(No Model.)

S. TURNER.

HYDROCARBON BURNER.

No. 419,738. Patented Jan. 21, 1890.

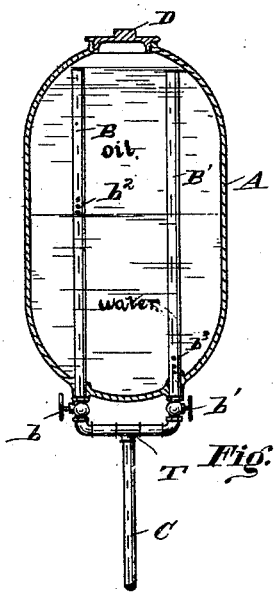

Fig. 2.

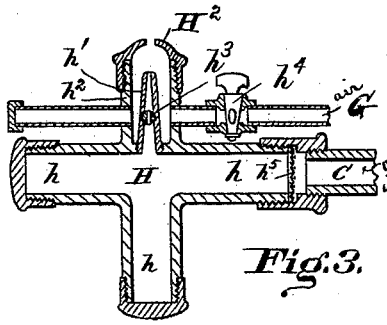

Fig. 3.

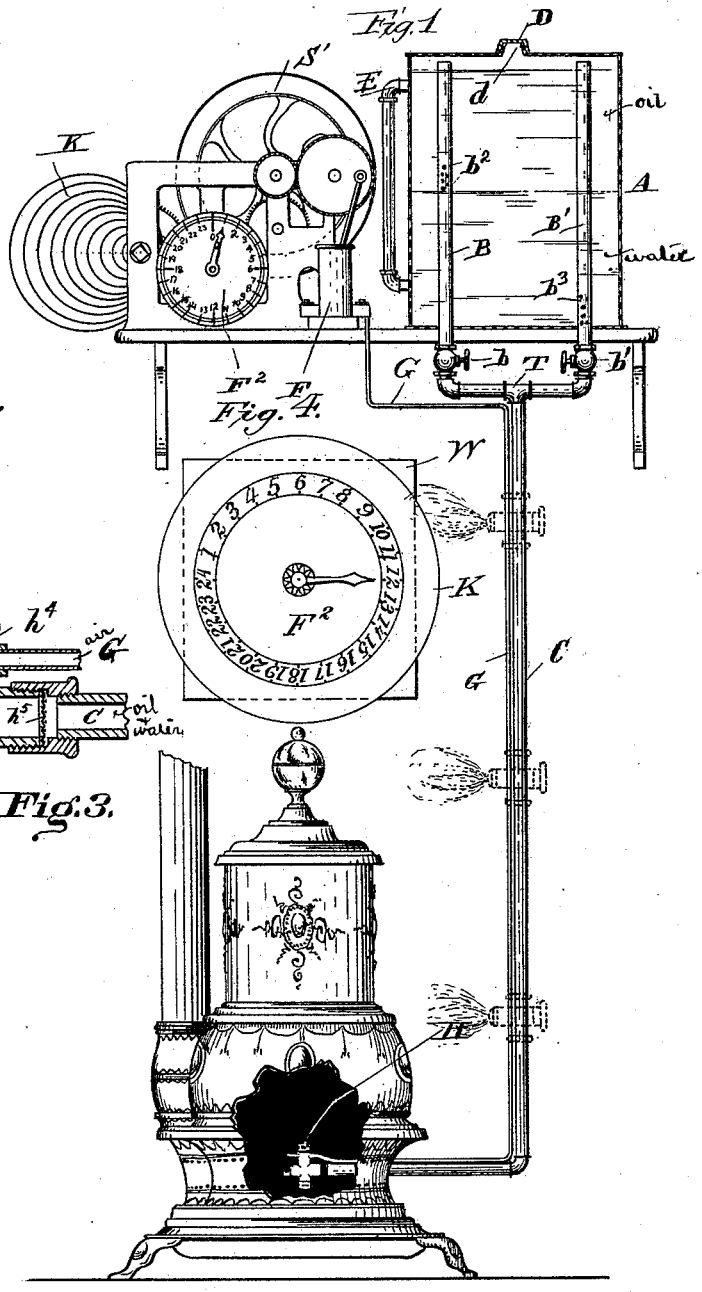

Fig. 4.

Attest.
Gideon C. Wilson
G. H. Paver.

Inventor.
Samuel Turner
per Wm. Hubbell Fisher,
Atty.

UNITED STATES PATENT OFFICE.

SAMUEL TURNER, OF CINCINNATI, OHIO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 419,738, dated January 21, 1890.

Application filed December 12, 1887. Serial No. 257,598. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL TURNER, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Hydrocarbon-Burners and Means for Supplying the Same with Air, Oil, and Water, of which the following is a specification.

The several features of my invention and the advantages arising from their use conjointly and otherwise will be apparent from the following description.

In the accompanying drawings, Figure 1 represents the device as applied to heating apartments and buidings of all grades, being partly in elevation and partly in section. In Fig. 1 the spring K is too small to well operate the mechanism such as described by S′ and F therein shown. The proper relative size of the said mechanism is shown in Fig. 5, in which F is an enlarged dial, and K is the box containing the enlarged spring, filling the entire box, and the rest of the mechanism (shown to the left of the cylinder A in Fig. 1) is contained with the rectangular box or casing A.

Fig. 2 represents the form of a tank for railway-cars. It is desirable that this tank be especially strong. It is preferably made of wrought-iron and of cylindrical form. In the event of accident to the cars or train, whatever position the cylinder be placed in or assumes, the oil therein being above and the water beneath, the latter, in case of breakage, would first escape, and the flame of the burner be instantly extinguished. By derangement of any of the operative parts of the device the flame will be extinguished, the fuel being no longer atomized.

Fig. 3 is a central vertical section of my new form of atomizer.

Fig. 4 shows the dial and spring in their proper relative proportion to the gear which are shown in Fig. 1, and which are contained in the box W. The tank A is provided with two pipes B B′, which project upward through the tank and may pass through the top. These two pipes B B′ connect by a T-coupling outside with a single pipe C. Before uniting with pipe C each pipe B B′ is provided with a stop-cock or valve marked *b* *b*′, the stop-cocks being preferably located outside of tank A in a portion easily reached and operated.

Within the tank the pipe B is provided with orifices located in the lower portion of the column of oil in the tank. As the bottom of the column of oil is preferably at the vertical center of the tank, these orifices b^2 will preferably be located just above the center. The other pipe B′ has similar orifices located in the lower or basal portion of the column of water in the tank. As the bottom of the column of water in the tank is preferably at the bottom of the tank, these orifices b^3 will preferably be located a little above the bottom of the tank. The opening in the top of the tank is provided with a cover D. A glass tubular gage E is preferably on the outside of the tank, to indicate the quantity of water in the tank.

The tank A may be placed on a shelf against the wall or other suitable support. The whole should be covered by the dial and case, giving the appearance of a clock. On the same shelf or support may be placed the blast-pump. The preferable means for operating this pump F is in the present illustrative instance clock-work.* The air-pipe G leads from the pump F to the atomizer or burner H, which it enters. The pipe C also enters the burner H. To regulate the clock-work, a fly-wheel S is preferably provided, put in motion by a spring K or other motive power. The parts are so adjusted that when the spring is wound up the index-hand will indicate on the dial F^2 the number of hours the device will run. In practice this dial, as before remarked, is preferably made large enough to conceal the pump and clock-work, so that the device on the shelf will appear like an ordinary clock. The clock-work for operating the pump, &c., may be operated by steam-power or power other than spring, and proper connections to such power—as, for example, belts and pulleys—may be employed.

The preferred form for burner is illustrated in Fig. 3. The pipe C is attached to one of the arms *h* of the cross H, the other two arms *h* being closed by caps. The nozzle *h*′ leads from the cavity of the cross H into the cavity

of the arm h^2. The nozzle h' is provided with a regulating-cock h^3. The arm h^2 is covered by the perforated cap H^2. The air-pipe communicates with the cavity of the arm h^2, and is provided with a regulating-cock h^4. Over the end of the entrance-arm h there is preferably placed a wire strainer h^5. When additional burners or atomizers are to be put upon a single line of extended pipe, connections may be made with one or other of the arms h, (shown capped in the drawings,) with the portion of pipe F leading away from arm H^2. When the mixed oil and water are to be drawn up from below, the pipe C is preferably attached to the vertical arm h.

When the pipe C passes vertically through several stories of building, a suitable burner or atomizer may be connected thereto at each story, substantially as shown in Fig. 1.

The mode of operation of the device is as follows: The tank A is filled with oil and water in such proportions that the water reaches the bottom of the openings b^2, while the oil floats on it. The cocks b b' are now opened to a greater or less extent. The water at the bottom passes through the openings b^3, and the oil at the top passes through the openings b^2 into pipe B. In this way a mixture of oil and water passes down through the pipe C to the atomizer H, where combustion occurs. The relative proportions of oil and water admitted through the pipe C can be regulated by the stop-cocks b b'. The air-pump F now being brought into operation, a blast of air is forced into the atomizer and assists materially in causing a complete combustion of the fuel. The blast of air is sufficiently strong to produce considerable suction, so that the mixture of oil and water could be siphoned by means of it from a point below the atomizer, if necessary.

When the device is used in railroad-trains, it is desirable that the oil-and-water tank should be made especially strong. For this reason the form with rounded ends shown in Fig. 2 is preferred.

One feature of this device which renders it particularly applicable for use in railway service is the direct relation borne to each other by the oil and water. In whatever position the tank may be the oil will be uppermost and the water below; hence in case of accident and breakage of the tank the water, being the lowest in the tank, would in most cases first escape and serve to aid in extinguishing any fire which had been communicated to the wood-work or other inflammable portions of the car.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the oil and water receptacle or tank A, containing oil-exit pipe B, provided with upper oil-passages b^2 above the water-line, and also containing water-exit pipe B′, provided with lower water-passages b^3 below the water-line, pipe C, connected at one end to the oil and water exit pipes B B′ and at the other end to the burner, and the burner, substantially as and for the purposes specified.

2. The combination of the oil and water receptacle or tank A, the oil-exit pipe B, having the upper oil-passages b^2 above the water-line, and water-exit pipe B′, having lower passages b^3 below the water-line, pipe C, connected at one end to the oil and water exit pipes B B′ and at the other end to the burner, and pipe G, connected at one end to the pump and at the other end to the burner, pump F, and burner, substantially as and for the purposes specified.

3. The combination of the oil and water receptacle A, containing oil-exit pipe B and water-exit pipe B′, the pipe B provided with oil-exit passages b^2 and the pipe B′ having water-exit passages b^3, the passages b^2 being above the water-line and the passages b^3 being below the water-line, regulating-cocks b b', located in pipes B B′, respectively, pipe C, connected at one end to the oil and water exit pipes B B′ and at the other end to the burner, air-pump F, pipe G, connected at one end to the pump and at the other end to the burner, burner H, clock-work, and indicating-dial, substantially as and for the purposes specified.

4. The combination of the oil and water receptacle A, containing the vertical exit oil-pipe B and the vertical exit water-pipe B′, the pipe B provided with oil-passages b^2 and the pipe B′ provided with passages b^3 below the water-line, regulating-cocks b b', located in pipes B B′, respectively, pipe C, connected at one end to the oil and water exit pipes B B′ and at the other end to the burner, elbow T, connecting pipes B and B′ to pipe C, pipe G, connected at one end to the pump and at the other end to the burner, and the atomizer H, consisting of cross H′, having arms h, nozzle h', regulating-cock h^3, substantially as and for the purposes specified.

5. The combination of the oil and water receptacle A, the vertical oil-exit pipe B, and the vertical water-exit pipe B′, located in said receptacle, the pipe B having exit oil-passages b^2 and the pipe B′ having exit water-passages b^3, pipe C, connected at one end to the oil and water exit pipes B B′ and at the other end to the burner, elbow T, connecting pipes B and B′ to pipe C, regulating-cocks b b', located in said pipes B B′, respectively, air-pump F, pipe G, connected at one end to the pump and at the other end to the burner, clock-work, indicating-dial, and the atomizer H, consisting of the arm h, nozzle h', regulating-cock h^3, arm or cap H^2, regulating-cock h^4, substantially as and for the purposes specified.

SAMUEL TURNER.

Attest:

A. S. LUDLOW,

G. A. W. PAREE.