

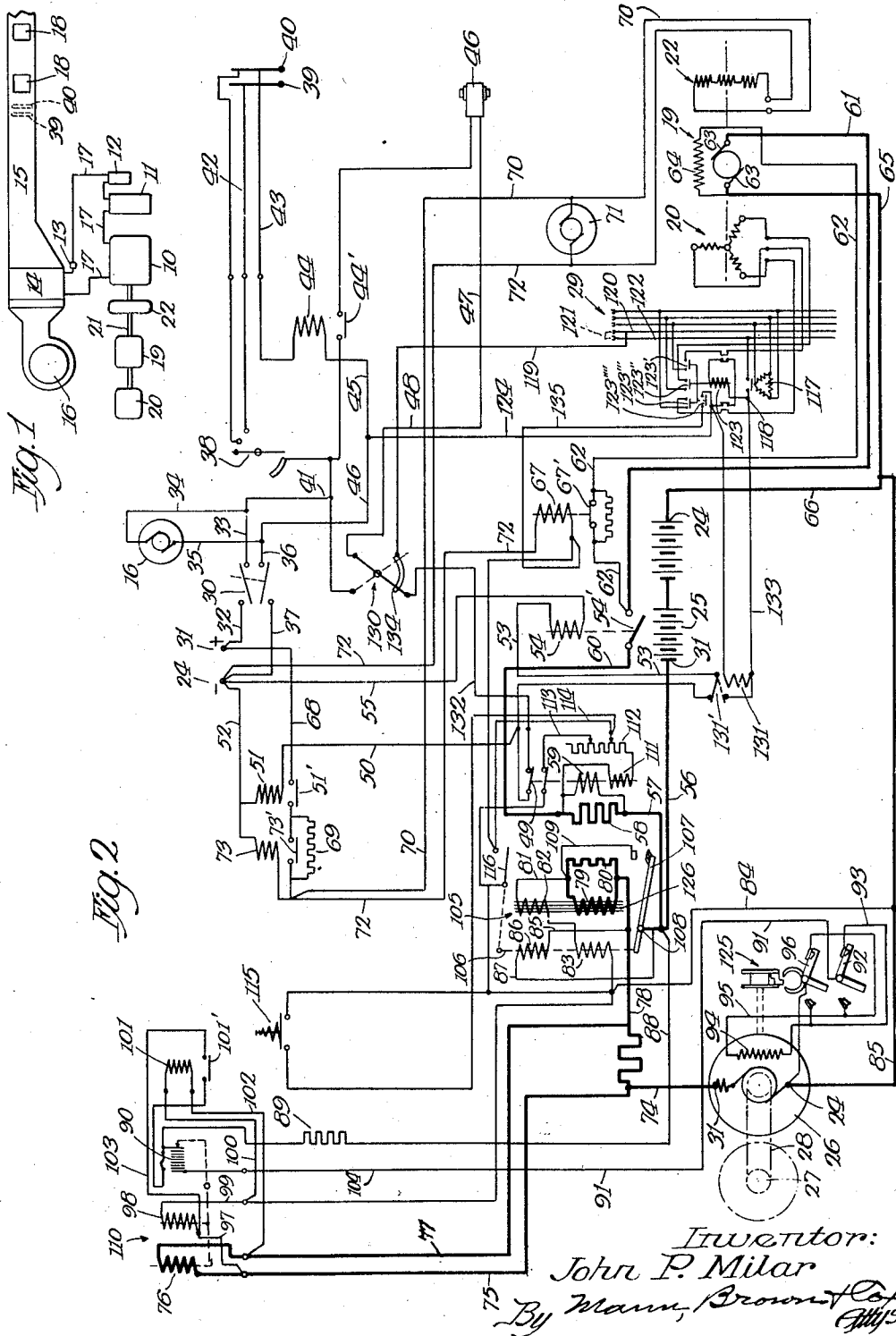
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AIR CONDITIONING SYSTEM

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AIR CONDITIONING SYSTEM

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The present invention relates to a control system, and as one of its principal objects it is intended to provide an efficient and simple means for removing from a motor its load prior to starting and stopping of the motor.

As another object it is intended to provide a means for gradually loading the motor while running at a reduced speed and then increasing the motor speed to full speed operation.

Other objects and advantages will become apparent as the disclosure proceeds and the description is read in conjunction with the accompanying drawing, in which

Fig. 1 is a schematic drawing of a complete air conditioning system; and

Fig. 2 is a wiring diagram of the electrical circuit used in operating the air conditioning system shown in Fig. 1, the heavy lines indicating the main electrical circuit from the D. C. source of current to the D. C. motor, while the lighter lines indicate the control circuit.

A specific embodiment of the present invention is selected for the purpose of disclosure only, and is not intended to place unnecessary limitations upon the claims. It is intended that the claims shall be construed as broadly as the prior art will permit.

The invention is shown as it applies to an air conditioning system, but it is recognized that it has many other applications. Wherever there is a motor driving a load, and it is desirable to unload the motor prior to its starting and stopping, the invention is applicable. In the present disclosure the motor drives a compressor for producing refrigeration to cool the interior of a railway passenger car. Under normal operating conditions the demand for cooling is not constant, so that the compressor operation is intermittent, resulting in repeated startings and stoppings of the compressor, and consequently the compressor drive.

When the motor is running under load, approximately 250 amperes of current are passing through the main circuit. If the motor is stopped under these conditions there is substantial arcing across the contact points which causes burning of the points of the switch and even results in the switch points becoming welded together.

When the load is removed from the motor drive and the motor is allowed to idle, a current of only about 30 amperes is required, so that there is practically no arcing when the circuit is opened under these conditions. For this reason it is desirable to unload the motor not only when starting but also when stopping the system.

Referring now to Fig. 1, a refrigeration system is shown including a compressor 10, a condenser 11, a receiver 12, an expansion valve 13,

and an evaporator 14, positioned in a duct 15 at the exhaust end of a blower fan 16. The various elements of this refrigeration system are interconnected by piping 17, which conducts the refrigerant through the usual refrigeration cycle. The duct 15 discharges into the car body through vents 18, spaced at intervals along the length of the car.

The compressor 10 is driven either by a D. C. motor 19, or by an A. C. motor 20, through a shaft 21 and a clutch 22. The D. C. motor 19 receives its electrical energy either from a battery 25 or from an axle generator 26, shown in Fig. 2. This generator is driven from the car axle 27 through a belt or other suitable means 28. The A. C. motor 20 receives its current from an outside source which is plugged in at 29.

D. C. operation

When the air conditioning system is placed in operation the first act is to close a blower fan switch 30, which is situated on the master control panel, generally located at one end of the car. The closing of this switch immediately completes a circuit from a positive terminal 31 of a D. C. source of current through a conductor 32, switch 30, conductors 33 and 34, to the blower fan 16, and thence to the negative side 24 of the source of current through conductors 35 and 36, fan switch 30, and conductor 37. Under these conditions the blower fan 16 is operating to blow air into the car body through the duct 15 and vents 18.

The positive and negative terminals 31 and 24, respectively, are indicated as being entirely separate from the battery 25 or the axle generator 26, but it is to be understood that they actually are in the battery and generator circuit. The entire showing in Fig. 2 is schematic, and the particular placing of these two terminals is done for the sake of convenience and to simplify the disclosure.

The next operation is to close a circuit at the selector switch 38, which also is generally situated on the master control panel, and, depending upon the position of the selector switch 38, one of the thermostats 39 or 40 is placed in the control circuit. Each of these thermostats 39 and 40 has a definite temperature at which it functions to close the control circuit, and for the purpose of illustration it is assumed that thermostat 39 is set to operate at 75° F., and the thermostat 40 is set to operate at 80° F.

Assuming that the selector switch 38 is set for 75°, when the temperature in the car reaches this value the thermostat 39 closes a circuit from the positive terminal 31 through the blower fan switch 30, conductors 33, 41, selector switch 38, conductor 42, thermostat 39, and back through conductor 43, cooling pilot relay 44, conductors

45 and 46, through the other side of the fan switch 30 to the negative terminal 24.

The energization of the cooling pilot relay 44 closes the cooling pilot relay switch 44', so that the current passes through this switch, through a high-low pressure switch 46, which normally is in a closed position when pressure conditions in the refrigerating system are proper, through transfer switch 130 which for D. C. operation is in the solid line position, through conductors 132, low voltage relay switch 49, which is normally held in a closed position when the voltage of the battery 25 is normal, and then back through conductor 50, Y relay 51, and conductor 52 to the negative terminal 24. Current also passes from the low voltage switch relay 49 through a T relay switch 131', through conductor 53, D. C. contactor relay 54, conductor 55, and back to the negative terminal 24.

The D. C. contactor relay 54 is a quick-make slow-break relay. Immediately upon closing of the cooling pilot relay 44' the D. C. contactor relay 54 is energized, snapping D. C. contactor relay switch 54' to a closed position.

Car standing still

While the car is standing still in a station or along the right of way, the condition of the electrical circuit is as shown in Fig. 2, so that current from the battery 25 flows from the positive terminal 31 through conductors 56 and 57, and then a portion of the current passes through the resistor 58, the remainder passing through a current coil 59; then they join and pass through the conductor 60, D. C. contactor switch 54', which has been closed by the D. C. contactor relay 54, and then through conductors 61 and 62 to the commutator brushes 63 and motor field 64, respectively, and thence back to the negative terminal 24 of the battery 25 through the conductors 65 and 66.

In the circuit of the D. C. motor field 64 is a motor field relay switch 67', which is normally held in closed position, as shown in Fig. 2, and is opened by the energization of a motor field relay 67. As long as the D. C. motor 19 is drawing from the battery 25 this motor field relay 67 is de-energized and the switch 67 is closed, so that the motor 19 is operating with a strong field 64 at a reduced speed.

After a time delay of from two to five seconds, during which time the D. C. motor 19 has built up its speed, the Y relay 51 operates to close the Y relay switch 51', thereby closing a circuit from the positive terminal 31 through the conductor 68, Y relay switch 51', resistor 69, conductor 70, condenser fan motor 71, and electric clutch 22, which are connected in parallel, and thence back through conductor 72 to the negative terminal 24. The closing of switch 51' also completes a circuit from the positive terminal 31 through conductor 68, switch 51', resistor 69, S relay switch 73, and thence back to the negative terminal 24 through conductor 52. The presence of the resistor 69 in this last circuit, however, prevents the energization of the S relay 73 to the extent where it can close the S relay switch 73'.

Under these conditions the condenser fan motor 71 commences its operation, and the electric clutch 22 becomes partially energized to drive the compressor 10. Because of the presence of the resistor 69 in the electric clutch circuit, the clutch is only partially energized, so that there is a lag between the speeds of rotation of the compressor 10 and shaft 21. As the con-

denser fan motor 71 builds up in speed it produces a counter-electromotive force which reduces the current through the condenser fan circuit, thereby permitting an increased amount of current to pass through the S relay 73 and increasing the energization of the S relay and closing the S relay switch 73'. The closing of this switch cuts out the resistor 69, and causes the condenser fan motor 71 to operate at full speed and the electric clutch 22 to become fully energized. The removal of the resistor 69 from the S relay 73 permits sufficient current to flow through this circuit to energize the S relay 73 sufficiently to maintain the switch 73' in closed position. There is now a positive drive between the D. C. motor 19 and the compressor 10 through the electric clutch 22, and refrigeration is being produced to cool the car.

When the car has been cooled to 75°, so that the thermostat 39 is no longer calling for cooling, the cooling pilot relay 44 is de-energized, opening the pilot relay switch 44', thereby immediately de-energizing the Y relay 51 and opening the Y relay switch 51'. This operation opens the circuit to the condenser fan motor 71, and the electric clutch 22, thus removing the load from the D. C. motor 19. After a time delay of from two to five seconds, the D. C. contactor relay 54 becomes de-energized, opening the contactor switch 54' and de-energizing the D. C. motor 19. The motor is thus stopped after first completely removing the compressor load from the shaft 21.

Car in motion—speeds up to 25 miles an hour

When the car is in motion the axle generator 26 rotates in a direction corresponding to the direction of the car movement. The usual field reversing switch, generally indicated at 125, is provided to maintain a unidirectional flow of current from the axle generator 26, regardless of the direction of travel of the car, and since its operation is well known in the art and it forms no part of the present invention a detailed description is believed unnecessary.

When the car is in motion and traveling at speeds up to about twenty-five miles an hour, the axle generator 26 is turning, but at these low speeds the generator output is less than the output of the battery 25, so that the air conditioning system, when it is in operation, receives its power from the battery in the same manner as is described above.

The axle generator 26 produces current which flows from the positive terminal 31 through conductors 74, 75, generator regulator relay 76, conductors 77, 78, and then the current splits, a portion passing through the series coil 79 and a portion passing through a resistor 80, and then they join and pass on through conductor 81, potential coils 82 and 83, and back to the negative side of the generator through conductors 84 and 85.

The current also passes through the conductors 74, 78, 85, and through a holding coil 86, conductors 87, 88, field teaser 89, carbon pile 90, conductor 91, field reversing switch blade 92, conductor 93, generator field 94, conductor 95, a second blade 96 of the field reversing switch, and thence to the negative terminal of the generator 26. This latter circuit energizes the axle generator field 94, and since it includes the field teaser 89 the strength of the field at speeds below twenty-five miles an hour is considerably limited, so that the generator output is small.

The generator current also passes from the

positive terminal 31 through conductors 74, 75, a conductor 97, a relay 98, conductors 99 and 100, a relay 101, conductors 102, 77, 78, where it splits and passes through the series coil 79 and resistor 80, and then on through conductor 81, potential coils 82 and 83, and thence back to the negative terminal through the conductors 84 and 85.

As long as the car is traveling below twenty-five miles an hour the field teaser 89 limits the strength of the field 94 to the extent that relay 101, though energized, is not sufficiently strong to close the relay switch 101'. When the car speed reaches twenty-five miles an hour, however, relay 101 closes the switch 101', cutting out the field teaser 89 by permitting the current to pass from conductor 75 through conductors 97, 103, relay switch 101', carbon pile 90, conductor 104, field reversing switch blade 92, conductor 93, generator field 94, conductor 95, field reversing switch blade 96, and thence back to the negative terminal. When the field teaser is removed from the circuit the generator field becomes fully energized, thereby stepping up considerably the generator output, and this increased output strengthens the series coil 79.

A generator relay, generally indicated at 105, includes the series coil 79, the potential coils 82 and 83, and the holding coil 86, a core 126, about which is wound the series coil 79 and potential coil 82, an armature 106 which passes through the potential coil 83, the holding coil 86, and a generator relay switch 107 fulcrumed at 108. The potential coils 82 and 83 oppose each other since they are acting on the switch 107 on opposite sides of the fulcrum 108, and they are of equal strength, so that the slightest variation in strength of the holding coil 86 will overcome the balance between the actions of the potential coils 82 and 83, thereby moving the switch 107. When this switch has once been closed the series coil 79 holds it in this position until the output of the axle generator 26 is limited below a predetermined amount corresponding to a vehicle speed of about twenty-five miles per hour.

When switch 107 has been closed by the generator relay, current flows from the positive terminal 31 of the axle generator through conductors 74 and 78, series coil 79 and resistor 80, conductor 109, switch 107, and then through conductor 56, battery 25, and back to the negative terminal of the generator, thereby charging the battery, or through the D. C. motor circuit as described under the conditions when the car was standing still. This D. C. motor receives its energy either from the battery 25 or axle generator 26, depending upon the position of switch 107 in the generator relay.

The generator relay itself forms no part of the present invention and, since its operation is well known in the art, a detailed description is believed unnecessary. For present purposes, it is sufficient to state that the relay functions to maintain an open circuit from the generator to the battery or to the D. C. motor circuit as long as the generator output is below the battery voltage, which is the case when the car is operating below 25 miles an hour. When the generator voltage exceeds the battery voltage, the generator relay operates to close switch 107, thereby permitting the generator to charge the battery and supply current to the D. C. motor circuit.

The output of the axle generator 26 is limited by a generator regulator, generally indicated at 110, which includes the usual carbon pile 90, 75

whose resistance is varied in response to the generator output, and since this carbon pile is in the generator field circuit the strength of the field varies conversely with the amount of resistance in the carbon pile. Thus as the car speed increases above a predetermined rate the increase in the generator output causes the carbon pile to insert more resistance into the generator field circuit, thus limiting the generator output.

The low voltage relay switch 49 is normally held in a closed position by a voltage coil 111, which is impressed with the voltage of the battery 25 or the axle generator 26, depending upon which source of current is in the circuit. Under these conditions current flows through the voltage coil 111 and the resistor 112 to either the conductor 113 or the conductor 114, depending upon which source of current is in the circuit. When the voltage is low, due to battery weakness, or to other conditions, the voltage coil will not have sufficient strength to maintain a closed circuit through the undervoltage relay switch 49, so that the control circuit will function to first de-energize the electric clutch by de-energizing the Y relay 51, and then will shut down the motor by de-energizing the D. C. contactor relay 54.

When the undervoltage relay switch 49 is open it may again be closed by pushing a reset button 115, which momentarily energizes the voltage coil 111 and closes the switch 49, and if the line voltage is up the voltage coil 111 will maintain a closed circuit. If, however, the voltage is still down the undervoltage relay switch 49 will immediately reopen.

Upon starting of the D. C. motor there is a surge in the flow of current through the D. C. motor circuit which momentarily reduces the voltage across the line, so that the voltage coil 111 would momentarily be partially deenergized. To prevent opening of the undervoltage relay switch 49 under these conditions the current coil 59 is placed in tandem with the voltage coil 111, and when this surge occurs this current coil maintains a closed circuit through the undervoltage relay switch.

When the D. C. motor is operating from the battery it is desirable to decrease the strength of the motor field 64, so as not to overload the battery, but when the axle generator 26 is supplying current to the motor a switch 116 is closed, energizing the motor field relay 67, thereby opening the motor field relay switch 67' and placing resistance in the motor field circuit to cause the motor to operate at full speed. The switch 116 is closed only when the generator relay switch 107 is closed.

A. C. operation

The transfer switch 130 is placed in the control circuit for the purpose of permitting the A. C. motor 20 to drive the D. C. motor 19 as a generator, to charge the battery 25, at a time when car cooling is not required. In the conventional equipment, the battery is charged by means of an outside D. C. source which is placed across the battery terminals when the car is in a station where such facilities are available, and no provision whatever is made for employing the A. C. motor to drive a car generator for charging purposes.

In the present arrangement, the A. C. motor is part of the air conditioning equipment carried by each car and is employed to drive the compressor at a time when car cooling is required, and at

the same time to drive the D. C. motor 19 as a generator to charge the battery or to drive the D. C. motor 19 alone with the compressor remaining idle at a time when air cooling is not required.

Assume for present purposes that the car is standing in a station where an outside source of alternating current is available, and temperature conditions are such that car cooling is required. The transfer switch 130 will be in the cooling position as shown in solid lines in Fig. 2. When either of the thermostats 39 or 40 calls for cooling, the cooling pilot relay 44 is energized, as previously explained, closing pilot relay switch 44', so that the current flows from the positive terminal 31 of the battery through the blower fan switch 30, pilot relay switch 44', high-low pressure switch 46, conductors 47 and 48, to the transfer switch 130 where the current divides, part of it flowing through the conductor plate 134, conductors 119 and 120, short 121, phase relay switch 118, A. C. contactor relay 123, and then back to the negative terminal 24 of the battery through conductors 124 and 46 and blower fan 30. The A. C. contactor relay 123 is thus energized to close switches 123', 123'', 123''', and 123''', thereby placing into operation the A. C. motor 20. The current passing through phase relay switch 118 also flows through conductor 133, T relay 131, then through conductors 124 and 46, and blower fan switch 30 to the negative terminal of the battery 24. The T relay 131 is thereby energized to throw the switch 131' to the dotted line position so that the current also flows from the conductor 133 across the T relay switch 131', then through conductor 53, D. C. contactor relay 54, and back to the negative terminal 24 of the battery through conductor 55.

The D. C. contactor relay 54 is thereby energized to close the D. C. contactor switch 54' so that the D. C. motor 19 is being driven as a generator by the A. C. motor 20 to charge the battery 25. The second path which the current flowing through the transfer switch 130 follows is through conductor 132, low voltage relay switch 49 (normally held in a closed position), conductor 50, Y relay 51, and then back to the negative terminal of the battery 24 through conductor 52. After a time delay of from two to five seconds, Y relay 51 operates to close the circuit to the electric clutch 22 and the load is gradually applied as previously described.

When there is no need for car cooling, as is the case in the winter time, the transfer switch 130 is turned to the dotted line position shown in Fig 2 so that, when the car is standing in a station where a source of alternating current is available, the battery 25 may be charged at a time when the compressor remains idle. Under these conditions, the current flows from the positive terminal 31 through the blower fan switch 30, conductor 41, transfer switch 130 (in the dotted line position), conductor 119, short 121, phase relay switch 118, and then through both the A. C. contactor relay 123 and T relay 131, as previously described. Thus the T relay switch 131 is held in the dotted line position, and the D. C. contactor relay 54 is energized, as previously explained. With the transfer switch in this position, however, the circuit through conductor 132, low voltage relay switch 49, and the Y relay 51 is open so that the electric clutch 22 remains de-energized, the compressor 10 remaining idle.

When the cooling thermostats are calling for

cooling, the control circuit functions as before to close the circuit through the Y relay switch 51' and S relay switch 73', thereby allowing current to flow from positive terminal 31 of the current source through these two switches, conductor 72, D. C. motor field relay 67, and then through conductor 135, switch 123'''' (which is held in the closed position by the A. C. contactor relay 123), and then back to the negative terminal 24 of the current source through conductors 124 and 46 and blower fan 30. The D. C. motor field relay 67 is thus energized to open the field relay switch 67', thereby placing resistance in the field 64 of the D. C. motor (now acting as a generator) to limit the generator output. In this manner, the generator output is reduced at a time when car cooling is required, and the load on the A. C. motor is at a maximum; but, when car cooling is not required, the control circuit causes the D. C. motor field relay 67 to become energized, thereby closing switch 67' to increase the strength of the motor field 64.

The condenser fan 71 is connected in parallel with the S relay 73, and it functions as a time delay control for the electric clutch 22. When Y relay switch 51' is first closed in response to the energization of Y relay 51, current flowing from the positive terminal 31 of the current source passes through resistor 69, and at first when the motor 71 is starting up the greater portion of this current is drawn through the condenser fan motor circuit so that only a relatively small amount of current passes through the S relay 73. When the condenser fan has built up to running speed, the demand for current in this circuit is greatly lessened so that the current flow through S relay 73 builds up to the point where S relay switch 73' is closed, thereby cutting out the resistor 69 and fully energizing the electric clutch 22.

The explanation for the diminishing demand for current through the condenser fan motor 71 may be found in *Elements of Electricity*, by W. H. Timbie, first edition, 1912, page 203. The principle, briefly, is as follows: When the circuit to an electric motor is first closed, the demand for current is great, but as the armature commences to rotate the lines of magnetic flux are being cut by electrical conductors so that there is a counter electro-motive force generated by the motor which may be thought of as setting up a resistance to the flow of current through the motor. It is the effect of this electro-motive force which reduces the current flow through the condenser fan motor circuit.

What I claim is:

1. A motor, a source of energy for driving the motor, a load driven by the motor in response to an intermittent demand, a clutch between the motor and the load, and control means responsive to the demand for the load for controlling the operation of the motor including a quick-make, slow-break relay for connecting the motor to the energy source, and a slow-make, quick-break relay for controlling the clutch operation.
2. An electric motor, a load driven by the motor in response to an intermittent demand, an electric clutch between the motor and the load, a source of electrical energy for driving the motor and energizing the clutch, and control means responsive to the demand for the load for controlling the operation of the motor including a quick-make, slow-break relay for connecting the motor to the energy source, and a slow-make,

quick-break relay for controlling the energization of the clutch.

3. A motor, a source of energy for driving the motor, a compressor driven by the motor, a clutch between the motor and the compressor, and control means responsive to requirements for compressor operation for controlling the motor operation including a quick-make, slow-break relay for connecting the motor to the energy source, and a slow-make, quick-break relay for controlling the clutch operation.

4. A motor, a source of energy for driving the motor, a load driven by the motor in response to an intermittent demand, a clutch between the motor and the load and control means responsive to the demand for the load for controlling the operation of the motor including a quick-make, slow-break relay for connecting the motor to the energy source, a slow-make, quick-break relay for controlling the clutch operation, means for driving the load from the motor at a reduced speed when it responds to the making of the last named relay, and a relay for establishing a positive drive through the clutch thereby driving the load at full speed.

5. A motor, a load driven by the motor, an electric clutch between the motor and the load, motor control means for operating the motor including a source of energy and means for quickly connecting the motor to the source of energy when starting the motor and slowly disconnecting the motor from the source of energy when stopping the motor, a clutch control circuit including a source of electrical energy, a resistor and a slow-make, quick-break relay for closing the circuit to the clutch, a relay responsive to the clutch circuit for removing the resistor from said circuit and control means responsive to the requirements for the load for actuating the motor control means and the clutch control circuit.

6. A motor, a load driven by the motor, a multispeed clutch between the motor and the load, motor control means for operating the motor including a source of energy and means for quickly connecting and slowly disconnecting the motor from the source of energy when starting and stopping the motor respectively, a clutch control including means for slowly establishing a slow speed drive through the clutch and for quickly declutching, a control means responsive to the requirements for the load for actuating the motor and clutch control means, and time delay means for changing the clutch drive to high speed drive.

7. An air conditioning system including a compressor, condenser, an evaporator, and means for driving the compressor, clutch means between the driving means and the compressor, and a control circuit including a thermostat, means responsive to the thermostat for energizing the compressor driving means, generating means, time delay means for energizing the generating means, and means responsive to the output of the generating means for energizing the clutch means so as to positively drive the compressor.

8. An air conditioning system including a compressor, and a motor driven condenser fan, a motor for driving the compressor, an electric clutch between the motor and the compressor, and a source of power for driving the motor and energizing the electric clutch, and a control circuit including a thermostat, a cooling pilot relay energized by the completion of the circuit through the thermostat, a quick-make, slow-break contactor relay energized by the source of

current when the pilot relay is closed, said contactor relay closing the circuit to the compressor motor, a slow-make, quick-break relay energized by the source of electric current when the cooling pilot relay is closed for completing the circuit to the condenser fan motor and the electric clutch, a resistor in the last named circuit, and a relay responsive to the counter-electromotive force set up by the operation of the condenser fan motor for cutting the resistance out of the condenser fan motor and electric clutch circuit after a predetermined interval of time.

9. A motor, a source of energy for driving the motor, a load driven by the motor in response to an intermittent demand, a multispeed clutch between the motor and the load, and control means responsive to the demand for the load for controlling the operation of the motor including a quick-make, slow-break relay for connecting the motor to the energy source, a slow-make, quick-break relay for controlling the operation of the clutch at slow speed, and time delay means acting in time delay relationship with respect to the slow speed operation of the clutch for placing the clutch in high speed operation.

10. A motor, a source of energy for driving the motor, a load driven by the motor in response to an intermittent demand, a multispeed clutch between the motor and the load, and a control circuit responsive to the demand for the load for controlling the operation of the motor including a quick-make, slow-break relay for connecting the motor to the energy source, a slow-make, quick-break relay for controlling the slow speed operation of the clutch, means in the clutch control circuit which initially draws a relatively large amount of current but which reduces the current flow after a predetermined time delay, and means responsive to this reduction in current flow for actuating the clutch to drive the load at full speed.

11. The combination of a load, a motor for driving the load, a source of energy for furnishing power to the motor, means for starting the motor and operating the motor at slow speed with the load disengaged from the motor drive, time delay means for gradually placing the load on the motor drive, and time delay means for increasing the speed of operation of the motor.

12. The combination of a load, a motor for driving the load, a source of energy for the motor, means for starting the motor and operating it at low speed, time-delay means responsive to the first named means for connecting the load to the motor during low speed operation of the motor, and time delay means for increasing motor speed to normal operating speed.

13. The combination of a load, a motor for driving the load, a source of energy for the motor, a clutch between the motor and the load, means for energizing the motor to start it operating at low speed, means acting in time delay relationship with respect to the starting of the motor responsive to the first named means operating on the clutch for driving the load by the motor through the clutch at a speed ratio of less than the normal operating ratio, means acting in time delay relationship with respect to the first time delay means operating on the clutch to increase the driving ratio between the motor and the load to its full driving ratio for normal operation, and means acting in time delay relationship with respect to the second time delay means for increasing the motor speed to normal operating speed.

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