

No. 702,367.

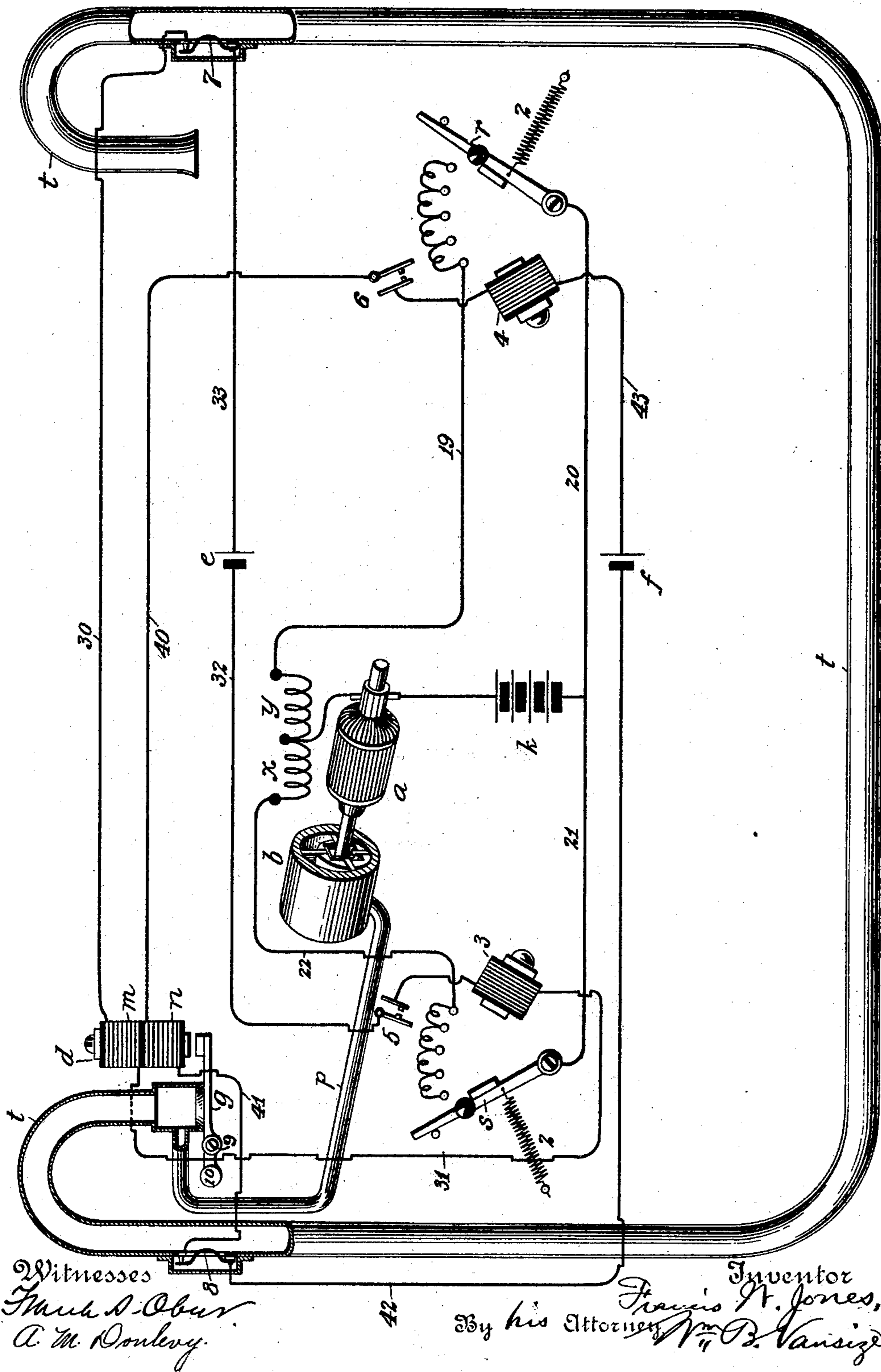
Patented June 10, 1902.

F. W. JONES.

PNEUMATIC TRANSFER TUBE SYSTEM.

(Application filed Apr. 25, 1902.)

(No Model.)



UNITED STATES PATENT OFFICE.

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PNEUMATIC-TRANSFER-TUBE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 702,367, dated June 10, 1902.

Application filed April 25, 1902. Serial No. 104,605. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS W. JONES, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have made certain new and useful Improvements in Pneumatic-Transfer-Tube Systems, of which the following is a specification.

My invention relates to pneumatic tubes for transferring carriers from one station to another by the movement of air. I employ a single tube connecting two stations and locate an air-pump at one station which I connect at one end of said tube. This air-pump is motor-driven and may be reversed or operated to either blow or draw air through the tube. The pump is started, stopped, and reversed by electromagnetic apparatus controlled by a circuit connecting the stations. There is a gate at one end of the tube only, and when the motor operates to blow air through the tube this gate is held closed by an electromagnet.

When the pump operates to draw air through the tube, the tendency of the air is to hold said gate closed; but the gate is liable to chatter and admit some air. The object of my improvement is to hold the gate above described firmly closed when the air pump or blower is operating to draw air through the tube. For this purpose I arrange the electromagnetic device to hold the gate closed under control of two operatively distinct electric circuits, each circuit including a coil on said electromagnetic device, a circuit-closer at one station operated by the motor-starting switch, and a circuit-breaker at the second station operated by a passing carrier, so that upon the passage of the carrier the gate is released and the air-pump simultaneously stopped.

The accompanying drawing illustrates my invention.

t is the tube.

b is a reversible air pump or blower connected with one end of tube t by branch tube p . Blower b is directly connected to armature a of an electric motor. The motor has two field-coil sections x and y . Coil x is in circuit with generator k , conductors 21 22,

and motor-starting switch s , controlled by electromagnet 3, having retracting-spring 2. Field-magnet coil y is in circuit with generator k , conductors 19 20, and motor-starting switch r , controlled by electromagnet 4, having retracting-spring 2. When circuit is closed through one coil, the field-magnet is polarized in one direction, and when circuit is closed through field-coil x the field-magnet is oppositely polarized. In this manner the direction of motor and blower movement is reversed. On the end of the tube t is a gate g , hinged or pivoted at 9. It is balanced by counterweight 10, so that it tends to maintain a horizontal position. This gate is held firmly closed by an electromagnetic device d , having two coil-windings m and n . The coil m is in circuit 30 31 32 33 with generator e and circuit-closer 5, which is held closed by the operation of the switch s and the automatic circuit-breaker 7, located in the wall of the distant end of the tube t . The curved surface of the movable member of the normally closed circuit-breaker 7 projects into the path of a moving carrier in the tube. In said circuit is also included electromagnet 3, which holds the switch-lever s in position to close the motor-circuit. The coil n of electromagnetic device d is in the circuit 40 41 42 43 with generator f , circuit-closer 6, operated by the motor-starting switch r , and the circuit-breaker 8, constructed and operating like circuit-breaker 7 and the magnet 4, which is the holding-magnet of the switch r .

The operation is as follows: A carrier is inserted at the left-hand station by pulling down gate g and pushing the carrier into position. Motor-switch s is moved toward the right, closing circuit through the motor-coil x , armature a , generator k , conductor 21, switch s , and wire 22. The blower b is rotated in a direction to force air through the tube t and propel the carrier. When the motor-switch s was carried to the extreme right-hand limit, the free end thereof came in contact with the circuit-closer 5, and the controlling-circuit was closed through magnet 3, operating to hold switch s in the position to which it had been moved, circuit passing from e via 32, 5, 3, 31, coil m of electromagnetic device d ,

30, normally closed circuit-breaker 7, and wire 33 to the generator. When the carrier reaches the distant station, it strikes the bent spring and temporarily breaks circuit at 7, magnet 3 releases switch-arm *s*, which is retracted by spring 2, and the motor-circuit is again open, the electromagnetic device *d* ceasing to attract and hold gate *g*. Let us assume now that a carrier is to be transmitted from the right-hand station toward the left. The motor-switch *r* is moved to its extreme left position, closing circuit through the field-magnet coil *y* and oppositely polarizing the motor-field. Circuit passes from generator *k* via 20, *r*, 19, *y*, *a* to the generator. The air-pump is operated in the reverse direction and inhales or draws air through tube *t*. The counterweight 10 on gate *g* normally holds said gate in a balanced horizontal position, and the draft of air tends to close the gate tightly; but experience shows that chattering occurs with variation of the impulses from the air-pump. The switch *r* when operated closes circuit at 6, circuit passing from *f* via 43, 4, 6, 40, *n*, 41, 8, 42 to the generator. The electromagnetic device *d* again holds the gate *g* closed. When the carrier strikes the bent spring forming part of circuit-breaker 8, circuit is momentarily broken, electromagnet 4 releases switch *r*, retracted by the spring 2, and the control-circuit is broken at 6, while motor-circuit is opened, the gate *g* is released,

and the impact of the arriving carrier forces it back, permitting the carrier to drop.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with a tube of a reversible air-pump connected to one end thereof, a hinged gate at one end of the tube, an electromagnetic device to hold the gate closed, an automatic circuit-breaker at each station in the path of a moving carrier, a circuit-closer at each station and two circuits each including said electromagnetic device, a circuit-closer at one station and an automatic circuit-breaker at the other station.

2. The combination of a pneumatic tube, a reversible, motor-driven, air-pump, a tubular connection between said pump and one end of the tube, a gate at one end of the tube, a motor-starting device at each station, a circuit-closer at each station operated by the starting device, an automatic circuit-breaker at each station in position to be moved by a passing carrier, an electromagnetic device to hold said gate closed and electrical conductors arranged in two circuits each circuit including said electromagnetic device, a circuit-breaker at one station and a circuit-closer at the other station.

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Witnesses:

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