March 8, 1927 1,620,359

E. E. KLEINSCHMIDT

MOTOR CONTROL SYSTEM

Filed May 21, 1923

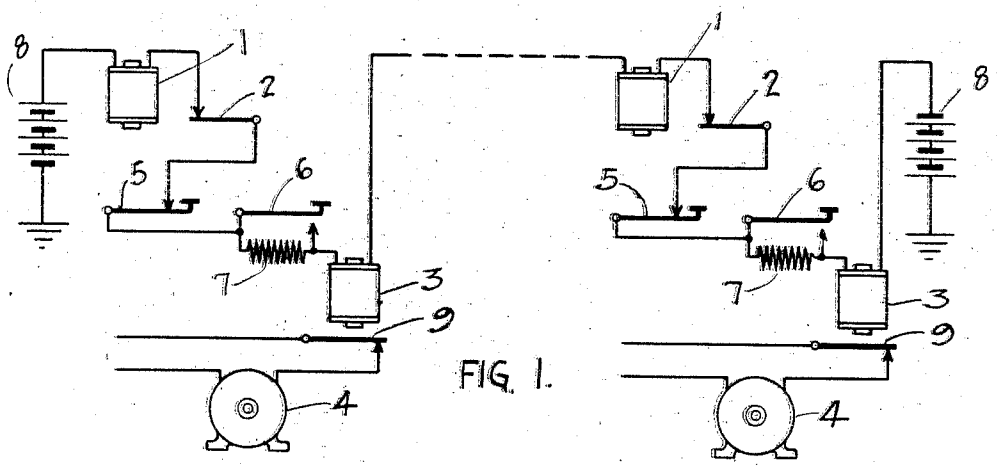


FIG. 1.

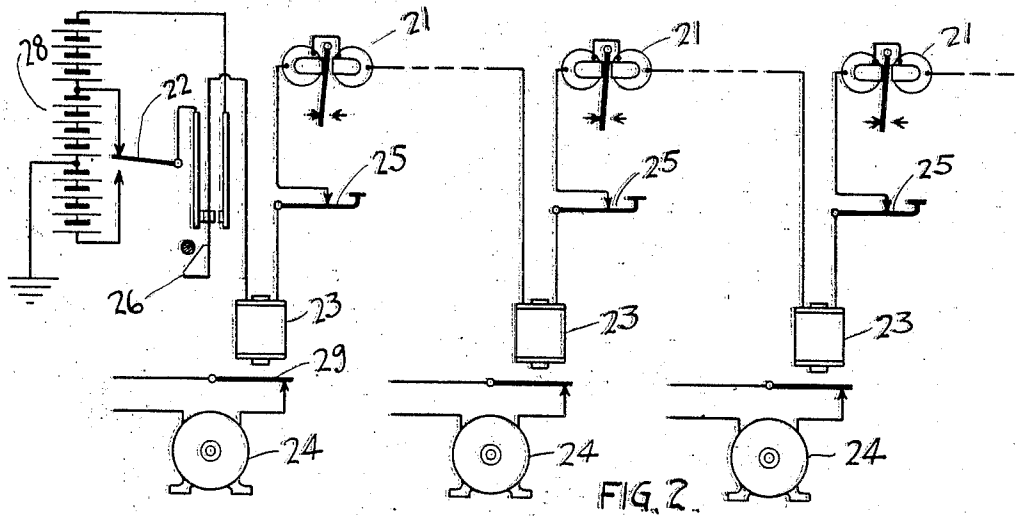


FIG. 2.

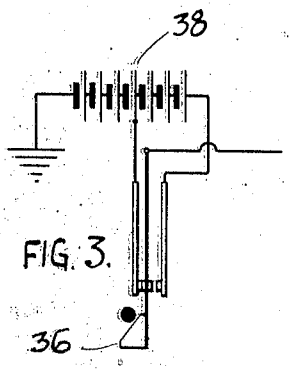


FIG. 3.

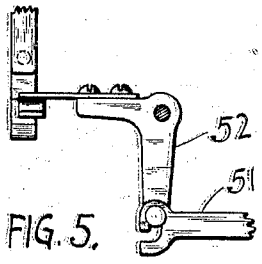


FIG. 5.

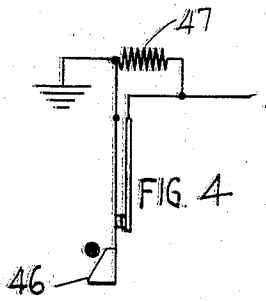


FIG. 4.

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UNITED STATES PATENT OFFICE.

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MOTOR-CONTROL SYSTEM.

Application filed May 21, 1923. Serial No. 640,630.

This invention relates to a system and apparatus for controlling motors at remote points.

More particularly, it relates to a system of starting and stopping motors at distant points, in a manner especially useful in printing telegraph systems of the light traffic type, although it will be understood that the invention is not limited to printing telegraph systems.

In systems where the demands on distant motors are not continuous, it is desirable to operate the motors only when the working of the system requires such operation. This is especially desirable in light traffic printing telegraph systems and the preferred embodiment of the present invention will herein be disclosed in connection with such a system.

The objects of the invention are to provide a simple and reliable control system for distant motors; to provide a control system in which commencement of operation of the system at any point will start the motors into operation; to provide an arrangement in which the control apparatus may be more or less centralized at a convenient point but operable from any point, and such other objects as may be attained in the preferred embodiments herein disclosed and shown in the drawings of which,

Figure 1 is a diagrammatic representation of the invention as applied to a printing telegraph system, using current and no-current signals.

Figure 2 is a diagrammatic representation of the invention as applied to a telegraph system in which signalling currents of reversed polarities are used.

Figures 3 and 4 show modified forms of control arrangements.

Figure 5 is a fragmental view of a selectively controlled contact arrangement.

Referring to Figure 1, 1 represents the printer receiving magnets, 2 are the transmitter contacts, 3 are the motor control magnets, 4 are printer operating motors and may also operate the transmitters, 5 are motor stop keys, 6 are motor start keys which are arranged to short circuit high resistances 7, and 8 are the usual line batteries. It will of course be understood that any well known type of telegraph apparatus may be used. Magnets 1 for example, may control mechanical single magnet printers of well known construction, or they may control rotary distributors and multiple magnet printers. It will also be understood that transmitting contacts 2 may be tape or key controlled as is well known in the art. Only so much of the well known apparatus has been indicated as is necessary to illustrate the manner of applying the present invention thereto.

It will be noted that when the apparatus is at rest as shown, the line is closed through magnets 3, resistances 7, keys 5, batteries 8 and to ground, permitting a relatively weak current to flow over the line. This current is sufficiently strong to hold armatures 9 of magnets 3 in attracted position, thus opening the energizing circuits of motors 4, and preventing their operation. With keys 6 open and resistances 7 in the circuit the line current is insufficient in strength to cause magnets 3 to pick up their armatures 9 and open the motor circuits after the armatures have been released.

With the system at rest as shown, commencement of transmission to any station on the line by operation of any transmitting contact 2, or operation of any start contact 5 will cause all the magnets 3 to de-energize, permitting armatures 9 to drop back and close all the local circuits through motors 4, all receiver motors will then be started into operation simultaneously with the commencement of transmission or opening of the line circuit. As above pointed out, the ordinary signalling currents are insufficient in strength to cause pulling up of armatures 9. With the motors in operation, in case it is desired by any station to stop operation of the motors, any stop key 6 is depressed to shunt a resistance 7 out of the line circuit. This causes a sufficient increase in line current to energize magnets 3 sufficiently so that armatures 9 are picked up and the circuits of motors 4 are opened.

In the modification shown in Figure 2, the invention is applied to a system using reversed polarity current signals. In this form 21 represents the receiving magnets or line relays, 22 represents the transmitting contact, 23 are the motor control magnets, 24 are the motors, 25 are the start keys, 26 is a selectively controlled stop switch, 28 is the line battery, and 29 are the motor con-

trol armatures of magnets 23. Battery 28 is arranged to apply to the line relatively weak potentials of opposite polarities for marking and spacing signals, and a relatively strong potential of the same polarity as the spacing impulses of the signals, for control purposes. Transmitter contact 22 normally rests on the weak spacing potential battery contact, and is moved to the marking contact to cause signaling. The spacing current normally on the line is sufficient to cause armatures 29 to be held up but is insufficient to pick up armatures 29 after they have been released. As in the first form, opening of the line by commencement of transmission or by the opening of any start key 25 will cause armatures 29 to fall back and close the motor start circuits. To stop the motors, a special signal is sent from any transmitter on the line. This special signal causes operation of special actuating bar 51 (Figure 5) which operates a bell crank 52 to close contacts controlled by 26 (Figure 2), and causes the application of the increased battery potential to the line. This increased potential will cause sufficient current to the line so that magnets 23 will pick up armatures 29 and open the circuits of motors 24. The details of the receiver or selector mechanism for operating pull bar 52 are well known in the art and is no part of the present invention. For a full disclosure thereof reference may be had to the signal bell operating actuating bar mechanism disclosed in copending application Serial Number 390,598, filed June 21, 1920. It will, however, be clear that any code signal, or printer actuating bar in upper or lower may be used to operate member 26. Pull bar 51 returns to the position shown in Figure 2, placing the relatively weak spacing potential on the line, until it is desired to again start operation of the apparatus.

Figure 3 shows a modification in which control on a system using line currents of one polarity only is effected by operation of a special actuating bar as in Figure 2. When it is desired to stop the motors, a special signal is sent to the line to operate an actuating bar 51 (Figure 5) which as above described, operates contact 36 to send a current of increased strength to the line from line battery 38, causing the motor control magnets to pick up as described in Figure 1. To apply this form in the system of Figure 1 batteries 8, resistances 7, and keys 6 are discarded, and 38 with its control contacts are placed in the line in obvious manner.

Figure 4 shows a modified form of stop control for Figure 1 in which resistances 7 and keys 6 are discarded, and a single resistance 47 are adapted to be short circuited by an actuating bar controlled set of contacts 46 is substituted in series with the line in place thereof. To stop operation of the motors, a special signal operates a special actuating bar 51 (Figure 5), as above described, to short circuit 47 and permit an increased line current to flow, thereby causing magnets 3 to pick up armatures 9 and stop the motors. The remainder of the operation is the same as for the system of Figure 1.

It will be obvious to those skilled in the art that the invention is not limited to the embodiments herein described, and that many changes may be made without departing from the spirit of the present description thereof.

Having described preferred embodiments of the invention, what is desired to be secured by Letters Patent and is claimed as new is:

1. A printing telegraph system comprising transmitting apparatus, receiving apparatus controlled by said transmitting apparatus, a motor for said receiving apparatus, a marginal relay controlling said motor and controlled by said transmitter, and control means for said relay.

2. The combination as set forth in claim 1 in which the control means for said relay embodies a contact controlling member adapted to vary the amount of current flowing through said marginal relay.

3. In a system comprising a remote control circuit, a motor and control means for said motor controlled over said circuit, the method of operation which consists in starting said motor into operation in response to a single circuit condition, and stopping said motor in response to a fixed combination of differing circuit conditions.

4. The method as set forth in claim 3 in which the starting condition is an open circuit condition.

5. The method as set forth in claim 3 in which the stop combination comprises a code combination of closed and open circuit conditions.

6. A telegraph system comprising a plurality of transmitters; a plurality of receivers; a plurality of operating motors for said receivers; supply circuits for said motors; and starting means embodying marginal relays individual to said motors controlling said supply circuits.

7. A telegraph system comprising a plurality of transmitters; a plurality of receivers; a plurality of operating motors for said receivers; supply circuits for said motors; starting means embodying marginal relays individual to said motors operating said supply circuits; and control contacts independent of said transmitters for controlling said marginal relays.

8. A printing telegraph system comprising means for transmitting code combinations of electrical conditions; a receiver se-

lectively responsive to said code combinations of impulses; a motor for said receiver; means to start said motor in operation in response to the initial operation of said transmitting means and to stop the operation of said motor in response to a special code combination of electrical conditions.

9. The combination as set forth in claim 8 in which said last mentioned means comprises a motor circuit control contact and operating means therefor.

Signed at Long Island City, N. Y., this 14th day of May, 1923.

EDWARD E. KLEINSCHMIDT.