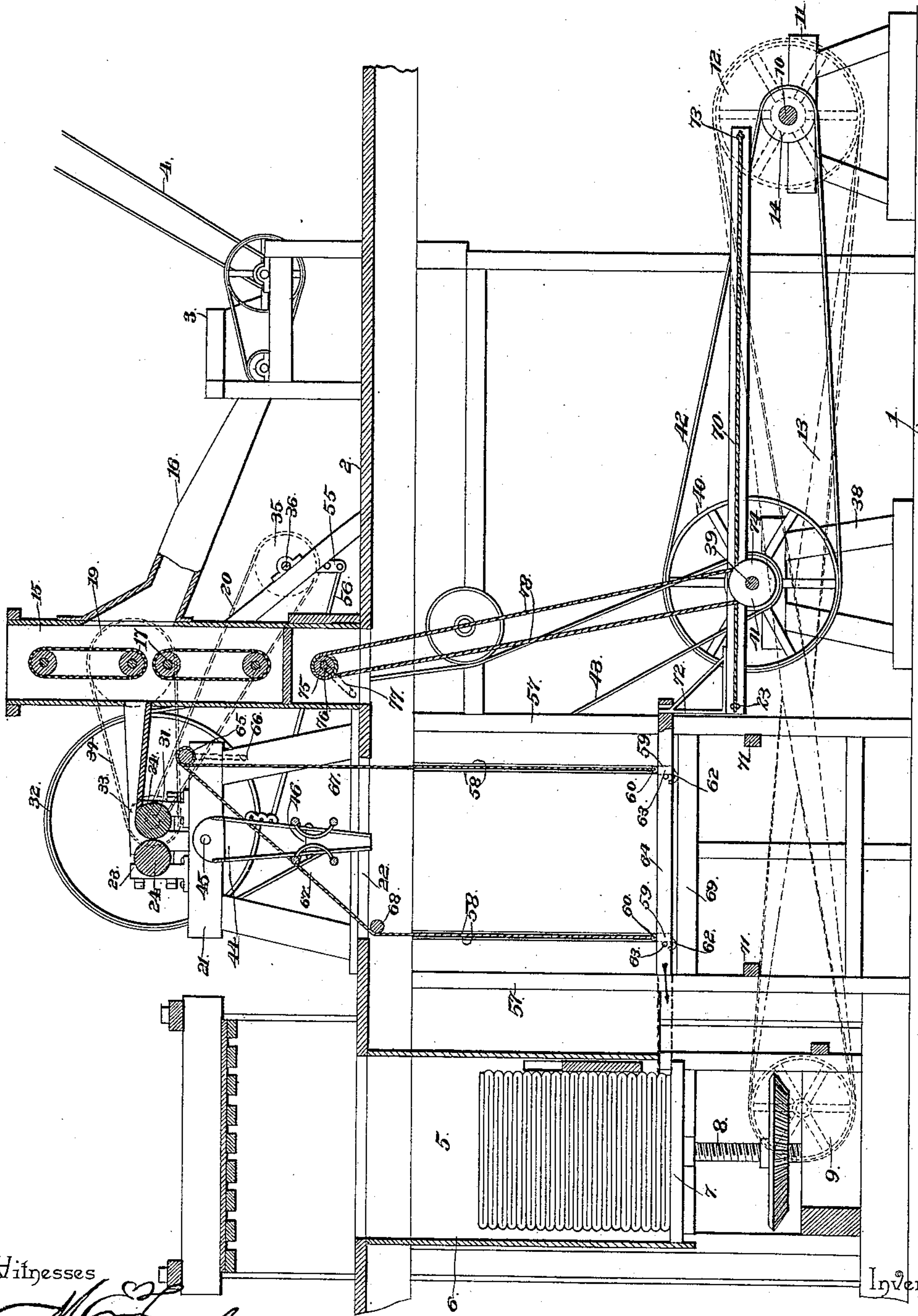


(No Model.)

H. REMBERT.
METHOD OF BALING COTTON.

No. 441,022.

Patented Nov. 18, 1890.



Witnesses

W. Fowler
W. A. Duval

By his Attorneys,

Henry Rembert

C. Snow & Co.

UNITED STATES PATENT OFFICE.

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

METHOD OF BALING COTTON.

SPECIFICATION forming part of Letters Patent No. 441,022, dated November 18, 1890.

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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 Method of Baling Cotton, of which the following is a specification.

This invention has relation to a method for baling cotton and other fibers, and said method is adapted to be practiced at the point of ginning and to form a continuation of the process of ginning. In other words, the object of my method is to gin, condense, and bale the cotton in one continuous operation, and to so effectually reduce the size of the resulting bale of cotton in this first, original, initial process as to make it of suitable dimensions and density for market or transportation by rail or sea to final destination.

Referring to the drawing, which is a vertical section and partial side elevation of an apparatus designed to practice my method, 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 in ordinary use, and is operated by a belt 4, connected with 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 any other style of baling-press may be substituted, as the construction of the same bears no relation to my invention and is only shown to complete the process and perform one of the steps thereof.

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 crossed 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 a purpose hereinafter apparent.

15 designates the condenser 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 into the condenser and by said condenser the same is formed into a mass. The condenser consists of the usual condensing-rolls 17, one of said rolls having the shaft extended beyond the wall of the condenser and provided with a pulley 19, which serves to drive said roll and is in turn driven through the medium of a belt hereinafter mentioned.

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. A pair of standards 23, having journal-boxes, rise from each side of the table, and in said journal-boxes is journaled the shafts of a pair of compressing-rolls 24. The rolls 24 have frictional contacts throughout their lengths and are mounted in unyielding boxes or bearings strongly supported by any suitable frame-work.

The shaft of one of the rolls 24 extends outside of its bearing and carries a small pulley 31, a large pulley 32, and an intermediately located and sized pulley 33. The intermediately pulley 33 is connected with the pulley 19 of the condenser by a belt 34. The small pulley 31 is connected to a pulley 35, mounted on the shaft 36 in rear of the condenser by means of a belt 20.

38 designates a suitable pair of standards located upon the ground floor in advance of 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 connected by a belt 42 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 presser-rolls.

44 designates a lapper-frame, and the same is pivoted at its opposite ends to the table 21 at each side of the opening in said table by opposite bolts 45. The lapper is of such length as to hang suspended through the opening 22 of the floor 2, and is provided within

itself with a loosely-suspended supporting device or guide 46.

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.

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

58 designates opposite pairs of guide-rods, forming vertical ways between the posts 57. Within each of the guides just mentioned is mounted a sliding block 59, which block terminates at its upper end in an eye 60 and at its lower end in a hook 62. These hooks are inwardly disposed, and receive studs 63 projecting from the opposite side edges of a horizontal movable bale-carriage 64, located under the opening 22 of the floor 2, under the lapper and between the four posts 57.

65 designates a windlass, mounted upon the table 21 and operated in this instance by a crank 66, designed to be turned by hand or otherwise. Opposite pairs of ropes 67 are secured to the windlass, intermediate their ends, and wound in the same direction thereupon, each lower terminal of each rope being connected with the eye of one of the sliding blocks 59, and the two terminals of the ropes, which are out of alignment with the windlass and carriage, pass over suitable guide-pulleys 68, located at the end of the opening 22 and under 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, 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, which bar is adapted for reciprocation between the pairs of posts 57 and to ride over guide-cleats 71 connecting said posts. At the front end of the bar 70 there is secured a vertically-disposed bracket or standard 72, and at one side of the bar there project eyes 73, said eyes being located at opposite ends of said 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 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 pulley 75 and around the remaining twin pulley, and in a direction opposite to that traveled 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 the direction of the movement of the crank. The cables are sufficiently slack not to be influenced or operated by the revolutions of the twin pulleys, said pulleys merely acting as guides for said cables.

Having described the construction of an apparatus adapted to practice my method, I will now proceed to describe in detail the method claimed by me.

The cotton coming from the gin passes into the conveyer connecting the same with the condenser, and while in the condenser is converted into the usual soft mass, which has heretofore been thrown into and subject to the action of the baling-press or lapped by suitable machinery, and subsequently subjected to the action of the baling-press. The bale thus formed is commonly termed a "plantation bale," and ranges from three to four feet in height, and is therefore too large for cheap transportation, convenient storing, and hauling, and is 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 bale or mass of reduced size. By my method, after the cotton has been discharged by the condenser, the same is introduced between the compressing-rolls 24, and as these rolls are revolved the cotton is compressed into a thin compact sheet to the greatest degree of compactness permissible without injury to the fiber.

By my method I am enabled to compress the bale at the point of ginning and form the same of a proper size for cheap transportation, without the necessity of further compression, and this in one continuous operation, thereby effecting a saving in the expense of further compressing the bale in hauling, transporting, and storing the same.

A marked distinction between my method of producing a bale of compressed cotton and those which preceded it lies in the fact that I effect the compression progressively—that is to say, by compressing a small portion or unit of the mass at a time, and thereafter accumulating these compressed units instead of effecting the compression of the entire mass at one operation, as heretofore practiced.

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.

By experience I have found that there is a limit of compression to which fibers may be successfully subjected without injury, said compression being sufficient to prevent expansion of the fiber (compressed sheet) dur-

ing the forming of the bale; and to this limit I compress the cotton as it emerges from the condenser, the degree being no more and no less, and the fibers are therefore as compact as if subjected in a mass to the action of a hydraulic or steam compress, their expansion being temporarily suspended. As the thin sheet emerges from between the rolls, the same passes down between the guide and through the lapper, which is being oscillated or swung like a pendulum back and forth over the bale-carriage, and said thin sheet is therefore continuously folded in alternately-opposite directions back and forth upon the carriage to form a bale. While the bale is completed, as to quantity, the windlass is operated so as to gradually and proportionately lower the carriage, and after a sufficient quantity of cotton has been deposited upon the carriage the web is severed. The windlass is now operated so as to further lower the carriage until the same reaches the track, and the blocks 59 fall by gravity in their guides below the carriage and their hook ends disengage from the studs of the carriage. As the carriage is lowered, an opening formed in the rear end of the same engages over the bracket at the front end of the carriage-operating bar, and said bar being reciprocated forwardly by the means hereinbefore described, the carriage and bale are pushed into the baling-chamber and upon the follower. The carriage is then withdrawn from under the bale and the baling operation continued or repeated, and while such operation is in progress the baling-press is operated so that the follower rises and acts to press the air from between the folds of cotton sheets or bats and retains the bale in position during the tying and covering of the same.

The press does not bale the cotton or compress it in any degree, as the cotton itself is compressed by the compress-rolls to the utmost limit to which it can be compressed with safety, and the density of the cotton is not increased by the press, but simply the air expelled from between the layers or folds and said layers maintained in close contact during the tying and completion of the bale.

By the above method it will be apparent that I provide in a simple and inexpensive manner a bale the density of which is as great as if subjected to the action of the usual compress for reducing what is usually termed the "plantation" or "uncompressed" bale to the compressed bale of standard density and proportions. I am thus enabled to obviate the expense of transporting the bale to the point at which the compress is located and the cost of such final compression, and can ship the bale direct to the manufacturer or to the point of shipment where the point of use is remote.

While I have illustrated and described herein that form of apparatus which I consider best adapted for carrying out my process under certain conditions, it is to be distinctly

understood that this apparatus is not the essence of the present invention, and that the method herein claimed may be carried into effect by various other mechanisms which will readily suggest themselves to the skilled mechanic as equivalents of the one herein shown and described.

In order that my invention may be more fully understood and appreciated by those unfamiliar with the handling of cotton, I will give the following comparison between my method and that usually employed.

Heretofore the usual method of handling and baling cotton practiced in the Southern States has been as follows: The cotton fiber when it comes from the field of production is first passed through the gin and condenser, and from the latter it is carried to an ordinary "country" or "plantation" press, where it is pressed and baled. The bales formed by these "plantation-presses," as they are termed, are very large and bulky, and therefore require considerable space for storage and greatly increase the cost of transportation. The bales after being formed are then transported to a compress located at some concentrating-point, where they are subjected to a very heavy pressure, sufficient to reduce their size and increase their density to the required "standard" fixed by the railroad companies, boards of trade, and others, after which they are ready for shipment by rail or otherwise to the manufacturers. This method of handling and baling the cotton has many disadvantages and drawbacks. In the first place, the usual method of handling the loose cotton in the ginnery establishment previous to being baled causes the atmosphere of the building to be completely filled with floating fiber finely comminuted, which dust not only stifles and interferes with the attendants, but also greatly increases the danger and risk of a conflagration, and thereby increases the cost of the fire-insurance. It also necessitates the employment of a number of attendants, which materially lessens the profits of the producer. The bales when they come from the first pressing operation are necessarily large and bulky and low in density, inasmuch as the ordinary plantation or country presses are not adapted for heavy pressing, and for that reason are not only difficult to handle and require a large storage-space for their keeping, but also greatly increase the cost of transportation from the ginning establishment to the compress, which is often located a long distance from the ginning-point; but probably the most serious drawback attendant upon the use of the foregoing manner of handling the cotton is the great cost of building and maintaining the powerful hydraulic and steam compresses required for compressing the bales before they are shipped to the manufacturer, and the expense to which the producer is put in having the bales thus compressed. To reduce the bales to the standard size and density required by the trade, these presses are nec-

essarily large and expensive, not only in building but in maintaining them in operation, as is evident.

By my invention I obviate the main difficulties of the manner of handling and baling cotton heretofore in vogue, and substitute therefor a simple and inexpensive method that may be carried out in the ginning establishment without the employment of costly labor and powerful compresses, and by means of which the cotton is not subjected to unnecessary handling or exposure, but by a continuous process is formed into bales of a size and density that will equal the standard compressed bales. This method may be carried out and operated by means of the same power that operates the ginning mechanism, and from this fact it derives one of its chief advantages.

Having described my method, what I claim is—

1. The method of baling cotton, which consists in compressing the same progressively, accumulating the compressed fiber previous to its expansion in the form of a bale, applying

pressure to expel the air, and finally tying the bale, substantially as specified.

2. The method of baling cotton, consisting in compressing 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.

3. The method of baling cotton, which consists in condensing the same in the form of a continuous soft bat, compressing the same progressively, accumulating the compressed fiber previous to its expansion in the form of a bale, applying pressure to expel the air, and finally tying the bale, 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.