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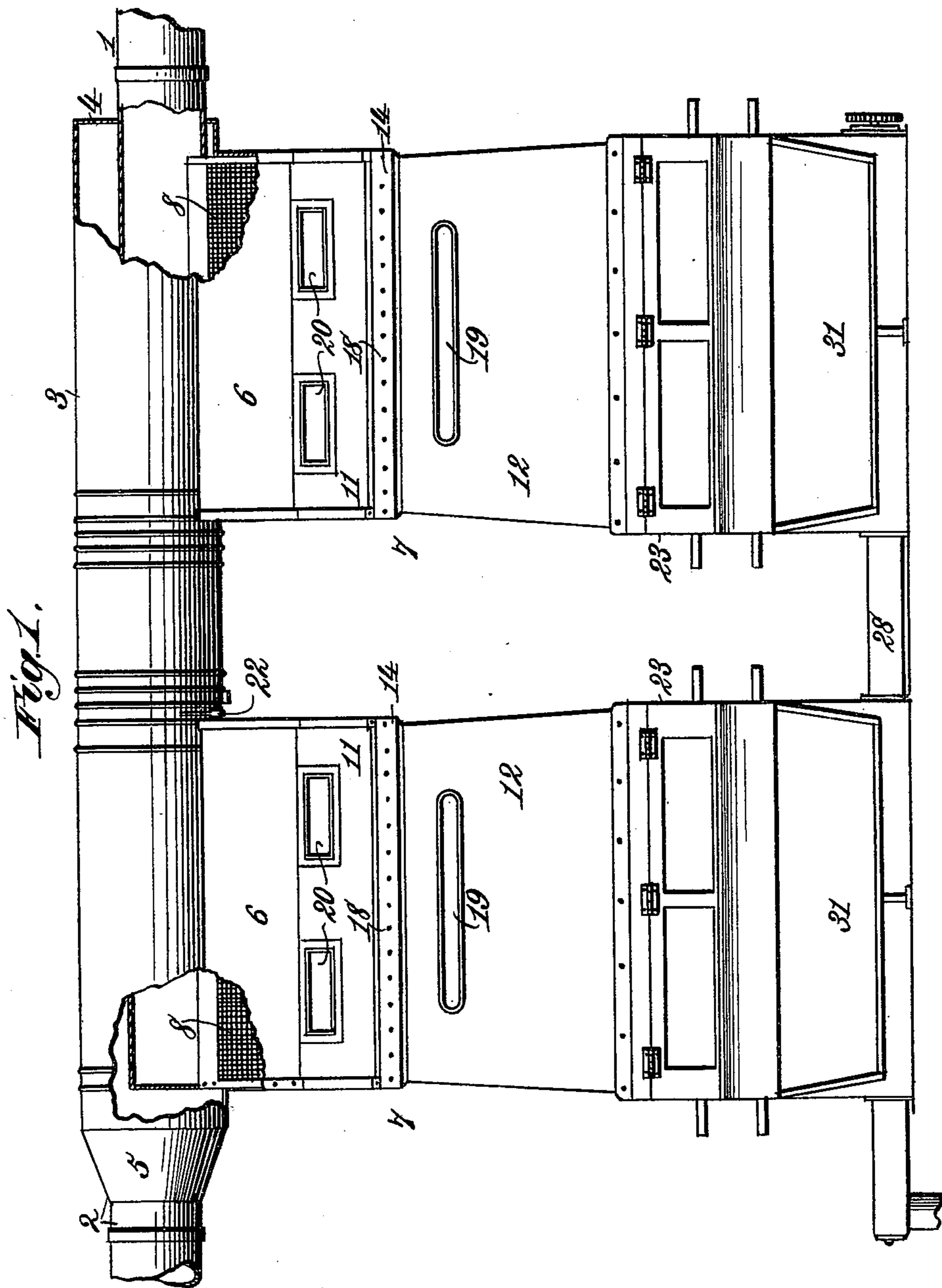
S. D. MURRAY.

COTTON ELEVATOR AND GIN FEEDER.

(Application filed Apr. 24, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
*Robert Emmett*  
*J. B. Keefe*

Inventor:  
*Stephen D. Murray*  
By *James L. Norris*  
Atty.

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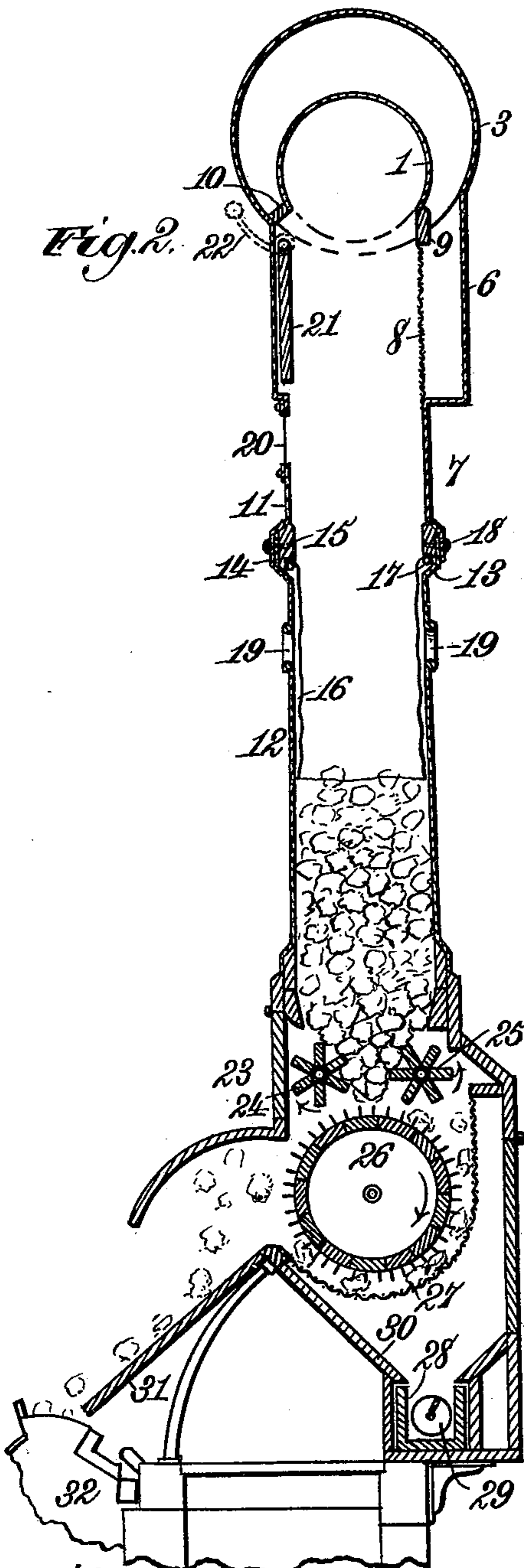
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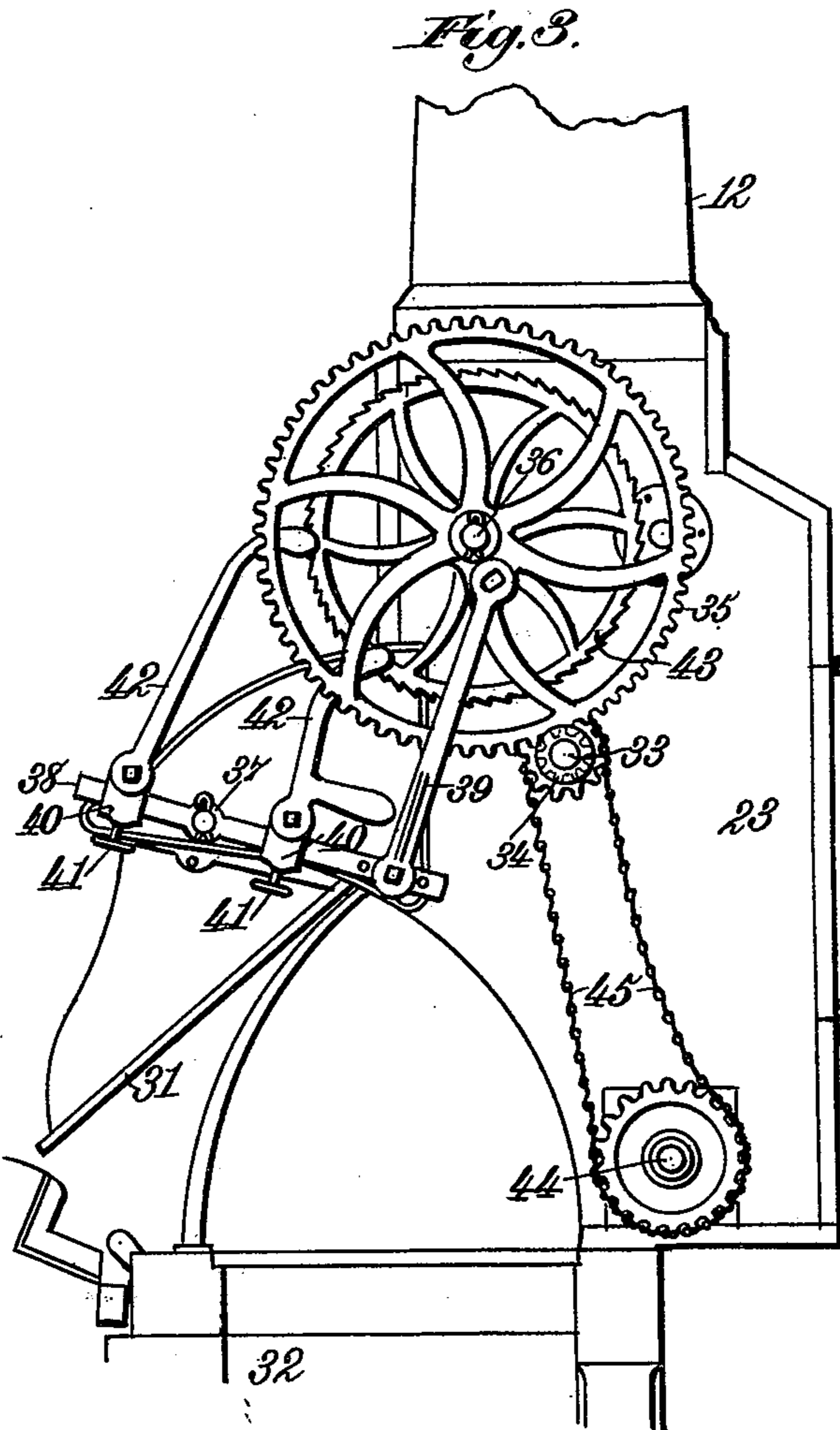
(Application filed Apr. 24, 1899.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses.  
*Robert Everett,*  
*J. B. Keefe*



Inventor,  
*Stephen D. Murray,*  
By *James L. Norris,*  
*Atty.*

# UNITED STATES PATENT OFFICE.

STEPHEN D. MURRAY, OF DALLAS, TEXAS.

## COTTON-ELEVATOR AND GIN-FEEDER.

SPECIFICATION forming part of Letters Patent No. 644,532, dated February 27, 1900.

Application filed April 24, 1899. Serial No. 714,296. (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-Elevators and Gin-Feeders, of which the following is a specification.

This invention relates to cotton-elevators and gin-feeders, and especially to that class of such apparatus employed for elevating and feeding seed-cotton to cotton-gins wherein an air conduit or tube is arranged longitudinally along and communicates with the cotton-distributing casing or trunk, provided with screens arranged therein at points above feed-chutes that lead to the gin-feeders in such manner that the seed-cotton is drawn by suction through the distributing casing or trunk and at the points where the screens are located drops by gravity into the feed-chute and by the latter is conveyed to the gin-feeders, which operate to feed the cotton to the cotton-gins, as in Letters Patent Nos. 472,607, 488,446, and 560,914, respectively dated April 12 and December 20, 1892, and May 26, 1896.

The object of the present invention is to provide an improved air conduit or tube for delivering the cotton to the feed-chutes, to form the feed-chutes in two removable sections to facilitate the ready insertion and removal of the flexible valves, to combine with the gin-feeder improved cotton-cleaning mechanism and means for conveying off the dirt, and finally to improve, simplify, and render more efficient this class of apparatus generally.

To these ends my invention consists in the features and in the construction, combination, and arrangement of parts hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a view in elevation, partly in section, of my improved apparatus. Fig. 2 is a transverse sectional view taken on the line 2 2 of Fig. 1, and Fig. 3 is a detail view of the mechanism for actuating the feed and picker rollers and the spiral conveyer.

Referring to the drawings the numerals 1 and 2 indicate the air conduit or tube, the

numeral 1 indicating that part of the conduit or tube that at one end communicates with the chamber, receptacle, or vehicle containing the seed-cotton which is to be distributed and fed to the cotton-gins, and the numeral 2 the part of the conduit or tube that leads from the fan or other suction device. (Not shown.) The end of the tube 1 is closed air-tight, as shown, and is inclosed in or surrounded by a tube 3 of greater diameter than itself, which at one end is closed air-tight about the tube 1, as at 4, and at its other end is reduced and connected with the end of the tube 2, as indicated at 5.

In the drawings I have illustrated a battery consisting of two gin-feeding devices connected with the distributing conduit or tube; but inasmuch as one is the duplicate of the other one only need be described. Connected air-tight to and depending from the under side of the tube 3 is a trunk 6, preferably rectangular in horizontal section, and attached to the bottom of the trunk is the feed-chute 7. As shown, the trunk is of slightly-greater width transversely than the feed-chute, and extending from the upper end of one side of the feed-chute to the bottom of the tube 1 is a screen 8, of wire or other suitable material. The upper end of the screen may be conveniently attached to the tube 1 by means of a wooden batten or strip 9, and a similar strip or batten 10 is secured air-tight between the tubes 1 and 3 on the opposite side of the trunk. The feed-chute is formed in two sections 11 and 12, the upper end of the lower section being enlarged or made flaring, as at 13, and is fitted in the correspondingly enlarged or flared lower end 14 of the upper section. Thus when the two sections are fitted together the enlarged ends form a groove, in which is seated the valve-support 15, comprising a rectangular wooden frame. Attached to the frame 15 is the flexible valve 16, comprising a rectangular bag or tube open at its opposite ends and attached at its upper end to the frame in any suitable or preferred manner. The lower end of the valve hangs loosely in the feed-chute, but at its opposite ends is attached to the chute by small bolts or rivets, as indicated at 17. The valve is preferably formed of canvas, but may

be formed of any flexible material suitable for the purpose. In assembling the parts together the valve is attached to the frame and the latter is inserted in the enlarged end 13 of the section 12 of the chute, and the ends of the valve are then secured to the chute. The upper end of the section 12 is then inserted in the lower end of the section 11, after which the two sections are secured together by screws 18, which pass through both sections and into the wooden frame 15, thus securing the two sections together and firmly fastening the frame in place. The fitting of the valve in the chute is thus rendered simple and easy, and it may be removed with equal ease for repairs, renewal, or the like. By seating the valve-support in a groove, as described, its inner side is flush with the inner side of the chute, whereby no obstruction is presented to the free passage of the cotton therethrough. Formed in the sides of the chute, opposite the sides of the valve, are elongated openings 19, which admit air between the inner sides of the chute and the outer sides of the valve to permit the latter to be readily collapsed by the suction. The chute is also provided with glazed sight-openings 20, through which the operation of the device may be viewed. The lower portions of the tubes 1 and 3 are removed or cut away between the battens 9 and 10 to place the said tubes in communication with the trunk.

The tubes 1, 2, and 3, the trunks, and feed-chutes are all preferably constructed of sheet metal.

In practice there will be arranged in the tube-section 2 at any suitable point between the tube 3 and the suction-fan a cut-off valve 2<sup>a</sup>, which may be either operated by hand or be automatically operated to close at suitable intervals to cut off the suction from the distributer pipe or tube. This valve is constructed and operates in the usual manner well understood by those skilled in the art and is therefore not shown.

The operation of this part of the invention is as follows: The inlet end being placed in communication with the chamber, receptacle, or vehicle containing the cotton to be ginned, the suction-fan is put in operation. The air is thus exhausted from the tube-section 2 and tube 3 and from the feed-chutes, whereupon the valves 16 collapse and close the chutes. The continued operation of the fan then exhausts the air from the tube-section 1, thus drawing the cotton into and through the latter. When the cotton arrives over the feed-chutes, it drops by gravity down the latter past the screens, the air-currents passing through the latter and through the tubes 3 and 2 to the fan. When a sufficient quantity of cotton collects in the feed-chutes, the cut-off valves before referred to are closed, and the suction being thus cut off the weight of the cotton opens the valves 15 and the cotton drops down the chutes by gravity. This operation is repeated at such intervals, by opening and

closing the cut-off valves, as will insure a sufficient quantity of cotton being at all times in the lower portions of the feed-chutes.

At times it may become necessary to throw one of the gins out of operation, and in order that this may be done without stopping the entire system I arrange in each trunk 6 a valve or gate 21. As shown in Fig. 3 of the drawings, the valve or gate is arranged in the trunk at a point opposite the screen and is hinged at its upper end, so as to normally hang by gravity against the side of the trunk. The pintle of the valve or gate projects at one end through the end of the trunk and has fixed thereon a crank or handle 22, by means of which the gate or valve may be swung up against the batten 9, thus entirely cutting off the communication between the trunk and the tube 3. The trunk and its feed-chute are thus thrown out of operation without interfering with the operation of the other feed chute or chutes.

The cotton is fed to the gins from the feed-chutes by mechanical feed mechanism which I will now describe.

Arranged beneath each of the feed-chutes is a casing 23, which incloses the feeding mechanism. Journaled longitudinally in the upper part of the casing, immediately beneath the feed-chute, are two parallel fluted feed-rollers 24 and 25 and beneath them a picker-roller 26. The construction and arrangement of these rollers is substantially the same as that shown and described in my Patent No. 488,446, dated December 20, 1892, before referred to. Fixed in the casing beneath and in rear of the picker-roller 26 is a wire screen 27, and in the bottom of the casing is formed a box or trough 28, in which is arranged a longitudinal worm or spiral conveyer 29. This box or trough and spiral conveyer are preferably made continuous—that is to say, are passed or extended through the bottoms of the casing of each feeder in the system. In each feeder-casing there is arranged beneath the picker-roller a hopper 30, which at its lower end communicates with the upper open side of the box or trough 28, and in front of said hopper is fixed an inclined board or chute 31, that operates to feed the cotton down into the gin 32. In practice the feed-rollers and picker-roller are rotated in the directions shown by the arrows, the picker-roller being driven at a high speed. The feed-rollers feed the cotton down from the chute onto the picker-roller, and the latter drives it against the screen 27, separating the cotton from the dirt. The clean cotton is carried by the picker-roller over onto the board or chute 31, which latter delivers it to the gin, while the dirt passes through the screen and is delivered by the hopper into the box or trough 28, from which it is carried off by the spiral conveyer. The cotton is thus freed from dirt by the feeder and is delivered to the gin in a clean condition.

Any suitable means may be provided for

actuating the feed and picker rollers and the spiral conveyer; but I prefer to employ that hereinafter described.

The power is applied to drive the shaft 33 of the picker-roller on one end of which is fixed a pinion 34, which gears with a relatively-large gear-wheel 35, loosely arranged on the shaft 36 of one of the feed-rollers. Pivoted, as at 37, to the end of the cleaner-casing is an oscillating arm 38, to one end of which is connected one end of a connecting-rod 39, the other end of which latter is connected to a crank-pin on the gear-wheel 35. Arranged on the arm 38, on opposite sides of its fulcrum, are sleeves 40, which are adjustable on said arm and are held in their adjusted positions by set-screws 41. Pivotally connected to each of said sleeves are pawls 42, which at their free ends engage a ratchet-wheel 43, fixed on the shaft 36 of the feed-roller before referred to. The feed-rollers are geared together at their opposite ends by any suitable gearing. The operation of the driving mechanism described will be obvious.

The pinion 34 rotates the loose gear-wheel 35, and the latter, through the medium of the connecting-rod 39, oscillates the arm 38. The oscillating arm causes the pawls to alternately engage and turn the ratchet-wheel 43, imparting to the latter a practically continuous rotary movement, which in turn rotates the feed-rolls. It will be manifest that by adjusting the sleeves 40, carrying the pawls, toward or from each other the distance the pawls are caused to move may be altered and the speed of rotation of the ratchet-wheel and the feed-rollers be thus regulated.

The shaft 33 is geared to the shaft 44 of the spiral conveyer by a sprocket-chain 45, whereby rotary motion is conveyed to the latter.

Having described my invention, what I claim is—

1. The combination with a vertical trunk or casing provided with a depending feed-chute, of a cotton-conveying tube arranged horizontally over the trunk and closed at one end, a tube of greater diameter surrounding the conveying-tube and closing the upper end of the trunk air-tight, said tubes having openings in their under sides over the trunk, the larger tube being closed air-tight at one end about the conveying-tube, a suction-pipe connected with the other end of said larger tube, and a screen arranged in the trunk to prevent the entrance of cotton into the larger tube, substantially as described.

2. The combination with a vertical trunk or casing provided with a feed-chute, of a cotton-conveying tube arranged horizontally over the trunk and closed at one end, a tube of greater diameter surrounding the conveying-tube and closing the upper end of the trunk air-tight, said tubes having openings in their under sides over the trunk, the larger tube being closed air-tight at one end about the conveying-tube, a suction-pipe connected with the other end of said larger tube, and a

screen arranged in the trunk, said screen being attached at its lower edge to the upper end of one side of the feed-chute and at its upper edge to the lower side of the conveying-pipe, substantially as described.

3. The combination with a vertical trunk or casing provided with a feed-chute, of a cotton-conveying tube arranged horizontally over the trunk and closed at one end, a tube of greater diameter surrounding the conveying-tube and closing the upper end of the trunk air-tight, said tubes having openings in their under sides over the trunk, the larger tube being closed air-tight at one end about the conveying-tube, a suction-pipe connected with the other end of said larger tube, a screen arranged in the trunk to prevent the entrance of cotton into the larger tube, and a normally-open gate or valve adapted to close the opening in the conveying-tube, substantially as described.

4. The combination with a vertical trunk or casing provided with a depending feed-chute, of a cotton-conveying tube arranged horizontally over the trunk and closed at one end, a tube of greater diameter surrounding the conveying-tube and closing the upper end of the trunk air-tight, said tubes having openings in their under sides over the trunk, the larger tube being closed air-tight at one end about the conveying-tube, a suction-pipe connected with the other end of said larger tube, a screen arranged in the trunk to prevent the entrance of cotton into the larger tube, and a flexible collapsible valve arranged in the feed-chute, substantially as described.

5. In an apparatus for feeding seed-cotton to cotton-gins, the combination with a suction conveyer, of a pendent feed-chute comprising two separable sections fitted, one within the other and interiorly grooved at their meeting ends, and a collapsible valve fitted in the groove in the innermost section, substantially as described.

6. In an apparatus for feeding seed-cotton to cotton-gins, the combination with a suction conveyer-pipe, of a pendent feed-chute, said chute being made in two separate sections, the adjacent ends of which are enlarged and fitted one within the other, a frame fitted in one of said enlarged ends, and a flexible valve attached to said frame, substantially as described.

7. In an apparatus for feeding seed-cotton to cotton-gins, the combination with a suction conveyer-pipe, of a pendent feed-chute, said chute being made in two separable sections the adjacent ends of which are enlarged and fitted one within the other, a frame fitted in one of said enlarged ends, and a flexible tube attached at one end to said frame and attached at two sides to the sides of the feed-chute, substantially as described.

8. In an apparatus for feeding seed-cotton to cotton-gins, the combination with a feed-chute or receptacle-box, of a casing, feed-rollers arranged in the casing, a picker-roll

disposed beneath the feed-rollers, a chute for delivering the cotton from the picker-roll to the gin, a screen located beneath and in rear of the picker-roll, a box or trough for catching the dirt which drops by gravity through the screen, means for directing the dirt into said box or trough and a conveyer arranged in the box or trough and operating to discharge the dirt therefrom, substantially as described.

9. In a cotton elevating or conveying device, the combination with a cotton-conveying tube closed at one end, a suction-tube of

greater diameter surrounding the conveying-tube and closed air-tight at one end about the conveying-tube, and means for discharging the cotton from the conveying-tube, substantially as described.

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

STEPHEN D. MURRAY.

Witnesses:

J. WEBSTER,  
O. LETCHER.