

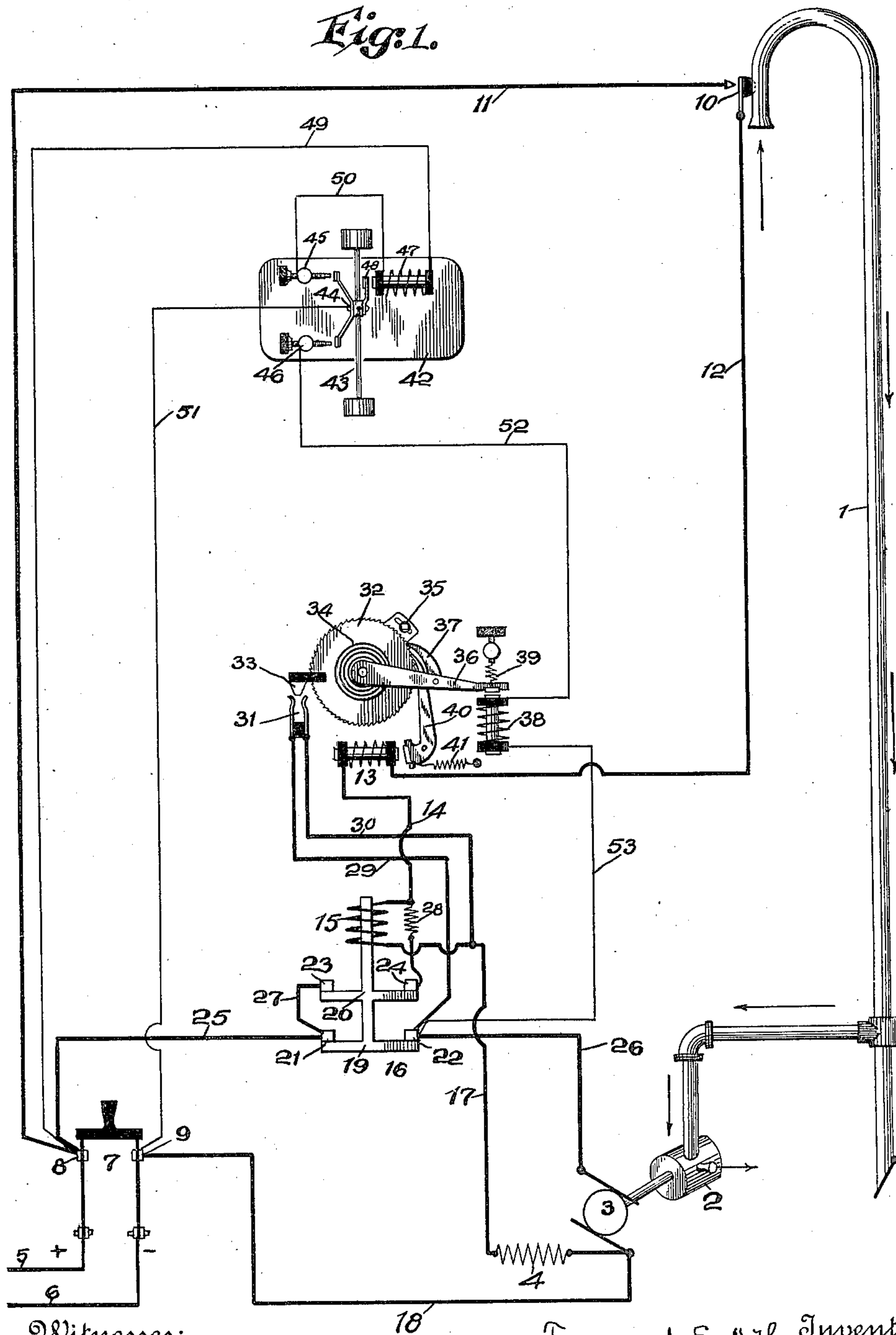
F. E. D'HUMY.
PNEUMATIC DESPATCH TUBE SYSTEM.
APPLICATION FILED JUNE 6, 1912.

1,090,907.

Patented Mar. 24, 1914.

2 SHEETS—SHEET 1.

Fig. 1.



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Fernand E. d'Humy Inventor
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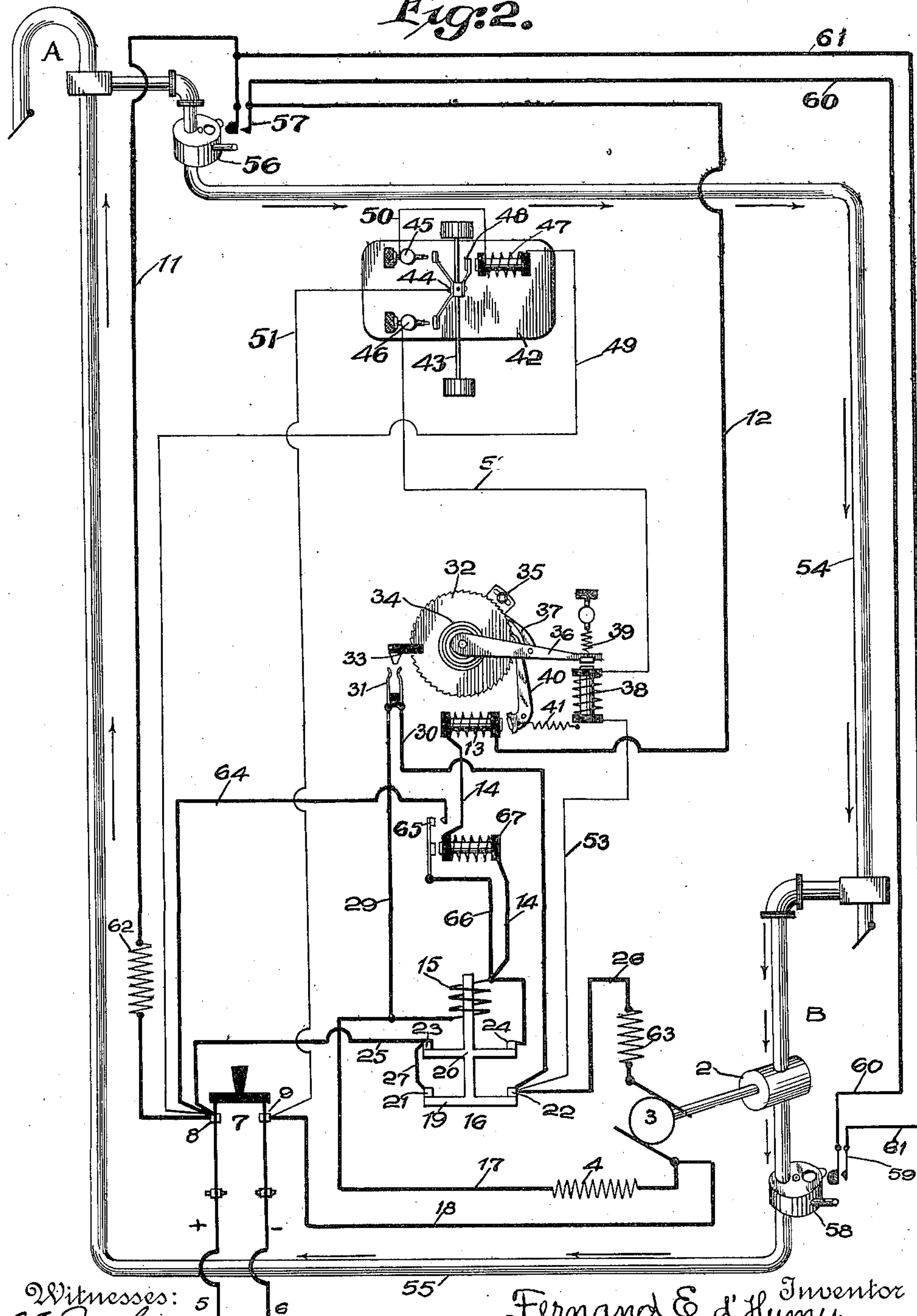
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

FERNAND E. D'HUMY, OF ENGLEWOOD, NEW JERSEY, ASSIGNOR TO THE WESTERN UNION TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

PNEUMATIC-DESPATCH-TUBE SYSTEM.

1,090,907.

Specification of Letters Patent.

Patented Mar. 24, 1914.

Application filed June 6, 1912. Serial No. 701,955.

To all whom it may concern:

Be it known that I, FERNAND E. D'HUMY, a citizen of the United States, and a resident of Englewood, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Pneumatic-Despatch-Tube Systems, of which the following is a specification.

This invention relates to pneumatic despatch tube systems in which an electric motor is employed to supply pressure to the despatch tube during the period when pressure is required for the despatch of a carrier from one station to another.

The invention has special reference to the system for starting and stopping the motor.

It seeks to provide an efficient and economical system especially designed for the quick starting of the motor from the sending station and for stopping it after the carrier has arrived at the receiving station.

One feature of the invention consists in providing a field winding of the motor in parallel with the armature and extending the circuit of said field winding to the starting switch at the sending station, whereby the operation of the starting switch serves to charge the motor field.

Another feature of the invention consists in employing a motor switch which serves to close the motor armature circuit and a short-path field connection after the field circuit has been closed at the starting switch.

Other features of the invention will be hereinafter pointed out.

In the accompanying drawings forming part of this specification, and in which like reference numerals designate corresponding parts, Figure 1 is a diagrammatic representation of the invention as applied to a single despatch tube of the vacuum type extending between two stations. Fig. 2 is a diagrammatic representation of the invention as applied to a despatch tube of the return loop pressure-vacuum type extending between two stations, and showing certain additional features to those shown in Fig. 1.

The circuits are shown in the drawings in the condition they are in at the time the motor is operating.

Referring now to the invention as shown in Fig. 1 of the drawings, 1 is a despatch tube extending between stations and communicating at the receiving station with a

pump or blower 2 operated by a motor having an armature 3 and field coil 4 in parallel with the armature. 5 and 6 are, respectively, the positive and negative main wires for supplying the operating current. 7 is a knife switch connected with the main wires and designed to make connection with the contacts 8 and 9. Located at or near the sending station of the tube is a starting switch 10, one contact of which is connected by wire 11 to contact 8. The other contact of the starting switch is connected by wire 12 through magnet 13, wire 14, coil 15 of motor switch 16, wire 17, field coil 4 and wire 18 to contact 9. When starting switch 10 is closed, field coil 4 is energized through the circuit just described. Magnet 13 and coil 15 are simultaneously energized through this same circuit. The switch 10 is normally open and may be of any suitable type. As shown in the drawings, it is arranged to be closed automatically by a carrier when inserted in the tube at the sending station. The circuit in which this starting switch is included may be called the field circuit because it includes the field coil 4 and serves to establish the magnetic flux of the motor field as the first step in starting the motor. The switch 16, as shown in the drawings, is of the solenoid type and is operated by the coil 15. It includes bridge pieces 19 and 20, the former of which operates to connect the contacts 21 and 22 and the latter of which operates to connect contacts 23 and 24 when coil 15 is energized. Contacts 21 and 22 and bridge piece 19 control the motor armature circuit which extends from contact 8, through wire 25, contacts 21, 19 and 22, wire 26, armature 3 and wire 18 to contact 9. Extending from wire 25 to wire 14 is a short-path field connection through switch 16 which may be traced from contact 21, through wire 27, contact 23, bridge piece 20, contact 24, resistance 28 to wire 14. When switch 16 is closed under the influence of coil 15, the motor armature circuit is closed and the short-path field connection is also closed. Thus, after the field circuit has been broken by the opening of starting switch 10, the field is kept energized by current passing through the short-path field connection and thence through coil 15, wire 17, field coil 4 and wire 18 to contact 9. This circuit also keeps coil 15

energized and switch 16 closed notwithstanding the opening of starting switch 10 after the carrier has departed.

Extending across from wire 26 to wire 17 are wires 29 and 30 having contacts 31 and providing a shunt around coil 15. When this shunt is closed at contacts 31, coil 15 is deenergized and switch 16 opens to stop the motor. The motor is designed to supply pressure to the despatch tube through a predetermined interval which allows time for the carrier to arrive at the receiving station.

In the preferred arrangement and as herein shown, a time regulated step-by-step controller is employed to close the shunt around coil 15 of the motor switch 16, thereby opening the switch and stopping the motor. This controller comprises a ratchet wheel 32 carrying contact 33 adapted to close, and normally closing, contacts 31. It is provided with a spring 34. When wheel 32 is free to respond to the action of spring 34, it rotates clockwise until arrested by the engagement of contact 33 with the adjustable stop 35. Ratchet wheel 32 is actuated counter-clockwise in a step-by-step movement, until contact 33 closes contacts 31, by means of a lever 36 pivoted on the arbor of wheel 32 and carrying the pawl 37. Lever 36 is pulled down by magnet 38 and is pulled up by a spring 39. A second pawl 40 acts to hold the wheel 32 against backward movement during the downward movement of lever 36 and pawl 37. Pawl 40 is operated in one direction by magnet 13 and in the opposite direction by a spring 41. When this pawl is actuated by the magnet 13, it is disengaged from wheel 32 and also disengages pawl 37 from said wheel thereby permitting the wheel to move clockwise in response to its spring until arrested by the stop 35. Magnet 38 is energized by current pulsations controlled by the interrupter 42. The interrupter 42 comprises a pendulum 43 carrying a contact piece 44 designed to make connection with contacts 45 and 46. The pendulum is ordinarily started by hand and its movement is continued by current pulsations through the magnet 47 of the interrupter. This magnet operates upon an armature 48 carried by the pendulum. One terminal of magnet 47 is connected by wire 49 with contact 8 and the other terminal is connected by wire 50 with contact 45. Contact 44 is connected by wire 51 with contact 9. When contact 44 makes connection with contact 45, magnet 47 is momentarily energized to act upon the pendulum by the circuit extending from contact 8, through wire 49, magnet 47, wire 50, contacts 45 and 44, and wire 51 to contact 9. Magnet 38 has one terminal connected by wire 52 to contact 46 and the other terminal by wire 53 to contact 22 of motor switch 16. Magnet 38 is therefore momentarily energized to op-

erate lever 36 by the circuit extending from contact 8, through wire 25, contacts 21, 19 and 22, of motor switch 16, wire 53, magnet 38, wire 52, contacts 46 and 44 and wire 51 to contact 9. It will be seen that this stepping circuit is controlled by the motor switch 16 so that magnet 38 cannot operate until the motor switch has been closed.

In the operation of the system, as shown in Fig. 1, when the carrier is inserted in the tube at the sending station the starting switch is closed, thereby energizing motor field coil 4 and simultaneously energizing magnet 13 and coil 15. Magnet 13 sets the step-by-step controller and coil 15 closes the motor switch 16. The motor thereupon starts and magnet 38 is energized by pulsations derived through the interrupter 42 to step the controller forward until contact 33 bridges contacts 31, whereupon the shunt around coil 15 is closed. This opens switch 16 and stops the motor. The time during which the controller is being stepped forward allows a sufficient interval for the arrival of the carrier at the receiving station. If a second carrier is inserted in the tube at the sending station before the first carrier has arrived at the receiving station, magnet 13 is again energized to reset the controller so that the motor is kept in operation until the arrival of the second carrier.

In Fig. 2 the system is applied to a tube system of the return loop type connecting stations A and B. Most of the features shown in Fig. 2 are the same as those shown in Fig. 1 and are therefore designated by similar reference letters and need not be particularly described. The motor or blower 2 exhausts air from the tube 54 to despatch a carrier from station A to station B and forces air into the tube 55 to despatch a carrier from station B to station A. Tube 54 is provided with a rotary sending head 56 at station A adapted to close the starting contacts 57 when the carrier is inserted for despatch to station B. Tube 55 is provided with a similar sending head 58 at station B adapted to close the starting switch 59, the contacts of which are connected by wires 60 and 61 with wires 12 and 11. Wire 11 includes a resistance 62 whose function is to prevent an excessive flow of current through conductors between terminal stations in case of grounds or short-circuits, and also to make it feasible to use a smaller gage of wire for wires 11, 12, 60 and 61. The motor is provided with a series field coil 63 in addition to the shunt coil 4. In Fig. 2 there is also provided a second short-path field connection extending from contact 8, through wire 64, contacts 65, wire 66 to wire 14. Contacts 65 are operated by magnet 67 connected to wire 14 and are therefore controlled by the starting switches at stations A and B. When this

short-path field connection is closed by the operation of the starting switch, it shunts resistance 62 and supplies increased current to motor switch magnet 15 and to field coil 4.

5 While the invention is shown in the drawings in its preferred embodiment, it will be understood that various changes may be made without departing from the scope of the invention.

10 What is claimed and desired to be secured by Letters Patent is:—

1. The combination with a despatch tube system and an electric motor for operating the same, of an energizing circuit for the 15 motor, an electromagnetic switch for governing the motor circuit, a circuit including the winding of the switch, means for closing this switch circuit, another circuit completed upon the energization of the switch through 20 contacts and winding, a shunt for the switch winding, and means for closing the shunt.

2. The combination with a despatch tube system and an electric motor for operating the same, of an energizing circuit for the 25 motor, an electromagnetic switch for governing the motor circuit, a circuit including the winding of the switch, means for closing this switch circuit, another circuit completed upon the energization of the switch through 30 its contacts and winding, a shunt for the switch winding, and a timing device for closing the shunt.

3. The combination with a despatch tube system and an electric motor for operating the same, of an energizing circuit for the 35 motor, a switch governing the motor circuit, a step-by-step electromagnetic timing device for the switch, means for setting the timing device, and a source of current impulses for actuating the timing device. 40

4. The combination with a despatch tube system and an electric motor for operating the same, of an energizing circuit for the 45 motor, a switch governing the motor circuit, a step-by-step electromagnetic timing device for the switch, a source of current impulses for the timing device, and a circuit for said timing device and source of current impulses extending through contacts of the switch.

50 5. The combination with a despatch tube system and an electric motor for operating the same, of an energizing circuit for the motor, a switch governing the motor circuit, an electro-magnetic timing device for the 55 switch, an energizing circuit for setting the timing device, a contact device associated with the tube and included in the setting circuit, and a source of current impulses for returning the timing device from its set position to normal. 60

6. In a pneumatic despatch tube system, the combination of a despatch tube; a sending station therefor; an electric motor for supplying pressure to said tube; a field circuit for the motor extending to the sending 65 station of said tube; a starting switch in said circuit at the sending station; a motor switch having an operating magnet and controlling the motor armature circuit; a short-path field connection through said operating magnet controlled by the motor switch, said 70 motor switch being operated from the starting switch; a resistance in the field circuit; a second short-path field connection in a shunt around said resistance and including 75 the motor switch magnet and controlled by the starting switch: and a time regulated controller device operating to open said motor switch and thereby cut out the motor and arranged to be set upon the operation of 80 the starting switch.

7. In a pneumatic despatch tube system, the combination of a despatch tube; a sending station therefor; an electric motor for supplying pressure to said tube; a controller 85 device arranged to cut out the motor after a predetermined operation; a setting magnet for said controller; a circuit for the setting magnet including a starting switch at the sending station; a magnet and circuit for 90 actuating said controller; and an interrupter for delivering current pulsations to said actuating magnet.

8. The combination with a despatch tube system and means for operating the same, 95 of governing means for the operating means, a step-by-step electromagnetic timing device for the governing means, an electric circuit for setting the timing device to its starting position, and a source of current impulses 100 for the timing device.

9. The combination with a despatch tube system and means for operating the same, of governing means for the operating means, 105 a step-by-step electromagnetic timing device for the governing means, an electric circuit for setting the timing device to its starting position, a stepping circuit for said timing device, and a source of current impulses for the timing device comprising an electro- 110 magnetically operated pendulum controlling the stepping circuit.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

FERNAND E. D'HUMY.

Witnesses:

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E. B. LESTER.