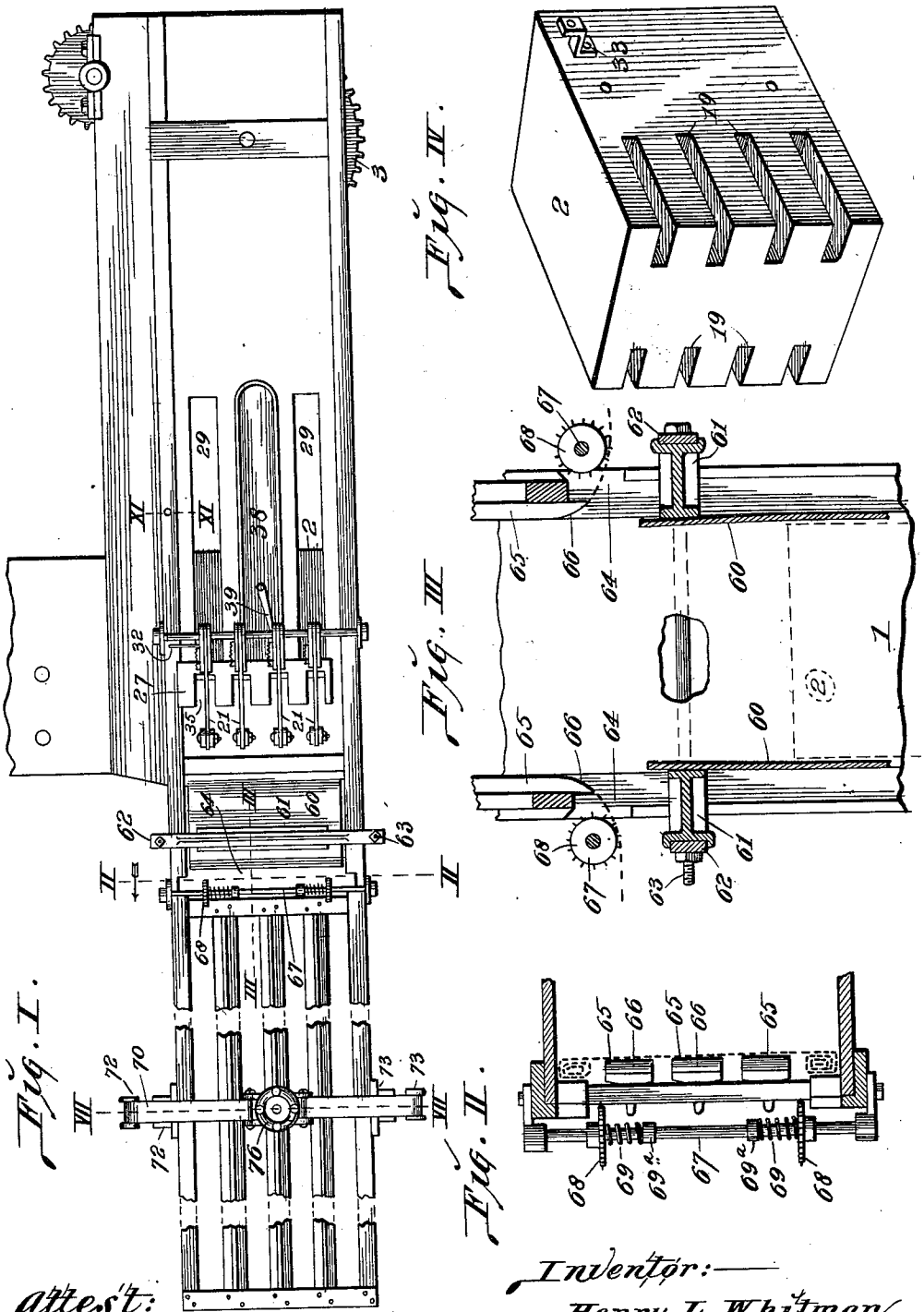
No. 675,258. Patented May 28, 1901.

H. L. WHITMAN.

BALING PRESS.

(Application filed Oct. 22, 1900.)

(No Model.) 4 Sheets—Sheet 1.



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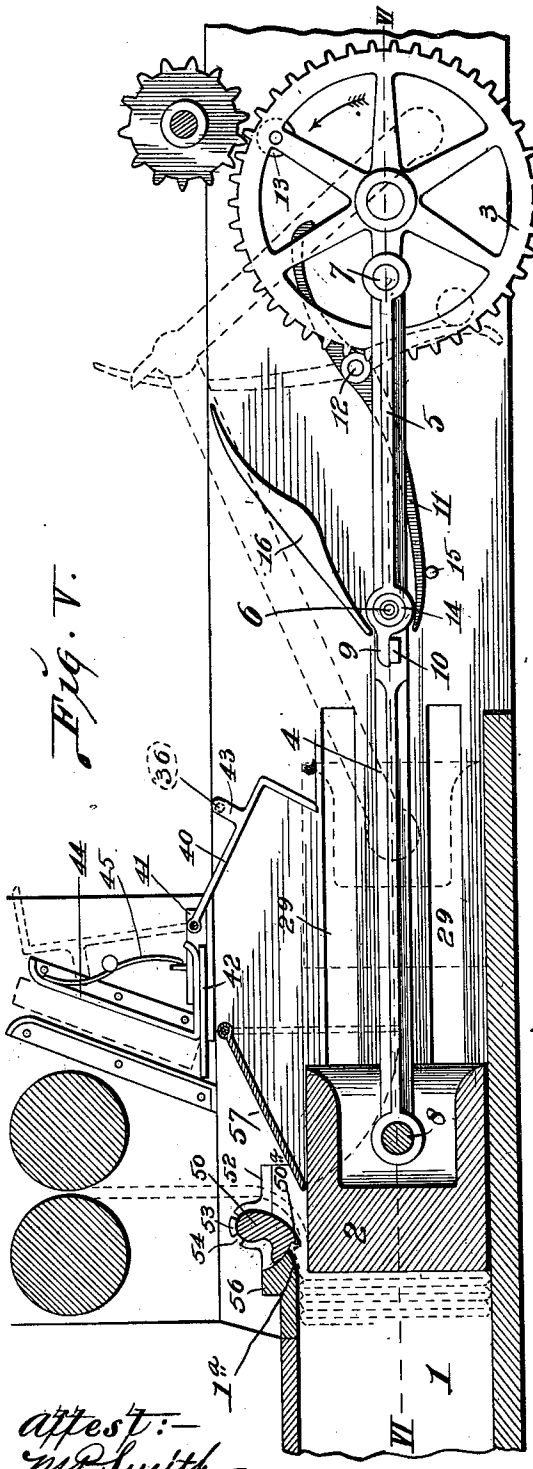

Fig. V.

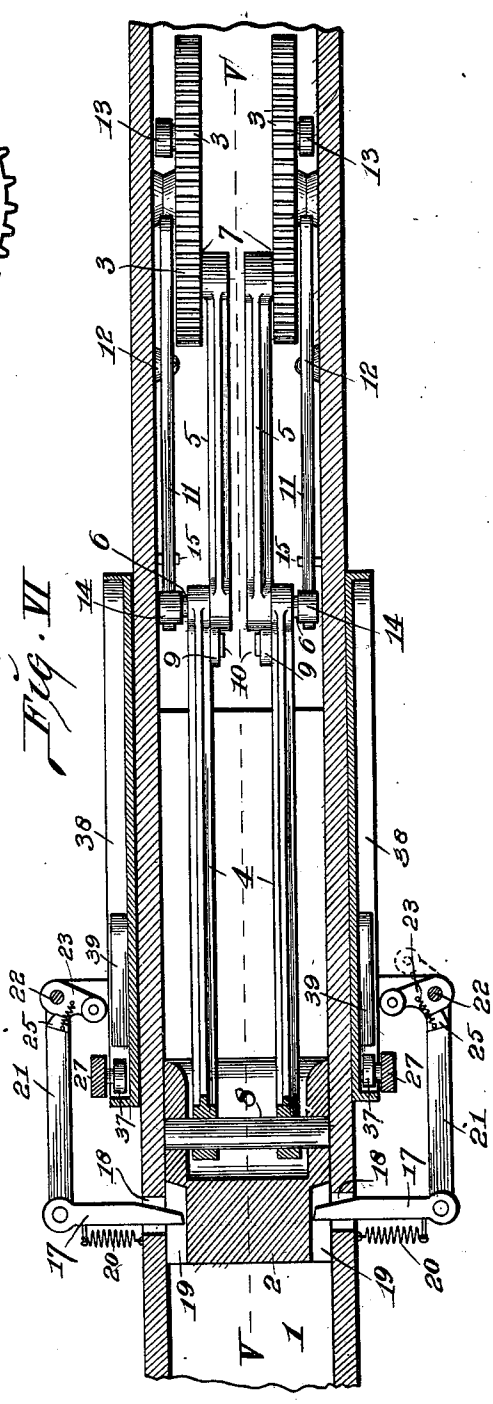

Fig. VI.

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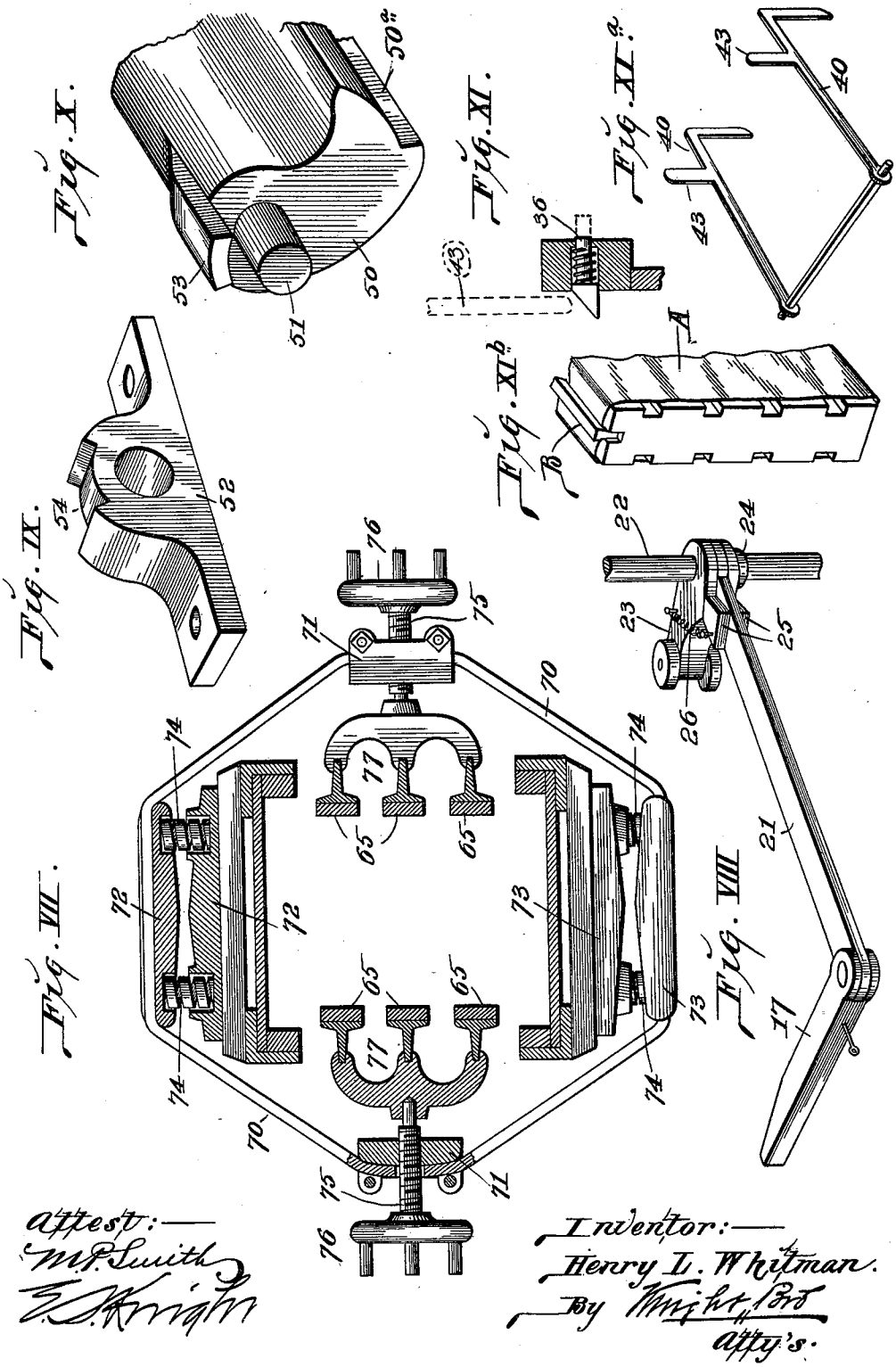
(No Model.) 4 Sheets—Sheet 3.



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(No Model.) 4 Sheets—Sheet 4.

Fig. XII.

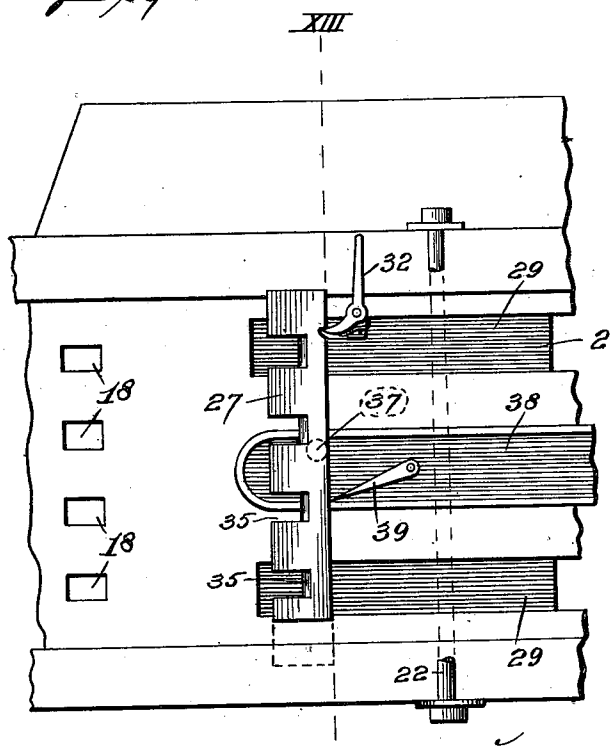


Fig. XIII.

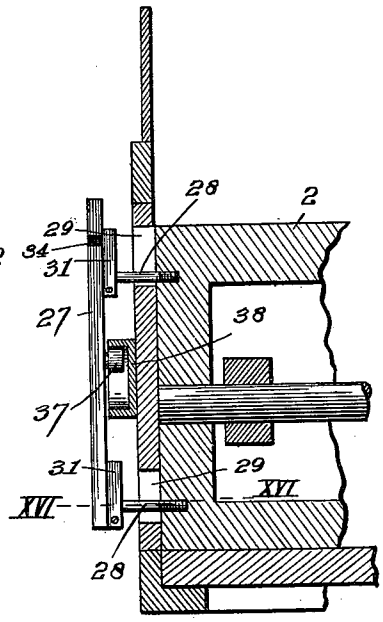


Fig. XIV.

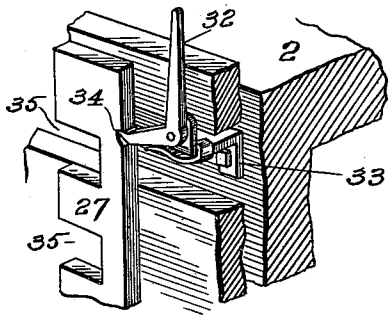


Fig. XV.

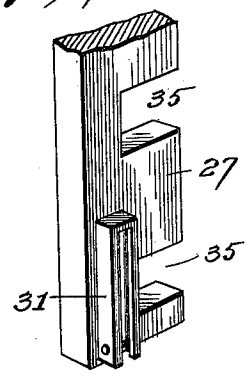


Fig. XVII.

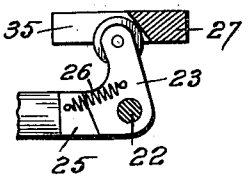


Fig. XVIII.

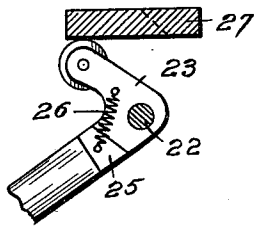
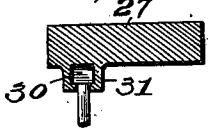


Fig. XVI.



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UNITED STATES PATENT OFFICE.

HENRY L. WHITMAN, OF ST. LOUIS, MISSOURI.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 675,258, dated May 28, 1901.

Application filed October 22, 1900. Serial No. 33,873. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. WHITMAN, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Baling-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention relates to certain improvements in presses for baling cotton, hay, excelsior, &c., and is especially well adapted for baling a material that is delivered to it in the form of a continuous bat or web, as in my Patent No. 643,995, dated February 20, 1900.

My present invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a top or plan view of my improved machine with parts broken away. Fig. II is a detail vertical section taken on line II II, Fig. I, looking in the direction of the arrow that crosses the section-line. Fig. III is a detail horizontal section taken on line III III, Fig. I. Fig. IV is a perspective view of the plunger or traverser. Fig. V is a vertical section taken on line V V, Fig. VI. Fig. VI is a horizontal section taken on line VI VI, Fig. V. Fig. VII is an enlarged vertical section taken on line VII VII, Fig. I. Fig. VIII is a perspective view of one of the retainers. Fig. IX is a perspective view of one of the boxes in which the folder is journaled. Fig. X is a detail perspective view of the folder. Fig. XI is a detail vertical section taken on line XI XI, Fig. I. Fig. XI^a is a perspective view of the hooks for retracting the slides of the division-board pocket. Fig. XI^b is a detail perspective view of a division-board. Fig. XII is an enlarged detail side view of the press with the retainers omitted. Fig. XIII is a detail vertical section taken on line XIII XIII, Fig. XII. Fig. XIV is a detail perspective view showing the mechanism for throwing out the retainers. Fig. XV is a detail perspective view showing part of one of the movable blocks that throw out the retainers. Fig. XVI is an enlarged detail horizontal section taken on line XVI XVI, Fig. XIII. Figs. XVII and XVIII are enlarged detail sections showing part of one of the retainer-arms and part of one of the bars that move the retainers, Fig. XVII showing the relative position of the parts when the press is at work after a division-board has been inserted and Fig. XVIII showing the relative position of the parts on the first forward movement of the plunger after a fresh division-board has been inserted.

Referring to the drawings, 1 represents the baling-chamber of the press, 2 the plunger, and 3 the gear-wheels for moving the plunger and which are connected up in any suitable way to a motor. (Not shown.) One part of my present invention relates to the power mechanism of the press. The wheels 3 are connected to the plunger by means of pitmen, each consisting of an inner section 4 and an outer section 5, jointed together by means of pivot-pins 6. The pitmen have a pivotal connection with the wheels 3, as shown at 7, and a pivotal connection with the plunger, as shown at 8. The inner ends of the sections 5 are provided with projections 9, that come in contact with lugs 10 on the sections 4 when the sections come to a horizontal position, so as to prevent the joints 6 from passing beyond the center.

11 represents levers pivoted at 12 to the inside walls of the press and the outer ends of which are in the path of projections 13, (preferably in the form of friction-rollers,) carried by the wheels 3, while their inner ends are in the path of the pins 6, the pins being preferably provided with friction-rollers 14 to receive the levers. The wheels 3 turn in the direction of the arrow, Fig. V, and force the plunger forward, the two sections of the pitman being brought into line just as the pivot-points 7 reach their most forward position, (at which time the plunger has been advanced to its most forward position,) and as the pivot-points 7 begin to recede the projections 13 come against the outer ends of the levers 11 and carry them to the position shown in dotted lines, Fig. V, thus imparting a long rearward movement to the plunger. As the levers are thus moved, their inner ends are in engagement with the friction-rollers 14, so that the plunger and pitmen are moved by the levers to the position shown in dotted lines, Fig. V. I thus obtain a quick and long

rearward travel of the plunger, which is desirable, especially where loose material is being baled. When the projections 13 leave the levers, the latter will drop to the position shown in full lines, Fig. V, their inner ends coming against stop-pins 15, projecting inwardly from the walls of the press, and when the levers thus leave the pitmen the latter will drop of their own weight and in so doing will move the plunger forward until its advance movement is checked by the resistance offered by the next charge of the material being baled, the further forward movement of the plunger being effected by the power-wheels 3. To prevent any possibility of an upward movement of the joints 6 as the power-wheels begin to exert their pressure on the pitmen, I form guard-rails 16 on the insides of the press-frame, against which the rollers 14 would impinge in case the joints were to start to move in an upwardly direction.

Another part of my invention relates to the retainer mechanism by which the compressed material is held from expending when the plunger recedes. These retainers consist of fingers 17, fitting in openings 18, formed in the side walls of the baling-chamber. The fingers are arranged to move in and out in a direction at right angles to the length of the baling-chamber and are thus much more effective in their operation than if arranged to move on the arc of a circle, as heretofore. The plunger is grooved at 19 to receive the inner ends of the fingers, so that its forward end can pass the fingers a short distance. The inward movement of the fingers is effected by means of springs 20, that connect them to the walls of the baling-chamber. The outer ends of the fingers are pivoted to arms 21, that are pivoted to rods 22, secured to the frame of the machine, as seen in Fig. I.

23 represents short levers (one for each arm 21) likewise pivoted to the rods 22 and held from downward movement thereon by collars 24. (See Fig. VIII.) The levers 23 are pulled against shoulders 25 on the arms 21 by means of springs 26, the springs allowing the levers to be moved away from the arms 21, as shown by dotted lines, Fig. VI. When the plunger recedes and a fresh supply of material is to be pressed by the next advance movement of the plunger, the fingers 17 should be withdrawn from the baling-chamber, so as not to engage the charge being pressed. In order to thus remove the inner ends of the fingers from the baling-chamber and to do it automatically, I provide the arms 21 and the levers 23, and I secure to the plunger on each side of the press a bar 27. (See Figs. XII to XVIII, inclusive.) The bars are held to the plunger by means of pins 28, screwed into or otherwise secured to the plunger and which extend out through slots 29 in the sides of the press. The outer ends of the pins are provided with heads 30, that fit in grooved brackets 31, formed upon or secured to the bars 27. The slotted brackets permit of the bars being moved in a vertical plane, and the bars are held normally in their elevated position by means of spring-actuated dogs 32, connected to the plunger by means of brackets 33 or otherwise, the lower ends of the dogs fitting in notches 34, formed in the backs of the bars 27, so that the dogs serve to hold the bars in their elevated position as the plunger moves back and forth. When the plunger advances, the bars come against the inner ends of the levers 23 and swing the arms 21 in a direction away from the press, thus drawing the inner ends of the fingers 17 out of the baling-chamber, this action taking place just as the next charge of material is about to be moved forward by the advancing plunger, so that the charge does not engage the fingers and is not torn thereby. When the bars 27 pass the levers 23, the springs 20 draw the fingers 17 inwardly, so that their inner ends project into the baling-chamber, and at this time they also project into the grooves 19, formed in the plunger. When the plunger recedes, the bars 27 engage the levers 23 from behind; but this has no effect upon the arms 21 or the fingers 17, for the springs 26 will permit the levers to swing on the rods 22 to the position shown by dotted lines, Fig. VI, thus allowing the bars to pass the levers, and when the bars have passed the levers the latter will be drawn forward again against the shoulders 25 by means of the springs 26, so that the levers will be in position to again retract the fingers 17 upon the next advance movement of the plunger. It is necessary to have the fingers 17 retracted sooner with relation to the advance movement of the plunger when a fresh division-board has been inserted than when the charges are being pressed between the times of the insertion of the division-boards. To accomplish this, I provide the bars 27 with notches 35, into which the levers 23 enter when the bars are in their raised positions, as seen in Fig. XVII, so that the bars do not begin to act upon the levers until the inner edges of the notches or the backs of the bars at the inner ends of the notches come against the levers. When a division-board is to be inserted, the bars 27 are dropped to the position shown by dotted lines, Fig. XII, and on the next advance movement of the plunger the forward or non-cut-out edges of the bars will come against the levers 23, as seen in Fig. XVIII, the notches 35 not now being opposite the levers 23. This will cause the bars to sooner engage the levers and will cause the fingers to be sooner retracted from the baling-chamber, thus providing for the thickness of the division-board and insuring the removal of the fingers from the baling-chamber before they are engaged by the next charge of material. To thus drop the bars 27, spring-actuated pins 36 are arranged in the top sill of the frame of the press, and when these pins are forced outwardly, (which is done,

the means for doing it being hereinafter described, on the last rearward movement of the plunger prior to the insertion of a division-board,) as shown by dotted lines, Fig. XI, they will be in the path of the upper ends of the dogs 32, so that as the plunger recedes the dogs will engage the pins, and their lower ends will be thus drawn out of engagement with the bars 27, which will drop by gravity until pins 37 on their inner faces come in contact with the lower flanges of grooved plates 38, secured to the outside of the press-frame. The bars are thus dropped automatically on the last rearward movement of the plunger prior to the insertion of a division-board, and on the next advance movement of the plunger the pins 37 pass beneath switch-points 39, pivoted in the channels of the plates 38, as seen in Figs. I and XII. As the pins 37 pass the switch-points, the free ends of the latter drop into contact with the lower flanges of the plates 38, so that the next time the plunger recedes the pins 37 will ride upon the switch-points, thus automatically lifting the bars 27 to their elevated or normal positions, where they will be engaged and held by the spring-dogs 32 until the dogs again come in contact with the pins 36. To move the pins 36 so that their outer ends will be in the path of the travel of the dogs 32, I hinge a pair of hooks 40 (see Figs. V and XI[a]) to the vertical sides 41 of horizontal slides 42. The hooks have vertical ears 43, and as the hooks are dropped into the position shown by full lines, Fig. V, they engage the pins 36 and force them outwardly into the positions shown by dotted lines, Fig. XI, the ears 43 remaining in contact with the pins 36 after the bodies of the hooks have passed the pins, thus holding the pins in their outer position. As the plunger recedes, the dogs 32 engage the pins 36 just before the outer end of the plunger comes against the hooks 40, and when the plunger comes against the downwardly-extending ends of the hooks the slides 42 (which form the bottoms of pockets 44, that receive the division-boards) are moved toward the power end of the press, thus allowing a division-board to drop into the baling-chamber. When the plunger makes its next advance movement and leaves the hooks 40, the slides 42 are forced to their inner positions by springs 45, and the operator now throws the hooks 40 up to the position shown in dotted lines, Fig. V, where they remain until the next division-board is to be dropped into the press. The construction and arrangement of the pockets 44, the slides 42, and the hooks 40, with the exception of the ears 43 on the latter, are the same, substantially, as shown and described in my patent referred to.

As already stated, my present invention relates to a press well adapted for baling material that is fed into the baling-chamber in the form of a bat or web, and my present invention relates in part to a means for folding the upper portion of the web downwardly upon each rearward movement of the plunger. To accomplish this, I provide a rocking block 50, (see Figs. V and X,) which is arranged at the upper part of the mouth of the baling-chamber, this block being provided with journals 51, that fit in boxes 52, secured to the top of the press. The back of the block is rounded off, so that as the plunger advances the lower edge of the block will be turned upwardly, with the back of the block lying against the bat or web, as seen in Fig. V, and as the plunger recedes the lower end of the block will drop, thus causing the bat to be folded downwardly into the press each time the plunger leaves the bat in its rearward movement. To limit the downward movement of the lower end of the block, I provide it with projections 53, that fit in notches 54 on top of the boxes 52, the notches being sufficiently wider than the projections to provide for the necessary movement of the block. The lower or free end of the block is fitted against a plate 56, (see Fig. V,) so that the material has no opportunity to pass upwardly beyond the free end of the block. The lower corner of the block is provided with a shoulder 50[a], and the top of the baling-chamber is beveled off, as shown at 1[a], Fig. V. As the material is pressed by the plunger a portion of it swells up into the space provided by the bevel 1[a] behind the shoulder 50[a]. When the plunger recedes, the material will expand slightly and that portion of it that engages with the shoulder 50[a] will act to assist gravity in causing the lower end of the block 50 to turn downwardly into the baling-chamber, the block thus acting effectually to fold the bat at the point where it was engaged by the upper corner of the plunger before the plunger started to recede.

While the plunger is in its forward position it is desirable to have a support for the bat or web, so that it will not accumulate on top of the plunger or fall behind the back of the plunger. For this purpose I hinge a plate 57 to the inside walls of the press-frame, the lower or free end of the plate being engaged by the flange as the latter moves forwardly, so that the plate is held in an inclined position by the plunger, and when the plunger recedes the plate will drop into a vertical position, as shown by dotted lines, Fig. V, and allow the bat to drop into the baling-chamber. The bat comes from a pair of compressing-rollers and is formed in the baling-chamber in an unbroken condition and in a series of folds, as in my patent referred to.

Another part of my invention relates to a provision for condensing the material to its full limit at a point within a short distance from the forward end of the plunger when at its extreme forward movement, so that the material will pass more freely through the baling-chamber from this point outwardly, thus making better provision for the insertion of a covering in which the material is

enveloped as it emerges from the press. This consists of spring-plates 60, constituting the sides of the press at the point indicated. On the outside of each plate is a block 61, (see Fig. III,) each block being grooved to receive a bar 62, and the two bars being connected by cross-bolts 63, one located above and the other beneath the body of the press. By tightening up the bolts the plates 60 can be pressed inwardly more or less, so as to contract the baling-chamber at this point as much as may be desired.

Another part of my invention relates to a provision for the insertion of a covering, such as burlap, (shown by dotted lines in Fig. III,) in which the baled material is enveloped as it emerges from the press. This burlap or fabric enters the baling-chamber through openings 64 in the sides of the press just back of the ends of the plates 60, the bars 65, that constitute the sides of the baling-chamber back of this point, being rounded off, as shown at 66, to permit the fabric to pass freely into the baling-chamber, and to keep the fabric stretched smoothly as it enters the openings 64 I arrange on the outside of each opening a shaft 67, each shaft being provided with a pair of wheels 68, having spurs on their peripheries, as seen in Figs. II and III. Surrounding the shafts 67 on the inside of each wheel 68 is a coil-spring 69, fitting between the wheel and a collar 69^a on the shaft. When the fabric is first inserted in the press, the wheels are forced slightly toward each other and the fabric stretched over them. The fabric is held into contact with the wheels, and the tension of the springs, forcing or tending to force the wheels apart, causes the fabric to be held in a stretched condition, so that it will enter the press in a smooth unwrinkled condition. The edges of the fabric are rolled or folded, as shown by dotted lines in Fig. II, these folds fitting, respectively, above the upper and below the lower bar 65. As the material and the fabric emerge from the press the folds of the fabric are turned over the top of the bales and beneath the bottom thereof, the edge of the fabric on one side of the bale being stitched to the fabric on the other side of the bale, so that the bales are thus completely inclosed by the fabric on their four sides. To cover the ends of the bales, I wrap the division-boards with a fabric A, as shown in Fig. XI^b, the ends of the fabric being suitably held to the boards, which may be done by a wedge B, fitting in a groove formed in one edge of the division-board. As the bales emerge from the press the fabric that is on the advance side of the division-board is stitched to the fabric covering the sides of the bale on the advance side of the division-board, and the fabric on the inner side of the division-board is stitched to the fabric covering the adjacent sides of the bale.

Another part of my invention relates to means for contracting the outer end of the baling-chamber both horizontally and vertically, so as to maintain it at the desired size. This is done by means of straps 70, secured to blocks 71, located at the sides of the press. These straps pass over saddles 72 and 73, located, respectively, above and beneath the baling-chamber, each saddle being made in two parts, with springs 74 located between the parts.

75 represents screws passing through the blocks 71 and the outer ends of which are provided with heads 76, by which the screws can be turned. The inner ends of the screws bear against saddles 77, that fit against the bars 65. By tightening on the screws 75 it will be readily seen that the top, bottom, and sides of the baling-chamber will be drawn together and there held by a yielding force due to the springs 74, so that the inside dimensions of the baling-chamber can be adjusted to suit conditions.

I claim as my invention—

1. In a baling-press, the combination of a plunger, means for imparting movement to the plunger, a two-part jointed pitman forming a connection between said means and said plunger, one end of said pitman being pivoted to said plunger, and a pivoted lever adapted to engage and effect a breaking action to said pitman at its joint, and to be engaged by said means to impart a long rearward movement to the plunger, substantially as set forth.

2. In a baling-press, the combination of a plunger, a wheel for imparting movement to the plunger, a two-part jointed pitman forming a connection between said wheel and plunger, one end of said pitman being pivoted to said plunger, a pivoted lever adapted to engage and effect a breaking action to said pitman at its joint, and a projection on said wheel adapted to engage said lever to impart a long rearward movement to the plunger, substantially as set forth.

3. In a baling-press, the combination of a plunger, a wheel for imparting movement to the plunger, a two-part jointed pitman forming a connection between said wheel and plunger, one end of said pitman being pivoted to said plunger, a pivoted lever adapted to engage a friction-roller on said pitman to effect a breaking action to said pitman at its joint, and a friction-roller carried by said wheel, and which is adapted to engage said lever, substantially as set forth.

4. In a baling-press, the combination of a plunger, a wheel for imparting movement to said plunger, a two-part jointed pitman forming a connection between said plunger and said wheel, one end of said pitman being pivoted to said plunger, a pivoted lever adapted to engage and effect a breaking action to said pitman at its joint, and which is engaged by said wheel, and a guard 16, substantially as set forth.

5. In a baling-press, the combination of a plunger, a wheel for imparting movement to said plunger, a pitman formed in two sections

pivoted together and which forms a connection between said plunger and wheel, a projection on one section of said pitman adapted to engage an ear on the other section of the pitman, and a pivoted lever adapted to engage said pitman and which is engaged by said wheel, substantially as set forth.

6. In a baling-press, the combination of a baling-chamber, a plunger, retainers adapted to enter the baling-chamber, and means for moving the retainers out of the baling-chamber, said means consisting of arms to which the retaining-fingers are connected, pivoted levers adapted to engage the arms, and bars carried by said plunger, and which are adapted to engage said levers on the forward movement of the plunger, substantially as set forth.

7. In a baling-press, the combination of a plunger, a baling-chamber, retainers adapted to enter the baling-chamber, and means for moving the retaining-fingers out of the baling-chamber, consisting of pivoted arms to which the fingers are hinged, pivoted levers adapted to engage the arms and which are spring-connected thereto, and bars carried by the plunger and which are adapted to engage said levers, substantially as set forth.

8. In a baling-press, the combination of a plunger, a baling-chamber, retaining-fingers adapted to enter the baling-chamber, and means for moving the fingers out of the baling-chamber, consisting of pivoted arms to which the fingers are hinged, pivoted levers adapted to engage the arms, and notched movable bars carried by the plunger and which are adapted to engage said levers, substantially as set forth.

9. In a baling-press, the combination of a plunger, a baling-chamber, retaining-fingers adapted to enter the baling-chamber, and means for moving said fingers out of the baling-chamber, consisting of pivoted arms to which the fingers are connected, pivoted levers adapted to engage the arms and notched bars movably connected to the plunger by means of pins fitting in grooved brackets carried by the bars, substantially as set forth.

10. In a baling-press, the combination of a plunger, a baling-chamber, retaining-fingers adapted to enter the baling-chamber, arms to which the fingers are connected, pivoted levers adapted to engage the arms, notched bars carried by the plunger, and which are adapted to engage said levers, and means for holding said bars in an elevated position and for dropping them automatically when a division-board is inserted, substantially as set forth.

11. In a baling-press, the combination of a plunger, a baling-chamber, retaining-fingers adapted to enter the baling-chamber, arms to which the retaining-fingers are connected, pivoted levers adapted to engage the arms, notched bars carried by the plunger, pins carried by the bars, means for holding the bars in an elevated position, and switches for raising the bars automatically when they have been lowered, substantially as set forth.

12. In a baling-press, the combination of a plunger, a baling-chamber, retaining-fingers adapted to enter the baling-chamber, arms to which the fingers are connected, levers adapted to engage the arms, movable bars connected to the plunger, means for holding the bars in an elevated position, grooved plates secured to the side of the press, pins projecting from said bars into said grooved plates, and switches pivoted to said grooved plates for automatically raising said bars when they have been lowered, substantially as set forth.

13. In a baling-press, the combination of a plunger, a baling-chamber, retaining-fingers adapted to enter the baling-chamber, movable bars carried by the plunger for moving said fingers out of the baling-chamber, spring-dogs for holding said bars in an elevated position, pins arranged in the frame of the press for moving said dogs, a division-board pocket having a movable bottom, and hooks secured to said movable bottom and adapted to force said pins into the path of said dogs when thrown down to be engaged by said plunger, substantially as set forth.

14. In a baling-press, the combination of a baling-chamber, a plunger, retainers adapted to enter the baling-chamber and means for moving the retainers out of the baling-chamber; said means consisting of arms to which the retainers are connected, and adjustable means carried by the plunger and adapted to move said arms sooner or later relative to the forward movement of the plunger according to whether a division-board has been inserted or not, substantially as set forth.

15. In a baling-press, the combination of a baling-chamber, a plunger, retainers adapted to enter the baling-chamber and means for moving the retainers out of the baling-chamber; said means consisting of arms to which the retainers are connected and notched movable bars carried by the plunger and adapted to move said arms sooner or later relative to the forward movement of the plunger according to whether a division-board has been inserted or not, substantially as set forth.

16. In a baling-press, the combination of a plunger, a baling-chamber into which the material to be pressed is fed in the form of a bat, and means for folding the bat, consisting of a swinging block journaled in notched boxes, and which is provided with projections fitting in said notches, whereby when the plunger advances the block is moved upwardly and when the plunger recedes falls to fold the bat, substantially as set forth.

17. In a baling-press, the combination of a plunger, means for forming the material to be pressed into a bat, a baling-chamber into which the bat is fed, and a support for receiving the bat when the plunger is in its forward position, consisting of a plate hinged to the frame of the press, and the free lower end of

which rides upon the plunger during the last part of its forward and the first part of its rearward movement, substantially as set forth.

18. In a baling-press, the combination of a plunger, a baling-chamber having openings in its sides for the admission of a covering fabric, and means arranged outside of the press for keeping the covering fabric stretched the width of the baling-chamber as it enters the baling-chamber, substantially as set forth.

19. In a baling-press, the combination of a plunger, a baling-chamber having openings for the admission of a covering fabric, and means for keeping the fabric stretched, consisting of spring-actuated wheels provided with spurs on their peripheries, substantially as set forth.

20. In a baling-press, the combination of a plunger, a baling-chamber having openings for the admission of a covering fabric, and means for keeping the fabric stretched as it enters the baling-chamber, consisting of shafts located outside of the baling-chamber, and spring-actuated rollers mounted on the shafts, and provided with spurs on their peripheries, substantially as set forth.

21. In a baling-press, the combination of a plunger, and a baling-chamber formed with openings to receive a covering fabric, and formed with spaces at top and bottom to receive folds of the fabric, substantially as set forth.

22. In a baling-press, the combination of a plunger, and a baling-chamber, the discharge end of which is made contractible by means of bands, spring-saddles located between the bands, and the top and bottom of the press, saddles on the sides of the press, and set-screws passing through blocks and the inner ends of which bear against the last-mentioned saddles, substantially as set forth.

23. In a baling-press, the combination of a plunger, and a baling-chamber having openings to receive a covering fabric, and having contracted sides 60 in advance of said openings immediately adjacent thereto, substantially as set forth.

In testimony whereof I have hereunto set my hand this 18th day of October, 1900.

HENRY L. WHITMAN.

In presence of—
E. S. KNIGHT,
N. V. ALEXANDER.