

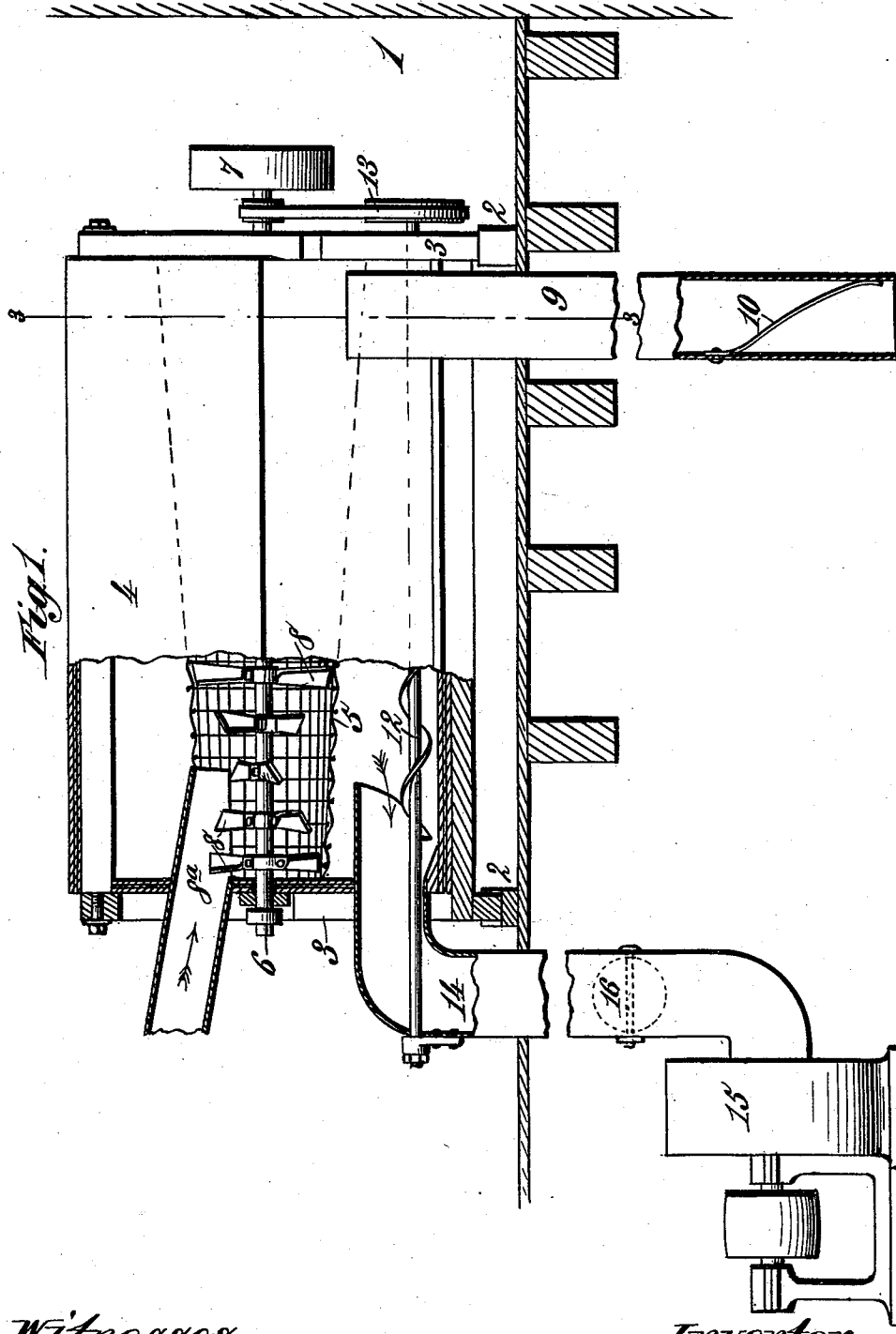
(No Model.)

3 Sheets—Sheet 1.

S. D. MURRAY.
COTTON CLEANING APPARATUS.

No. 547,671.

Patented Oct. 8, 1895.



Witnesses:
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Inventor.
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By James L. Norris.
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(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

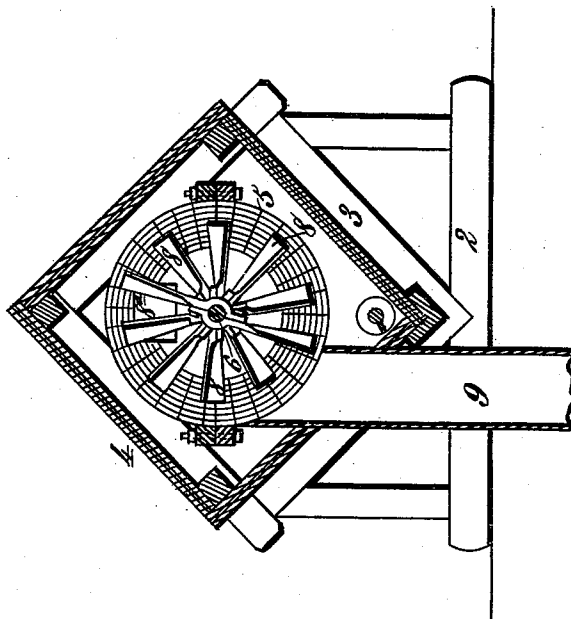
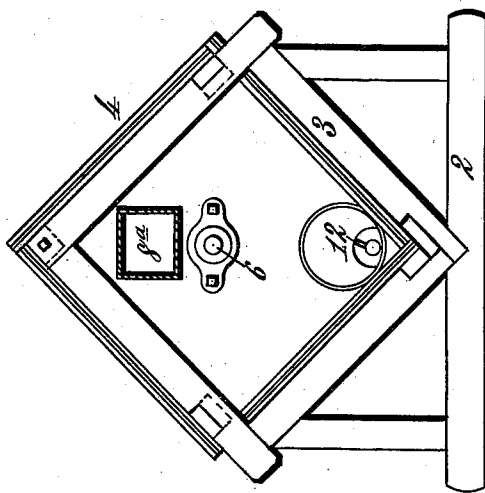


Fig. 2.



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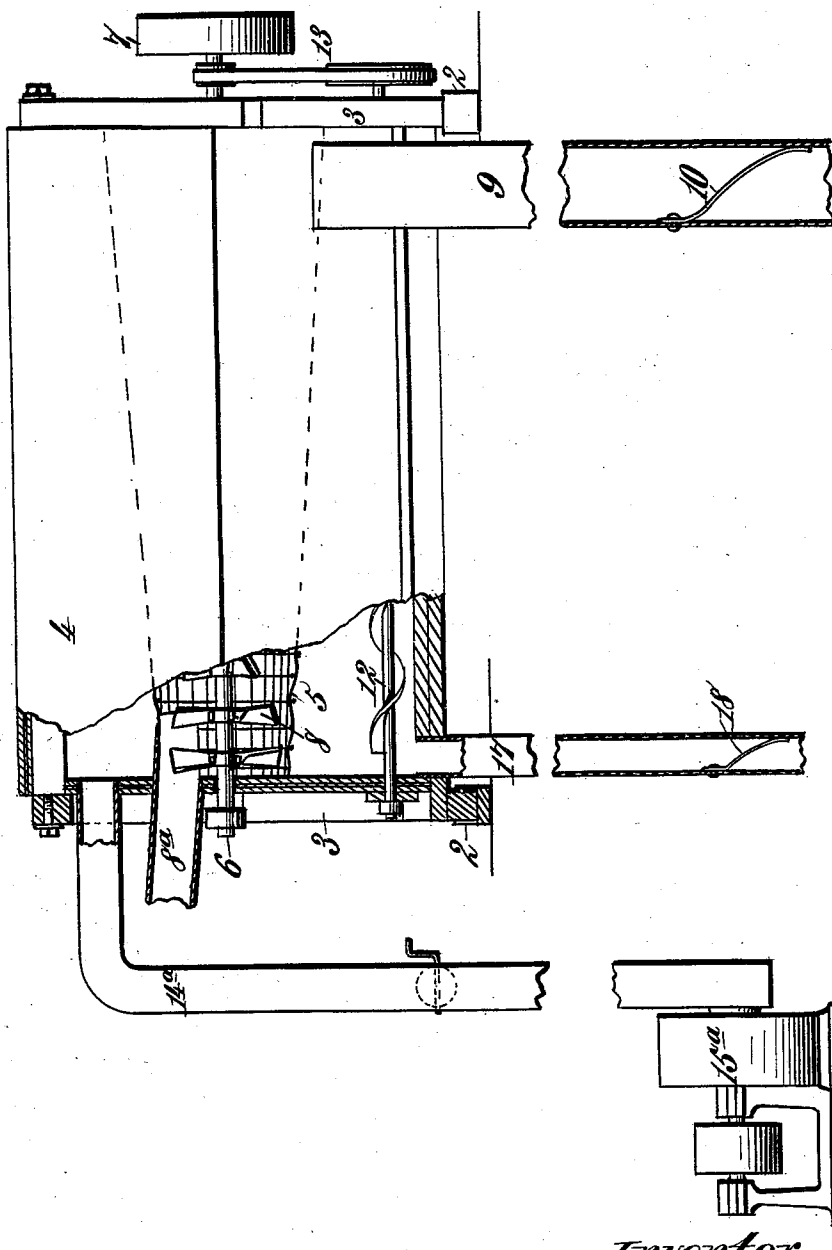
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Fig. 4.



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UNITED STATES PATENT OFFICE.

STEPHEN D. MURRAY, OF DALLAS, ASSIGNOR TO WILLIAM F. LADD, OF GALVESTON, TEXAS.

COTTON-CLEANING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 547,671, dated October 8, 1895.

Application filed June 25, 1895. Serial No. 554,030. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN D. MURRAY, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented new and useful Improvements in Cotton-Cleaning Apparatus, of which the following is a specification.

This invention relates to that class of seed-cotton cleaners comprising a stationary foraminous case or drum having an inlet-opening in the upper side of its small end, a rotary shaft extending centrally through the case or drum and having a plurality of spirally-arranged beater-arms, and an air-forcing fan arranged at the large end of the foraminous case and having a discharge-pipe for conveying the cotton to the point where it is to be deposited or discharged—as, for instance, into gins or gin-feeders.

In the practical use of the former cleaners of the character briefly referred to the cotton is delivered to the inlet-opening in the small end of the foraminous case or drum through the medium of cotton-elevating mechanism, and the beater-arms on the rotary shaft agitate and move the cotton along the inner surface of the case or drum to and through the large end thereof, where the fan acts to drive the cotton through the discharge-pipe to the gins, the construction and operation being such that dirt, dust, and trash are separated from the cotton and driven through the openings or perforations in the case or drum into the cleaner-room in which the apparatus is located.

In the ordinary use of cotton-cleaners as heretofore constructed a special cleaner-room is provided for the cleaner and a cotton conveyer or elevator is arranged in operative connection with the cleaner to furnish a supply of cotton thereto. The great quantity of dirt and dust discharged into the cleaner-room is objectionable for many reasons, particularly as it presents a very bad condition for the belts employed to transmit power to the working part of the cleaner and to the cotton conveyer or elevator.

The provision of a conveyer or elevator for raising and delivering the seed-cotton to the cleaner is a mechanical element which in-

creases the cost of the apparatus, and which it is desirable to dispense with. In many ginneries it is necessary to employ a number of cleaners, located at different points in the building, and in such cases the objections to a cleaner-room are largely increased, in that a separate cleaner-room is employed for each cotton-cleaner.

The objects of my invention are to avoid the objections hereinbefore alluded to, and to provide a novel, simple, and effective cotton-cleaning apparatus which entirely avoids the provision of a special cleaner-room, and which delivers the separated dirt and dust out of the building through or by means of the blast of a suction-fan, or in a condensed state by gravity through a suitable conduit to any suitable receptacle, from which it can be carted or transported.

The invention also has for its object to provide new and improved means whereby the dirt and dust are effectually separated from the cotton and prevented from being scattered about the building.

The invention also has for its object to provide novel means whereby a suction apparatus serves to carry a continuous flow or stream of cotton from the source of supply into the cotton-cleaner, while the work of cleaning the cotton is performed by the action of beater-arms, and the dirt and dust are discharged either by the blast from a suction-fan or in a condensed state through a suitable conduit.

The invention also has for its object to provide means for discharging the cleaned cotton from a drum arranged in a casing in which a partial vacuum is maintained for the purpose of drawing the cotton into the drum.

The invention also has for its object to provide novel means whereby a suction apparatus is utilized to draw cotton into a cotton-cleaner. The cotton is cleaned in a partial vacuum produced by the suction apparatus, and the dirt and dust and the cotton are delivered by gravity from the cleaner.

To accomplish all these objects my invention involves the features of construction, the combination or arrangement of parts, and the principles of operation hereinafter described

and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of sufficient of a cotton-cleaning apparatus to enable my invention to be clearly understood. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical sectional view taken on the line 3 3, Fig. 1; and Fig. 4 is a vertical sectional view showing a modification of my invention.

In order to enable those skilled in the art to make and use my invention I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a part of a building or factory in which my improved cotton-cleaning apparatus is arranged.

The numeral 2 indicates a base-frame, from the ends of which rise end frames 3, which support a practicably air-tight casing 4, of any form suitable for the purpose in hand, but which is here shown as substantially square in cross-section and composed of layers of boards with building-paper or other suitable material interposed between the layers, as will be clearly understood by reference to Figs. 2 and 3.

I do not wish to be understood as confining myself to any particular construction of air-tight casing, as this part of the apparatus can be changed in form or construction without affecting the spirit of my invention. The casing is supported by the end frames 3 and incloses a foraminous case or drum 5 of any suitable construction and form that will present throughout its periphery a plurality of openings or perforations for the passage of dirt, dust, or trash. The case or drum is here shown in the form of a frustum of a cone, so that it is tapering and is provided with small and large ends, which are secured to the ends of the inclosing casing 4 to retain the case or drum stationary in the casing. A rotary shaft 6 extends centrally through the case or drum and is provided at one end with a driving-pulley 7, adapted to be connected by a belt with any suitable motor. The shaft 6 is provided with a plurality of beater arms or wings 8, extending spirally around the shaft and secured thereto by clamps or by any other suitable devices. The number of beater arms or wings will vary according to the length of the cleaner, but in practice I arrange a beater arm or wing to every six inches in the length of the shaft. The beater arms or wings are so set on the shaft that all of them constitute in effect a screw, in that they are set spirally, as beforestated. In practice the shaft of the cleaner is preferably of such length as to accommodate about twenty beater arms or wings, and the beater arms or wings are preferably so set as to make a turn about once and a half around the shaft. The beater arms or blades are each twisted or turned obliquely in a manner similar to the blades of a propeller-screw, so

that when the shaft is rotated and cotton is fed into the small end of the case or drum such cotton will be carried around the internal surface of the case or drum and caused to traverse the same toward the large end of the case or drum. In the traversing movement of the cotton the dirt, dust, or trash will be expelled through the openings or perforations in the case or drum into the inclosing-casing, which latter effectually prevents the dirt, dust, or trash gaining access to the room in which the apparatus is located. The cotton to be cleaned is delivered into the small end of the case or drum through the medium of a cotton-inlet 8^a, and the cleaned cotton is discharged from the large end of the foraminous case or drum through a cotton-conduit 9, which extends into the inclosing casing 4 and is placed in communication with the interior of the case or drum.

The cotton-discharge conduit may be square, rectangular, or of any other suitable shape in cross-section; but it is shown square, and in the lower portion of this conduit is arranged a check-valve 10 of any construction suitable for the purpose, but preferably substantially the same as the flexible check-valve located in the suspended feeder of the cotton distributing and feeding apparatus described and shown in Letters Patent No. 472,607, issued to me April 12, 1892.

In the lower portion of the inclosing casing 4 is arranged a horizontal conveyer, composed, as here shown, of a worm or screw 12, adapted to be rotated by a belt connection 13 with the rotary shaft 6 in such manner that when the conveyer is rotated it operates to move the dirt, dust, or trash along the lower portion of the inclosing-casing to the mouth of the suction conduit or pipe, or the mouth of the discharge-conduit hereinafter referred to. The inclosing-casing 4 is at one end placed in communication with a suction conduit or pipe 14, having its other end in operative connection with an air-suction apparatus 15, preferably in the form of an exhaust-fan, so that when the fan is in operation the dirt, dust, or trash separated from the cotton in the foraminous case or drum and deposited into the inclosing casing will be withdrawn from the latter and discharged at a point outside the building or factory containing the cleaner. The air-exhausting apparatus or exhaust-fan also withdraws air from within the inclosing-casing, and thereby creates by suction a partial vacuum therein, which causes air-currents to flow in the direction of the arrows, Fig. 1, and by this means draws the seed-cotton from the source of supply into the small end of the foraminous case or drum through the cotton-inlet 8^a.

The suction conduit or pipe 14, which connects the air-exhausting apparatus or exhaust-fan 15 with the interior of the inclosing casing 4, is provided with a suitable valve 16

for controlling communication between the air-exhausting apparatus or exhaust-fan and the casing.

In the operation of the cotton-cleaning apparatus the check-valve 10 prevents air from being drawn into the cleaner through the cotton-delivery conduit 9, and yet permits the cotton to pass out when the cotton accumulates within the delivery-conduit 9, and its weight overcomes the external air-pressure on the check-valve. The check-valve 10 is closed tight by the pressure of the external air from beneath. If it is desired at any time to permit all the cotton to drop out of the delivery-conduit 9, the valve 16 is adjusted to close the suction conduit or pipe 14, and consequently the weight of cotton in the delivery-conduit 9 will cause the valve 10 to automatically open and thus permit the cotton to pass out of the delivery-conduit to any desired place, as, for example, to the gin-feeders.

The conveyer 12 serves to move the dirt, dust, or trash up to the mouth of the suction conduit or pipe 14, at which point the air-currents withdraw the dirt, dust, or trash, and the latter passes through the air-exhausting apparatus or exhaust-fan to a point outside the building containing the cleaner. In some instances it may not be desirable to discharge the dirt, dust, or trash into the open air through the air-exhausting apparatus or exhaust-fan 15, and therefore I provide the modified construction of apparatus illustrated in Fig. 4, wherein all the parts are constructed the same as described with reference to Figs. 1, 2, and 3, except that the suction-pipe 14^a of the air-exhausting apparatus or exhaust-fan 15^a is placed in communication with the upper portion of the inclosing-casing 4 and a special dirt, dust, or trash discharge-pipe 17 extends from the inclosing casing 4, preferably from the end opposite the end from which the cotton delivery or discharge conduit 9 extends. The dirt, dust, or trash discharge-pipe 17 is provided with a check-valve 18, in all substantial respects the same as the check-valve 10, so that when the dirt, dust, or trash accumulates to a certain height in the pipe 17 the weight of the dirt, dust, or trash overcomes the external air-pressure on the valve 18, and the dirt, dust, or trash can descend through the pipe 17 to any desired point. When the dirt, dust, or trash is discharged by the special conduit or pipe 17, the air-suction conduit or pipe 14^a should connect with the upper portion of the inclosing casing 4, as before described, so that but a comparatively small quantity of the dirt, dust, or trash expelled from the cotton into the inclosing casing will pass through the air-exhausting apparatus or exhaust-fan.

By my invention the dirt, dust, or trash is not permitted to escape into the building or factory containing the cleaner, but is confined and delivered either through the air-exhaust-

ing apparatus or exhaust-fan or through the special dirt, dust, or trash discharge conduit or pipe 17.

The action of the air-exhausting apparatus or exhaust-fan is such that the cleaner is made to lift its own cotton, and therefore I entirely avoid the employment of special cotton-elevating mechanism for raising the seed-cotton to the cotton-inlet.

The foraminous case or drum may, as before stated, be of any construction suitable for the purpose, but an ordinary wire screen will give satisfactory results.

It will be observed that in my invention the dirt, dust, or trash is confined in a small space and that I entirely avoid the use of a conveyer or elevator for raising and delivering the seed-cotton to the foraminous drum. In my improved apparatus the cotton-inlet 8^a may take the seed-cotton direct from the wagon and deliver it into the foraminous drum, where it is effectually cleaned and the cotton discharged at one point, while the dirt, dust, or trash are carried off at another point.

A cotton-cleaner embodying my invention entirely prevents dirt and dust from being scattered about the building, and renders it possible to avoid the provision of a special cleaner-room, and enables several cleaners to be placed in one building and located at different parts thereof.

In my improved cleaner the dirt and dust are deposited inside of the air-tight casing, from which the dirt and dust are continuously removed in such manner that the belts used to transmit power to the working parts of the cotton-cleaner do not operate in a cloud of dust, as is the case with ordinary cotton-cleaners.

An important advantage attained by my improved apparatus is that it does not require a special cleaner-room, but may be located at any convenient point in the building at any suitable height, so that the discharge-pipe may be of considerable length. A special cleaner-room is necessary with the ordinary cotton-cleaner, and, moreover, in the use of the latter the cleaner-room becomes filled with dust, which presents a very bad condition for the belts employed in connection with the working parts of the cleaning apparatus.

In my improved cleaner the cotton is delivered into a foraminous drum and is whipped, and carried around and around against the interior surface thereof until, and, finally, after having been whipped and carried along the great surface-area of screen, it reaches the opposite end of the drum and is discharged.

The cleaning efficiency of my improved apparatus is somewhat in proportion to the length of the drum, and by suitably constructing the shaft and beater-arms the drum may be made of considerable length, although I have found that a length of ten feet produces excellent results.

In my improved cotton-cleaner the dirt and

dust are discharged gently instead of violently and passed through a conduit or pipe to any desired point or to any receptacle, from which the dirt and dust can be carted or transported.

Having thus described my invention, what I claim is—

1. The combination in a cotton cleaning apparatus, of a foraminous case, or drum, a casing inclosing the case, or drum, a cotton inlet opening into one end of the case, or drum, a cotton delivery conduit leading from the opposite end of the case, or drum, and provided interiorly in its lower portion with a self-acting check-valve, means for agitating the cotton and moving the same longitudinally along the case, or drum, from the inlet end to the outlet end thereof, and an air exhausting apparatus arranged in operative connection with the interior of the casing and operating to exhaust air therefrom and thereby create suction which draws the seed-cotton into the case, or drum, through the cotton inlet, substantially as described.

2. The combination in a cotton cleaning apparatus, of a foraminous case, or drum, a casing inclosing the case, or drum, a cotton inlet opening into one end of the case, or drum, a cotton delivery conduit leading from the opposite end of the case, or drum, and provided interiorly in its lower end portion with a self-acting check-valve, a rotary beater having spirally arranged beater arms and operating to agitate the cotton and move the same longitudinally in the case, or drum, from the inlet end to the outlet end thereof, and air exhausting apparatus arranged in operative connection with the interior of the casing and operating to exhaust air therefrom and thereby create suction which draws the seed-cotton into the case, or drum, through the cotton inlet, substantially as described.

3. The combination in a cotton cleaning apparatus, of a foraminous case, or drum, a casing inclosing the case, or drum, a cotton inlet opening into one end of the case, or drum, a cotton delivery conduit leading from the opposite end of the case, or drum, and provided interiorly in its lower end portion with a self-acting check-valve, a rotary beater having spirally arranged beater arms and operating to agitate the cotton and move the same longitudinally in the case, or drum, from the inlet end to the outlet end thereof, means for moving the separated dirt, dust or trash along the lower portion of the casing toward one end thereof, and air exhausting apparatus arranged in operative connection with the interior of the casing and operating to exhaust air therefrom and thereby create suction which draws the seed-cotton into the case or drum through the cotton inlet, substantially as described.

4. The combination in a cotton cleaning apparatus, of a closed casing, a foraminous drum

arranged in the casing, a cotton inlet for delivering cotton into one end of the drum, a cotton discharge conduit leading from the opposite end of the drum, a self-acting check valve arranged at the lower end portion of the cotton discharge conduit, a rotary beater located within the drum and comprising spirally arranged beater arms for moving the cotton longitudinally from the receiving to the delivery end of the drum, a conveyer for moving the separated dust, dirt or trash in the casing toward one end thereof, and an air exhausting apparatus connected with the casing and operating to exhaust air therefrom and deliver the same outside said casing, and creating suction which draws the seed cotton into the drum through the said cotton inlet, substantially as and for the purposes described.

5. The combination in a cotton-cleaning apparatus, of a casing, a foraminous drum arranged within the casing, means for agitating the cotton and moving the same longitudinally in the drum, a cotton-inlet for delivering cotton into one end of the drum, a cotton-discharge conduit leading from the opposite end of the drum, a check-valve located in the cotton-discharge conduit, an air-exhausting apparatus connected with the casing and operating to exhaust air therefrom and deliver the same outside said casing, and creating suction which draws the seed cotton into the drum through the said cotton inlet, and a dirt conveyer arranged in the lower portion of the casing and serving to continuously convey the dirt, dust, or trash along the bottom of the casing to a suitable discharge point, substantially as described.

6. The combination in a cotton-cleaning apparatus, of a casing, a rotary beater having spirally arranged beater arms for moving the cotton longitudinally in the drum, a foraminous drum arranged in the casing, a cotton-inlet for delivering cotton into one end of the drum, a cotton-discharge conduit leading from the opposite end of the drum, a check-valve arranged in the cotton-discharge conduit, an air-exhausting apparatus connected with the interior of the casing and operating to exhaust air therefrom and deliver the same outside said casing, and creating suction which draws the seed cotton into the drum through the said cotton inlet, a dirt-conveyer arranged in the bottom of the casing and operating to convey the dirt and dust toward one end of the casing, and a dirt-discharge conduit into which the dirt and dust are delivered by the conveyer, substantially as described.

7. The combination in a cotton-cleaning apparatus, of a foraminous case or drum, a casing inclosing the case or drum, a shaft extending through the case or drum and having a plurality of attached beater-arms or wings, a cotton-inlet opening into the case or drum,

a cotton-discharge conduit leading from the case or drum, an air-exhausting apparatus arranged in operative connection with the interior of the casing and operating to exhaust air therefrom and thereby create suction which draws the cotton into the case or drum through the cotton-inlet, and a conveyer arranged in the casing outside the drum for moving the separated dirt, dust, or trash toward one end thereof, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

STEPHEN D. MURRAY.

Witnesses:

H. B. SMITH,
G. E. CASSIDY.