J. T. COWLEY.

PNEUMATIC DESPATCH TUBE APPARATUS.

APPLICATION FILED MAY 11, 1908.

978,272.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

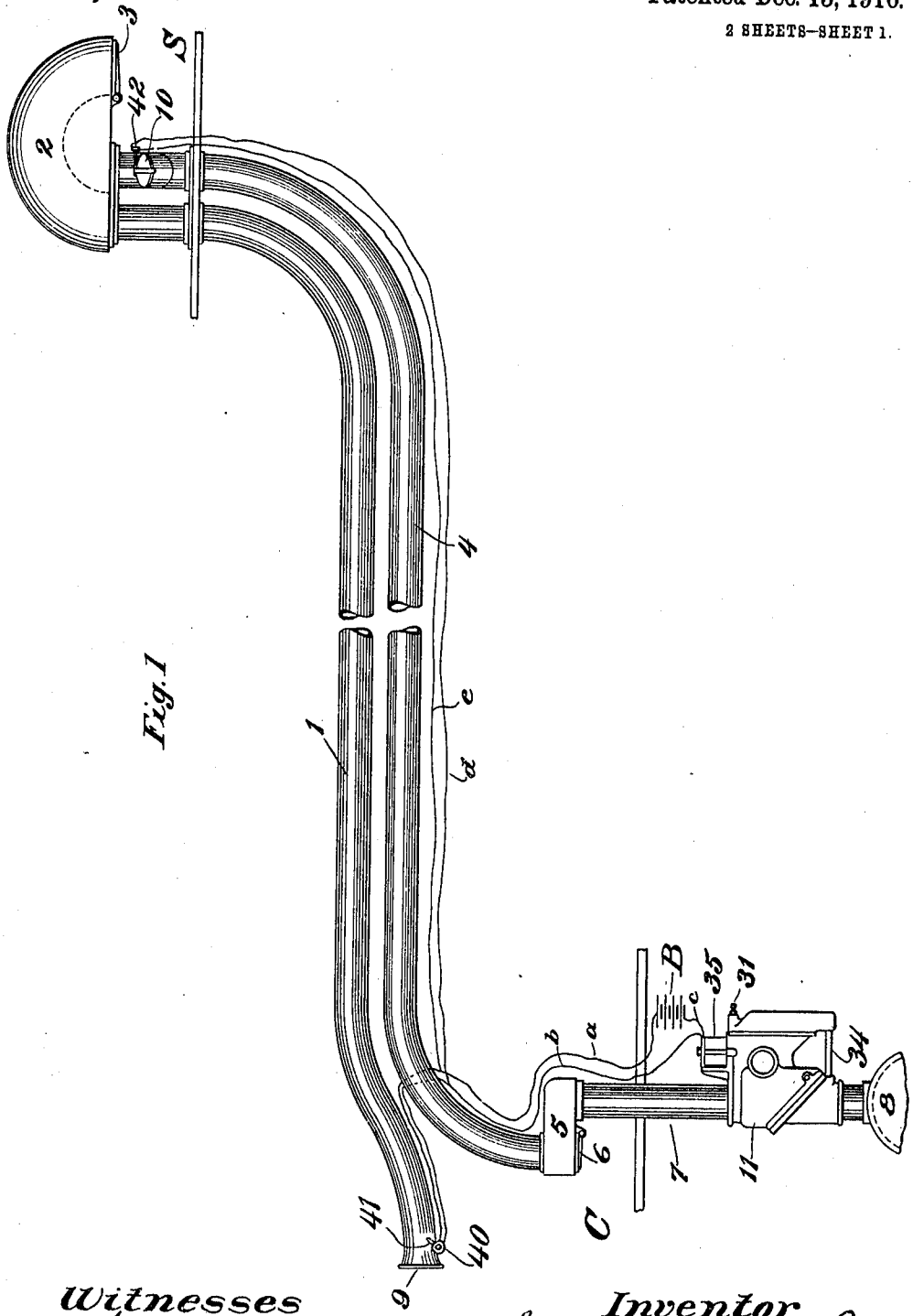

Fig. 1

Witnesses
A. L. Wesser
L. G. Bartlett

Inventor
James T. Cowley
by J. C. Ruark
Atty

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Fig. 3

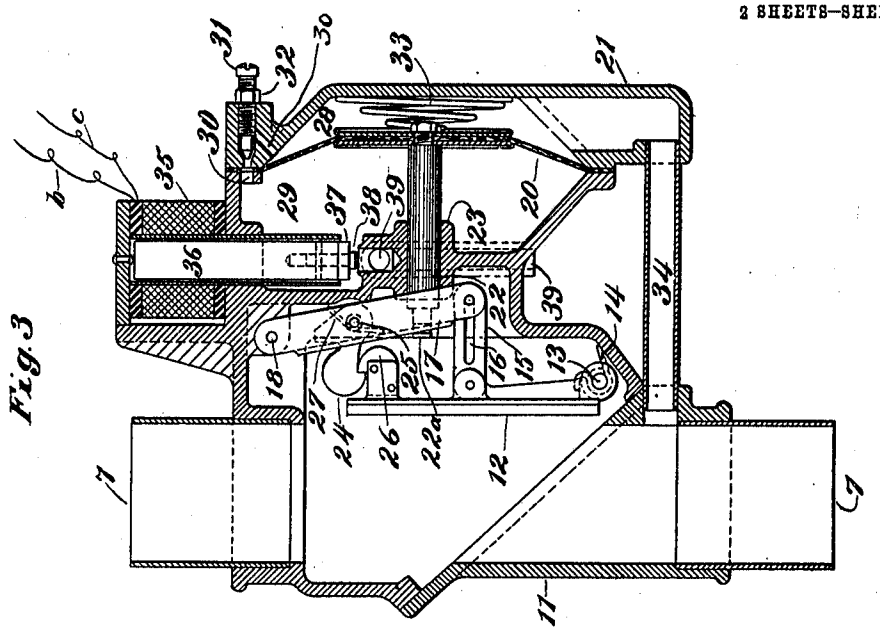
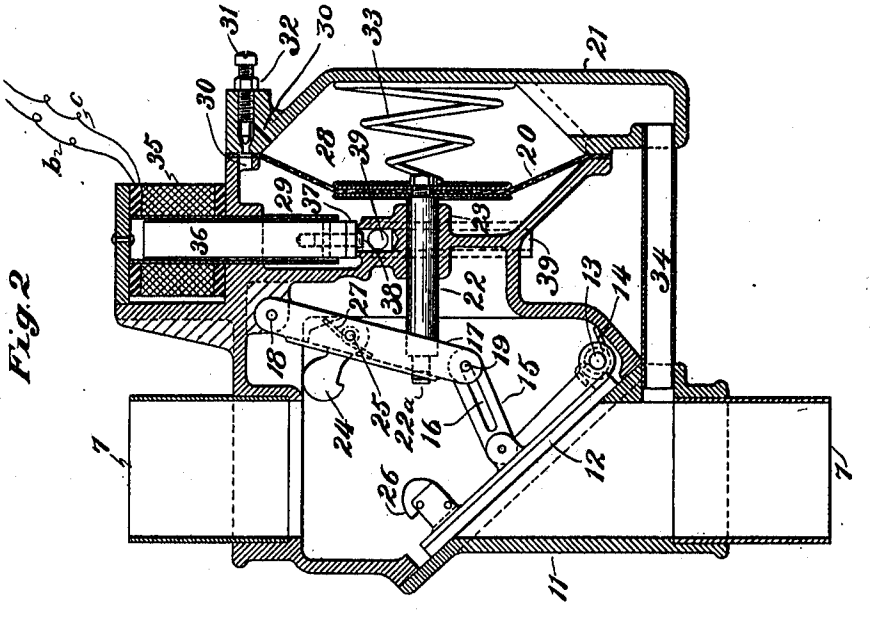


Fig. 2



Witnesses
L. G. Bartlett
A. L. Mason

Inventor
James T. Cowley
by J. H. Rusk
Atty

UNITED STATES PATENT OFFICE.

JAMES T. COWLEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO LAMSON CONSOLIDATED STORE SERVICE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

978,272. Specification of Letters Patent. **Patented Dec. 13, 1910.**

Application filed May 11, 1908. Serial No. 432,155.

To all whom it may concern:

Be it known that I, JAMES T. COWLEY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic-Despatch-Tube Apparatus, of which the following is a specification.

My invention relates to improvements in pneumatic despatch tube apparatus and particularly to that class of power control systems wherein a valve is used to control the flow of air for driving the carriers.

The object of my invention is to provide means whereby the valve is held fully open without restricting the flow of air during the transit of a carrier or carriers, and to close the said valve quickly when all carriers have delivered at their destination.

In the accompanying drawings which illustrate a construction embodying my invention, Figure 1 is a diagram of the device in operating connection with a circuit of pneumatic transit tubes; Fig. 2 is an enlarged sectional view showing the normal position of the parts when there are no carriers in transit. Fig. 3 is a similar view to Fig. 2 showing the position of the parts when a carrier is being transmitted.

Like letters of reference refer to like parts throughout the several views.

1 represents a transmission tube connecting the central station C with the discharge terminal 2 controlled by the delivery valve 3 at the substation S.

4 is a return transmission tube connecting the terminal 2 with the discharge terminal 5 controlled by the usual valve 6 at the central station C.

7 is a vacuum tube connecting the terminal 5 with the vacuum drum 8 at the central station C.

9 is a bell mouth or air inlet for despatching carriers in the tube 1 and 10 is the usual despatching inlet located at the substation S for inserting carriers into the transmission tube 4.

11 is a casing interposed in the vacuum tube 7 and has pivoted therein at 13 the valve 12 adapted to control the flow of air through said tube, and held normally closed by the spring 14.

15 is a link centrally pivoted at one end to the valve 12 and having a slot 16 in which is movably mounted a pin or stud 19 fixed to the lower end of the yoke lever 17 which lever is stationarily pivoted to the casing at 18.

20 is a diaphragm mounted in one end of the casing 11 and secured therein by the head 21, and 33 is a spring located between said diaphragm and said head and normally adapted to hold said diaphragm in the position shown in Fig. 2.

22 is a stem secured at one end to the diaphragm 20 and reciprocally mounted in the bearing 23 and carrying at its opposite end a cross piece 22^a between which and the stem 22 the yoke lever 17 is adapted to play.

26 is a catch secured to the upper end of the valve 12, and adapted when said valve is fully opened, to engage the latch 24, which is pivoted at 25 to the yoke lever 17 to retain said valve in open position.

27 is a spring adapted to hold the latch 24 in position to engage the catch 26.

34 is a passage connecting the chamber 28 on one side of the diaphragm 20 with the vacuum tube 7, and 30 is a by-pass adapted to be restricted by the adjustable timing valve 31 which is held in adjusted position by the check nut 32, and which connects the chamber 28 with the chamber 29 on the opposite side of said diaphragm whereby the air is normally exhausted from both of said chambers.

35 is a solenoid magnet mounted on the upper part of the casing 11 and 36 is the core or armature having secured thereto at its lower end the leather valve 37 by means of a screw 38. This valve 37 normally closes by the weight of the armature 36 a passage 39 which is adapted to admit atmospheric pressure to the chamber 29. The solenoid magnet 35 is in circuit with the battery B and a normally open switch 40 adapted to be closed by a trip 41 and located at the bell mouth 9, said circuit being as follows; from battery B through wire *a*, switch 40, wire *b*, thence through the magnet 35 and wire *c* back to the battery.

42 is a normally-open switch in multiple circuit with the magnet 35 through wires *e* and *d* and which switch is adapted to be closed by the opening of the despatching inlet 10 at the substation S.

The operation is as follows: In despatching a carrier from the central station C to the substation S, the operator inserts the carrier into the bell mouth 9 where it engages the trip 41 closing the switch 40

and energizing the magnet 35 which raises the armature 36 and valve 37 admitting air through the port 39 into the chamber 29 destroying the vacuum therein. The pressure in the chamber 29 now actuates the diaphragm 20 against the tension of spring 33 and through stem 22, yoke lever 17 and link 15 opens the valve 12 to the position shown in Fig. 3, when the latch 24 engages the catch 26 and holds the valve open. The air now enters the bell mouth 9 driving the carriers toward the substation S. In the meantime, the carrier has passed and released the trip 41 breaking the circuit through and deënergizing the magnet 35 allowing the armature 36 and valve 37 to drop cutting off the admission of air through the passage 39. The air in the chamber 29 is gradually exhausted through the chamber 28 and passage 34, timed by the valve 31 allowing the spring 33 to move slowly the diaphragm 20, stem 22 and yoke lever 17 until the stud 19 has moved to the opposite end of slot 16 when the latch 24 will be withdrawn from the catch 26 releasing the valve 12 which is closed by the spring 14 cutting off the flow of air through the bell mouth 9. By the time the valve 12 is closed, the carrier is delivered through the valve 3 at the substation S, the action of the valve 12 being timed by the timing valve 31. In despatching a carrier from substation S to central station C, the operator opens the inlet 10 and inserts the carrier into the tube 4 closing the inlet. The opening of the inlet closes the switch 42 which energizes the magnet 35 attracting the armature 36 and opening the valve 37, when through the action of the diaphragm 20, the valve 12 is opened in the manner heretofore described being held fully opened while the carrier is in transit and closed when the carrier delivers through the valve 6 at the central station C.

Having thus described my invention and set forth a construction embodying the same, what I claim as new and desire to secure by Letters Patent of the United States is,—

1. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an exhauster connected with said tube, a normally closed valve adapted to control the flow of air through said tube for driving carriers, means for opening said valve to create a flow of air through said tube for the despatch and transmission of carriers, means for locking said valve fully open during the transmission of said carriers, timing means adapted to operate to release and permit the closure of said valve to cut off the flow of air when said carriers have delivered from said tube, and means under the control of said timing means for unlocking and closing said valve.

2. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an air valve controlling the passage of air through said tube and normally closed, an exhaust tube, mechanism for operating said valve, an electric circuit for controlling said mechanism, mechanism operated by the insertion of a carrier into said tube to close said circuit for opening said air-valve to create a flow of air through said tube for driving carriers, means for locking said valve in full open position during the transmission of carriers, and means under the control of said timing means for unlocking and closing said valve.

3. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an air valve controlling the passage of air through said tube and normally closed, an exhaust tube, mechanism for normally holding said air-valve closed, an electric circuit for controlling said mechanism, mechanism operated by the insertion of a carrier into said tube to close said circuit for opening said air-valve to create a flow of air through said tube for driving said carrier, means for locking said valve fully open during the transmission of said carrier, timing means adapted to operate to release and permit the closure of said valve to cut off the flow of air when said carrier has delivered, and means under the control of said timing means for unlocking and closing said valve.

4. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an air-valve controlling the passage of air through said tube, an exhaust tube in communication with said transit tube and normally closed by said air-valve, mechanism normally holding said air-valve closed, a valve adapted to be operated to admit atmospheric pressure to said mechanism to open said air-valve to create a flow of air through said tube for driving carriers and adapted to cut off atmospheric pressure from said mechanism to close said air-valve, a solenoid magnet connected to operate said valve to control the admission of atmospheric pressure to said mechanism, an electric circuit adapted to be operated to control said solenoid magnet, and means for retaining said valve in full open position during the transmission of carriers.

5. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an exhaust tube in communication with said transit tube and normally closed by said air-valve, mechanism normally holding said air-valve closed, a solenoid magnet, an armature or core for said magnet, a valve connected with and held normally closed by the weight of said core, an electric circuit adapted to be closed to energize said magnet to open said valve for admitting atmospheric pressure to said mechanism to open said air-valve to create a flow of air through said

tube for driving carriers, said circuit adapted when broken to deënergize said magnet for cutting off the admission of atmospheric pressure from said mechanism to close said air-valve, and means for retaining said air valve in full open position during the transmission of carriers.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this seventh day of May A. D. 1908.

JAMES T. COWLEY.

Witnesses:
L. G. BARTLETT,
A. L. MESSER.