with relation to the length of the crank-head and terminating in seats 39, facing in opposite directions, for the reception of a shifting or movable wrist-pin 40, which operates in the guide-slot. In practice I prefer to provide each wrist-pin with an antifriction-sleeve 41, which is interposed between the head 42 of the wrist-pin (and which operates between the inner and outer cheeks of the crank-head) and the inner or adjacent surface of the pitman 33, whereby in operation the frictional contact of the wrist-pin in traversing the main portion of the guide between the terminal seats 39 is reduced to the minimum.

As above indicated, the driven shafts 27 rotate in opposite directions, due to the engagement of a single drive-gear 29 with the receiving or driven gears 28, and therefore the crank-arms operate in reverse or opposite directions, and in order that each wrist-pin may be effectually positioned in one of the terminal seats of the coöperating crank-arm during the forward movement of the connected plunger it will be seen that the seats 39 must face forward or in the direction of movement during the operation of the mechanism. The wrist-pin of one of the pitmen, however, is positioned in the upper seat of the coöperating crank-arm during the forward or return movement of said pitman, while the wrist-pin of the other pitman is positioned in the seat at the lower end of the operating crank-head during the forward or operative movement thereof; but owing to the bearing-rollers 20 the thrust due to the inclination of the pitmen is prevented from causing undue friction between the cross-head of the plunger rod or stem and the guide.

Pivotally or hingedly mounted upon the framework in coöperative relation with each return-rod 23 is a trip-arm 43, having a transverse extension or pressure-finger 44 for contact with the pin 22, and in practice I prefer to provide said trip-arm with an antifriction-roller 45 to reduce to the minimum the frictional contact between said parts, the function of said trip-arm being to apply return pressure to the pin, and thus actuate the return-rod 23 to withdraw the connected plunger after each forward stroke preparatory to the succeeding stroke. In the construction illustrated the trip-arms are hingedly mounted upon securing-plates 46, arranged in contact with the cross-bar 25 of the power-frame, said securing-plates being longitudinally slotted, as shown, for engagement by screws or bolts 47, whereby longitudinal adjustment of the securing-plates may be attained to vary the pivotal points of the trip-arms to suit the positions of the trip-arm-operating elements of the mechanism, as hereinafter set forth.

The trip or return arm operating mechanism as I prefer to construct it consists of trip-cams 48, having collars embracing and suitably secured to the driven shafts 27 and having arms 49 for successive contact with the trip-arms 43 or preferably with projections 50 from said arms, the arms 49 in the construction illustrated being provided with antifriction-rollers 51 to traverse the surface of the projection 50, while imparting return movement to the trip-arms 43. While at one side of the power mechanism the main trip-cam 48, as above described, may operate directly upon the projection 50 of the trip-arm 43, at the other side of the mechanism, where the driven shaft 27 turns in the reverse direction, it is preferable in order to maintain a uniform construction of trip-arm 43 to interpose an auxiliary trip-cam 52, also having a barrel or sleeve mounted upon a suitable pivot-pin 53, carrying a cam-faced ear 54 for engagement successively by the arms 49 of the main trip-cam, and also provided with an arm 55 for contact with the projection 50 of the trip-arm, said arm 55 being provided with an antifriction-roll 56.

In operation continuous rotary motion in a uniform direction is communicated to the driving-shaft 30 to impart rotary motion in opposite directions to the driven shafts 27. This causes the movement of the crank-heads in the directions indicated by the arrows in Fig. 2 while the near or adjacent crank-head is approaching the completion of its movement in advancing the connected pitman 33. As the motion of said near or adjacent crank-head proceeds the wrist-pin will be free to leave the seat 39, in which it has been arranged, and simultaneously therewith one arm of the coöperating main trip-cam 48 will come in contact with the projection 50 of the adjacent trip-arm 43, said relation of parts being indicated in Fig. 5, where the said arm of the main trip-cam is about to engage the projection 50. The continued movement of the crank-arm, therefore, will impart swinging movement to the trip-arm to bring the pressure-finger 44 thereof into contact with the pin 22, and thus impart return movement to the plunger, and this return movement will continue until the arm 49 of the trip-cam leaves the projection 50, whereupon the trip-arm will return to its nor-

mal pendent position. (Indicated in Fig. 5.) In Fig. 4 is shown the position of the trip-arm as it approaches the limit of its plunger-returning movement; but in said Fig. 4 I have illustrated the other member of the operating mechanism from that which is illustrated in Fig. 5, or, in other words, that member wherein the intermediate auxiliary trip-cam 52 is employed. The operation in this portion of the mechanism is analogous to that just described in that as the connected pitman approaches the limit of its forward or baling stroke, and thus approaches that position at which the attached wrist-pin will be released from the seat in which it has been fitted, an arm of the main trip-cam will come in contact with the arm 54 of the auxiliary trip-cam to communicate motion, through the arm 55, to the projection 50 of the adjacent trip-arm, and when the trip-arm has been swung outward from the plane of the supporting-frame a sufficient distance to return the plunger to its normal or initial position the arm 55 will release the projection 50 and allow the trip-arm to return to its normal pendent position. It will be seen that with the construction illustrated two forward strokes are imparted to each plunger during one complete revolution of each driven shaft, and at the limit of each forward or baling stroke the plunger will be positively returned by mechanical means to its initial position preparatory to the succeeding stroke. A stop 57 may be arranged in the path of operative movement of the auxiliary trip-cam to limit the swinging movement thereof, and in order that the auxiliary trip-cam may be returned after each operative movement to a position preparatory to a succeeding engagement by the main trip-cam the arm 55 and the projection 50 may be made of such relative lengths that the former does not at its extremity leave the surface of the latter, as will be seen by reference to Fig. 4, but remains in such a position that when the auxiliary cam is released by the main cam the weight of the trip-arm 43 will operate to return the auxiliary cam to its initial position.

It will be understood in practice that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

1. In a baling-press, the combination with plungers, and means for imparting forward or baling motion thereto, and for releasing the same at the limit of their forward or baling motion, of reciprocatory return elements connected with the plungers, oscillatory trip-arms for contact with said return elements, oppositely-revoluble main trip-cams actuated by the plunger-operating means, one of said trip-cams being adapted for periodic contact with a trip-arm to impart plunger-returning movement thereto, and an auxiliary trip-cam actuated by the other main trip-cam, and adapted for periodic contact with the other trip-arm, substantially as specified.

2. In a baling-press, the combination with a plunger, and means for imparting forward or baling motion thereto, and for releasing the same at the limit of its forward or baling motion, of a return-rod operatively connected with the plunger and provided with a bearing-pin, an oscillatory trip-arm adapted for contact with said bearing-pin to impart motion in one direction to the return-rod, and a continuously-operated rotary trip-cam, actuated by the plunger-operating means, for periodic contact with the trip-arm, to communicate plunger-returning motion to the return-rod, substantially as specified.

3. In a baling-press, the combination with a plunger, and means for imparting forward or baling motion thereto, and for releasing the same at the limit of its forward or baling motion, of a return-rod operatively connected with the plunger and provided with a bearing-pin, an oscillatory trip-arm arranged for contact with said bearing-pin and provided with a rearwardly-extending projection, and a continuously-operated rotary trip-cam, actuated by the plunger-operating means, and provided with an arm for periodic contact with said projection of the trip-arm, to impart plunger-returning movement thereto, substantially as specified.

4. In a baling-press, the combination with reciprocatory plungers, of plunger-operating mechanism consisting of shafts mounted for rotation in opposite directions and operatively connected respectively with the plungers, means for communicating motion to said shafts, said connections being adapted to release the plungers at the limits of their advance movements, return-rods operatively connected respectively with the plungers and provided with bearing-pins, oscillatory trip-arms arranged in operative relation with said bearing-pins and provided with rearward projections, trip-cams carried respectively by said shafts, the projection of one of said trip-arms being arranged in the path of an arm of one of the main trip-cams, and an auxiliary trip-cam having a bearing-ear arranged in the path of an arm of the other main trip-cam, and having an arm in the path of which said projection of the other trip-arm is arranged, substantially as specified.

5. In a baling-press, the combination with a plunger, and plunger-operating mechanism including a shaft, of a return-rod operatively connected with the plunger and provided with a bearing-pin, a trip-arm adapted for periodic contact with said bearing-pins to impart plunger-returning movement to said return-rod, an adjustable securing-plate upon which said trip-arm is pivotally mounted for swinging movement, means for fastening said securing-plate at the desired adjustment, and an armed trip-cam carried by said shaft for periodic contact with a projection on the trip-arm, the

adjustment of said securing-plate being adapted to vary the relation of the pivotal point of the trip-arm with the axis of movement of the trip-cam, substantially as specified.

6. In a baling-press, the combination with a supporting-frame, baling-chambers, and reciprocatory plungers arranged in the chambers, of plunger-operating mechanism having oppositely-revoluble coaxial driven shafts carrying crank-heads, a single driving-shaft operatively geared with said driven shafts, shifting wrist-pins mounted upon said crank-heads and adapted to occupy positions at opposite sides of the axes of the driven shafts, said crank-heads being provided with spaced seats for engagement with the wrist-pins to impart plunger-advancing movement to said pins, cross-heads 16 connected with the plungers for movement therewith, guides parallel with the paths of the plungers upon which said cross-heads are mounted, pitmen connecting the cross-heads with said wrist-pins, and bearing-rollers carried by the cross-heads for receiving the thrust of the pitmen, said bearing-rollers being adapted to traverse bearing-surfaces of the supporting-frame, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHAS. HARRINGTON.

Witnesses:
J. T. DILLARD,
B. D. MCKINZIE.