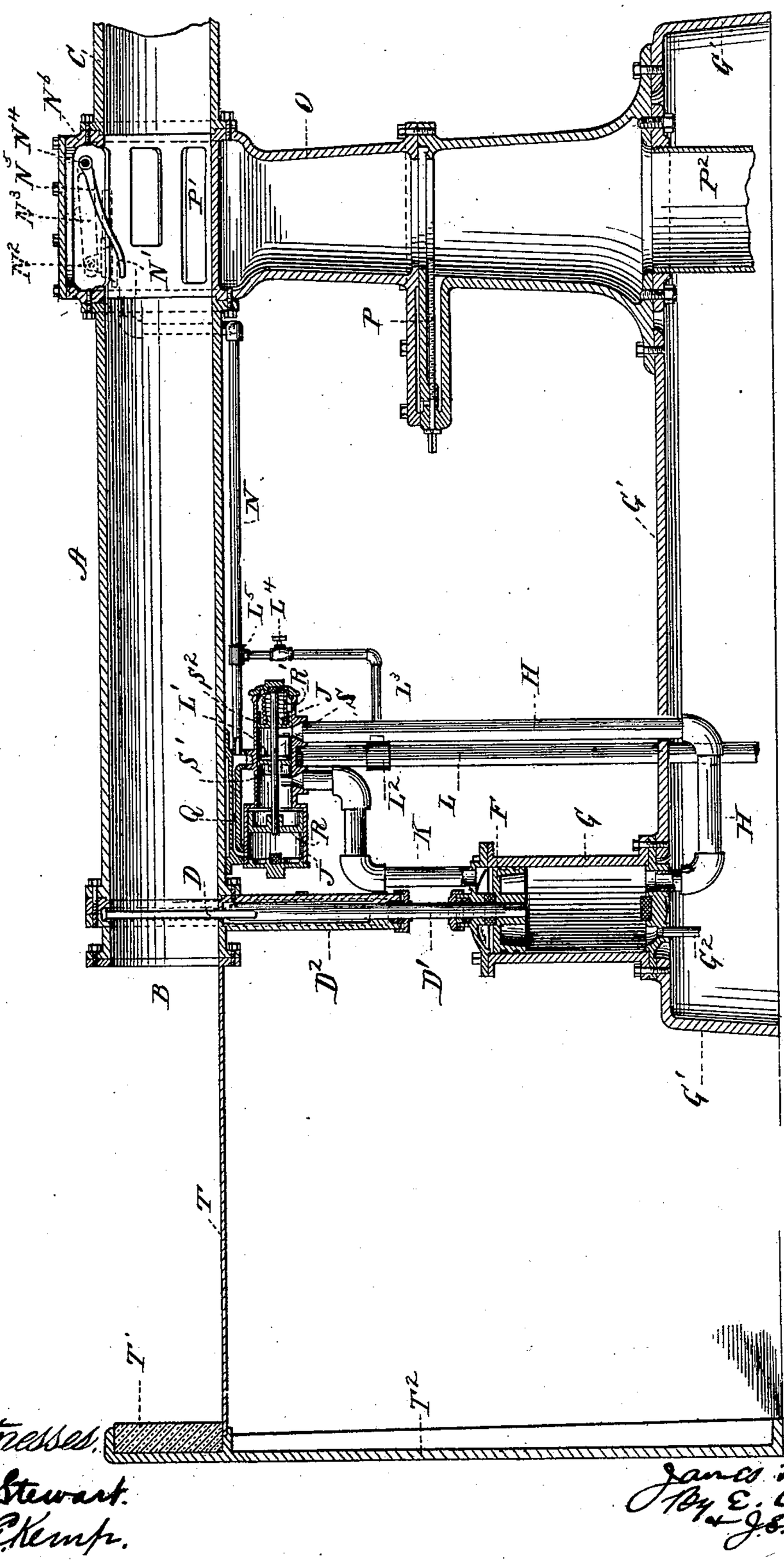
No. 677,759. Patented July 2, 1901.

J. T. COWLEY

PNEUMATIC DESPATCH TUBE APPARATUS.

(Application filed Aug. 23, 1899.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses.
C. A. Stewart.
Bert C. Kemp.

Inventor.
James T. Cowley
By E. C. Gilman
& J. B. Rust
Attys

Fig. 1.

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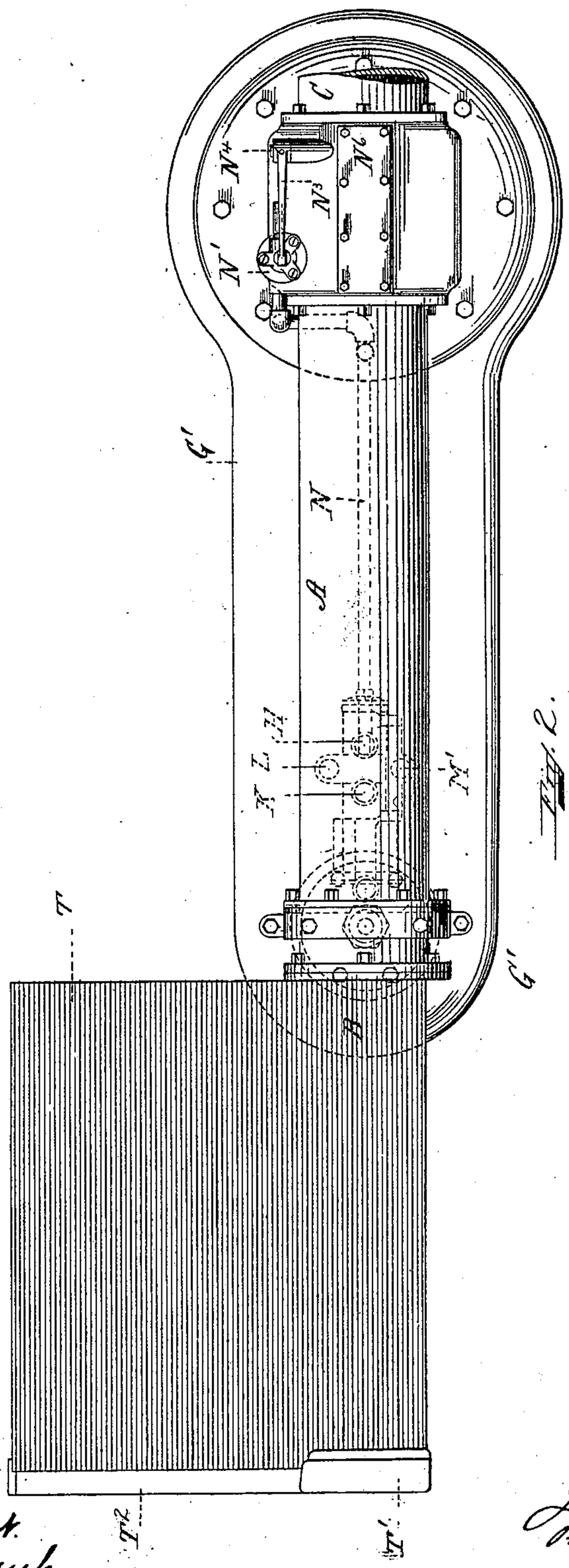

Fig. 2.

Witnesses:
C. A. Stewart.
Bert C. Kemp.

Inventor:
James T. Cowley
By E. C. Gilman
& J. S. Rusk
Attys

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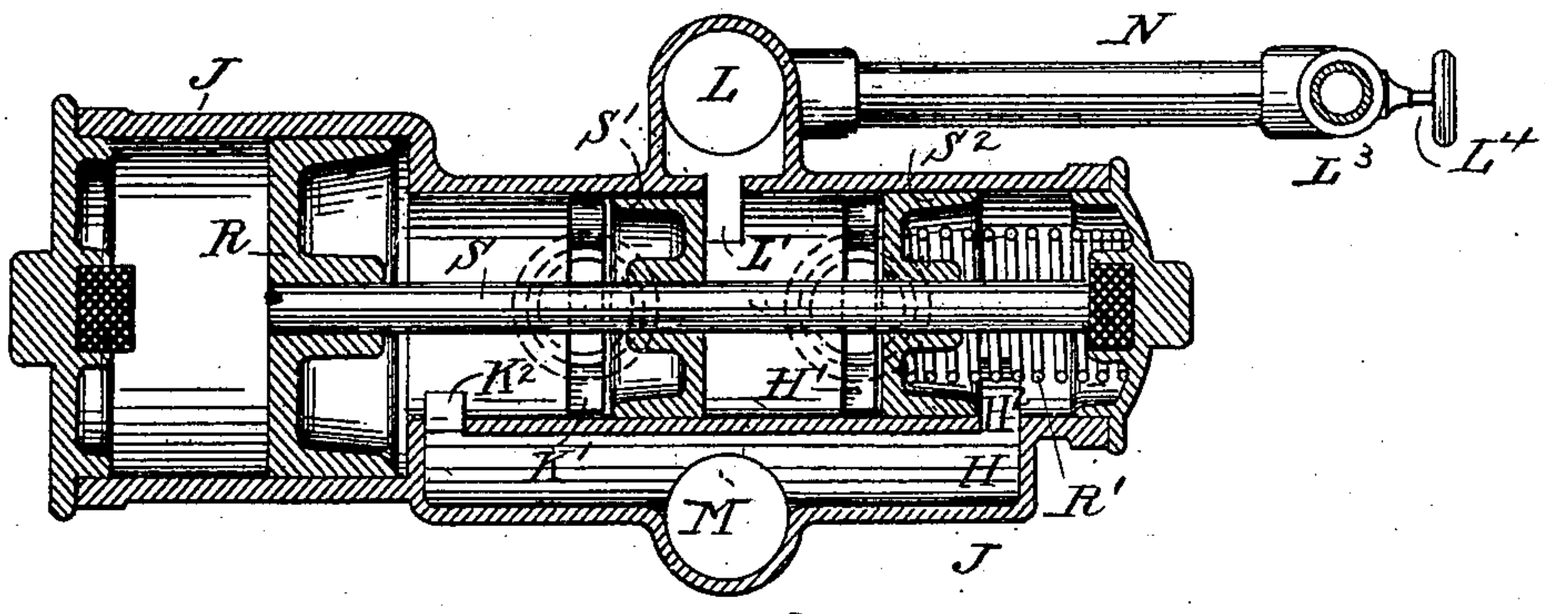

Fig. 3

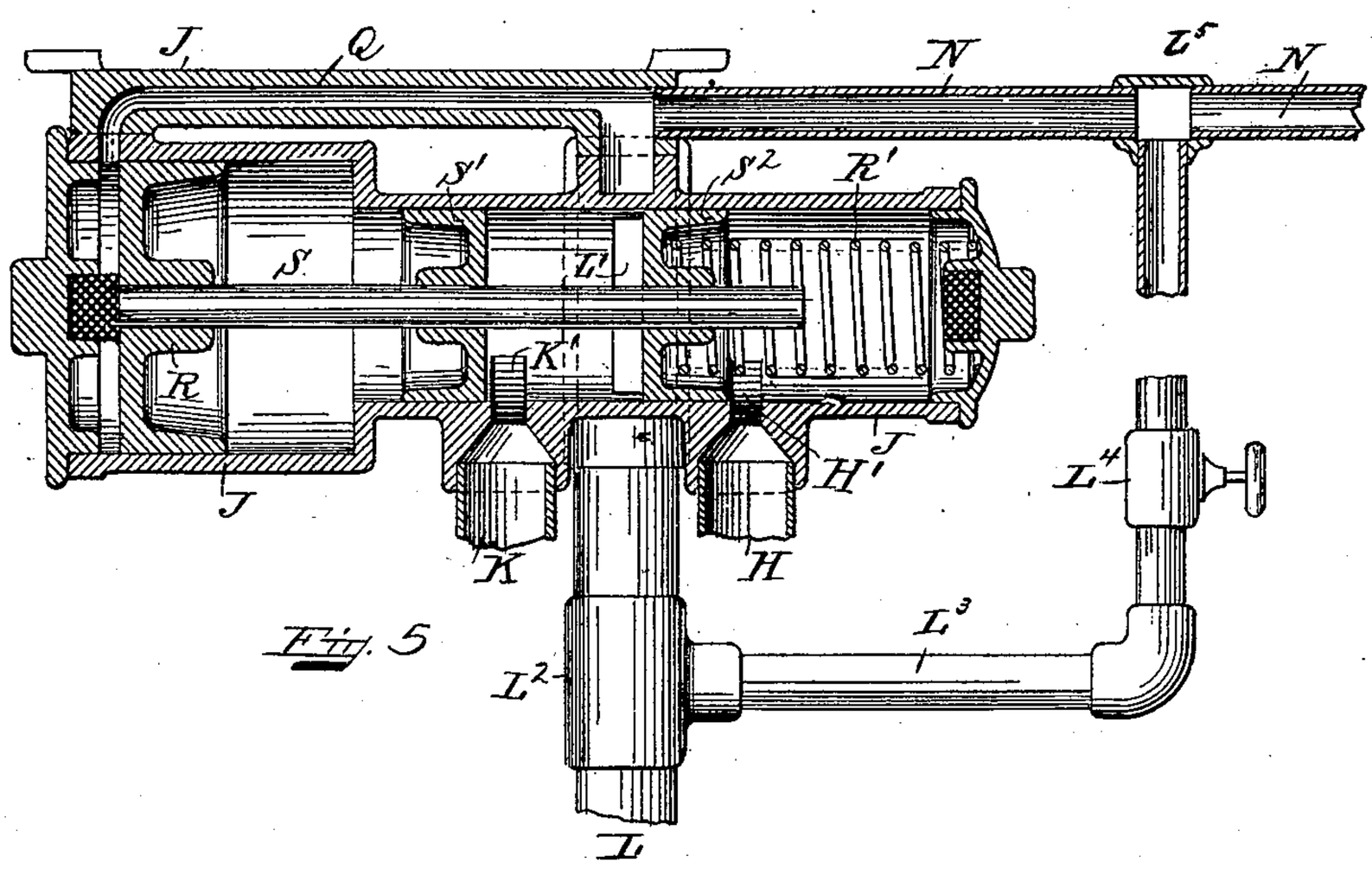

Fig. 5

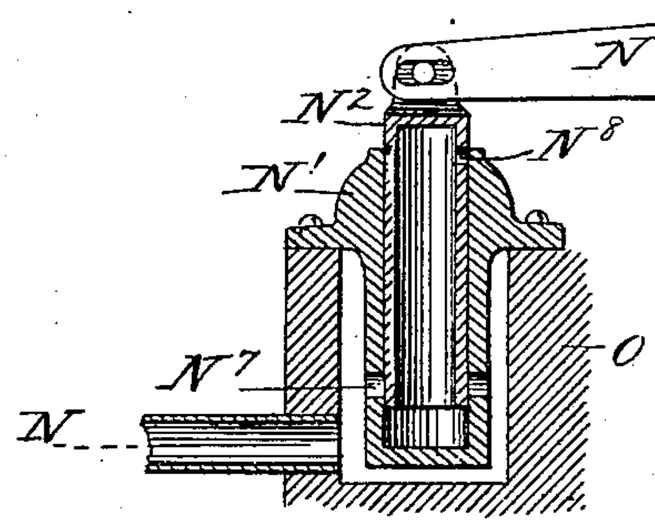

Fig. 4.

Witnesses.
C. A. Stewart.
Bert E. Kemp.

Inventor:
James T. Cowley
By E. C. Gilman
& J. S. Rusk
Attys

UNITED STATES PATENT OFFICE.

JAMES T. COWLEY, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE LAMSON CONSOLIDATED STORE SERVICE COMPANY, OF NEWARK, NEW JERSEY.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 677,759, dated July 2, 1901.

Application filed August 23, 1899. Serial No. 728,149. (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 receiving-terminals for pneumatic-tube apparatus; and its object is to provide a terminal for receiving the carrier and gradually stopping its momentum and also to provide means for actuating a gate in the terminal to cause it to open automatically for the delivery of the carrier and close automatically after said carrier has been delivered from the tube.

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 represents a central longitudinal vertical section of my improved receiver. Fig. 2 is a top plan view of the same. Fig. 3 is an enlarged central longitudinal sectional view through the valve-chamber. Fig. 4 is a detail view of the air-escape valve. Fig. 5 is an enlarged central vertical sectional view through the valve-chamber, showing the pistons in an opposite position to that shown in Fig. 1.

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

The terminal A is closed at one end B and at the other end is in open communication with the despatch-tube C, from which the carriers pass into the terminal A. The terminal A is normally closed at the end B by the gate D, connected to the piston-rod D′, secured to the piston F in the cylinder G, supported by the base G′.

G^2 is a drip-pipe from the cylinder G. Communicating with the bottom of the cylinder G is a pipe H, which communicates at its opposite end through the port H′ with the valve-chamber J. Communicating with the upper end of the cylinder G is a pipe K, the opposite end of which is also in communication with the valve-chamber J through the port K′. Communicating also with the valve-chamber J is a supply-pipe L, through which air is transmitted through the port L′ to the valve-chamber J to operate the gate D by actuating the piston-rod E and piston F. The exhaust-pipe M communicates with the valve-chamber J through the ports H^2 and K^2, and through the connections of the pipes H and K the air is exhausted to the atmosphere from the cylinder G when the gate D is respectively opened and closed. The pipe N has one end in communication with the valve-chamber J throughout the port Q, and the opposite end is connected to the exhaust-valve chamber N′, which is closed by the plunger N^2, connected to the lever N^3 on the shaft N^4, to which is also connected the lever N^5 in the path of the incoming carrier. The shaft N^4 is journaled in the cap N^6 on the terminal A. The terminal A is supported by the hollow column O, having the adjustable valve P for controlling the passage of air passing from the tube C, through the ports P′, into the tube P^2, secured to the column O, and the compressed air passes through said pipe P^2 back to the compressor, or, if desired, may be allowed to escape into the atmosphere. This valve P is used for regulating the pressure back of the carrier in the terminal A to discharge the carrier from the terminal when the gate D is open. If more pressure is required to discharge a carrier, the valve P is partially closed, which will create a greater pressure back of the carrier and less pressure in the pipe P^2 while the gate D is open.

With the parts in the position shown in Fig. 1, which is the normal condition of the apparatus, air from the pipe L is admitted into the valve-chamber J through the couplings L^2 and L^5, into the pipes L^3 N and port Q, into the valve-chamber in front of the piston R, moving and holding the said piston in the position shown in Fig. 1 against the tension of the spring R′ and in this position forming a communication from the supply-pipe L through the port L′, Fig. 3, with the valve-chamber J, and thence through the port H′ into the pipe H, communicating with the bottom of the cylinder G, and holding

the piston in its raised position, as shown in Fig. 1, to close the gate D.

In operation when a carrier is approaching the terminal A it engages with the lever N^5, connected to the shaft N^4, upon which is mounted the lever N^3, connected to the valve-plunger N^2, and as the lever N^5 is raised by the carrier the plunger N^2 is raised, allowing the air to escape from the pipe N through the ports N^7 and N^8 and releasing the air from the chamber J in front of the piston R. When the air is released, as above described, the spring R′ will force the pistons R, S′, and S^2, all fast on the shaft S, to the position shown in Fig. 5. In this position the air from the supply-pipe will be admitted to the top of the piston F in the cylinder G through the pipe K and port K′ and port L′ from the supply-pipe L and will force the piston down and open the gate D, which will move into the chamber D^2, the air in the lower end of the cylinder G escaping through the pipe H and port H′ into the valve-chamber J and out through the port H^2 into the exhaust-pipe M and out into the atmosphere, as the ports H′ and H^2 are in communication, as the piston S^2 has moved to the left beyond the port H′, and the carrier will be forced out of the terminal A onto the receiving-table T by the air-pressure in the terminal A against the bunter T′, supported by the stand T^2. As soon as the carrier has passed the lever N^5 said lever will drop by its own weight and move down the valve-plunger N^2 and close the ports N^7 and N^8, and the escape of the air from the pipe N will be stopped, so that the air entering the valve-chamber J through the pipe L^3 and valve L^4 will gradually fill the chamber J and force the piston R back to its normal position, (shown in Fig. 1,) again admitting the air from the pipe L through the port L′ into the chamber J and through the port H′ into the pipe H to the bottom of the cylinder G, when the piston F will be forced up and close the gate D and the parts will all assume the position shown in Fig. 1. As the carrier enters the terminal A the air compressed between the carrier and the gate D will gradually check the momentum of the carrier, and upon the opening of the gate D, as previously described, this compressed air will pass out into the atmosphere ahead of the carrier. The valve L^4 regulates the amount of air passing into the valve-chamber J within a given time. The pistons will not be forced back to their normal position (see Figs. 1 and 3) until a certain time has elapsed which will be sufficient to allow the carrier to pass out of the terminal A onto the table T. Without this regulating device the pressure might operate too quickly on the pistons and close the gate D before the carrier is delivered onto the table T.

The air-supply pipe L may be connected to the same source as the compressed air for the transmitting-tube or to an independent source, as desired. The compressed air in said pipe L is used to operate both the gate and the valve mechanism, which controls the admission and the exhaust of the air to and from the cylinder G.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

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 an apparatus of the character specified, a transmitting-tube, a gate closing said tube, a cylinder, a piston in said cylinder and connected to said gate, an air-supply, a communication between said cylinder and an air-supply, a valve controlling said communication, mechanism operated by the traveling carrier for operating said valve to release air-pressure from said cylinder for opening said gate, and means independent of the traveling carrier for closing said gate.

2. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, mechanism operated by the traveling carrier independently of air in the transmission-pipe and of the air compressed by the travel of the carrier for opening said gate, and means actuated independently of the traveling carrier for closing said gate.

3. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, a valve operated by compressed air for controlling said air-supply to close the gate, and mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for releasing said compressed air to open the gate.

4. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, a valve operated by compressed air for controlling said air-supply to close the gate, mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for releasing said compressed air to open the gate, and means independent of the traveling carrier for closing said gate.

5. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, a valve mechanism for controlling said air-supply and operated by compressed air to close said gate, and means operated independently of the air compressed by the travel of the carrier and acting on said valve mechanism for controlling said air-supply to open the gate.

6. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for closing said gate, mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for releasing said air-

pressure to open the gate, and means independent of the traveling carrier for closing said gate.

7. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for closing said gate, mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for releasing said air-pressure to open the gate, means actuated independently of the traveling carrier for closing said gate, and means for controlling the closing of said gate.

8. In an apparatus of the character described, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for opening said gate, means actuated independently of the traveling carrier for closing said gate, and means for controlling the closing of said gate.

9. In an apparatus of the character described, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for opening said gate, means actuated independently of the traveling carrier for closing said gate, and a valve controlling the flow of air for regulating the closing of said gate.

10. In an apparatus of the character described, a transmitting-tube, a gate closing said tube, a cylinder, a piston in said cylinder and connected to said gate, an air-supply for operating said gate, a communication between said cylinder and said air-supply, a valve controlling said communication, mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for operating said valve to release the air-pressure from one side of said piston and to admit it to the other side of said piston in said cylinder for opening said gate, and means independent of the traveling carrier for operating said valve to release the air-pressure which opened the gate and to admit air-pressure to the cylinder for closing said gate.

11. In an apparatus of the character described, a transmitting-tube, a gate closing said tube, a cylinder, a piston in said cylinder and connected to said gate, an air-supply for operating said gate, a communication between said cylinder and said air-supply, a valve controlling said communication, mechanism operated by the traveling carrier independently of the air compressed by the travel of the carrier for operating said valve to release the air-pressure from one side of said piston and to admit it to the other side of said piston in said cylinder for opening said gate, means independent of the traveling carrier for operating said valve to release the air-pressure which opened the gate and to admit air-pressure to the cylinder for closing said gate, and a valve controlling the flow of air for regulating the closing of said gate.

12. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, a cylinder, a piston in said cylinder and connected to said gate, a communication between said cylinder and said air-supply on each side of said piston, a valve-chamber located between said cylinder and said air-supply and in communication with said air-supply and said cylinder on each side of said piston, a valve mechanism in said valve-chamber controlling said communications and operated by said air-supply to admit air to said cylinder to close said gate, an outlet to the atmosphere for the air-pressure which operates said valve mechanism, a valve controlling said outlet, mechanism connected to said valve and located in the path of the traveling carrier and operated thereby to open the valve to allow the escape of said air-pressure which operates the valve mechanism, means for moving said valve mechanism to admit the air to the cylinder on the opposite side of said piston to open said gate, and means for closing said gate after the discharge of the carrier.

13. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, a cylinder, a piston in said cylinder and connected to said gate, a communication between said cylinder and said air-supply on each side of said piston, a valve-chamber located between said cylinder and said air-supply and in communication with said air-supply and said cylinder on each side of said piston, a valve mechanism in said valve-chamber controlling said communications and operated by said air-supply to admit air to said cylinder to close said gate, an outlet to the atmosphere for the air-pressure which operates said valve mechanism, a valve controlling said outlet, mechanism connected to said valve and located in the path of the traveling carrier and operated thereby to open the valve to allow the escape of said air-pressure which operates the valve mechanism, means for moving said valve mechanism to admit the air to the cylinder on the opposite side of said piston to open said gate, and means independent of the carrier for closing said gate after the discharge of the carrier.

14. In an apparatus of the character specified, a transmitting-tube, a gate closing said tube, an air-supply for operating said gate, a cylinder, a piston in said cylinder and connected to said gate, a communication between said cylinder and said air-supply on each side of said piston, a valve-chamber located between said cylinder and said air-supply and in communication with said air-supply and said cylinder on each side of said piston, a valve mechanism in said valve-chamber controlling said communications and operated by said air-supply to admit air to said cylinder to

close said gate, an outlet to the atmosphere for the air-pressure which operates said valve mechanism, a valve controlling said outlet, mechanism connected to said valve and located in the path of the traveling carrier and operated thereby to open the valve to allow the escape of said air-pressure which operates the valve mechanism, a spring for moving said valve mechanism to admit the air to the cylinder on the opposite side of said piston to open said gate, and means for closing said gate after the discharge of the carrier.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of August, A. D. 1899.

JAMES T. COWLEY.

Witnesses:
K. F. CHASE,
E. E. WESTERBERG.