

(No Model.)

5 Sheets—Sheet 1.

E. A. FORDYCE.
PNEUMATIC DESPATCH APPARATUS.

No. 570,160.

Patented Oct. 27, 1896.

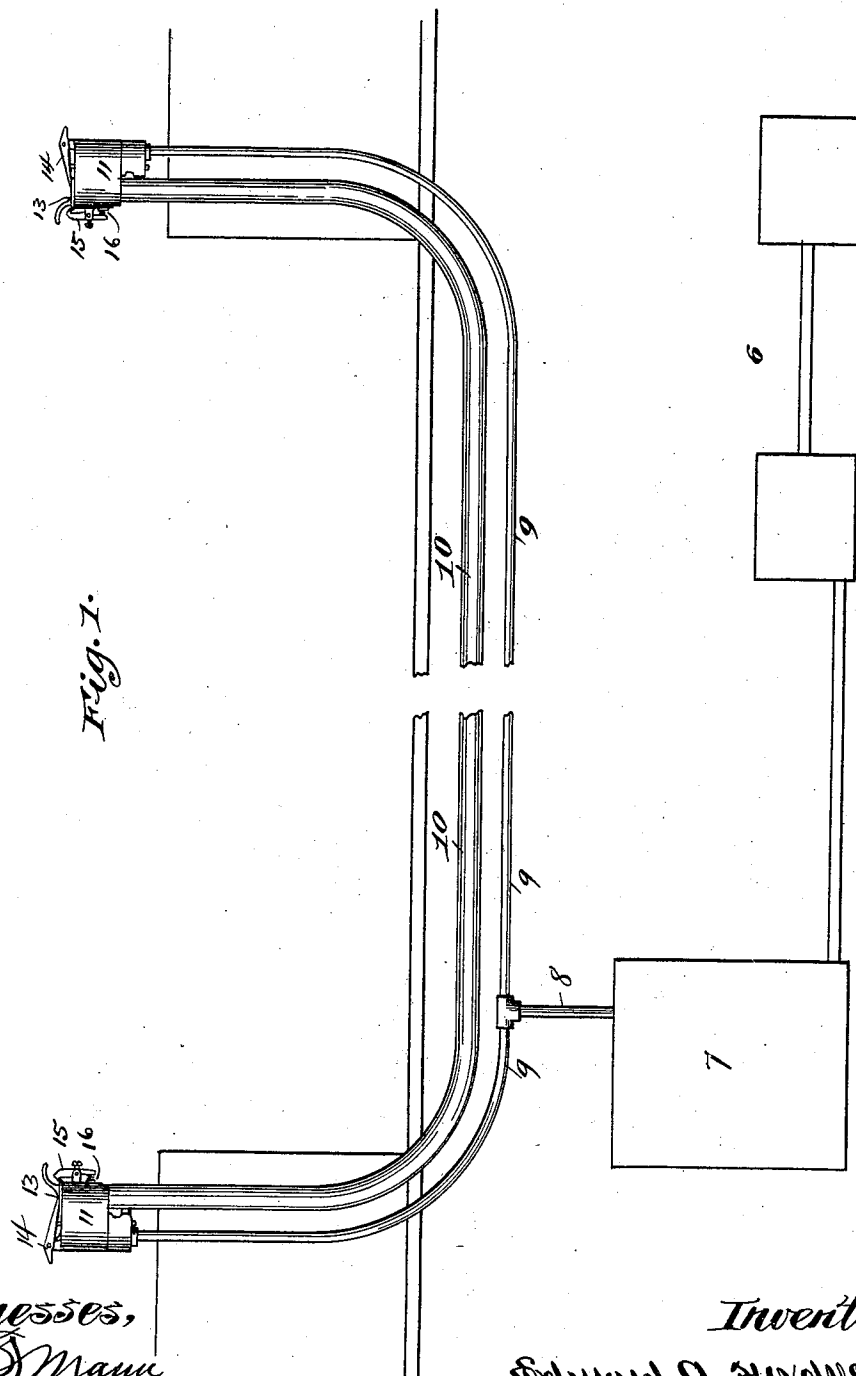


Fig. 1.

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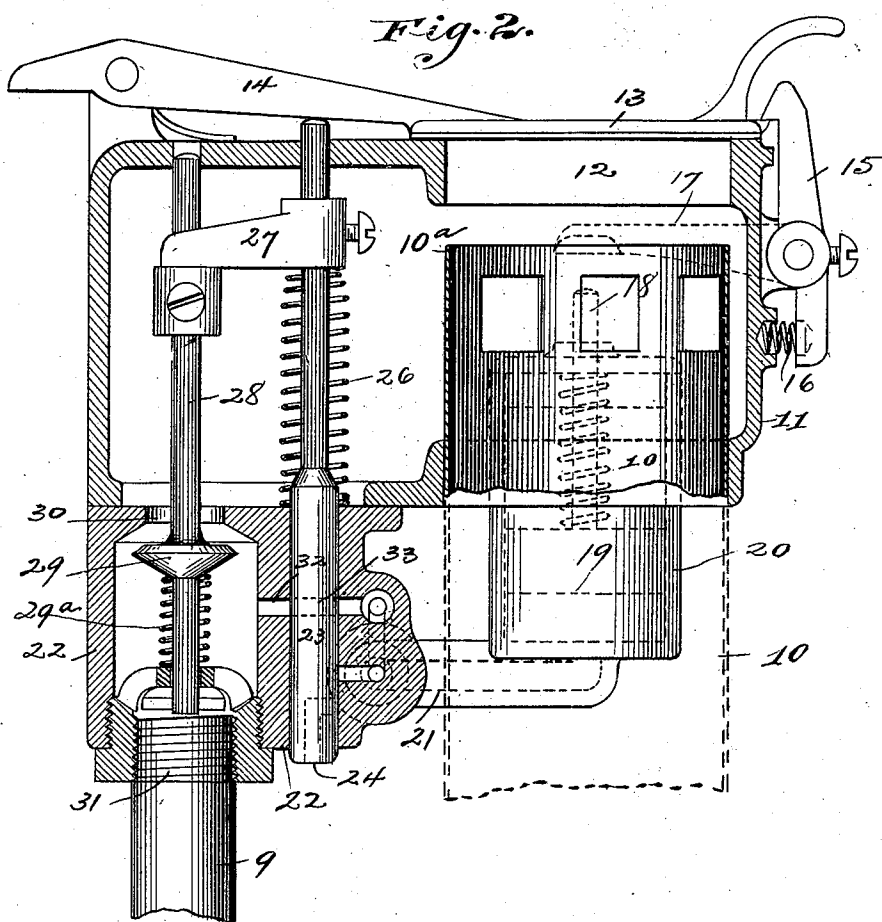
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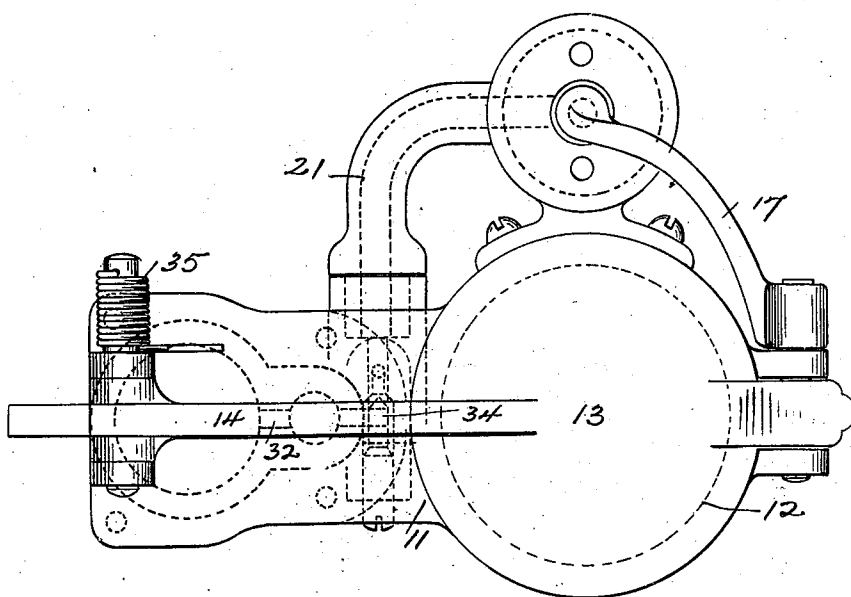
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Fig. 3.



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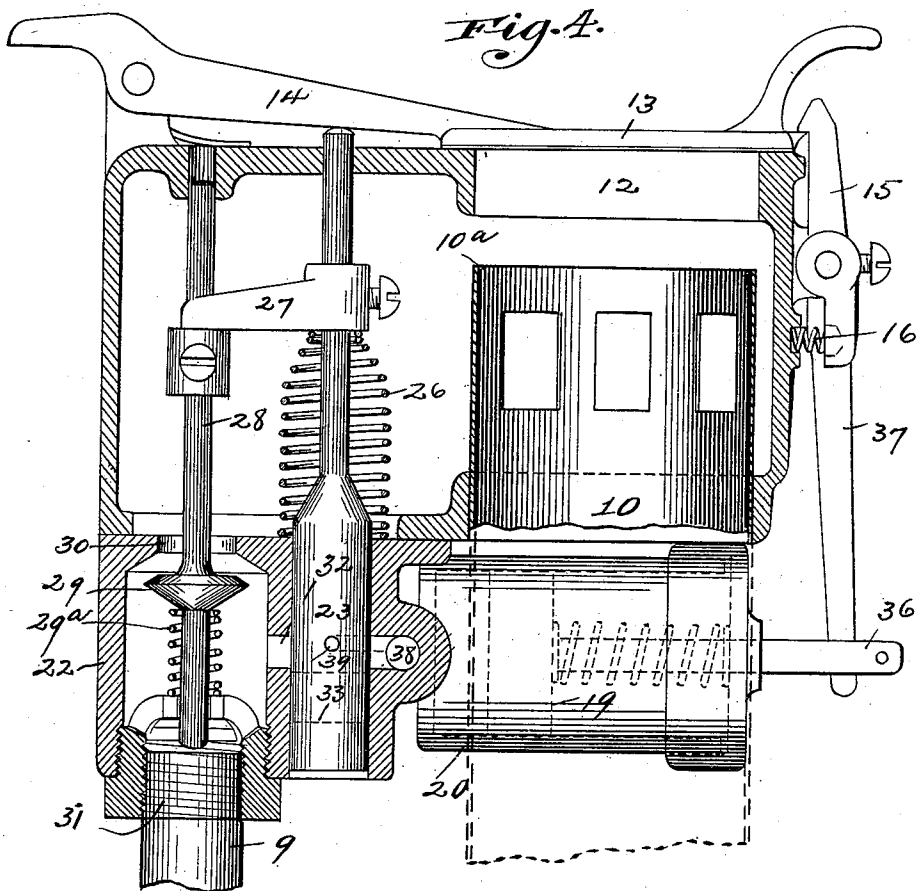
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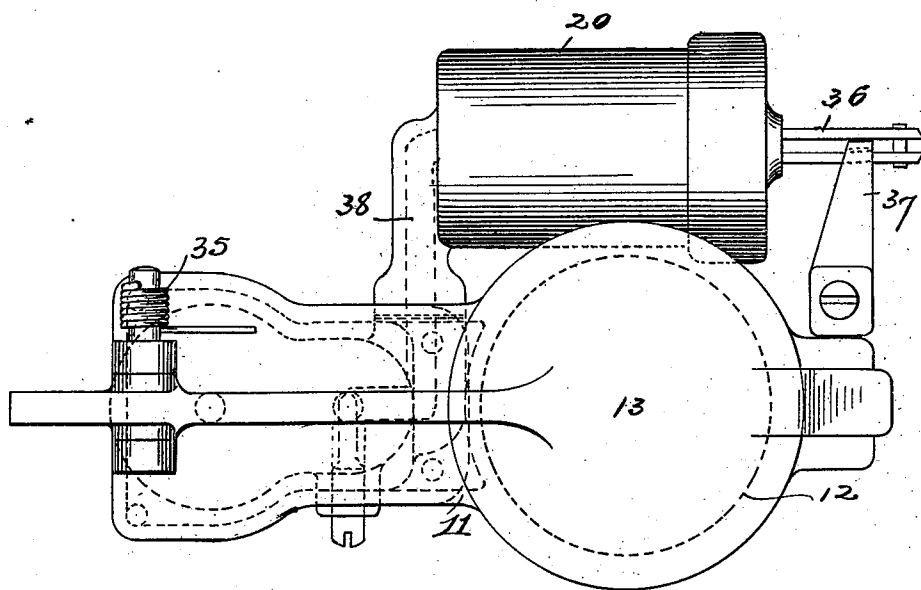
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Fig. 5.



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UNITED STATES PATENT OFFICE.

EDMOND A. FORDYCE, OF CHICAGO, ILLINOIS.

PNEUMATIC-DESPATCH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 570,160, dated October 27, 1896.

Application filed July 29, 1895. Serial No. 557,497. (No model.)

To all whom it may concern:

Be it known that I, EDMOND A. FORDYCE, of Chicago, Illinois, have invented certain new and useful Improvements in Pneumatic-Despatch Apparatus, of which the following is a specification.

This invention relates to that class of pneumatic-despatch apparatus in which a motor fluid under pressure, such as air, is used for the transmission of carriers through a tube from one station to another.

My invention relates particularly to a terminal to be used upon the end of the line and which is adapted both for the receiving and despatching of the carriers.

In the construction of a system of this character there is provided a despatch-tube which extends between two distant points or stations between which communication is desired. Each end of this pipe is preferably provided with a terminal, the two terminals being of like construction, so that carriers may be despatched either way. There is also provided, in conjunction with the system, an air-compressor, a reservoir for compressed air, pipes for conveying the compressed air or motor fluid to the respective ends of the despatch-tube, valves for controlling the admission of air to the end of the tube, and a door or cover which may be opened to admit the carrier, with provisions for retaining the door closed while the carrier is being transmitted from that end of the line. The door may be left open, but is not necessarily so, when a carrier is being despatched from that end of the line at which the door is located.

In the accompanying drawings, Figure 1 is a diagrammatic view showing the arrangement of a system of this character. Fig. 2 is a sectional elevation of the terminal. Fig. 3 is a plan view of the preferred construction of terminal. Figs. 4 and 5 are respectively a sectional elevation and a plan of a terminal of a modified construction.

In the drawings, let 6 represent a compressor; 7, an air tank or reservoir; 8, a supply-pipe, and 9 the branches thereof extending to the respective ends of the line.

10 represents the main despatch-tube. Referring now to Figs. 2 and 3, one end of this despatch-tube (marked 10^a) is shown as inclosed by a terminal, the casing or shell of

which (marked 11) may be a hollow casting of rectangular form and provided with an inlet-aperture 12, to which a hinged door or lid 13 is applied. This door or lid is pivoted upon the arm 14, and is provided with a catch 15, having an actuating-spring 16, normally adapted to hold the catch in engagement with the edge of the door.

To the pivot of the catch is rigidly secured an arm 17, which projects to one side of the terminal casing 11 in position to impinge a valve-stem 18, connected with a piston or slide-valve 19, working within the chamber formed by the cylinder-casing 20. The lower end of the chamber formed by this casing is in communication with a valve-chamber formed in a valve-casing 22, depending from or integrally constructed with the casing 11, through a pipe or passage 21.

23 represents a slide-valve having a port 24 open at one end to the atmosphere and at the other end adapted to register with the end of the passage 21 when the valve-stem 23 is raised to its normal position, which it attains by reason of the spring 26. The upper end of this valve-stem projects through the top wall of the casing and is adapted to be acted upon by the arm 14 when the lid is being moved toward its closed position. An arm 27, secured to the valve-stem 25, has a bearing on the valve-stem 28, said valve-stem controlling the valve 29, adapted to close a port or passage 30 in a division-wall or diaphragm between the air-inlet (indicated at 31) and the interior of the casing 11. A transverse port or passage 32, formed in the wall of the casing 22, and the passage 33, adapted to register therewith and formed in the valve 23, establishes communication in one position of the ports between the chamber below the valve 29 and the passage-way 21. The size of this opening may be varied in order to control the volume of the current of the air moving through the passage, and a manual adjustable plug-valve 34 is fitted in the casing 11.

The operation of the mechanism thus far described is as follows: Suppose a carrier has been placed in the end of the tube inclosed by the casing 11, door 13 being open for that purpose. The door is then closed and engaged by the catch 15. The closing of the door places the valve 23 in the position shown

in Fig. 2, and the arm 27 forces the valve 29 off its seat. Air is thus admitted directly through the inlet 31, to which one end of the pipe 9 is connected, to the chamber above the carrier, and into the open end 10^a of the despatch-tube, and the carrier is despatched by the pressure of the motor fluid. The air finds its freest escape through this large opening, but a portion of the air passes through the ports 32 and 33 and through the passage 21 below the piston 19, thus gradually raising said piston, and when its stem 18 comes in contact with the arm 17 it will rock said arm, which, being secured with the pivot of the catch 15, will release said catch, compressing its spring 16. The catch 15 being released, the spring 35 raises the arm 14 and opens the door. This releases the valve 23, and the spring 26 lifts said valve, cutting off the passage of air through the ports 32 and 33 and permits the valve 29 to be raised by its spring 29^a, thus cutting off the passage of air through the port 30. The raising of valve 23 puts the port 24 in communication with the passage 21 and the air beneath the piston 19 escapes gradually to the atmosphere. Obviously the time of the release of the catch is determined by the volume of air passing through the ports 32 33 to the chamber below the piston 19. With a short line the passage will be left unobstructed, so as to obtain a quick release. With a long line the valve 34 will be closed correspondingly, so that the action will be slow, thus giving time for the carrier to traverse the length of the line.

The construction shown in Figs. 4 and 5 is only slightly modified. The piston-chamber in this instance is arranged horizontally and the piston-stem 36 is bifurcated to receive an arm 37, projecting from the pivot of the catch. The space below the piston is in communication through a passage 38 with the valve-chamber of the valve 23. The latter is provided with a straight port, as in the former construction, but the escape-port, in this instance marked 39, is carried laterally through the side of the valve and casing and is controlled by the manual adjustable plug, as in the former instance. When the lid is closed, as shown in Fig. 4, the air passes, as in the former case, through the port 30 and into the space beneath the carrier. Normally the piston is held at the outer limit of its movement by air compressed within the piston-chamber, thus holding the lid closed, and the gradual leakage of air through the passage 38 and the escape-opening 39 permits the spring to return the piston to the inner limit of its movement, thus releasing the catch and permitting the door to open under the action of its spring. This releases the springs controlling the valves 23 and 39 and allows them to shift so as to allow the motor fluid to pass to the piston-chamber by way of the ports 32 33 and passage 38, thus forcing the piston out and placing the latch in position to engage the door when it is closed.

The carrier may be received from either end of the line through the terminal above described whenever the door is unlatched, the force being sufficient to discharge the carrier upwardly through the end of the tube. Of course the discharge may be arranged horizontally or in other positions, the vertical position being represented for convenience of illustration.

This apparatus is chiefly intended for use in the transmission of messages which may be inclosed in a carrier of a form adapted to the form of the despatch-tube and to the size or shape of the article to be transmitted. The system is not so rapid as those working on the principles of the exhaust, but it has an advantage over the exhaust system in this, that the air is only used while the carrier is being transmitted, whereas in the exhaust system a continuous current of air must be induced through the tube.

It will be observed that this system is entirely automatic, except in the deposit of the carrier and the manual closing of the door, the valves controlling the locking mechanism operating without manual intervention, and consequently reducing the labor of an attendant to a minimum.

Obviously, therefore, many of the details of construction may be varied, and I do not intend to limit my invention thereto, except as hereinafter pointed out in the claims.

I claim—

1. In a pneumatic-despatch-tube apparatus, the combination with a despatch-tube, of a terminal therefor to which air under pressure is admitted, an opening in the casing of the terminal and a door adapted to said opening, a catch for said door, a pressure-operated piston for controlling the catch and suitable air passages and valves whereby the motor fluid is controlled to despatch the carrier and to release the latch, substantially as described.

2. In a pneumatic-despatch apparatus, the combination with a despatch-tube, of a terminal therefor communicating with the opening of the tube and having an aperture in its wall, a door adapted to said aperture, a catch for holding the door closed, a motor-fluid-supply pipe communicating with the interior of the casing, a pressure-chamber, a piston working therein and adapted to control the catch, and valves for controlling the air-passages whereby the air may be admitted to the despatch-tube and to the piston-chamber and an escape port or passage for relieving the piston-chamber of pressure, substantially as described.

3. In a pneumatic-despatch apparatus, the combination with a despatch-tube, of a terminal therefor communicating with the opening of the tube and having an aperture in its wall, a door adapted to said aperture and carried by a hinged arm, a catch for holding the door closed, a motor-fluid-supply pipe communicating with the interior of the terminal, a valve for controlling said pipe and having

a projecting valve-stem, a pressure-chamber, a piston working therein, an air-passage communicating with the motor-fluid-supply pipe below its valve, a valve in said passage having a projecting valve-stem and adapted to be moved by the closing of the door, a piston working in the pressure-chamber and adapted to control the catch and an escape port or passage for relieving the pressure-chamber of pressure, substantially as described.

4. In a pneumatic-despatch apparatus, the combination with a despatch-tube, of a terminal therefor, a motor-fluid-supply pipe communicating with the interior of the terminal, a valve for controlling the passage of the supply-pipe, a catch for locking the door in the

closed position, a pressure-chamber having a working piston therein adapted to operate the catch in one direction, an air-passage between the motor-fluid-supply pipe and the pressure-chamber, a valve controlling said passage, said valve being adapted to be moved in one direction by the closing of the door, an escape-aperture in the passage-way for relieving the pressure-chamber and springs for returning the valves and piston at the close of each actuation, substantially as described.

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