

No. 684,388.

Patented Oct. 8, 1901.

A. D. THOMAS.
COTTON CLEANER.

(Application filed Sept. 10, 1900.)

(No Model.)

2 Sheets—Sheet 1.

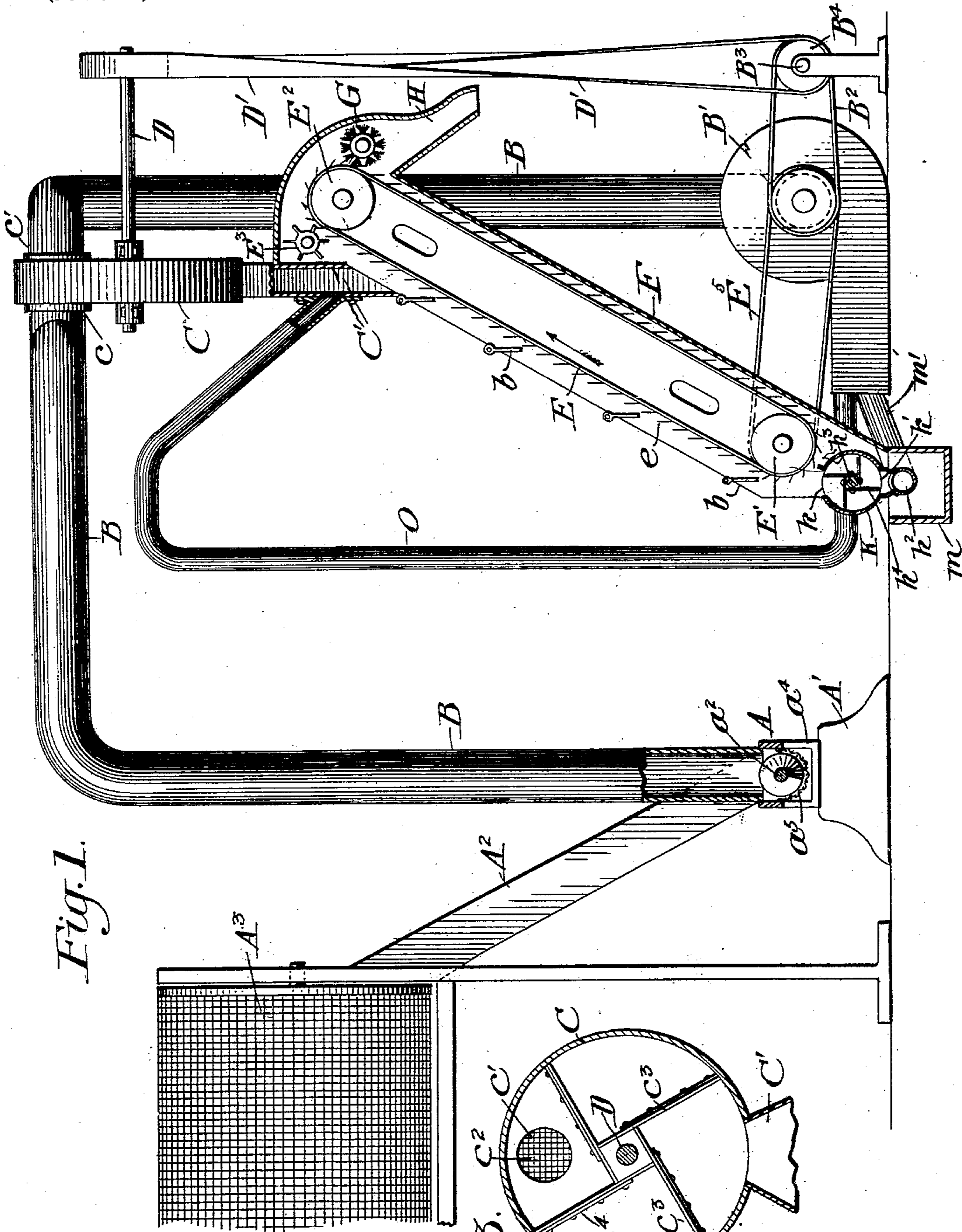


Fig. 1.

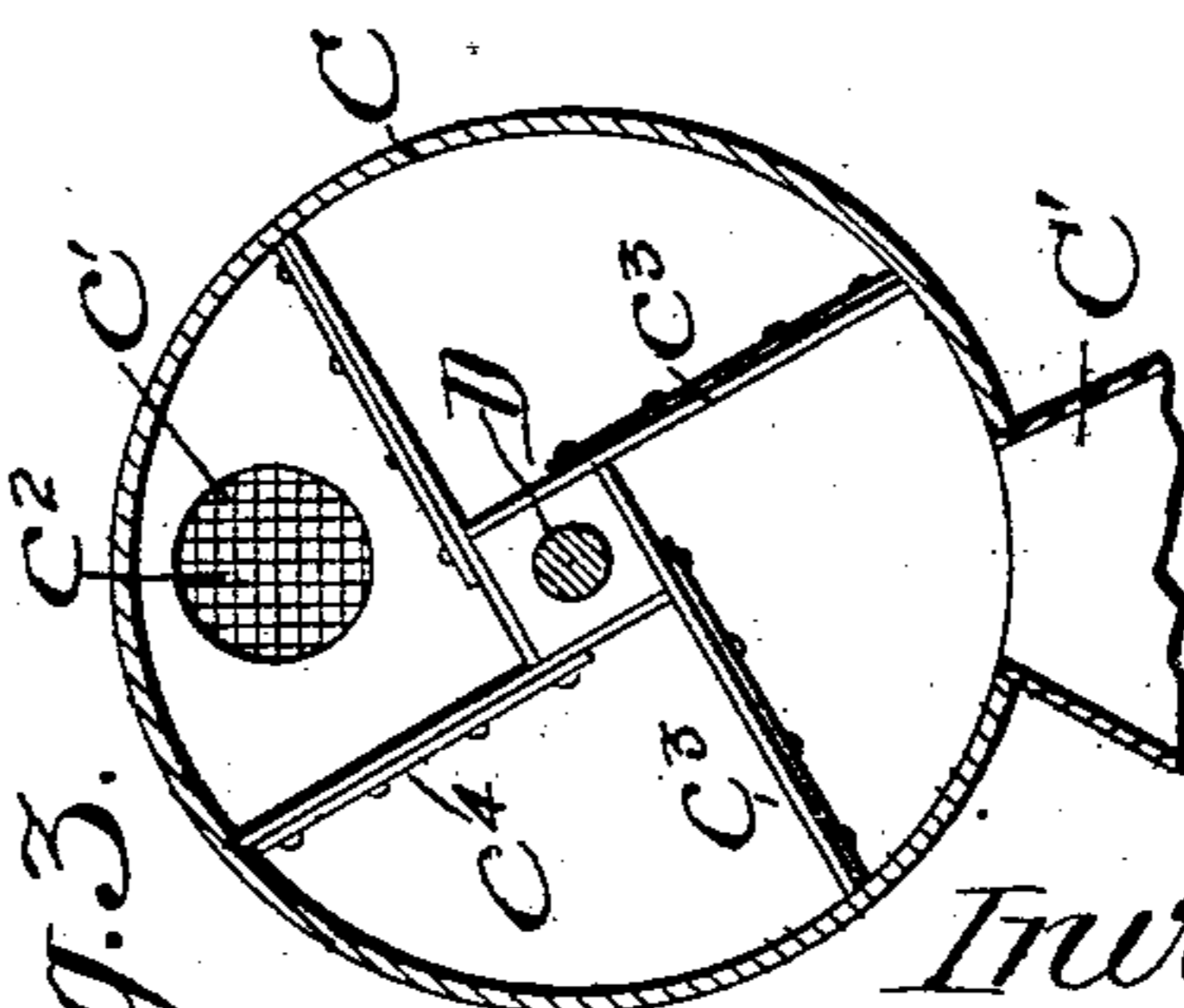


Fig. 3.

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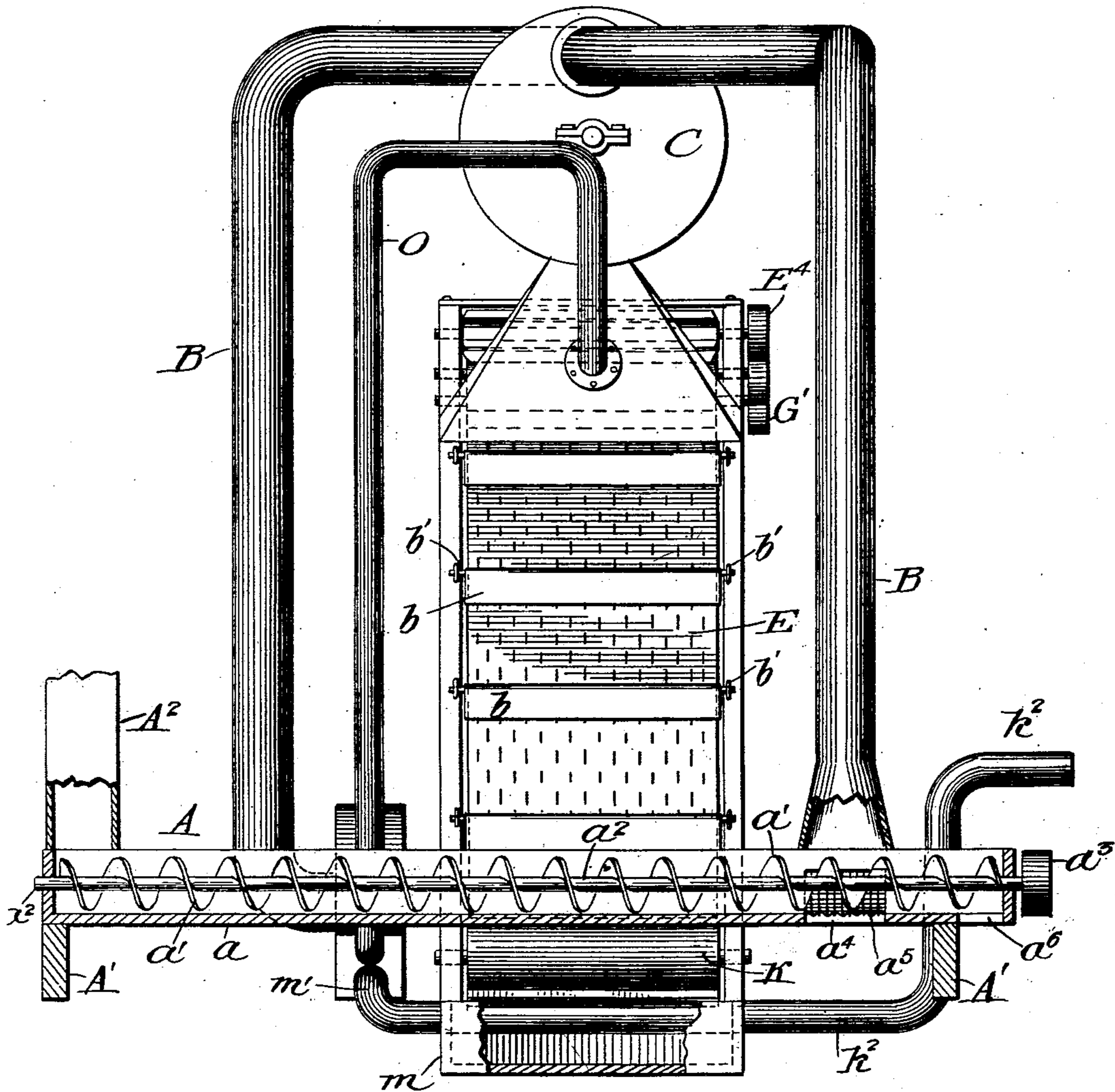
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2 Sheets—Sheet 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

ABNER D. THOMAS, OF LITTLE ROCK, ARKANSAS, ASSIGNOR TO THOMAS MANUFACTURING CO., OF SAME PLACE.

COTTON-CLEANER.

SPECIFICATION forming part of Letters Patent No. 684,388, dated October 8, 1901.

Application filed September 10, 1900. Serial No. 29,497. (No model.)

To all whom it may concern:

Be it known that I, ABNER D. THOMAS, a citizen of the United States, residing at Little Rock, county of Pulaski, and State of Arkansas, have invented certain new and useful Improvements in Cotton-Cleaners, of which the following is a specification.

The invention to be hereinafter described relates to cotton-cleaners for separating cotton from accompanying and adhering substances, and more particularly to that type of such device especially designed to treat very hully cotton—such, for instance, as comes from the boll-screen in oil-mills, commonly denominated “grabots.” The product of the boll-screen usually consists of a mixture of hulls, seed, cotton, or short fiber and many forms of foreign substances—such as cobs, nails, coal, pieces of wood, and the like—that are commonly mixed with the material sold to the oil-mills, and such mixture heretofore has been usually disposed of as a waste product; but as such mixture contains much valuable fiber and seed—often as much as from one to three pounds of fiber or lint-cotton and from two to five pounds of seed in each ton of the material crushed—it becomes desirable to reclaim the same from the less valuable portions.

It is therefore the object of my present invention to provide means whereby the heavy or foreign substances referred to are first separated from the mixture and then the hulls and lighter substances are eliminated from the cotton fiber, leaving the latter free from them and the foreign substances referred to, that it may be subjected to the treatment of an ordinary gin, thereby producing a fairly-good sample of cotton.

With the above objects in view my invention, generally stated, consists of means for eliminating the heavy foreign substances from the mixture and for separating the hulls and light materials from the lint or fiber and attached seed, all as will be hereinafter more fully described, and definitely pointed out in the claims.

While I have shown in the present embodiment of my invention the boll-screen as connected by a chute to the device which embraces my invention, it is to be understood

that the material may be delivered for treatment by other means, my invention not being limited in this respect, and while I have illustrated a particular form of apparatus and disposition of parts as the preferred construction it is to be understood that the same may be varied without departing from the spirit of my invention.

In the drawings, Figure 1 is a side elevation of my device or apparatus, showing portions of an ordinary boll-screen connected thereto, with some of the parts in section. Fig. 2 is a front view of the apparatus, parts also being shown in section; and Fig. 3 is a sectional detail of the separator, to be described.

Preferably disposed in proximity to the remainder of the apparatus on appropriate supports A' A' is a conveyer A, preferably, though not necessarily, of the screw-type and consisting of a trough *a*, in which works a screw *a'*, mounted on a suitable supporting-shaft *a''*, driven by any suitable means, as a pulley *a'''*, from a convenient source of power. Discharging into the trough *a* is the chute A², leading from the usual boll-screen A³, by which the material may be treated at once as it leaves said screen. It is to be understood, of course, that the boll-screen and chute are not necessary adjuncts of the apparatus and that the material, if desired, may be fed to the conveyer or trough by hand or other means. At a point in its length the trough *a* is provided with an opening *a*⁴, covered by a screen *a*⁵, and beyond said screen with a second opening *a*⁶, so that material fed to the trough at one end will, upon rotation of the screw conveyer, be caused to traverse the trough to the other end thereof. Rising from the trough and connected thereto over the screen *a*⁵ is a suction-pipe B, connected to a suitable suction device, as the fan B', which derives motion by means, such as the belt B², from a line or other shaft B³ and its pulley B⁴, driven from any suitable source of power. By the construction thus far described it will be seen that as the material fed to the conveyer is passed across the screen *a*⁵ the light portion thereof, such as the lint or fiber and attached seed, together with much of the light hulls, will be drawn by the suction device

upward into the suction-pipe B, while the heavy particles—such as cobs, nails, coal, pieces of wood, and so on—will be uninfluenced by the suction created across the screen and will be carried by the conveyer to the opening or outlet a^6 , whence they will fall from the apparatus and be eliminated.

Interposed in the length of the suction-pipe B is a separator C, consisting of a casing having opposite openings in its side walls, as at $c\ c'$, with which the pipe B is connected, as will appear from Fig. 1. The opening c' on the exit side of the casing is covered by a wire or other screen c^2 , so that while the air drawn through the tube B by the suction device may pass freely therethrough the fiber, seed, and hulls are intercepted and continually swept from the screen c^2 by the arms c^3 of the separator, which are mounted upon a shaft D, driven by the belt D' from the line or other shaft B³. The arms c^3 accurately fit the casing, being preferably edged with rubber or like material c^4 , which effectually prevents currents of air from passing to the suction device through the discharge or hopper C' and at the same time effectually sweeps all material from the screen c^2 .

Subjacent the discharge or hopper C' of the separator C is a spiked apron E, passing over rolls E' E² and preferably inclined somewhat to the vertical, though such inclination is not essential, the teeth e on said apron being preferably of highly-tempered steel and of a size that while they incline to catch and retain any fiber they do not materially retard the downward progress of the hulls and other particles denuded of lint under the action of gravity. To aid in the elimination of the hulls and like denuded material, I journal near the upper roll E² a spiked beater E³, which, being driven by the pulley E⁴ from a suitable driving means, serves to tear up, disintegrate, and throw upon the fine steel teeth e of the apron E the material fed thereto from the separator. The effect of this beater is to give impetus to the hulls and other particles, which, being denuded of fiber, do not readily catch upon the fine teeth, and to cause them to fall to the lower end of the casing F, in which the endless belt E is mounted, and yet facilitate the engagement of any lint or fiber-bearing particles, such as seed and the like, upon the teeth of the apron, whereby they are carried over the roll E² to be detached therefrom by the brush or other device G, driven by the pulley G' through any convenient belt connection. (Not necessary to illustrate.) The casing F is preferably carried over the beater, upper roll E², and brush G and is provided with a discharge-chute H, by which the lint and fiber bearing particles, such as seed and the like, are delivered for further treatment by an ordinary gin. The rolls E' E² may be driven from any convenient source of power, as by the belt E⁵.

Adjacent the upward-moving run of the belt E and loosely swinging in bearings b' on

the side of casing F are the riffle-boards B, which as the material falls toward the lower end of the belt serve to yieldingly force it upon the teeth thereof, so that should any fiber-bearing particles or seed fail to catch the teeth under the action of the beater E³ they will be forced into engagement with said teeth and be carried upward to the brush G.

At the lower end of the casing F and in position to receive the hulls and other particles denuded of lint as they fall under the action of gravity is the vacuum-trough, comprising a casing K, having an inlet k at its upper side and an outlet k' in its under side discharging into an air-pipe k^2 . In the vacuum-trough is journaled the shaft k^3 , having arms k^4 , which accurately fit the interior of the trough, the said shaft being rotated by any usual means to thereby deliver the hulls and like material that fall into the trough between the arms k^4 into the discharge-opening k' and the air-pipe k^2 . The said air-pipe k^2 is connected to the discharge m' of the fan B', whereby a blast of air is sustained through said pipe to carry the hulls and other material delivered thereinto from the apparatus to any desired point, the arms k^4 in the vacuum-trough preventing the blast of air from passing into said trough. Below the air-pipe k^2 a trough or receptacle m may be provided, if desired, to catch any hulls or like material that may slide down the lower wall of the casing F, and from which trough they may be removed as necessary.

From the construction thus described it will be seen that the heavy material—such as cobs, nails, coal, and the like—is separated from the mixture fed to the conveyer as the latter passes the mixture over the screen a^5 and that the light particles, including the hulls, lint-bearing seed, and the like, are carried to the separator by the suction device, where they are swept into the discharge or hopper C' and onto the teeth of the endless belt E. Here the lint or fiber bearing particles, such as seed and the like, are caused to be caught by the teeth of the apron, while the denuded hulls and other matter not being readily retained on the fine teeth fall to the vacuum-trough K and are ultimately driven from the apparatus by the blast of air from the fan B, the lint-bearing seed and fiber being in the meantime carried by the apron E to the brush G, where they are detached and pass into the delivery-chute H.

To further insure a proper catching of the fiber on the teeth of the apron as the material is fed thereonto from the separator, I provide means for directing a blast of air across the path of the falling material and toward the apron, such means comprising a blast or auxiliary pipe O, connected to the discharge or hopper C' and to the exhaust of the fan B'. It will be noted that the pipe O at its connection with the hopper C' is directed diagonally downward, thereby serving to give to the material as it falls past the mouth of the pipe O a forcible downward movement onto the

teeth of the apron, with the effect that lint and fiber bearing particles are brought into intimate contact with and are engaged by the said teeth, while the hulls and denuded material not readily caught by the fine teeth of the apron continue to fall to the bottom of the casing F. It will thus be seen that the air-blast delivered by the auxiliary pipe O serves to aid the beater and riffle-boards in causing a separation of the material into two divisions—one that contains all the lint and fiber bearing particles of the mixture which is caught by the teeth of the apron E and delivered to the chute H and the other that contains all the hulls and denuded particles that fall to the bottom of the casing F and are delivered to the air-pipe k^2 . It is to be understood, of course, that the auxiliary pipe O and the air-blast delivered thereby are not always necessary, as it is evident that under some circumstances and in the treatment of some characters of mixture complete separation of the materials as specified may be accomplished without the aid of such pipe and blast.

For the purpose of clearness and to avoid excessive repetition it is to be understood that in the claims when reference is made to "heavy particles" it means such adulterations as coal, cobs, iron, wood, and the like, and where reference is made to "fiber-bearing" and "non-fiber-bearing" particles it means with respect to the former such matter as seed and the like, to which there is still clinging some fiber or lint and free fiber, and with respect to the latter only those portions to which no fiber adheres, such as hulls and the like. When reference is made to "light particles," it means a mixture of fiber and non-fiber bearing particles, as above defined and as distinguished from the heavy particles.

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

1. In a cotton-cleaner, the combination of a trough or casing into which the material to be cleaned may be placed, a conveyer to move said material in said trough or casing, an exhaust-pipe connected to said trough or casing, means to produce an air-current in said pipe and across the path of movement of the material in the trough or casing to lift the light from the heavy portions of the material and carry it to be afterward treated, said trough or casing being provided with an opening through which the heavy portions may be positively moved and discharged by the conveyer, and means connected to the exhaust-pipe for separating the lint and denuded portions of the material.

2. In a cotton-cleaner, the combination of means for separating the light from the heavy portion of the material to be treated, means to thereafter separate the lint and fiber bearing portions from the denuded portions, said means comprising an apron and provisions

for forcing the light portion of the material upon said apron to cause the lint and fiber bearing portions to adhere thereto.

3. In a cotton-cleaner, the combination of means for separating the light from the heavy portion of the material to be treated, an apron provided with teeth, means for dropping the separated light portion upon said apron to have the lint and fiber bearing particles engage the teeth of said apron, means for removing the lint and fiber bearing particles from said apron, and a discharge for the denuded particles and hulls below said apron.

4. In a cotton-cleaner, the combination of means for separating the light from the heavy portion of the material treated, and means to thereafter separate the fiber-bearing particles from the non-fiber-bearing particles, said means comprising an apron provided with teeth, rolls around which said apron passes, means for delivering the fiber and non-fiber bearing particles to the action of said apron, a beater to tear apart and throw said particles onto the teeth of the apron to cause the fiber-bearing particles to catch thereon and the non-fiber-bearing particles to be forcibly thrown toward the bottom of the apron, a discharge-chute for the non-fiber-bearing particles, and means to detach the fiber-bearing particles from the teeth of the apron and deliver them separated from the non-fiber-bearing particles.

5. In a cotton-cleaner, the combination of means for separating the light from the heavy particles of the material treated, and means to thereafter separate the fiber-bearing particles from the non-fiber-bearing particles, said means comprising an apron provided with teeth, devices for dropping the light particles toward said apron, and an air-blast for forcibly throwing the said particles onto said apron to cause the fiber-bearing particles to be caught by the teeth of the apron.

6. In a cotton-cleaner, the combination of means for separating the light from the heavy portions of the material treated, and means to thereafter separate the fiber-bearing from the non-fiber-bearing particles, said means comprising an apron provided with teeth, means for delivering the light particles or portion to said apron, means to direct a blast of air across the path of movement of said particles or portions to forcibly carry the same onto the apron, and a beater adjacent said apron.

7. In a cotton-cleaner, the combination of means for separating the light from the heavy portions of the material treated, and means to thereafter separate the fiber-bearing from the non-fiber-bearing particles, said means comprising an apron provided with teeth, rolls over which the apron is passed, a beater near the upper of said rolls, riffle-boards pivoted in proximity to the upward-moving run of said apron to force the material into contact with the teeth thereof and means to de-

tach the fiber-bearing particles from said teeth and deliver them separated from the non-fiber-bearing particles.

8. In a cotton-cleaner, the combination of
5 means for separating the light from the heavy particles or portions of the material treated, and means to thereafter separate the fiber-bearing from the non-fiber-bearing particles, said means comprising an apron provided
10 with a surface adapted to catch and retain fiber, rolls over which said apron is passed, devices for delivering the light particles or portion to said apron, a beater near the upper end portion of the apron, riddle-boards pivotally arranged along the upper run of said
15 apron, and means for directing a blast of air to carry the light particles or portion forcibly onto the apron.

9. In a cotton-cleaner, the combination of
20 means for separating the light from the heavy portions or particles of the material treated, a traveling apron onto which the light portions or particles are delivered, means for forcing the said portions or particles into contact with said apron to cause the lint to adhere thereto, a vacuum-trough below the said

apron, an air-pipe into which said vacuum-trough discharges, means for producing a blast of air through said pipe, and devices for
30 detaching the fiber-bearing particles from said apron and delivering them separated from the non-fiber-bearing particles.

10. In a cotton-cleaner, the combination of a conveyer, a suction-pipe connected thereto for separating the light from the heavy particles, a separator connected to said pipe, an
35 apron provided with teeth onto which the separator discharges the light particles carried from the heavy particles in the conveyer, a suction-fan connected to said suction-pipe, and an auxiliary pipe leading from the discharge of the suction-fan to direct a current
40 of air across the path of the light particles as they are being delivered from the separator and to force said particles onto the apron.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ABNER D. THOMAS.

Witnesses:

BEN. D. SCHAADY,
GEO. TAYLOR.