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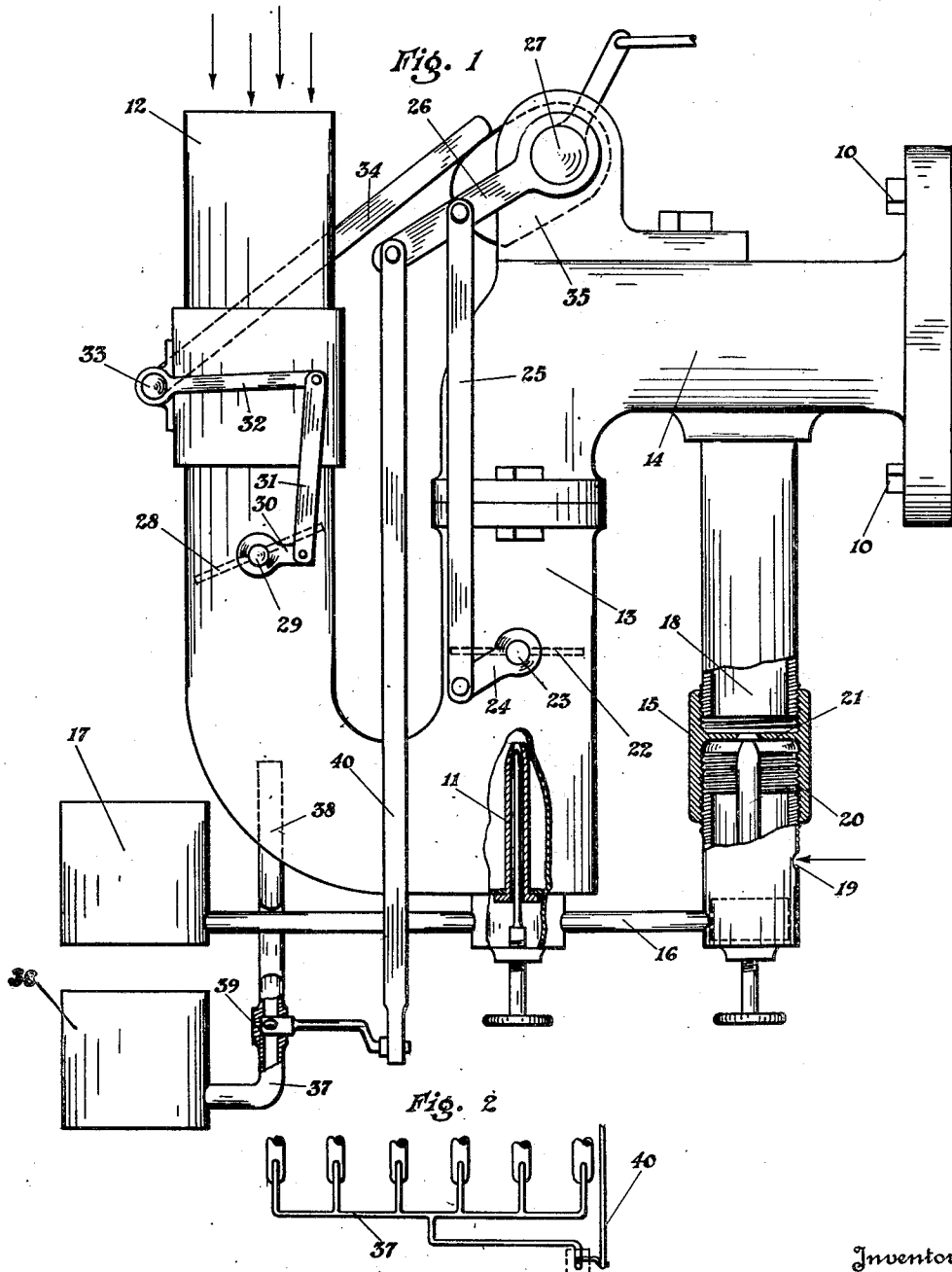
J. E. HARRIS

1,920,174

CARBURETOR

Filed June 22, 1931

2 Sheets-Sheet 1



Inventor

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By

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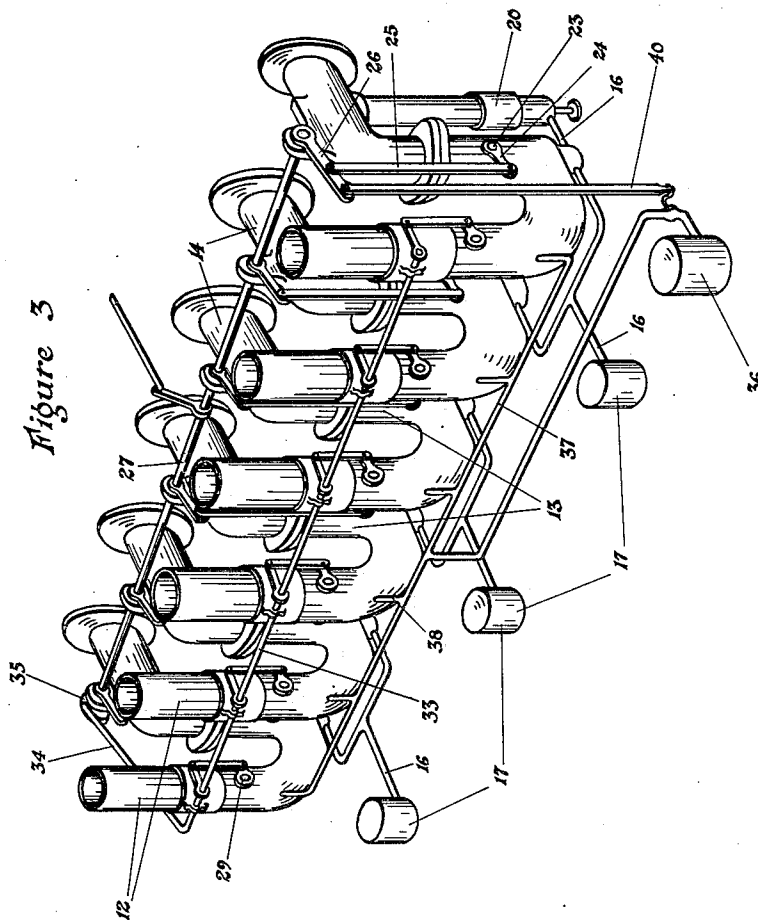
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UNITED STATES PATENT OFFICE

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CARBURETOR

James E. Harris, Central City, Nebr.

Application June 22, 1931. Serial No. 546,138

5 Claims. (Cl. 261—18.)

My invention relates to carburetors but more exclusively to carburetors employing heavy hydrocarbon fuels for use in motors used by railroads.

5 One object of the invention is the provision of throttle and choke valves with actuating mechanism so that the opening of the throttle valve will automatically open the choke valve but at a different rate of speed.

10 Another of my objects is the provision of an idling jet in the carburetor together with means for regulating the amount of air entering the carburetor at the idling jet.

Another of my objects is the provision of an 15 air moistening system for moistening the air of a plurality of carburetor units, the operation being automatic on the actuation of the throttle valve.

Another object which I have in view is the 20 provision of mechanism for actuating the throttle valves of a battery of carburetors uniformly and together with means for automatically and simultaneously actuating the choke valves and the water valves.

25 Having in view these objects and others which will be pointed out in the following description, I will now refer to the drawings, in which

Figure 1 is a view in side elevation of the carburetor, parts being broken away to disclose interior structures.

30 Figure 2 is a diagrammatic view showing the arrangement of the moistening device for feeding a plurality of cylinders.

Figure 3 is a perspective view showing a battery of carburetor units.

35 The present carburetor is designed for use with a motor for doing heavy duty work such as the motors used in driving the vehicles commonly known as "motors" on railroads. The carburetor is also designed for the operation of the motor on a heavy hydrocarbon fuel such as distillate or kerosene. Since the motor is provided with a battery of cylinders it is necessary that the carburetor be in the form of as many units as there 40 are cylinders in the motor and it is also necessary that the actuation of all of the units be simultaneous.

Figure 1 shows one unit of the carburetor which is adapted to be secured to the motor by 50 means of bolts 10 or the like. The main fuel jet is shown at 11, the air intake at 12, the mixing chamber at 13, and the passageway for the mixture to the cylinder at 14. All of the units are alike in these respects. Each unit also has 55 an idling jet at 15. The fuel feed line to the

unit is shown at 16 for conducting the fuel from any suitable fuel reservoir such as that shown conventionally at 17. The arrangement is such that all of the units of the carburetor receive their fuel from the same fuel container 17. This 60 arrangement may, however, be varied in numerous ways by employing a plurality of fuel tanks each of which is connected to one or more carburetor units as shown for example in Figure 3 where each fuel tank feeds two carburetor units. 65

The idling jet 15 is in the form of a needle valve positioned within the chamber 18. Air is drawn into this chamber in limited quantities through the aperture 19. The upward passage of the air from air inlet 19 in the chamber 18 draws 70 out the fuel through the valve 15 and the air and fuel then become mixed to form the explosive gas which is conducted into the cylinder. By shutting off the air supply which would enter through the aperture 19, the passage of the fuel 75 through the needle valve 15 would also be shut off. For this purpose I have provided a collar 20 having an apertured septum 21. The central aperture is so shaped and dimensioned that it seats readily over the end of the fuel jet of the 80 needle valve to thereby stop the passage of air. The collar 20 is screw threaded for engagement with the screw threaded ends of the walls of the chamber 18. The collar 20 may be knurled on its outer surface or otherwise provided with means 85 so that it may be engaged by the operator's fingers to turn the collar. It will be readily apparent that the turning of the collar in one direction will move the septum 21 downwardly on to its seat on the fuel jet of the needle valve and that move- 90 ment in the other direction will cause the septum 21 to move away from the fuel jet so that air can freely pass through the central aperture of the septum to be mixed with the fuel leaving the needle valve. 95

The main throttle is shown in dotted lines at 22. This throttle is provided with a shaft 23 having an arm 24. At the outer extremity of the arm 24 is a link 25 extending upwardly and connected with the arm 26 of the shaft 27. When 100 the throttle 22 is in its closed position as shown in dotted lines no air can pass through and consequently no fuel can leave the needle valve 11. The air inlet chamber is also provided with an automatic choke shown in dotted lines at 28. 105 This also has a shaft 29 with an arm 30 connected to a link 31 which in turn is connected to an arm 32 on the shaft 33. Also secured to the shaft 33 but at the opposite extremity thereof is an arm 34 which lies in the path of the cam 35 at the 110

opposite extremity of the shaft 27. The rocking of the shaft 27 will therefore not only open the throttle 22 but it will also open the throttle 28, the operation being entirely automatic. The shape of the cam 35 and the arrangement of the linkage are such that the initial movement of the shaft 27 will result in very slow movement of the throttle 28 as compared with the movement of the throttle 22. As the cam 35 approaches the end of its movement, the rocking of the lever arm 34 will be much more rapid to thus increase the rapidity of opening of the throttle 28.

It is desirable that moisture be introduced into the fuel mixture and this is especially desirable in the use of heavy fuels. The water for moistening the mixture may be taken from the expansion tank or it may be taken from a special receptacle such as that shown conventionally at 36. This has a water line 37 connected individually with each of the carburetor units through branches 38. In order to more equally distribute the pressure it is desirable that the water be introduced into the water line at or near its middle point as shown in Figure 2. The branches 38 terminate within the air chamber where the water is subjected to the suction of the inflowing stream of air. The water line is also provided with an automatic valve 39 which is connected through a link 40 with the lever arm 26 as shown in Figure 1.

Having thus described my invention in such full, clear, and exact terms that its construction and operation will be readily understood by others skilled in the art to which it pertains, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A carburetor including an air conduit for connection with a cylinder of an explosion engine, a main fuel jet within said conduit, a vertical tubular chamber communicating with said conduit, an idling jet within said chamber, said chamber being provided with an aperture for admitting air to said idling jet, and a septum within said chamber and movably adjustable in an up and down direction, said septum being provided with an aperture for receiving the upper end portion of said idling jet for preventing the admission of air thereto.

2. A carburetor including an air conduit for connection with a cylinder of an explosion engine, a main fuel jet within said conduit, a vertical tubular chamber communicating with said conduit, an idling jet within said chamber, said chamber being provided with an aperture for

admitting air to said idling jet, the walls of said chamber having an upper part and a lower part with their contiguous extremities in proximity to the mouth of said idling jet, a vertically adjustable collar surrounding the contiguous extremities of the walls of said chamber, and an apertured septum adapted to be seated against the outer wall of said idling jet for preventing the admission of air thereto.

3. A carburetor including an air conduit for connection with a cylinder of an explosion engine, a fuel jet within said conduit, a throttle valve within said conduit in the rear of said fuel jet, a water line having a discharge outlet within said conduit between said choke valve and said fuel jet, a valve for said water line, and operating mechanism between said throttle valve and said choke valve and said valve in said water line for simultaneous actuation thereof.

4. A carburetor including an air conduit for connection with a cylinder of an explosion engine, a fuel jet within said conduit, a throttle valve within said conduit above said fuel jet, a choke valve within said conduit in the rear of said fuel jet, a water line having a discharge outlet within said conduit between said choke valve and said fuel jet, a valve in said water line, operating mechanism between said throttle valve and said choke valve and said valve in said water line for simultaneous actuation thereof, and an idling jet within said conduit and positioned between said throttle valve and the outlet of said conduit.

5. A carburetor including a plurality of carburetor units, each of said units comprising an air conduit for connection with a cylinder of an explosion engine, a fuel jet and a water jet within said conduit, a throttle valve within said conduit above said fuel jet, and a choke valve within said conduit in the rear of said fuel jet, a water line for the water jets of all of said units, a valve in said water line, means for simultaneously opening or closing the throttle valves of all of said units, operating connections between said means and the choke valves of all of said units for causing said choke valves to open at first slowly and then rapidly as compared with the opening movement of said throttle valves, and operating connections between said means and said valve in said water line for automatically opening said water valve in said water line when said throttle valve is being opened.

JAMES E. HARRIS.