

T. BEMIS.

PNEUMATIC DESPATCH APPARATUS.

APPLICATION FILED MAY 28, 1908. RENEWED OCT. 28, 1912.

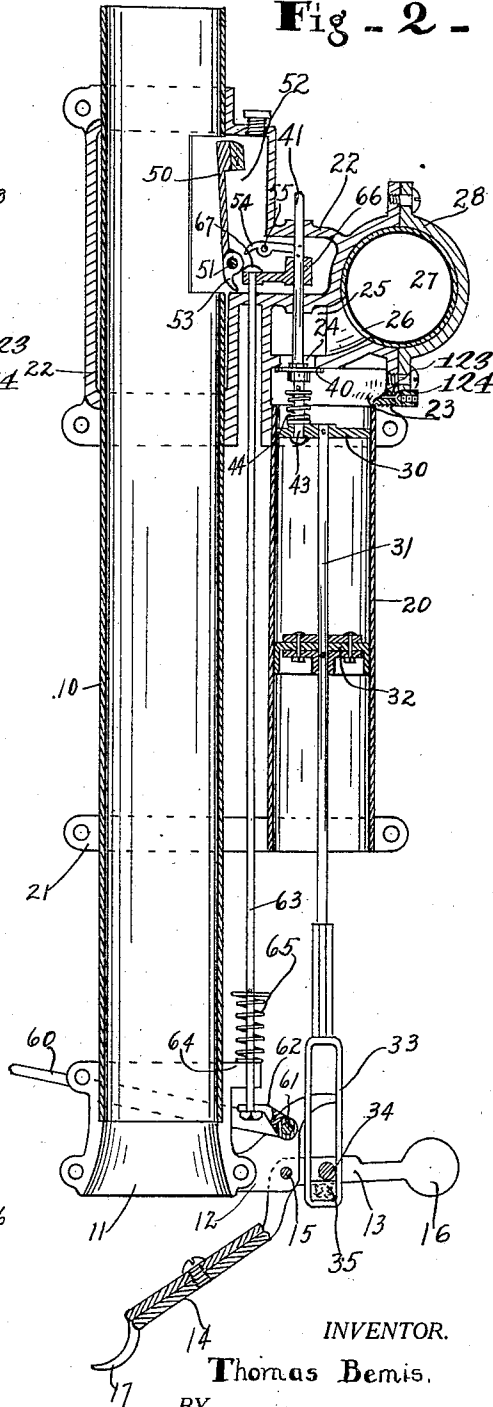
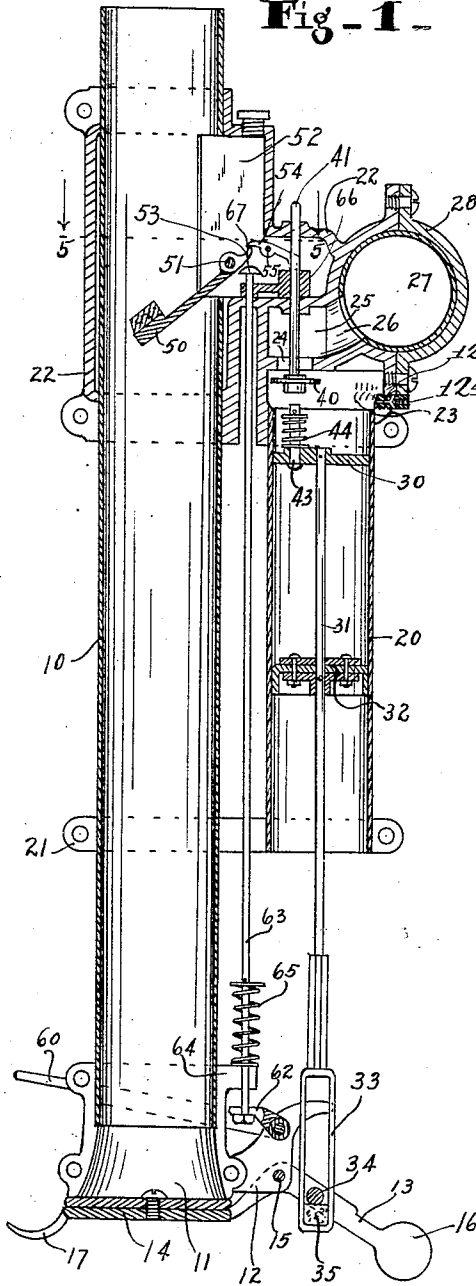
1,048,931.

Patented Dec. 31, 1912.

2 SHEETS-SHEET 1.

Fig. 1 -

Fig. 2 -



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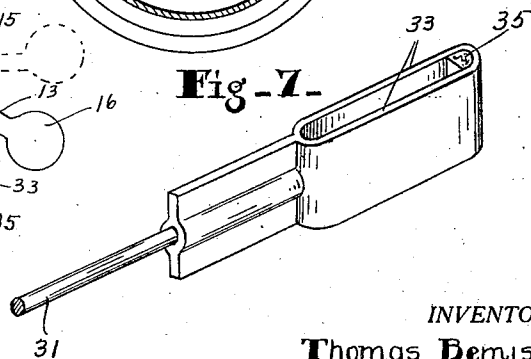
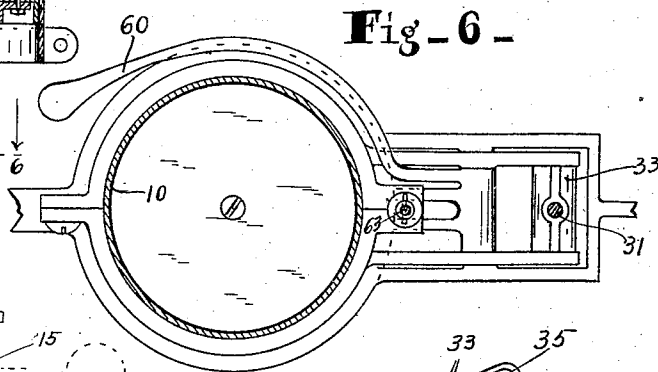
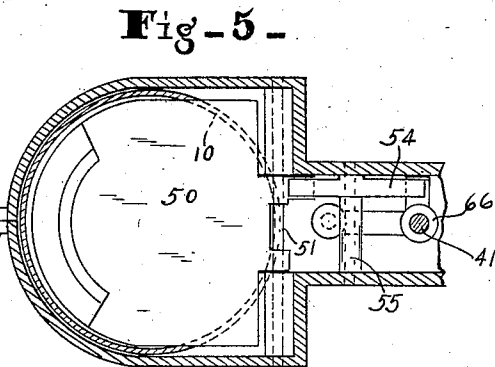
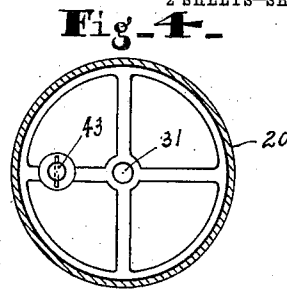
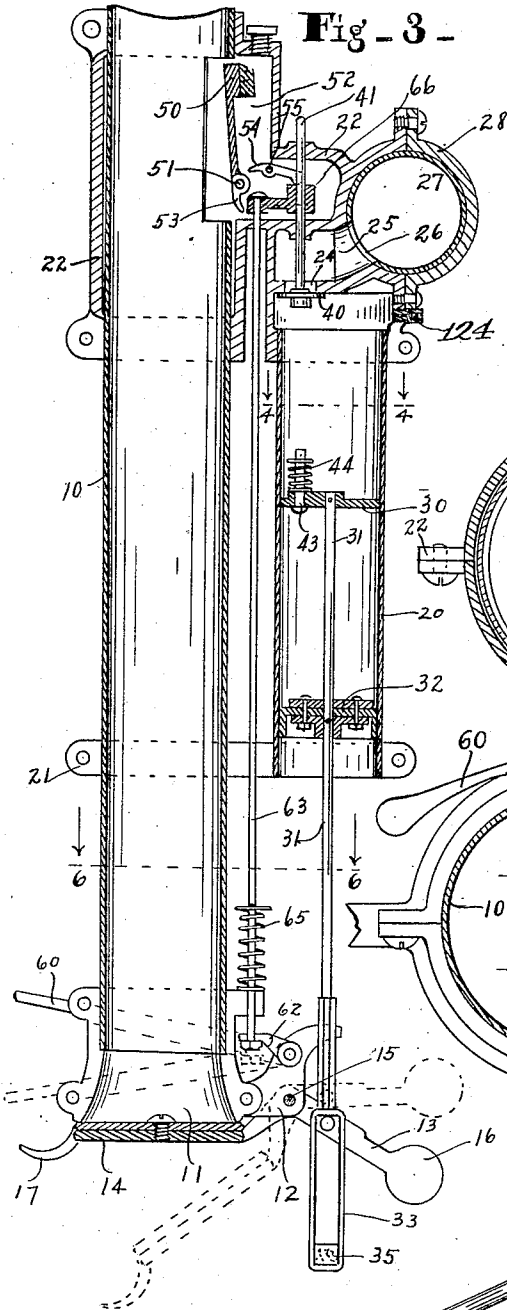
PNEUMATIC DESPATCH APPARATUS.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC-DESPATCH APPARATUS.

1,048,931.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed May 28, 1908, Serial No. 435,414. Renewed October 28, 1912. Serial No. 728,247.

To all whom it may concern:

Be it known that I, THOMAS BEMIS, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Pneumatic-Despatch Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

The object of this invention is to improve the construction of pneumatic despatch apparatus, so as to reduce the expense of operating the same by saving the power. Herein this object is accomplished by limiting the operation of the pneumatic apparatus in the system to the portion in actual use and to the time when in use. This invention is for an improved means to accomplish said object.

One feature of the invention is the compact form of the construction for accomplishing the object desired, there being provided a cylinder and piston preferably parallel with and adjacent to the carrier inlet terminal and a valve for closing said terminal that is pivoted in connection therewith and is closed by said piston. The piston is actuated by gravity and is returned by the suction in the despatch apparatus. Means is provided for regulating the partial vacuum for retarding the actuating movement of the piston in order to time the closing of the valve thereby so as to give the carrier sufficient time to reach its destination.

Another feature of the invention consists in providing means for partially returning the valve closing means while and immediately after the valve has been closed, whereby said valve closing means will be in position for immediate action and much time be saved in the operation of the device as the valve closing mechanism has made almost its entire return movement while the valve is closed. As soon as the valve is opened it makes a very slight further return movement instead of having to make the entire return movement before it starts on its actuating movement.

Another feature of the invention consists in combining with the valve closing means a paddle or the like that is controlled by the current of air passing through the terminal

for opening the port into the cylinder of the valve closing means in order to cause the latter to make almost a complete return movement after the main valve has been closed.

The full nature of this invention will be understood from the accompanying drawings and the following description and claims.

In the drawings Figure 1 is a central vertical section through a carrier and air inlet at the central station, with its associated parts, the parts being shown in their position when the terminal is closed. Fig. 2 is the same showing the parts in the position immediately after the inlet valve is opened to receive the carrier. Fig. 3 is the same showing the parts in the position at the end of the closing movement of the inlet valve, the open position of said valve and operated position of the hand lever being shown by dotted lines. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is a section on the line 5—5 of Fig. 1. Fig. 6 is a section on the line 6—6 of Fig. 3. Fig. 7 is a perspective view of the lower end of the piston rod.

In detail 10 represents a carrier and air inlet terminal at the central station of a pneumatic despatch apparatus. It is provided with a flaring mouth 11 secured to the end of the terminal by clamping or other suitable means, so that the transverse area of the mouth 11 is greater than that of the main portion of the terminal 10. From the mouth piece 11 there is a projection to which the shank 13 of the valve 14 is fulcrumed at 15 and said valve is partially counter-balanced by the weight 16 and is provided with a finger hook 17 for opening the valve, by striking the finger or a carrier downwardly against it, when it is desired to insert a carrier in the terminal, for, when the valve 14 closes the mouth of the terminal, suction will tend to keep said valve in closed position, but the effect of this suction is destroyed by knocking down the valve from the position shown in Fig. 1 to that shown in Fig. 2.

Adjacent to and preferably parallel with the inlet terminal 10 there is a cylinder secured at the lower end by clamps 21 and at the upper end to a clamping frame 22. The lower end of the cylinder 20 is open

while the upper end is closed by a chamber 23 in a casting or part of the frame 22 and there is a suction port 24 leading from the chamber 23 into a chamber 25 and a port 26 leading from the chamber 25 to a suction tube 27 that is carried by the clamp 28 connected with the frame 22 and is in communication with the despatch system so that there is a constant suction through said pipe 27 and the effect of that, when the port 24 is opened is to elevate the piston 32 in the cylinder 20 and which is mounted on the rod 31. The piston rod 31 has also a guide frame 30 on its upper end and at its lower end is provided with a vertically slotted portion 33 through which a pin 34 from the shank 13 extends. The loop 33 has a buffer 35 in its lower end for engaging the pin 34. The port 24 that effects a communication between the suction tube 27 and the cylinder 20 is controlled by the suction valve 40 on the vertical stem 41 that is guided by two parts or walls of the frame 22. The valve 40 is closed by the pin 43 in the sliding guide frame 30 that is spring supported by the spring 44, as the piston 32 reaches its highest position.

The valve 40 is opened by the paddle 50 which is fulcrumed at 51 in the recessed attachment 52 to the terminal, said attachment being part of the frame 22. The paddle 50 is so mounted that it will normally drop downwardly by gravity into the position shown in Fig. 1 and into the terminal when there is no air current passing through said terminal. When, however, the valve 14 is opened for any purpose and an air current sets in through the terminal 10 the paddle 50 will be moved by the current out of the terminal into the recess 52 and into the vertical position. The paddle 50 has a projection 53 adapted to engage one end of the lever 54 that is fulcrumed at 55 between its ends, the other end of said lever bearing downwardly on arm 66 on the stem 41 of the valve 40. Therefore, when the paddle 50 drops down by gravity into the position shown in Fig. 1, the projection 53 thereof will, through the lever 54 open the valve 40 as shown in Fig. 1. But when the air current sets in through the terminal, the paddle 50 will be elevated and thus leave the stem 41 free so that the valve 40 may be closed by the pin 43 or otherwise.

To the extension 12 from the mouth-piece 11 a hand lever 60 is fulcrumed at 61 and is provided with an arm 62 that is connected with the vertical rod 63 passing through the guiding extension 64 from the mouth piece and also through a part of the frame 22 at the upper end. On its lower end there is a spring 65 mounted that tends normally to hold said rod 63 in its upper position. The upper end of said rod

63 passes loosely through the arm 66 secured to the valve stem 41 and has on its upper end a head 67 so arranged that when the rod 63 is drawn downwardly by the lever 60 the valve stem 41 will be depressed and the valve 40 opened. But when the lever 60 is released the spring 65 will hold it in its upper position where it leaves the valve stem 41 free to be manipulated.

The operation of the device is as follows: Assuming that there is a suction pump or other means for exhausting the air from the apparatus and creating and maintaining suction therein and the parts are in the position shown in Fig. 1, when the operator at the central station desires to send a carrier she strikes down on the projection 17 from the valve 14 which opens the inlet terminal and enables her to insert the carrier. The valve 14 and associated parts then assume the position shown in Fig. 2. As the mouth of the inlet is opened the inrush of air moves the paddle 50 out of the terminal into the recess 52, whereby the passage of the carrier will not be interrupted and the valve stem 41 and valve 40 be left free. Then suction through the tube 27 which is normally maintained further elevates the piston rod 31 and loop 33 to the position shown in Fig. 2 whereupon the pin 43 closes the valve 40. That leaves the sliding guide frame 30 and piston 32 and piston rod 31 in condition to descend slowly by gravity. The descending of these parts is retarded by the partial vacuum in the upper part of the cylinder 20 above the piston 32. As the air leaks into said chamber 23, through the small port 123 controlled by valve 124 said parts descend until they approach the position shown in Fig. 3, whereupon the upper part of the loop 33 engages the pin 34 of the shank of the valve 14 and gradually closes said valve in the latter part of the movement of the piston and piston rod when the parts reach the position shown in Fig. 3. As soon as the valve 14 is closed, there is no passage of air through the inlet terminal whereupon the paddle 50 drops by gravity to the position shown in Fig. 1, which through the intermediate means explained, opens the valve 40 that permits suction through the tube 27 to act on the piston 32 and elevate the piston and piston rod from the position shown in Fig. 3 to that shown in Fig. 1. Said piston, piston rod and loop are stopped short of their highest limit of movement, in order to leave the valve 40 open, by the resistance to the further upward movement of the piston rod 31 due to the engagement of the pin 34 on the valve shank 13 with the lower end of the loop on piston rod 31. This slight resistance to the further upward movement of the loop and piston is sufficient to prevent

the piston reaching its highest limit of movement, because the transverse area of the mouth of the inlet is greater than that of the piston 32, so that the suction on the valve 14 will be proportionately greater than the pull on the piston 32 through the suction tube 27. That enables the valve 14 through its shank 13 and pin 44 to hold the piston short of its complete upward movement and in the position shown in Fig. 1.

From the foregoing it is seen that the carrier will have time to reach its destination while the piston 32 is descending and before it causes in the latter part of its movement the closing of the valve 14 or can be adjusted to do so by valve 124. If the operator wishes to send a second carrier before the valve 14 closes, she resets the timing mechanism. This returns the piston 32 to its upper position by depressing the hand lever 60. This through the rod 63 opens the valve 40 and the suction through the tube 27 will return and elevate the piston 32 before the loop 33 has closed the valve 14 and when the piston reaches its uppermost position and the pin 43 closes the valve 40 and terminates the suction, the piston 32 will descend again by gravity as explained before. After the main valve 14 is closed each time the paddle 50 opens the port 24 so that suction elevates the piston 32 and returns the piston and piston rod almost to their upper limit of movement. That leaves the piston rod in position to begin the actuating movement after a slight further upward movement sufficient to close the valve 40.

If a clerk inserts a carrier at an outlying station to be sent to the central station and at the time the valve 14 is closed, the opening of the valve at the outlying station will terminate the suction in the despatch tube and terminal at the central station so that the valve 14 at the central station will drop open. And since the valve 40 is at the time in an open position, the suction will elevate the piston and cause a return movement of the valve closing means and thus permit the carrier inserted at the outlying station to reach the central station before the valve 14 closes. If a clerk at the outlying station inserts a carrier while the valve 14 is open, the passage of air through the terminal at the central station temporarily ceases and then the paddle 50 drops to its open position, as shown in Fig. 1, by gravity and causes the valve 40 to open and again the piston is drawn upwardly and makes a complete return movement closing valve 40, thus giving time for the carrier inserted at the outlying station to reach the central station. In the latter case, as soon as the carrier is inserted at the outlying station after the valve there closes, the current passes through the cen-

tral station of the terminal and moves the paddle 50 to the position shown in Fig. 2.

What I claim as my invention and desire to secure by Letters Patent is:

1. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, means for closing said valve and then partially returning and afterward completing the returning movement and opening the valve, means for partially returning the valve closing means from the limit of its valve closing movement immediately after and while the valve is closed, and means for preventing the complete return movement of said valve closing means, substantially as set forth.

2. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, gravity actuated means for closing said valve and then partially returning and afterward completing the returning movement and opening the valve, means for retarding the actuating movement of said valve closing means whereby the closing of the valve will be timed, means for partially returning the valve closing means from the limit of its valve closing movement while the valve is closed, and means for preventing the complete return movement of said valve closing means.

3. Pneumatic despatch apparatus including a carrier and air inlet terminal, a valve for closing the same, gravity actuated means for closing said valve and then partially returning and afterward completing the returning movement and opening the valve, means for retarding the actuating movement of said gravity means, whereby the closing of the valve will be timed, means controlled by the air pressure in the apparatus for partially returning said valve closing means from the limit of its valve closing movement, and means for preventing the complete return movement of said valve closing means.

4. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, a cylinder in communication with the despatch apparatus, a piston therein, a piston rod in such connection with the valve as to close the valve in the latter part of the actuating movement of said piston rod and then partially returning and afterward completing the returning movement and opening the valve, means for partially returning said piston from the limit of its valve closing movement after and while the valve is closed, and means for preventing the complete return movement of said piston.

5. Pneumatic despatch apparatus including a vertically disposed inlet terminal, a valve pivoted in connection therewith for closing the same that when released by suction will remain open by gravity, a cylinder

in communication with the despatch apparatus, a piston in said cylinder, a piston rod connected therewith that is operably connected with said valve so that the piston and piston rod will descend by gravity and close the valve, and means for exhausting air from said cylinder above the piston so the suction will return the piston and piston rod to their inoperative positions while the valve is closed.

6. Pneumatic despatch apparatus including an inlet terminal, a valve mounted in connection therewith that is provided with a shank, a cylinder in communication with the despatch apparatus, a piston therein, a gravity piston rod in operative engagement with the shank of said valve so that it will not act upon said valve excepting in the latter part of the movement of said piston rod, and means for exhausting air from the cylinder above the piston for returning the same.

7. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, a cylinder in communication with the despatch apparatus, a piston therein, a piston rod in such connection with the valve as to close the valve in the latter part of the actuating movement of said piston rod and then partially returning and afterward completing the returning movement and opening the valve, means for partially returning said piston from the limit of its valve closing movement after and while the valve is closed, and means controlled by said valve for preventing the complete return movement of said valve closing means while the valve is closed.

8. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, means for closing said valve and then partially returning and afterward completing the returning movement and opening the valve, means for partially returning the valve closing means immediately after and while the valve is closed, means for preventing the complete return movement of said valve closing means from the limit of its valve closing movement, and means for causing the complete return of the valve closing means when the valve is opened, substantially as set forth.

9. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, a cylinder in communication with the despatch apparatus, a piston therein, a piston rod in such connection with the valve as to close the valve in the latter part of the actuating movement of said piston rod and then partially returning and afterward completing the returning movement and opening the valve, means for partially returning said piston from the limit of its valve closing movement after and while the valve is closed, means for pre-

venting the complete return movement of said piston, and means controlled by the opening of the valve for permitting said piston to complete its return movement.

10. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, a cylinder in communication with the despatch apparatus, a piston therein, a piston rod in such connection with the valve as to close the valve in the latter part of the actuating movement of said piston rod and then partially returning and afterward completing the returning movement and opening the valve, means for partially returning said piston from the limit of its valve closing movement after and while the valve is closed, means for preventing the complete return movement of said piston, means controlled by the closing of the valve for opening the communication between said cylinder and the despatch apparatus, means controlled by the opening of the valve for permitting said piston to complete its return movement, and means on the piston rod for closing said communication at the end of the complete return movement of said piston.

11. Pneumatic despatch apparatus including an air inlet terminal, a main valve for closing the same, a cylinder with a port in communication with the despatch apparatus whereby the suction in the apparatus will act upon the piston in said cylinder, a suction valve for closing said port, a piston in said cylinder for closing said valve, a piston rod in such connection with the main valve as to close it in the latter part of the actuating movement of said piston rod, and a paddle mounted in the carrier passage-way of the despatch tube that will be actuated by gravity when there is no current of air passing therethrough for opening said suction valve and causing the piston to return.

12. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, means for closing said valve and then partially returning and afterward completing the returning movement and opening the valve, means for partially returning the valve closing means from the limit of its valve closing movement immediately after and while the valve is closed, and means connected with said valve for stopping the return movement of said valve closing means before it is completed, substantially as set forth.

13. Pneumatic despatch apparatus including an inlet terminal, a valve mounted in connection therewith that is provided with a shank, a cylinder in communication with the despatch apparatus, a piston therein, a piston rod in operative engagement with the shank of said valve so that it will not act upon said valve excepting in the latter part

of the movement of said piston rod and then partially returning and afterward completing the returning movement and opening the valve, and means controlled by the
 5 current of air passing through said apparatus for causing the partial return movement of said piston from the limit of its valve closing movement, said valve being adapted to stop the return movement of said
 10 piston before it is completed, substantially as set forth.

14. Pneumatic despatch apparatus including an inlet terminal, a valve mounted in connection therewith, a cylinder in communication with the despatch apparatus, a piston therein that is of less diameter than the mouth of the inlet terminal, a piston rod with its outer end in operative engagement with said valve so that said piston rod will
 15 not act upon said valve excepting in the latter part of the movement of said piston rod and then partially returning and afterward completing the returning movement and opening the valve, and means controlled
 20 by the current of air passing through said apparatus for causing the partial return movement of said piston from the limit of its valve closing movement, said valve being adapted to stop the return movement
 25 of said piston before it is completed, substantially as set forth.

15. Pneumatic despatch apparatus including an air inlet terminal, a valve for closing the same, means for closing said valve and
 35 then partially returning and afterward completing the returning movement and opening the valve, and means for partially returning the valve closing means from the limit of its valve closing movement immediately after and while the valve is closed,
 40 substantially as set forth.

16. Pneumatic despatch apparatus including a carrier inlet terminal, a main valve

for closing the same, a cylinder with a port in communication with the despatch apparatus whereby the suction in the apparatus will act upon the piston in said cylinder, a suction valve for closing said port, a piston in said cylinder with a piston rod in such connection with the main valve as to close it
 45 in the actuating movement of said piston rod, a lever mounted in connection with the terminal adapted to be operated by the operator, a rod actuated by said lever, and an arm drawn downwardly by said rod for
 50 opening said suction valve, whereby the piston may be caused to return after the beginning of this actuating movement.

17. Pneumatic despatch apparatus including an air inlet terminal, a main valve for
 60 closing it, a cylinder with a port in communication with the despatch apparatus whereby the suction in the apparatus will act upon the piston in the cylinder, a suction valve for closing said port having an upwardly
 65 extending stem, a piston in said cylinder with a piston rod in such connection with the main valve as to close it in the actuating movement of said piston rod, an arm secured on the stem of said suction valve,
 70 a lever pivoted between its ends with one end bearing upon said arm, and a paddle mounted in connection with the terminal that is pivoted between its ends so that one end will actuate said lever to open said
 75 suction valve when the other end of said paddle drops by gravity into the passageway of the terminal.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses
 80 herein named.

THOMAS BEMIS.

Witnesses:

O. GREENER,
 J. H. SWAN.