

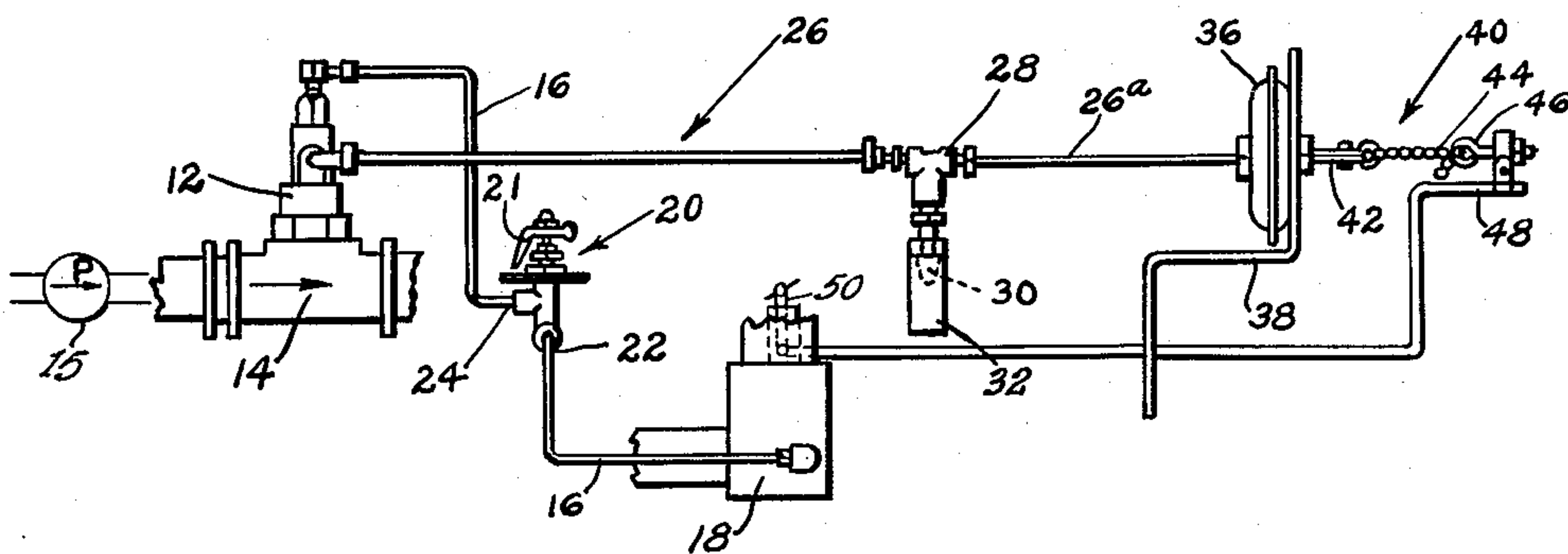
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FLUID-ACTUATED APPARATUS TO CONTROL MOTOR SPEED

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5 Claims. (Cl. 103-17)

This invention relates to apparatus, actuated by a fluid, whereby the speed of a motor can be controlled.

One object of my invention is to provide such apparatus having vacuum-creating means operably connected to a vacuum-operated, control member and throttle-control mechanism, and having restricting means in a vacuum-conduit line whereby the vacuum therein can be controlled to a fine degree.

Another object is to provide such apparatus having said restricting means, with a vacuum breaker, the restricting means being so set that it has at least a minimum opening that is sufficient to permit establishment of a vacuum that can overcome the effect of air entering said line through the vacuum breaker.

A further object is to provide parts that form said apparatus and to so operably arrange them that the installation of my apparatus in an automobile truck power mechanism, or the like, is relatively simple and inexpensive.

The foregoing and other objects which will appear as the nature of the invention is better understood, may be accomplished by a construction, combination and operative arrangement of parts such as is disclosed by the drawing. The nature of the invention is such as to render it susceptible to various changes and modifications, and, therefore, I am not to be limited to the construction disclosed by the drawing nor to the particular parts described in the specification; but am entitled to all such changes therefrom as fall within the scope of my claims.

In the drawing:

FIG. 1 is a diagrammatic view showing my apparatus operably connected to a fluid-actuated device that operates without an electric circuit.

As illustrated, my throttle control apparatus has a fluid-actuated, magnet device 12 responsive to fluid flow having a passage therein and that is operably connected to a fluid discharge conduit 14 communicating with a pump 15 and such as disclosed in my Patent No. 2,842,150, dated July 8, 1958. Communicating with said device 12 is a conduit 16 that communicates with the usual vacuum-creating means having a manifold 18 of an internal combustion motor of an auto truck.

In order to control the degree of vacuum in said conduit 16 I provide a vacuum restricting valve 20 therefor having the usual control mechanism 21 and having a lower opening 22 on the manifold side thereof which opening is closed when the valve is shut off. Said valve 20 also has an upper opening 24 on the device side thereof. This restricting valve 20 is used to control the speed of the pumping operation, as later explained.

A conduit 26 communicates with a vacuum breaker 28 which permits sufficient air to pass into said conduit 26 to break the vacuum when the pumping operation ceases thus relieving pull on a control diaphragm 36 and an arm 42 later described. This vacuum breaker 28 has a filter 30 and an open dust cover 32. Said conduit 26 continues preferably as a flexible hose 26a that communicates with a vacuum-operated member such as a control diaphragm 36 that is mounted on a bracket 38 and to which throttle control mechanism 40 is operably attached, having an arm 42 extending therefrom that is attached to a bead chain 44. The latter is attached to a connector 46 to which is connected a throttle rod 48 ex-

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tending to a carburetor 50 that governs the supply of gasoline or other fuel to an internal combustion motor.

When oil, for instance, is pumped by the motor, from a supply tank to a place of use, such as a heating apparatus storage tank, the fluid-actuated device 12 is actuated to thereby establish communication through the passage in the latter, through said conduits 16 and 26 and said manifold 18. Thus said vacuum operated member 36 is actuated and thereby said throttle control mechanism 40. This automatically speeds up the motor which accelerates the pumping operation.

Inasmuch as the number of gallons per minute that can be pumped into a storage tank varies, depending upon different conditions, I provide said vacuum-restricting valve 20 in said conduit 26 which can vary the degree of vacuum in the latter.

Since my apparatus is used by those unfamiliar with the details of its mode of operation, said restricting valve 20 is preferably so regulated as to always be open sufficiently so that the vacuum established in the passages in my apparatus will be sufficient to overcome the effect of said vacuum breaker. This makes certain that the throttle control mechanism can be actuated to some degree when my apparatus becomes operative.

What I claim is:

1. Fluid-actuated apparatus to control motor speed comprising a motor, fluid pumping means connected to said motor, fluid flow responsive valve means communicating with said pumping means, vacuum-creating means, a first conduit communicating with said valve means and said vacuum-creating means, a vacuum-operated control member, a second conduit communicating with the latter and with said valve means, governing means for said vacuum-creating means, throttle-control mechanism operably connected to said motor and to said governing means and operably connected to said vacuum-operated member whereby said mechanism is adapted to be actuated by said latter member, a restricting valve connected to said first conduit adapted to regulate the degree of vacuum in said first conduit, and a vacuum breaker communicating with said second conduit and adapted to introduce air into said second conduit, said valve means being responsive to the flow of fluid from said pumping means whereby the degree of vacuum in said first conduit can be controlled by said restricting valve.

2. Fluid-actuated apparatus to control motor speed comprising a motor, fluid pumping means connected to said motor, fluid flow responsive valve means having a passage therein, communicating with said pumping means, vacuum-creating means, a first conduit communicating with said valve means passage and said vacuum-creating means, a vacuum-operated control member, a second conduit communicating with the latter and with said valve means passage, governing means for said vacuum-creating means, throttle-control mechanism operably connected to said motor and to said governing means and operably connected to said vacuum-operated member whereby said mechanism is adapted to be actuated by said latter member, a restricting valve connected to one of said conduits adapted to regulate the degree of vacuum therein, and a vacuum breaker communicating with one of said conduits and adapted to introduce air into the latter, said valve means being responsive to the flow of fluid from said pumping means whereby the degree of vacuum in said first conduit can be controlled by said restricting valve.

3. Fluid-actuated apparatus to control motor speed comprising a motor, fluid pumping means connected to said motor, fluid flow responsive valve means communicating with said pumping means, vacuum-creating means, a first conduit communicating with said valve means and

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said vacuum-creating means, a vacuum-operated control member, a second conduit communicating with the latter and with said valve means, governing means for said vacuum-creating means, throttle-control mechanism operably connected to said motor and to said governing means and operably connected to said vacuum-operated member whereby said mechanism is adapted to be actuated by said latter member, a restricting valve connected to one of said conduits adapted to regulate the degree of vacuum therein, and a vacuum breaker communicating with one of said conduits and adapted to introduce air into the latter, said restricting valve being so regulated that in its most restricted position the vacuum established there-through is sufficient to overcome the effect of air passing through said breaker, said valve means being responsive to the flow of fluid from said pumping means whereby the degree of vacuum in said first conduit can be controlled by said restricting valve.

4. Fluid-actuated apparatus to control motor speed comprising a motor, fluid pumping means connected to said motor, fluid flow responsive valve means having a passage therein communicating with said pumping means, vacuum-creating means, a first conduit communicating with said valve means passage and said vacuum-creating means, a vacuum-operated control member, a second conduit communicating with the latter and with said valve means, governing means for said vacuum-creating means, throttle-control mechanism operably connected to said motor and to said governing means and operably connected to said vacuum-operated member whereby said mechanism is adapted to be actuated by said latter member, a restricting valve connected to said first conduit adapted to regulate the degree of vacuum in said first

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conduit, and having a lower opening communicating with a portion of said first conduit and with said vacuum-creating means and having an upper opening communicating with a portion of said first conduit and said passage in said valve means, said valve means being responsive to the flow of fluid from said pumping means whereby the degree of vacuum in said first conduit can be controlled by said restricting valve.

5. Fluid-actuated apparatus to control motor speed comprising a motor, fluid pumping means connected to said motor, fluid flow responsive valve means communicating with said pumping means, vacuum-creating means, a vacuum-operated control member, conduit means communicating with said valve means, said vacuum-creating means, and said vacuum-operated member, governing means for said vacuum-creating means, throttle-control mechanism operably connected to said governing means and operably connected to said vacuum-operated member whereby said mechanism is adapted to be actuated by said latter member, a restricting valve operably connected to said conduit means adapted to regulate the degree of vacuum in the latter, and a vacuum breaker communicating with said conduit means and adapted to introduce air into the latter, said valve means being responsive to the flow of fluid from said pumping means whereby the degree of vacuum in said conduit means can be controlled by said restricting valve.

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