A. W. PEARSALL.

PNEUMATIC DESPATCH TUBE APPARATUS.

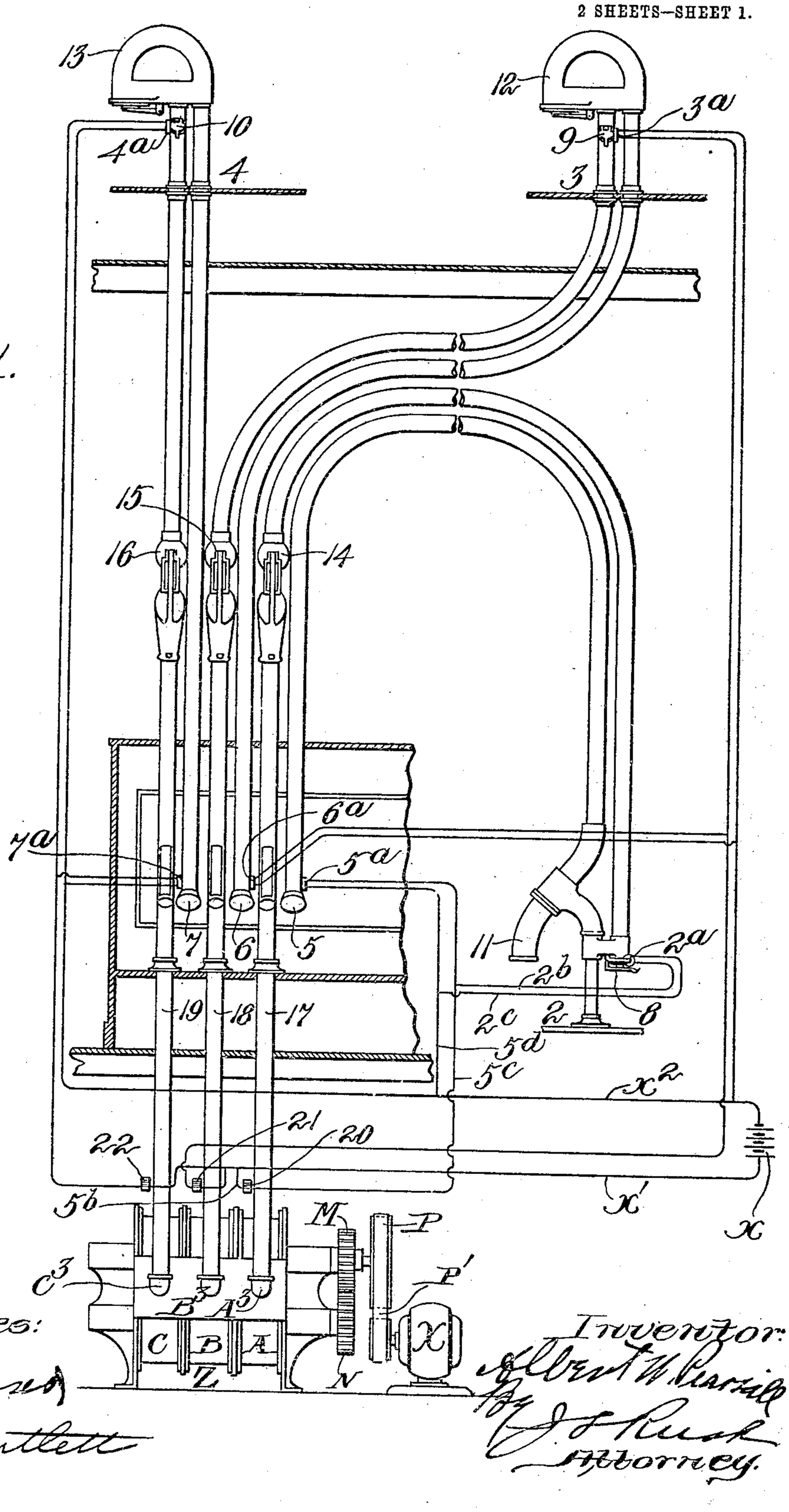
APPLICATION FILED MAR. 9, 1908.

962,853.

Patented June 28, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

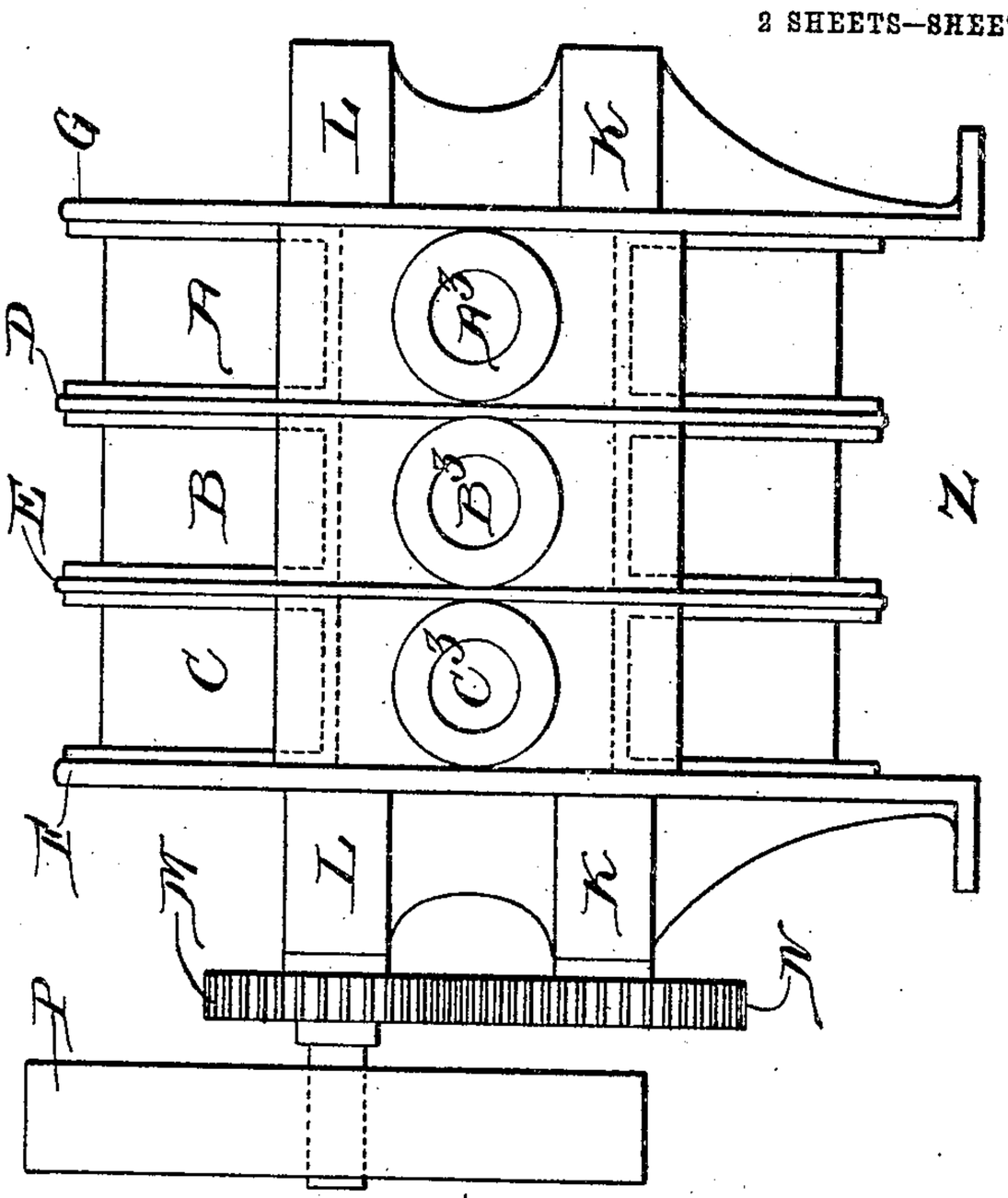
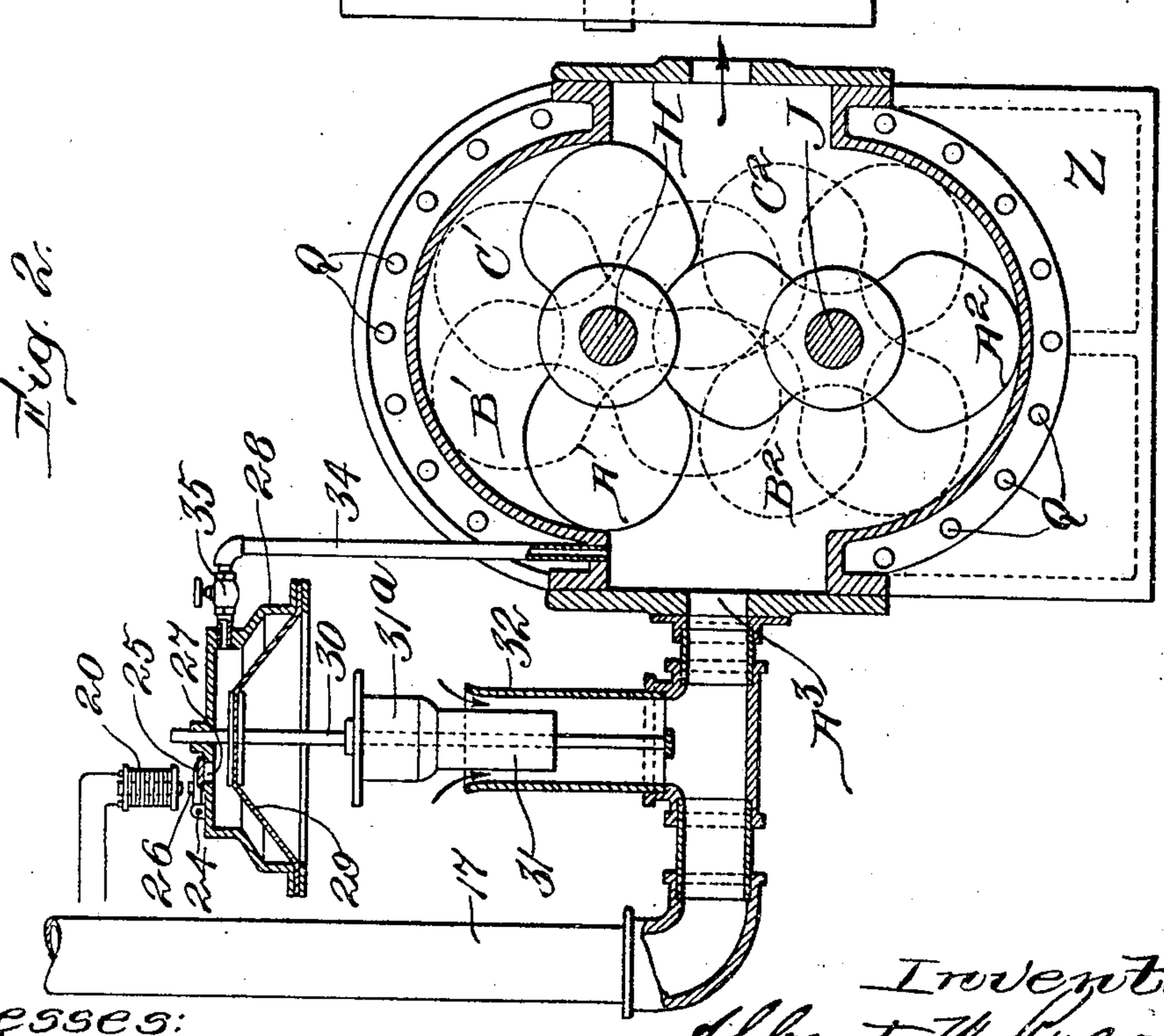


Fig. 2.



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UNITED STATES PATENT OFFICE.

ALBERT W. PEARSALL, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO LAMSON CONSOLIDATED STORE SERVICE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

962,853. Specification of Letters Patent. **Patented June 28, 1910.**

Application filed March 9, 1908. Serial No. 419,880.

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 its object is to provide suitable means for controlling the current of air generated by the blower or pump, to switch said current of air through the transmission tubes when a carrier is inserted for transmission and to maintain the circuit of air through said tubes only while said carrier is in transmission. Means are provided for automatically timing the duration of the circuit of air through the transmission tubes and causing the same to be short circuited to the atmosphere upon the delivery of the carrier thereby reducing the resistance to a minimum and effecting a saving of power.

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

Figure 1 is a diagrammatic view of the apparatus showing the electric circuits for controlling the same. Fig. 2 is an enlarged sectional elevation showing the normal position of the mechanism controlling the connection between a double line of transmission tube and one of the cylinders of a blower. Fig. 3 is a front elevation of the segmental blower shown in Fig. 2.

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

The cashier's desk or central station 1 is connected with the sub or clerks' stations 2, 3 and 4 by independent circuits or double lines of transmission tube each having a central or bellmouth despatching inlet 5, 6 and 7 respectively and a sub-station despatching inlet 8, 9 and 10.

11, 12 and 13 represent ordinary delivery terminals controlled by the usual valves and located at sub-stations 2, 3 and 4 respectively, and 14, 15 and 16 are delivery terminals located at central station 1.

The terminals 14, 15 and 16 are connected by means of tubes 17, 18 and 19 respectively with the low pressure or vacuum connections A^3, B^3 and C^3 of the compartments or cylinders A, B and C of the blower Z. These cylinders are separated by the dividing plates D and E and secured in position between head plates F and G by suitable bolts Q.

The shafts J and H are mounted in bearings K and L respectively in head plates F and G, the shaft H carrying the impellers A′, B′ and C′ and the shaft J the impellers A^2, B^2 and C^2, said impellers adapted to operate respectively in the cylinders A, B and C.

M and N represent two gears mounted on shafts H and J respectively and maintain a relative speed of both shafts.

P is a driving pulley secured to one end of shaft H and driven through a belt P′ by a motor X.

The diaphragm 29 mounted in casing 28 carries the stem 30 secured thereto on the lower end of which is mounted a tubular valve 31. This diaphragm 29 is open to the atmosphere on the lower side while the chamber in the casing 28 above said diaphragm is connected with the cylinder A of blower Z by a pipe 34 controlled by a timing valve 35.

32 is a branch tube or air inlet communicating with tube 17 and controlled by the valve 31 which is normally held open by diaphragm 29 permitting the air to enter as shown by arrows (see Fig. 2). The resistance offered to the passage of air by valve 31 maintains a sufficient vacuum in the cylinder A to normally hold diaphragm 29 up and valve 31 open.

27 is a port adapted to admit air to the casing 28 above the diaphragm 29 and is controlled by a normally closed valve 25 pivoted at 24 to the casing 28 and carrying an armature 26 adapted to be operated by a magnet 20 to open said valve 25. The magnet 20 is in circuit with a battery X and a normally open switch 5^a at bellmouth 5 through wires X′ 5^b, 5^c, 5^d and X^2 and is also in multiple circuit with a similar switch 2^a at substation 2 through wires 2^b and 2^c. These switches are adapted upon the insertion of a carrier for despatch to energize the magnet 20 and start the controlling mechanism into operation as will be hereinafter described. Similar mechanism controls the connections 18 and 19 and is adapted to be operated by magnets 21 and 22 respectively, the magnet 21 being in circuit with similar switches 6^a

and 3ª and the magnet 22 with switches 7ª and 4ª.

The operation of the apparatus is as follows,—with the blower Z driven at a constant speed by the motor X and no carriers in transit in the system, each cylinder A, B and C operates unloaded, that is, air is taken in through each inlet or branch tube 32 and through each cylinder as shown by arrows Fig. 2.

If it is desired to despatch a carrier, for example through the line of tube connecting the central station 1 with sub-station 2, the cashier inserts the carrier into the bellmouth 5 when it will engage and close the switch 5ª energizing magnet 20 which will attract armature 26 opening valve 25 and destroying the vacuum maintained in casing 28 through pipe 34.

The destroying of the vacuum causes the diaphragm 29 to drop closing valve 31 and cutting off the flow of air through inlet 32 thereby switching the flow of air through bellmouth 5 and said circuit of tubing and transmitting the carrier toward sub-station 2. In the meantime the carrier has passed over and released the switch 5ª breaking the circuit through and deënergizing magnet 20 permitting the armature 26 to drop and valve 25 to close cutting off the admission of air to the casing 28.

The vacuum above the diaphragm 29 is gradually restored through pipe 34 gradually raising diaphragm and valve 31 so that, by the time the carrier has delivered at sub-station 2, the enlarged tubular portion 31ª of the valve 31 will have moved out of the mouth of the inlet 32 admitting the air thereby unloading the cylinder or compartment A of the blower Z. The timing of the opening of valve 31 can be regulated by the timing valve 35.

The operation of the device is identical with that heretofore described when a carrier is despatched from any of the stations, the cylinder or compartment of the blower connected with the circuit of tubing through which a carrier is being transmitted being loaded, while the cylinders connected with the circuits of tubing not in use remain unloaded.

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 plurality of transmission tubes, a constantly operating blower or pump having a plurality of independent cylinders or compartments each connected with one of said tubes, mechanism adapted to normally maintain each of said cylinders unloaded, and electro-magnetic means adapted to be operated upon the insertion of a carrier into one of said tubes to control said mechanism to load its respective cylinder and maintain the flow of air through said tube for driving said carrier only while said carrier is in transmission.

2. In a pneumatic despatch tube apparatus, a plurality of transmission tubes, a constantly operating blower or pump having a plurality of independent cylinders or compartments each connected with one of said tubes, mechanism adapted to normally maintain each of said cylinders unloaded, and electro-magnetic means adapted to be operated to control said mechanism whereby any of said cylinders may be loaded or thrown into communication with its respective tube and create a flow of air for the transmission of carriers.

3. In a pneumatic despatch tube apparatus, a plurality of transmission tubes, a constantly operating blower or pump having a plurality of independent cylinders or compartments each connected with one of said tubes, mechanism adapted to normally maintain each of said cylinders unloaded, electro-magnetic means adapted to be operated to control said mechanism whereby any of said cylinders may be loaded or thrown into communication with its respective tube and create a flow of air for the transmission of carriers, and means for timing the loading of said cylinders to the interval necessary for the transmission and delivery of the carriers.

4. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, a blower or pump, a connection between said tube and said blower or pump whereby air is exhausted from said tube and provided with an air-inlet, a normally open valve controlling the admission of air through said inlet, means acting on said valve to maintain said air-inlet open, and electro-magnetic means arranged to be operated upon entering the carrier into the transmission tube to actuate the valve to close the air-inlet thereby causing a flow of air through the transmission tube to drive said carrier.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 2nd day of March A. D. 1908.

ALBERT W. PEARSALL.

Witnesses:

A. S. Plesser,

L. G. Bartlett.