J. N. ELLENBURG & A. NELSON.

COTTON ELEVATOR AND DISTRIBUTER.

APPLICATION FILED APR. 6, 1912.

1,037,223.

Patented Sept. 3, 1912.

2 SHEETS—SHEET 1.

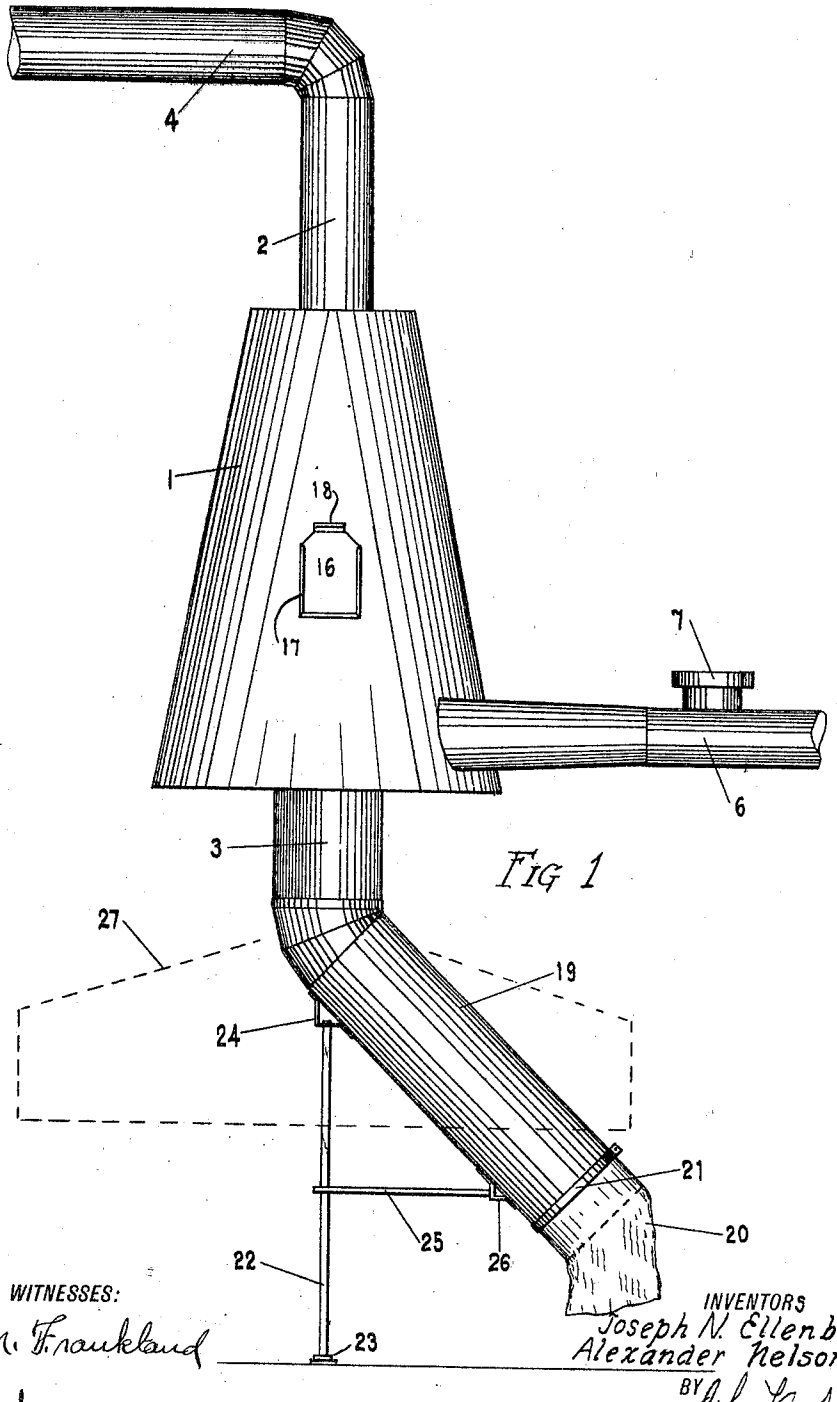

FIG 1

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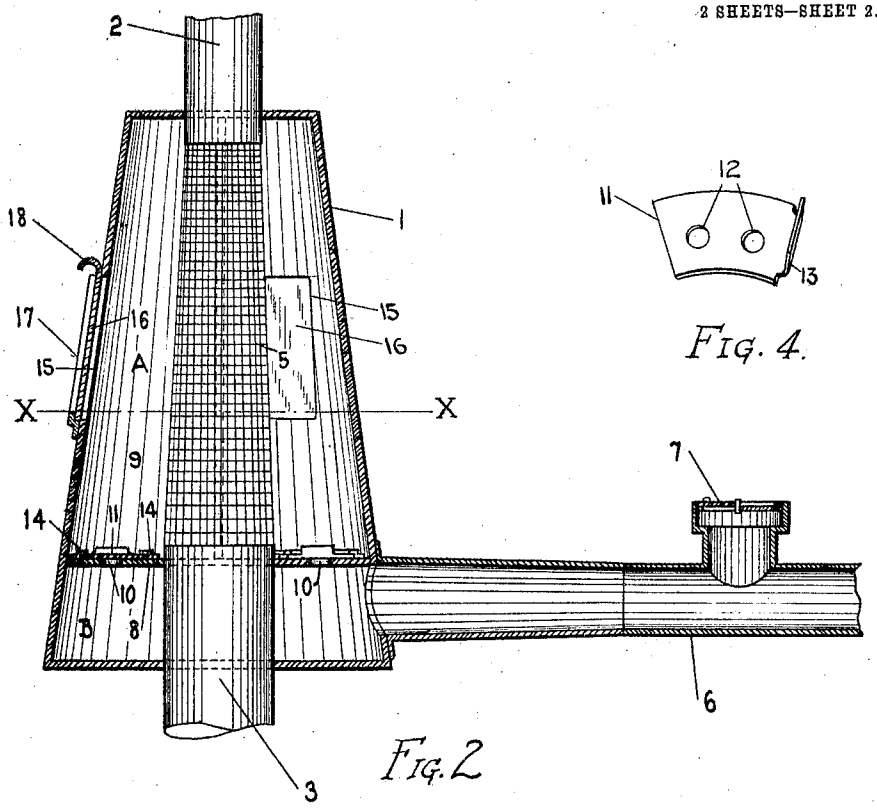

FIG. 2

FIG. 4.

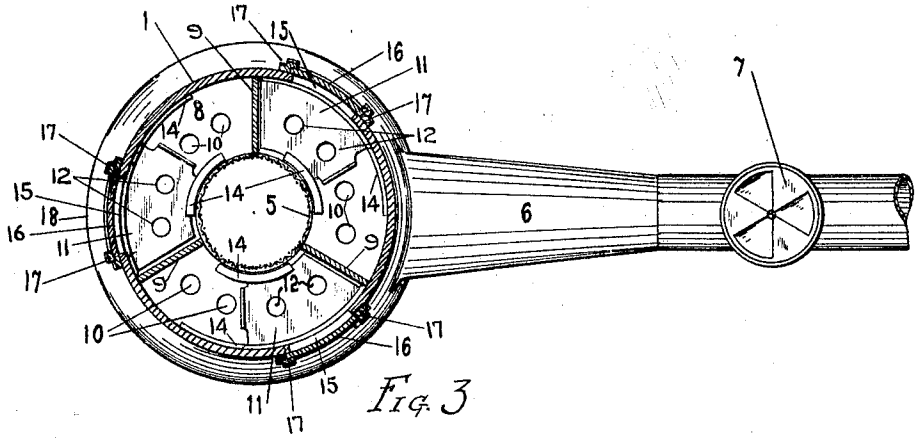

FIG. 3

WITNESSES:

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UNITED STATES PATENT OFFICE.

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COTTON ELEVATOR AND DISTRIBUTER.

1,037,223. Specification of Letters Patent. Patented Sept. 3, 1912.

Application filed April 6, 1912. Serial No. 688,876.

To all whom it may concern:

Be it known that we, JOSEPH N. ELLENBURG and ALEXANDER NELSON, citizens of the United States, residing at McKinney, in the county of Collin and State of Texas, have invented certain new and useful Improvements in Cotton Elevators and Distributers, of which the following is a specification.

Our invention relates to new and useful improvements in cotton elevators and distributers, and relates more particularly to such devices of this class as depend for the production of a vacuum.

The object of the invention is to provide a vacuum-operated cotton elevator and distributer so constructed that the cotton will have no tendency to clog the screen through which air is withdrawn from the cotton conveying pipe.

Another object of the invention is to provide an improved form of vacuum box, forming part of a combined elevator and distributer, a means being provided within said box to accurately regulate the intensity of the partial vacuum created.

A further object of the invention is to provide a means by which cotton in being discharged from the vacuum box may be easily distributed over a considerable area of floor space, and to substitute the easier plan of moving the discharge pipe for the practice now prevailing of raking away the discharged cotton from the outlet of the discharge pipe.

Finally, the object of the invention is to provide a device of the character described that will be strong, durable, simple and efficient, and comparatively easy to construct and also one, the various parts of which will not be likely to get out of working order.

With these and various other objects in view, our invention has relation to certain novel features of the construction and operation, an example of which is described in the following specification, and illustrated in the accompanying drawings, wherein:

Figure 1 is a view of the combined elevator and distributer in side elevation, the cotton inlet pipe and air exhaust pipe being both broken away and a conveyer casing being shown in dash lines, which may be substituted for the swivel discharge pipe shown in full lines. Fig. 2 is a vertical, axial, sectional elevation of the same. Fig. 3 is a horizontal, sectional view taken upon the line *x*—*x* of Fig. 2. Fig. 4 is a detail, perspective view showing a novel form of slide valve employed to control the passage of air from the exhaust chamber into the exhaust pipe.

Referring now more particularly to the drawings, wherein like reference characters designate similar parts in all the figures, the numeral 1 denotes a frusto-conical exhaust chamber, preferably of sheet metal construction, the top of said chamber having communication with a vertical inlet pipe 2, and the bottom thereof having communication with a vertical outlet pipe 3. The pipe 2 communicates through a suitable elbow with a horizontal pipe 4 extending to and communicating with some receptacle for cotton, as for example, a wagon box. The pipe 3 extends upwardly for some distance into the casing, as clearly shown in Fig. 2, and its upper extremity is connected with the lower extremity of the pipe 2 by a frusto-conical wire screen 5. An air exhaust pipe, having a valve member 7, communicates with the lower extremity of the casing 1 at some point between the vacuum box 1 and the fan or similar device (not shown) by which suction is created. By opening the valve 7, the suction within the box 1 may be destroyed at any time, thus permitting any cotton in the discharge pipe to escape. A horizontal partition 8 divides the exhaust box into a large upper compartment A and a small lower compartment B, the upper end of the pipe 3 being passed through said partition and terminating just above the same. As is clearly shown in Fig. 2, the exhaust pipe 6 communicates with the compartment B of the exhaust box just below the partition. The larger compartment A of the vacuum box is divided into three equal minor compartments by the same number of vertical partitions 9, said partitions extending between the inner surface of the casing 1 and the outer of the screen 5 and being perpendicular to both of said surfaces. Communication is established between the compartments A and B through twelve circular apertures 10, four of which communicate with each of said three minor compartments. A sliding valve formed by a metal plate 11, and provided with two circular apertures 12, is adapted to open or close two of the apertures 10 through a sliding ad-

justment. One extremity of said valve member is bent over, as indicated at 13, to form a handle by which the valve may be conveniently slid back and forth. Each of the sliding valve members 11 are guided during their sliding adjustment by a pair of curved metal strips 14, said strips transcribing fragmentary arcs having their centers upon the central axis of the casing 1. The side wall of the casing 1 is provided with three equidistant apertures 15, each communicating with one of the minor compartments of the large compartment A. Each aperture 15 is adapted to be closed by a vertically sliding door 16, having a handle member 18 at its top and received by guiding strips 17 rigid with the casing at each side of the door. Normally the doors 16 occupy positions closing the apertures 15.

The lower extremity of the discharge pipe 3 communicates with an inclined pipe 19 through a swivel elbow. The lower extremity of the pipe 19 is at an elevation above the floor upon which cotton is to be discharged. A fabric sleeve 20 has its upper end mounted upon the lower end of the pipe 19, being held securely in such a position by means of a clamping ring 21. Said sleeve depends for some distance below the lower end of the pipe 19. The inclined pipe 19 is supported by a vertical rod 22 axial with the pipe 3, the lower end of said rod being received by a thrust bearing 23 resting upon the floor, and its upper end being received by an angular bracket 24 secured to the upper portion of said pipe 19. The lower end of the pipe 19 is further supported by a horizontal brace member 25, one end of which is mounted upon the rod 22 and the other end received by an angular bracket 26 secured to the lower extremity of the pipe 19.

The operation and advantageous features of the above-described invention will now be more fully discussed.

In all types of cotton elevators now commonly used, considerable trouble and annoyance is occasioned by the tendency of the cotton to clog up the screen through which air is withdrawn from the vacuum box. In the above-described invention this annoyance is eliminated by providing a comparatively large screen area, through which the air is uniformly withdrawn at all sides. The strength of suction at any one point of the screen is thus sufficiently reduced to prevent the cotton being deflected laterally from the natural path in which it falls through the vacuum box. The frusto-conical shape of the screen 5 is a very important consideration in preventing the cotton from clogging up the screen, since it spaces the screen from the falling cotton and thereby weakens the effect of the suction in its tendency to draw the cotton toward the screen. It is also apparent that a very uniform suction may be secured by dividing the larger compartment A of the vacuum box into minor compartments with each of which several valve-controlled apertures communicate, through which apertures the air is withdrawn. Obviously, such an arrangement makes it quite impossible for the suction to act at any one side of the screen 5. It may further be observed that, since the suction acts through the screen 5 equally from all sides, any tendency that may arise to move the cotton laterally toward the screen in one direction will be counteracted by an equal tendency exerted from the opposite direction. The several apertures 15 permit of access being had to each of the minor compartments of the upper vacuum chamber, so that the position of the slide valve 11 may be conveniently regulated. The valve 7 in the exhaust pipe 6 provides a still further means for regulating the strength of suction created in the exhaust chamber 1, and in case the suction becomes too strong, for any reason, the valve 7 may be sufficiently opened to permit the force of suction to be modified by a certain amount of air entering through said valve.

The novel feature of the discharge pipe 19 lies in its swivel connection to the pipe 3, said discharge pipe being pivotally supported by the rod 22, may be swung about its swivel connection and made to assume various positions lying in a circle centered at the foot of the rod 22. Thus when the cotton accumulates sufficiently on the floor to block the outlet of the pipe 19, said pipe may be readily adjusted so that it may discharge upon a clear floor space, and this adjustment may be repeated a large number of times without making it necessary to remove the discharged cotton.

In case it is desired to gin the cotton immediately after its discharge from the elevator, an ordinary conveyer casing 27 may be substituted for the discharge pipe 19, said conveyer casing being made to connect with a gin (not shown).

It is obvious that various changes and modifications may be made in the form and proportions of parts in the above-described invention without departing from the spirit or sacrificing the advantages thereof, and said invention is presented as including all such changes and modifications as come within the scope of the following claims.

What we claim is:

1. In a device of the character described, the combination with a casing, of a horizontal partition mounted in the lower portion of the casing, dividing it into an upper and a lower compartment, vertically alined inlet and outlet pipes respectively communicating with the top and the bottom of the casing, the latter projecting through the

lower compartment, a screened inclosure centrally mounted within the casing and spaced from the walls thereof, the upper and lower ends of said inclosure respectively communicating with inlet and outlet pipes, a plurality of vertical partitions dividing said upper compartment into a plurality of sub-compartments, each of which has communication with the lower compartment through a plurality of apertures in the horizontal portion, and an air exhaust pipe communicating with said lower compartment.

2. In a device of the character described, the combination with a casing, of a horizontal partition mounted in the lower portion of the casing, dividing it into an upper and a lower compartment, vertically alined inlet and outlet pipes respectively communicating with the top and the bottom of the casing, the latter projecting through the lower compartment, a screened inclosure communicating with the outlet and inlet pipes, a plurality of vertical partitions dividing the upper compartment into a plurality of sub-compartments, each of which has communication with said lower compartment through a plurality of apertures in the horizontal partition, guide members in each sub-compartment securely fastened to the horizontal partition, a slide-valve, received by the guide members, containing a plurality of apertures which are adapted to aline with like apertures in the horizontal partition, and an air exhaust pipe communicating with said lower compartment.

3. In a device of the character described, the combination with a frusto-conical casing, of a horizontal partition mounted in the lower portion of the casing dividing the same into an upper and a lower compartment, vertically alined inlet and outlet pipes respectively communicating with the top and bottom of the casing, the latter projecting through the lower compartment, and the inlet pipe being smaller in diameter than the outlet pipe, a screened inclosure of frusto-conical shape making communication between the inlet and outlet pipes, and an air exhaust pipe communicating with said lower compartment.

4. In a device of the character described, the combination with a casing, of a horizontal partition mounted in the lower portion of the casing, dividing the same into an upper and lower compartment, vertically alined inlet and outlet pipes respectively communicating with the top and the bottom of the casing, the outlet pipe projecting through the lower compartment, a plurality of vertical partitions dividing the upper compartment into a plurality of sub-compartments, access being had to each sub-compartment through an aperture in the casing wall, guide members rigidly fastened to the exterior surface of the casing at each side of each aperture, a sliding door received by the guide members, and an air exhaust pipe communicating with said lower compartment.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOSEPH N. ELLENBURG.
ALEXANDER NELSON.

Witnesses:
HOWELL E. SMITH,
J. G. FITZHUGH.