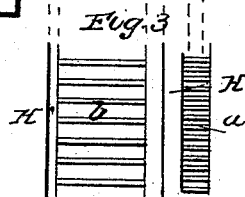
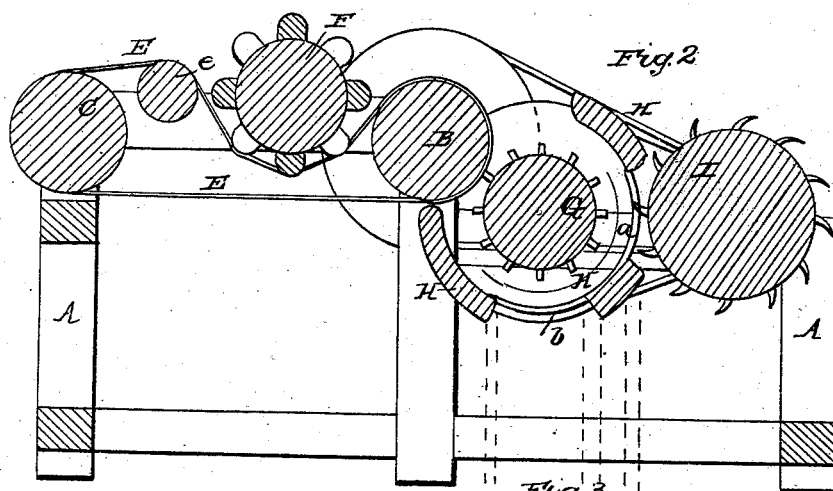


Cotton Gin.

Patented May 8, 1866,



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# UNITED STATES PATENT OFFICE.

EDWARD TOWN, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN COTTON-GINS.

Specification forming part of Letters Patent No. 54,625, dated May 8, 1866.

*To all whom it may concern:*

Be it known that I, EDWARD TOWN, of the city of Washington, in the District of Columbia, have invented a new and useful Machine for Ginning Cotton or Separating the Fiber from the Seed; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan view of the machine. Fig. 2 is a vertical section on the red line X X. Fig. 3 is a detached view of the cylindrical box or receiver H H, the same being inverted or viewed from the bottom, showing the two gratings *a* and *b*.

The same letters of reference in the several figures of these drawings refer to the same parts of the machine.

The object or design of this invention is to produce a machine having an efficiency equal, or nearly equal, to that of the well-known saw-gin, and applicable to the cleaning of the long-staple or Sea-Island cotton, its operation being such that this or any other kind of cotton can be cleaned or separated from the seed or any extraneous matter without breaking the fiber or otherwise shortening or injuring the staple.

To enable others skilled in the art to make and use my invention, I now proceed to describe its construction and operation, as follows:

A is the frame of the machine. B and C are two rollers, over which runs an endless apron, E, of heavy canvas or other suitable material.

F is a studded or knobbed roller, composed either of metal or wood, and constructed as shown in the drawings. The uses of this roller and of the apron E will be fully set forth in a description of their operation.

G is a cylinder armed with short metal teeth on its surface, as shown in the drawings, revolving in the cylindrical receiver H H, the construction and use of which receiver will be understood by reference to the drawings, Fig. 3, and the description of the operation of the machine making part of this specification.

I is a cylinder, on the face of which are fixed a set of teeth, formed as shown in the drawings, arranged in lines equally distant from each other and running round the cylinder spirally. These teeth perform the functions

of the saw-teeth in the well-known saw-gin, as they strike through the grating *a* of the receiver H H and draw the cotton through in the same manner. Thus it will be seen that this part of the machine operates on the principles of the saw-gin, the most noticeable difference being that the teeth are set in the cylinder separately and arranged in a series of helices. But I do not claim either of these peculiarities as essential to my invention, as the same result could be effected with the use of saws by cutting the teeth at the proper distance apart and arranging them properly on the arbor, or other than the helical arrangement might be adopted and all the essential elements of my invention be still retained. I adopt the helical arrangement in this machine as being a convenient one to effect the result aimed at in this invention, which is to so arrange the teeth that those composing the row which strikes the mass of cotton in the receiver at any given time shall be a distance apart equal to the average length of the fiber, and yet all the interstices between the bars of the grating *a* are penetrated alternately, so as to draw the cotton equally from all parts of the mass. Thus it will be seen no single fiber can be seized by two or more teeth at the same time and thereby broken as it is drawn across the bars. By this arrangement, in connection with the other parts of this machine which I claim, the principles of the saw-gin can be applied in cleaning the Sea-Island or long-staple cotton, whereas it is well known that the machines of this kind in common use cannot be used upon this staple without breaking the fiber and thereby rendering it useless for all the purposes to which it is usually applied.

The operation of my machine is as follows: The machine is set in motion by foot, hand, or any other power to which it may be adapted, and the operator feeds the cotton upon the apron E between the roller C and the supporting-roller *c*, taking the cotton by hand from any convenient receptacle and spreading it evenly in a thin layer on the apron as it passes through the machine. The apron carries it forward under the knobbed roller F. This roller is driven at a much higher rate of speed than the apron, and the action of the knobs as they rub the cotton against the apron, which is strained so as to bear against them with considerable pressure, serves to loosen and

free the seeds from their natural connection with the fiber. Experiment shows that if the attempt is made to separate the fiber of the long-staple cotton from the seed by direct tension, as in the action of the teeth of the saw-gin upon the fiber while the seed is held against the bars of the grating, the fiber will break in any part of its length before it will part from the seed, while it is very easily detached by a crowding pressure similar to that effected by the action of the roller and apron, as above described. I will here state that though but one roller, F, is exhibited in the drawings and model accompanying this specification, it being deemed sufficient to illustrate the principle, the working machine is provided with two or more of these rollers, as may be necessary to effect the required result, all constructed and operating precisely as described above, with a supporting-roller similar to the roller *e* between each two, and so arranged that the cotton will pass under the whole set, whatever number may be used, before it passes into the receiver. The fiber and seed, being thus completely freed from their natural connection pass together into the receiver H H. The cylinder G collects the cotton as it passes from the apron E and carries it round with its own revolutions within the receiver. The receiver H H is provided with two gratings, *a* and *b*. The grating *a* forms the front or breast of the receiver, through which the cotton is drawn by the action of the teeth on the cylinder I, the bars being so near together that the seeds cannot pass between them. The grating *b* forms the bottom or under side of the same, the openings between the bars of which grating are wide enough to permit the seeds to pass freely through as the mass is swept over it by the rotation of the cylinder G.

From the above description it may be seen that two new principles are introduced in this machine, by the application of which I am enabled to produce a machine having nearly or quite the efficiency of the saw-gin, and capable of operating upon the long-staple or other kinds of cotton without breaking or otherwise injuring the staple. These principles are, first, the breaking of the natural connection of the seed and fiber by mechanism designed to effect this purpose alone and as a distinct operation, disconnected with any device designed to effect their final separation; and, second, the arrangement of the teeth of the separator in such a manner that no two teeth can strike the mass of cotton so near together as to seize upon the same fiber and thereby break it by drawing it across the bars of the grating, and yet each of the openings of the entire grating will be penetrated alternately, so that the cotton will be drawn evenly from all parts of the mass.

The reason why the first-mentioned principle specified above is necessary or desirable is this, that the peculiar tenacity or adhesion of the seed and fiber in their natural condition

is such that neither the saw-gin nor any other known device designed to fully effect their separation is capable of doing this without breaking the fiber and injuring the staple in a greater or less degree. I therefore use a set of rollers similar to the roller F in combination with the endless apron E, as described in this specification, the action of which combination is well adapted to free the fiber from the seed, it breaking the natural tenacious connection by the only kind of mechanical force yet known that will do this without breaking the fiber in some part of its length. After this result is obtained nothing remains for the separator to do but to lift the fiber from the seed.

The advantage of the second principle mentioned above is obvious from its statement.

Thus, having fully described and set forth the principles and operation of my invention, it is only necessary, in order to complete a full description of the working machine, to state that the mechanical details necessary to its successful operation, which form no part of my invention, and therefore are not represented in the model and drawings accompanying this specification, are as follows:

First, the roller C is set in sliding journal-boxes, with screws and nuts for guiding the run and regulating the tension of the apron E, according to the well-known method adopted in all machines in which an endless running-apron is used.

Second, it is necessary to use some device to prevent the cotton from clinging to the apron and to secure its leaving it at the proper time to pass into the receiver. A revolving brush, or a comb, or any other convenient device may be used for this purpose.

Third, the cotton is cleared from the teeth on the cylinder I by a revolving brush, such as is commonly used for this purpose.

I now proceed to state my claim as follows:

1. The arrangement of the teeth in the separator, as and for the purposes described and set forth in this specification—viz., so arranging them that no two or more teeth can seize upon the same fiber at the same time, and thereby break it by drawing it across the bars of the grating, and yet so arranging the teeth that all the interstices between the bars of the grating will be penetrated alternately, so as to draw the cotton equally from all parts of the mass, as specified.

2. The studded or knobbed roller F, or a set of such rollers, operating in combination with the endless apron E, as described, and for the purposes set forth in this specification.

3. In combination, the revolving cylinder G and the cylindrical receiver H H, with its two gratings, *a* and *b*, operating together, as and for the purposes described and set forth in this specification.

EDWARD TOWN.

Witnesses:

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