(No Model.)

J. O'CONNELL.

COTTON OPENER.

No. 602,265. Patented Apr. 12, 1898.

Fig. 1.

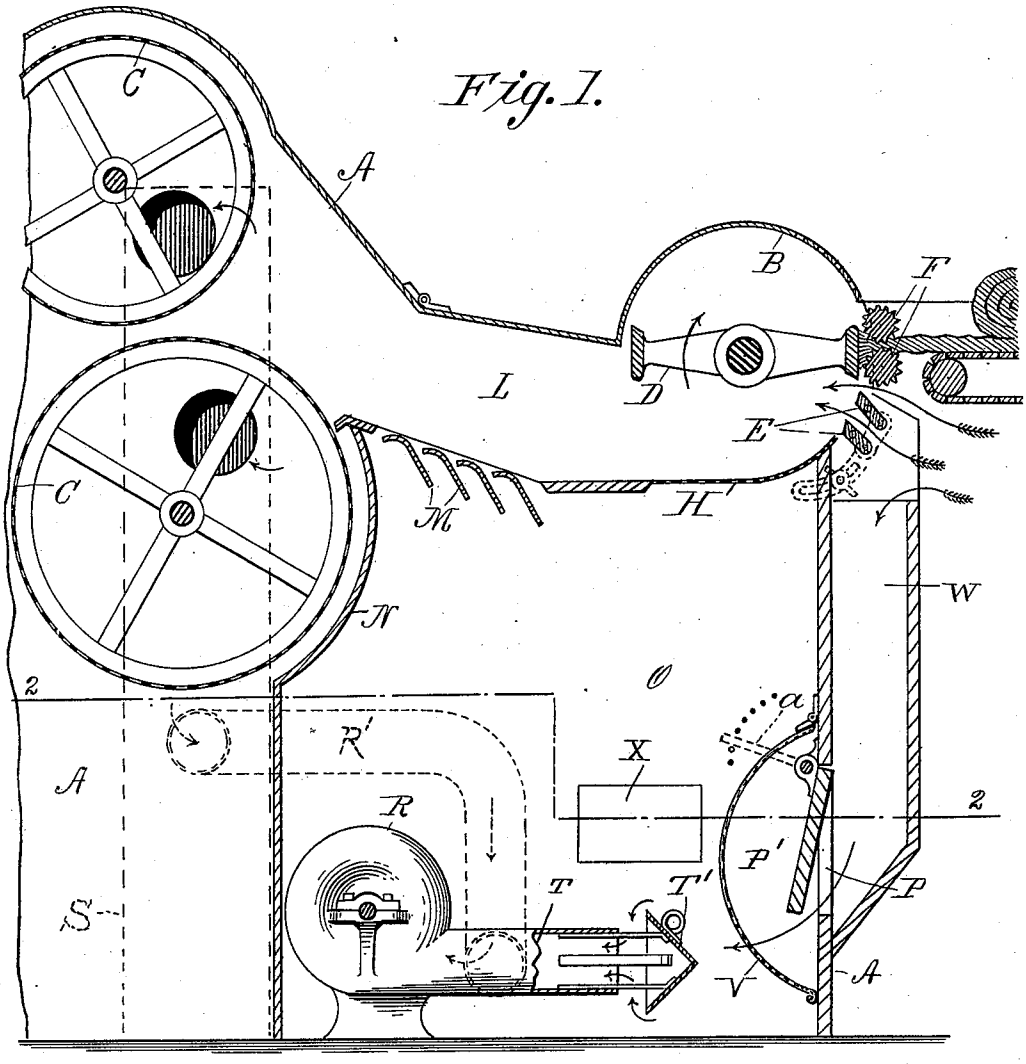
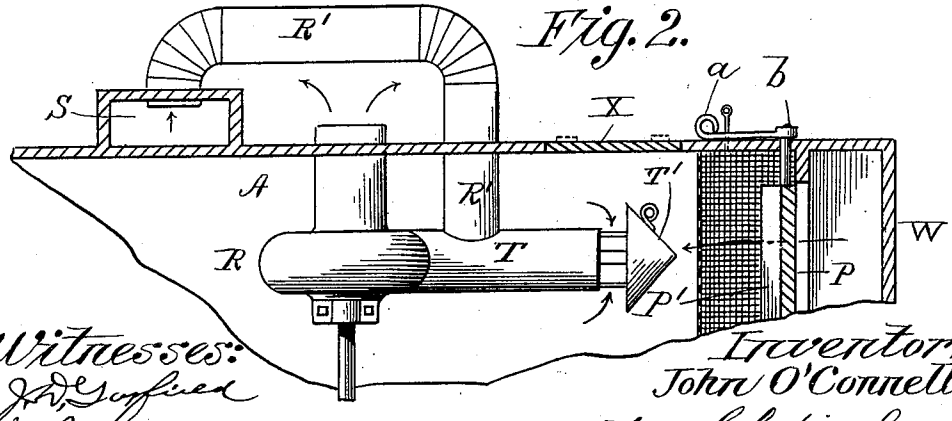


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN O'CONNELL, OF CHICOPEE, MASSACHUSETTS.

COTTON-OPENER.

SPECIFICATION forming part of Letters Patent No. 602,265, dated April 12, 1898.

Application filed September 9, 1897. Serial No. 651,142. (No model.)

To all whom it may concern:

Be it known that I, JOHN O'CONNELL, a citizen of the United States, residing at Chicopee, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Cotton-Openers, of which the following is a specification.

This invention relates to improvements in cotton openers or beaters, and has for its object particularly the improvement in the construction of the feed end of machines of this class whereby the impurities in the fiber are more thoroughly removed therefrom, said improvements being especially adapted to the removal of the very minute pieces of seed-hulls and similar substances which have but little weight and the extraction of which it has always been difficult to accomplish; and the invention consists in the construction of the machine as fully set forth in the following specification and claims and shown in the drawings accompanying the same.

In the drawings, Figure 1 is a vertical section of the feed end of a cotton-opener, showing my improvements applied thereto. Fig. 2 is a sectional plan view of a part of the end of the machine shown in Fig. 1, said section being taken on line 2 2 of that figure.

Referring to the drawings, A is the frame and casing of the machine; B, the beater-cylinder; C C, the cylinders which receive the cotton from the beater-cylinder; D, the beater-arms; E, the adjustable bars, located under the feed-rolls F.

The bars E are so located that their sharpened edges lie in close proximity to the feed-rolls F, to the end that by the rotation of said arms the cotton fiber as it is delivered from between said rolls is struck by the rapidly-rotating beater-arms and finely separated and carried by the said arms across the edges of the bars E. Said bars are so adjusted that their operative edges are turned up at a suitable angle to receive thereby the cotton fiber torn from the mass of fiber fed through the rolls F into the machine. The impact of the beater-arms against the cotton coming from the feed-rolls and the whipping out of said fiber against the edges of the bars E, beat out of it all of the heavier impurities contained therein and drives them out through the said bars.

A screen H of suitable fineness forms the bottom part of the inclosing case B of the beater-arms, and through said screen is drawn the greater part of the finer impurities remaining in the cotton which has been carried by the beater-arms across the edges of the bars E, as will be hereinafter described. A passage L is provided between the beater-cylinder B and the two exhaust-cylinders C C, and, if desired, a part of the bottom of said passage-way may be formed of a series of slats M, constituting a "grating," so called. This grating, however, is not essential to the proper operation of my improvements and forms no part of this invention.

The exhaust-cylinders are inclosed in a part of the machine which has no connection with the part thereof lying under the beater-cylinder and the passage L, a suitable partition N being located across the feed end of the machine and constituting in that part under the beater-cylinder an inclosed chamber O, into which the air has no access except through an opening P in the end thereof and through the screen H and the grating M. A door P', pivotally hung above the opening P, is adapted to close said openings more or less, as may be necessary. The air is exhausted from the cylinders C C by a fan R, located in said compartment O, from the suction-pipe of which a suitable pipe connection R' extends to a vertical conduit S, from which connections are made to the circular stationary heads of one end of the said cylinders. The suction-pipe of said fan is indicated by T and its open end is provided with sliding cap T', by means of which the area of said open end may be reduced, as desired, by moving said cap T' more or less toward the end of said pipe. Said fan R may be rotated in any suitable manner.

A screen V, extending across the machine in the compartment O, is hinged to the end casing, as shown, by its upper edge and is of suitable shape for inclosing the door P' completely. Said screen is for the purpose of catching any of the impurities beaten out of the cotton, and, passing through the bars E, are drawn toward the compartment O through the conduit V V.

An opening X, closed by a suitable door, is made in the casing forming the side of the compartment O, whereby the accumulations

of impurities which are drawn into the said compartment may be from time to time removed.

The swinging door P′ may be operated to open and close the opening P by means of a handle *a*, secured to a rod *b*, attached to the door on the axial line of the hinges thereof, and means are provided for holding said door open to any extent, which means consist of a series of holes bored in the casing of the machine on an arc of a circle concentric with said rod *b*, and a pin inserted in any one of said holes will support the said handle and hold the door open, as desired.

The machine having been set in motion, its operation is as follows: As the cotton begins to pass through the rolls F and is caught by the rotation of the beater-arms between the latter and the edges of the bars E the coarser impurities held in the fiber are beaten out of it and forced out through the bars E, the air having been more or less exhausted from the compartment O by the rotation of the fan R and the door P′ having been opened more or less by the operator. Now the proper operation of the machine, whereby the maximum quantity of the impurities contained in the cotton is removed with the loss of the minimum amount of fiber, depends upon the proper regulation of the air-currents entering the machine and upon means for regulating the relative degree of vacuum to be maintained in the cylinders C C and the compartment O and the beater-cylinder.

When the machine is well under way, the operator by examining the product and the waste of the machine can determine at a glance whether or not the action of the air upon the fiber is such as to insure the best results. If too much loose fiber is found with the waste behind the screen V, it indicates that not enough air is passing through the bars E, and by closing the door P′ more or less the air will pass through said bars in proportion as it is excluded from the vertical conduit V V. If it is found that the finer impurities do not pass down through the screen H in proper quantities, by manipulating the cap T′ on the end of the exhaust-pipe T of the fan to increase the area of the opening of the latter an additional part of the air-current entering through the bars E will be diverted downward through the screen, carrying with it the light particles of seed-hulls, &c., which form the larger part of the impurities at this point. Furthermore, it frequently happens, owing to atmospheric conditions or peculiar conditions of the fiber, that a lesser degree of exhaust is required on the cylinders C C than at other times. When this occurs, the defect is remedied by reducing the exhaust action of the fan on said cylinders by a further opening of the end of the pipe T, as above described, and if this operation causes too strong a current downward through the screen this can be offset by slightly increasing the opening P. From the above description it is seen that by means of my improvements a cotton-opener or similar machine can be adapted to any condition of atmosphere or quality of fiber and while the machine is in operation. The impurities are more perfectly removed and with less waste of fiber than has been possible with machines of this class as heretofore constructed.

What I claim as my invention is—

1. A cotton-opener having suitable feed-rolls, revolving beater-arms, adjustable bars for receiving the impact of the cotton carried by the said beater-arms, means for revolving said arms, a screen near said bars, a compartment under said screen, suitable means for maintaining a partial vacuum in said compartment whereby a current of air is established through said bars into the machine and down through said screen into the said compartment, combined with means for increasing or diminishing said air-current, for the purpose described.

2. In a cotton-opener, suitable feed-rolls, beater-arms revolving in proximity to said rolls within a suitable case, exhaust-cylinders for receiving fiber from said beater-arm case, adjustable bars located in proximity to said feed-rolls, a compartment under said beater-arm case, a conduit or chute having one of its ends connected to the said compartment, and its opposite end lying near said adjustable bars, means for regulating the size of the opening between said conduit and said compartment, a screen between the said beater-case and said compartment, and means for creating a partial vacuum in the latter, substantially as set forth.

3. In a cotton-opener, suitable feed-rolls, adjustable bars located in proximity to said feed-rolls, beater-arms revolving in proximity to said rolls and bars, exhaust-cylinders for receiving cotton from said beater-arms, a suitable casing for said beater-arms and cylinders, a fan, a compartment under said beater-casing, a conduit extended between said compartment and said cylinders, and connected to said fan whereby air may be exhausted from both said cylinders and compartment, means for regulating the amount of air to be so exhausted, and a conduit connected by one of its ends with said compartment and having its opposite end lying near said bars, and means for opening and closing said conduit, substantially as described.

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Witnesses:
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