Oct. 14, 1930. M. J. PATE 1,778,088

COTTON GIN FEEDER AND THE LIKE

Filed Jan. 4, 1929 3 Sheets-Sheet 1

FIG. 1.

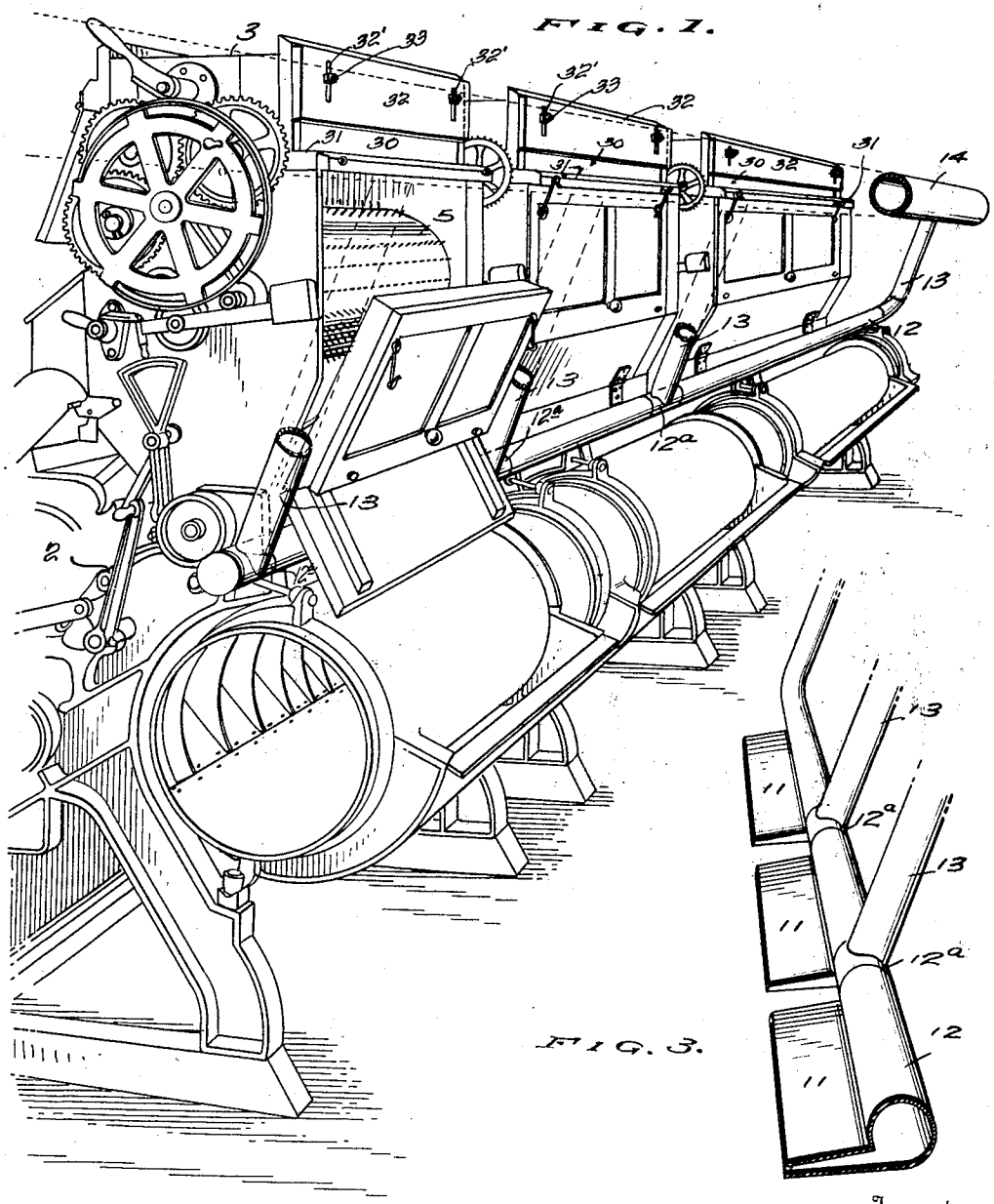



FIG. 3.




Inventor

M. J. PATE

By Eugene E. Stevens

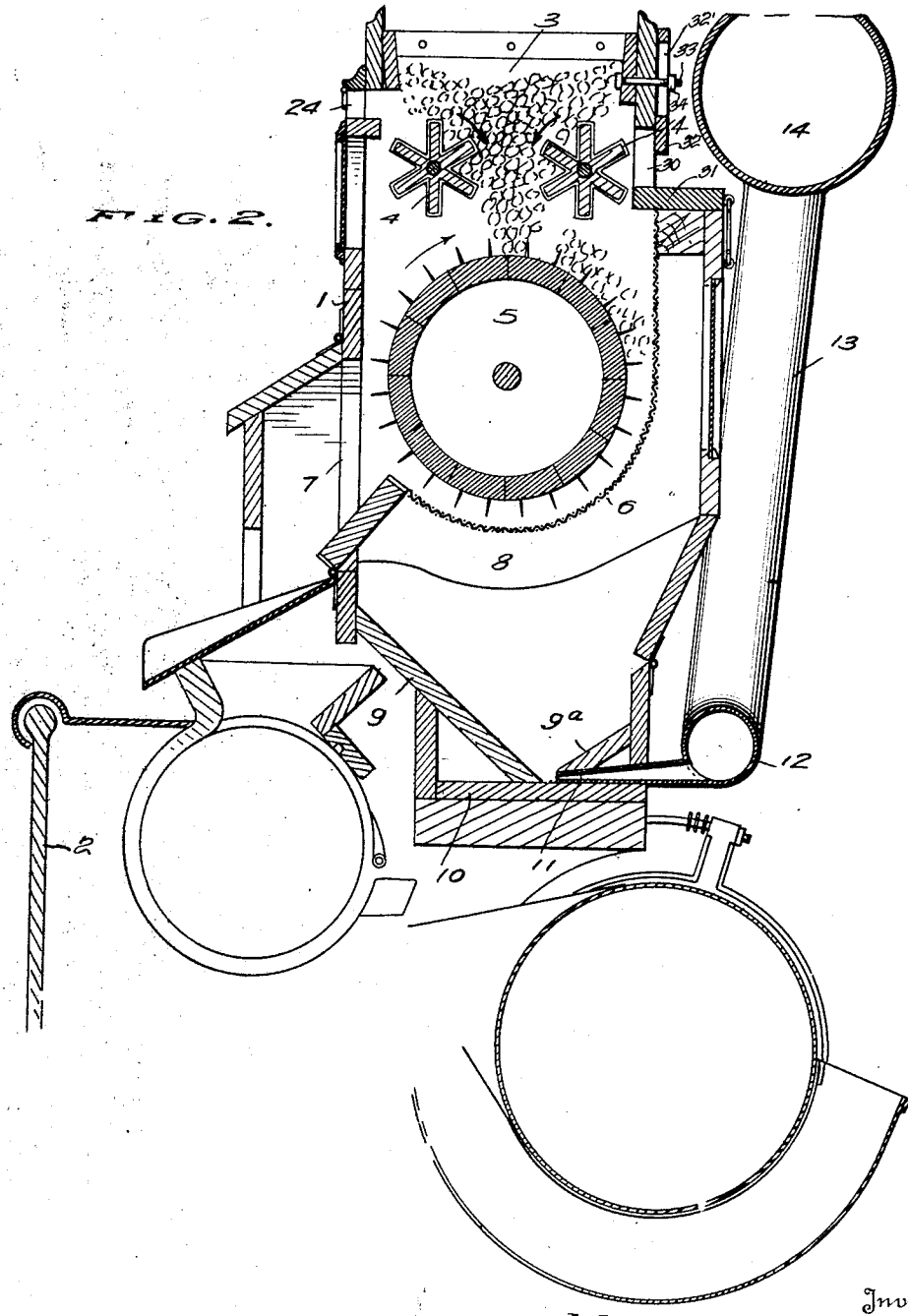
Attorney

Oct. 14, 1930. M. J. PATE 1,778,088

COTTON GIN FEEDER AND THE LIKE

Filed Jan. 4, 1929 3 Sheets-Sheet 2

FIG. 2.




Inventor
M. J. PATE
By Eugene Stevens
Attorney

Oct. 14, 1930. M. J. PATE 1,778,088

COTTON GIN FEEDER AND THE LIKE.

Filed Jan. 4, 1929 3 Sheets-Sheet 3

FIG. 4.

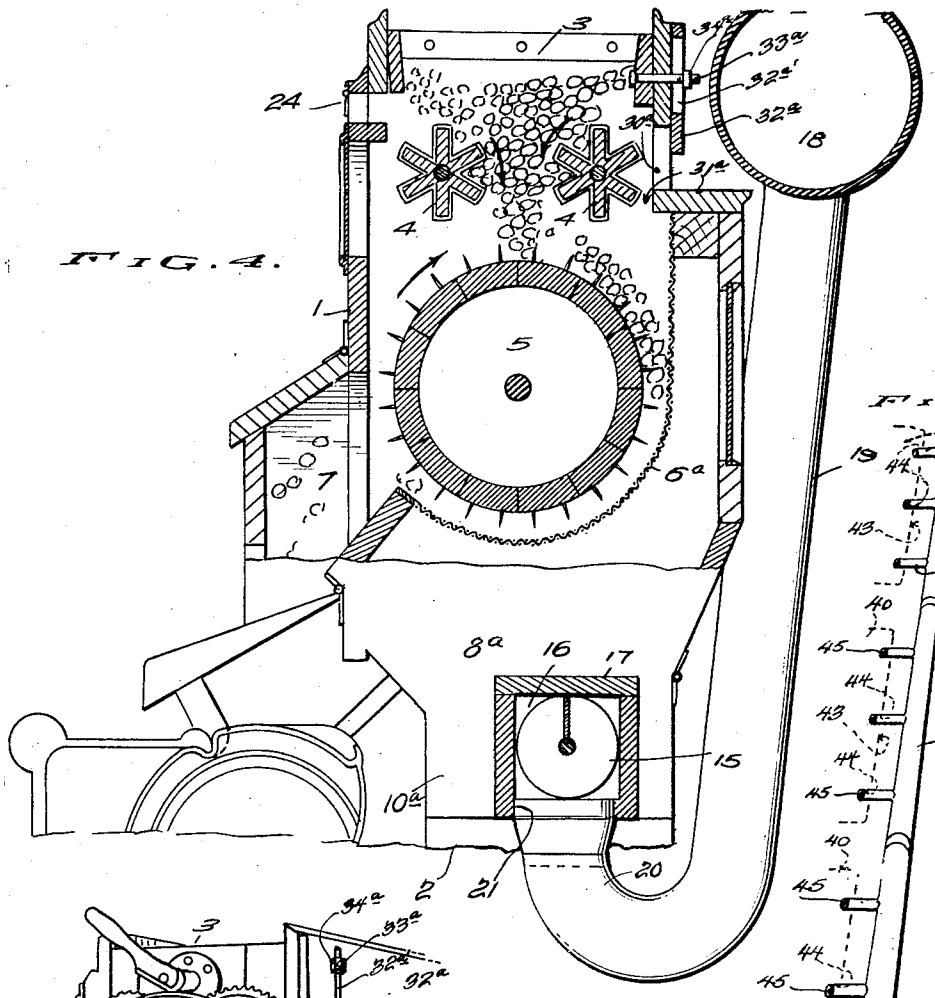



FIG. 6.

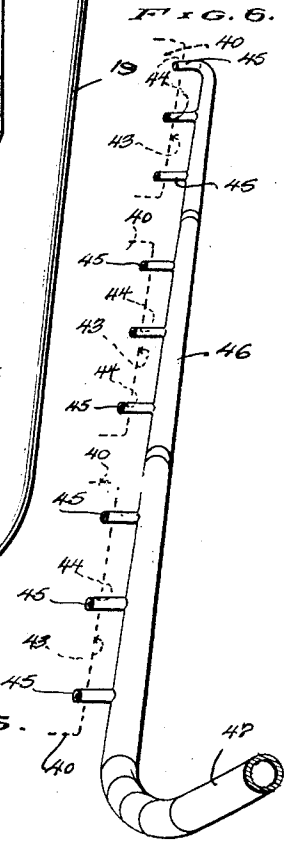
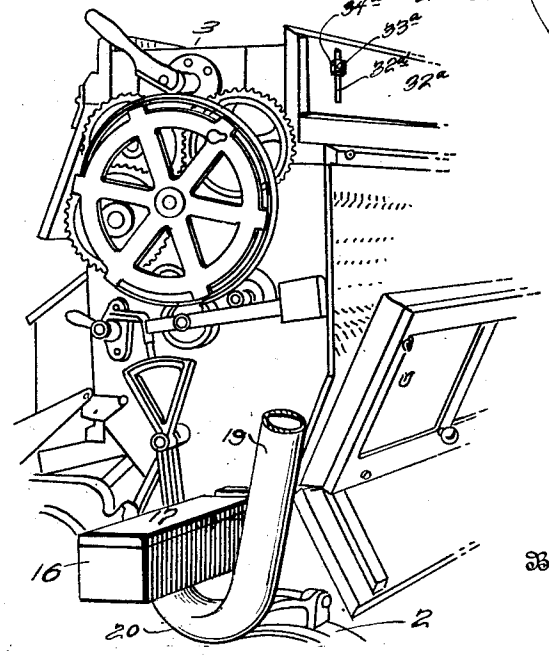



FIG. 5.




Inventor

M. J. PATE

By Eugene Stevens

Attorney

Patented Oct. 14, 1930 1,778,088

# UNITED STATES PATENT OFFICE

MATTHEW J. PATE, OF WILSON, NORTH CAROLINA, ASSIGNOR TO LUMMUS COTTON GIN COMPANY, OF COLUMBUS, GEORGIA, A CORPORATION OF GEORGIA

## COTTON-GIN FEEDER AND THE LIKE

Application filed January 4, 1929. Serial No. 330,376.

My invention relates to improvements in cotton gin feeders and the like, having for its primary object the provision of novel means for effectually preventing the trash and dirt from being swept into the gin through the action of the revolving spiked drum or other cotton motivating means and for removing trash and dirt from the cotton.

Even under the most favorable of ginning conditions,—that is to say when ginning high grade and comparatively clean cotton,—the air of the gin room will be heavily ladened with dust and loose lint which emanates from the feeder, the dirt and trash conveyor of the feeder or that of the gin itself. Manifestly, when the cotton being ginned is of the dirty, storm-beaten, sledded, snapped or bolly variety, the dust and lint ladening of the gin room air will be increased several fold. In addition to impairing the quality of the cotton, this condition is a serious menace to the health of the gin room workers and needless to say it is very difficult to induce the help to work under these conditions.

It is therefore a further and highly important object of my invention to eliminate the dust and lint-ladening of the gin room atmosphere, through the provision in association with the feeder, or feeders, of novel enclosed means for conducting the dirt, trash and loose lint away to a point remote from the scene of ginning operation,—and which is capable of use with or without the usual dirt conveyor which ordinarily dumps the siftings in a pile adjacent the gins.

A further object of the invention is to provide in a feeder or the like for cotton gins, suction means for extracting the dirt from the cotton,—the nature of the invention being such that it can be incorporated in the usual type of feeder or the like, without substantial modification thereof and at small expense.

The invention also resides in certain novel features of construction, combination and arrangement of the various parts, and in modes of operation,—all of which will be readily understood and appreciated by those skilled in the art upon reference to the accompanying drawings in connection with the following descriptive matter.

It is to be understood, of course, that the invention is capable of mechanical expression in a number of different ways, and that the disclosure of the drawings and this specification are to be taken merely as illustrative of what now appear to be the best modes of putting the invention to practice.

In the drawings, wherein like reference characters have been employed to designate the same parts in all views,—

Figure 1 is a perspective view partly in section illustrating the application of one form of my invention to a battery of cotton gin feeders;

Figure 2 is a cross sectional view through one of the feeders with the invention applied;

Figure 3 is a detail perspective view, partly in section of a series of connected suction nozzles having dirt take-off pipes or flues associated therewith;

Figure 4 is a cross sectional view showing a modified form of the invention eliminating the nozzles of Figure 2;

Figure 5 is a fragmentary perspective view showing the suction pipe and connecting trough construction of Figure 4, and

Figure 6 is a perspective view largely diagrammatic illustrating another application of the invention,—the dirt chambers of the feeders being shown in dotted lines.

Referring specifically to the drawings and particularly to Figure 2, the general construction of the feeder, therein disclosed, is more or less familiar and comprises the body 1 adapted to be positioned upon or above the gin 2. The cotton is fed into the top opening 3 of the feeder through any suitable means, being acted upon by the slowly revolving feeder or compression rollers 4 which discharge it upon the rapidly rotating drum 5, which is separated from the subjacent dirt chamber 8 by a screen 6. The compression rollers 4 and drum 5 rotate in the direction indicated by the arrows in Figure 2 and the cotton is discharged through the outlet 7 of the feeder into the breast of the gin in a familiar manner. The action of the compression rollers 4 and the drum 5 tend to separate

the dirt and loose lint from the cotton and a considerable portion thereof will pass through the openings in the screen 6 down into the chamber 8. However, it will be obvious that in the operation of the spiked drum 5 a considerable amount of dirt freed from the cotton will float up and out thru opening 24 and also be swept out thru the cotton outlet 7. It is this which fills the gin room with dirt and loose lint.

In order to obviate the ladening of the atmosphere with dirt and loose lint, I positively draw the same thru the screen 6 by the air suction means which will now be described and which is the subject of my invention. The feeder construction described up to this point is more or less familiar and no novelty is claimed therefor.

Still referring to Figure 2 it will be noted that the front dirt chamber wall 9 is extended to a point approximately mid-way between the front and rear walls of the trough-like bottom 10 of said chamber which ordinarily carries or receives the screw conveyor (not shown) for conducting the dirt longitudinally of the feeder or battery thereof. The rear wall of the chamber 8 has a lower portion or section $9^a$ extending in the direction of the lower edge of the front wall section 9 and terminating just short of the same and somewhat above the plane of the bottom wall of the trough 10. The space thus provided between the trough bottom 10 and the bottom edge of the wall section $9^a$, preferably runs the length of the feeder, and, as shown, is availed of to receive the elongated nozzle 11, whose inlet end is substantially flush with the inner edge of the wall section $9^a$ and spaced from the corresponding edge of the section 9.

The nozzle 11 discharges into a suction pipe 12 of which there will be one for each feeder. Since, the gins are ordinarily employed in batteries of from two to six, the suction pipes 12, which carry the nozzles 11, will be connected between the respective feeders by means of short pipe sections $12^a$, (see Figure 1). These pipe sections $12^a$ have lateral conduits 13 communicating with the suction flue 14, as indicated in Figure 1. The suction flue 14 will have therein a suitable exhaust fan or other means (not shown) for creating the necessary vacuum in pipes 13, the pipe line 12, $12^a$ and in the chamber 8 of each of the feeders 1.

The flue 14 will preferably discharge at a point remote from the scene of ginning operations and preferably in an enclosed room or chamber,—the nature of which is immaterial to the present invention.

It is believed to be plain from the foregoing description taken in connection with the drawings, that the chamber 8 will be under suction or vacuum and that, thus, the loose dirt and lint which is separated from the cotton by the action of the drum 5 will be positively drawn through the screen 6, making it impossible or substantially impossible for the cotton to wipe such dirt and foreign matter out through the feeder outlet 7.

Another mode of carrying out my invention is illustrated in Figures 4 and 5. Here the bottom or dirt collecting chamber $8^a$ beneath the screen $6^a$ is in nowise modified. Here, the usual screw conveyor 15 is illustrated extending longitudinally through the trough-like bottoms $10^a$ of the series of feeders and through customary trough boxes 16 disposed between the feeders. However, the troughs, or connections 16 between and at each outside end of the respective feeders are modified in that their tops are closed, as indicated at 17.

In carrying out the invention, each trough section 16 is connected to the suction flue 18 by means of a conduit 19 having an elbow 20, the outer end of which is snugly fitted in an opening 21 in the trough section bottom. Location of the openings 21 in the bottoms of the trough sections 17 is preferable in that it assures the carrying off of the heavier trash. In this form of the invention it will be manifest that the suction created by the exhaust element in flue 18 will, through the closed trough sections 16, subject to suction the dirt and dust chambers $8^a$ of each feeder, thus, extracting all the dirt and free lint from the cotton, and drawing it through the screen $6^a$.

Assuming that the suction draft is constant in each instance, the main difference between the two forms of invention, is that the use of the nozzle 11 produces a more efficient suction since each chamber 8 will be subjected to perpendicular suction throughout its entire length. On the other hand when employing the construction of Figures 4 and 5, the lines of suction force or draft will converge toward each end of trough 10 of each feeder. Thus, the effective dirt extracting capacity or strength of the draft will tend to decrease in force toward the center of chamber $8^a$.

However, it is proper to state that this latter construction has been found very efficient in practical use as the conveyor 15 will collect up all the screenings and deliver them to the suction openings or connections 21 between and at outside ends of all the feeders.

In each instance air will be drawn through the feeder, through the openings 3, 24 and also through the discharge opening 7 at the front. The openings 7, 24 being availed of to draw in any dirt ladened air that may be in the gin room and stirred up by the vibration and operation of the machinery.

Of course, it is to be understood that the form of invention of Figures 4 and 5 can be applied to a single feeder as well as to a battery thereof and likewise that the outer end of the outermost trough sections 16 will pref-

erably be closed so that the chamber or chambers 8ª may be subjected to a stronger suction. Furthermore, it will be evident that the conveyor 15 can be eliminated if desired and good results obtained, although the use of this is preferable for reasons above advanced.

In order that the suction draft may more efficiently operate for cleaning the cotton,—and more specifically to enable a stronger suction draft to be developed at the back of the feeder,—an auxiliary air inlet opening 30 is provided in the rear wall of the feeder above the sill 31, as indicated in Figures 1 and 2,—these parts being designated as 30ª, 31ª, respectively, in Figures 4 and 5. The openings 30, 30ª are adapted to be controlled by valves 32, 32ª in Figures 1 and 2 and 3 and 4, respectively. The valves 32, 32ª are of the panel variety and have closed transverse slots 32′, 32ª′, respectively, which receive guide studs 33, 33ª, respectively, extending from the back of the feeder. Nuts 34 are availed of for clamping the valve panels in a set position.

As will be obvious, the provision of the auxiliary air inlet openings at the rear of the feeders enables air to be drawn downwardly along the back of the feeder and overcomes the suction obstructing effect of the drum 5 which with the accumulated cotton between the same and the screen 6 would materially diminish the suction at the back of the feeder as compared to the suction at the front. Furthermore, at the front of the feeder there is the opening 24 and likewise the opening 7. The valve or panel 32 or 32ª can be regulated to increase or diminish the size of the opening 30 or 30ª according to the nature of the cotton being cleaned and fed to the gin, and also in accordance with the rapidity of feed of the cotton.

Figure 6 illustrates a further modification of the invention. Here, the dirt chamber 40 has its lower rear wall 43 provided with three openings 44 spaced in the direction of the length of the feeder. These openings 44 receive the ends of three pipes 45, the outer ends of which are carried by a conduit 46 which has at its end a branch 47 leading to a suitable discharge point,—it being understood that a suction draft creating element is associated with the pipe 46 or the pipe 45 and which element has not been shown. The construction just recited has the advantage over the construction shown in Figures 4 and 5 in that a more uniform draft or suction may be applied to the chamber 40 than is the case with the chamber 8ª of Figure 4, inasmuch as there the suction outlet pipes 20, 19 are located at the ends of each feeder. In the construction shown in Figure 7 the provision of the intermediate suction branch, that is to say between the ends of the feeder, greatly increase the efficience since the dead suction space at the center of the dirt chamber is substantially eliminated.

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

1. In a cotton feeder, having a dirt chamber, a suction pipe extending longitudinally thereof, a nozzle co-extensive in length with said pipe and feeder, the feeder having a longitudinal opening adjacent the bottom of the dirt chamber to receive said nozzle, and a suction flue communicating with said suction pipe and adapted to convey the dirt from a plurality of suction pipes to a remote point.

2. The combination of a cotton feeder or the like comprising a casing having an inlet and an outlet for the cotton and a communicating dirt chamber, a suction exhaust conveyor communicating with said dirt chamber, and said feeder casing having an air inlet in one wall between said cotton inlet and outlet and clear of the path of the cotton whereby dust laden air of the gin room will be exhausted through said feeder and conveyor.

3. The combination of a cotton feeder or the like comprising a casing having an inlet and an outlet for the cotton and a communicating dirt chamber, a suction exhaust conveyor communicating with said dirt chamber, and said feeder casing having an air inlet substantially co-extensive with the length of one wall and located between said cotton inlet and outlet whereby dust laden air of the gin room will be exhausted through said feeder and conveyor, and a control valve for said air inlet.

4. The combination of a gin feeder having a cotton feeding opening, a scren and a dirt chamber beneath the screen, suction means associated with said chamber, one wall of the feeder above said screen having a valved air blast inlet opening independent of said cotton feeding opening which is usually pretty well closed by incoming cotton, means for diverting the incoming cotton away from said air inlet opening to prevent clogging of same, and means for throwing the cotton against said screen in the path of the air drawn in through said air inlet opening.

5. In a cotton gin feeder comprising a casing having a cleaning chamber and a subjacent dirt chamber, a rotating feeder drum in said cleaning chamber and turning toward the rear wall of said casing, a screen separating said dirt and cleaning chambers and having an upwardly extending portion spaced from the rear casing wall to provide an upward extension of said dirt chamber, said rear casing wall having an air blast inlet opening into said cleaning chamber above said upward extension of said dirt chamber, and means for applying suction to said dirt chamber.

6. In a cotton gin feeder comprising a casing having a cleaning chamber and a subja-

cent dirt chamber, a rotating feeder drum in said cleaning chamber and turning toward the rear wall of said casing, a screen separating said dirt and cleaning chambers and having an upwardly extending portion spaced from the rear casing wall to provide an upward extension of said dirt chamber, said rear casing wall having an air blast inlet opening into said cleaning chamber above said upward extension of said dirt chamber, means for applying suction to said dirt chamber, rotatably driven feeding means substantially opposite said air blast inlet opening for supplying cotton to said feeder drum, and said feeding means turning in a direction to throw the incoming cotton initially away from said air blast inlet.

7. In a cotton gin feeder comprising a casing having a cleaning chamber and a subjacent dirt chamber, a rotating feeder drum in said cleaning chamber and turning toward the rear wall of said casing, a screen separating said dirt and cleaning chambers and having an upwardly extending portion spaced from the rear casing wall to provide an upward extension of said dirt chamber, said rear casing wall having an air blast inlet opening into said cleaning chamber above said upward extension of said dirt chamber, said dirt chamber having an outlet substantially coextensive in length therewith, an elongated nozzle in said outlet, and means for applying suction to said nozzle.

8. In a cotton gin feeder including a walled casing having a cotton inlet and outlet, a rotatable feeder drum, a dirt chamber, a screen separating said drum from said dirt chamber, one casing wall having an air inlet opening, means for initially deflecting the incoming cotton away from said air inlet, and means for applying suction to said dirt chamber whereby to subject the cotton between said drum and casing wall to a direct dirt-removing draft and keep the gin room clear of dust.

9. In a cotton gin feeder including a walled casing having a cotton inlet and outlet, a rotatable feeder drum, a dirt chamber, a screen separating said drum from said dirt chamber, one casing wall having an air inlet opening, rotatable means opposite said air inlet opening for feeding the cotton to said drum and away from said opening, and means for applying suction to said dirt chamber whereby to subject the cotton between said drum and casing wall to a direct dirt-removing draft and keep the gin room clear of dust.

10. The combination of a gin feeder having a cotton feeding opening, a screen and a dirt chamber beneath the screen, suction means associated with said chamber, one wall of the feeder above said screen having a valved air blast inlet opening independent of said cotton feeding opening which is usually pretty well closed by incoming cotton, and means for diverting the incoming cotton away from said air inlet opening to prevent clogging of same.

11. The combination of a gin feeder having a cotton feeding opening, a screen and a dirt chamber beneath the screen, suction means associated with said chamber, one wall of the feeder above said screen having an air blast inlet opening independent of said cotton feeding opening which is usually pretty well closed by incoming cotton, a slidable closure panel for varying the dimensions of said air blast inlet opening, holding means for said panel, and means for diverting the incoming cotton away from said air inlet opening to prevent clogging of same.

12. In a cotton feeder having a dirt chamber, a suction pipe extending longitudinally thereof, a nozzle co-extensive in length with said pipe and feeder, the feeder having a longitudinal opening adjacent the bottom of the dirt chamber to receive said nozzle, and means for applying suction to said nozzle.

In testimony whereof I affix my signature.

MATTHEW J. PATE.