

(No Model.)

3 Sheets—Sheet 1.

G. A. KEITH.
BALING PRESS.

No. 551,771.

Patented Dec. 24, 1895.

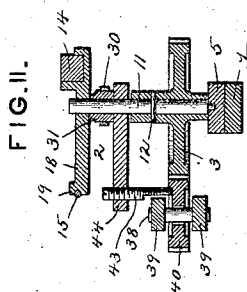


FIG. 12.

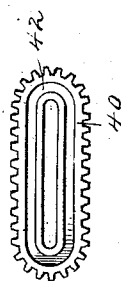
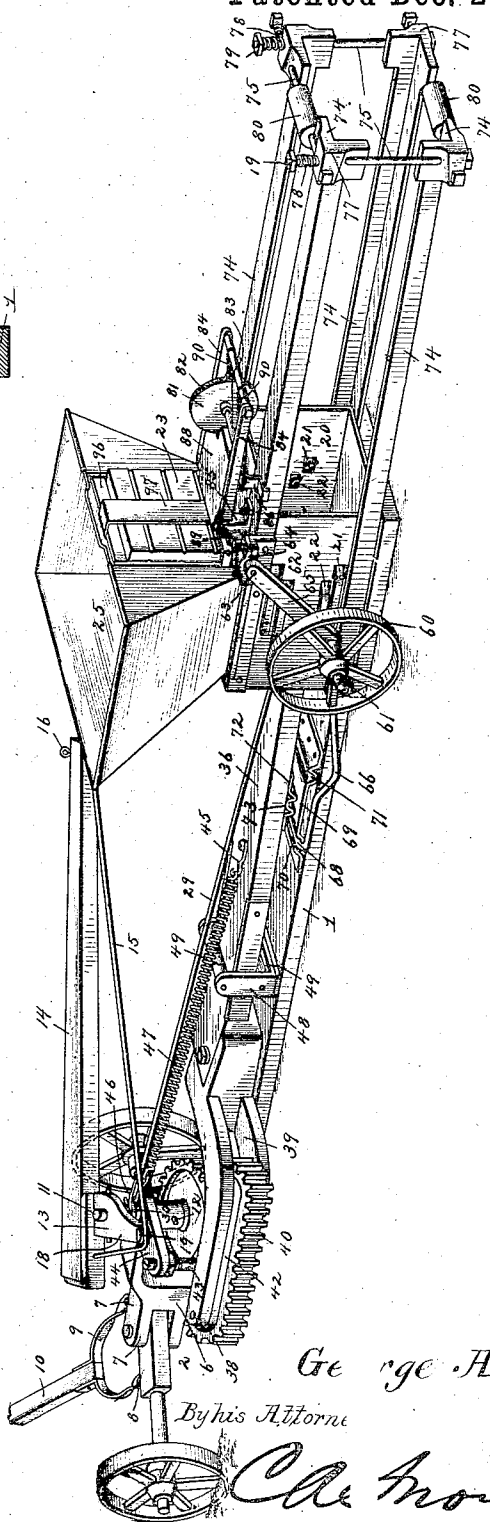


FIG. 1.



Witnesses

Harry L. Amer.
[Signature]

Inventor

George A. Keith.

By his Attorney

[Signature] Charles Knowlton.

(No Model.)

3 Sheets—Sheet 2.

G. A. KEITH.
BALING PRESS.

No. 551,771.

Patented Dec. 24, 1895.

FIG. 2.

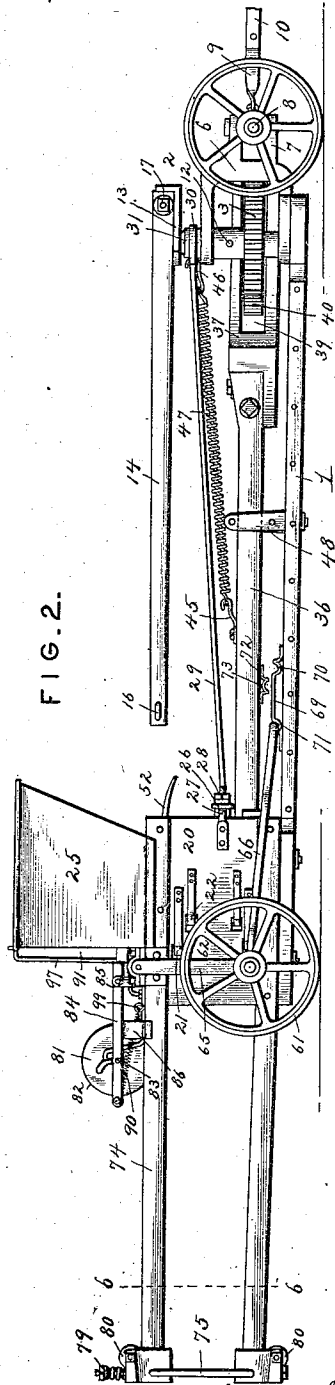
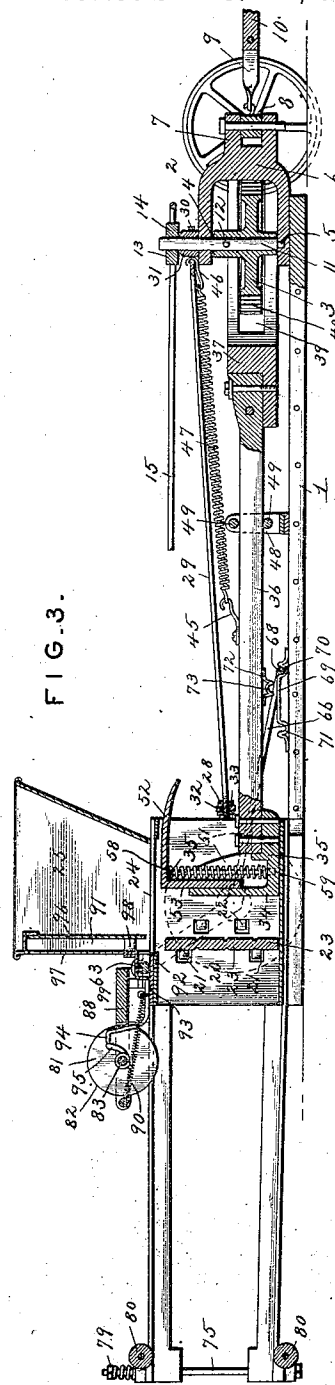


FIG. 3.



Witnesses

Harry L. Amer.
[Signature]

By His Attorneys,

George A. Keith.
[Signature]

Inventor

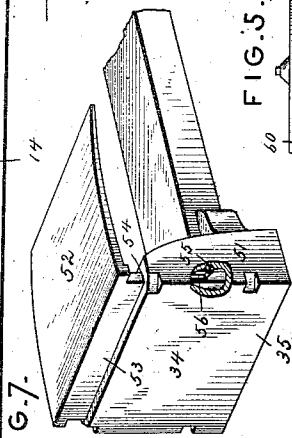
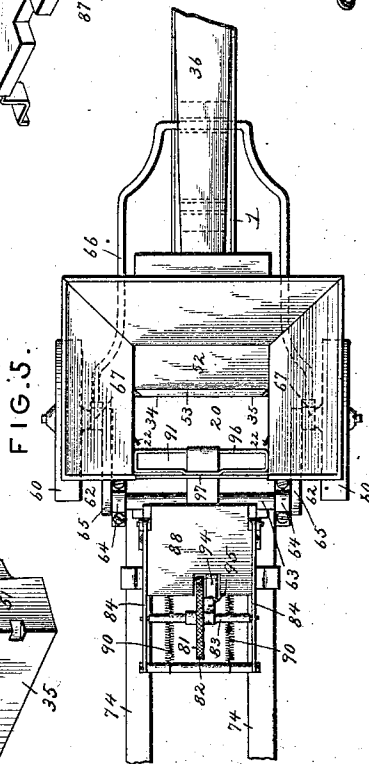
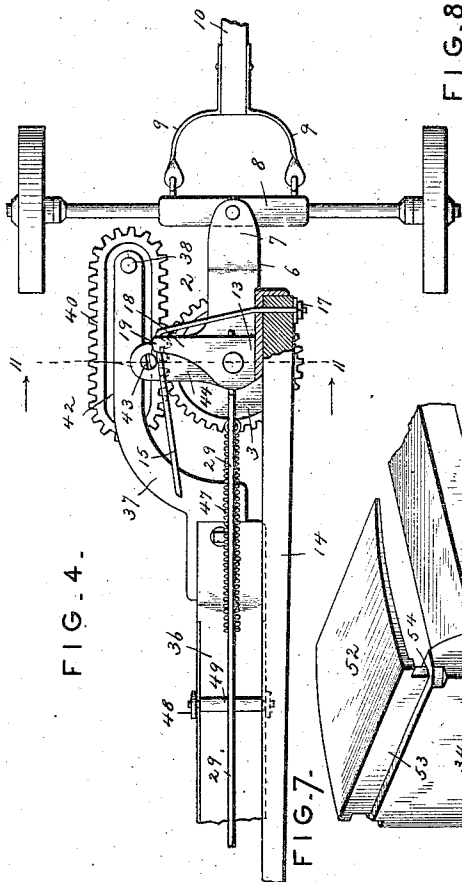
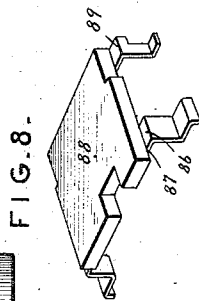
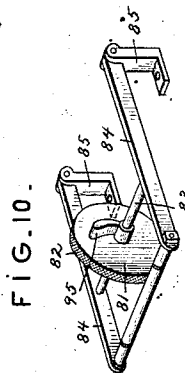
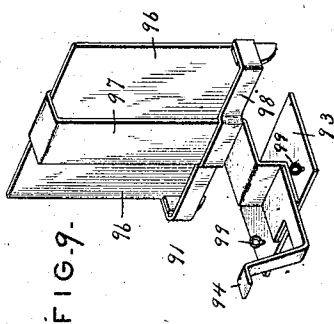
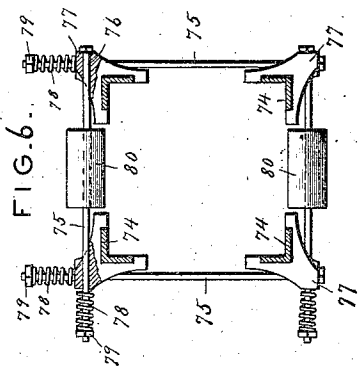
(No Model.)

3 Sheets—Sheet 3.

G. A. KEITH.
BALING PRESS.

No. 551,771.

Patented Dec. 24, 1895.



Witnesses
Harry L. Amer.
[Signature]

By his Attorneys,

Inventor
George A. Keith.
Cashnow & Co.

UNITED STATES PATENT OFFICE.

GEORGE A. KEITH, OF SAGINAW, TEXAS.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 551,771, dated December 24, 1895.

Application filed November 14, 1894. Serial No. 528,805. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. KEITH, a citizen of the United States, residing at Saginaw, in the county of Tarrant 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, and has for its objects to provide a simple and efficient apparatus embodying a rebounding plunger; to provide means for regulating the resistance offered to the advance movement of the forward head-block; to provide improved means for tucking the material during the advance movement of the plunger; to provide means for regulating the length of a bale; to provide means for automatically inserting a head-block when a bale of the desired length has been formed; and to provide means whereby the raising and lowering of the press-box or baling-chamber is accomplished by the draft-horses through the sweep, and without the use of jacks or other analogous devices.

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

In the drawings, Figure 1 is a perspective view of a baling apparatus embodying my invention, showing the parts in their operative positions. Fig. 2 is a side view of the machine, viewing it from the opposite side, showing the parts elevated by the supporting or carrying devices and ready for removal. Fig. 3 is a longitudinal central section of the machine, showing it in its lowered or operative position. Fig. 4 is a detail plan view of the power or operating mechanism. Fig. 5 is a similar view of the gage and block-feeding mechanism. Fig. 6 is a transverse vertical section on the line 6 6 of Fig. 2 to show the means for adjusting the front ends of the guides for the head-blocks. Fig. 7 is a detail view of the plunger detached. Fig. 8 is a similar view of the platform for supporting the assistant who feeds the press. Fig. 9 is a similar view of the means for feeding the head-blocks. Fig. 10 is a similar view of the gage apparatus. Fig. 11 is a detail transverse section on the line 11 11 of Fig. 4. Fig. 12 is a detail plan view of the tumbling-gear.

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

1 designates a base-beam, at one end of which is arranged the power or operating mechanism 2, consisting of a master-gear 3, having its spindle arranged in a vertical position, and mounted at its upper and lower ends in bearings 4 and 5 in the arms of a yoke 6, said yoke having a forwardly-extending clip 7, between the upper and lower ears of which is fulcrumed the front axle 8. The hounds 9 of the tongue 10 are loosely connected to said axle. The spindle 11 of the master-gear, to which said gear is fixed by means of a transverse pin 12, extends above the upper arm of the yoke 6, and to the extremity thereof is fixed a bracket 13 at the inner end of the draft-sweep 14, said draft-sweep having a tension or rod brace 15, which is fixed at one end to the outer end of the sweep by passing therethrough and forming a clip 16 and extends through the inner end of the sweep, and is engaged by a nut 17. The bracket 13 is extended outward or from the sweep beyond the spindle 11 to form a bridge 18, provided at its outer end with a seat 19, in which the brace 15 lies. The brace acts as a truss-brace, and by tightening the nut 17 the tension thereof may be adjusted as desired.

Arranged upon the other end of the base-beam is the press-box or baling-chamber 20, provided in its sides with front and rear sets of detents 21 and 22, the interval between the sets of detents being approximately equal to the thickness of a head-block 23, whereby when arranged in the chamber the head-block will be held in proper position for operation until pressed forward by the advance movement of the plunger, as will be more fully explained hereinafter.

The feed-opening 24 in the top of the baling-chamber communicates with a hopper 25, having a vertical front side and a rearwardly-inclined rear side, said front side being approximately over the forward set of detents 21. A cross-bar 26 is provided at its extremities with perforations which receive the rearwardly-extending bolts 27 upon the side walls of the baling-chamber, said bar being held upon said bolts, and being capable of forward

and rearward adjustment by means of nuts 28. A tension brace-rod 29 is provided at its rear end with a ring 30, which fits upon a sleeve 31 upon the upper side of the upper arm of the yoke 6 and is threaded at its front end, extends through a perforation 32 at the center of the transverse bar 26, and is engaged by a nut 33, by which the tension of said brace may be adjusted.

34 represents a plunger to the body portion 35 of which is attached the front end of the stem 36, having a slotted lateral offset arm 37 bolted to its rear end, said arm terminating in a pin 38 which is arranged transversely in the slot 39 to close the rear end thereof. Meshing with the master-gear 3, which receives rotary motion from the sweep-arm 14, is an elongated tumbling-gear 40, having parallel sides and rounded ends and being provided in its upper surface with a continuous guide-groove 42 for the reception of the lower reduced end of a threaded guide-pin 43, arranged in a threaded opening in a lateral projection 44 of the upper arm of the yoke 6. The guide-pin 43 is adjustable by means of its threads to take up lost motion in the guide-groove. During the advance and swinging movements of the tumbling-gear this guide-pin prevents premature lateral deflection, and holds the teeth of the tumbling-gear in operative relation with the teeth of the master-gear.

Attached at its front end to a hook 45 on the plunger-stem and at its rear end to a similar hook 46 which is swiveled upon the sleeve 31, rising from the upper arm of the yoke 6, is a return or rebounding spring 47 to return the plunger to its initial position after the completion of each advance movement. The hook 46 to which the rear end of the spring 47 is connected is engaged with the ring 30 at the rear end of the brace-rod 29. The plunger-stem is guided in its forward and return movements by means of a keeper 48 provided with upper and lower antifriction-rollers 49, and the shock of the plunger as it reaches the limit of its return movement, caused by the rebounding spring, is cushioned by means of the elastic bumpers or cushions 50 which are attached to the front side of the transverse bar 26, said plunger being provided with opposite rearwardly-projecting cheeks 51 to strike said cushions.

Mounted for vertical sliding movement upon the body portion 35 of the plunger, and forming a part of said plunger, is a tucker-plate 52, having its rear end depressed or curved downward to facilitate the return or backward movement of the plunger and provided at its front end with a vertical sliding plate 53 which is fitted between the cheeks 51 with its side edges engaged in guide-grooves 54. Stop-pins 55 are threaded in perforations in the cheeks 51 and engage grooves 56 in the lateral edges of the guide-plate 53, whereby the upward movement of the tucker-plate is limited, and actuating-springs 57 are coiled upon

guide-pins 58 depending from the tucker-plate and fitting in perforations 59 in the floor of the plunger, said springs bearing at their upper ends against the under surface of the tucker-plate, and at their lower ends against the upper surface of said floor.

The ground-wheels 60 are mounted upon the spindles 61 of the crank-axle 62, said crank-axle having a central offset portion 63 which is mounted in bearings 64 upon the upper side of the baling-chamber, the parallel arms 65 of the axle being arranged parallel with and adjacent to the side walls of the chamber. The length of the arms of the crank-axle, or the distance between its central fulcrumed portion and the spindles which carry the wheels, is such that when said arms are in a vertical or approximately vertical position the base-beam is elevated and the weight of the baling-chamber and adjacent portion of the apparatus is supported by said wheels. In order to hold the axle in this position I employ a bail 66, having its arms swiveled by means of rings 67 upon the spindles of the axles and having a transverse connecting portion 68 arranged between the plunger-stem and the base-beam. Fixed to the upper surface of the base-beam is a catch-plate 69 provided at its extremities, respectively, with seats 70 and 71 for the reception of the transverse connecting portion 68 of the bail. The portion of the catch-plate between said seats comprises a holding-plate 72 which is arranged in a plane corresponding with the open upper sides of the seats 70 and 71, and secured to the under surface of the plunger-stem is an auxiliary or movable seat 73 which is adapted to receive the transverse connecting portion 68 of the bail and the open lower side of which is closed by the holding-plate 72 in passing thereover. When the end of the bail is engaged in the stationary seat 70, the arms of the crank-axle are inclined and allow the base-beam to descend and rest upon the surface of the ground, as shown in Figs. 1 and 3; and when the end of the bail is engaged in the seat 71 the arms of the crank-axle are arranged in an approximately vertical position to hold the base-beam out of contact with the ground and thus adapt the machine for movement as in approaching or leaving the place of use. In order to facilitate the adjustment of said parts, or raise and lower the apparatus without employing screw-jacks or similar devices, I provide the above-described auxiliary or movable seat 73 attached to the under side of the plunger-stem. If the parts are in the positions shown in Fig. 2, and it is desired to lower the apparatus and thereby arrange it for operation, the sweep is turned sufficiently to bring the movable seat 73 over the seat 71. The bail is then elevated sufficiently to engage its transverse connecting portion 68 in the movable seat, and the sweep is further operated by the draft-horse to move the bail without strain or jar to the position shown in Fig. 3.

If the parts are in the positions shown in Fig. 3, and it is desired to elevate the base-beam, the sweep is operated to bring the movable seat over the stationary seat 70, and then the sweep is further advanced to carry the transverse connecting portion 68 toward the seat 71. During the movement of the auxiliary seat between one stationary seat and the other the transverse portion of the bail is held in the seat 73 by means of the plate 72.

The forwardly-convergent cross-sectionally angular guides 74 are secured at their rear ends to the angles of the baling-chamber, and are connected at their front ends by tension-rods 75, fitting in perforations 76 in ears or enlargements 77 at the extremities of said guides, and coiled upon said tension-rods outside of the guides are springs 78 held in place by adjusting-nuts 79, whereby the tension of the springs may be adjusted to cause more or less resistance to the outward springing movement of the guides 74 as the bales are successively advanced therebetween. Antifriction-rolls 80 are mounted upon the tension-rods between the extremities of the guides to facilitate the passage therebetween of the bales as they are discharged.

In connection with the above-described apparatus I employ a gage for determining and regulating the length of the bales, in order that they may be of a uniform size, and said gage, in the construction illustrated, comprises a gage wheel or disk 81 having a milled or serrated periphery 82 and a spindle 83 which is mounted in bearings in the sides of a swinging frame 84, said swinging frame being fulcrumed at its rear end to uprights 85, rising from the upper side of the baling-chamber and held from descending below a horizontal position by means of stops 86 disposed upon the guides 74. Upon inward extensions 87 of these stops rests the front end of a platform 88 adapted to support an assistant employed in feeding the press, the rear end of said platform being supported by legs 89 which rest upon the upper side of the baling-chamber.

The circumference of this gage wheel or disk corresponds with the length of the proposed bale, and, as the lower portion of the periphery rests upon the upper side of the bale, one complete revolution of the wheel or disk indicates the length desired and also indicates the time to insert a head-block or follow lower to separate the preceding completed bale from the succeeding bale the construction of which is about to be commenced. The swinging frame which supports the gage wheel or disk allows the latter to rise and fall to accommodate inequalities in the surface of the adjacent side of the bale, and in order to insure a positive pressure of the wheel or disk upon the bale I have found it expedient to employ springs 90.

In order to relieve the assistant of the responsibility of watching the gage wheel or disk and the labor of introducing the head-

blocks at the proper intervals, I employ a feeding device comprising a carrier 91 which operates in an opening in the front side of the hopper above a supporting-ledge 92 and is provided with a sliding plate 93 which operates in a horizontal position to guide the carrier. Projecting forwardly from this sliding plate is an arm 94 which is arranged in the path of a projection 95 on the gage wheel or disk, said projection being adapted, as the wheel or disk is rotated, to engage the extremity of said arm and move the carrier to the rear. The normal position of the carrier is with its lower open side closed by the ledge 92, but when said carrier is repressed by the contact of the projection or cam 95 with the extremity of the arm 94 said open side is moved beyond the ledge 92 and the head-block 23, which has been inserted from the outside and which normally occupies the position shown in Figs. 1 and 2, is allowed to drop vertically and assume a position between the advance detents 21 and the rear detents 22, as shown in Fig. 3. Therefore when the compression of a bale has progressed sufficiently to cause the gage wheel or disk to make one complete revolution the projection or cam carried thereby operates the head-block carrier, and while the hay or other material which is being baled is held from backward movement by the advance detents 21 the head is dropped from the carrier in rear of said detents 21 to separate the completed bale from the space below the hopper. Thus the feeding for the succeeding bale may be commenced without interruption and the completed bale is advanced between the guides until both ends are exposed for tying. The carrier 91 comprises a plate 96 which exactly fits the opening in the vertical front side of the hopper, a vertical keeper 97, and a horizontal keeper 98, said horizontal keeper being arranged near the lower edge of the plate 96 and being connected at an intermediate point to the lower portion of the keeper 97. In order to return the carrier to its normal position after being operated by the projection or cam on the gage wheel or disk, I employ springs, and as the above-described springs 90 may be utilized for this purpose without interfering with their function in connection with the frame 84 they are attached at their rear ends to eyes 99 upon the holding-plate 93. These springs hold the gage wheel or disk in contact with the upper side of a bale, and at the same time serve to return the head-block-carrier to its normal position after the placement of each head-block.

From the above description relating to the operating mechanism it will be understood that the master-gear receives a uniform and positive rotary impulse from the sweep and that the plunger-stem, guided by the keeper 48, has a directly reciprocatory movement, receiving motion at the limit of its forward movement from a rebounding spring to return it to its initial position. The master-gear is permanently in mesh with the tum-

bling-gear, and hence the latter, which is guided by the pin 43, receives alternately a linear and a rotary movement, the linear movement being caused when the master-gear is in engagement with the teeth on one of the parallel sides of the tumbling-gear, and the rotary movement being the result when the master-gear is in mesh with the teeth at the rounded extremities of the same. In other words, the tumbling-gear advances or moves toward the baling-chamber when the master-gear is in engagement with the teeth upon either of its parallel sides, and when the tumbling-gear reaches the limit of its forward movement the front extremity thereof swings rearwardly until its opposite side is in position for engagement by the master-gear. Obviously the swinging movement of the tumbling-gear is accomplished at the limit of each forward movement of the same, and the rotary movement merely accomplishes the reversal of the gear to cause the former front extremity thereof to become the rear extremity, whereby the forward motion of the tumbling-gear may be approximately continuous. As the tumbling-gear advances it forces the plunger-stem forward in a direct line, and as the tumbling-gear turns at the limit of its forward movement the pin 38 at the extremity of the arm 37 carried by the plunger-stem remains stationary, the extremities of the slot in the tumbling-gear being concentric with the toothed extremities of the gear, and when the tumbling-gear has accomplished its rotary movement and is again in position for advance movement, with its slot parallel with the direction of movement of the plunger-stem, the plunger-stem is thrown back by its rebounding spring, the pin 38 passing quickly from the front to the rear end of the slot in the tumbling-gear in position to again receive the forward impulse caused by the meshing of the master-gear with the teeth upon the parallel sides of the tumbling-gear. Thus without the use of trips, and hence without the jar and friction incidental to the use of trips and similar devices for releasing the plunger at the limit of its forward movement, I accomplish the alternate advance and rebound of the plunger and secure a steady and uniform operation of the press.

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 this invention.

Having thus described my invention, I claim—

1. In a baling-press, the combination with a baling-chamber, and a plunger operating therein and having a return-spring, of a master-gear, means for imparting a continuous rotary motion to the master-gear, an arm fixed to the plunger-stem and provided with a pin, and an elongated tumbling gear meshing with the master-gear and having a longitudinal

slot in which the pin carried by said arm operates, substantially as specified.

2. The combination with a baling-chamber, and a plunger operating therein and having a return-spring, of a master-gear, means for imparting rotary motion thereto, a slotted arm fixed to the plunger-stem and having a terminal transverse-pin, and an elongated tumbling-gear meshing with the master-gear, arranged in a plane between the sides of the slot in said arm, and having a longitudinal slot in which operates the terminal-pin of the arm, substantially as specified.

3. The combination with a baling-chamber, and a plunger operating therein and having a return-spring, of a master-gear, means for imparting rotary motion thereto, an arm fixed to the plunger-stem and having a terminal pin, an elongated tumbling-gear meshing with the master-gear, and provided with a longitudinal slot in which operates the terminal-pin of said arm, and a fixed guide-pin engaging a continuous guide-groove in the tumbling-gear, said groove being arranged parallel with the peripheral teeth of the tumbling-gear, substantially as specified.

4. The combination with a baling-chamber, and a plunger operating therein and having a return-spring, of a yoke having upper and lower arms, a master-gear having its spindle mounted in bearings in the arms of the yoke, means for imparting motion to the master-gear, a slotted-arm fixed to the plunger-stem and provided with a terminal-pin, an elongated parallel sided tumbling-gear meshing with the master-gear, arranged in the plane of the slot in said arm and longitudinally slotted to receive the pin carried by said arm, and an adjustable guide-pin threaded in an opening in a lateral projection of the upper arm of said yoke, and engaging a continuous guide-groove in the adjacent side of the tumbling-gear, substantially as specified.

5. The combination with a base-beam, a baling-chamber secured to one end of said beam, and a plunger operating in the baling-chamber and having a stem, and a return-spring, of a yoke fixed to the other end of the base-beam and having upper and lower arms and oppositely extending-ears, a front axle pivotally mounted between said ears and carrying supporting-wheels, a spindle mounted in bearings in the arms of said yoke, a master-gear fixed to said spindle between the arms of the yoke, a sweep-arm secured to the upper end of the spindle, a tumbling-gear meshing with the master-gear and provided with a longitudinal slot, and an arm fixed to the plunger-stem and having a terminal-pin operating in the slot of the tumbling-gear, substantially as specified.

6. The combination with a base-beam, a baling-chamber arranged at one end of the base-beam, and a plunger operating in the baling-chamber and having a stem and a return-spring, of a master-gear, an arm fixed to the plunger-stem and provided with a ter-

minial-pin, a tumbling-gear meshing with the master-gear and having a longitudinal slot for the reception of the terminal-pin, a sweep-arm secured by means of a bracket to the spindle of the master-gear, a bridge formed as an extension of the bracket by which the arm is secured to the spindle of the master-gear, a brace-rod extending at its terminals through the ends of the sweep-arm and at an intermediate point over the bridge, one end of said rod being provided with an eye for the attachment of a whiffletree, and a nut threaded upon the other end of said rod to regulate the tension of the latter, substantially as specified.

7. The combination with a base-beam, a baling-chamber, and a plunger operating therein and having a stem and a return-spring, of a yoke, a master-gear having its spindle mounted in bearings in the yoke, a sweep-arm secured to the spindle of the master-gear, an arm fixed to the plunger-stem and having a terminal-pin, an elongated tumbling-gear meshing with the master-gear and having a longitudinal slot for the terminal-pin, a transverse-bar arranged at the rear end of the baling-chamber and carrying cushions to relieve the shock of the plunger when it reaches the limit of its return movement, means for adjusting said bar, and a brace-rod provided at one end with a ring engaging an extension of the yoke and adjustably secured at the other end to the said transverse-bar, substantially as specified.

8. The combination with a baling-chamber, a plunger operating therein and having a stem, and means for operating the plunger, of ground-wheel spindles mounted for forward and rearward movement in an inclined direction, ground-wheels mounted upon said spindles, and means for temporarily connecting said spindles to the plunger-stem, whereby said spindles may be moved to raise or lower the baling-chamber by the operation of the plunger-stem, substantially as specified.

9. The combination with a baling-chamber, a plunger operating therein and having a stem, an operating mechanism for the plunger, of ground-wheel spindles mounted to swing in an arc of a circle, which descends toward one end, ground-wheels mounted upon said spindles, a bail connected to the spindles, and means for temporarily attaching the loose end of the bail to the plunger-stem, substantially as specified.

10. The combination with a baling-chamber, a plunger operating therein and having a stem, and means for operating the plunger, of ground-wheel spindles mounted to swing in an arc of a circle, ground-wheels mounted upon said spindles, a bail having the terminals of its arms attached to the spindles and having a transverse-portion arranged adjacent to the plunger-stem, a seat carried by the plunger-stem, to receive the transverse-portion of the bail, and means for locking the

spindles in their adjusted positions, substantially as specified.

11. The combination with a baling-chamber, a plunger operating therein, and means for imparting motion to the plunger, of ground-wheel spindles mounted for movement in an arc of a circle, ground-wheels mounted upon said spindles, a bail connected to the spindles and having a transverse-portion arranged adjacent to the plunger-stem, spaced stationary seats for the reception of said transverse-portion of the bail, a movable-seat carried by the plunger-stem and adapted to temporarily receive said transverse-portion of the bail, and a holding or guide-plate arranged between the stationary-seats to hold said transverse-portion in the movable-seat when passing from one stationary-seat to the other, substantially as specified.

12. The combination with a baling-chamber, a plunger operating therein, and means for operating the plunger, of a crank-axle having a central-portion mounted in bearings on the baling-chamber, parallel arms arranged contiguous to the sides of the baling-chamber, and terminal laterally extending spindles, ground-wheels mounted upon said spindles, a bail having its arm connected to the spindles and having a transverse-portion arranged below the plane of the plunger-stem, front and rear stationary seats for the reception of said transverse-portion of the bail, said seats being connected by an interposed horizontal holding or guide-plate, and a movable-seat secured to the under side of the plunger-stem and having an open lower side closed by said holding or guide-plate in traversing the latter, substantially as specified.

13. The combination with a baling-chamber, of a plunger having a body-portion including side parallel checks, a tucker-plate having a depending guide plate fitted at its edges in guide-grooves in the inner surfaces of the checks, springs interposed between the tucker-plate and the body-portion of the plunger to normally hold said plate in its elevated position, and a limiting pin carried by the body-portion and engaging slots in said guide-plate, and means for operating the plunger, substantially as specified.

14. The combination with a baling-chamber, a plunger and operating connections, of a gage-wheel or disk adapted to bear at its periphery upon the surface of a bale, a head-block carrier arranged in operative relation with the feed-opening of the chamber, and connections between said gage-wheel or disk and the carrier whereby a head-block is discharged into the baling-chamber at intervals regulated by the gage-wheel or disk, substantially as specified.

15. The combination with a baling-chamber, a plunger and operating connections, of a vertical head-block carrier mounted to slide horizontally above a stationary ledge contiguous to the feed-opening of the chamber

and having its lower open side normally closed by said ledge, and means for moving the carrier at intervals beyond said stationary ledge to release a head-block, said means including
 5 a gage-wheel and connections, substantially as specified.

16. The combination with a baling-chamber, a plunger and operating connections, of
 10 a head-block carrier having its open lower side normally closed by a ledge, a gage-wheel or disk adapted to bear upon the surface of a bale and rotate by contact therewith, and
 15 a projection or cam on said gage-wheel or disk and adapted to engage an arm or projection of the carrier, said carrier having a return-spring, substantially as specified.

17. The combination with a baling-chamber, a plunger and operating connections, of a carrier normally arranged with its open

lower side closed by a stationary ledge, a piv- 20
 otal frame, a gage-wheel or disk mounted upon said frame to bear against the surface of a bale, springs connecting the free end of said frame with the carrier and serving to
 25 hold the gage-wheel or disk in contact with the surface of a bale and at the same time hold said carrier in its normal position, and
 30 a cam on the wheel or disk to engage an arm of the carrier to move the latter out of operative relation with the stationary ledge, 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.

GEORGE A. KEITH.

Witnesses:

JOHN H. SIGGERS,
 C. E. DOYLE.