(No Model.) 4 Sheets—Sheet 1.

R. S. THOMAS, S. W. HARDWICK & W. E. ELAM.

MACHINE FOR HANDLING AND CLEANING SEED COTTON.

No. 458,380. Patented Aug. 25, 1891.

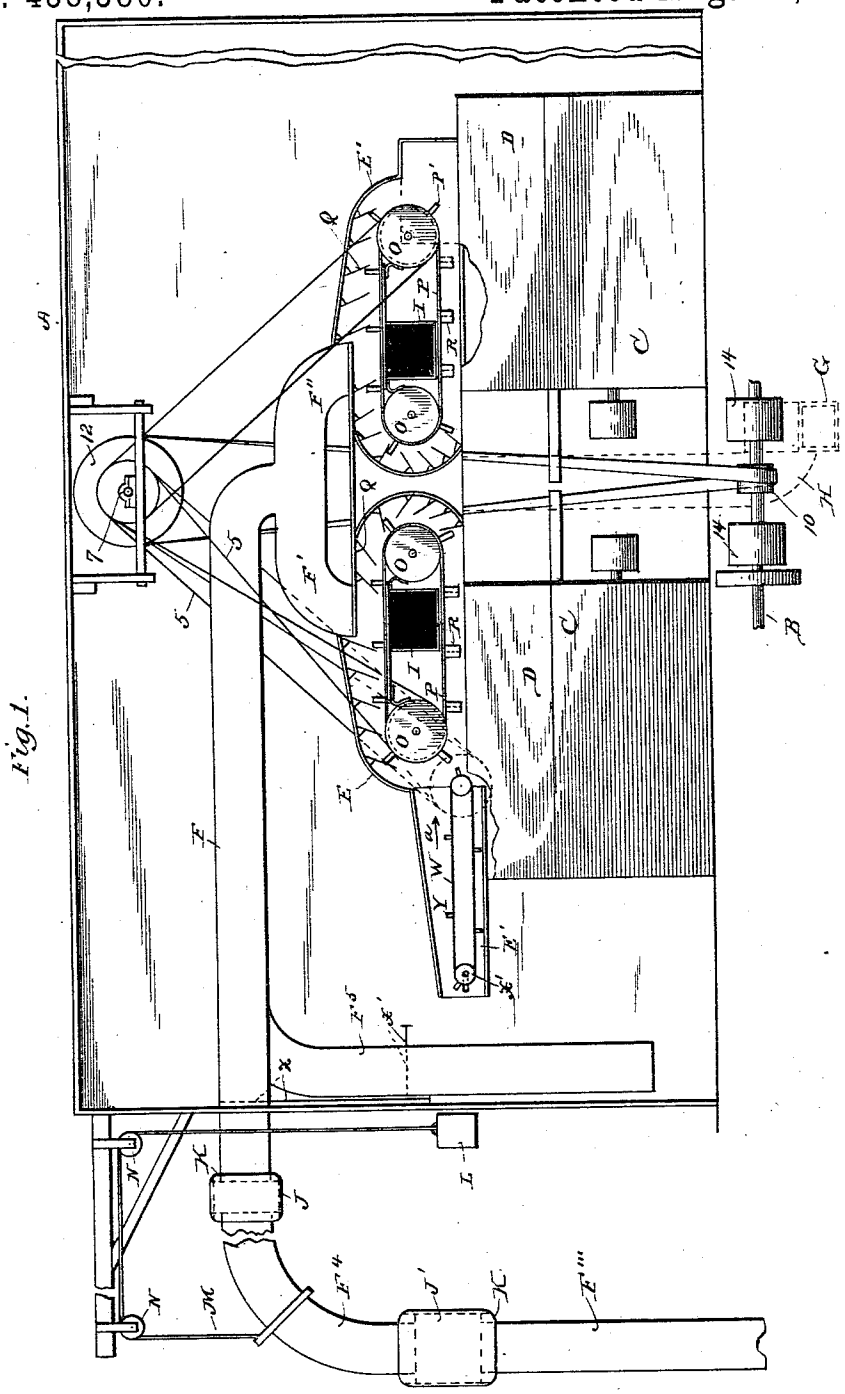


Fig. 1.

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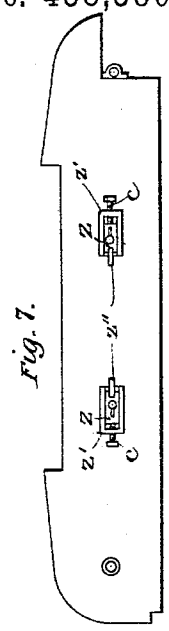


Fig. 7.

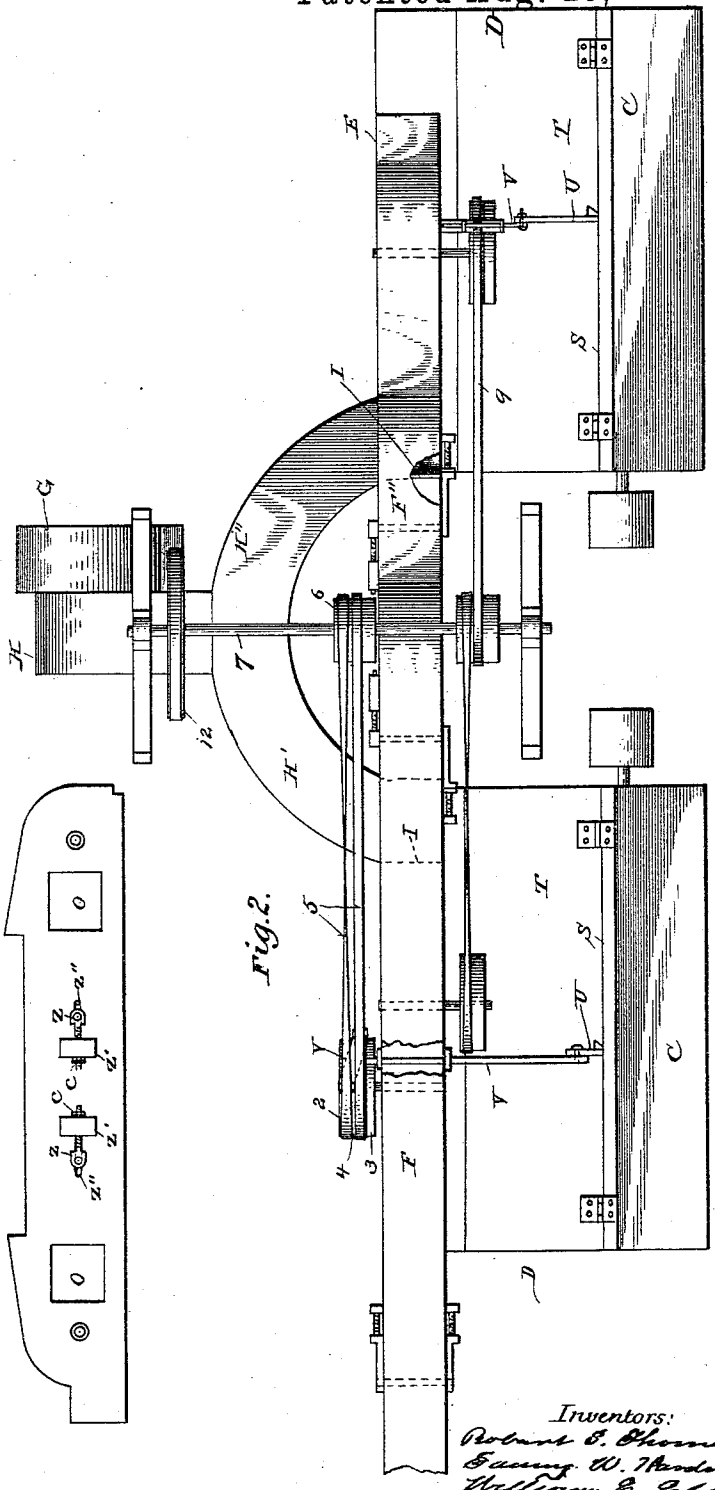


Fig. 2.

Fig. 6.

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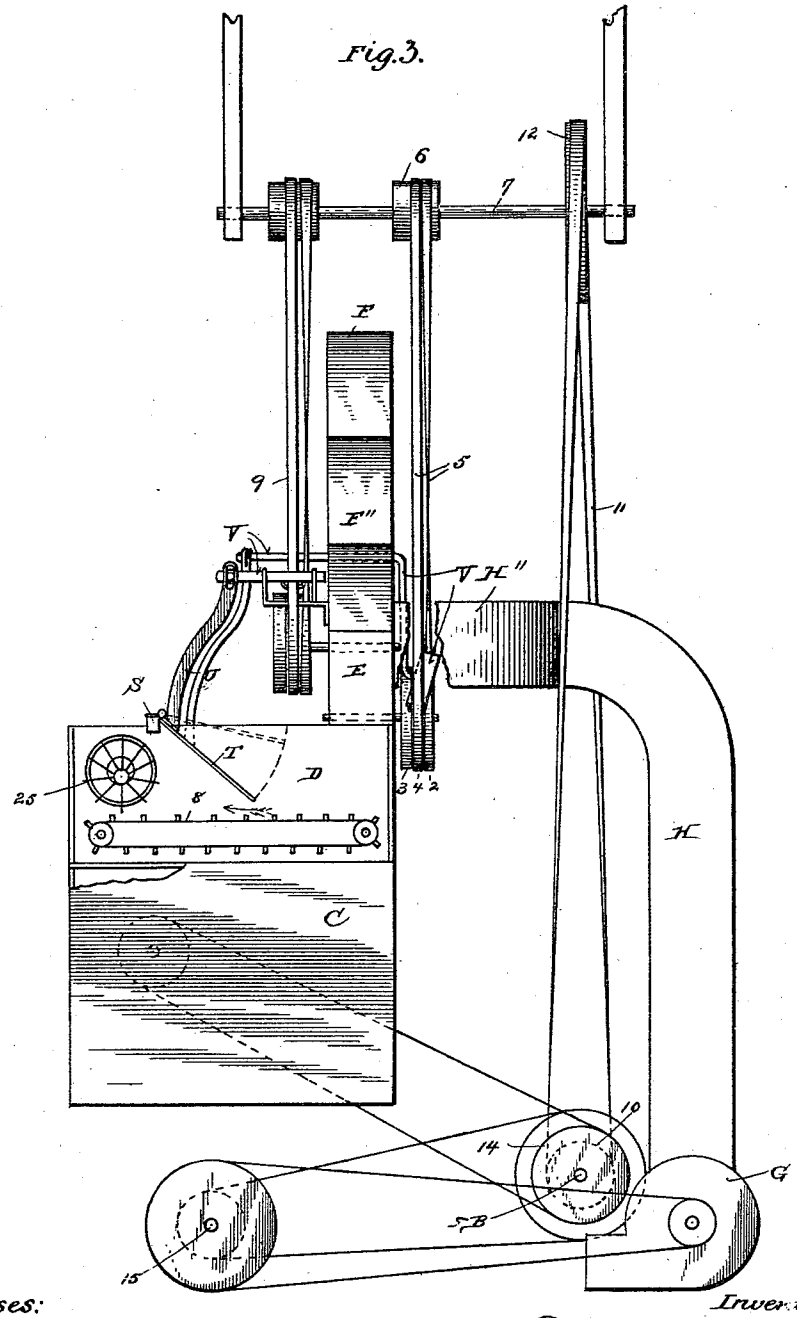
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R. S. THOMAS, S. W. HARDWICK & W. E. ELAM.

MACHINE FOR HANDLING AND CLEANING SEED COTTON.

No. 458,380. Patented Aug. 25, 1891.

Fig. 3.



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R. S. THOMAS, S. W. HARDWICK & W. E. ELAM.

MACHINE FOR HANDLING AND CLEANING SEED COTTON.

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Fig. 4.

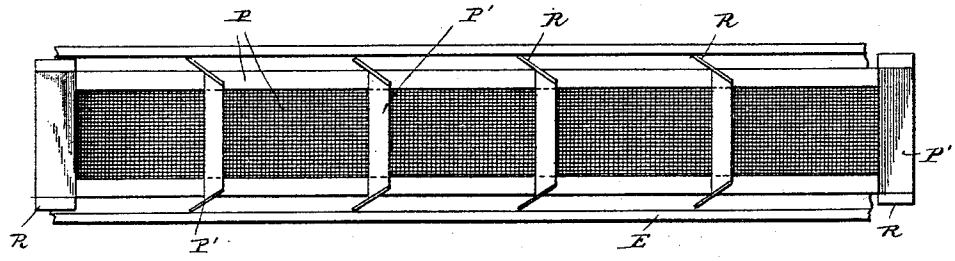


Fig. 8.

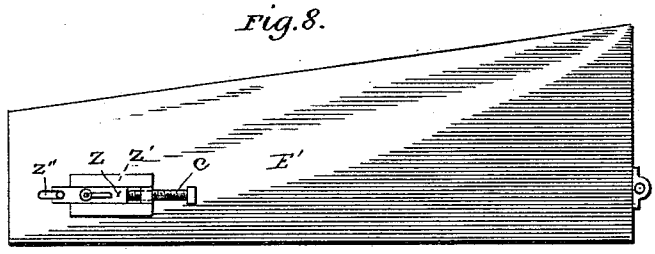
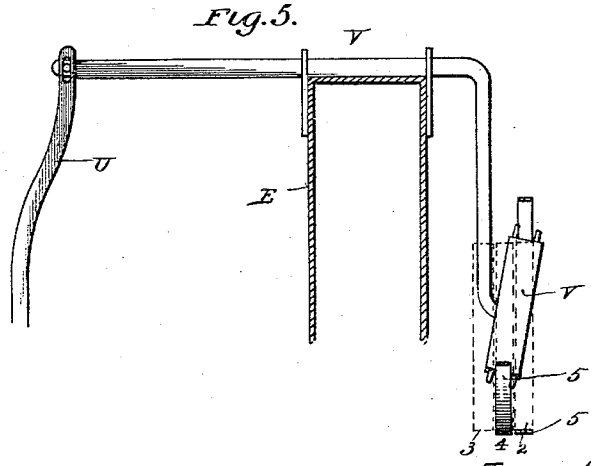


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROBERT SMITH THOMAS, SAUNY WARREN HARDWICK, AND WILLIAM ERWIN ELAM, OF DALLAS, TEXAS.

MACHINE FOR HANDLING AND CLEANING SEED-COTTON.

SPECIFICATION forming part of Letters Patent No. 458,380, dated August 25, 1891.

Application filed January 30, 1890. Serial No. 338,614. (No model.)

To all whom it may concern:

Be it known that we, ROBERT SMITH THOMAS, SAUNY WARREN HARDWICK, and WILLIAM ERWIN ELAM, citizens of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Machines for Handling and Cleaning Seed-Cotton; and we 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 taking seed-cotton from wagons or storehouses through pneumatic tubes and delivering it freed from dust and other extraneous matter to any number of gins. It includes devices for imparting flexibility to the feed-section of the tube for distributing the cotton and for disposing of the surplus when the cotton is supplied faster than it can be ginned.

In the accompanying drawings, Figure 1 is an elevation of a gin-house with our apparatus in position therein, one side of the house being removed to expose the interior. Fig. 2 shows the apparatus in plan. Fig. 3 is an elevation looking to the left in Figs. 1 and 2. Fig. 4 is a partial enlarged plan of a certain conveyer with the conveyer-belt in place therein. Fig. 5 is an enlarged view of belt-shipping mechanism. Figs. 6 and 7 show the outer faces of the opposite sides of a certain separator-box. Fig. 8 is a similar view of one side of an auxiliary conveyer.

In the drawings, A represents the walls of a gin-house, and B a power-shaft by which all the mechanism is driven.

C C are gins, each provided with a gin-feeder D. Upon the tops of the feeders rests a separator-box E E′, that communicates by suitable openings with each feeder. The box has two compartments, to each of which cotton is supplied by a tube F, having branches F′ F″, through which an air current is induced by a fan G, connected with the branches F′ F″ by a tube H, its branches H′ H″, and short troughs I crossing the box E. The tube F passes through the walls of the building and upon the outside is joined to a normally vertical feed-tube F‴ by two flexible pipes J J′ and an intermediate curved tube F^4. The connections J J′ are of leather, rubber, or other flexible material, and are closely secured to the ends of the rigid sections, or preferably to flanges or collars K upon the ends of those sections. The collars are employed in order that the pipes may be of greater diameter than the rigid sections, and may therefore permit the passage of the full air-current even when by flexure they are partially closed. It is evident that the pipe J may be omitted without destroying the possibility of the universal motion necessary for the feed-tube F‴; but we prefer the construction shown. The weight of the parts beyond the connection J is counterbalanced by a weight L, attached to the parts to be supported by a cord M, passing over suitably-supported pulleys N. Within the gin-house the tube F is provided with a downwardly-extending branch F^5, intended for taking up and again offering to the gins such surplus cotton as rapid feeding may cause to accumulate, mechanism to be described delivering such surplus near the mouth of the tube. By means of common valves x x' either the tube or its branch may be closed at will.

Within each of the compartments of the box E are mounted two drums O, which carry screen-belts P, having at intervals transverse wings P′, some of which are always in contact with flexible wings Q, projecting inward from the top and ends of the compartments. These wings are intended to obstruct the passage of air from the feeder, and this object is further aided by flaps R of like material fastened to the ends of the wings P′ to completely close the lateral space.

Immediately beneath the ends of the branches F′ F″ and beneath the folds of the belts, respectively, are the troughs I, each of which is closed at its front end by the front wall of the box, and each of which communicates by an aperture in the rear wall with one of the branch tubes H′ H″, leading to the fan. Cotton delivered by either of the branches F′ F″ falls upon the moving screen-belt, which arrests it while allowing the dust to pass on to the fan, by which it is discharged outside the building or elsewhere, as desired. The cotton thus arrested is carried on with the

screen-belt and drops into the feeder. If the cotton be fed faster than it can be ginned, the feeder fills, and were there no counteracting devices the apparatus would be clogged. Means are therefore provided for automatically interrupting the transmission to any feeder while it is filled.

At the left in Fig. 1 is shown a continuation E′ of the box E. In this is a common conveyer-belt W, running upon drums x' and provided with transverse cleats Y.

Upon the shaft of one of the drums are two loose pulleys 2 3, and between them is a pulley 4, fixed to the shaft. Upon these pulleys run two parallel belts 5, one of which is crossed. Both are driven by the same pulley 6 upon a shaft 7 above the apparatus already described. The pulleys 2 3 4 are equidistant and the two belts are arranged to run upon either two adjacent ones and are changed simultaneously from one pair to the other by a belt-shipper V. As shown, the crossed belt runs upon a loose pulley and the other upon the fixed pulley, and this causes the carrier-belt to run in the direction of the arrow *a*; but if both be shipped the crossed belt will run upon the fixed pulley and the other upon the loose pulley, and the motion of the carrier-belt will be reversed. Now bars S are fixed across the tops of the feeders, and to these bars are hinged boards T. To each board is rigidly secured an arm U, whose upper end is slotted and pivoted to the shipper V, the latter being supported in suitable guides. This part of the apparatus is adapted for use only with that common form of feeder illustrated in Fig. 3 in connection with another part of the apparatus. In this feeder the entering cotton falls upon a feeder-belt 8, which carries it forward and deposits it, or a part of it, in the gin. Above the front end of the feeder-belt is a rotating toothed cylinder 25, whose teeth continually throw backward the excess of cotton, if there be any, and thus regulate the speed of delivery to the gin itself. Evidently continued excess fills the feeder. Now so long as there is no such accumulation the belt W runs in the direction of the arrow and all the cotton from the box E is deposited in the feeder; but if there be an accumulation, as described, the board is thereby forced to rotate upon its hinges, as suggested in dotted lines in Fig. 3, and the belts are shipped, reversing the motion of the belt W and causing it to take the cotton coming from the box E and deposit it near the mouth of the tube F^5. Meantime the gin operates to remove the accumulation and the board falls again, shipping the belts 5 and reversing the motion of the belt W. It is not necessary that each gin should have an auxiliary carrier, one being sufficient to remove the whole surplus. Therefore the other gins have a different arrangement to prevent choking, a shipper V, actuated by like means, being used to ship upon an idler the belt 9, which drives the drums O. The accumulation in the corresponding feeder thus temporarily stops the passage of the cotton through the tube branch F″ by arresting the motion of the screen-belt, the cotton that would pass therethrough being carried by the branch F′ and discharged at the mouth of the tube F^5. As before, the removal of the accumulation by the gin permits the board to fall and the belt 9 automatically resumes its working position.

The shafts of the conveyer-drums are mounted in movable bearings Z, as seen in Figs. 6, 7, and 8, whereby the turning of two screws *c*, Figs. 7 and 8, or nuts *c*′, Fig. 6, may regulate the tension upon either conveyer-belt. The bearings Z, which in Figs. 7 and 8 slide in ways z', are pushed or drawn by the screws or nuts, the side walls of the box being slotted at z'' to permit lateral motion of the shafts rotating in the bearings. As shown, the pulley 10 upon the driving-shaft is connected by a belt 11 with a pulley 12, upon the shaft 7, and from this latter shaft the belts already mentioned pass to the several drum-shafts. Other pulleys 14 upon the driving-shaft operate the gins. The belts driving the feeder-carrier 8 and the toothed cylinder are not shown, but may be such as are illustrated in many patents showing this feeder or such other arrangement as is deemed suitable.

In Fig. 3 we have shown a counter-shaft 15 and belts adapted to give the fan a high speed.

It is plain that many details of construction and arrangement may be varied without passing beyond the scope of our invention. For example, the hinged board in the feeder may be any movable body arranged in any position to be displaced by the pressure of the cotton accumulated in the feeder and connected with any mechanism adapted to arrest the flow of cotton approaching the feeder, the most important part of this invention being not in the novel constructions employed to accomplish subordinate ends, but in the combination, with a feeder, means for delivering cotton to the feeder, and mechanism for arresting the flow of approaching cotton, of devices operated by the pressure of cotton accumulated in the feeder, and connections whereby the motion of said devices is imparted to the arresting mechanism to actuate it. We do not therefore wish to limit ourselves to the exact forms and relative positions shown.

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a gin-feeder and apparatus for delivering cotton thereto, of mechanism operable to arrest the flow of cotton in said apparatus, a movable body arranged to be displaced by pressure of cotton accumulated in the feeder, and suitable connections arranged to transmit to the arrest-

ing mechanism the motion of the pressure-actuated body, whereby clogging in the feeder is automatically prevented.

2. The combination, with a gin, its feeder, and a conveyer to deliver cotton to the feeder, of a subordinate conveyer operable to divert from the feeder the cotton brought by the first conveyer, and means whereby the pressure of cotton accumulated in the feeder may cause the operation of the subordinate conveyer.

3. The combination, with a gin-feeder and a branched tube, one branch of which delivers cotton to said feeder, of mechanism operable to divert the approaching cotton from said branch to another branch, a movable plate or board arranged in position to be displaced by the pressure of cotton accumulated in the feeder, and suitable connections whereby the pressure-induced motion of said plate may operate said mechanism, preventing undue congestion in the feeder.

4. The combination, with the gins and their feeders, of distinct conveyers for delivering cotton to the feeders, a pneumatic tube having a branch to convey cotton to each conveyer, means whereby the pressure of cotton in one feeder may arrest the corresponding conveyer and thus cause its cotton to pass to the other conveyer, a subordinate conveyer operable to take the cotton from the conveyer last named before it reaches the corresponding feeder, and means whereby the pressure of cotton in that feeder may cause such operation of the subordinate conveyer.

5. The combination, with the gins, their feeders, and a pneumatic cotton-conveying tube having branches to supply the separate feeders, of screen-conveyers moving transversely across the ends of the branches to receive the cotton and deliver it to the feeders, and means whereby the pressure of the conton when accumulated in one of the feeders may arrest the motion of one of the conveyers and thus temporarily cause all the cotton to pass to the other.

6. The combination, with the gins, their feeders, and a pneumatic cotton-conveying tube having a branch to each feeder, of a conveyer adapted to intercept the cotton passing through one branch and convey it away, a board hinged in each feeder and adapted to be displaced by the pressure of cotton accumulated therein and to return to its normal position when such pressure ceases, mechanism connected to one board and adapted to arrest the flow of cotton in one branch or to permit it, according as the board is raised or is in its normal position, and mechanism connected to the other board and adapted under like conditions to cause said conveyer to intercept the cotton or to permit it to pass to its feeder.

7. The combination, with the gins, their feeders, and the divided box resting upon the feeders, of the tubes F F′ F″, the troughs I, the tubes H H′ H″, the fan creating a current in said tubes and troughs, the screen-belts O, passing over the troughs below the mouths of the tube branches F F″, the auxiliary conveyer X, driven by belts 5, the boards T, hinged in the feeders, and the arms U, connecting the boards to the belt-shippers V, operating, respectively, to ship the belts 5, and the belt 9, driving one of the screen-belts, whereby the auxiliary conveyer and one of the screen-belts are automatically thrown into and out of operation as the accumulation of cotton in the feeders increases or diminishes.

In testimony whereof we affix our signatures in presence of two witnesses.

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WILLIAM ERWIN ELAM.

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