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PNEUMATIC DESPATCH TUBE APPARATUS.

APPLICATION FILED JUNE 26, 1908.

975,903.

Patented Nov. 15, 1910.

3 SHEETS—SHEET 1.

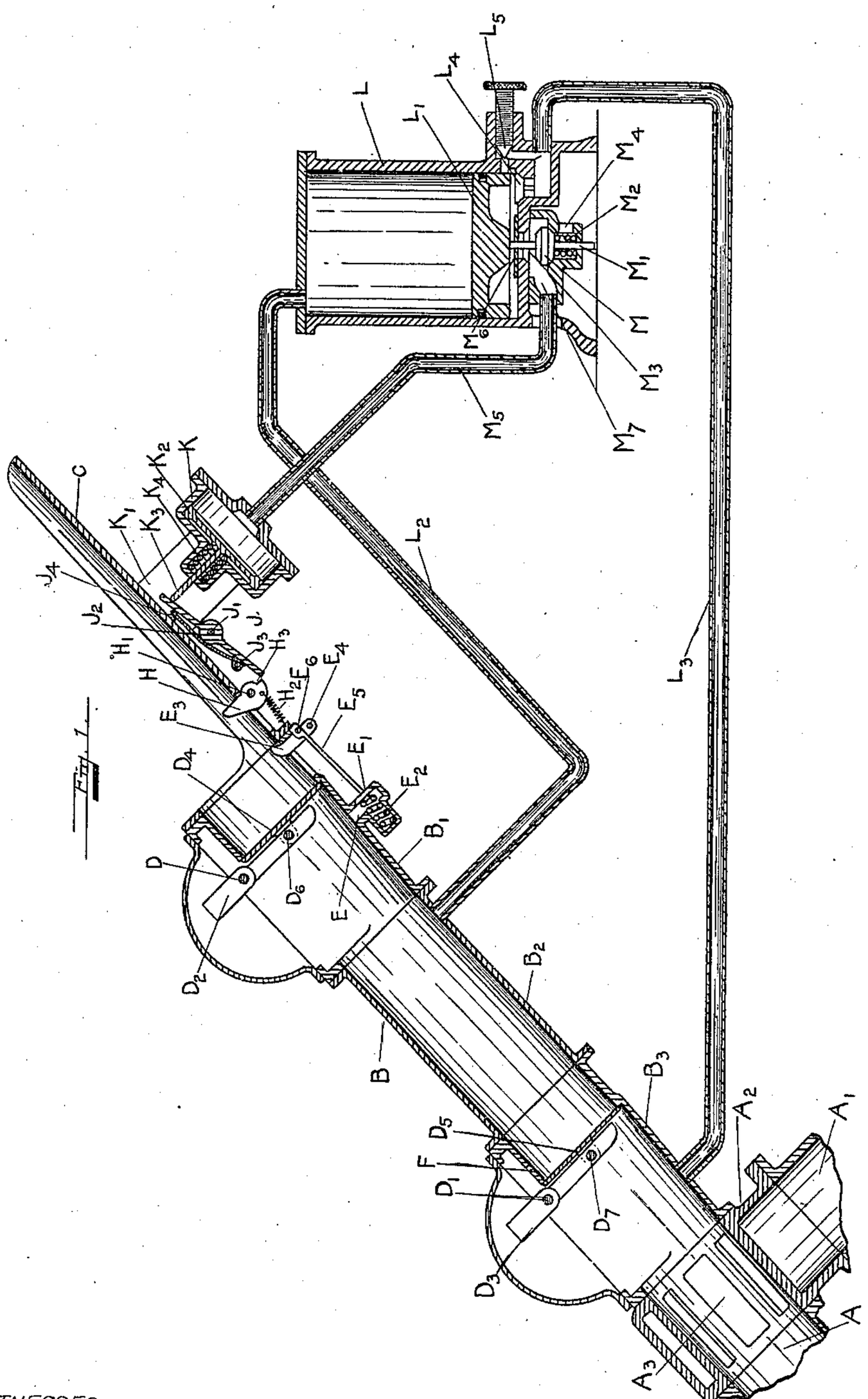

Fig. 1.

WITNESSES

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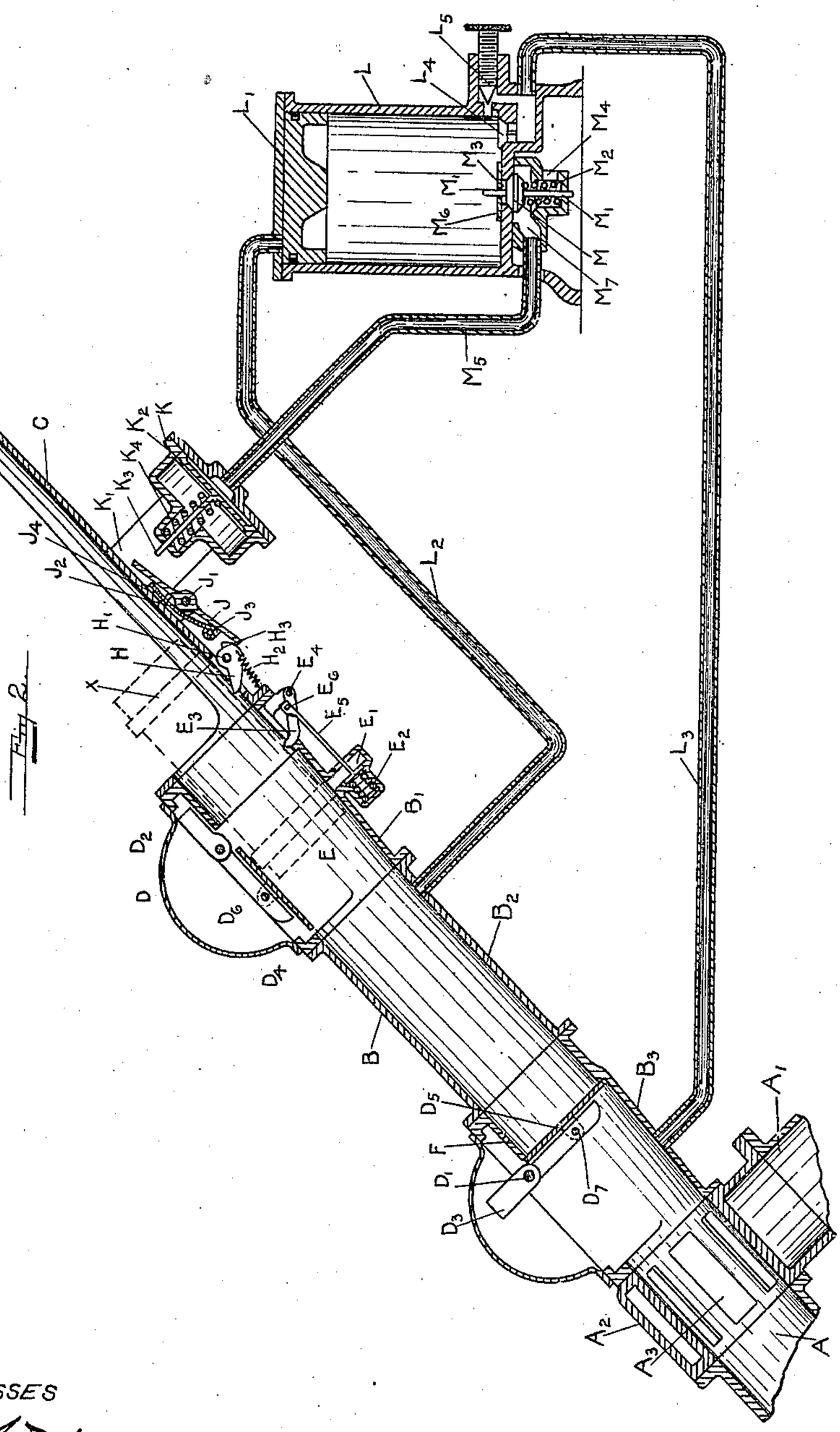

Fig. 2.

WITNESSES

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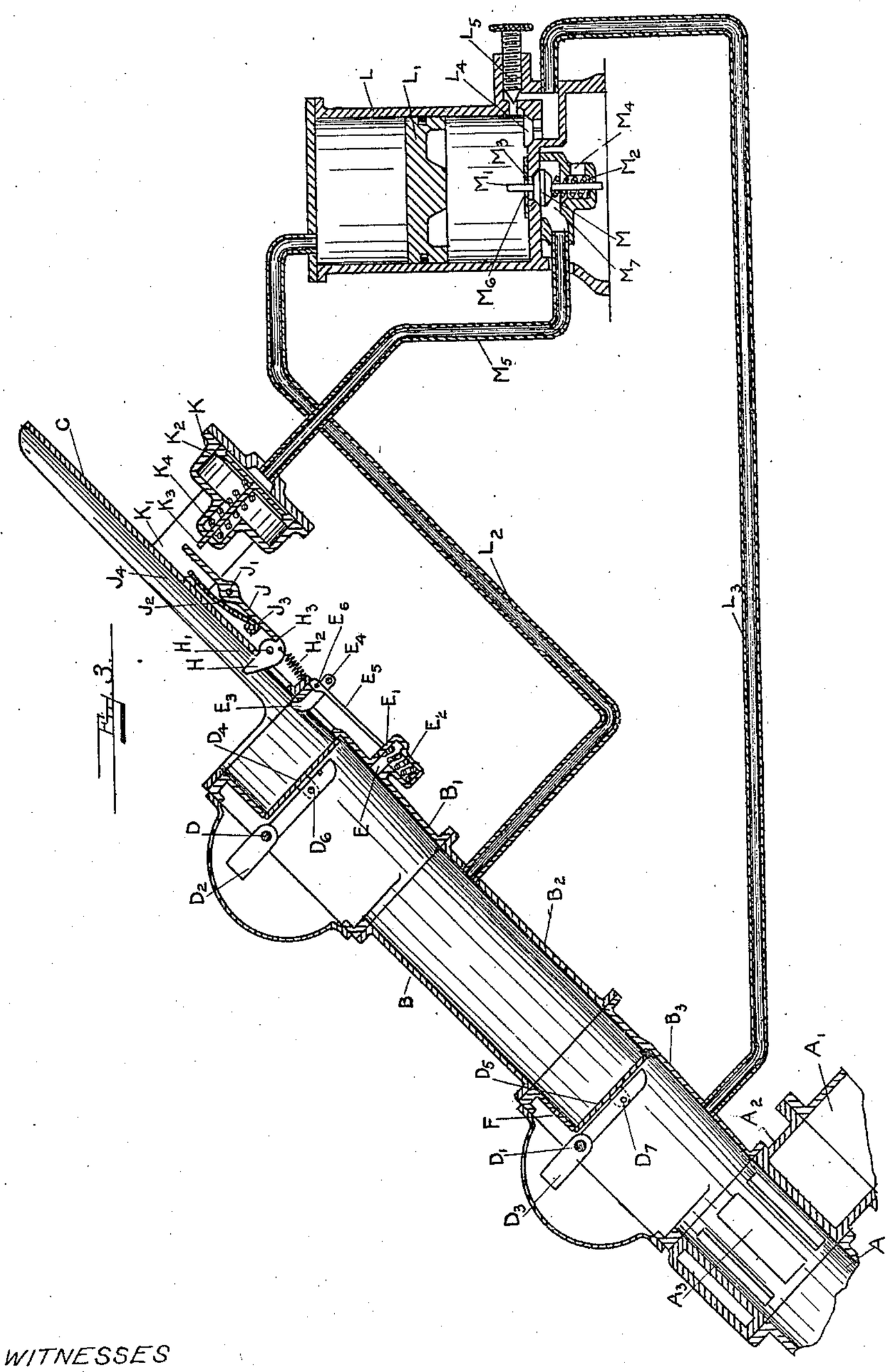

WITNESSES

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PNEUMATIC-DESPATCH-TUBE APPARATUS.

975,903. Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed June 26, 1908. Serial No. 440,424.

To all whom it may concern:

Be it known that I, CHARLES F. STODDARD, of Dorchester, 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 especially to a means for preventing the despatching of carriers at too short intervals, an apparatus commonly called a time lock.

This invention is shown connected to a pneumatic despatch tube sending terminal, as described in patent issued to me Oct. 27, 1903, No. 742,513.

In the accompanying drawings which illustrate a construction embodying my invention, Figure 1 is a longitudinal cross section showing the parts in their normal positions; Fig. 2 is a similar view showing the parts in the positions they would assume just as a carrier is being inserted into the sending terminal; Fig. 3 is a similar view showing the position which the parts would assume after the carrier has left the sending terminal and before the time lock had unlocked the tripping mechanism to permit another carrier to be despatched.

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

The transmission tube A is in communication with the supply pipe A′ through the casing A^2 provided with slots A^3. Secured to this slotted casing A^2 is the sender B composed of three chambers B′, B^2 and B^3; secured to the upper chamber is a chute C. Swinging on the shafts D D′ in the chambers B′ B^3 are the counterweighted gate arms D^2 D^3 to which are fastened the gates D^4 D^5 by pins D^6 D^7. Just below the upper valve or gate D^4 is the port E which is normally closed by the valve E′ held in closed position by the spring E^2. The opening of the valve E′ is controlled by the finger E^3 placed just above the valve D^4 in the casing B′ and pivoted to the casing B′ by the pin E^4. The rod E^5 pivoted to the finger E^3 by the pin E^6 connects the finger E^3 with the valve E′.

The by-pass port F connects the inside of the chamber B^3 below the gate D^5 with the chamber B^2 above the gate D^5 and is of an area much smaller than the area of the port E so that when the port E is open to the atmosphere, the port F cannot supply pressure fast enough to overcome the leakage through the port E and the pressure in the chamber B^2 remains at about atmospheric. The trip finger H is pivoted to the chute C by the pin H′ and normally held in the position shown in Fig. 1 by the spring H^2. The swinging arm J is pivoted to the chute C by the pin J′ and moved to the position shown in Fig. 3 by the spring J^2 which engages the swinging arm J at the point J^3 and the chute C at the point J^4. The cylinder K is secured to the chute C by the side plate K′ and is provided with the piston K^2 to which is secured the piston and plunger rod K^3. The piston K^2 is thrown into the position shown in Fig. 2 by the spring K^4.

The time lock cylinder L is provided with a floating piston L′; the upper end of the time lock cylinder L is connected with the chamber B^2 above the gate D^5 by the pipe L^2 and the lower side of the time lock cylinder L is connected to the chamber B^3 below the gate D^5 by the pipe L^3; between the pipe L^3 and the lower end of the time lock cylinder however is the check valve L^4. The double valve M is secured to the valve stem M′ and guided at the upper end by the guide M^6 and is thrown into the position shown in Fig. 2 by the spring M^2. The lower end of the trip cylinder K is connected to the valve chamber M^7 by the pipe M^5 and when the valve M is in the position shown in Fig. 1, the lower end of the trip cylinder K is in communication with the lower end of the time lock cylinder L through the port M^3, but when the double valve M is in the position shown in Fig. 2, the lower end of the trip cylinder K is in communication with the atmosphere through the port M^4.

X represents the carrier.

The operation is as follows: In Fig. 1 all the parts are shown in their normal position and the transmitter is ready to despatch a carrier. A carrier is placed upon the chute C and by the force of gravity slides down against the trip finger H throwing it into the position shown in Fig. 2 and then down against the finger E^3 throwing it into the position shown in Fig. 2, and thereby opening the valve E′ and reducing the pressure in the chamber B^2 between the gates D^4 and D^5 to substantially atmospheric. The car-

rier X slides on down against the gate D^4 opening same and entering the chamber B^2 and dropping against the lower gate D^5 which is now being held closed by the pressure on the under side of it. After the carrier passes from under the gate D^4 said gate assumes the position shown in Fig. 3 as do all the other parts. The valve E', now being closed, the pressure on the chamber B^2 is raised through the port F to the same as that on the under side of the gate D^5, and the carrier X by its weight opens the gate D^5 and passes through the slotted casing A^2 into the transmission tube A. When the carrier X presses the finger E^3 into the position shown in Fig. 2, thereby the port E to the atmosphere and reducing the pressure in the chamber B^2 to substantially atmospheric, the pressure in the upper end of the time lock cylinder L is also reduced to substantially atmospheric through the pipe L^2 and the perssure under the gate D^5 communicating with the lower end of the time lock cylinder L through the pipe L^3 and the check valve L^4 quickly raises the piston L' to the position shown in Fig. 2. When the piston L' is in the position shown in Fig. 1, it rests on the upper end of the valve stem M' and holds the valve against the spring M^2 in the position shown in Fig. 1; when the piston L' moves to the position shown in Fig. 2 it raises the valve stem M' and allows the spring M^2 to throw the valve M into the position shown in Fig. 2 thereby connecting the lower end of the trip cylinder K with atmospheric pressure through the pipe M^5 and port M^4 and this allows the spring K^4 to throw the piston K^2 into the position shown in Fig. 2, and this in turn allows the spring J^2 to throw the swinging arm J against the trip finger H as shown in Fig. 2. When the carrier passes over the trip finger H, the spring H^2 throws it back into the position shown in Fig. 3 and the spring J^2 presses the swing arm J back, of the shoulder H^3 of the trip finger H thereby locking same, so that if another carrier is put on the chute C it will slide down against the trip finger H but can go no farther until said trip finger H is unlocked. After the carrier H passes under the gate D^4 and said gate and the valve E have assumed the positions shown in Fig. 3, as did also the finger H, the pressure in the chamber B^2, as before explained, became equal to that in the chamber B^3 under the gate D^5. This pressure being communicated to the upper end of the time lock cylinder L through the pipe L^2 the pressure on each side of the piston L' becomes equal and the piston L' by its own weight tends to assume the original position shown in Fig. 1, but is retarded by the closing of the check valve L^4 and the air under the piston L' has to pass out through the needle valve L^5 which is adjusted so that the descent of the piston L' takes place in a predetermined length of time. When the piston L' reaches the bottom of the cylinder L it rests on the valve stem M' thereby throwing the double valve M into the position shown in Fig. 1 and connecting the lower end of the cylinder K with the pressure in the lower end of the time lock cylinder through the pipe M^5 and port M^3, and this pressure throws the piston K^2 into the position shown in Fig. 1, and the piston plunger rod K^3 in turn throws the swinging arm into the position shown in Fig. 1 thereby locking the trip finger H and completing the cycle of operation. The machine is now ready to despatch another carrier.

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 apparatus, a transmission tube, a sender connected to said transmission tube having a normally closed exhaust port, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission tube and the sender, an exhaust valve controlling said port to allow the pressure to exhaust from the sender for releasing the transmission tube pressure on the outer gate to permit the entrance of a carrier into the sender, means operated by the carrier for opening said exhaust valve, means for closing said exhaust valve after the entrance of the carrier to permit the pressure in the sender and the transmission tube to substantially equalize on the inner gate whereby the weight of the carrier will open said inner gate and enter the transmission tube, mechanism holding the carrier out of contact with the outer gate, mechanism for preventing the passage of another carrier until the preceding carrier has passed the inner gate, and a time lock on opposite sides normally under the pressure of the transmission tube and sender for controlling the operation of said carrier holding mechanism and adapted when the pressure between the inner and outer gates is reduced to be operated to release said carrier holding mechanism.

2. In a pneumatic despatch apparatus, a transmission tube, a sender connected to said transmission tube having a normally closed exhaust port, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission tube and the sender, an exhaust valve controlling said port to allow the pressure to exhaust from the sender for releasing the transmission tube pressure on the outer gate to permit the entrance of a carrier into the sender, means operated by the carrier for opening said exhaust valve, means for closing said exhaust valve after the entrance of

the carrier to permit the pressure in the sender and the transmission tube to substantially equalize on the inner gate whereby the weight of the carrier will open the said inner gate and enter the transmission tube, mechanism holding the carrier out of contact with the outer gate, mechanism for preventing the passage of another carrier until the preceding carrier has passed the inner gate, and a time lock on opposite sides normally under the pressure of the transmission tube and sender for controlling the operation of said carrier holding mechanism and adapted when the pressure between the inner and outer gates is reduced to be operated to release said carrier holding mechanism.

3. In a pneumatic despatch apparatus, a transmission tube, a sender connected to said transmission tube having a normally closed exhaust port, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission tube and the sender, an exhaust valve controlling said port to allow the pressure to exhaust from the sender for releasing the transmission tube pressure on the outer gate to permit the entrance of a carrier into the sender, means operated by the carrier for opening said exhaust valve, means for closing said exhaust valve after the entrance of the carrier to permit the pressure in the sender and the transmission tube to substantially equalize on the inner gate whereby the weight of the carrier will open said inner gate and enter the transmission tube, mechanism holding the carrier out of contact with the outer gate, mechanism for preventing the passage of another carrier until the preceding carrier has passed the inner gate, a time lock on opposite sides normally under the pressure of the transmission tube and sender for controlling the operation of said carrier holding mechanism and adapted when the pressure between the inner and outer gates is reduced to be operated to release said carrier holding mechanism, and means for regulating the equalization of pressure on said time lock whereby a predetermined time elapses between the despatching of carriers.

4. In a pneumatic despatch apparatus, a transmission tube, a sender connected to said transmission tube having a normally closed exhaust port, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission tube and the sender, an exhaust valve controlling said port to allow the pressure to exhaust from the sender for releasing the transmission tube pressure on the outer gate to permit the entrance of a carrier into the sender, means operated by the carrier for opening said exhaust valve, means for closing said exhaust valve after the entrance of the carrier to permit the pressure in the sender and the transmission tube to substantially equalize on the inner gate whereby the weight of the carrier will open said inner gate and enter the transmission tube, and to hold said outer gate closed so that the pressure in the transmission tube will not escape into the atmosphere, mechanism holding the carrier out of contact with the outer gate, mechanism for preventing the passage of another carrier until the preceding carrier has passed the inner gate, and a time lock on opposite sides normally under the pressure of the transmission tube and sender for controlling the operation of said carrier holding mechanism and adapted when the pressure between the inner and outer gates is reduced to be operated to release the said carrier holding mechanism.

5. In a pneumatic despatch apparatus, a transmission tube, a sender connected to said transmission tube having a normally closed exhaust port, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission tube and the sender, an exhaust valve controlling said port to allow the pressure to exhaust from the sender for releasing the transmission tube pressure on the outer gate to permit the entrance of a carrier into the sender, means operated by the carrier for opening said exhaust valve, means for closing said exhaust valve after the entrance of the carrier to permit the pressure in the sender and the transmission tube to substantially equalize on the inner gate whereby the weight of the carrier will open said inner gate and enter the transmission tube and to hold said outer gate closed so that the pressure in the transmission tube will not escape into the atmosphere, mechanism holding the carrier out of contact with the outer gate, mechanism for preventing the passage of another carrier until the preceding carrier has passed the inner gate, and a time lock on opposite sides normally under the pressure of the transmission tube and sender for controlling the operation of said carrier holding mechanism and adapted when the pressure between the inner and outer gates is reduced to be operated to release said carrier holding mechanism.

6. In a pneumatic despatch apparatus, a transmission tube, a sender connected to said transmission tube having a normally closed exhaust port, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission tube and the sender, an exhaust valve controlling said port to allow the pressure to exhaust from the sender for releasing the transmission tube pressure on the outer gate to permit the entrance of a carrier into the sender, means operated by the

carrier for opening said exhaust valve, means for closing said exhaust valve after the entrance of the carrier to permit the pressure in the sender and the transmission tube to substantially equalize on the inner gate whereby the weight of the carrier will open said inner gate and enter the transmission tube and to hold said outer gate closed so that the pressure in the transmission tube will not escape into the atmosphere, mechanism holding the carrier out of contact with the outer gate, mechanism for preventing the passage of another carrier until the preceding carrier has passed the inner gate, a time lock on opposite sides normally under the pressure of the transmission tube and sender for controlling the operation of said carrier holding mechanism and adapted when the pressure between the inner and outer gates is reduced to be operated to release said carrier holding mechanism, and means for regulating the equalization of pressure of said time lock whereby a predetermined time elapses between the despatching of carriers.

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

CHARLES F. STODDARD.

Witnesses:
GEO. A. LLOYD,
N. E. REMICK.