

No. 721,743.

PATENTED MAR. 3, 1903.

G. E. RICHMOND.
PNEUMATIC COTTON CONVEYER.
APPLICATION FILED NOV. 21, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

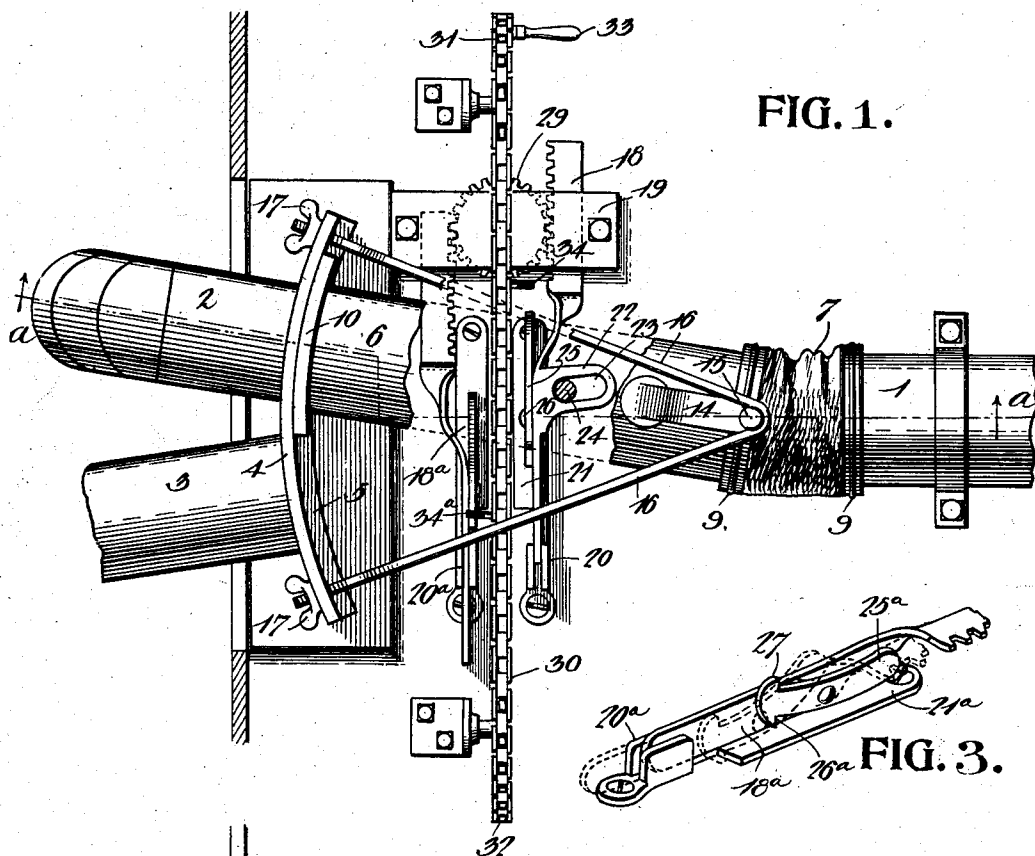


FIG. 1.

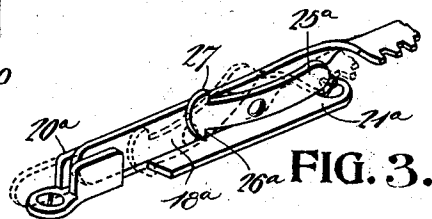


FIG. 3.

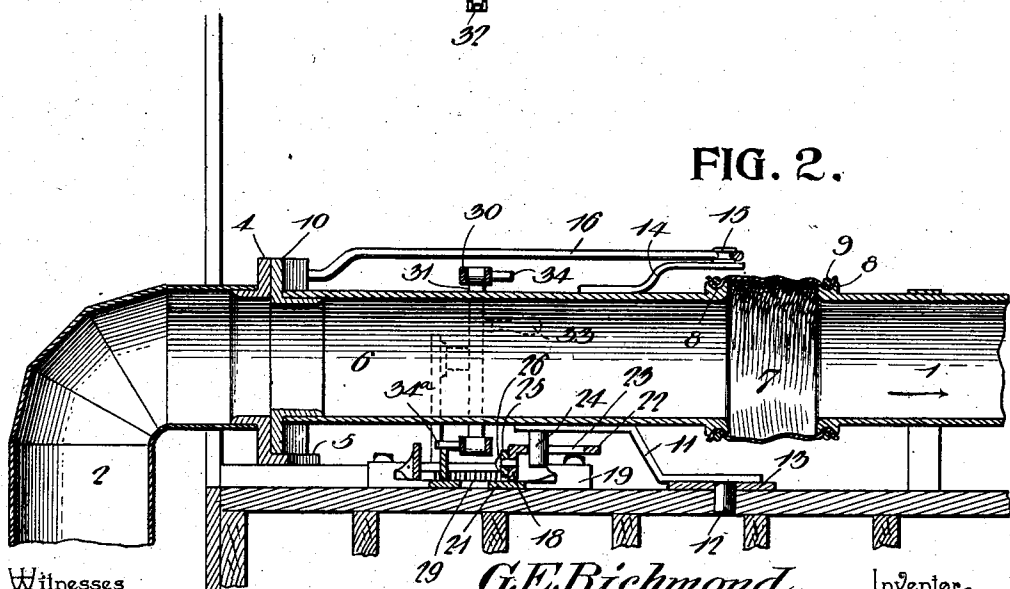


FIG. 2.

Witnesses

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2 SHEETS—SHEET 2.

FIG. 4.

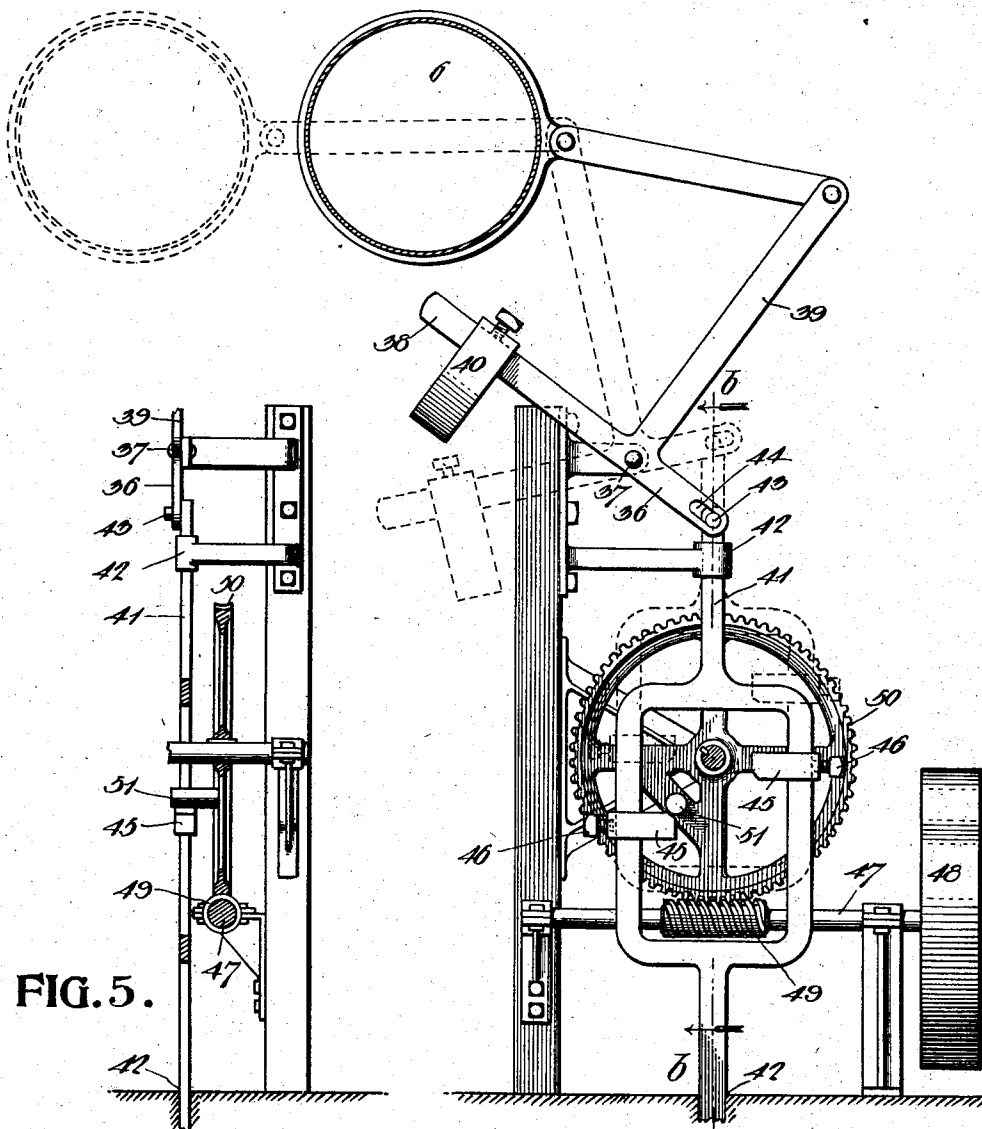


FIG. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE EUSTACE RICHMOND, OF HOUSTON, TEXAS.

PNEUMATIC COTTON-CONVEYER.

SPECIFICATION forming part of Letters Patent No. 721,743, dated March 3, 1903.

Application filed November 21, 1902. Serial No. 132,263. (No model.)

To all whom it may concern:

Be it known that I, GEORGE EUSTACE RICHMOND, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented a new and useful Pneumatic Cotton-Conveyer, of which the following is a specification.

My invention relates to an improvement in pneumatic cotton-conveyers, particularly with relation to means for putting the exhaust-pipe which leads to the elevator in communication with either of a series of intake-pipes at will and for relieving the partial vacuum caused by the operation of the exhaust-fan at will.

My invention consists in the peculiar construction and combination of devices herein-after fully set forth and claimed.

In the accompanying drawings, Figure 1 is a plan view of an apparatus embodying my improvements. Fig. 2 is a sectional view of the same, taken on a plane indicated by the line *a a* of Fig. 1. Fig. 3 is a detail perspective view. Fig. 4 is an elevation of a modified form of means for shifting the switch-pipe. Fig. 5 is a detail sectional view of the same, taken on a plane indicated by the line *b b* of Fig. 4.

The exhaust-pipe 1 leads to the elevator. A series of two intake-pipes are here shown, the intake-pipe 2 being adapted to be extended to a wagon to draw the load of cotton-seed or seed-cotton therefrom and the intake-pipe 3 extending from a storehouse. The inner ends of the said intake-pipes are opposite the outer end of the exhaust-pipe 1 and communicate with ports in an arc-shaped guide-plate 4. In the form of my invention here shown the guide-plate has a base-flange 5 on its inner side. A switch-pipe 6 is flexibly connected to the exhaust-pipe 1 by a section of flexible tubing 7, which may be of leather or other suitable material. In the form of my invention here shown the proximate ends of the exhaust-pipe and switch-pipe are provided with circumferential grooves 8, and rings 9, which pass around the flexible tube, embedding the same in the said grooves, thereby effecting an air-tight connection between the said flexible tube and said exhaust and switch pipes. At the outer end of the switch-pipe

is a head 10, which conforms to the face of the arc-shaped plate 4 and effects a ground joint therewith. On the under side of the switch-pipe is an arm 11, which is secured thereto and provided with a depending pivot 12, which turns in a suitable bearing, as at 13, and forms the pivot for the said switch-pipe. On the opposite side of the latter from the arm 11 is a similar arm 14, which has a pivot 15, that aligns with the pivot 12 and is engaged by rods 16, which pass through openings in the curved plate 4. The outer ends of the said rods 16 are screw-threaded, and on the same are thumb-nuts 17, by tightening which the free end of the switch-pipe may be caused at all times to bear snugly against the curved plate 4 and effect and maintain a tight joint therewith. Hence wear on the head 10 and the curved plate 4 may be compensated. When the switch-pipe is placed in communication with one of the intake-pipes, it will be understood that the exhaust will operate pneumatically through the latter and serve to pneumatically convey either cotton-seeds or seed-cotton, as may be necessary. When the switch-pipe is turned from an intake-pipe, the partial vacuum is relieved in the latter, as will be understood, by reason of the end thereof being opened. Hence no valve is required for this purpose. It will be understood that any number of the intake-pipes may be employed in connection with the exhaust-pipe and my switch-pipe. The head 10 of the latter bears on the flange 5 of the curved plate 4.

I will now describe means for shifting the switch-pipe rapidly, so that any of the intake-pipes desired may be also instantly connected to the exhaust-pipe. A longitudinally-movable rack-bar 18 has its ends disposed in suitable guides 19 20. A cam 21, which is here shown as a flat plate of suitable length, is under the rack-bar. The latter has a laterally-extending arm 22, which is provided with a slot 23. A stud 24 projects from the switch-pipes and operates in the said slot. Hence by moving said rack-bar longitudinally the said switch-pipe will be caused to move therewith, as will be understood. A link 25 is disposed on the inner side of the rack-bar 18, is carried thereby and connected thereto by a

pivot 26, and said link operates on the cam-plate 21. One end of said link is longer and heavier than the other. The opposite lighter end of the link is provided with a notched shoulder 26^a on its under side and on its upper side with a shoulder or detent 27. The said detent 27 is by the counterweighting-arm of the link normally raised above the upper side of the rack-bar 18. A rack-bar 18^a is disposed opposite the rack-bar 18. One end thereof is engaged by the guide 19 and the other end thereof by a guide 20^a. A cam-plate 21^a is under said rack-bar 18^a, and the latter carries a pivoted counterweighted link 25^a, which is identical in construction with the link 25. A spur gear-wheel 29 is mounted in suitable bearings and engages the rack-bars 18 18^a, and hence when the rack-bar 18 is moved in one direction the rack-bar 18^a is simultaneously moved in the opposite direction, and vice versa.

An endless chain 30 is carried by sprocket-wheels 31 32, one of which is here shown as provided with a crank 33, by which it may be rotated. Power may be employed to operate endless traveling chain 30 or the same may be operated manually. The lower lead of the endless chain 30 is disposed between the rack-bars 18 18^a. Said endless chain is provided at diametrically opposite points with tappets 34 34^a. The said tappets respectively and alternately operate in paths in which the detents 27 of the links 25 25^a are disposed.

In order to shift the switch-pipe, the chain 30 is put in motion, thereby causing one of the tappets thereof to engage the detent of one of the links, draw the latter, together with the rack-bar to which it is attached, longitudinally, and hence shift the switch-pipe. The length of each of the cam-plates is such that the latter when the switch-pipe is in communication with one of the intake-pipes releases the notched shoulder of the link, thereby causing the latter to turn on its pivot sufficiently to release the detent 27 thereof from the engaging tappet of the endless traveling chain.

In Figs. 4 and 5 I show a modified form of mechanism for shifting the switch-pipe 6. A lever 36 is fulcrumed, as at 37, and has a weighted arm 38 and an arm 39. The weight 40 is adjustable on the arm 38 and assists in operating the switch-pipe. A vertically-movable yoke 41 is maintained in position by suitable guides 42 and is connected to the lever 36 by a pin or stud 43, which operates in a slot 44 in said lever. Tappets 45 are secured on opposite sides of the said yoke and are here shown as being adjustable thereon by means of set-screws 46.

A shaft 47, which may be revolved by power, being provided with a pulley 48 for that purpose, has a worm 49. A wheel 50 is engaged and rotated by said worm, and said wheel has a tappet 51, which alternately engages the oppositely-disposed tappets 45 of yoke 41, and hence is adapted to move the latter longi-

tudinally and to shift the switch-pipe, as will be understood. Other modifications may be made within the scope of my invention.

Having thus described my invention, I claim—

1. In pneumatic conveyers, the combination with a plurality of intake-pipes, of an exhaust-pipe and a switch-pipe connected to the exhaust-pipe and adapted to be placed in communication with either of the intake-pipes, substantially as described.

2. In a pneumatic conveyer, the combination of a plurality of intake-pipes, an exhaust-pipe, a switch-pipe connected to the latter and adapted to be placed in communication with either of the intake-pipes, and means to operate said switch-pipe, substantially as described.

3. In a pneumatic conveyer, the combination of a plurality of intake-pipes, a curved plate having ports communicating with said intake-pipes, an exhaust-pipe, a switch-pipe flexibly connected to the exhaust-pipe and having a head at its free end bearing on said curved plate, and means to maintain a tight joint between said head of said switch-pipe and said curved plate, substantially as described.

4. In a pneumatic conveyer, the combination of a plurality of intake-pipes, a curved plate having ports communicating with said intake-pipes, an exhaust-pipe, a switch-pipe, a flexible tube connecting said switch-pipe to said exhaust-pipe, said switch-pipe having a head bearing against the face of said curved plate, and a pivot for said switch-pipe, substantially as described.

5. In a conveyer of the class described, the combination of an exhaust-port, a switch-pipe flexibly connected thereto, a plurality of intake-pipes, a pair of oppositely-movable bars, means connecting the same to transmit power from one to the other, one of said bars being connected to said switch-pipe, links connected to said bars and having detents, an endless traveling element having tappets adapted to alternately engage the detents of said respective links and means to automatically disengage said links from said tappets of said endless traveling element, substantially as described.

6. In a pneumatic conveyer of the class described, the combination of a plurality of intake-pipes, a guide having ports communicating with said intake-pipes, an exhaust-pipe, a switch-pipe, a flexible pipe connecting said exhaust-pipe to said switch-pipe, the latter having a head bearing against said guide, and means to maintain a tight joint between said guide and said head, substantially as described.

7. In a pneumatic conveyer of the class described, the combination of a plurality of intake-pipes, an exhaust-pipe, a switch-pipe to establish communication between the exhaust-pipe and either of said intake-pipes, a reciprocating element connected to said

switch-pipe, and an endless traveling element having tappets to alternately engage said reciprocating element, and thereby shift the switch-pipe, substantially as described.

5 8. In a pneumatic conveyer of the class described, the combination of a plurality of intake-pipes, an exhaust-pipe, a switch-pipe connected thereto and adapted to be shifted into communication with either of the intake-
10 pipes, an endless traveling element, and automatically-operated connections between

said endless traveling element and said switch-pipe, whereby the latter is operated, substantially as described.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
the presence of two witnesses.

GEORGE EUSTACE RICHMOND.

Witnesses:

JOHN BROUGHTON,
JOHN W. MACKEY.