(No Model.)

S. D. KEENE.

COTTON OPENER AND CLEANER.

No. 307,118. Patented Oct. 28, 1884.

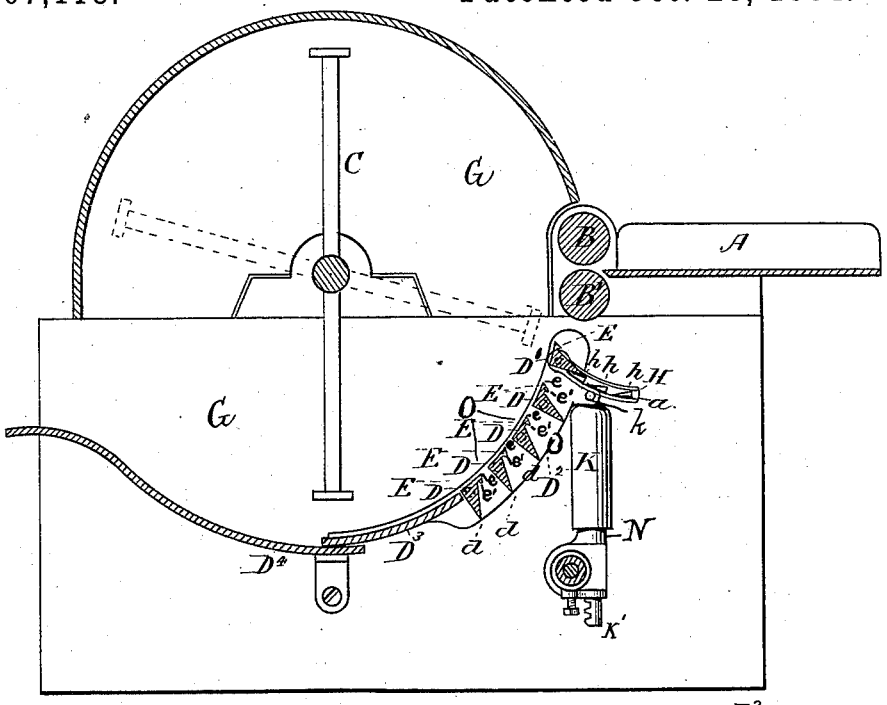

Fig. 1.

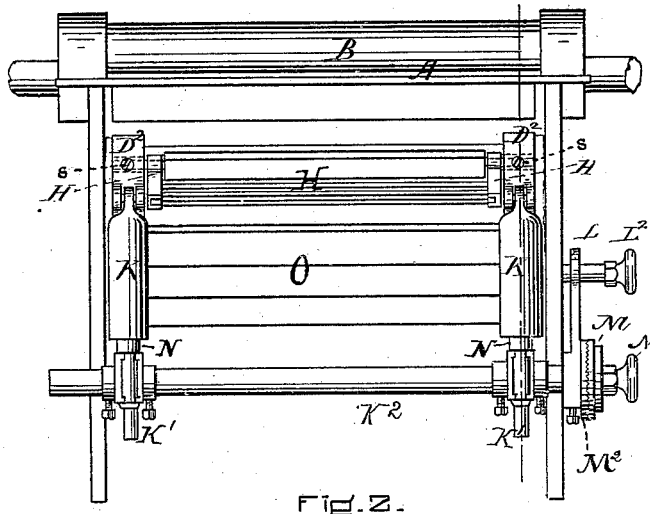

Fig. 2.

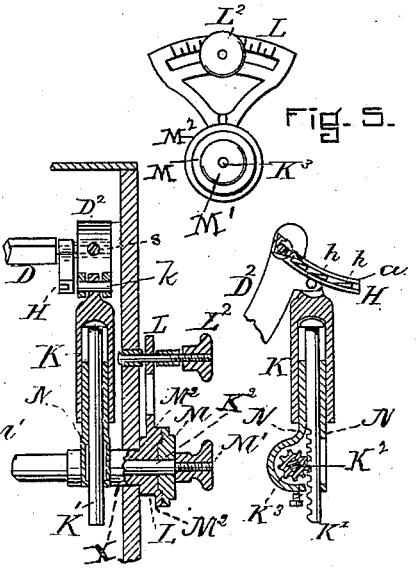

Fig. 5. Fig. 3. Fig. 4.

WITNESSES.

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COTTON OPENER AND CLEANER.

SPECIFICATION forming part of Letters Patent No. 307,118, dated October 28, 1884.

Application filed May 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL D. KEENE, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Cotton Openers and Cleaners; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates particularly to that part of a cotton opener and cleaner known as the "separator," the object being to make the separator more effective in the treatment of various classes of cotton fiber, including cotton waste; and to this end the said invention consists, principally, in the novel construction of the grill-bars, whereby double or two separate whipping-edges are provided to the same, the re-entrance within the machine of dirt, &c., once removed from the cotton by the action of the beaters prevented, and the said bars adapted to be adjusted within the side pieces which support them to change the angle of the said bars, and then securely held in adjusted position.

It consists, further, in the particular construction of the devices employed to adjust the grill in a vertical and lateral direction, whereby the parts becoming clogged by escaping dirt, cotton, &c., is prevented; and it consists, finally, in other operative combinations of the various parts of the machine, all as and for the purposes more particularly hereinafter described and claimed.

In machines of this character beaters revolving in a shell strike against the sheet of cotton fiber drawn into the machine by feed-rolls, and by this striking beat out and separate dirt, seed, leaf, motes, and other foreign matter, which fall through bars and out of the machine. This rapid rotation of these beaters creates an air-draft or suction of air into the machine, which has a tendency to draw back into the machine through the spaces between the lower bars foreign matter, particularly of the lighter character, which has been beaten through the spaces between the upper bars. Various expedients have been resorted to to prevent this drawing back into the machine of such foreign matter in the treatment of all kinds of cotton fiber, but, so far as I am aware, without much success.

Referring more particularly to the accompanying drawings for a better comprehension of my invention, Figure 1 represents a vertical longitudinal sectional elevation of a part of an opener embodying my invention; Fig. 2, a front end elevation of the same. Figs. 3, 4, and 5 illustrate details of the mechanism employed to adjust the grill in a vertical and lateral direction.

A represents the feeding-trough within which the feeding-in apron is situated, B B′ the feeding-rolls, and C the beater, all of a well-known construction and arrangement.

O represents the main grill, composed of a series of bars, D D′, which are pivoted in side pieces, D^2, having secured to their lower ends a curved plate, D^3, which plate extends from the lower edge of the lower grill-bar a sufficient distance to rest upon the bottom D^4 of the beater cylinder or shell G, and thereby support the said grill at its lower end. Each of these grill-bars D D′ may be adjusted or turned on its axis, and then held by a set-screw, *s*, which, entering through the side pieces, D^2, impinges against the journals formed on the ends of said grill-bars, whereby any desired angularity relatively to the orbit of the beaters may be given thereto and the same be secured in the adjusted position. This angle necessary for the grill-bars to assume is ascertained upon trial by the experienced operator, and varies somewhat as the staple being used varies in quality, the position shown in Fig. 1 being a suitable one for ordinary qualities of cotton fiber.

Each of the grill-bars D D′ is made with a re-entering angle, E, so that when the motes or other foreign matter is once knocked out of the cotton and falls between the bars and upon the upper surface of the same, and attempts to re-enter the cylinder because of the influence exerted upon it by the indraft created by the revolving beaters, said motes, &c., are caught and held against the angle E, where they accumulate until sufficient to overcome the indraft, when they, by gravity, fall off the upper surfaces of the several bars and away from the machine. Should the lighter foreign matter be drawn inward in falling from the outer

edge of any of the upper grill-bars, the lower or the lowest grill-bar in any event is sure to catch it by its angle E and prevent its entrance into the cylinder or shell.

At the upper end of the side pieces D^2 is arranged a second grill, H, which may be used to great advantage. The bars *h* of this grill are secured between side pieces *a a*, which in turn are mounted at their inner ends upon the top grill-bar, D′, which bar, as before stated, has its journal-bearings within the side pieces D^2, whereby simultaneously with the turning of the said bar D′ to change the angle thereof the elevation or depression of the grill H may be correspondingly effected. Instead, however, of mounting the said side pieces *a a* of this grill H upon the top grill-bar, D, of the grill O, the said side pieces may be journaled directly to the top of the said side pieces D^2 and move independent of the top grill-bar, if desired. This grill H is for the purpose of obstructing the return of any light motes, seed, or leaf, &c., which may be driven out of the top of the grill by the action of the beater; and the bars *h*, composing the said grill, are preferably formed of sheet metal bent in triangular form in cross-section and arranged with one angular point or edge in each toward the cylinder, as shown. These bars are made smaller than the ones D D′, and they are slightly separated from each other, so as to allow the motes and other foreign matter to drop between them.

The grill-bars D D′ are, as shown, made triangular in cross-section, with the point or apex *d* of the triangle pointing outward and the base or largest end inward, and on the same curve with the curve of the orbit of the beaters C.

By reason of the formation of the grill-bars D D′ with the re-entering angle E, another very important function is the result, in addition to that of said re-entering angle preventing the return of dirt, &c., in that the edge formed by the re-entering angle presents an additional whipping-edge to the cotton to that afforded by the front edges of the bars. In other words, the cotton, when acted upon by the beaters C, is whipped over the top edge, *c*, of the bars D D′, and around the same, and against the edge *e*′, formed by the re-entering angle E. Thus, as before stated, two whipping-edges are provided, and the result is a quick and effectual cleaning of the cotton.

The main grill O, as before stated, rests at its bottom upon the bottom of the cylinder G, and at its top it is pivoted to a sleeve, K, by which means the said grill O, together with the grill H, mounted thereon, is supported at its top, and may be swung out and in. This sleeve K is pivoted, as at *k*, to the side pieces D^2, and has a vertical movement upon another sleeve, N, which in turn is pivoted to the round portion of a shaft, K^2. A bar, K′, which extends up through the sleeve N, and at its upper end takes against the upper inner surface of the head of the sleeve K, has a rack at its lower end, into which a cog-wheel, K^3, meshes. The outward and inward movement of the grill O is effected by a slotted quadrant, L, which is secured to or integral with the collar X, forming a part of the sleeve N. L^2 is a pinch-screw attached to the frame of the machine and working in the slot in the quadrant. When, therefore, this pinch-screw is loosened and the quadrant moved, the collar X, together with the sleeves N and K, is correspondingly turned, and the grill O, together with the short grill H, secured thereto, thereby moved outward or inward, as the case may be.

The up-and-down motion given to the grill O is effected by the cog-wheel K^3, which is secured upon a square portion of the shaft K^2, and meshes with the rack K′, so that when this cog-wheel K^3 is turned the grill-supporting sleeve K, together with the grills O and H, is raised and lowered to any desired degree.

One jaw, M, of a clutch is secured upon the squared portion of the shaft K^2, and when it is desired to operate the mechanism by which the grill is raised or lowered said jaw is turned either in one direction or the other, and, operating the cog-wheel K^3, secured upon shaft K^2, the bar K′ is run up or down, as the case may be, and the grill correspondingly affected. To secure the parts, the jaw M of the clutch is pressed into contact with jaw M^2, forming a part of or integral with the quadrant, by means of the thumb-nut M′.

As will be seen, the side pieces D^2, forming the support for the grill-bars, are made curved to correspond with the curvature of the shell, and the grill-bars are arranged in this frame on the same curve as that of the orbit of the beaters, so that the face of each bar shall be at an equal distance from the periphery of the beaters, and thus all the bars will be acted on equally.

Having thus described my invention, what I claim therein as new, and desire to secure by Letters Patent of the United States, is as follows, viz:

1. The combination, with the curved side pieces, of the grill-bars provided with re-entering angles adjustably arranged within said side pieces, and means for holding said grill-bars in adjusted positions, as and for the purposes set forth and shown.

2. The combination, with the curved side pieces and grill-bars secured therein, of the short laterally-arranged grill secured at the top of the curved side pieces, as and for the purposes set forth and shown.

3. The combination, with the curved side pieces and the grill-bars secured therein, of the short laterally-arranged side pieces and a series of bars triangular in cross-section secured within said side pieces, as and for the purposes set forth and shown.

4. The combination, with the grill O, composed of the curved side pieces D^2 and the bars D D′, of the mechanism for elevating said

grill, consisting of the sleeve K, pivoted to the side pieces D^2, sleeve N, and rack-bar K′, working within said sleeve K, shaft K^2, gear-wheel K^3, secured to said shaft and meshing with the rack-bar K′, jaws M M^2, and clamping-nut M′, as and for the purposes set forth and shown.

5. The combination of the curved side pieces D^2 and the bars D D′ with the sleeve K, pivoted to said side pieces, sleeve N, and rack-bar K′, working within the sleeve K, shaft K^2, upon which the sleeve K revolves, gear-wheel K^3, secured to said shaft and meshing with the rack-bar K′, jaws M M^2, clamping-nuts M′ L^2, and segment L, integral with the sleeve N, all constructed and arranged as described, whereby the grill frame may be either raised or lowered or oscillated, for the purposes specified.

6. The combination, with the cylinder or shell and the beater revolving therein, of the curved side pieces adapted to the curvature of the shell, and the grill-bars adjustably secured within said side pieces, each formed with a re-entering angle and two whipping-edges, substantially as described, for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL D. KEENE.

Witnesses:

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