No. 847,233. PATENTED MAR. 12, 1907.

C. H. BURTON.

PNEUMATIC DESPATCHING TUBE SYSTEM.

APPLICATION FILED DEC. 19, 1906.

2 SHEETS—SHEET 1.

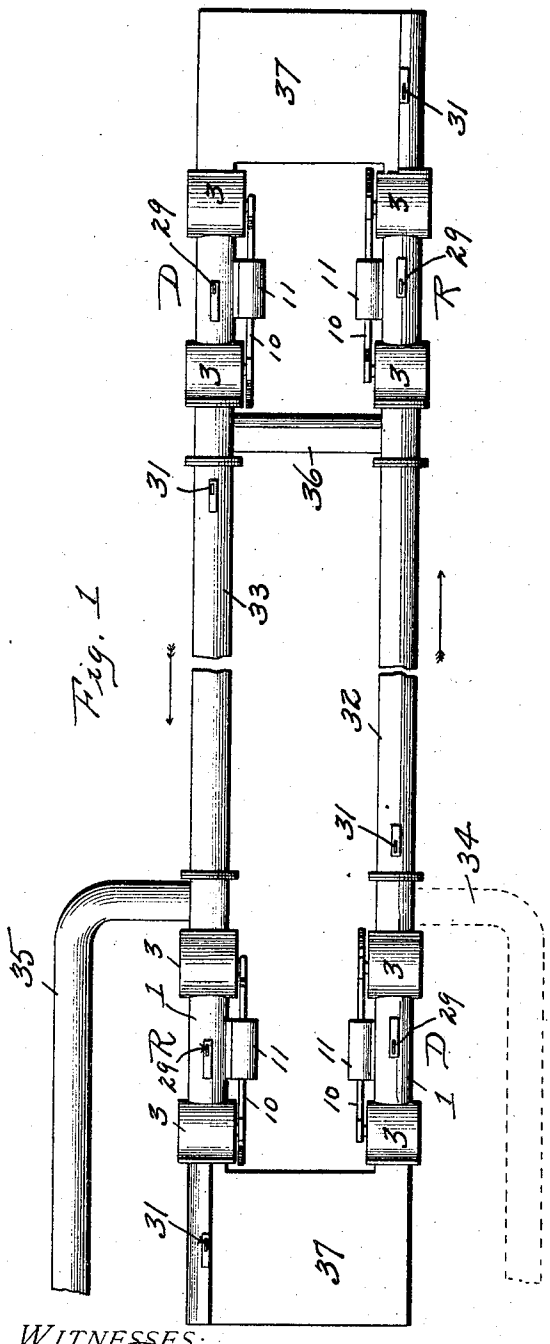


Fig. 1.

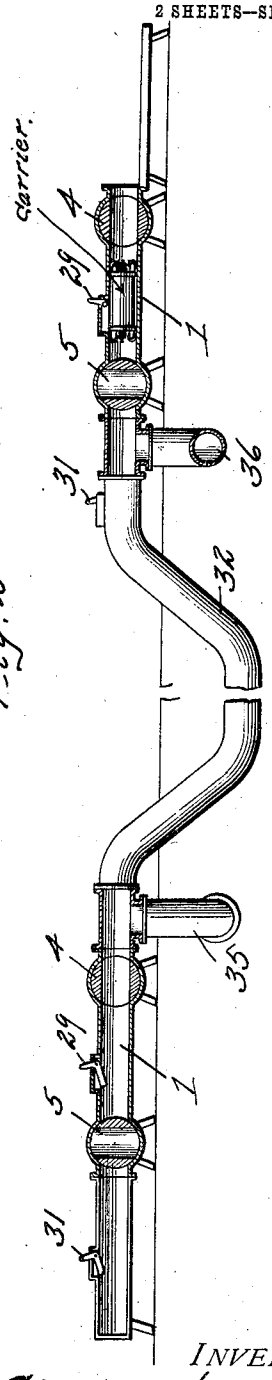


Fig. 2.

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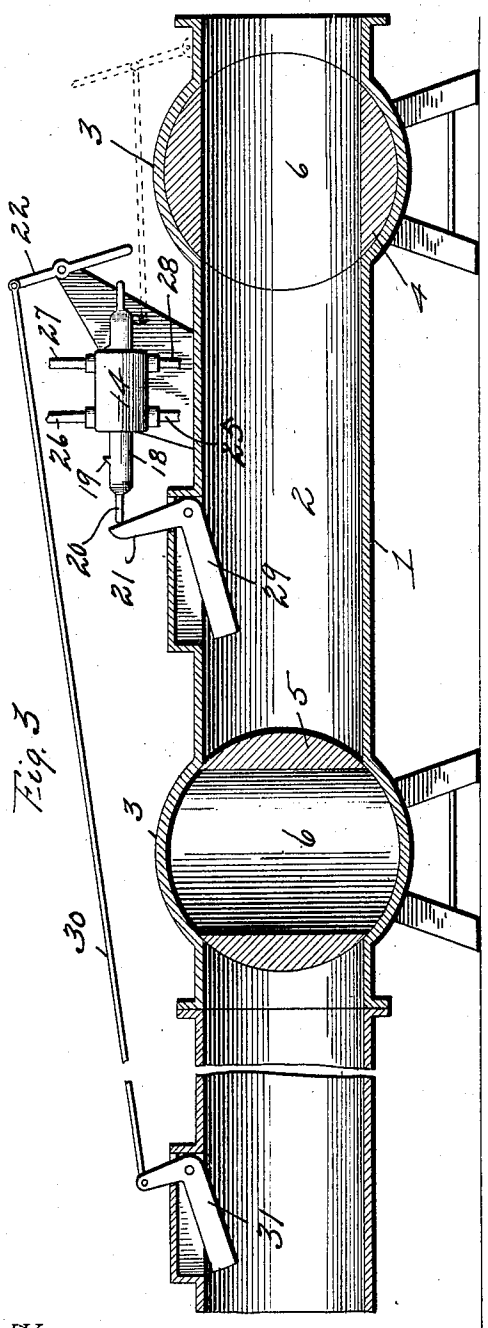


Fig. 3.

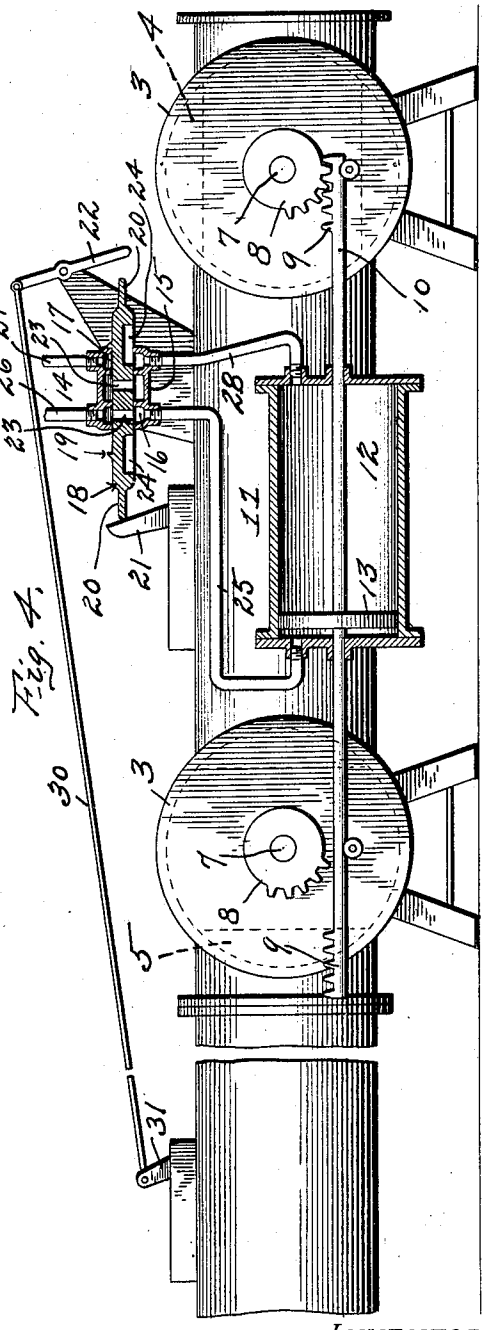


Fig. 4.

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PNEUMATIC-DESPATCHING-TUBE SYSTEM.

No. 847,233. Specification of Letters Patent. Patented March 12, 1907.

Application filed December 19, 1906. Serial No. 348,622.

To all whom it may concern:

Be it known that I, CHARLES H. BURTON, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Pneumatic-Despatching-Tube Systems, of which the following is a specification.

This invention relates to pneumatic-despatch-tube systems, and has in view certain practical and novel improvements in systems of this character, rendering the same available for long or short distance transmission with the greatest possible economy and safety.

To this end the invention contemplates a pneumatic-despatch-tube system involving in its organization a practical and effective valve arrangement for the carrier-stations, which valve arrangement is applicable to stations operated either as terminal stations for receiving and sending purposes or as an intermediate or relay station, in any of which uses the said valve arrangement provides for automatically and positively receiving and delivering the carrier or carrier-cartridge with absolute safety and certainty.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention are necessarily susceptible to a wide range of structural modification without departing from the scope thereof; but a preferred embodiment of the same is shown in the accompanying drawings, in which—

Figure 1 is a top plan view of a complete pneumatic-despatch-tube system embodying the invention, the view omitting the motor-controlling valve device for each carrier-station. Fig. 2 is a sectional elevation on the line 2 2 of Fig. 1. Fig. 3 is an enlarged sectional view of one of the carrier-stations. Fig. 4 is a side elevation of one of the carrier-stations, showing in section the double-acting valve-operating motor and the automatic motor-controlling valve.

Like references designate corresponding parts in the several figures of the drawings.

In carrying out the present invention a distinctive feature thereof resides in the construction and automatic operation of what may be termed the "individual carrier-stations," which stations are capable of use in any location—that is, as a receiving-terminal, as a despatching-terminal, or as a relay-station. In any of these uses the construction and action of the improved carrier-station is the same, and, referring particularly thereto, it will be observed that each of said carrier-stations embodies in its organization a main trap-casing 1, inclosing therein what may be characterized as a carrier-chamber in which the despatch-carrier is trapped and handled. At opposite end portions of the carrier-chamber 2 the trap-casing 1 is provided with valve-housings 3, which accommodate therein the oppositely-located and reversely-arranged trapping-valves 4 and 5, respectively, which valves are provided therethrough with transverse passage-ways 6 of a shape and size corresponding to the shape and size of the transmission-tube through which the carriers are driven or drawn by pressure or suction. The reverse arrangement of the opposite valves 4 and 5 is such that one valve occupies an open position while the other is closed, and vice versa, and this relation is maintained at all times during the operation of the system and its various stations.

Each of the valves 4 and 5 embodies a cylindrical body portion pierced by the passage-way 6 and carrying upon one of its spindle extremities 7 an exterior mutilated or partial gear 8, the teeth of which are adapted to mesh with a rack-section 9 on one end of a reciprocating valve-shifting rod 10, which is adapted to be automatically actuated by means of a pneumatic valve-operating motor 11, essentially consisting of a working cylinder 12 and a double-acting piston 13, arranged within the cylinder and mounted upon the rod 10.

The distance between the rack-sections 9 at opposite ends of the rod 10 is greater than the distance between the gears 8 of the opposite valves 4 and 5, so that the opening movement of one valve must be entirely completed before the closing movement of the other valve starts, and vice versa, this operation insuring perfect safety in the handling of the carriers, as will presently appear.

The pneumatic valve-operating motor 11 also properly includes as a part thereof a motor-controlling valve device, (designated in its

entirety by the reference-number 14.) This valve device essentially consists of a double valve-casing 15, having the separate and distinct valve-chambers 16 and 17, respectively, with both of which coöperate a reciprocating valve 18. The valve 18 preferably consists of a straight bar mounted to slide transversely through the casing 15 and across both valve-chambers 16 and 17, the said valve being provided with stop projections 19 for limiting its movement in both directions and also with the terminal strike-heads 20, adapted to be respectively engaged by the tappet-levers 21 and 22, respectively, as will be further explained.

That part of the valve 18 coöperating with each of the valve-chambers 16 and 17 is provided with the separate power-controlling port 23 and a relief-port 24, the latter being in the form of a bridging channel or groove adapted to connect the interior of the valve-chamber with the outer air, while the other port 23 opens up the passage-way through the valve-chamber for the suction or pressure, whichever may be employed for working the motor 11. The valve-chamber 16 has a pipe connection 25 at one end with one end of the cylinder 12 and a suction or power pipe connection 26 at its other end with a suction-pipe or other point of power-supply in the system. A similar suction or power supply connection 27 is made with the other valve-chamber 17, and the latter also has a pipe connection 28 with the end of the cylinder 12 opposite the pipe connection 25.

The tappet-lever 21, which is adapted to engage one end of the valve 18, may be conveniently formed as one end of a bell-crank trigger 29, whose operating-arm normally lies in the path of the carrier within the carrier-chamber 2 of the main trap-casing 1, so that a carrier, which is moved into said chamber by hand or otherwise, serves to lift the inner operating-arm of the trigger 9 with the result of moving the valve 18 in one direction. The valve is returned in the opposite direction by the action of the oppositely-located lever 22, having a connecting-rod connection 30 with a second valve-return trigger 31, also preferably in the form of a bell-crank pivotally supported beyond the trap-casing 1, either within or without the transmission-tube, according to the use of the station as a receiving-terminal, a despatching-terminal, or a relay-station.

From the construction described it will be obvious that when a despatch-carrier passes through the open valve 4 into the chamber 2 the same moves into engagement with the trigger 29, so that by the time the carrier has completely passed said open valve the motor-controlling valve 18 will have been shifted to a position for opening up the chamber 17 to the suction through the port 23, thereby applying suction-power to the piston 13, with the result of moving the rod 10 in a direction for closing the previously-opened valve 4 and opening the previously-closed valve 5, so that the carrier can pass out through the latter valve. When this occurs, the carrier passes into engagement with the valve-return-trigger 31, which serves to automatically reverse the position of the valve 18, and hence reverse the action of the motor 11. When suction is applied to one side of the piston 13, the vacuum at the opposite side thereof is relieved by one of the relief-ports 24, connecting the cylinder-pipe 25 or 28, whichever it may be, with the outer air.

A preferable manner of incorporating the stations described in a complete system is shown in the drawings and consists in arranging a pair of the stations at the opposite ends of the sending and return transmission-tubes 32 and 33, respectively, the former of said tubes having a supply-inlet 34 in communication with the outer air, and the tube 33 having a power-supply connection 35 with the pump at the power-station. At one end next to the carrier-stations the two tubes 32 and 33 are connected by a cross circulating-pipe 36, which completes the pneumatic circuit. Adjacent to the carrier-stations at each end of the tubes 32 and 33 is arranged a receiving and despatching table 37, utilized for receiving and despatching purposes.

It will be observed that the arrangement described involves the idea of the two carrier-stations adjacent to each table 37, acting, respectively, as a despatching-terminal D and a receiving-terminal R. Hence each of the transmission-tubes has at one end a despatching-terminal and at its opposite end a receiving-terminal.

It will be observed that the arrangement above described constitutes a vacuum or suction system for handling the despatch-carriers, and in this connection it may be noted that in this embodiment of the invention there is utilized the well-known expedient of having the terminal stations arranged at a slight inclination, so that a carrier when introduced into the despatching-terminal will roll into the line of suction and when received into the receiving-terminal will also roll out onto the table after the outermost valve opens.

I claim—

1. In a pneumatic-despatch system, the transmission-tube, and a carrier-station comprising a trap-casing, opposite reversely-arranged trapping-valves each of which carries a gear, a reciprocating valve-shifting rod having opposite rack-sections respectively engaging the gears of the opposite valves, said rack-sections being spaced a greater distance apart than the opposite gears, and a pneumatic operating-motor for said rod.

2. In a pneumatic-despatch system, the transmission-tube, and a carrier-station com-

prising a trap-casing, opposite trapping-valves, a valve-shifting rod, a double-acting pneumatic operating-motor for said rod, a motor-controlling device having a shiftable valve comprising means for establishing a power and a relief connection with each end of the motor-cylinder, a carrier-actuated trigger within the trap-casing for operating said motor-controlling valve in one direction, and a valve-return trigger arranged beyond the trap-casing and adapted to actuate said motor-controlling valve in the opposite direction.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CHARLES H. BURTON.

Witnesses:
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CHAS. W. FISHER.