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BALING PRESS.

No. 551,302. Patented Dec. 10, 1895.

Fig. I.

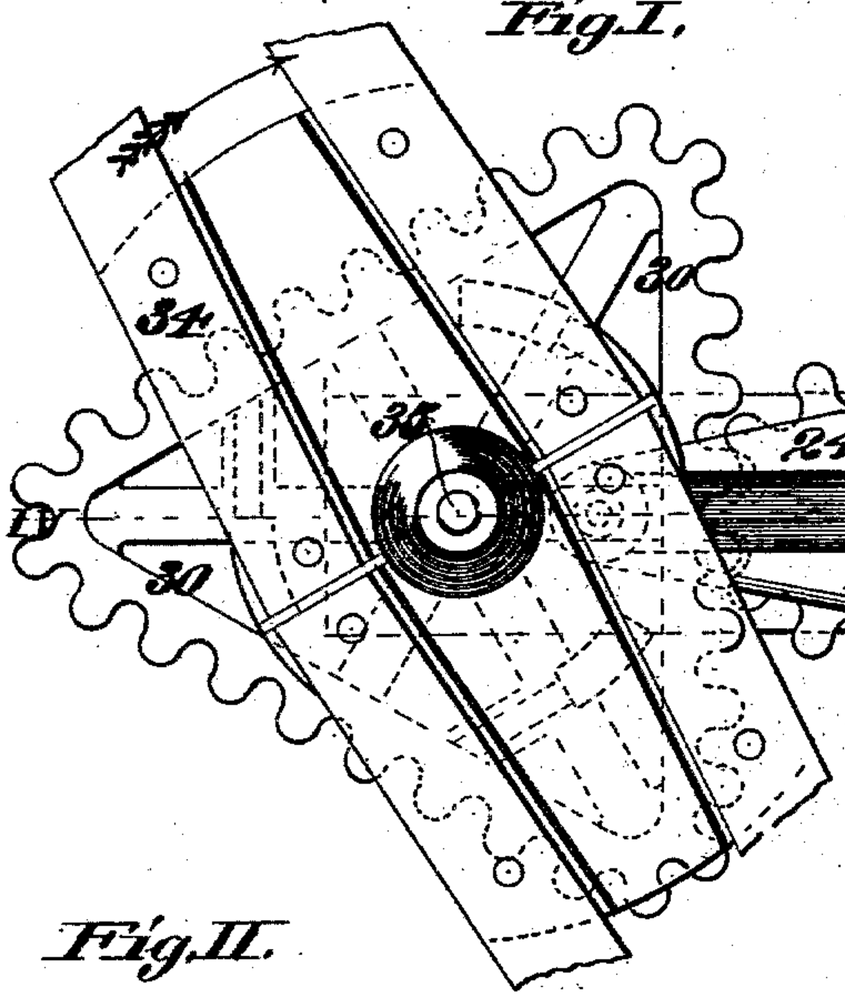


Fig. II.

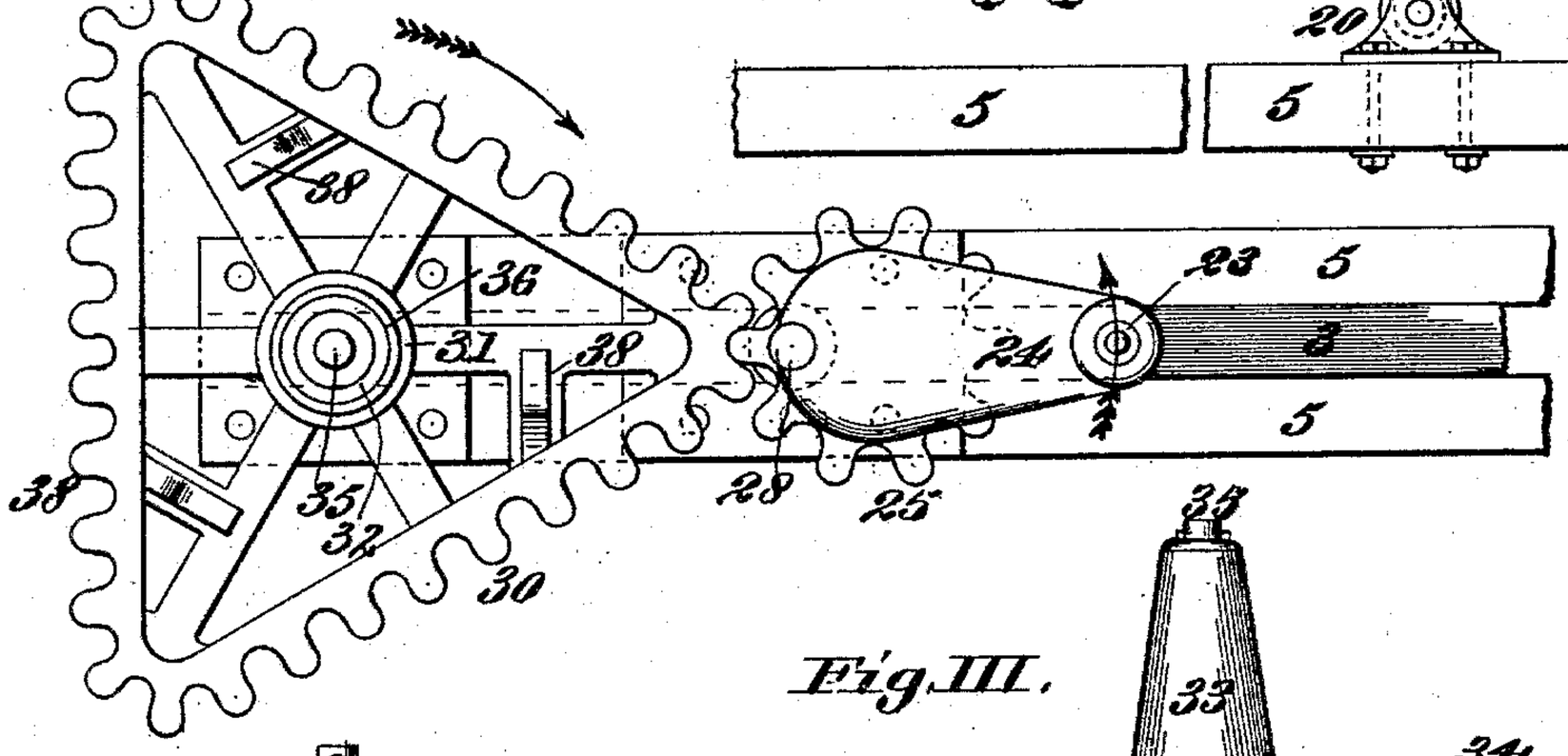


Fig. III.

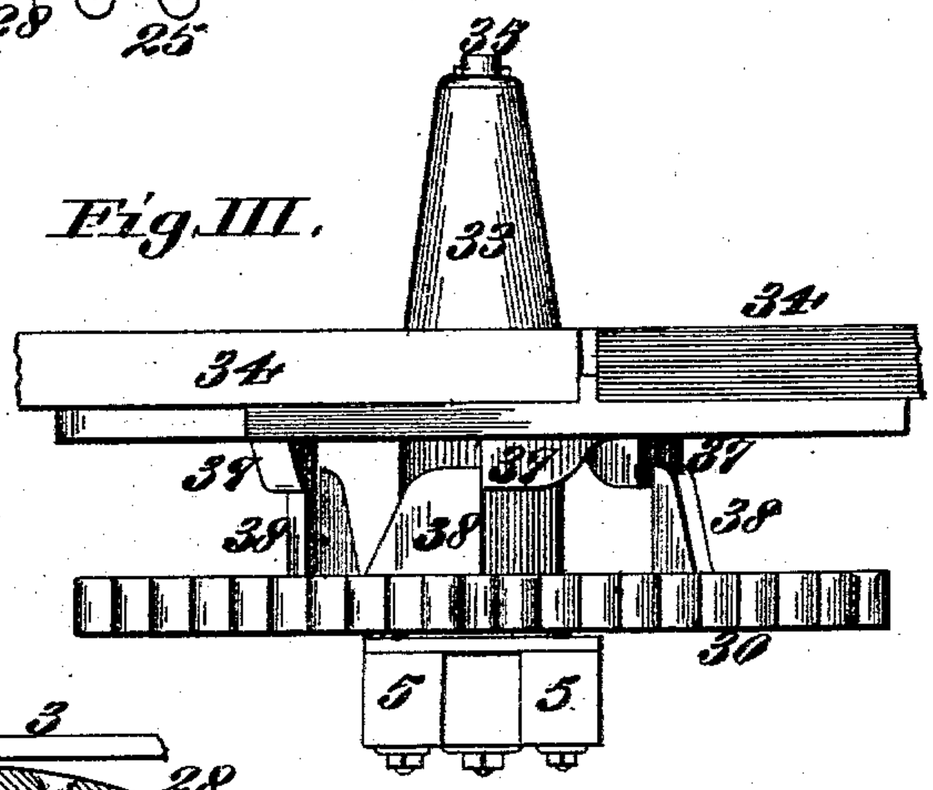


Fig. IV.

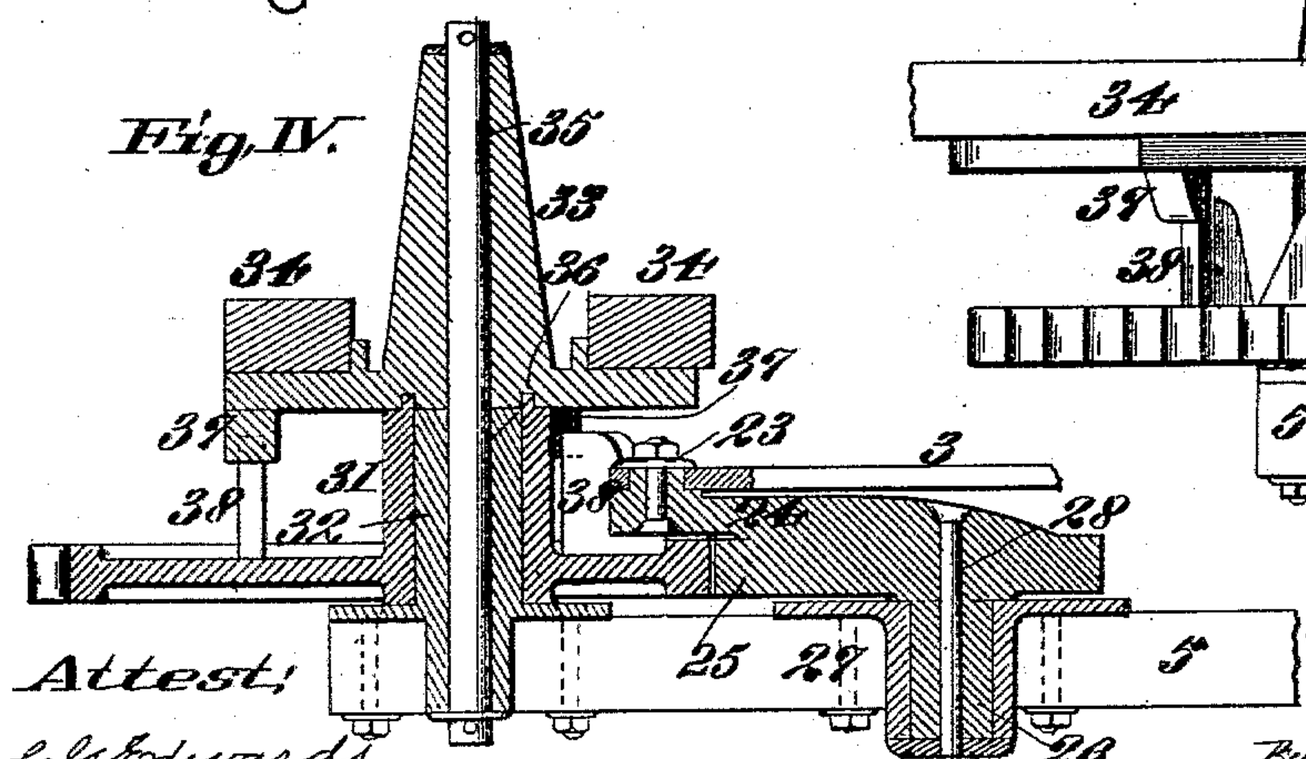


Fig. V.

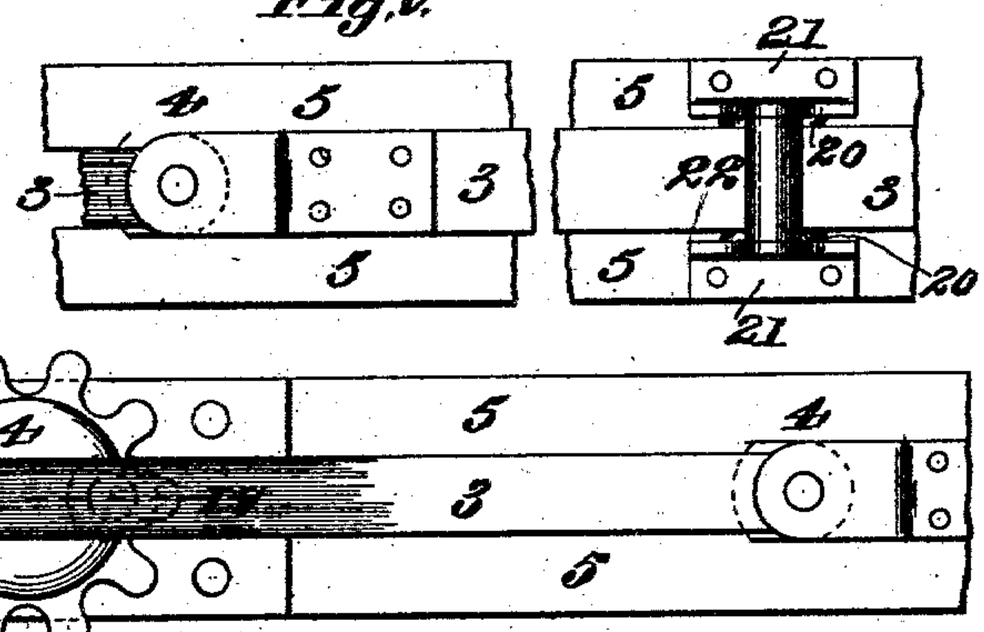
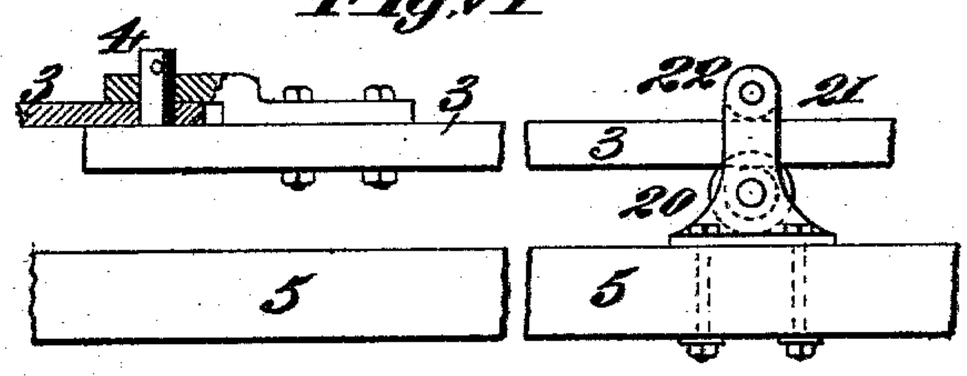


Fig. VI



Witnesses:
C. L. Edwards.
E. S. Knight

Inventors
J. W. Brown
A. A. Gehrt.
By Wright Brt. Bro
Atty's

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J. W. BROWN & A. A. GEHRT.

BALING PRESS.

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Fig. VII.

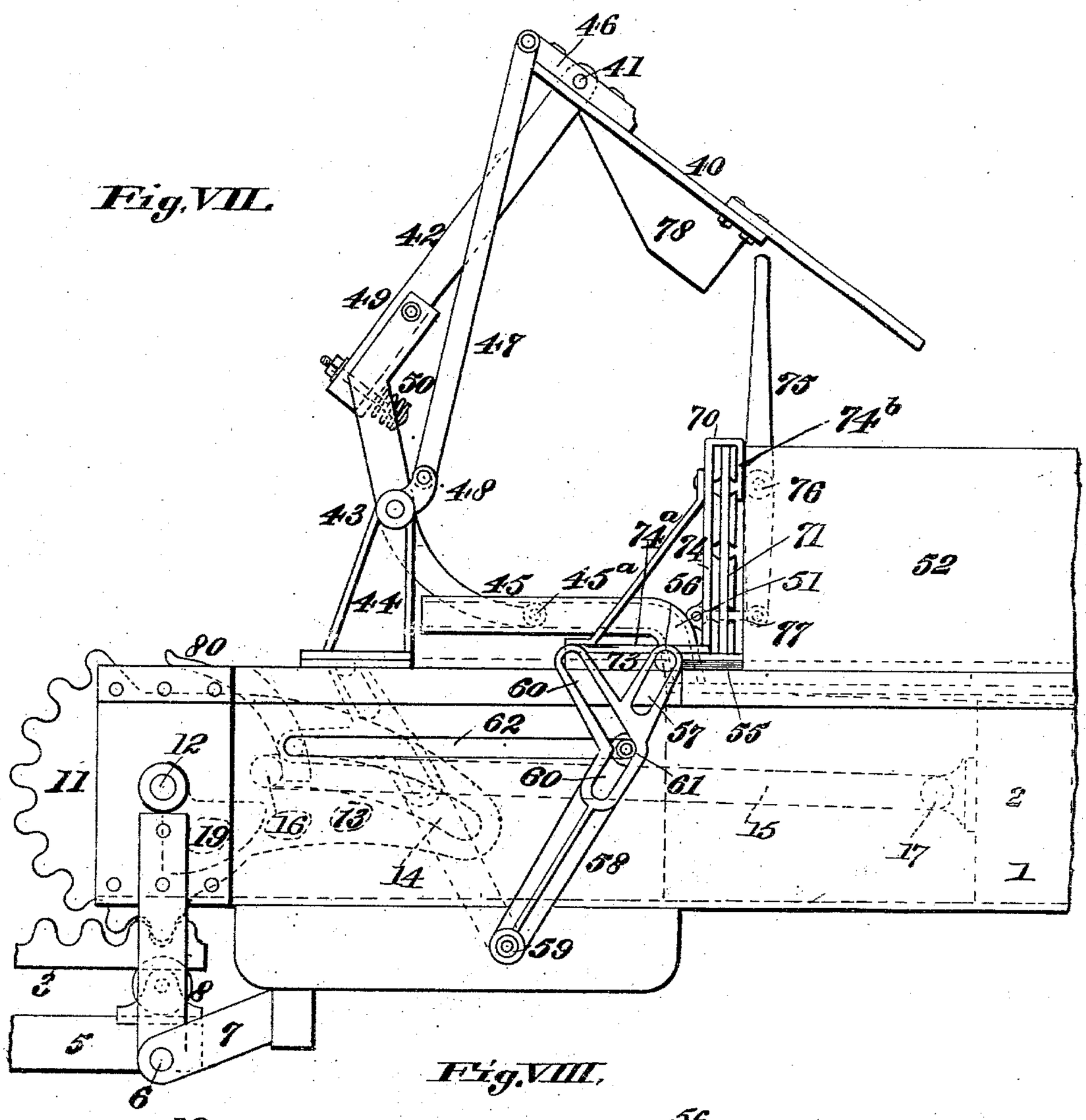
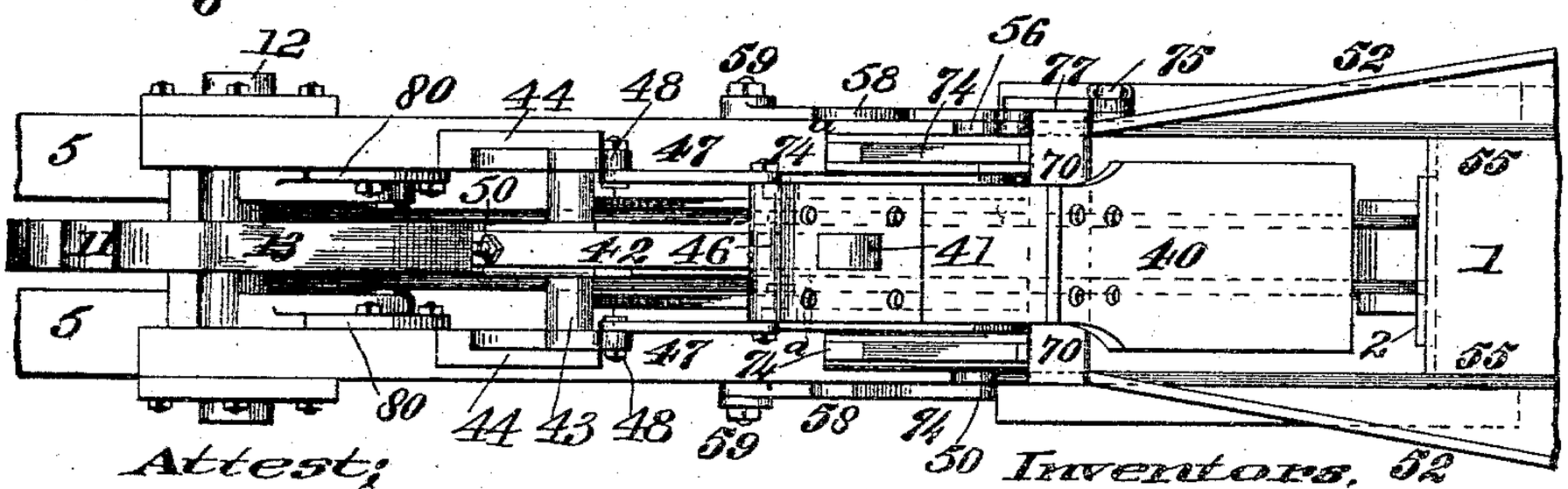


Fig. VIII.



Attest:
Chas. Edwards.
E. S. Knight

Inventors.
J. W. Brown
A. A. Gehrt
By Wright Bros
Atty's

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J. W. BROWN & A. A. GEHRT.

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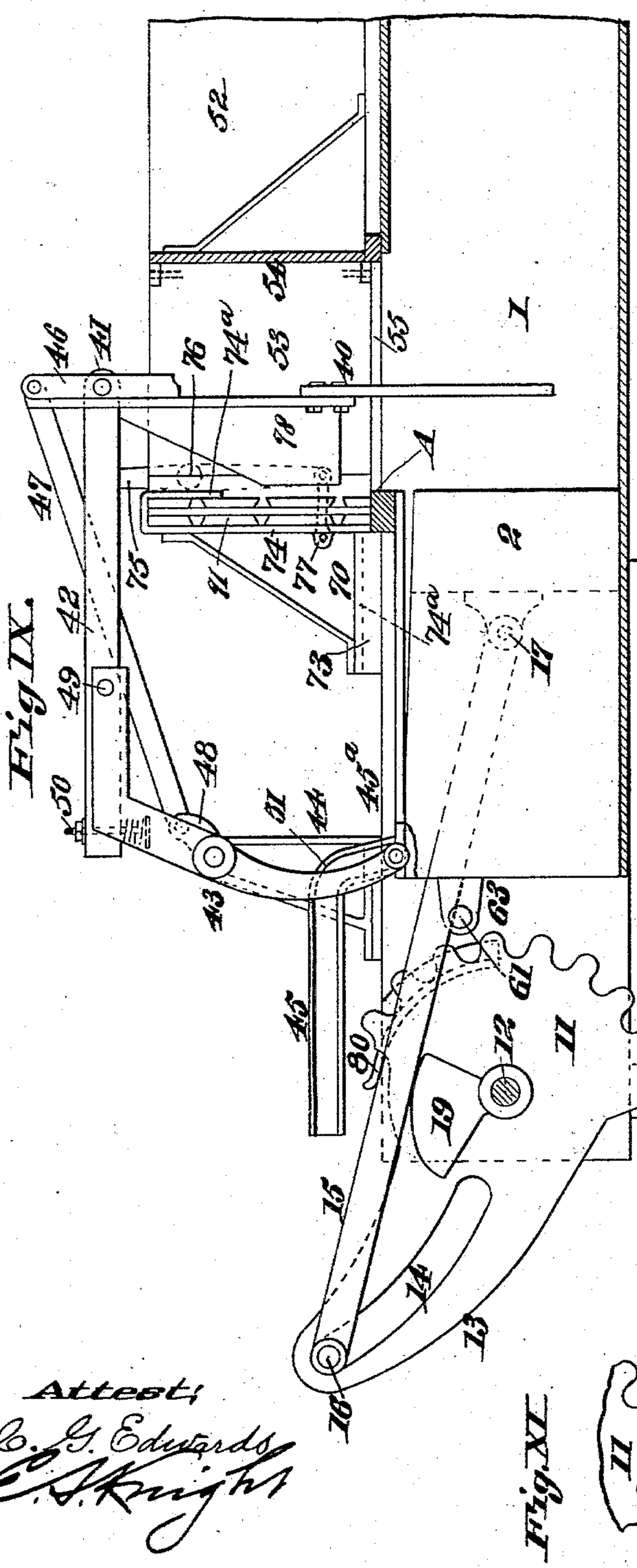

Fig. IX.

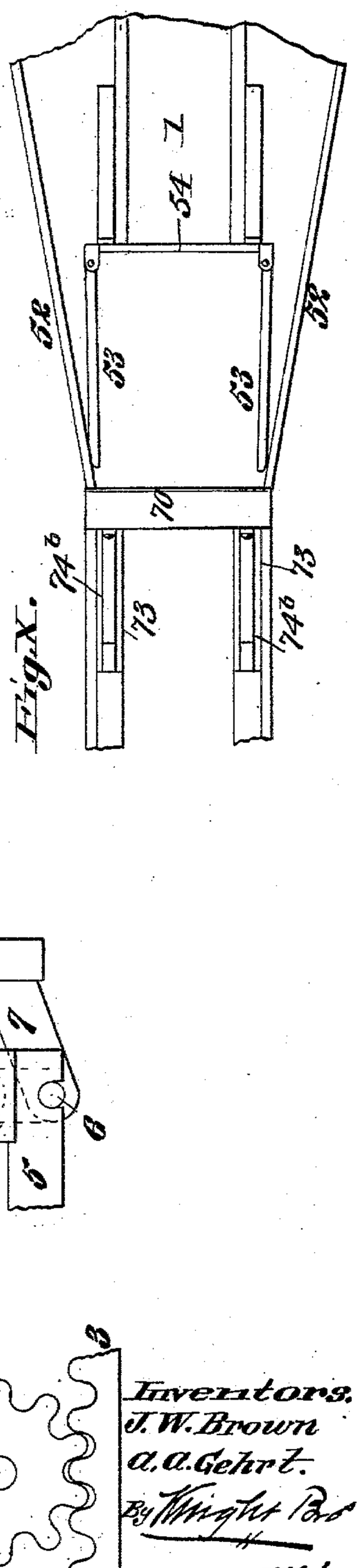

Fig. X.

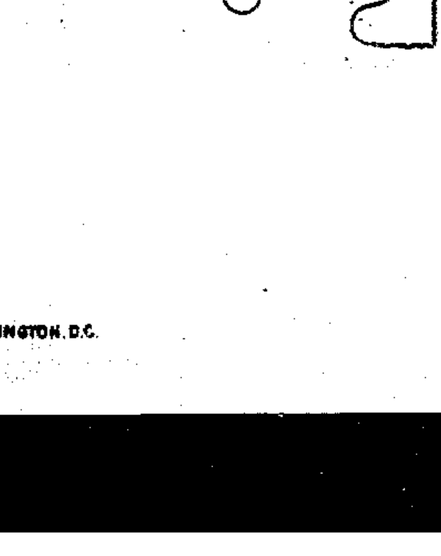

Fig. XI.

Attest:
C. G. Edwards
C. L. Knight

Inventors.
J. W. Brown
A. A. Gehrt.
By Wright Bros
Atty's.

(No Model.) 4 Sheets—Sheet 4.

J. W. BROWN & A. A. GEHRT.

BALING PRESS.

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Fig. XII.

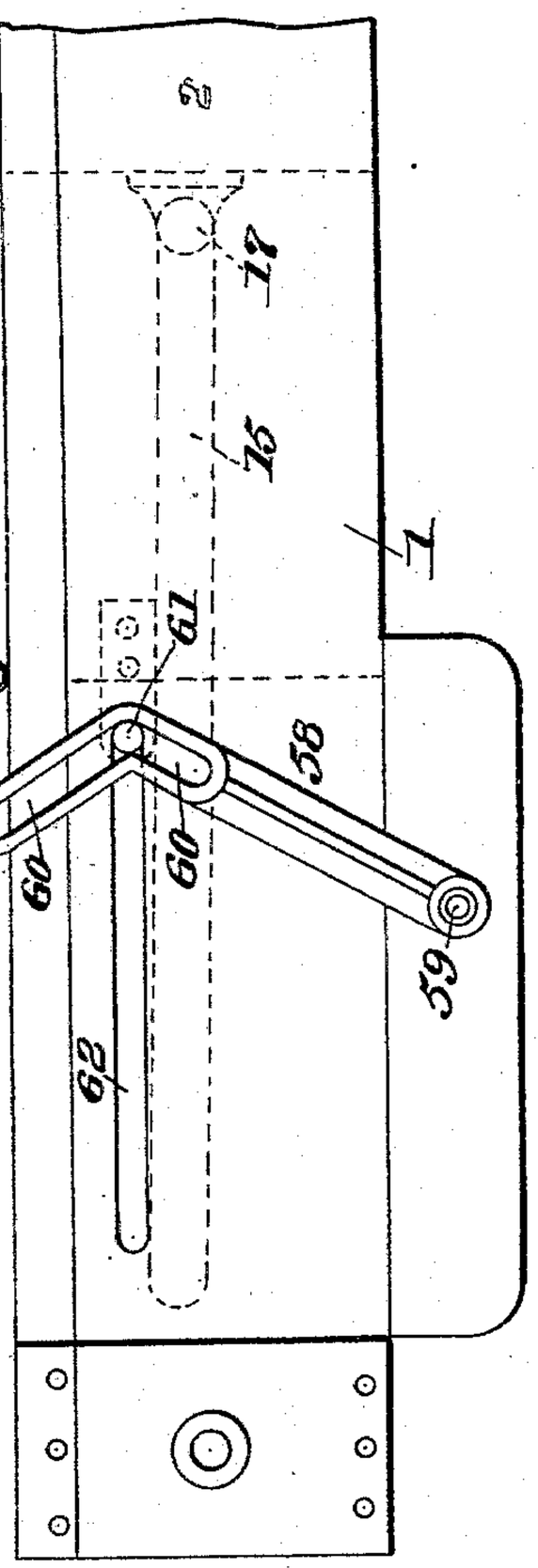
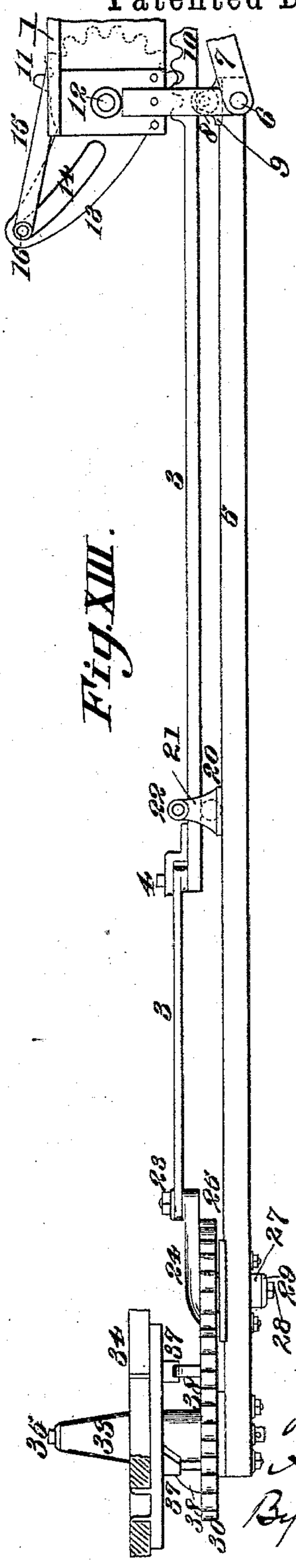


Fig. XIII.



Attest:
E. S. Knight
H. Finley.

Inventors
J. W. Brown
A. A. Gehrt
By Knight Bros
Attys

UNITED STATES PATENT OFFICE.

JOHN W. BROWN AND ALBERT A. GEHRT, OF QUINCY, ILLINOIS, ASSIGNORS TO THE COLLINS PLOW COMPANY, OF SAME PLACE.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 551,302, dated December 10, 1895.

Application filed July 11, 1894. Serial No. 517,248. (No model.)

To all whom it may concern:

Be it known that we, JOHN W. BROWN and ALBERT A. GEHRT, of Quincy, in the county of Adams and State of Illinois, have invented a certain new and useful Improvement 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.

Our invention relates to certain improvements in presses for baling hay, straw, excelsior, and the like; and our invention consists in features of novelty hereinafter fully described and pointed out in the claims.

Figure I is a detail top view showing the power end of the press with part of the sweep and sweep-head. Fig. II is a similar view, the sweep and sweep-head being omitted. Fig. III is an end view of the power end of the press, showing part of the sweep. Fig. IV is a vertical section taken on line IV IV, Fig. I. Fig. V is a detail top view showing the joint of the pitman and showing also the upper guide-roller of the pitman. Fig. VI is a detail side view of the parts shown in Fig. V. Fig. VII is a detail side elevation showing the baling portion of the press. Fig. VIII is a top view of the part shown in Fig. VII. Fig. IX is a detail vertical section of the baling part of the press, the feeder mechanism and the plunger-gear being shown in elevation. Fig. X is a detail top view of the condenser. Fig. XI is a detail view showing a modification of the connection between the pitman-rack and the plunger-toothed segment. Fig. XII is a detail side elevation showing a modification in connection with the baling portion of the press. Fig. XIII is a side elevation of the power end of the baling-press in connection with the plunger-gear mechanism.

Referring to the drawings, 1 represents the baling-chamber of the press.

2 represents the plunger; 3, the pitman, which is jointed at 4.

5 represents a timber or sill extending rearwardly from the baling-chamber, and on the outer end of which the power mechanism is supported. The inner end of the timber 5 is supported on pins 6, fitted in a strip or timber 7, secured to the baling-chamber 1.

8 represents a roller journaled in a casting 9 secured to the inner end of the timber 5, the roller forming a support for the inner end of the pitman 3. (See Figs. VII, IX, and XIII.) The inner end of the pitman is formed with a rack 10, engaging a toothed segment 11, mounted on a horizontal shaft 12. The toothed segment 11 is provided with a crank or arm 13, having a slot 14.

15 represents a link connected at its outer end by means of a pin 16 to the crank-arm 13, the pin 16 fitting in the slot 14. The inner end of the link 15 is pivoted at 17 to the plunger 2.

Instead of engaging directly with the toothed segment 11, the rack 10 may do so, through the interposition of a pinion 18, as shown in Fig. XI.

19 represents a cam formed upon or secured to the toothed segment 11, or if desired this cam may be rigidly secured to the shaft 12, which carries the toothed segment. The object of this cam is to force the connection 16, between the link 15 and the crank 13, to the outer end of the slot 14 as the rack 10 moves forward, and thus the plunger 2 is retracted with but a short movement or throw of the toothed segment 11. It will be understood that in the absence of the cam 19 the point of connection between the link 15 and the crank 13 would remain (except where there might be a severe return of the plunger under the expansive force of the pressed material) at the inner end of the slot 14; but by providing the cam 19, which comes against the link 15 as the toothed segment moves from the position shown in Fig. VII to the position shown in Fig. IX, the point of connection between the link 15 and the crank 13 is moved to the outer end of the slot 14, and thus the plunger is drawn back with a movement of the toothed segment 11 comparatively short to what would be necessary in the absence of the cam 19. Near the joint 4 the pitman is supported by a roller 20, journaled in a casting or bracket 21, secured to the timber 5. (See Figs. VI and XIII.) Above the pitman is a roller 22, journaled in the bracket 21, (see Figs. V, VI, and XII,) and which serves to prevent upward movement or strain of the pitman. The outer end of the pitman is connected at 23 to a crank 24, secured to or formed integral with

a pinion 25. The pinion 25 is connected to the frame 5, preferably as shown in Fig. IV, by means of an extension 26 thereon, journaled in a bushing 27, fitted in the timber. The projection is held in the bushing by means of a bolt 28, passing through the pinion, through the projection, and through a washer 29 fitting against the lower end of the bushing 27. The journal of the pinion 25 is eccentrically located with relation to the pinion, as shown in Figs. I, II, and IV.

30 represents a triangular cog-wheel, or cog-wheel having three equal sides, the teeth of the cog-wheel meshing with the teeth of the pinion 25. The eccentric journaling of the pinion 25 will miss the constant meshing of the teeth of the cog-wheel with the teeth of the pinion, notwithstanding the distance from the center of the cog-wheel to the corners of the triangle is greater than the distance from the center of the cog-wheel to the sides of the triangle. The cog-wheel has a hub 31, fitting a stud 32 secured to the timber 5. The cog-wheel is loosely supported on this journal-stud, so as to turn freely. Over the hub 31 is a sweep-head 33, to which the sweep 34 is connected. The head 33 is held in place by a bolt 35 passing through the sweep-head and through the stud 32, as shown in Fig. IV. We prefer to rabbet the upper end of the hub 31 into the lower surface of the sweep-head, as shown at 36. The sweep-head is carried independently of the cog-wheel 30, except when the projections 37 on the sweep-head come against projections 38 on the cog-wheel, and then the cog-wheel is caused to turn with the sweep-head, and as it is turned its motion is transmitted to the plunger 2, through means of the pinion 25, the crank 24, the pitman 3, the rack 10, the toothed segment 11, the crank 13, and the link 15.

As the corners of the triangular cog-wheel pass the pinion 25, the plunger is free to rebound without its movement or force being imparted to the sweep, as at such times the lugs or projections 37 on the cog-wheel will simply leave the lugs or projections on the sweep, and as the sweep continues to move, the lugs or projections thereon come against the lugs or projections on the cog-wheel again and the plunger is again advanced.

The cog-wheel 30 and the pinion 25 being mounted on separate centers, and the parts being so disposed that the corners of the cog-wheel engage with the pinion as the crank 24 and pitman 3 assume a parallel position, great power is obtained at the time that it is most needed—that is, when the final pressure is being made by the plunger upon the material being baled. By making the cog-wheel 30 in triangular form there are three forward movements of the plunger at each revolution of the cog-wheel or at each revolution of the sweep, thus making a press which is capable of baling a large amount of material in a given time.

It will be understood that the number of cogs in the pinion 25 is one-third of the number of cogs in the wheel 30, so that at each revolution of the wheel 30 the pinion turns three times around, thus giving three forward movements to the plunger at each revolution of the sweep. The result is a press capable of baling a large amount of material within a given time.

40 represents a feeder-blade, pivoted at 41 to a lever 42, the lever being pivoted at 43 to a standard or standards 44 mounted on the machine. The lever is of approximately bell-crank form, the upper arm carrying the feeder-blade and the lower arm being preferably curved below the pivot 43 and having a pin 45^a, (upon which may be a friction-roller,) fitting in a grooved arm 45, secured to the plunger. The feeder-blade has an extension 46 above the pivot 41, and to this extension is pivoted one end of a link 47, the other end of which is connected to the standard 44 or to a projection 48 on the standard. This link is for the purpose of imparting a parallel movement to the feeder-blade, so that as the feeder-blade enters the mouth of the press it will move in substantially a vertical direction instead of on the arc of a circle, as it would do were it rigidly connected to the end of the lever 42. The upper arm of the lever 42 is pivoted to the lower arm at 49, and back of the pivot 49 the upper arm is connected to the lower arm by means of a spring-bolt 50. By thus connecting the two arms of the lever together the feeder-board can yield slightly under severe strain, (as, for instance, in case of an overcharge of material for the press,) and thus danger of breakage is avoided.

Assuming the parts to be in the position shown in Fig. VII, with the plunger forward, the feeder will be in its raised position. As the plunger recedes, and before it reaches the limit of its rearward movement, the bend 51 in the arm 45 comes against the pin 45^a in the lower arm of the bell-crank lever 42, which causes the feeder to be forced from the position shown in Fig. VII to the position shown in Fig. IX. Before the feeder descends, a charge of the material has been thrown into the condenser, and is forced by the feeder into the baling-chamber. As the plunger moves forward again, carrying the arm 45 with it, the feeder is raised by the pin 45^a moving upward in the groove of the arm 45, and it will be observed that both the downward and upward movement of the feeder is very quick, making it possible to press three charges at each revolution of the sweep, and also have the feeder in the proper position as much of the time as it is possible for it to be in this position.

52 represents the fixed sides of the condenser, and 53 the movable and flexible sides. The sides 53 are hinged to a back piece 54, from which extends strips or arms 55, along the top sills of the press. These strips or arms are provided with projections 56, (which may be armed with friction-rollers,) fitting in

slots 57, formed in the upper end of levers 58, pivoted or hinged at 59 to the lower part of the press-chamber, the levers being located on the outside of the press and having angular slots 60, which receive pins 61 carried by the plunger, the pins, if preferred, being provided with friction-rollers where they fit in the slots 60. The pins move in slots 62 in the sides of the press, when the sides are closed. Otherwise no slots 62 are needed. We have shown the plunger provided with extensions 63 for carrying the pins 61. As the plunger recedes, the levers 58 will be moved from the position shown in full lines, Fig. VII, to the position shown in dotted lines, and as they are thus moved they will draw the movable part of the condenser forward toward the fixed part, and condense the material just prior to the descent of the feeder. The slots 57 are made to accommodate the vibratory movement of the lever 58 to the horizontal movement of the projections 56, for, as will be seen, when the arms or levers 58, as shown in both forward and backward stroke, Fig. VII, the projections 56 will always be near the top of slots 57; but when the levers stand in a perpendicular position the projections 56 will be lower down in the slot 57.

The slots 60 are made angular. The lower parts of slots 60 are made for the purpose of accommodating the pins 61 in their horizontal movement—that is to say, the pins 61 move in the lower part of the slots 60 as the levers pass over their pivot-lines.

The upper parts of the slots 60 are for the purpose of making an intermittent movement to the condenser-head 54. When the plunger is forced toward the toothed segment 11, the arms 58 being hinged at 59 and moved by the pins 61, the projections 56 move in a horizontal position much faster than 61, owing to its greater distance from the center 59. Then just before the plunger reaches its backward stroke the pins 61 will move into the upper parts of slots 60. Hence the arms 58 will cease to move. Then the condenser-head 54 will, by means of the projections 56, be at rest for the time being until the plunger starts on its forward stroke, when pins 61 will move out of the upper parts of slots 60 to the lower parts of slots 60. Then the arm 58 will move toward the baling-chamber and carry with it the projections 56 and the condenser-head. From this it will be seen that the condenser-head 54 has an intermittent movement, allowing it to condense, the material being fed very fast until the condenser-head 54 has reached the end of the feed-hole. Then it rests until the feeder 40 has forced the material into the press and resumes its position shown in Fig. VIII.

Other means (see Fig. XII) might be used to move the condenser with the arm 58. For instance, one end of a link 56^a could be attached to the rear of projections 56. The other end could be attached to the upper end of arm 58. By referring to Fig. VII it will be seen that this simply leaves off the slot 57 and connects the projections 56 to the arm 58 by the link. Of course the connection of the link to the projections 56 could be made farther back toward the press and by this means make a longer link, the link only being used to overcome the up-and-down motion of the vibrating arm 58, as it moves backward and forward.

70 represents the division-block holder, and 71 one of the blocks. This holder is mounted on top of the press and is capable of having a slight forward movement to allow the blocks to fall by gravity into the press. The holder consists of a base 73, which is held to the press by means of suitable slides 74^a that allow it to move slightly, and a vertical part 74, into which the blocks are inserted sidewise, the lower ends of the blocks resting, when the holder is in its rear or normal position, upon the top of the press. The top of the blocks are held by a flange or lip 74^b on the head.

75 represents a lever pivoted at 76 to the press-hopper, and connected by a link 77 to the block-holder. At the proper time the block-holder is moved slightly forward, through means of the lever 75, until the block is over the feed-opening, or until the block passes the corner A, Fig. IX, of the feed-opening. The block will then fall, by gravity, into the press, and the holder is then moved back to its normal position. Should the block be obstructed, or not fall entirely into the press by gravity, it will be struck by a plate or projection 78, secured to the feeder-plate 40, and will thus be moved by a positive pressure until it is entirely within the baling-chamber. By thus making the block-holder, and arranging it in a vertical position, a very simple means of inserting the division-blocks without taking hold of them with the hand is provided.

80 represents a fixed cam or plate, secured to the press in front of the toothed segment 11 on the side to which the crank 13 moves. The pin 16 that connects the link 15 to the crank moves behind this plate when the plunger is making the last part of its forward movement and the first part of its rearward movement, the result being that the pin 16 will be held to the inner end of the slot 14 during the first part of the backward movement of the mechanism, so that the plunger will be carried back by the crank-arm, and the pin 16 not allowed to move in the slot 14 before the crank has reached a position at, or substantially at, right angles to the length of the press, and then at about this time the cam 19 comes against the link 15 and forces the pin 16 to the outer end of the slot in crank-arm.

We claim as our invention—

1. In a baling press, the combination of a plunger, a pitman, a toothed segment adapted to be moved by the pitman and having a slotted crank, a link connecting the plunger to the crank of the toothed segment, and a

cam for engaging said link; substantially as set forth.

2. In a baling press, the combination of a plunger, a pitman, a toothed segment engaged by the pitman, and having a slotted crank, a link connecting the slotted crank to the plunger, a plate 80 and cam 19 located on the same axis as the toothed segment; substantially as and for the purpose set forth.

3. In a baling press, the combination of a plunger having a grooved angular arm rigidly secured thereto, a feeder having an operating lever, and a connection between the feeder-lever and the arm carried by the plunger; substantially as set forth.

4. In a baling press, the combination of a plunger, a feeder, a pivoted arm and a condenser; said arm having a slot and pin connection with the movable portion of condenser, and having a pin and angular slot connection with said plunger; substantially as and for the purpose set forth.

5. In a baling press, the combination of a plunger, an arm rigidly secured to and carried by the plunger, and having a substantially horizontal, and a substantially vertical portion, and a feeder connecting with said arm; substantially as set forth.

6. In a baling press, the combination of a plunger, a grooved arm secured rigidly to and carried by the plunger, and having a substantially horizontal, and a substantially vertical portion, and a feeder engaging with and operated by said arm; substantially as set forth.

7. In a baling press, the combination of a plunger, a condenser, a pivoted lever and means whereby the pivoted lever is so connected to each as to produce an intermittent movement of the condenser, as set forth.

8. In a baling press, a holder for the division boards, consisting of a base portion, adapted to slide on the press, and a vertical portion adapted to hold the boards; substantially as set forth.

9. In a baling press, a holder for the division boards, consisting of a base portion, adapted to fit and move on the press, and a vertical portion adapted to hold the division boards with their lower ends resting on the press, and a lever for moving the holder; substantially as set forth.

10. In combination with a baling press, a division board holder, and means for moving the holder longitudinally of the press; substantially as set forth.

11. In a baling press, a division board holder, mounted on top of the press, so as to be moved in the direction of the length of the press; substantially as set forth.

JOHN W. BROWN.
ALBERT A. GEHRT.

In presence of—
E. S. THOMAS,
GEORGE W. ELICK.