C. S. JENNINGS.

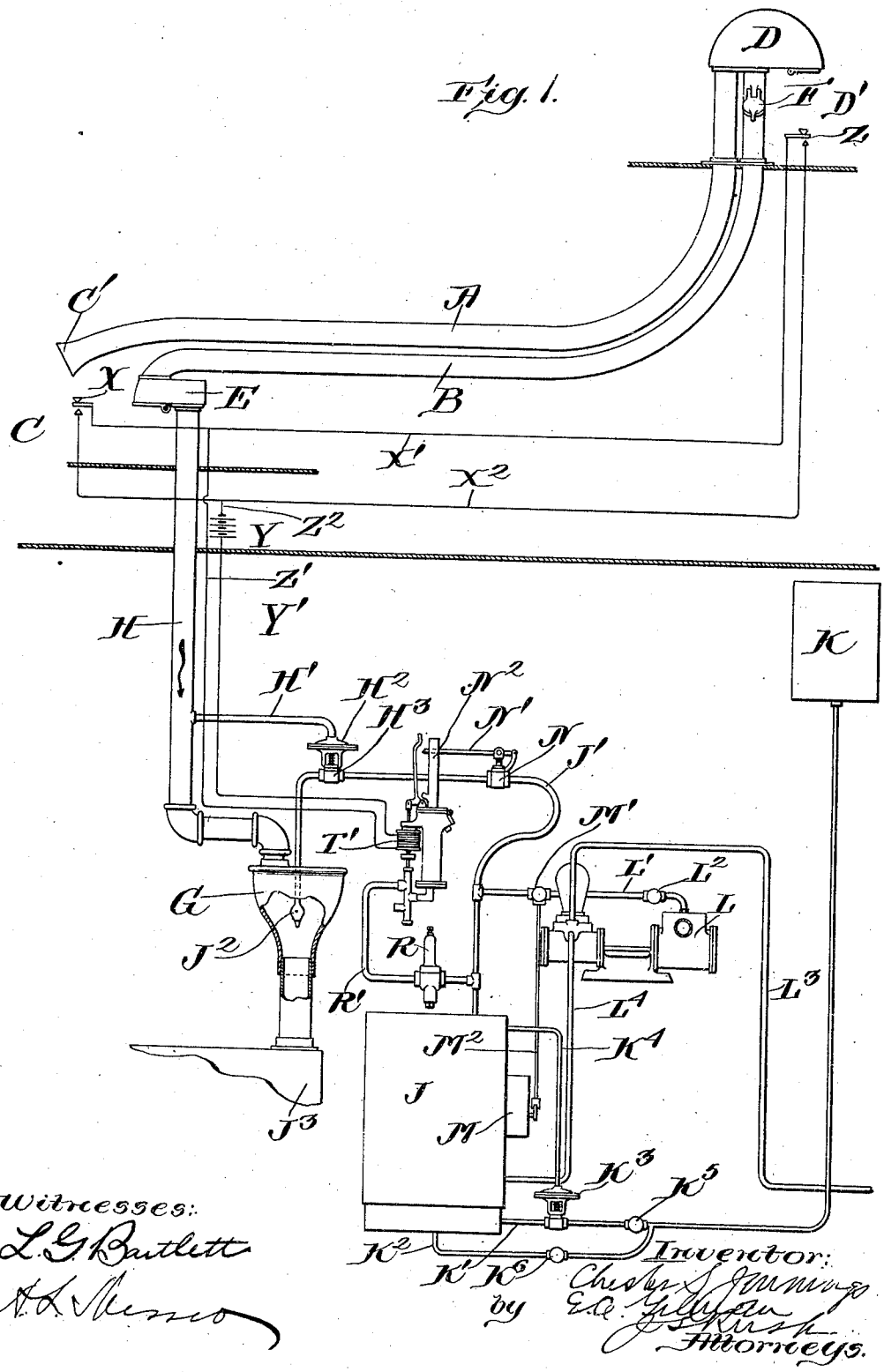
PNEUMATIC DESPATCH TUBE APPARATUS.

APPLICATION FILED APR. 1, 1907.

972,381. **Patented Oct. 11, 1910.**

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

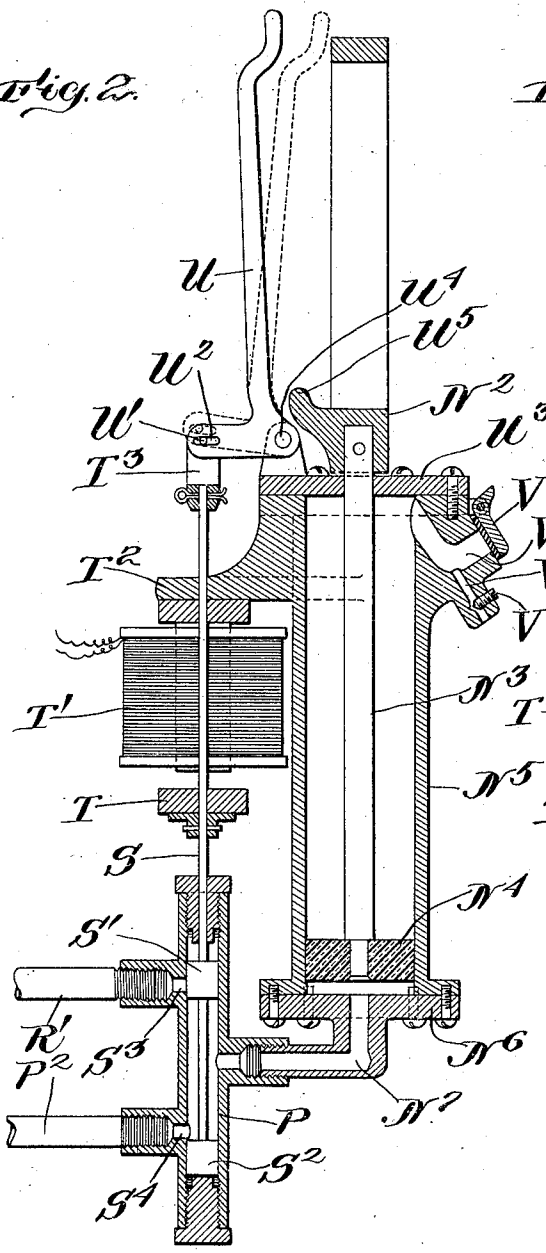
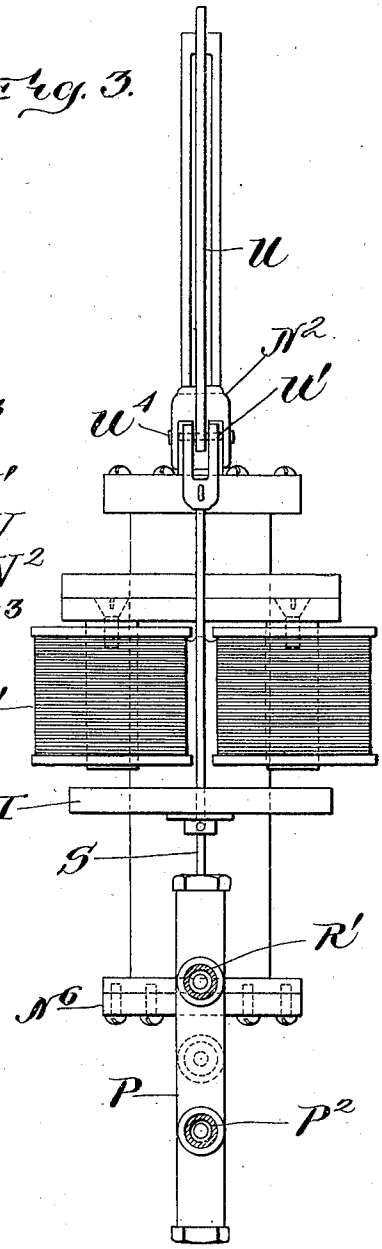


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHESTER S. JENNINGS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO LAMSON CONSOLIDATED STORE SERVICE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

972,381. Specification of Letters Patent. **Patented Oct. 11, 1910.**

Application filed April 1, 1907. Serial No. 365,627.

To all whom it may concern:

Be it known that I, CHESTER S. JENNINGS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic-Despatch-Tube Apparatus, of which the following is a specification.

This invention relates to improvements in pneumatic despatch tube apparatus and particularly to that class wherein a fluid under pressure is used to create a vacuum for the transmission of carriers.

The object of this invention is to control and maintain a predetermined normal pressure in the actuating fluid for producing the vacuum or air current for driving carriers. This is accomplished by automatically controlling the fuel supply for generating the steam pressure, which is the fluid described herein for creating the vacuum in the tube system; another object is to control the amount of fluid used to produce and maintain a predetermined vacuum in the system while carriers are in transit through the same, and to automatically shut off the supply of fluid when there are no carriers in transit.

In the accompanying drawings which illustrate a construction embodying my invention; Figure 1 is a diagrammatic view of a pneumatic tube system operated by the device; Fig. 2 is an enlarged sectional view of the mechanism for establishing and limiting the operation of the steam pressure; Fig. 3 is a front elevation of the mechanism shown in Fig. 2.

Like letters of reference refer to like parts throughout the several views.

A represents a transmission tube connecting the central station C with the ordinary receiving terminal D at the sub-station D'.

B is a transmission tube for the return of carriers and connects the terminal D at the sub-station D' with the terminal E at the central station C. Carriers are inserted into the tube B through the despatching inlet F. The terminal E is connected with the inspirator G by a vacuum pipe H. The inspirator G is connected with the steam boiler J by means of the pipe J' which is fitted with a nozzle J^2 and adapted to throw a jet of steam into the exhaust chamber J^3.

K is a tank for supplying liquid fuel under gravity to the main burner K' and pilot burner K^2.

K^3 is an automatic regulating valve connected with the boiler J by the pipe K^4 and adapted to cut off the main burner when the pressure in the boiler has reached a predetermined point.

K^5 and K^6 are hand operated valves for controlling the main and pilot burners respectively.

L is a steam pump connected with steam pipe J' and controlled by a valve L^2. Water is supplied to the pump by a pipe L^3 and supplies the boiler through the pipe L^4.

M is a float feed adapted to open or close the steam valve M' through a link M^2 to control the operation of the pump L according to the level of the water in the boiler J. The balance valve N controls the pipe J' intermediate the boiler J and the inspirator G. The lever N' adapted to operate said valve is mounted at one end in the slotted member N^2 attached to the piston rod N^3 (Figs. 2 and 3) which carries the piston N^4 mounted in the cylinder N^5, the lower cylinder head N^6 being connected with the two-way valve P by the passage N^7, the lower part of said valve P being connected with the exhaust pipe P^2. Connecting the upper part of the valve P with the steam pipe J' is a pipe R' controlled by the reducing valve R (Fig. 1).

Mounted on the rod S in the cylinder of valve P are pistons S' and S^2 controlling respectively the passages S^3 and S^4; attached to the rod S is the armature T which is adapted to be operated by the magnet T' which is secured to an extension T^2 of the cylinder N^5. The upper portion of rod S is reciprocally mounted in extension T^2 and carries the cross-head T^3 which is connected with the bell crank lever U by a pin U' mounted in slot U^2. The lever U is pivoted to the upper cylinder head U^3 at U^4. The slotted member N^2 carries the cam projection U^5 adapted to engage the upper end of the bell crank U. In the upper part of cylinder N^5 is a passage V communicating with the atmosphere and controlled by the outwardly-opening check valve V' and also a smaller passage V^2 controlled by the adjustable timing screw V^3. A balance valve H^3 located in the pipe J' is adapted to control the amount of steam used in the inspirator G and is operated by a diaphragm H^2 connected with the vacuum tube H by a

pipe H′. This valve H^3 is normally open sufficiently to admit enough steam to the nozzle J^2 to produce the vacuum necessary for transmitting a single carrier, but if there are a number of carriers in transmission increasing the load, the vacuum in the tube H will rise and act on the diaphragm regulator H^2 to further open the valve H^3, thereby admitting an increased amount of steam to the nozzle J^2 to take care of the increased load. The push button X at the central station C and the button Z at the sub-station D′ are connected with the magnet T′ by wires X′ and Z′ and with battery Y by wires X^2 and Z^2, the battery Y being connected with magnet T′ by wire Y′.

The operation is as follows: If it is desired to despatch a carrier from the central station C to the sub-station D′ the button X is pushed completing the circuit and energizing the magnet T′ and lifting the armature T and through the rod S raising the pistons S′ S^2 opening the passage S^3 at the same time throwing the bell crank lever U to the position shown by dotted lines Fig. 2. The opening of passage S^3 admits the steam which enters the cylinder N^5 through passage N^7 driving the piston N^4 upward causing the slotted member N^2 to engage the bell lever U forcing it to its original position and closing the admission of steam through the passage S^3. In the meantime, the lower portion of the slot N^2 engages and lifts the lever N′ opening the balance valve N and allowing the flow of steam from boiler J through pipe J′ and nozzle J^2 of the inspirator G. The flow of steam creates a vacuum in inspirator chamber G causing a flow of air in the pipe H in direction indicated by arrow, thereby transmitting the carrier through the tube A and discharging the same at sub-station D′. In the meantime, the check valve V′ has permitted the quick rise of the piston N^4, and, the passage S^3 being closed as hereinbefore described, the steam in the cylinder N^5 is allowed to exhaust through the port S^4 and the piston N^4 gradually drops by gravity and timed by the admission of air through passage V^2. When the member N^2 has nearly reached the normal position, the upper end of the slot engages the lever N′ closing the valve N and shutting off the flow of steam. If more than one carrier is in transit the load is increased, causing an increase in the vacuum in the pipe H and tube H′ and acting on the diaphragm regulator H^2, opens the valve H^3 to a greater extent causing an increase in the volume of steam and a corresponding increase in the flow of air. The operation in despatching a carrier from the sub-station D′ to the central station C is identical with that above described except that the button Z is used to complete the circuit and energize the magnet T′.

Having thus described the nature of my invention and set forth a construction embodying the same, what I claim as new and desire to secure by Letters Patent of the United States is—

1. The combination with a pneumatic despatch tube system, of an inspirator adapted to create a flow of air through said system, a source of fluid pressure for operating said inspirator, means for throwing into operation said inspirator whereby a carrier may be transmitted through said system, and mechanism adapted to be operated by said source of fluid pressure for automatically timing the operation of said inspirator for the proper transmission and delivery of said carrier.

2. In a pneumatic despatch tube system, a fluid pressure-actuated inspirator adapted to create a flow of air through the system, a source of fluid pressure for operating said inspirator, an electric circuit for throwing into operation said inspirator whereby a carrier may be transmitted through the system, means independent of said circuit for throwing out of operation said inspirator, mechanism for timing the operation of said independent means, and means for automatically controlling the actuating fluid for creating a flow of air in proportion to the load on the system.

3. In a pneumatic despatch tube system, a fluid pressure-actuated inspirator adapted to create a flow of air through the system, a source of fluid pressure for operating said inspirator, an electric circuit for throwing into operation said inspirator whereby a carrier may be transmitted through the system, means independent of said circuit for throwing out of operation said inspirator, mechanism for timing the operation of said independent means, and a regulator for automatically controlling the actuating fluid for creating a flow of air in proportion to the load on the system.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 20th day of March A. D. 1907.

CHESTER S. JENNINGS.

Witnesses:

A. L. Messed,

A. R. Larrabee.