No. 742,517. PATENTED OCT. 27, 1903.

C. F. STODDARD.

PNEUMATIC DESPATCH APPARATUS.

APPLICATION FILED AUG. 1, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

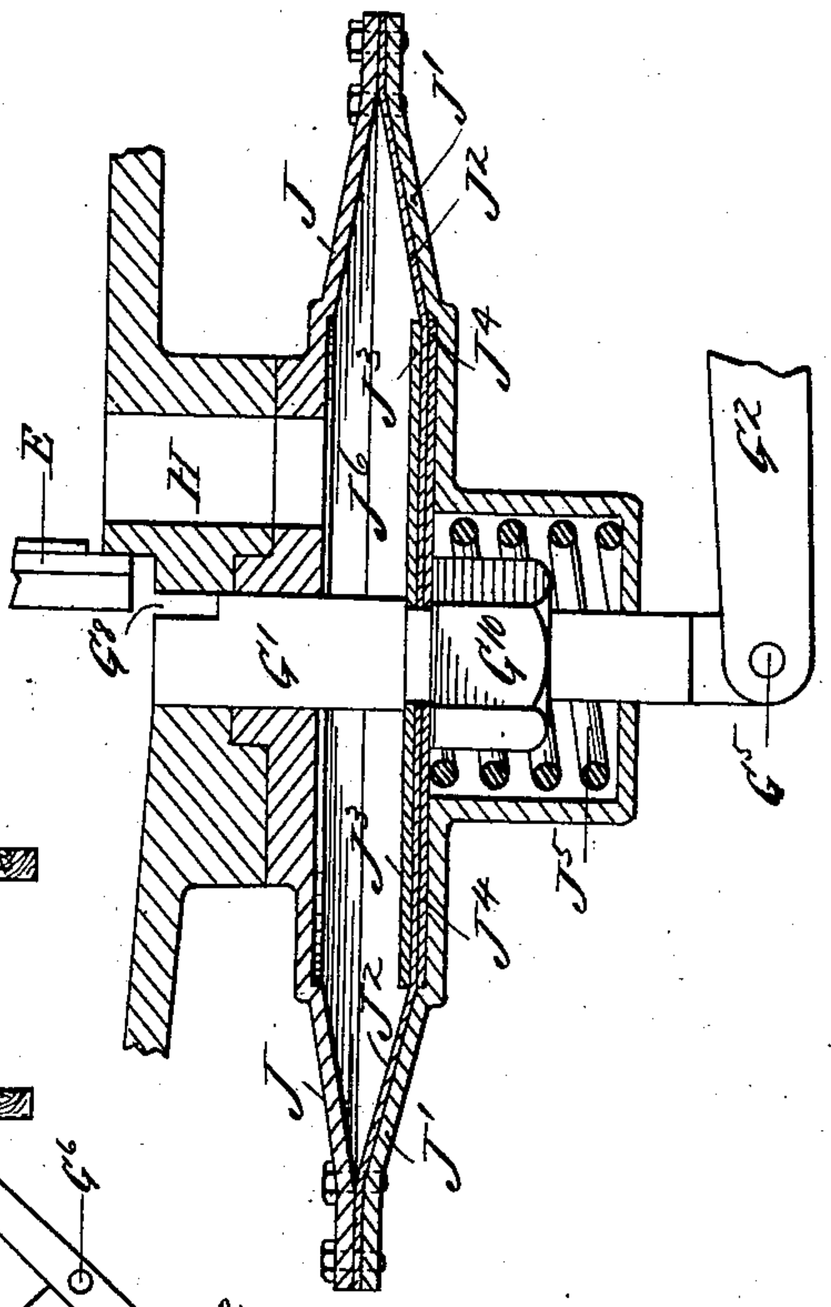

Fig. 2.

Fig. 1.

Witnesses:
E. L. Harlow
A. L. Musser

Inventor
Charles F. Stoddard
By E. C. Tillman & J. S. Rush Attys.

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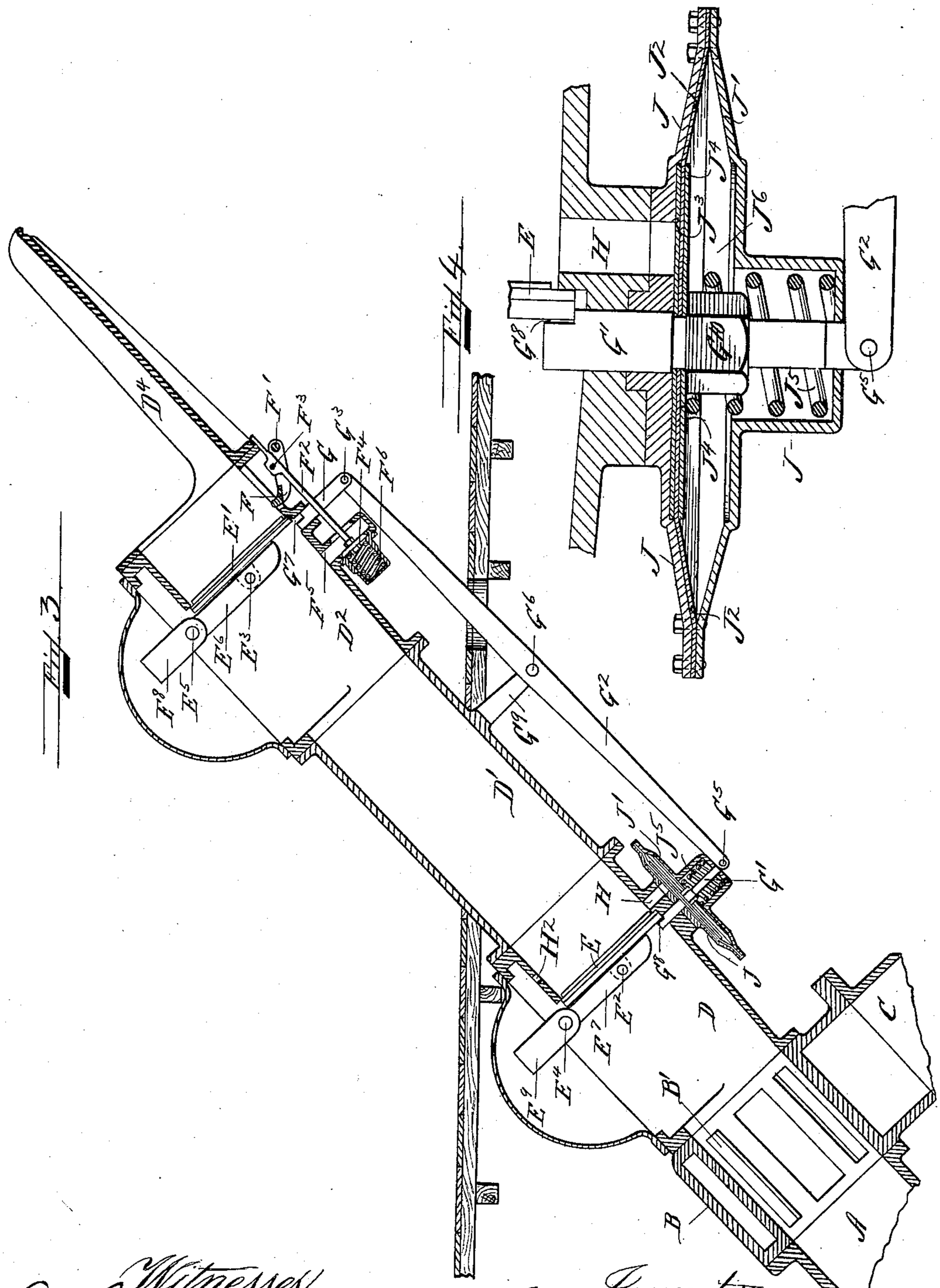

Witnesses
E. L. Harlow
A. D. Hussell

Inventor
Charles F. Stoddard
By E. C. Tilman & W. S. Rusk, Attys

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UNITED STATES PATENT OFFICE.

CHARLES F. STODDARD, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO AMERICAN PNEUMATIC SERVICE COMPANY, OF DOVER, DELAWARE, A CORPORATION OF DELAWARE.

PNEUMATIC-DESPATCH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 742,517, dated October 27, 1903.

Application filed August 1, 1903. Serial No. 167,818. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. STODDARD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic-Despatch Apparatus, of which the following is a specification.

My invention relates to improvements in pneumatic-despatch apparatus, and especially to a sending-terminal with swinging gates which are interlocked.

This interlocking device is applied to gravity-transmitters of the character disclosed in United States application, Serial No. 146,555, filed March 6, 1903. In this apparatus there is a diaphragm in connection with a chamber of the machine and which operates a plunger under the lower gate. This plunger is connected to another plunger, which is below the upper gate, by means of a rocker-arm, so that when the lower gate is locked the upper one is unlocked, and vice versa.

My invention consists of certain novel features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate a construction embodying my invention, Figure 1 is a section through the sending-terminal with the parts in their normal positions. Fig. 2 is a detail of the lower plunger and diaphragm with the exhaust-valve closed. Fig. 3 is a section through the machine, showing interlocking mechanism reversed and the exhaust-valve open. Fig. 4 is an enlarged detail view of the lower plunger and diaphragm, as shown in Fig. 3.

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

A is the transmission-tube, which is supplied with air from the pipe C through the gated T B, which contains openings B′.

D is a lower valve-casing, and D′ a chamber connecting the upper valve-casing D^2 and the lower valve-casing D. The gate E swings on the counterbalanced arm E^7 at the point E^2, which arm E^7 swings on the shaft E^4. The upper gate E′ swings on the counterbalanced arm E^6 at E^3, and the counterbalanced arm E^6 in turn swings on the shaft E^5.

E^8 E^9 are respectively counterbalanced supports for the gates E E′.

F is a finger, pivoted at F′, and to which is connected the plunger-rod F^2 at the point F^3. To the plunger F^2 is fastened the valve-disk F^4, which valve controls the opening F^5.

F^6 is a spring, which seats the valve-disk F^4 and also returns the finger F to its normal upright position.

G is the upper plunger, connected to the rocker-arm G^2 at the point G^3. The rocker-arm G^2 swings at G^6 on the projection G^9, and to its lower end at G^5 is connected the plunger G′, which is fastened by the nut G^{10} to the diaphragm J^2 between the plates J^3 J^4.

J^5 is a spring tending to hold the plunger G′ in a position locking the valve E, Figs. 3, 4, and H is a port connecting the chamber D′ on the upper side of the diaphragm J^2 with the chamber J^6, formed by the plates J J′.

With the parts in their normal position, as shown in Fig. 1, the line-pressure in the transmission-tube A enters the chamber D′ through the port H^2, and the pressure being equal on the gate E said gate remains closed and the gate E′ is held closed by this pressure in the chamber D′ and cannot open, as the cut-away end G^7 of the plunger G is directly below it until the apparatus is operated, as hereinafter described. The plunger G′ has also a cut-away end G^8, in which rests the end of the gate E, as shown in Fig. 3, when said gate is held closed by said plunger.

In operation a carrier is placed on the scoop D^4 and drops down against the finger F, forcing it into the position shown in Fig. 3, which opens the valve F^4, which valve opens the port F^5 to the atmosphere, thereby spilling the pressure in the chamber D′ and in the space above the diaphragm J^2 through the port H. This allows the spring J^5 to force the plunger G′ up behind the gate E, as shown in Fig. 3. When the plunger G′ moves up, the plunger G, being connected by means of the rocker-arm G^2, moves down, thereby unlocking the gate E′ and allowing the carrier by its weight to force the gate E′ open and pass into the chamber D′. As the carrier passes into the chamber D′ it allows the finger

F to move back into its normal position, which is shown in Fig. 1. This is accomplished by means of the spring F^6 pressing against the valve-disk F^4 and raising the plunger F^2. The valve-gate E′ closes after the passage of the carrier by the counterweight E^8. The line-pressure is then established in the chamber D′ through the port H^2. When the air in the chamber D′ is raised to the line-pressure, the diaphragm J^2 is forced down into the position shown in Fig. 2, which unlocks the gate E and locks the gate E′, as shown in Fig. 1. The carrier by its weight then forces the gate E open and passes into the line A through the gated T B. The gate E then closes by means of the counterweight E^9 and the machine is ready to receive another carrier.

The object of locking the inner gate E is to prevent a carrier knocking it open against the line-pressure when said carrier drops down against it, which occurs at every operation. The object of locking the gate E′ is to prevent it from being opened when the gate E is open or while there is pressure in the chamber. This is insured by the area of the port F^5 being so small as to be unable to spill pressure in the chamber D′ when the gate E is open. Therefore said pressure will hold the diaphragm J^2 down, which holds the plunger G up, thereby locking the gate E′, as shown in Fig. 1.

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, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, 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 mechanism for controlling the opening of said gates.

2. In a pneumatic-despatch apparatus, a transmission-tube, a sender connected to said transmission-tube, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, 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, the pressure holding the said outer gate closed so that the air in the transmission-tube will not escape into the atmosphere, and mechanism for controlling the opening of said gates.

3. In a pneumatic-despatch apparatus, a transmission-tube, a sender connected to said transmission-tube, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, an exhaust-valve controlling said port to allow the pressure to exhaust from the sender thereby 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, a counterweight on said exhaust-valve for closing the same after the entrance of the carrier thereby permitting 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, the pressure holding the said outer gate closed so that the air in the transmission-tube will not escape into the atmosphere, and mechanism for controlling the opening of said gates.

4. In a pneumatic-despatch apparatus, a transmission-tube, a sender connected to said transmission-tube, inner and outer gates normally closing said sender, a by-pass for normally producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, 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, a counterweight on said exhaust-valve for closing the same after the entrance of the carrier to permit the pressure in 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 the said outer gate closed so that the pressure in the transmission-tube will not escape, and mechanism for controlling the opening of said gates.

5. In a pneumatic-despatch apparatus, a transmission-tube, a sender connected to said transmission-tube, inner and outer gates normally closing said sender, means for normally

producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, 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 mechanism for normally preventing the opening of the outer gate.

6. In a pneumatic-despatch apparatus, a transmission-tube, a sender connected to said transmission-tube, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, 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 mechanism operated by the pressure in the sender for normally preventing the opening of the outer gate.

7. In a pneumatic-despatch apparatus, a transmission-tube, a sender connected to said transmission-tube, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, 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 operated by the pressure in the sender for normally preventing the opening of the outer gate, and means for operating said mechanism to prevent the opening of the inner gate while the pressure in the sender is reduced.

8. In a pneumatic-despatch apparatus, a transmission-tube, a sender connected to said transmission-tube, inner and outer gates normally closing said sender, means for normally producing equalization of pressure in the transmission-tube and the sender, an exhaust-port from said sender to the atmosphere normally closed, 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 consisting of a plunger beneath each gate connected to a pivoted rocker-arm and a diaphragm connected to the plunger at the inner gate and adapted to be operated by the pressure in the sender for moving inward the plunger at the outer gate, and a spring for moving said diaphragm inward with the plunger at the inner gate upon a reduction of pressure in the sender.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of July, A. D. 1903.

CHARLES F. STODDARD.

Witnesses:
A. L. MESSER,
E. L. HARLOW.