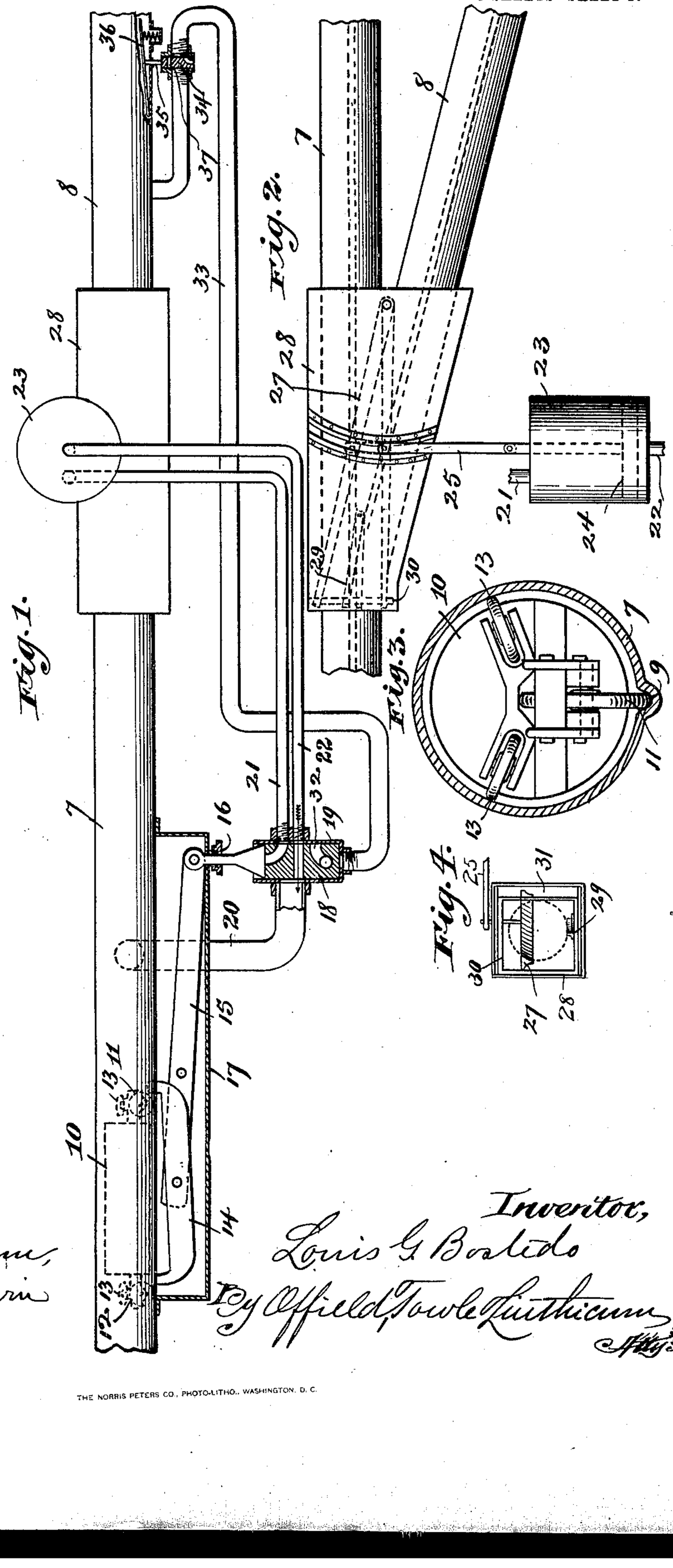
No. 736,680. PATENTED AUG. 18, 1903.

L. G. BOSTEDO.

PNEUMATIC TUBE.

APPLICATION FILED MAY 17, 1897.

NO MODEL. 3 SHEETS—SHEET 1.



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NO MODEL. 3 SHEETS—SHEET 2.

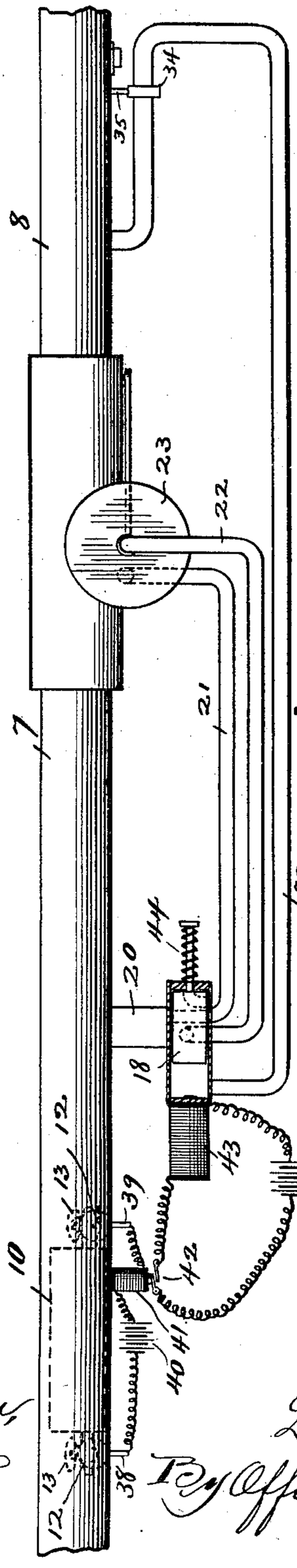

Fig. 5.

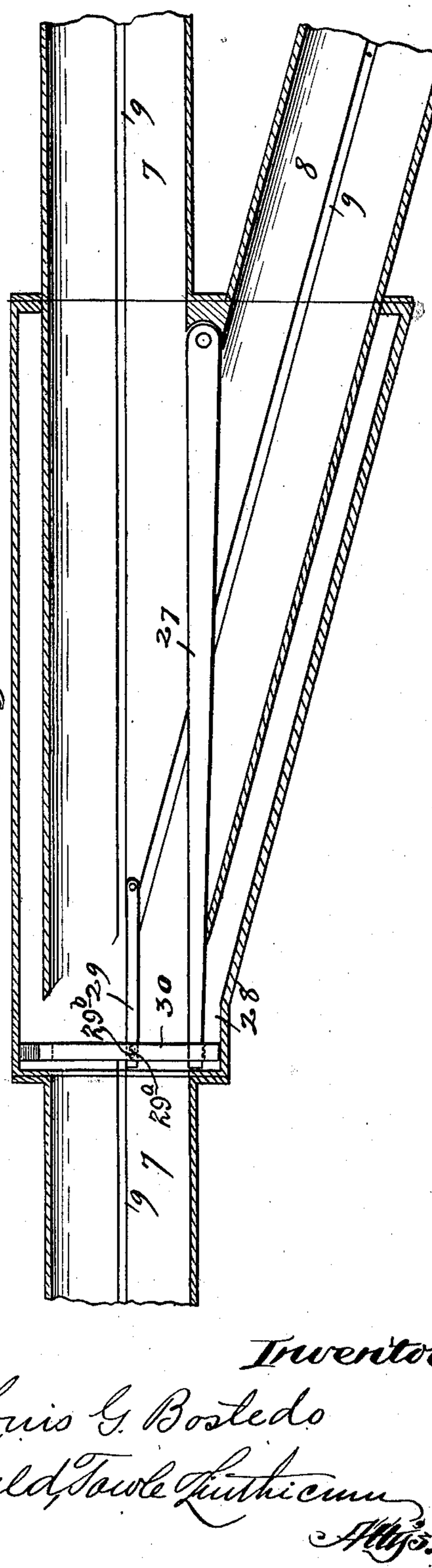

Fig. 6.

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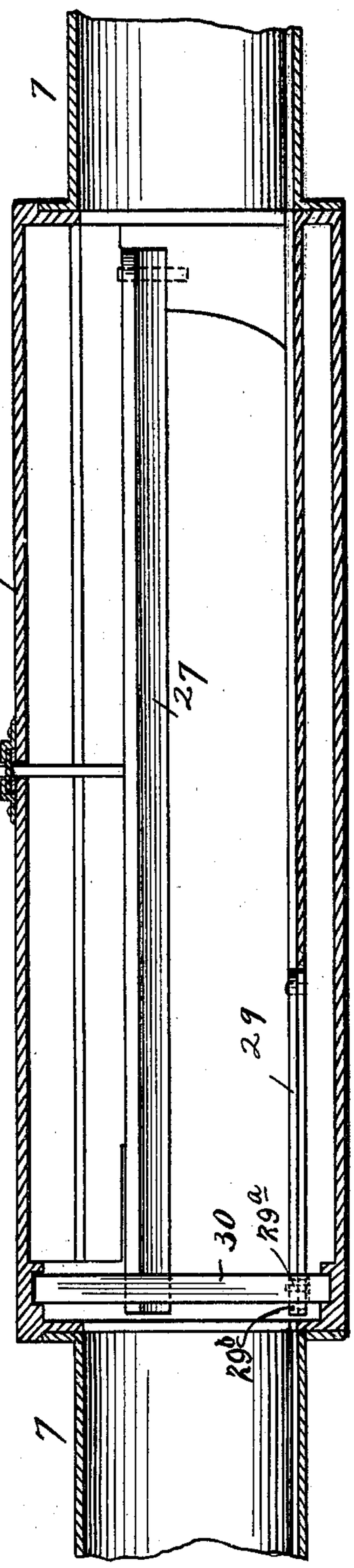
NO MODEL. 3 SHEETS—SHEET 3.

Fig. 7.



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No. 736,680. Patented August 18, 1903.

UNITED STATES PATENT OFFICE.

LOUIS G. BOSTEDO, OF CHICAGO, ILLINOIS, ASSIGNOR TO BOSTEDO PNEUMATIC TUBE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PNEUMATIC TUBE.

SPECIFICATION forming part of Letters Patent No. 736,680, dated August 18, 1903.

Application filed May 17, 1897. Serial No. 636,974. (No model.)

To all whom it may concern:

Be it known that I, LOUIS G. BOSTEDO, of Chicago, Illinois, have invented certain new and useful Improvements in Switching Mechanism for Pneumatic Tubes, of which the following is a specification.

This invention relates to a switching mechanism for pneumatic tubes, and more particularly to a switch mechanism for pneumatic tubes of large size used for commercial purposes.

The principal object of my invention is to provide means whereby the switch is operated by a fluid-pressure motor controlled by the carriers themselves, said carriers having selective devices and intermediate mechanisms whereby the carrier intended for a station operates through said intermediate mechanism to apply the fluid-pressure, the latter operating through its motor to move the switch.

To this end my invention consists, broadly stated, in the combination, with a switch, of a fluid-pressure motor for moving the switch comprising a cylinder closed at both ends and an inclosed piston operatively connected with the switch, a pressure-fluid-supply valve, branch pipes leading from said valve to the opposite ends of the cylinder, a motor-fluid-supply pipe with which either of said branch pipes may be connected by the valve, the other of said pipes being simultaneously placed in communication with the atmosphere, and selective devices operated by the carrier, with intermediate mechanisms, whereby the carrier operates through said intervening devices to move the valve controlling the pressure-fluid supply, and thereby to shift the switch. Said intermediate mechanisms may be mechanical, electrical, or pneumatic, or a combination of said forces.

In the accompanying drawings I have shown two forms of the apparatus, one employing mechanical devices intermediate the selective and the power-operating mechanisms, while in the other said intermediate mechanism is electrically operated.

In the drawings, Figure 1 is a side elevation, partly in section, of a pneumatic tube taken at the switch. Fig. 2 is a plan view, partly broken away. Fig. 3 is an end elevation of one of the carriers within the tube, the latter showing in section. Fig. 4 is an end elevation of the switch-box, showing the switch-shifting frame in side elevation and the switches in perspective therein. Fig. 5 is a side elevation showing a pneumatic tube in which electric connections are employed between the selective devices and the valves controlling the compressed air. Fig. 6 is a sectional plan view of the main tube and its branch at the switch; and Fig. 7 is an elevation, partly in section, of the switch-box and the associated mechanism.

The mechanism shown in the accompanying drawings is adapted to be operated either by direct pressure or by suction or exhaust, and although the parts are shown in positions assumed by them in the operation of an exhaust system it will be understood that the same mechanism is equally well adapted for use with direct pressure, the alterations necessary for this purpose being obvious.

In the drawings let 7 represent the main tube, and 8 a branch thereof, said tubes being in the contemplated construction large and intended for the transmission of bulky articles. They are provided with a track 9 in their bottoms and are adapted to be used in connection with a carrier such as shown in end elevation in Fig. 3 and indicated in dotted lines in Figs. 1 and 5, said carriers being marked 10 and having supporting-wheels 11 12 at their ends and guide-wheels 13 on opposite sides of their bodies at or near their ends. The supporting and carrying wheels are preferably mounted on the ends of a frame, while the body of the carrier is supported between said ends. The wheels of the several carriers may be placed at various distances from each other, and thereby adapt said carriers to automatically switch themselves out at the proper station by combination with a switch mechanism, which will now be described.

As shown in Fig. 1, a selective device is employed, consisting of a pronged arm 14, which is pivotally mounted upon the end of a lever 15, the latter itself being pivotally supported between its ends and connected at

one end thereof to a valve-rod 16. The ends of the pronged arm protrude through apertures in the wall of the main tube 7, and the arm and lever are inclosed by a suitable casing 17, the valve-rod working through a suitable stuffing-box in the wall of the casing 17. The valve-rod 16 is connected to a shifting valve 18, working in a casing 19, and air is exhausted into the main pipe 7 from said casing through the pipe 20. From the opposite side of the casing pipes 21 22 lead to opposite ends of the power-cylinder 23, within which a piston 24 is mounted to slide. The piston-rod 25 is connected to a pivoted switch 27, said switch being pivoted within a switch-box 28 and at an elevation above the bottom of the tube, so that it serves to shift the carrier by engaging with one of the guide-wheels 13 thereof. While I have called the part 27 the "switch," I have shown and preferably employ a short track-switch 29, which is pivoted in the crotch between the tracks 9 of the main and branch line, its free end vibrating across the slot or track in the main tube and directing the supporting-wheel into the track of the main tube or the branch, as may be dictated by the selective device. The switch 27 is projected through a sliding frame of rectangular form (marked 30) and having an endwise sliding movement within and transversely of the switch-box. The point of the switch 29 is connected to the lower bar of this frame 30 through a pin 29^a in the lower horizontal member of the frame, which projects upwardly through a slot 29^b in the point of the switch, as shown in Figs. 6 and 7, and the frame has only a slight movement, as indicated by the width of the space 31 between its side and the side wall of the switch-box. The switch 27 is shown in Fig. 2 in such position as to leave the main track open, and when the switch is shifted its free end moves the width of the frame before it encounters the latter. This is best shown in Fig. 4, which is a view looking into the open smaller left-hand end of the switch-box 28 and showing in elevation the frame 30 and illustrating the capacity of the latter for an endwise limited sliding movement transversely of the switch-box. In this view the switches 27 and 29 appear in perspective, the left-hand ends of the switches, as shown, being the free ends, which engage the frame 30, and the right-hand ends being the rear pivoted ends of the switches. As the free end of the switch 27 swings across the frame, alternately engaging its opposite side members, it thus shifts the said frame and with the latter the point of the switch 29, which is secured thereto through the pin-and-slot connection 29^a and 29^b, described above. The frame 30 thus constitutes the means of operating the lower switch 29 from and in properly-timed relation to the movement of the upper switch 27.

Assuming that the system above described is operated by suction or exhaust, the carrier will be propelled through the tube by reason of the minus pressure in advance of it. As the carrier approaches the switch if its wheels 11 and 12 are separated from each other, so as to simultaneously engage the points of the arm 14, the latter will be depressed, thus rocking the lever 15 upon its pivot and shifting the valve 18, so as to establish communication between the inner end of the cylinder 23 and the main tube 7 through the pipes 20 and 21 and valve 18 and at the same time opening pipe 22 to the atmosphere through the waste-port 32. This will result in movement of the piston and the shifting of the switch, so as to direct the carrier into the branch. In order to restore the parts to the normal position, the valve-casing is connected with the branch through the pipe 33, having a valve 34, whose stem 35 is operated by a spring-supported lever 36. As the carrier passes over the lever 36 a port 37 in the valve 34 passes the outer end of the valve-casing in communication with the branch tube 8, and the suction is therefore effective through the pipe 33 upon the outer end of the valve 18 to return it to its normal position. The return of the valve again places the outer end of the cylinder in communication with the main tube 7, and the piston is returned, thus shifting the switch to its normal position.

In the construction shown in Fig. 5 I have used electrical mechanism for moving the fluid-pressure-supply valve instead of the tilting lever of the construction first described. Let 38 39 represent electrical contacts, which are placed in graduated positions at the respective switches. Said contact-points are electrically connected through a battery 40 and magnet 41 by suitable wiring. When the wheels of the carrier simultaneously make contact with said contact-points 38 39, a local circuit will be established through said carrier and the magnet will be energized. The magnet 41 controls the circuit-breaker 42 of a normally closed electric circuit, including a magnet 43, and the latter is made to hold the valve 18 in its normal position. When the circuit, including magnet 43, is broken by the passage of the carrier, the magnet 43 is deënergized and the valve is shifted by means of a spring 44. The valve is returned to its normal position by exhaust or suction, operating in a similar manner to that described in reference to Fig. 1.

I claim—

1. In a pneumatic-tube system, the combination, with a main tube and its branch, of carriers, a pivoted switch for diverting the carriers from the main tube into the branch, a cylinder closed at both ends and having a piston operatively connected with the switch, a motor-fluid-supply pipe connected with the main tube and having branch pipes connected with the opposite ends of the cylinder, a valve controlling the supply of motor fluid to said branch pipes, whereby either end of said cylinder may be placed in communication

with the main tube, a selective device, separated devices on the respective carriers for operating the selective device, and mechanism intermediate the selective device and the valve for shifting the valve and switch, substantially described.

2. In a pneumatic-tube system, the combination, with a main tube and its branch, of carriers, a pivoted switch for diverting the carriers from the main tube into the branch, a cylinder closed at both ends and having a piston operatively connected with the switch, a motor-fluid-supply pipe connected with the main tube and having branch pipes connected with the main tube, a casing, a valve inclosed in said casing and controlling the supply of motor fluid to said branch pipes, whereby either end of said cylinder may be placed in communication with the main tube, a selective device, separated devices on the respective carriers for operating the selective device, mechanism intermediate the selective device and the controlling-valve whereby the passage of the carrier is made to shift the controlling-valve in one direction, and a valved passage between the branch tube and the controlling-valve casing, the valve of said passage being actuated by the carrier as it leaves the switch to shift the controlling-valve in the other direction and return the switch to its normal position, substantially as set forth.

3. In a pneumatic-tube system, the combination with a main tube and its branch, of a carrier, a switch for diverting the carrier from the main tube into the branch, and instrumentalities for operating said switch including a pivoted lever, an arm pivoted intermediate its ends directly to said pivoted lever, and separated devices on the carrier arranged to contact the ends of the arm; substantially as and for the purpose described.

4. In a pneumatic-tube system, the combination with a main tube and its branch, of a carrier, a switch for diverting the carrier from the main tube into the branch, and instrumentalities for operating said switch including a pivoted lever, an arm pivoted intermediate its ends to said lever, and separated rollers on the carrier arranged to contact the ends of the arm; substantially as and for the purpose described.

5. In a pneumatic-tube system, the combination with a main tube and its branch, of a carrier, a switch for diverting said carrier from the main tube into the branch, and instrumentalities for operating said switch including separated contact-points, and separated rollers on the carrier arranged to engage said contact-points; substantially as and for the purpose described.

6. In a pneumatic-tube system, the combination with a main tube and its branches, of carriers, switches for diverting the carriers from the main tube into its branches, and instrumentalities for operating said switches including separated contact-points, and separated rollers on the carriers arranged to engage said contact-points, the contact-points for each switch being spaced at different distances apart and the coöperating rollers on the carriers being correspondingly spaced; substantially as and for the purpose described.

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