

No. 680,165.

Patented Aug. 6, 1901.

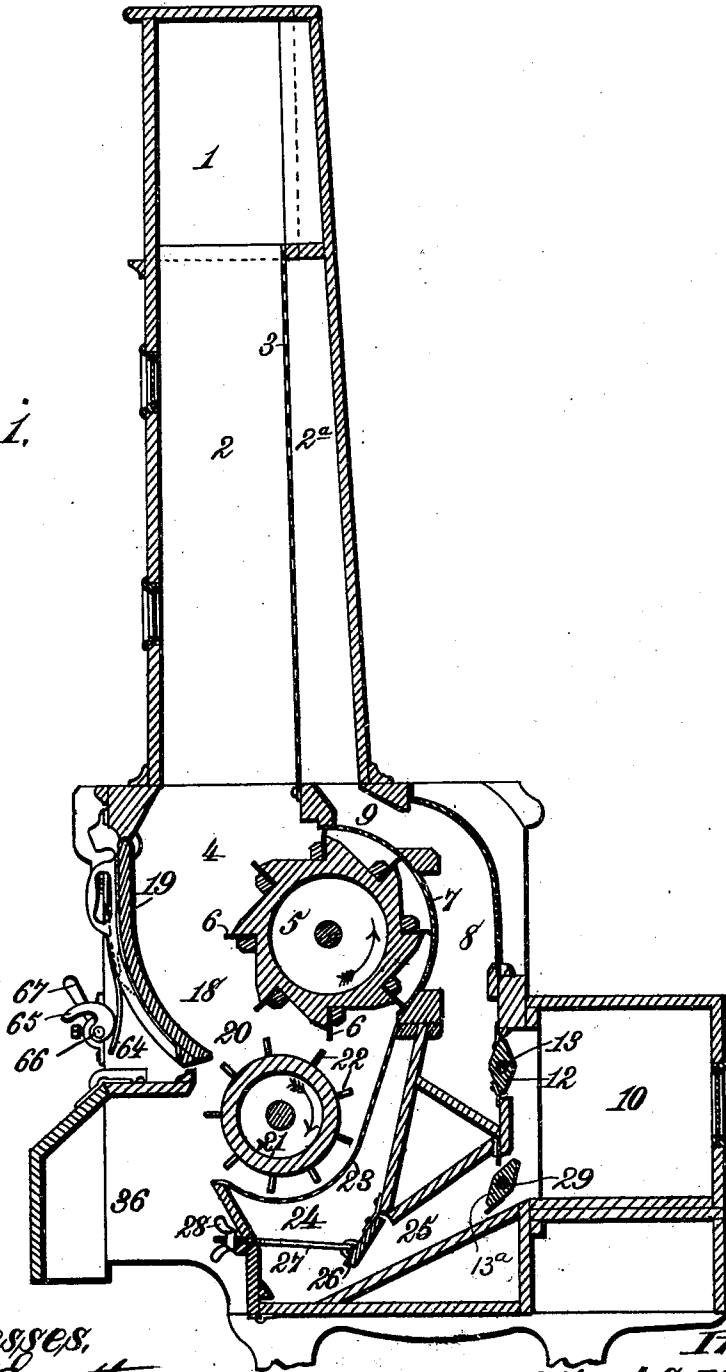
R. S. MUNGER.
COTTON ELEVATOR, CLEANER, AND FEEDER.

(Application filed Feb. 3, 1899. Renewed Sept. 10, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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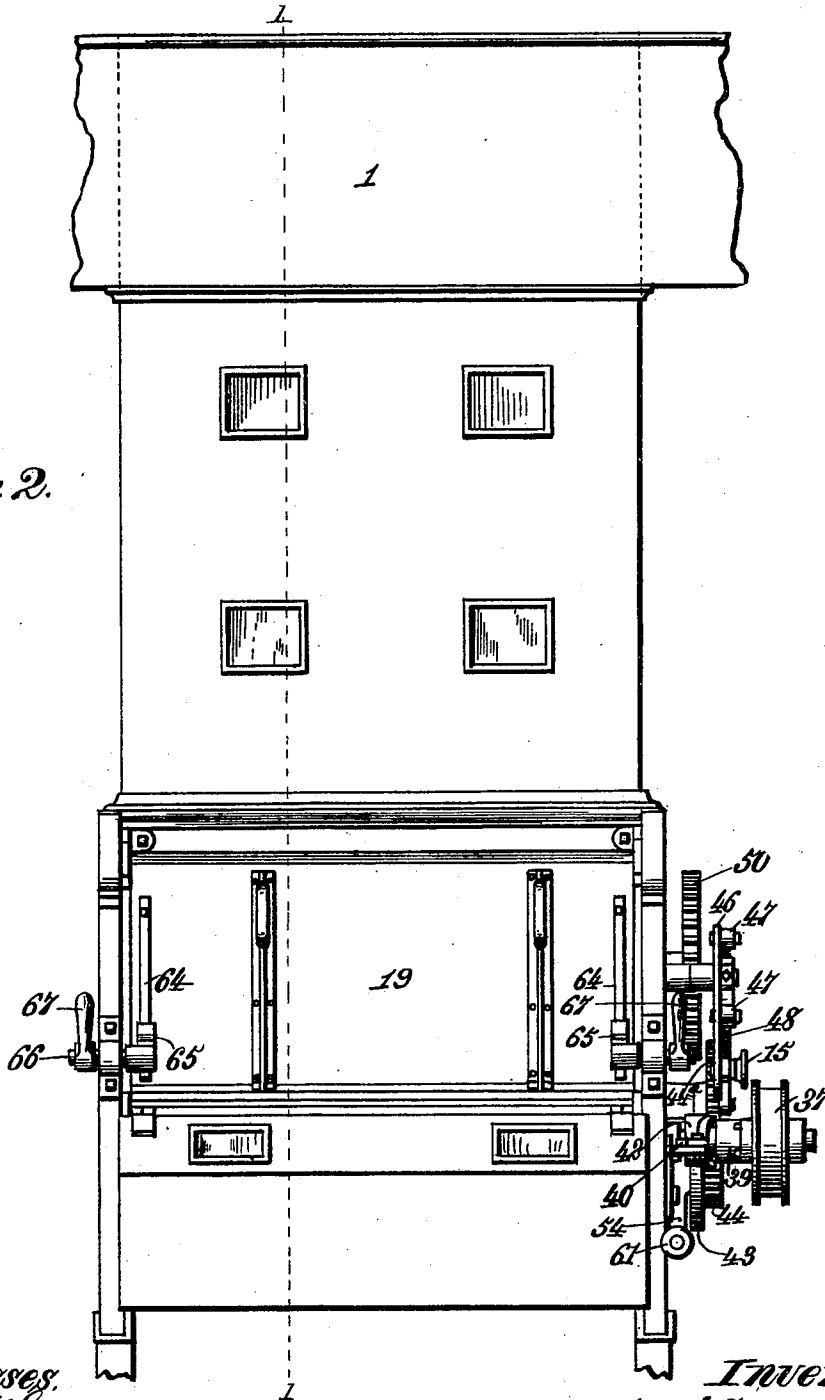
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4 Sheets—Sheet 2.

Fig. 2.



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4 Sheets—Sheet 3.

Fig. 3.

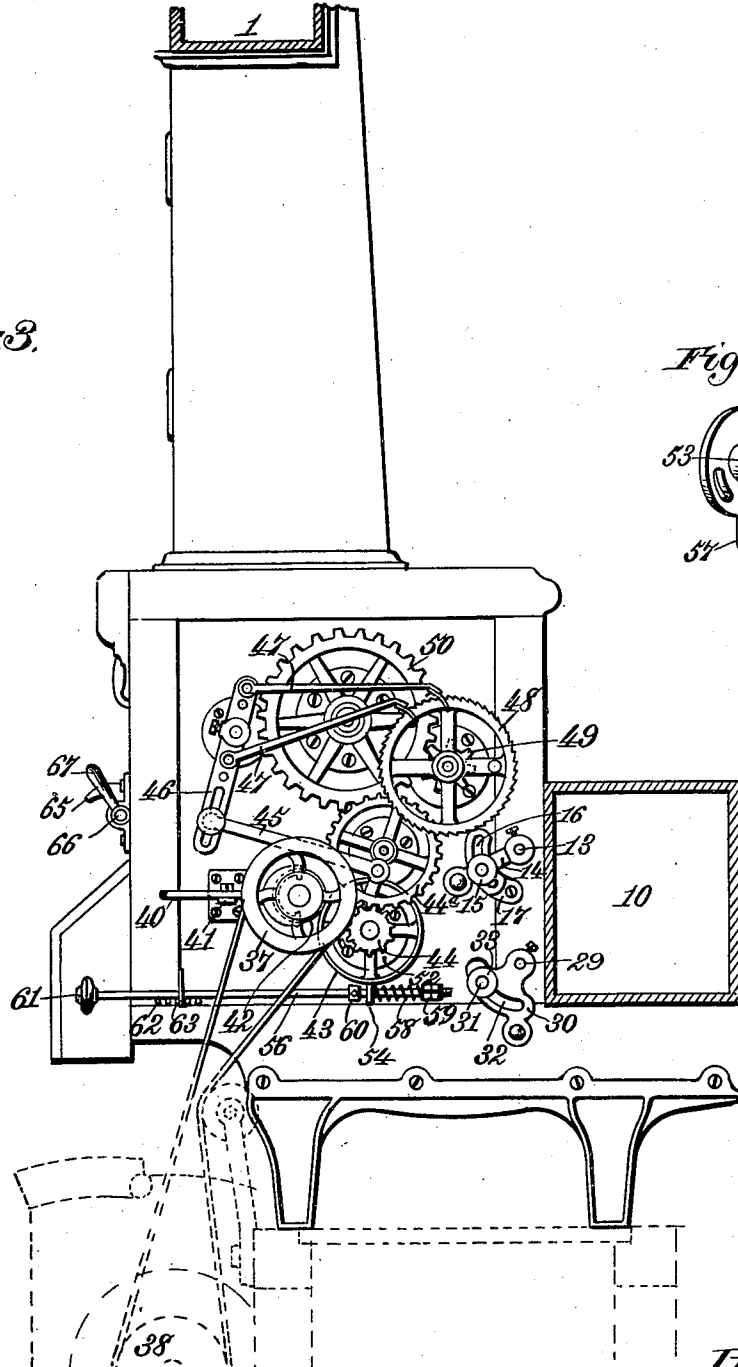
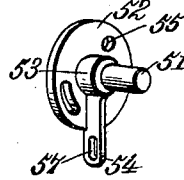


Fig. 4.



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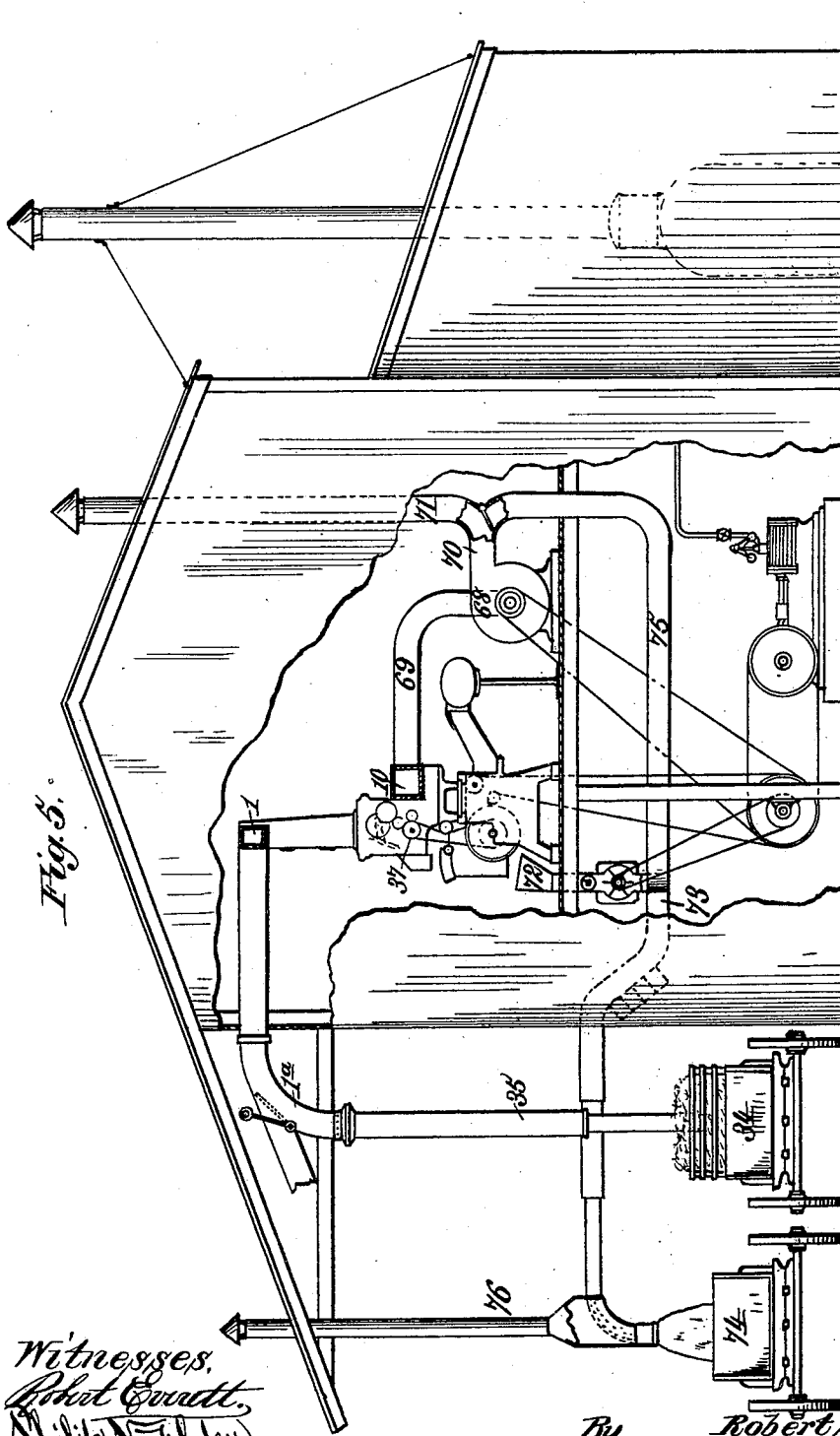
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

ROBERT S. MUNGER, OF BIRMINGHAM, ALABAMA.

COTTON ELEVATOR, CLEANER, AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 680,165, dated August 6, 1901.

Application filed February 3, 1899. Renewed September 10, 1900. Serial No. 29,587. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. MUNGER, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Cotton Elevators, Cleaners, and Feeders, of which the following is a specification.

It is the purpose of my invention to provide mechanism for elevating, conveying, and cleansing seed-cotton and feeding it directly to the gins, whereby the cotton is improved in quality and the method of handling rendered more simple and economical than heretofore.

One object of my invention is to combine with an elevating and conveying mechanism for seed-cotton positive means for separating and removing dust, leaf trash, and other impurities before the cotton is fed to the gins, whereby the cleansing process which is incidental to a pneumatic conveyer or elevator may be much more thoroughly and perfectly accomplished, while the cotton is materially improved in quality and the period of useful service of the ginning devices is prolonged sufficiently to effect a marked economy as one of the advantages of my invention, these results being increased by the saving in time due to the more rapid action of which the gins are capable, when the grit and other foreign matters liable to clog, break, and rapidly wear away the gin-saws are practically eliminated.

It is my further purpose to so organize an elevator, conveyer, and cleaner for seed-cotton that the latter may be fed therefrom directly to the gins without the intervention of a distributor.

My invention also comprises other novel and useful features, all of which will be fully described hereinafter and then particularly pointed out and defined in the claims at the close of this specification.

For the purposes of said description reference is had to the accompanying drawings, in which—

Figure 1 is a vertical section through the exhaust-chamber, feed-chamber, and cleaning-throat of an apparatus constructed in accordance with my invention, the section being taken upon the line 1 1 in Fig. 2. Fig. 2

is a front elevation of the parts shown in Fig. 1. Fig. 3 is a side elevation of the same, the point of view being at the right hand of the apparatus in Fig. 2, part of the lower portion being in section, with the top of a gin indicated by dotted lines beneath. Fig. 4 is a detail perspective view of a part removed from the mechanism. Fig. 5 is a diagrammatic elevation showing a ginning-house equipped with my invention, the walls of the structure being broken away to disclose the interior.

In the following description I will first explain the construction, arrangement, and operation of the elevating, conveying, feeding, and cleaning apparatus and will then point out the arrangement and relations of the same to the ginning mechanisms.

The reference-numeral 1 in said drawings indicates a pneumatic conveyer, through which cotton is carried by an exhaust-blast—that is to say, a blast or current of air which is produced by exhausting or withdrawing the air from said conveyer at one end or point and admitting air from the exterior at another point, the cotton being carried by the air-current last referred to. The conveyer 1 extends or passes over the top of an exhaust-chamber, the latter being separated into two parts 2 and 2^a by a vertical foraminous partition or wire screen 3. The chamber 2 opens directly into a feed-chamber 4, in which is arranged a feeding roll or drum 5, having flexible or elastic wings 6 projecting in radial lines from the periphery of said drum. The edges of these wings pass, when the drum revolves, close to or in contact with a curved partition or wall 7, concentric with the drum 5. This partition forms part of the inclosing structure of an air-flue or air-chamber 8, which has communication with a chamber 9, forming one of the two chambers into which the exhaust-chamber 2 is divided by the wire screen 3. The chamber 8 also communicates with an exhaust-passage or suction-flue 10 by means of a port which is controlled by a valve 12, (shown in Fig. 1,) the valve-shaft 13 being operated by a lever 14, having a thumb-screw 15 mounted thereon. The end of the screw engages with a curved slot 16 in a plate 17, so that by turning it the valve-shaft can be locked with the valve in any desired position.

The valve-wings 6 are usually made either wholly or in part of rubber, so that they are elastic, and have a close fit upon the wall or curved partition 7 to prevent the passage of
5 air between said partition and the drum 5.

The feed-drum 5 is so arranged that a passage 18 is formed between said drum and a curved breast or wall 19, which is practically a continuation of the front wall of the exhaust-chamber 2, with which said passage 18
10 communicates. The breast or wall 19 curves slightly downward and rearward or toward the drum 5, so that a gradual contraction is produced in the width of the passage 18, as
15 shown in Fig. 1. The passage terminates at a point 20 just below the drum 5, or thereabout, this being its narrowest point or throat. Immediately below this throat is placed a
20 drum 21, having cleaner and picker spikes or teeth 22 projecting from its cylindrical face and of such length that their ends or points revolve in close proximity to the throat 20 and quite near the lower edge of the curved
25 wall 19 and the edges of the valve-wings 6 on the lower side of the drum 5.

Behind and beneath the drum 21 is a screen or foraminous partition 23, which extends from the lower edge of the curved wall 7 and
30 inclines in a plane which is nearly tangential to the ends of the spikes upon the rearward side of the drum and thence curves concentrically beneath the said drum, with a narrow space between it and the ends of the spikes
35 22. In the rear of the screen 23 and beneath it is a chamber 24, from which a passage 25 leads to the exhaust-conduit or suction-flue
40 10. Said passage is provided with a valve at each of its ends having any suitable form that will admit of an independent adjustment of said valves. As shown in this instance, the inlet-valve 26 is hinged to one
45 wall of the chamber 24 and may be regulated by a rod 27, having one end hooked into a staple or eye upon the valve, while the other end projects through a wall of the chamber and is threaded to receive a thumb-nut 28,
50 by turning which in one direction the valve is opened, while by turning it in the opposite direction the valve is permitted to close. The other or outlet valve 13^a at the exit end of the passage 25 is similar in construction to the valve 12. Upon one end of the valve-shaft 29, which projects outside the wall enclosing said passage, is mounted a lever-plate
55 30, as seen in Fig. 3, by which the valve-shaft can be turned to give any required adjustment of the valve 13^a. A screw 31 passes through a curved slot 32 in the lever-plate and enters the outer face of the wall, a thumb-nut 33 being turned upon the threaded and shouldered outer end of the screw to lock the lever-plate at any point to which it may be
60 turned.

It will aid in arriving at a clear understanding of the invention if I describe at this point
65 the functions of the parts thus far mentioned and their method of operation when com-

bined and arranged in the manner shown. It will be understood that the conveyer 1 is so arranged as to take cotton from any point,
70 and in this instance I have shown it in Fig. 5 in the act of taking cotton from a wagon 34 by means of a telescoping drop-pipe 35, which enters or has communication with the conveyer. This pipe is jointed and is flexible and constitutes in the present illustration
75 of the invention the means for elevating the cotton. It needs no specific description, being shown, described, and claimed in Letters Patent No. 308,790, issued to me December
80 2, 1884. The drop-pipe is connected to the conveyer 1 by a curved section 1^a, and that portion of the conveyer which connects directly to the elevator enters or communicates with the portion 1, lying at a right angle, by
85 means of a similar curved section, whereby the direction of movement is changed gradually. It should be noted that these constructional features are all subject to a wide variation without any departure from my invention.
90 As a simple example of such modification I will mention that the cotton-conveyers may enter the front of the exhaust-chamber 2 instead of the top, and when two or more are connected such a construction will be preferable. Any other point of entrance which will permit of the contemplated operation may be used also as well as those specified. A second elbow is also employed communicating with a conveyer leading from a cotton-
100 house where the raw fiber is stored, as shown in my Letters Patent already mentioned.

The mechanism for producing the necessary exhaustion of air will be referred to hereinafter, it being sufficient for the present to
105 understand that there is a partial exhaustion of air established in the suction-flue 10, the valves 12, 13^a, and 26 being suitably adjusted to give the necessary communication between the flue 10, the exhaust-chamber 2, and the
110 chamber 24.

The feed-drum 5 is given a revolution from right to left at a slow speed, as shown by the arrow in Fig. 1, and the cleaning-drum 21 is shown in the present instance as if it were
115 rotated in the opposite direction with a comparatively high speed, this direction of movement being shown by an arrow in Fig. 1. It is not indispensable, however, that this direction of construction be followed, since I may
120 drive the cleaning-drum in either direction without affecting the operation of the other parts or the result arrived at. The cotton which is drawn into the mouth of the jointed telescoping elevator or drop-pipe is carried
125 up therein, passes into the conveyer 1, and thence into the exhaust-chamber 2. The strong air-blast which traverses these passages speedily dries and carries away any moisture or dampness in the cotton, and to a
130 limited extent it removes the dust and lighter trash that are mingled with the fiber. These, so far as they are removed, pass through the screen 3 and into the chamber 2^a behind it,

and then following and borne by the air-current such foreign matters pass into the chamber 8 and through the valves opening into the flue 10, through which they are drawn to and through the fan and driven off outside the building, as explained hereinafter.

The exhaust-chamber 2 is preferably arranged so that the cotton coming into it from the conveyer 1 will pass by its own gravity to the feed-chamber 4 and into the broad mouth of the passage 18, where it is subjected to the action of the feeding-drum 5. This drum having a comparatively slow rotation, its speed being perhaps one complete revolution per minute, or thereabout, takes the cotton in the upper part of the feed-chamber and by its fluted or corrugated surface and projecting wings, which turn over toward the wall 19 and downward, it rolls the cotton, and as it travels down in the passage 18 it is slowly compressed into a mass of constantly-increasing density owing to the gradual contraction of the passage. In this manner a closely-compacted body of cotton is maintained in the throat 20 and above the same, by which any material leakage of air is prevented, leakage on the other side of the feed-drum being cut off by the wings 6 and the curved partition 7. Upon passing the throat 20 the bat of cotton is subjected to the action of the spiked cleaning-drum 21, which is driven at high speed in a direction from left to right, or vice versa. Thus whether its rotary movement is opposite that of the drum 5 or in the same direction the spikes 22 upon its upper side act upon the compacted mass of cotton near the lower or adjacent side of the feed-drum, so that they practically assist the onward movement of the cotton in the throat 20 and its uniform removal from that point to make room for the constantly-advancing mass behind. It accomplishes this result without such action as would tend to produce a leakage of air through the throat 20. In one direction of revolution the cotton will be simply disintegrated from the compressed bat lying in the throat 20 and carried over the screen 23, as shown in Fig. 1. When the feed-drum is rotated in the opposite direction, the cotton will simply be thrown into the chamber 36 and go to the gin without passing over the screen 23. The spikes 22 of the cleaning-drum pick the cotton apart and thresh it against the screen 23, thereby effectually driving out the dirt and foreign matter lodged in it, which pass through the screen into the chamber 24, being drawn therein by the current of air established by the communication of said chamber 24 with the suction-flue 10, through the passage 25.

In order that there may be a substantially uniform action of the air-current upon every part of the screen or as nearly so as possible and to permit such a regulation of the air-current drawn through the screens 3 and 23 as may be necessary relatively to the air pass-

ing the screen 23, the valves 12, 13^a, and 26 are extended across the whole width of the chambers to which they give admission, and by adjusting the inlet area afforded by their open position the results referred to may be accomplished. For example, by opening the valve 26 a short distance only, according to the force of the suction in the flue 10 and the area of the screen 3, the air passing out of chamber 24 will be compelled to seek exit throughout the whole extent of the opening afforded by the valve and the air is compelled to traverse the ends of the chamber through which it passes with as much force as in the middle portion. This function of the valve 26 is supplemented by a suitable adjustment of the valve 13^a at the other end of the passage 25. By adjusting the valve 12 also with reference to the volume of air allowed by the valves 26 and 13^a it is possible to use a screen 3 of less area than is otherwise practical. Moreover, by closing the valve 12 the whole force of the current may be thrown upon the screen 23 and the cotton in the feed-chamber 18 and throat 20. After passing off the screen 23 the cleansed cotton goes into a passage 36, by which it is delivered directly to the ginning apparatus, the latter being indicated in dotted lines in Fig. 3.

The shaft of the cleaning-drum 21 is provided with a loose pulley 37, (shown in Figs. 2 and 3,) which is belted to a pulley 38 on the shaft carrying the gin-saws. A clutch-box 39 is keyed upon the drum-shaft, and adapted to engage with and be disengaged from a clutch-section on the hub of the pulley 37. A lever 40, fulcrumed upon a bracket 41, serves to operate the clutch-box and bring the cleansing-drum into and out of operation. The shaft of said cleaning-drum also has a friction-disk 42, which is adapted to drive a second friction-disk 43, the latter of which also carries a spur-gear 44, the gear 44 having mesh with a larger gear 44^a, supported by a stud on the frame. A pitman 45, having one end engaged with a wrist upon the gear 44^a, has its other end adjustably connected to the slotted end of a pivoted lever 46. Upon each side of the pivotal bearing for the latter a push-rod 47 is connected, a pawl upon its free end engaging a ratchet 48, having a pinion 49 upon its shaft. This pinion meshes with a spur-gear 50 on the shaft of the feed-drum 5, revolving the latter with the proper direction and speed.

The friction-disk 43 is mounted upon a stud 51, projecting from a plate 52. An eye or loop 53 projects from the center of the plate and the stud 51 passes through it, said eye having a short bar 54 extending from it. The plate 52 is mounted upon a pivot which passes through a hole 55, Fig. 4, eccentric to the stud, and enters the wall of the machine-casing. A rod 56 passes through a slot 57 in the end of the bar 54 and has a spring 58 coiled upon it between the bar and a nut 59, adjustable upon the threaded end of the rod. The

tension of the spring 58 swings the plate 52 upon its pivot and pushes the friction-disk 43 away from or in a direction to remove it from contact with the disk 42 when held in such contact by the operation of the rod 56. The spring 58 insures a yielding contact. A collar 60, loose and adjustable upon the rod 56 on the other side of the bar 54, engages the latter when the rod is moved longitudinally against the tension of the spring 58, swings the plate 52 in the opposite direction, and separates the friction-disks, causing the feeding-drum 5 to come to a stop. The rod 56 extends to the front of the machine and has a knob or handle 61 and is provided with a series of teeth 62 to engage a detent 63, so that the friction-disk 43 may, if desired, be held for a time out of engagement with the friction-disk 42. By these means the operation of the feed-drum 5 may be arrested at any moment and caused to remain inoperative, according to the requirements of the gin. The cleaning-drum will be independently controlled by the clutch-operating lever 40.

The breast-wall 19, which forms one side of the passage 18, is not only removable, but is made adjustable in such manner as to regulate the width of the passage 18 and of the opening or throat 20. For this purpose the wall is pivoted at its upper edge and is provided with leaf-springs 64, the tension of the latter being increased or diminished by means of cams 65, mounted on a cam-shaft 66, which is turned in its bearings by levers 67, projecting from the ends of the shaft, as shown in Figs. 1, 2, and 3.

In Fig. 5 of the accompanying drawings I have given a diagrammatic illustration of the complete apparatus by showing a working plant in operation. It will be observed that the fan 68, which exhausts air from the conveyer and elevating-pipe, is placed behind the gin and upon the same floor and connects with the suction-flue 10 by an air-conduit 69, which enters one side of the flue. The latter, as will readily be understood, has communication with a plurality of exhaust-chambers, there being one complete mechanism similar to that shown in Figs. 1, 2, and 3 for each gin. As each mechanism is practically independent of all the others, I dispense with all devices between the same and the gin and deliver the clean seed-cotton to the latter apparatus directly from the cleaning-drum. The air-exhausting fan may of course be located elsewhere and at any convenient point, provided that the suction-flue 10 communicates with the chamber 2^a behind the screen 3 and with the dust-chamber 24 by independent air-passages, the passage leading out of the latter chamber being preferably caused to take the air therefrom at a point beneath the cleaning-drum 21, or nearly so. The air-exit 70 from the fan-casing 68 enters or communicates with a chimney 71, by which the dust, dirt, leaf-trash, and other foreign matters removed from the cotton are blown out of the

gin-house and pass off without any portion of the same being driven into the ginning-room to affect the health of the operatives and become deposited upon the cotton. The conveyer 1, as shown in Fig. 5, is carried along at a point where it can have suitable communication with the exhaust-chamber 2 of each machine.

To show a complete plant, I have included in Fig. 5 the seed-handling mechanism, which, however, forms no part of my present invention. The reference-numeral 72 indicates the seed-hopper, and 73 the blast-flue or air-box, which receives the seed from a flue beneath the hoppers 72 and carries it to any point desired—as, for example, a wagon 74, outside the building. The air-box 73 receives a forced blast of air through a conduit 75, which receives air from the exit-passage 70, that leads from the casing of the fan 68 to the chimney 71. This arrangement will necessarily result in driving off more or less of the dust, leaf-trash, and other refuse withdrawn from the chamber 24 through the fan-casing 68 and thence through the exit-passage 70 from said casing into the blast-flue 73. After traversing the latter it will be driven off through a chimney 76, which also carries off the dust which had become mingled with the seed, leaving the latter clean.

What I claim is—

1. In an apparatus for elevating, conveying and cleaning seed-cotton and feeding it to the ginning mechanism, the combination with a suitable drop-pipe and conveyer, of means for establishing suction therein, an exhaust-chamber communicating with the conveyer, a feed-drum having peripheral valve-wings arranged in a chamber opening into the exhaust-chamber, a breast located in proximity to the feed-drum and arranged to create a gradually-contracting passage-way in which the cotton is rolled and compacted by the valve-wings, a curved wall or partition against which the valve-wings move, and a cleaning-drum arranged directly below and receiving the cotton from the lower end of said gradually-contracting passage-way, the passage of air between the said curved wall or partition and the feed-drum being cut off by the wings of said drum, substantially as described.

2. In a mechanism for elevating, conveying and cleaning seed-cotton and feeding it to the gin, the combination with suitable elevating and conveying conduits, or passages, of means for establishing suction therein, an exhaust-chamber opening into the conveyer, a feed-drum in a chamber communicating with the exhaust-chamber, a breast located in proximity to the feed-drum and arranged to create a gradually-contracting passage-way in which the cotton is rolled and compacted by said drum, and a spiked cleaning-drum arranged directly below and receiving the cotton from the lower end of said gradually-contracting passage-way, said drum having wings

to cut off leakage of air between it and the opposite wall, substantially as described.

3. In a cotton elevating, feeding and cleaning mechanism, the combination with a passage for carrying the cotton, means for establishing air-suction in said passage, and an exhaust-chamber into which said passage opens, of a cotton-feeding and bat-rolling device arranged in a chamber below the exhaust-chamber and having means to cut off the escape of air at one side, a breast located in proximity to the opposite side of said device and constructed to create a gradually-contracting passage-way in which the cotton is rolled and compacted by said device, and a cotton-cleaning device arranged below and receiving the compacted cotton from the lower end of said gradually-contracting passage-way, substantially as described.

4. In a cotton elevator, feeder and cleaner, the combination with a passage for the cotton, and means for withdrawing air from said passage, of an exhaust-chamber divided into two parts by a vertical screen, one part receiving the cotton from said passage and the other communicating with a suction-flue by which the air is withdrawn from said passage, a feeding-drum having wings which prevent ingress of air upon one side of said drum, a breast located in proximity to the opposite side of said drum and arranged to create a gradually-contracting passage-way in which the cotton is rolled and compacted by said drum, a cleaning-drum arranged below and receiving the compacted cotton from the lower end of said gradually-contracting passage-way, and means for driving the two drums at different speed, substantially as described.

5. In a cotton elevator, feeder and cleaner, the combination with a passage for the cotton, of means for withdrawing air therefrom, an exhaust-chamber divided by a screen into two parts, one receiving the cotton and the other communicating with a suction-flue through which the air is withdrawn, a feed-drum to compact the cotton and cut off ingress of air on one side of said drum, the latter having wings which operate in conjunction with a curved partition to cut off air-ingress on the other side of said drum, a cleaning-drum rotating at a higher speed than said feeding-drum, a dust-chamber behind and beneath the cleaning-drum and separated from it by a screen, and independent valved passages between said dust-chamber and suction-flue and the exhaust-chamber and said flue, substantially as described.

6. In a cotton elevator, feeder, and cleaner, the combination with a passage for the cotton, of means for producing air-suction therein, a feeding-drum having wings which engage a curved partition on one side of the drum and prevent ingress of air to the exhausted passage, an adjustable wall on the other side of the drum inclosing a passage for the cotton which contracts in the direction of rota-

tion of the drum, a cleaning-drum having spikes which act upon the cotton compacted in said passage, a dust-chamber separated by a screen from said drum, and a valve-controlled passage from said dust-chamber to a flue through which the air is withdrawn, substantially as described.

7. In a cotton elevator, feeder and cleaner, the combination with a passage for the cotton, of means for producing air-suction therein, an exhaust-chamber divided by a screen, the cotton being received from said passage in a compartment on one side of said screen, while the compartment on the other side has communication with a flue through which the air is removed from said passage to produce suction, a feeding-drum having elastic wings, and arranged on one side of a passage for the cotton and rotating in such a direction that the side of the drum next the cotton moves in the same direction with it, compacting it in the narrowest part of said passage and preventing the entrance of air, the elastic wings engaging a curved, concentric partition to prevent entrance of air on the other side of said drum, a cleaning-drum having spikes projecting from it and rotating at a speed higher than that of the feeding-drum, a screen against which the cotton is threshed by the cleaning-drum, a dust-chamber on the other side of said screen, and a valve-controlled air-passage from said chamber to the flue through which the air is withdrawn, substantially as described.

8. In a cotton elevator, feeder and cleaner, the combination with a pipe and conveyer and with means for producing an air-suction therein, of an exhaust-chamber divided by a screen, the compartment on one side receiving cotton from the conveyer and that on the other side having communication with a suction-flue, through which air is withdrawn to produce the air-suction, a feeding-drum on one side of a passage for the cotton coming from the exhaust-chamber, a wall for said passage which is adjustable to vary its contraction toward the exit end, wings projecting from the feed-drum and engaging with a curved partition to cut off entrance of air on the side of the drum farthest from the contracting passage, in the throat of which the feed-drum compacts the cotton to cut off entrance of air to the passage, a spiked cleaning-cylinder to act upon the compacted cotton, and means for driving said drums at different speeds of rotation, substantially as described.

9. In a cotton elevator, feeder and cleaner, the combination with a passage for the cotton, of a suction-flue to withdraw air therefrom, a feeding-drum and a cleaning-drum acting successively upon the cotton coming from said passage, a dust-receiving chamber below the cleaning-drum, and an independent air-passage between the suction-flue and said dust-receiving chamber, substantially as described.

10. In a cotton elevator, feeder and cleaner, the combination with a passage for the cotton, of a suction-flue to withdraw air from said passage, a feeding-drum to which the cotton passes, a breast located in proximity to the opposite side of said drum and arranged to create a gradually-contracting passage-way in which the cotton is rolled and compacted by the drum, a cleaning-drum arranged below and receiving the compacted cotton from the lower end of said gradually-contracting passage-way, an air-passage to carry the dust and other substances removed from the cotton into the suction-flue, and a ginning apparatus to which the cotton is delivered directly after passing the cleaning-drum, substantially as described.

11. In a cotton elevator, feeder and cleaner, the combination with a cotton-conveying passage and with means for creating an air-suction therein, of an exhaust-chamber divided into two parts by a screen, a suction-flue communicating by a valve-controlled passage with one of said parts, a feed-drum to act upon the cotton as it comes from the other part of the chamber, a cleaning-drum operating on the cotton passing the feed-drum, an independent, valve-controlled passage to a suction-flue which is independent of said cotton-conveying passage to carry away the dust and dirt removed by the cleaning-drum, and

a gin to which the cleaned cotton is delivered, substantially as described.

12. In a cotton elevator, feeder and cleaner, the combination with a passage for the cotton, of an exhaust-chamber divided by a screen, a suction-flue drawing air from one part of said chamber, a feed-drum acting on the cotton coming from the other part into a passage on one side of said drum, elastic wings carried by the latter in contact with a curved partition behind said drum to prevent entrance of air, means for varying the width and contraction of the passage in front of the drum in which the cotton is compacted to prevent entrance of air, a cleaning-drum revolving at high speed and acting upon the cotton compacted by the latter, a screen behind and beneath said drum, an independent, valve-controlled passage leading from the place behind and beneath the screen to the suction-flue, and a gin to which the cleaned cotton is delivered direct, substantially as described.

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

ROBERT S. MUNGER.

Witnesses:

F. B. KEEFER,
GEO. W. REA.