(No Model.) 2 Sheets—Sheet 1.

C. F. PIKE.

ELECTRIC DESPATCH SYSTEM.

No. 566,532. Patented Aug. 25, 1896.

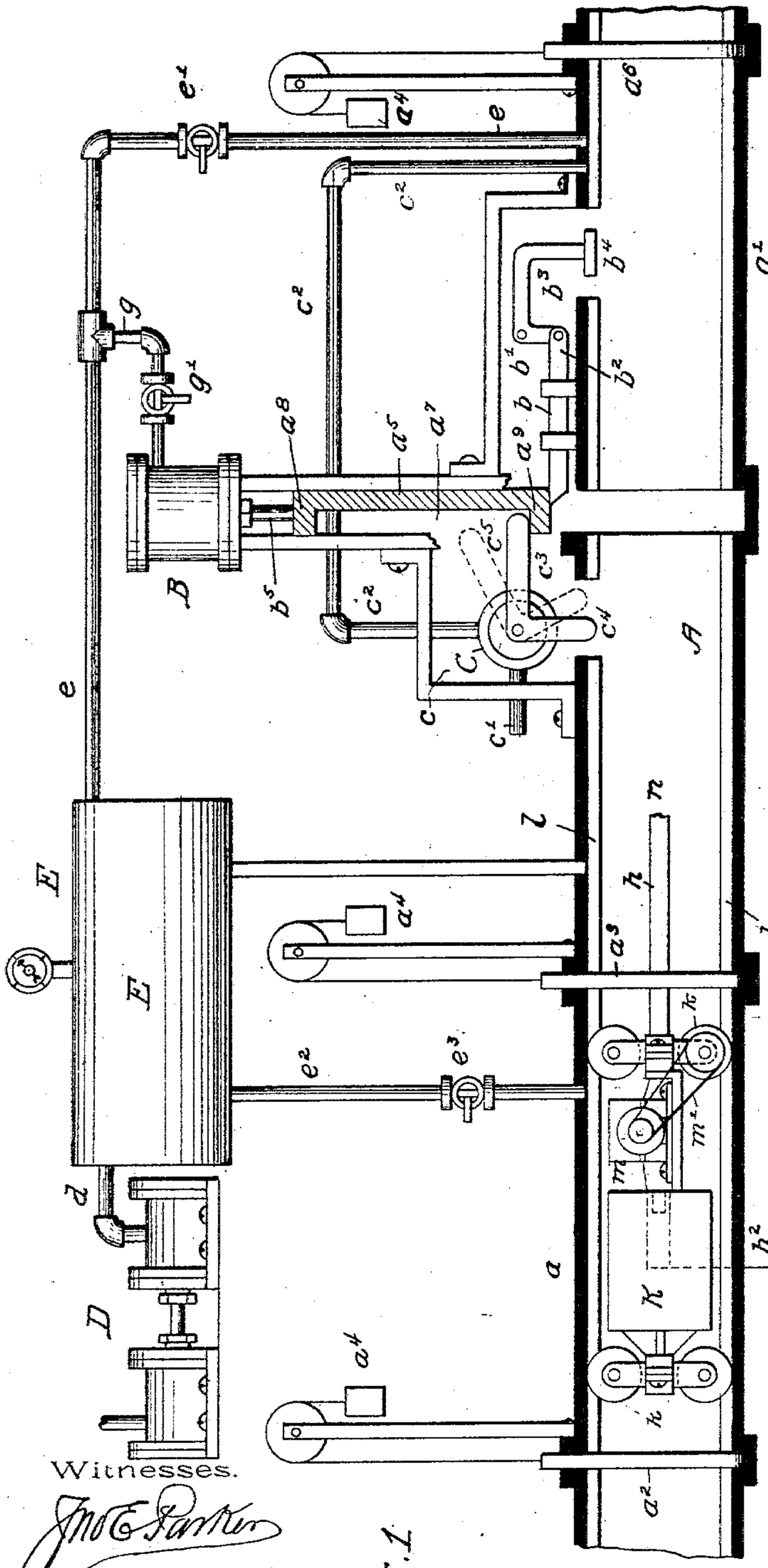

FIG. 1.

FIG. 4

Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

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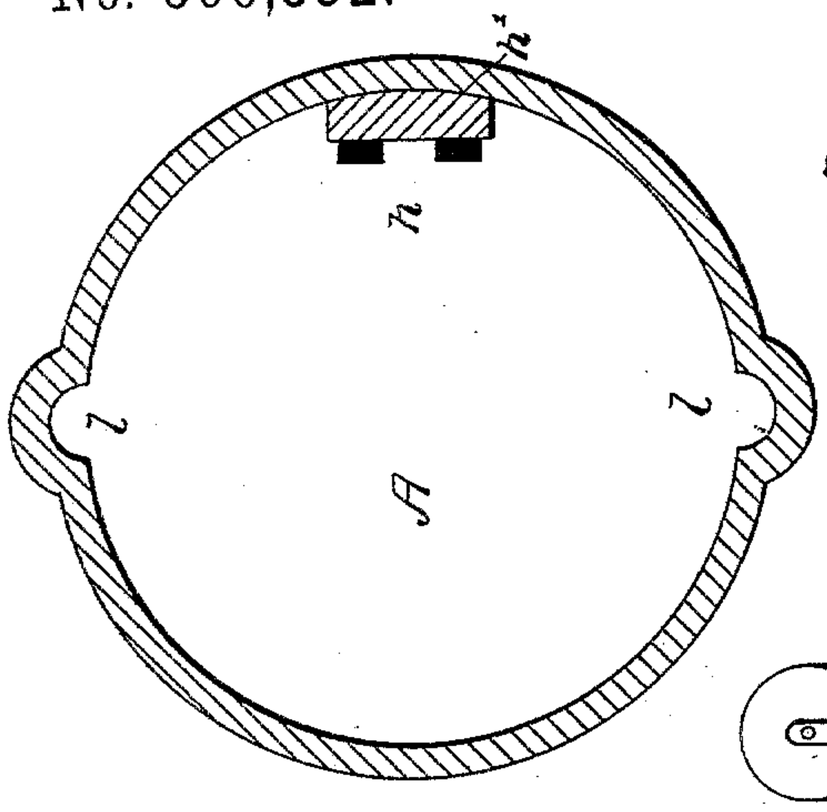

FIG. 3

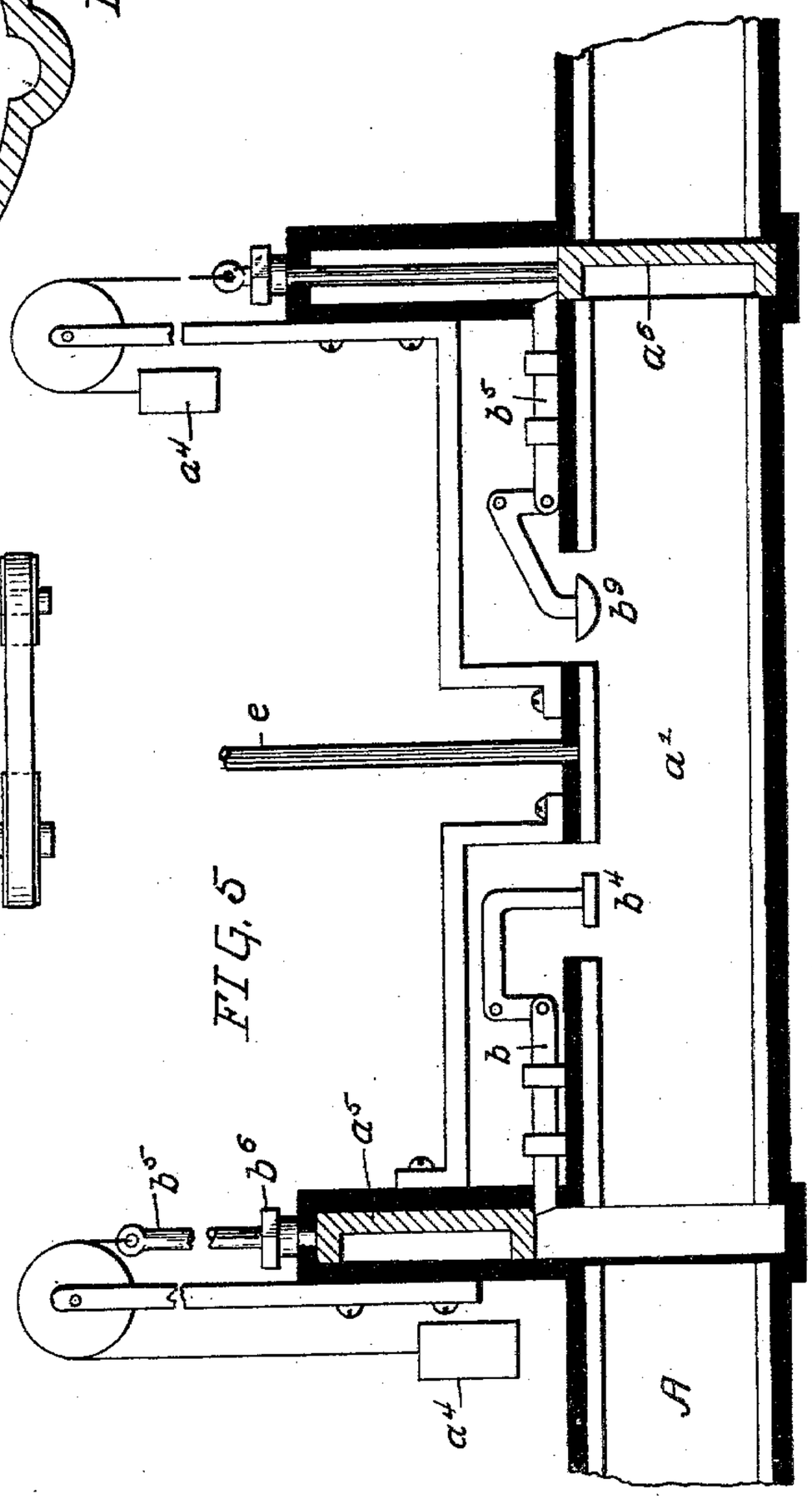

FIG. 5

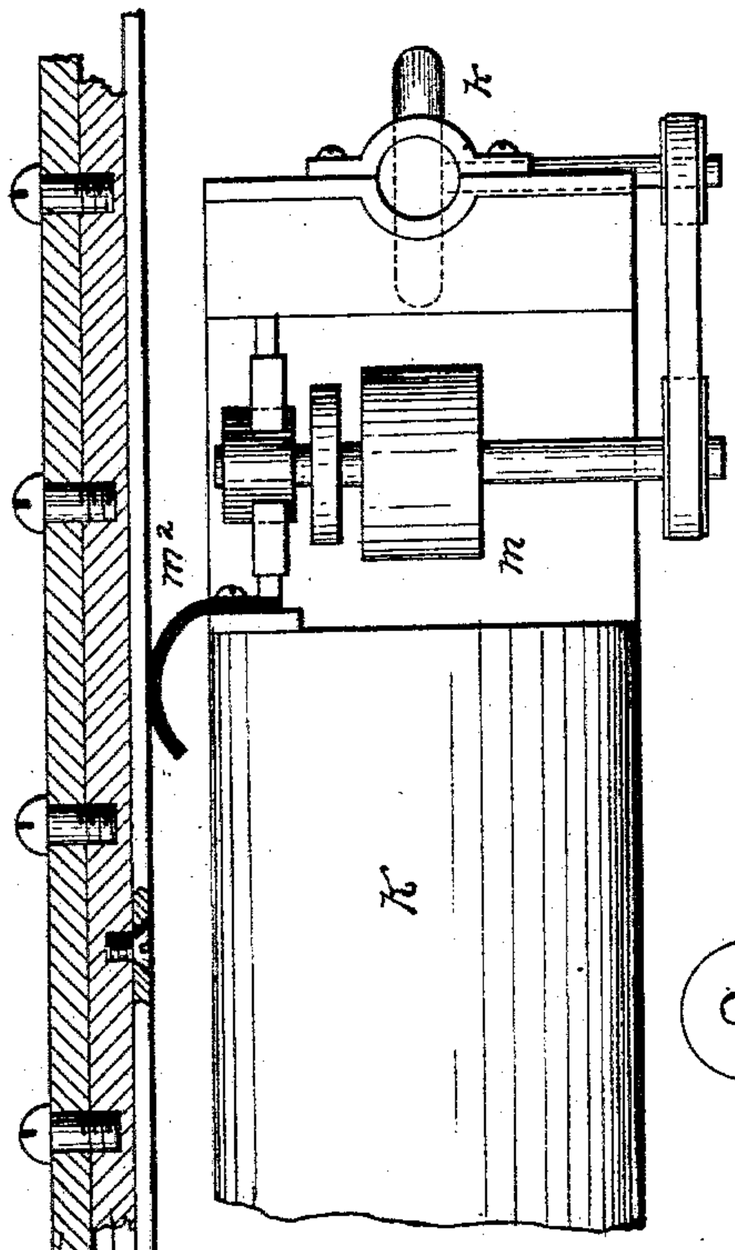

FIG. 2

Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES F. PIKE, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC DESPATCH SYSTEM.

SPECIFICATION forming part of Letters Patent No. 566,532, dated August 25, 1896.

Application filed May 31, 1895. Serial No. 551,221. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. PIKE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Despatch Systems, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to electric despatch or other railways; and it has for its object the running of electromotor carriers or other vehicles or cars in pneumatic tubes or those which have been exhausted of their air, or, in other words, the running of electromotor carriers or vehicles *in vacuo*.

In carrying out my invention I provide a suitable tube in which a constant vacuum is maintained, and the carriers or vehicles are provided with electromotors for propelling the carriers or vehicles through the tube *in vacuo*, whereby the highest speed is obtainable with the greatest safety and at a minimum cost; and it has for its further object the provision of means for inserting the carriers or vehicles into the tube and receiving them therefrom without affecting the vacuum in the tube.

My invention accordingly consists of the system of electrically propelling carriers or vehicles in tubes exhausted of their air or *in vacuo*, and of the combinations, constructions, and arrangements of parts, as hereinafter described in the specification and pointed out in the claims.

Reference is had to the accompanying drawings, wherein—

Figure 1 is a diagrammatic sectional view of a tube system and electrically-propelled carriers or vehicles embodying my improvements. Fig. 2 is a section of part of the tube and a top view of part of a carrier. Fig. 3 is a cross-section of a form of tube with line conductors and track-grooves for the carriers or vehicles. Fig. 4 is an end elevation of part of the front face of a carrier, and Fig. 5 is a modification.

A represents a line of tube, which may have as many substations, suitably provided with transmitters and receivers for the carriers or vehicles, as hereinafter described for the tube A, and suitable switches may be provided at the junctions of the main and substation tubes, as desired, but which are not shown in the drawings, as the same are well known.

a indicates the transmitter end of tube A, and a' its receiver end. The transmitter a has at both ends gates a^2 and a^3, respectively, which may be manually or otherwise opened, as desired. In the drawings I have shown these gates provided with suitably constructed and arranged counterbalances a^4, so that they may be easily and quickly raised and lowered manually. Both of these gates are normally lowered or closed. The receiver a' is also provided at both ends with gates a^5 and a^6, respectively. The gate a^5 is normally raised or opened and the gate a^6 normally lowered or closed. The latter is provided with a counterpoise a^4, similar to those for gates a^3 a^2, or otherwise, as desired, so as to be manually operated. The gate a^5 is recessed on one side, as shown at a^7, so as to leave top and bottom ledges or abutments a^8 a^9, respectively, or said ledges may be otherwise provided, as desired. This gate a^5 is held in its raised position by a sliding catch b, which passes under the lower edge of the gate, as shown, and is located in a suitably constructed and located chamber b' on the tube, and has a rear or opposite end connection b^2 with a suitably-pivoted crank-arm b^3, to the upper end of which is connected a tripper b^4, which normally extends into the receiver a', so as to be in the path of the carriers or vehicles and be actuated by the same.

The gate a^5 has a connection with the piston-rod b^5 of a power-cylinder B, which acts to raise said gate after it has been unlocked and descends by gravity to close the receiver a'.

In a suitable chamber c, projecting from tube A, is located a valve C, having an opening c' to the atmosphere and a pipe connection c^2 with the receiver a' near its outlet end, as shown. The stem for the valve C is provided with a right-angle or bell-crank tripper c^3, one end, c^4, of which normally projects into the tube A, as shown, in which position of said end c^4 the valve C is closed, and the other end, c^5, is in line with the ledges a^8 a^9 of the gate a^5.

D represents a vacuum-pump having, pref-

erably, a pipe connection d with a vacuum reservoir or chamber E, from which leads a pipe e to the receiver a', and in said pipe is a cut-off e'. e^2 is another pipe leading from chamber E to transmitter a, and is provided with a cut-off e^3, and from cylinder B leads a pipe g to pipe e, or, if desired, to chamber E, and is provided with a three-way cock or cut-off g', which in its normal position is open to admit the atmosphere into cylinder B to allow gate a^5 to descend.

Within tube A, on one side thereof, as more plainly shown in Fig. 2, is a line conductor h, secured to insulator h', which in turn is fastened to the tube. This line conductor also extends into the transmitter a and has a connection h^2 with a dynamo or other source of electric supply H. A suitable electric switch h^3 is included in connection h^2.

K represents the carrier or vehicle. In the drawings a carrier is shown mounted on wheels k, at each end of the same, running in track-grooves l at the top and bottom of tube A. (Seen more plainly in Fig. 3.) Upon the carrier is an electromotor m, having a belt gear or other connection m' with the journal of one of the wheels k, as shown more plainly in Fig. 1, for propelling the carrier, and also has a suitably-located contact-finger or trolley m^2, as shown more plainly in Fig. 2, for completing the circuit of the dynamo H from conductor h to the motor m, and thence through the framework of the carrier and the tube A to ground.

At a suitable distance from the receiver a' the conductor h terminates, as shown at n, Fig. 1, in order that the carrier or vehicle will not be electrically propelled as it approaches the receiver, but will be advanced by its acquired velocity, to slacken its speed as it enters the receiver. The latter has preferably a smaller bore than that of the tube A, in order that the windage for the carrier in the receiver may be greatly diminished to admit of the carrier more rapidly compressing the air ahead of it to a greater pressure to effect a stoppage of the carrier within the shortest length possible.

The operation is as follows: The pump D is constantly in action, when the system is in use, to maintain a vacuum in tube A. The carrier K is inserted into the transmitter until its trolley m^2 contacts with conductor h by first raising the gate a^2, the cut-off e^3 in pipe e^2 being closed, which is its normal condition. After the carrier is so inserted the gate a^2 is closed and cut-off e^3 is opened and the air in the transmitter a is exhausted therefrom. The gate a^3 is then raised or opened and the electric switch h^3 is closed, whereupon the carrier is propelled into and through the tube A *in vacuo*, the gate a^2 and cut-off e^3 being closed. When the carrier passes by the end c^4 of tripper c^3 for valve C, the carrier strikes and moves said end c^4 to open valve C to the atmosphere to supply air through pipe c^2 to the receiver a' in front of the carrier. In moving said tripper end c^4 the other end c^5 of the tripper is also moved, but not out of the line of the ledges a^8 and a^9 of the gate a^5. As the carrier passes by and moves the tripper b^4 the crank b^3 is actuated to withdraw the lock b from gate a^5, which drops or closes, and as it does so its ledge a^8 strikes the tripper end c^5 to close valve C and cut off the air supply to the receiver. The carrier comes to rest in the receiver before reaching the gate a^6, whereupon it is raised or opened, the carrier withdrawn from the receiver, and gate a^6 closed. The cut-off e' in pipe e is open to exhaust the air from the receiver, and said cut-off is then closed. The three-way cock or cut-off g' in pipe g is turned to establish communication with vacuum-chamber E to permit cylinder B to raise gate a^5 to its locked position, whereupon said three-way cock or cut-off g' is returned to its normal position, and all of the said described parts are in position for the successive carriers, the electric switch h^3 meanwhile being opened, which is done when a signal is received that the carrier has about reached its destination, or this may be automatically effected in any of the well-known ways.

The tube and receivers and transmitters may be round in cross-section, or be square or oblong or other configuration, as desired, and the track grooves or rails may be located to suit the configuration of the tube.

It is obvious that changes in construction and arrangement of parts may be made without departing from the spirit of my invention, as, for instance, the gates a^5 and a^6 may be constructed as shown in Fig. 5. The cylinder B not being employed, the piston-rod b^5 extends through into the atmosphere and is provided with a stuffing-box b^6, to which is attached the cord and counterbalance-weight a^4, by means of which the gate is opened manually. Gate a^6 is held in a closed position by a sliding catch b^5, constructed and operated the same as sliding catch b. When the carrier or vehicle has passed the tripper b^4 of catch b, it comes in contact with the tripper b^9 of sliding catch b^5, and the gate a^6 is raised by the weight a^4, which is made heavy enough to raise said gate. This permits the carrier to pass out of the receiver and be brought to a stop in any manner desired, or, if desired, separate exhausting-pumps D and chambers E may be located at the receiver end of the tubes of the system, in which case the pipes e and g will lead thereto and not to the common pump and chamber E, as shown. So too, if desired, storage batteries upon the carriers or vehicles may be substituted for the dynamos and line conductor h. Therefore, I do not confine myself to the same as shown and described.

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

1. The combination of a tube, exhausting mechanism therefor, a transmitter having

end gates and an exhaust-pipe, a receiver having end gates, one of which is controlled in its closing movement by a carrier or vehicle, exhausting mechanism and air-supply devices for the receiver, electromotor for a carrier or vehicle and a line conductor in said tube for said electromotor-carriers, substantially as set forth.

2. In a pneumatic-despatch-tube system the combination of a main-line tube provided with exhausting mechanism to constantly maintain a vacuum therein and a receiver provided with two gates, one of which is closed by the action of the arriving carrier and exhausting mechanism for said receiver, substantially as set forth.

3. In a pneumatic-despatch-tube system, the combination of a main-line tube provided with exhausting mechanism to constantly maintain a vacuum therein, a receiver provided with two sealing-gates, one of which is closed by the action of the arriving carrier, and an air supply and exhausting mechanism for said receiver, substantially as set forth.

4. In a pneumatic-despatch-tube system, the combination of a main-line tube provided with exhausting mechanism to constantly maintain a vacuum therein, and a receiver provided with two sealing-gates, one of which is closed and the other opened by the arriving carrier and exhausting mechanism therefor, substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES F. PIKE.

Witnesses:
THOS. S. RODGERS,
JOHN H. HUDSON.