July 21, 1942. C. R. CARR ET AL 2,290,405

PNEUMATIC MOTE CONTROL

Filed Aug. 5, 1940 2 Sheets-Sheet 1

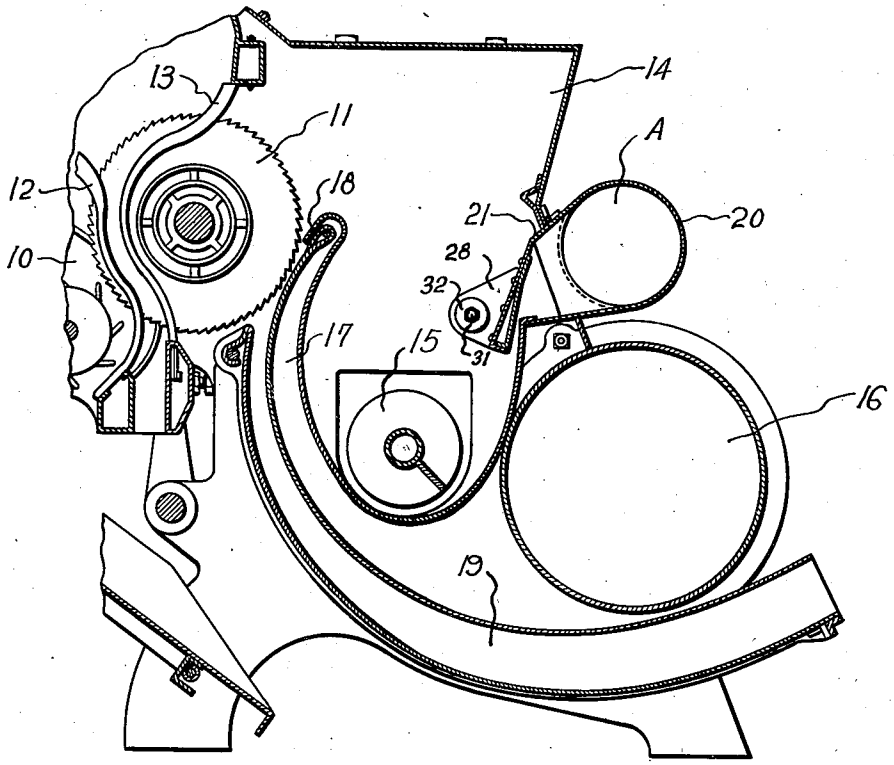
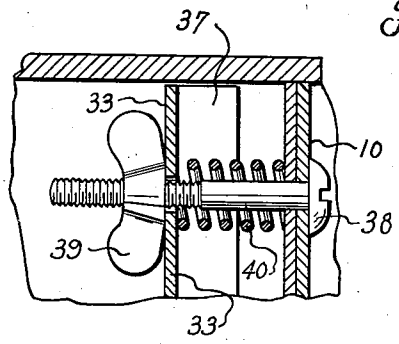


Fig. 1.



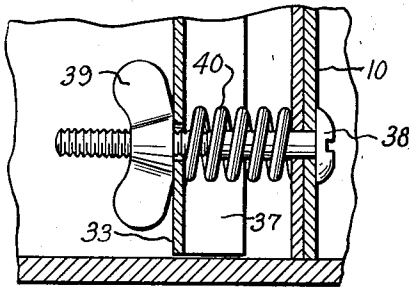


Fig. 6.

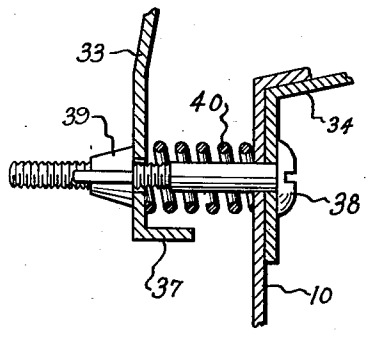


Fig. 7.

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PNEUMATIC MOTE CONTROL

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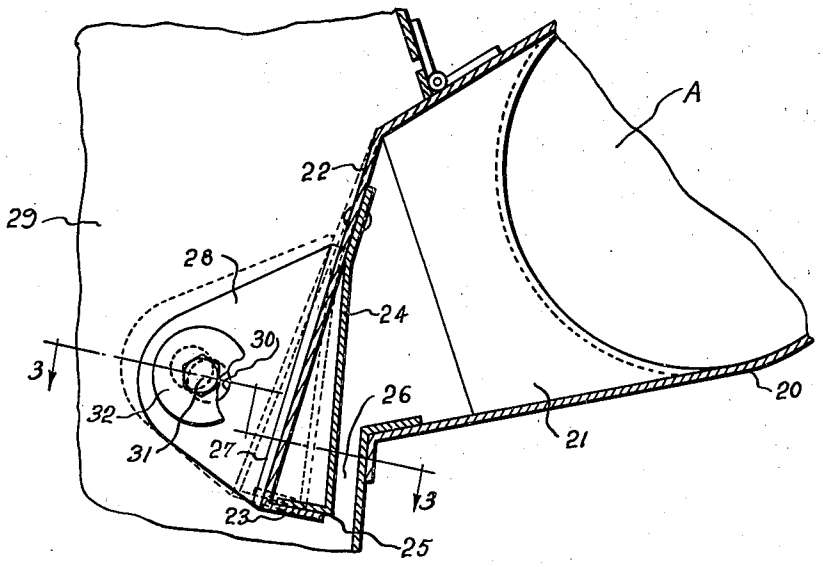


Fig. 2.

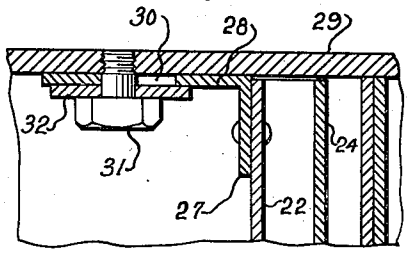


Fig. 3.

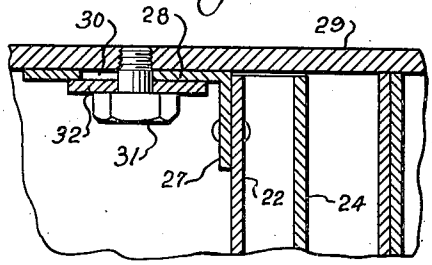


Fig. 4

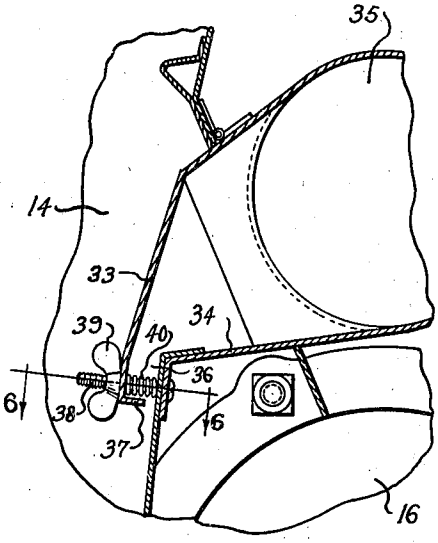


Fig. 5.

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UNITED STATES PATENT OFFICE

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PNEUMATIC MOTE CONTROL

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Application August 5, 1940, Serial No. 351,458

9 Claims. (Cl. 19—58)

This invention relates to new and useful improvements in pneumatic mote controls.

One object of the invention is to provide improved means for effectively and economically increasing the separation and removal of motes, dirt, trash, and other extraneous matter from a cotton gin.

An important object of the invention is to provide an improved pneumatic mote control which is associated with the mote chamber of an air blast gin and which is arranged to aid in the removal of motes and other extraneous matter from said chamber, the mote control being adjustable so that the motes and other matter are positively removed irrespective of the nature of said motes and the conditions under which the ginning is performed.

Another object of the invention is to provide an improved suction duct which is connected with the lower portion of a mote chamber for setting up a suction or induced air current within said chamber so as to attract and withdraw the fine or light-weight motes therefrom; the duct being so mounted with respect to the mote chamber and mote discharge conveyor that the air current set up thereby does not interfere with the normal separation and discharge of the heavier motes and other extraneous matter.

A particular object of the invention is to provide an adjustable intake nozzle for the suction duct, whereby the size or cross-sectional area of the inlet opening of said duct may be readily varied in accordance with the operating conditions and nature of the motes.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is a partial, transverse, vertical, sectional view of an air blast cotton gin having a pneumatic mote control, constructed in accordance with the invention, mounted thereon,

Figure 2 is an enlarged, transverse, vertical, sectional view of the mote control showing the inlet nozzle in detail,

Figure 3 is a partial, horizontal, cross-sectional view, taken on the line 3—3 of Figure 2, showing the nozzle adjusted to its least open position,

Figure 4 is a view, similar to Figure 3, showing the nozzle in its fully opened position,

Figure 5 is a view, similar to Figure 2, of a modified form of the invention,

Figure 6 is an enlarged horizontal, cross-sectional view, taken on the line 6—6 of Figure 5, and

Figure 7 is an enlarged, transverse, vertical, sectional view of the modified nozzle and one of its adjusting screws.

In the drawings, the numeral 10 designates the rear portion of a conventional air blast gin having the usual ginning saws 11 which revolve between the ribs 12 and 13. A mote chamber 14 is disposed behind the saws and a screw conveyor 15 for discharging the separated motes and other extraneous matter is located at the bottom of this chamber. An ordinary air chamber or conduit 16 is positioned at the rear of the gin, in the usual manner, while an air blast duct 17 leads upwardly from the air conduit to the saws. For directing the air stream within the air duct into contact with the saws, a transverse nozzle 18 is mounted on the upper end of said duct. A downwardly curved lint duct 19 extends from the saws contiguous to the duct 17 and conducts the lint from said saws.

The gin operates in the usual manner with the cotton being pulled through the ribs 12 and 13 by the saws 11, whereby said cotton is separated from the seed. Although the ribs are sufficiently close to the saws to prevent the passage of the seeds, they do not prevent motes, trash and other extraneous matter present in the cotton from being carried through said ribs by said saws. Centrifugal force is depended upon to throw this extraneous matter from the saws into the mote chamber 14 and the heavier particles fall into the discharge conveyor 15 so as to be conveyed from the gin. Because of their light weight, the lighter motes or particles, when thrown from the saws, tend to float in the upper portion of the mote chamber with the result that those motes adjacent the nozzle 18 may be drawn downwardly into the lint duct 19 by the air suction therein. In actual practice, it has been found that a large portion of the light-weight extraneous matter becomes admixed with the ginned cotton which is being drawn from the saws 11 by the air suction within the lint duct.

To remedy this highly undesirable situation and for removing the lighter motes from the mote chamber 14, a pneumatic mote control A is provided and includes an air suction duct 20 which is disposed behind said chamber and above the conduit 16. As is clearly shown in Figure 2, a suitable flue or transition 21 establishes com-

munication between the duct 20 and the lower portion of the mote chamber. The flue or transition extends throughout the transverse width of the gin and has its open end partially closed by a depending, deflecting member or sheet 22 which extends downwardly at an angle into the mote chamber beyond the lower end of said flue and which is made integral with said flue. The lower end of the sheet 22 is spaced from the rear wall of the mote chamber and is provided with a rearwardly-directed flange 23. For increasing the rigidity of the sheet 22, an angular reinforcing member 24 is secured by rivets or other suitable means to the rear surface thereof and is coextensive therewith (Fig. 3). The extreme lower end of the member 24 is bent forwardly upon itself at substantially a right angle as shown at 25 and is fastened to the flange 23 of the sheet 22 by rivets or other suitable means. Thus, the lower portion of the member 24 is spaced from the sheet 22 and the upper ends of said member and sheet are contiguous, whereby the connected member and sheet are triangular in cross-section as shown in Figure 2. It is pointed out that the elongate, transverse opening formed between the sheet 22 and the rear wall of the gin provides a nozzle 26 for drawing air from the mote chamber 14 into the duct 20.

For maintaining the sheet 22 in various adjusted positions so as to change the size of the nozzle opening, each end of said sheet is provided with an angular bracket 27 which is secured to the external surface thereof. Each bracket is provided with a flange or ear 28 which is enlarged and which extends in a vertical plane so as to lie contiguous to the adjacent side wall 29 of the gin as shown in Figure 3. A circular opening 30 is formed in each flange 28 and is arranged to receive a small bolt or cap screw 31 which is screw-threaded into the gin wall 29. In order to prevent the head of the bolt or screw 31 from entering the opening 30, a circular washer 32 of greater diameter than said opening is interposed and confined between the flange 28 and said bolt or screw head.

With the nozzle in the position shown in Figure 3, only a relatively small volume of air will be drawn from the mote chamber 14 into the duct 20 and therefore only a relatively light current of air or suction is induced in said chamber. This light suction will act only upon those motes which are in close proximity to the opening of the nozzle and will not affect the extraneous matter in the central portion of the mote chamber whereby separation in the remainder of the chamber is unaffected by the induced air current. This position of the suction nozzle has been found to be ideal when the extraneous matter is green or damp, due to weather conditions or for other reasons, because such matter has added weight and the centrifugal force of the saws will throw the same further into the mote chamber. The extraneous matter or motes, which are of insufficient weight to fall into the conveyor 15, are drawn downwardly within the chamber 14 and through the nozzle opening into the duct 20. Obviously, the downwardly-moving air stream caused by the suction nozzle is of greatest intensity in the lower portion of the mote chamber and immediately adjacent the rear wall thereof.

It is pointed out that the sheet 22 is held in its adjusted positions by the frictional engagement of the bracket flanges 28 with the gin side walls 29 and that tightening of the cap screws 31 will positively hold said sheet in a fixed position. When it is desired to vary the area or size of the nozzle opening, it is only necesary to swing the deflecting sheet forwardly or rearwardly of the gin so as to move the brackets 27 with relation to the screws 31 and side walls 29. It is manifest that this movement of the deflecting sheet and its brackets is permitted by the relatively large diameter of the openings 30. The relative area or size of these openings also controls the extent or scope of the adjustability of the sheet 22. Since cotton and, consequently, ginning thereof is affected by weather conditions, it is obvious that the size or area of the nozzle opening must be varied in accordance with the conditions.

When the extraneous matter is extremely dry, the deflecting sheet and its brackets are moved to the position shown in Figure 4. With the nozzle fully opened, the air suction exerted upon the motes and other extraneous matter, or the induced air current within the mote chamber is of much greater intensity than when said nozzle is in any other position. With the nozzle fully open, the relatively increased air current or stream is drawn downwardly within the chamber and upwardly through the nozzle opening and flue 21 into the duct 20, whereby the extraneous matter within the chamber which is of insufficient weight to fall into the conveyor 15 will be carried from the mote chamber. It is pointed out that this air stream or current will be of greatest intensity along the rear wall of the chamber, but that the same will be of insufficient strength to overcome the effect of the induced suction set up immediately adjacent the air blast nozzle 18 so as to remove minute particles or motes from in front of said nozzle. However, this suction will be of sufficient intensity to affect the fine motes in the central and lower portions of the mote chamber and remove the same from said chamber. It is also pointed out that light weight motes will be drawn from the trough of the conveyor 15 instead of rising and floating above the heavier motes.

In Figures 5 to 7, a slightly modified form of the invention is shown and includes a depending, deflecting member 33 which is similar to the sheet 22 of the first form. The lower end of the member 33 projects beyond the bottom of the flue 34, which connects the suction duct 35 with the mote chamber, so as to provide a suction nozzle 36. A rearwardly-directed flange 37 is preferably made integral with the lower end of the member 33 so as to strengthen the same. For holding the deflecting member in various adjusted positions, a plurality of elongate screws 38 extend through the rear wall of the gin and openings formed in said member adjacent the flange 37. A wing nut 39 is screw-threaded on the outer end of each screw 38, while a coiled spring 40 surrounds said screw and is confined between the member 33 and the rear gin wall. It is readily apparent that the springs exert their force to hold the member away from the gin wall and in engagement with the wing nuts. The operation of this form of the invention is exactly the same as that of the first form, since the area or size of the nozzle opening is varied by manipulating the nuts 39 to move the member 33.

It is noted that in both forms, the nozzles 26 and 36 are disposed below and to the rear of the air blast nozzle 18 so that normal separation and discharge of the heavier motes is not interfered with and also the suction created at the lint discharge or air blast nozzle 18 is not af-

fected by the induced air current set up from the suction ducts **20** and **35**. Attention is also directed to the fact that the disposition of the nozzles is such that the same are not within the moting zone. Thus, an efficient means for assuring removal of the lighter motes from the chamber to prevent their withdrawal through the lint duct **19** is provided. Manifestly, the heavier motes are deflected away from the suction nozzles **26** and **36** into the conveyor by the deflecting members or sheets of said nozzles to prevent stoppage of the suction ducts, since the air current therein is of insufficient intensity to move the same. Due to the intensity of the air current or stream adjacent the rear wall of the mote chamber, the motes of intermediate weight will be directed downwardly into the conveyor.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What we claim and desire to secure by Letters Patent is:

1. The combination with the mote chamber of a cotton gin having lint removing means which chamber is provided with an opening in the lower portion of its rear wall below the lint removing means, of a suction duct connected to said opening for setting up a downwardly sweeping air current within said chamber, whereby lighter motes and other extraneous matter may be drawn into the lower portion of the chamber and withdrawn from said chamber, a longitudinal deflecting element within the mote chamber overlying the opening and spaced from the rear wall of the chamber, said element co-acting with the rear wall to form a downwardly opening nozzle through which air is drawn upwardly from the chamber into the duct, and means for adjustably fastening the element in various positions with respect to the wall to vary the size of the nozzle.

2. The combination with the mote chamber of a cotton gin which chamber is provided with an opening in the lower portion of its rear wall, of a suction duct connected to said opening for setting up an air current within said chamber, whereby lighter motes and other extraneous matter may be drawn into the lower portion of the chamber and withdrawn from said chamber, a longitudinal deflecting element within the mote chamber overlying the opening and spaced from the rear wall of the chamber, said element co-acting with the rear wall to form a nozzle through which air is drawn from the chamber into the duct, outwardly directed flanges at each end of the element and disposed contiguous to the side walls of the chamber, and means for frictionally clamping the flanges to said side walls to lock the element in various positions relative to the rear wall and thereby permit variation of the size of the nozzle.

3. The combination with the mote chamber of a cotton gin which chamber is provided with an opening in the lower portion of its rear wall, of a suction duct connected to said opening for setting up an air current within said chamber, whereby lighter motes and other extraneous matter may be drawn into the lower portion of the chamber and withdrawn from said chamber, a longitudinal deflecting element within the mote chamber overlying the opening and spaced from the rear wall of the chamber, said element co-acting with the rear wall to form a nozzle through which air is drawn from the chamber into the duct, a plurality of elongate screws connecting the element with said rear wall, and resilient means on said screws interposed between the element and wall for maintaining the element spaced from the wall.

4. The combination with the mote chamber of a cotton gin having lint removing means which chamber is provided with an opening in the lower portion of its rear wall and a mote discharge conveyor in its bottom, of a suction duct connected to said opening for setting up an air current sweeping downwardly across the conveyor within said chamber, whereby lighter motes and other extraneous matter may be drawn into the lower portion of the chamber and withdrawn from said chamber, the opening being spaced below and to the rear of the lint removing means and the moting zone which is unaffected by the induced air current.

5. The combination with a cotton gin having an air blast nozzle for removing lint from its saws and a mote discharge conveyor in the bottom of its mote chamber, of a pneumatic mote control including, a suction duct having its inlet opening communicating with the mote chamber and spaced below and to the rear of the nozzle, and means opening downwardly for directing an air stream from said chamber upwardly into the duct to draw motes thrown from the saws of the gin and of insufficient weight to fall into the conveyor into the lower portion of the chamber.

6. The combination with a cotton gin having an air blast nozzle for removing lint from its saws and a mote discharge conveyor in the bottom of its mote chamber, of a pneumatic mote control including, a suction duct communicating with the lower portion of the mote chamber and spaced below and to the rear of the nozzle, and means opening downwardly associated with the duct and disposed below and to the rear of the moting zone for directing an air stream from said chamber upwardly into said duct, whereby the light-weight motes thrown from the saws of the gin are drawn into the lower portion of the chamber.

7. The combination with a cotton gin having an air blast nozzle for removing lint from its saws and a mote discharge conveyor in the bottom of its mote chamber, of a pneumatic mote control including, a suction duct, a transition for establishing communication between the duct and the mote chamber below and to the rear of the air blast nozzle, a downwardly opening nozzle associated with the transition for drawing air upwardly from said chamber, whereby the motes of insufficient weight to fall into the conveyor of the gin will be drawn into the lower portion of the chamber, and means for varying the size of the nozzle so as to vary the amount of suction drawn.

8. The combination with the mote chamber of a cotton gin having an air blast nozzle, which chamber is provided with a mote discharge conveyor in its bottom, of a suction duct having its inlet communicating with the mote chamber and spaced below the nozzle and to the rear of said chamber for receiving mote-laden air streams from the chamber flowing across the conveyor, the suction duct inlet being out of the influence of the air blast of the nozzle.

9. The combination with the mote chamber of a cotton gin having an air blast nozzle, which

chamber is provided with a mote discharge conveyor in its bottom, of a suction duct having its inlet communicating with the mote chamber and spaced below the nozzle and to the rear of said chamber for receiving mote-laden air streams from the chamber flowing across the conveyor, the suction duct inlet being above and to the rear of said conveyor and out of the influence of the air blast of said nozzle, whereby only the light-weight motes are drawn into said suction duct.

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