

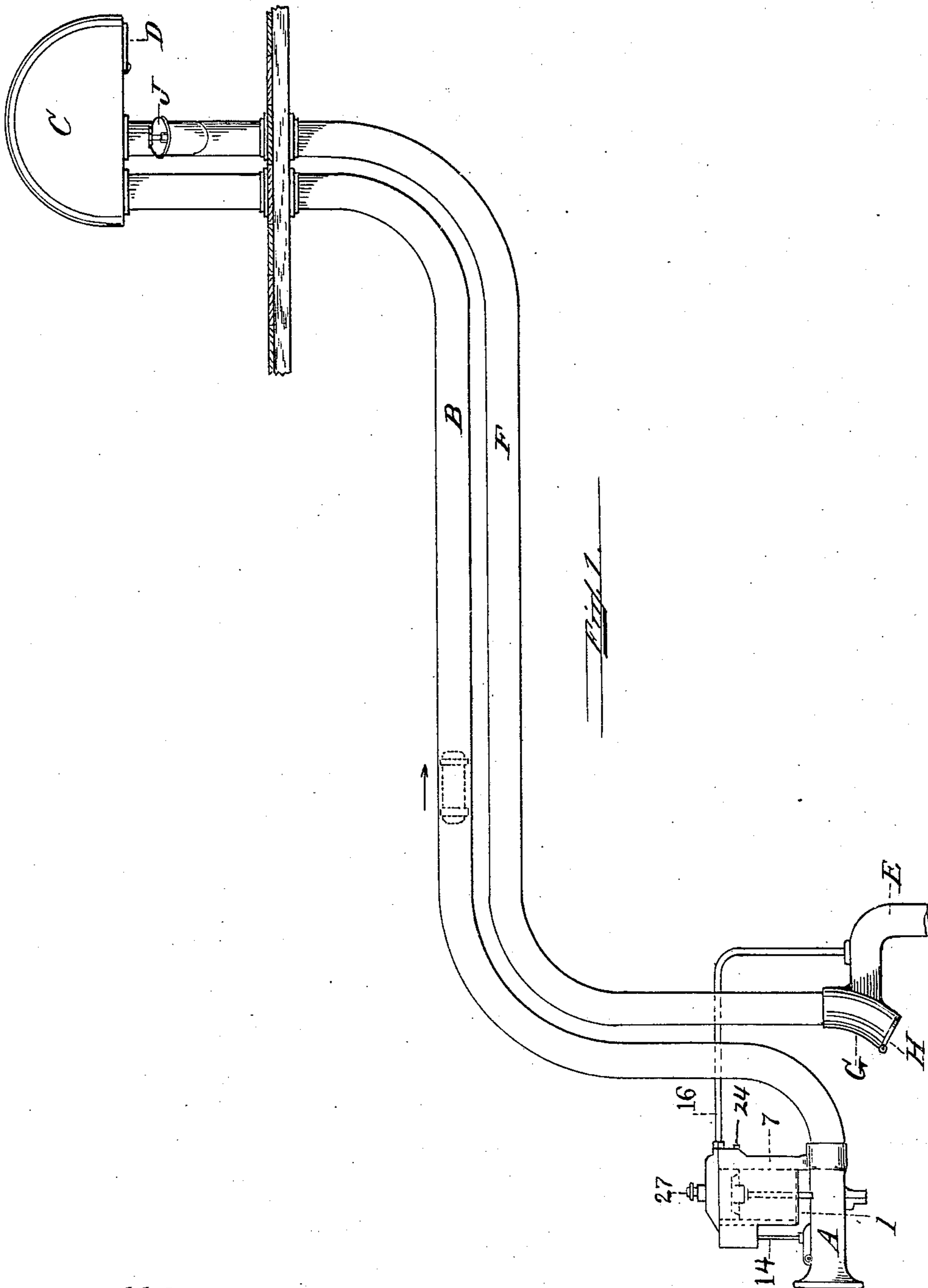
No. 873,740.

PATENTED DEC. 17, 1907.

E. A. FORDYCE.
PNEUMATIC DESPATCH TUBE APPARATUS.

APPLICATION FILED NOV. 9, 1906.

2 SHEETS—SHEET 1.



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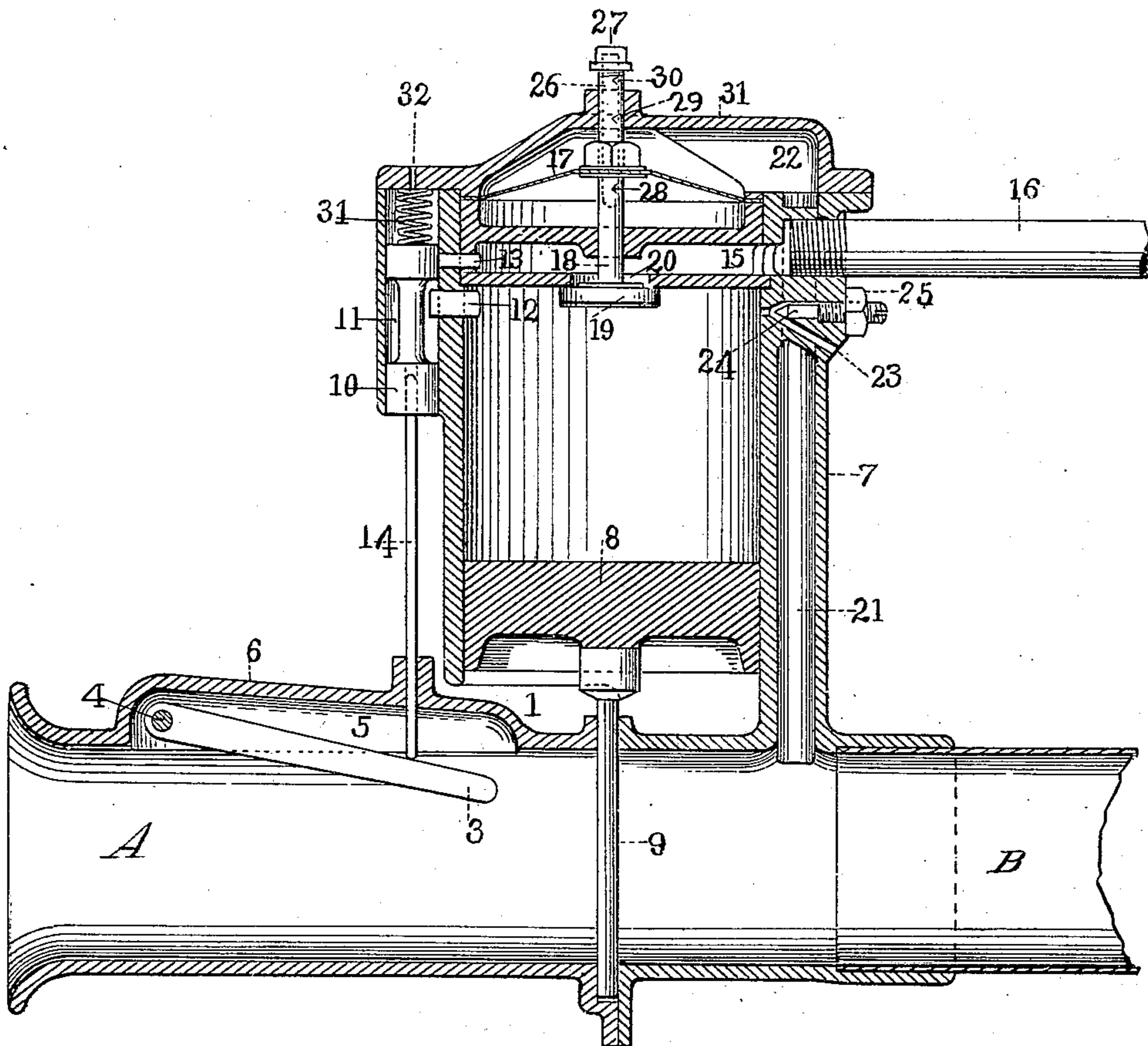


Fig. 2.

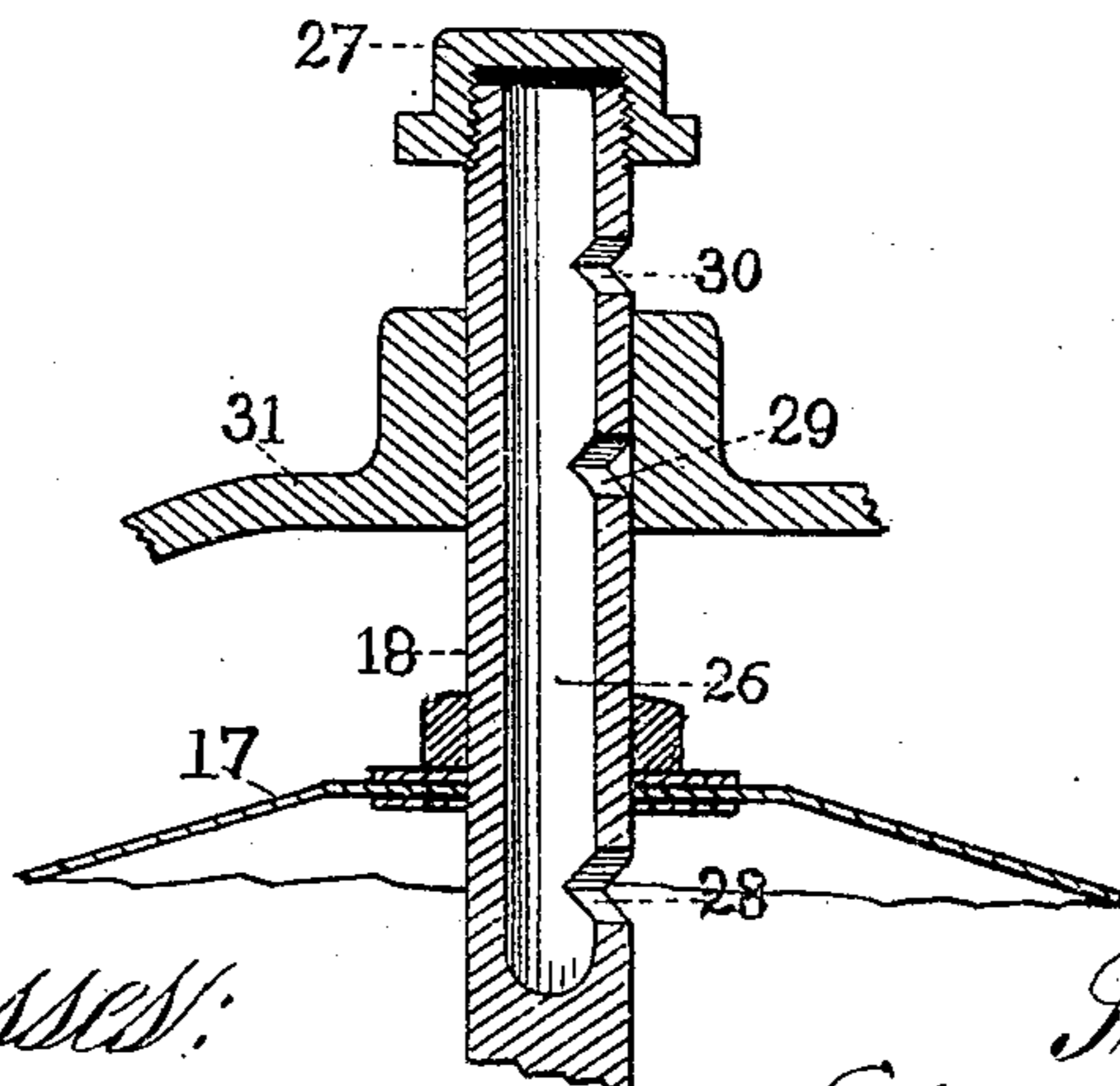


Fig. 3.

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UNITED STATES PATENT OFFICE.

EDMOND A. FORDYCE, OF BOSTON, MASSACHUSETTS.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

No. 873,740.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed November 9, 1906. Serial No. 342,642.

To all whom it may concern:

Be it known that I, EDMOND A. FORDYCE, 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 those systems wherein a vacuum is maintained and carriers are transmitted therethrough by the admission of atmospheric pressure behind said carriers.

The object of my invention is to control the admission of atmospheric pressure through bell mouths or openings provided for the despatching of carriers, and to limit or time the inflow of air to the interval actually necessary for the proper transmission and delivery of carriers thereby securing economy of power and at the same time insuring the proper delivery of said carriers. This object is attained by supplying the bell mouths of the system with suitable valves normally closed, which valves are adapted to be automatically pneumatically opened upon the insertion of a carrier permitting the carrier to be transmitted to its destination by means of the inflow of air or atmospheric pressure through the bell mouth.

Timing means are supplied adapted to be regulated according to the length of the system to close the valve at the bell mouth or opening after a suitable interval for the transmission and delivery of the carrier.

In the accompanying drawings which illustrate a construction embodying my invention, Figure 1 is a diagram of an ordinary pneumatic system showing a carrier in transit and controlling mechanism at the bell mouth opening admitting air for the propulsion of the carrier. Fig. 2 is a sectional view showing normal position of the device in operating connection with and controlling the bell mouth or despatching opening of an ordinary pneumatic transmission tube. Fig. 3 is a detail of part of Fig. 2.

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

A is the central station or bell mouth for the reception of carriers and B is a transmission tube connecting the bell mouth A with the sub-station or delivery terminal C controlled by the ordinary delivery valve D.

F is a transmission tube for the return of carriers and connecting the terminal C with

the terminal G controlled by the valve H. The inlet-valve J is for the insertion of carriers into the tube F.

E is a suction tube connecting the exhaust drum with the terminal G.

Referring to Fig. 2; 3 is a starting trip pivoted at 4 in the chamber 5 of the casing 6, the free end of said starting trip projecting slightly into the bell mouth A. The cylinder 7 fixed to the casing 6 and open at the lower end thereof to the atmosphere as shown at 1, carries the piston 8 connected with the gate valve 9 and controlling the bell mouth or opening in the transmission tube, said piston adapted to be reciprocated within the cylinder 7 for the purpose of opening or closing the bell mouth A to the atmosphere.

10 is a piston or balance valve mounted in the chamber 11 and adapted to connect the ports 12 and 13. The connecting rod 14 attached to the lower end of said valve is reciprocally mounted within the casing 6, the lower end of said connecting rod adapted to be engaged and operated by the starting trip 3. The port 12 communicates with the upper portion of the cylinder above the piston and the port 13 communicates with the vacuum chamber 15 adapted to be connected with the suction drum of the tube system by means of the pipe connection 16.

17 represents a diaphragm mounted in the upper part of the cylinder attached to which is the valve stem 18 carrying on the lower end thereof the pilot valve 19 controlling the port 20 connecting the vacuum chamber 15 with the upper portion of the cylinder 7.

21 is a vacuum passage connecting the transmission tube B with the chamber 22 above the diaphragm 17.

23 is a small air port connecting the cylinder 7 above the piston 8 with the atmosphere and controlled by the timing valve 24 secured by the check nut 25. The upper portion of the valve stem 18 is reciprocally mounted in the head 31 of the cylinder 7 and has a passage 26 plugged at the upper end with the cap 27 screwed upon the stem.

28, 29 and 30 are ports communicating with the passage 26, the port 28 being located below the diaphragm 17 and the ports 29 and 30 above the diaphragm 17.

The operation is as follows: To despatch a carrier from the bell mouth A to the terminal C, the carrier is inserted in the bell mouth A and immediately strikes and raises the starting trip 3 which through the medium of con-

necting rod 14 raises the piston valve 10 thereby placing the cylinder 7 in communication with the vacuum chamber 15 through the ports 12 and 13. This causes the piston 8 to rise carrying with it the gate valve 9. On the opening of the valve 9 the carrier is admitted and despatched by the inrush of atmospheric pressure into the transmission tube B, and the trip 3 and piston valve 10 allowed to resume normal position through the medium of the spring 31 and vent 32 thereby cutting off the vacuum from the cylinder 7 permitting the piston 8 and gate valve 9 to drop slowly by gravity, closing said valve 9, the speed of the closure being regulated by timing valve 24 which allows the cylinder 7 to fill with air through the air port 23 rapidly or slowly in proportion to the interval of transmission of the carrier, thus by the time the gate valve 9 is entirely closed, the carrier will have delivered through the valve D.

If it is desired to despatch a carrier from station D to station A, the carrier is inserted through the valve J into the tube F, which causes a drop in the vacuum in the tube B, causing the diaphragm 17 to drop by the weight of the valve 19, the air below the diaphragm escaping through port 28, passage 26 and port 30 into the atmosphere, until the pilot valve 19 has dropped sufficiently to place vacuum chamber 15 into communication with cylinder 7 above piston 8, which causes said piston to be raised as before described, opening valve 9 and admitting air to the tube B. In the meantime, during the drop of the valve 19, the port 30 has been closed to the atmosphere and the port 29 has now been placed in communication with the vacuum in chamber 22 which vacuum communicates through port 29, passage 26 and port 28 with the under side of diaphragm 17; therefore, the diaphragm 17 cannot close the valve 19 when the vacuum in the tubes rises again by the closing of the valve J for the reason that the under side of the diaphragm, which, in normal position, communicates with the atmosphere through passages 28, 26 and 30 is now of the same vacuum as the chamber 22 on the top side through the passages 28, 26 and 29, the port 30 being closed to the atmosphere. The valve 19 is always closed by contact with the rising piston 8. In this way it is impossible for the piston to rise to anything less than its full extent. As soon as the valve 19 is closed, the piston 8 gradually drops closing the gate valve 9, and the carrier is delivered through the valve H.

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 transit tube through which carriers are

transmitted and a central or sending station into which carriers are inserted for transmission, means through which air is exhausted from said tube, a valve at the sending station normally closing said tube and adapted to open to admit air into the tube for driving carriers, a cylinder, a piston connected to said valve and operating in said cylinder and normally under atmospheric pressure on both sides thereof, means for exhausting air from one side of said piston whereby the atmospheric pressure on the opposite side will move said piston and open said valve, and mechanism operated upon the insertion of a carrier for causing the operation of said piston.

2. In a pneumatic despatch tube apparatus, a transit tube through which carriers are transmitted and a central or sending station into which carriers are inserted for transmission, means through which air is exhausted from said tube, a valve at the sending station normally closing said tube and adapted to open to admit air into the tube for driving carriers, a cylinder, a piston connected to said valve and operating in said cylinder, means for exhausting air from one side of said piston whereby the atmospheric pressure on the opposite side will move said piston and open said valve, mechanism operated upon the insertion of a carrier for causing the operation of said piston, and means for timing the closing of said valve.

3. In a pneumatic despatch tube system, a transit tube through which carriers are transmitted and a central or sending station into which carriers are inserted for transmission, means through which air is exhausted from said tube, a valve at said sending station and normally closing the tube and adapted to open to admit air into the tube for driving the carrier, mechanism connected to said valve and normally under atmospheric pressure for holding said valve closed, a return or sub-station, a valve-controlled air-inlet at said return station, and mechanism for operating or opening said valve at the sending station upon the fluctuation of pressure within said tube upon the insertion of a carrier or carriers at the return station.

4. In a pneumatic despatch tube system, a transit tube through which carriers are transmitted and a central or sending station into which carriers are inserted for transmission, means through which air is exhausted from said tube, a valve at said sending station and normally closing the tube and adapted to open to admit air into the tube for driving the carrier, a return or sub-station, a valve-controlled air-inlet at said return station, mechanism for operating or opening said valve at the sending station upon the fluctuation of pressure within said tube upon the insertion of a carrier or carriers at the return station, and means for timing the closing of said valve.

5. In a pneumatic despatch tube apparatus, a transit tube through which carriers are transmitted and a central or sending station into which carriers are inserted for transmission, means through which air is exhausted from said tube, a valve at the sending station normally closing said tube and adapted to open to admit air into the tube for driving carriers, a cylinder, a piston connected to said valve and operating in said cylinder, means for exhausting air from one side of said piston whereby the atmospheric pressure on the opposite side will move said piston and open said valve, and mechanism operated upon the insertion of a carrier for causing the operation of said piston.

6. In a pneumatic despatch tube system, a transit tube through which carriers are transmitted and a central or sending station into which carriers are inserted for transmission, means through which air is exhausted from said tube, a valve at said sending station and normally closing the tube and adapted to open to admit air into the tube for driving the carrier, a return or sub-station, a valve-controlled air-inlet at said return station, and mechanism for operating or opening said valve at the sending station upon the fluctuation of pressure within said tube upon the insertion of a carrier or carriers at the return station.

7. In a pneumatic despatch tube apparatus, a transit tube through which carriers are transmitted, means through which air is exhausted from said tube, a valve normally

closing said tube and adapted to open to admit air into the tube for driving carriers, mechanism connected to said valve and normally under atmospheric pressure for holding said valve closed, and means operated upon the insertion of a carrier into said tube for exhausting air from one side of said mechanism whereby the atmospheric pressure on the other side will operate said mechanism and open said valve to allow the despatch of carriers.

8. In a pneumatic despatch tube apparatus, a transit tube through which carriers are transmitted, means through which air is exhausted from said tube, a valve normally closing said tube and adapted to open to admit air into the tube for driving carriers, a cylinder, a piston connected to said valve and operating in said cylinder, and means operated upon the insertion of a carrier into said tube for connecting said cylinder with the said exhausting means for exhausting air from one side of the piston whereby the atmospheric pressure on the other side of the piston will move the same and open said valve.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 27th day of October, A. D. 1906.

EDMOND A. FORDYCE.

Witnesses:

MARY G. SMITH,
H. D. WATERHOUSE.