# S. D. KEENE.

## COTTON-OPENER AND CLEANER.

No. 173,646. Patented Feb. 15, 1876.

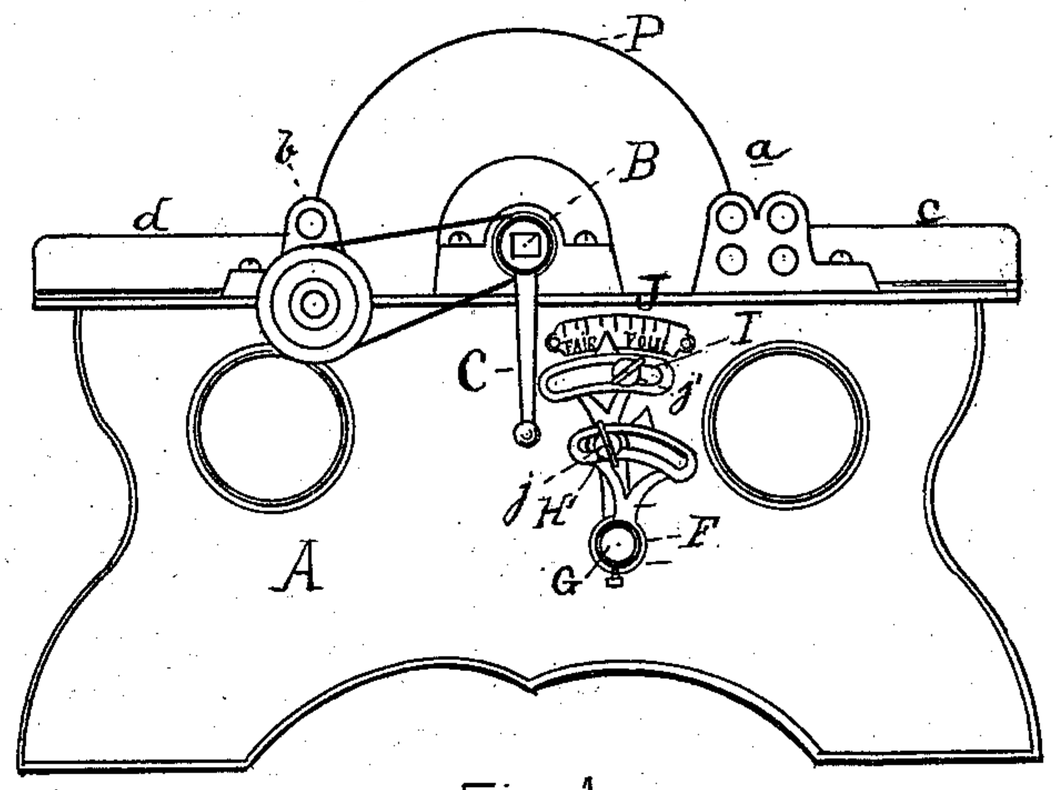


Fig. 1.

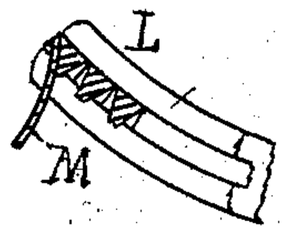


Fig. 5

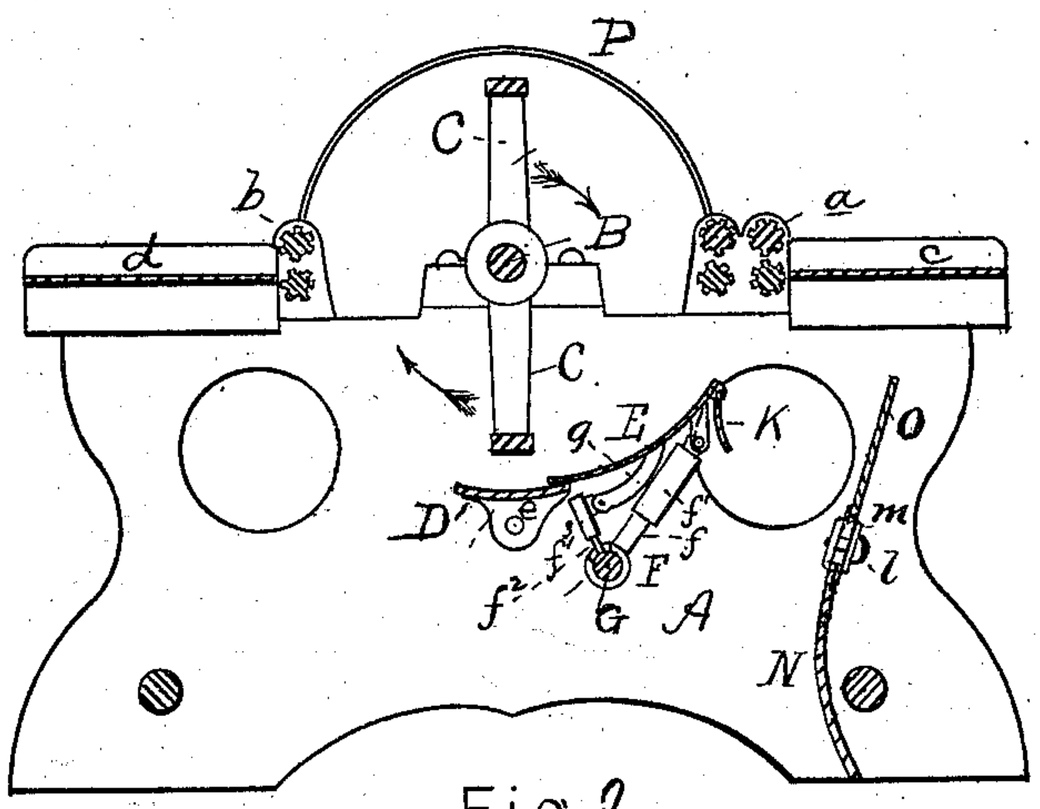


Fig. 2.

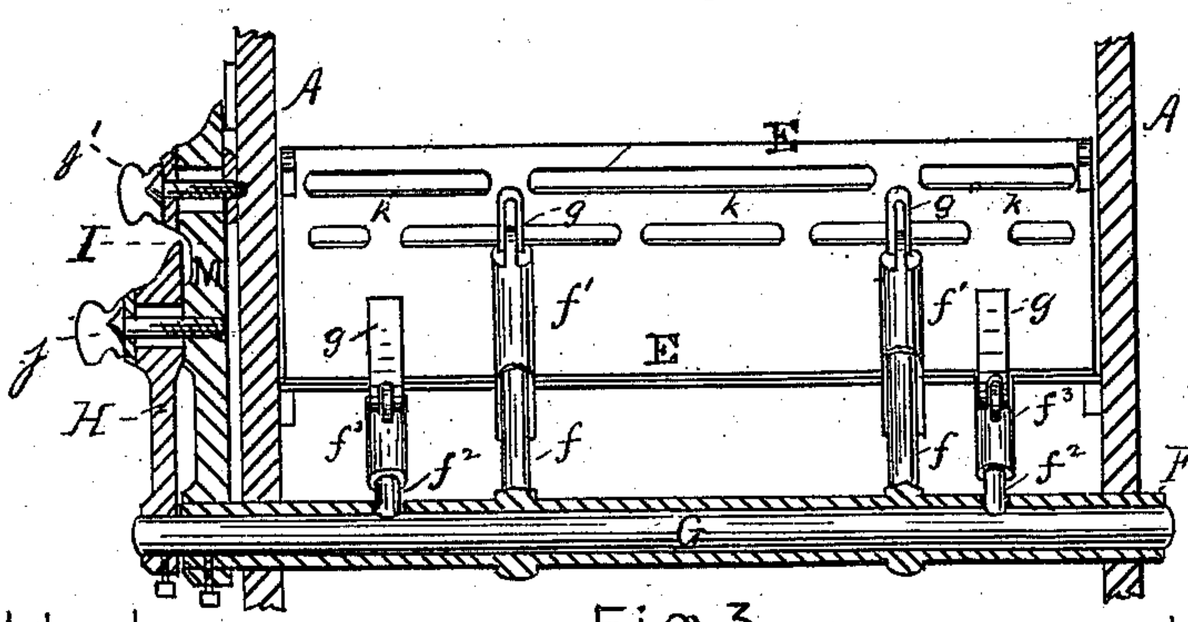


Fig. 3.

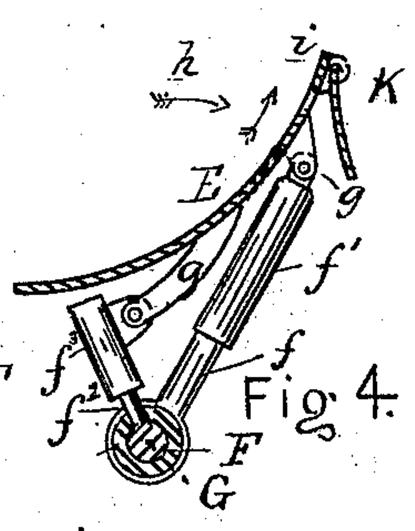


Fig. 4.

WITNESSES

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S. DAVIS KEENE, OF PROVIDENCE, RHODE ISLAND.

## IMPROVEMENT IN COTTON OPENERS AND CLEANERS.

Specification forming part of Letters Patent No. **173,646,** dated February 15, 1876; application filed July 31, 1875.

*To all whom it may concern:*

Be it known that I, S. DAVIS KEENE, of Providence, in the county of Providence and State of Rhode Island, have invented certain Improvements in Cotton Openers and Cleaners, of which the following is a specification:

The object I have in view is the better and more convenient cleaning of cotton from all impurities which detract from its marketable value; and my invention therein consists, mainly, in the means employed for regulating the admission and direction of currents of air into the machine; in the means employed for regulating the position of the separator or grill, and in the various operative combinations of the several operative parts, all as more fully hereinafter described and explained.

In the drawings making a part of this specification, Figure 1 is a side elevation of my machine; Fig. 2, a longitudinal vertical section of the same; Fig. 3, a vertical cross-section of the same; Fig. 4, an end view of the separator and attachments; and Fig. 5, a similar view of the grill and its deflector-wing.

Like letters denote corresponding parts in each figure.

Upon a suitable frame, A, and upon bearings mounted on either end of the same, are placed the feeding-rolls *a*, withdrawing-rolls *b*, feeding-apron *c*, and withdrawing-apron *d*. In other suitable bearings, placed centrally upon the frame A, is journaled the beater-shaft B, carrying beater-arms C. Neither of these parts constitute any portion of the invention claimed in this application. A lag-board or girt, D, passes across the lower central part of the machine, and is supported upon suitable bearings, *e*. A separator, E, rests, at its lower edge, upon the girt D, and is rendered adjustable by the following means: A hollow shaft, F, which passes through the machine from side to side a little below and one side of the girt D, has within it another shaft, G. The shaft F has arms *f*, with sleeves $f^1$, which latter are pivoted to the under side of the separator, near its upper edge. Other arms, $f^2$, are secured upon the shaft G at right angles to the arms *f*, having sleeves $f^3$, which, in turn, are pivoted to a rigid arm, *g*, which, in turn, is firmly secured to the under side of the separator at a point near its lower edge. The arms $f^2$ have freedom of movement in the shaft F by means of slots made therein. It follows, then, that the shaft F, being rotated, the upper edge of the separator will have a rotary movement about said shaft, as shown by the arrows *h* in Fig. 4, while the rotation of the shaft G insures the movement of the separator up and down, as shown by the arrows *i* in Fig. 4. To make this movement effectual from the outside of the machine an indicator-arm, H, is secured upon the end of the shaft G, and another similar arm, I, upon the shaft F. Each of these arms is quadrant-shaped, and has a slot in its periphery. Through the slot in the arm H a set-screw, *j*, passes into the arm I, which serves to secure the arm I to the arm H at any point in the slot of the arm H, and a set-screw, *j'*, passes through the slot in the arm I into the side of the machine, which serves to secure the arm H at any point in its own slot. A fair and foul weather scale, J, is secured to the side of the machine, opposite to the pointer of the indicator-arm I, corresponding in length with the movement permitted to it by its set-screw *j'*. It follows, then, that, the set-screws *j j'* being loosened, the indicator-arm I has a rotary movement independent of that of the arm H; but, if the set-screw *j* is turned up, then the arm H is moved by the movement of the arm I; also, the arm I being held by its set-screw, the arm H has an independent movement. The separator E has, near its upper edge, a series of slots, *k*, shown particularly in Fig. 3, and at its upper edge a wing-deflector, K, preferably pivoted to it.

Instead of the separator E there may be used a grill, L, as shown in Fig. 5, having a wing-deflector, M, and arranged and adjusted in the same manner with the separator E.

The particular advantage of the grill may be found in its better adaptation to the cleaning of very dirty or sandy cotton, by reason of its numerous spaces admitting more freely the passage of objectionable material, and giving, also, a larger circulation of air-currents.

The feed end of the machine is nearly closed by draft-regulators, being two plates, preferably curved, as shown, the lower plate

N being secured to the machine, and the upper plate O overlapping the other, being capable of being raised or lowered by means of set-screws *l* operating in slots *m* in the said plate O.

A cover, P, covering and protecting the beater and serving to exclude the air, completes the enumeration of the parts of my machine, the operation of which will be next described, it being understood that an exhaust is used in connection with this machine, in the way common with machines for like purposes.

The cotton, entering upon the apron *c*, passes between the feeding-rolls, by the increased speed of the last set of which it is drawn into a thin film, which extends under the beaters and up through the rolls *b*, from which it is delivered upon the apron *d* in a clean condition. The film of cotton is subject to the impact of the beaters from near the point after it leaves the feeding-rolls until near the point where it enters the last set of rolls, and is all the time subject to currents of air created by the exhaust passing through it. Cotton, however, is much inclined to take moisture from the atmosphere, and requires a greater volume or force of air-currents in damp weather than in bright, clear weather, and cottons also vary greatly in the amount of dirt and other foreign matter contained in them, the dirtier and more impure cotton usually requiring a greater volume or current of air for proper cleaning. Accordingly the separator E or grill L is adapted to be raised or lowered, or more or less inclined, by the mechanism before described, by which the space for the entrance of air is enlarged or diminished. In the revolutions of the beater the dust, motes, and other light foreign matter thrown over the edge of the separator or grill would be withdrawn by the suction of the beater as it passes over the separator or grill back again upon the same through the openings in the separator or grill, which has been a serious disadvantage in this class of machines. To remedy this, I provide the separator or grill with a wing or deflector, the effect of which is to deflect or turn such foreign substances over the separator or grill and away from the sucking action of the beater, so that they fall by their own gravity. This action may be beneficially assisted, in the different varieties of dirty cotton, by having the deflector hinged so as to give it different degrees of inclination. The action of the regulator governs the size of the air-opening to suit the necessities of the case, without changing the speed of the beater or of the exhaust-fan.

Having thus described my machine, what I claim as new therein is—

1. In a machine for cleaning cotton, the combination of a deflector-wing with a separator, substantially as and for the purposes set forth.

2. In combination with a separator or grill having a deflector-wing, the draft-regulator N O, substantially as and for the purposes set forth.

3. In combination with the separator or grill, the shafts F and G, with their arms $f$, $f^1$, $f^2$, $f^3$, for the purpose of adjusting the separator or grill, substantially as described.

4. In combination with a separator or grill and its operating arms and shafts, the indicator arms H and I, with their set-screws for the purpose of adjusting the said separator or grill, substantially as described.

S. DAVIS KEENE.

Witnesses:
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P. EVANS, Jr.