No. 676,777. Patented June 18, 1901.

P. C. SOUTHWICK.

BALING PRESS.

(Application filed Sept. 14, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1

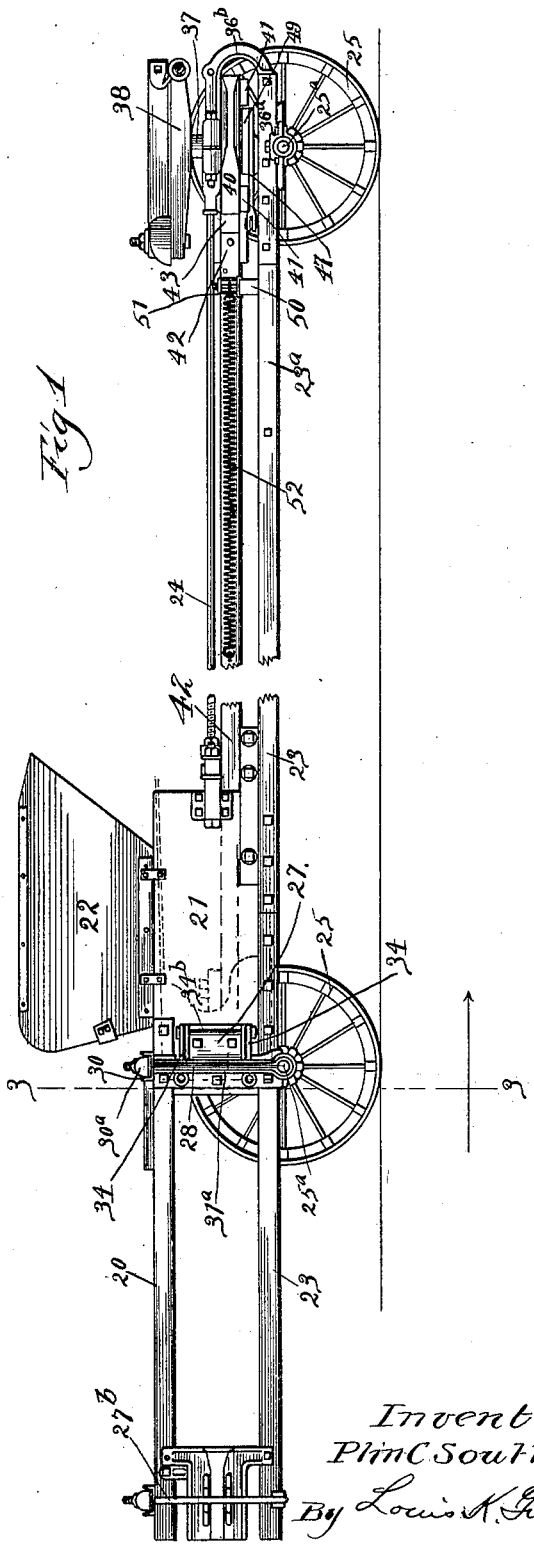
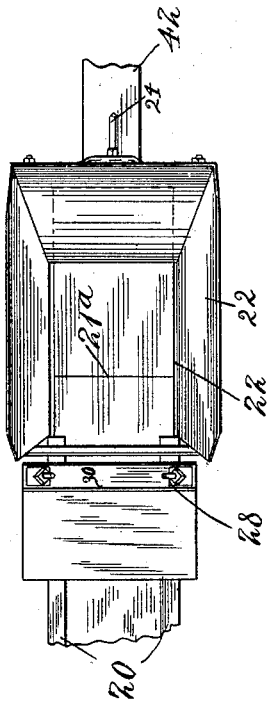


Fig. 2



Witnesses.
W. C. Coolidge
Watson Hurlburt

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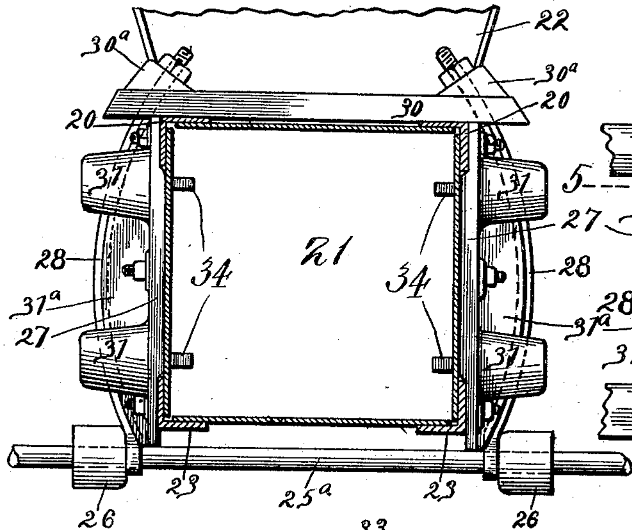


Fig 3

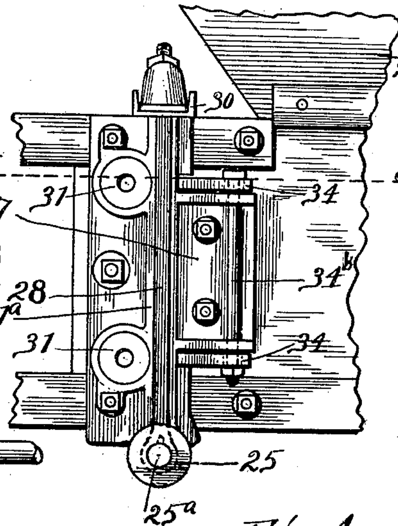


Fig 4

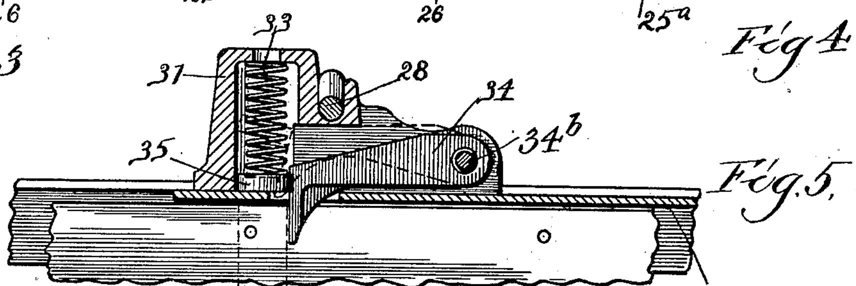
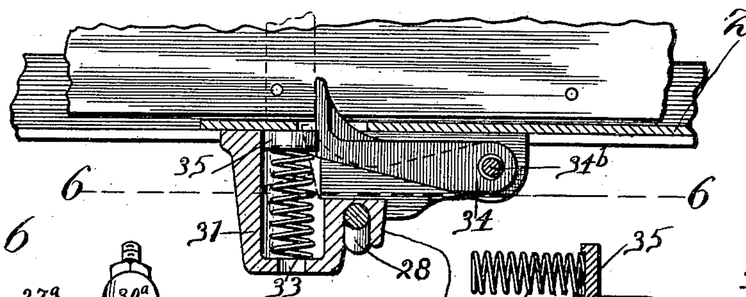


Fig. 5.



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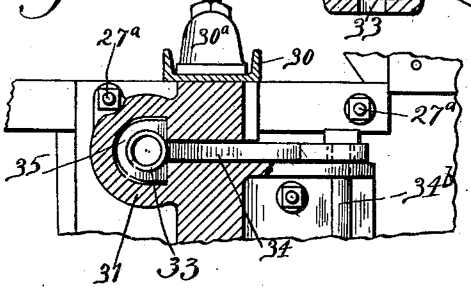

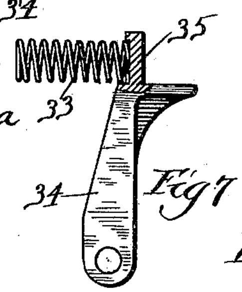

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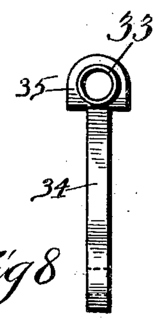

Fig 8

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No. 676,777. Patented June 18, 1901.

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(No Model.) 4 Sheets—Sheet 3.

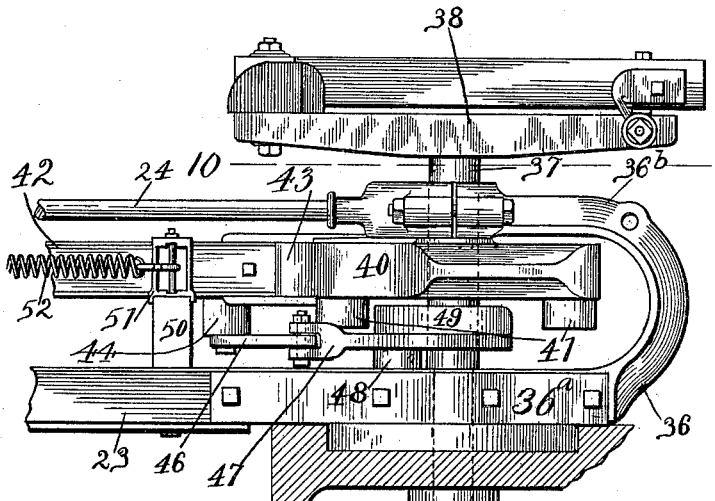

Fig. 9.

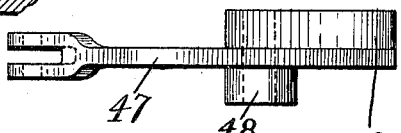

Fig 11

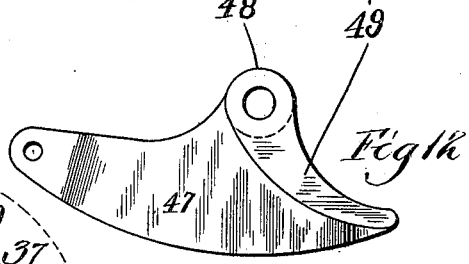

Fig 12

Fig 10

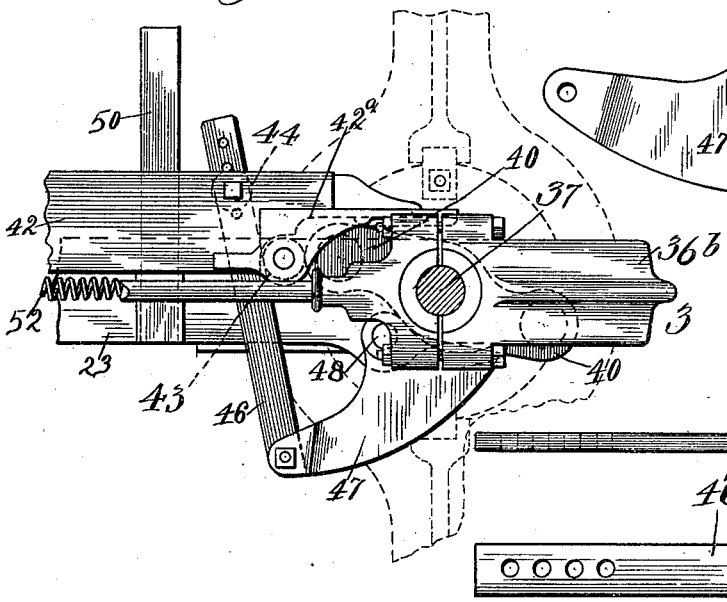

Fig 13

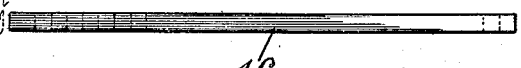

Fig 14

Witnesses
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(Application filed Sept. 14, 1900.)

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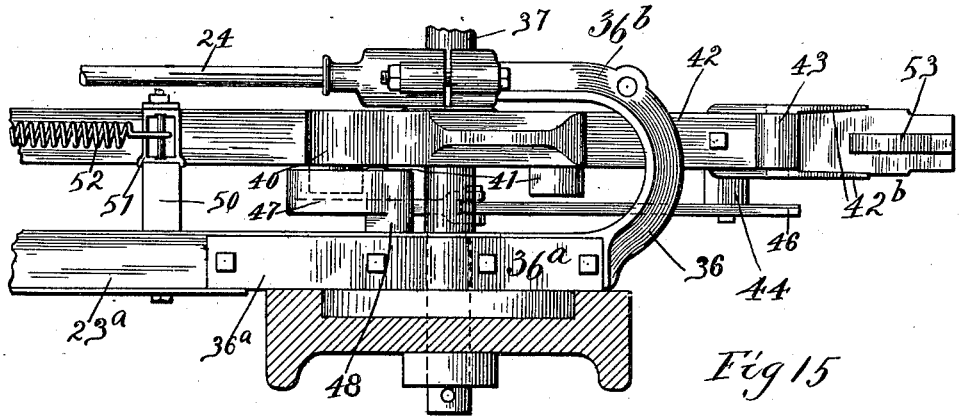

Fig 15

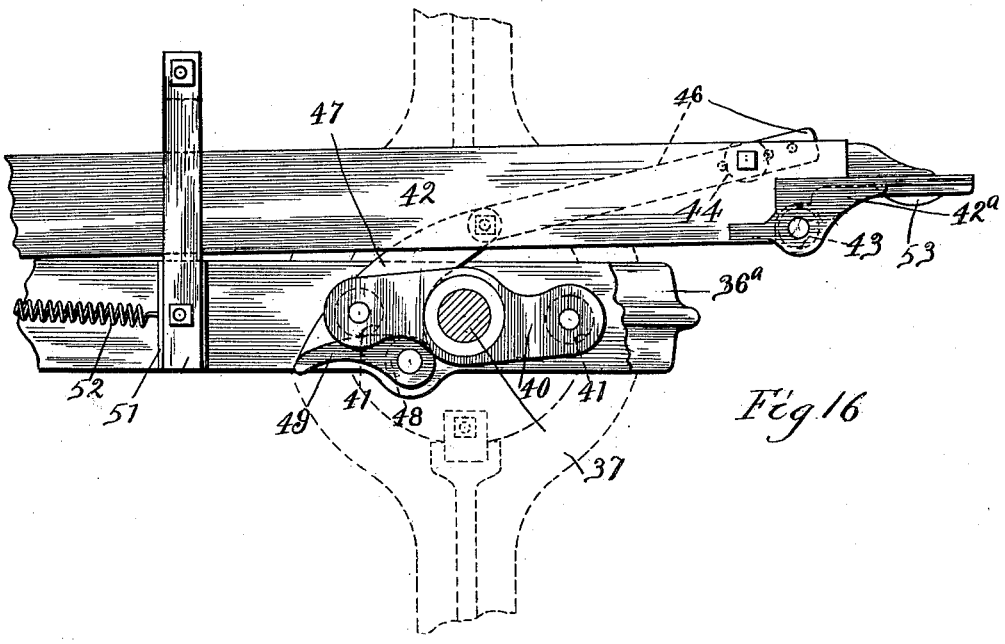

Fig 16

Witnesse
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UNITED STATES PATENT OFFICE.

PLIN C. SOUTHWICK, OF SANDWICH, ILLINOIS.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 676,777, dated June 18, 1901.

Application filed September 14, 1900. Serial No. 30,079. (No model.)

To all whom it may concern:

Be it known that I, PLIN C. SOUTHWICK, a citizen of the United States, and a resident of Sandwich, county of Dekalb, and State of Illinois, have invented certain new and useful Improvements in Baling-Presses, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

This invention relates to that type of baling-presses in which a compressing-plunger reciprocates within the baling-chamber and in which the power is applied from a sweep-driven power-shaft directly to the plunger-pitman.

The objects of the invention are to improve the means for retaining the compressed material upon the recession of the plunger and to improve the means for applying the power to the pitman, the invention consisting in the parts and arrangement of parts, as hereinafter fully described, and as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the baling-press. Fig. 2 is a detail plan of the same. Fig. 3 is a transverse section on the line 3 3 of Fig. 1. Fig. 4 is a detail side elevation of the body of the press. Fig. 5 is a detail section on the line 5 5 of Fig. 4. Fig. 6 is a detail section on the line 6 6 of Fig. 5. Figs. 7 and 8 are details of parts of the machine. Fig. 9 is a detail side elevation, partly in section, of the power mechanism. Fig. 10 is a plan view of the same, partly in section, and taken on the line 10 10 of Fig. 9. Figs. 11, 12, 13, and 14 are details of certain parts of the power mechanism. Figs. 15 and 16 are views of the power mechanism, the same as Figs. 9 and 10, respectively, with the parts in different positions.

The frame of the body portion of the machine is composed of the angle-irons 23 23, forming the sills, and the angle-irons 20 20, forming the upper corners of the frame. These upper and lower members are bound together at one end by side plates 27 27 and at the other end by the usual contracting-bands 27^b. Each of the plates 27 is provided with an outstanding bowed vertical flange 31^a, and across the top of the frame in line with these plates there is a bar 30. A pair of binding-bands 28, secured to the ends of the bar 30, pass downwardly over the flanges 31^a and are secured at their lower ends to an axle 25^a, being retained in position thereupon by a pair of collars 26 26.

The baling-chamber 21, within which reciprocates a compressing-plunger 21^a, is secured to the frame heretofore described immediately forward of the axle 25^a, and is provided with a feed-hopper 22. Material compressed within the chamber 21 is forced backwardly to the delivery end of the machine past the retaining-hooks 34, which it crowds backwardly out of its path as it advances, and which are forced forwardly by the springs 33 after the passage of the material and hold it against undue expansion upon the recession of the plunger. The retaining hooks 34 may be of any desired number. Four are shown, two on each side. These hooks are pivotally secured to suitable flanges formed upon the side plates 27 by means of pivots 34^b, which fit loosely through the pivot-holes in the hooks.

A chambered boss 31, formed upon the plate 27, serves as a housing for the spring 33, controlling each of the hooks 34, the hook being provided with a shoulder-plate 35, extending into the chamber of this boss and serving as a bearing for the end of the spring. The plate 35 is of greater width than the thickness of the hook 34, and the side wall of the boss 31, slotted for the accommodation of the end of the hook, forms an abutment against which the laterally-projecting portions of the plate bear when pressure is applied to the nose of the hook by the expanding material, so that this solid abutment sustains the pressure exerted upon the hook, thereby relieving the pivot-pin 34^b from undue strain.

A bed-plate 23^a extends forwardly from the sills 23, to which it is rigidly secured, and rests upon a forward axle 25^a. To the forward end of the plate 23^a there is secured a casting 36 by means of side straps 36^a, this casting forming a bearing for the lower end of the power-shaft 37 and having at its front end an upwardly-extending arm 36^b, which is curved backwardly to make a bearing for the upper end of the power-shaft. A brace 24 leads from the upper end of the arm 36^b backwardly

and is secured to the baling-chamber 21. Any suitable form of sweep 38 is fixed upon the upper end of the power-shaft 37.

The pitman 42 extends forwardly from the plunger 21ª and when the plunger is receded projects beyond the power-shaft 37. A cross-bar 40, fixed upon the power-shaft 37, constitutes a pair of crank-arms, from the outer end of each of which there depends a pin 41, carrying an antifriction-roller. A lever 47 is pivoted to the casting 36, as shown at 48, and one of its arms is connected, by means of a link 46, with the pitman. The other arm of the lever is provided with an upstanding flange 49, adapted to receive the pins 41, whereby as the shaft 37 is rotated the lever 47 is swung upon its pivot and draws the pitman forwardly, so as to accomplish the first part of the stroke of the plunger.

At the extreme end of the pitman 42 is mounted a plate 42ª, recessed to receive the crank-arms, which are suitably rounded to engage with the recess. The plate 42ª is provided with top and bottom flanges 42ᵇ, between which there is mounted an antifriction-roller 43 to minimize the wear upon the crank-arms, and this roller also serves a useful purpose in affording a better engagement of the crank-arm with the pitman.

The pivot 48 of the lever 47 is located back of the power-shaft 37, so that the initial engagement of the pin 41 of either of the crank-arms with the flange 49 is near the pivotal point of the lever, and hence the leverage is very slight and the initial movement of the pitman is rapid. As the lever swings upon its pivot the pin 41 slides along the flange 49 to and beyond its outer end, the leverage of course constantly increasing and the speed of the pitman being correspondingly retarded.

The parts are so proportioned that just as the pin which has been in engagement with the flange 49 passes beyond the end thereof the other end of the cross-bar 40 enters the recess of the plate 42ª and completes the advance movement of the pitman 42.

A swell or boss 43, formed upon the face of the plate 42ª near its rearward end, comes into engagement with the side of the cross-bar 40 as the pitman reaches the end of its instroke and forces the pitman laterally away from and out of engagement with the cross-bar.

A retracting-spring 52 is secured to the pitman 42 and to a casting 51, mounted upon a block 50, bolted to the bed-plate 23ª and insures the complete withdrawal of the plunger 21ª.

The operation of the machine is as follows: The material, such as hay, being introduced into the compression-chamber 21 through the hopper 22 is forced backwardly past the retaining-hooks 34 by the plunger 21ª. As the bale accumulates, so that there is exerted great expansive force as the plunger is withdrawn, this pressure is applied to the retaining-hooks 34 and is supported by the shoulder-plates 35, bearing against the walls of the bosses 31 as solid abutments. Power is applied by the rotation of the power-shaft 37, and each end of the cross-bar 40 in turn engages the flange 49 of the lever 47 and swings this lever upon its pivot. At the commencement of a stroke of the plunger but little power is required, as the material lies loosely within the bale-chamber, and it is of course desirable that but a minimum time be occupied in accomplishing this part of the stroke. To this end the power is first applied to the lever 47 near its pivot, so that the lever moves through a wide angle as the cross-bar 40 advances. The resistance of the material within the compression-chamber increases as the plunger advances, thereby necessitating the application of a greater pressure, and this is secured by the construction shown, wherein the bearing of the pin 41 of the cross-bar 40 is constantly shifted away from the pivot or fulcrum-point of the lever. The last portion of the stroke of the plunger is secured by the direct application of one end of the cross-bar 40 to the end of the pitman, and by this means also there is a constant acceleration of pressure, as the first engagement of the cross-bar with the pitman is when the former is substantially perpendicular to the latter. The stroke is completed as the cross-bar comes substantially into line with the pitman, and there is a constant decrease of speed and increase of power from the moment of the engagement of the cross-arm with the pitman to the moment of its disengagement therefrom.

The axles 25ª are provided, so that the machine may be mounted for transportation upon a set of wheels 25.

I claim as my invention—

1. In a baling-press, in combination, a baling-chamber, a plunger reciprocating therein, a retaining-hook pivoted at the side of the chamber and projecting thereinto, and an abutment against which the hook has a bearing independent of its pivot.

2. In a baling-press, pivoted retaining-hooks for resisting expansion of the compressed material, and means other than the pivots of the hooks for sustaining such resistance.

3. In a baling-press, in combination, a compression-chamber, retaining-hooks projecting therein, and having lateral projections, and abutments for engaging such projections and sustaining the pressure upon the hooks.

4. In combination, a compression-chamber, a frame fixed thereto, spring-actuated retaining-hooks pivoted to the frame and normally extending into the baling-chamber, such hooks being provided with lateral projections adapted to abut directly against the fixed frame.

5. In a baling-press, in combination, a plunger, a pitman secured thereto, a rotatable power-shaft, a cross-bar fixed to the shaft, a pivoted lever crossing the path of the cross-

bar, and a link connecting the lever with the pitman, the pivotal point of the lever being within the circle described by the arms of the cross-bar whereby as the lever is moved by the cross-bar the point of contact of such parts is shifted to increase the leverage, and a shoulder on the pitman for engagement by the cross-arm after the partial advance of the pitman by the lever.

6. In a baling-press, in combination, a plunger, a pitman secured thereto, a rotatable power-shaft, a cross-bar secured to the shaft, a lever adapted to be engaged by the cross-arm and so disposed that as it swings the point of contact of the arm with the lever is moved away from the fulcrum of the latter, a link connecting the lever with the pitman, and a shoulder on the pitman for engagement by the cross-arm after the partial advance of the pitman by the lever.

7. In a baling-press, in combination, a plunger, a pitman secured thereto, a rotatable power-shaft, a cross-bar fixed to the shaft, a lever crossing the path of the cross-bar, a link connecting the lever with the pitman, a recessed plate located at the end of the pitman for engaging one end of the cross-bar to advance the pitman, and a boss formed on the face of the plate adapted to force the pitman laterally away from and out of engagement with the cross-bar.

8. In a baling-press, in combination, a plunger, a pitman secured thereto, a rotatable power-shaft, a cross-bar fixed to the shaft for engaging the end of the pitman to advance the same, a lever crossing the path of the cross-bar, a link connecting the lever with the pitman, and means carried by the pitman to force the same laterally away from and out of engagement with the cross-bar.

PLIN C. SOUTHWICK.

Witnesses:
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C. A. PHELPS.