

(No Model.)

2 Sheets—Sheet 1.

J. M. GARDNER.

PNEUMATIC DEVICE FOR ELEVATING AND DISTRIBUTING SEED COTTON.

No. 556,180.

Patented Mar. 10, 1896.

Fig. 1.

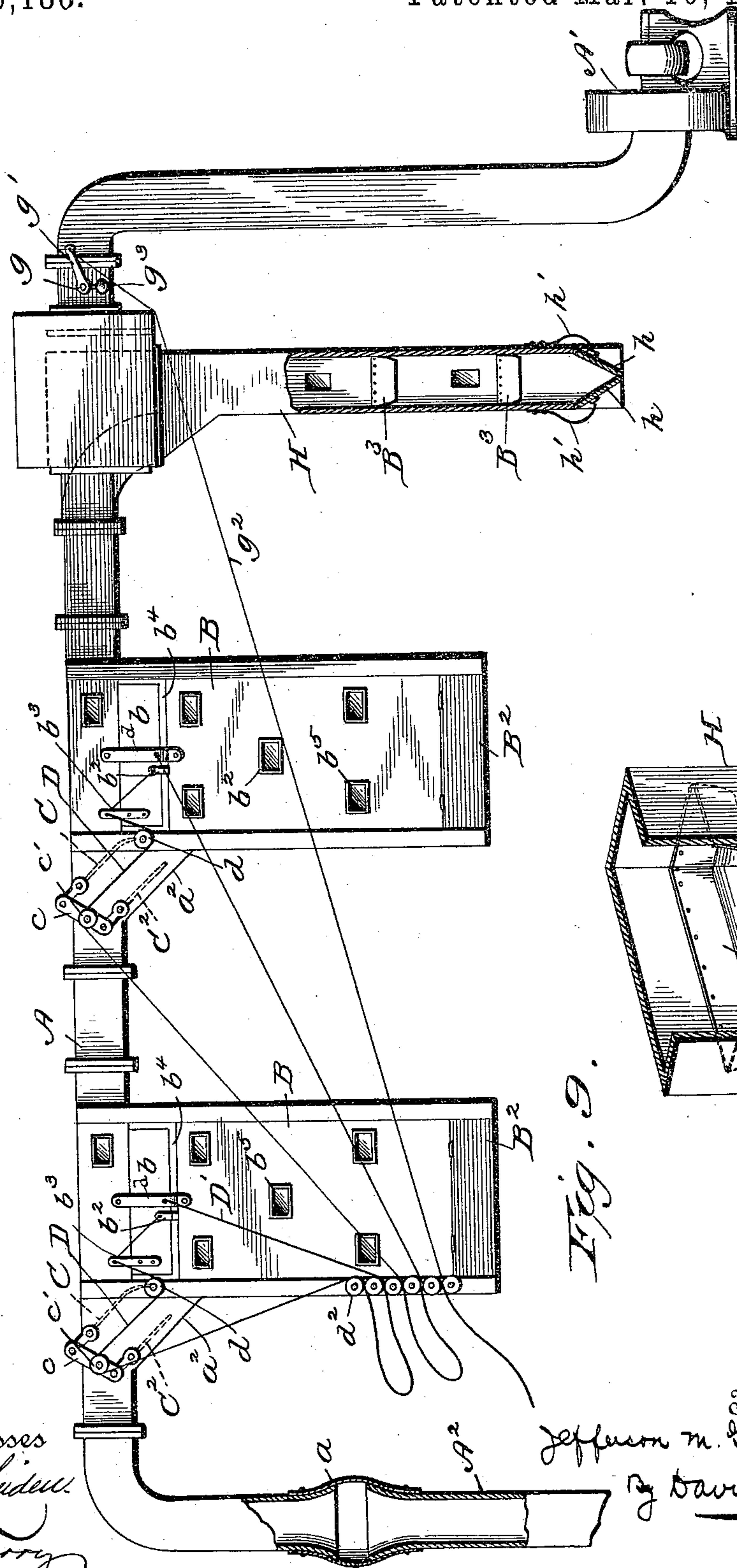
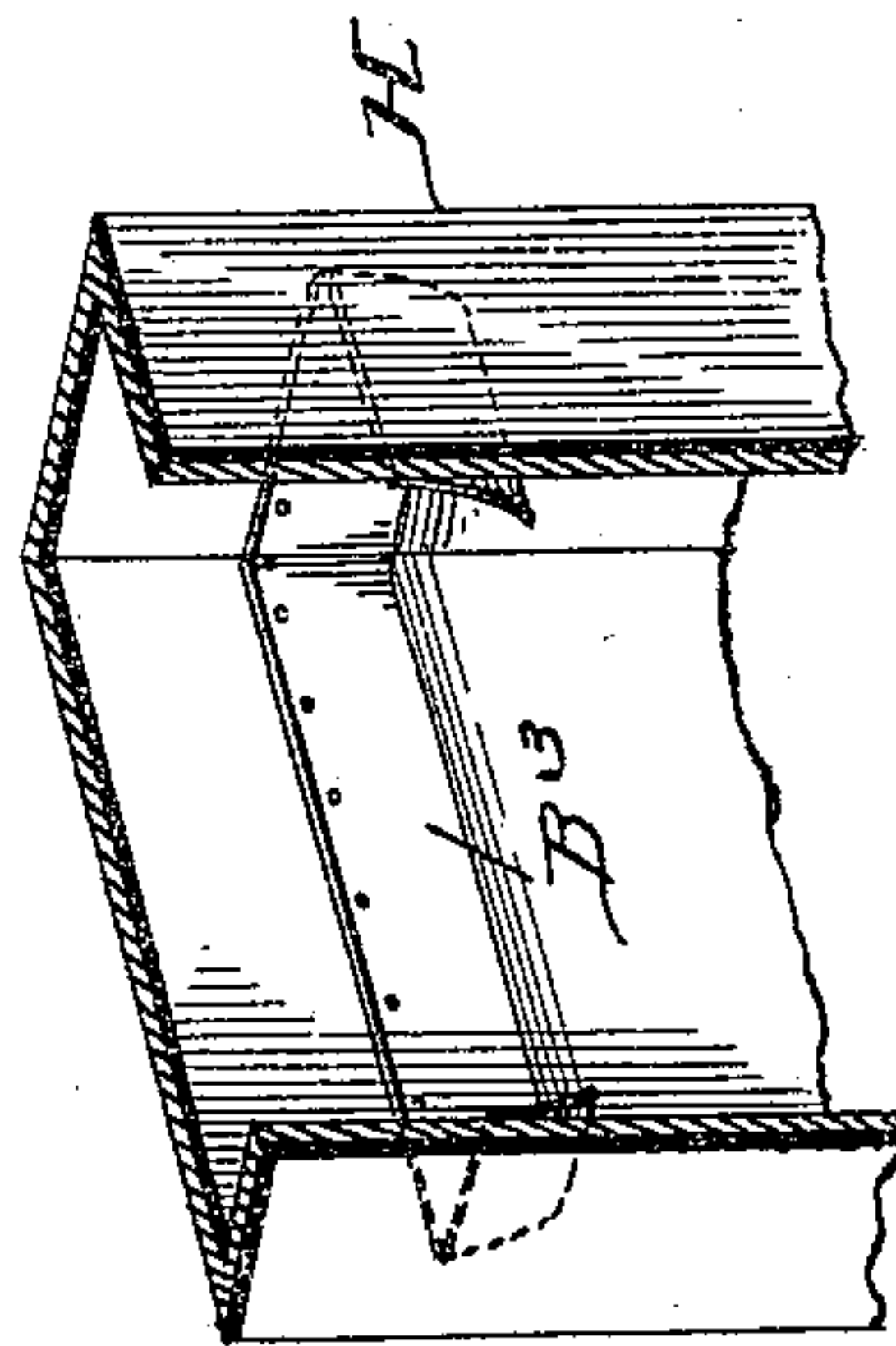


Fig. 9.



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(No Model.)

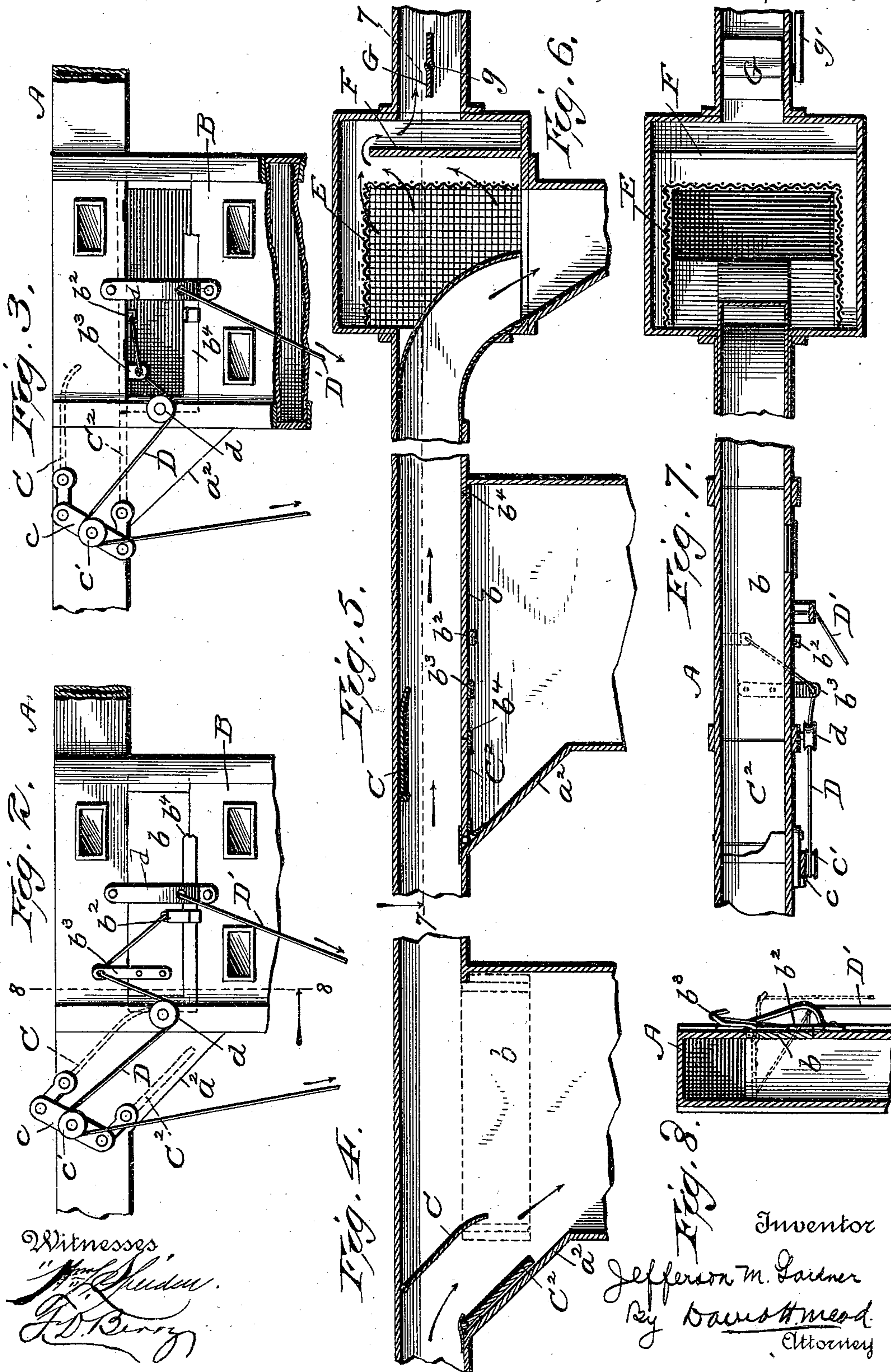
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# UNITED STATES PATENT OFFICE.

JEFFERSON M. GARDNER, OF NEW LONDON, CONNECTICUT.

PNEUMATIC DEVICE FOR ELEVATING AND DISTRIBUTING SEED-COTTON.

SPECIFICATION forming part of Letters Patent No. 556,180, dated March 10, 1896.

Application filed September 25, 1895. Serial No. 563,592. (No model.)

*To all whom it may concern:*

Be it known that I, JEFFERSON M. GARDNER, a citizen of the United States, residing at New London, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Pneumatic Devices for Elevating and Distributing Seed-Cotton; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to devices for elevating and distributing seed-cotton.

The object of the invention is to provide simple and effective means for elevating seed-cotton from a wagon or platform and for depositing it in receptacles from which it passes to feed-boxes of cotton-gins or to places of storage.

Further, the object of the invention is to provide simple and effective means for elevating seed-cotton from a wagon or platform and for distributing it successively in a series of receptacles in which it is stored or from which it is discharged to the feed-boxes of gins.

Further, the object of the invention is to provide means for elevating seed-cotton from a wagon or platform by means of suction created in a tube and for depositing the same in receptacles, and then discharging the cotton to gin-feeders or places of storage by the action of gravity, and to provide an overflow or vacuum box for the reception of cotton not received by the receptacles and which would otherwise enter the fan by which the suction in the tube is created.

Further, the object of the invention is to provide means for elevating and distributing seed-cotton whereby the cotton may be taken from a wagon or platform, carried through a tube, automatically directed into receptacles in which the return-passage of the cotton is prevented, and to prevent passage of the overflow of cotton to the fan by which the exhaust in the tube is created.

With these objects in view the invention consists of a seed-cotton elevator and distributor comprising a tube connected with an exhaust-fan, movable deflectors composed of upper and lower portions, which portions, ac-

ording to the position in which they are placed, form, respectively, the upper and lower walls of the tube, or form a downward extension of the tube.

Further, the invention consists of a seed-cotton elevator and distributor comprising a tube connected with an exhaust-fan, movable deflectors composed of upper and lower portions and arranged in the tube, receptacles arranged adjacent to the tube, and movable doors arranged at the juncture of the tube and the receptacles and serving to form a portion of the lower wall of the tube or to afford a passage from the receptacles to the tube.

Further, the invention consists of a seed-cotton elevator and distributor comprising a tube connected with an exhaust-fan, receptacles arranged adjacent to the tube, downward extensions from the tube communicating with the receptacles, deflectors composed of upper and lower portions arranged adjacent to the downward extensions, and means for moving the deflectors and retaining them in any desired position.

Further, the invention consists of means for elevating and distributing seed-cotton comprising a tube, a fan for exhausting air from the tube, and receptacles connected with the tube, the interior of the receptacles being provided with flaps or wings whereby the upward passage of cotton is prevented.

Further, the invention consists of a device for elevating and distributing seed-cotton comprising a tube, movable deflectors arranged in the tube, receptacles communicating with the tube, movable doors or partitions arranged between the tube and the receptacles, and ropes connected with the doors and with the movable deflectors.

Finally, the invention consists of various novel details of construction and arrangement of parts whereby the objects of the invention are attained.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the elevator and distributor; the inlet-nozzle and the overflow-box being shown in section. Fig. 2 is a fragmental view particularly showing means for operating the movable deflectors and the door or partition which is arranged between



the tube and receptacle. Fig. 3 is a view similar to Fig. 2, the deflector and doors being shown in position when the cotton is allowed to pass beyond the receptacles shown. Fig. 4 is a longitudinal sectional view of the parts of the device shown in Fig. 2, the movable deflector being arranged to direct cotton into the receptacle. Fig. 5 is a vertical longitudinal sectional view, the parts being arranged to conduct cotton past the receptacle shown. Fig. 6 is a vertical sectional view showing the screen and partition arranged in the tube and also showing the entrance to the overflow or vacuum boxes. Fig. 7 is a horizontal sectional view. Fig. 8 is a section on line 8 8 of Fig. 2, showing in full lines the positions of the parts when the receptacle is adapted to receive cotton and in dotted lines the positions of the door arranged between the tube and the receptacle when cotton is not to enter the receptacle; and Fig. 9 is a perspective sectional view, one side being broken away, showing one of the receptacles and the flaps or wings therein.

In the drawings, A represents a tube which is provided at one end with an exhaust-fan A' and at the other end with an inlet-nozzle A<sup>2</sup>. The tube is provided at intervals with windows closed by plates of glass to permit inspection of the interior of the tube. The inlet-nozzle A<sup>2</sup> is connected with the tube A by any suitable means which will permit the universal movement of the nozzle—as, for instance, by the tube a, of canvas, rubber or the like, attached to the end of the tube and to the upper end of the nozzle A<sup>2</sup>.

Arranged at suitable distances apart along and beneath the tube A are any desired number of receptacles B, there being in the present embodiment of the invention two of these receptacles shown. The upper end of each receptacle B is open and at its point of juncture with the tube the latter has its bottom removed. Suspended to one side of the tube and connected therewith by hinges is a door b, which when closed cuts off communication between the tube and the receptacles and forms a portion of the bottom of the tube, and which when open forms the upper portion of one side of the receptacle. The receptacle is provided around the sides of the opening closed by the door with strips of leather, rubber, or the like, which will be drawn inward by the suction created in the tube and thus prevent inlet of air around the door.

Adjacent to each receptacle B is a downward extension a<sup>2</sup> from the tube A. This extension communicates with the side of the receptacle adjacent to which it is placed. Pivottally mounted in the tube above each extension a<sup>2</sup> are thin boards C C<sup>2</sup> whose ends are connected by a brace c pivottally connected to the respective boards and provided with a roller c'. The board C, which is arranged in the upper portion of the tube, forms a deflector by which cotton passing from the inlet-noz-

zle through the tube is directed through the extension a<sup>2</sup> to the receptacle B. The lower board C<sup>2</sup> forms the lower portion of the passage from the tube to the receptacle when in the position shown by dotted lines in Fig. 1, and forms a portion of the lower wall of the tube A when moved into the positions shown in Figs. 3, 5, 7, and 8.

The door b, which serves to separate, when desired, the receptacle B from the tube A, is provided on one side with hinges attaching it to the tube, and on the other side with a latch b<sup>2</sup> designed to engage a suitable opening in the side of the receptacle B. Connected with this latch is a rope D, which passes through an opening in an arm b<sup>3</sup> attached to the door b over an idle-pulley d attached to the frame of the receptacle, thence over the pulley c' on the brace c, and from there to a suitable point convenient for grasping by an operator. The arrangement of the parts described is such that by pulling on the rope D the deflector C and the boards C<sup>2</sup> will be moved on their pivots to bring them into the position shown in Figs. 3, 5, and 7. Continued pulling on the rope will withdraw the latch, and a further continuance will result in moving the door b into a horizontal position by pulling on the arms b<sup>3</sup>, which extend from the door b. The other end D' of the rope passes through an opening in a guide-plate d and is attached to the door b. By pulling on the rope D' the door b may be drawn from a position closing the passage between the tube and the receptacle to a position opening the passage. The free ends of the boards C and C' are of a greater weight than the ends to which the brace is connected, so that by releasing the rope D the deflector C will fall into position to direct cotton to the receptacle.

The rope may be fastened in any suitable way, preferably by passing it between friction-wheels d<sup>2</sup> attached to the frame of the elevator or in any other suitable or convenient place.

The lower end of each receptacle B is provided with doors or flaps B<sup>2</sup>, there being two of these doors or flaps arranged one on each of two opposite sides of the receptacle. The doors or flaps are hinged at their upper ends and are free to remain open until closed by the suction created in the tube.

The walls of the receptacle are provided with windows b<sup>5</sup>, closed by plates of glass, through which the height of the cotton in the receptacles may be ascertained from the exterior. The interior of each receptacle is provided at intervals with flaps or wings B<sup>3</sup>, of canvas, rubber, leather, or the like. The flaps or wings are attached at their upper edges to the inner walls of the receptacles and have their lower ends free to be moved out in order to engage the cotton and prevent its upward movement or the upward passage of air between the cotton and the wall.

The tube A extends a suitable distance beyond the receptacles, and interposed between



it and the fan by which the suction in the tube is created is a frame E, covered with wire-netting or the like and entirely obstructing the passage of cotton or other substance through the tube. Arranged between the frame E and that portion of the tube which is connected to the fan is a board or wall F, extending upward in the tube a distance corresponding to the height of the frame E. In this way the current of air passing to the fan is obstructed and caused to impinge upon the board, and centralization of the draft on any part of the covered frame E, which might result in clogging, is prevented.

Between the frame E and the fan in the tube A is arranged a damper G, which is mounted on a suitable shaft  $g$ . Attached to this shaft  $g$  is an arm  $g'$  from which extends a rope  $g^2$  by which the damper may be operated. Depending from the arm  $g'$  is a weighted arm  $g^3$ , the tendency of which is to retain the chamber G in an open position, as shown in Figs. 6 and 7 of the drawings.

Arranged below the frame E is a vacuum or overflow chamber H, which is provided with windows covered with glass and with interior wings or flaps  $B^3$ , corresponding to those in the receptacles B. The lower end of the vacuum or overflow chamber is provided on two opposite sides with pivoted doors or flaps  $h$ , and bearing on the outside of these flaps or doors, having a tendency to keep them in a closed position, as shown in Fig. 1, are springs  $h'$ . These springs are of light tension in order that they may be only sufficient to keep the doors in a closed position when not opened by the weight of cotton in the boxes. The function of these springs is to retain the doors or flaps  $h$  in a closed position when starting the elevator in order that the suction in the tube A to draw cotton through the inlet-nozzle may not be destroyed by inlet of air through the vacuum or overflow boxes.

In the operation of the device, when constructed as described, the fan is started and in this way suction is created in the tube. The nozzle  $A^2$  being brought into contact with the seed-cotton to be elevated and distributed, and the deflector being in the position shown in Figs. 1, 2, 4, and 8, and the doors in the openings between the tube-receptacles being open, the cotton will be deflected into the first receptacle. When sufficient cotton has passed into the first receptacle to bring it to a height sufficient to be acted upon by the suction in the tube, the cotton passing from the nozzle will move over the top of the first receptacle and will be directed into the second, and so on, according to the number of receptacles employed. Any cotton which may escape being deposited into either of the receptacles will pass to the vacuum or overflow box to be retained therein until the weight of the cotton is sufficient to overcome the springs  $h'$ , when the doors  $h$  will open and allow its discharge.

The doors or flaps  $B^2$  in the bottoms of the receptacles are retained in a closed position by the suction created in the tube until the weight of the cotton in the receptacle is such as to overcome the force thus exerted, when the doors will open and the receptacles will thus automatically empty themselves.

As the cotton drops into the receptacles it will naturally pack closely and present a mass whose body is practically impervious to air. The particular and important functions of the flaps  $B^3$  are to prevent passage of air upward around the body of the cotton, which would usually be looser at its edge and therefore more liable to be carried upward by currents of air, and to engage the body of the cotton at its edges and prevent its rising. The flaps are, as described, of flexible material and are attached at their upper edges and loose at their lower edges. From this it will be seen that in the event of there being spaces around the sides of the body of cotton through which a current of air might be drawn the flaps will at once be moved outward, filling the spaces, thus shutting off the currents of air, and will also engage the body of the cotton, checking any tendency to rising.

The operation may continue indefinitely, as the height of the receptacles and the force of the suction in the tube A may easily be so regulated as to allow discharge of cotton from the receptacles at predetermined intervals—that is, when sufficient weight of cotton is accumulated—and in this way a regular feed to cotton-gins arranged below the receptacles is provided.

When the door  $b$  of any of the receptacles is closed the latter will be cut off from the tube A, and as the closing of the door renders the tube A at the point at which it is placed intact the cotton will be carried past the receptacle thus shut off.

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

1. A seed-cotton elevator and distributor, comprising a tube connected with an exhaust-fan, movable deflectors composed of upper and lower portions, and means for moving the deflectors whereby they form respectively portions of the upper and lower walls of the tube, or form a downward extension of the tube, substantially as described.

2. A seed-cotton elevator and distributor, comprising a tube connected with an exhaust-fan, movable deflectors composed of upper and lower portions and arranged in the tube, receptacles arranged adjacent to the tube, and movable doors arranged at the junctures of the tube and the receptacles, and serving to form a portion of the lower wall of the tube or to afford a passage from the receptacle to the tube, substantially as described.

3. A seed-cotton elevator and distributor comprising a tube connected with an exhaust-fan, receptacles arranged adjacent to the tube,



downward extensions from the tube communicating with the receptacles, deflectors composed of upper and lower portions arranged adjacent to the downward extensions, and  
5 means for moving the deflectors and retaining them in any desired position, substantially as described.

4. A cotton-seed elevator and distributor comprising a tube connected with an exhaust-  
10 fan, downward extensions from the tube, pivoted deflectors composed of upper and lower portions arranged adjacent to the downward extensions, a passage between the tube and each receptacle, and doors arranged in the  
15 passages, substantially as described.

5. A seed-cotton elevator and distributor comprising a tube connected with an exhaust-  
fan, downward extensions from the tube, piv-  
20 oted deflectors composed of upper and lower portions arranged adjacent to the downward extensions, receptacles arranged adjacent to the tube and communicating with the downward extensions, a passage between the tube and each receptacle, doors arranged in the  
25 passages, and ropes each connected at one end to one of the doors, and one end of each rope passing over a part connected with one of the pivoted deflectors, substantially as described.

6. A seed-cotton elevator and distributor  
30 comprising a tube, a fan for exhausting air from the tube, and receptacles connected with the tube, the receptacles being provided with flaps or wings whereby the upward passage of cotton in the receptacles is prevented, sub-  
35 stantially as described.

7. A seed-cotton elevator and distributor comprising a conveyer-tube, receptacles arranged adjacent to the tube and designed to receive cotton from the same, the receptacles  
40 being provided with flaps or wings whereby

the upward movement of cotton in the receptacles is prevented, substantially as described.

8. A seed-cotton elevator and distributor comprising a tube, a fan for exhausting air  
45 from the tube, movable deflectors arranged in the tube, receptacles arranged adjacent to the deflectors and an overflow or vacuum box connected with the tube and provided with wings or flaps for preventing upward move-  
50 ment of the cotton, and also provided at its lower end with pivoted wings or flaps having springs bearing thereon, substantially as described.

9. A seed-cotton elevator and distributor comprising a tube, means for exhausting air  
55 from the tube, and receptacles arranged adjacent to the tube and communicating therewith, the receptacles being provided on their inner faces with strips of canvas, rubber, or the like attached to the faces at their upper  
60 edges, and having their lower edges free substantially as described.

10. A seed-cotton elevator and distributor comprising a tube, provided at intervals with  
65 openings in its bottom, a fan for exhausting air from the tube, receptacles arranged beneath the openings in the tube, and having the upper portions of their walls removed, strips of leather or the like arranged around  
70 the spaces thus formed, and swinging doors capable of closing the openings in the tube or for forming parts of the walls of the receptacles, substantially as described.

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

JEFFERSON M. GARDNER.

Witnesses:

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F. D. BERRY.