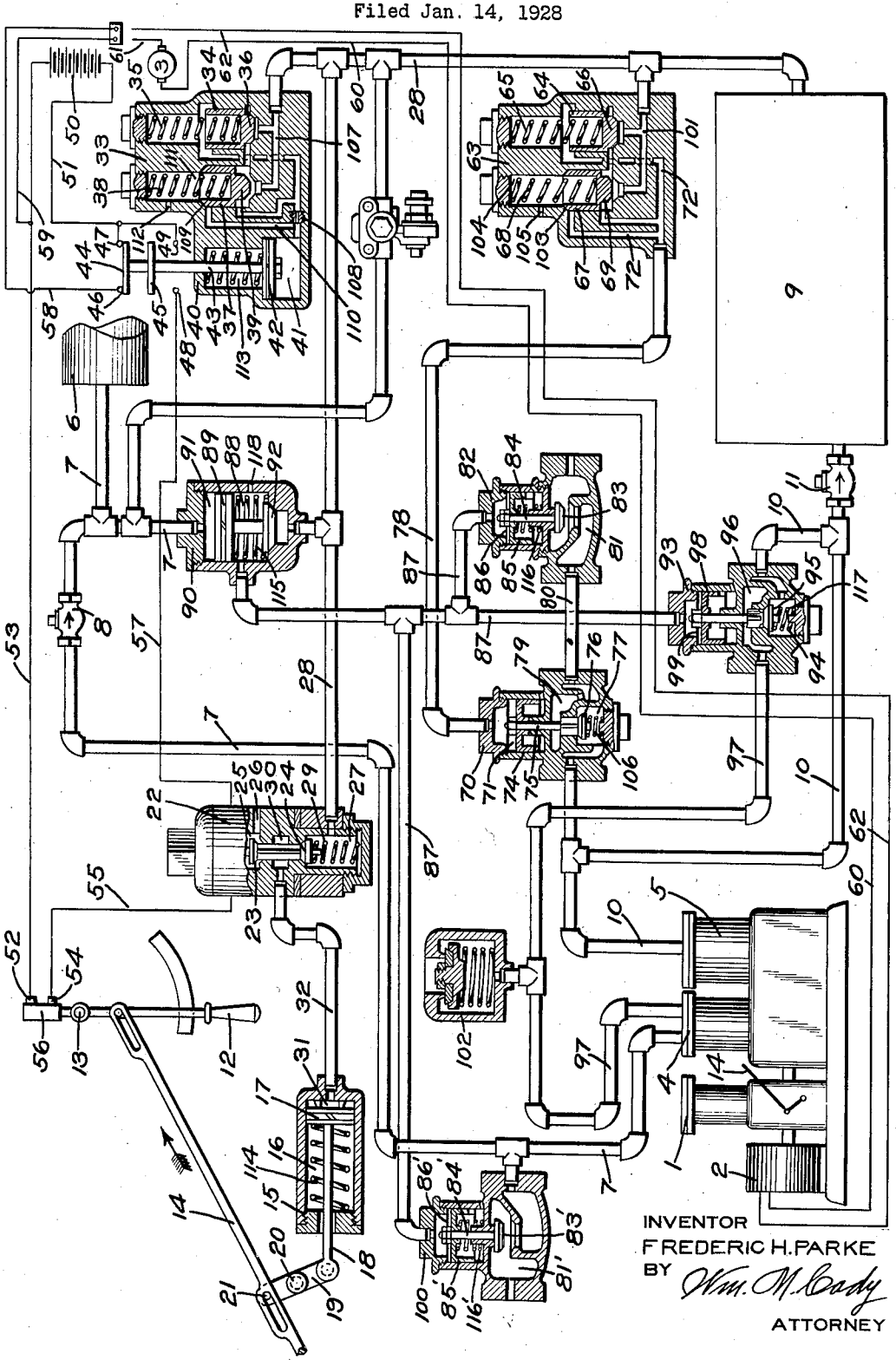
April 23, 1929. F. H. PARKE 1,709,871

PRESSURE GOVERNOR

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PRESSURE GOVERNOR.

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This invention relates to vehicles of the type in which an internal combustion or oil engine is employed for driving a generator for supplying an electric current to the vehicle propelling motor and for driving a fluid compressor to supply fluid under pressure to the fluid pressure brake system. In this type of vehicle, with the controller for the motor circuit in power "on" position, the speed of the vehicle depends upon the speed of the engine, that is to say, if it is desired to increase or decrease the speed of the vehicle, the speed of the engine will be increased or decreased as the case may be, and will thus effect an increase or decrease in the supply of electric current from the generator to the vehicle propelling motor and the motor will operate to propel the vehicle in accordance with the current supplied.

When a vehicle, equipped with my invention, is standing at a stop or descending a grade, the engine continues to run at the usual slow idling speed, so that the rate at which fluid is compressed by the compressor is reduced below that obtained at the average running speed. In order to increase the output of the compressor I provide means for automatically accelerating the engine and consequently the compressor under conditions where the engine is idling and the pressure of fluid compressed by the compressor is below a predetermined degree.

With the engine running at idling speed, the electric generator will be driven at a correspondingly slow speed, so that the current generated by the generator will be of low voltage. When the engine is accelerated to increase the output of the compressor, the speed of the generator is correspondingly increased, with the result, that the current, generated by the generator, will be of high voltage, and if the motor circuit should be closed while the engine is running at increased speed and the controller in power "on" position, this current would be suddenly imposed upon the propelling motor, and due to its high voltage, might damage the motor to such an extent as to render it inoperative.

To effect the automatic opening and closing of the motor circuit, a control circuit of the usual type may be employed.

The principal object of my invention is to provide means automatically operative for preventing an electric current of high voltage from being suddenly imposed upon the vehicle propelling motor when the speed of the engine is suddenly increased.

Another and more specific object of my invention is to provide means for automatically increasing the speed of the engine to increase the output of the compressor and to provide means, automatically operative, for maintaining the motor control and motor circuits open until after the fluid compressed by the compressor has been increased to a predetermined degree and the speed of the engine has been reduced to substantially idling speed.

A further object of my invention is to provide novel means for loading and unloading the high and low pressure cylinders of a fluid compressor and for maintaining an adequate supply of fluid under pressure in the fluid pressure system at all times.

Other objects and advantages will appear from the following more detailed description.

In the accompanying drawing, the single figure is a diagrammatic view, principally in section, of a fluid compressing and electric circuit control apparatus embodying my invention.

In the accompanying drawing, the reference character 1 indicates an internal combustion or oil engine which may be mounted on a vehicle in any desired manner and drives an electric generator 2 for supplying current to the vehicle propelling motor 3 and also drives a two stage fluid compressor having a high pressure cylinder 4 and a low pressure cylinder 5, the compressor piston (not shown) in the high pressure cylinder 4 being adapted to operate to supply fluid under pressure to a high pressure reservoir or bottle 6 through a pipe 7, a check valve device 8 being interposed in the pipe 7 to prevent back flow of fluid from the reservoir or bottle 6, and the compressor piston (not shown) in the low pressure cylinder being adapted to operate to supply fluid under pressure to a storage or main reservoir 9 through a pipe 10, there being a check valve device 11 interposed in this pipe to prevent the back flow of fluid from the reservoir.

For the purpose of manually operating the usual throttle valve device, with which

the engine may be equipped, a throttle operating lever 12 is provided which is pivotally mounted, intermediate its ends, on a pivot pin 13 and is operatively connected with the throttle device of the engine, by a rod 14. For the purpose of automatically operating the throttle device, a piston device 15 is provided which comprises a cylinder 16 containing a piston 17 having a stem 18 which extends through one end of the cylinder, and at its end is pivotally connected with one end of a lever 19 which is pivotally mounted on a pivot or fulcrum pin 20. The other end of the lever 19 is pivotally and slidably connected with the rod 14 by a pin 21.

Associated with the piston device 15 is a magnet valve device comprising a magnet 22 adapted to control the operation of double seat valves 23 and 24. The valve 23 is contained in a valve chamber 25 which is connected to the atmosphere by a passage 26 and the valve 24 is contained in a valve chamber 27 which is connected with the reservoir 9 by a pipe 28. Also contained in the valve chamber 27, is a coil spring 29 which tends to maintain the valve 24 closed and the valve 23 open. Intermediate the valves 23 and 24 there is a chamber 30 which is connected with the chamber 31 at one side of the piston 17, of the piston device 15, by a pipe 32.

A low pressure governor device 33 is provided, comprising a casing containing a cut-out piston 34, subject to the pressure of a coil spring 35, and carrying a valve 36, and also comprises a cut-in piston 37 subject to the pressure of a coil spring 38 and carrying a valve 39.

Associated with the low pressure governor device 33, is an electrical switch device 40, comprising a casing having a chamber 41 containing a piston 42 which has a stem 43, the outer end of which projects through the casing, and has mounted thereon spaced contact members 44 and 45. The contact member 44 is adapted to be moved into and out of electrical engagement with contact terminals 46 and 47 of a motor control circuit, and the contact member 45 is adapted to be moved into and out of electrical engagement with contact terminals 48 and 49 of a throttle control circuit. The contact terminals 47 and 49 are connected together and to one terminal of a battery 50, or other desired source of electrical supply, by a wire 51. The other terminal of the battery 50 is connected to a contact terminal 52 by a wire 53, and adjacent this contact terminal 52, there is a contact terminal 54 which is connected with one terminal of the magnet 22 by a wire 55, said contact terminals being adapted to be electrically connected by a contact 56 carried by the throttle lever 12, when said lever is in engine idling position as shown in the drawing. The other terminal of the magnet 22 is connected to the contact terminal 48 of the switch device 40, by a wire 57. The contact terminal 46 of the switch device 40 is connected by a wire 58 with one terminal of the usual means (not shown) for effecting the control of the motor circuit. From the wire 53 there is a tap wire 59 which is connected to the other terminal of the means for controlling the motor circuit.

The motor circuit may comprise a wire 60 leading from one terminal of the generator to one terminal of the propelling motor 3, the other terminal of the motor 3 and the other terminal of the generator being connected by wires 61 and62 respectively with the above mentioned control means.

The purpose of the control means (not shown) is for automatically effecting the control of the propelling motor circuit and is interposed between the control circuit wires 58 and 59 and the motor circuit wires 61 and 62 and may be of the type usually employed in vehicles which are electrically propelled. As this type of means is well known in the art, and as the details thereof do not enter into this invention, said means have not been shown nor have they been described in detail.

It will here be noted that if desired the switch device 40 may be arranged to directly control the propelling motor circuit.

A high pressure governor 63 is also provided comprising a casing containing a cut-out piston 64 subject to the pressure of a coil spring 65 and carrying a valve 66, and also comprises a cut-in piston 67 subject to the pressure of a coil spring 68 and carrying a valve 69.

Associated with the high pressure governor device 3, is a valve device 70, comprising a casing having a piston chamber 71 connected to a passage 72 in the governor device 63 by a pipe 78 and containing a piston 74 having a stem 75, carrying a valve 76 which is contained in a valve chamber 77, connected to the compressor cylinder 5, by the pipe 10. Intermediate the piston 74 and valve 76 there is a chamber 79 which is adapted to be connected to the atmosphere through a pipe 80 and passage 81 in a valve device 82, there being a valve 83 contained in the casing adapted to control the flow of fluid from the low pressure cylinder 5 of the compressor, to the atmosphere. The valve 83 has a stem 84 which is secured to a piston 85, the chamber 86, at one side of which is connected to a pipe 87 which is connected to a chamber 88 at one side of a piston 89 contained in the casing of a piston valve device 90. The chamber 91 at the other side of the piston 89 is connected to the pipe 7 leading from the high pressure cylinder 4 of the compressor to the reservoir 6. The piston 89 carries a valve

92, to a small seated area of which the pipe 28 from the reservoir 9 leads.

For controlling the flow of fluid under pressure from the low pressure cylinder 5, to the high pressure cylinder 4 of the compressor, a valve device 93 is provided, comprising a casing having a valve chamber 94 connected, by the pipe 10, to the low pressure cylinder 5, intermediate the cylinder and the check valve device 11, and contains a valve 95 adapted to control communication between the chamber 94 and a chamber 96, which latter chamber is connected to the high pressure cylinder 4 by a pipe 97. The valve 95 has a stem to which is secured a piston 98, the chamber 99, at one side thereof, is connected to the pipe 87.

For the purpose of controlling the unloading of the high pressure cylinder 4, a valve device 100 is provided which may be of substantially the same construction as the valve device 82. In this case, the valve 83′ controls communication from pipe 7, leading from the high pressure cylinder 4 of the compressor to the reservoir 6 and piston chamber 91 of the valve device 90, to the atmosphere through passage 81′. It will here be noted that the pipe 87 connects the chamber 99 of the valve device 93 and chambers 86 and 86′ of the valve devices 82 and 100 respectively with chamber 88 of the valve device 90.

With the main reservoir 9 charged with fluid under pressure exceeding a predetermined degree, the cut-in valve 69 will be maintained in its open position, permitting the flow of fluid at main reservoir pressure from passage 101, past the valve 69 and through passage 72 and pipe 78 to the face of piston 74, so that said piston is operated to hold the valve 76 open.

The other parts of the equipment will be in the positions shown in the drawing, so that if the engine 1 is running, fluid discharged from the high pressure cylinder 4 will flow to the atmosphere through pipe 7 and passage 81′ in the valve device 100 past the open valve 83′. Between the valve device 93 and the high pressure cylinder 4 of the compressor there is connected to the pipe 97, a relief valve device 102 which, when the valve 95 is seated, is operative to permit air to flow from the atmosphere to the pipe 97, thereby preventing a vacuum from being created in the pipe 97, by the action of the usual compressing piston of the high pressure cylinder 4. Fluid discharged from the low pressure cylinder 5 of the compressor will flow to the atmosphere through pipe 10, valve chamber 77 of the valve device 70, past the open valve 76 into chamber 79 and from thence through pipe 80 and passage 81 and past the open valve 83 of the valve device 82.

Should the pressure of fluid in the main reservoir 9 be decreased below that of the adjustment of the spring 68 of the high pressure governor device 63, the pressure of the spring acting on the cut-in piston 67, causes it to move down, seating the valve 69, and unseating a valve 103 carried by the piston 67, so that the supply of fluid under pressure from the reservoir 9 to the valve device 70 is cut off and fluid under pressure in the piston chamber 71 of the valve device 70 is vented to the atmosphere by way of pipe 78, passage 72 in the high pressure governor device 63, past the open valve 103 into a spring chamber 104 and through an atmospheric passage 105. The valve 76 of the valve device 70 is now caused to close by the pressure of a spring 106 contained in the piston chamber 77, thus preventing further flow of fluid from the low pressure cylinder to the atmosphere, so that fluid compressed in the low pressure cylinder will be supplied to the main reservoir 9. When the pressure of fluid in the reservoir 9 is increased above that of the pressure of the spring 68, the pressure of fluid, acting on the piston 67, causes it to move upwardly, unseating the valve 69, so that fluid under pressure will flow from the reservoir 9 to the piston chamber 71 of the valve device 70, by way of pipe 28, passage 101, past the open valve 69, passage 72 and pipe 78, flow of fluid from the passage 72 to the atmosphere being cut off by the seating of the valve 103 carried by the piston 67. Fluid under pressure thus supplied to the chamber 71 of the valve device 70, causes the piston 74 to move downwardly against the pressure of the spring 106, which causes the valve 76 to be unseated. Fluid discharged from the low pressure cylinder 5 now flows to the atmosphere through pipe 10, valve chamber 77, past the open valve 76 into chamber 79, and from thence through pipe 80, and passage 81 in the valve device 82, thus unloading the low pressure cylinder 5. The valve 83 of the valve device 82 is maintained open when the reservoir 6 is charged to a predetermined degree.

Should the engine 1 be running at idling speed, as when the vehicle is standing at a stop or is descending a grade, and should the pressure of fluid in the reservoir 9 reduce at a faster rate than fluid under pressure is supplied by the low pressure cylinder 5 when the engine is running at idling speed, the pressure of the fluid in the reservoir 9 may reduce to a degree which is lower than that necessary to maintain the cut-in valve 39 of the low pressure governor device 33 open against the pressure of the coil spring 38 acting on the piston 37. When the pressure in the reservoir 9 is thus reduced to a predetermined degree, the pressure of the spring 38 causes the piston 37 to move downwardly, seating the cut-in

valve 39 so as to cut off the further supply of fluid under pressure to the piston chamber 41 of the switch device 40 by way of pipe 28, passage 107 of the low pressure governor device 33 and a choked passage 108. As the valve 39 seats, a valve 109, carried by the piston 37, unseats, and fluid under pressure in the piston chamber 41 of the switch device is vented to the atmosphere, through a passage 110, spring chamber 111 and atmospheric port 112, all of which are in the low pressure governor device 33. The pressure of a spring 113 of the switch device, acting on the piston 42 moves it downwardly, which first causes the contact 44 to be moved out of contact with the contact terminals 46 and 47, thus rendering the control circuit inoperative, so that the motor circuit cannot be closed. After the control circuit is thus opened, the contact 45, carried by the stem 43, contacts with the contact terminals 48 and 49. With the throttle lever 12 in engine idling position, as shown in the drawing, the contact 56 on the lever, connects the contact terminals 52 and 54, so that when the contact 45 connects the contact terminals 48 and 49, the throttle circuit will be completed and the electric current flowing therethrough from the battery 50, energizes the magnet 22, causing valve 23 of the magnet valve device to be seated and the valve 24 to be unseated, and fluid under pressure in the valve chamber 27, supplied by the reservoir 9 through pipe 28, will flow past the open valve 24 into chamber 30 and from thence to the piston chamber 31 of the piston device 15. The pressure of fluid supplied to the chamber 31, causes the piston 17 and stem 18 to move forward, thus rotating the lever 19 about its pivot or fulcrum 20, and due to the connection between the lever and the operating rod 14, the rod will be moved in the direction of the arrow in the drawing, causing the usual throttle device of the engine 1 to be operated to accelerate the engine.

As the engine is thus accelerated to increase the output of the low pressure cylinder 5 in order that the pressure of fluid in the reservoir 9 may be built up rapidly, the speed of the generator 2 is correspondingly increased, resulting in the generation of an electric current of high voltage, which, due to the control circuit being open, cannot be suddenly imposed upon the vehicle propelling motor 3. If the control circuit could be operated to close the motor circuit when the engine is accelerated, the high voltage current generated by the generator, would be suddenly imposed upon the motor 3, and would probably damage said motor to such an extent as to render it inoperative.

With the engine 1 accelerated, the low pressure cylinder 5 compresses fluid into the reservoir 9 a great deal faster than when the engine is running at idling speed, and when the pressure of fluid in the reservoir is increased to a degree which is higher than the setting of the low pressure governor device 33, said device will operate in the usual manner so that the cut-in valve 39 will be unseated and fluid under pressure will flow from the reservoir 9 to the piston chamber 41 of the switch device 40 by way of pipe 28, passage 107 in the low pressure governor device 33, past the open cut-in valve 39 and through the choked passage 108. When the valve 39 is unseated, the valve 109, carried by the cut-in piston 37, is seated, thus closing communication from the chamber 41 to the atmosphere through passage 110, chamber 111 and atmospheric port 112. The choke in the passage 108 is of such a size that fluid under pressure will flow slowly therethrough to the piston chamber 41 so that the piston 42 which is subject to the pressure of fluid in this chamber, will move slowly upward to the limit of its travel. As the piston begins to be moved upwardly, the contact member 45 carried by the stem 43 is moved out of engagement with the contact terminals 48 and 49, opening the throttle circuit, thus deenergizing the magnet 22, which permits the spring 29 to seat the valve 24 to cut off further supply of fluid under pressure to the piston chamber 31 of the piston device 15, and unseat the valve 23 so that fluid under pressure in the piston chamber 31 will be vented to the atmosphere by way of pipe 32, chamber 30 in the magnet valve device, past the open valve 23, through chamber 25 and atmospheric passage 26. When the chamber 31 is thus vented, the pressure of a spring 114, contained in the cylinder 16, causes the piston 17 and stem 18 to move toward the right, rotating the lever 19 about its pivot 20 which permits the operating rod 14 to move in the direction opposite that indicated by the arrow, operating the throttle device to decelerate the engine. After the throttle device has thus been operated, the speed of the engine 1 will gradually reduce to idling speed over a period of substantially thirty-five to forty-five seconds, and I desire to delay the closing of the control circuit by the contact member 44 for substantially the same length of time. To accomplish this, the opening through the choke in the passage 108 is of such a size that fluid under pressure flows therethrough to the piston chamber 41 of the switch device 40 at such a rate that the piston 42 will move upwardly for a period of time substantially equal to the time it requires to reduce the speed of the engine to idling speed. After this time has elapsed, the contact 44 carried by the stem 43 of the valve 42, will contact with the contact terminals 46 and 47, thus closing the

control circuit, so that the operator now has control of the motor circuit. It will be understood that the time period intervening between the opening of the throttle circuit and the closing of the control circuit may be greater or less than that mentioned, and this may be accomplished in a number of ways, some of which may be, the changing of the size of the opening in the choke in the passage 108, the changing of the capacity of the spring 113, the changing of the travel of the piston, or the changing of the volume of the piston chamber 41.

Assuming the pressure of fluid in the high pressure reservoir 6 to be reduced to a predetermined degree, fluid at main reservoir pressure flowing through pipe 28, acting on the seated area of the valve 92 of the valve device 90, together with the pressure of a spring 115, causes the piston 89 to move upwardly, unseating the valve 92, so that fluid at main reservoir pressure flows into the chamber 88, and through pipes 87 to the piston chambers 86 and 86′ of the valve devices 82 and 100 respectively and causes the pistons 85 and 85′ to move downwardly against the action of springs 116 and 116′ and seating the valves 83 and 83′. At the same time fluid under pressure flows through pipe 87 into the piston chamber 99 of the valve device 93 and moves the piston 98 downwardly against the action of a spring 117, unseating the valve 95, thus establishing communication between the low pressure cylinder 5 and the high pressure cylinder 4 by way of pipes 10 and 97. As the valve 83 of the valve device 82 is closed, fluid discharged from the low pressure cylinder 5 cannot flow to the atmosphere through this valve device, but will flow through pipe 10, valve device 93 and pipe 97 to the high pressure cylinder 4, where it is further compressed and, as the valve 83′ of the valve device 100 is closed, the fluid compressed will flow through pipe 7 and check valve device 8 into the reservoir 6. When the pressure of the fluid in the reservoir 6 is again increased to a predetermined degree, the pressure of the fluid in the chamber 91 of the valve device 90, causes the piston 89 to move downwardly, seating the valve 92, thus cutting off the further supply of fluid under pressure from the main reservoir 9 to the piston chambers 86 and 86′ of the valve devices 82 and 100 respectively and to the piston chamber 99 of the valve device 93. Fluid under pressure in these three piston chambers is now vented to the atmosphere through pipes 87, chamber 88 of the valve device 90 and atmospheric passage 118, thus permitting the springs 116 and 116′ of the valve devices 82 and 100 to move the pistons 85 and 85′ upwardly to unseat the valves 83 and 83′. At the same time, the pressure of the spring 117 of the valve device 93 seats the valve 95, thus cutting off communication from the low pressure cylinder 5 to the high pressure cylinder 4. With the valve 83′ of the valve device 100 open, the high pressure cylinder 4 will unload to the atmosphere through pipe 7 and passage 81′ in the valve. With the valve 83 of the valve device 82 open, the low pressure cylinder 5 is adapted to be unloaded to the atmosphere through passage 81.

While one illustrative embodiment of the invention has been described in detail, it is not my intention to limit its scope to that embodiment or otherwise than by the terms of the appended claims.

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

1. The combination with an engine driven compressor and electric generator and a circuit through which current generated by said generator may flow, of means subject to the pressure of fluid compressed by the compressor for automatically controlling the acceleration and deceleration of the engine and for automatically effecting the control of said circuit according to the speed of the engine.

2. The combination with an engine driven compressor and electric generator and a circuit through which current generated by said generator may flow, of means subject to the pressure of fluid compressed by the compressor for automatically controlling the acceleration and deceleration of the engine and for rendering said circuit inoperative as said engine is automatically accelerated.

3. The combination with an engine driven compressor and electric generator and a circuit through which current generated by said generator may flow, of means subject to the pressure of fluid compressed by the compressor for automatically controlling the acceleration and deceleration of the engine and for rendering said circuit operative after said engine has been automatically decelerated to substantially idling speed.

4. The combination with an engine driven compressor and electric generator and a circuit through which current generated by said generator may flow, of means automatically operated upon a predetermined increase in the pressure of fluid compressed by the compressor for controlling the deceleration of said engine and for rendering said circuit operative after the deceleration of said engine.

5. The combination with an engine driven compressor and electric generator and a circuit through which current generated by said generator may flow, of means subject to the pressure of fluid compressed by the compressor for automatically controlling the acceleration and deceleration of the engine and pressure sensitive means operative automat-

ically for rendering said circuit operative and inoperative only when the engine is operating at slow speed.

6. The combination with an engine driven compressor and electric generator, and a circuit through which current generated by the generator may flow, of an electric control circuit for controlling the generator circuit, an electric throttle circuit for controlling the acceleration and deceleration of the engine, and means subject to the pressure of fluid compressed by the compressor for controlling the operation of said control and throttle circuits.

7. The combination with an engine driven compressor and electric generator, and a circuit through which current generated by the generator may flow, of an electric control circuit for controlling the generator circuit, an electric throttle circuit for controlling the acceleration and deceleration of the engine, and means subject to the pressure of fluid compressed by the compressor for at one time rendering said control circuit operative and the throttle circuit inoperative and for at another time rendering said control circuit inoperative and said throttle circuit operative.

8. The combination with an engine driven compressor and electric generator, and a circuit through which current generated by the generator may flow, of an electric control circuit for controlling the generator circuit, an electric throttle circuit for controlling the acceleration and deceleration of the engine, means subject to the pressure of fluid compressed by the compressor for at one time rendering said control circuit operative and the throttle circuit inoperative and for at another time rendering said control circuit inoperative and the throttle circuit operative, and means for timing the action of the first mentioned means.

9. The combination with an engine driven compressor and electric generator, and a circuit through which current generated by the generator may flow, of an electric control circuit for controlling the generator circuit, an electric throttle circuit for controlling the acceleration and deceleration of the engine, means subject to the pressure of fluid compressed by the compressor for at one time rendering said control circuit operative and the throttle circuit inoperative and for at another time rendering said control circuit inoperative and the throttle circuit operative, and means whereby a time period is caused to elapse between the opening of one of the last mentioned circuits and the closing of the other.

10. The combination with an engine driven compressor and generator and a circuit through which current generated by the generator may flow, of pressure sensitive means for controlling the acceleration and deceleration of the engine, an electric throttle circuit for controlling the operation of said pressure sensitive means, a circuit for controlling the generator circuit, and pressure sensitive means operative upon a predetermined decrease in the pressure of fluid compressed by the compressor for opening the control circuit to render it inoperative and for closing the throttle circuit to cause the first mentioned pressure sensitive means to operate to accelerate the engine from idling speed, the second mentioned pressure sensitive means being operative upon a predetermined increase in the pressure of fluid compressed by the compressor to open the throttle circuit to decelerate the engine and to close the control circuit when the engine has decelerated to substantially idling speed.

11. The combination with an engine driven compressor and generator and an electric circuit through which current generated by the generator may flow, of a pressure sensitive element operative for controlling the acceleration and deceleration of the engine, a magnet valve device for controlling the pressure of fluid to said pressure sensitive means, an electric circuit through which current is adapted to flow to operate said magnet valve device, and a switch device subject to fluid compressed by the compressor for controlling both of said circuits.

12. The combination with an engine driven compressor and generator and an electric circuit through which current generated by the generator may flow, of a control circuit for controlling the generator circuit, a pressure sensitive element operative for controlling the acceleration and deceleration of the engine, a magnet valve device for controlling the pressure of fluid to said pressure sensitive means, an electric throttle circuit through which current may flow to operate said magnet valve device, and a switch device subject to the pressure of fluid for controlling the control and throttle circuits.

13. The combination with an engine driven compressor and generator and a circuit through which current generated by the generator may flow, of a control circuit for effecting the opening and closing of said circuit, means for automatically controlling the speed of the engine, and means subject to the pressure of fluid compressed by the compressor for opening and closing said control circuit only when the engine is operating at a slow speed.

14. The combination with an engine driven compressor and generator and a circuit through which current generated by the generator may flow, of a control circuit for effecting the opening and closing of said circuit, means for maintaining said control

circuit closed when the pressure of fluid compressed by the compressor is above a predetermined degree, for opening said control circuit when the pressure of fluid compressed by the compressor is below said predetermined degree and for effecting the acceleration of said engine to increase the supply of fluid under pressure from said compressor.

15. The combination with an engine driven compressor and generator and a circuit through which current generated by the generator may flow, of a control circuit for effecting the opening and closing of said circuit, means for accelerating and decelerating the engine, an electric throttle circuit for controlling the operation of said means, pressure sensitive means for maintaining the control circuit open and the throttle circuit closed when the pressure of fluid compressed by the compressor is below a predetermined degree, and for opening said throttle circuit to effect the deceleration of the engine when the fluid compressed by the compressor has been increased to a predetermined degree, and means for controlling the operation of said pressure sensitive means so that the control circuit will be closed only after the pressure of fluid compressed by the compressor has been increased to said predetermined degree and the engine has been decelerated.

16. On a vehicle, the combination with an engine driven fluid compressor and an electric motor for driving the vehicle, of means for automatically speeding up the engine and thereby the speed of the compressor and means operated upon automatically speeding up the engine for preventing the supply of electric current to said motor.

In testimony whereof I have hereunto set my hand.

FREDERIC H. PARKE.