

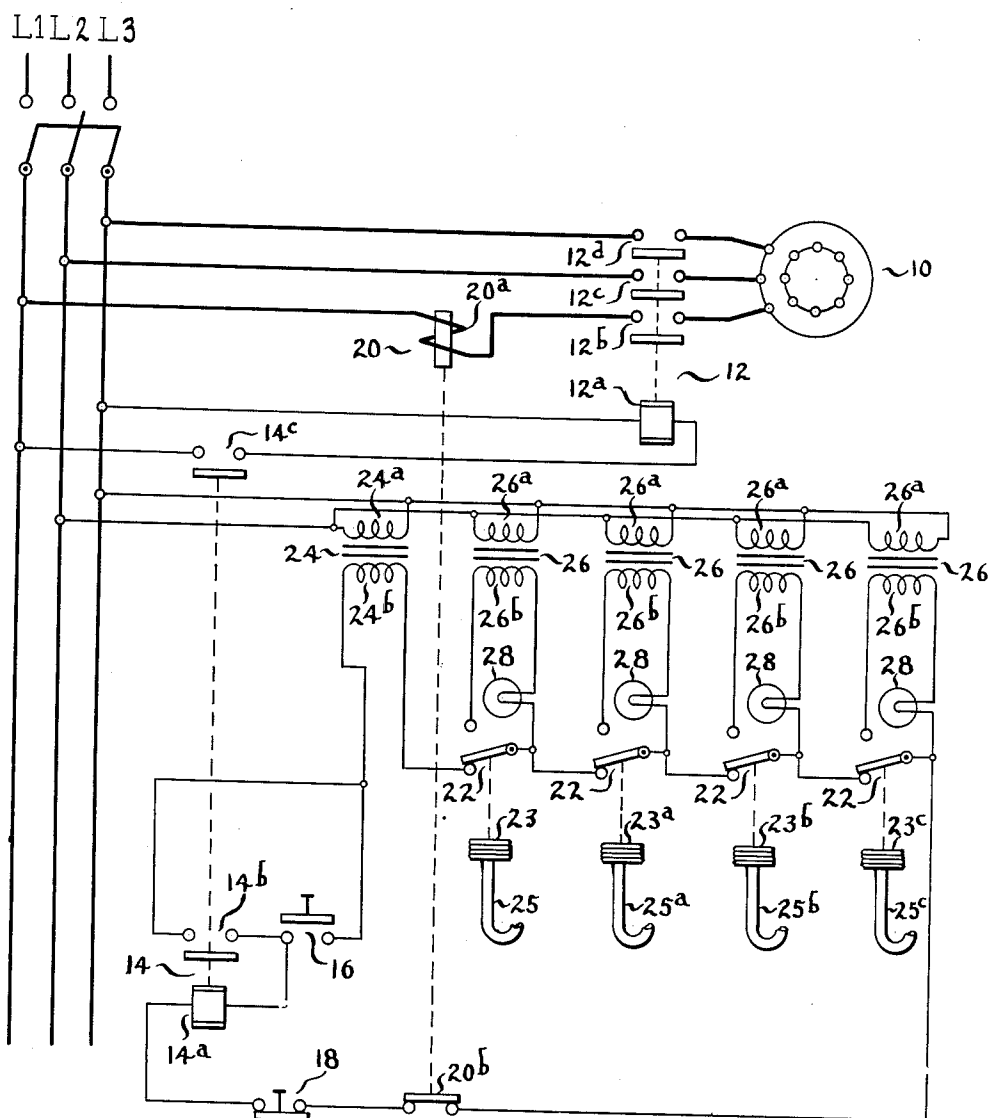
Feb. 21, 1956

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2,736,009

SUPERVISORY CONTROL AND FAULT INDICATING SYSTEM

Filed Sept. 13, 1953



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SUPERVISORY CONTROL AND FAULT INDICATING SYSTEM

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Application September 18, 1953, Serial No. 381,016

2 Claims. (Cl. 340-213)

This invention relates to improvements in indicating systems, and more particularly to systems for indicating the occurrence of a predetermined condition and for stopping an electric motor upon occurrence of said condition.

The primary object of this invention is to provide an indicating system comprising single pole, double throw condition responsive switches which perform the dual function of stopping an electric motor upon the occurrence of any one of a plurality of predetermined conditions and indicating which of the several predetermined conditions has occurred.

The novel features which I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and mode of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawing in which the single figure is a diagrammatic view of an indicating system embodying the principal features of my invention.

Referring to the drawing, it illustrates an electric motor 10 which is connectable to electric power lines L1, L2 and L3 by means of contacts 12^b, 12^c and 12^d of an electromagnetic switch 12. Electromagnetic switch 12 has an energizing winding 12^a connected across lines L1 and L3 in series circuit relation with normally open contacts 14^c of an electromagnetic switch 14. Electromagnetic switch 14 has an energizing winding 14^a connected in series circuit relation with a normally open start switch 16, a normally closed stop switch 18, contacts 20^b of an overload switch 20, a plurality of single pole, double throw condition responsive switches 22 and a secondary winding 24^b of a transformer 24.

Transformer 24 has a primary winding 24^a connected across lines L2 and L3 in parallel circuit relation with each primary winding 26^a of a plurality of transformers 26. Each of said transformers 26 has a secondary winding 26^b in series circuit relation with an indicating light 28 and one of the aforementioned condition responsive switches 22.

The actuating means for switches 22 can be of the type which employ bellows for independent actuation of said switches 22 in response to variations in temperature or pressure of different fluids. As indicated in the drawings, each bellows 23, 23^a, 23^b and 23^c is connectable to a fluid reservoir by means of conduits 25, 25^a, 25^b and 25^c so that the bellows can be remotely located from the conditions to be indicated. It is believed apparent to one skilled in the art that the present invention need not be limited to fluid condition variations directly created by operation of motor 10, but rather is intended to include any conditions regardless of where or how they are created.

Running operation of motor 10 is initiated by momentary closure of start switch 16 thereby completing the energizing circuit for winding 14^a of electromagnetic switch 14. Such energizing circuit as shown includes

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secondary winding 24^b of transformer 24, switches 22, overload contacts 20^b, stop switch 18, energizing winding 14^a and start switch 16. Energization of electromagnetic switch 14 closes contacts 14^c thus effecting energization of electromagnetic switch 12. Energization of electromagnetic switch 12 closes contacts 12^b, 12^c and 12^d thus connecting motor 10 to the electric power lines L1, L2 and L3.

Energization of electromagnetic switch 14 also closes contacts 14^b, thus providing a maintaining circuit for continued energization of winding 14^a following release of start switch 16.

In this condition, motor 10 operates until a predetermined fluid condition is reached or until stop switch 18 is momentarily depressed. Upon the occurrence of such fluid condition, the respective condition responsive switch 22 interrupts the energizing circuit for winding 14^a of electromagnetic switch 14. Deenergization of electromagnetic switch 14 effects interruption of power connections to motor 10 through deenergization of winding 12^a of electromagnetic switch 12.

Actuation of any one of the condition responsive switches 22 also effects completion of the energizing circuit for the respective one of the indicating lights 28. The respective indicating light 28 is energized by means of a series circuit consisting of the secondary winding 26^b of the associated transformer 26, switch 22 and indicating light 28.

It is thus seen that I have provided means for interrupting the motor energizing circuit upon the occurrence of a predetermined condition, and for indicating which of the several conditions has occurred to cause such interruption. Moreover, it will be noted that such dual function is obtained in a simple and inexpensive manner through the use of single pole, double throw switches.

Although I have shown and described a specific embodiment of my invention, I am fully aware that many modifications thereof are possible. My invention, therefore, is not to be restricted except in so far as is necessitated by the prior art and by the spirit of the appended claims.

I claim:

1. For use with an electric motor and a source of power therefore, in combination, means comprising a first electroresponsive switch energizable to connect the motor to the source of power, a second electroresponsive switch having an energizing circuit and a first normally open contact in the energizing circuit of said first electroresponsive switch and having a second normally open contact, a plurality of indicating devices having individual energizing circuits, and individual single pole, double throw condition responsive switches for said indicating device energizing circuits, a start switch, said second normally open contact of said second electroresponsive switch being connected in parallel with said start switch, said condition responsive switches having series connections when each is in normal position and being included in series circuit with said start switch in said energizing circuit of said second electroresponsive switch, each of said single pole, double throw switches being individually responsive to any desired preselected condition to interrupt said energizing circuit of said second electroresponsive switch and to complete its respective indicating device circuit.

2. For use with an electric motor and a source of power therefore, in combination, means comprising an electroresponsive switch for connecting and disconnecting said motor and said source in response to energization and deenergization of said electroresponsive switch, a plurality of double throw switches each comprising a common contact for connection to one or the other of a second and third contact, a like plurality of electrical indicating devices, individual energizing circuits for said indicating devices

each comprising in series with one of said indicating devices the common contact and second contact of an associated one of said double throw switches, an energizing circuit for said electroresponsive switch comprising in series with said electroresponsive switch the common contact and third contact of each of said double throw switches and a start switch and a maintaining circuit around the start switch, means responsive to energization of said electroresponsive switch to close said maintaining circuit, and means to operate said double throw switches individually in accordance with preselected conditions.

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