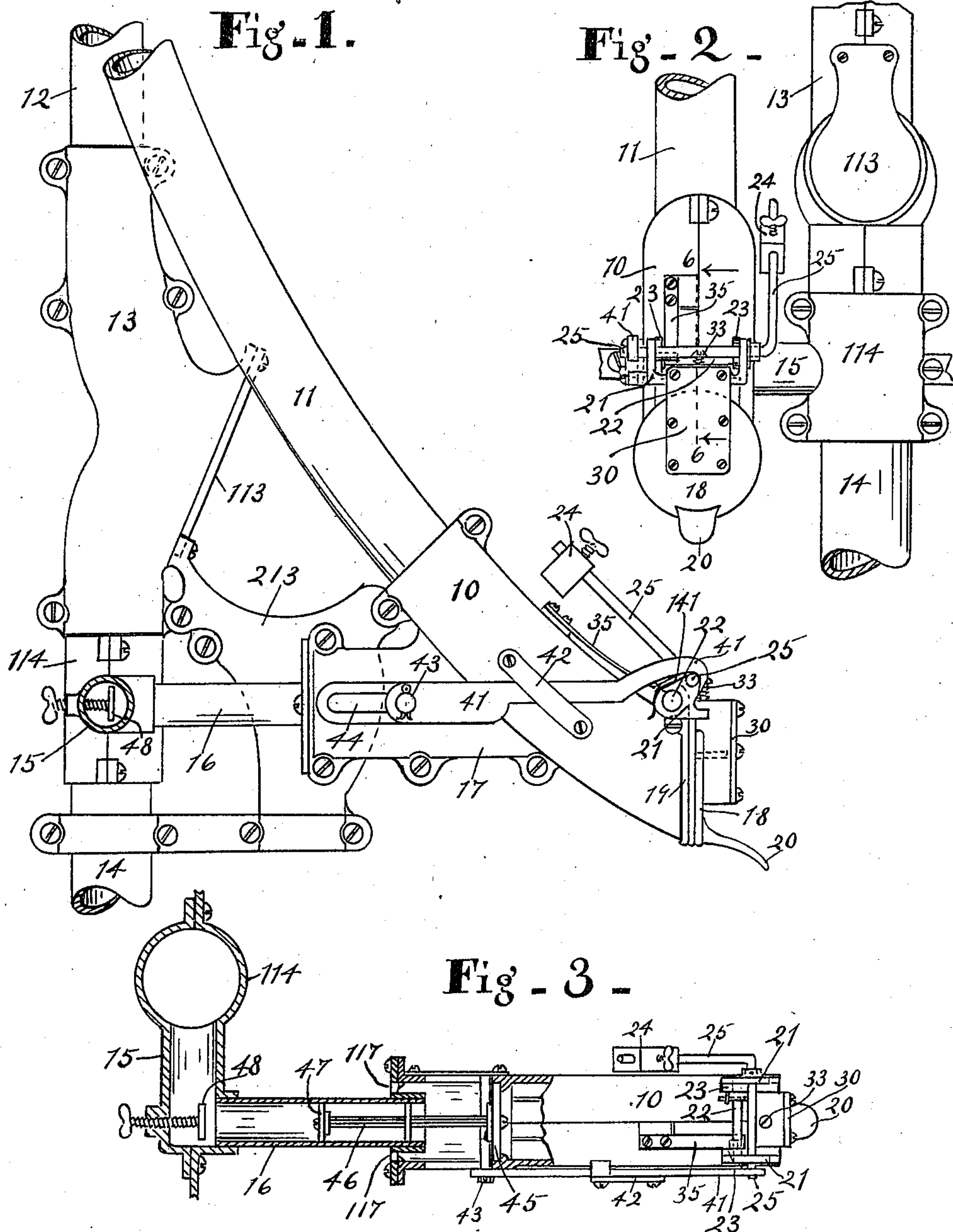


T. BEMIS.
PNEUMATIC DESPATCH APPARATUS.
APPLICATION FILED JAN. 31, 1907.

975,501.

Patented Nov. 15, 1910.

2 SHEETS-SHEET 1.



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Fig - 4 -

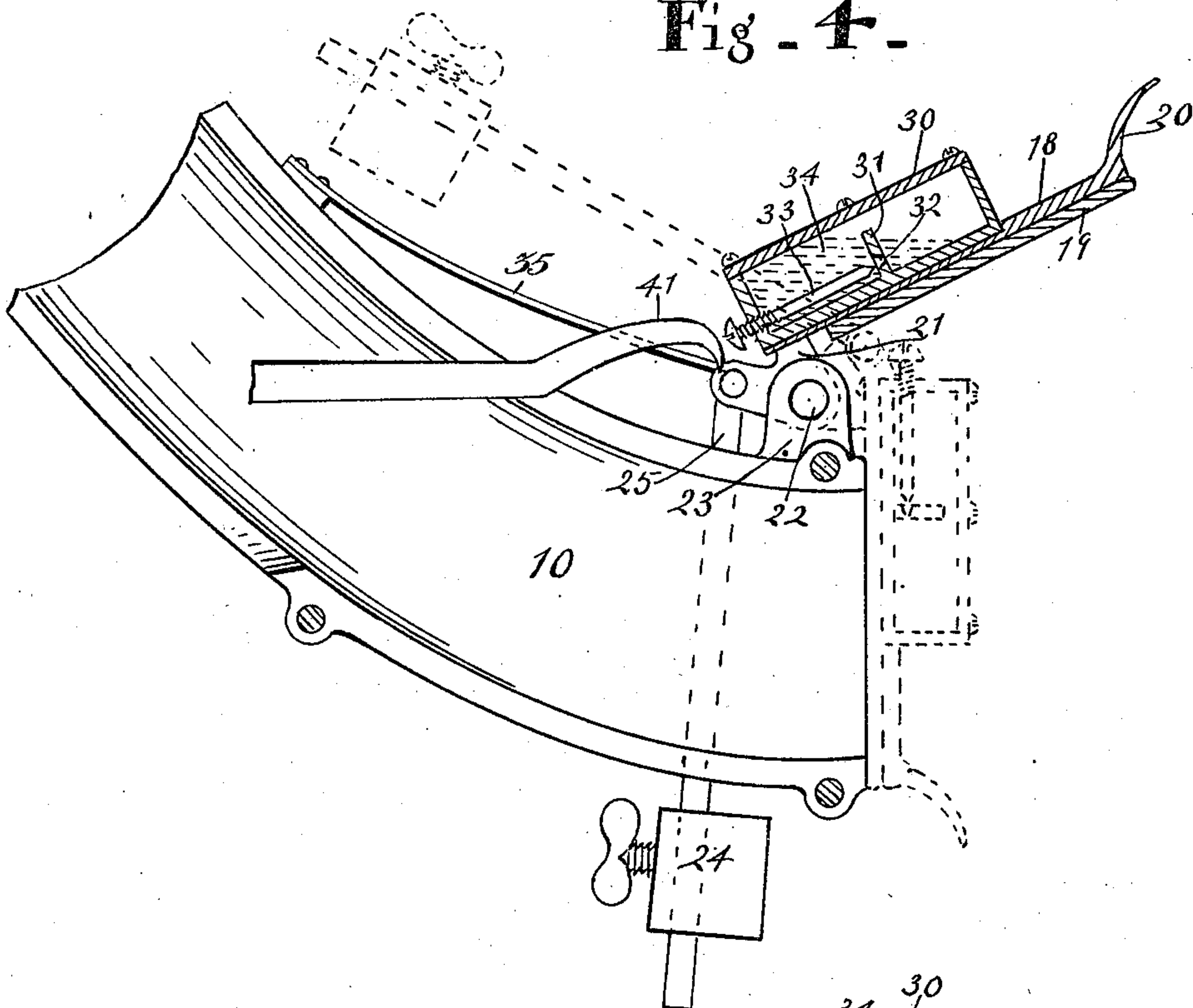


Fig - 5 -

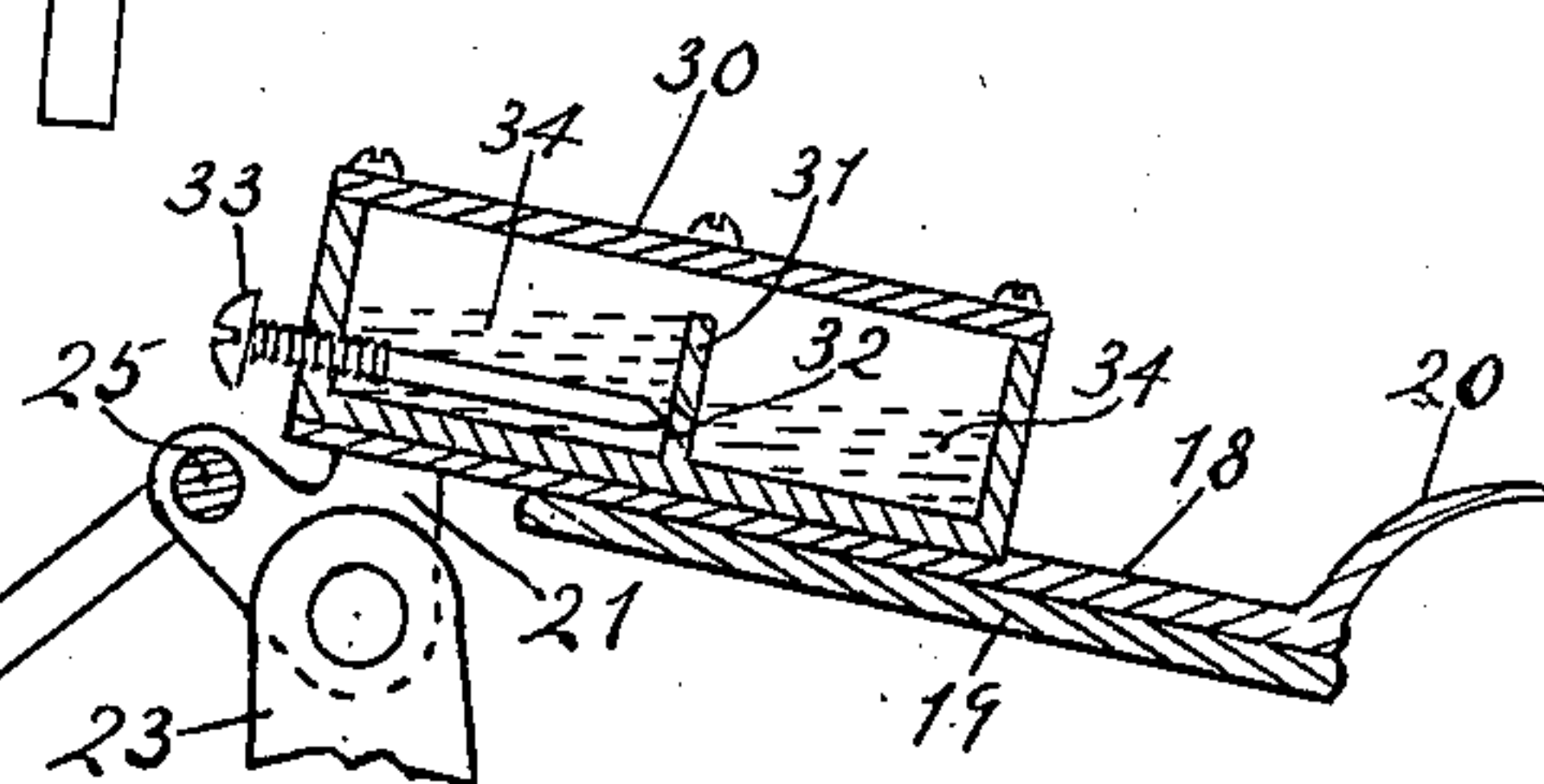
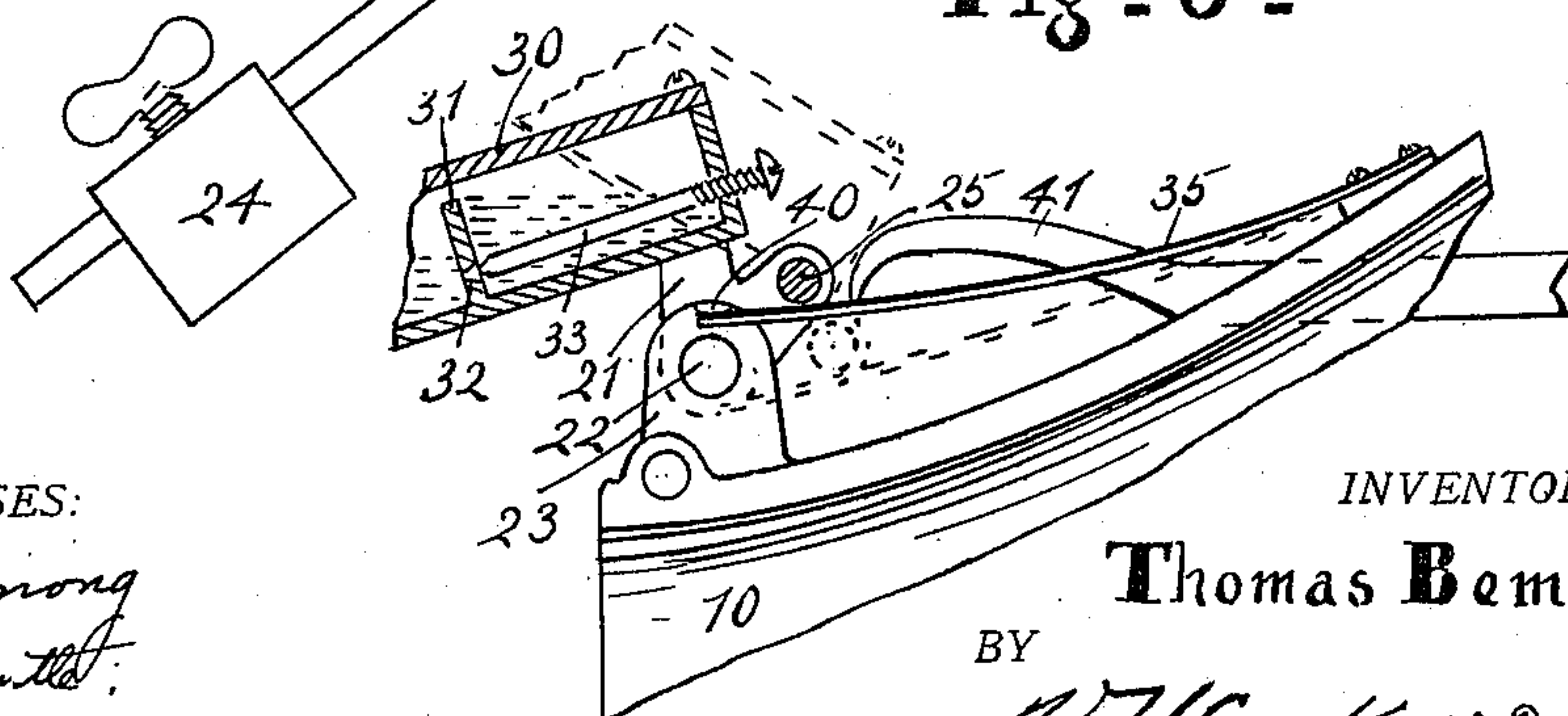


Fig - 6 -



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UNITED STATES PATENT OFFICE.

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PNEUMATIC-DESPATCH APPARATUS.

975,501.

Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed January 31, 1907. Serial No. 355,129.

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 pneumatic despatch apparatus by providing a construction in which the air for the transmission of the carrier can enter only through the carrier inlet opening at the central station and it is kept closed entirely excepting while a carrier is passing through the apparatus. This inlet opening is kept normally closed by a valve and, when no carrier is being introduced or passing through the apparatus, no air enters the same, so that there is a partial vacuum in the despatch tube until a valve at the central station or some other sending station is opened to insert a carrier and then the air rushes in at the central station opening with great force at the instant the carrier is inserted and immediately picks it up and carries it through the despatch tube. Pneumatic means are provided for opening the valve at the central station when a valve is opened at any other sending station for inserting a carrier. The air continues to rush in at such central station inlet opening as long as the valve therefor is open. Hence, in addition to the feature of invention above mentioned there is combined with the valve an adjustable timing mechanism which holds the valve open long enough to permit the discharge of the carrier introduced. With this construction the apparatus is practically out of use and no air is passing through it except while a carrier is passing through it. The valve closing the carrier inlet opening at the central station, therefore, is the vacuum control of the apparatus and there is no additional vacuum control and there is no additional means connected with the valve or actuated thereby for controlling the vacuum.

Another feature of the invention consists in means actuated by the air in the apparatus for completely opening the valve at the central station carrier inlet, because the operator at the central station might neglect to fully open said valve and hence this

invention utilizes the air pressure in the apparatus for further and freely opening the valve and the atmospheric air pressure for returning the valve opening means to its normal and unoperated position. Also said means opens the valve at the central station when a valve at some other sending station is opened to insert a carrier. In this connection a fluid or mercury-controlled means is employed for timing the closure of the valve.

One feature of this invention is that the suction effect of the drum or other air exhausting means is always present within the despatch tube at the inlets for carriers so that there is immediate action of the air on the carrier when the valve is opened.

These and the other features of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings, Figure 1 is a side elevation of a central station terminal in said despatch apparatus, parts being broken away and a part in section. Fig. 2 is a front elevation of said terminal with the hopper omitted. Fig. 3 is a horizontal section through the rear portion and a plan view of the forward portion of the means for opening the valve for the carrier inlet. Fig. 4 is a central vertical section through the carrier inlet tube at the central station with the valve open in full lines and shown closed by dotted lines, parts being broken away and the valve opening hook bar being in full lines. Fig. 5 is a side elevation partly in section of said valve and its balancing weight. Fig. 6 is a section on the line 6—6 of Fig. 2 through a part of the apparatus, showing the valve partly open in full lines and entirely open in dotted lines, and parts being broken away.

A carrier inlet tube 10 at the central station forms a continuation of and is connected with a despatch tube 11 through which and from which air is drawn by suitable means and which leads to a clerk's or outlying station of any suitable construction for receiving and sending carriers.

12 is a return tube leading to the discharge terminal 13 from which a pipe 14 continues to the drum or other means for moving the air through said despatch apparatus. The tube 14 is connected with the terminal 13 by a coupling 114 which has a

small transverse tube 15 extending laterally from it with a small tube 16 connected with a rearward extension 17 from the inlet tube 10.

5 The inlet opening of tube 10 is normally closed by a valve 18 having a leather pad 19 and a finger-piece 20 and projections or ears 21 which are fulcrumed by the pin 22 to ears 23 on the inlet tube 10 and so that the valve
10 can be opened to substantially the position shown in Fig. 4. It is substantially counter-balanced by a weight 24 on a cranked rod 25 which is secured to the valve and one end thereof extends through the
15 ears 21 on the valve and at a point normally above and to the front of the pivot 22 and which as the valve is opened moves down and ultimately to a position back of the pivot 22.

20 When no carrier is being inserted or passing through the apparatus there is a partial vacuum in all parts of the apparatus because the fan or other exhausting means is operating and no air is being admitted. Since
25 the vacuum effect is in all parts of one apparatus there is immediate action as soon as any valve is opened and the action does not await the operation by said opening valve of some remote or distantly acting means
30 for opening up the air passageways through the apparatus. Hence, when an operator desires to transmit a carrier, he opens the valve 18 and inserts a carrier. As soon as he opens a valve to insert the carrier there is an im-
35 mediate inrush of air that at once picks up his carrier and conveys it through the despatch tube, so there is no loss of time. Since there is no other transmission air inlet be-
40 side the carrier inlet just opened, its valve must be kept open long enough to permit the carrier to pass to its destination, and while the central station operator might if desired hold the valve open long enough for
45 this result, still that would require a loss of time on the part of the operator and often the operator might not hold the valve open long enough or be indifferent about it. Hence, a timing means for closing the valve or rather adjustable means for delaying the
50 closing of the valve and to predetermine substantially the period of time during which it will close is provided. This is one object of the balancing weight 24 but it alone is hardly sufficient. To it is added a
55 mercury chamber 30 secured on the valve and provided with a partition 31 forming substantially two chambers, and said partition does not extend to the top and has a small hole 32 near its bottom to which a
60 needle valve or pin 33 extends from the outside whereby the extent of the passage-way through the hole 32 may be modified and the rapidity of movement of the mercury through said hole be altered.

65 Assuming that the valve 18 is thrown up

into the position shown in Fig. 4, the mercury would move into the left hand chamber. A spring 35 is secured to the inlet tube 10 and normally bears up against a
70 stop lug 40 on an ear 23, and is depressed by the transverse portion of crank-rod 25 as the valve reaches its limit of opening movement. When the valve is released the spring 35 will immediately move the valve
75 from the position shown in Fig. 4 to that in Fig. 5, when the spring engages the lug 40 and ceases to act further. Then the mercury will begin to flow from the left hand or upper chamber to the right hand or lower
80 chamber in the casing 30. Since the hole 32 is small it will require some time for the mercury to pass through it but as it passes it tends more and more to overcome the weight 24 and close the valve. When the
85 valve is thus moved by the mercury almost to a closed position the suction through the tube immediately closes it quickly and holds it closed securely until again opened. By the time the door closes under the influence
90 of these means the carrier will have been conveyed through the apparatus.

While the foregoing mechanism will operate satisfactorily if the operator at the central station is careful enough to open
95 the valve completely, still means are herein provided for mechanically or automatically opening the valve completely after it has been opened by the operator far enough to introduce the carrier. Also when a carrier
100 is inserted at some other sending station, it is necessary to have some means for opening the valve at the central station. Such mechanism is made as follows: The transverse portion of the rod 25 is engaged by a hook
105 on the end of a bar 41 which passes between a strap 42 and the inlet tube 10 and at its rear end is connected by a pin 43 that extends transversely through the extension 17 from the inlet tube and loosely through slots
110 44, one being on each side of the extension 17. Within said extension said pin 43 is connected with a piston 45 the stem 46 of which projects into the smaller tube 16 to a smaller piston 47 therein. An adjustable
115 valve 48 controls the inlet into said tube 16 from the return air tube 14. The operation of this valve opening mechanism is as follows: When the valve 18 is opened to introduce a carrier, the air in the inlet tube 10
120 is under considerable pressure and the suction of the air exhausting means moves the small piston in the same direction, and thus the hooked arm 41 is withdrawn and it holds the valve open in the position shown
125 in Fig. 4. Then the hook 41 disengages the rod 25, as during the latter part of the opening movement of the valve said rod 25 is being gradually lowered out of engagement with said hook, and the further movement
130 of the bar 41 by its piston 45 to the limit

of the latter's movement removes the hook on the end of the bar 41 so that it will not engage the rod 25 during the closing movement of the valve and then the valve may be closed by the means heretofore described. The hook bar 41 is returned to its engaging position immediately after the valve has closed by the atmospheric pressure acting on the large piston 45, as the air comes through the opening 117 into the outer end of the tube 17 and as at the instant after the valve closes there is a partial vacuum on the other side of the piston 45 in the inlet tube and extension 17 therefrom which overbalances that acting in the smaller piston.

When a carrier is inserted in the apparatus by a clerk or other person at a station other than the central station, it is necessary that the valve 18 at the central station be opened and held open long enough to admit what may be called "transmission air" to the despatch tube for conveying the carrier through the return tube 12 to the terminal 13 at the central station. The valve 18 at the central station is in this case opened by the small piston 47 which is withdrawn by the suction in the tube 14, as soon as the valve is opened where the carrier is inserted; and because of the opening 117, seen in Fig. 3, the large piston 41 will not retard the movement of the piston 47.

While there is shown no other carrier inlet terminal than the one at the central station, of course it is understood that in this apparatus as a whole, as in other pneumatic despatch apparatus, there are various outlying stations at the ends of the tubes 11 and 12 where clerks and others receive carriers from the central station and send carriers to the central station. The valves at such station are not different in this apparatus from what they are in others. As soon as a clerk introduces a carrier, a valve where it is introduced is usually immediately closed and in this device the air for conveying the carrier must come through the inlet opening at the central station and to do that the valve at the central station must not only be open but be held open long enough for the carrier to reach its destination.

An inclined flange 141 is placed on the left ear 21 on the valve so that the hooked end of the bar 41 in its return movement may slide upon said flange 141 and catch the rod 25.

113 is the discharge valve and 213 is the hopper for receiving the carrier as discharged.

Instead of a hook on the end of bar 41 for opening the valve any other modified catch can be used.

It will be understood that modifications such as would result from a reversal of

parts and would occur to the ordinary mechanic skilled in the art may be substituted without departing from my said invention.

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

1. A pneumatic despatch apparatus including an air exhaust despatch tube having a carrier inlet opening, a valve for closing said opening, and means entirely on said valve for automatically closing the same.

2. A pneumatic despatch apparatus including an exhaust despatch tube with a single inlet opening for both air and carriers, a valve for closing said air and carrier opening, and which is held closed normally by a partial vacuum, and mechanism mounted entirely upon said valve for holding said valve open for a predetermined period.

3. A pneumatic despatch apparatus including an air exhaust despatch tube with no inlet opening except for the introduction of carriers, a valve for closing said inlet opening, and which is held closed normally by a partial vacuum, and mechanism mounted entirely upon said valve for holding said valve open a predetermined period.

4. A pneumatic despatch apparatus including a despatch tube with a carrier and inlet opening, a valve for closing said opening and means for timing the closing of the valve after it has been opened and which is entirely carried by the valve.

5. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing said opening, and means controlled by the air in said despatch tube for engaging and opening said valve, said opening means being adapted to disengage said valve as soon as the valve has been completely opened.

6. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing the same, means controlled by the air in said despatch tube for engaging and opening said valve, and means mounted on said valve for retarding its closing movement.

7. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing said opening, means controlled by the air in said despatch tube for engaging and opening said valve, said opening means being adapted to disengage said valve as soon as the valve has been completely opened, and means mounted on said door for retarding its closing movement.

8. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing said opening, means controlled by the air in said despatch tube for opening said valve, said opening means being adapted to disengage said valve as soon as the valve has been completely opened, means mounted on said door for re-

tarding its closing movement, and means for regulating said retarding means to time the closing of the valve.

9. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing said opening, means controlled by the air in said despatch tube for opening said valve, and means for returning said valve opening means to its normal unoperated position independently of the valve.

10. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing the same, means controlled by the air in said despatch tube for opening said valve, and means for returning said valve opening means, said valve opening means being adapted to disengage said valve as soon as the valve has been completely opened.

11. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing said opening that is pivoted to the despatch tube, a piston controlled and actuated by the air in said despatch tube, a longitudinally movable bar connected with said piston that is provided at one end with a hook, and means on the valve that will be engaged by said hook-bar when the valve is closed and that will disengage said hook when the valve is completely opened, whereby said bar will open said valve when actuated by said piston.

12. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve for closing the opening to said inlet tube, a pair of pistons in line with each other and one being larger than the other, tubes connected with the despatch tube so said pistons will be controlled by the air pressure in the apparatus, a hook bar actuated by said pistons and means on said valve adapted to be engaged by the hooked end of said bar when the valve is in the closed position and to disengage said bar when the valve is in the open position, substantially as set forth.

13. A pneumatic despatch apparatus including a despatch tube with an inlet opening, with sending tube and a return air tube, a valve for opening and closing the sending tube that is pivoted to said tube, a cylinder-like extension from said sending tube opening to the atmosphere at its outer end, a smaller cylinder communicating centrally with the outer end of said larger cylinder and leading from the return air tube, a piston in each of said cylinders, a stem for connecting them longitudinally, a movable bar connected with said pistons so as to be moved thereby and having a hooked end, and means on the valve adapted to be engaged by said hooked end when the valve is closed and to be disengaged when the valve is opened completely.

14. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a pivoted valve for closing said opening, means for closing said valve and a counter-balancing weight connected with said valve for preventing its closing movement until closed by said means.

15. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve pivoted thereto for closing said opening, a counter-balancing weight connected with said valve and means on said valve for gradually overcoming said weight and closing the valve.

16. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve pivoted thereto for closing said opening, a chamber on said valve and mercury therein for controlling the closing movement of the valve.

17. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve pivoted thereto for closing said opening, a chamber mounted on said valve with a perforated partition partially dividing it into two compartments, means for regulating the perforation in said partition, and mercury in said chamber for controlling the closing movement of the door.

18. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve pivoted thereto for closing said opening, a mercury controlled means mounted in connection with the valve for closing it, and a spring for giving said valve its initial closing movement after the valve has been completely opened.

19. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve pivoted thereto for closing said opening, a counter-balancing weight connected with said valve, a spring engaged and compressed by said valve as it reaches its completely open position and whereby the valve receives its initial closing movement, a stop for limiting the action of the spring after such initial movement of the valve, and a mercury controlled means in connection with the valve for gradually finishing its closing movement.

20. A pneumatic despatch apparatus including a despatch tube with an inlet opening, a valve pivoted thereto for closing said opening, a spring for giving said valve its initial closing movement after it has been completely opened, and means for subsequently completing the closing movement of the valve.

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

THOMAS BEMIS.

Witnesses:

H. B. McCORD,
N. ALLEMONG.