(No Model.) 3 Sheets—Sheet 1.

# H. REMBERT.

## APPARATUS FOR BALING COTTON.

No. 446,888. Patented Feb. 24, 1891.

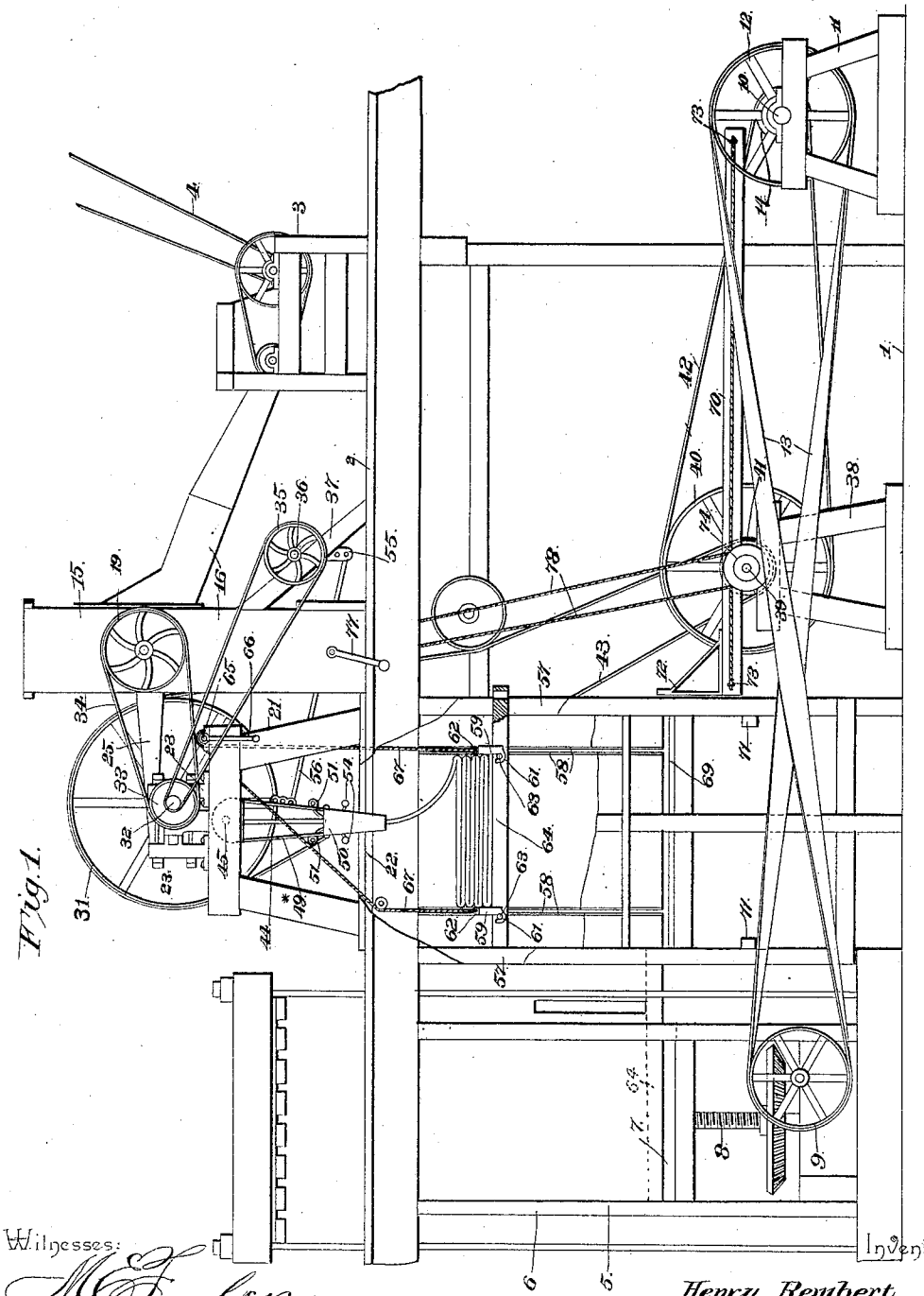


Fig. 1.

Witnesses:
M. Fowler

Inventor
Henry Rembert
by his attys
W. S. Duvall. Cashow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

# H. REMBERT.

## APPARATUS FOR BALING COTTON.

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Fig. 3

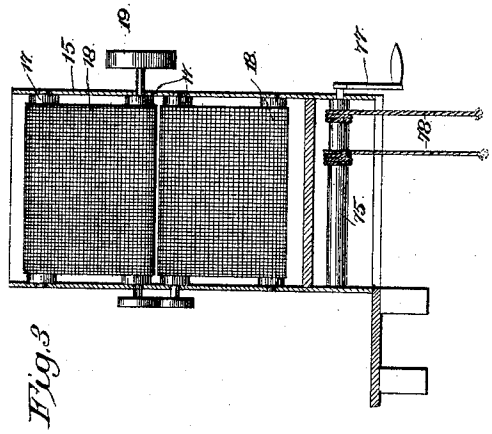


Fig. 4.

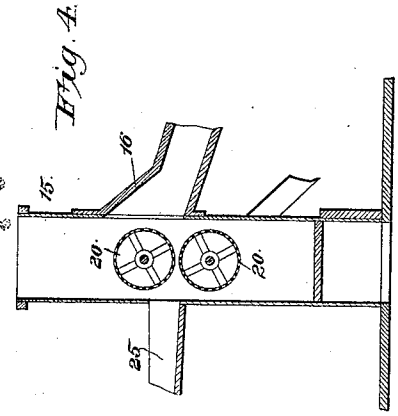


Fig. 7.

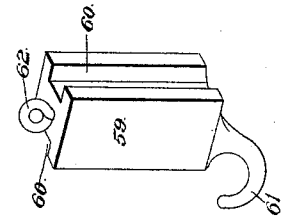
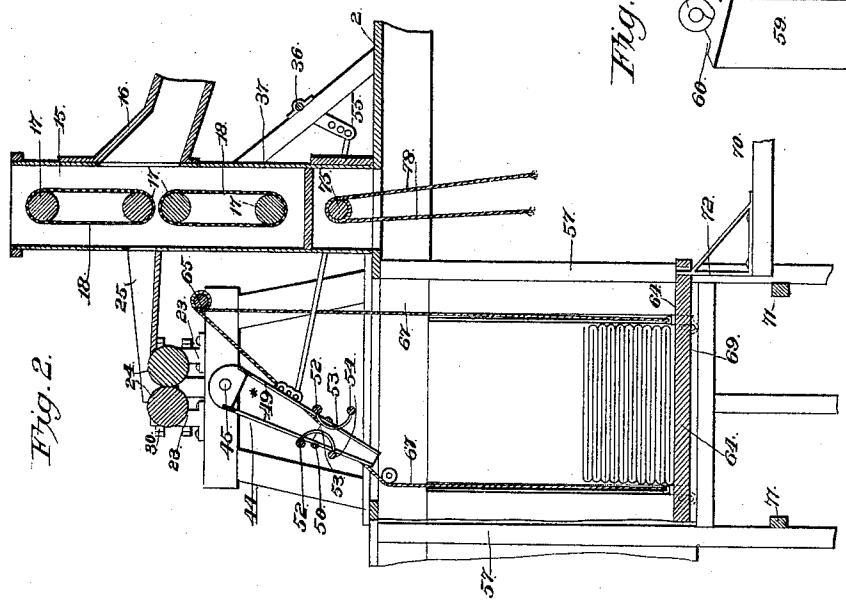


Fig. 2.



Witnesses:
M. Fowler
W. S. Dewey

Inventor
Henry Rembert
By his Attorneys,
C. A. Snow & Co.

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(No Model.) 3 Sheets—Sheet 3.

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## APPARATUS FOR BALING COTTON.

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Fig. 5.

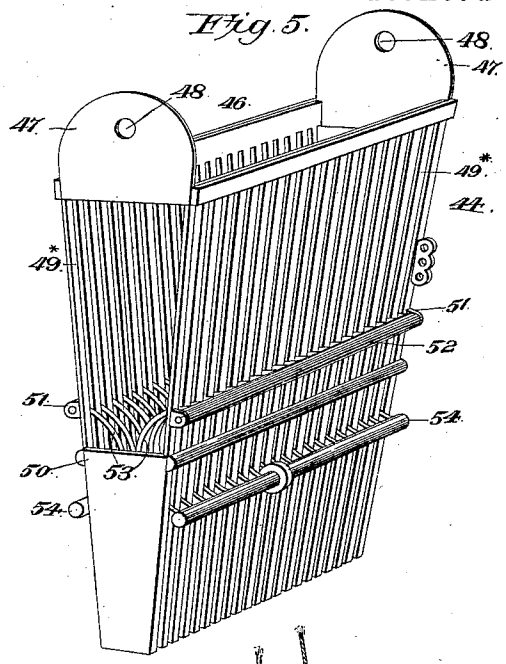



Fig. 6.

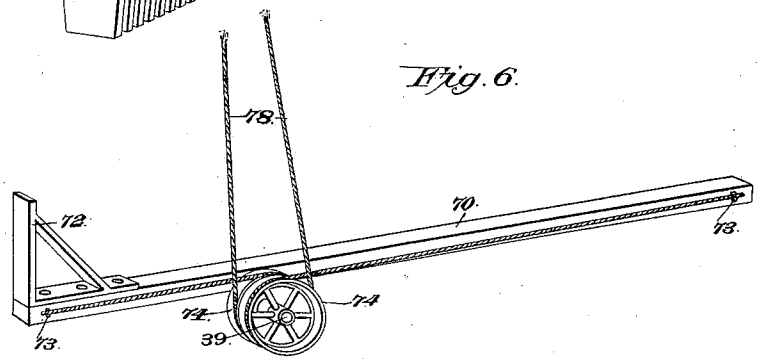
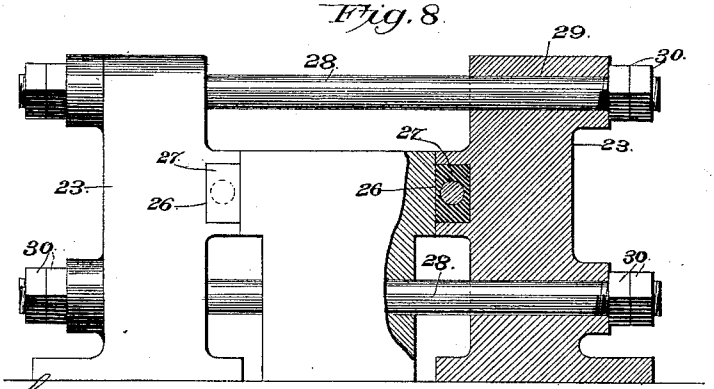



Fig. 8.




Witnesses:

M. Fowler

W. S. Duvall.

Inventor

Henry Rembert

By his Attorneys,

C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

HENRY REMBERT, OF WILLIS, ASSIGNOR TO THE REMBERT ROLLER COMPRESS COMPANY, OF GALVESTON, TEXAS.

## APPARATUS FOR BALING COTTON.

SPECIFICATION forming part of Letters Patent No. 446,888, dated February 24, 1891.

Application filed June 10, 1890. Serial No. 354,882. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY REMBERT, a citizen of the United States, residing at Willis, in the county of Montgomery and State of Texas, have invented a new and useful Apparatus for Baling Cotton, of which the following is a specification.

This invention has relation to a machine for baling cotton, the objects of the invention being to provide a mechanism for baling the fiber in packages or bales of such density as to admit of its cheap transportation and handling.

A further object of the invention is to prevent the loss of cotton or fiber in transporting the same from the gin to the baling-press, and to accomplish the above in a cheap and economic manner and without the necessity of employing the usual heavy, costly, and intricate machinery necessary to such a result, but by the employment of the simple and ordinary "plantation-press" in conjunction with my invention.

With the above general objects in view and many minor objects not stated, but hereinafter apparent, the invention consists in certain main and detailed features hereinafter specified, but more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a gin, a baling-press, and a baling mechanism, the latter constructed in accordance with my invention and located in proper position between the two and operatively connected therewith. Fig. 2 is a vertical longitudinal section of my mechanism. Fig. 3 is a transverse section in front of the bat-forming rolls or belts. Fig. 4 is a vertical longitudinal section illustrating a modified form of bat-forming roll. Fig. 5 is a detail in perspective of the bat-lapping frame. Fig. 6 is a detail in perspective of the carriage-operating bar. Fig. 7 is a detail in perspective of one of the carriage-supporting guide-blocks. Fig. 8 is a longitudinal section of a pair of the pressing-rolls and shaft-supporting standards.

Like numerals of reference indicate like parts in all the figures of the drawings.

In the accompanying illustration, Fig. 1, I have illustrated my invention properly located in a ginning mill or house and in connection with an ordinary gin and what is commonly termed a "plantation-press," which latter is of the usual screw or other pattern, and is employed upon plantations for the purpose of primarily baling the cotton in order to facilitate transporting the same to point of use or larger and more powerful presses previous to its final transportation to the manufacturers. By such an arrangement time is lost and money expended for the purpose of a final compression. Bales previous to their final compression are of undesirable bulk and occupy more space than they would occupy if properly compressed, therefore increasing the cost of hauling from the gin-house.

By my invention I propose to compress the bale to a density equaling a bale formed by the most powerful press, said baling being performed upon the plantation or at the gin-house, whereby space of storing under sheds upon the plantation or at the gin-house and in wagons for hauling the same to the points of shipment is economized, this result being accomplished in a rapid, cheap, and economical manner and without any additional power over what is required to operate the gin and press, and, furthermore, without reducing their efficiency in any degree.

By my invention also I propose to prevent loose fiber from circulating or floating in the atmosphere of the gin-house, thereby lessening the danger of conflagration by reason thereof.

1 designates the floor of the ginning-mill, and above the same is the usual platform or second floor 2.

3 designates the cotton-gin, operated by the belt 4, leading from a suitable motor.

5 designates the baling-chamber of the baling-press 6, and 7 the follower operated by the screw 8, which in turn is operated through the medium of the pulley 9.

10 designates a counter-shaft journaled in a suitable support or standard 11 and carrying a pulley 12, which is connected with the pulley 9 by a cross-belt 13. The counter-shaft is operated by the same motor as the gin, as

will be readily understood, and also carries in addition to the pulley 12 a small pulley 14, for the purpose hereinafter apparent.

15 designates the condensing-chamber located in front of the gin 3 and between it and the baling-press. This chamber is connected to the gin by a conveyer 16, which conveyer delivers the fiber to the condensing-chamber.

Referring to Figs. 2 and 3 more especially, it will be seen that I journal in the opposite walls of the condenser vertically-opposite pairs of rolls 17, each pair being connected by a flexible reticulated belt 18. The inner roll of one of the pairs has its shaft extended outside of the wall of the condenser and carries a pulley 19, which is rigidly mounted upon the shaft and serves to drive the roll mounted on that shaft, and with it the companion roll and the connecting-belt. The inner rolls, or rather the belts, run in contact with each other, so that the other belt and rolls are driven by friction. The fiber coming from the gin is caught between these moving belts and is converted into a bat.

Referring to Fig. 4, which is a modification of the construction of bat-forming rolls, it is seen that I employ simply two perforated or reticulated rolls 20, between which the fiber is passed, which act upon the fiber in the same manner as do the belts, though I prefer the latter, believing them to be more efficient in their operation.

By experience I have ascertained that the fiber forming these bats by means of the rolls or belts is disposed more uniformly than where the mass of cotton is simply tumbled into the baling-chamber of the baling-press, and the result is that the cotton packed by this process "grades" higher than that baled in the usual way. This high grade attained is further facilitated by means of a mechanism to be hereinafter described.

21 designates a frame-work or table located in front of the condenser and between it and the baling-press, and below said frame-work the floor 2 is provided with an opening 22. At each side of the table 21 is located a pair of standards 23, provided with journal-boxes, and in each of said pair of standards is journaled a presser-roll 24, said rolls having frictional contact throughout their lengths and maintained, by means hereinafter specified, under great binding-pressure. The rolls are of metal and are located above the table, and to said rolls the soft bat formed by the condenser is continuously fed, the same being accomplished through the medium of an intermediate conveyer 25.

Referring to Fig. 8, it will be seen that the standards 23 are arranged in pairs at opposite sides of the table, and that each standard is provided upon its inner side with a socket or recess 26, in which is located a snugly-fitting journal-box 27. These standards are bolted most securely to the table and in such position that the metal rolls 24 are snugly pressed one against the other, which pressure is maintained by means of opposite pairs of binding rods or bolts 28, which pass through eyes or openings 29, formed in each side pair of standards, said binding rods or bolts being provided at their ends with double nuts 30 or other binding devices. By this means, though to such I do not limit my invention, the pressure of the rolls against each other is extremely powerful—in fact is as powerful as is permissible without the liability of injuring the fiber of cotton.

The shaft of one of the rolls extends outside of its boxing and is provided with a large and small pulley 31 and 32, respectively, and an intermediate pulley 33. The intermediate pulley 33 is connected with the pulley 19 of the condenser by a belt 34, and the small pulley 32 is connected to a pulley 35, mounted upon a shaft 36, which is journaled in a pair of inclined standards 37 in rear of the condenser.

38 designates a suitable pair of standards located upon the ground-floor 1 in advance of the standards 11, and in said standards 38 is journaled a transverse shaft 39, carrying a large and small pulley 40 and 41, the former pulley being connected by a belt 42 to the pulley 14 of the shaft 10 and receiving motion from said shaft and transmitting it to the shaft 39. The smaller pulley 41 of the shaft 39 receives motion from the shaft and through the medium of the belt 43 transmits motion to the large pulley 32, that operates the pressing-rolls.

44 designates the lapper-frame, and the same is hinged, as at 45, to the opposite sides of the table 21.

Referring to Fig. 5, it will be seen that the lapper consists of an upper oblong frame 46, terminating at its opposite ends in upwardly-projecting ears 47, having bearing-openings 48, through which openings pass the bolts 45, the ears 47 embracing the opposite sides of the table, which table, as shown in Fig. 2, has a transverse slot or opening 49 occurring vertically above the pivot of the lapper-frame and the meeting-point of the pressing-rolls 24. From the upper frame 46 of the lapper there depends from each of the side bars thereof a series of rods 49, arranged at intervals, the series at one side of the lapper converging toward those of the opposite side and being held in suitable relative position by means of a lower clamping-frame 50. Above the frame 50 the outer rods 49 of each series are provided with bearing-ears 51, in which is mounted outside of each series of rods a transverse bar 52.

Opposite the spaces between the rods 48 there projects from each of the bars 52 a series of semicircular or curved bars 53, the lower ends of which project outwardly from the lapper between the rods 49, and outside of said rods each series is connected by a connecting-bar 54. These curved series of guide-bars are loosely suspended in position, so that whatever be the position of the latter, said guide-bars hang in a common and perfectly-vertical

position, and thus give a uniform support to the bar as it descends from the compressing-rolls 24.

From the shaft 36 at the rear of the condenser there extends a crank-arm 55, which, by a connecting-rod 56, is pivotally connected with the loosely-suspended lapper 44. Adjusting-holes are formed in the arm, whereby the rod may be connected at various points for the purpose of adjustment.

Below the opening 22 in the floor 2, and at each side of the same, is a pair of posts 57, which are connected by suitable cross-bars for the purpose of strengthening the same.

58 designates opposite pairs of guide-rods, forming vertical ways, two pairs of these guides extending vertically and being located between each pair of posts 57. Within each of the guides just mentioned is mounted a sliding block 59, (see Fig. 7,) said block having its opposite edges longitudinally grooved, as at 60, to receive the rods, terminating at its lower end in a hook 61 and at its upper end in an eye 62. These hooks are inwardly disposed and receive studs 63, projecting from the opposite side edges of a horizontal movable bale-carriage 64, located between the four posts 57.

65 designates a windlass, which is mounted upon the table 21 and operates in this instance by a crank 66, designed to be turned by hand or otherwise operated. Opposite pairs of ropes 67 are secured to the windlass and wound in the same direction thereupon, the lower terminals of the ropes being connected each to an eye 62 of one of the sliding blocks 59 and the two ropes out of alignment with the windlass passing over suitable guide-pulleys 68, located at the end of the opening 22 in the floor 2. By means of the windlass just mentioned the bale-carriage 64 may be raised and lowered to and from the lapper.

On a level with the follower 7 of the baling-press there is secured to the posts 57 a pair of track-rails 69.

70 designates a bale-carriage-operating bar. (Clearly shown in Figs. 1 and 6.) This bar is adapted for reciprocation between the pairs of posts 57 and over suitable guide-cleats 71, connecting said posts. At the front end of the bar 70 there is secured a vertically-disposed engaging bracket or standard 72, and at one side of the bar, at its opposite end, there project eyes 73. The shaft 39, in addition to the pulleys heretofore mentioned, carries a pair of twin grooved pulleys 74. (Best shown in Fig. 6.)

75 designates a grooved pulley journaled at one side of the condenser 15, the shaft 76 of said pulley being provided with and adapted to be operated by hand through the medium of a crank 77. Over the pulley 75 passes an operating cord or cable 78, one terminal of which passes down and around one of the twin pulleys 74, and is then carried to the rear and made fast to the rear eye or staple 73. The opposite terminal passes down from the pulley 75 and around the remaining twin pulley and in a direction opposite to that traveled by the companion terminal, and is then fastened to the front eye or staple 73. By operating the crank 77 it will be obvious that the bar 70 will be reciprocated in a direction in accordance with the direction of movement of the crank. This cable is so slack as not to be moved or operated by the revolutions of the twin pulleys 74, said pulleys merely acting as guides for the cable.

This being the construction, the operation is as follows: The fiber is passed from the gin through the conveyer 16 and between the bat-forming reticulated rolls, and from thence through the conveyer 25 between the pressing-rolls 24, where the bat is subjected to an enormous pressure and passes from the rolls in a thin web or sheet, and from thence into the lapping-frame, which is being swung from side to side by means of the crank-shaft 36 and the connecting-rod 56. The web or bat passes between the curved bars 53 and out through the end of the lapper and is folded in successive layers upon the carriage 64, a layer being formed at each vibration or swing of the lapper. As the bale is formed by the successive layers, the windlass 65 is operated so that the carriage 64 is lowered until a sufficient quantity of cotton has been deposited upon the carriage to form the bale of the customary weight. When the desired amount of cotton has been thus folded upon the carriage, the same is lowered by means of the windlass 65 and its ropes until it rests upon the track-rails 69. The carriage is disconnected from the operating ropes and blocks 59 and left free to be moved longitudinally upon the rails by simply unwinding a portion of the ropes from the windlass 65 and permitting the blocks 59 to fall by gravity out of engagement with the lateral studs 63 on the carriage. The web or bat is severed at this juncture, and the crank 77 operates so as to advance the bar 70, which bar has heretofore remained stationary and inactive, and with its standard or bracket 72 vertically opposite and below an opening 79 formed in the rear end of the carriage, so that as the carriage descends the opening 79 receives the bracket. By the advancement of the bar 70 the carriage is slid along the tracks 69 and into the baling-chamber and upon the follower 7. A bar (shown in dotted lines) is now passed through a pair of transversely-opposite slots 80, formed in the side walls of the baling-press, and is therefore located in rear of the bale or mass of cotton. The crank 77 is now rotated in the reverse direction, so that the bar 70 is withdrawn. With the bar moves the carriage to its original position and in position to be re-engaged by the sliding blocks 59, which are elevated through the medium of their ropes, and with them the carriage, ready for a repetition of the operation just described. The function of the removable transverse bar mounted in the openings 80 will be obvious, in that it acts to retain the

bale within the baling-chamber and upon the follower while the carriage is in the act of being withdrawn.

The above completes the operation of forming a bale, so far as my invention relates, and it simply remains to throw the baling mechanism into operative position to actuate or raise the follower for the purpose not of compressing the cotton fiber, as such has heretofore been accomplished as much as is possible by a press, but simply to press and hold in a flat position the several layers composing the bale during the tying up or binding of the bale, and, furthermore, to flatten the folds so that the finished bale will be of a uniform thickness.

It will be obvious that the dimensions of the bale may be altered as desired by adjusting the connecting-rod 56, as heretofore indicated, and therefore increasing or decreasing the length of swing of the lapper. In this manner bales of predetermined sizes may be formed, whereby they are adapted for close and snug packing into a given storage-space—as, for instance, a car, which, as is well known, varies in dimensions.

No loose fiber escapes from the gin or condenser to strew the floor and endanger the mill by reason of fire. By experience I have found that the bales formed by my invention have their density increased and their size diminished two-thirds above and below that of the average bale.

It is apparent that a compression of the bat could be secured by substituting for one of the rolls 24 a metal bed and arranging a roll above the bed and adapted to travel thereover. Such, however, is not advantageous and does not compare favorably with the simple mechanism comprising the two compressing-rolls, and is simply suggested as one of the many ways in which the compression of the bat may be accomplished. The compressing-rolls are journaled in rigid unyielding boxes, so that the surfaces of the rolls normally have contact—in other words, except when in operation, at which time they are separated to the extent as caused by the passage thereinbetween of the thin compressed sheet of fiber. What yielding of the rolls actually takes place is from the metal.

A marked distinction between the operation of my machine and those heretofore patented lies in the fact that the fiber is progressively compressed a unit at a time, and subsequently accumulated in contradistinction to a compression of the entire mass at one operation, as heretofore practiced.

By the term "unit" I mean, practically speaking, a reduced unit—in other words, that narrow portion of cotton extending from end to end of the rolls and immediately between the rolls at that point thereof opposite what would be their actual point of contact were the fiber removed.

The expressions "compression" and "compressed cotton" as used in the present specification and claims refer to that extreme compression such as is effected by the so-called "compresses" of the present day, and which, falling just short of the crushing of the individual fibers, so solidifies or condenses the mass that the elastic or expansive tendency is for the time being suspended.

Having thus described my invention and its operation, what I claim is—

1. The combination of two compressing-rolls mounted in unyielding bearings and normally in contact, or practically so, feeding devices for the rolls, with a baling mechanism arranged to receive the compressed fiber from said rolls, and devices intermediate the rolls and baling mechanism for transferring the compressed sheet of fiber, substantially as specified.

2. In mechanism of the class described, the combination, with a pair of bat-compressing rolls, of a swinging lapping-frame arranged under the rolls, a vertically-movable receiver located under the lapper, and mechanism for rotating the rolls for swinging the frame and for lowering the receiver, substantially as specified.

3. In a mechanism of the class described, the combination, with a pair of compressing-rolls, of a swinging lapper-frame, mechanism for operating the rolls and lapper, and a pair of parallel vertically-hanging guides carried by the lapper, substantially as specified.

4. In a mechanism of the class described, a pivoted lapper, the same consisting of an upper frame adapted to be pivoted to a suitable support, and an opposite series of depending rods spaced apart, the series converging toward each other and forming a reduced delivery end, substantially as specified.

5. In a mechanism of the class described, a lapper comprising an oblong frame terminating in opposite perforated end ears, opposite series of depending rods spaced apart, said series converging to form a reduced delivery end, a frame encircling the series, the end bars of each series being provided with bearing-ears, transverse rods pivoted in ears, and opposite series of semicircular curved guide-bars projecting from the transverse bars into the lapper and having their lower extremities projecting from the lapper, said guide-bars alternating with the depending bars of the lapper and being connected outside of said latter bars by a transverse connecting-bar, substantially as specified.

6. In a mechanism of the class described, the combination, with a pair of compressing-rolls, means for operating the same, and a swinging lapper arranged under the rolls and means for operating the lapper, of a carriage located under said lapper and adapted for lateral movement, and a baling-press located in the path of the carriage, substantially as specified.

7. In a mechanism of the class described, the combination, with a pair of compressing-rolls, a swinging lapper arranged thereunder,

and mechanism for operating the two, of a vertically and longitudinally reciprocating bale-carriage, a baling-press located in the longitudinal path of the carriage, and mechanism for raising and lowering the carriage and reciprocating the same longitudinally, substantially as specified.

8. In a mechanism of the class described, the combination, with a pair of compressing-rolls, a lapper arranged thereunder, and mechanism for operating the two, of a frame-work arranged under the lapper, opposite pairs of vertical guides, guide-blocks mounted in the guides, a windlass arranged above the guides, opposite cables secured intermediate their ends to the windlass and at their ends to the blocks, a carriage adapted for connection with the blocks and to be raised and lowered by the cables, and means for liberating the carriage from the blocks when in their lowered position, substantially as specified.

9. In a mechanism of the class described, the combination, with a pair of compressing-rolls, a swinging lapper, and means for operating the two, of a frame-work arranged below the lapper, tracks mounted thereon, a baling-press having its baling-chamber located at the ends of the tracks, opposite vertical guides extending above and below the tracks, reciprocating blocks provided with hooks mounted in the guides, a windlass located above the blocks, opposite ropes or cables connected intermediate their ends to the windlass and having their terminals connected with the blocks, a carriage provided with opposite studs for engaging the hooks of the blocks, and adapted to be supported thereby and lowered upon the track, and means for reciprocating said carriage into the baling-press, substantially as specified.

10. In a mechanism of the class described, the combination, with a frame-work having a track, a bed mounted for vertical movement in the frame-work and adapted for reciprocation on the track, and a baling-press located at one end of the track, of a reciprocating bar located under the frame-work and adapted for removable connection with the carriage when the latter is in its lowered position upon the track, and mechanism for reciprocating said bar so as to advance the carriage along the track into the baling-press and withdraw the same from said press, substantially as specified.

11. In a mechanism of the class described, the combination, with the frame-work provided with opposite track-rails, the baling-press located at the end of the track, and the carriage mounted for longitudinal movement on the track, of a transverse shaft having a twin pulley, a crank-shaft arranged at one side thereof and having a single pulley, a reciprocating bar mounted above the transverse shaft and adapted for connection with the carriage, and a cable or rope mounted over the single pulley and having its terminals passed in opposite directions each around one of the twin pulleys and connected to opposite ends of the bar, substantially as specified.

12. In a mechanism of the class described, the combination, with a supporting-table having an opening, opposite standards arranged at each end of the opening, a pair of rolls mounted in the standards above the opening, and a lapper pivoted below the opening, of a pulley mounted on the shaft of one of the rollers, a transverse shaft having a pulley, a belt connecting the two, a pulley mounted on the shaft of the roll, a crank-shaft located at one side of the roll, a pulley mounted on said shaft, and a belt connecting the lapper with the crank of the crank-shaft, substantially as specified.

13. The combination, with a condenser, a pair of compressing-rolls arranged at one side thereof, a conveyer leading from the condenser to said rolls, a vibrating lapper suspended under the rolls, a vertically and longitudinally reciprocating carriage mounted under the lapper, and a bale-press located at one side of the carriage, of mechanism for operating the condenser, rolls and lapper for raising and lowering the carriage and for reciprocating the same, substantially as specified.

14. The combination, with a swinging lapping-frame, of an automatic guide consisting of a pair of sections pivoted to the opposite sides of the folding frame and adapted to swing in unison with each other, as and for the purpose set forth.

15. The combination, with a swinging folding frame having its sides composed of a series of vertical separated bars or rods, of a guide consisting of two sections pivotally connected at their upper ends to the opposite slotted sides of the folding frame, each of said sections consisting of curved bars working in the spaces between the slots of the said frame, as and for the purpose described.

16. In mechanism of the class described, the combination, with a pair of rigidly-mounted bat-compressing rollers and a cotton-receiver thereunder, of a pivoted swinging lapping mechanism supported for movement between the rolls and receiver, and means for operating the rolls and operating the lapper, substantially as specified.

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

HENRY REMBERT.

Witnesses:
J. G. GOLDTHWAITE,
W. S. DUVALL.