J. F. SKIRROW.

TRANSFER TUBE SYSTEM.

APPLICATION FILED JUNE 10, 1910.

1,045,335. **Patented Nov. 26, 1912.**

Fig. 1

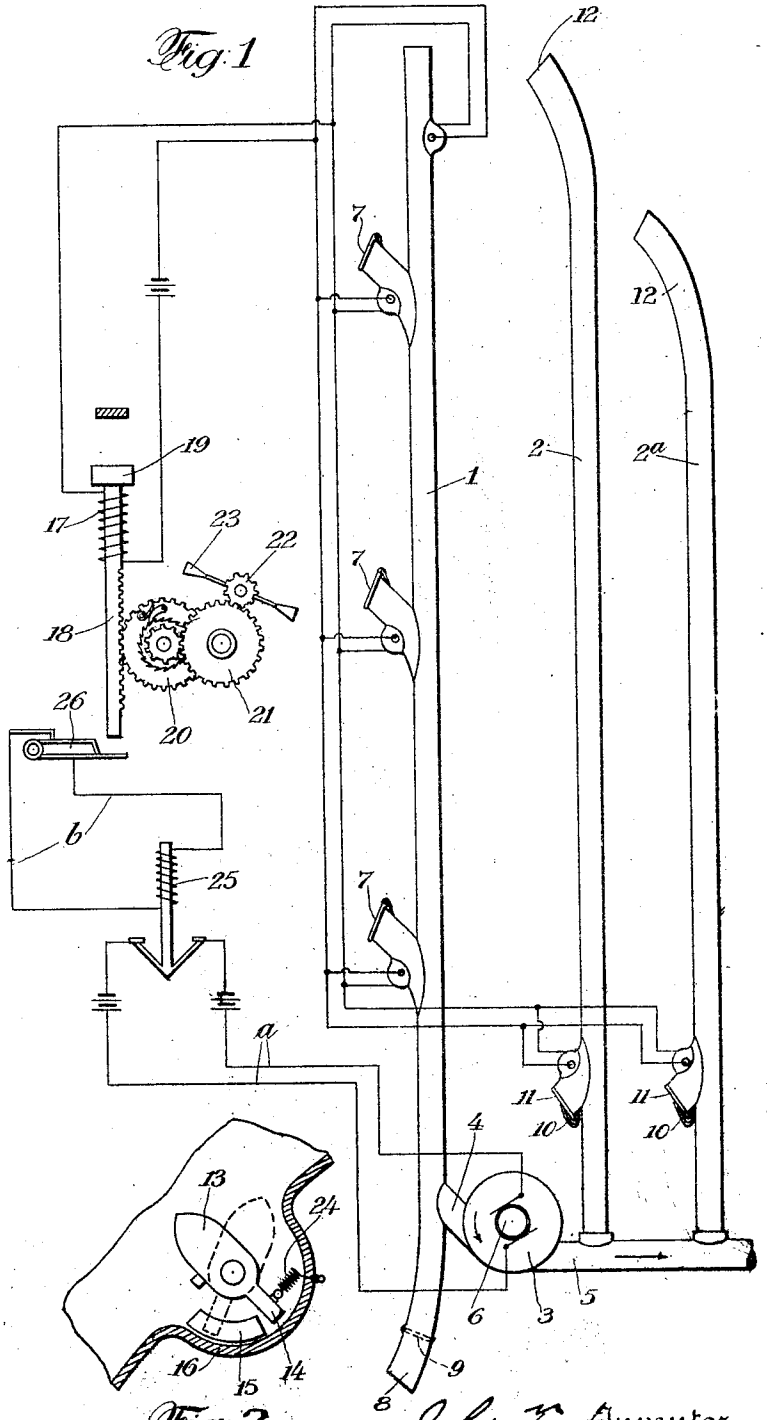

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN F. SKIRROW, OF EAST ORANGE, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO LAMSON CONSOLIDATED STORE SERVICE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TRANSFER-TUBE SYSTEM.

1,045,335. Specification of Letters Patent. Patented Nov. 26, 1912.

Original application filed May 23, 1905, Serial No. 261,912. Divided and this application filed June 10, 1910. Serial No. 566,128.

To all whom it may concern:

Be it known that I, JOHN F. SKIRROW, a citizen of the United States, and resident of East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Transfer-Tube Systems, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 shows a diagrammatic view of an apparatus wherein air is exhausted from one tube and forced through a plurality of tubes; Fig. 2 a detail view of one of the circuit closing trigger keys.

One of the objects of this invention is to provide means whereby a plurality of receiving stations may be connected to a single transmission tube, each receiving station being provided with means for independently actuating the timing mechanism whereby the motor will be independently controlled from each of said stations.

A further object of the invention is to provide a single transmission tube, with a plurality of receiving stations, an air blower being arranged to draw air through said tube and to force it out through a plurality of tubes, whereby all the carriers transmitted by said single tube will be delivered at the central station. All of the transmitting tubes connected to the pressure side of the blower lead from the central station and each is provided with a receiving terminal. All of the receiving terminals on both tubes are provided with means for independently setting the timing means, whereby the motor will be independently controlled from each of said stations.

This application is a division of my application filed May 23, 1905, Serial No. 261,912.

Referring to the various parts by numerals, 1, 2 and 2^a designate the transmission tubes, 1 being the incoming tube and 2 and 2^a the outgoing tubes. The inner, or what might be termed the central station end of each of these tubes, is connected to a blower 3, the suction side 4 of said blower being connected to the incoming tube 1, and the pressure side 5 thereof being connected to the inner or central station ends of the outgoing tubes 2 and 2^a.

The blower 3 is operated by any suitable form of electric motor 6, as shown in the drawing. The motor is directly connected to the shaft of the blower, but, of course, it may be connected thereto in any suitable manner, the blower being driven in the proper direction to draw air through the tube 1 and force it outwardly through the tubes 2 and 2^a.

The incoming tube 1 is provided with receiving terminals 7, the central station end of said tube being formed with the single discharge terminal 8, said discharge terminal being fitted with an outwardly opening door 9 to prevent the air from flowing into the tube at that point. This door is shown in Fig. 2 of the drawing. Each of the outgoing tubes is provided at its inner or central station end with a receiving terminal 10 which is normally closed by a door 11, said door being so disposed that it will prevent the escape of air from the tube at that point. Each of these outgoing tubes is provided at its distant or outer end with a discharge terminal 12.

In ordinary store service apparatus, the outgoing tubes are arranged so that each will discharge at or near a separate receiving terminal in the suction tube 1, that is to say, one outgoing tube will lead to the most distant receiving terminal in tube 1; another to the next distant receiving terminal and so on throughout the series. It will, of course, be understood, however, that to adapt the system for other uses the outgoing tubes need not necessarily lead to a receiving terminal in the suction tube.

At each of the receiving terminals of both the incoming and outgoing tubes is arranged a circuit closing trigger 13. Each of these triggers is arranged to extend into the tube so that its end lies in the path of the entering carriers. This trigger is provided with a contact arm 14 which is adapted to engage the stationary contact 15 located in a small casing 16 connected to the side of the tube. When the contact arm engages the said stationary contact 15 the motor timing circuit is closed. In this circuit is a solenoid 17 whose armature or core is prolonged to form a rack bar 18, and is provided at its upper end with a weight 19. The rack bar 18 meshes with a gear 20 of a train of gearing 21. This gear is loose on its shaft, but is connected thereto by means of a pawl and

ratchet in such manner that when the solenoid armature descends to its normal position and under the influence of the weight 19 it will rotate said gear and its shaft and actuate the timing train. The final shaft 22 of said train carries a small governing fan 23. The trigger or key 15 is provided with means, preferably a spring 24, to hold its contact arm 16 out of engagement with the fixed contact 17 so that the motor timing circuit will normally be open. It will, therefore, be seen that when a carrier is inserted in any one of the receiving terminals or stations the motor timing circuit will be completed and the solenoid armature or core lifted to its uppermost position. It is manifest that the timing train and the fan 23 actuated thereby may be so arranged and proportioned that it will require a given time for the descent of the solenoid armature after the motor timing circuit has been broken.

The motor circuit *a* is completed through a motor starting solenoid 25, and said motor starting solenoid is arranged in a motor controlling circuit *b*. Directly below the armature of the timing solenoid is arranged a pair of normally closed contacts 26, one of said contacts being adapted to be engaged by the armature of the timing solenoid at the lower end of its movement to separate said contacts. As these contacts form a part of the motor controlling circuit it is manifest that when they are separated said circuit will be broken and the coil of the motor starting solenoid will be deënergized, thereby permitting the solenoid core to drop and open the motor circuit.

It will thus be seen that when a carrier is inserted in any one of the receiving terminals the motor timing circuit is completed through the trigger, and the armature of the timing solenoid 17 raised to its upper position. As soon as the armature of said solenoid is free of the contacts 26 the motor controlling circuit is closed and the armature of the motor starting solenoid 25 completes the motor circuit. As soon as the carrier is passed beyond the trigger by the receiving terminal the motor timing circuit will be broken and the armature of the solenoid 17 will begin its downward movement. This movement may be retarded to any extent desired by means of the timing train and the fan so that the motor will be permitted to run any desired length of time, usually only a few seconds, until the lower end of the armature of said solenoid engages and separates the contacts 26. It will be observed that the last carrier inserted in any one of the transmission tubes resets the timing mechanism so that the motor will run a predetermined time after the last carrier is inserted, whether it be an incoming carrier or an outgoing one.

It will, of course, be understood that as many incoming and outgoing transmission tubes may be connected to and operated by one motor and blower as desired, it being only necessary to have the motor and blower of the proper capacity.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent is:

1. A transfer tube system comprising a plurality of transmission tubes, an air pump connected thereto and arranged to draw air from one of said tubes and to force it through a plurality of said tubes, an electric motor for driving said pump, a plurality of receiving terminals in the suction tube connected to the exhaust side of the pump, each outgoing tube through which air is forced being arranged to discharge carriers at a separate receiving terminal in the suction tube, a single discharge terminal for the suction tube, means for stopping the motor after a determined period of operation, and means at each receiving terminal for starting the motor.

2. A transfer tube system comprising a plurality of transmission tubes, an air pump connected thereto and arranged to draw air from one of said tubes and to force it through a plurality of said tubes, an electric motor for driving said pump, a plurality of receiving terminals in the tube connected to the exhaust side of the pump, a single discharge terminal for said tube, a single timing means controlling said motor and arranged to be placed in operation and acting after a determined period of operation to arrest the motor and means at each receiving terminal for starting the motor and the timing means.

3. A transfer tube system comprising a plurality of transmission tubes, an air pump connected thereto and arranged to draw air from one of said tubes and to force it through a plurality of said tubes, an electric motor for driving said pump, a plurality of receiving terminals in the tube connected to the exhaust side of the pump, a single discharge terminal for said tube, a single timing means controlling said motor and arranged to be placed in operation and acting after a determined period of operation to arrest the motor and means at each receiving terminal for starting the motor, each motor starting means serving to independently start the timing means.

4. A transfer tube system comprising a plurality of transmission tubes, an air pump connected to one of said tubes to exhaust air therefrom, a plurality of receiving terminals in said suction tube, a single discharge terminal for said suction tube, a pipe connected to the pressure side of the pump, a plurality of outgoing tubes connected to and arranged to receive air from

said pressure pipe, each of said outgoing tubes leading to a separate receiving terminal in the suction tube, an electric motor for driving said pump, a single timing means controlling said motor and arranged to be placed in operation and acting after a determined period of operation to arrest the motor and means at each receiving terminal for starting the motor, each motor starting means serving to independently start the timing means.

5. A transfer tube system comprising a plurality of transmission tubes, an air pump connected thereto and arranged to draw air from one of said tubes and to force it through a plurality of said tubes, a motor for driving said pump, a plurality of receiving terminals in the tube connected to the exhaust side of the pump, each outgoing tube through which air is forced being arranged to discharge carriers at or near a separate receiving terminal in the suction tube, a single discharge terminal for the suction tube, a motor controlling means responsive to the carrier insertions of said transit tubing for insuring the operation of the motor during a predetermined minimum time interval following each carrier insertion and independent of the actual travel of the inserted carrier.

6. A transfer tube system comprising a plurality of transmission tubes, an air pump connected thereto and arranged to draw air from one of said tubes and to force it through a plurality of said tubes, a motor for driving said pump, a plurality of receiving terminals in the tube connected to the exhaust side of the pump, each outgoing tube through which air is forced being arranged to discharge carriers at or near a separate receiving terminal in the suction tube, a single discharge terminal for the suction tube, an automatic controller for starting and stopping the motor, and actuating means therefor comprising a timing device and means for setting it each time a carrier is inserted in said tubing, said timing device actuating said controller when a carrier is inserted to start the motor if stopped, to maintain it in operation after that carrier insertion or any subsequent carrier insertion until the interval of time following any carrier insertion without a following carrier insertion exceeds a predetermined period and to stop the motor when said interval exceeds that period.

7. A transfer tube system comprising a plurality of transmission tubes, an air pump connected thereto and arranged to draw air from one of said tubes and to force it through a plurality of said tubes, a motor for driving said pump, a plurality of receiving terminals in the tube connected to the exhaust side of the pump, each outgoing tube through which air is forced being arranged to discharge carriers at or near a separate receiving terminal in the suction tube, a single discharge terminal for the suction tube, timing means for said motor arranged to be set to stop the carrier driving operation of the motor independently of the travel of the carriers, and means at each despatching station for starting the motor and setting the timing means for the transmission of carriers.

8. A transfer tube system comprising a plurality of transmission tubes, an air pump connected thereto and arranged to draw air from one of said tubes and to force it through a plurality of said tubes, a motor for driving said pump, a plurality of receiving terminals in the tube connected to the exhaust side of the pump, each outgoing tube through which air is forced being arranged to discharge carriers at or near a separate receiving terminal in the suction tube, a single discharge terminal for the suction tube, a timing means for said motor arranged to be set to stop the carrier driving operation of the motor independently of the travel of the carriers, and means for resetting said timing means independently of the position of the timing means under the previous setting.

In testimony whereof I hereunto affix my signature in the presence of two witnesses this 24th day of May, 1910.

JOHN F. SKIRROW.

Witnesses:
EMMA D. NOLLER,
ALICE C. HUDSON.