July 6, 1948. A. L. OBERBECK ET AL 2,444,665

INTERNAL-COMBUSTION ENGINE

Filed March 7, 1947 2 Sheets-Sheet 1

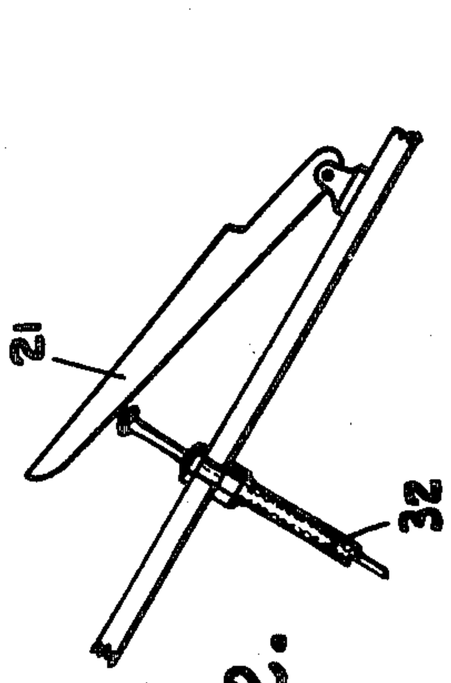

Fig 2.

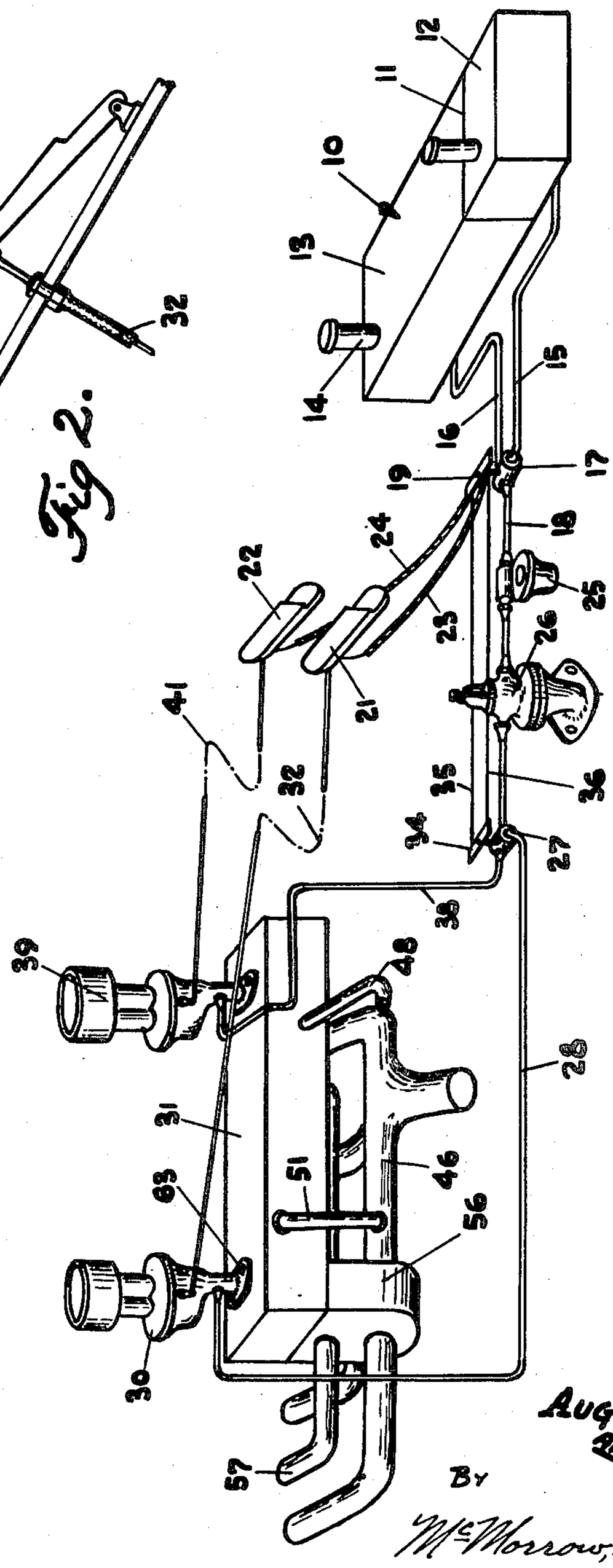

Fig 1.

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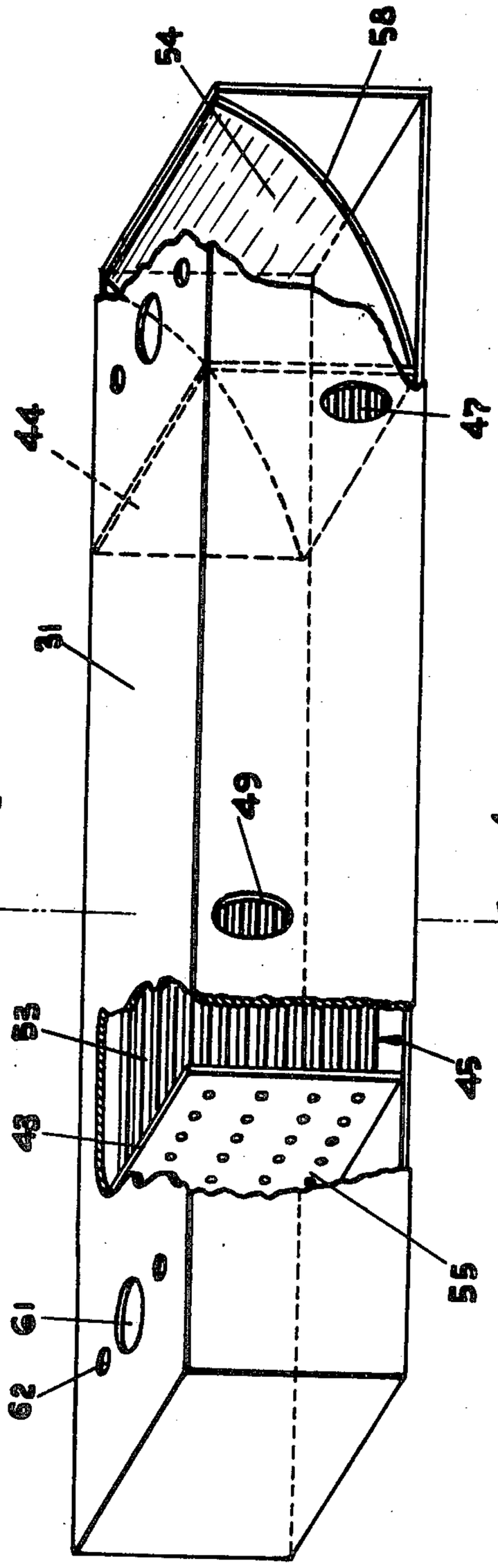

Fig 3

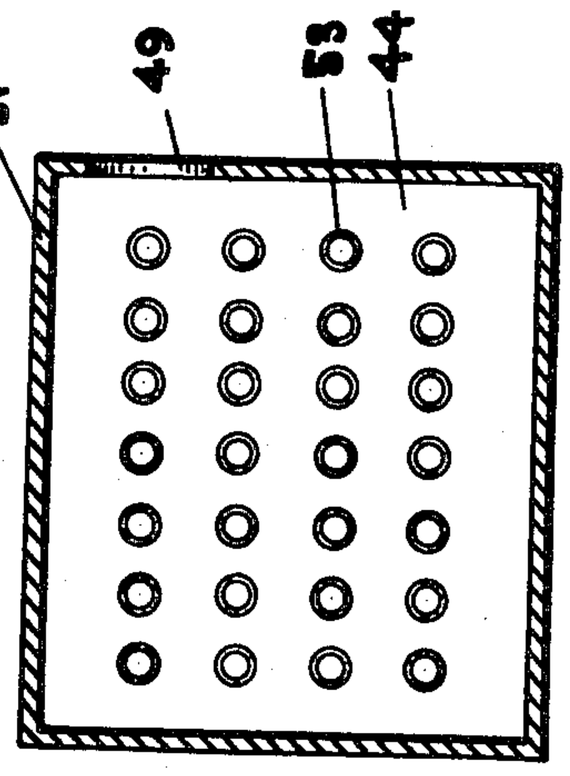

Fig 4

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UNITED STATES PATENT OFFICE

2,444,665

INTERNAL-COMBUSTION ENGINE

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Application March 7, 1947, Serial No. 733,256

3 Claims. (Cl. 123—127)

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This invention relates to fuel systems for internal combustion engines.

It is an object of the present invention to provide a dual fuel system for internal combustion engines wherein the selection of one fuel or the other is effected automatically upon selecting one or the other of two accelerator pedals located in the driver's space of a motor vehicle.

It is another object of the present invention to provide a common vaporizer for the different fuels which is adapted to be mounted above the engine and have located thereon two different carburetors, one for gasoline and the other for fuel oil such as kerosene.

It is another object of the invention to provide a fuel tank which has two compartments, one for each of the different fuels and a pipe line system wherein the same fuel pump and filter can be utilized for the two fuels.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which

Figure 1 is a diagrammatic view showing the fuel piping system, the accelerator pedals, the two compartment fuel supply tank, engine manifolds, a common vaporizer with dual carburetors connected to the top thereof,

Figure 2 is a detail cross-sectional view taken of a floor board and showing an accelerator bearing upon the headed end of a push-and-pull wire,

Figure 3 is a perspective view of a vaporizer with parts broken away to show the heated fire tubes,

Figure 4 is an enlarged cross-sectional view taken transversely through the vaporizer to show in section the several fire tubes and as viewed along the line 4—4 of Figure 3 and looking in the direction of the arrows thereof.

Referring now to the drawing, 10 represents a fuel tank having a partition 11 therein to provide a small compartment 12 for gasoline and a large compartment 13 for fuel oil. These compartments are filled through capped filling tubes 14. Leading from these compartments are pipes 15 and 16 which connect with a selector valve 17 adapted to direct the fuel from either one of the pipes 15 or 16 to a common pipe line 18 depending upon which way the cross arm 19 of the selector valve is turned.

Dual accelerator pedals 21 and 22 are connected respectively by cables 23 and 24 to opposite ends of the cross arm 19. If the accelerator pedal 21 is being used the cross arm 19 is pulled by the cable 23 and gasoline is directed from the

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pipe line 16 to the pipe 18. Gasoline is used for the initial warming up of the engine. Gasoline from pipe 18 at first passes through filter 25 before entering pump 26 which will force the gasoline through a selector valve 27 to pipe line 28 and to carburetor 30 mounted on the top of a vaporizer 31 and operated by a push-and-pull wire 32 connected with the accelerator pedal 21. The selector valve 27 has a transverse bar 34 adapted to be operated from the bar 19 of the selector valve 17 by means of coupled wires 35 and 36. Thus when the selector valve 17 is operated by the foot pedal 21 the selector valve 27 will be correspondingly adjusted.

After the engine has become warmed up, the operator of the vehicle will shift his foot to the accelerator pedal 22 whereby to pull on cable 24 to condition the selector valves 17 and 27 for reception of fuel oil such as kerosene from pipe lines 16 and compartment 13. The selector valve 27 is connected by a pipe line 38 with a fuel oil carburetor 39 mounted on the opposite end of the vaporizer from the gasoline carburetor 30 and adjusted by a push-and-pull cable 41 connected with the accelerator pedal 22.

The vaporizer 31 has partition walls 43 and 44 longitudinally spaced from one another to provide a gas chamber 45 for receiving the heating exhaust gases from an exhaust manifold 46 connected to inlet opening 47 in the vaporizer by a pipe 48 and to an outlet opening 49 in the vaporizer by a pipe 51. Between the partition walls there are connected a plurality of fire tubes 53 which are heated by the incoming exhaust gases and which serve to conduct fuel vapors leaving carburetor 39 and from a chamber 54 to the opposite end of the vaporizer and to a chamber 55 connected by a heated depending housing 56 to an intake manifold 57 of an internal combustion engine. In order to deflect the incoming gases from the carburetor 39 and direct them to the ends of the tubes 52 there is provided a forwardly and downwardly inclined baffle 58 within chamber 54.

Openings 61 serve to connect the carburetor outlet with the interior of the vaporizer. Bolt holes 62 at opposite sides of the opening 61 serve to receive bolts 63 by which the carburetor is held in an upright position on the top of the vaporizer.

Having now described our invention, we claim:

1. A dual fuel system for internal combustion engines comprising fuel compartments having different fuels, a pair of carburetors connected with an intake manifold of an engine, dual accelerator pedals connected respectively to the car-

buretors to operate the same, a fluid pressure supply arrangement for delivering fuel oil to the carburetors including selector valve means, and connection means between the respective foot pedals and the selector valve means for automatically causing the diversion of the selected fuel depending upon which accelerator is operated.

2. A dual fuel system for internal combustion engines comprising fuel compartments having different fuels, a pair of carburetors connected with an intake manifold of an engine, dual accelerator pedals connected respectively to the carburetors to operate the same, a fluid pressure supply arrangement for delivering fuel oil to the carburetors including selector valve means, and connection means between the respective foot pedals and the selector valve means for automatically causing the diversion of the selected fuel depending upon which accelerator is operated, said fluid pressure supply arrangement including a fluid pump and filter and said selector valve means including two selector valves one for directing one or the other of the fuels to the filter and pump and the other selector valve serving to divert the fuel leaving the pump to one or the other of the carburetors.

3. A dual fuel system for internal combustion engines comprising fuel compartments having

different fuels, a pair of carburetors connected with an intake manifold of an engine, one of said carburetors being adapted to receive a volatile fuel and the other of said carburetors being adapted to receive a less volatile fuel, dual accelerator pedals connected respectively to the carburetors to operate the same, a fluid pressure supply arrangement for delivering fuel oil to the carburetors including selector valve means, and connection means between the respective foot pedals and the selector valve means for automatically causing the diversion of the selected fuel depending upon which accelerator is operated, a vaporizer adapted to be connected to an exhaust manifold to receive and return heating exhaust gases, both of said carburetors being mounted upon the vaporizer, a depending housing extending from the vaporizer and connected with an intake manifold, said carburetor for the volatile fuel being mounted on the vaporizer adjacent the depending housing and said carburetor for the less volatile fuel being connected to the opposite end of the vaporizer whereby fuel gases are required to pass longitudinally through the heated chamber of the vaporizer.

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