(No Model.) 3 Sheets—Sheet 1.

A. & J. W. MATHIS.

PNEUMATIC DISPATCH APPARATUS.

No. 558,825. Patented Apr. 21, 1896.

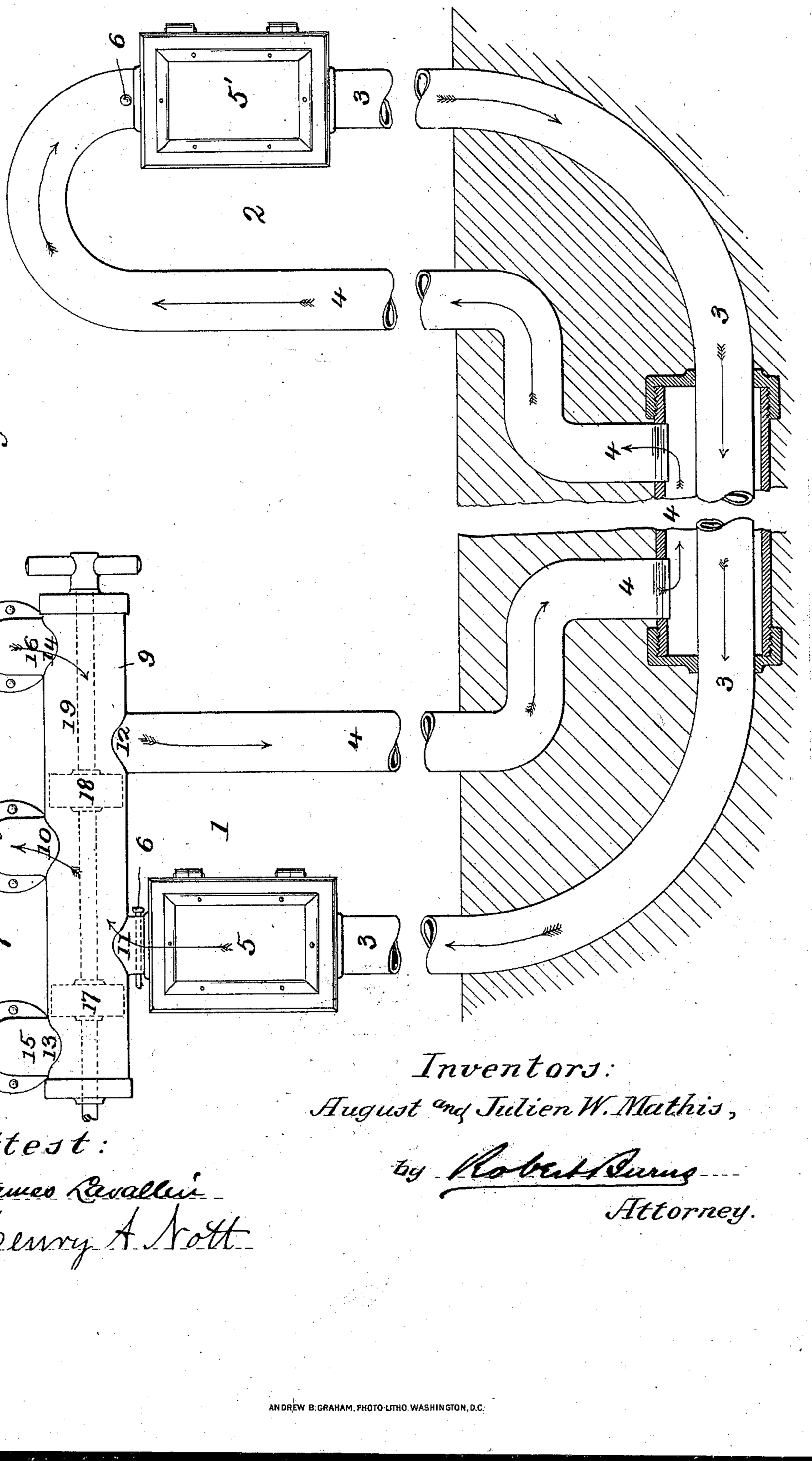


Fig. 1.

Inventors:
August and Julien W. Mathis,
by Robert Burns
Attorney.

Attest:
James Lovell
Henry A Nott

(No Model.) 3 Sheets—Sheet 2.

A. & J. W. MATHIS.

PNEUMATIC DISPATCH APPARATUS.

No. 558,825. Patented Apr. 21, 1896.

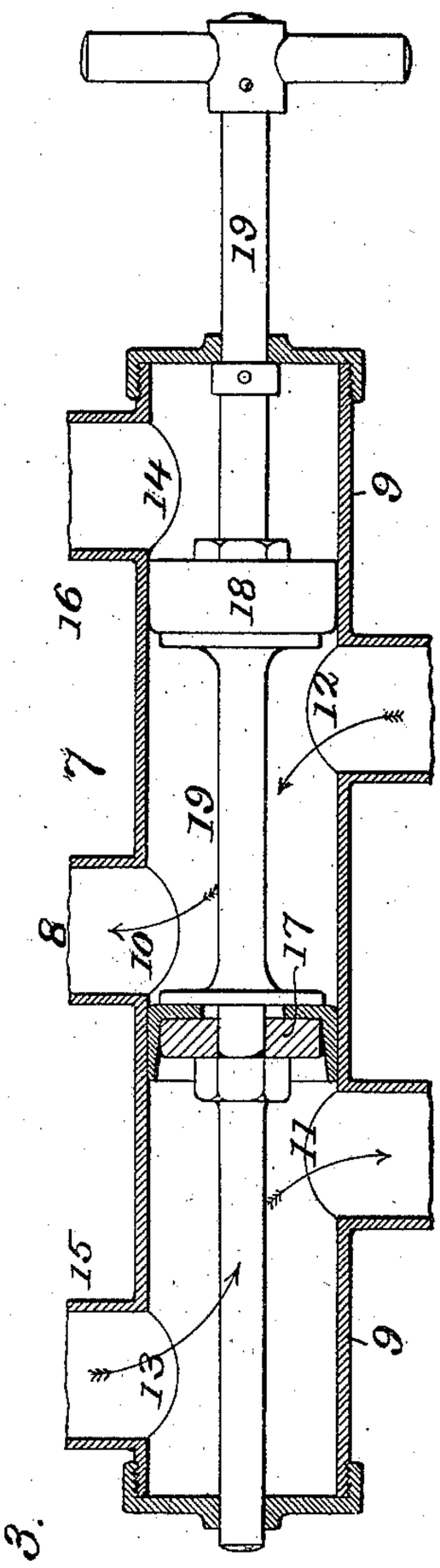


Fig. 3.

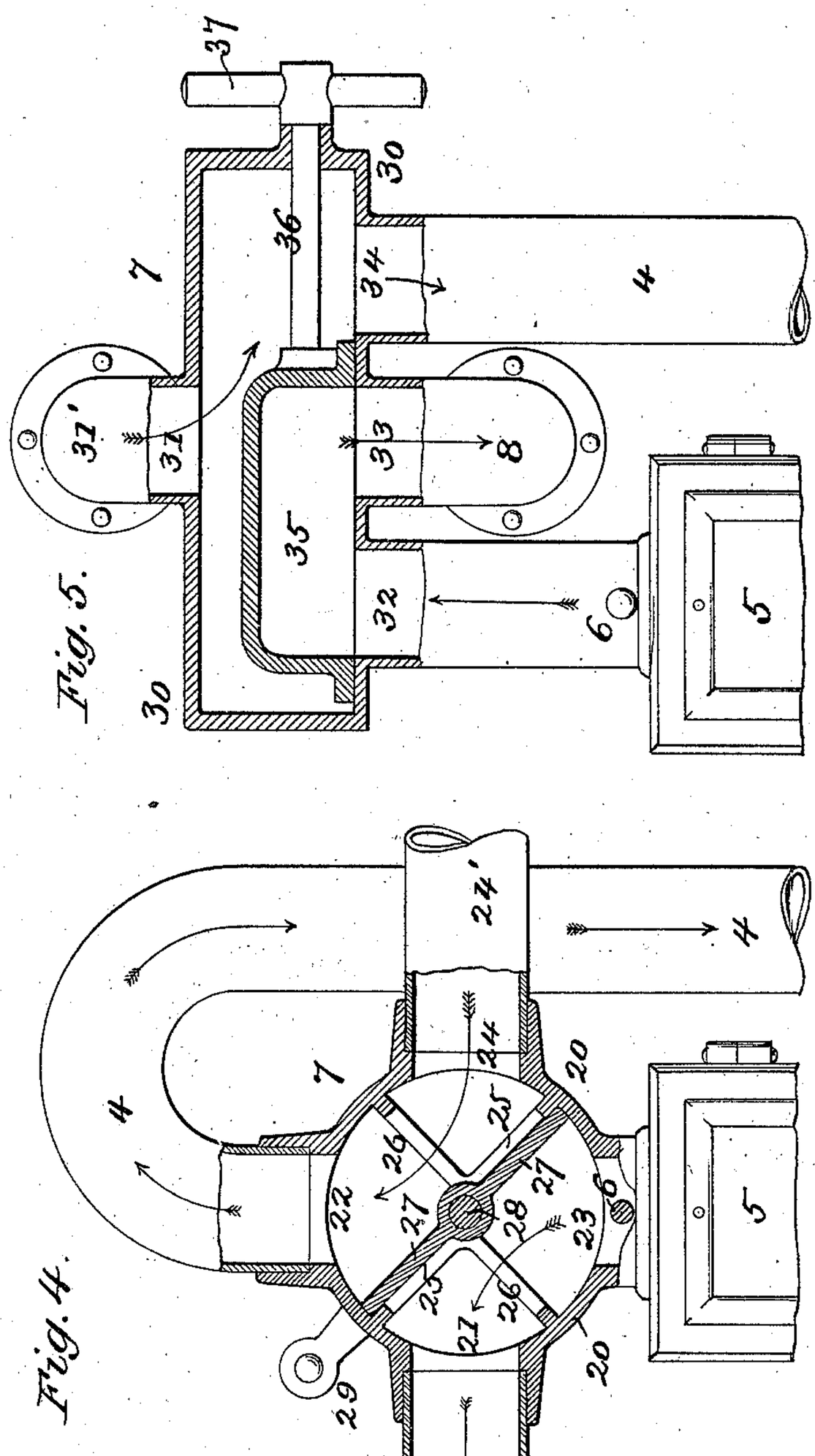


Fig. 5.

Fig. 4.

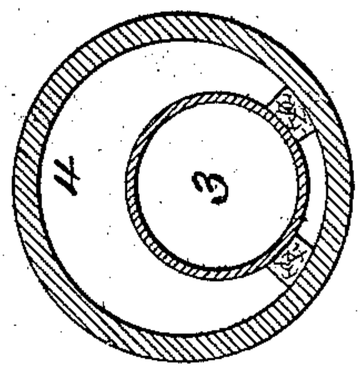


Fig. 2.

Attest:

James Lavallee

Henry A. Nott

Inventors:

August & Julien W. Mathis,

by Robert Burns

Attorney.

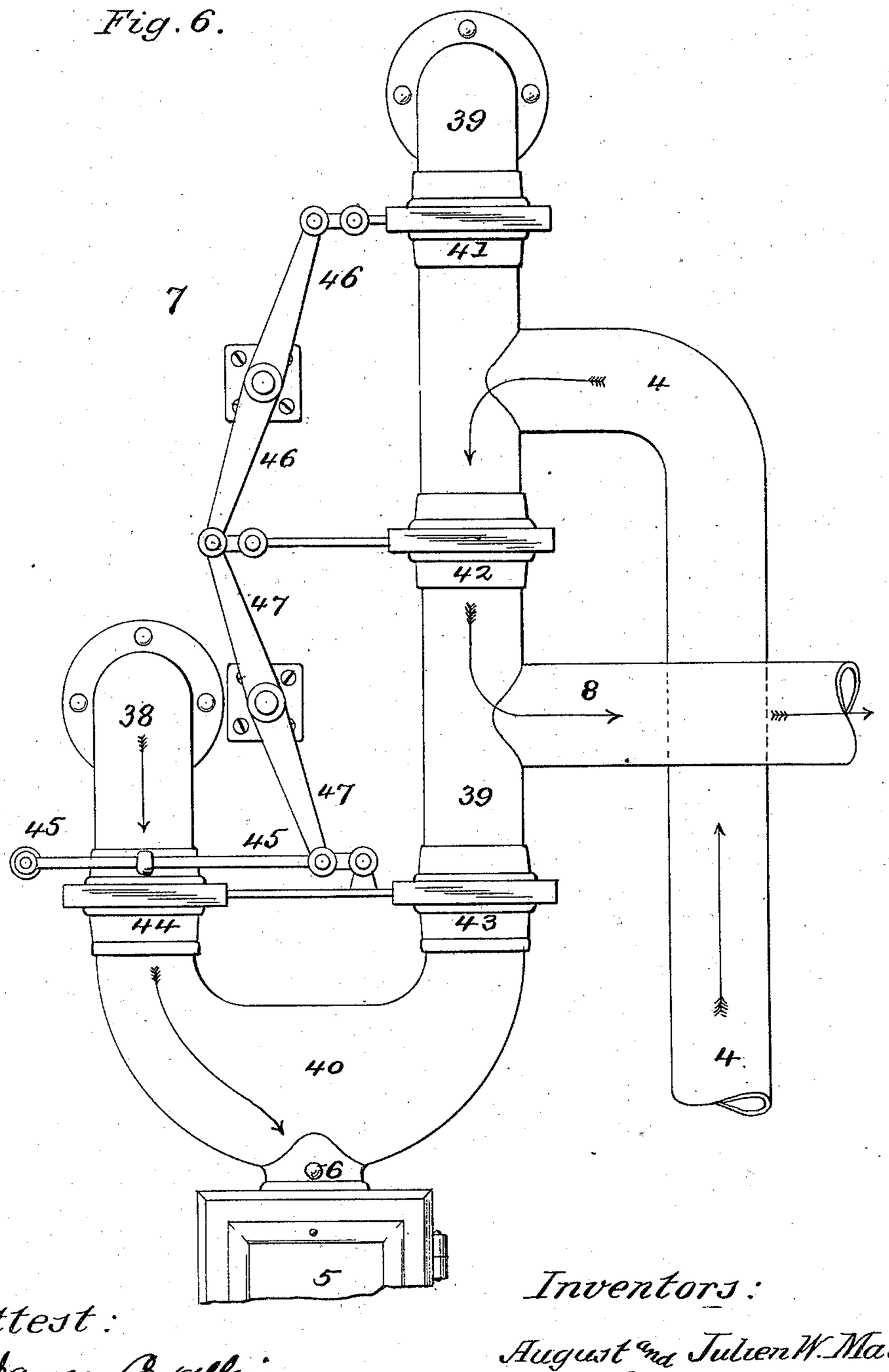
(No Model.) 3 Sheets—Sheet 3.

A. & J. W. MATHIS.

PNEUMATIC DISPATCH APPARATUS.

No. 558,825. Patented Apr. 21, 1896.

Fig. 6.



Attest:
James Ewalkis
Henry A Nott

Inventors:
August and Julien W. Mathis,
by Robert Burns
Attorney.

UNITED STATES PATENT OFFICE.

AUGUST MATHIS AND JULIEN W. MATHIS, OF CHICAGO, ILLINOIS.

PNEUMATIC-DESPATCH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 558,825, dated April 21, 1896.

Application filed September 16, 1895. Serial No. 562,710. (No model.)

To all whom it may concern:

Be it known that we, AUGUST MATHIS and JULIEN W. MATHIS, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pneumatic-Despatch Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to that type of apparatus in which messages and other like parcels, inclosed in a suitable carrier, are drawn or forced by a current of air from one station to another through a tube connecting such stations together, and more especially to that type of such apparatus in which one conducting-pipe or despatch-tube is employed for the passage of the traveling carrier to and from the main station in despatching and receiving messages, &c., from the various local or substations of the system, and another conducting-tube employed as a return for the current of air back to the source of supply, the two conductors constituting, in connection with the pump or other air propelling or exhausting appliance, an endless circuit for the apparatus.

The object of the present improvement is to provide a simple and efficient combination and arrangement of the parts of such apparatus, whereby a ready and convenient reversal of the air-current through the apparatus can be effected when the main-station operator desires to change from a sending to a receiving condition of the apparatus, or vice versa, as will hereinafter more fully appear, and be more particularly pointed out in the claims. We attain such object by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, with parts in section, of a pneumatic-despatch apparatus embodying the present improvements; Fig. 2, a cross-section of the message-carrying and air-returning tubes, showing the present improved arrangement of the same; Fig. 3, a detail longitudinal sectional elevation of the reversing-valve shown in Fig. 1; Figs. 4 and 5, detail longitudinal sections of modified forms of such reversing-valve; Fig. 6, a detail side elevation of another modified form of such reversing-valve.

Similar numerals of reference indicate like parts in the several views.

As represented in the drawings, the present improved apparatus will consist in its simpler form of a main station 1 and substation 2, that are connected together by a message-carrying tube 3 and an air-return conduit or pipe 4, such message-carrying tube being provided at each station with a receiver 5 5′ of any usual and suitable construction for receiving the traveling carrier of the system. Each of such receivers is connected at one end with the message-carrying tube 3 and at the opposite end with the air-return tube or conduit 4, 6 being a stop, preferably in the form of a cross-rod, intersecting the air-return tube adjacent to the receivers and adapted to prevent the passage of the message-carrier from the receivers into such air-tube.

In the local or substation 2 a receiver 5′ and the tube connections just described will be used.

In the main or central station 1, in addition thereto, an air-current-reversing valve 7 will be arranged above the receiver 5, such reversing-valve having port connections with the upper end of the receiver 5, with the air-return tube or conduit 4, with the tube 8 that extends to a suitable air-pump or other air propelling or exhausting device, and with the atmosphere, so that by the operation of such valve by the central-station operative the current of air will be caused to pass down through the central-station receiver and through the message-carrying tube 3, up through the substation-receiver, and back through the air-return conduit 4 to the exhaust-pump through the branch tube 8. This will be the direction of the air-current in the transmission of a message from the central station to a substation. In the transmission of a message from the substation to the main station the valve is simply reversed, after which the current of air will be caused to pass through the air-return conduit 4, down through the substation-receiver, and back through the message-carrying tube

3, up through the central-station receiver, and through the branch tube 8 to the exhaust-pump.

In view of the fact that an exhaust-pump for causing a movement of air through pneumatic-despatch tubes has been found the most practical, we have shown and described our present improvements arranged for such form of current. It is, however, within the province of our present invention to employ the same in connection with an air-blast where such use is needed or desired.

The reversing-valve 7 may be of any of the usual forms of four-way reversing-valves, and we have accordingly illustrated four different types of valves adapted for the present use.

In Figs. 1 and 3 we have illustrated a piston type of valve in which a cylindrical valve-casing 9 is provided in its periphery with ports as follows: A centrally-arranged port 10, communicating with the branch tube 8, that has connection with the exhaust-pump; a pair of ports 11 and 12, arranged at each side of the port 10, the latter of which communicates with the air-return tube or conduit 4 and the former with a section of tube connected to the top of the main-station receiver 5, and a pair of ports 13 and 14, near the opposite ends of the valve-casing, that preferably connects with the outer air by branch tubes 15 and 16.

17 and 18 are piston-valves arranged within the casing upon a piston-rod 19, that extends out through the end of the valve-casing and is provided with a handle by which movement can be imparted to the valves by the central-station operator.

The valves 17 and 18 are arranged a sufficient distance apart upon their piston-rod, so that the space between the same will embrace the central port 10 and either one or the other of the ports 11 and 12, according to the position of such valves.

In use, with the valves in the sending position indicated in Fig. 3, the suction through the pipe 8 is in connection with the air-return tube 4, while the top of the central-station receiver 5 is in communication with the atmosphere through the branch pipe 15, so that the suction through the pipe 8 and return-tube 4 will cause a current of atmospheric air to pass into the top of the central-station receiver, down through the same, and through the message-carrying tube 3, to carry a message-carrier from such central station to the receiver in the substation. With the valves in the receiving position indicated in dotted lines in Fig. 1, a reverse action to that above described takes place. The suction through the tube 8 is in connection with the top of the central-station receiver, while the air-return tube 4 is in communication with the atmosphere through the branch pipe 16, so that the suction through the tube 8, central-station receiver, and message-carrying tube 3 will cause a current of atmospheric air to pass into the air-return tube 4 and down through the same to carry a message-carrier from the substation-receiver to the central-station receiver.

In Fig. 4 the reversing-valve is shown in the form of a cylindrical casing 20, having four ports 21, 22, 23, and 24, equidistantly arranged around its periphery, with seats 25 and 26 arranged between the ports, as shown, 27 being a valve fitting the diameter of the valve-casing and mounted upon an axial shaft 28, that extends out through the end of the valve-casing and is provided with an operating hand-crank 29, by which the valve is oscillated to either of its two positions.

The four ports 21, 22, 23, and 24, heretofore described, are connected as follows: the port 21 with the branch tube 8, that has communication with the exhaust-pump; the port 22 with the air-return tube or conduit 4; the port 23 with a section of tube connected to the top of the central-station receiver, and the port 24 with the atmosphere through a branch pipe 24′.

With the valve in the receiving position (shown in Fig. 4) and resting upon the seat 25, the suction through the tube 8 is in connection with the top of the central-station receiver and the message-carrying tube 3, while the air-return tube 4 is in communication with the atmosphere through the branch pipe 24, so that the suction through the pipe 8, central-station receiver, and message-carrying tube 3 will cause a current of atmospheric air to pass into the air-return tube 4 and down through the same to carry a message-carrier from the substation-receiver to the central-station receiver. With said valve in its sending position, and resting upon the valve-seat 26, a reverse action to that above described takes place. The suction through the tube 8 is in connection with the air-return tube 4, while the top of the central-station receiver is in communication with the atmosphere through the branch pipe 24′, so that the suction through the pipe 8 and return-tube 4 will cause a current of atmospheric air to pass into the top of the central-station receiver, down through the same, and through the message-carrying tube 3 to carry a message-carrier from such central station to the receiver in the substation.

In Fig. 5 the reversing-valve is shown in the form of a slide-valve, the valve-casing 30 being provided with an overhead port 31 and three seat-ports 32, 33, and 34, arranged in line, 35 being a sliding D-shaped valve, sliding on a seat of the valve-casing and receiving movement from a valve-rod 36, extending out through the side of the valve-casing and provided with a suitable operating-handle 37. In this construction the valve-ports 31, 32, 33, and 34 will have connections as follows: the central seat-port 33 with branch tube 8, that has connection with the exhaust-pump of the apparatus; the seat-port 32 with a section of tube connected to the top of the central-station receiver; the seat-port 34 with the air-return tube or conduit 4, and the over-

head port 31 with the atmosphere through branch pipe 31′. The operation of this valve is substantially the same as that heretofore described in connection with the valve shown in Figs. 1 and 3.

In Fig. 6 the reversing-valve is shown in the form of a pair of branch tubes 38 and 39, the upper ends of which communicate with the atmosphere, while the lower ends are connected together and to the top of the central-station receiver by means of a Y-shaped union 40. One of these branches, 39, is provided with a series of three sliding cut-off valves 41, 42, and 43, while the other branch, 38, is provided with a single sliding cut-off valve 44. In the construction shown the sliding plates of the valves 43 and 44 are fixedly connected together, so as to move in unison, and are provided with a handle 45, by which they are operated. The sliding plates of the valves 41 and 42 are connected to the opposite ends of a centrally-pivoted lever 46, which in turn is connected to one end of a secondary centrally-pivoted lever 47, the other end of which is connected to the operating-handle 45, so that the whole series of valves will move in unison. The branch pipe 8, that connects with the exhaust-pump of the apparatus, is connected in the present construction to the branch pipe 39 between the valves 42 and 43, while the air-return pipe 4 is connected to said branch pipe 39 between the valves 41 and 42.

With the parts in the sending position indicated in Fig. 6, and with the valves 42 and 44 open and the valves 41 and 43 closed, the suction through the pipe 8 is in connection with the air-return tube 4, while the top of the central-station receiver is in communication with the atmosphere through the branch pipe 38, so that the suction through the pipe 8 and return-tube 4 will cause a current of atmospheric air to pass into the top of the central-station receiver, down through the same and through the message-carrying tube 3, to carry a message-carrier from such central station to the receiver in a substation. With such valves reversed to a receiving position, and with the valves 42 and 44 closed and the valves 41 and 43 open, a reverse action to that above described takes place. The suction through the tube 8 is then in connection with the top of the central-station receiver, while the air-return tube 4 is in communication with the atmosphere through the branch pipe 39, so that the suction through the tube 8, central-station receiver, and message-carrying tube 3 will cause a current of atmospheric air to pass into the air-return tube 4, and down through the same, to carry a message-carrier from the substation-receiver to the central-station receiver.

In some uses of the present invention it is preferable to arrange the message-carrying tube within the air-return tube 4, as illustrated in Figs. 1 and 2. In this construction the inner tube 3, usually of brass and quite expensive for long distances, is inclosed and protected from corrosion, &c., by the inclosing tube 4, which in the present construction can be made of cast-iron or other cheap metal or material.

In the practical use of the present invention electrical or other signaling apparatus may be used in connection with the same to signal the sending, &c., of the messages; but such does not form any part of the present invention, being old and well known in pneumatic despatch systems.

Having thus fully described our present invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A pneumatic-despatch apparatus, comprising in combination, a main or central station receiver, a local or substation receiver, a message-carrying tube, and an air-return tube or conduit, connecting the opposite ends of said receivers together, and a reversing-valve arranged in the central station and connected to the message-carrying tube, the air-return tube and a suitable air-pump, substantially as set forth.

2. A pneumatic-despatch apparatus, comprising in combination a main or central station receiver, a local or substation receiver, a message-carrying tube, and an air-return tube or conduit connecting the opposite ends of said receivers together, a stop intersecting the air-return tube adjacent to the receiver, and forming a barrier for the message-carrier, and a reversing-valve arranged in the central station and connected to the message-carrying tube, the air-return tube, and a suitable air-pump, substantially as set forth.

3. A pneumatic-despatch apparatus, comprising in combination, a main or central station receiver, a local or substation receiver, a message-carrying tube and an air-return tube or conduit, connecting the opposite ends of said receivers together, and a reversing-valve arranged in the central station and connected to the message-carrying tube, the air-return tube, and a suitable air-pump, such reversing-valve consisting of a valve-casing having ports 10, 11, 12, 13 and 14, a pair of piston-valves arranged within said casing and an operating piston-rod carrying said piston-valves, substantially as set forth.

In testimony whereof witness our hands this 12th day of September, 1895.

AUGUST MATHIS.
JULIEN W. MATHIS.

In presence of—
ROBERT BURNS,
JAMES LAVALLUI.