A. W. PEARSALL.

PNEUMATIC DESPATCH TUBE APPARATUS.

APPLICATION FILED JUNE 26, 1903.

1,031,816. **Patented July 9, 1912.**

3 SHEETS—SHEET 1.

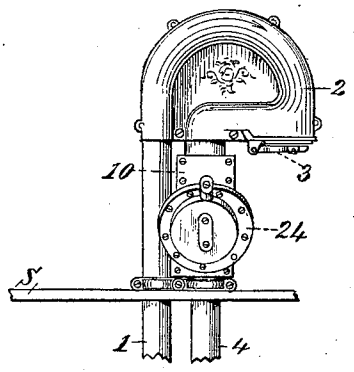
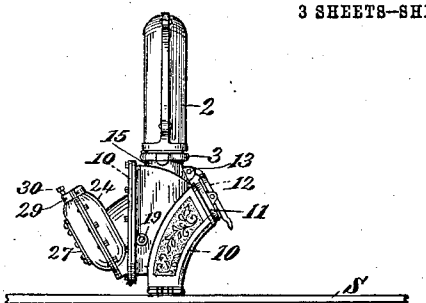


Fig. 2.



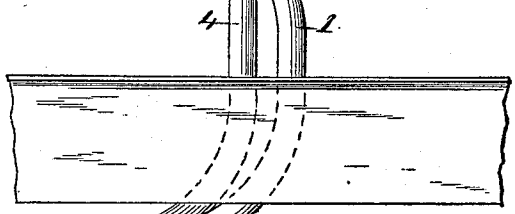
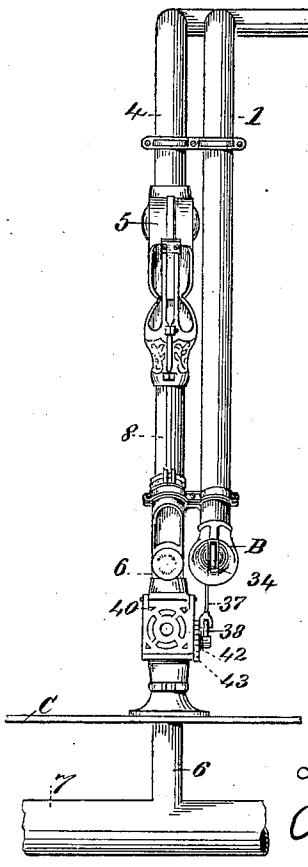


Fig. 1.



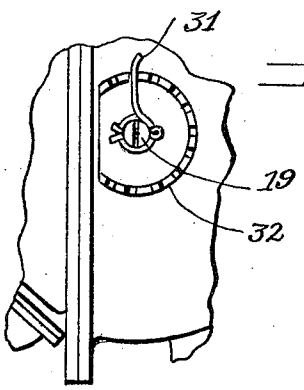


Fig. 6.

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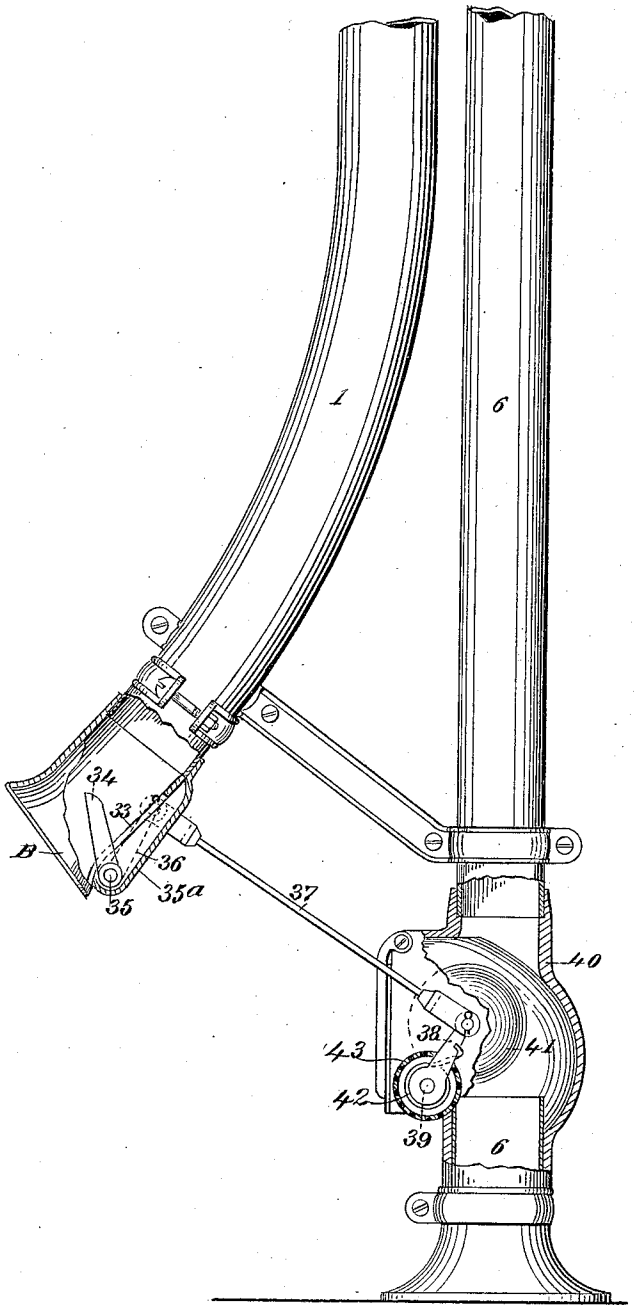

Fig. 3.

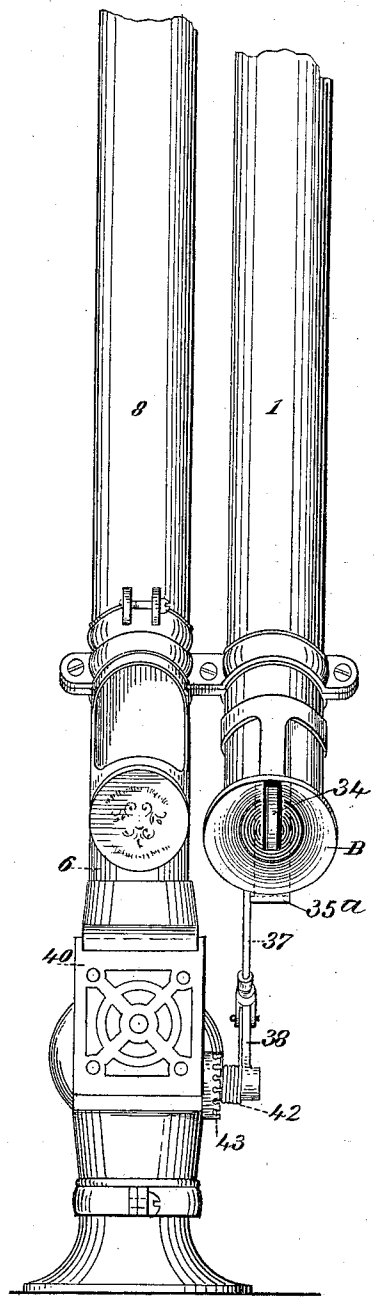

Fig. 4.

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3 SHEETS—SHEET 3.

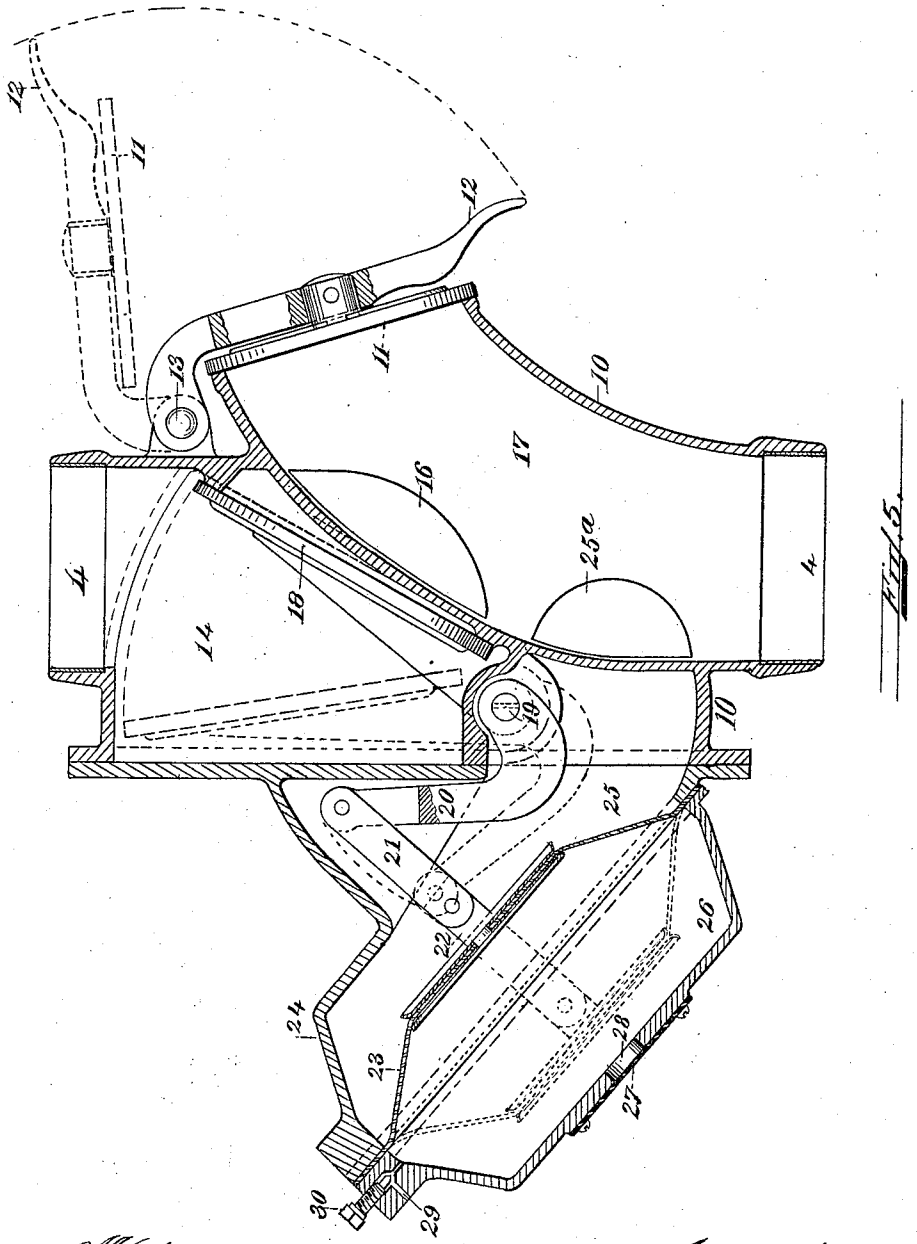

Fig. 5.

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UNITED STATES PATENT OFFICE.

ALBERT W. PEARSALL, OF LOWELL, MASSACHUSETTS.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

1,031,816. Specification of Letters Patent. Patented July 9, 1912.

Application filed June 26, 1908. Serial No. 440,444.

To all whom it may concern:

Be it known that I, ALBERT W. PEARSALL, of Lowell, in the county of Middlesex 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 wherein the flow of air is controlled by a normally closed valve which valve is controlled to open to admit air for driving carriers and which is timed to close and cut off the flow of air when said carriers have arrived at their destination.

The object of this invention is to simplify the construction of such systems and render the same more positive and efficient in operation.

In the accompanying drawings is illustrated a construction embodying my invention in which,—

Figure 1 is a diagrammatic view of the system showing the device in operating connection therewith. Fig. 2 is a side elevation of the upper portion of Fig. 1. Fig. 3 is an enlarged elevation, partly in section, of the lower part of Fig. 1, showing the normal position of the mechanism. Fig. 4 is a front elevation of Fig. 3. Fig. 5 is an enlarged sectional view of the controlling and timing mechanism located at the sub-station and Fig. 6 is a detail view of the end of one of the shafts and its tension spring.

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

1 represents a transmission tube connecting the central station C with the ordinary delivery terminal 2 controlled by the usual valve 3 at the sub-station S.

4 is a return transmission tube connecting the terminal 2 at the sub-station S with the terminal 5 at the central station C and 6 is a vacuum tube connecting the terminal 5 with the usual vacuum drum 7.

B is a bell-mouth for inserting carriers and admitting air into the tube 1 at the central station C for driving the same.

Interposed in the tube 4 at the sub-station S adjacent the terminal 2 is a casing 10 having therein an inlet 17 for despatching carriers in the tube 4 and which inlet is controlled by the usual valve 11 pivoted at 13 to said casing and adapted to be operated by the handle 12. Located in the upper part of the casing 10 is a chamber 14 which connects and is in communication with the terminal 2 and transmission tube 1 and which is normally closed from communication with the inlet 17 and tube 4, through ports 16, by an air valve 18 fixed to a shaft 19 pivoted in said casing 10.

20 is an arm fixed to shaft 19 and pivotally connected through a link 21 with the stem 22 of diaphragm 23 which is mounted in the diaphragm casing 24 secured to one side of the casing 10.

31 is a helical spring mounted over and secured at one end to shaft 19, the other end adjustably mounted in a rack 32 for regulating the tension thereof and which spring acts to open valve 18 as hereinafter described.

The chamber 25 above the diaphragm 23 normally communicates with the vacuum in the inlet 17 and tube 4 through apertures 25^a while the chamber 26 below the diaphragm is normally in communication with the atmosphere through a port 29 restricted by an adjustable timing valve 30.

28 is a port through which the air may be expelled from chamber 26 when the diaphragm 23 drops, and 27 is a strip of flexible material covering the outer side of port 28 and preventing the admission of air to chamber 26 through said port 28 when the diaphragm 23 returns to normal position as shown in full lines Fig. 5.

Projecting through a slot 33 in the bell-mouth B is a trip-lever 34 fixed to a shaft 35 pivoted in a casing 35^a said shaft 35 carrying secured to the outer end thereof an arm 36 connected by a link 37 with an arm 38 fixed to a shaft 39 journaled in a casing 40 which is interposed in the vacuum tube 6.

41 is a flexible ball mounted within the casing 40 and secured to and operated through shaft 39 to cut off the upper portion of tube 6 from the lower portion thereof, and 42 is a spring adapted to hold ball 41 and trip-lever 34 normally in the position shown in Fig. 3.

The spring 42 is mounted over and secured at one end to the shaft 39 while the other end is adjustable in a rack 43 to regulate the tension of said spring.

The operation of the device is as follows: In despatching a carrier from the clerk's or sub-station S to the cashier's or central station C, the clerk opens the inlet valve 11

and inserts the carrier into the inlet 17 and then closes said valve. The air admitted during the opening of said valve causes a fluctuation of the vacuum in the inlet 17 and chamber 25 thereby releasing the diaphragm 23, said diaphragm being normally held by the vacuum in the full line position shown in Fig. 5, and permitting the valve 18 to be opened by action of spring 31, and through arm 20 and link 21, moving the diaphragm 23 to the dotted line position shown in Fig. 5. This movement of said diaphragm 23 expels the air from chamber 26 through port 28 past the flexible strip 27 allowing the valve 18 to open quickly and creating a flow of air through bellmouth B, tube 1, terminal 2 and tube 4 through the open valve 18 driving the carrier toward the central station C. The vacuum now acting in chamber 25 upon the upper side of diaphragm 23 causes the diaphragm to be drawn gradually upward, restricted by the air entering the chamber 26 through the restricted passage 29, and said diaphragm acting through link 21 and arm 20 against the action of spring 31 gradually closes valve 18 so that, by the time the carrier has arrived at the central station C and discharged into the rack 8, the valve 18 has entirely closed cutting off the flow of air. In despatching a carrier from the central station C to the sub-station S, the cashier inserts the carrier into the bellmouth B when the trip 34 is engaged and pushed downward by the carrier and acting through arm 33, link 37, arm 38 and shaft 39 against the action of spring 42, depresses the ball 41 in casing 40 cutting off the upper portion of tube 6 from the lower part of said tube nearest the source of vacuum. This action causes a fluctuation in the upper portion of tube 6 and in chamber 25 releasing the diaphragm 23 and opening the valve 18 as heretofore described. The carrier actuated by the inrush of air in the bellmouth B drives the carrier over the trip 34 into the tube 1, the trip 34 and ball 41 being restored to normal position shown in Fig. 3 by means of spring 42, when the air circuit will be entirely open and the carrier driven through tube 1 toward the sub-station S. The vacuum now acts upon diaphragm 23 as described gradually closing valve 18 until, by the time the carrier has delivered at the sub-station S, said valve has entirely closed cutting off the flow of air.

Having thus described the nature of 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 central station, a substation, an open out-going tube for transmitting carriers from said central station to said substation, a return tube for despatching carriers from said substation to said central station, a connection at said substation between said outgoing tube and said return tube, means connected with said return tube at said central station for exhausting the air therefrom, a normally closed air valve located at said substation and adapted to normally cut off communication between said outgoing tube and said return tube, and means operative upon the despatching of a carrier at either station to open said valve and create a flow of air through said tubes for driving said carrier.

2. In a pneumatic despatch tube apparatus, a central station, a sub station, an open out-going tube for transmitting carriers from said central station to said sub station, a return tube for despatching carriers from said sub station to said central station, a connection at said sub station between said outgoing tube and said return tube, means connected with said return tube at said central station for exhausting the air therefrom, a normally closed air valve located at said substation and adapted to normally cut off communication between said outgoing tube and said return tube, means operative upon the despatching of a carrier at either station to open said valve and create a flow of air through said tubes for driving said carrier, and means timing the closure of said valve for cutting off the flow of air through said tubes.

3. In a pneumatic despatch tube apparatus, a central station, a sub station, a normally open outgoing tube for the transmission of carriers from said central station to said sub station, a normally closed return tube for transmitting carriers from said sub station to said central station, a connection between said outgoing tube and said return tube at said substation, an air valve at said sub-station normally cutting off communication between said tubes, mechanism adapted to operate said valve means for exhausting the air from said return tube, and means adapted to operate upon the despatching of a carrier from the central station to create a fluctuation in said return tube to operate said mechanism and open said air valve to create a flow of air through said tubes for driving carriers.

4. In a pneumatic despatch tube apparatus, a central station, a sub station, a normally open outgoing tube for the transmission of carriers from said central station to said substation, a normally closed return tube for transmitting carriers from said substation to said central station, a connection between said outgoing tube and said return tube at said substation, an air valve at said substation normally cutting off communication between said tubes, mechanism adapted to operate said valve, means for exhausting the air from said return tube,

means adapted to operate upon the despatching of a carrier from the central station to create a fluctuation in said return tube to said mechanism and open said air valve to create a flow of air through said tubes for driving carriers, and means for actuating and timing the closure of said air valve for cutting off the flow of air therethrough.

5. In a pneumatic despatch tube apparatus, a central station, a substation, an open out-going tube for transmitting carriers from said central station to said substation, a return tube for despatching carriers from said substation to said central station, a connection at said substation between said out-going tube and said return tube, means connected with said return tube at said central station for exhausting the air therefrom, a normally closed air valve located at sub station and adapted to normally cut off communication between said out-going tube and said return tube, and a trip adapted to be operated upon the insertion of a carrier at the central station to cause the opening of said valve and create a flow of air through said tubes for driving said carrier.

6. In a pneumatic despatch tube apparatus, a central station, a substation, an open out-going tube for transmitting carriers from said central station to said substation, a return tube for despatching carriers from said substation to said central station, a connection at said substation between said out-going tube and said return tube, means connected with said return tube at said central station for exhausting the air therefrom, a normally closed air valve located at said substation and out of the path of the traveling carriers and adapted to normally cut off communication between said out-going tube and said return tube, and means operative upon the despatching of a carrier at either station to open said valve and create a flow of air through said tubes for driving said carrier.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 10th day of June A. D. 1908.

ALBERT W. PEARSALL.

Witnesses:
N. L. DONAHUE,
C. O. SMITHERS.