No. 646,158. Patented Mar. 27, 1900.

L. RABORN.

ROLLER COTTON COMPRESS.

(Application filed July 7, 1899.)

(No Model.)

2 Sheets—Sheet 1.

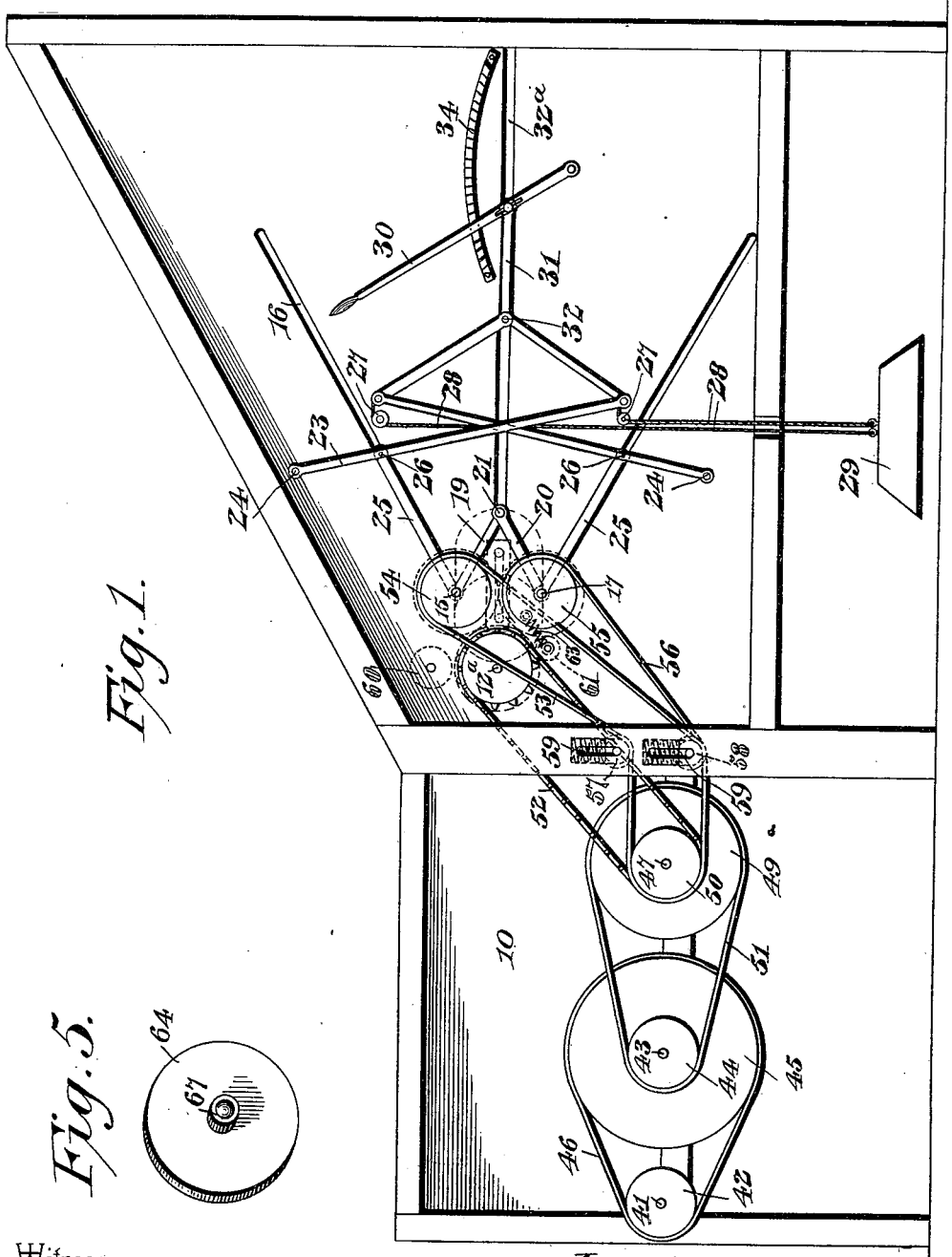

Fig. 1.

Fig. 5.

Witnesses
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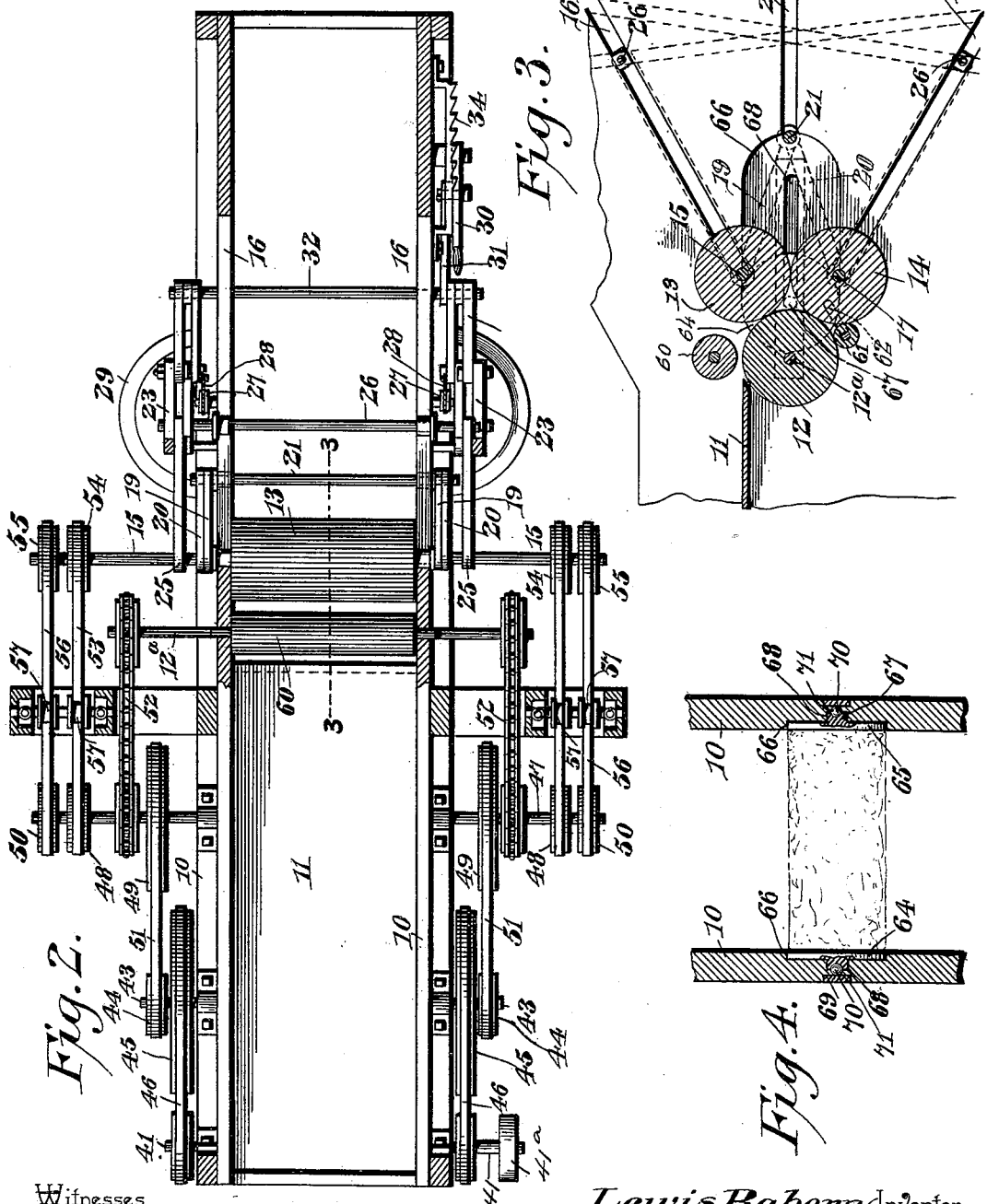

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

LOUIS RABORN, OF WHITNEY, TEXAS.

ROLLER COTTON-COMPRESS.

SPECIFICATION forming part of Letters Patent No. 646,158, dated March 27, 1900.

Application filed July 7, 1899. Serial No. 723,070. (No model.)

To all whom it may concern:

Be it known that I, LOUIS RABORN, a citizen of the United States, residing at Whitney, in the county of Hill and State of Texas, have invented a new and useful Roller Cotton-Compress, of which the following is a specification.

My invention relates to a roller cotton-compress of that class which employ revoluble rolls for forming the cotton-bat into cylindrical bales, and is more particularly directed to compresses in which the rolls are yieldable automatically on the enlargement of the bale during its formation.

The leading thought of the present invention is the provision of a compress dispensing with the use of a core around which the lint-cotton in the form of a bat from a condenser is rolled into convolutions for the formation of a cylindrical bale.

A further object of the invention is to provide means for the separation of the rolls to make them yieldable to the enlargement of the embryo bale without, however, disturbing the equidistant relation of the rolls one to the other, so that the rolls will exert pressure on the embryo bale and will also serve to rotate it in order to coil the bat thereon.

A further object of the invention is to provide means for exerting the pressure on the rolls to make them compress the cotton-bat around the embryo bale, and such pressure-exerting appliances are disposed for operation conjointly with the rotary motion given to the rolls and without being affected by the separation of the rolls during the formation of the bale.

A further object of the invention is to provide an improved pressure-producing appliance arranged to multiply the effect of counterweights and to exert pressure uniformly on the movable rolls of the set of coacting rolls, and with such pressure-producing appliance is combined a means for conveniently separating the movable rolls relative one to the other and to the non-slidable rolls, so as to provide for ejectment of the bale.

A further object of the invention is to provide means which prevent the heads of the embryo bale from riding against the press-frame, such limiting-plates being free to rotate with the bale and to travel in the press-frame on the enlargement of the bale, the rotary motion of the limiting-plates being effected with minimum friction on the press-frame.

To the accomplishment of these ends the invention consists in the novel combination of devices and in the construction and arrangement of parts, which will be hereinafter more fully described and claimed.

To enable others to understand the invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification and in which—

Figure 1 is a side elevation of a roller cotton-compress constructed in accordance with the present invention, illustrating more particularly the pressure-exerting appliances for the slidable working rolls and the driving mechanism by which each roll of the series of working rolls may be positively rotated on its axis. Fig. 2 is a sectional plan view of the compress shown by Fig. 1. Fig. 3 is a diagrammatic sectional elevation illustrating the relation of the working rolls at the beginning of the operation of forming a bale, the plane of the section being indicated on the dotted line 3 3 of Fig. 2. Fig. 4 is a detailed section, taken transversely in a vertical plane, through the press-frame and illustrating a part of said frame and the limiting end plates for the bale, the latter being shown in a conventional manner. Fig. 5 is a detailed perspective view of one of the end disks for the bale, showing the stub-axle and bearing-ball for said disk.

The same numerals of reference are used to indicate like and corresponding parts in each of the several figures of the drawings.

In carrying this invention into practice I employ a framework 10 of any suitable character to support the working rolls, the pressure devices therefor, and the driving mechanism by which the rolls are rotated positively, and it will therefore be understood that I do not limit myself to the style of framing illustrated by Figs. 1 and 2 of the drawings. This framing supports a feed-table 11, (shown by Fig. 3 as arranged in a substantially-horizontal position,) and on this table the lint-cotton from a condenser or other suitable source of supply is deposited for deliv-

ery to the set of coacting rolls, which constitute the leading feature of the compress mechanism forming the subject-matter of this application.

According to my invention it is necessary to employ a set of three coacting working rolls, which are arranged for their axes to occupy positions equivalent to the angles or corners of a triangle, and one of these rolls has its shaft mounted in fixed bearings for rotation on a stationary axis, while the other rolls are mounted for slidable travel on divergent or convergent lines with relation to the axis of the non-traveling roll, all of the rolls being positively driven and each of the slidable rolls being held by pressure devices in yieldable relation to the non-traveling roll. The working rolls are indicated by the numerals 12 13 14, and they are disposed contiguous to the delivery edge of the feed-table 11. The roll 12 has its shaft 12^a journaled in stationary bearings in the framing in a position for its upper surface to lie in substantially the horizontal plane of the feed-table 11, so that the lint-cotton will pass from the table directly upon the non-traveling roll 12.

The rolls 13 14 are disposed in the same vertical plane with relation one to the other and at one side of the vertical plane of the roll 12, although this particular arrangement of the two slidable rolls is not strictly essential. The rolls 13 14 are guided or mounted for their axes to lie above and below the horizontal plane of the non-traveling roll 12, respectively, and said slidable rolls are adapted to move during the formation of the bale in divergent lines away from each other and from the roll 12. The upper roll 13 has its shaft 15 arranged to travel freely in the upwardly-inclined guideway 16, and in like manner the lower roll 14 has its shaft 17 mounted to travel freely in a downwardly-inclined guideway 18. These guideways are shown by Figs. 1 and 3 as being formed by slots in the framing 10; but the particular construction of these guideways is not material. Said guideways 16 18 diverge from the axis of the non-traveling roll 12.

It is important in a press employing a pair of yieldable or traveling rolls adapted to recede from a stationary or non-traveling roll to make provision for giving uniform movement or play to the traveling rolls and also to exert pressure on said traveling rolls for holding them in proper relation to the non-traveling roll, so as to compress the bat on the embryo bale during its formation. I obtain the object of equalizing the travel of the slidable rolls by pairs of links 19 20 and by a common equalizing-bar 21, the latter being guided to travel in the horizontal plane of the non-traveling roll 12. A pair of equalizing-links 19 20 is disposed at each end of the rolls 13 14, the links 19 being connected to the shaft 15 of the roll 13, while the links 20 are loosely connected to the ends of the shaft 17, on which the roll 14 is mounted. The links constituting each pair converge from the shafts of the rolls toward the equalizing-bar 21, and said links of each pair have common connection loosely with said bar. This equalizing-bar 21 is free to travel in a horizontal guideway 22, which is arranged in a horizontal plane of the shaft 12^a, that carries the non-traveling roll 12.

The means which I prefer to employ for exerting pressure uniformly on the traveling rolls 13 14 of the set of coacting working rolls consists of counterweighted levers arranged in pairs on opposite sides of the press-frame and having independent linked connection with the shafts of said slidable rolls. A lever 23 is fulcrumed at 24 contiguous to one guideway 16 or 18 for each slidable roll, and this lever is connected operatively with a roll-shaft by an intermediate link 25, said link having loose connections with roll-shaft and a pivotal connection at 26 to the lever at a point intermediate the length of the latter. The levers 23 are arranged in pairs on opposite sides of the press-frame, each pair of levers being inclined to cross one another, as clearly shown by Fig. 1, the fulcra 24 of said levers being arranged opposite to the diverging guideways. Guide-sheaves 27 are journaled on the press-frame at suitable points near the levers 23, and over these guide-sheaves pass the cables 28, which are fastened to the free ends of levers 23. Said cables pass downwardly through the press-frame and are attached to a counterweight 29. As shown by Fig. 1, a single counterweight has both of the cables 28 fastened thereto for the purpose of drawing the levers of a pair toward each other and, through the links 25, pressing the slidable rolls 13 14 toward the non-slidable roll. It is to be understood that a pair of the levers or links and a single counterweight are employed on each side of the press, as represented generally by Fig. 2 of the drawings. I have arranged the levers 23 for the fulcra thereof to lie equidistant from the axes of the slidable rolls 13 14, and by employing a counterweight which is common to the levers of each pair the pressure-producing mechanism is made to apply pressure uniformly to the slidable rolls of the coacting working rolls.

It is desirable in a three-roller cotton-compress to provide a mechanism by which the rolls may be conveniently separated by manual adjustment after the bale has attained the desired diameter in order that the bale may be ejected or discharged from the working rolls. I attain this object by the provision of a hand-lever 30, which is fulcrumed at one end to the press-frame, on the outside thereof. To this hand-lever is connected one end of a pitman 31, the opposite end of which is pivotally connected to a cross-rod 32, the latter being arranged in a horizontal position across the press-frame and fitted to slide freely in horizontal slots or guideways 32^a. Diverging links are connected in pairs to opposite ends

of the slidable cross-rod 32, and each pair of the links on one side of the press is pivotally connected with the free ends of the levers 23, the pivotal connection of the links 33 to the levers 23 being adjacent to the points of adjustment of the cables 28 to said levers. The handle of the lever 30 is mounted to traverse a notched segment 34, which is fixed on the side of the press-frame in the path of said lever; but a part of this segment has a smooth unbroken surface, free from notches or teeth, for the purpose of permitting the lever 30 to play freely across or over the smooth face of the segment when the slidable rolls 13 14 are forced upward and the levers 23 are separated on the travel of said slidable rolls in their diverging paths.

From the foregoing description it will be observed that the slidable working rolls have common connection with an equalizing-bar that serves to impart equal travel to the rolls, and said rolls 13 14 are normally impelled by pressure devices toward the non-traveling roll. The pressure devices associated individually with the slidable rolls apply the pressure thereto substantially in the plane of travel of said rolls as they diverge or recede from the roll 12 during the formation of the bale, whereas the equalizing-bar 21 and the pairs of links tend to draw the rolls 13 14 toward each other, thus maintaining the traveling rolls in proper relation one to the other and to the roll 12.

In connection with the set of rolls arranged and operating in the manner described I employ a driving mechanism for positively rotating each roll on its axis, and while this driving mechanism may be of any suitable character I have illustrated one adaptation thereof in Figs. 1 and 2 of the drawings.

The means for rotating the rolls is in the form of speed-reducing gearing which embodies as one element thereof a prime shaft 41, journaled in suitable bearings of the framing 10 and provided with suitable pulleys, one pair of which pulleys is indicated at 42 for coacting with the counter-shaft 43, that is journaled in the framing in parallel relation to said prime shaft, the latter being driven in any suitable way from a line-shaft or a motor—as, for example, by a pulley 41^a. (See Fig. 2.) The counter-shaft 43 has double pulleys 44 45, which pulleys are of different diameters, and the large pulleys 44 are connected by belts 46 with the small pulleys 42 on the prime shaft. The shaft for driving the compress-rolls is indicated at 47 as being journaled in bearings on the frame in parallel relation to the counter-shaft 43, and this driving-shaft has a series of pulleys indicated at 48 49 50, the pulleys 48 being operatively connected by the belts 51 to the pulleys 45 on the counter-shaft, whereby this counter-shaft transmits the motion of the prime shaft 41 to the driving-shaft 47, and the speed is reduced in order to impart slow speed to the driving-shaft 47. This driving-shaft is connected individually with the shafts of the three working rolls 12 13 14, and as the shaft 47 and the shaft 12^a of the non-traveling roll 12 are in fixed relation one to the other I find it desirable to employ sprocket-gearing, as 52, (see Fig. 2,) for operatively connecting the shaft of the non-traveling roll with the driving-shaft, thus minimizing lost motion between the roll 12 and the shaft 47. The shaft 15 of the upper slidable roll is equipped with a belt-pulley 54 at each end, and the pulleys 49 54 are connected operatively by the endless belts 53. In like manner the shaft 16 of the lower slidable roll 14 is provided with belt-pulleys 55, and endless belts 56 are employed to connect the pulleys 50 on the driving-shaft with the pulleys 55 on said shaft of the roll 14. It will thus be seen that the slidable rolls are connected individually by power-transmitting appliances to the driving-shaft, from which is propelled the non-slidable roll 12, and as the slidable rolls are adapted to recede from the non-traveling roll it is necessary to provide a permanent allowance of abundant slack in the belts which connect the shafts of the rolls 13 14 with the driving-shaft 47. In view of this allowance of slack in the belts 53 55 to permit the rolls 13 14 to recede from the roll 12 and to secure sufficient friction on the belts for the transmission of motion to said slidable rolls to effect their positive rotation the driving mechanism is equipped with belt-tightener devices disposed in operative relation to the belts 53 55. These tightener devices are shown by Fig. 1 as embodied in the form of spring-actuated tension-rollers 57 58, arranged to individually ride upon the belts 53 55, and said tension-rollers are slidably confined in suitable guides 59 on the frame.

To properly direct the lint-cotton to the working rolls, as well as to condense the cotton as it passes from the feed-table, I employ the condensing-roller 60, which is mounted directly over the roll 12 in the vertical plane of the shaft thereof. This condensing-roller is mounted idly in suitable bearings on the frame, and, if desired, said condensing-roller may be held yieldably in relation to the roll 12 by spring-actuated or weighted bearings. As these are well-known devices in press construction, I have not considered it necessary to illustrate the same.

During the enlargement of the bale the lower roll 14 travels away from the roll 12, and hence a gap or space exists between said rolls, which would have a tendency for the lint-cotton to drop away from the rolls. To overcome this objection, I employ a detaining-roller 61, which is disposed in the vertical plane between the axes of the rolls 13 14 and the roll 12. This detaining-roller is adapted to yield to the enlargement of the embryo bale during its formation, and to properly keep the detaining-roller in operative relation to the bale said roller is mounted to travel in guides 62 on the frame. A suitable tension

or pressure device 63 acts against the detaining-roller to hold it up to the bale, and this tension device yields or gives for the detaining-roller to descend as the bale enlarges.

When the compression-rolls are closed together, as shown by Fig. 3, the bat-roller 61 is held in a position against the lower side of the rolls 12 14; but as the roll 14, with the roll 13, moves away from the roll 12 on the enlargement of the bale, this bat-roller 61 is moved automatically into the space between the two rolls 12 14, so as to serve as a barrier to the bat and prevent it from dropping. This is accomplished by mounting the bat-roller to slide freely in the guides 62 of the frame (see dotted lines in Fig. 3) and by the use of the springs 63, (see Fig. 1,) which act to move the bat-roller in an upward direction on the separation of said rolls 12 14.

To prevent the ends of the embryo bale from riding against the sides of the press-frame and to minimize the friction between the ends of the embryo bale and the press-frame, I have provided the disks 64 65 on opposite sides of the bale, forming a space or chamber between the set of triangularly-arranged coacting working rolls 12 13 14. Each end disk 64 65 is equal in diameter to the bale when complete, and said disks 64 65 are fitted or confined loosely in horizontal recesses 66, which are produced in the opposing faces of the sides of the press-frame, as clearly shown by Fig. 4. Said disks are free to travel lengthwise in the horizontal recesses on the enlargement of the bale, and each disk is provided with a stub-axle 67, said axle extending laterally from the outer face of the disk and fitted slidably in a horizontal slot 68, which is formed in the press-frame. The slot 68 in each side of the press-frame is arranged centrally and parallel to the horizontal recess 66, said slot and recess communicating directly, as shown by Fig. 4. To the outside of the press-frame is secured in a suitable way a horizontal metallic bearing-plate 69, which covers the horizontal slot 68, and against this bearing-plate rides a bearing-ball 70, the latter being confined to the recess 71, which is produced in the end of the stub-axle 67 on one of the limiting or end disks 64 or 65. The horizontal recess 66 and the slot 68 in communication with said recess lie in the horizontal plane of the shaft 12^a, that supports a non-slidable working roll 12, and the end plates 64 65 are adapted to travel in the recess and the slots in a plane coincident with the axis of the non-slidable roll. At the same time the end disks 64 65 are free to rotate with the embryo bale during the process of winding the cotton-bat into the convolute or spiral form to produce a cylindrical bale, the rotation of the end disks 64 65 being due to friction between the ends of the bale and said disks. As the disks 64 65 are supported by stub-axles, which have ball-bearing engagement with metallic bearing-plates on the press-frame, it is evident that the friction between the disks and the press-frame is minimized.

The employment of the bearing-plates 69 limits the displacement of the end disks with relation to the ends of the bale, and by fitting said disks and the stub-axles thereof in the recesses and the slots of the press-frame the disks are confined in operative relation at all times to the bale during the process of its formation.

The operation is as follows: The bat of lint-cotton from the condenser or other source of supply is fed to the table 11, and the pressure devices force the traveling working rolls 13 14 into contact with the roll 12 and with each other, as clearly shown by Fig. 3, the disks 64 65 occupying an axial relation to the space or chamber between the triangularly-disposed rolls. The driving-gearing positively rotates all the rolls on their axes and the lint-cotton is fed to the working rolls by passing between the condensing-roll 60 and the working roll 12. By reference to Fig. 3 it will be noted that my compression mechanism dispenses with the employment of a core, and the rolls 12 13 14 provide a substantially-triangular space between their meeting and opposing surfaces. At the beginning of the operation of feeding lint-cotton to the rolls the bat passes over the surface of the roll 12 and lodges upon the upper surface of the roll 14, and from thence the bat is lifted by the rotary action of the roll 14 into contact with the lower surface of the roll 13, the last-named roll serving to deflect the cotton-bat toward the opposing surface of the roll 12. All of the rolls being positively driven, the cotton-bat is caused to pursue a course similar to a convolute or spiral, and the bat is thus coiled or rolled upon itself to produce a cylindrical bale. The series of triangularly-arranged working rolls support the embryo bale and rotate it, so as to make the action of forming the bale progressive and continuous. As the diameter of the embryo bale increases the slidable rolls 13 14 recede from the roll 12; but they are normally held in contact with the bale for properly supporting the latter and for compressing the cotton-bat thereon by the action of their pressure devices, the travel of the slidable rolls being uniform under the limiting action of the links 19 20, which have common connection with the equalizing-bar 21. The disks 64 65 slide in horizontal paths on the enlargement of the embryo bale, due to the frictional engagement between said disks and the ends of the bale. The lint-cotton is compacted or condensed by the roller 60 as it passes from the feed-table to the working rolls, and during the enlargement of the bale the detaining-roller 61 prevents the cotton-bat from dropping or falling through the gap or space exposed by the separation of the roll 14 with respect to the roll 12. The bale when completed may be discharged from the roller-compress by shifting the lever 30 toward the notched end of the

segment and drawing on the links 33 to move the levers 23 in a direction to adjust the rolls 13 14 away from the cylindrical bale. This adjustment of the lever 30 elevates the counterweight 29, and as the lever is held fast by its engagement with the segment it is evident that the bale may be tied or bound previous to its discharge from the press. The lever may be released from the notched segment for the counterweight to return the slidable rolls to their initial positions and in engagement with the non-slidable roll 12, thereby placing the compress in a condition to renew the operation of making a cylindrical bale.

Changes may be made in the form and proportion of some of the parts while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what I claim is—

1. In a roller cotton-compress for forming cylindrical bales, a coreless compression mechanism including a set of three coacting rolls arranged in triangular relation, one of said rolls being mounted in fixed bearings relative to the point of feed and the two remaining rolls arranged for their axes to lie in a common vertical plane at one side of the first-named roll and also supported to travel in divergent paths, in combination with means for limiting the movable rolls to slidable travel relative to the stationary roll, positively-acting devices connecting said slidable rolls independently of the stationary roll and equalizing the travel of said slidable rolls with respect to each other and to the stationary roll, whereby the two slidable rolls are confined for their axes to lie in a common plane at all points of their adjustment, pressure devices independent of the equalizing device and connected operatively with the slidable rolls, and a driving mechanism for propelling each compression-roll, substantially as described.

2. In a roller cotton-compress for forming cylindrical bales, a coreless compression mechanism comprising a set of three rolls arranged in triangular relation, one of said rolls being mounted in fixed bearings relative to the point of feed and the remaining rolls limited to slidable travel in diverging paths with relation to the fixed roll, combined with pressure devices in active relation to the slidable rolls, means independent of the pressure devices for positively equalizing the travel of the slidable rolls, and a driving mechanism having operative connection individually with said compression-rolls, substantially as described.

3. In a roller cotton-compress for forming cylindrical bales, the combination of a coreless compression mechanism embracing a set of rolls arranged in triangular relation and with two of said rolls mounted to travel in divergent paths, the oppositely-inclined guideways in which the traveling rolls are slidably confined, an equalizing-bar confined for movement in a horizontal plane of the non-traveling roll devices connecting the traveling rolls operatively with the equalizing-bar, and tension devices to normally move the equalizing-bar and the traveling rolls toward the non-traveling roll, substantially as described.

4. In a roller cotton-compress for forming cylindrical bales, the combination of a coreless compression mechanism embracing the set of rolls arranged in triangular relation one of said rolls being mounted in fixed bearings and with two of said rolls mounted to travel in divergent paths, a guideway in the horizontal plane of the non-slidable roll, an equalizing-bar confined slidably in said guideway, links connecting the slidable rolls with said equalizing-bar, and tension devices for normally holding the slidable rolls in active relation to the fixed roll, substantially as described.

5. In a roller cotton-compress for forming cylindrical bales, the combination of a coreless compression mechanism embracing a set of rolls disposed in triangular relation and with two of said rolls arranged to recede from the remaining roll of the set, inclined guideways in which the slidable rolls are confined, another guideway between the inclined guideways and in the plane of the non-slidable roll, a horizontally-slidable bar confined in the last-named guideway and connected operatively with the slidable rolls to equalize the travel thereof, other bars fitted in the inclined guideways and connected with the slidable rolls, and tension devices connected with all of said bars to normally impel the slidable rolls toward the non-slidable rolls, substantially as described.

6. In a roller cotton-compress for forming cylindrical bales, the combination with a set of compression-rolls arranged to separate relative one to the other on the formation and enlargement of a bale, of a bat-detaining roll of less diameter than either of the compression-rolls and mounted for movement into or from the space between two of said rolls on the divergence thereof, said bat-detaining roll lying out of the baling-space formed by convergence of the compression-rolls during the initial formation of a bale, and means for automatically moving said bat-detaining roll into the path of a cotton-bat on the separation of the compression-rolls, as and for the purposes set forth.

7. In a roller cotton-compress for forming cylindrical bales, the combination of a coreless compression mechanism embracing a set of three coacting rolls, inclined guideways divergent from the axis of a non-slidable roll and receiving the shafts of the slidable rolls, the pressure-levers fulcrumed on the press-frame and having link connections with the shafts of the slidable rolls, a counterweight connected operatively with said pressure-le-

vers, and a hand-lever connected with said pressure-levers, substantially as described.

8. In a roller cotton-compress for forming cylindrical bales, the combination of a coreless compression mechanism embracing a set of working rolls, two of which are mounted to travel in divergent paths, counterweighted pressure-levers having link connections with said slidable rolls, and a hand-lever linked to the pressure-levers for manually separating the slidable rolls previous to ejecting a bale, substantially as described.

9. In a roller cotton-compress for forming cylindrical bales, the combination of a set of coacting working rolls, two of which are slidably mounted to travel in divergent paths, the counterweighted pressure-levers having link connections with the slidable rolls, a cross-rod guide to travel in the horizontal plane of a non-slidable roll, links connecting said cross-rod with the pressure-levers, and a single hand-lever connected operatively with the cross-rod, substantially as described.

10. In a roller cotton-compress for forming cylindrical bales, the combination of a coreless compression mechanism embracing a set of three coacting rolls, two of which are mounted to travel in divergent paths relative to the axis of the non-slidable roll, and shiftable end disks idly supported to travel in the horizontal plane of the non-slidable roll and free to rotate with an embryo bale by frictional contact therewith, substantially as described.

11. In a roller cotton-compress for forming cylindrical bales, the combination of a press-frame having horizontal guideways, a set of coacting working rolls, two of which are arranged to travel in divergent paths with respect to the axis of the guideways, and shiftable end disks slidably confined in said guideways and free to rotate on their axes by frictional contact with an embryo bale, substantially as described.

12. In a roller cotton-compress for forming cylindrical bales, the combination of a press-frame having horizontal guideways and metallic bearing-plates in the plane of said guideways, shiftable end disks having axles fitted slidably in the recesses to travel in a horizontal path therein during the enlargement of the embryo bale, and ball-bearings between the axles of said end disks and the bearing-plates, for the purpose described, substantially as set forth.

13. In a roller cotton-compress for forming cylindrical bales, the combination of a press-frame having the horizontal recesses and the slots, a set of coacting working rolls, the shiftable end disks fitted in said recesses and provided with stub-axles which are slidably confined in the slots of the press-frame, the bearing-plates fixed to said press-frame, and the bearing-balls fitted in the stub-axles of the disks and arranged to ride against the bearing-plates, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

LOUIS RABORN.

Witnesses:
S. A. FAULKNER,
T. D. DERDEN.