

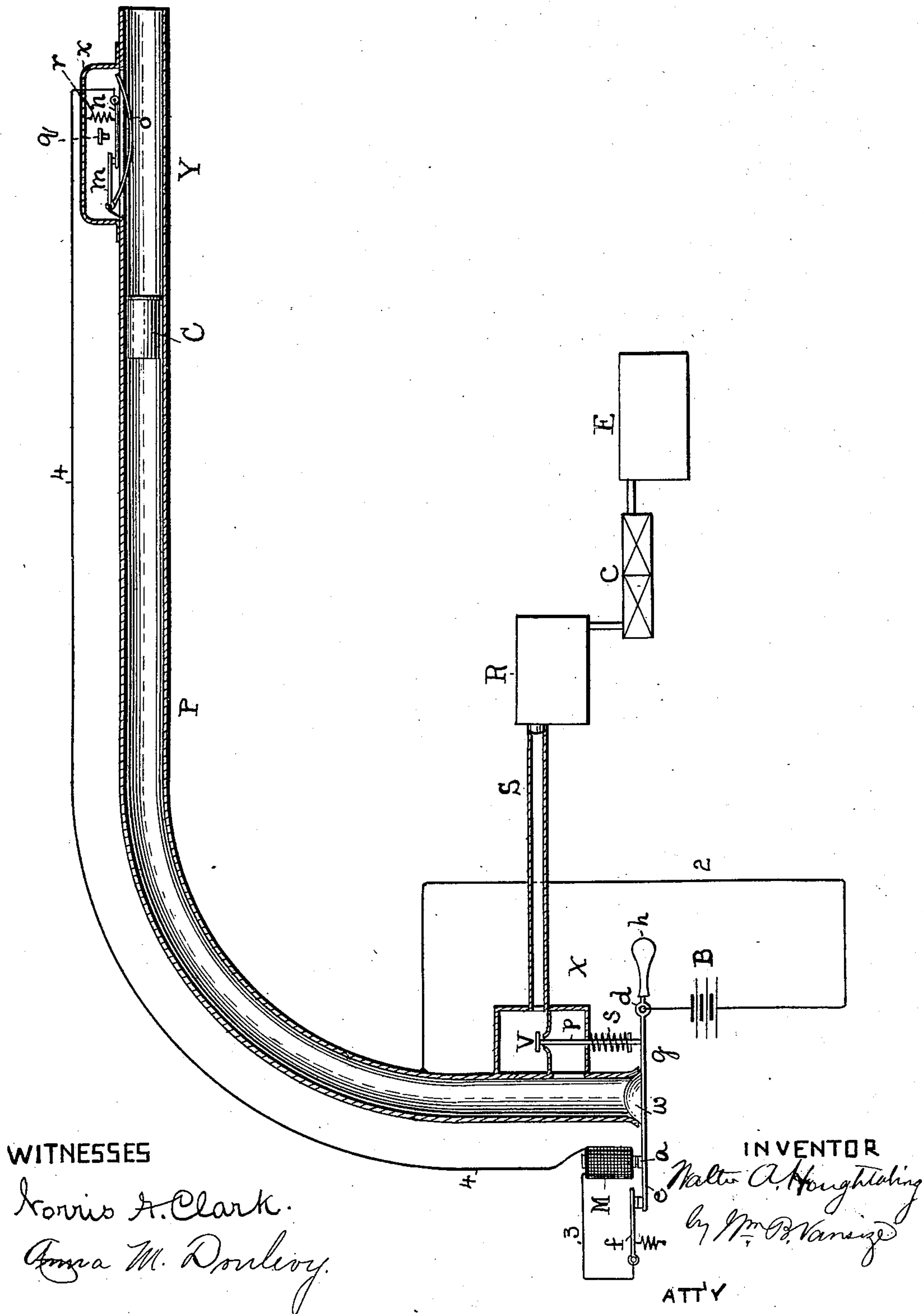
No. 652,270.

Patented June 26, 1900.

W. A. HOUGHTALING.  
PNEUMATIC TRANSFER TUBE SYSTEM.

(Application filed Feb. 24, 1899.)

(No Model.)



# UNITED STATES PATENT OFFICE.

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## PNEUMATIC-TRANSFER-TUBE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 652,270, dated June 26, 1900.

Application filed February 24, 1899. Serial No. 706,651. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER A. HOUGHTALING, a citizen of the United States, and a resident of New York, (Brooklyn,) in the county of Kings, State of New York, have invented certain new and useful Improvements in Pneumatic-Transfer-Tube Systems, of which the following is a specification.

Transfer-tube systems consist of a tube or passage, a car or carrier, means for directing a current of air through the tube, such as an air-pump, which can be started and stopped, or a reservoir of compressed air with a controlling-lever for directing the air-current into the tube.

In United States Letters Patent No. 532,966, dated January 22, 1895, issued to Francis W. Jones, an electrical circuit is described in which an electromagnet operates a detent or holding device to catch and hold the gate and the valve controlling the inlet end of the tube. The magnet is included in an electric circuit extending to a circuit-closer at a second and remote station. The circuit-closer projects into the path of the carrier, which as it passes closes the circuit and energizes the magnet at the first station. The magnet withdraws the detent and the gate and valve assume their normal position of rest.

The object of my invention is to improve and render more certain the operation of this means for restoring the normal condition of the system or apparatus. I have found that the use of a detent to hold the gate is difficult and troublesome, because the gate is necessarily forced into its closed position against the resistance of the rubber packing and of the spring controlling the inlet-valve, and when said arm is engaged by the detent the friction at the point of engagement is so great that a large magnet and exaggerated current strength is necessary to release it, the operation being too slow and accompanied with sparking at the circuit-breaker.

My improvement consists in providing in combination with a controlling device like a pivoted arm, which operates the valve connecting the air under pressure with the tube, an electromagnet which operates by magnetic attraction directly upon the arm or controlling device, holding it in position to admit motive power to the tube until the carrier ar-

rives at the distant station, when the circuit is broken and the magnet immediately releases the controlling device, which returns to its normal position. There is a normally-open circuit-closer at the first station closed by the operation of completing the connection with the motive power, and there is a normally-closed circuit-breaker at the second station opened by the operation of the passing carrier.

The accompanying drawing illustrates my invention.

P is the transfer-tube, extending from station X to station Y.

E is an engine; c, a condenser; R, a reservoir of compressed air, and S is a supply-pipe connecting the reservoir R with the tube P through the valve V. On the valve V there is a piston *p* and a retracting-spring *s*, tending to close the valve.

*g* is a controlling device or arm pivoted at *d*. It has an operating-handle *h* and carries a weight *w*, operating as a retracting device. In close proximity to the lever *g* is an electromagnet M, having an armature *a* fixed to the arm *g*. Magnet M is in the circuit 2 3 4 with the main battery B and the circuit-closer *e f*. The pipe P is included in the circuit. At the distant station Y there is a circuit-breaker which is normally closed, composed of the two pivoted members *m* and *n*. *n* is electrically connected to the wire 4, but is insulated from tube P. *m* is electrically connected to the curve-strap of metal *o*. This strap *o* projects through a slot in the side of the tube into the path of the moving car or carrier C. *n* is retracted by the spring *r* toward the fixed stop *q*. A cap *x* incloses this circuit-breaker *m n* and maintains the tube P in an air-tight condition. The arrangement of these parts is such that a passing car or carrier like C strikes the curved strap *o*, forcing it outward, raising the part *m*, and the spring *r* draws *n* upward with the movement of *m* until *n* strikes the stop *q*, when *m*, continuing its upward movement, contact is broken between *m* and *n* and the circuit is temporarily opened during the passage of the car or carrier C past the strap *o*, after which it again closes or resumes its normal position. The circuit is normally closed at *m n* and is normally open at *e f*. When



the carrier is inserted at station X, the handle *h* is depressed, carrying the weighted gate *w* upward to close the end of tube P. The arm *g* makes contact with the piston *p*, opening the valve V and admitting air from R to propel the carrier C. Simultaneously with the opening of the valve the circuit-closer *ef* is closed, the armature *a* comes into the field of the magnet M, which is in the closed circuit 2 3 4 and is there held by direct magnetic attraction of the magnet M. When the carrier C reaches the station Y, *o* is pushed aside. Circuit is broken at *mn*. Magnet M is de-energized and releases the gate *g*, the valve V is closed, the motive power is cut off by the dropping of the gate *g*, and the parts return to their normal condition. For transmitting in the opposite direction the apparatus would be duplicated in reverse. By causing the magnet M to act directly upon the controlling device *g* the operation of the transfer-tube is rendered more certain, more expeditious, and more satisfactory.

In United States Letters Patent No. 543,184, dated July 23, 1895, issued to Francis W. Jones for pneumatic-transfer-tube systems there is shown and described the combination of a tube, an air-pump, an electric motor, a controlling device or arm by the operation of which the motor and pump are started and stopped, and there is a detent to catch and hold the controlling device, which is released by an electromagnet in an electric circuit containing suitably-arranged circuit-closers. I do not claim anything therein described; but I desire to have it understood that the arrangement of pneumatic tube, air-pump, and motor there described is an equivalent for the arrangement of tube and air-reservoir hereinbefore shown and described to illustrate my improvement.

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

1. In a pneumatic transfer system the combination of a tube having an opening for the introduction of a carrier, a pivoted controlling device or arm, a gate for said opening fixed to said arm, a valve controlling the air-pressure inlet located in position to be opened by the movement of the arm to close the gate, an electric circuit including a magnet, a circuit-closer and a circuit-breaker, said electromagnet being fixed in position in proximity to said arm, an armature therefor fixed to said arm, said circuit-closer at the transmitting-station in position to be closed by the operation of the arm in closing the gate, and said circuit-breaker at a second station having a movable part or member projecting into the path of the moving carrier whereby the circuit is broken.

2. In a pneumatic transfer system the combination of a tube or passage having an opening for the introduction of a carrier; a suitable gate for said opening; means for directing a propelling-current of air through said tube, including a pivoted controlling device or arm; an electric circuit including a magnet, a circuit-closer and a circuit-breaker, said magnet being fixed in position in proximity to said arm; an armature therefor fixed to said arm; said circuit-closer at the transmitting-station in position to be closed by the operation of said arm, and said circuit-breaker at a second station having a movable part or member located in position to be operated by a passing carrier whereby said circuit is broken.

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Witnesses:

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