F. H. WOLEVER.

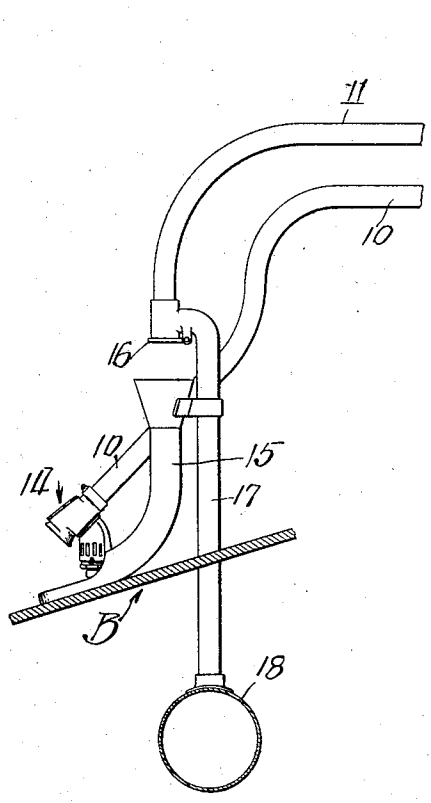
SENDING TERMINAL FOR PNEUMATIC DESPATCH TUBE SYSTEMS.

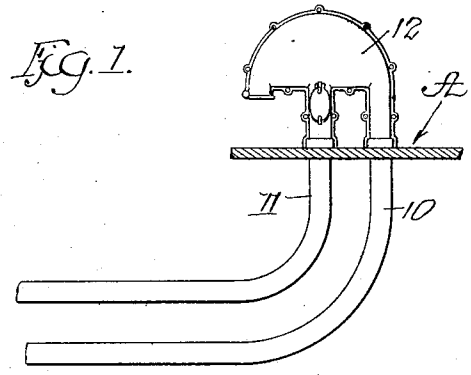
APPLICATION FILED NOV. 29, 1909.

965,494. **Patented July 26, 1910.**

2 SHEETS—SHEET 1.

Fig. 1.





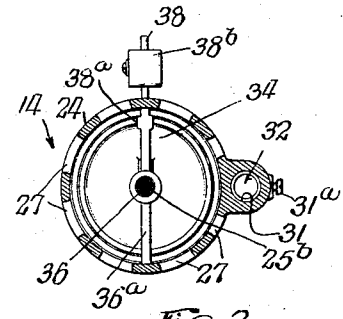
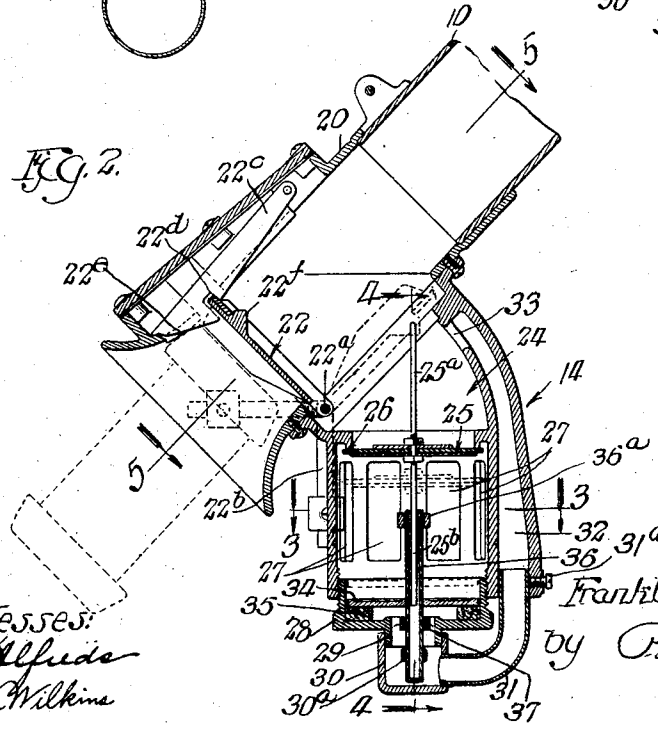


Fig. 3.

Fig. 2.



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2 SHEETS—SHEET 2.

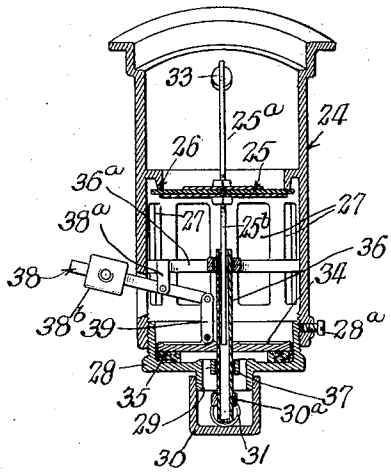

FIG. 4.

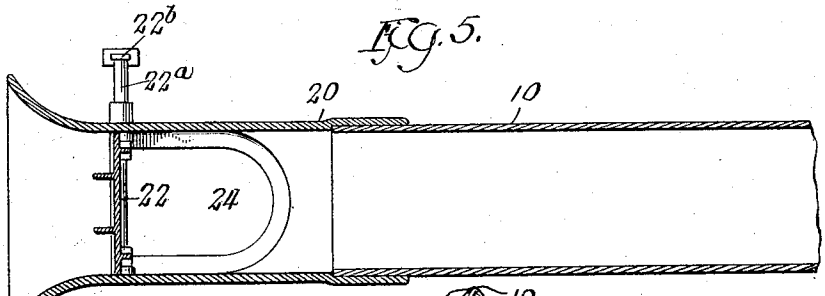

FIG. 5.

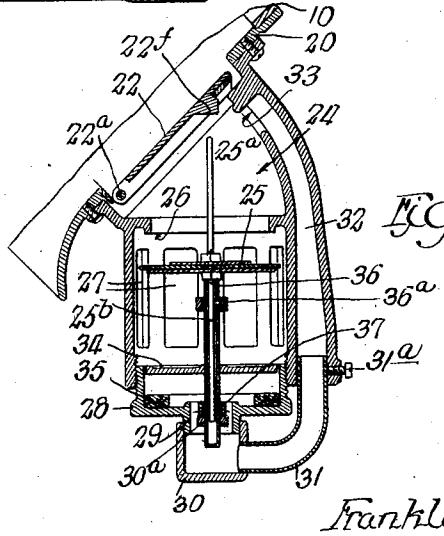

FIG. 6.

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UNITED STATES PATENT OFFICE.

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SENDING-TERMINAL FOR PNEUMATIC-DESPATCH-TUBE SYSTEMS.

965,494. Specification of Letters Patent. **Patented July 26, 1910.**

Application filed November 29, 1909. Serial No. 530,329.

To all whom it may concern:

Be it known that I, FRANKLIN H. WOLEVER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sending-Terminals for Pneumatic-Despatch-Tube Systems; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in pneumatic despatch tube systems and especially to improvements in the sending terminal of such a system.

The invention consists in the matters hereinafter described and more particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a diagrammatic view, with parts broken away, of a portion of a pneumatic despatch tube provided with my improvements. Fig. 2 is a vertical, axial section through the sending terminal. Fig. 3 is a transverse section through Fig. 2 on the line 3—3 thereof. Fig. 4 is a partial vertical section through Fig. 2 on the line 4—4 thereof. Fig. 5 is a section through Fig. 2 on the line 5—5 thereof. Fig. 6 is a section similar to that of Fig. 2 showing the parts in a different position.

As shown in the drawings, and referring more particularly to Fig. 1, 10 designates the cashier's sending tube, and 11, the salesman's return tube. The sending and return tubes are connected at the salesman's station A by a combined receiving and sending terminal 12 of the usual form, whereby the two lines of tubes constitute a closed loop through which the air current is maintained in a proper direction to transmit the cartridges therethrough from station to station. At the cashier's station B, the cashier's sending tube is provided with a sending terminal 14, and with a receiving terminal 15 located, as herein illustrated, vertically below the discharge end of the salesman's return tube. Said discharge end of the return tube has a downwardly and outwardly opening, self-closing gate 16 which is normally closed and is opened to permit a cartridge to pass from the return tube to the delivery terminal. The return tube is connected at a point above said gate with a vacuum trunk 18 by means of a pipe 17. The system herein illustrated is of that type wherein the sending and delivery terminals are normally closed and the tubes normally sealed during periods when the system is not in use. When a cartridge is inserted into one of the sending terminals, air is admitted to the system and the arrangement is such that air is admitted to the system only as long as the cartridge is in transit therethrough, the system being automatically sealed as soon as the cartridge is discharged therefrom. A complete system of the type herein illustrated usually embraces a plurality of loops extending from a number of salesmen's stations to a single cashier's station, with the discharge end of each salesman's return tube connected with the main vacuum trunk 18.

Referring now to the construction and arrangement of the sending terminal at the cashier's station, shown in Fig. 2:—said terminal embraces a tube section 20 and an inwardly opening swinging gate 22 which normally closes the cartridge thoroughfare of the sending terminal. 22ª indicates the hinged rod of said gate which is preferably formed rigidly with the gate so as to turn therewith and which projects through the wall of the sending terminal tube section 20, and is there provided with a weighted lever arm 22ᵇ which tends to hold the gate in closed position. This construction for closing the gate is preferable for the reason that the weight may be adjusted so as to exactly suit the particular condition under which the system operates.

24 indicates an air inlet branch which opens into the terminal just inside of the gate. Said air inlet is normally closed by a check valve 25 which closes against an annular seat 26 projecting inwardly from the wall of the inlet pipe.

27, 27 indicate air inlet openings in the walls of the inlet tube 24, said openings being arranged below the check valve seat 26. Said inlet tube is closed at the bottom by means of an inverted screw-threaded cap 28 provided with a central, hollow, depending stem 29. A cup 30, fitting smoothly over said stem 29, closes it and is provided with a laterally extending curved tube 31 which projects into the lower end of a vertical

conduit 32 formed on the outer wall of the inlet tube 24. Said conduit 32 communicates with the upper end of said inlet tube 24 above the check valve seat 26, and near the junction of the air inlet tube with the terminal tube section 20, as indicated at 33.

34 indicates a dash pot located at the lower end of the air inlet tube. Said dash pot is normally in closed position against a rubber gasket 35 arranged within the cap 28. Said dash pot has a hollow stem 36 which passes through an annular opening in a spider 37, formed within the stem 29 of the cap 28, and through a similar opening in a spider 36^a extending inwardly from the walls of the inlet chamber above said dash pot. Said spiders serve to guide the stem 36 as the dash pot rises or falls. The check valve 25 is provided with an upwardly projecting stem 25^a and a downwardly projecting stem 25^b, the latter engaging within the hollow stem 36 of the dash pot. A weighted lever arm 38 (Fig. 4) is pivoted to a lug 38^a depending from the spider 36^a and is pivotally connected at its inner end to a link 39 which is pivotally attached to the dash pot 34 near its center. Said weight tends normally to raise said dash pot. By adjusting the weight 38^b in or out on the lever, the upward tendency of the dash pot may be regulated to suit the conditions existing in any particular system.

The gate 22 is normally locked as usual in closed position by means of a gravity latch 22^c provided with a notch 22^d which engages the rim of said gate. When a cartridge is inserted its end engages the forward beveled end 22^e of the latch so as to raise it and thus release the gate which opens under the pressure of the cartridge and permits the cartridge to pass.

The operation of my improvement is as follows:—With the parts as indicated in Fig. 2, with the gate 22, the check valve 25, and the dash pot 34, each in closed position, a vacuum exists in the system, said vacuum extending through the conduit 32 and pipe 31 to the chamber below the dash pot 34. When a cartridge is inserted through the gate 22, said gate is swung into the position indicated in Fig. 6. As the gate is opened a lug 22^f on its back engages the upper end of the stem 25^a of the check valve and thus forcibly pushes the valve from its seat. By this arrangement, in case the check valve should become stuck against its seat by reason of its non-use throughout a long period, the valve is forcibly released from contact with its seat and its operation thus insured. Air enters the tube 24 through the openings 27, passes about the valve 25 and entering the terminal tube 20 drives the cartridge through the system. As the air freely enters the tube 24 the partial vacuum in the conduit 32 and curved pipe 31 is broken and atmospheric pressure is brought to bear on both sides of the dash pot 34, so that the weighted lever arm 38 raises the dash pot 34 and with it its tubular stem 36 which rises to receive and support the check valve 25. A lug 30^a secured near the lower end of the tubular stem 36 is adapted to engage the spider 37, and thus limit the upward movement of the dash pot, and of its stem 36. After the cartridge has passed the open gate 22, said gate is automatically closed by the weighted lever arm 22^b. The system is now sealed, except for the entrance of air through the air inlet tube 24. On account of variations of the speed of the motor which operates to produce the vacuum in the main 18, or on account of the operation of other branches of the system, or for various other reasons, the speed of the cartridge proceeding toward the salesman's desk is apt to vary and were the check valve 25 uncontrolled, a partial vacuum might be produced above it momentarily, sufficient to prematurely close it on its seat before the discharge of the cartridge. By the construction described, such premature closing of the check valve is prevented. As before stated, when the check valve is forced from its seat it is caught on the upper end of the stem 36 of the dash pot. Should a partial vacuum be produced above the check valve, through a momentary change of the speed of the cartridge, as above described, this vacuum will be immediately communicated through the conduit 32 to the chamber below the dash pot, in advance of any influence on the check valve, so that the dash pot will move toward its seat, this permitting the check valve to fall farther away from its closed position. The weighted lever arm normally tends to resist this action and to hold the check valve as near as possible to its seat. Upon the discharge of the cartridge, a strong vacuum is at once produced above the check valve which causes its instant closure, and also by its action through the conduit 32, the closing of the dash pot on its seat.

The cap 28 may be adjusted up or down and locked in any desired position by means of a set screw 28^a which engages a lead or other soft metal plug which is in contact with the screw-threaded wall of the cap. To accommodate given positions of the cap, the curved pipe 31, telescopes within the conduit 32 and is held in the desired position by means of a set screw 31^a. As illustrated, said cap is shown in its lowermost position to accommodate a short tube line. For a longer tube line it would be raised.

I claim as my invention:—

1. In a vacuum tube system, in combination with the sending terminal tube, a gate normally closing the same, an air inlet branch opening into the sending terminal tube adjacent said gate, and a check-valve

adapted to close said air inlet branch, means for controlling the closing of said check-valve comprising a variable pressure chamber in which the pressure varies with the pressure above the check-valve, a supporting member subjected upon one side to the pressure in said variable pressure chamber and on the other side to atmospheric pressure, said supporting member being movable between predetermined points and being adapted to support said check-valve when in open position, and means tending to force said supporting member toward said valve when the pressures upon opposite sides of said supporting member are equalized.

2. In a vacuum tube system, in combination with the sending terminal tube, a gate normally closing the same, an air inlet branch opening into the sending terminal tube adjacent said gate, and a check-valve adapted to close said air inlet branch, means for controlling the closing of said check-valve comprising a variable pressure chamber in which the pressure varies with the pressure above said check-valve, a supporting member forming one wall of said pressure chamber adapted to support said valve when in open position, said supporting member being movable between predetermined points, and means tending to force said supporting member toward said valve when the pressures on opposite sides of said supporting member are equalized.

3. In a vacuum tube system, in combination with the sending terminal tube, a gate normally closing the same, an air inlet branch opening into the sending terminal tube adjacent the gate, and a check-valve adapted to close said air inlet branch, means for controlling the closing of the check-valve comprising a variable pressure chamber, a conduit connecting said chamber with said air inlet branch above said check-valve, a supporting member forming one wall of said chamber adapted to support said valve when in open position, said supporting member being movable between predetermined points, and means tending to force the supporting member toward said valve when the pressures on opposite sides of said supporting member are equalized.

4. In a vacuum tube system, in combination with the sending terminal tube, a gate normally closing the same, an air inlet pipe opening into the sending terminal tube adjacent to the gate and a check-valve adapted to close said air inlet pipe, means for controlling the closing of the check-valve comprising a variable pressure chamber located below said check valve, a conduit connecting said chamber with said air inlet branch above said check-valve, a piston working in said chamber, said piston being provided with a hollow stem which projects upward toward said valve and is adapted to support said valve when in an open position, means for limiting the movement of said piston in both directions, said check-valve being provided with a guide stem which projects within the hollow stem of said piston, and a weighted lever arm pivotally mounted above said piston and adapted to raise the same.

5. In a vacuum tube system, in combination with the sending terminal tube, a gate normally closing the same, an air inlet branch opening into the sending terminal tube adjacent to said gate, and a check-valve adapted to close said air inlet branch provided with a downwardly extending stem, air inlet openings in the walls of said branch tube, an inverted screw-threaded cap adapted to close the lower end of said inlet tube, a piston working within said cap provided with a hollow stem, which is in line with said downwardly projecting stem of said check-valve, means for limiting the movement of said piston in both directions, a depending, hollow stem formed at the bottom of said inverted cap, a cup fitting over and closing said hollow stem, a laterally and upwardly extending tube opening into said cup, a conduit formed on the outer wall of said inlet branch tube, said conduit opening into the branch tube above said check-valve, and being open at the bottom to receive said laterally and upwardly extending tube in telescopic relation, and means for securing said tube within said conduit.

In testimony, that I, claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 17th day of November A. D. 1909.

FRANKLIN H. WOLEVER.

Witnesses:

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