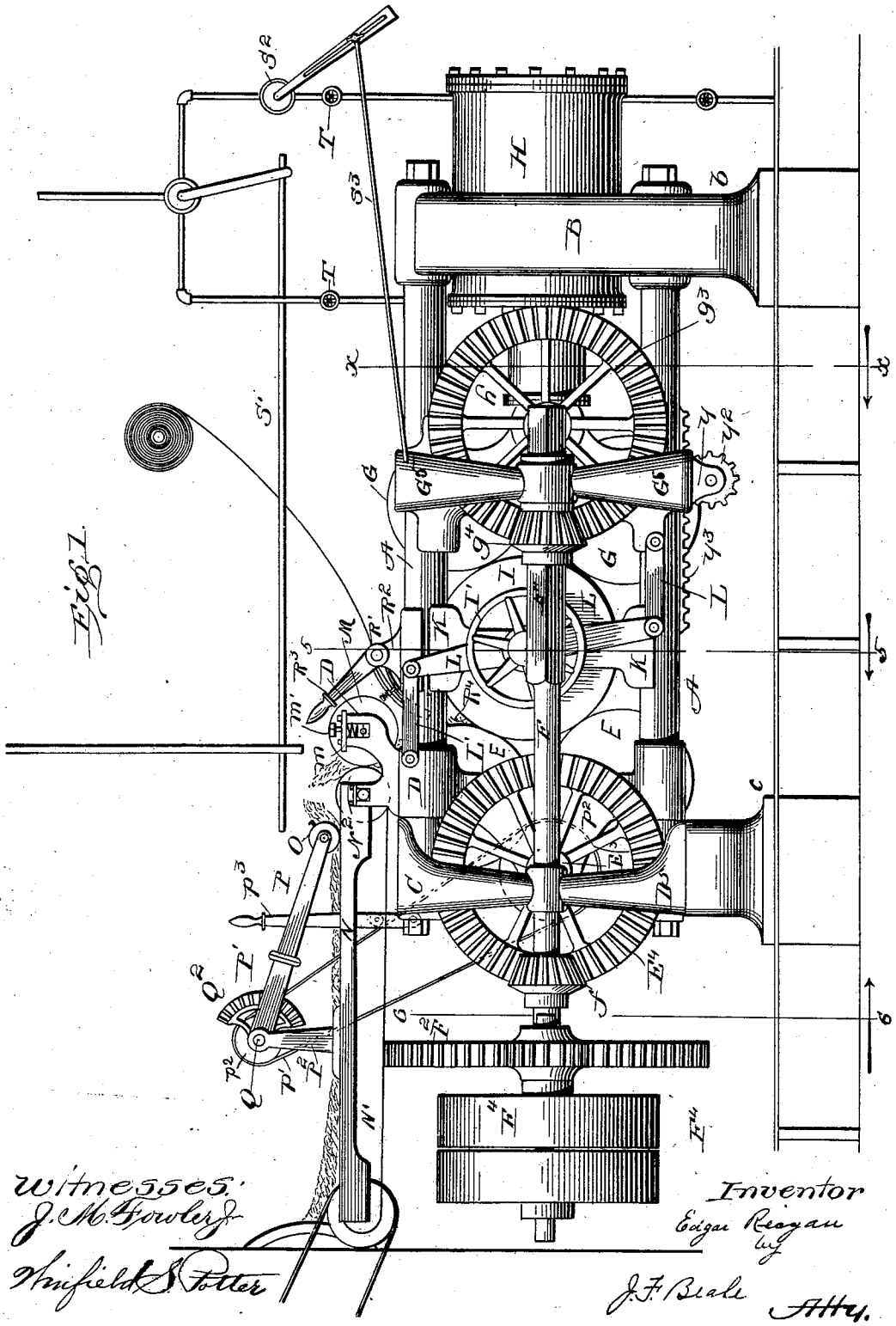
No. 699,114. Patented Apr. 29, 1902.

E. REAGAN.

ROLLER PRESS.

(Application filed May 16, 1901.)

(No Model.) 8 Sheets—Sheet 1.



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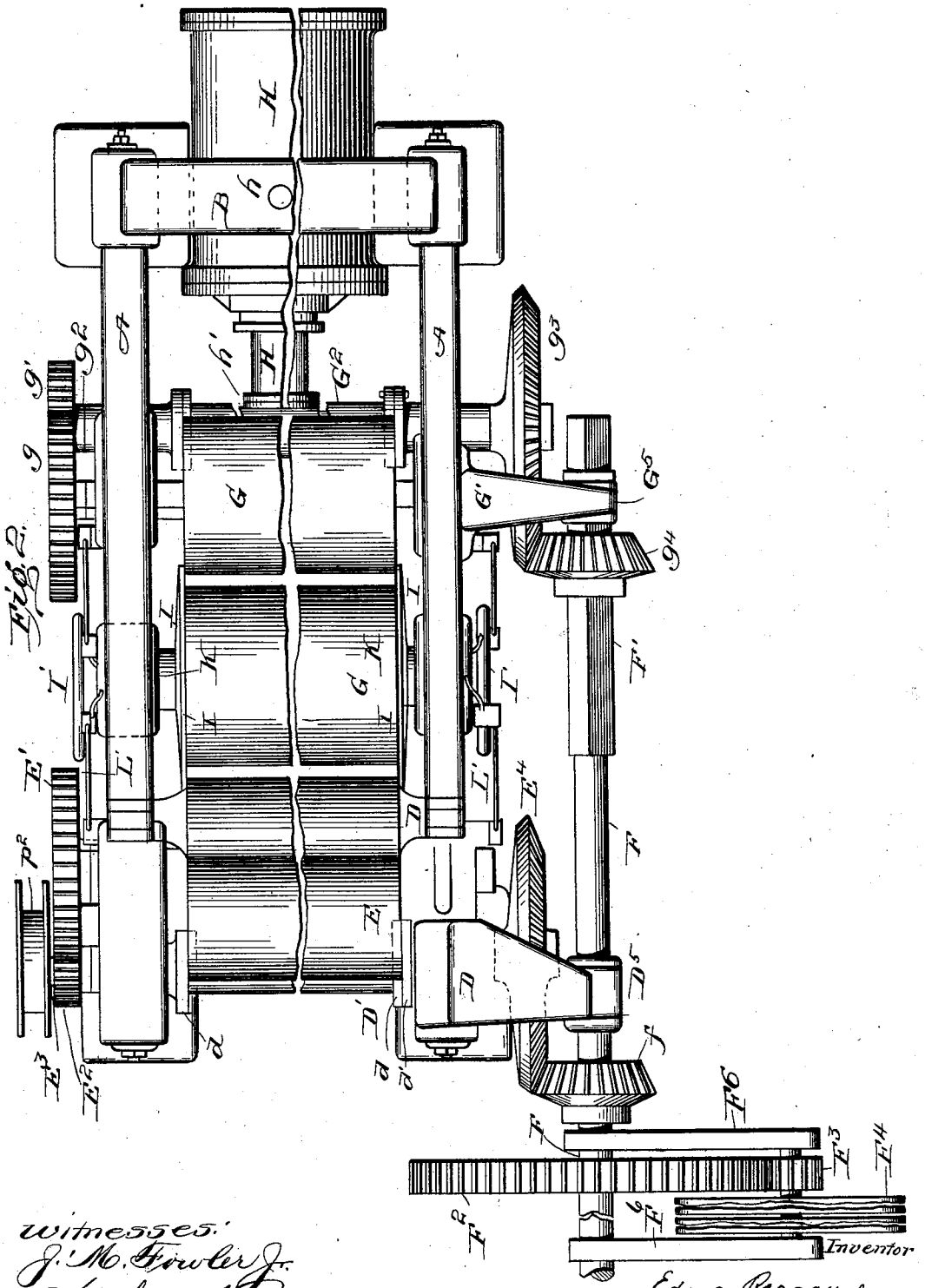


Fig. 2.

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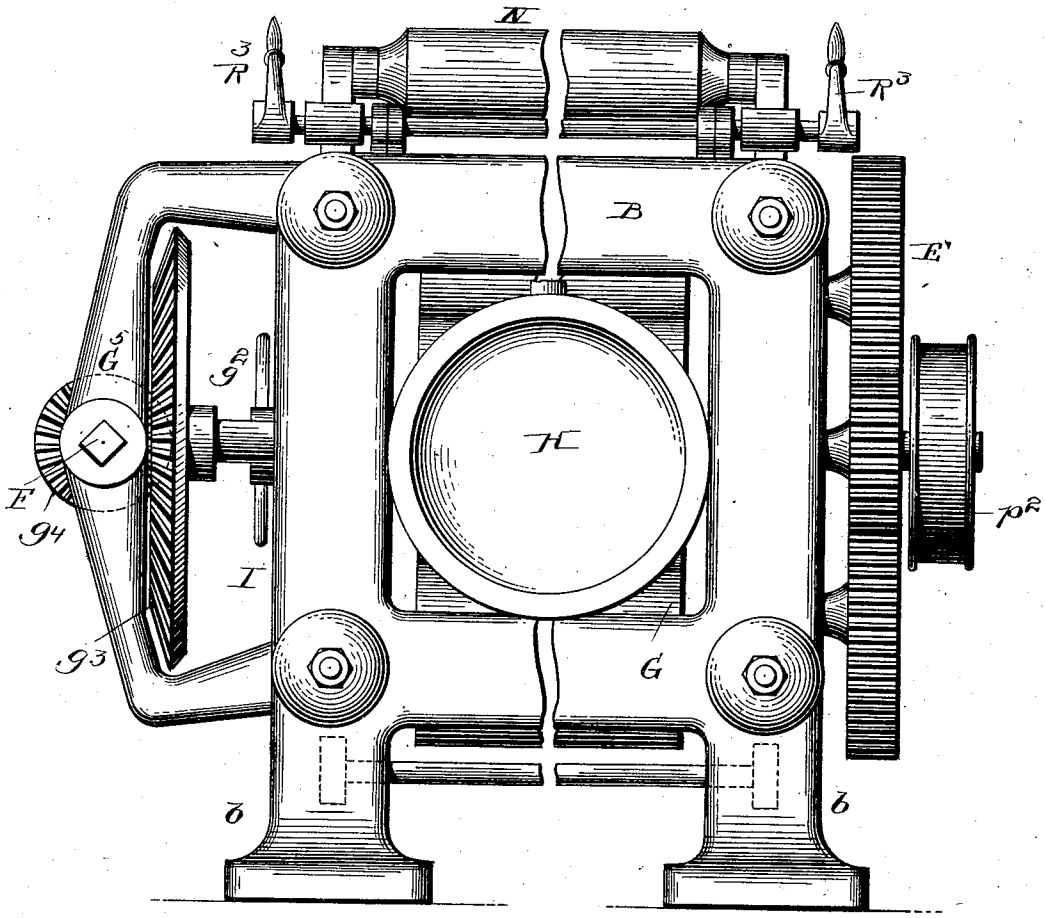
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Fig. 3.



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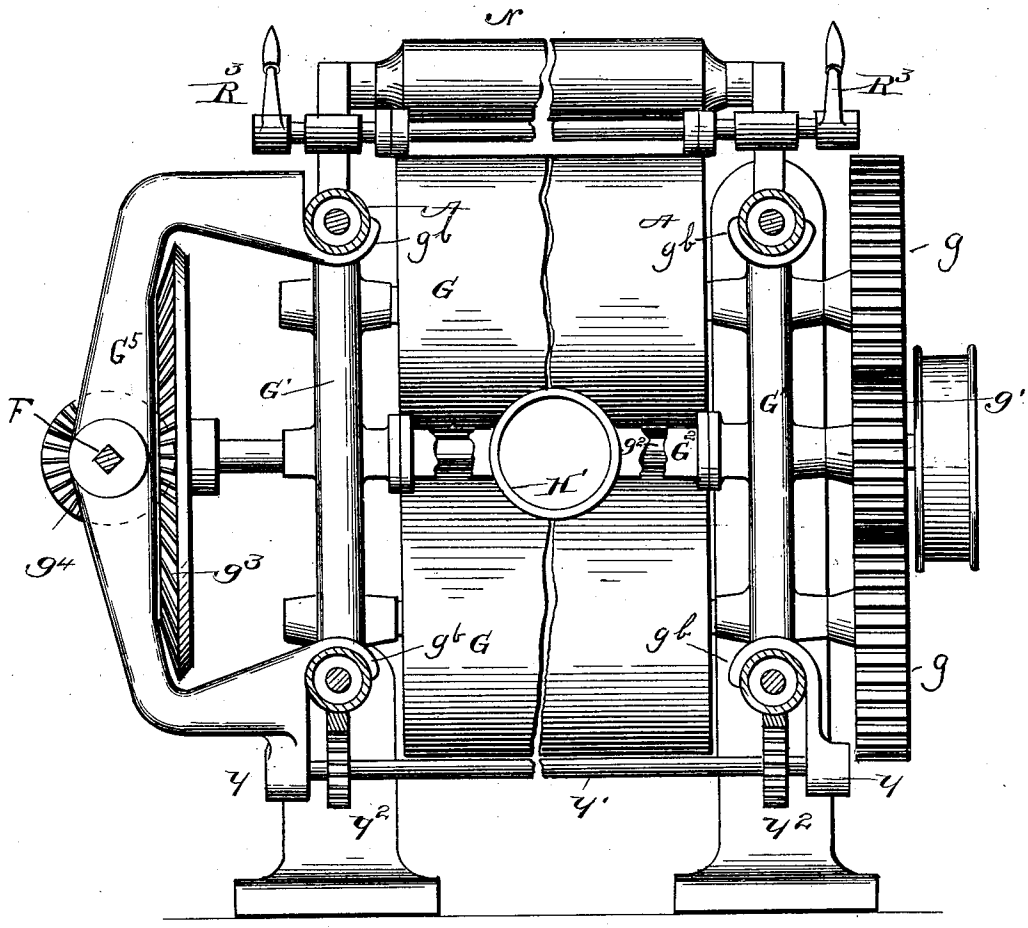
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Fig. 4.



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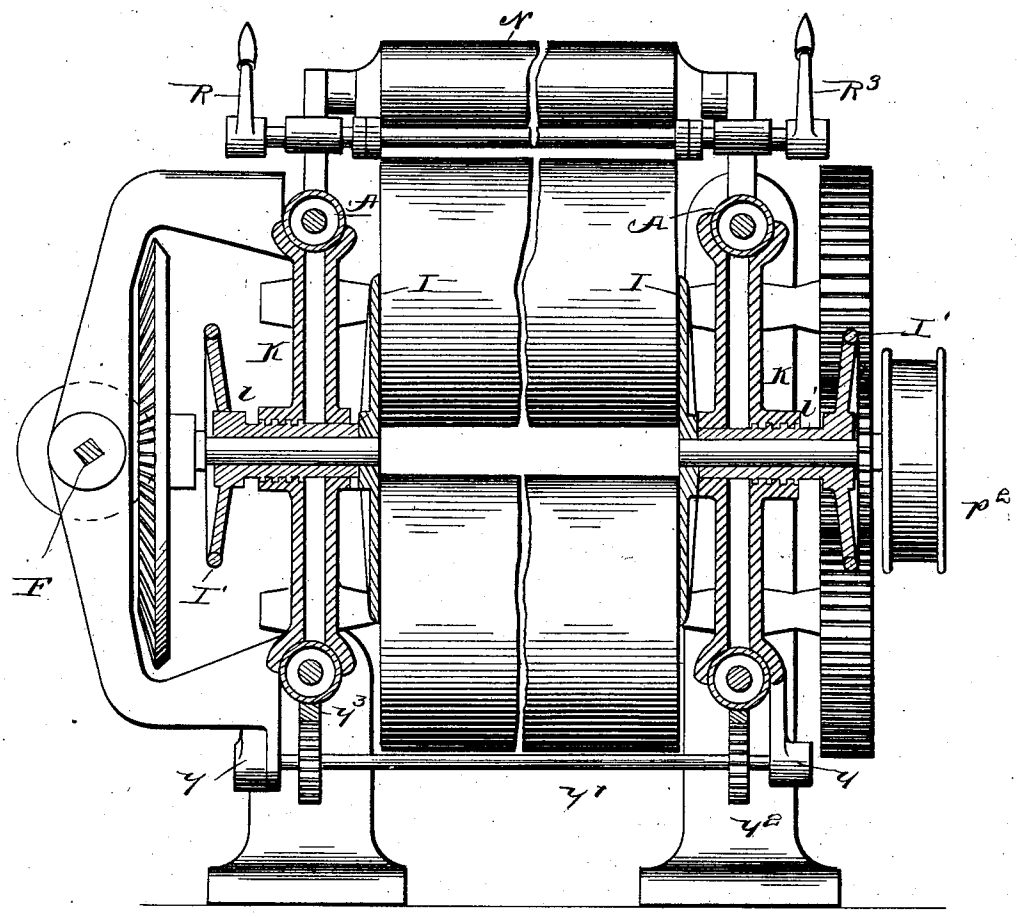
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Fig. 5.



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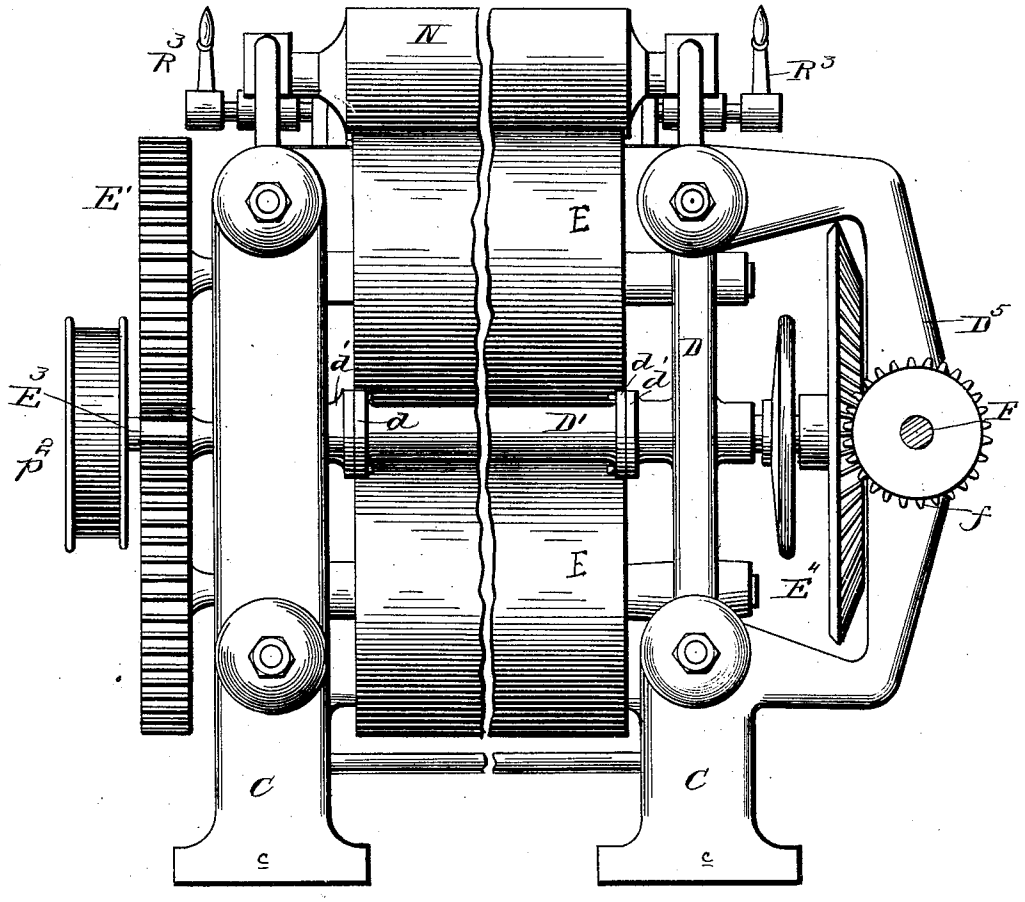
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(Application filed May 16, 1901.)

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Fig. 6



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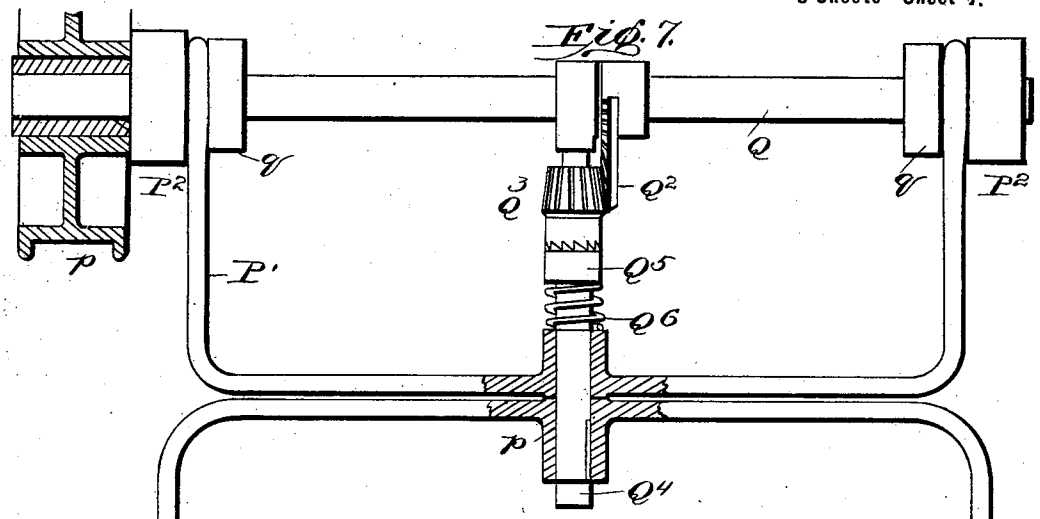
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(Application filed May 16, 1901.)

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Fig. 7.



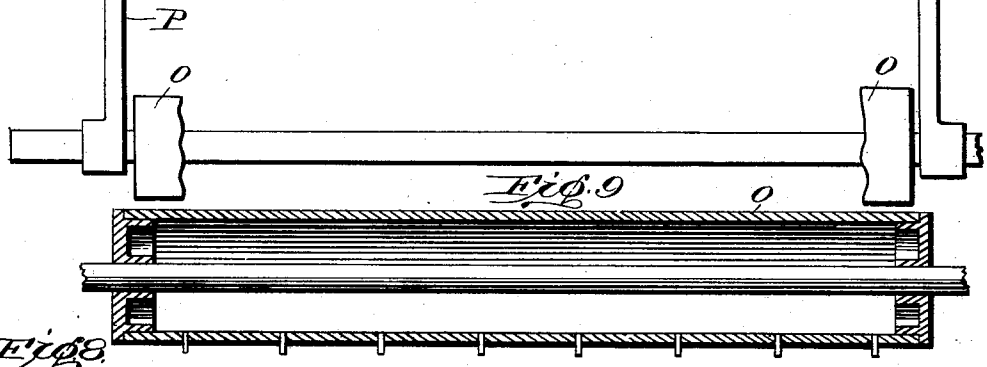


Fig. 9.

Fig. 8.

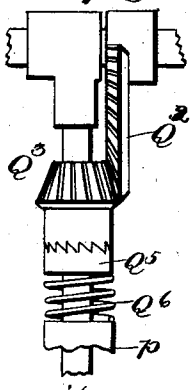


Fig. 11.

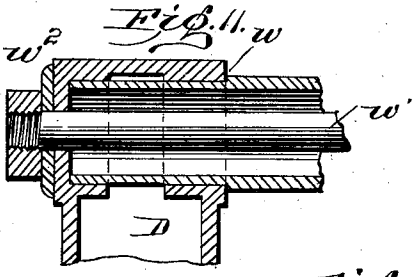


Fig. 10.

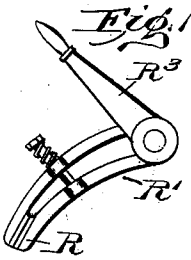
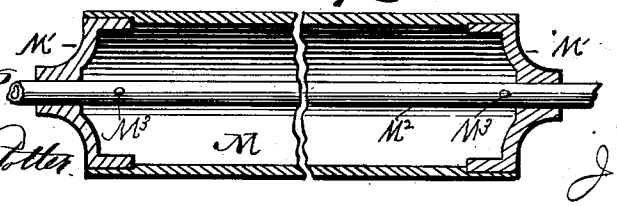


Fig. 12.



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(Application filed May 16, 1901.)

(No Model.) 8 Sheets—Sheet 8.

Fig. 14.

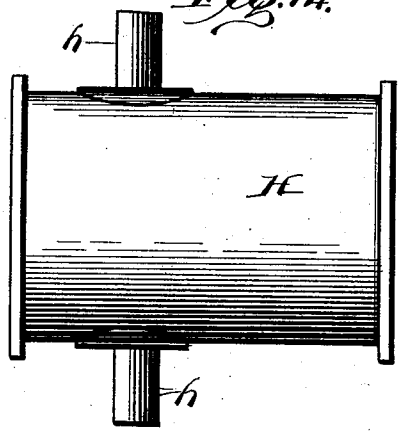


Fig. 13.

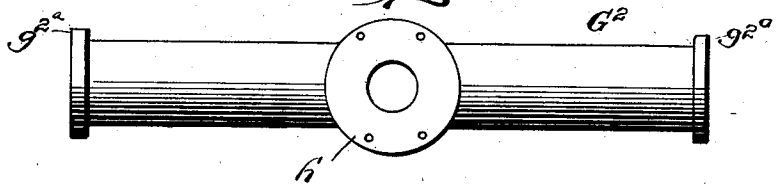


Fig. 15a.

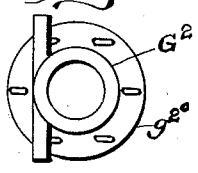
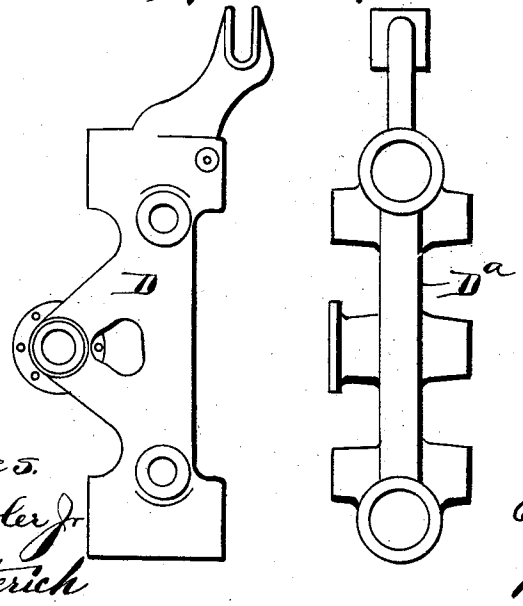


Fig. 15. Fig. 15a.



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UNITED STATES PATENT OFFICE.

EDGAR REAGAN, OF FLORESVILLE, TEXAS, ASSIGNOR OF ONE-HALF TO WILBUR C. BRUFF, OF FLORESVILLE, TEXAS.

ROLLER-PRESS.

SPECIFICATION forming part of Letters Patent No. 699,114, dated April 29, 1902.

Application filed May 16, 1901. Serial No. 60,478. (No model.)

To all whom it may concern:

Be it known that I, EDGAR REAGAN, a citizen of the United States, residing at Floresville, in the county of Wilson, State of Texas, have invented certain new and useful Improvements in Roller-Presses; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to roller-presses for forming cylindrical bales from cotton-bat delivered from the gin-condenser to the press.

The objects of the invention are to improve the general design and manner of assembling the parts of the press, whereby the structure is made more compact, lighter, and is given greater strength and capacity.

A further object of the invention is to provide a roller-press which will relieve frictional contact between the cotton and press while the bale is in process of formation, provided with a gearing which will always insure for the movable pressing-rollers a speed corresponding exactly with the speed of the stationary pressing-rollers.

A further object is to provide means for automatically increasing the pressure of the movable pressing-rollers as the bale increases in diameter.

A further object is to provide means for facilitating the formation of the bale by dispensing with the necessity of employing a mandrel or core for the bale.

A further object is to provide a conductor for the bale-covering, whereby an end of the covering for a bale is presented directly between the bale and the stationary pressing-rollers and is adapted to be fed evenly and uniformly under tension from said conductor.

A further object is to provide means for accumulating the bat during the tying off of a bale and subsequently feed it to the pressing-rollers for the formation of the next bale.

The invention consists of certain novel details of construction and combinations and arrangements of parts, which will show other and further advantages in the construction and operation of presses, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a side elevation of a roller-press embodying the present improvements and showing the bat as it is fed from the condenser and the accumulator in the act of separating the bat to permit of the tying off of a completed bale. Fig. 2 is a top plan view of the press. Fig. 3 is an end elevation. Fig. 4 is a vertical section on the line *x x*, Fig. 1, looking toward the left. Fig. 5 is a vertical section taken in the plane of the axis of the bale. Fig. 6 is an elevation looking at the rear end of the machine, the drive-shaft being broken away. Fig. 7 is a detail top plan of the accumulator. Fig. 8 is a top plan of the clutch, pinion, and segment for reversing the accumulator. Fig. 9 is a detail section, on an enlarged scale, of the accumulator-roll. Fig. 10 is a detail of the bagging-clamp and its controlling-handle. Fig. 11 is a detail section through one end of a side bar, showing its connection with the end frame. Fig. 12 is a detail horizontal section of the feed-roller. Fig. 13 is a side elevation of the tubular union G^2; and Fig. 13^a, an end view thereof, showing one of the flanged ends removed. Fig. 14 is a side elevation of the pressure-cylinder, and Fig. 14^a an end view thereof. Figs. 15, 15^a are detail views showing side elevations of the stationary roller-frames.

The main frame of the press consists, essentially, of four tubular stringers or side pieces A, united at their front ends by a rectangular cross-frame B, preferably having downward extensions *b*, constituting feet or supports. At the rear ends the top and bottom side pieces are connected by upright frames C, having extensions *c*, corresponding to the extensions *b*. Just inside the frame C the side pieces support other vertical frames, which may be conveniently termed "roller-frames" D D^a, (shown in Figs. 15, 15^a,) preferably fixed on the side pieces and united to secure transverse rigidity by a tubular union D', the flanged ends *d* of which are suitably bolted to the flanged bearing extensions *d'* on the frames D, as shown in Figs. 2 and 6.

Suitable transverse bearings are formed in the frames D for supporting the two stationary pressing-rollers E, such rollers receiving motion through gear-wheels E′, carried at one end of the roller-shafts and both meshing with an intermediate gear E^2 on an intermediate drive-shaft E^3, passing through the union D′ and at its opposite end carrying a relatively large bevel-gear E^4, adapted to mesh with a bevel-gear f on the main drive-shaft F.

The two movable pressing-rollers G are journaled in frames G′, preferably castings, and having concave seats g^b, formed therein for the reception of the top and bottom side pieces, as will be best understood by reference to Fig. 4. These movable roller-frames are preferably connected by a tubular union G^2, corresponding to the union D′, but preferably connected with the frames G′ in such manner as to be capable of affording a slight sidewise play—as, for instance, by forming the bolt-holes in the flanged ends g^{2a} of the union G^2 somewhat elongated or of larger diameter than the bolts, as shown in Fig. 13^a. The flanged ends g^{2a} bear against flanges g^3, fixed to the inner sides of frames G′, as shown in Fig. 4, and the latter flanges have bolt-holes which register with the holes g^{2c}.

The movable pressing-rollers are driven by a gearing corresponding to the gearing for the fixed rollers—that is to say, they have gear-wheels g, mounted on their shafts at one end and meshing with an intermediate gear g', carried by an intermediate shaft g^2, extending through the union G^2 and carrying at its opposite end a large bevel-gear g^3, meshing with a gear g^4, adapted to be driven by the drive-shaft F. This drive-shaft F is journaled in yoke-shaped projections D^5 and G^5 on the sides of frames D and G′, respectively, and in order to impart rotation to the gear g^4 with the frame G^5 at any point of adjustment the shaft is preferably squared throughout a portion of its length, as at F′, and the gear-wheel is formed with a corresponding opening through which the shaft passes. The shaft F receives its rotation from a large gear F^2, with which a small gear F^3, connected with the fast pulley of the fast and loose belt-pulleys F^4, meshes. The pulleys and gear-wheel F^3 are mounted in a swinging frame F^6, having the drive-shaft as an axis, whereby it may adjust itself to a counter-shaft in any position with relation to the press and also take up any slack in the belt. The movable pressing-rollers are advanced, retracted, or held up with the desired pressure by steam-power. For this purpose a cylinder H is employed, said cylinder being journaled on vertical trunnions h in the end frame B, as shown in Fig. 3, while the piston or ram H′ takes its bearing against a central boss or flange h' on the union G^2, which latter, as before stated, may have a slight rocking movement by means of the elongated bolt-holes in its flanged ends. With this construction slight twist or pivotal action of the rolls, especially should the bale be slightly irregular, is compensated for without straining the frame or causing side wear in the gland or on the piston, as will be readily understood.

The bale is adapted to be formed between the four pressing-rollers and also between flat heads or disks, which give shape and prevent friction to the ends of the bale. These heads or disks (lettered I in the drawings) are journaled to rotate in a sliding frame K, mounted between the top and bottom side pieces, and they are adapted to be advanced or withdrawn, so as to be in position to form the bale ends or so as to release the formed bale by hand-wheels I′, the hubs i of which (see Fig. 5) are threaded into the frames K and in turn constitute the bearings in which the heads rotate. Thus while the heads are free to rotate with the bale as it is formed or pressed they may be quickly and easily retracted to release the formed bale and as quickly set up again for the formation of a new bale.

One of the objects of the present invention is to dispense with the use of a core or mandrel about which to form a bale. To accomplish this object, it is highly desirable that the axis of the heads should coincide at all times with the axis of the bale. In the present press the axis of the heads is maintained at a point equidistant between the pressing-rolls by journaling on the hubs of the hand-wheels or heads equalizing bars or levers L and connecting the ends of these bars or levers, by means of links L′, with the fixed frame on the one hand and with the frame of the movable rollers on the other hand. From this it follows that the heads are moved positively and maintained at all times in proper position concentric with the bale. Even in the initial stages of formation the heads are correctly positioned, and as the cotton accumulates between the rollers and pressure is exerted against the heads they begin to rotate and aid in supporting the bale during the subsequent stages of its formation.

The frames D are provided at the top with upward extensions having vertical slot-bearings D therein for the reception of the journals of a feed-roller M, preferably held down against the top presser-roller by springs m, located above the journals and the tension of which may be regulated by set-screws m'. The feed-roller M is hollow and its inner ends are adapted to receive heads M′ M′. The shaft M^2 of said roller is hollowed at each end and provided with ports M^3, opening into the interior of said roller, affording communication therewith through suitable swivel connections (not shown) with the exhaust of the pressure-cylinder, whereby the exhaust-steam is passed, by means of a suitable hose or pipe, (not shown,) to and through the cylinder, heating it, for the purposes hereinafter mentioned.

The cotton-bat is fed in over the table N by means of an endless belt N′, which at the

forward end passes around a roller N^2, journaled in proximity to the roller M. The two rollers M and N^2 therefore insure the feeding of the bat to the pressing-rollers, and the roller M, working with considerable pressure against the top pressing-roller, subjects the bat to a preliminary compression, heats it, and simultaneously passes it down between the four pressing-rollers under pressure, excluding the air as the bat is pressed into bale form.

The cotton-bat is supplied from the condenser continuously, and as the bale reaches the desired size and weight an accumulator is thrown into action to break the bat and accumulate the portion fed during "tying-off" of or covering and removal of the bales from the machine. This accumulator consists of a roller O, having teeth in one side so set that when the roller is dropped down on the bat said teeth will pick the bat up and separate that portion from the preceding portion, as shown in Fig. 1. The belt continuing to move causes the accumulator-roller to rotate and wind the bat about it until the press is ready for the formation of a new bale, when the roller is raised and the bat allowed to feed forward under the roller until it is caught by the roller M and fed down between the pressing-rolls. The pull thus given to the bat on the accumulator-roll gives the roll a reverse rotation, causing it to discharge its bat, which feeds along on top of the main bat and is incorporated into the bale.

Various mechanisms may be employed for securing the reverse rotation of the accumulator-roll; but I prefer to reverse the position of the roller end for end and allow it to drop down onto the bat and belt, when it will unwind its cotton and lay it smoothly on the main bat.

For the purpose of handling the accumulator-roll in this way it is journaled in a U-shaped frame P, centrally journaled at p on a second frame P', the latter in turn being journaled in brackets P^2, secured to the belt-table or other suitable support.

If the frame P' be turned up, the frame P and accumulator-roll may be turned end for end and again lowered, and I prefer to employ mechanism for raising the frame and automatically reversing the roller. The means for raising the frame P' consists of a pulley p, secured to the frame P' and connected by a loose belt p' with a pulley p^2 on the end of the cross-shaft E^3 with a tightener p^3, whereby the pulley p may be partially rotated and the frame raised by simply tightening the belt.

The frame P' supports a cross-shaft Q, held against rotation by brackets q, and this shaft Q carries a gear-segment Q^2, with which a pinion Q^3 on a shaft Q^4, connected axially with the frame P, is adapted to mesh. The pinion Q^3 is loose on the shaft Q^4 and is adapted to be clutched with the shaft when rotated in one direction, but to allow said shaft and frame P to rotate freely in the other direction. The clutch is formed by a simple ratchet-collar Q^5, keyed to the shaft and held in mesh with a ratchet-face on the pinion by a spring Q^6. With this construction the upward movement or swing of the frames P' and P causes the pinion to engage the segment and the frame P to rotate a half-turn; but as the frames descend the ratchet connection prevents frame P from rotating reversely, and consequently the roller is reversed end for end. To again cause the roller to engage and accumulate the bat, it is again reversed, only this time it is reversed while empty. It will be understood that the teeth are so pointed or shaped that they will engage the bat when the roller is in one position, but will draw out of and not pick up the bat when the roller is in the other position.

Bagging for covering the bale is supplied from a reel conveniently arranged with reference to the machine and passes through clamping-jaws R on the ends of arms R', journaled in brackets R^3 on the side frames, adapted to be oscillated by a handle R^3. The end of the bagging R^4 depends from the clamp, and as the bale is finished the clamps are depressed, allowing the end of the bagging to be caught between the bale and upper roll of the stationary rolls, as shown in Fig. 1, and drawn around the bale by the action of the four pressing-rolls. As the clamps are under tension, the bagging is held taut, and the rolls therefore draw it tightly around the bale. When the bale has completed a revolution, the clamps are elevated to draw out a new depending portion and the bagging severed. The two ends on the bale are now fastened together, when the bale is ready to be discharged, which is done by turning the hand-wheels to withdraw the heads and moving the pressure-rollers back.

Admission of steam to one end or the other of the cylinder through the supply-pipes is controlled by a hand-rod S', and the pressure is regulated by a regulator-valve S^2, which is controlled by a rod S^3, connected with the movable roll-frame, so as to admit more and more pressure as the rolls are moved back by the enlargement of the bale.

To prevent sudden movements of the piston, the steam-pipes are preferably fitted with valves T, which may be more or less closed to prevent sudden entry or escape of steam, even should the control-valves be opened to the full extent.

By reference to Fig. 11 it will be seen that the side bars are connected with the end frames by being let into sockets therein, the side bars being shouldered at w, and the whole frame is held together by tie-rods w', extending through the side bars and having washers or disks and nuts w^2 applied to their ends outside of the end frames.

To insure the parallel advance of the movable rollers, the frames G may be provided with downward extensions Y, adapted to form bearings for a cross-shaft Y', on which

shaft gear-wheels or pinions Y^2 are rigidly mounted. These pinions Y^2 mesh in racks Y^3, secured to the under side bars A and serve, as just stated, to insure the parallelism of the rollers in their back-and-forth movements.

It will be seen that the tubular unions D′ and G^2 afford a housing for the shafts E^3 and g^2, making the bearings dust-proof, the frame more compact by utilizing the shafts as crossties, and also facilitates separating the parts for shipment or for access thereto for purposes of cleaning, repair, or renewal.

In operation steam is admitted to the rear end of the cylinder by moving the bar S′ in the proper direction, thereby bringing the pressing-rollers together, and in the formation of the bale the elastic tension of the steam in the rear end of the cylinder determines the density of the bale, for in the formation of the bale the movable pressing-rollers are forced back against the pressure of the steam in the cylinder. The bat is fed in over the table N′, down between the feed-rollers, and into a space or pocket formed between the four pressing-rollers, where it is rolled into a cylindrical mass which is confined at the ends by the movable heads I. As the size of the bale increases and the movable pressing-rollers retreat the heads move proportionately through the described connections, whereby the centers of the heads are maintained in alinement with the axis of the bale at all times. The bale having reached the desired size, the accumulator-roll O is lowered into engagment with the bat, or if it has been running in contact therewith in inoperative position it is reversed, so as to cause its teeth to catch or engage the bat, sever it, and by contact with the belt be rotated, so as to wind the bat about itself. The portion of the bat forward of the point of severance winds in about the bale, and when completely wound in the bagging-clamp is lowered, permitting the end of the bagging to catch between the upper roller of the stationary rollers and the bale which draws the bagging in contact with the other pressing-rollers and so around the bale. At this moment the operation of the pressing-rollers is stopped by shifting the driving-belt or otherwise, the bagging severed, and the ends united by sewing or fastening. This completes the formation of the bale in the machine, and the movable pressing-rollers may be backed off by admitting steam to the forward end of the cylinder and the bale released by backing off the heads I through the medium of the hand-wheels I′ I, when it may be removed from the press. In the meantime the bat has been accumulating on the accumulator-roll, and when the pressing-rolls have been brought together belt p is tightened, thereby raising the accumulator-frames P P′, and by the engagement of the gear-wheel Q^3 and segment Q^2 the frame P and the accumulator-roll and the bat carried thereby are given a half-turn bodily and lowered into operative position, when the accumulator will unwind its bat on top of the bat which is being fed forward by the belt. Thus the two layers of bat are conducted by the belt to the feed-rollers. After the accumulator-roller is relieved of its bat it may be slightly raised, or, if desired, allowed to continue to run in contact with the bat in inoperative position—that is, with the teeth so inclined that they will not engage with or catch the bat. As the bat is passed down between the four pressing-rollers the roller M heats it sufficiently to soften the fiber and adapt it to pack closer under the pressure of the pressing-rolls as they simultaneously wind the bat under pressure into the bale.

The heads I support the ends of the bale during its formation, and being revoluble as soon as the pressure of the sides or edges of the bat is sufficient to cause frictional contact with the heads it causes them to revolve with the winding bat during formation of the bale, and thus prevent friction and injury to the fiber at the ends of the bale.

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

1. In a roller-press, the combination with the pressing-rollers mounted in fixed bearings, the coöperating rollers mounted in movable bearings, means for holding the movable rollers against backward movement with a yielding pressure and means for feeding a bat to said rollers, of heads between which the bale is formed, sliding frames in which said heads are journaled, equalizing-bars connected with the frames for positioning the heads and frames, and links connecting opposite ends of the bars with the fixed and movable roller-frames respectively; substantially as described.

2. In a roller-press, the combination with the pressing-rollers mounted in fixed bearings, the coöperating rollers mounted in movable bearings, means for holding the movable rollers with a yielding pressure and means for feeding a bat to the rollers, of heads between which the bale is formed, sliding frames in which the heads are journaled, hand-wheels having screw-hubs for withdrawing said heads from engagement with the bale, equalizing-bars pivotally connected with the frame, and links connecting opposite ends of said bars with the fixed and movable roller-frames, whereby the axis of the heads is kept coincident with the axis of the bale; substantially as described.

3. In a roller-press for forming cylindrical bales, the combination with the side bars, vertically-extending roller-frames carried by the side bars, and rollers journaled in said roller-frames, of tubular unions connecting the roller-frames and the drive-shafts for the rollers extending through said unions from one side of the press to the other; substantially as described.

4. In a roller-press for forming cylindrical bales, the combination with the side bars, vertically-extending frames carrying the pressing-rollers supported by the side bars and having yoke-shaped projections extending to one side of said bars, of a drive-shaft journaled in the yoke-shaped projections, pinions on said drive-shaft and gear-wheels for driving the rollers, located on the inner side of the yoke-shaped projections and meshing with said pinions; substantially as described.

5. In a roller-press for forming cylindrical bales, the combination with the main frame, the sliding roller-frame mounted thereon and the rollers journaled in said sliding frame, of the power-cylinder mounted on vertical trunnions, and the piston working in said cylinder with a pivotal connection between the piston and sliding frame; substantially as described.

6. In a roller-press for forming cylindrical bales, the combination with the main frame, the sliding roller-frame mounted thereon and having the union loosely connected therewith to have a limited oscillation in a vertical plane, and the rollers journaled in said roller-frame, of the power-cylinder mounted on vertical trunnions, and the piston working in said cylinder and connected with the said union; substantially as described.

7. In a roller-press adapted to receive a bat directly from the gin, the combination with the pressing-rollers and means for actuating the same, of a reversible accumulator-roll having bent teeth for picking up and severing the bat and means for rotating said accumulator-roll for winding the bat thereon during the covering of the previously-formed bale and means for elevating and turning said roll end for end and lowering the same; whereby its accumulated bat is brought in contact with the moving bat as it is fed from the gin and unwound thereby and fed to the press.

8. In a roller-press adapted to receive a bat directly from the gin, an accumulator-roll, a frame in which said roll is mounted pivoted on a center at right angles to the axis of the roll, a second frame on which said first frame is pivoted and bearings for supporting said second frame on an axis parallel with the axis of the roll; substantially as described.

9. In a roller-press adapted to receive a bat directly from the gin, an accumulator-roll, a frame in which said roll is mounted pivoted on a center at right angles to the axis of the roll, a second frame on which said first frame is pivoted, mounted to turn on an axis parallel with the axis of the roll and a reversing mechanism for the roll embodying a pinion connected with the roll-frame and a gear-segment with which said pinion meshes, whereby the roll may be simultaneously elevated and reversed; substantially as described.

10. In a roller-press for forming cylindrical bales, the combination with the pressing-rollers between which the bale is formed, of a clamp through which the bagging is fed extending parallel with the pressing-rolls interposed between the bagging-supply reel and the bale and in position to drop a depending end to be caught by the rolls and drawn around the bale; substantially as described.

11. In a roller-press for forming cylindrical bales, the combination with the pressing-rollers and means for actuating the same, of a bagging-clamp consisting of jaws between which the bagging is drawn, pivoted arms on which said jaws are mounted and a handle for swinging said arms and jaws whereby the bagging may be lowered into position to be caught by the rollers, and drawn around the bale and the jaws returned to normal position to leave a depending end for the next operation; substantially as described.

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

EDGAR REAGAN.

Witnesses:
L. P. BECKER,
J. M. TIPTON.