

5 Sheets—Sheet 1.

No. 543,584.

Patented July 30, 1895.

FIG. 1.

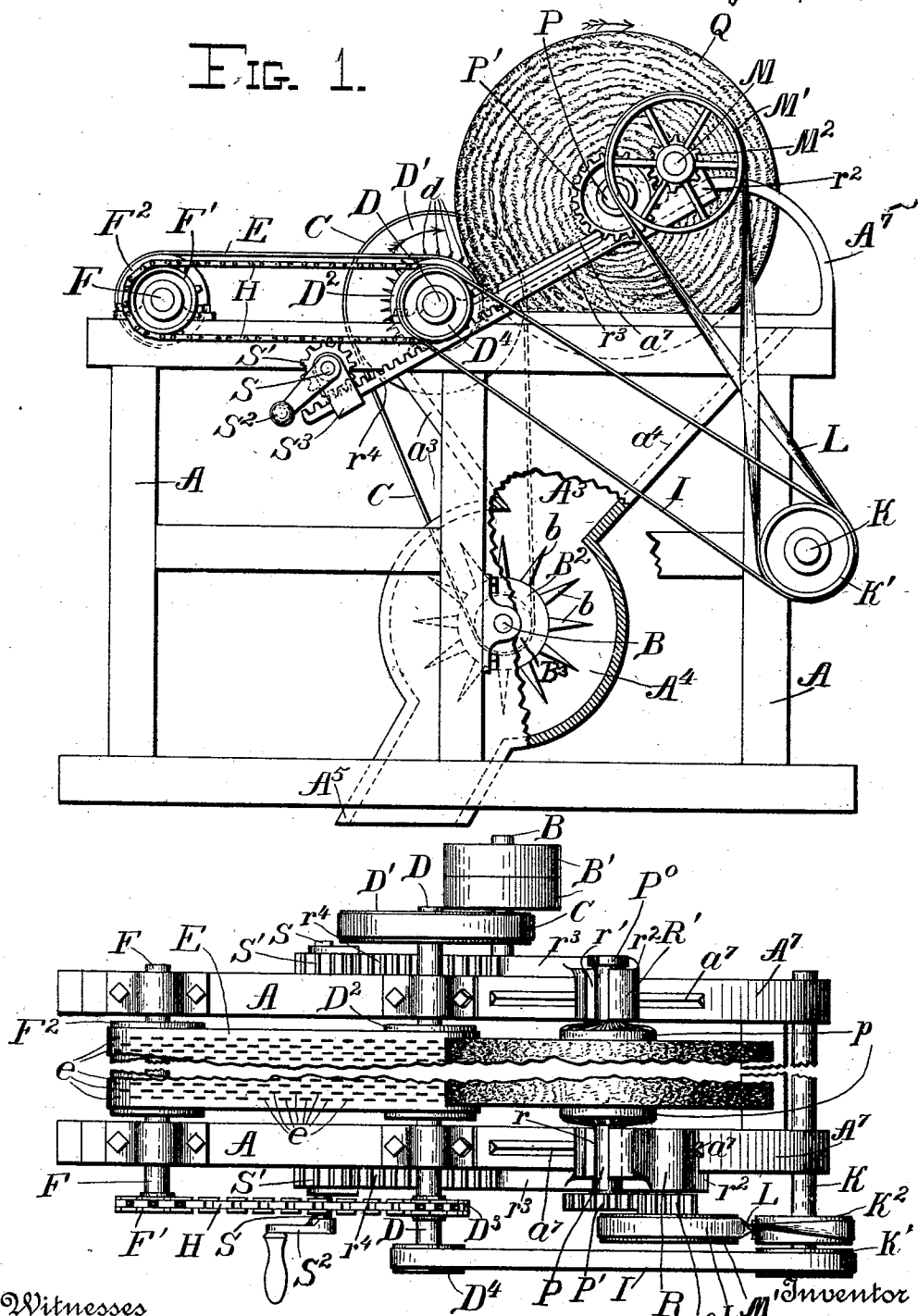


Fig. 2.

Witnesses

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(No Model.)

5 Sheets—Sheet 2.

W. A. PATTERSON.
FIBER UNWINDER AND MIXER.

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FIG. 3.

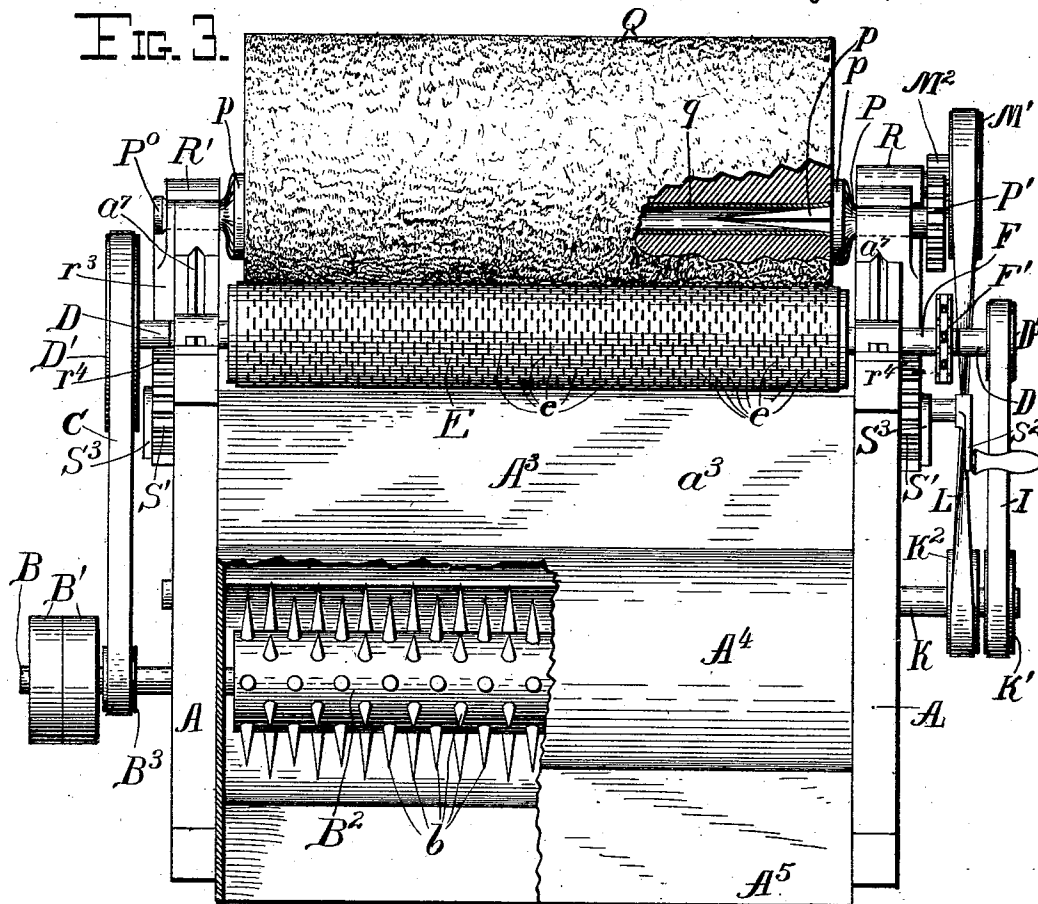


FIG. 5.

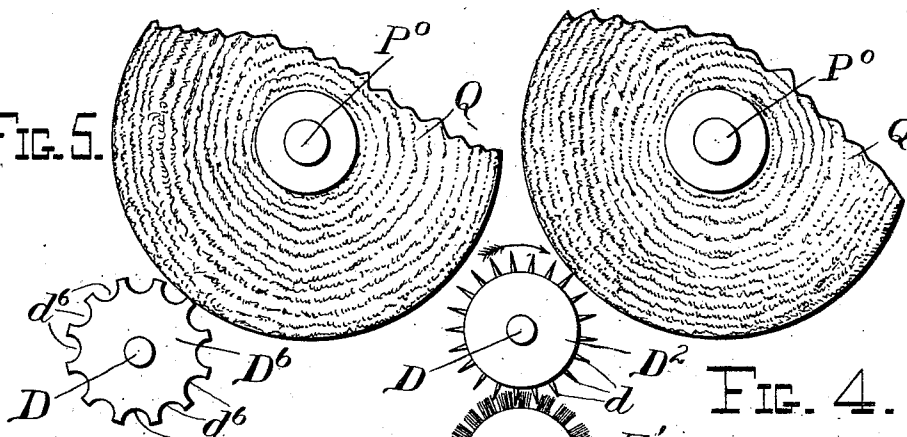
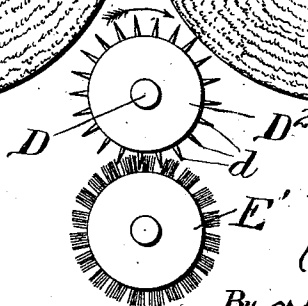


FIG. 4.



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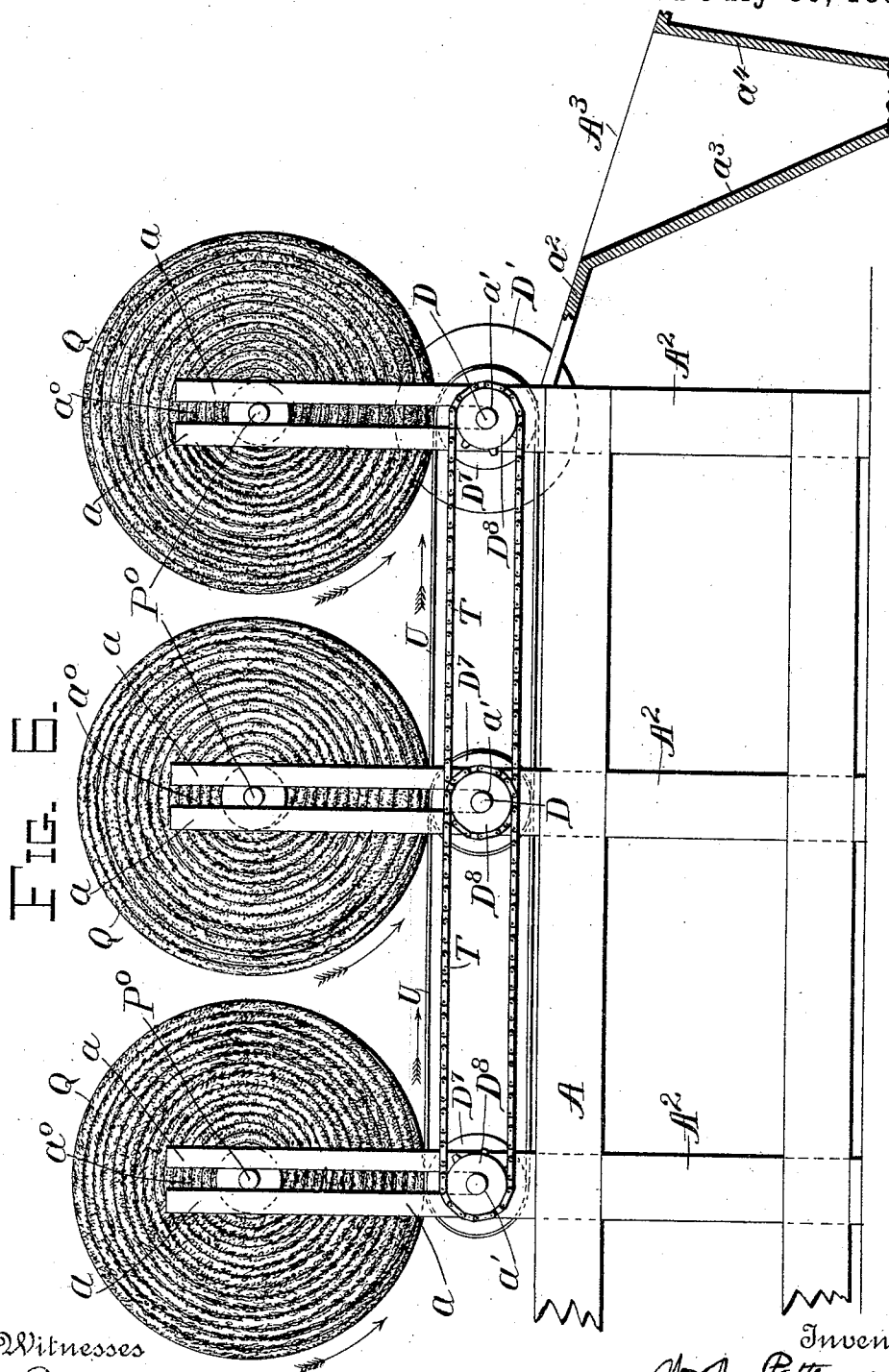
(No Model.)

5 Sheets—Sheet 3.

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Patented July 30, 1895.



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5 Sheets—Sheet 4.

W. A. PATTERSON.
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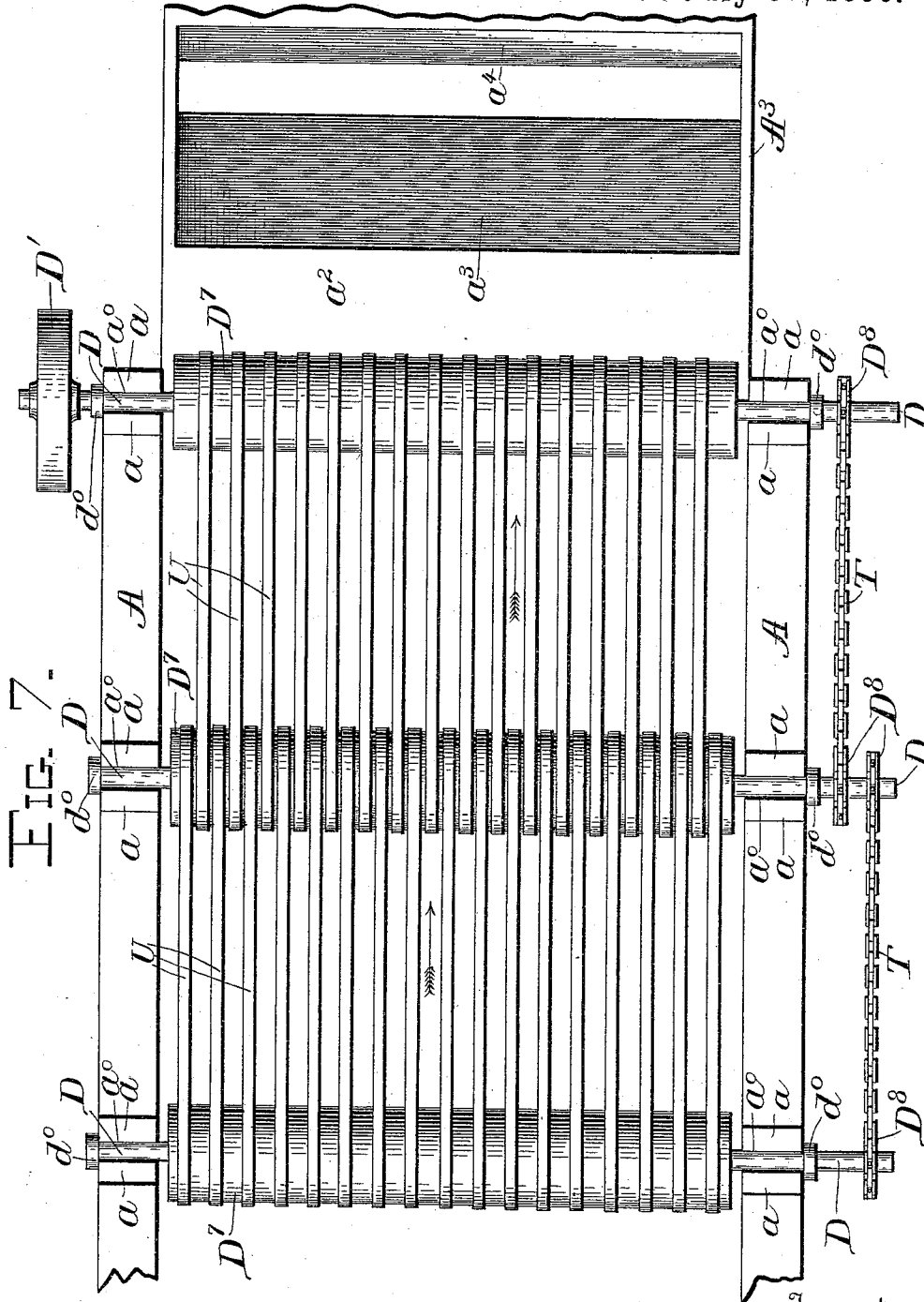


FIG. 7.

Witnesses

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(No Model.)

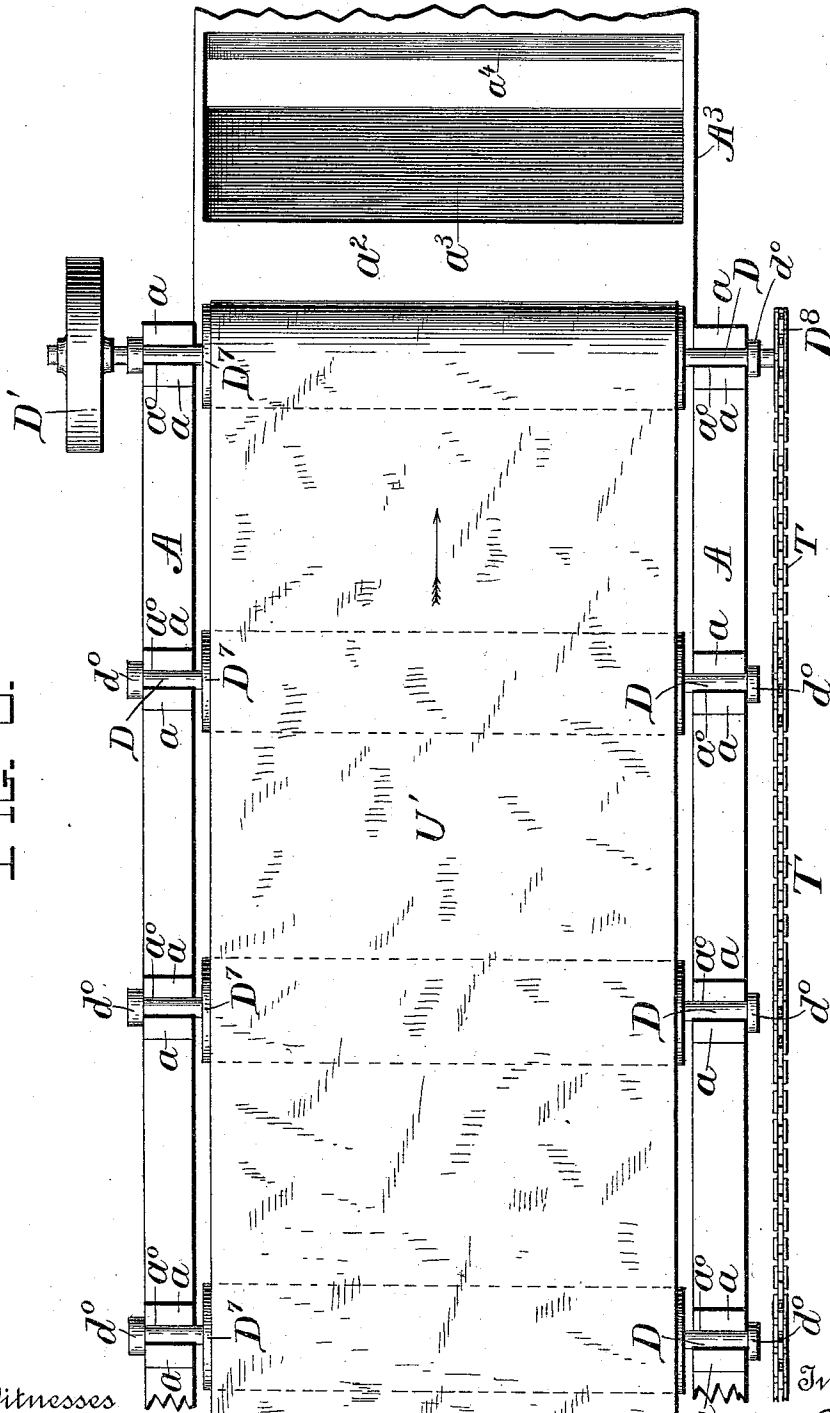
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FIG. 8.



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UNITED STATES PATENT OFFICE.

WARREN A. PATTERSON, OF WACO, TEXAS, ASSIGNOR OF THREE-EIGHTHS
TO L. W. CAMPBELL, OF SAME PLACE.

FIBER UNWINDER AND MIXER.

SPECIFICATION forming part of Letters Patent No. 543,584, dated July 30, 1895.

Application filed November 15, 1894. Serial No. 528,924. (No model.)

To all whom it may concern:

Be it known that I, WARREN A. PATTERSON, a citizen of the United States, residing at Waco, in the county of McLennan and State of Texas, have invented certain new and useful Improvements in Fiber Unwinders and Mixers; and I do hereby 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.

My invention is designed to provide improved means for picking or stripping apart, unrolling, unwinding, and mixing, after being unwound, lint-cotton or similar fibrous material, pressed or compressed into cylindrical bales, in order to restore the cotton or similar material in such bales to the loose condition requisite for the usual processes of manufacture in mills, and to mix different grades of cotton or like fibrous material, when desired, as will be hereinafter fully described.

Reference is had to the accompanying drawings, wherein the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a side elevation, parts being broken away, of a complete machine for unwinding or stripping the layers of cotton from a cylindrical bale and for picking the layers so unwound. Fig. 2 represents a plan view of the machine shown in Fig. 1, parts being broken away. Fig. 3 represents an end view of the machine shown in Fig. 1, as seen from the left of the said figure, and parts being broken away. Fig. 4 is a detailed view showing one means of doffing the fiber from the stripping-rod. Fig. 5 represents a modified form of stripping-roller in operation on a bale. Fig. 6 represents a modification in which the bat from three bales is unwound on a plurality of carrier-bands, the bales resting on the said bands by their own weight. Fig. 7 represents a plan view of the device shown in Fig. 6 with the bales removed; and Fig. 8 represents a plan view of a device similar to that shown in Fig. 7, except that one continuous apron of leather, walrus-hide, or the like is used and an indefinite number of bales may be supported thereon.

A represents the frame in which the ma-

chine is mounted. In the construction shown in Figs. 1 to 3 the said frame is provided with a hopper A³, having sloping ends a³ and a⁴, terminating in the circular chamber A⁴ above the spout A⁵. Journaled across the frame A is a driving-shaft B, having fast and loose pulleys B', which are driven by a belt from the driving-engine, which is not shown. Gear-wheels may be used instead of the said pulleys, if desired. This driving-shaft B passes through the circular chamber A⁴ and carries drum B², provided with picking-teeth b for picking and stretching the cotton-bats. The driving-shaft B also carries a pulley B³, which is connected by the belt C to the pulley D' on the shaft D, which carries the stripping-roller D², which is provided with teeth d adapted to engage in the cotton-bat. The pulleys D' and B³ are so arranged that the stripping-roller D² will move considerably slower than the picking and stretching roller B², and therefore the cotton bat will be partly picked and stretched out by the lower and faster moving roller B². The shaft D also carries a sprocket-wheel D³ gearing into the sprocket-chain H, which drives, by means of the sprocket-wheel F', the shaft F, on which is mounted the drum F². Over the drum F² and the stripping-roller D² an endless apron E passes, which apron is provided with a plurality of holes e, adapted to admit the teeth d of the stripping-roller D². The function of this perforated apron is to doff the fiber from the stripping-teeth d. The shaft D also carries a pulley D⁴, which drives the belt I passing over the pulley K' on the shaft K. This shaft K carries a second pulley K², which drives the crossed belt L and the pulley M', which latter is mounted on the short shaft M, journaled in the bearing-block R. This shaft also carries a gear-wheel M², which meshes in the gear-wheel P' on the journal P on which the bale Q revolves. The opposite journal P⁰ of the bale is similar to the journal P, except that the gear-wheel P' is omitted. Each of the said journals is flanged, as at p, to fit snugly against the ends of the bale, and is provided with an angular holding-tang, which is driven into the core q of the bale, as shown in Fig. 3, thus rigidly attaching the bale to the said journal. These two

journals P and P⁰ drop into bearings r and r' in the bearing-blocks R and R', which slide along the ribs a^7 on the top of the sloping frames A⁷, which frames are secured on the top of the frame A. These bearing-blocks R and R' are bent downward, as at r^2 , and terminate in arms r^3 , having racks r^4 attached to or integral therewith. These racks gear into a cogged wheel S', fast on the shaft S, which is journaled in the frame A. This shaft S is turned by the hand-crank S² or may be operated by any suitable mechanism. The rack r^4 is held against the cogged wheel S' by means of a stirrup S³.

It will be seen that by turning the cogged wheel S' the rack r^4 may be moved in either direction, and therefore the bearing-blocks R and R', and consequently the bale Q, may be moved toward or away from the stripping-roller D², as may be desired.

In order to obtain uniformity of action at both ends of the bale, there are two of these racks r^4 , one on either side of the bale, and two of the cogged wheels S', as shown most clearly in Fig. 3.

The rib a^7 prevents lateral motion of the bearing-blocks R and R', while the distance between the centers of the shafts K and M is sufficient to render unimportant the slight change in the tautness or slackness of the belt L. With this form of machine the downward slant of the frame H⁷ enables the bale Q to press, by its own weight, on the stripper-roller D², while the pressure or the rate of feed may be varied by means of the cogged wheel S' and the hand-crank or other means for operating the same.

The cotton-bat is stripped off by the teeth of the stripper-roller D², and, hanging down into the hopper A³, is caught by the more rapidly-revolving picker-teeth b , by means of which it is stretched out and partly picked and is pushed down the chute A⁵, whence it is carried by any suitable means to the desired point. It will thus be seen that the layers of cotton are removed from the cylindrical bale and that the compressed cotton is loosened, so as to be readily handled by machines of the construction ordinarily found in cotton-mills.

In the form of device shown in Fig. 4 the perforated endless band E and the means for driving the same are omitted, the fiber being doffed from the roller D² by means of a revolving brush E'.

In the form of device shown in Fig. 5 a roller D⁶, corrugated, as at d^6 , is used instead of the toothed stripping-roller D², the points of the said corrugations pressing into the cotton and causing the bale to revolve, and at the same time drawing off the cotton.

In the form of device shown in Fig. 6 the frame A is provided with a plurality of upright pieces A², which terminate in the vertical arms a , slotted, as at a^0 , in which slots the journals of the bale are free to revolve. Be-

neath each bale is a roller D⁷, on which are stretched a plurality of bands U, connecting the said roller with the adjacent roller, as shown in Fig. 7. Between these bands on the rollers teeth may be placed, if desired; but the simple friction of the bands on the bottom of the bale will ordinarily be sufficient for the purpose of revolving the bale and unwinding the bat therefrom. The various rollers are revolved by means of the pulley D', the sprocket-wheels D⁸, and the chains T, or in any other suitable way.

While I have shown three bales, and three stripping-rollers beneath the same, it will be evident that the number of each may be varied indefinitely.

In the device shown in Fig. 8 the divided bands U are replaced by a single endless apron U', which passes over all the rollers and beneath all the bales. This endless apron should preferably be driven at either end, as by the pulley D' and the sprocket-chain D; but it may be driven at one end only, as by the omission of the said sprocket-chain D, or all of the rollers may be positively driven, as shown in Fig. 7.

In the constructions shown in Figs. 6 to 8 the various bands and bales move in the direction shown by the arrows and the cotton is fed to the chute A³ over the sloping board a^2 in a plurality of layers the thickness of which depends upon the number of bales from which the various bats are unwound. After leaving the chute A³ the cotton may be stretched, if desired, and picked by one or more devices similar to the picking-roller B² already described with reference to Figs. 1 and 3. It will thus be seen that the devices described with reference to Figs. 6 to 8 will not only simultaneously unwind the cotton from several bales, but will also mix the said cotton from the said bales.

The bands U (shown in Fig. 7) may be of leather or walrus-hide, or may be chains, if desired.

The endless apron U' (shown in Fig. 8) should be of rough leather or walrus-hide; but the same may be otherwise roughened in any well-known way, if desired.

While the herein-described apparatus has been described particularly in connection with the cylindrical cotton-bale now manufactured, it will be obvious that it is applicable, with or without minor changes, to cylindrical bales of fibrous material of any description. It will also be evident that various modifications of the herein-described apparatus might be made which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous mate-

rial, and means for revolving said bale, of a stripper adapted to engage the outer layer and unwind the same, substantially as and for the purposes described.

5 2. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material, and means for revolving said bale, of a stripper adapted to engage the outer layer and unwind the same, and a picker adapted to pick and stretch the layer so unwound, substantially as described.

3. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material, and means for revolving said bale, of a stripper adapted to engage the outer layer and unwind the same, and a dentated picker moving at a higher surface speed than said bale, and adapted to pick and stretch the layer so unwound, substantially as described.

4. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material, and means for revolving said bale, of a stripper moving beneath said bale and supporting the same, the said stripper being adapted to engage the outer layer and unwind the same, substantially as and for the purposes described.

5. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material, and means for revolving said bale, of a stripper moving beneath said bale and supporting the same, the said stripper being adapted to engage the outer layer and unwind the same, and a picker adapted to pick and stretch the layer so unwound, substantially as described.

6. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material, and means for revolving said bale, of a stripper moving beneath said bale and supporting the same, the said stripper being adapted to engage the outer layer and unwind the same, and a dentated picker moving at a higher surface speed than said bale, and adapted to pick and stretch the layer so unwound, substantially as described.

7. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material; of journals driven into said bale; bearings for said journals; means for revolving said journals in said bearings; and a stripper adapted to engage the outer layer and unwind the same, substantially as and for the purposes described.

8. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material; of journals driven into said bale; bearings for said journals; means for revolving said journals in said bearings; a stripper adapted to engage the outer layer and unwind the same, and means for pressing said bale on said stripper, substantially as described.

9. In an apparatus of the character described, the combination with a support adapted to hold a cylindrical bale of fibrous material; of journals driven into said bale; bearings for said journals; means for revolving said journals in said bearings; a stripper adapted to engage the outer layer and unwind the same, and means for moving the centers of said journals toward said stripper, substantially as described.

10. In an apparatus of the character described, the combination with a plurality of supports adapted to hold cylindrical bales of fibrous material, and means for revolving said bales, of a stripper moving beneath each of said bales and supporting the same, the said stripper being adapted to engage the outer layer of each of said bales and unwind the same, substantially as and for the purposes described.

11. In an apparatus of the character described, the combination with a plurality of supports adapted to hold cylindrical bales of fibrous material, and means for revolving said bales, of a stripper moving beneath each of said bales and supporting the same, the said stripper being adapted to engage the outer layer of each of said bales, and unwind the same; and a picker adapted to pick, stretch and mix the layers so unwound, substantially as described.

12. In an apparatus of the character described, the combination with a plurality of supports adapted to hold cylindrical bales of fibrous material, and means for revolving said bales, of a stripper moving beneath each of said bales and supporting the same, the said stripper being adapted to engage the outer layer of each of said bales and unwind the same; and a dentated picker moving at a higher surface speed than said bales, and adapted to pick, stretch, and mix the layers so unwound, substantially as described.

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

WARREN A. PATTERSON.

Witnesses:

L. W. CAMPBELL,
OSCAR N. WIEL.