No. 749,152. PATENTED JAN. 12, 1904.

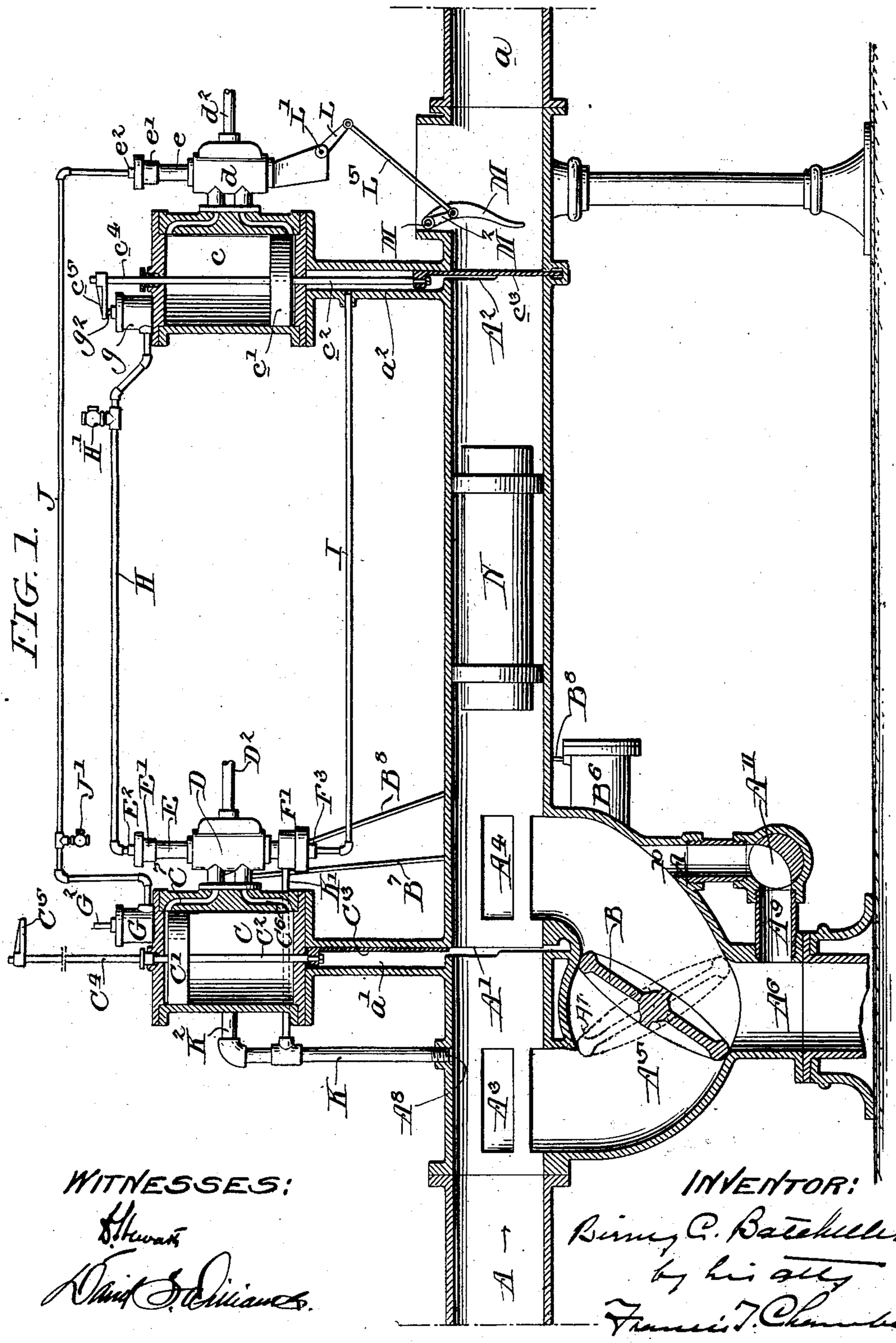
B. C. BATCHELLER.

PNEUMATIC DESPATCH SYSTEM.

APPLICATION FILED APR. 17, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.



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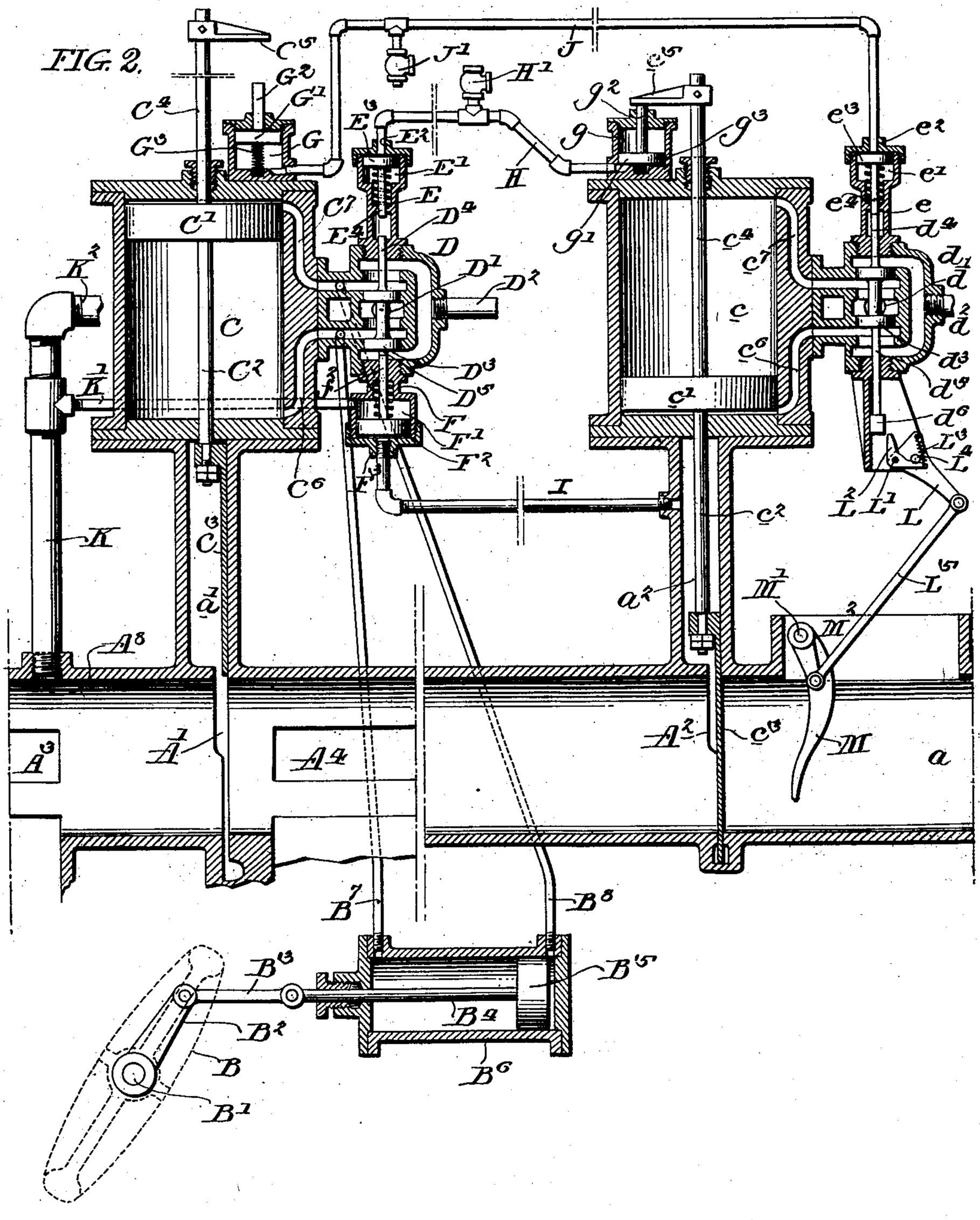
NO MODEL. 2 SHEETS—SHEET 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

BIRNEY C. BATCHELLER, OF PHILADELPHIA, PENNSYLVANIA.

PNEUMATIC-DESPATCH SYSTEM.

SPECIFICATION forming part of Letters Patent No. 749,152, dated January 12, 1904.

Application filed April 17, 1901. Serial No. 56,177. (No model.)

To all whom it may concern:

Be it known that I, BIRNEY C. BATCHELLER, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Pneumatic-Despatch Systems, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to pneumatic-despatch systems, and particularly to that part of such a system which may be described as the receiver—that is to say, the mechanism for delivering the carrier at the end of its travel.

The object of my invention is to provide a simple and efficient device for receiving and delivering the carrier; and my invention consists in various features of construction and combination of parts, which will be best understood as described in connection with the drawings in which they are illustrated, and in which—

Figure 1 is a sectional elevation of my improved receiving apparatus in what I believe to be its best form; and Fig. 2 is a similar sectional elevation, on a larger scale, showing additional parts not illustrated in Fig. 1.

A indicates the pneumatic-despatch tube, in the end of which are formed gated openings A' and A^2, placed at such a distance apart as to leave ample room between them for the reception of a carrier.

a indicates the delivery end of the tube, through which the carriers are delivered after the second gate is raised to permit their exit.

A^3 and A^4 indicate openings leading into the tube on each side of the gated passage A' and connecting through a yoke-like conduit A^5 with the air-outlet pipe A^6.

A^7 indicates a segmental gate-bearing at the top of the yoke-like passage A^5, the purpose of which will be hereinafter described.

A^8 is an internally-threaded opening leading from the pipe A on the front side of the gateway A'.

A^9 A^{10} are pipes leading from the pipe A^6 to a portion of the yoke-like connection A^5 in permanent communication with the opening A^4.

A^{11} indicates a valve by which the passage through the pipes A^9 A^{10} may be regulated in size.

B indicates a gate, the purpose and function of which is to alternately close and open the passages A^3 and A^4, cutting off the communication of one passage with the air-escape pipe A^6 and connecting the other therewith. As shown, it is made in the general form of a damper, the upper end of which works on the segmental bearing A^7, the gate being secured to a shaft B', having also secured to it a lever-arm B^2, which by means of a link B^3 is connected to a piston-rod B^4, secured to a piston B^5, working in a cylinder B^6, B^7, and B^8, indicating pipes leading to the opposite ends of the cylder and connecting with the ports C^6 and C^7, to be hereinafter described. It is obvious, of course, that the motion of the piston B^5 will move the gate from the position shown in full lines in Fig. 1 to the alternative position shown in dotted lines.

C and *c* are cylinders, C' and c' pistons working therein and connnected through piston-rods with the gates C^3 and c^3, arranged to open and close the gateways A' A^2 and working in the chambers a' and a^2. Each of the pistons has also attached to it an upwardly-extending piston-rod, (indicated at C^4 and c^4,) and each of these rods, as shown, has attached to its end a laterally-extending finger. (Indicated at C^5 and c^5.) The ports of the cylinders C and *c* are indicated at C^6 C^7 and c^6 c^7, said ports communicating with valve-casings D *d*, into which lead the conduits D' d' for fluid under pressure, preferably compressed air, and from which lead the exhaust-pipes D^2 d^2.

D^3 and d^3 indicate piston-valves working in the valve-casing and arranged, as shown, so as to alternately connect the ports with the admission and exhaust pipes.

The valve D^3 has at its upper end a spindle D^4 and at its lower end a short stud D^5, the valve d^3 having a similar spindle d^4 at its upper end, but an extended spindle d^5 at its lower end terminating in a rectangular block. (Indicated at d^6.) Neither valve is, as shown, positively connected with valve-actuating mechanism, and both are intended to retain the po-

sitions to which they may be moved by frictional contact with the portions of the valve-casing in which they move.

To the top of both valve-casings D and d are attached heads (indicated at E and e) having formed in them cylinders E′ and e' provided with openings E^2 e^2 in their tops to receive the ends of pipes J and H.

E^3 and e^3 indicate pistons working in the cylinders and having piston-rods E^4 e^4, arranged in line with and adapted to act upon the valve-spindles D^4 d^4, the stroke of the pistons E^3 e^3 being sufficient to enable the spindles E^4 e^4, acting on the spindles D^4 d^4 to press the valves D′ d' down to the position occupied by the valve D′ in Fig. 2. The pistons E^3 e^3 are normally pressed up to the top of their cylinders by springs, as indicated, and in their uppermost positions they permit the valves D^3 d^3 to be moved upward with respect to the valve d^3 in Fig. 2.

To the lower end of the valve-casing D is secured the head F, having formed in it the cylinder F′, in which works the piston F^2, normally held down by a spring F^3, indicating the opening in the lower end of the cylinder for the reception of the end of the pipe I.

f^2 is a spindle attached to the piston F^2 and adapted to act upon the stud D^5 of the valve D^3, the lower position of the piston permitting the valve to assume the position indicated in Fig. 2, while the upward stroke of the piston moves the valve to its upper position, that corresponding to the position shown as to the valve d^3.

G and g are cylinders secured, as shown, to the tops of the cylinders C c, said cylinders having working in them the pistons G′ g', normally pressed up by the springs G^3 g^3 G^2 g^2, indicating spindles attached to the pistons and extending through the tops of the cylinders, the ends of the spindles being in line with the fingers C^5 c^5, so that when the fingers are moved down they will depress the pistons indicated with reference to the piston g' in Fig. 2.

H is a pipe connecting the lower end of the cylinder g with the upper end of the cylinder E′, H′ indicating a non-return valve connected with said pipe.

J is a pipe connecting the lower end of the cylinder G with the upper end of the cylinder e', J′ indicating a non-return valve connected with this pipe.

I is a pipe connecting the chamber a^2, which is in free communication with the gateway A^2, with the pipe A, with the lower end of the cylinder F′.

K is a pipe connecting with the tube A through the opening A^8 and having, as indicated, a connecting-pipe K′, by which it is placed in communication with the upper end of the cylinder F′.

K^2 is another branch of the pipe K, which through branches (not shown) I place in connection with the admission-passages D′ d' of the valve-casings already described.

L is a rock-lever pivoted on an extension of the lower head of the valve-casing d and having pivoted upon it at l' the smaller bell-crank lever, (indicated at L^2,) which is normally held in the position indicated in Fig. 2 by the spring L^3 holding one arm against the stop L^4. The rock-lever L is actuated through a link L^5 and lever-arm M^2 by the finger M, which projects into the outer end a of the tube A and is attached to the same rock-shaft M′ as the lever M^2, the normal position of the finger being that shown in the drawings and the finger being capable of turning outward under the influence of an outwardly-passing carrier.

N, Fig. 1, indicates a carrier in the act of entering the space between the gates.

The operation of the device is as follows: The normal position of the parts is that indicated in both figures of the drawings, the gate C^3 being open and the gate c^3 closed and the gate B being in the position indicated in full lines in Fig. 1. The air passing through the pipe A therefore passes the gateway A′ and finds its way into the exhaust-pipe A^6 through the opening A^4, a carrier, such as N, moving with considerable speed in the direction of the air after it passes the gateway A′ and opening A^4, compresses by its impetus the air in the portion of the tube lying between the side opening A^4 and the gate c^3. Prior to this compression of the air the pressure of the cylinder F′ on both sides of the piston F^2 is equal, as both ends of the cylinder are connected with the air-tube, and the pressures being equal the piston F^2 is held in its lowermost position by the action of the spring. When, however, the air is compressed in the dead end of the tube the increased pressure is communicated through the chamber a^2 and pipe I to the lower end of the cylinder F′ and the piston F^2 moved up to the end of its stroke, its spindle f^2 pressing the valve D^3 up, so as to place the lower end of the cylinder C in communication with the exhaust of the upper end in communication with the entrance-passage D′ at the same time the front end of the cylinder B^6, which through the pipe B^7 is in communication with the port C^6, is placed in communication with the exhaust of the rear end of the cylinder, which through the pipe B^8 communicates with the ports C^7 is placed in communication with the admission-port. Consequently the piston C′ moves downward, closing the gate C^3, and the piston B^5 in the cylinder B^6 moves forward, shifting the position of the gate B to that indicated in dotted lines in Fig. 1, this shifting of the gate cutting off the opening A^4 from the outlet-pipe A^6 and connecting the opening A^3 therewith, so that the closing of the gate C^3 does not interfere with the movement of air through the tube A. As the piston C′ moves downward

the finger C^5, moving with it, at the end of its stroke acts upon the spindle G^2, pressing the piston G′ down and forcing the air in the cylinder G through the pipe J into the head of the cylinder e'. The pressure of the air forces down the piston e^3, the spindle e^4 of which, acting on the spindle d^4 of the valve h^3, presses it down, so as to place the upper end of the cylinder c in communication with the exhaust and the lower end in communication with the entrance port for the compressed air. The piston c' is therefore moved upward, opening the gate c^3, the upward movement of the finger c^5 permitting the piston g' to move up in its cylinder g. The gate c^3 being opened, sufficient compressed air is permitted to pass into the end of the tube through the opening A^4, the gate passing from the pipe A^6 through the pipes A^9 and A^{10}, which last-mentioned pipes constitute a by-pass round the gate B until sufficient air being permitted to escape to move the carrier N out of the space between the gateways into the delivery end a of the tube. As the carrier passes the finger M it moves said finger upward, the spring-supported lever L^2 moving below the head d^6 of the spindle d^5, and as soon as the carrier has cleared the finger it moves back to its normal position, as shown in the drawings, the corresponding movement of the connected parts causing the end of the lever L^2 to press the block d^6 and spindle d^5 upward to the position shown in Fig. 2, said spindle of course carrying the valve d^3 with it to the position also indicated. The shifting of the valve admits the air to the upper end of the cylinder c, causing the piston c' to move down and the gate c^3 to close. The end of the downward stroke of the piston c' causes its finger c^5 to press down on the spindle g^2 of the piston g', forcing the air in the cylinder g through the pipe into the head of the cylinder E′, pressing down the piston E^3, which through its spindle E^4 forces the valve D^3 to the position shown in Fig. 2, admitting the compressed air to the bottom of the cylinder C and causing the piston C′ and gate C^3 to move up, at the same time the front end of the cylinder B is placed in communication with the admission-port and its rear end in communication with the exhaust-port, so that the piston B^5 moves backward and the gate B is restored to its normal position, all parts of the apparatus being now ready for the reception of another carrier.

My device is capable of many and great alterations without departure from the essential features of my invention, the most essential feature of which is the connection of the dead-space in front of the second gate with controlling mechanism which will be set in operation by the compression of air due to the advance of a carrier, and which controlling mechanism will set in operation power-actuated mechanism for shifting the position of the gates, closing the front gate and opening the rear gate.

A further important feature of my invention lies in causing the exit of the carrier from the tube to set in operation controlling devices by which the power-actuated mechanism will restore the gate to normal position, and a third and further important feature of my invention is the provision of the two outlet-openings on each side of the front gate and the use of a gate for alternately opening and closing said openings, so that while the air-current normally passes beyond the front gate it will as soon as said gate is closed pass from the tube in advance of said gate. This feature is of use in preventing the carrier from being thrown back beyond the front gate by the resilient action of the compressed in front of it.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pneumatic-despatch system, the combination with a pneumatic tube of gates for closing the same arranged a sufficient distance apart to give ample space between them for a carrier, mechanism for opening and closing said gates actuated by a power other than the compression of air by an advancing carrier, controlling devices whereby the gate-actuating mechanisms are made to operate in different directions, means for actuating said controlling devices to successively close the first and open the second gate set in operation by the approach of a carrier to the second gate, means for actuating the controlling devices to successively close the second and open the first gate set in operation by the passage of a carrier beyond the second gate, an air-outlet passage having connections A^3 A^4 with the tube on both sides of the first gate, a gate whereby said connections are alternately opened and closed, gate-actuating mechanism for moving said gate and controlling devices for shifting said mechanism connected with the actuating mechanism of the first tube-gate and arranged to connect the opening A^4 in the rear of the tube-gate with the air-outlet passage when the said gate is open and to connect the opening A^3 in advance of said gate when it is closed.

2. In a pneumatic-despatch system, the combination with a pneumatic tube of gates for closing the same arranged a sufficient distance apart to give ample space between them for a carrier, mechanism for opening and closing said gates actuated by a power other than the compression of air by an advancing carrier, controlling devices whereby the gate-actuating mechanisms are made to operate in different directions, means for actuating said controlling devices to successively close the second and open the first gate set in operation by the passage of a carrier beyond the sec-

ond gate, an air-outlet passage having connections A^3 A^4 with the tube on both sides of the first gate, a gate whereby said connections are alternately opened and closed, gate-actuating mechanism for moving said gate, controlling devices for shifting said mechanism connected with the actuating mechanism of the first tube-gate and arranged to connect the opening A^4 in the rear of the tube-gate with the air-outlet passage when the said gate is open and to connect the opening A^3 in advance of said gate when it is closed and a by-pass connecting the outlet-passage with opening A^4 around the gate in said air-passage.

3. In a pneumatic-despatch system, the combination with a pneumatic tube of gates for closing the same arranged a sufficient distance apart to give ample space between them for a carrier, cylinders C and *c* for opening and closing said gates, valves for alternately connecting the ends of said cylinders with a source of fluid under pressure and with an exhaust, means for shifting the controlling-valve of the first gate-cylinder to position to close said gate connected to be set in operation by an advancing carrier, means for shifting the controlling-valve of the second gate-cylinder to position to open said gate connected to be set in operation by the closing of the first gate, means for shifting the last-mentioned valve to position to close the second gate arranged to be set in operation by the passage of the carrier beyond the second gate, means for shifting the valve of the first gate-cylinder to position to open said gate arranged to be actuated by the closing of the second gate, an air-exit passage having openings A^3 A^4 into the tube on each side of the first gate, a gate to alternately open and close said openings and means for moving said gate to connect the opening A^3 when the tube-gate is closed and the opening A^4 when the said gate is open, said means being controlled by the movements of the controlling-valve of the gate-cylinder.

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