(No Model.) 2 Sheets—Sheet 1.

A. BRISBANE & R. GILLHAM.

PNEUMATIC CARRIER.

No. 303,803. Patented Aug. 19, 1884.

Fig. 1.

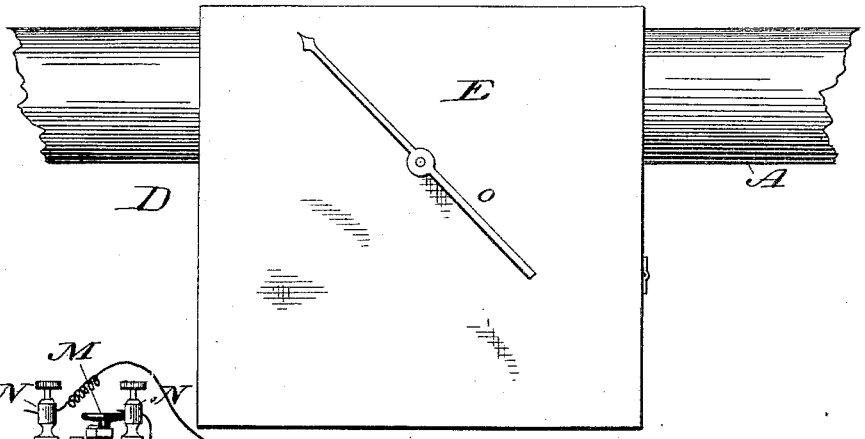


Fig. 2.

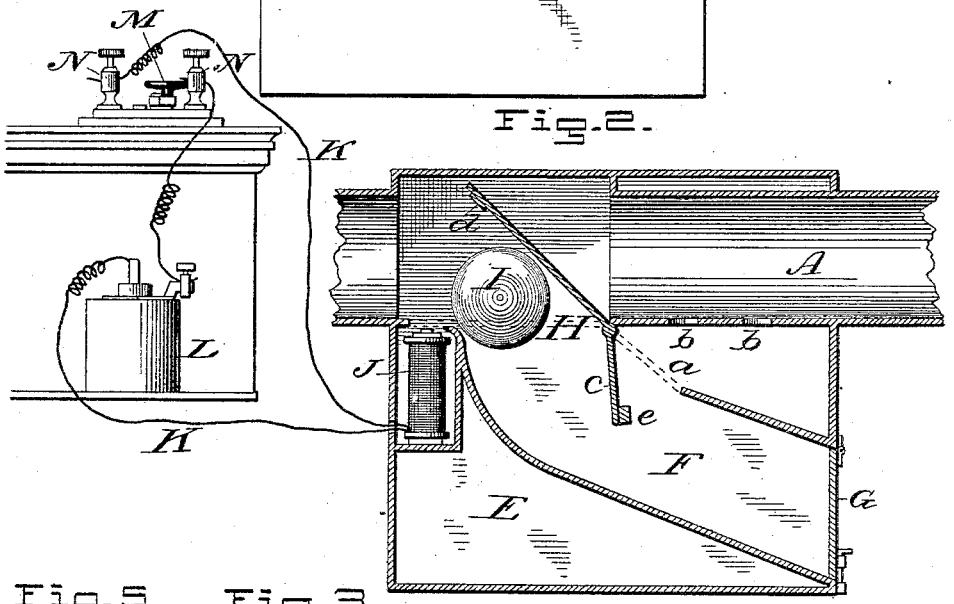
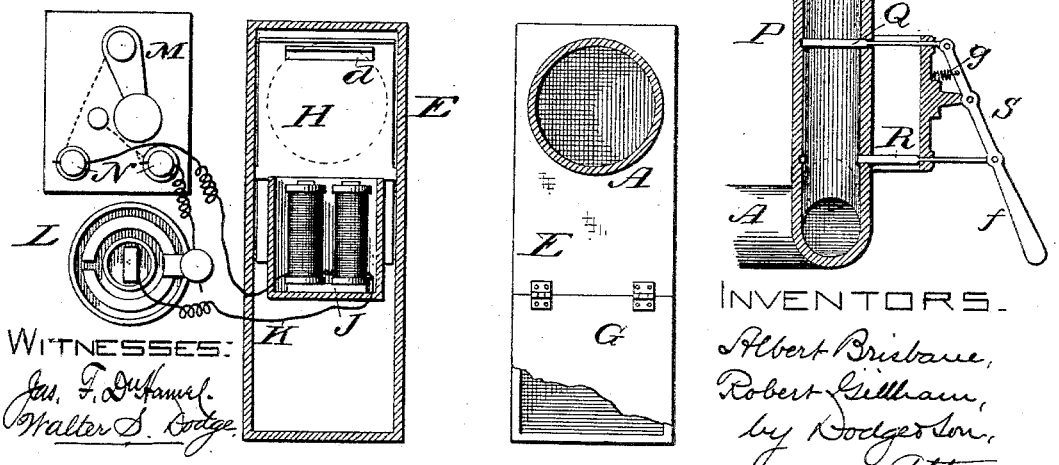


Fig. 5. Fig. 3. Fig. 4. Fig. 6



WITNESSES:
Jas. F. DeHamel.
Walter S. Dodge.

INVENTORS.
Albert Brisbane,
Robert Gillham,
by Dodgeson,
Attys.

(No Model.) 2 Sheets—Sheet 2.

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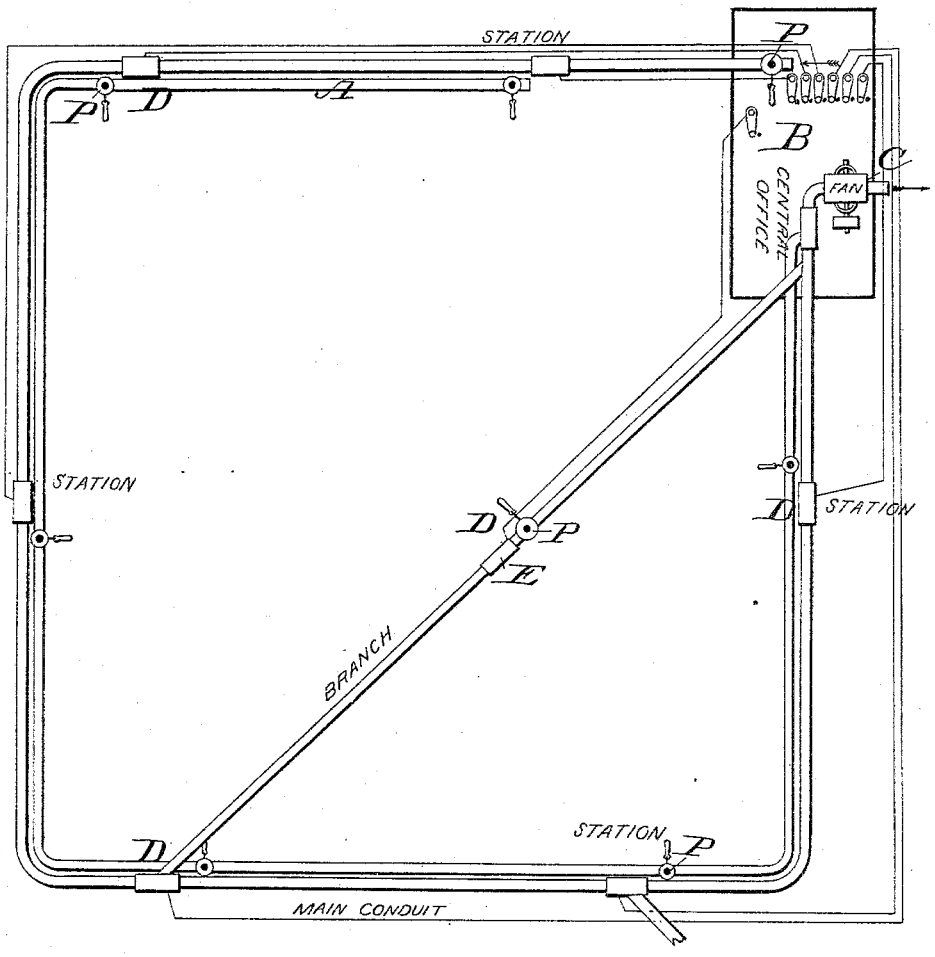
Fig. 7.



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Jas. F. DeHamel

Walter S. Dodge.

INVENTORS:

Albert Brisbane,

Robert Gillham,

by Dodger & Son,

Attys.

UNITED STATES PATENT OFFICE.

ALBERT BRISBANE, OF NEW YORK, N. Y., AND ROBERT GILLHAM, OF KANSAS CITY, MISSOURI.

PNEUMATIC CARRIER.

SPECIFICATION forming part of Letters Patent No. 303,803, dated August 19, 1884.

Application filed March 19, 1883. Renewed January 23, 1884. (No model.)

To all whom it may concern:

Be it known that we, ALBERT BRISBANE and ROBERT GILLHAM, of Kansas City, in the county of Jackson and State of Missouri, (said BRISBANE being a resident of the city, county, and State of New York, but temporarily residing in Kansas City, State of Missouri,) have invented certain Improvements in a Pneumatic Carrier System, of which the following is a specification.

Our invention relates to a pneumatic carrier system more especially designed for use in stores, hotels, and other large buildings for conveying small parcels, change, orders, &c., from one point to another or others, the improvements being, however, applicable to general carrier systems extending over a town or city, or from one city or town to another.

The invention consists in a novel construction and arrangement of self-acting valves, gates, or switches, controlled from a central office or station by means of electricity, for causing the carriers to be delivered at any desired point or way-station, or directed into a branch tube or pipe, as may be required.

In the accompanying drawings, Figure 1 represents a side elevation of the apparatus at a way-station; Fig. 2, a longitudinal vertical section of the same, showing also battery and switch connections through which the valve or gate is controlled; Fig. 3, a cross section of Fig. 1; Fig. 4, an end view of the case or receiver at the way-station; Fig. 5, a plan view of the electric switch; Fig. 6, a vertical sectional view of the receiving pipe or inlet used at way-stations; Fig. 7, a diagram illustrating the general arrangement of the tube or tubes and the way-stations.

The use of pneumatic tubes and carriers has long been understood, and many successful applications thereof have been made; but these have more commonly been confined to communication between two points only through one tube; or, in other words, it has been the general practice to employ a separate tube between each two points to be connected, though it has been proposed to provide a single conduit or tube with way-stations and to furnish means for insuring the delivery of the carrier at any one of such stations.

It is to this latter plan that our invention particularly relates; and the improvements consist in providing at each way-station a weighted valve arranged to swing across the tube or conduit when not held back and prevented from so doing, and which serves, when thus allowed to swing into the tube, to deflect the carrier therefrom into a suitable receiver.

The invention further consists in providing an electro-magnet at each station, controllable from the main or central station, to normally hold the valve back or out of the tube, and in forming each valve with a depending arm or tail, against which the carrier strikes in leaving the tube or conduit, thereby restoring the valve to its normal position.

Referring now to the drawings, A represents the tube or conduit, which, for use in buildings and where it is intended to employ the system only for small parcels, may be advantageously made of metal tubing, but which, for larger carriers, may be made of wood, metal, or other suitable material.

B indicates a main office or central station, at which point is located a fan, C, which may either be arranged to force a blast of air through the tube or conduit A or to create a suction and exhaust the air therefrom, as indicated.

D represents a way-station, of which there may be any desired number, each arranged as in Figs. 1 and 2, where it will be seen that the pipe or conduit is separated and a box or receiver, E, is interposed between the separated sections of the tube, the box or receiver being provided with a chute or incline, F, at the lower end of which is a door, G, by which the case is ordinarily closed air-tight, but which may be opened to remove a carrier from the receiver.

H represents a gate or valve, pivoted at or near one end, at the lower side of the tube or conduit A, and arranged to swing upward into the path of the carrier, or across the line of the tube or conduit, as shown in Fig. 2, in which position it intercepts the carrier I and the air-current, deflecting both into the chute F, and causing the carrier to fall therein, the air-current escaping therefrom through an opening, *a*, in the upper side of the chute, and

passing thence through openings *b* back into the main tube or conduit and continuing its course uninterruptedly.

For the purpose of causing the gate or valve to open automatically—that is, to swing upward across the conduit and to open the upper mouth of the incline—it is provided with a leaf or extension, *c*, in rear of its pivot, which leaf is counterweighted, as shown, so as to overcome the weight of the valve or gate and raise it to the position shown in Fig. 2. The leaf or extension *c* also performs two other offices, being set at an angle to the main portion of the valve, so that as the latter rises the leaf is caused to project into or across the chute F, in the path of the deflected carrier, which, being urged forward by the force of the deflected air-current, bears against the wing or leaf *c* and causes it to rise, thereby depressing the valve or gate H, and causing it to resume a horizontal position and to form a continuation of the bottom or lower side of the tube or conduit A. In thus rising or moving back to place the leaf or extension *c* of valve H also closes the opening *a*, and thus all communication between the tube or conduit and the chute F is cut off, so that the door G may be opened and the carrier removed without permitting any interference with the air-current. The valve or gate H is held normally in a horizontal position, as indicated in dotted lines in Fig. 2, by means of an electro-magnet, J, the valve or gate being furnished with a soft-iron armature, *d*, to be attracted and held thereby, it being of course understood that the counter-weight *e* of leaf *c* must be sufficiently heavy to overcome the weight of the valve and armature. So long as the electro-magnet is made active by the passage of an electric current through its coils, the valve or gate is held back and prevented from intercepting the carriers; but the instant the electric current is interrupted the magnet loses its power and the counter-weight raises the valve or gate; hence it is only necessary to provide at the central office a key or switch for making or breaking the electric circuit of the magnet of each separate station, without interfering with the magnets of other stations, to enable the operator at said central office to operate any one of the way-station gates or valves. Such an arrangement is illustrated in Figs. 2 and 5, in which K K represent the wires running from a battery, L, to the electro-magnet J, and thence back to the battery, an ordinary switch button or lever, M, being introduced into the line at the central office or station.

N N represent the usual binding-posts, by which the ends of the separated line or wire are held, and to one of which the lever M is attached or swiveled. The posts rest upon a block of gutta-percha, or are otherwise suitably insulated, so that when the lever M is swung from the second post the current is interrupted, but when brought into contact therewith the current passes through said lever, and the circuit is thus completed.

While we have, for convenience of illustration, shown and described the complete metallic circuit or double-wire line, it will of course be understood that by making the proper earth-connections the second wire may be dispensed with. An indicator, O, is secured upon the axle or pivot-pin of valve H, outside of the case or box E, to show the position of the valve, and to call attention to any movement thereof. At the central station, and at each way-station ordinarily, there will be provided an inlet or charging tube, those at way-stations opening into special return-tube A′, so constructed that a carrier may be let into the conduit or tube without permitting the entrance or exit of air through such inlet, a convenient construction for this purpose being shown in Fig. 6.

P represents the inlet tube or spout, communicating at its lower end with the main tube or conduit A, and provided with two alternating valves or slides, Q R, placed a distance apart somewhat greater than the length or diameter of the carriers used, spherical carriers being here contemplated, though any known form of carrier may be used. Both valves are jointed to a lever, S, which is pivoted at a point midway between the two valves, and is furnished with a handle, *f*, by which to move it. By moving the hand-lever inward the valve Q, which is ordinarily held closed by the action of a spring, *g*, is opened, and the carrier I is permitted to fall upon the lower valve, R, which is closed in the act of opening valve Q. The hand-lever is then released, whereupon the spring *f* restores the valves to their first position, permitting the carrier to pass into the main tube or conduit A. Thus it will be seen one or the other valve is closed all the time, except during the brief period of movement, and by providing for a certain amount of lost play, or by making one valve double the length of the other, the closure may be made perfect at all times.

The carriers I are here represented as spherical in form, and will preferably be so made, in order that they may move freely in the tube, the spheres being made of two hollow parts screwed or locked together in any convenient manner, and of such size as to contain the class of parcels for which the system is or may be intended.

It is particularly to be noted that under our plan the electro-magnet has only to retain the valve in position until it is desired to release it, for which purpose a very slight attractive force, and consequently small battery power, is required, the valve being just overbalanced, and therefore exerting no considerable tendency to draw away from the magnet.

As indicated in Fig. 7, the tube or conduit passes from the central office to and through the various way-stations D, and finally back to the central office, so that the operator at

that point may send carriers to any one of the way-stations at will, or the parties at the way-stations may send carriers to the central station. Branch pipes may also be employed, as indicated.

It is obvious that a spring may be substituted for the weight *c* to raise the valve or gate H.

The door G may be made to swing or slide, and it or the side or front of the receiver E may be made of glass or other transparent material, to permit the carrier to be seen from the outside when therein.

It is manifest that the valves or gates may be applied to the common cash-carrier systems, in which inclined planes are used instead of tubes or pipes, or, in fact, to any form of conduit or carrier, whether of tubular or trough form, or consisting simply of rails.

Having thus described our invention, what we claim is—

1. In a pneumatic carrier system, the combination of a tube or conduit, means for producing an air-current therein, and a valve or gate arranged, substantially as shown and described, to swing into or across the tube, and to intercept the carrier and air-current and deflect them outward.

2. In combination with a tube or conduit and a receiver, E, having chute F, valve H, having leaf or extension *c*, set at an angle to the body of the valve, substantially as and for the purpose set forth.

3. In combination with tube or conduit A, provided with holes *b*, and with receiver E, having chute F and outlet-opening *a*, valve or gate H, pivoted to swing across the tube, and provided with leaf or extension *c*, substantially as and for the purpose set forth.

4. In combination with a tube or conduit and a deflecting-valve, substantially such as shown and described, provided with an armature, an electro-magnet arranged, substantially as shown, to attract said armature and hold the valve normally out of the path of carriers passing through the tube or conduit.

5. The combination, substantially as herein set forth, of a conduit, valve, or gate, H, electro-magnet J, and switch-lever M, whereby the magnet may be caused to release the valve or gate at will.

6. In a pneumatic carrier system, the combination of a main tube or conduit, a series of receivers at intermediate points in the length of the conduit, each furnished with a deflecting gate or valve, substantially such as described, and with an electro-magnet arranged to hold the valve or gate normally out of the tube, and a series of switch-levers all under control of an operator at a central office, and each adapted to release one gate of the series, to permit it to swing into the tube by interrupting or breaking the circuit of the battery connected with such electro-magnet.

7. In combination with a tube or conduit, a self-acting gate arranged to swing across the same, and means, substantially such as shown and described, for holding the gate back out of the conduit.

8. In combination with tube A and valve H, indicator O, arranged upon the axle of the valve, as shown.

ALBERT BRISBANE.
ROBERT GILLHAM.

Witnesses:
CHARLES L. DOBSON,
SHANNON C. DOUGLASS.