

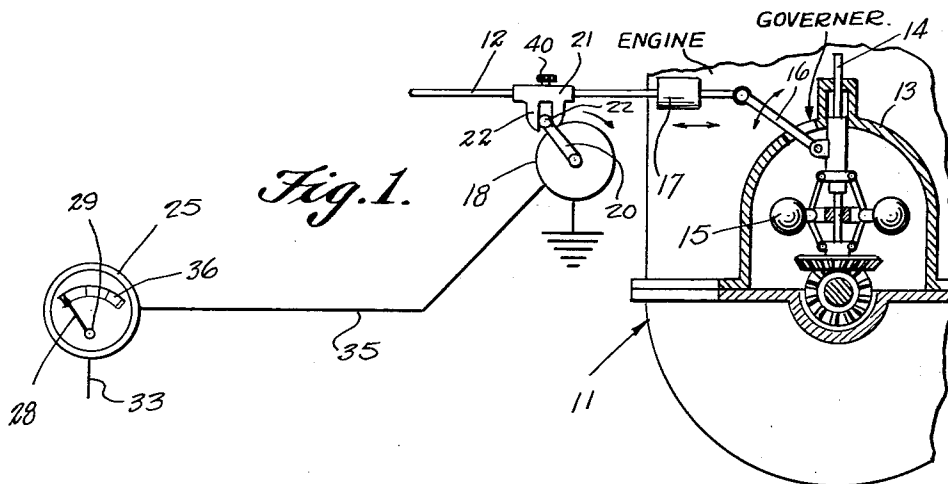
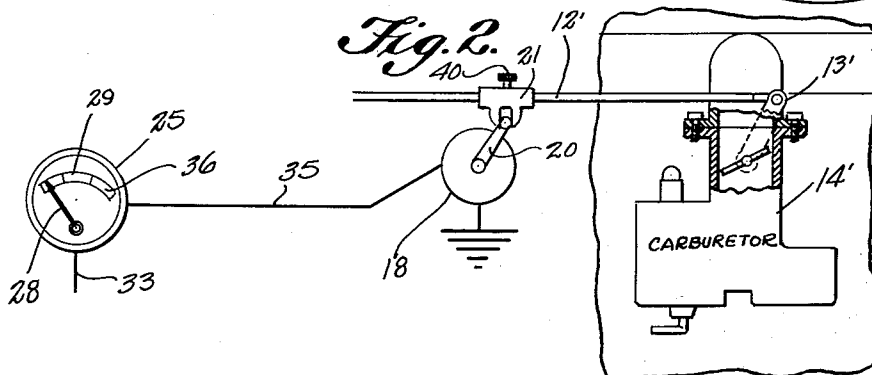
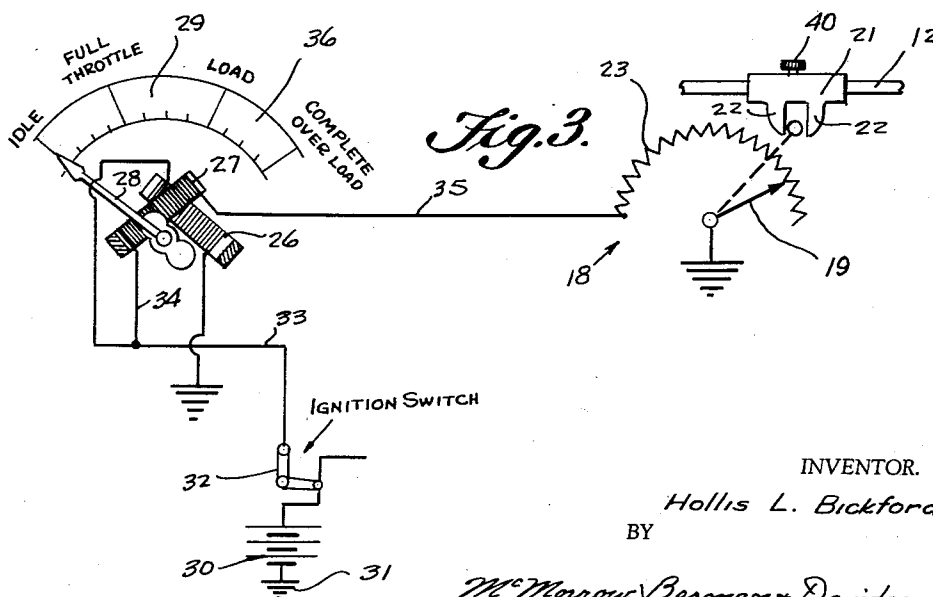
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OVERLOAD DETECTOR

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2,979,704

OVERLOAD DETECTOR

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1 Claim. (Cl. 340—177)

This invention relates to fuel feeding systems, and more particularly to an overload detecting device for an engine.

A main object of the invention is to provide a novel and improved overload detector for an engine of the type employing liquid fuel, the detector being simple in construction, being easy to install, and being reliable in operation.

A further object of the invention is to provide an improved fuel feed indicator for a fuel supply system, for example, for a fuel supply system of an internal combustion engine, the indicator being calibrated to show when the engine is taking excessive fuel and is overloaded, the indicator involving inexpensive components, being compact in size, and involving only a few parts.

Further objects and advantages of the invention will become apparent from the following description and claim, and from the accompanying drawings, wherein:

Figure 1 is a diagrammatic view showing an improved overload detector according to the present invention, shown installed in an engine provided with a governor and illustrating the manner in which the rheostat member of the device is operated by the throttle control rod of the engine.

Figure 2 is a diagrammatic view similar to Figure 1, showing the manner in which the device is installed so as to be operated by the throttle control rod of an internal combustion engine.

Figure 3 is a schematic view showing the electrical connections employed in an overload detecting system such as the systems illustrated in Figures 1 and 2.

Referring to the drawings, 11 generally designates an engine of the type operated by the combustion of liquid fuel, the engine being provided with a throttle control rod 12 which is in turn actuated by a conventional governor 13, the governor comprising a vertically movable rod 14 which is centrifugally actuated by the governor balls 15 connected in a well known manner to the rod 14 and responding to speed conditions to move the rod 14 up or down in accordance in changes of speed of the engine. Thus, when the engine speed exceeds a predetermined amount, the balls 15 are moved outwardly by centrifugal force, moving the rod 14 downwardly and moving control rod 12 toward the right, as viewed in Figure 1, namely, in a direction to reduce the fuel supply. The rod 14 is connected by a link member 16 to the end of the throttle control rod 12, the throttle control rod being slidably supported in a suitable bracket 17 mounted on the engine frame, whereby the vertical movement of the governor rod 14 moves the control rod 12 in a manner to control the throttle of the engine and thus regulate its speed.

Designated at 18 is a rheostat mounted on a suitable stationary part of the engine, said rheostat having a movable contact arm 19 which is mounted on a rotatable shaft journaled in the housing of the rheostat 18, the external end of said shaft having secured thereto a radially extending actuating arm 20. Secured to the throttle con-

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trol rod 12 is a yoke member 21 having the depending spaced yoke arms 22, 22 receiving therebetween the end of the rheostat actuating arm 20, whereby movement of the throttle control rod 12 causes the rheostat actuating arm 20 to rotate and to move the internal contact arm 19 along the rheostat winding, shown at 23 in the wiring diagram of Figure 3.

The rheostat 18 is connected between the frame of the engine 11 and one terminal of a galvanometer-type instrument, designated generally at 25, said instrument comprising a stationary coil 26, a movable coil 27 magnetically coupled to the stationary coil and pivotally mounted to rotate relative thereto, the movable coil carrying an indicating pointer 28 movable relative to an arcuate scale 29. Designated at 30 is a suitable source of current, for example, the battery associated with the engine 11, which may be employed to energize the ignition system of the engine. One terminal of the battery 30 is grounded to the engine frame, as shown at 31. The other end of the battery is connected through an ignition switch 32 to a wire 33. The stationary coil 26 is connected between the wire 33 and the engine frame, whereby coil 26 is continuously energized by battery 30 when the ignition switch 32 is closed. One terminal of the moving coil 27 is connected by a wire 34 to the battery wire 33, and the other terminal of coil 27 is connected by a wire 35 to the ungrounded terminal of rheostat 18.

The scale 29 of the meter 25 is suitably calibrated in accordance with different rates of fuel supply, namely, in accordance with the different positions of the throttle control rod 12. Thus, the scale 29 includes a region 36 corresponding to overload conditions of the engine, namely, conditions where fuel is being delivered at an excessive rate to the engine.

The meter 25 is mounted in a suitable position easily visible to the operator of the engine, for example, if the engine is employed on a vehicle, the meter 25 may be mounted on the vehicle dashboard. When the engine is being overloaded, namely, when control rod 12 is moved to the left, as viewed in Figure 1, as a result of slowing down of the engine by excessive load, the resistance of rheostat 18 decreases and the pointer 28 will swing to the overload region 36 on the meter, whereby the operator will be aware of the overload conditions and will be able to take the necessary steps to correct the same.

The overload indicator may also be employed on an engine of the conventional type employed in motor vehicles, for example, an engine provided with a throttle control rod 12' which is connected to the throttle link 13' of the engine carburetor 14'. The yoke member 21, shown in Figure 2, is mounted on the control rod 12', being rigidly secured thereto at a suitable position on the control rod. The yoke member 21 is provided with a thumb screw 40 which may be tightened to securely clamp the yoke member in a selected position on the control rod 12'.

As in the previously described application of the invention, the yoke member 21 receives the end of the rheostat operating arm 20, whereby movement of the control rod 12' rotates the arm 20 and thus rotates the internal contact arm 19 of the rheostat. The rheostat is connected in series with the ungrounded terminal of the battery associated with the vehicle and the moving coil of the meter 25, these elements being thus connected in a series circuit in which the current through the moving coil 27 of the meter varies in accordance with the rotation of the contact arm 19 of the rheostat. Thus, when the throttle control rod 12' is moved to the left as viewed in Figure 2, to a position allowing excessive fuel to be furnished to the engine through the carburetor 14', the rheostat contact arm 19 is rotated to a position reducing the rheostat resistance so that the coil 27 receives relatively large cur-

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rent, causing the pointer 28 to swing to the overload region 36 of the meter scale. As in the arrangement illustrated in Figure 1, the operator may thus observe the fuel supply conditions of the engine at all times and will be instantly notified when excessive fuel is being delivered to the engine, whereby the engine is being overloaded.

While a specific embodiment of a fuel feed indicator and overload detector for a fuel supply system has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore it is intended that no limitations be placed on the invention except as defined by the scope of the appended claim.

What is claimed is:

In a fuel system for an engine, the combination of a rectilinearly movable throttle control rod controlling the rate of supply of fuel to the engine, a stationary rheostat mounted on the engine adjacent said throttle control rod, said rheostat having a rotatable contact arm, a crank arm rigidly connected to said contact arm, a yoke member ad-

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justably secured to said throttle control rod and slidably and rotatably receiving the end of said crank arm in driving engagement therewith, mechanically coupling said contact arm to a selected portion of said throttle control rod, a remotely located meter, a source of current, and means connecting said meter, rheostat and source of current in circuit, whereby said meter provides a fuel supply rate indication in accordance with the position of said throttle control rod, and whereby said meter will indicate excess fuel consumption corresponding to overloading of the engine.

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