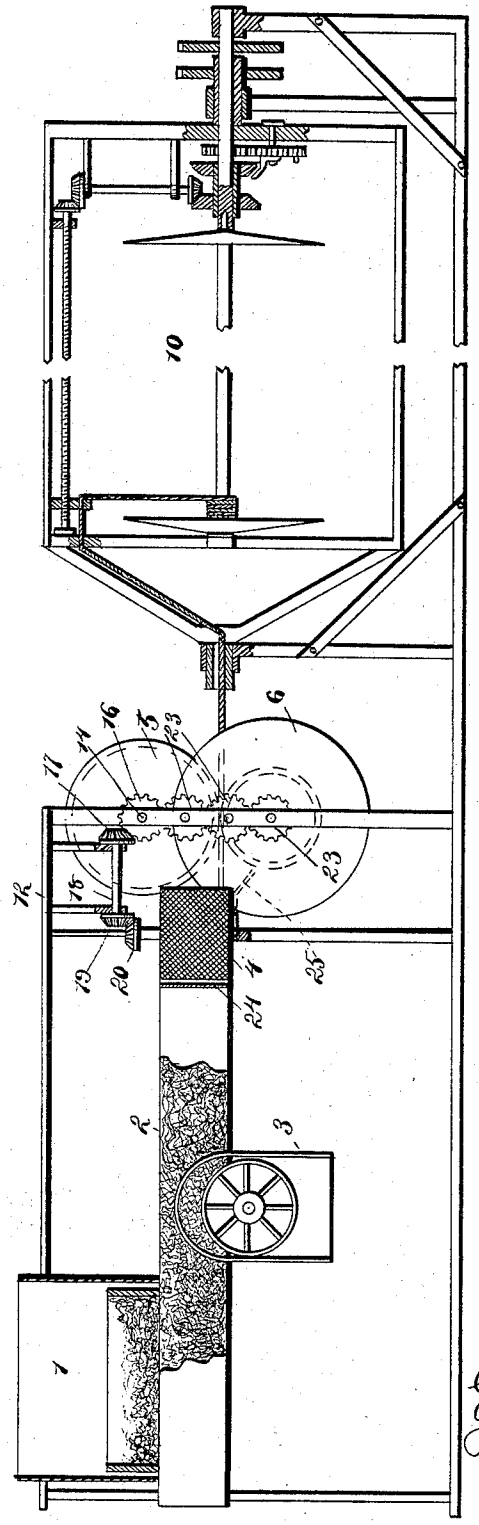
(No Model.) 2 Sheets—Sheet 1.

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COTTON BALING APPARATUS.

No. 590,110. Patented Sept. 14, 1897.

Fig. 1.



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COTTON BALING APPARATUS.

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Fig. 2.

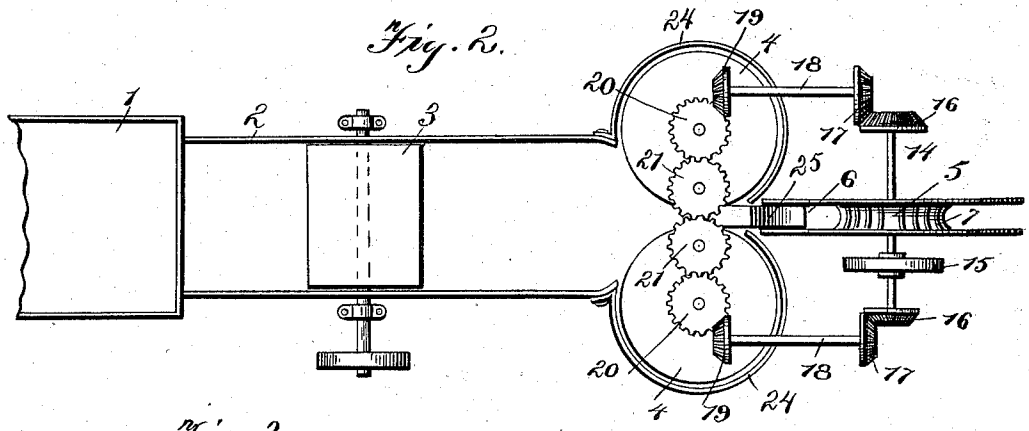


Fig. 3.

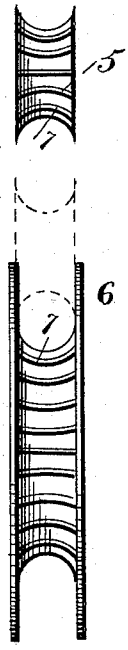
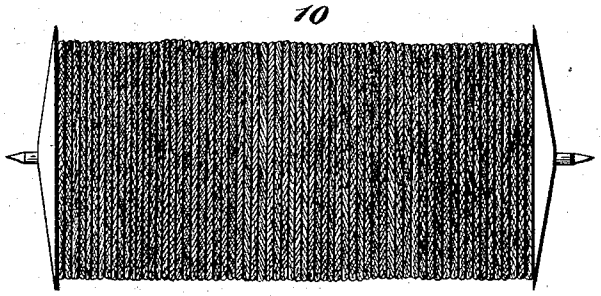


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES L. MELCHER, OF SWISS ALP, TEXAS.

COTTON-BALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 590,110, dated September 14, 1897.

Application filed July 28, 1896. Serial No. 600,804. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. MELCHER, of Swiss Alp, in the county of Fayette and State of Texas, have invented certain new and useful Improvements in Cotton-Baling Apparatus or Compresses; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in cotton-baling apparatus or compresses of that type in which the cotton is received directly from the gin or gins and condensed into a rope and then wound upon a spool, all of which will be fully described hereinafter, and particularly pointed out in the claims.

The object of my invention is to provide a machine of cheap and simple construction adapted to twist and compress the cotton at the initial point of ginning and in a continued operation with that of ginning, whereby I avoid the expense and labor occasioned by the handling of the cotton during its storage and transportation to the neighboring compress and also the expense of said compression, while at the same time I produce such condensation of the cotton as will secure the cheap rates of transportation accorded cotton which has been compressed to the standard degree of density.

I am aware that machines have heretofore been devised to compress the cotton as it is delivered from the gin, one form being to force the cotton lint into a rotating funnel intended to collect the cotton at its reduced end and twist it, it then being caught between feed-rollers, which deliver it to a spooling apparatus. I find that in an apparatus of this character the cotton must first be formed into a definite and tangible form by suitable mechanism, such as a web, then shaped into approximately a circular form in cross-section, and afterward subjected to the twisting action. It is found that the cotton will not shape itself into a definite form in a revolving funnel, but will simply collect and clog, and that feed-rollers situated at its reduced end cannot draw the cotton therefrom which is fed in the form of lint, and my invention differs therefrom in first putting the cotton into a definite and tangible form—as, for instance, a web, which web, being caught by rollers, is shaped into approximately a circular form, and when so treated it is in a form capable of standing the severe twisting action necessary to properly and efficiently condense it.

Another form of machine has been devised which receives the lint and condenses it into a web, but I find that a pressure upon a traveling web will not condense the cotton nearly so much as twisting, as will be readily understood, for the reason that as soon as the cotton has passed between the rolls it expands, there being nothing to hold it against expansion, as does the twisting of the cotton, and for the further reason that the cotton when formed into a web has not sufficient strength to stand a pull sufficient to compress it upon a revolving roller to any great degree, as does a twisting action; and I also find that a web, though definite and tangible in form, has not sufficient strength to be caught and twisted without the intervention of a means to first compress the web into approximately a rope. When it has been so treated, it then has sufficient strength to be subjected to the twisting action, and as it is being twisted its strength correspondingly increases and it is capable of being condensed to a great degree. It will thus be seen that my invention differs radically from both of these previously-devised machines.

I am also aware that in the process of forming a yarn from wool after it has been carded and the fibers specially arranged to form a fairly strong web it has been passed through a funnel to shape into approximately a rope form, but this differs from my invention in that the process requires a previous preparation of the wool, so that when compacted into a web it will be sufficiently strong to be drawn through a funnel, while the same method could not be followed in shaping cotton, for a cotton web formed from loose lint is not sufficiently strong to be drawn through a funnel for shaping into circular or rope form, but must be so shaped by a member or members which are traveling with the cotton, such as

rollers properly shaped to perform this function. In this manner the strain upon the web is reduced to a minimum in that the rollers are traveling just fast enough to take up the lint as it is being delivered and no faster, and when it is compressed by rollers into a rope form, as in my machine, and delivered to a twisting-machine traveling at the proper speed the lint-web does not become separated and disintegrated, as it would were it drawn through a funnel. Where the wool is specially and previously prepared by a carding-machine and then formed into a web, the web may stand the strain of pulling through a funnel, but such a method as before stated cannot be practiced in connection with cotton lint gathered direct from the gin, as is necessary to carry out my invention. My invention therefore differs from the wool-yarn method referred to in gathering the loose lint and then taking the web formed by rollers which are traveling and compressing it into a rope form, whereby it is relieved of that strain which will disintegrate the web and defeat the result aimed at in my machine.

Referring now to the accompanying drawings, Figure 1 is a side elevation of an apparatus embodying my invention, the same being shown in connection with gins and condensers. Fig. 2 is a top plan view of the same, the spooling apparatus being omitted. Fig. 3 is a detached view of the feeding-rollers for condensing the lint into a circular or cord form. Fig. 4 is the bale after it is completed and taken from the machine.

1 indicates an ordinary gin or condenser, and 2 a flue so situated in relation to the gin or condenser as to receive the cotton therefrom.

While I here show but one gin, I wish it understood that the invention is intended and adapted to be used in connection with a series of gins placed at one or both sides of the flue, as may be desired.

Situated at the outlet end of the flue is a condensing apparatus to be presently described, and situated between the cotton gin or condenser and the said condensing apparatus is a blower 3, which has the double function of blowing and sucking owing to its location in the trough. It serves to draw or suck the cotton from the condenser or gin as it passes into the trough, and to thence force it to the condensing apparatus at the outlet end of the flue or trough. It is found that a blower placed at the outer end of the flue will cause the cotton to clog therein, while when situated as here shown it draws it throughout the length of the flue in contradistinction to pushing it, and the pushing is only a very short distance to the condensing apparatus at the outlet end of the flue.

The lint-cotton within the flue is sucked and forced to and between the rollers 4. These rollers are situated, preferably, in an upright position and are formed, preferably, of woven wire, whereby the air forced by the forcer 3 will be permitted to pass on through the end of the flue, which is practically closed thereby, and also serving to more effectually grasp the cotton and draw it through the flue. The function of these rollers 4 is to receive and collect the cotton lint and to form it into a definite tangible form, such as a web, which adapts it for the succeeding steps, as will be fully described hereinafter.

Situated just beyond the condensing-rollers 4 are the rollers 5 and 6, which contract the web as it passes from the rollers 4 into a circular or rope form, which fits it for the twisting action by giving it considerable strength, as will be clearly understood. The upper roller 5 is what I term a "male" roller, having a shallow U-shaped groove, as clearly shown, and the lower roller 6 a "female" roller, having a very deep circumferential groove coacting with the U-shaped groove of the upper male roller 5, both serving to form a circular opening, as illustrated. The grooves of the male and female rollers 5 and 6 are provided with blunt transverse ribs 7, as shown, which causes a biting action upon the cotton and draws it along and also prevents it from being forced backward or away from the rollers. Situated just beyond these male and female rollers is a twisting and spooling device 10 of any desired form or construction. As the spooling device forms no part of my invention and is well understood by those skilled in the art it is not necessary to enter into a detail description thereof. The function of the twisting and spooling device is to twist the cotton after it has been properly treated to enable it to stand the twisting action. It is then wound upon a spool, as shown in Fig. 1, ready to be transmitted for the use of the spinner. By reference to Fig. 1 it will be seen that the twisting apparatus twists the lint to the bite of the frictional point of the male and female rollers 5 and 6, thus effectually twisting the lint and forcing all air therefrom and condensing it to the standard degree of density before being wound into spool form.

12 is a frame upon which the condensing apparatus is supported at the outlet end of the trough 2. The frame is so constructed as to support the upright rollers 4 and the circular condensing-rollers 5 and 6.

The shaft 14 of the upper male roller 5 carries a driving-pulley 15 and the opposite ends of this shaft 14 are provided with beveled gears 16, meshed with bevel-gears 17, situated upon shafts 18, extending parallel to each other, as shown. The opposite ends of these shafts 18 are provided with bevel-gears 19, meshing with gears 20 upon the shafts of the upright condensing-rollers 4. A train of gear 21 is preferably situated between the rollers 4, which insures them moving regularly and uniformly and at the same speed and in the direction indicated by arrow. Also situated between the shafts of the male and female rollers 5 and 6 are a series of gear-wheels 23,

which serve the same function of feeding the rollers uniformly and at the same speed and in the direction indicated by arrow.

A machine of this character can be constructed at a very slight cost and is within the reach of nearly every cotton producer, and by such means he is enabled to condense ready for shipment with all the advantages of the rates to any desired market and also effect a saving in hauling it to the point of compression to reduce the mass or bale to the standard density required by transportation companies in order to get advantageous rates.

Various changes in the details of my invention will suggest themselves to those skilled in the art, the essential features being the forming of the lint into a definite tangible continuous strip or web, which is afterward compressed into a rope form, whereby it has sufficient strength to stand the twisting action.

Placed at the outlet end of the trough and engaging or practically engaging the surface of the rollers 4 are the leather wings 25, which serve to prevent waste of the lint, and an apron 26 is placed between the female roller 6 and the rollers 4 to prevent waste of the lint at this point.

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

1. A cotton-lint-compressing apparatus comprising a lint-collecting trough or chamber, receiving collecting and compressing rollers situated at the outlet end of the trough or chamber which compress the cotton into a web, rollers situated outside of the said collecting and compressing rollers and journaled at right angles thereto between which the web is compressed edgewise into rope form, and a twisting mechanism situated beyond the last-named rollers receiving and twisting the cotton as it passes in rope form therefrom, substantially as described.

2. A cotton-lint compressing or condensing apparatus comprising a receiving and collecting chamber into which the lint is fed from the gin, collecting and compressing rollers situated at the outlet end of the chamber which collect the lint and compress it into web form, coacting peripherally-grooved rollers journaled at right angles to the collecting and compressing rollers and situated on a line drawn between them which receive the web and compress it into rope form, and a twisting apparatus receiving the rope form lint and compressing the same by twisting it, substantially as described.

3. A cotton-lint-compressing apparatus comprising a collecting flue or chamber into which the lint is fed from the gin, collecting and compressing rollers situated at the outlet end of the flue for compressing the cotton into web form, a blower situated between the gin and the rollers for drawing and forcing the lint to and against the collecting-rollers, rollers situated outside of the collecting and compressing rollers which receive and compress the web into a rope form, and a twisting apparatus receiving the rope-shaped lint and compressing it by a twisting action, substantially as described.

4. A cotton-condensing apparatus comprising a receiving-chamber for the lint, collecting and compressing rollers at the outlet end of the chamber which collect and compress the lint into a web shape, rollers situated outside of the said collecting and compressing rollers and journaled at right angles thereto, said rollers having peripheral grooves, one roller being a female and receiving the other a male roller, whereby the web-shaped cotton is compressed into rope form, and a twisting mechanism receiving the rope-shaped lint and compressing the same by a twisting action, substantially as described.

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

CHARLES L. MELCHER.

Witnesses:
AUG. STINMANN,
J. PAUSENANG.