

No. 665,191.

C. W. DAVIDSON.
BALING PRESS.

Patented Jan. 1, 1901.

(No Model.)

(Application filed July 9, 1900.)

4 Sheets—Sheet 1.

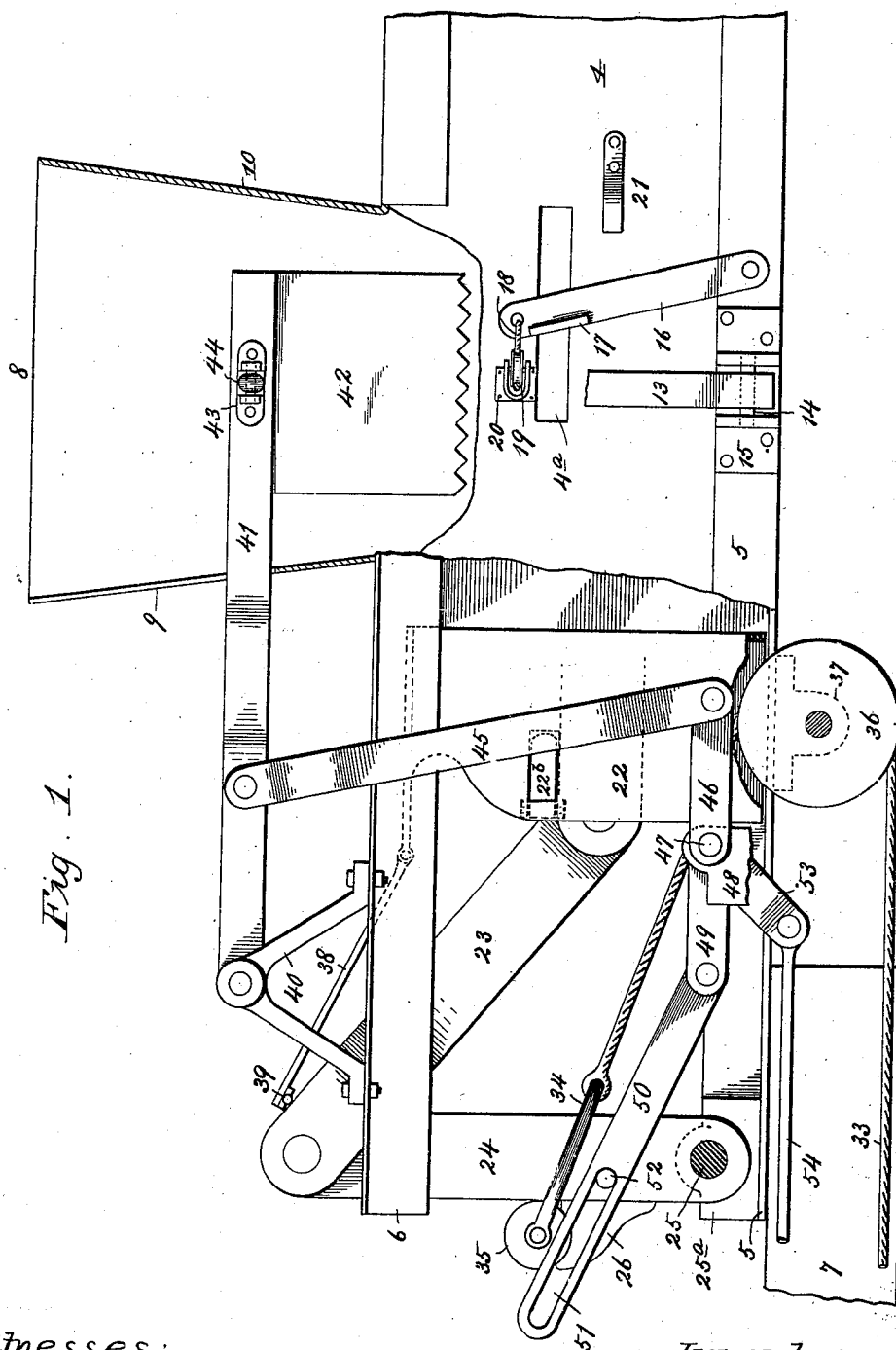


Fig. 1.

Witnesses:

A. C. Rodgers.
A. Cooper

Inventor:

C. W. Davidson

By Fischer & Thayer
Attys.

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4 Sheets—Sheet 2.

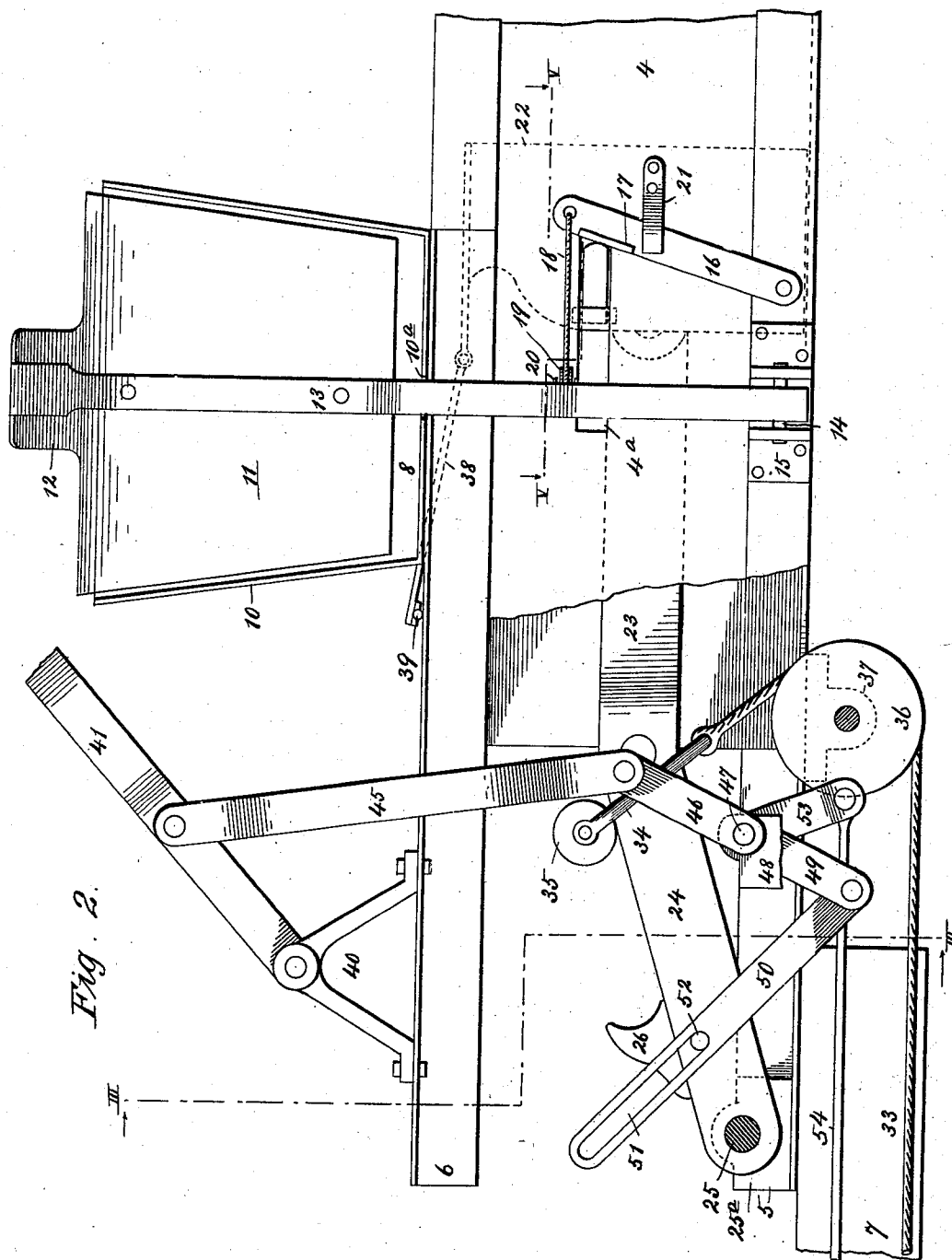


Fig. 2.

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(No Model.)

4 Sheets—Sheet 3.

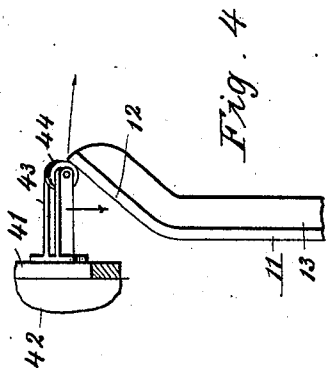


Fig. 4

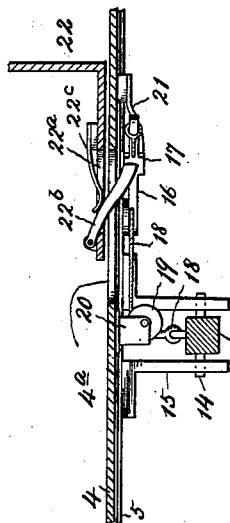
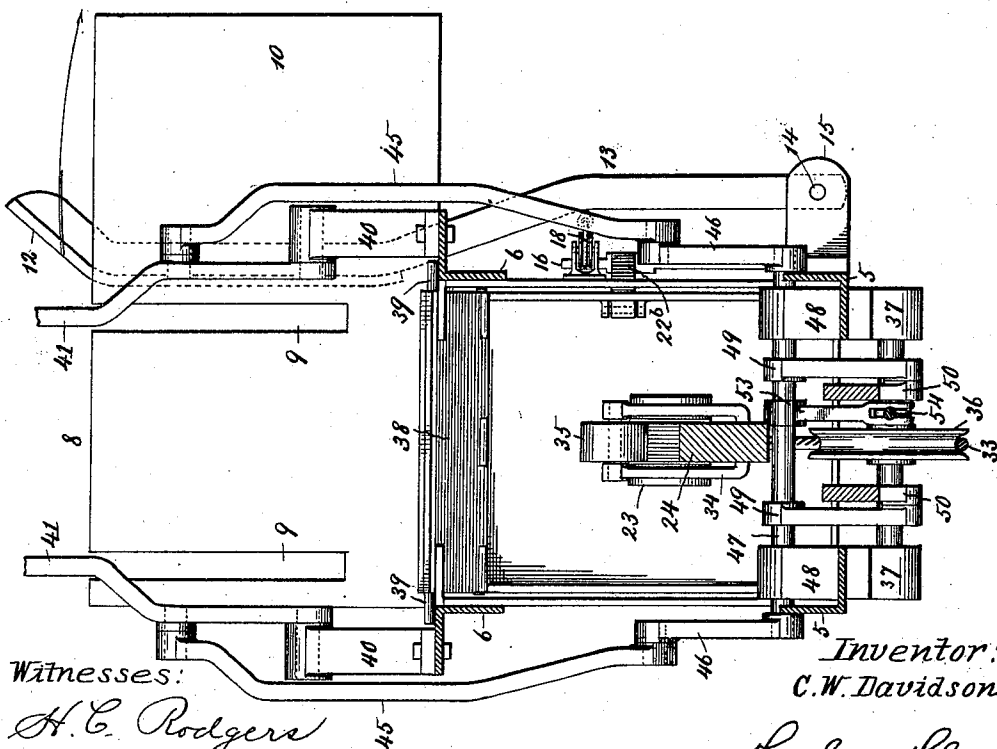


Fig. 5

Fig. 3



UNITED STATES PATENT OFFICE.

CASSIUS W. DAVIDSON, OF KANSAS CITY, KANSAS.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 665,191, dated January 1, 1901.

Application filed July 9, 1900. Serial No. 23,008. (No model.)

To all whom it may concern:

Be it known that I, CASSIUS W. DAVIDSON, a citizen of the United States, residing at Kansas City, Wyandotte county, in the State of Kansas, have invented a new and useful Baling-Press, of which the following is a specification.

My invention relates to baling-presses, and more particularly to that class which automatically condenses and feeds the charge of hay into the baling-chamber and then compresses it in said baling-chamber; and my object is to produce a machine of this character which is positive and efficient in operation.

With this general object in view and others, as hereinafter appear, the invention consists in certain novel and peculiar features of construction and combinations of parts, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a view, partly in side elevation and partly in vertical section, of the baling-chamber end of the machine. Fig. 2 is a similar view with the operative parts occupying different positions from that shown in Fig. 1. Fig. 3 is a cross-section taken on the line III III of Fig. 2. Fig. 4 is a detail view showing the relative positions of the feeder and the condenser as the former descends and forces the latter outward. Fig. 5 is a horizontal section showing the plunger advanced and the mechanism by which the plunger advances and holds the condenser. Fig. 6 is a horizontal section of the power end of the press. Fig. 7 is a vertical section of the same.

Referring to the drawings in detail, where like reference-numerals designate corresponding parts, 1 designates the stationary part of the front end of the machine, the same being adapted to be mounted on wheels (not shown) in any suitable manner.

2 designates the power-shaft, and 3 the usual two-arm trip-lever.

4 designates the baling-chamber, also adapted to be mounted on wheels and provided at one side with the longitudinal slot 4^a and at its lower and upper corners with the rearwardly-projecting angle-irons 5 and 6.

The bed of the machine consists, preferably,

of two bars or timbers 7, connecting the stationary part 1 and the baling-chamber.

8 designates the hopper, provided at its rear side, by preference, with a pair of vertical notches or slots 9 and at one side with a lateral extension 10, forming a condensing-chamber.

11 designates the condenser, arranged to work back and forth in the condensing-chamber to condense the charge in the hopper and bent or formed at its upper end with the upwardly and outwardly inclined shoulder or cam 12 for a purpose which is hereinafter explained, said condenser being secured to the arm or lever 13, operating in a slot 10^a in the bottom of the extension and pivoted, as at 14, to a fixed part on the framework—viz., the brackets 15.

16 designates a lever also pivoted at its lower end to a fixed part on the framework and arranged to operate at right angles to lever 13 and parallel with the side of the machine, said lever being provided near its upper end with flanges 17 to provide a more extended bearing-surface and connected by a cable 18 with the inner side of lever 13, the cable being guided around a pulley 19, secured to bracket 20, forming part of the framework. When lever 16 swings forward, and therefore advances the condenser, it is engaged by the friction-spring 21, secured to the framework, to retain the condenser in its advanced position against the expansive tendency of the condensed charge in the hopper until after the feeder has begun its descent or power-stroke, as hereinafter explained.

22 designates the reciprocatory plunger, of the usual or any preferred construction, provided with an opening 22^a and a pivoted dog 22^b, pressed outwardly by a spring 22^c, in order that when said dog registers with the slot 4^a of the baling-chamber it shall spring outward through said slot and impinging against the lever 16 at the point provided with the flanges 17 force the lever from the position shown in Fig. 1 to the position shown in Fig. 2 and into frictional engagement with retaining-spring 21, said dog on the recoil of the plunger being forced back into the baling-chamber by striking against the front end of the slot. The plunger is connected by a toggle-joint to the rear of the baling-chamber end of the framework, said toggle-joint

consisting of the bar 23, pivoted to the plunger, and bar 24, pivoted to bar 23 at its front end and to the shaft 25, journaled in boxes 25^a, secured to the rear ends of angle-irons 5, (see Figs. 1 and 2,) said bar 24 being provided at its upper or rear edge with a stop-block 26 for a purpose which hereinafter appears.

27 designates a lever journaled upon the power-shaft, below the trip-arm, by preference, and 28 a block pivoted to the outer end of said lever and provided with an arm 29, pivotally connected to a link 30, said link carrying a roller 31, traveling and supported upon the flanged track 32, secured to one of the timbers 7 of the bed.

33 designates a cable secured at its rear end to said link and at its front end to the similar link 34, which straddles toggle-bar 24 from below and carries a roller 35 to travel upon the upper or rear edge of said bar and when the plunger is withdrawn to rest upon the stop-block 26, (see Fig. 1,) said cable extending around the guide-roller 36, journaled in brackets 37, depending from angle-irons 5, said roller and part of the cable when the plunger is withdrawn projecting up into the latter, (see Fig. 1,) because it is of the usual construction and open at the rear side. (See also Fig. 3, which shows that the rear side of the plunger is open.) Hinged to the upper rear edge of the plunger is an apron 38, and journaled in the rear end of the apron and resting at times on bar 23 of the toggle is a shaft or roller 39, said shaft or roller projecting outwardly beyond the sides of the apron, so that as the advance of the plunger depresses the toggle from the position shown in Fig. 1 entirely below the angle-irons 6 (see Fig. 2) said shaft or roller 39 shall rest upon said angle-irons in order that the apron, in conjunction with the plunger, shall form a bottom for the hopper and prevent any hay or straw from dropping down into the baling-chamber in rear of the plunger.

40 designates a pair of arched brackets mounted on the angle-irons 6, and 41 a pair of levers fulcrumed on said brackets and arranged to operate vertically in the notches or slots 9 of the hopper. To the front end of said levers is secured a feeder-block 42, and at one side of said end a bracket 43, carrying a roller 44, the latter in the descent of the feeder being adapted to strike the inclined or cam shoulder 12 of the advanced condenser (see Fig. 4) and force the latter outward, thereby withdrawing lever 16 from its frictional engagement with the retaining-spring 21.

To effect the vertical operation of the feeder, a pair of links 45 pivotally connect lever 41 with the crank-arms 46 of the rock-shaft 47, journaled in boxes 48, secured upon the angle-irons 5.

49 designates a pair of crank-arms projecting from shaft 47 oppositely to arms 46, and pivoted to crank-arms 49 are links 50, provided with longitudinal slots 51, engaging the

opposite ends of a pin 52, projecting from toggle-bar 24.

53 designates a fifth crank-arm depending from the rock-shaft 47 and connected by a pull-rod 54 to a link 55, pivoted to one arm of the bell-crank lever 56, mounted on the machine-bed and having its opposite end in the path of the trip-lever, said lever working, of course, in a horizontal plane.

Assuming that a charge of hay occupies the baling-chamber and the parts are arranged as shown in Figs. 1 and 6, the practical operation of the machine is as follows: It will be noticed that the revolution of the trip-lever by the pressure of one of its roller-carrying arms against block 28 causes arm 27, carrying said block, to swing around from the position shown in full lines to the position shown in dotted lines, Fig. 6, the block moving pivotally on said arm until as said dotted position is attained it is extending practically parallel with the motion of the abutting end of the trip-lever. As said block and arm are thus operated the connected roller 31 rolls rearward on the guide-track 32 and through the instrumentality of cable 33 and roller 35 straightens out the toggle and advances the plunger, the roller 35 as the plunger advances traveling forward upon toggle-bar 24 until it eventually assumes the position shown in Fig. 2, and in this connection it will be noted that as said roller moves forward or said bar an increase of power by increased leverage is gained at a sacrifice of speed in order that the greatest pressure of the plunger may be applied when most needed—namely, at the latter part of the stroke. As the plunger advances the spring-actuated dog 22^b springs outward through slot 4^a and swings the lever 16 forward and the condenser inward to the position shown in Fig. 3, the frictional engagement between lever 16 and spring 21 serving to maintain the condenser in such position for a short time after the recoil of the plunger. As the toggle-bar 24 swings downward and forward with the advance of the plunger the pin 52, bearing against the front end of slot 51, rotates the rock-shaft arms from the position shown in Fig. 1 to the position shown in Fig. 2, and thereby throws the bell-crank lever to the position shown in Fig. 6 for engagement by the adjacent end of the trip-lever just after the opposite end of the latter clears block 28 and elevates the feeder from the position shown in Fig. 1 to the position shown in Fig. 2, the feeder being withdrawn from the hopper, of course, before the condenser is advanced, so as to give time for a charge of hay to be inserted in the hopper in advance of the condenser. The instant the recoil of the plunger takes place, with the result of throwing the toggle from the position shown in Fig. 2 to the position shown in Fig. 1, the trip-lever strikes the opposing arm of bell-crank 56 and operates it in the direction indicated by the arrow, Fig. 6, and through

the medium of the pull-rod 54 throws link 50 rearward and the feeder downward to force the condensed charge of hay in the hopper down into the baling-chamber in advance of the withdrawing plunger, the feeder in its descent, by means of antifriction-roller 44, striking the inclined cam or shoulder 12 of and forcing the condenser outward, the impact of the feeder on said shoulder serving to withdraw lever 16 from its frictional engagement with retaining-spring 21, as will be readily understood. It will be seen that the trip-lever, through the medium of the bell-crank, pull-rod, and crank-shaft 47, depresses the feeder, and that through the instrumentality of link 50 the plunger, should it get stuck in the baling-chamber, will be positively and reliably withdrawn, to the end that the descent of the feeder shall never find the plunger in its path. It will also be noticed that as the operation of the bell-crank and the recoil of the plunger are simultaneous, even though the latter is more rapid, the pin 52 never travels sufficiently fast to affect the descent of the feeder, because said pin never strikes the rear end of slot 51. In fact, if desired the rear end of said slot may be open, as the pin never gets that far back. All succeeding operations are repetitions of those described.

From the above description it will be apparent that I have produced a baling-press which is automatic, positive, and reliable in operation and which is of strong, durable, and comparatively cheap construction, and while I have illustrated and described the preferred embodiment of the invention it is obvious that various modifications may be made as regards its detail construction without departing from its spirit and scope.

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

1. In a baling-press, a baling-chamber, a plunger, a toggle connecting the plunger with the framework, a stop-block on the rear part of the toggle, a pulley attached to the framework, a cable extending around the pulley, a roller engaging the stop-block and the rear part of the toggle and connected to the cable, and means for operating the cable and thereby expanding the toggle, substantially as described.

2. In a baling-press, a baling-chamber, a plunger, a toggle connecting the plunger with the framework, a trip-lever, an arm journaled on the trip-lever, a block pivoted to said arm and provided with a roller-carrying arm suitably guided, and a connection between said roller-carrying arm and the toggle whereby the latter is expanded and the plunger advanced, substantially as described.

3. In a baling-press, a slotted baling-chamber, a hopper communicating therewith and provided with an extension forming a condensing-chamber, a lever pivoted to the framework and carrying a condenser to oper-

ate in said condensing-chamber, a second lever pivoted to the framework, a flexible connection suitably guided between said levers, a reciprocating plunger, means to advance the plunger, and a spring-actuated dog carried by said plunger and adapted near the latter part of the stroke to protrude through said slot and operate said second lever, substantially as described.

4. In a baling-press, a slotted baling-chamber, a hopper communicating therewith and provided with an extension forming a condensing-chamber, a lever pivoted to the framework, and carrying a condenser to operate in said condensing-chamber, a second lever pivoted to the framework, a flexible connection suitably guided between said levers, a reciprocating plunger, means to advance the plunger, a spring-actuated dog carried by said plunger and adapted near the latter part of the stroke to protrude through said slot and operate the second lever, and a retaining-spring secured to the framework to retain said lever in the position to which it is adjusted by said dog, substantially as described.

5. In a baling-press, a baling-chamber provided with a hopper, a lever pivoted to the framework and provided with a feeder to swing down into the hopper and baling-chamber, a rock-shaft journaled in the framework and provided with a crank-arm, a link connecting said crank-arm with said lever, a second crank-arm on said shaft, a bell-crank on the framework connected to said second crank-arm, and means for operating said bell-crank and effecting the descent or feed-stroke of the feeder, substantially as described.

6. In a baling-press, a baling-chamber provided with a hopper, a lever pivoted to the framework, and provided with a feeder to swing down into the hopper and baling-chamber, a rock-shaft journaled in the framework and provided with a crank-arm, a link connecting said crank-arm with said lever, a second crank-arm on said shaft, a bell-crank on the framework connected to said second crank-arm, means for operating said bell-crank and effecting the descent or feed-stroke of the feeder, and means to reëlevate said feeder, substantially as described.

7. In a baling-press, a baling-chamber provided with a hopper, a lever pivoted to the framework, and provided with a feeder to swing down into the hopper and baling-chamber, a rock-shaft journaled in the framework and provided with a crank-arm, a link connecting said crank-arm with said lever, a second crank-arm on said shaft, a bell-crank on the framework connected to said second crank-arm, means for operating said bell-crank and effecting the descent or feed-stroke of the feeder, a plunger to compress the charge forced into the baling-chamber by the feeder, and means to synchronously advance the plunger and operate said crank-shaft to raise said feeder, substantially as described.

8. In a baling-press, a baling-chamber provided with a hopper, a reciprocatory plunger, a toggle connecting the plunger with a fixed part of the framework, a feeder pivoted to the framework and adapted to swing down into the hopper and baling-chamber, a crank-shaft linked to the feeder, a link connected to the crank-shaft and provided with a slot engaging the rear part of the toggle, means for expanding the toggle and thereby advancing the plunger and raising the feeder, and means for operating said crank-shaft to lower the feeder and cause the slotted link to push back upon the toggle, substantially as described.

9. In a baling-press, a baling-chamber provided with a hopper and a condensing-chamber communicating therewith, a condenser to condense the charge in the hopper and provided with an inclined or cam shoulder, and a feeder adapted in its descent to strike said shoulder and force the condenser outward, substantially as described.

10. In a baling-press, a slotted baling-chamber, a hopper communicating therewith and provided with an extension forming a condensing-chamber, a lever pivoted to the framework, and carrying a condenser to operate in said condensing-chamber, a second lever pivoted to the framework, a flexible connection suitably guided between said levers, a reciprocating plunger, means to advance the plunger, a spring-actuated dog carried by said

plunger and adapted near the latter part of the stroke to protrude through said slot and operate the second lever, a retaining-spring secured to the framework to retain said lever in the position to which it is adjusted by said dog, a feeder, and means to swing the feeder outward as the recoil of the plunger takes place and cause it by striking the condenser to overcome the resistance of said retaining-spring and force the condenser outward, substantially as described.

11. In a baling-press, a baling-chamber, a plunger, a shaft, an arm journaled thereon, a block pivoted to said arm and provided with an arm having one end guided to reciprocate in alinement with the plunger movement, a trip-lever to engage said block and simultaneously operate the carrying-arm and turn the block pivotally thereon, and a connection between said reciprocatory end of the block-arm and the plunger whereby movement of the former imparts advance movement to the latter, and the recoil of the latter causes the block-carrying arm to swing back to the position it occupied before being moved by the trip-lever, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

CASSIUS W. DAVIDSON.

Witnesses:

H. C. RODGERS,
G. Y. THORPE.