J. T. NEEDHAM.

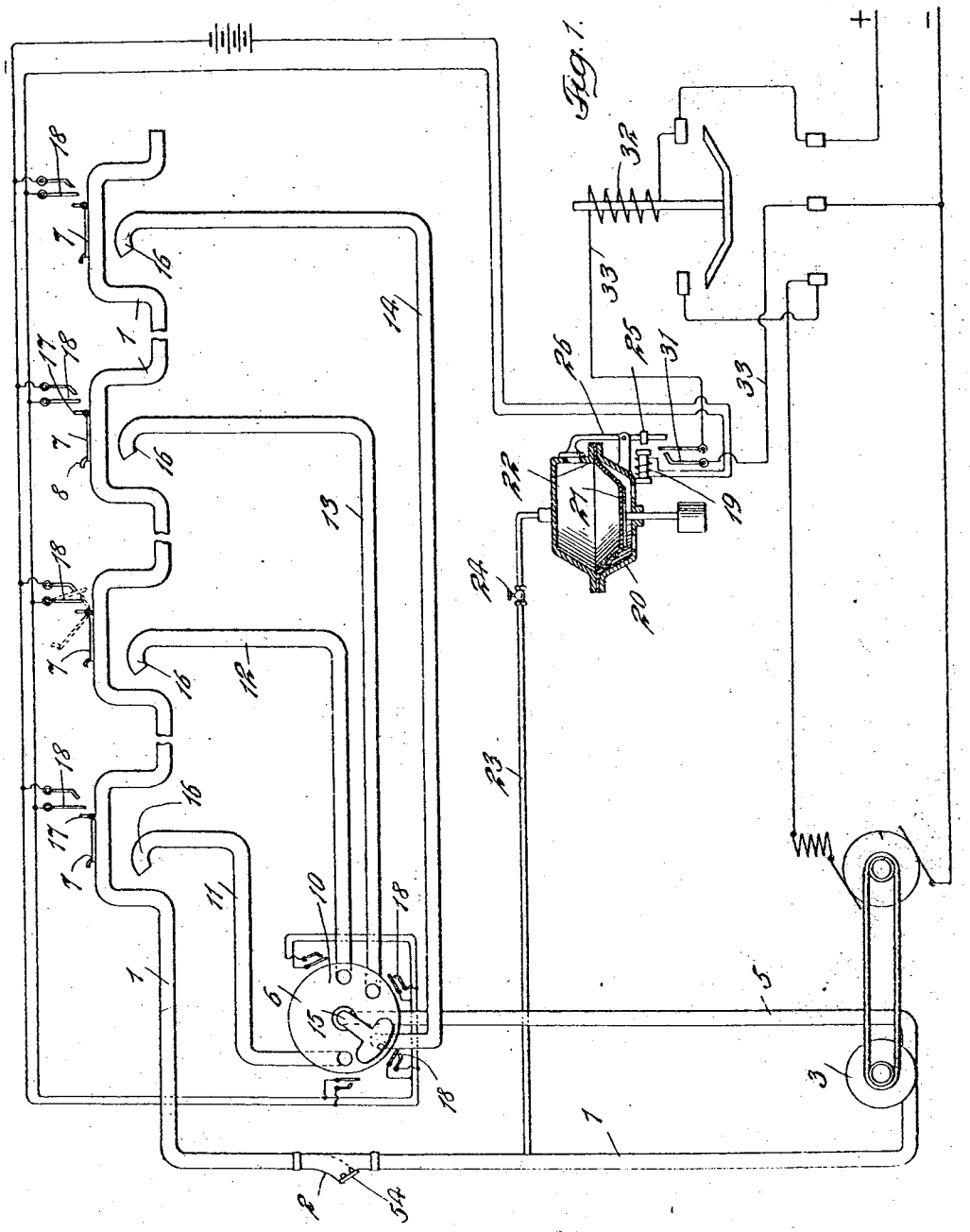
PNEUMATIC DESPATCH TUBE APPARATUS.

APPLICATION FILED APR. 7, 1910.

1,124,505.

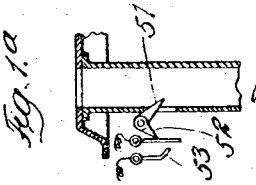
Patented Jan. 12, 1915.

3 SHEETS—SHEET 1.



WITNESSES:

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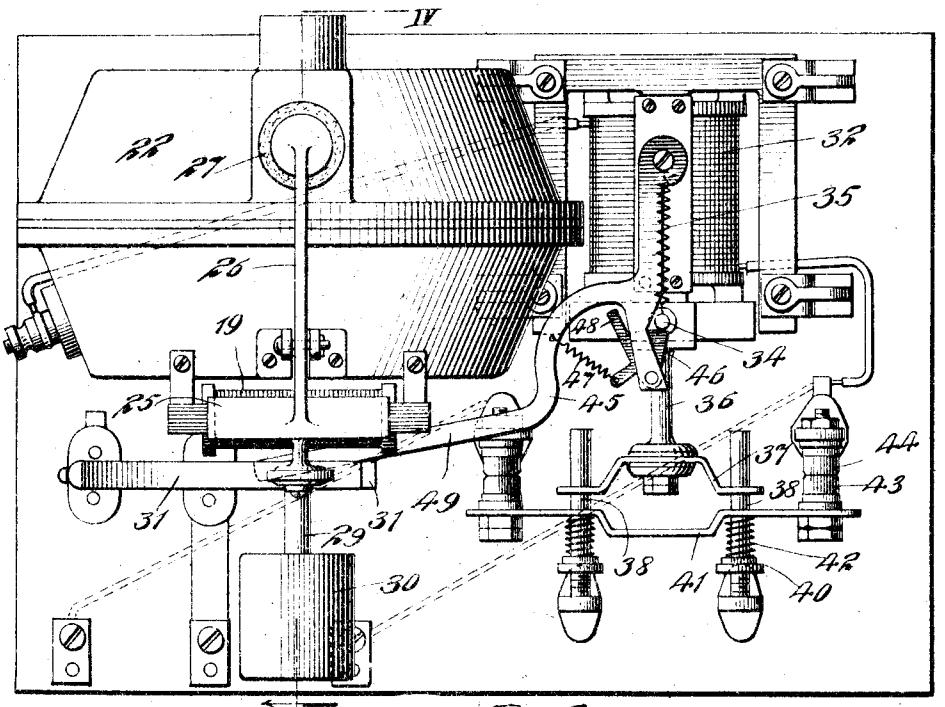


Fig. 2.

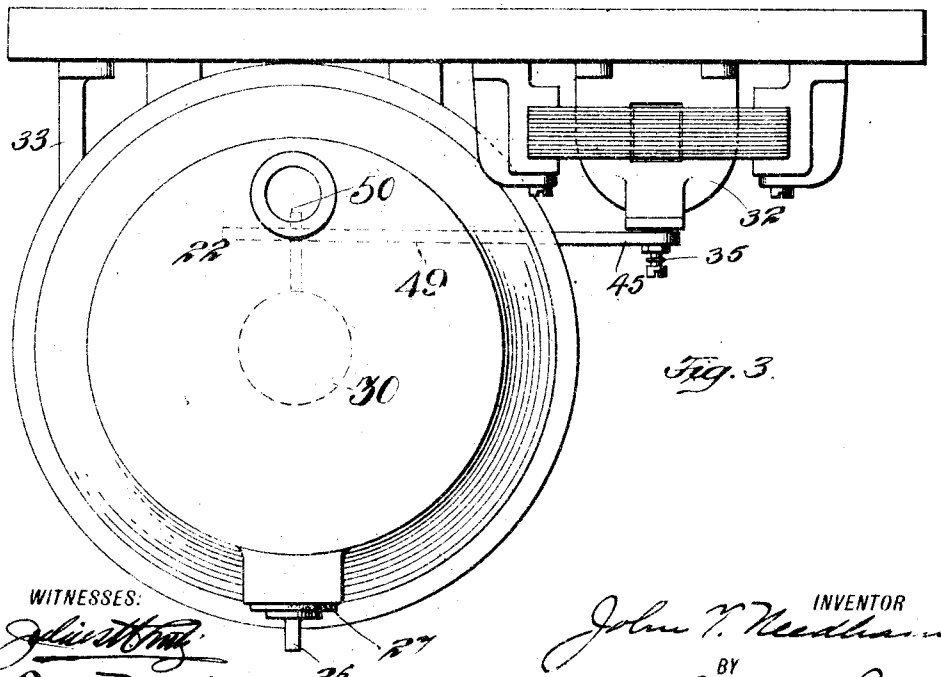


Fig. 3.

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3 SHEETS—SHEET 3.

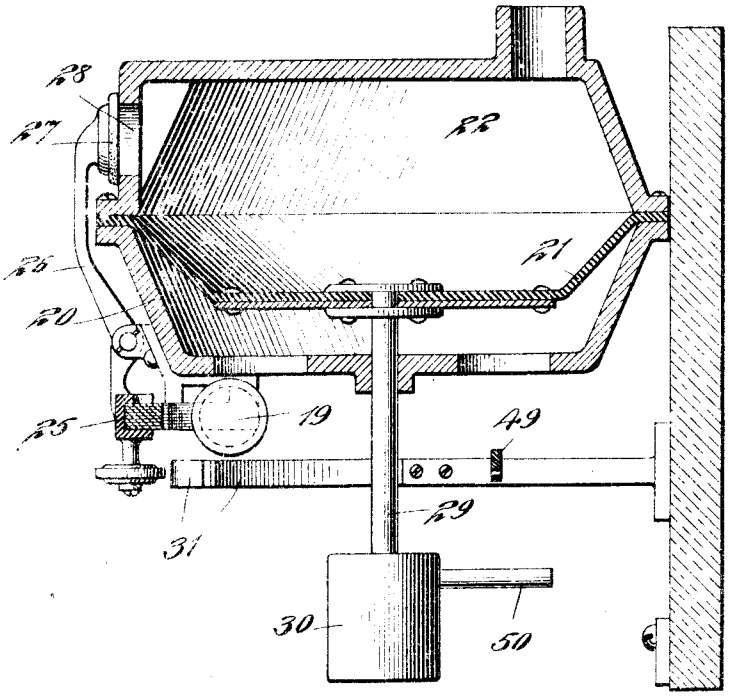


Fig. 4.

Fig. 5.

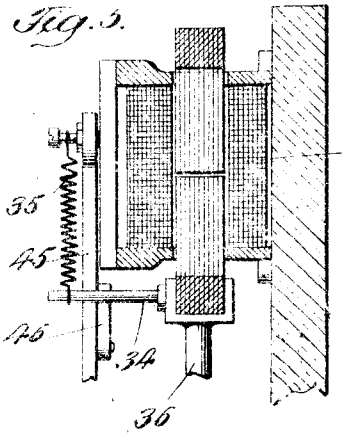


Fig. 6.

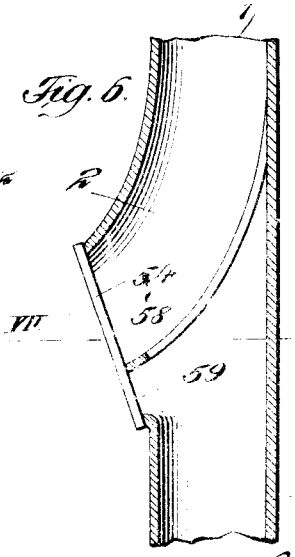
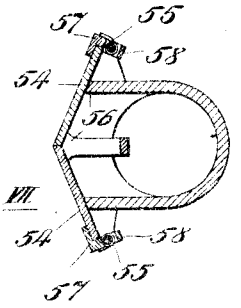


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN T. NEEDHAM, OF BAYONNE, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE LAMSON COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PNEUMATIC-DESPATCH-TUBE APPARATUS.

1,124,505. Specification of Letters Patent. Patented Jan. 12, 1915.

Application filed April 7, 1910. Serial No. 554,010.

To all whom it may concern:

Be it known that I, JOHN T. NEEDHAM, a subject of the King of Great Britain, a citizen of Canada, and resident of Bayonne, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Pneumatic-Despatch-Tube Apparatus, of which the following is a specification.

One of the objects of this invention is to provide an apparatus wherein a single transmission tube leading to a central station is provided with a plurality of terminals and a plurality of return or outgoing tubes extend from the central station to the terminals on the single transmission tube, air being drawn through the transmission tube and then forced through the outgoing tubes, and electrical means being provided to control the operation of the air moving means.

Another object of the invention is to provide an improved and simplified electrically operated power controlling means adapted to be actuated from each carrier receiving station or terminal, both at the central station and on the transmission tube, whereby an air blower or other suitable air moving means may be set in motion when a carrier is to be transmitted or returned to its proper terminal, and whereby said air moving means will be stopped a predetermined time after the insertion of a carrier in any one of the said terminals.

Another object of the invention is to provide a simplified and improved timing means for controlling the operation of the motor which drives the air blower or other suitable air moving means.

Another object of the invention is to provide an automatically operating mechanical locking means for holding the motor starting means in its closed position for a predetermined time.

A further object of the invention is to provide a new and improved discharge terminal on the transmission tube through which the carriers will be delivered at the central station.

Other objects and advantages of the invention will appear hereinafter.

In the drawings, Figure 1 is a diagrammatic view of the apparatus; Fig. 1ª a detail vertical sectional view of the receiving end of the outgoing tubes; Fig. 2 a front elevation of the timing means; Fig. 3 a plan view thereof; Fig. 4 a vertical sectional view on the line IV—IV of Fig. 2; Fig. 5 a vertical sectional view of the solenoid coil showing the solenoid core locking means; Fig. 6 a vertical sectional view of the central station discharge terminal; and Fig. 7 a horizontal sectional view of said terminal on the line VII—VII of Fig. 6.

Referring to the various parts by numerals, 1 designates a single transmission tube leading from the various outlying or distant stations to the central station. This tube is open at its outer end and is provided with a discharge or delivery terminal 2 at the central station through which all of the carriers are discharged. To this tube at a point beyond the central station is connected a rotary blower 3 driven by an electric motor 4 in the proper direction to suck air through the transmission tube 1. The pressure side of said blower is connected to a pressure pipe 5 which leades to a central distributing station 6. This central station is usually arranged at the cashier's desk when the apparatus is installed for store service. It will, therefore, be seen that the blower sucks air through pipe 1 and forces it out through pipe 5 and from said pipe it is directed into any one of the outgoing or return tubes by means of any suitable air switching device connected to the end of said pressure pipe.

The transmission tube is provided with a plurality of receiving terminals or stations 7, each receiving terminal being provided with a hinged door 8 which closes a carrier receiving opening 9 leading into the transmission tube. In operation the door 8 is lifted to permit a carrier to be dropped lengthwise into the tube as indicated in dotted lines in Fig. 1, said doors being then immediately closed. It is apparent that a carrier dropped in any one of the receiving terminals in the transmission tube will be carried through said tube and delivered through the discharge terminal 2 at the central station without interfering in the least with the travel of any other carrier that may be in the tube.

The central station 5 is provided with any suitable pneumatic switch by means of which air under pressure from pipe 5 may be directed into any one of the outgoing or return tubes. As shown in the drawings, this air switching device consists of a hori-

zontal circular plate 10 which may be secured to the top of the cashier's desk or otherwise suitably supported. This plate 10 is formed with a series of apertures arranged in an arc struck from the center of said plate. Outgoing or return tubes 11, 12, 13 and 14 are connected at their inner or central station ends to said plate, and register with said apertures. The pipe 5 is connected to the center of said plate and registers with an aperture therein. To the center of said plate, and on the upper side thereof is connected a pneumatic or tubular arched switch 15, said switch being swiveled to the plate at the center thereof by any suitable means, its outer end being so arranged that it may be swung over and in register with the openings leading to the outgoing or return tubes. It is apparent, therefore, that air under pressure may be directed from pipe 5 into any one of the outgoing tubes. Each of the outgoing tubes is provided with a discharge terminal 16 which may be of any suitable form.

Each terminal door is formed with cam 17 which, when the door is open is adapted to bring together two contacts 18 which complete a battery circuit through the magnet 19 of the motor timing device. Each of the doors of the terminals in the transmission tube is adapted to independently close the battery circuit through said magnet. The magnet 19 is preferably mounted on a diaphragm holder 20. This holder contains a diaphragm 21 which forms a vacuum timing chamber 22, said chamber communicating with the pipe 1 through a small exhaust pipe 23 in which is arranged a small controlling valve 24. The magnet 19 is provided with an armature 25 which is mounted on a lever 26, the upper end of said lever carrying a valve 27 adapted to control a small exhaust port 28 leading into the timing chamber 22. Depending from the diaphragm is a rod 29 carrying near its lower end a weight 30. It is manifest that when the contacts of any one of the pairs of contacts 18 are brought together by means of the terminal door, or otherwise, the armature 25 will be attracted by the magnet 19 and the exhaust port 28 opened, thereby destroying the vacuum in the chamber 22 and permitting the diaphragm to be pulled downwardly by the weight 30. When the terminal doors 8 are closed the contacts 18 separate, the magnet 19 is deënergized and armature 25 thereof released, thereby permitting the valve 27 to close, the lever 26 being so mounted that the weight of the armature will swing the valve closed when it is released from the magnet 19. A partial vacuum is produced in the vacuum chamber by the exhaustion of the air therein through pipe 23 and pipe 1.

Near the lower end of the lever 26, and adapted to be engaged by it, is one of a pair of contacts 31, said contacts being so arranged that when the lever is moved to open the exhaust valve 27, contacts 31 will be brought together. These contacts are in circuit with the coil 32 of a motor starting solenoid, the motor circuit being completed by said solenoid through wires 33. It will, therefore, be seen that when the exhaust valve 27 is open the motor circuit will be completed and the motor started to draw air through pipe 1 and force it out through pipe 5, and that as soon as the motor is started air is exhausted from the chamber 22.

When the magnet 19 is deënergized by the separation of the contacts 18 the lever 26 swings outwardly to close the valve 27, and to permit the contacts 31 to separate, thereby breaking the circuit through the solenoid coil. It is manifest that if some means were not provided for holding the solenoid core in its proper position to maintain the solenoid contacts in engagement with each other, said core would drop and the motor circuit be interrupted. To hold the motor circuit closed I provide a mechanically operating locking device to lock the solenoid core in its upper position. Said locking device consists of a pin 34 projecting horizontally from the solenoid core, a spring 35 being connected to said pin and to a part of the solenoid frame, said spring serving merely to yieldingly suspend the solenoid armature. Extending downwardly from the solenoid armature is a rod 36 carrying a rigid cross bar 37 at its lower end. This cross bar is provided at its ends with depending rods 38 carrying collars 39, their lower ends extending through guides 40. On these rods just below the cross bar 37 is a loosely supported contact bar 41, springs 42 being interposed between said contact bar and the collar 40 on the depending rods 38. The contact bar is provided near each of its ends with carbon contact points 43, which are adapted to engage fixed carbon contact points 44 suitably supported. One of the fixed carbon contacts is in circuit with one of the mains, the other electrically connected to the motor, the other side of the motor being connected to the mains. The purpose of loosely mounting the contact bar on the depending rods 38 is to permit the armature core to have an upward movement after the contacts are in engagement to insure the operation of the locking devices which will now be described.

Pivoted on the solenoid frame, or at any suitable point above the pin 34, is a locking lever 45 which extends below the pin 34 and has pivoted near its lower end a locking pawl 46. A spring 47 is connected to the lower end of this locking pawl and to the lever, and tends to force the upper

end of said pawl outwardly into the path of the pin 34, whereby as the solenoid core is drawn upwardly and said pin is raised above the upper end of the locking pawl, said pawl will be thrown by its spring under said pin, thereby locking the solenoid core in its upward position and holding the contacts in engagement until said locking pawl is released. By this means the circuit through the solenoid coil may be interrupted without permitting the solenoid core to drop and without interrupting the motor circuit. The locking pawl is provided with an upwardly extending stop finger 48 which limits the movement of said dog under the influence of its spring, said stop finger being arranged to engage a part of the lever 45. This stop finger insures the locking dog stopping in position to engage the pin 34, and prevents the spring 45 throwing said locking dog outwardly beyond the pin 34. The lever 45 is provided with a laterally extending arm 49 which extends into the path of a pin 50 projecting from the weight 30 suspended from the diaphragm 21. It is manifest, therefore, that as said diaphragm is drawn up by reason of the vacuum created in the vacuum chamber, the pin 50 will engage the lateral arm of the lever 45 and lift it sufficiently to release the locking dog from the pin 34, thereby permitting the solenoid armature to drop and separating the motor circuit contacts, thereby stopping the motor. It will, therefore, be seen that I provide electrical means for completing the solenoid circuit and starting the motor; a mechanical locking means for holding the motor circuit closed, and a pneumatically operated means for releasing the solenoid core, and thereby breaking the motor circuit and stopping the motor. The advantage of providing a mechanical lock for the solenoid core so that the circuit through the solenoid coil may be broken the instant the solenoid core is drawn to its upper position will be manifest. It not only affects a saving in current, but increases the life of the solenoid coil.

Each outgoing tube is provided at the central station with a trigger 51 adapted to be moved outwardly by the insertion of a carrier in the tube. Each trigger is provided with a cam 52 which is arranged to bring contacts 53 into engagement with each other to thereby complete the battery circuit through the magnet 19 for opening the venting valve.

The discharge or delivery terminal 2 at the central station is provided with two outwardly swinging doors 54. These doors meet at the center of the terminal and are arranged to extend inwardly and downwardly with respect to the vertical axis of the tube 1, and from their pivotal points they extend forwardly, their forward edges meeting and fitting closely together in a plane passing longitudinally through the center of the tube 1. Each door is provided at its pivot with a light spring 55 which holds the door closed and pressed lightly against its seat, the terminal being so formed that each door seats against an inclined surface 56. The doors are formed of leather or other suitable material suitably secured in the metal hinge portions 57. Each hinge portion is provided with a rearwardly extending stop 58 which limits the outward swinging movement of the door. Below the carrier discharge opening 58 is formed an air inlet opening 59, both of these openings being closed by the terminal doors. The object of this air inlet opening is to permit air to be drawn into the tube 1 when the doors are open and a carrier is being discharged through the discharge opening 58. If the said inlet opening were not provided air would be drawn in through the opening 58 when the doors are open thereby retarding the discharge of the carrier, and at times preventing its delivery. The object of inclining the doors 54 and arranging them to meet at the center of the terminal is to have a carrier contact with said doors as near the center line of the terminal or the meeting edges of the door as is possible, so that said doors will swing open quickly and easily. Another object for dividing the doors as shown is that the doors need swing outwardly only a short distance before the carrier is entirely free of them. It is manifest that a terminal so constructed will operate almost noiselessly and rapidly, both in opening and closing, so that the amount of air admitted to the suction pipe during the discharge of the carrier will be very small. This is of advantage for the reason that any air admitted at the discharge terminal reduces the speed of the air and the volume thereof moving through the transmission tube from the receiving terminals.

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

1. A pneumatic despatch tube apparatus comprising a single transmission tube, a plurality of receiving terminals in said tube, an electric motor, means operated by said motor to draw air through said single tube, a pipe connected to the pressure side of said blower, a plurality of return tubes, means to direct the air from the pressure pipe into any one of said return tubes, a motor starting solenoid, means adapted to be operated from any one of the receiving terminals to energize said solenoid, means for completing the motor circuit through said solenoid, means for locking the solenoid core with the motor circuit closed, and means for releasing said solenoid core after a predetermined time to open the motor circuit.

2. A pneumatic despatch tube apparatus comprising a single transmission tube, a plurality of receiving terminals in said tube, an electric motor, means operated by said motor to draw air through said single tube, a pipe connected to the pressure side of said blower, a plurality of return tubes, means to direct the air from the pressure pipe into any one of said return tubes, a motor starting solenoid, means adapted to be operated from any one of the receiving terminals to energize said solenoid, means for completing the motor circuit through said solenoid, means for automatically locking the solenoid core with the motor circuit closed, and means for releasing said solenoid core after a predetermined time to open the motor circuit.

3. A pneumatic despatch tube apparatus comprising a transmission tube, an electric motor, means operated by said motor to move air through said tube, a motor starting solenoid, means to complete the solenoid circuit, means for completing the motor circuit through said solenoid, means for locking the solenoid core with the motor circuit closed, and means for releasing said solenoid core after a predetermined time to open the motor circuit.

4. A pneumatic despatch tube apparatus comprising a transmission tube, an electric motor, means operated by said motor to move air through said tube, a motor starting solenoid, means to complete the solenoid circuit, means for completing the motor circuit through said solenoid, automatically operated means for locking the solenoid core with the motor circuit closed, and pneumatically operated means for releasing said solenoid core after a predetermined time to open the motor circuit.

5. A pneumatic despatch tube apparatus comprising a single transmission tube, a receiving terminal therein, an electric motor, a blower for moving air through said tube and operated by said motor, a motor starting solenoid, a pair of contacts for completing the solenoid circuit, a vacuum chamber, a diaphragm therein, a weight connected to said diaphragm, a venting valve for said vacuum chamber, an electrically operated device for opening said venting valve, and closing the solenoid coil circuit, means at the terminal for closing the circuit through said electrical device, a motor circuit arranged to be closed by the movement of the solenoid core into the solenoid coil, an automatically operated locking device, for locking said core in said coil to hold the motor circuit closed, means for moving the diaphragm in the diaphragm chamber, and means operated by said diaphragm to release the solenoid core locking means and thereby open the motor circuit.

6. A pneumatic despatch tube apparatus comprising a transmission tube, an electric motor, a blower for moving air through said tube and operated by said motor, a motor starting solenoid, a diaphragm chamber, a diaphragm therein, a venting valve for said chamber, an electrically operated device for opening said venting valve and closing the solenoid coil circuit, means for closing the circuit through said device, a motor circuit arranged to be closed by the movement of the solenoid core into its coil, an automatically operating locking device for locking said core in said coil to hold the motor circuit closed, means for moving the diaphragm in the diaphragm chamber, and means operated by said diaphragm to release the solenoid core locking means and thereby open the motor circuit.

7. A pneumatic despatch tube apparatus comprising a transmission tube, an electric motor, a blower for moving air through said tube and operated by said motor, a motor starting solenoid, a vacuum chamber, a diaphragm therein, a venting valve for said vacuum chamber, an electrically operated device for opening said venting valve and closing the circuit through the solenoid coil, means for closing the circuit through said electrical device, a motor circuit arranged to be closed by the movement of the solenoid core into the solenoid coil, an air pipe connecting the vacuum chamber with the suction side of the blower, and means operated by the diaphragm to open the motor circuit.

8. A pneumatic despatch tube apparatus comprising a transmission tube, a blower for moving air therethrough, a motor for operating said blower and a timing means for said motor consisting of a solenoid, means for completing the solenoid circuit, means connected to the solenoid core arranged to complete the motor circuit when the solenoid is operated, an automatically operating latch to lock the core in the solenoid coil, a lever carrying said latch, and means adapted to be moved by the motor for releasing said latch.

9. A pneumatic despatch tube system comprising a transmission tube, a motor, a blower operated by the motor to move air through said tube, a diaphragm chamber, a pipe connecting said chamber to the tube whereby air will be moved through said tube by the blower, a solenoid, means operated by the solenoid to close the motor circuit, a venting valve for the diaphragm chamber, means for operating said valve and closing the solenoid circuit, a latch device for locking the solenoid core in its coil, and means operated by the diaphragm to release said latch to open the motor circuit.

10. A pneumatic despatch tube apparatus comprising a single transmission tube, a plurality of receiving terminals in said tube, an electric motor, a blower operated there-

by and arranged to draw air through the single transmission tube, a plurality of return tubes, a pressure pipe leading from the blower, movable means for connecting the said pressure pipe to any one of the return tubes, a vacuum chamber, a diaphragm therein, a venting valve for said chamber, a pipe connecting said chamber to the suction side of the blower, a motor starting solenoid, electrical means adapted to be operated from any one of the receiving terminals to open the venting valve and close the solenoid circuit, an automatically operating latch to lock the solenoid core in its coil, means carried by the said core to close the motor circuit, and means operated by the diaphragm to release the core locking latch.

11. A timing device for pneumatic despatch tube apparatus comprising a vacuum chamber, means for drawing air from said chamber, a diaphragm in said chamber, a venting valve for said chamber, a motor starting solenoid, means for opening said venting valve and closing the solenoid circuit, an automatically operating latch to lock the solenoid core in its coil, and means operated by the diaphragm when the proper degree of vacuum is produced in the vacuum chamber for releasing the latch and thereby opening the motor circuit.

12. A timing device for a pneumatic despatch tube apparatus comprising a vacuum chamber, a diaphragm therein, a venting valve in said chamber, a lever carrying said valve and normally biased to close said valve, a motor starting solenoid, means to open the venting valve and close the solenoid circuit, an automatically operating latch to lock the solenoid core within its coil, a releasing lever, and means carried by the diaphragm for moving said releasing lever when the proper degree of vacuum is produced in the vacuum chamber to free the solenoid core and thereby open the motor circuit.

13. A timing device for a pneumatic despatch tube apparatus comprising a diaphragm chamber, a diaphragm therein, a venting valve for said chamber, a lever carrying said valve, and normally biased to hold said valve closed, a motor starting solenoid, means for opening the venting valve and closing the solenoid circuit, an automatically operating locking latch to lock the core within the coil, a releasing lever carrying said latch, and means operated by the diaphragm to swing said lever and thereby release the solenoid core to open the motor circuit.

14. A timing device for pneumatic despatch tube apparatus comprising a vacuum chamber, a diaphragm therein, a weight connected to said diaphragm, a venting valve, a solenoid, an electrically operated means for opening the venting valve and closing the solenoid circuit, a motor circuit controlled by the solenoid, a locking device to lock the solenoid core within its coil, a lever carrying said locking device, and means whereby when the diaphragm is raised said lever will be swung upon its pivot and the solenoid locking device released to open the motor circuit.

15. A transfer tube apparatus comprising a transmission tube, a discharge or delivery terminal therein, said terminal consisting of a pair of doors, one hinged at each side of the terminal opening, said doors inclining on their outer faces inwardly and downwardly, and in transverse section inclining outwardly and rearwardly with respect to the direction of movement of the carrier, the two doors meeting on a plane running longitudinally through the tube, whereby the carriers will strike said doors near the center or meeting line thereof and the carriers will be quickly released by said doors.

16. A pneumatic despatch tube apparatus comprising a single transmission tube, a plurality of receiving terminals in said tube, an electric motor, means operated by said motor to draw air through said single tube, a pipe connected to the pressure side of said blower, a plurality of return tubes, means to direct the air from the pressure pipe into any one of the return tubes, an electro-magnetic motor starting device, means arranged to be operated from any one of the receiving terminals to energize said starting device, means for automatically locking said electro-magnetic device to hold the motor circuit closed, and means for automatically releasing said electro-magnetic device after a predetermined time to open the motor circuit.

17. A pneumatic despatch tube apparatus comprising a single transmission tube, a plurality of receiving terminals in said tube, an electric motor, means operated by said motor to draw air through said single tube, a pipe connected to the pressure side of said blower, a plurality of return tubes, means to direct the air from the pressure pipe into any one of said return tubes, an electro-magnetic motor starting device carrying a pair of contacts and adapted to complete the motor circuit through said contacts, means for automatically locking said device to hold the contacts in engagement and the motor circuit complete, and means for releasing said locking device after a predetermined time to open the motor circuit.

18. A pneumatic despatch tube apparatus comprising a transmission tube, an electric motor, means operated by said motor to move air through said tube, an electro-magnetic motor starting device carrying a pair of contacts and adapted to complete the motor circuit through said contacts, means for automatically locking said device to hold

the contacts in engagement and the motor circuit complete, and means for releasing said locking device after a predetermined time to open the motor circuit.

19. A pneumatic despatch tube apparatus comprising a single transmission tube, a receiving terminal therefor, an electric motor, a blower operated by said motor for moving air through said tube, an electro-magnetic motor starting device carrying a pair of contacts arranged to complete a motor circuit, a vacuum chamber, a diaphragm therein, a weight connected to said diaphragm, a venting valve for said vacuum chamber, an electrically operated device for opening said venting valve, means at the receiving terminal for closing the circuit through the valve opening device, means operated by the valve opening device to close the circuit of the motor starting device, an automatically operating device for locking the electro-magnetic device to hold the motor circuit closed, a pipe connecting the diaphragm chamber to the blower, and means operated by said diaphragm to release the said locking means and thereby open the motor circuit.

20. A pneumatic despatch tube system comprising a transmission tube, a motor, a blower operated by the motor to move air through said tube, a diaphragm chamber, a pipe connecting said chamber to the blower whereby air will be moved through said pipe by the blower, an electro-magnetic device, means operated by said device to close the motor circuit, a venting valve for the diaphragm chamber, means for operating said valve and closing the circuit of the said electro-magnetic device, a latch adapted to lock the said device to hold the motor circuit closed, and means operated by the diaphragm to release said latch to open the motor circuit.

21. A pneumatic despatch tube apparatus comprising a transmission tube, a blower connected thereto, a motor for operating said blower, a motor starting solenoid, means to complete said solenoid circuit, means whereby the solenoid core will complete the motor circuit, an automatically operating latch to lock the core within its coil, and pneumatically operated means for releasing said latch and opening the motor circuit.

22. A pneumatic despatch tube apparatus comprising a transmission tube, a blower connected thereto, a motor for operating said blower, an electro-magnetic motor starting device, means to complete the circuit for said electro-magnetic device, means whereby the said device will complete the motor circuit, an automatically operating latch to lock said device to hold the motor circuit closed, and pneumatically operating means connected to the suction side of the blower for releasing said latch for a predetermined time.

23. A pneumatic despatch tube apparatus comprising a transmission tube, a blower connected thereto, a motor for operating said blower, a motor starting device arranged to complete the motor circuit, mechanical means for holding said circuit closed and means for releasing said holding means after a predetermined time.

24. A pneumatic despatch tube apparatus comprising a transmission tube, a motor, a blower operated by the motor to move air through said tube, a diaphragm chamber, a pipe connecting said chamber to the blower whereby air will be moved through said pipe by the blower, an electro-magnetic device, means operated by said device to close the motor circuit, a venting valve for the diaphragm chamber, an electric device for operating said valve and closing the circuit of the electro-magnetic device, a terminal door in the transmission tube, and means whereby the circuit of the electric device for operating the venting valve will be closed when the terminal door is opened.

25. A pneumatic despatch tube apparatus comprising a transmission tube, means for moving air through said tube, a solenoid for controlling said air moving means, means for completing the solenoid circuit, means for locking the solenoid core to hold the air moving means in operation, and means to release said solenoid core locking means after a predetermined time to stop the air moving means.

26. A pneumatic despatch tube apparatus comprising a transmission tube, a solenoid, means for completing the solenoid circuit, means whereby the solenoid core will control the movement of air through said tube, means for automatically locking the solenoid core after the solenoid circuit is completed, and means for releasing the solenoid core locking means after a predetermined time.

27. A transfer tube system comprising a transmission tube, a receiving terminal and a discharge terminal, an air pump connected to said transmission tube, an electric motor for operating said pump, electrical means controlled from the receiving terminal for operating said motor, means for directly locking the motor circuit closed and means for releasing said locking means and thereby stopping the motor after a predetermined time.

28. In a pneumatic despatch tube system the combination with a transit tubing of an air moving device, a motor for driving it, motor controlling means responsive to the carrier insertions in said transit tubing for insuring the operation of the motor, means for locking the motor controlling means in its operative position independent of the

solenoid circuit and means for releasing said locking means a predetermined minimum time interval following each carrier insertion and independent of the actual travel of the inserted carrier.

29. In a pneumatic despatch tube system the combination with a transit tubing, of an air moving device, an electric motor for driving said device, means at each carrier receiving station in the transit tubing for insuring the operation of the motor, means for directly locking the motor circuit closed and means for releasing said locking means after a predetermined time interval, said means being independent of the actual travel of the carrier.

30. A pneumatic despatch tube apparatus comprising a single transmission tube, a plurality of receiving terminals in said tube between its inlet and its discharge ends, an electric motor, means operated by said motor to draw air through said single tube, a pipe connected to the pressure side of said blower, a plurality of return tubes, means to direct the air from the pressure pipe into any one of said return tubes, a motor starting solenoid, means adapted to be operated from any one of the receiving terminals to energize said solenoid.

31. A pneumatic despatch tube apparatus comprising a single transmission tube, a plurality of receiving terminals in said tube, an electric motor, a blower operated by said motor to draw air through said single tube, a pipe connected to the pressure side of said blower, a plurality of return tubes, means to direct the air from the pressure pipe into any one of said return tubes, a motor starting solenoid, means adapted to be operated from any one of the receiving terminals to energize said solenoid, and means for completing the motor circuit through said solenoid.

32. A transfer tube apparatus comprising a transmission tube, a discharge or delivery terminal therein, said terminal consisting of a pair of doors, one hinged at each side of the terminal opening, said doors inclining on their outer faces inwardly and downwardly and in transverse section inclining outwardly and rearwardly with respect to the direction of movement of the carrier, an air inlet into the transmission tube adjacent the carrier discharge opening, said inlet being normally closed by said doors, the two doors meeting in a plane running longitudinally through the tube, whereby the carriers will strike said doors near the center or meeting line thereof, and said carriers will be quickly released by said doors.

In testimony whereof I hereunto affix my signature in the presence of two witnesses this 5th day of April, 1910.

JOHN T. NEEDHAM.

Witnesses:
WM. R. DAVIS,
F. R. MILLER.