No. 657,091. Patented Sept. 4, 1900.

J. T. COWLEY.

PNEUMATIC DESPATCH TUBE APPARATUS.

(Application filed Dec. 21, 1899.)

(No Model.) 2 Sheets—Sheet 1.

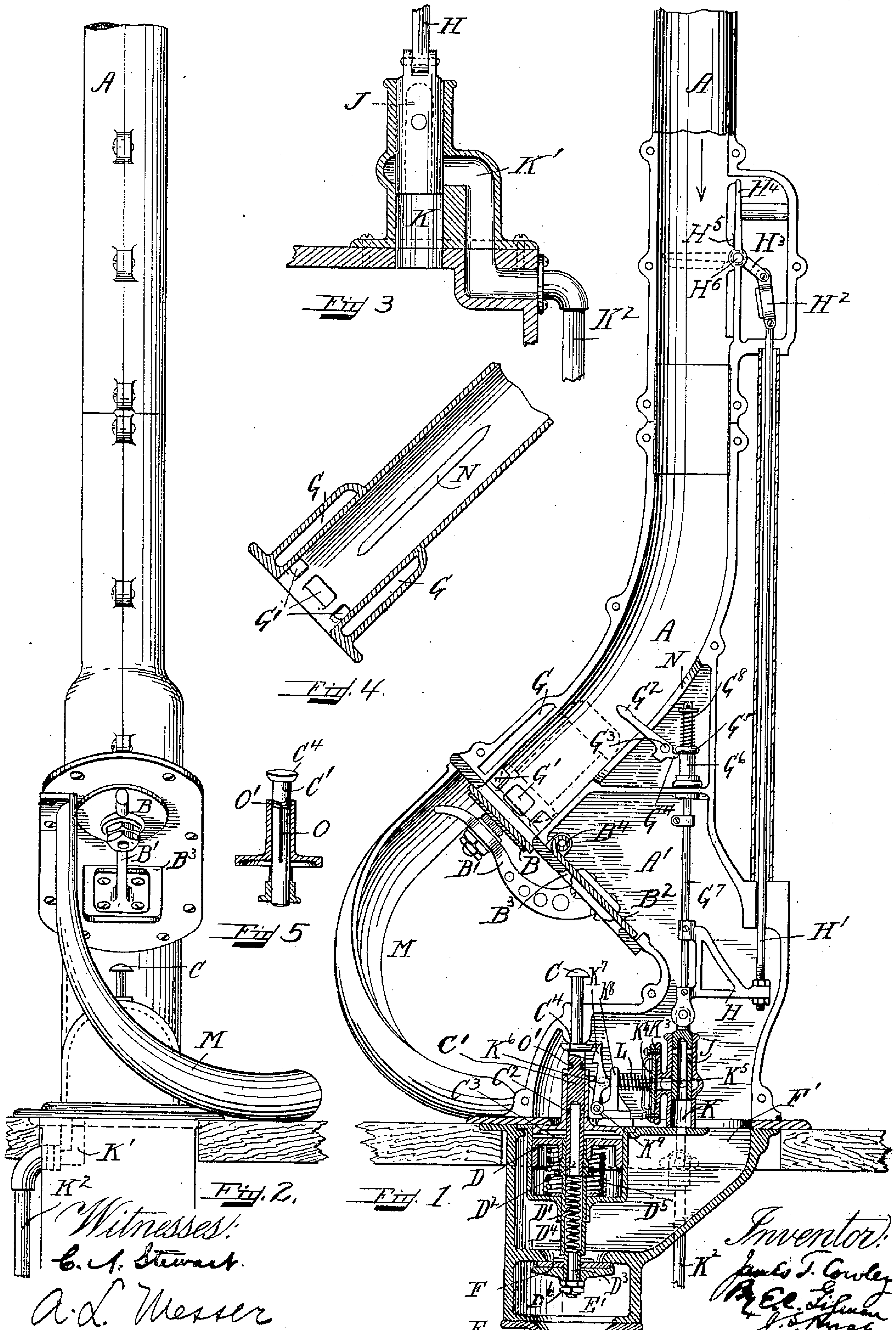

Fig 3

Fig. 4.

Fig 5

Fig. 2.

Fig. 1.

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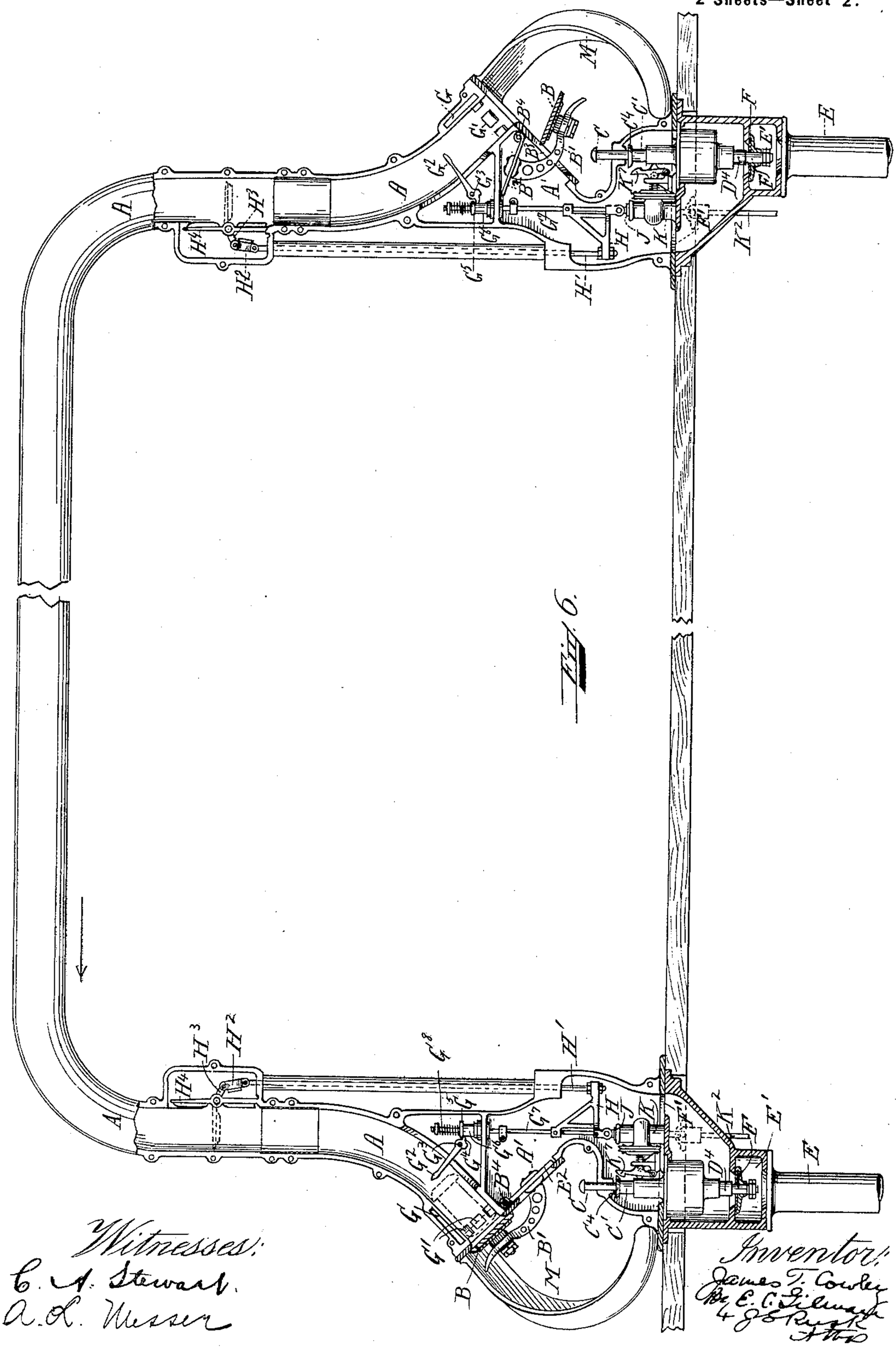

Fig. 2.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC-DESPATCH-TUBE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 657,091, dated September 4, 1900.

Application filed December 21, 1899. Serial No. 741,111. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. COWLEY, 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 a terminal for the delivery of the carriers.

In carrying out my invention I provide an apparatus in which the carrier is inserted into the transmitting-tube and the valve admitting air to the terminal is opened and the carrier driven by air-pressure to the opposite end of the line, where it is received in a terminal similar to the one from which it was sent or of any suitable construction.

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 vertical sectional view of my improved terminal. Fig. 2 is a front view of the terminal. Fig. 3 is a sectional detail view of part of the valve mechanism controlling the valve-releasing mechanism. Fig. 4 is a sectional view through the end of the tube. Fig. 5 is a detail sectional view of part of the valve mechanism admitting air to the terminal. Fig. 6 is a side elevation of the line, showing both terminals partly in section.

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

When it is desired to despatch a carrier, the carrier is inserted into the end of the transmission-tube A, as shown in Figs. 1 and 6, and the valve B, closing the end of the transmission-tube, is moved to the position shown in Fig. 1 and at the left hand of Fig. 6. This valve is mounted on one end of the arm B′, and the opposite end of the arm is secured to the valve B^2, closing the opening B^3, and this valve is pivoted at B^4 within the chamber A′ of the terminal. When the valve B is closed by hand, the valve B^2 is closed also. The plunger C is then pushed down, moving with it the valve-stem C′. The lower end of this valve-stem C′ passes into the plunger D and in contact with the spring D′ within the plunger D, (see Fig. 1,) the spring D′ tending to hold the plunger C in its raised position. The valve-stem C′ has a passage D^2 communicating with the passage D^3 through the stem D^4 of the plunger D. This passage D^3 is open through the nuts D^6 to admit air from the supply-pipe E, leading to the chamber E′. When the plunger C is pushed down, as above described, moving with it the valve-stem C′, the ports C^2 in the valve-stem C′ are brought opposite the space C^3 above the plunger D and air is admitted through the passages D^3 and D^2 and the ports C^2 to above the plunger D, lowering the plunger D against the tension of the spring D^5 and lowering the valve F, thereby admitting air to the terminal from the supply-pipe E. The air will pass upwardly through the passage F′ into the chamber A′ and pass around the lower end of the tube A through the passages G and will pass through the openings G′ into the transmission-tube A behind the carrier and the carrier will be driven to the opposite end of the line. The air-pressure thereby acting on the valves B and B^2 will hold the said valves in the position shown in Fig. 1 and at the left hand of Fig. 6. As the valve B^2 is of greater area than the valve B more pressure will be exerted on the valve B^2 than on the valve B, and these valves will be held in this position, as shown in Fig. 1 and at the left hand of Fig. 6, as long as the carrier is in transit; but when the carrier reaches the opposite end of the line and the air-pressure is shut off, as hereinafter described, the valves B B^2 will open by gravity and assume a position similar to that shown at the right hand of Fig. 6 and allow the discharge of the carrier when it is returned from the opposite end of the line. As the carrier starts from the left hand of Fig. 6, the finger G^2 will be pushed back through the slot N, allowing the carrier to pass, when the finger will return again by gravity to its normal position. (Shown in Fig. 1.) When the

carrier reaches the opposite end of the line, as shown at the right hand of Fig. 6, it will enter a terminal of similar construction to that shown in Fig. 1 and will strike the lever G^2, which operates to shut off the air at the left-hand end of the line in a manner similar to that hereinafter described for a carrier traveling from the right-hand end to the left-hand end and then be delivered in the chute M. To return the carrier, it will be inserted in the transmission-tube and returned in a manner similar to that described for the carrier sent from the left-hand end of the line, Fig. 6, as above described. Upon its return as it enters the terminal at the left-hand end and passes through the despatch-tube A the carrier will contact with the finger G^2 and depress the same. This finger G^2, which is pivoted at G^3, has on its opposite end the finger G^4, which engages with the flange G^5 on the collar G^6 around the rod G^7 within the terminal. When the finger G^2 is depressed and the collar G^6 is raised, the spring G^8 is pushed upwardly, moving with it the rod G^7, carrying with it the bracket H and the rod H', and through the connections of the link H^2 and arm H^3 the wing H^4 is moved to the dotted position shown in Fig. 1. As the air-pressure is still passing through the tube A in the direction of the arrow in Figs. 1 and 6, the air-pressure, acting upon the wing H^4, will tend to retain it in the position shown in dotted lines, Figs. 1 and 6, and by this means, through the connections of the link H^2 and rod H', the bracket H is held in its raised position and the air will be allowed to escape from the pipe K^2 until the catch K^7 is released from the flange C^4 at the opposite end of the line and the air-pressure shut off from the transmission-tube A, at which time the wing H^4 will resume its normal position (shown in full lines, Fig. 1) and the plunger J will drop and shut off the escape of the air through the pipe K^2. This mechanism constitutes means for allowing sufficient time for the air to escape from the pipe K^2, so that the spring L at the opposite end of the line from where the air is escaping can act to withdraw the catch K^7 from the flange C^4 and allow the air-inlet valve to close.

The lower end of the bracket H is pivoted to the plunger J, which is adapted to work freely in the chamber K. In communication with the chamber K is a passage K', leading from the air-supply pipe K. (See Fig. 3.) When the plunger J is in the position shown in Figs. 1 and 3, the air-pressure from the air-supply pipe K^2 is shut off from the passage K, and the pressure within the passage K' will act upon the diaphragm K^3, and said diaphragm will be distended. Resting upon the outer surface of the diaphragm is a plate K^4, secured on the outer end of the rod K^5. The opposite end of this rod K^5 is secured at K^6 to the catch K^7, and the rod is adapted to move freely within the lug K^8 and be supported thereby. The catch K^7 is pivoted at K^9 and is located in position to engage with the flange C^4 on the upper end of the valve-stem C' and hold the valve-stem in its lower position when the same is depressed by the plunger C to admit air to the terminal, as above described. When a carrier passes through the despatch-tube and engages with the finger G^2 at either end of the line and raises the rod G^7, bracket H, and plunger J, as above described, air will be allowed to escape from the passage K'. The supply-pipe K^2 is connected to the terminal at both ends of the line, which are similar in construction, and therefore the apparatus described for the terminal shown in Fig. 1 will apply in every respect to both terminals. When the air is released from the passage K' and supply-pipe K^2 upon the delivery of the carrier, the pressure will be relieved from the diaphragm K^3 and said diaphragm will be forced back by the action of the spring L and the catch K^7 will be released from the flange C^4 in the valve-stem C', and the spring D' acting on the lower end of the valve-stem C' will raise said valve-stem and will close the ports C^2 and shut off the air-pressure from above the plunger D and the spring D^5 acting against the plunger D will raise the same and the valve F will be closed and shut off the air-pressure from the terminal. As the carrier passes out from the despatch-tube A it is guided by the curved chute M onto a receiving-table. The finger G^2 in its movements moves in the slot N, which opens into the transmission-tube. The plunger C^2 is provided with longitudinal slots O, communicating with the circular groove O' in the valve-stem C'. These slots O act as a vent for the air above the plunger D when the valve-stem C' is in its raised position, as shown in Fig. 1; but when the plunger D is lowered to open the valve F the circular groove O' is lowered and the passage cut off and the vents closed, thereby preventing the escape of air from above the plunger D until the valve-stem C' has again returned to its normal position and the valve F closed upon the discharge of a carrier from the terminal.

The wing H^4 is pivoted on the pin H^6 and held in its relative position with the arm H^3 by the spring H^5, said spring allowing the wing H^4 to yield downwardly, as a carrier should be passing through the transmission-tube A when the wing H^4 was in the dotted position, (shown in Fig. 6,) thus allowing the carrier to pass by the wing H^4 and be delivered, and the wing H^4 will return to the dotted position by means of the spring H^5, as shown in Fig. 1.

Having thus ascertained 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 carrier transmission-tube having an inlet and an outlet for the carriers, a valve for closing said inlet after the insertion of the car-

riers, a source of compressed air, an air-inlet for said compressed air, a valve normally closing said air-inlet, means for opening said air-inlet valve, means operated by compressed air for holding said air-inlet valve open, mechanism in the path of the traveling carriers adapted to be operated by the traveling carriers to release the air-pressure on said air-inlet-valve-holding means and thereby release the same to allow the closing of said air-inlet valve, and mechanism operated by air-pressure in the transmission-tube for allowing the escape of the compressed air from the air-inlet-valve-holding means.

2. In a pneumatic-despatch-tube apparatus, a carrier transmission-tube having an inlet and an outlet for the carriers, a valve for closing said inlet after the insertion of the carriers, a source of compressed air, an air-inlet for said compressed air, a valve normally closing said air-inlet, means for opening said air-inlet valve, means operated by compressed air for holding said air-inlet valve open, mechanism in the path of the traveling carriers to release the air-pressure on said air-inlet-valve-holding means and thereby release the same to allow the closing of said air-inlet valve, mechanism operated by air-pressure in the transmission-tube for allowing the escape of the compressed air from the air-inlet-valve-holding means, and yielding means acting on said air-inlet-valve-holding means for releasing the same upon the release of the compressed air from said air-inlet-valve-holding means.

3. In a pneumatic-despatch-tube apparatus, a carrier transmission-tube having an inlet and an outlet for the carriers, a valve for closing said inlet after the insertion of the carriers, a source of compressed air, an air-inlet for said compressed air, a valve normally closing said air-inlet, means for opening said air-inlet valve, means operated by compressed air for holding said air-inlet valve open, mechanism in the path of the traveling carriers to release the air-pressure on said air-inlet-valve-holding means and thereby release the same to allow the closing of said air-inlet valve, mechanism operated by air-pressure in the transmission-tube for allowing the escape of the compressed air from the air-inlet-valve-holding means, and a spring acting on said air-inlet-valve-holding means for releasing the same upon the release of the compressed air from said air-inlet-valve-holding means.

4. In a pneumatic-despatch-tube apparatus, a carrier transmission-tube having an inlet and an outlet for the carriers, a valve for closing said inlet after the insertion of the carriers, a source of compressed air, an air-inlet for said compressed air, a valve normally closing said air-inlet, a plunger manually operated to open said air-inlet valve, a catch for holding said air-inlet valve open, a diaphragm operated by compressed air for operating said catch to hold the air-inlet valve open, a valve for controlling the exhaust of air from said diaphragm, mechanism in the path of the traveling carriers for operating said valve, and mechanism operated by air-pressure in the transmission-tube for holding said exhaust-valve open.

5. In a pneumatic-despatch-tube apparatus, a carrier transmission-tube having an inlet and an outlet for the carriers, a valve for closing said inlet after the insertion of the carriers, a source of compressed air, an air-inlet for said compressed air, a valve normally closing said air-inlet, a plunger manually operated to open said air-inlet valve, a catch for holding said air-inlet valve open, a diaphragm operated by compressed air for operating said catch to hold the air-inlet valve open, a valve for controlling the exhaust of air from said diaphragm, mechanism in the path of the traveling carriers for operating said valve, mechanism operated by air-pressure in the transmission-tube for holding said exhaust-valve open, and a spring acting on said catch for releasing the same upon the release of the compressed air from the diaphragm.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 19th day of December, A. D. 1899.

JAMES T. COWLEY.

Witnesses:

A. L. MESSER,

C. A. STEWART.