No. 664,547. Patented Dec. 25, 1900.

J. McA. HECTOR.

PNEUMATIC DESPATCH CARRIER SYSTEM.

(Application filed Apr. 10, 1900.)

(No Model.) 2 Sheets—Sheet 1.

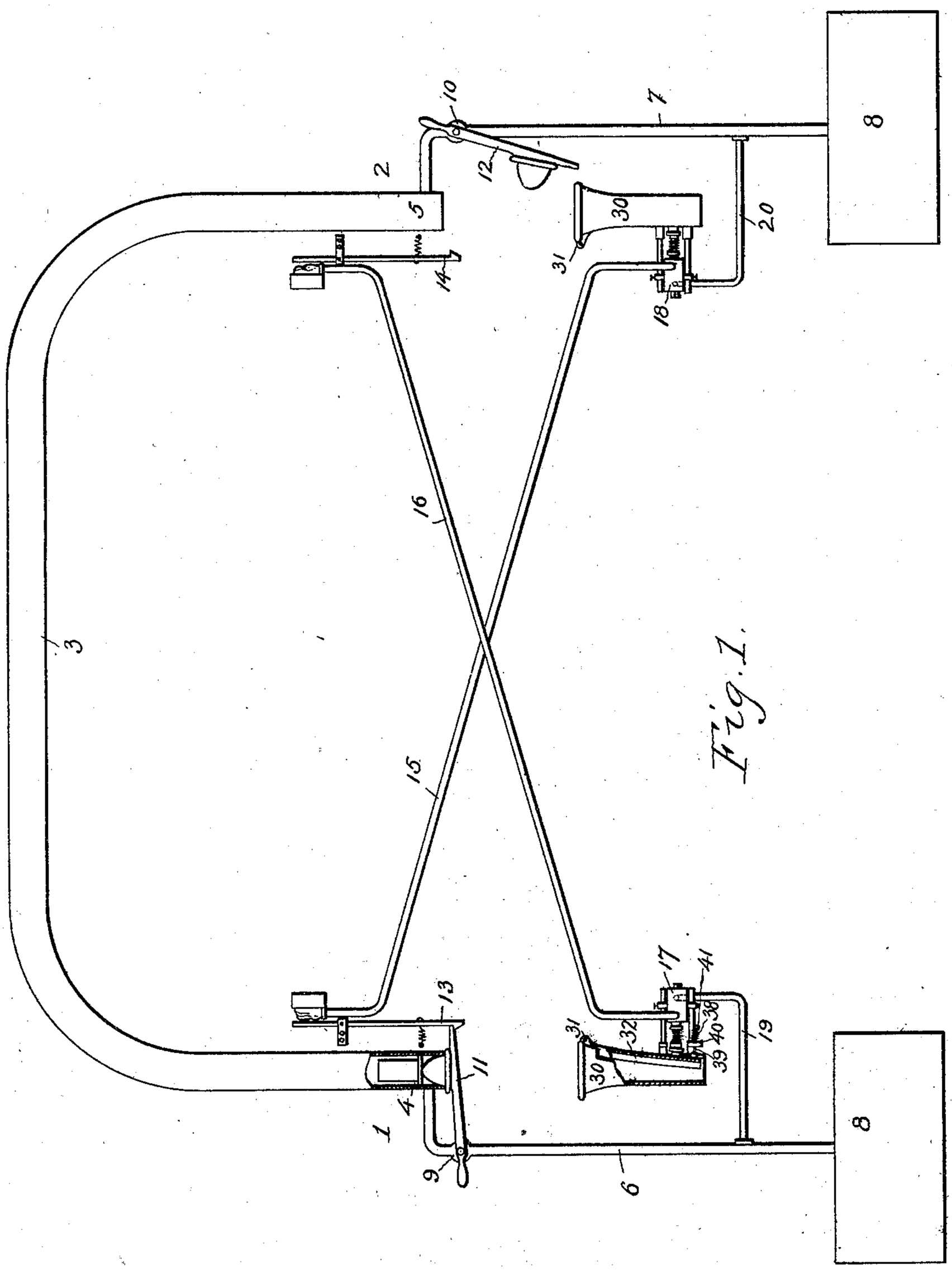

Fig. 1.

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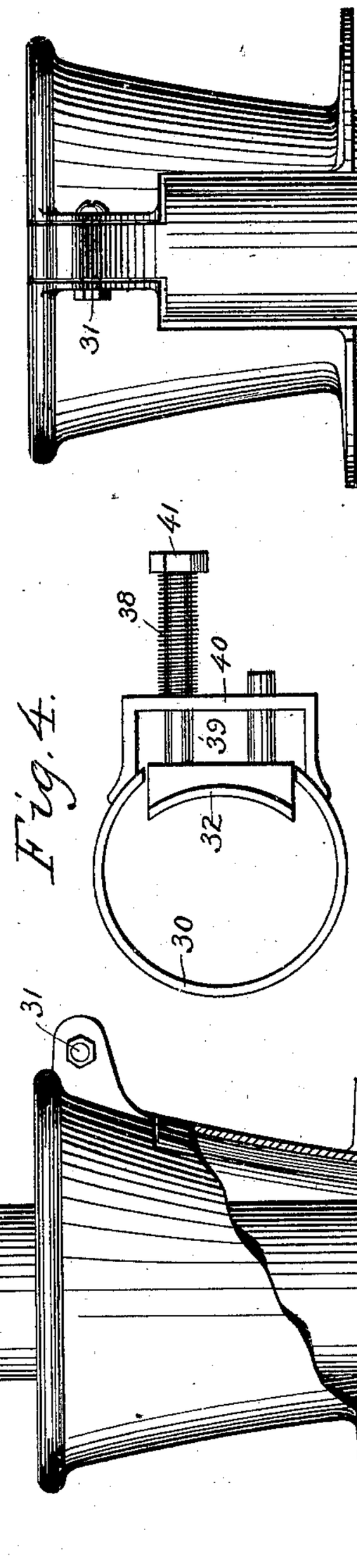

Fig. 4.

Fig. 1.

Fig. 3. on line a-a

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UNITED STATES PATENT OFFICE.

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PNEUMATIC-DESPATCH-CARRIER SYSTEM.

SPECIFICATION forming part of Letters Patent No. 664,547, dated December 25, 1900.

Application filed April 10, 1900. Serial No. 12,332. (No model.)

To all whom it may concern.

Be it known that I, JAMES McA. HECTOR, of Pittsburg, county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Pneumatic-Despatch-Carrier Systems, of which the following is a specification.

This invention has reference to a pneumatic-despatch carrier of the single-tube-pressure type in which the carriers are introduced into a chamber closed by a gate and, being acted on by compressed air, are propelled to the next station through a connecting-tube.

The invention relates more particularly to the mechanism employed in these systems for automatically opening the gate at one station and cutting off the pressure there by devices acted on by the incoming carrier at the other station. A familiar form of mechanism for accomplishing this purpose comprises a valve at one station connected with the pressure source and by a branch pipe with suitable devices at the other station, controlling a latch for holding the gate closed, the latter being connected with a cut-off valve to cut off the pressure to the chamber when the gate is opened. The valve is operated by the depression of a stem resting beneath a lever having a flat extended receiving-surface arranged in the path of the incoming carriers, which being thrown by the air-pressure forcibly onto the receiving-surface depresses the valve-stem momentarily and admits air to the branch pipe and operates the latch at the other station to open the gate there and cut off the pressure. In operation the incoming carriers, striking the receiving-surface with great force and falling in quick succession, rebound in the cabinet and make a great noise, which is a source of great objection and annoyance. Further, it has been found that by reason of the momentary action of the valve by the quick blow of the carrier but a limited amount of air is momentarily admitted to the branch pipe, which, while operating satisfactorily at short distances, will not operate where the stations are separated by long distances, so that the application of devices of this character is limited.

My invention consists of mechanism by which these objections are overcome, the operation of the same by the incoming carrier being noiseless and the valve being operated in such manner that the mechanism at the next station is effectively actuated notwithstanding the intervening distance.

The invention consists also in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a view in the nature of a diagram of two connected stations, showing my invention applied thereto. Fig. 2 is an elevation, on an enlarged scale, of the device, partly in section. Fig. 3 is a vertical sectional elevation on the line *a a* of Fig. 2. Fig. 4 is an end view of the receiving-casing for operating the valve.

Referring to the drawings, 1 and 2 represent two stations connected by a pipe 3, with its ends communicating, respectively, with receiving-chambers 4 and 5, into which the carriers are introduced for transmission from one station to the other, the incoming carrier passing through the chamber at the receiving-station. The chambers are connected by pipes 6 and 7 with any suitable source of air-pressure, (usually tanks 8,) and the admission of pressure to the chambers is controlled by valves 9 and 10, connected, preferably, with gates 11 and 12, adapted to close the bottoms of the chambers 4 and 5, the connection with the valves being such that when the gate is opened the valve will be closed, and vice versa. The gates are held closed by latches 13 and 14, adapted to be operated by air in the respective branch pipes 15 and 16, leading from the latches to the opposite stations and connected there with controlling-valves 17 and 18, formed, as will be more fully described hereinafter, to control the admission of air through pipes 19 and 20, connecting the valves with the source of air-pressure.

The valves at the two stations and their operating mechanisms are identical in construction and operation. Hence a description of one will suffice for both. Each comprises a cylindrical valve-casing 21, Fig. 2, divided into two chambers 22 and 23, connected by an opening 24, formed by an annular shoulder 25, against which a piston 26 is yieldingly held by a spring 27, encircling a piston-rod 28 and bearing at its ends against a head 29 on

the end of the rod and the end of the cylinder. Pipe 19 from the source of pressure enters chamber 23 through an opening 23× in the side of the cylinder, and chamber 22 is connected with the branch pipe 16, leading to the next station, so that when communication is established between the two chambers in the cylinder by the movement of the piston to uncover the opening 23× the air will pass through the valve and the branch pipe 16 to the next station and will operate the latch there and release the gate, and the latter falling the chamber will be opened and the supply of pressure cut off. The piston is so arranged with relation to the opening 23× that the slightest movement of the former will establish communication between the two chambers in the cylinder. The movement of the piston to permit the pressure to act through the branch pipe to operate the releasing mechanism at the next station is effected by the passage of the incoming carrier through a cylindrical receiving-casing 30, which constitutes the main part of my invention. These casings are arranged beneath the receiving-chambers 4 and 5 in the usual cabinets, and each is widened at its upper end to facilitate the entrance of the incoming carrier. At one side throughout the length the casing has formed in it a slot in which is pivoted on a horizontal axis 31 at the upper end a wing or lever 32, which gradually extends inward beyond the interior surface of the casing toward its lower end, forming a gradually-increasing obstruction in the opening through the casing. The lever is held in this position yieldingly by the head 29 on the end of the rod abutting against a boss 33, projecting from the side of the lever, the piston when the parts are in this position being seated against the annular shoulder and closing communication between the two chambers of the valve-casing. As a result of this construction when the lever is moved outward the boss, acting on the head 29, will push the rod and piston endwise and admit the air to branch pipe 16. The movement of the lever to cause this action is effected by the passage of the carriers through the casing, the end of the former being provided with an enlarged head or shoulder which fits snugly in the delivery end of the casing. In its forcible passage through the casing the enlarged head on the carrier begins to engage the lever at a point near its upper end and maintains contact therewith throughout the length of the casing, the lever being forced outward and the valve in this manner being operated for a prolonged period and communication between pipes 19 and 16 established from the moment the carrier forms contact with the lever to the time it leaves the delivery end of the casing. Under these circumstances full time is given for the air to act with full effect through pipe 16 on the releasing mechanism at the other station, so that the operation of the releasing mechanism is certain and prompt notwithstanding the distance between the stations. Further, it is seen that there is a certain and positive operation of the valve, for the reason that the carrier in its passage through the casing is held with certainty against the lever. It will be seen also that the fall of the carrier is practically noiseless by reason of the form of the receiver, its gradually-diminishing throat, due to the inclined lever, acting to arrest the rapid motion of the incoming carrier and preventing any objectionable rebound after it leaves the casing.

In order that in the event of the enlarged shoulder on the carrier becoming worn in its passage through the connecting-tubes and casing it may not interfere with the uniform and proper operation of the valve, I provide for adjusting the part so as to compensate for any wear. This is effected by providing the cylindrical casing of the valve with perforated lugs 35, embracing sustaining guide-rods 36, projecting outward from the side of the casing. Set-screws 37 are tapped through the lugs and bear on the rods and serve to hold the cylinder at the position desired. If the annular shoulder on the carrier becomes worn and fails to contact with the lever at the proper point, the latter may be adjusted inward farther to compensate for the wear by loosening the set-screws and shifting the valve-cylinder inward on the rods. The lever is acted on at its lower end by a spring 38, encircling a pin 39, projecting from the lever and extending through a lug 40, between which and a nut 41 the spring bears. It tends to pull the lever outward and maintains contact of the boss with the head on the piston-rod and further acts to prevent the lever from falling inward beyond its proper position.

The operation is as follows: The parts being in the position shown in Fig. 1, with both gates open and pressure cut off from the chambers and from the branch pipes, if it is desired to send a carrier from station 1 to 2 it is placed in chamber 4 and the gate 11 closed. This will act to admit the pressure to chamber 4 and will propel the carrier through pipe 3 to chamber 5, through which it will be propelled into the receiving-casing, and, acting on the lever therein, will open communication between pipe 20 and pipe 15, admitting air thereto, which will act on latch 13 and release the gate 11, and this falling will open the chamber and close the cut-off valve 9. It is seen, therefore, that carriers may be sent at will from either station to the other, the delivery at one station serving to automatically cut off pressure at the other station and open the gate there.

Having thus described my invention, what I claim is—

1. In a pneumatic-despatch-carrier system, the combination with a source of air-pressure, of a transmitting-tube in connection therewith and connecting two stations, a control-

ling-valve at one station, a releasing mechanism at the other station, a branch pipe connecting said controlling-valve with the releasing mechanism, a connection between the source of pressure and the valve independent of the branch pipe, a movable member operatively connected with the controlling-valve and arranged in the path of the incoming carrier, and a fixed device in proximity to said movable member and serving to prolong the engagement of the carrier with the movable member.

2. In a pneumatic-despatch carrier the combination of two stations, a transmitting-pipe connecting them, receiving-chambers at said stations, gates for closing the same, releasing mechanisms for the gates, a source of air-pressure connected with the receiving-chambers, branch pipes extending from each station to the releasing mechanism of the other station, valves controlling the admission of pressure to said branch pipes, direct connections between the source of pressure and the controlling-valves independent of the branch pipes, receiving-casings for the carriers independent of the transmitting-tubes, movable members in said receiving-casings, and means for maintaining the engagement of the carriers with said movable members to prolong the opening of the valves.

3. In a pneumatic-despatch carrier the combination with a valve for controlling mechanism at the next station, of the movable member operatively connected with the valve, and extending obliquely of the path of the incoming carrier in the general direction of the same, and movable at right angles thereto to open the valve.

4. In a pneumatic-despatch carrier the combination with the valve for controlling mechanism at the next station, of a cylindrical casing in which the incoming carrier is received, a movable member mounted in said casing in the path of the incoming carrier, and a connection between the valve and the movable member.

5. In a pneumatic-despatch carrier the combination with the valve-casing, of a source of pressure connected thereto, a branch pipe also connected with the casing and leading to the next station, a movable valve in the casing adapted to control communication between the pressure and the branch pipe, a stem connected with the valve, a cylindrical receiving-casing in which the incoming carrier is received, and a longitudinal lever pivoted in the casing near its upper end and extending obliquely therein in the path of the carrier, said lever being movable transversely of the casing in position to engage the valve-stem.

6. In a pneumatic-despatch-carrier system the combination with a receiving-casing, of a transversely-movable member extending longitudinally thereof and adapted to be engaged by the incoming carrier, a controlling-valve and a communication between said member and the valve.

7. In a pneumatic-despatch-carrier system the combination of the receiving-casing, a member therein movable transversely by the passage of the carrier through the casing, a valve-casing, a valve in said casing operatively connected with the movable member and means for adjusting the valve-casing bodily in the direction of the movement of the member.

8. In a pneumatic-despatch-carrier system the combination with the receiving-casing, of a longitudinal member therein movable transversely, a valve-casing sustained by the receiving-casing and adjustable in the direction of movement of said member, a movable valve in the valve-casing, and connections between the longitudinal member and said valve.

9. In a pneumatic-despatch-carrier system the combination with the transmitting-tube of a receiving-casing disconnected therefrom and independent thereof, a longitudinal lever pivoted at its upper end to the receiving-casing and movable transversely therein and extending obliquely in the path of the carrier, and a valve adapted to be operated by the movement of said lever.

10. In a pneumatic-despatch-carrier system the combination of a transmitting-tube, a receiving-casing independent thereof in position to receive the incoming carrier, and a valve adapted to be operated by the passage of the carrier through the casing.

11. In a pneumatic-despatch-carrier system the combination with the receiving-casing of a movable member therein adapted to be engaged by the incoming carrier, a valve in position to be operated by the movement of said member, and means for adjusting the position of the member with respect to the casing; whereby the wear of the carrier may be compensated for by the adjustment of said member.

In testimony whereof I hereunto set my hand, this 3d day of April, 1900, in the presence of two attesting witnesses.

JAMES McA. HECTOR.

Witnesses:
FRANK H. HALL,
W. R. KENNEDY.