C. R. LIBBY.

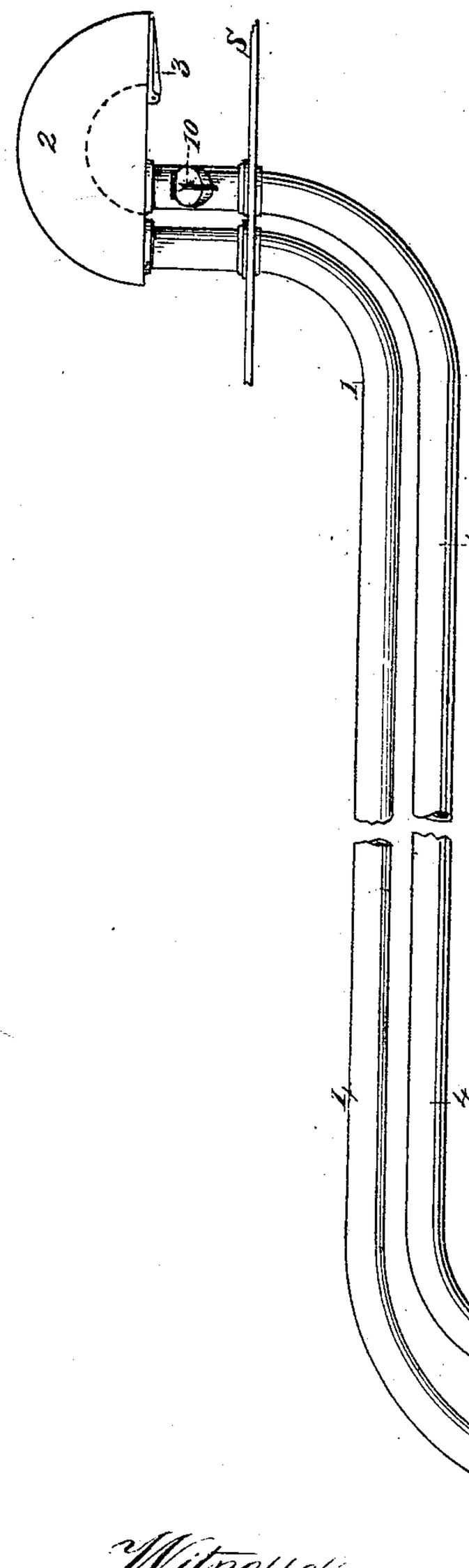
PNEUMATIC DESPATCH TUBE APPARATUS.

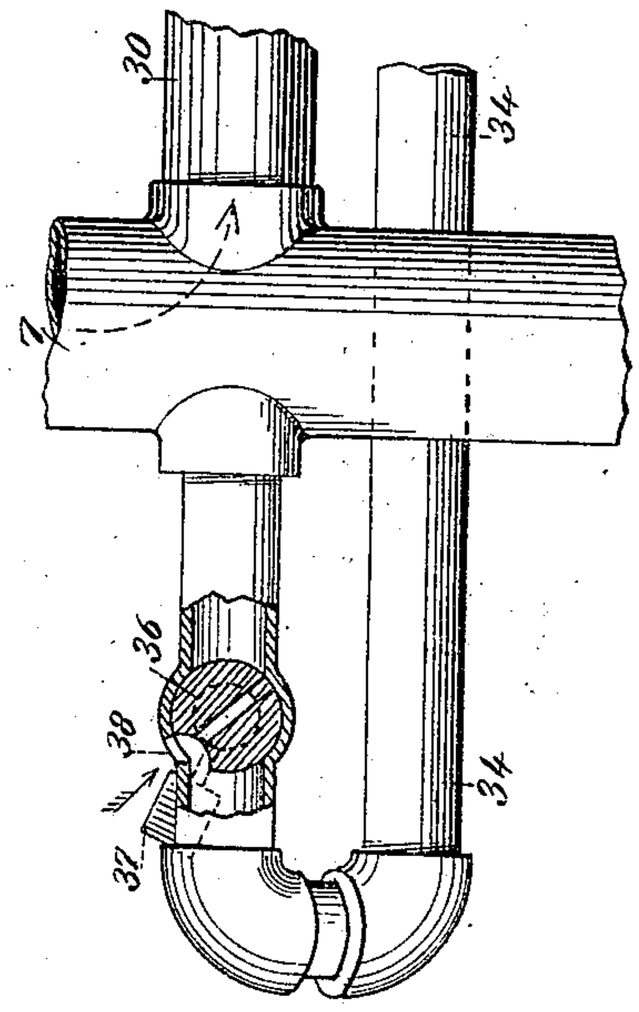
APPLICATION FILED MAY 14, 1908.

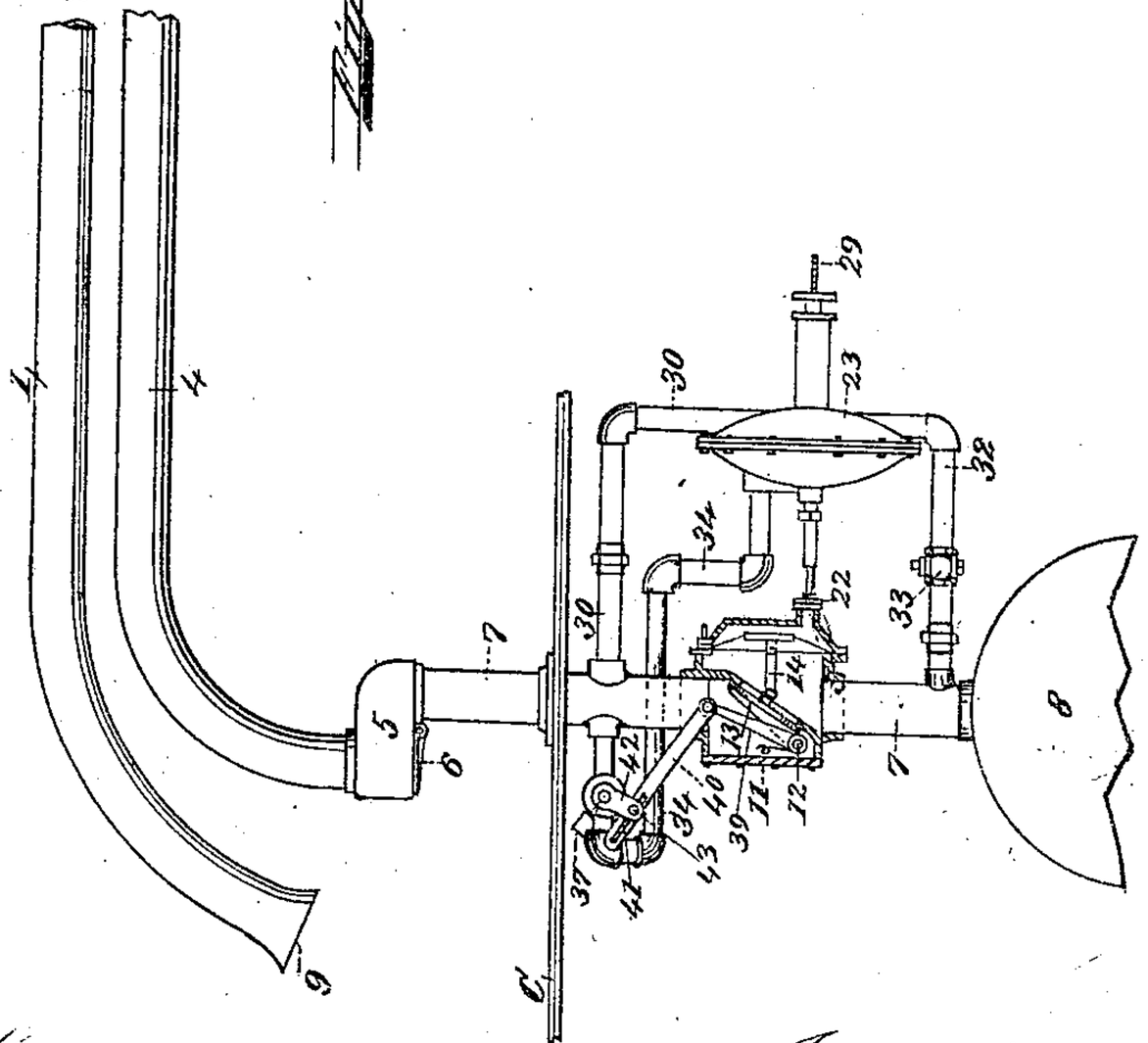
968,576.

Patented Aug. 30, 1910.

3 SHEETS—SHEET 1.







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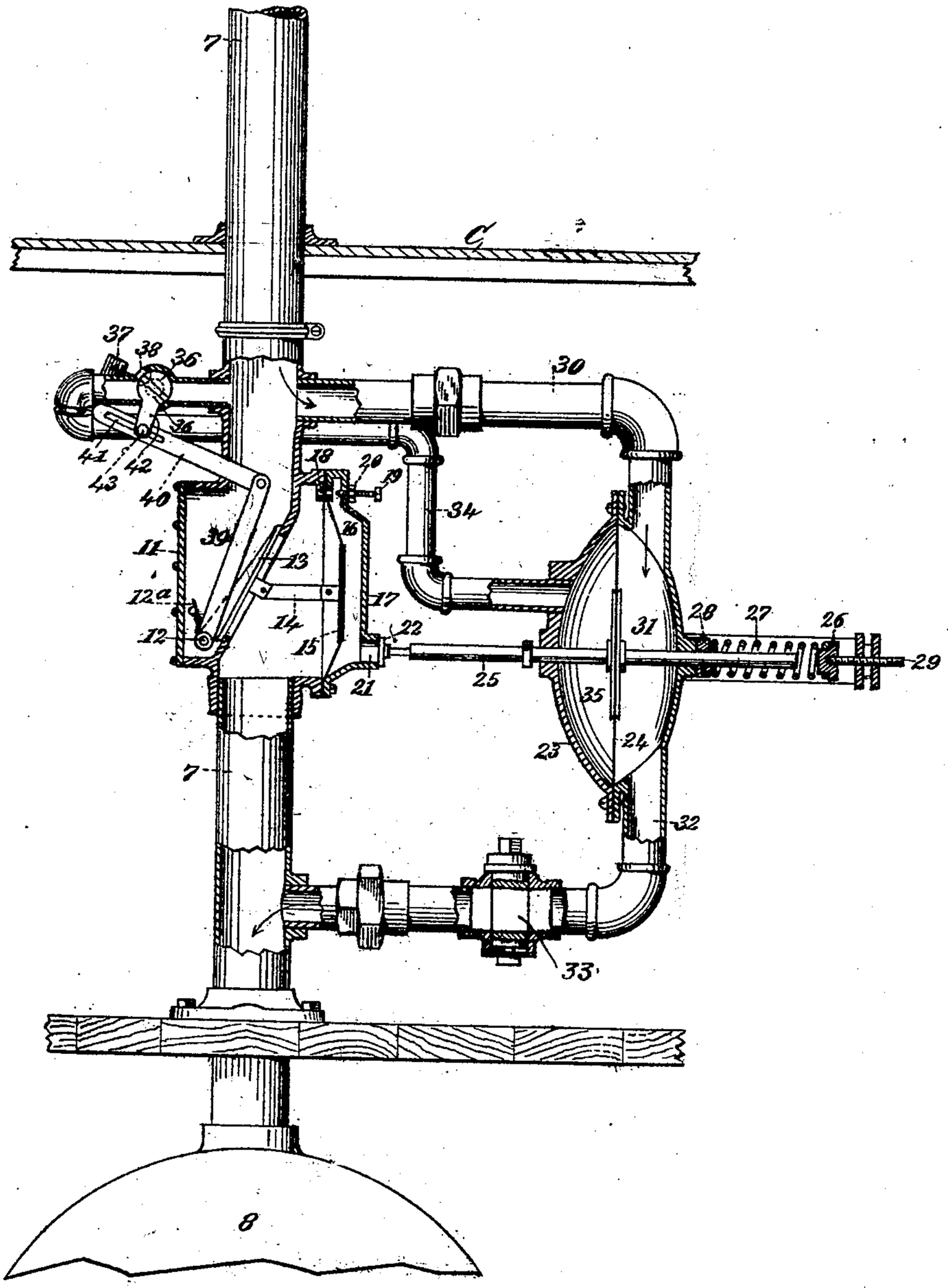

Fig 2.

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3 SHEETS—SHEET 3.

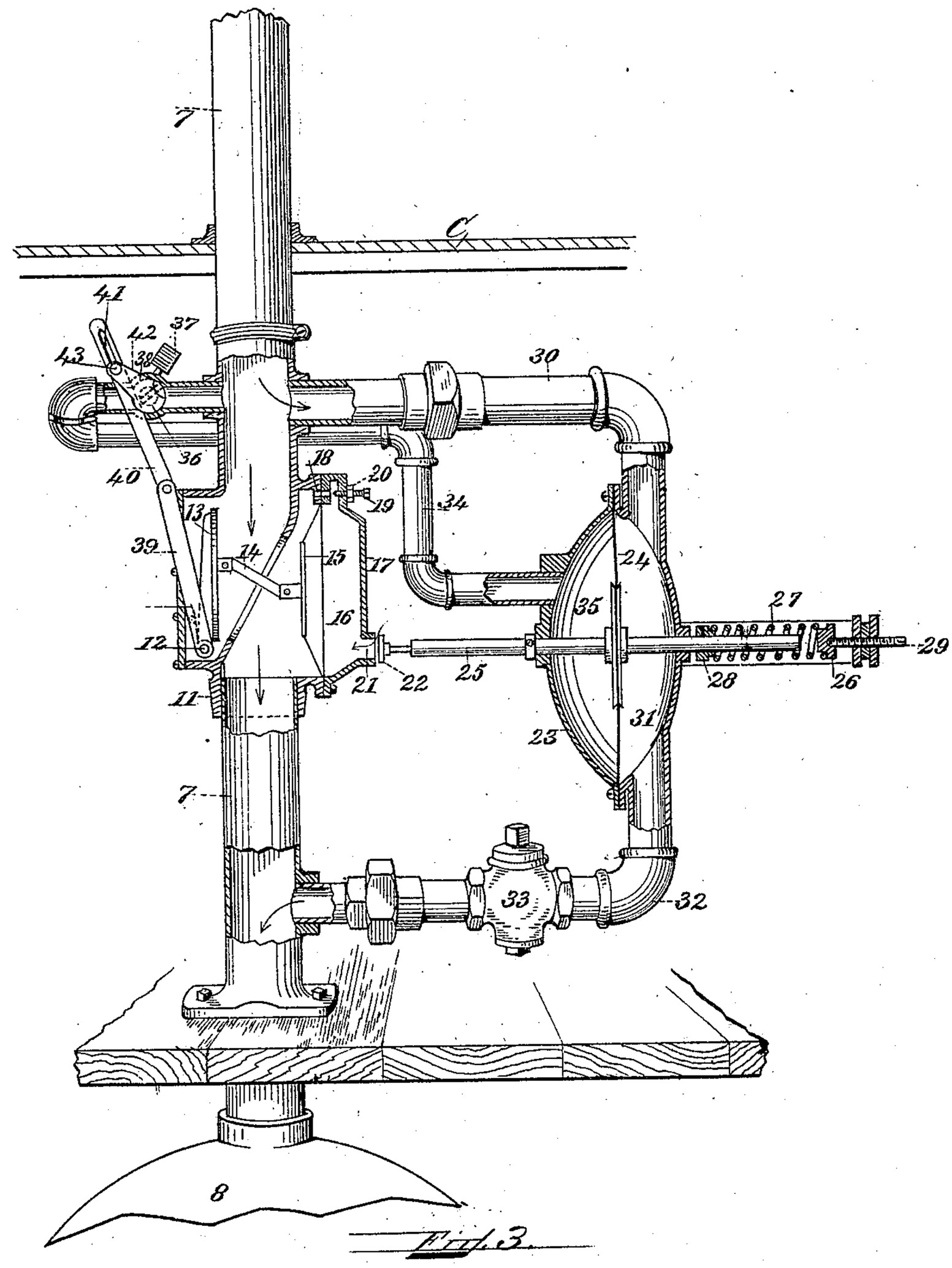

Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES R. LIBBY, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO LAMSON CONSOLIDATED STORE SERVICE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

968,576. Specification of Letters Patent. Patented Aug. 30, 1910.

Application filed May 14, 1908. Serial No. 432,810.

To all whom it may concern:

Be it known that I, CHARLES R. LIBBY, 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 the class known as the open current or vacuum system and the object of this invention is to reduce the quantity of air normally flowing through the system to a mimimum when no carriers are in transit thereby economizing in the use of power.

Another object of this invention is to provide means operative upon the despatching of a carrier to admit a maximum amount of air for driving said carrier and for maintaining the flow of air until the carrier has delivered at its destination when the flow is automatically reduced to a minimum.

In the accompanying drawings is illustrated a construction embodying this invention in which:—

Figure 1 is a diagram of a circuit of pneumatic transmission tubes showing the controlling mechanism connected therewith and in normal position. Fig. 2 is an enlarged elevation, partly in section, of the controlling mechanism shown in Fig. 1. Fig. 3 is a similar view to Fig. 2 showing the parts in operating position when a carrier is despatched. Fig. 4 is an enlarged section of one of the valves hereinafter described.

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

Referring to Fig. 1, C represents a cashier's or central station which is connected by the transit tube 1 with the discharge terminal 2 controlled by the usual valve 3 at the sales or sub-station S.

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

7 is a vacuum tube connecting the terminal 5 with the usual vacuum drum 8.

9 is a bellmouth or despatching inlet for inserting carriers into the tube 1 and 10 is the usual despatching inlet located at the sub-station for inserting carriers into the tube 4.

Interposed in the vacuum tube 7 is a casing 11 in which is pivoted the normally closed valve 13 connected by a link 14 with the diaphragm 15. This diaphragm 15 is so mounted in the casing 11 that its inner face is constantly in communication with the vacuum in the tube 7 below valve 13, and its outer face is inclosed by the cover 17 forming a chamber 16 which communicates with said vacuum through a by-pass 18 controlled by a timing valve 19 which is held in adjustment by a check nut 20.

21 is a port for admitting air to the chamber 16 and normally closed by a valve 22.

25 is a stem centrally secured to the diaphragm 24 which is mounted in the casing 23, said stem having secured thereto at one end the valve 22 and mounted over the other end the spring 27, one end of said spring acting against the collar 28 secured to said stem 25, the opposite end of said spring confined by a movable collar 26 which is operated by the adjusting screw 29 to regulate the tension of said spring.

30 is a by-pass connecting the vacuum tube 7 above the valve 13 with the chamber 31 on one side of diaphragm 24 and 32 is a continuation of said by-pass connecting said chamber 31 with the vacuum tube 7 below the valve 13 and which continuation is controlled by a valve 33 to regulate the amount of air passing through said by-pass.

Connecting the chamber 35 on the opposite side of diaphragm 24 with the tube 7 above the valve 13 is a tube 34 controlled by a valve 36 which is normally held in the position shown in Figs. 1 and 4 by a weight 37 and in which position the chamber 35 is cut off from communication with the tube 7 and air is admitted through a port 38. 39 is an arm secured at one end to the shaft or pivot 12 of valve 13 and pivoted at the opposite end to a link 40 in which is located a slot 41.

42 is an arm connected with valve 36 and carries the stud or pin 43 mounted in the slot 41.

The operation of the apparatus is as fol-

lows:—In the normal or non-operating position of the apparatus as shown in Figs. 1, 2 and 4, a minimum or restricted flow of air is maintained through the bellmouth 9, tubes 1, 4 and 7 thence through by-pass 30 and 32 restricted by valve 33 to the drum 8. To despatch a carrier from station C to sub-station S the operator inserts the carrier into the bellmouth 9 thereby blocking the flow of air through said bellmouth and causing the vacuum in the chamber 31 to increase until the diaphragm 24 is drawn back against the tension of spring 27 opening the valve 22 (see Fig. 3) admitting air through port 21 to the chamber 16. The vacuum on the opposite side of diaphragm 15 causes said diaphragm to act through link 14 to open valve 13 allowing a maximum flow of air through tube 7 to the drum 8 driving the carrier toward the sub-station S.

In the meantime the opening of the valve 13 has acted through arm 39 to move link 40 until the end of slot 41 engages the stud 43 and moves valve 36 to the position shown in Fig. 3 cutting off communication of chamber 35 with the atmosphere and throwing said chamber, through the passage in valve 36, into communication with the vacuum in tube 7 when the pressure on both sides of diaphragm 24 will be equalized and spring 27 will close valve 22.

The air in chamber 16 is now gradually exhausted through by-pass 18 timed by valve 19 equalizing the pressure on diaphragm 15 so that by the time the carrier has delivered at sub-station S the valve 13 has been closed by spring 12^a thereby switching the flow of air through the restricted by-pass 30 and 32. The closing of valve 13 simultaneously moves link 40 through arm 39 until the end of slot 41 engages the stud 43 which is located on valve 36, and weight 37, attached to said valve is moved by the closing of said valve 13, until said weight acts by gravity to move valve 36 to the position shown in Fig. 4 admitting air to chamber 35 placing the apparatus in position ready for the despatching of another carrier.

In despatching a carrier from sub-station S to central station C the operation of the mechanism is identical with that heretofore described the carrier being inserted in the inlet 10 and the inlet closed when the vacuum in chamber 31 will increase causing the valve 13 to open allowing the carrier to be transmitted to station C when the said valve will close.

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 exhaust tube, a normally closed air-valve located in said exhaust tube, mechanism for operating said valve, a connection between said exhaust tube and said transit tube for normaliy permitting a minimum flow of air through said transit tube, and means adapted to operate by the restriction of said flow of air to operate said mechanism for opening said air-valve to create a maximum flow of air through said transit tube for driving carriers.

2. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an exhaust tube, a normally closed air-valve controlling the flow of air through said exhaust tube, means normally permitting a restricted flow of air through said transit tube, mechanism for operating said air-valve, and means adapted to operate upon the cutting off of said restricted flow of air for operating said mechanism and opening said air-valve to permit a maximum flow of air through said transit tube for driving carriers.

3. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an exhaust tube, a normally closed air-valve located in said exhaust tube, mechanism for operating said air-valve, means normally permitting a restricted flow of air through said transit tube, means adapted upon the cutting off of said restricted flow of air to operate said mechanism for opening said air-valve to create a maximum flow of air through said transit tube for driving carriers, and means for maintaining said maximum flow of air only during the transmission of carriers through said transit tube.

4. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an exhaust tube, a normally closed air-valve controlling the flow of air through said exhaust tube, means normally maintaining a restricted flow of air through said transit tube, mechanism for operating said air-valve, means adapted upon the cutting off of the restricted flow of air to operate said mechanism for opening said air-valve to create a maximum flow of air through said transit tube for driving carriers, and means for timing the closure of said air-valve to limit the maximum flow of air to the interval necessary for the transmission and delivery of the carriers.

5. In a pneumatic despatch tube apparatus, a tube for the transmission of carriers, an exhaust tube, a normally closed air-valve controlling the flow of air through said exhaust tube, means for normally maintaining a restricted flow of air through said transit tube, mechanism for operating said air-valve, means operative upon a fluctuation of said restricted flow of air to operate said mechanism to open said air-valve to establish a maximum flow of air through said

transit tube for driving carriers, means for timing the closure of said air-valve to restore said restricted flow of air when said carriers have been transmitted, and means for regulating the volume of said restricted flow of air.

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

CHARLES R. LIBBY.

Witnesses:

L. G. BARTLETT,

A. L. MESSER.