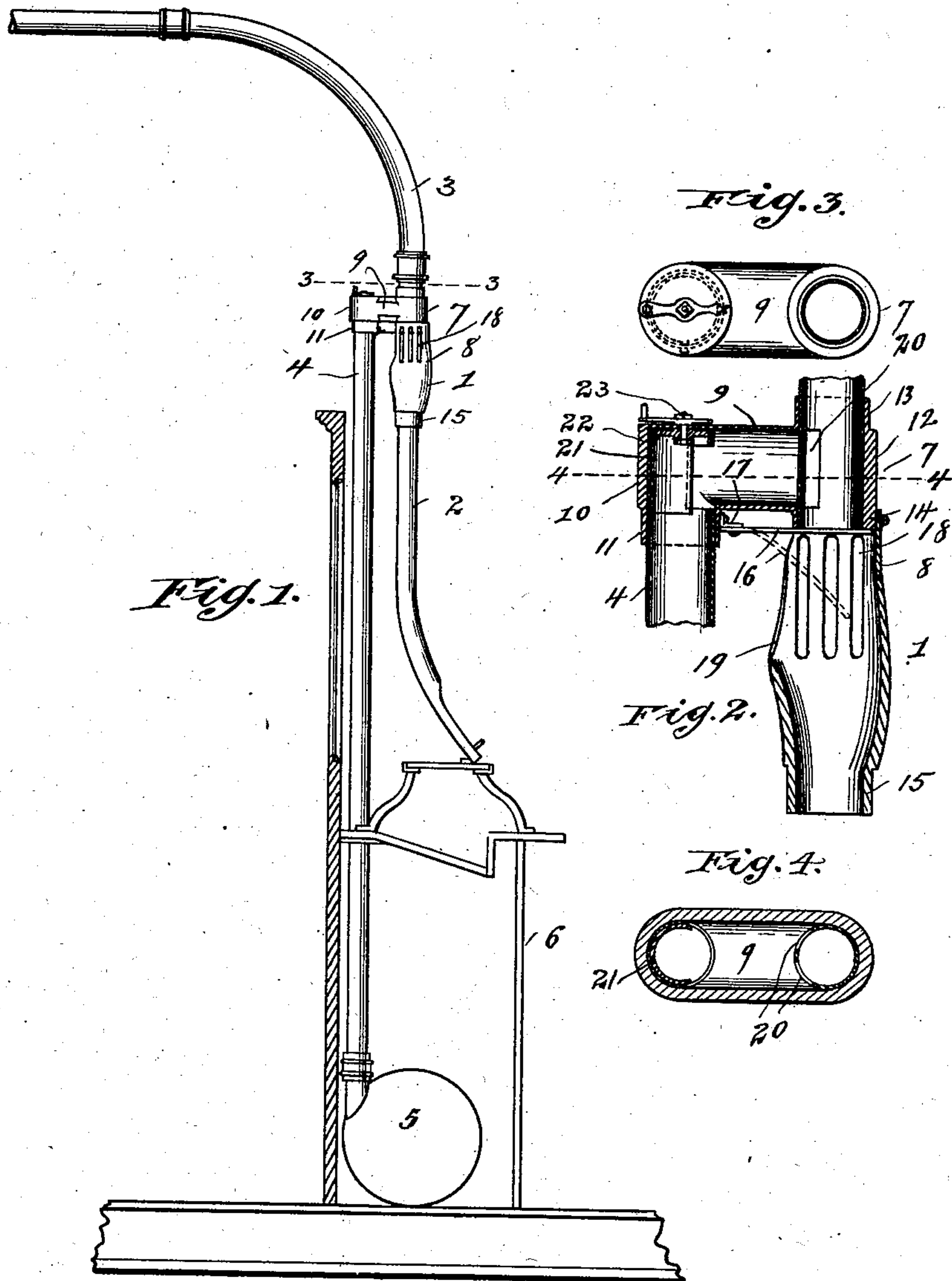


No. 724,688.

PATENTED APR. 7, 1903.

E. A. FORDYCE.
PNEUMATIC TUBE TERMINAL.
APPLICATION FILED JUNE 16, 1900.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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PNEUMATIC-TUBE TERMINAL.

SPECIFICATION forming part of Letters Patent No. 724,688, dated April 7, 1903.

Application filed June 16, 1900. Serial No. 20,542. (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-Tube
5 Terminals, of which the following is a specification.

This invention relates to improvements in pneumatic-despatch-tube terminals, and refers more specifically to an improved construction in terminals of that type wherein
10 the carrier is discharged through a downwardly-directed discharge-tube and wherein the delivery-chute is arranged in alinement with or continuation of the delivery-tube,
15 while the air-draft is deflected out of the path of the carrier at a point adjacent to the flap-valve or door of the terminal-box. It is found necessary in systems of this character to provide means for retarding the speed of the
20 carriers just prior to their discharge through the terminal, and this is frequently done, as in the present case, by causing the carrier to pass through a curved portion of the delivery-tube, so that the friction of the carrier
25 against the walls of the tube in rounding the curve will serve to sufficiently retard its movement. Heretofore this curved portion of the delivery-tube has usually been built within and so as to form a part of the terminal-box
30 construction within which the valve was located, and it has been found impracticable to give to the curved portion of the delivery-tube a curve which will serve to sufficiently retard the carrier without either making
35 it so abrupt as to bring an undue strain and wear upon the carriers or else necessitate an abnormally large and inconvenient terminal-box. In prior constructions also the carrier has passed out of the influence of the
40 suction-draft coincidently or about coincidently with its entrance to the curved retarding portion of the delivery-tube and at a considerable distance from the point where the carrier impacts against the flap-valve, the
45 result being that if the suction be somewhat irregular or the carriers not uniform in their fit within the delivery-tube they may occasionally stick in the retarding portion of the delivery-tube or at least be retarded to such
50 an extent as to fail to open the flap-valve and be properly delivered.

It is the object of the present invention to overcome the foregoing objections and also to provide a more economical construction, whereby substantially the whole terminal-
55 box is formed by means of two comparatively simple metal castings with which all of the connecting-tubes are connected by simple straight joints, thereby reducing the cost of manufacture and installation to a minimum,
60 to provide a simplified and improved form of valve for regulating the suction-draft, and in general to simplify and improve the details of construction of the terminal.

The invention consists in the matters here-
65 inafter described, and more particularly pointed out in the appended claims, and will be readily understood from the following description, reference being had to the accompanying drawings, in which—
70

Figure 1 is a side elevation with parts in section of a terminal and the several pipe connections embodying my invention. Fig. 2 is an axial sectional view taken through the
75 terminal-box and connected pipes in the plane of the delivery-chute and suction-pipe. Fig. 3 is a horizontal sectional view taken on line 3 3 of Fig. 1 and looking downwardly, and Fig. 4 is a sectional view taken on line 4 4 of
80 Fig. 2.

Referring to the drawings, 1 designates as a whole the terminal-box; 2, the delivery-chute, connected with the lower discharge end of the box; 3, the curved retarding portion of the delivery-tube, connected with the
85 upper end of the terminal-box, and 4 the suction-tube, connected with the offset extension of the terminal-box and extending thence downwardly to the main suction pipe or trunk
90 5, which latter is desirably and as shown herein located underneath the desk or counter 6, upon which the operator works.

In the improved construction shown herein the terminal-box comprises two main members or castings, designated 7 and 8, respectively, the former consisting of a horizontally-
95 arranged tubular portion 9, closed at one end, as indicated at 10, and provided at this end with a downwardly-directed nipple 11, adapted for connection with the suction-
100 pipe 4, and having at its opposite end a vertically-disposed tubular section 12, with the

central portion of which the horizontal section 9 communicates, and the upper and lower ends of which, 13 and 14, are respectively adapted for connection with the delivery-tube 3 and the section member 8 of the terminal-box. The member 8 consists of a tubular body constructed at its upper end to telescope upon and be united with the lower end of the portion 12 of the upper member and terminating at its lower end with a nipple portion 15, adapted for connection with the delivery-chute 2, said member being enlarged both internally and externally midway of its length and constructed to taper toward each end, as indicated clearly in the drawings, so that as the carrier emerges from the vertical portion of the upper member of the terminal-box it enters a hopper-shaped receptacle and is thereby directed into the delivery-chute 2.

16 designates the flap-valve, which normally closes the lower end of the delivery-passage at the point where the latter enters the upper end of the member 8. Said valve consists in the present instance of a leather flap, one end of which is secured to a bracket 17, mounted upon the terminal-box at a point centrally beneath the horizontal portion 9 thereof, the free end of the flap being arranged to project horizontally within the upper portion of the member 8 in position to close the lower end of the delivery-passage, as indicated clearly in Fig. 2. Said flap is desirably constructed of leather, and the natural resiliency of the leather and the suction of the air is depended upon to close and hold closed the flap after it has been opened by the passage of a carrier. In order that there may be a free inflow of air into the upper part of the hopper-shaped member of the box behind the carrier, so as to relieve the latter of the suction which would be exerted thereon during the time the flap were open were it possible for the air to enter only through the delivery-chute, the hopper-shaped member is provided in its side walls at a point immediately below the nominal position of the flap-valve with a plurality of vertical slots or air-inlets 18. Desirably also and as shown herein the rear side of the member is left entirely open from its upper end downwardly throughout a part of its length, as indicated at 19, the object of this construction being to facilitate the adjustment of the valve and to obtain more ready access to the interior of the member in case it should become necessary.

In the preferred construction shown the lower end of the delivery-tube 3 is extended down through the vertically-disposed portion 12 of the terminal-box and its end margin arranged to form the valve-seat against which the flap-valve 16 rests. In order to provide for the passage of air from the vertical portion 12 of the terminal-box into the horizontal portion 9 thereof and thence to the suction-tube 4, that portion of the side of the delivery-tube 3 which comes opposite the

horizontal passage is provided with a plurality of slots or openings 20 of sufficient size to permit ample flow of the air therethrough.

In order to control the exhaust of air through the terminal-box, I provide an improved damper-valve, which is constructed and arranged as follows: The end portion 10 of the box, which communicates with the suction-tube 4, is made parti-cylindric, and within this parti-cylindric portion is arranged to fit a correspondingly-shaped valve-sleeve 21, closed at its upper end by means of a disk or cap 22, open at its lower end and at one side, as indicated in sectional view, Fig. 4. To the center of the disk 22 is connected an operating-stem 23, which extends up through the upper wall of the terminal-box and is provided outside of the latter with an operating arm or handle, whereby the valve may be manipulated. Desirably that portion of the terminal-box over which the operating-arm sweeps is provided with graduations or marks whereby the position of the valve may be determined.

The operation of the device constructed as above described will be entirely obvious and need not, therefore, be repeated in detail. It is to be noted, however, that by reason of the relatively long and easy curve of the delivery-tube 3, located entirely outside of the terminal-box, the carrier will be gradually arrested without undue wear thereon, and it is to be further noted that by reason of the fact that the carrier remains under driving pressure until it is entirely through the curved portion of the delivery-tube and practically in contact with the door or flap-valve there is no tendency for it to stick or fail to be discharged, and this certainty of action will be equally present whether or not carriers be of uniform dimensions and whether or not the driving pressure be uniform. By reason of the peculiar construction and arrangement of the relief-ports 18 the valve will be closed very promptly, and the carrier will at once pass out of the influence of the air-draft as soon as it passes by the valve, and by reason of the fact that it is passing through a straight portion of the passage at the time that it encounters the valve it will readily overcome the resistance of the latter and drop into the delivery-chute. The construction as a whole is, moreover, extremely economical and of neat and attractive appearance, the terminal-box constituting but a slight enlargement of the pipe connections.

I claim as my invention—

1. In a pneumatic-despatch apparatus, the combination of a curved downwardly-discharging delivery-tube, a terminal-box into which said delivery-tube discharges, comprising a portion having a vertical passage in alinement and communication with the delivery-tube, a flap-valve interposed in said vertical passage, relief-openings communicating with the vertical passage immediately below the flap-valve, a portion having a trans-

verse draft-deflecting passage communicating with the vertical passage at a point immediately above the valve, and an exhaust-pipe connected with said transversely-extending passage, substantially as described.

2. In a pneumatic-despatch apparatus, the combination of a curved downwardly-discharging delivery-tube, a terminal-box into which said delivery-tube discharges, comprising a portion having a vertical passage in alinement and communication with the delivery-tube, a flap-valve interposed in said vertical passage, relief-openings communicating with the vertical passage immediately below the flap-valve, a portion having a transverse draft-deflecting passage communicating with the vertical passage at a point immediately above the valve, an exhaust-pipe connected with said transversely-extending passage, and a damper-valve arranged to control the exhaust through the terminal-box, substantially as described.

3. In a pneumatic-despatch apparatus, the combination of a curved downwardly-discharging delivery-tube, a terminal-box into which said delivery-tube discharges, comprising a portion having a vertical passage in alinement and communication with the delivery-tube, a flap-valve interposed in said vertical passage, relief-openings communicating with the passage immediately below the flap-valve, a portion having a transverse exhaust-passage communicating with the vertical passage at a point immediately above the valve, an exhaust-pipe connected with said transverse passage and arranged at an abrupt angle thereto, and a damper-valve arranged to control said passage and having its operating-stem arranged to project through the wall of the terminal-box adjacent to said angular connection, substantially as described.

4. In an apparatus of the character described, the combination with a tubular passage and a communicating passage entering the tubular passage at one side, of a damper-sleeve fitting within the tubular passage opposite the entrance of the communicating passage and provided with an inlet-aperture adapted to be brought into and out of register with the communicating passage by rotation of the sleeve, and means for operating said damper-sleeve, substantially as described.

5. In an apparatus of the character described, the combination with a terminal-box having a transverse passage, as 9, terminating in a parti-cylindric portion arranged at right angles to the transverse passage and communicating with an exhaust-passage, of the damper-valve 21 having the end cap 22 and the operating-stem connected therewith and extending out through the wall of the passage, substantially as described.

6. In a pneumatic-despatch apparatus, a terminal-box comprising upper and lower main members, said upper member comprising

a horizontally-disposed tubular portion having intersecting communicating vertical tubular portions at each end, a flap-valve arranged to control the lower end of one of said vertically-arranged portions, said lower member comprising a tubular body connected at its upper end with the lower end of the flap-valve-controlled vertical portion of the upper member and inclosing the main portion of the valve, and a plurality of inlet-apertures formed through the walls of said lower member at a point immediately below the valve when the latter is in closed position, the interior of said lower member being enlarged to accommodate the downward opening of the valve and permit the free passage of carriers therethrough, substantially as described.

7. In a terminal-box of the character described, the combination of the horizontally-disposed portion 9, having at each end downwardly-extending tubular portions, a resilient flap-valve mounted upon one of said extensions arranged to extend horizontally beneath and in position to control the passage through the other extension, and a hopper-shaped member connected with the valve-controlled extension, provided with inlets immediately below the normal position of the valve, substantially as described.

8. In a consecutive-delivery terminal, the combination with a hollow coupling adapted to be connected to the end of the receiving-tube and having a vertical tubular member for the passage of discharging carriers, and a lateral branch for the passage of the air-current to the exhausting device, of a flap-valve pivoted on said lateral branch and normally closing the lower end of said tubular member of the coupling, and a delivery-chute connected to the latter, said delivery-chute being cut away in the rear near its upper end for the purpose of permitting the free operation of the valve and also to prevent the formation of a vacuum in rear of a discharging carrier, substantially as described.

9. In a consecutive-delivery terminal, the combination with a hollow coupling adapted to be connected to the end of the receiving-tube, and having a vertical tubular member for the passage of discharging carriers, and a lateral branch for the passage of the air-current to the exhausting device, of a suitably-pivoted valve-disk normally closing the lower end of said tubular member of the coupling, and a delivery-chute connected to the latter, said delivery-chute being cut away on its rear and front sides near its upper and lower ends respectively for the respective purposes of permitting the free operation of the valve-disk and the consecutive removal of the discharging carriers, substantially as described.

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Witnesses:

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