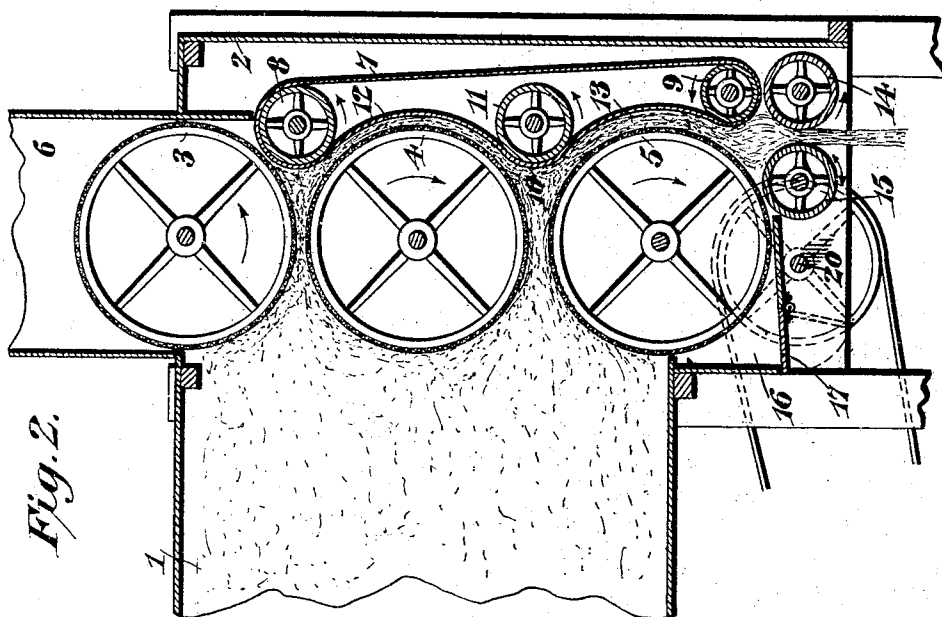
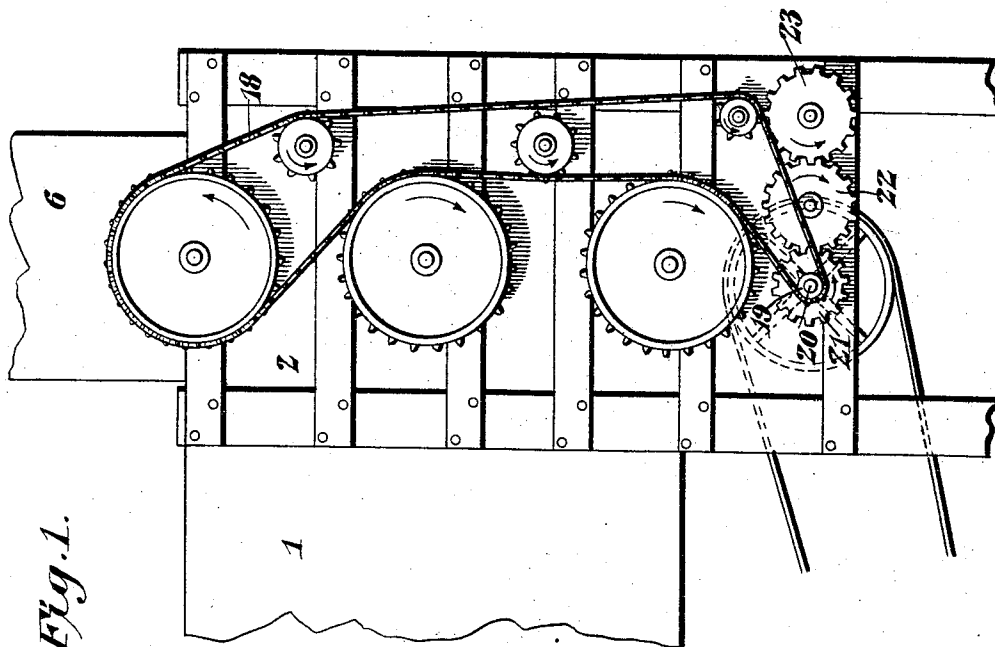


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PATENTED JULY 26, 1904.

E. D. CARTER.
COTTON CONDENSER.
APPLICATION FILED FEB. 28, 1901.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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COTTON-CONDENSER.

SPECIFICATION forming part of Letters Patent No. 765,916, dated July 26, 1904.

Application filed February 28, 1901. Serial No. 49,327. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. CARTER, a citizen of the United States, residing at Brenham, in the county of Washington and State of Texas, have invented a new and useful Cotton-Condenser, of which the following is a specification.

This invention relates to a novel cotton-condenser, and has for its object the production of a condenser especially adapted for the formation of a thick bat suitable for employment in the formation of wound cylindrical bales.

Cotton-condensers as ordinarily constructed are capable of forming only a comparatively thin bat, although several ways have been suggested for adapting condensers to the formation of bats of greater thickness. One of these proposed improvements in the usual single-cylinder condenser is the employment of two or more cylinders from which the several thin bats are separately removed, and another of the proposed improvements embodies the idea of a plurality of cylinders arranged to receive a bat or bats from the preceding cylinder or cylinders and to deliver said bats, together with its own bat, to the succeeding cylinder or cylinders of the series. The first of these proposed variations of the old form of condensers is objectionable, because the bat as it is delivered lacks uniformity, and the second variation is objectionable, for the reason that doffer-rolls are located in operative proximity to the cylinders within the lint or gin flues, where they are apt to become wrapped with cotton to an extent sufficient to interfere with the bats being formed upon the cylinders and to ultimately cause a stoppage of the mechanism. Another and perhaps greater objection to that form of condenser wherein the bats accumulate successively upon the several cylinders is that the bat or bats increasing in thickness are led around the opposite sides of the successive cylinders and cover so much of their surfaces as to interfere with the free passage of air through the drums and into the blast-flue, the result being the clogging of the bat and the choking down of the gin-stands.

In its broadest aspect my invention consists

in providing a series of condensing-cylinders arranged to deliver their individual comparatively thin bats or accumulated lint to a bat-former common to the series of cylinders, this common bat-forming device being arranged to multiply or combine the several thin bats to form a bat of increasing thickness, which will be opposed to a small portion only of the surface of each cylinder and which will be located exclusively at that side of the series of cylinders opposite the gin-flue. The result of this arrangement is to leave the major portion of the several cylinders free for the passage of air therethrough, to obviate the necessity for the employment of doffer-rolls or other cylinder-clearing mechanism within the gin-flue, and to at the same time secure all of the advantages of means for forming a thick bat by combining the thin bats or condensed layers of cotton adhering to the several cylinders of the series.

In the accompanying drawings, in which I have illustrated one embodiment of the condenser constructed in accordance with my invention, Figure 1 is a side elevation of the condenser, illustrating the arrangement of gearing for operating the several cylinders and coöperating devices; and Fig. 2 is a longitudinal sectional view of the subject-matter of Fig. 1, illustrating the arrangement of the condenser-cylinders, the bat-former, and compression-rolls.

Referring to the numerals employed to designate corresponding parts in both views, 1 indicates the flue leading from the gin or gins and through which cotton is blown to the condenser. The condenser comprehends, as usual, a casing 2, within which are mounted a vertically-disposed series of horizontal condenser cylinders or drums 3, 4, and 5, of wire-netting or other open formation. The condenser cylinders or drums are disposed in obstructing positions at the end of the gin-flue 1 and are in communication, preferably at their ends, with a blast or dust flue 6, through which is induced a blast or strong current of air calculated to blow the cotton from the gin-stands and through the flue 1 to the condenser, where it adheres in a manner well understood in the art to the condenser-cylinders and forms upon

each of them a thin layer or bat of cotton. The uppermost cylinder 3, besides communicating at its ends with the dust-flue, obstructs that portion of the flue which opens into the top of the casing. This cylinder is so disposed that approximately one-half of its surface is exposed within the dust-flue, and as this exposed surface is kept free from any accumulation of lint in a manner to be described the blast is much more effective to remove the dust from the lint-flue than in ordinary forms of condensers and the choking of the gin-flue is prevented. It is evident that the location of cylinder-clearing devices—as, for instance, doffer-rolls—within the flue 1 adjacent to the cylinders would result in the adherence thereto of a sufficient quantity of cotton to cause the clogging of the bat or bats, and it is equally evident that should a bat of considerable thickness be permitted to accumulate upon those surfaces of the cylinders adjacent to the gin-flue the free circulation of air through the gin-flue by way of the cylinders and blast-flue would be impeded, and as a consequence the cotton would not be properly removed from the gin-stands and the entire mechanism would ultimately become inoperative. To overcome these objectionable features of condensers of well-known types, I provide at the side of the series of cylinders opposite to or beyond the gin-flue 1 a vertically-disposed bat former and conveyer 7, disposed to receive a comparatively thin bat from each of the drums and to combine them for the purpose of forming a thick well-defined bat suitable, after being subjected to more or less compression, to be fed directly to a press. The bat former and conveyer 7 is preferably embodied in an endless belt, within the terminal bights of which are located belt-rollers 8 and 9. The roller 8 is preferably located directly beyond the space intervening between the adjacent peripheries of the drums 3 and 4 and sufficiently near the former to doff the bat therefrom and to compel the air circulating into the flue 6 to pass through that portion of the cylinder 3 located in advance of the bat-former. The other belt-roller 9 is located in a plane adjacent to the lower side of the cylinder 5, and the belt or bat-former carried by these rollers is disposed in such relation to the adjacent cylinders as is necessary to accommodate the interposition of that portion of the bat formed by accumulation or otherwise at these particular points—that is to say, the belt passing over the roller 8 is disposed closely adjacent to the cylinder 3 in order to wipe the bat or layer of cotton from the face thereof, but is removed from the cylinder 4 a sufficient distance to permit the interposition of a bat of such width as will be produced by the combining of the bats formed upon the cylinders 3 and 4.

In order to effectually form a bat by combining the layers of cotton received from the

two upper rolls, it is desirable that the bat-former or belt 7 be disposed in coöperative relation with the face of the cylinder 4 through a considerable arc, and in order to effect this result an intermediate bight 10 is formed in the front run of the belt or bat-former 7 by interposing a third belt-roller 11 between the rollers 8 and 9 and preferably at a point directly opposite the space intervening between the adjacent peripheries of the cylinders 4 and 5. This arrangement will form in the front run of the belt 7 a pair of loops or concave portions 12 and 13 opposite to and concentric with the cylinders 4 and 5. The loop or concavity 13 opposite the cylinder 5 will, however, be located at a slightly greater distance from the cylinder 5 than the space intervening between the loop 12 and the cylinder 4, as it is evident that while the combined bats accumulated upon the cylinders 3 and 4 are required to pass between the upper loop 12 and the cylinder 3 the combined bat thus formed is augmented as it passes the intermediate bight 10 by the bat formed upon the cylinder 5, and this successive increase in the thickness of the bat must of course be accommodated by the location of the bat-former at a greater distance from each successive cylinder of the series. As the belt passes from between the cylinder 5 and the lower end of the endless bat-former it is passed between a pair of compression-rolls 14 and 15, which doff the bat from the belt and the cylinder 5 and effect the final compression or condensation of the combined bat before its delivery to the press.

An incidental feature of the construction, but one which is of considerable importance in cotton-condensers, resides in the formation of a dust receptacle or pocket 16, into which dust and debris finding their way into the cylinder 5 will gravitate, and as the major portion of the dust passing through the flue 1 with the cotton will drop to the bottom thereof before reaching the condenser practically all of the dust passing into the flue will find its way into the pocket 16, from which its removal is facilitated by the hinged section 17 of the pocket-floor.

It will be understood that the several cylinders are designed to rotate in the direction of the arrows in Fig. 2 and that the forward or bat-forming run of the bat-former 7 must be given a downward movement to cause the continued formation and delivery of the bat. In Fig. 1 I have illustrated a simple form of gearing for imparting the desired motion to these coöperating parts. This gearing consists in providing sprockets upon the adjacent extremities of the several cylinders and belt-rollers and in gearing said sprockets for movement in the desired directions by means of a sprocket-chain 18, likewise passed around the sprocket-pinion 19 upon the power-shaft 20, driven in any suitable manner and having

keyed thereon a gear-wheel 21, meshing with a somewhat larger gear-wheel 22, keyed upon the shaft of the compression-roll 15 and meshing with a similar gear-wheel 23, fixed to the shaft of the compression-roll 14.

The operation of the condenser, stated briefly, is as follows: A circulation of air being induced through the flue 1, condenser-cylinders, and flue 6, the cotton in loose form is drawn from the gin or gins to the condenser-cylinders and is deposited upon the latter in thin layers. As the cylinders are rotated these thin adhering layers are removed from the cylinders successively by the bat-former 7, located entirely beyond the series of cylinders, and the combined bat of comparatively great thickness is passed between the compression-rolls in advance of its delivery to the press.

It should be noted in considering the operation of the condenser that the combined bat is not formed against the sides of the cylinders opposite the gin-flue for the sole purpose of permitting the free circulation of air through the cylinders to the dust-flue, but that the vertical disposition of the series of cylinders and of the belt located beyond the same results in the formation of a bat which moves downwardly in the direction in which it would naturally gravitate. This latter fact I regard as material, because while the belt constitutes a bat-former common to a series of cylinders the weight of the bat is not imposed upon the belt, and the latter may therefore cooperate with any desired number of cylinders without requiring a corresponding increase of power to drive the belt.

In order that the scope of the claims may be clearly comprehended, it should be noted that the endless belt 7, constituting the bat receiving and forming member, is located exclusively at one side of the series of cylinders and that it receives a layer or thin bat from each cylinder and transfers the layer or layers thus received to the succeeding cylinder, against which the several layers are compressed to give a definite form to the bat and to cause it to effect the detachment of the layer from the adjacent cylinder, thus augmenting the thickness of the bat and causing its slight compression as it reaches each of the cylinders in order. Furthermore, the bat-former constitutes means for removing the thin layers of cotton from the several condensers and located exclusively at the side of the series of cylinders opposite the gin-flue and practically in line with the rear wall of the blast-flue 6, so that the endless belt or bat-former 7 forms, in effect, the end of the gin-flue, and by forming the bat adjacent to the outer end of said flue obviates the necessity for leading the heavy bat around the front side of any cylinder, and thereby obstructing the free circulation of air through the open face of said cylinder. I do not wish to be understood, however, as limit-

ing the improvements to the particular form of bat receiving and forming member illustrated in the drawings, as it is evident that the primary objects of the invention will be attained through the medium of various structural variations of the construction shown. The right is therefore reserved to effect such changes, modifications, and variations as may fall properly within the scope of the protection prayed.

What I claim is—

1. In a condenser, the combination with a gin-flue, and a series of condenser-rolls obstructing said flue, of a bat receiving and forming device arranged to form a bat against the cylinders at the sides thereof opposite the gin-flue exclusively, whereby those portions of the cylinders directed toward the gin-flue are left comparatively unobstructed for the free circulation of air therethrough.

2. The combination with a single gin-flue, and a series of condenser-cylinders arranged therein in closely-adjacent relation and obstructing said flue, of an endless bat receiving and forming belt also located in the flue and disposed at the rear side of the cylinders to form a bat against certain of the latter.

3. The combination with a single gin-flue, and a series of condenser-cylinders arranged therein in closely-adjacent relation and obstructing said flue, of an endless bat receiving and forming belt also located in the flue and disposed at the rear side of the cylinders to form a bat against certain of the latter, and compression-rolls located to receive and compress the bat as it issues from between the belt and the last cylinder of the series.

4. The combination with a single gin-flue, and a series of condenser-cylinders disposed across the flue and located one above the other in closely-adjacent relation to obstruct said flue, of an endless bat receiving and forming belt also located in the flue and disposed at the rear side of the cylinders to form a bat against certain of the latter, and a single roller located within the belt opposite each interval between the cylinders to hold the belt in co-operative relation with a pair of said cylinders.

5. The combination with a single gin-flue, and a series of condenser-cylinders disposed across the flue and located one above the other in closely-adjacent relation to obstruct said flue, of an endless bat receiving and forming belt also located in the flue and disposed at the rear side of the cylinders to form a bat against certain of the latter, a single roller located within the belt opposite each interval between the cylinders to hold the belt in co-operative relation with a pair of said cylinders, and a pair of compression-rolls located immediately below the belt and the lowest cylinder to receive the bat and compress the same.

6. The combination with a single gin-flue, and a blast-flue leading therefrom, of a ver-

tically-disposed series of horizontal condenser-cylinders obstructing the gin-flue, one of said cylinders also serving to obstruct the blast-flue, and an endless bat receiving and forming belt also located within the gin-flue and disposed at the rear side of the cylinders to form a bat against certain of the latter.

7. The combination with a single gin-flue, and a blast-flue leading therefrom, of a vertically-disposed series of horizontal condenser-cylinders located within and obstructing the gin-flue, the top cylinder of the series also serving to obstruct the inner end of the blast-flue, means for rotating the said top cylinder in a direction opposite to the direction of rotation of the other cylinders, and an endless bat receiving and forming belt located at the rear side of the cylinders to receive the lint from all of the cylinders and to form the bat against certain of them.

8. The combination with a vertical series of horizontal condenser-cylinders, and means for supplying lint thereto, of an endless bat-forming device disposed vertically and arranged to doff the thin bat or lint layer from the top cylinder, and to form against the other cylinders a combined bat composed of the bat or

layer doffed from the top cylinder and the bats of the other cylinders, and means for rotating the top cylinder in a direction opposite to the rotation of the other cylinders.

9. The combination with a single gin-flue, and a vertical series of condenser-cylinders therein, of an endless bat-forming device disposed vertically and arranged to doff the thin bat or lint layer from the top cylinder, and to form against the other cylinders a combined bat composed of the bats or lint layers of all of the cylinders, means for rotating the top cylinder in a direction opposite to the direction of rotation of the cylinders against which the combined bat is formed, and a pair of compression-rolls disposed to doff the bat from the lower end of the bat-forming device and from the lowermost cylinder, and to compress said bat prior to its delivery to the press.

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

EDWARD D. CARTER.

Witnesses:

R. E. PENNINGTON,
J. D. CAMPBELL.