

No. 739,246.

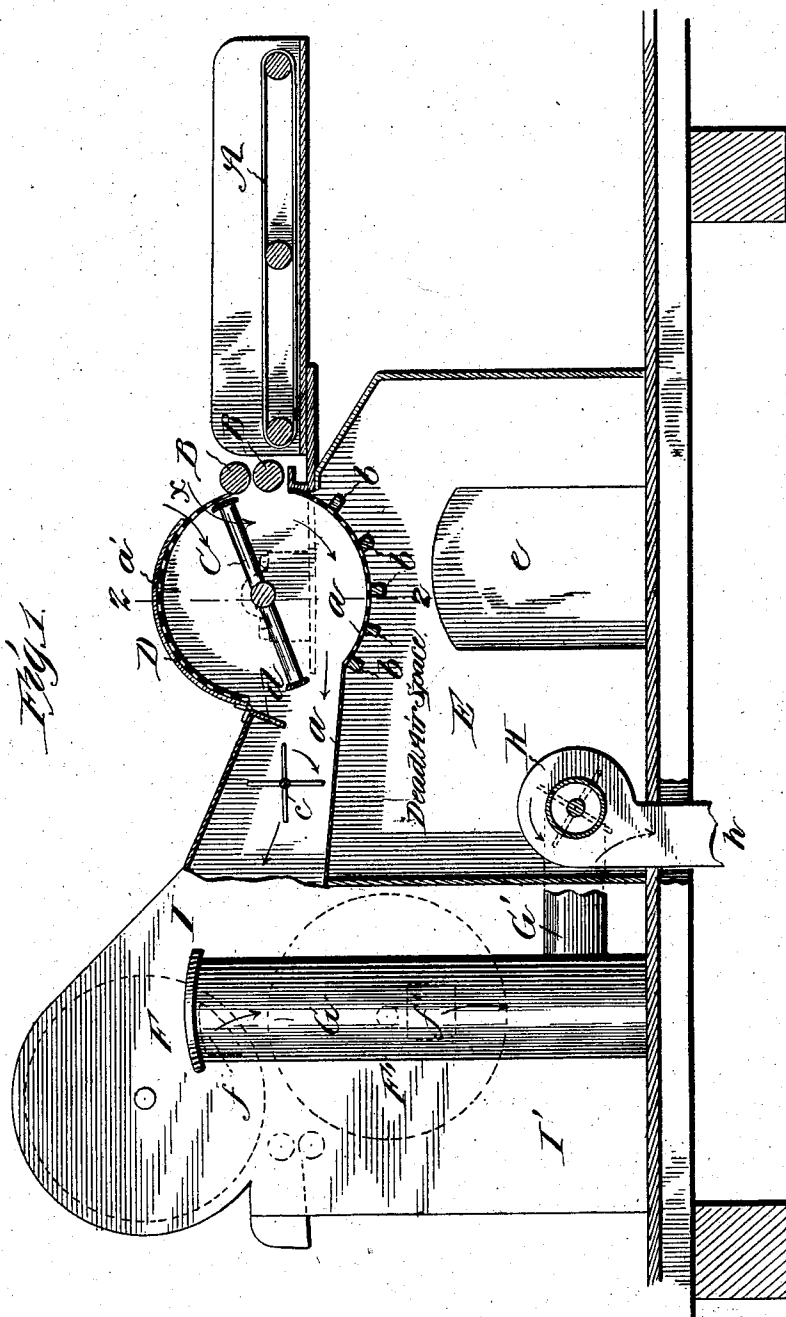
PATENTED SEPT. 15, 1903.

D. J. WINN.  
MACHINE FOR OPENING AND CLEANING COTTON.

APPLICATION FILED MAR. 13, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

*Geo. P. Hingshney,*  
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INVENTOR

*David J. Winn.*

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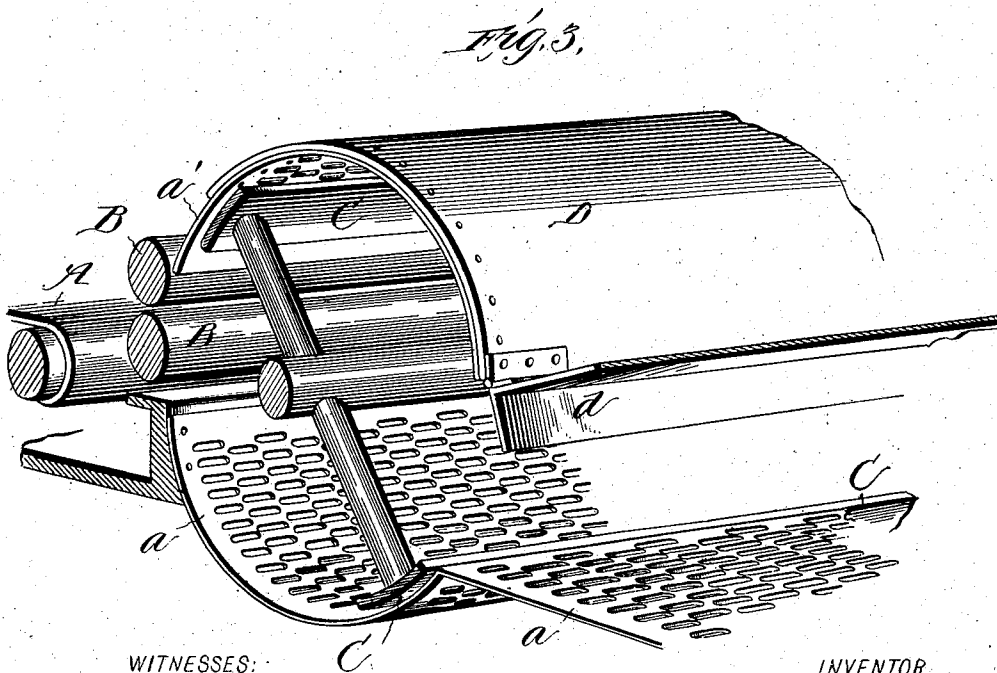
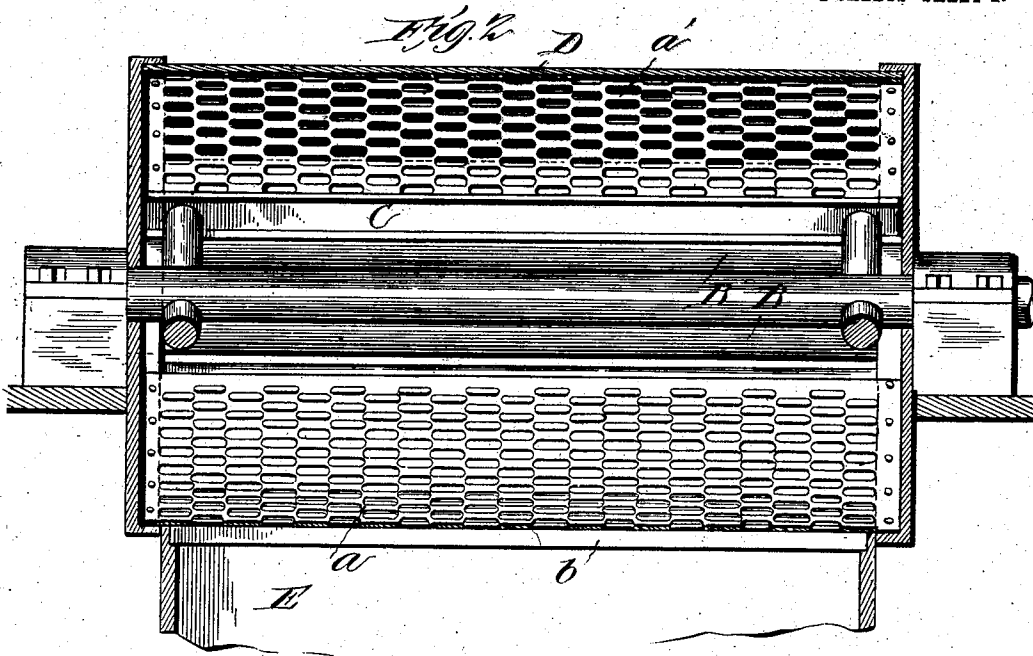
PATENTED SEPT. 15, 1903.

D. J. WINN.  
MACHINE FOR OPENING AND CLEANING COTTON.

APPLICATION FILED MAR. 12, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

DAVID JAMES WINN, OF SUMTER, SOUTH CAROLINA.

## MACHINE FOR OPENING AND CLEANING COTTON.

SPECIFICATION forming part of Letters Patent No. 739,246, dated September 15, 1903.

Application filed March 13, 1903. Serial No. 147,631. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID JAMES WINN, of Sumter, in the county of Sumter and State of South Carolina, have invented a new and useful Improvement in Machines for Opening and Cleaning Cotton, of which the following is a specification.

The opening and cleaning of cotton as it comes from the bale or the gin and before going to the carding-machine has generally been accomplished by a machine of that type of which the Kitson machine, Patent No. 144,394, is the best-known example, in which the cotton passes along a feed-apron between two feed-rolls into a chamber containing a revolving beater, the bottom of which beater-chamber is formed of separate parallel grids. The cotton thus opened passes out between two large wire-mesh screen-cylinders, which compress the lint into a flat bat. A suction-fan is combined with these parts, so as to draw from the interior of the screen-cylinders and discharge into a dust-chamber below the floor. At the same time air is drawn from the chamber below the grids or grating of the beater-chamber, so that this air in rising through this grating will prevent the cotton fiber with the dust, motes, lint, and lighter impurities from passing down between the grids, but will allow the beater to drive down through the grids from centrifugal action the imperfect seed and such heavier impurities and knots of cotton as are able to resist and fall through the uprising currents of air. This apparatus while in general use allows all of the finer impurities to pass along out with the cotton without being separated therefrom, such fine impurities being unseparated and getting into the carding-engine, where they do much damage to the teeth, and into the spinning-machine, where they involve the breaking of threads and the production of a large quantity of waste. These finer impurities, which are so difficult to separate and dispose of and which involve serious objections in the machine and a depreciation in the value of the stock, are what my machine is designed to take out in a preliminary way before even the larger impurities are taken out, the latter being removed in a subsequent operation by one of

the Kitson machines, hereinbefore referred to. By thus preliminarily taking out these finer and refractory impurities all the subsequent operations on the cotton are relieved of their objectionable presence, the life of the carding and spinning machinery is prolonged, and the quality of the cotton improved and made of greater commercial value.

My invention consists in certain special constructions and arrangements of parts, acting on the general principle of the machine described, but having important novel features which after long experimentation and careful adjustment of the agencies employed I find accomplish almost perfectly the very desirable object hereinbefore named. This novel construction and arrangement I will first fully describe in connection with the drawings, and then point out in the claims.

Figure 1 is a partial longitudinal section of my machine, taken in a vertical plane transversely to the beater. Fig. 2 is an enlarged vertical transverse section on line 2 2 of Fig. 1, the slots of the open bottom and inner lining of the top being shown somewhat larger than correct proportion for clearer illustration. Fig. 3 is a sectional perspective view looking in one end of the beater-chamber.

In the drawings, A represents the feed-apron, which feeds the cotton taken from the bales between the two rollers B, whence it passes into a beater-chamber having a revolving beater C and an open bottom and then passes into the throat of a casing II' and between the wire-screen cylinders F F', by which it is compressed into a lap which is discharged continuously at one side. A suction-fan H draws air through the side flues G and G', the vertical members G of which open through holes *f* and *f'* in the casing into the interior space of the screen-cylinders.

As so far described my machine does not differ materially from those already in use. In such old machines, however, the fan H drew the air into the beater-chamber from the chamber E beneath the open bottom of the beater-chamber, and the air passing upwardly through more or less widely-separate grids held the cotton lint and the finer impurities from dropping down, allowing only the imperfect seed, knots of cotton, and heavier im-

purities to drop down into the subjacent chamber. In my invention the air is drawn into the beater-chamber above the feed-rolls at *x*, and no air rises through the open bottom of the beater, the space below the said bottom being a dead-air space, which extends all the way from the feed-rolls B B to the discharge end of the open bottom. This dead-air space is one of the elements necessary to the success of my invention, but not the only one. Its especial value is to allow the finer and lighter impurities to gravitate into this dead-air space instead of being forced up and out with the cotton by the air rising through the open bottom.

I will now describe the other elements of my invention which contribute to its successful action. First, the open bottom *a* of the beater-chamber is of a special construction. I have found that if separate parallel grids are used for this open bottom, with no air rising through them, the cotton fiber under the high speed and centrifugal action of the beaters will pass between the grids and go into the subjacent chamber with the impurities. If round holes in a perforated sheet are used, the beaters sweep the cotton into the converging sides of the circular holes and wedge it tightly therein, stopping up the holes, and besides the holes do not give the jar or shake to the fiber that is necessary to whip or beat the fine impurities out of the same—that is to say, a mere round hole does not allow the fiber from centrifugal action to bulge into or protrude into said round hole far enough to get a distinct blow against the edge of the hole, and besides the edge of the hole is a curve, which does not give a sharp impact, as does a straight line at right angles to the plane of revolution of the beater.

With an open bottom *a* constructed, as shown in Figs. 2 and 3, of heavy sheet metal perforated with slots about one-half inch long and one-eighth inch wide and with the slots arranged parallel with the axis of the beater I have found that the fiber does not drive through in thin sheets, nor are the holes stopped up, and yet as the beater, revolving at the rate of several thousand revolutions a minute, swings the fiber around and presses it from centrifugal action in rapid transit across the slots transversely to their length the fiber strikes the straight edges of the slots with a sharp and infinitely rapid recurring impact which jars the fine impurities and short fiber or lint out of the stock, and as no air-current is rising through the open bottom there is nothing to impede the fall of these lighter impurities into the dead-air space below and separation is effectively accomplished. This slotted metal *a* is supported on cross-bars *b* and extends along the throat of the casing I, forming its bottom, to a point near the screen-cylinders. This same perforated metal of the special slotted construction described is continued at *a'* around and forms the lining of the upper portion D of

the beater-casing, which is hinged on top, so as to permit it to be raised up to inspect the interior. This lining of the upper portion of the beater-casing serves to produce a greatly-increased beating action of the fiber, which shakes up and opens the cotton and gets it into condition for more thorough extraction of the intimately-lodged fine impurities which I seek to remove.

The air which passes into my machine enters above the feed-rolls B B through an uncovered portion of the perforated material *a'*, and thus passes through the cotton in gaining the interior and helps to loosen up and dislodge the fine impurities. As there are no rising air-currents through the open bottom in the beater-chamber, but only a suction above the cotton, I find it desirable to energize the movement of the fiber after it leaves the beater-chamber by one or more feeding-wheels or subsidiary beaters *c*, having radial arms. The casing of the main beater is also extended down at *d*, so as to deliver the cotton to the bottom part of this feed-wheel or beater *c* instead of allowing it to be wound around the wheel.

In my invention I have shown a beater C of the type known as the "bar-beater," having slats or bars parallel with the axis of the beater; but it will be understood that any other form of beater may be used, this forming no part of my invention.

The subjacent chamber E, which for all practical purposes when in operation is a tightly-closed chamber, is provided with a door *e*, through which the accumulated impurities are removed from time to time.

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

1. In a cotton opener and cleaner of the kind described, the combination with the revolving beater; of a subjacent open bottom composed of slotted sheet metal having its slots arranged parallel with the axis of the beater, and a tightly-closed subjacent chamber forming a dead-air space below said open bottom substantially as and for the purpose described.

2. In a cotton opener and cleaner of the kind described, the combination with the revolving beater; of a subjacent open bottom composed of slotted sheet metal having its slots arranged parallel with the axis of the beater, a cover for the beater lined with said slotted sheet metal, and a tightly-closed subjacent chamber forming a dead-air space below said open bottom substantially as and for the purpose described.

3. In a cotton opener and cleaner of the kind described, the combination with the revolving beater; of a subjacent open bottom composed of slotted sheet metal having its slots arranged parallel with the axis of the beater, two feed-rolls for the beater and a cover for the beater lined inside with the slotted sheet metal, the outer casing of the

cover stopping short of the feed-rolls to allow air to be taken in above the feed-rolls, and a tightly-closed subjacent chamber for the beater forming a dead-air space below the open bottom of the beater substantially as described.

4. In a cotton opener and cleaner of the kind described, the combination with the revolving beater; of a subjacent open bottom, a casing for the beater having feed-rolls and an opening in the casing above the feed-rolls, a depending wing or deflector for the discharge side of the casing of the beater, and a supplementary revolving beater or feed-wheel arranged behind said depending wing

substantially as and for the purpose described.

5. In a cotton opener and cleaner of the kind described, the combination with the revolving beater and its feed-rolls; of a subjacent open bottom having a dead-air space below it extending from the feed-rolls to the discharge end of the open bottom, a casing having inlet-openings for air above the feed-rolls and a suction-fan substantially as shown and described.

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Witnesses:

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