

(No Model.)

4 Sheets—Sheet 1.

J. G. GOLDTHWAITE.
APPARATUS FOR BALING COTTON.

No. 467,860.

Patented Jan. 26, 1892.

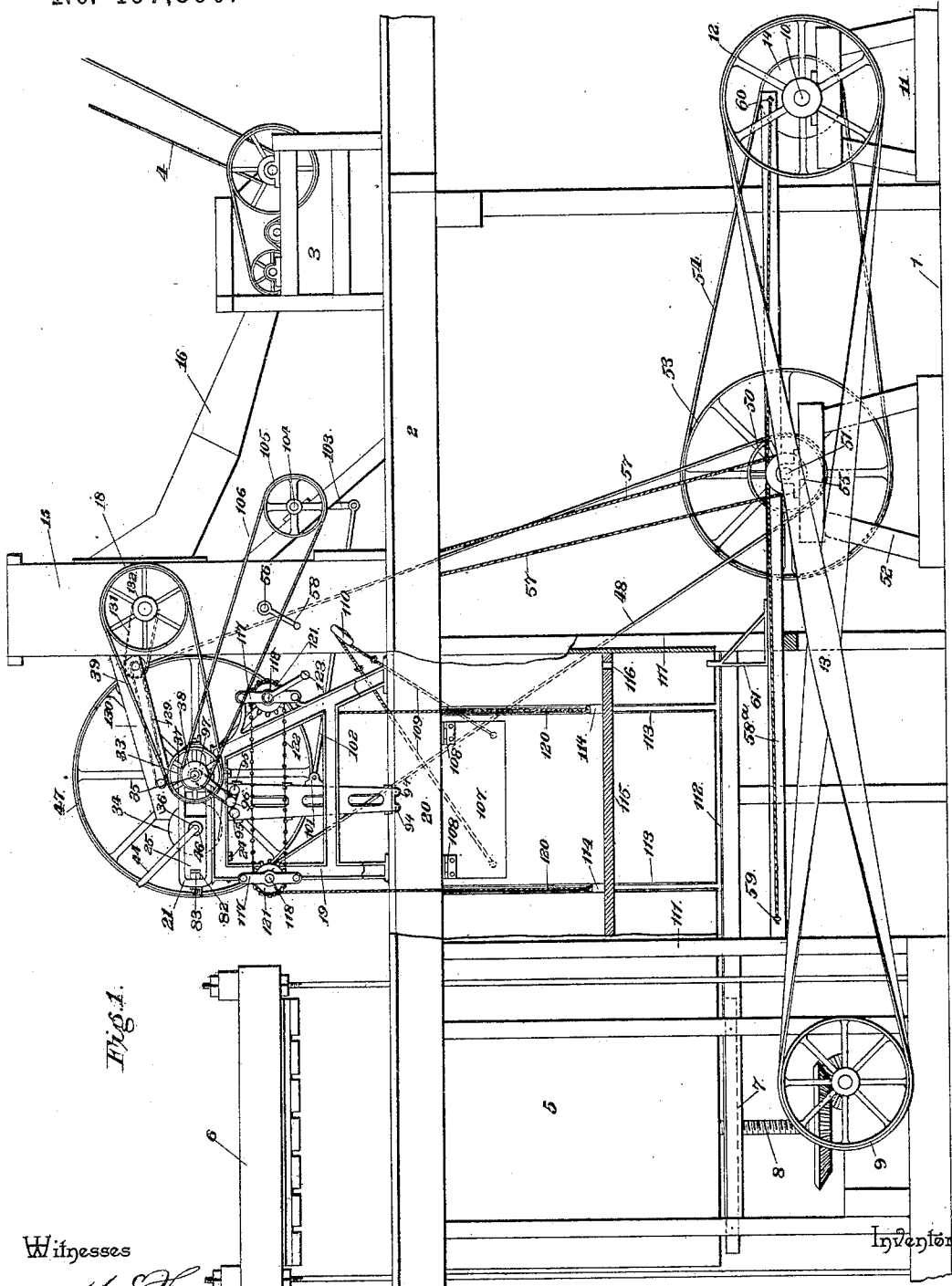


Fig. 1.

Witnesses

M. Fowler
W. S. Duval

By his Attorneys,

Jos. G. Goldthwaite

C. A. Snow & Co.

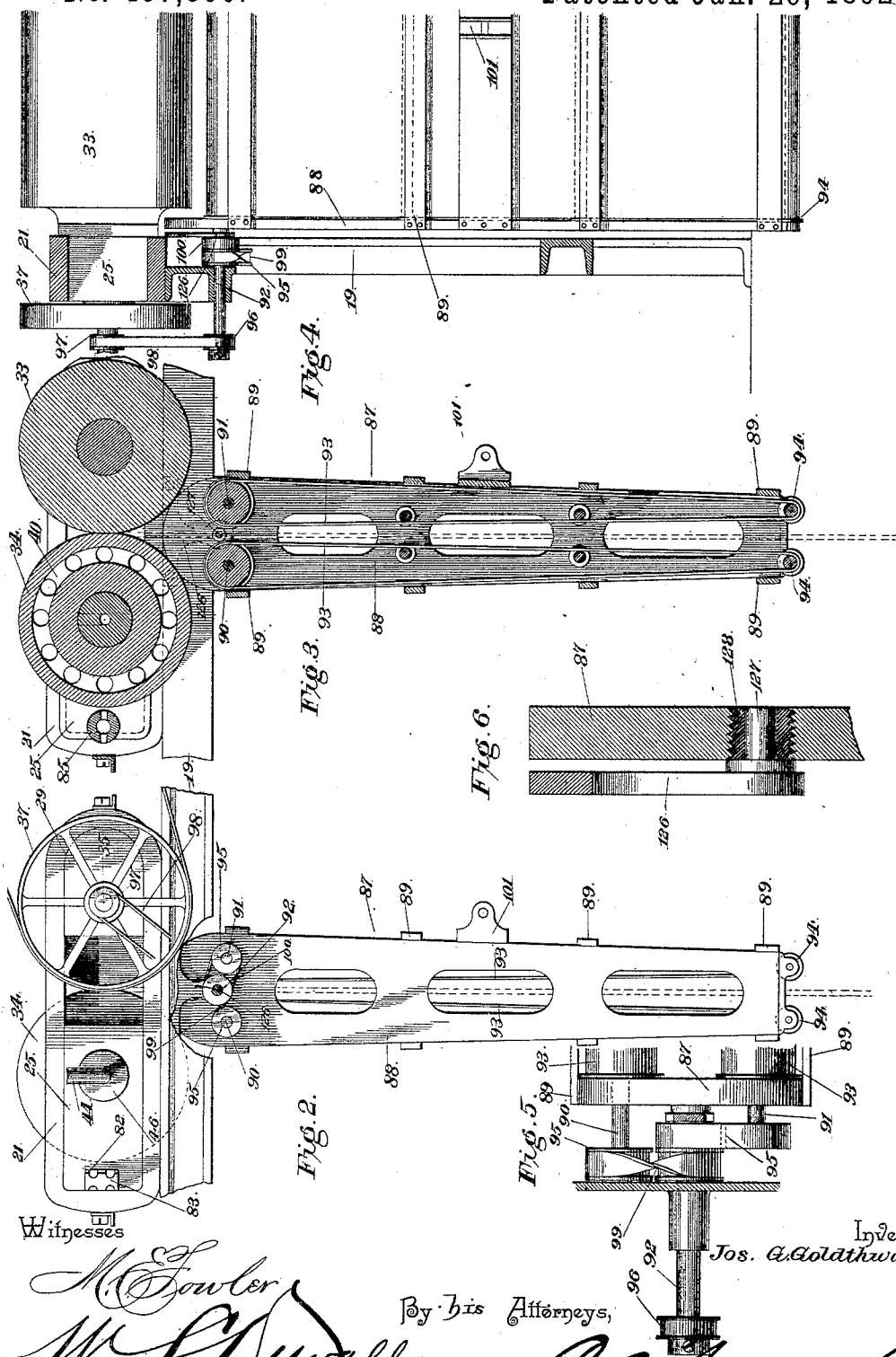
(No Model.)

4 Sheets—Sheet 2.

J. G. GOLDTHWAITE.
APPARATUS FOR BALING COTTON.

No. 467,860.

Patented Jan. 26, 1892.



Witnesses

M. Fowler
W. S. Duggall

By his Attorneys,

C. A. Snow & Co.

Inventor
Jos. A. Goldthwaite

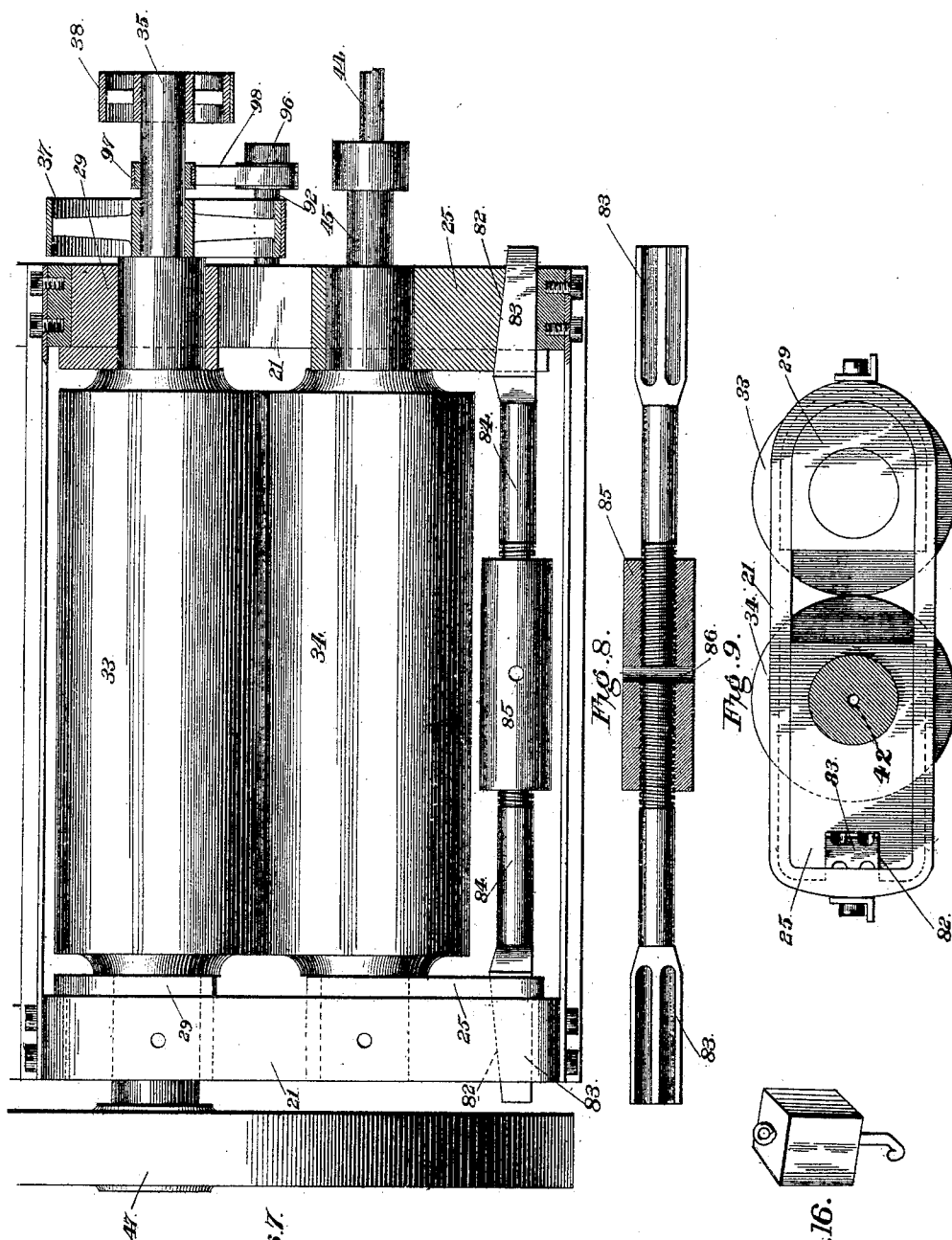
(No Model.)

4 Sheets—Sheet 3.

J. G. GOLDTHWAITE.
APPARATUS FOR BALING COTTON.

No. 467,860.

Patented Jan. 26, 1892.



Witnesses

M. Fowler

W. S. Duwall

Fig. 1.

By his Attorneys,

Cash & Co.

Inventor

Jos. A. Goldthwaite

Fig. 16.

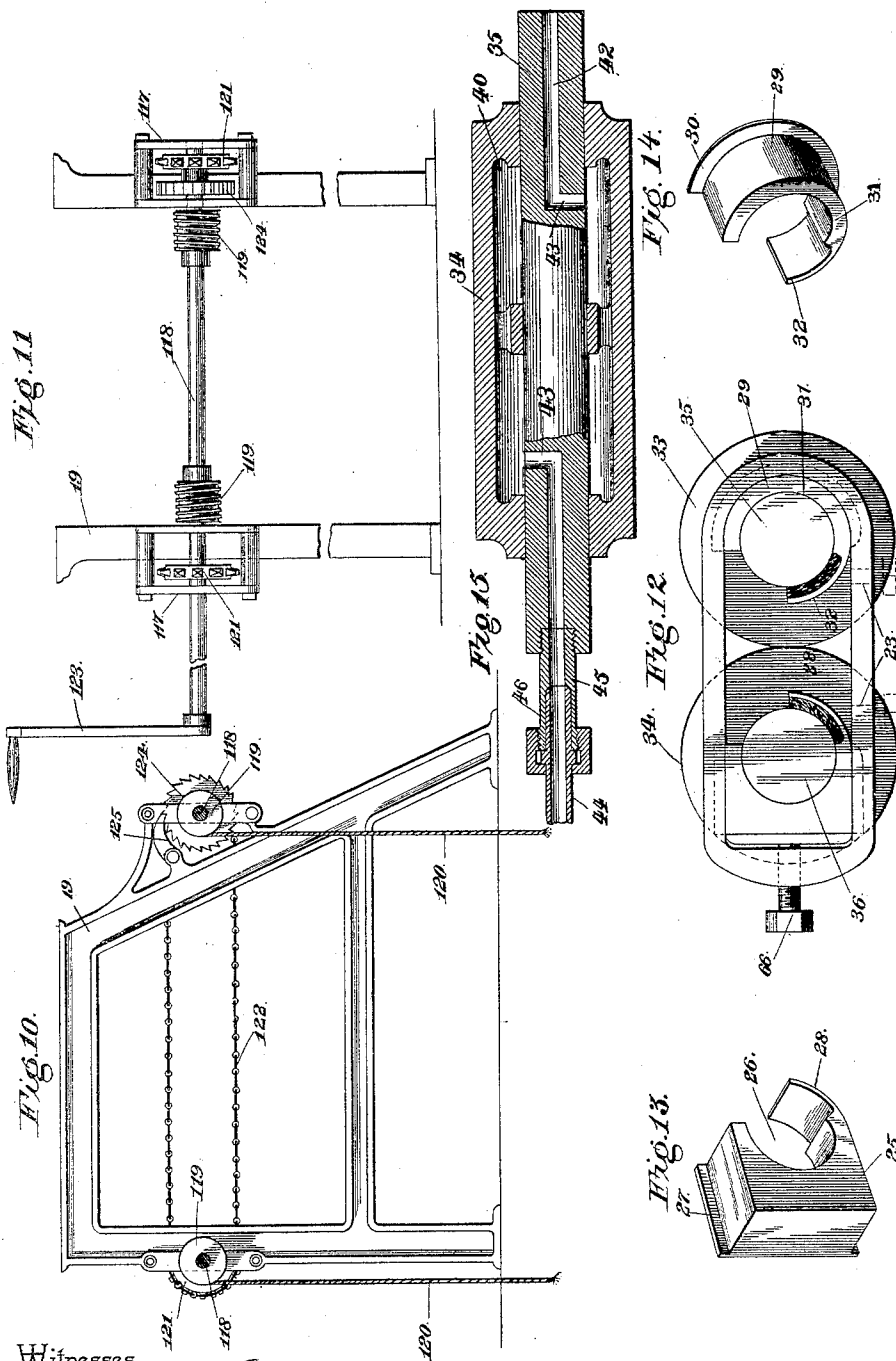
(No Model.)

4 Sheets—Sheet 4.

J. G. GOLDTHWAITE.
APPARATUS FOR BALING COTTON.

No. 467,860.

Patented Jan. 26, 1892.



Witnesses

M. C. Fowler
W. S. Duwall

By his Attorneys,

C. A. Snow & Co.

Inventor

Jos. G. Goldthwaite

UNITED STATES PATENT OFFICE.

JOSEPH G. GOLDTHWAITE, OF GALVESTON, TEXAS, ASSIGNOR TO THE
REMBERT ROLLER COMPRESS COMPANY, OF SAME PLACE.

APPARATUS FOR BALING COTTON.

SPECIFICATION forming part of Letters Patent No. 467,860, dated January 26, 1892.

Application filed November 5, 1890. Serial No. 370,405. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH G. GOLDTHWAITE, a citizen of the United States, residing at Galveston, in the county of Galveston 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 an apparatus for compressing cotton, and has particular reference to improvements upon the construction of that apparatus disclosed by United States Patent No. 446,888, granted the 24th day of February, 1891.

Among the objects of my invention are to facilitate a compression of the cotton fiber between the compressing-rolls or other compressing mediums, or, in other words, to render the fibers softer and more susceptible to the action of the compressing mediums; to provide means for automatically feeding and advancing the free end of the condensed sheet if in case through accident said sheet should become broken or clogged; to provide improved means for lowering and raising the bale-carriage as the same becomes filled or after discharging a bale; to provide means for temporarily supporting the bale at the beginning of its formation and during the time the carriage is in the act of transporting a previously-formed bale to the baling-press and during the return and elevation of the carriage, and, finally, to provide means of simple and economical construction for positively, firmly, and evenly binding the rolls in contact.

With the above objects in view the invention consists in certain features of construction hereinafter specified, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation and partial vertical longitudinal section of a baling apparatus embodying my improvements. Fig. 2 is a side elevation in detail of the lapper. Fig. 3 is a vertical transverse section of the same. Fig. 4 is a vertical longitudinal section thereof. Fig. 5 is a detail in top plan of the upper end of the lapper. Fig. 6 is a detail in vertical section of the upper end and one side of the lapper. Fig. 7 is a detail in plan of the compressing-rolls and means for adjusting the same. Fig. 8 is a detail in side elevation of the wedges

for binding the rolls. Fig. 9 is a side elevation of the rolls bound in position in accordance with the devices shown in Figs. 7 and 8. Fig. 10 is a detail in side elevation of the roll-supporting frame embodying my improved mechanism for raising and lowering the bale-carriage. Fig. 11 is a front elevation of the same. Fig. 12 is a detail in side elevation of an improved frame or stirrup for supporting the journal-boxes of the rolls. Fig. 13 is a detail in perspective of the journal-box designed to be employed at one end of the stirrup, and Fig. 14 is a similar view of that box adapted to be employed at the opposite end thereof. Fig. 15 is a detail in longitudinal section of the heating compressing-roll. Fig. 16 is a detail of the block 114. Fig. 17 is a detail in perspective of one of the sliding blocks.

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

1 designates the floor of the ginning house or mill, above which is the usual platform or second floor 2.

3 designates the cotton-gin, which is of the usual construction and is operated by a belt 4, leading from any suitable motor.

At a proper distance from the gin is located the baling-press 6, the baling-chamber of which is in this instance some distance below the level of the gin. Any form of baling-press adapted for the purpose may be substituted for the one herein shown and to be described, and in the present instance the same consists of the follower 7, the baling-chamber 5, and the screw 8, which latter, it will be understood, is operated through the medium of the pulley 9.

10 designates a counter-shaft journaled in suitable supporting-standards 11 and carrying a pulley 12, connected with and adapted to operate the pulley 9 through the medium of a crossed belt 13. The counter-shaft is operated, preferably, by the same motor as the gin and in addition to the pulley 12 carries a small pulley 14.

15 designates the condenser, located in front of the gin 3 and between it and the baling-press and connected to the former by a conveyor 16, designed to deliver the fiber into the condenser, where said fiber is formed into

a soft mass. The condenser comprises the usual condensing-rolls, one of which has its shaft extended beyond the wall of the condenser and is there provided with a pulley 18, which drives the roll and is in turn driven by a belt to be hereinafter mentioned.

19 designates a frame-work or table located adjacent to the condenser, and in this instance in rear of the same and directly over an opening 20 formed in the floor 2. The table or frame-work 19 has bolted at opposite sides and upon the same a pair of opposite frames, or what I shall herein term "stirrups," 21. These stirrups are metal bands or oblong frames, preferably curved at one end and approximately flat or square at the opposite end, and are formed of suitable dimensions and metal to adapt them to withstand the severe strain to which they are subjected. The under sides of the stirrups are provided with bolt-openings 23, which receive a series of bolts 24 passed therein and through the frame-work or table 19.

25 designates a journal-box, a pair of which is mounted in the rear or square ends of the stirrups. These boxes (see Fig. 19) are of rectangular shape to fit loosely within the stirrups, have a rear flat surface, a front semi-cylindrical concaved or half bearing 26, and at their inner sides are provided with flanges 27, the latter taking against the inner sides or edges of the stirrups. The lower edges or walls of the boxes have their half-bearings continued for a short distance in the form of a curved flange 28, which flange is offset from the surface of the bearing, as shown.

29 designates the companion journal-boxes, (see Fig. 20,) which are for the most part cylindrical, so as to fit in the front ends of the stirrups and are provided with the retaining-flange 30, the half-bearing 31 and the offset-flange 32 corresponding to those parts in the construction of box shown in Fig. 19.

33 and 34 respectively designate the front and rear compressing-rolls, the journal 35 of the front roll taking bearing in the journal-box 29 and the journal 36 of the rear roll taking bearing in the rear boxes 25. The journal of the front roll 33 is extended beyond its box or bearing, and is there provided with a pair of pulleys designated as 37 and 38, the former being connected to and driving the pulley 18 of the condenser by a belt 39. The roll 33 is preferably solid, while the roll 34 is hollow or provided with a steam-chamber 40, the shell of the roll being of sufficient thickness to prevent fracture by reason of the pressure to which it is subjected. The shaft 35 of said roll is provided near its opposite end with a steam inlet or passage 41 and a steam outlet or passage 42, the inner ends of the passages having ports 43, which communicate with the interior of the roll 34. To the inlet-passage 41 is connected a steam supply pipe 44, the inner end of which is coupled to a nipple 45, extending from the passage by means of a coupling 46. It will be observed

that although I herein show means for and preferably heat but one roll, yet, if desired, both rolls may be thus heated. The shaft of the roll 33 is also extended at the opposite side of its bearing, and is there provided with a large pulley 47, which operates the shaft of said roll, and said roll through frictional contact operates the roll 34. The pulley 47 may be operated by any suitable system of belting leading to the motor, and in the present instance is revolved through the medium of a belt 48, driven by a pulley 50, located upon a horizontal shaft 51, journaled upon a suitable base 52. The shaft also carries a large pulley 53, connected by a belt 54 with the pulley 14 of the counter-shaft 10, and near its center a small twin pulley 55. Near the lower end of the condenser there is journaled in the side walls thereof a shaft 56, around which is wound one or more times a rope 57, said shaft also being provided with a crank 58. The terminals of the ropes are each passed in opposite directions around one of the twin pulleys 55, and at their ends one is connected to the front end of a reciprocating carriage-operating bar 58, as at 59, while its opposite end is secured, as at 60, to the rear end of said bar. By operating the crank 58 it will be observed that the bar may be reciprocated back and forth. Slightly in rear of the front end of the bar is located a bracket 61 for a purpose hereinafter apparent.

In the mounting of the rolls in position it is essential that some means be provided not only for supporting the rolls unyieldingly in the stirrups, but also for adjusting said rolls to and from each other, so as to bind the same together and create between them a proper binding-pressure. This pressure requires to be varied, I have found by experience, in accordance with the state of the atmosphere and other governing circumstances in order to secure a proper condensing of the fiber and yet avoid pulverization of the same. I have therefore devised a highly-practical construction by which adjustment of the rolls located in my stirrups may be accomplished, which I will now proceed to describe.

Referring to Figs. 7, 8, and 9, it will be observed that I provide the front edges or faces of the front pair of boxes with rectangular openings 82, and in said openings terminate the wedge-shaped ends 83 of a pair of transversely-disposed rods or bars 84, the inner ends of which are threaded, the threads of one bar being disposed contrary to those of the other, and the two inner ends of the bars being connected by a turn-buckle 85, provided with internal right and left hand threads and at intervals with perforations 86 to receive a lever whereby the buckle may be rotated and the wedges spread to bind the rolls or drawn inwardly to relax the rolls.

It will be seen that various devices may be employed for binding or adjusting the rolls within the stirrups.

Referring more particularly to Figs. 2 to 6, inclusive, 87 designates a lapper for the purpose of lapping or folding the compressed sheet of cotton as it emerges from between the rolls. This lapper comprises opposite end walls 88, connected at intervals by suitable connecting-bars 89. In the upper ends of the opposite end walls of the lapper are journaled shafts 90 and 91 transversely opposite each other and between the said shafts a shaft 92. The shafts 90 and 91 support a pair of opposite endless belts or aprons 93, the lower ends of which pass over rolls 94 at the lower end of the lapper, the upper ends of said belts passing over rolls 95, mounted upon said shafts 90 and 91. The belts 93 are tightly laced and are moved in unison in the direction of the movement of the sheet of compressed cotton by a means hereinafter described. Upon the outer end of the shaft 92 is mounted a pulley 96, which is belted to the pulley 97 upon the shaft of the front compressing-roll 33 by means of a belt 98. The pulley 97 is of such relative size with regard to the pulley 96 that the two pulleys move at the same rate of speed. The shaft 90 is provided with a pulley 95, as heretofore mentioned, and is by means of a crossed belt 99 connected to the shaft 92. The opposite shaft 91 is likewise provided with a pulley 95, and is connected to the shaft 92 by means of a straight belt 100. It will thus be seen that motion from the roll 33 is transferred by the described belting to the endless aprons 93.

Heretofore in practice it is found that the thin sheet of cotton issuing from between the rolls sometimes becomes broken and fails to flow from the lapper, and, if not restarted by hand or otherwise, clogs the lapper. To restart the sheet necessitates the insertion of the hand into the lapper for the purpose of withdrawing the leading end of the sheet. By the employment of the constantly-moving belts the sheet is fed and supported at the same time, so that I not only avoid to a great extent the liability of the web parting, but in case it should part the sheet is fed automatically and the necessity of any interference upon the part of the operator is unnecessary.

101 designates the perforated lug, which is secured to one side of the lapper, and in the perforation of which is loosely connected one end of a pitman 102, the opposite end being loosely pivoted to a crank 103 of a shaft 104, upon which is mounted the pulley 105, operated by a belt 106, leading to the pulley 38 of the roll-shaft 35.

107 designates a pair of opposite doors hinged at their outer edges, as at 108, to the opposite sides of the opening 20 in the floor 2. Cords 109 (see dotted lines, Fig. 1) lead from the inner or free ends of the doors to a suitable cleat 110, secured to the wall of the condenser, and may be employed for elevating the doors and supporting the same in

such position whereby they partially close the opening 20 in the floor 2 and serve, as will hereinafter appear, as a temporary support for the sheet of cotton as the same is lapped. At opposite sides of the opening 20 are located pairs of vertical uprights 111, which are connected and braced in any suitable manner and support a track 112 in line with and leading to the follower 7 of the baling-press when said follower is in a lowered position, and between said tracks the push-bar 58^a reciprocates.

113 designates an opposite pair of vertical guides, and in each of the same is mounted for vertical movement a sliding block 114, and each of the blocks is provided at its lower ends with a hook 114^a, adapted at its lower end to removably engage the edge of a bale carriage or table 115, which latter is provided near one end with an opening 116, adapted when the carriage is lowered to take over the upper end of the bracket 61 of the push-bar.

In suitable bearings 117, located at the front and rear ends of the frame-work 19 of the compressing-roll supporting-table, is journaled a pair of transverse winding-shafts 118. (Best shown in Figs. 1, 16, and 17.) Each shaft is provided with a pair of spirally-grooved drums 119, to which are secured ropes 120, the lower ends of which are secured to the sliding blocks. The two shafts 119 each carry a pair of sprocket-wheels 121, the sprockets of one shaft being connected to those of the other shaft by means of sprocket-chains 122. The front shaft 118 also carries an operating-crank 123, and in addition a ratchet-wheel 124, adapted to be locked against accidental retrograde movement by means of a gravity-pawl 125.

126 designates a pair of hangers securely bolted to the opposite inner sides of the frame-work or table 19 below the rolls. Each of these hangers is provided with a bearing-pin 127, inwardly disposed, said pins entering and forming a bearing for metal bushings 128, located in perforations formed in the opposite end walls of the lapper near the top of the same.

In operation the flanges 28 and 32 of the bearing-blocks combine with the journals or shafts of the compressing-rolls to form pockets, and in the same is packed a suitable absorbent stuffing adapted to be soaked in a lubricant, and thereby form a means for lubricating the said journals at their bearing-points.

Referring more particularly to Fig. 1, the following brief description of the operation may be given: The cotton is ginned in the gin 3, is conducted by the conveyer 16 to the condenser 15, where it is converted into a soft mass, and is fed gradually, yet positively, to the compressing-rolls by means of an endless apron 129, forming the bottom of the conveyer 130, said apron being operated by an endless belt 131, running over a pulley 132 upon the shaft of one of the condensing-rolls. The

mass of cotton as it approaches the actual point of compression between the rolls and during such compression is softened by the heat transmitted from the heated roll 34.

5 The fibers of cotton by the action of the heat have their expansibility temporarily suspended and are therefore the more susceptible to the action of the compressing-rolls 33 and 34. As the cotton is progressively compressed into a thin condensed sheet, the same is by the swinging movements of the lapper

10 evenly lapped or folded upon the carriage 115, which is gradually lowered as the bale is built, and when a sufficient quantity of cotton has been deposited upon the carriage the sheet is severed, and by operating the crank 58 the carriage-operating bar is reciprocated so as to move the carriage into the baling-chamber, after which it is withdrawn and the

20 follower of the press operated so as to press the bale thus formed, expel the air from between its layers or laminae, and maintain the bale in the compressed state during the tying up of the bale.

25 In order to avoid any stopping of the machinery during the time the bale is being transported to the baling-press, I provide the pair of doors 107, which after the sheet is cut are drawn to a horizontal position and there supported by means of the ropes 110, so that the first few laps made by the lapper are received by or deposited upon said doors, which

30 constitute a temporary platform for this purpose. After the carriage 115 has been returned from the baling-chamber to its position under the lapper and elevated by the described means the ropes 109 are released at their upper ends and slackened, so that the doors are permitted to fall by gravity and

35 assume a vertical position, and the cotton is dropped upon the carriage 115.

Having described my invention, what I claim is—

1. In a baling-press, the combination of a pair of rigidly-mounted compressing-rolls running in contact, one of which is hollow, and means for heating one of said rolls, substantially as specified.

2. In a baling-press, the combination, with the compressing-rolls, the journal in one of which is extended and provided with a pulley, of a lapper pivoted below the roll, a shaft centrally journaled in the upper end of the lapper and provided with a pulley, a belt connecting the same with the pulley of the roll-shaft, vertically-opposite pairs of rolls mounted in the lapper, the shaft of the upper roll

of each pair being extended beyond the lapper at one side and provided with pulleys, a cross-belt connecting one of the pulleys with the central shaft of the lapper, a straight belt connecting the other pulley to the central shaft, and opposite endless aprons connecting the vertically-opposite pairs of rolls of the lapper, substantially as specified.

3. In a baling-press, the combination, with the roll-supporting table, the opposite pairs of vertical guides, the blocks mounted for movement therein, and the carriage adapted to be engaged by the blocks, of the opposite horizontal winding-shafts journaled in the roll-supporting frame-work and provided with pairs of drums and sprockets, a crank located upon one of the shafts, chains connecting the sprockets, and ropes leading from the drums and connected to the blocks, substantially as specified.

4. In a baling-press, the second floor having the opening, the compressing mechanism located thereabove, lapping mechanism located thereunder and above the opening, and a vertically and laterally reciprocating carriage mounted below the opening, in combination with a pair of doors hinged to the opposite sides of the openings at their outer ends and means for raising the doors and forming a temporary platform for the reception of the cotton, substantially as specified.

5. In a baling-press, the second floor having the opening, the compressing mechanism located thereabove, and a vertically and laterally reciprocating carriage mounted below the opening, in combination with a pair of doors hinged to the opposite sides of the openings at their outer ends and ropes connected to the inner ends of the doors and adapted to raise the same and to be connected at their upper ends to a suitable device, substantially as specified.

6. The herein-described improved baling-press, the same comprising a condenser, a pair of rotatable compressing-rolls, devices for binding the same in contact, means for heating one of the rolls, and a conveyer leading from the condenser to a point between the rolls, substantially as specified.

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

JOSEPH G. GOLDTHWAITE.

Witnesses:

W. F. DUVALL,
J. H. SIGGERS.