

(No Model.)

2 Sheets—Sheet 1.

J. G. GOLDTHWAITE.
METHOD OF BALING COTTON.

No. 460,747.

Patented Oct. 6, 1891.

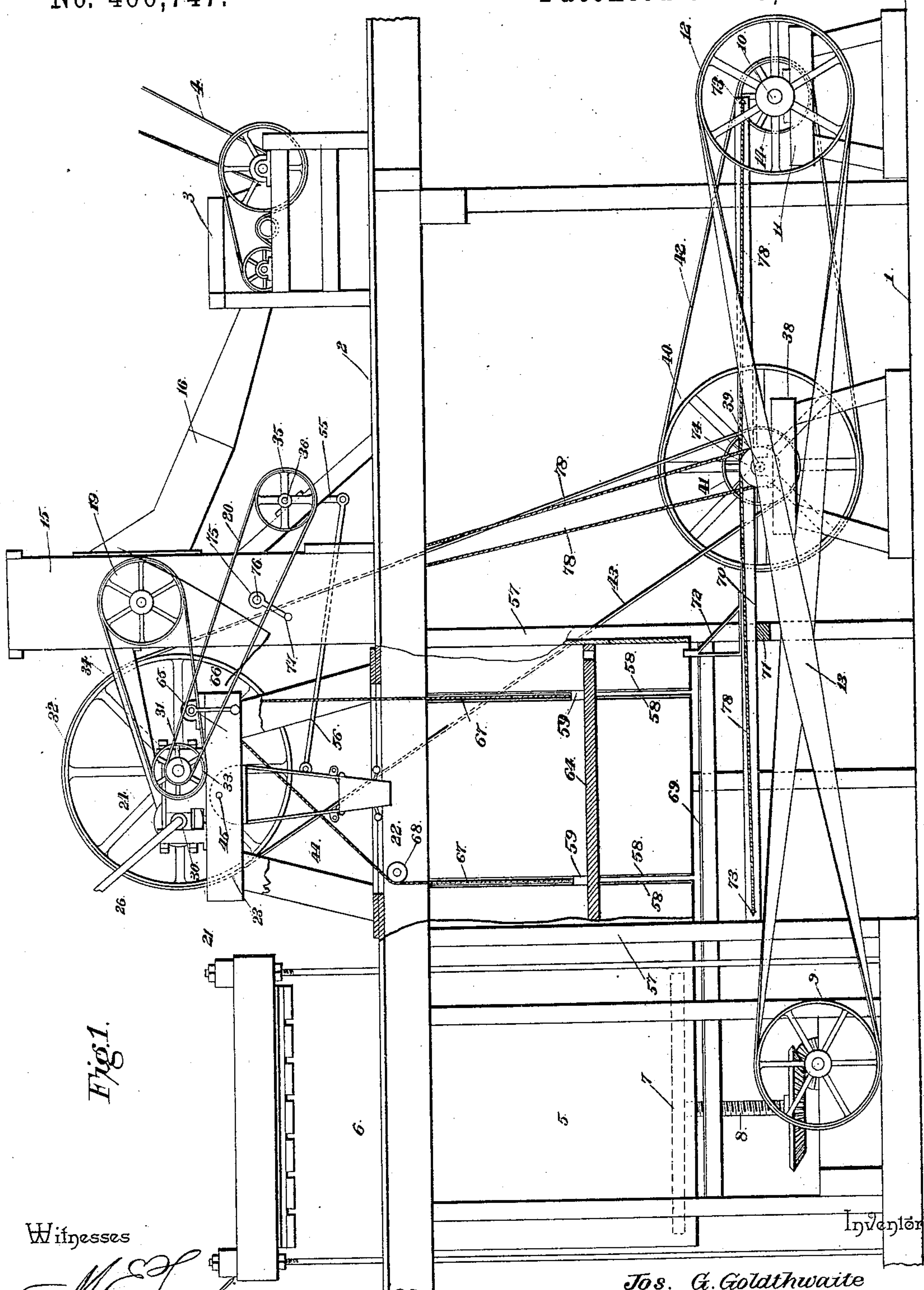


Fig. 1.

Witnesses

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By his Attorneys,

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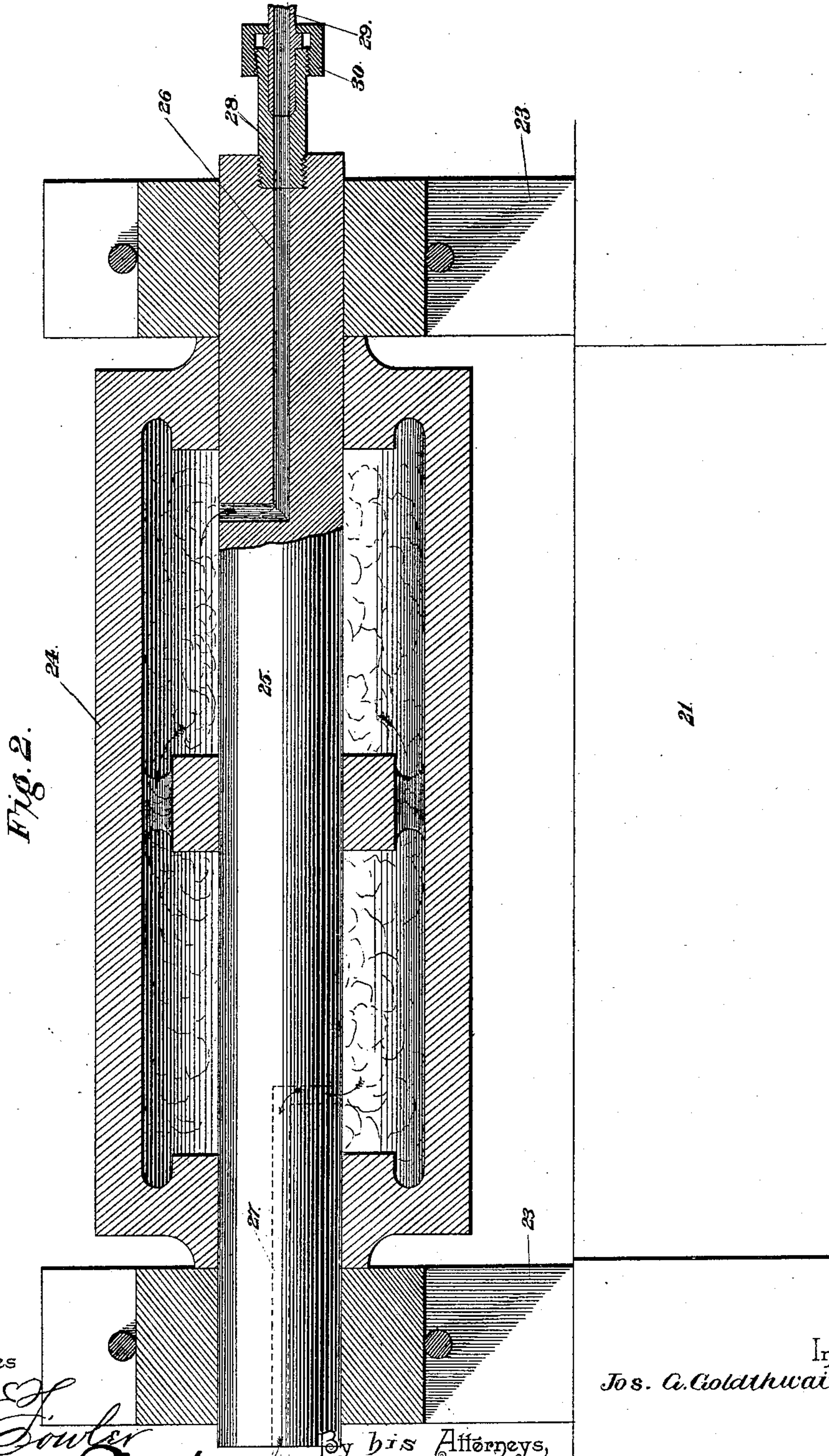
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UNITED STATES PATENT OFFICE.

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

METHOD OF BALING COTTON.

SPECIFICATION forming part of Letters Patent No. 460,747, dated October 6, 1891.

Application filed November 5, 1890. Serial No. 370,404. (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 Method of Baling Cotton, of which the following is a specification.

This invention has relation to a method for baling cotton, and has particular reference to an improvement in such method thereof as is set forth and claimed in the United States Patent No. 441,022, granted on the 18th day of November, 1890. In the method above referred to as covered by said patent the cotton is taken direct from the gin, condensed, compressed progressively into a thin sheet of suitable density, and baled, the bale being formed previous to the expansion of the fiber. By practical experience I have found that the fiber contains more or less moisture. Such moisture gives to the cotton more or less expansibility, in accordance with the amount present. I have discovered that by the application to the fiber of a moderate degree of heat the expansibility of the fiber is temporarily suspended and the fibers individually and collectively are rendered more soft and compressible than when not heated; also, that when thus heated and compressed there is less tendency upon the part of the fiber to early expansion and a resuming of its former shape than without the application of heat. It is known that cotton fiber is a stem covered with minute spears. When thus treated by heat the stems and the spears of the fiber are softened and their expansibility suspended and more readily compressed or flattened.

The object, therefore, of my method is to facilitate the compression of the cotton fiber by the method set forth in the patent above referred to, whereby not only is the compression more easily effected, but the cotton may be maintained in such compressed state for a longer period after such compression than heretofore.

The invention consists, therefore, in the step or method of heating the cotton previous to or at the time of compressing the same.

In the accompanying drawings, Figure 1 is a partial side elevation and section of one of

the many forms of apparatus that may be employed for practicing my method. Fig. 2 is a detail hereinafter more particularly referred to.

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

1 designates the floor of a ginning house or mill, above which is the usual platform or second floor 2. 3 designates the cotton-gin, which is of the construction in ordinary use, and is operated by a belt 4, leading from any suitable motor. At some distance from the gin is located the baling-press 6, the baling-chamber of which is, in this instance, some distance below the gin. I have herein shown an ordinary screw-press of the usual pattern, the same comprising the follower 7, the baling-chamber 5, and the screw 8, which screw, it will be understood, is operated through the medium of the pulley 9. In lieu of this press other styles of baling-presses may be substituted.

10 designates a counter-shaft journaled in a suitable supporting-standard 11, said shaft carrying a pulley 12, which is connected with and operates the pulley 9 through the medium of a cross-belt 13. The counter-shaft is operated by the same motor as the gin, and carries, in addition to the pulley 12, a small pulley 14 for a purpose hereinafter apparent.

The condenser 15 is located in front of the gin 3 and between it and the baling-press, and is connected to the gin by a conveyer 16, designed to deliver the fiber into the condenser, wherein it is formed into a soft mass. The condenser comprises the usual condensing-rolls, and the shaft of one of the same is extended beyond the wall of the condenser and there provided with a pulley 19, which serves to drive said roll and is in turn driven through the medium of the belt hereinafter mentioned.

A frame-work or table 21 is located in front of the condenser and between the same and the baling-press, and below the frame-work the floor 2 is provided with an opening 22. A pair of standards 23, having journal-boxes rigidly mounted therein, are securely connected to the opposite sides of the frame-work, and in said boxes are mounted for rotation the shafts of a pair of compressing-

rolls 24. These rolls, it will be observed, are mounted and normally have frictional contact throughout their lengths, and are maintained by any suitable binding devices under great binding-pressure. The shaft of one of the rolls 24 extends outside of its bearing, and is there provided with a small pulley 31, a large pulley 32, and an intermediately located and sized pulley 33. The intermediate pulley 33 is connected with the pulley 19 of the condenser through the medium of a belt 34. The small pulley 31 is connected to a pulley 35, mounted on the shaft 36 in rear of the condenser through the medium of a belt 20.

38 designates a suitable pair of standards, located upon the ground floor 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, respectively. The former pulley is by a belt 42 connected to the pulley 14 of the shaft 10, receives motion from said shaft, and transmits it to the shaft 39. The smaller pulley 41 of the shaft 39 receives motion from said shaft, and through the medium of the belt 43 transmits motion to the large pulley 32, that operates the compressing-rolls.

The shaft 25 of one of the compressing-rolls 24 is at its opposite ends provided with elbow or L shaped steam inlet and exhaust passages designated as 26 and 27, respectively, the inner ends of the passages communicating with the said roll 24, which latter in this instance is hollow but of sufficient thickness to lend proper strength and rigidity. The outer end of the inlet-opening 26 has threaded therein a nipple 28, which is connected to one end of a steam inlet or supply pipe by means of a suitable coupling 30.

44 designates a lapper-frame and the same is pivoted at its opposite upper ends to the opposite inner sides of the frame-work or table directly under the rolls 24 by means of pivot-bolts 45. The lapper is of such length as to hang suspended through the opening 22 in the floor 2, and is preferably provided with a proper support for automatically supporting the cotton after condensation and as the same is fed from the rolls. From the shaft 36 at the rear of the condenser extends a crank-arm 55, which by a connecting-rod 56 is pivotally connected with the loosely-suspended lapper 44.

Below the opening 22 in the floor 2 and at each side of the same is a pair of posts 57, the pairs being connected by suitable cross-bars for strengthening the same. Guide rods or bars 58 are located in pairs between the posts 57. Upon each is mounted for vertical movement a sliding block 59, adapted at its lower end to connect with a bale-carriage 64, located under the opening 22 of the floor and between the four posts.

65 designates a windlass mounted upon the table 21 and adapted to be operated in this instance by a crank 66, to be turned by hand

or otherwise, if desired. Opposite pairs of ropes 67 are secured to the windlass intermediate their ends and wound in the same direction thereupon, each terminal of each rope being connected to one of the sliding blocks, and those two terminals of said ropes which are out of vertical alignment with the windlass are passed over suitable guide-pulleys 68, located at the end of the opening 22. 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 and leading to said follower a pair of track-rails 69, upon which the bale-carriage, as hereinafter described, is adapted to move from a point below the lapper to and within the baling-chamber.

70 designates a bale-carriage operating-bar designed for reciprocation between the pairs of posts and to ride over guide-cleats 71 connecting said posts. At its front end the bar 70 is provided with a vertically-disposed bracket or standard 72, and at one side of the bar are located eyes 73, which latter are also located at the opposite ends of the bar. The shaft 39, in addition to the pulleys heretofore mentioned, carries a pair of twin grooved pulleys 74.

75 designates a grooved pulley journaled at one side of the condenser 15, the shaft 76 of said pulley being provided with a crank 77, adapted to be operated by hand or otherwise. Over the pulley 75 passes an operating cord or cable 78, one terminal of which passes down and around one of the twin pulleys, thence to the rear, and is made fast to the rear eye or staple 73. The opposite terminal passes down from the pulleys 75 around the remaining twin pulley and in a direction opposite that traversed by the companion terminal and has its end made fast 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 agreeing with that of the movement of the crank. The cable is sufficiently slack as not to be influenced or operated by the revolution of the twin pulleys, said pulleys merely acting as guides for the cables. The cotton coming from the gin passes into the conveyer connecting the same with the condenser and is there converted into the usual soft mass, which has usually and indiscriminately been thrown into the baling-box and subjected to pressure. The bale thus formed is large and bulky, and is what is termed a "plantation" bale, is too large for either cheap transportation or convenient storing or hauling, and is therefore usually carried to some point and subjected to the action of a steam or hydraulic compress, by which it is converted from the large bulky bale above mentioned to a compact or compressed bale of reduced size.

In the method as covered by the patent hereinbefore mentioned the bale is compressed at

the point of ginning and progressively, and is thereby designed for cheap transportation or storage from the initial point, and thereby effects a saving in the expense of further re-handling the original bale for compressing. As the cotton in the form of a soft mass emerges from the condenser, the same is conducted progressively to the compressing-rolls 24, one of which is heated, and which, as before stated, are maintained under binding-pressure and in actual contact when not in use. As the cotton arrives opposite that point between the rolls and opposite that which would be the actual point of contact, if not in use, the same is warmed or heated, preferably upon one side, to a moderate degree sufficient to temporarily suspend the expansibility of the fiber, so that when the cotton has reached the actual point of compression, and during said compression the same is, by the heat imparted thereto, readily susceptible to the action of the compressing-rolls, and the cotton emerges in a thin condensed sheet composed of cohering compressed fibers. From this point the cotton passes to the lapper, which, being vibrated, serves to fold the cotton in layers upon the carriage, which is gradually lowered by hand or otherwise until a proper quantity of cotton to constitute a compressed bale has been deposited thereupon. By this time the carriage will be either directly upon or close to the track and will be in engagement with the bracket at the front end of the carriage-operating bar. The sheet is severed and the bar, being reciprocated, moves the carriage and the bale into the baling-chamber, from which the carriage is withdrawn and re-elevated, and at the same time the press operated to press the bale thus formed, not for the purpose of condensing, but simply to expel from between the laminals or layers air gathered therein during the process of lapping. The bands are now applied and the bale discharged from the press, and is so formed as to have the density of the

usual compressed bale and therefore requires no re-pressing, but may be stored or shipped direct to the consumer.

Although I have shown means for heating the cotton practically only at the point of compression, yet it will be obvious that the heat may be applied at a point distant from said point. In fact, in the construction shown the heat radiated from the compression-roll would act upon the cotton fiber previous to its arrival opposite the point of compression, though of course the highest degree of heat to which the cotton is subjected is directly at the point of compression. In other words, to practice this portion of my method, it is simply necessary to apply the heat and to compress the fiber before it gets from under the influence thereof.

The expressions "compression" and "compressed cotton," as used in the present specification and claim, 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 described my invention, what I claim is—

The method of baling cotton, which consists in progressively compressing and simultaneously heating the same in the form of a continuous sheet, lapping said sheet before it has time to expand in the form of a bale, and subsequently applying pressure to expel the air from between the layers, 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:

J. H. SIGGERS,
W. S. DUVALL.