R. E. HAYNES.

COTTON PRESS.

APPLICATION FILED SEPT. 9, 1908.

919,861.

Patented Apr. 27, 1909.

5 SHEETS—SHEET 1.

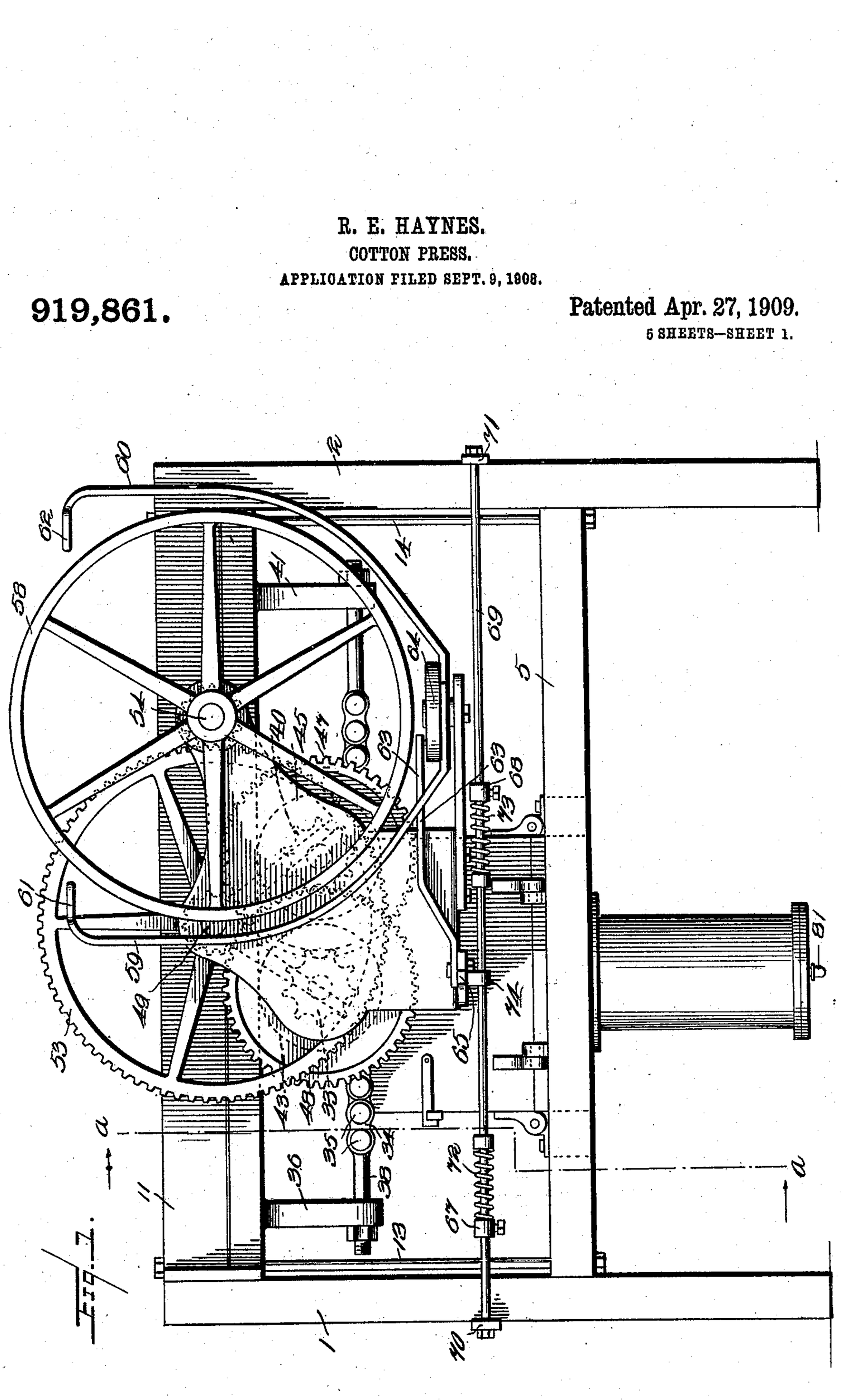

Fig. 1.

Witnesses.
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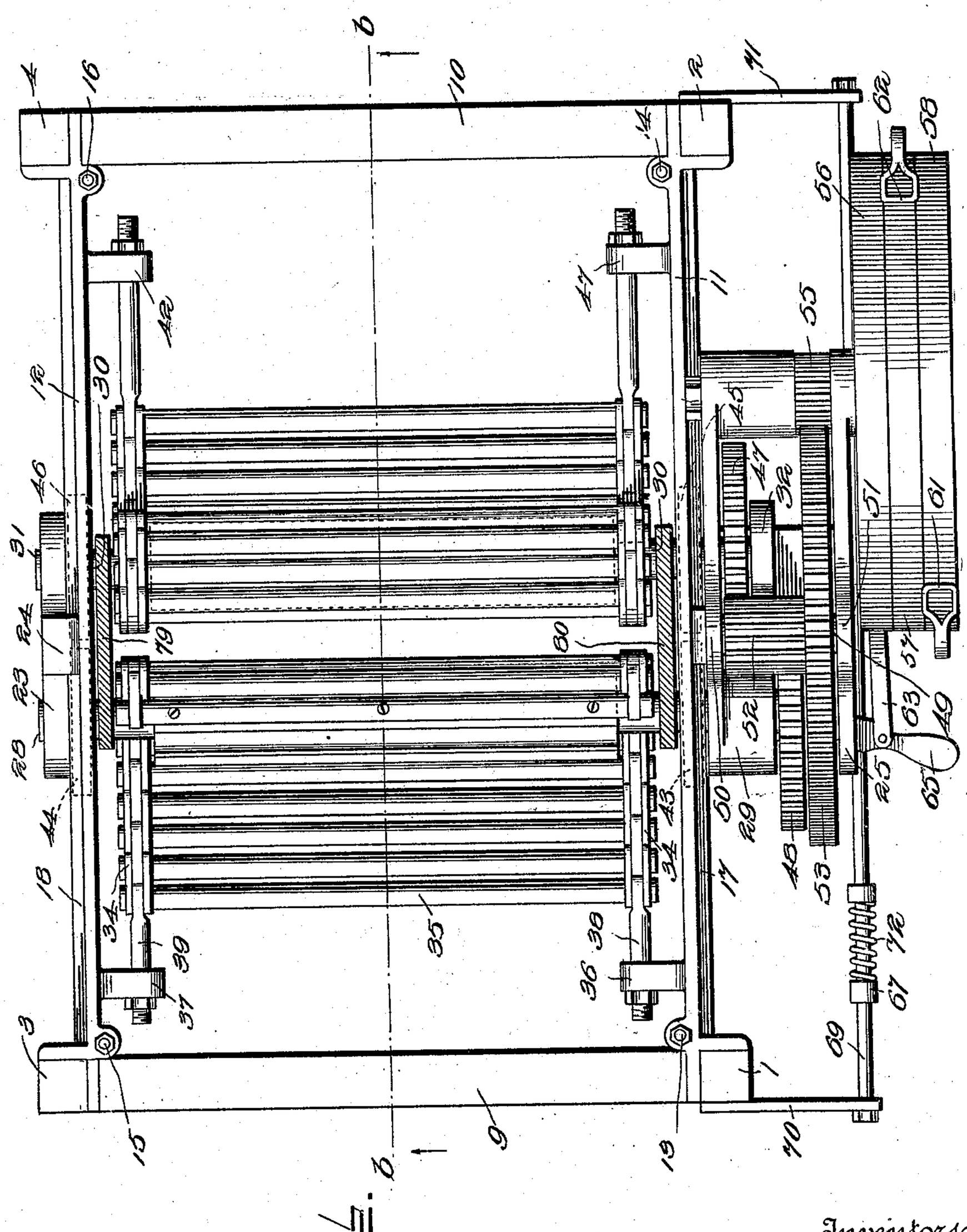

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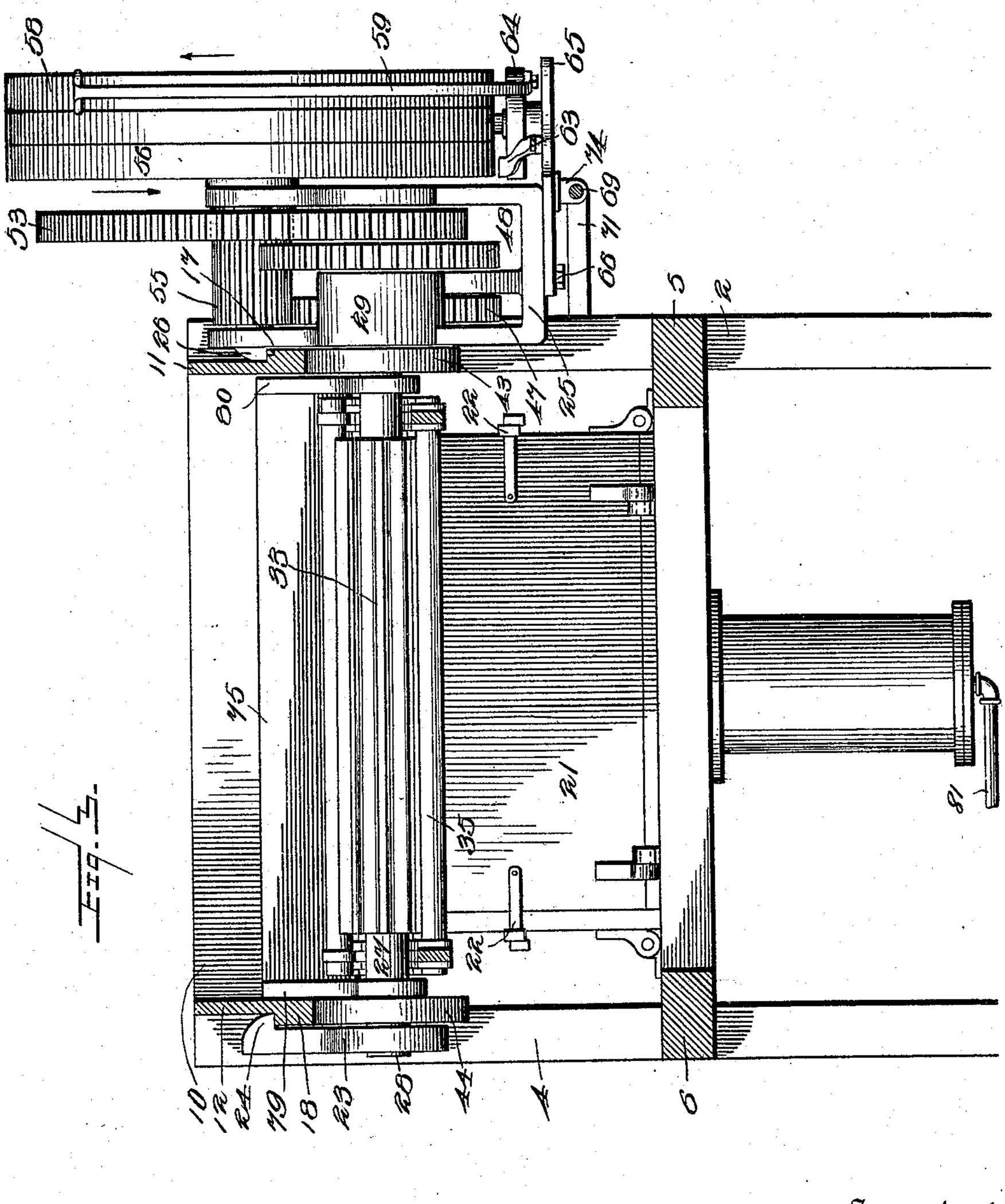

Fig. 4.

Witnesses

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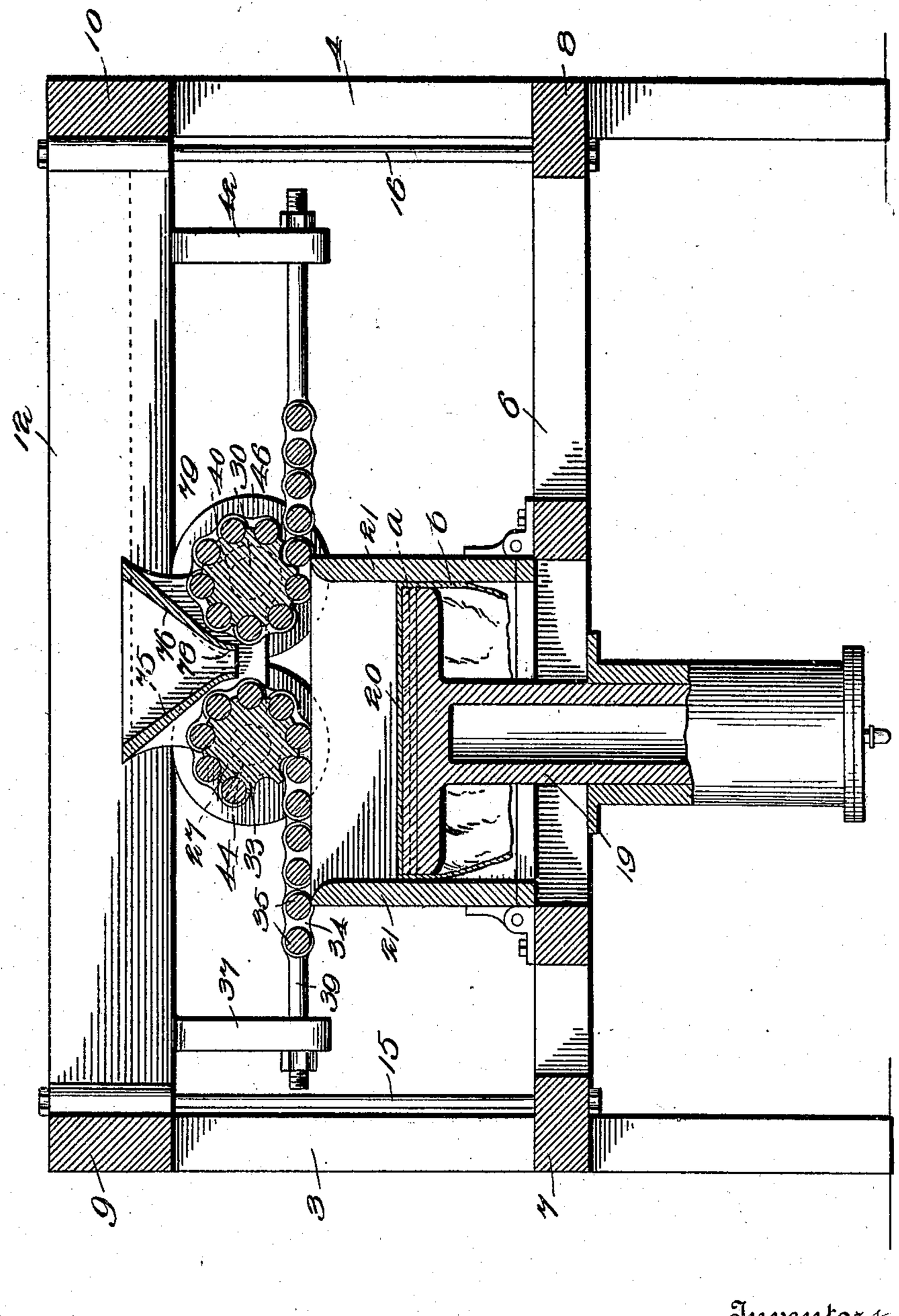

Fig. 4.

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5 SHEETS—SHEET 5.

FIG. 5.

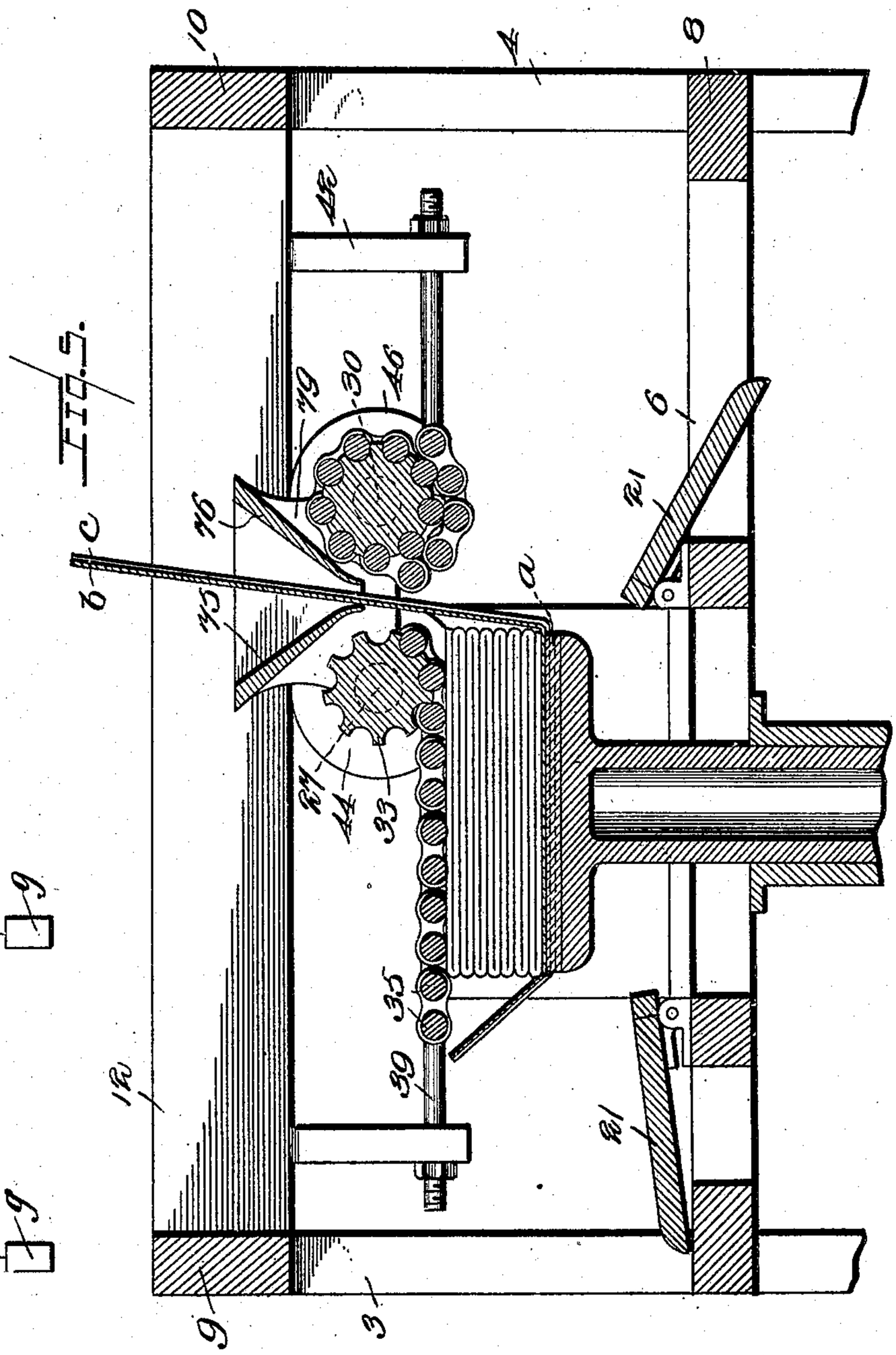
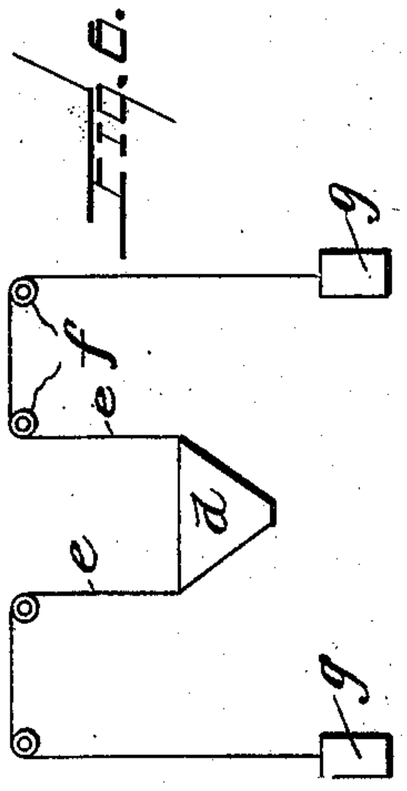


FIG. 6.



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UNITED STATES PATENT OFFICE.

ROBERT E. HAYNES, OF SALISBURY, NORTH CAROLINA, ASSIGNOR OF ONE-HALF TO HENRY T. TRANTHAM, OF SALISBURY, NORTH CAROLINA.

COTTON-PRESS.

No. 919,861. Specification of Letters Patent. Patented April 27, 1909.

Application filed September 9, 1908. Serial No. 452,250.

To all whom it may concern:

Be it known that I, ROBERT E. HAYNES, a citizen of the United States, residing at Salisbury, in the county of Rowan and State of North Carolina, have invented certain new and useful Improvements in Cotton-Presses; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to cotton presses and particularly to that type known as belt and roller presses in which the cotton is fed by suitable mechanism to a hopper, thence between rollers to a baling box and under compressing chains in overlapping layers.

Heretofore in baling cotton in the manner just named it has been customary to employ mechanism wherein the platen is secured to a frame which is reciprocated by a mangle gear or otherwise, so that the platen is constantly moved back and forth in order to expose the entire surface thereof to the cotton feed inlet; such reciprocation of the platen and frame also serving to actuate by suitable connections other essential mechanism of a complete press. In such mechanism it has been discovered that an exceedingly large amount of power is required to reciprocate the platen and frame due to immense friction created by the pressure exerted by the platen and of the connections necessary to be supplied to operate other essential elements of the press; and it is the object of this invention to produce a mechanism wherein the aforementioned friction will be so materially reduced and the power required for proper operation so lessened that the power which operates the gin may also be utilized to actuate the press. To this end the platen and frame are constructed so as to have a fixed position throughout the entire operation of the press except as to the downward movement of the platen as the bale is increased in size; while the other features of the press are so simplified that its efficiency and durability are greatly enhanced.

With the above and other objects in view the invention consists in the details of construction and in the combination and arrangement of parts to be hereinafter more fully set forth and described.

In describing the invention in detail reference will be had to the accompanying drawings wherein like characters of reference denote corresponding parts in the several views, and in which,

Figure 1 is a front elevation of the improved cotton press; Fig. 2, a plan view of the same; Fig. 3, a vertical transverse section on the line *a*—*a* of Fig. 1; Fig. 4 a longitudinal vertical section on the line *b*—*b* of Fig. 2; Fig. 5, a longitudinal section, showing the manner of applying the bagging and ties to the bale; Fig. 6, a modified means of supporting the hopper.

Referring to the drawings, 1, 2, 3 and 4 represent the standards of a frame for supporting the mechanism and are adapted to rest upon a suitable support at their bases. Longitudinal cross beams 5 and 6, and transverse cross beams 7 and 8, serve to connect said standards at a suitable point from their bases, while they are connected at their tops by the transverse beams 9 and 10 and the longitudinal beams 11 and 12. Said longitudinal beams are preferably constructed of metal and have their respective ends angled to form pockets for the standards 1, 2, 3 and 4, and are further connected with the cross beams 7 and 8 through the medium of the binding rods 13, 14, 15 and 16, whereby the complete frame is more efficiently secured together. At the base of the longitudinal beams 11 and 12 are respectively formed the outwardly projecting flanges 17 and 18 for a purpose to be hereinafter described. Suitably secured to the longitudinal beams 5 and 6 is a hydraulic piston 19, which is adapted in its movement to rise above said beams 5 and 6, and carries a platen 20 which is provided with suitable grooves (shown in dotted lines Fig. 4) for the reception of bale ties. Surrounding the platen 20 is a compressing box provided with hinged side walls 21 and latches 22.

A bearing plate 23 is mounted adjacent the longitudinal beam 11, and has an inwardly extending angular portion 24 adapted to overlap the flange 18. Another bearing plate 25 is mounted adjacent the longitudinal beam 10, and also has an inwardly extending angular portion 26 adapted to overlap the flange 17. A shaft 27 extends transversely of the frame and has a bearing 28 at one end in the plate 23 and a bearing 29 at the other end in the plate 25. Another shaft 30 also extends transversely of the frame

in proximity to the shaft 27 and has a bearing 31 at one end in the plate 23 and a bearing 32 at the other end in the plate 25. Fixed to the shaft 27 is a fluted roller 33 which has secured thereto one end of a compressing chain, said chain being formed of two parallel link portions 34, connected by the roller 35 which pass through corresponding bearings in the link portions 34 and are adapted upon rotation of the roller 33 to enter and leave the grooves of said roller. The other end of said compressing chain is secured to the longitudinal beams 10 and 12 through the medium of depending lugs 36 and 37 respectively formed on said longitudinal beams and the tie bolts 38 and 39 which have one end secured to the nearest roller 35, and their other end to the lugs 36 and 37 respectively. The link portions 34 of the compressing chain lie beyond the limiting edges of the fluted roller 33 so that the roller 35 can enter the grooves of the roller 33 to their full extent. Fixed to the shaft 30 is another fluted roller 40 which has secured thereto one end of a compressing chain precisely similar to that just described but oppositely disposed with its other end secured to depending lugs 41 and 42, in the longitudinal beams 10 and 11, respectively.

Loosely mounted in the shaft 27, near each end are the rollers 43 and 44, which are adapted to bear against the under side of the flanges 17 and 18 respectively. Similar rollers 45 and 46 are loosely mounted on the shaft 30 which are also adapted to bear against the under side of the flanges 17 and 18, respectively. It will thus be obvious that a simultaneous rotation of shafts 27 and 30 in the same direction will cause the chains to wind upon one of the fluted rollers and unwind from the other and at the same time the fluted rollers will move longitudinally of the frame in the same direction.

The mechanism for rotating the shafts 27 and 30, will now be described. The shaft 30 has fixed thereto adjacent its bearing 32, a gear wheel 47, while the shaft 27 is extended beyond its bearing 29, and has a gear wheel 48, fixed on its extended end.

A shaft 49 is mounted with bearings in the plate 25 at 50 and 51, and small and large gear wheels 52 and 53 are fixed to said shaft; the gears 47 and 48 both meshing with gear 52, whereby a rotation of gear 52, through the agency of shaft 49 and gear 53, causes the gears 47 and 48 to rotate in the same direction and consequently the shafts 27 and 30, and fluted rollers 33 and 40. Rotation of gear 53 is had through the medium of a shaft 54, having suitable bearing in the plate 25 and which has fixed thereto a gear 55 in mesh with gear 53. The shaft 54 also has mounted thereon a series of driving wheels 56 and 58 and between said wheels 56 and 58 a wheel 57 which is adapted to rotate freely on the shaft in either direction but without influence on said shaft. The wheel 56 is capable of rotating the shaft 54 in the direction of the arrow in Fig. 3; while the wheel 58 is adapted to rotate said shaft 54 only in the opposite direction also indicated by an arrow in Fig. 1. Rotation of the wheels 56 and 58 in a direction opposite to that indicated by the arrows will simply cause them to run idly in said shaft 54. A belt guide is mounted so as to partially surround one or the other of said driving wheels 56 and 58 and the idle wheel 57 and compress two upwardly extending arms 59 and 60 having their upper ends terminating in loops 61 and 62 respectively; the loop 61 being adapted to have an elastic driving belt passed therethrough for driving the wheel 58 in the direction indicated by the arrow in Fig. 1; while the loop 62 receives another elastic driving belt for actuating the wheel 56 in the opposite direction as shown by the arrow in Fig. 3.

The arms 59 and 60 are adapted to be simultaneously shifted transversely of the peripheries of wheel 56, 57 and 58, and it will be noted that such a shifting of the same will cause one of the belts to be removed from the driving wheel to the idle wheel, while the other is at the same time moved from the idle wheel to the driving wheel and as the aforementioned belts are traveling in opposite directions it will be apparent that such a shifting of the belting will reverse the direction in which all the elements of the mechanism are moving. Any suitable means may be employed in intermittently shifting the position of the arms 59 and 60, in order to intermittently reverse the direction in which the elements of the mechanism are traveling. The means for intermittently shifting the belt guiding arms is herein shown as actuated by an arm 63 one end of which operatively engages the shifting mechanism 64 which in turn connects with the arms 59 and 60 and the other end of arm 63 engages a lever 65 which is pivoted to the plate 25 at 66 and is adapted to be intermittently moved on its pivot in opposite directions by the stops 67 and 68 as the fluted rollers and their operating mechanism move to and fro on the frame; such movement of the lever 65 actuating the shifting mechanism through the medium of arm 63.

The stops 67 and 68 are mounted in a rod 69 extending longitudinally of the frame and secured thereto by the brackets 70 and 71, said brackets having their inner ends secured to standards of the frame and their outer ends connected to the ends of rod 69. The stops 67 and 68 have inwardly extending spring buffers 72 and 73 respectively formed therewith, and surrounding the rod whereby the intermittent engagement of the lever 65 with stops 67 and 68 is cushioned.

The plate 25 has a depending portion 74

having an aperture therein adapted to easily receive the rod 69 whereby the traveling mechanism of the press may be better guided in its travel to and fro on the frame.

A hopper is mounted to travel with and empty in the feed inlet between the fluted rollers and to this end is constructed with two downwardly converging sides 75 and 76 forming the mouth 78 which lies between the fluted rollers. The corresponding ends of said sides are fixed to vertical end plates 79 and 80 which are flared at their base and each provided with corresponding apertures through which the shaft 27 and 30 respectively pass and freely rotate therein.

A pipe 81 transmits the hydraulic pressure to the piston 19, and platen 21, and any suitable means may be employed to regulate the pressure on the piston 19, either to slowly reduce it as the thickness of the bale is increased and the desired density thereof obtained, or to hold the pressure stationary, by means of an automatic pressure relief valve.

Means for bringing the bagging and the bale ties across the top of the bale while it is still compressed, so that the tying may be easily effected, are provided, said means being best shown in Figs. 4 and 5. In the bottom of the platen 20 grooves *a* are provided, shown in dotted lines in Fig. 4, and before the compressing operation is begun the sides 21 are folded down and the bagging *b* is placed over the platen, hanging loosely down around it, and the sides 21 are then brought to the upright position, as shown in Fig. 4, the bale ties (not shown in Fig. 4) lying in the grooves *a* underneath the bagging. After the bale has been compressed the mechanism is stopped with the parts substantially in the position shown in Fig. 5, and the sides are then folded down. One end of the bagging *b* and the bale tie *c* is then brought up between the compressing chains through the hopper, as shown in Fig. 5, and the machine is then started for a time, which carries the bale tie and the bagging across over the top of the bale, still keeping the latter tightly compressed. The other end of the bagging and ties are then brought up on the left-hand side of the bale, as shown in Fig. 5, and the bale ties are fastened while the bale is still under compression. Thus a simple and effective means of quickly tying up the bale in bagging, while still under pressure, is provided.

To avoid the necessity of inserting the bagging and ties up through the hopper I have devised the means shown in Fig. 6, in which figure *d* represents the hopper which is movably held by cords *e* running over pulleys *f* and having weights *g* secured thereto, so that the hopper may be readily swung out of the way when it is desired to bring the bagging and bale ties across the top of the bale.

The operation is as follows:—Assuming the parts to be in the position shown in Figs. 1 and 2, and the platen 20 raised so as to bear against the rollers 35 of the compressing chains. The cotton is delivered into the hopper supported by the shafts 27 and 30, and the arms 59 and 60 are so positioned (see Fig. 2) that the driving belts are actuating the driving wheel 58 and the idle wheel 57. The driving wheel 58 is thus rotated in the direction indicated by the arrow adjacent thereto in Fig. 3, and consequently the shaft 54 and gear 55 are rotated in the same direction; this rotation of gear 55 causes the gear 53, shaft 49 and gear 52 to rotate in the opposite directions. The rotation of gear 52 in turn serves to rotate the gears 48 and 47 in opposite directions; said gears 48 and 47 respectively actuating the shafts 30 and 27, and the fluted rollers 33 and 40 in unison therewith. It will now be observed that this opposite rotation of the fluted rollers 33 and 40 will cause the compressing chain attached to roller 33 to unwind therefrom and spread over the face of the platen 20 and at the same time the compressing chain attached to roller 40 will be wound upon said roller and thereby lifted from the face of the platen 20. However, as the compressing chain secured to the roller 40 is secured at its other end to the frame, the winding of the chain on the roller 40 will cause said roller to move toward the cross beam 10; and inasmuch as said roller 40, roller 33 and all the multiple gearing for actuating said rollers have their bearings in plates 23 and 25, which are situated on opposite sides of the frame, the entire mechanism just enumerated will travel in unison toward cross beam 10; the rollers 44, 46 and 43, 45, being up against the under side of the flanges 18 and 17 respectively and serving as a bearing for the entire mechanism during its travel. At the termination of this movement of the mechanism toward cross beam 10, the lever 65 engages the cushioned stop 68 and is turned on its pivot thus causing the bar 63 to actuate the shifting mechanism 64 to throw the belting guided by arm 59, from driving wheel 58 to idle wheel 57, and at the same time, to throw the belting guided by arm 60, from the idle wheel 57 to the driving wheel 56. Immediately that the shifting of the belts just mentioned takes place, the wheel 56 begins to rotate the shaft 54 and gear 55 in the opposite direction to that in which they had been rotating, and consequently the movement of the rollers and their actuating mechanism is reversed and said rollers and mechanism will travel in the direction of cross beam 9, thus causing the compressing chain attached to the roller

40 to be unwound and spread over the surface of the platen 20, as the compressing chain attached to the roller 33 is moved thereon and lifted over the surface of the platen. At the termination of the movement of the mechanism toward the cross beam 9, the lever 65 engages the cushioned stop 67 and again actuates the shifting mechanism 64, through the medium of arm 63, whereby the entire mechanism is reversed and again moves toward cross beam 10 in the manner first described. This automatically controlled reciprocating movement of the rollers 33 and 40 is repeated until a sufficient number of layers of cotton have been pressed together to make a bale of desired size and density, when the mechanism is stopped and the bale is tied up and removed as above described.

While I have shown and described one form of carrying my invention into practice, I wish it distinctly understood that I do not limit myself to the exact structure shown and described as it is evident that same may be varied in many ways without departing from the scope of my invention.

What I claim is:—

1. In a baling press, the combination of a non-reciprocating compressing box; a pair of rotating and reciprocating feed rollers for feeding the material in a continuous layer into said compressing box; sliding plates in which said rollers are mounted; means comprising chains carrying compressing rollers for compressing the material as rapidly as it is fed to said box; and means for simultaneously rotating and reciprocating said feed and compressing rollers over the compressing box whereby the layer is deposited in folds therein, substantially as described.

2. In a baling press, a frame; a non-reciprocating compressing box; a pair of rotating and reciprocating feed rollers; sliding plates in which said rollers are mounted; a pair of oppositely disposed compressing chains each having their outer ends secured to the frame, and their inner ends respectively secured to said feed rollers; said chains adapted to reciprocate with said feed rollers; means for simultaneously rotating the feed rollers in the same directions whereby said rollers respectively wind and unwind said chains and are moved over the compressing box in the direction of the chain being wound; and means automatically actuated at the termination of said winding and unwinding of the compressing chains for automatically reversing the direction of rotation of the rollers and moving them in the opposite direction over the compressing box, substantially as described.

3. In a baling press, the combination of a non-reciprocating compressing box; a pair of rotating and reciprocating feed rollers for feeding the material in a continuous layer into said compressing box; means comprising reciprocating compressing rollers for compressing the material as rapidly as fed to said box; means whereby the rotation of said feed rollers causes them to move in one direction over the compressing box, and a reverse rotation causes them to move in the opposite direction; a system of multiple gearing for rotating said rollers; a reversing mechanism operatively connected with the gearing; and stops adapted to operatively engage said reversing mechanism at the termination of the movement of the rollers in one direction whereby the rotation of the elements of the system of gearing and rollers is reversed and the rollers are moved over the compressing box in the opposite direction, substantially as described.

4. In a baling press; a frame; a non-reciprocating compressing box; a pair of fluted rollers mounted to simultaneously rotate and reciprocate on said frame over the compressing box; a pair of oppositely disposed compressing chains each having their outer ends secured to the frame and their inner ends respectively secured to said rollers; said chains each comprising a pair of longitudinally parallel sets of links connected by a series of transversely parallel rollers adapted to enter and leave the flutes of said fluted rollers during rotation of said rollers; means for simultaneously rotating the rollers in the same direction whereby said rollers respectively wind and unwind said chains and are moved over the compressing box; and means for reversing the rotation of the fluted rollers whereby they are moved in the opposite direction over the compressing box, substantially as described.

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

ROBERT E. HAYNES.

Witnesses:

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E. H. WOODSON.