

(No Model)

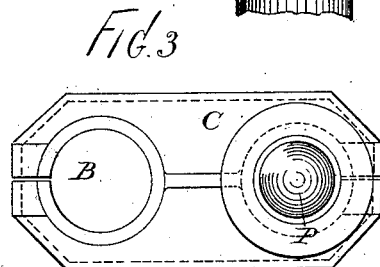
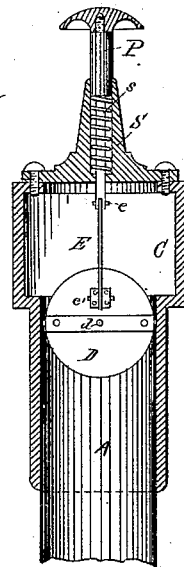
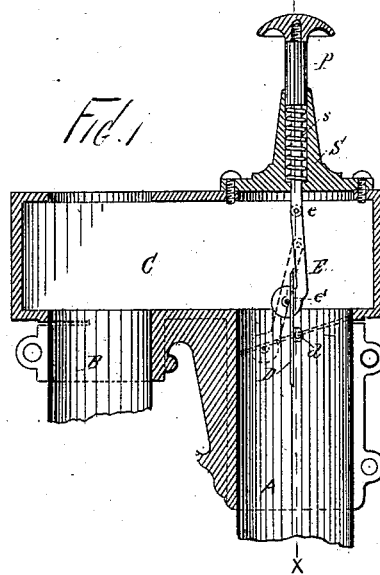
2 Sheets—Sheet 1.

E. S. LEAYCRAFT.

PNEUMATIC DISPATCH AND SIGNALING APPARATUS.

No. 304,832.

Patented Sept. 9, 1884.



Witnesses
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2 Sheets—Sheet 2.

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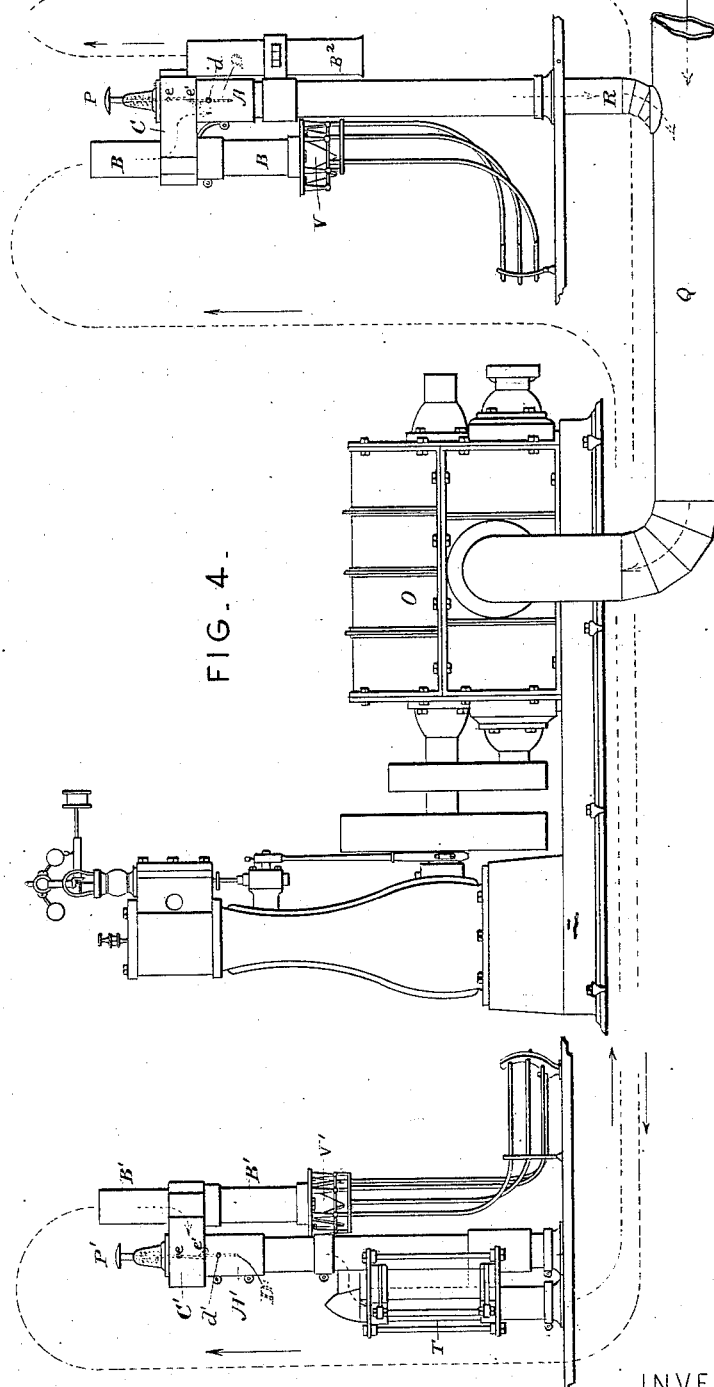


FIG. 4 -

ATTEST -

Geo T. Smallwood.
J. Henry Kaiser

INVENTOR -

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UNITED STATES PATENT OFFICE.

EDWIN S. LEAYCRAFT, OF JERSEY CITY, NEW JERSEY.

PNEUMATIC DISPATCH AND SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 304,832, dated September 9, 1884.

Application filed January 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWIN S. LEAYCRAFT, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Pneumatic Dispatch and Signaling Apparatus, of which the following is a specification.

There are two systems or methods of moving carriers or parcels in pneumatic tubes—one where the air is forced through the tubes by a force-pump or other means placed at one end of the tube and the carrier or parcel is forced along in front of the air, and the other where an exhaust-pump is used at the end of the tube, sucking the air out of the tube, thereby creating a vacuum in front of the carrier or parcel, and causing it to be driven through the tube by the current of air forced in at the other end by atmospheric pressure. In both these systems it is necessary to place valves in the circuit of the tube at the places where it is desired to insert or remove the carriers. In what is known as the force system—that is, where a current of air is forced through the tubes, pushing the carrier before it—the valves at the various receiving and delivery stations are kept closed over the entrance to the tube at those places. When the current is cut off, these valves open. They are generally arranged so as to open against the inner side of the tube. If now the air-current is again suddenly admitted, these valves will close with a noise, which is conveyed through the entire tube, said tube acting similarly to a speaking trumpet or tube. In the other or exhaust system the valves at the stations are closed during the passage of the current, and, being generally arranged to open outward when the current is stopped, fall open, and close with a noise when the suction of the air in the tube is again commenced.

The invention consists in the combination, with a circuit of conducting-pipes and with automatic delivery-valves adapted to be closed by the direct action of air-pressure, of manual valves by which the current can be cut off at will by an operator at either station, the shutting and opening of which manual valves serve to interrupt and re-establish the current of air, causing the automatic delivery-valves to open and shut with an audible concussion, which is used for signaling from one station to another.

The drawings represent one form of shut-off valve which can be used for my improved method of signaling.

In the drawings, Figure I represents a sectional view of my improved valve; Fig. II, another sectional view of the same in the line *xx* of Fig. I. Fig. III represents a plan of the same. Fig. IV is an elevation to illustrate the operation of the invention, showing a common form of blowing-engine, a part of the main pneumatic tube connecting therewith, a branch tube connecting with the main tube, and two of the receiving and delivering stations, with dotted lines indicating the circuit by which they are connected, each of these stations being provided with automatic discharge-valves and conducting-tubes, such as are shown and described in my patent of June 13, 1876.

Q represents a portion of the main tube of a pneumatic system or apparatus; R, a branch pipe connecting therewith, and O a blowing-engine, which in the present illustration is represented as operating by exhaust or suction to produce a current through the several tubes, as indicated by the arrows. With the branch tube R the portion A of the valve system is directly connected, and with this the delivery branch B, having a discharge-valve, V, connects through the air-chamber or connecting-tube C.

In employing the apparatus as a pneumatic-tube cash system in retail stores, the tube A and its accessories may constitute the cashier's instrument, and a similar tube, A', branch tube B', and air-chamber C' one of the counter instruments, the latter being furnished with an air-lock, T, as described in my previous patent, already referred to, for introducing the carriers to the return-tube.

D D' represent valves placed in the tubes A and A', preferably of an oval shape, and tightly closing said tubes when in an inclined position. This valve D or D' is hinged or pivoted upon a rod, *d* or *d'*, in the center of said tube A or A', and is connected by the rod E, hinged at that side of said valve nearest the tube B or B', to the plunger P or P' by means of the hinge connections or pivots *e* and *e'*. This plunger P or P' works in a sleeve, S, placed upon an air-chamber, C, immediately over the center of the main tube A, and is provided in said sleeve with spiral spring *s*.

The mode of operation is as follows: When it is desired to signal through the pneumatic tube A, the operator presses upon the top of the plunger, forcing it downward, and by means of the rod E and its hinge-connections *e* and *e'* closes the valve D, thus interrupting the current of air passing through the tube A, and hence causing the valves at the exit of the tube or tubes to open. The operator, by lifting his hand, permits the plunger to resume its normal position by the recoil of the spring, thus opening the valve D and allowing the current of air to pass through the main tube, which in turn closes the valves at the exit of the tubes with a check or noise. By alternately pressing and freeing the plunger P according to a prearranged system a complete code of signaling may be worked.

It will be understood that at the cashier's instrument the depression of the plunger P, by shutting off connection with the main tube Q, will permit the discharge-valves V V' to drop open at both stations. The pressure of the plunger P' at the counter instrument does not affect the discharge-valve V at the cashier's instrument, but causes the discharge-valve V' at the said counter instrument to drop open, and the closing of this makes a sound clearly audible through the pipe B', leading from the cashier's instrument, and through its open end or mouth B². So long as both valves D D' stand open the air-current entering at the open mouth B² will pass completely around the circuit, as indicated by the arrows, and through the branch R into the main pipe Q. A carrier inserted at the open mouth B² of the cashier's instrument will be delivered at the counter instrument through the branch pipe B' and valve V', and when inserted through the air-lock T of the counter instrument it will be transported to the cashier's instrument and there delivered through the branch pipe B and discharge-valve V.

Another advantage to be derived from the introduction of a valve capable of being opened and shut at will is the clearing the tube of obstructions, small particles of dirt,

and such like matter which might accidentally be lodged therein. Such obstructions are to be found, if anywhere, around the joints of the valves and the edges of the openings in the tubes. If now the current of air is suddenly shut off by means of a valve, the air still in the tube continues momentarily to move toward the valve by its acquired momentum, but, meeting the closed valve, rebounds from it, loosening by its backward motion the particles and obstructions lodged in the tube, and when the current is again admitted it carries with it to the mouth of the tube these loosened obstructions.

When the air-current is shut off, as above described, the tube becomes well adapted for use as a speaking-tube.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A pneumatic dispatch-circuit provided at the stations with delivery branch pipes and automatic delivery-valves, and with manual valves at the respective stations actuating one or more of the automatic valves through the medium of the air-current in the circuit, substantially as set forth.

2. The combination, with a pneumatic system having automatic delivery-valves, of a valve pivoted in the circuit-tube of said system, operated by a plunger hinged thereto, and having means for automatically opening said valve.

3. A signaling apparatus consisting of a pneumatic circuit having automatic delivery-valves constituting sounders and manual valves, the successive opening and closing of which actuate the said automatic valves through the medium of the pneumatic current, producing signals, as herein described.

In testimony whereof I have hereunto set my hand this 30th day of December, 1882.

E. S. LEAYCRAFT.

In presence of—

CHARLES G. COE,
R. T. VAN BOSKERCK.