No. 653,065. Patented July 3, 1900.

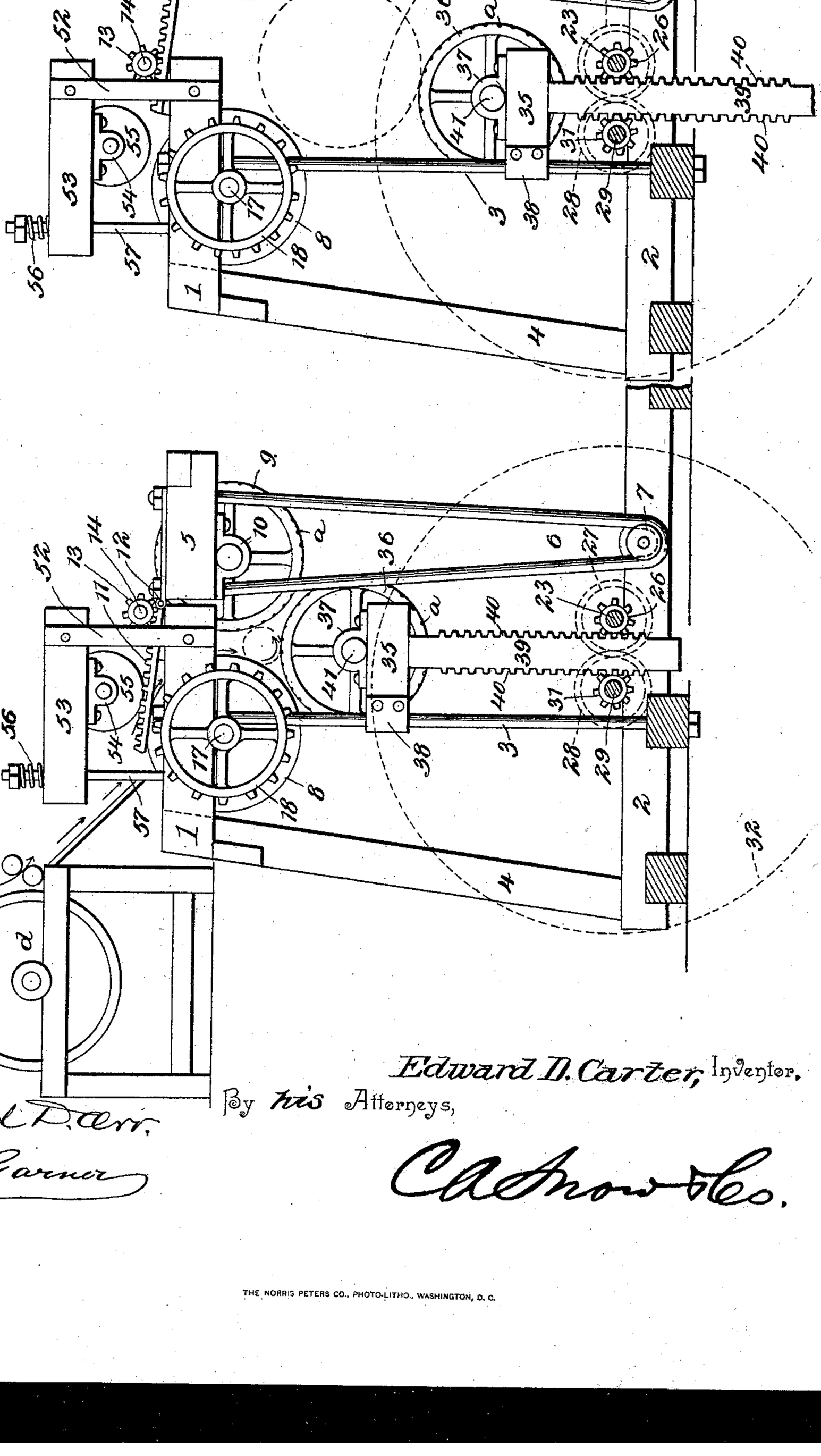
E. D. CARTER.

ROLLER COMPRESS.

(Application filed Mar. 30, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



Witnesses
Howard P. Denn.
J. W. Garner

Edward D. Carter, Inventor.
By his Attorneys,
C. A. Snow & Co.

No. 653,065. Patented July 3, 1900.

E. D. CARTER.

ROLLER COMPRESS.

(Application filed Mar. 30, 1900.)

(No Model.) 4 Sheets—Sheet 2.

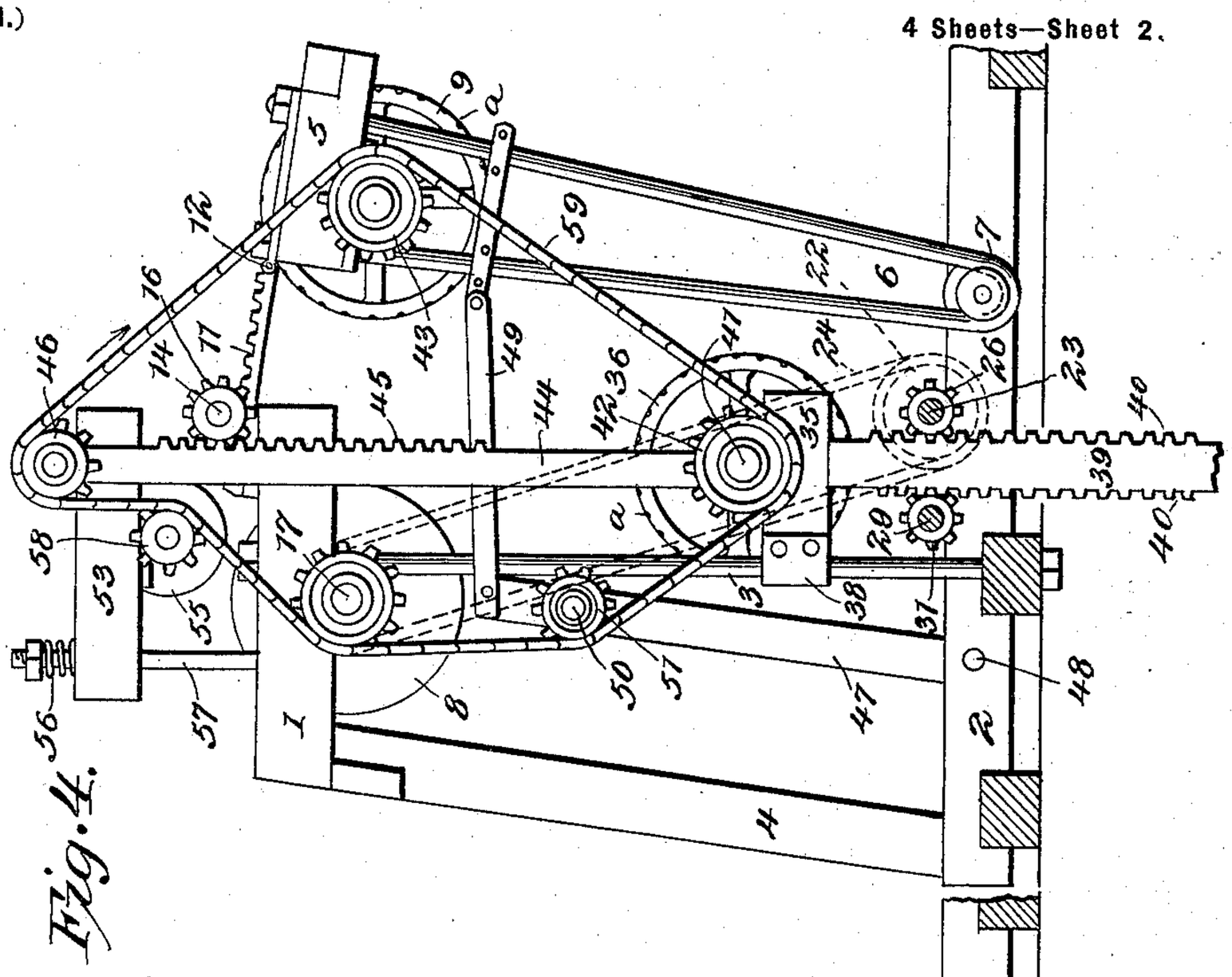


Fig. 4.

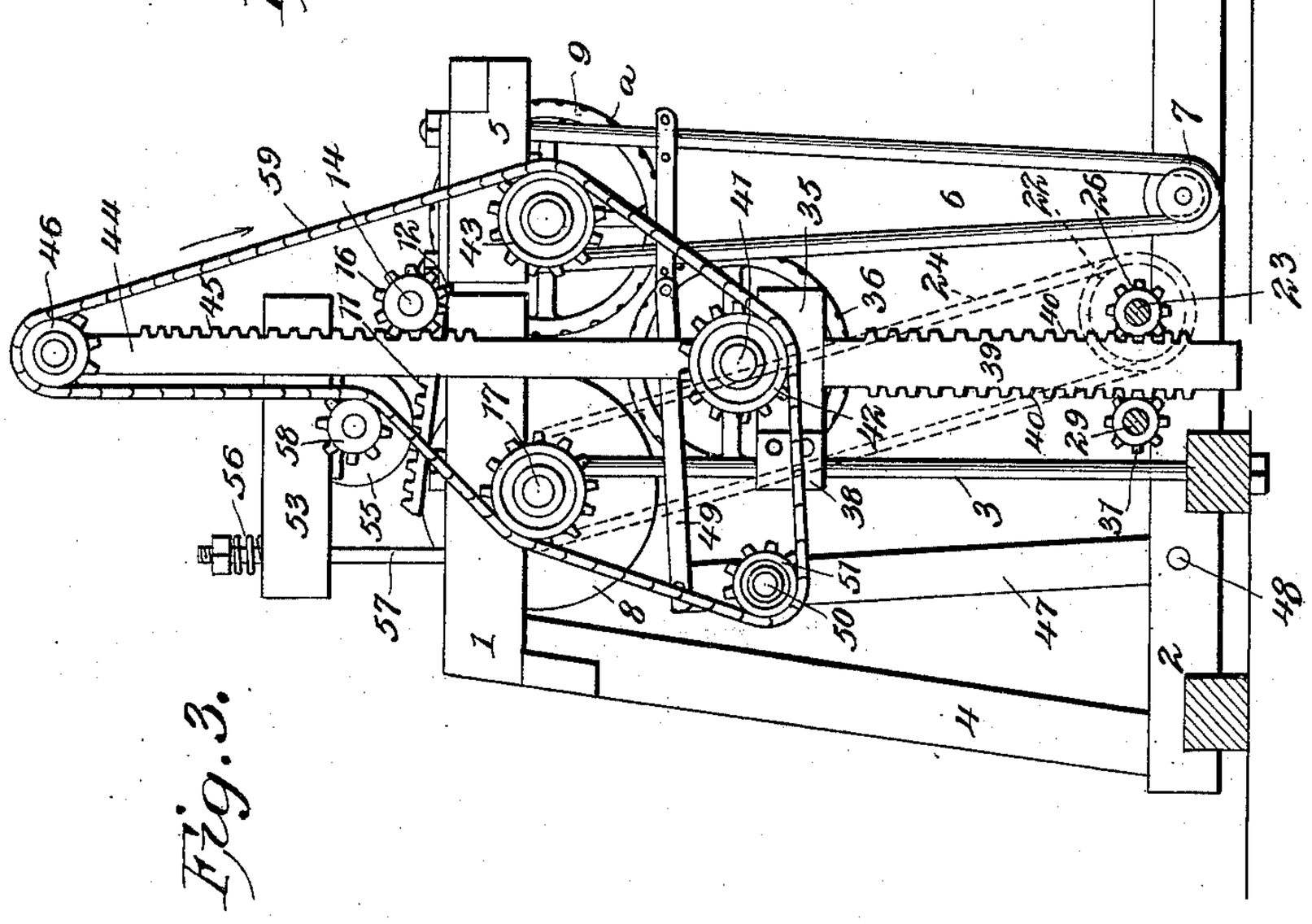


Fig. 3.

Witnesses
Howard D. Orr,
J. W. Garner

Edward D. Carter, Inventor,
By his Attorneys,
C. A. Snow & Co.

No. 653,065. Patented July 3, 1900.

E. D. CARTER.

ROLLER COMPRESS.

(Application filed Mar. 30, 1900.)

(No Model.) 4 Sheets—Sheet 3.

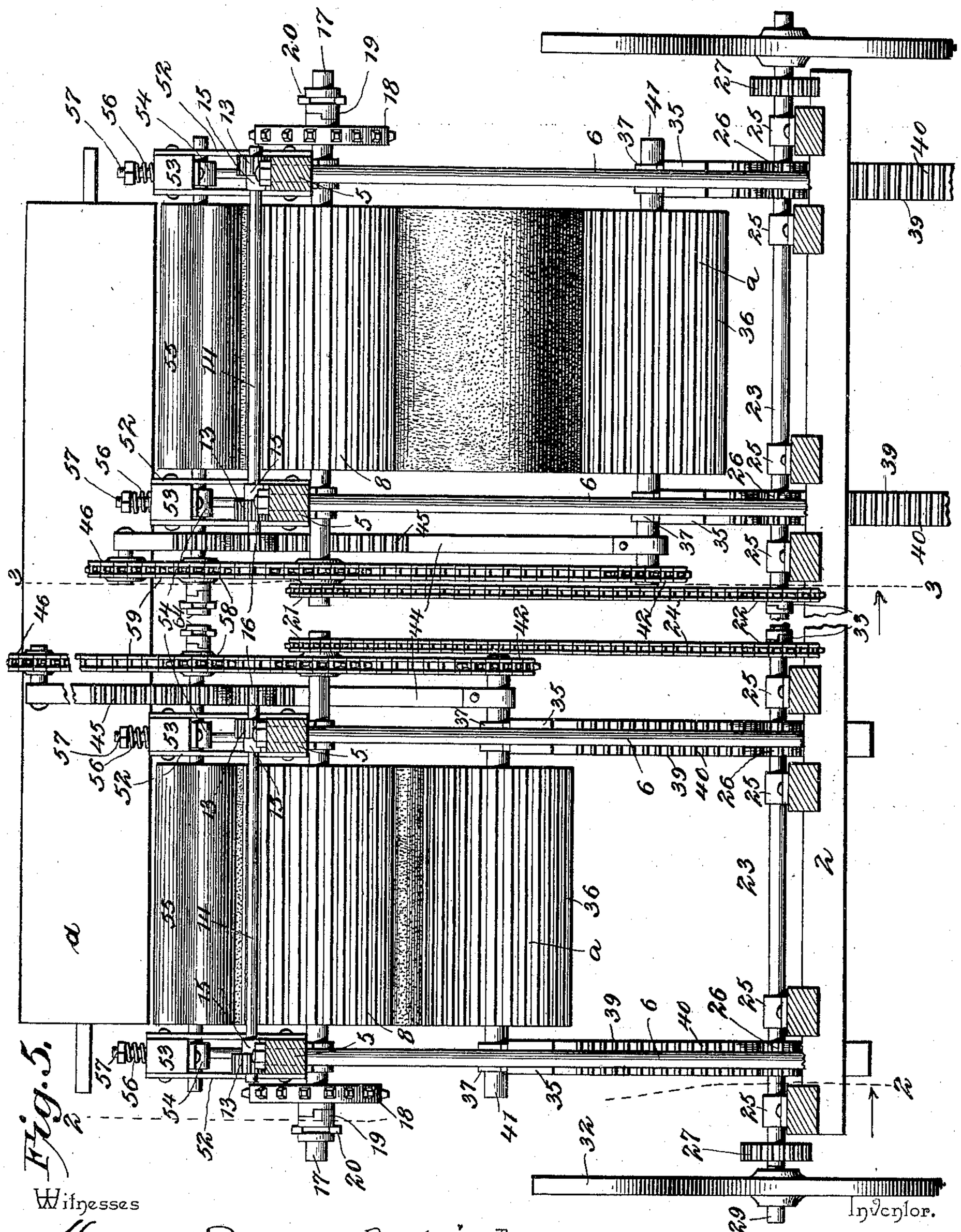


Fig. 5.

Witnesses
Howard D. Orr.
J. W. Garner

By his Attorneys, Edward D. Carter,
C. A. Snow & Co.

Inventor.

No. 653,065. Patented July 3, 1900.

E. D. CARTER.

ROLLER COMPRESS.

(Application filed Mar. 30, 1900.)

(No Model.) 4 Sheets—Sheet 4.

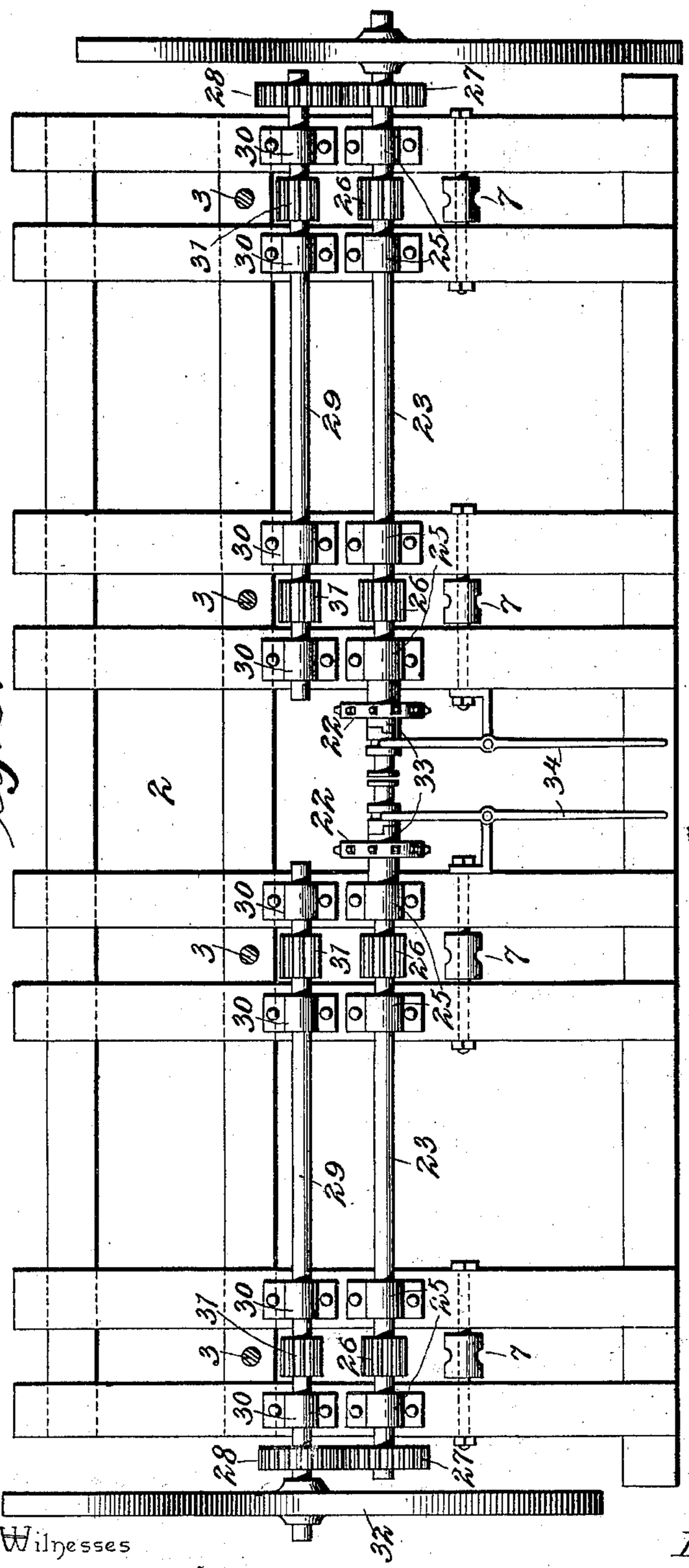


Fig. 6.

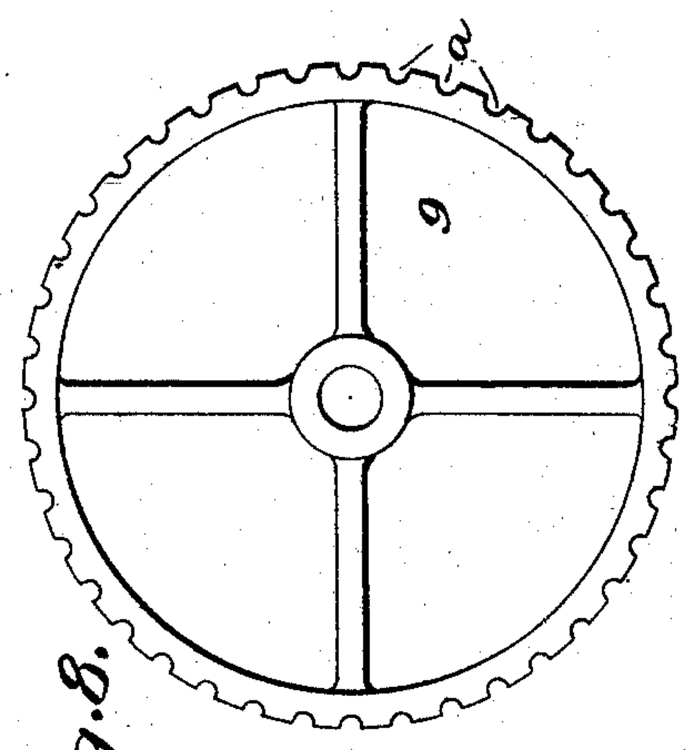


Fig. 8.

Fig. 7.

Witnesses
Howard D. Orr.
J. W. Garner

Edward D. Carter, Inventor,
By his Attorneys.
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

EDWARD D. CARTER, OF BRENHAM, TEXAS.

ROLLER-COMPRESS.

SPECIFICATION forming part of Letters Patent No. 653,065, dated July 3, 1900.

Application filed March 30, 1900. Serial No. 10,801. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. CARTER, a citizen of the United States, residing at Brenham, in the county of Washington and State of Texas, have invented a new and useful Roller-Compress, of which the following is a specification.

My invention is an improved roller-compress especially adapted for forming cylindrical bales from cotton-bat by winding the same in successive layers upon itself; and it consists in the peculiar construction and combination of devices hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a roller-compress embodying my improvements, showing the same in position to begin the formation of a bale. Fig. 2 is a similar view showing the same in the position assumed at the completion of the bale. Fig. 3 is a similar view on the line 3 3 of Fig. 5, a compress in which the operating connections are in reverse relation on the ends thereof as compared with the compress shown in Fig. 1. Fig. 4 is a similar view of the same in the position assumed at the completion of the bale. Fig. 5 is an elevation, partly in section, of a pair of my improved roller-compresses arranged side by side. Fig. 6 is a top plan view of the base-frame on which the roller-compresses are mounted, showing the power-shaft, the counter-shaft, and their connections. Fig. 7 is a horizontal sectional view of a lint-flue for feeding lint to the condenser-cylinder common to both of the presses. Fig. 8 is a detail end elevation of one of the compressing-rolls.

A pair of horizontal beams 1 are supported above a base-frame 2 and disposed in transverse relation thereon by means of standard-rods 3 and inclined studs 4, and each of the said beams 1 alines with a beam 5, said beam 5 being supported by rocking standards 6, which are pivotally connected at their lower ends, as at 7, to the base-frame 2. The beams 1, standard-rods 3, and studs 4 constitute fixed supporting-frames for the fixed compressing-roll 8, which is journaled in suitable bearings on the under side of the beams 1, and the rocking standard 6 and beams 5, which are bolted to the upper ends thereof, constitute rocking frames which carry a compressing-roll 9, that is journaled in bearings 10 on the under sides of the beams 5. Rack-bars 11 are pivotally connected to the said rocking frames, as at 12, said rack-bars overlapping and extending over the beams 1 of the fixed frame, and said rack-bars are engaged by pinions 13 on a shaft 14, which shaft is journaled in suitable bearings, as at 15, on the upper side of the beams 1. Said shaft is further provided at one end with a pinion 16 for the purpose presently described.

On one end of the shaft 17 of compressing-roll 8 is a loose sprocket-wheel 18, by means of which power may be applied to said compressing-roll by a suitable endless sprocket-chain (not shown) driven by a suitable engine or other source of power, and said sprocket-wheel 18 is adapted to be locked to the said shaft 17 by means of a clutch 19, which clutch is operated by a suitable hand-lever, (indicated at 20 in Fig. 5.) On the opposite end of roll-shaft 17 is a sprocket-wheel 21, which is connected to a sprocket-wheel 22 on a shaft 23 by means of an endless sprocket-chain 24. Said shaft 23 is journaled in bearings 25 on the base-frame 2. Said shaft 23 is provided with pinions 26 and with a spur-wheel 27, which engages a similar wheel 28 on a shaft 29, said shaft 29 being journaled in bearings 30 on the base-frame 2 and arranged parallel with the shaft 23. Said shaft 29 is further provided with a pair of pinions 31, which are opposite the pinions 26, and has at one end a brake-wheel 32. Sprocket-wheel 22 is loose on shaft 23 and is adapted to be locked thereto by a clutch 33, which is operated by a lever 34.

A compressing-roll 36 is journaled in bearings 37, which are mounted on cross-heads 35, the latter being connected to the standard-rods 3, as at 38, and adapted to move vertically. From said cross-heads depends standards 39, which are provided on opposite sides with rack-bars 40, that are engaged by the pinions 26 31 on the shafts 23 29, respectively. The shaft 41 of compressing-roll 36 is provided at one end with a sprocket-wheel 42. The compressing-roll 9, carried by the rocking frame, is provided at one end of its shaft with a sprocket-wheel 43.

On the shaft 41 of compressing-roll 36 and near the sprocket-wheel 42 is pivoted a bar

44, which has a rack 45 on one side thereof, that engages the pinion 16 on shaft 14. Said bar is provided near its upper end with a sprocket-wheel 46, which is journaled on a spindle that projects from the outer side of said bar.

A rocking standard 47 has its lower end pivotally connected to the base-frame, as at 48, and the upper end of said standard is connected to one of the rocking standards 6 by a link 49, and thereby said standard 47 is adapted to rock in unison with the rocking frames which carry the compressing-roll 9. On a spindle 50, which projects from the outer side of said standard, is journaled a sprocket-wheel 51.

Standards 52 rise vertically from the upper side of the fixed frames, and to the upper ends of said standards are pivotally connected bolsters 53, which have bearings 54 on their under sides, in which are journaled the spindles or trunnions of a roller 55 on the upper side of compressing-roll 8. Said bolsters are adapted to play vertically to permit of vertical movement of the roller 55, and tension-springs 56 bear upon said bolsters, said tension-springs being supported by vertical rods 57, which rise from the fixed frames. On one end of the shaft of roller 55 is a sprocket-wheel 58. An endless sprocket-chain 59 connects the sprocket-wheels 21, 51, 42, 43, 46, and 58, as shown in Figs. 3 and 4, and thereby the compressing-rolls and rollers 55 are adapted to rotate in unison, the said endless sprocket-chain constituting a flexible driving element connecting said rolls and the sprocket-wheels 42 46 and sprocket-wheel 51 constituting, in connection with the vertically-movable compressing-roll 36 and rocking standard 47, tightening devices which keep said flexible driving element in operative tension at all times, notwithstanding the fact that the rolls 9 and 36, which it connects with the rolls 8 and 55, are movable toward and from said roll 8.

It will be further observed and understood that by means of the shafts 23 29, which are geared together and have the pinions engaging the rack-bars on the standards connected to the vertically-movable compressing-roll 36, and the connections hereinbefore described between said shaft 23 and the power-roll 8 in fixed bearings, as the latter is rotated during the formation of a bale the roll 36 is lowered and caused to recede from said fixed roll 8, and it will be further understood that by means of the shaft 14 and the connections between the same and the vertically-movable roll 36 and the laterally-movable roll 9 in the rocking frames power is communicated from said roll 8 in fixed bearings to said rocking frames through the rack 45, shaft 16, pinions 13, and racks 11, and thereby said roll 9 is caused to recede laterally from said roll 8.

The parts of the press hereinbefore described are so proportioned and arranged that the recession of the rolls 9 36 from the relatively-fixed roll 8 will correspond with the increasing size of the cylindrical bale during the formation of the latter, and that during the formation of the bale the movable rolls are positively driven from the relatively-fixed roll at a speed corresponding with the growth or rate of formation of the bale, and, moreover, that said movable rolls are positively rotated at all times during the formation of the bale, and hence that the compression exerted by the various compression-rolls upon the bale is uniform and unvarying throughout the entire period of the formation of the bale, and that the density of the latter is uniform throughout its various convolutions.

It will be further understood, more especially by reference to Figs. 2 and 4 of the drawings, that when the movable rolls 9 36 reach the limit of their movement from the relatively-fixed roll 8 the bale may be readily discharged from between said rolls and taken from the press.

In order to prevent the compressing-rolls from slipping on the contacting surface of the bale during the formation of the latter, I provide said compressing-rolls with longitudinal peripheral grooves *a*, which serve to increase the friction between said compressing-rolls and the bale and adapt the latter to be positively rotated by the coacting surfaces of the revolving positively-driven compression-rolls, thereby insuring the rotation of the bale at all times during the formation thereof, and thus contributing essentially to the efficiency of the compress in making bales in which all the convolutions are of uniform density.

The function of the roller 55, which operates above the relatively-fixed compressing-roll 8, as will be understood, is to feed the cotton-bat from the condenser (indicated at *b*) to the compress.

In order to regulate the compression of the rolls on the bale, I provide a brake 60, comprising a brake-shoe 61, which bears on the wheel 32 and is supported by a screw 62 in a standard 63, secured to the base-frame. By turning said screw 62 the brake may be caused to contact with said wheel 32 with any desired degree of force, thereby creating the requisite friction between said brake and wheel to retard the rotation of the latter as may be required, and hence retard the movement of the rolls 9 36 from the relatively-fixed roll 8 during the formation of the bale.

In practice I employ a pair of my improved cotton-compresses side by side and operate the same so that one of the compresses completes a bale at the same period that the other compress begins the formation of a bale, so that the operating-hands may be employed in the bagging and delivery of the completed bale while the other bale is in process of formation, which is an exceedingly economical arrangement and enables two compresses to be operated by the same number of hands that would otherwise be required to operate one of the compresses. When a pair of my improved

cotton-compresses are thus arranged and operated, I provide the condenser with a roller *d*, which is coextensive in length with the combined lengths of the compresses, and I further provide a lint-flue *c*, which leads from a cotton-gin (not shown) and is provided with a pair of diverging discharge-mouths *d*, arranged opposite the end portions of said condensing-rolls, as indicated in Fig. 7, and at the intersection of said diverging discharge-mouths with the lint-flue is a pivoted gate or cut-off *e*, which by means of levers *f* (one or more) may be turned so as to cut off communication between either of said discharge-mouths and said flue and establish communication between the other discharge-mouth and said flue, and thereby adapt the lint to be fed to one end of the condensing-roller and cut off from the other end thereof, and hence the pair of compresses may be supplied with bat as may be required while the same are in operation, and the processes of ginning the cotton and forming the bat continuously carried out during the operation of the compresses. When the movable compressing-rolls of one of the presses reach the outer limit of their movement and the bale is discharged, the rotation of the roll 8 is discontinued by moving the clutch 19 out of engagement with the driving sprocket wheel or pulley 18 of said roll, thereby permitting said sprocket wheel or pulley to rotate idly. The wheel 22 is then permitted to rotate idly on the shaft 23 by throwing the clutch 33 out of engagement therewith, whereupon the brake is released from the wheel 32, and the latter rotated in a retrograde direction, hence imparting rotary motion to shafts 23 29 and causing the pinions 26 31 and rack-standard 39 to raise the roll 36 to its initial position, and as the bar 44 is elevated by said roll the racks of said bar by engagement with the pinions 16 on shaft 14 rotate said shaft, and the pinions 13 on said shaft and rack-bars 11, with which they engage, draw the rocking frames inward, thereby returning the roll 9 also to its initial position, as will be readily understood.

Each roller 55 is provided on the inner end of its shaft with a clutch 64, adapted to engage the sprocket-wheel 58 and lock the latter to said shaft, said clutches being provided with operating-levers of the usual type, whereby they may be engaged with or disengaged from said wheels 58. When a bale has been formed in one of my presses, the clutch 64 is thrown out of engagement with the sprocket-wheel 58, thus causing the feed-roller to stop, and thereby cutting off the supply of the bat to the bale while the driving-roller 8 is continuously revolved, while the bagging is placed around said completed bale. When this has been done, the clutch 19 is thrown out of engagement with the wheel 18, thus causing roller 8 to remain idle while the bagging is sewed on the bale. The brake 60 is then released from wheel 32, thereby causing roller 36 to descend and free the bale. The clutch 19 is then thrown into engagement with wheel 18 and clutch 33 is thrown into engagement with sprocket-wheel 22, thus causing shafts 23 and 29 to rotate and returning rollers 36 and 9 to their initial positions ready for the formation of a new bale. Clutch 33 is then thrown out of engagement with wheel 22, said wheel standing idle while the next bale is formed. When the rollers 36 and 9 are in their initial positions for the formation of a new bale, the brake is applied to lever-wheel 32 and the clutch thrown out of engagement with the wheel on the feed-roller, the bat being then fed to the bale-forming rollers and the new bale started.

Having thus described my invention, I claim—

1. In a roller-press, the combination of a roll in fixed bearings, a vertically-movable roll carried by a vertically-movable support, a laterally-movable roll carried by a laterally-movable support, a flexible connecting driving element for said rolls, said flexible element being engaged by tension devices carried by the movable supports, and means connecting said vertically and laterally movable supports whereby they are actuated in unison, substantially as described.

2. In a roller-press, the combination of a roll in fixed bearings, a vertically-movable roll carried by a vertically-movable support having vertical rack-bars above and below the roll, a laterally-movable roll carried by a laterally-movable support, a flexible driving connecting element for said rolls, tension devices, carried by the vertically and laterally movable supports and engaging said flexible connecting element, a shaft connected to and driven from the relatively-fixed roll and having a pinion engaging the lower rack-bar, a shaft having a pinion engaging the upper rack-bar, and connections between said shaft and the laterally-movable support, substantially as described.

3. In a roller-compress, the combination of a roll in fixed bearings, counter-rolls in movable bearings, a flexible driving element connecting said rolls, a brake-wheel, and connections between the latter and one of the movable rolls, whereby said wheel is rotated as said roll moves toward and from the fixed roll, substantially as described.

4. In a roller-compress, the combination of a roll in fixed bearings, counter-rolls in movable bearings, a flexible driving element connecting said rolls, a brake-wheel, connections between the latter and one of the movable rolls, whereby said wheel is rotated as said roll moves toward and from the fixed roll, and a brake to retard the rotation of said wheel, substantially as described.

5. In a roller-compress, the combination with a series of rolls movable toward and from one another, of a flexible driving element connecting said rolls, a shaft, connections between the latter and said flexible driving ele-

ment, a brake-wheel on said shaft and friction devices to retard the rotation of said brake-wheel, substantially as described.

6. In a roller-compress, the combination with a roll in fixed bearings, of counter-rolls, in movable bearings and adapted to move away from each other and said fixed rolls as the bale is formed, a flexible driving element connecting said rolls and movable tightening devices carried by the supports of the counter-rolls engaging said flexible driving element and connected and movable in unison with said movable rolls, substantially as described.

7. In a roller-compress, the combination with a positively-driven roll in fixed bearings, of counter-rolls in movable bearings and adapted to move away from each other and the fixed rolls as the bale is formed, a flexible driving element connecting said rolls, means carried by the supports of the counter-rolls to maintain the tension of said flexible connecting driving element, substantially as described.

8. In a roller-press, the combination of a roll in fixed bearings, a vertically-movable counter-roll, a vertically-movable support therefor having a vertical rack-bar, intergeared shafts engaging said rack-bar, one of said shafts having a brake-wheel and the other being connected to and actuated by the relatively-fixed roll, a rocking frame, a counter-roll carried thereby, a flexible driving element connecting the rolls, tension devices carried by the supports of the counter-rolls engaging said flexible connecting element and connections between the vertically-movable supports of the respective counter-rolls, for the purpose set forth, substantially as described.

9. In a roller-compress, the combination of a roll in fixed bearings, a vertically-movable roll, a laterally-movable roll, a flexible driving element engaging said rolls and adapted to rotate the same in unison, and connections between said rolls for moving said vertically and laterally movable rolls, said means forming tension devices for said driving flexible element, 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.

EDWARD D. CARTER.

Witnesses:
W. B. VAN HUTTON,
J. W. RICHARDSON.