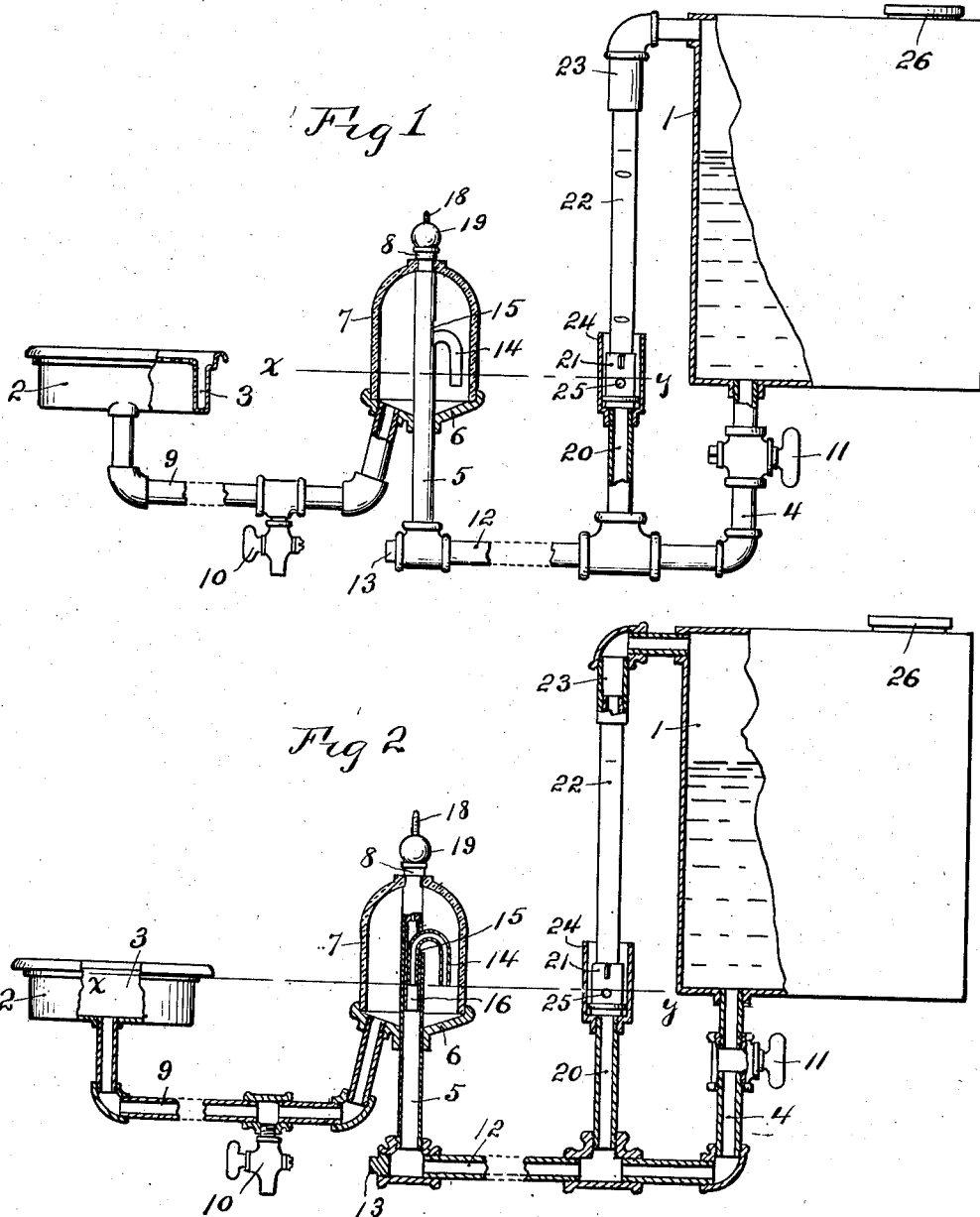


1,043,488.

J. C. WAUGH.
FUEL FEEDING APPARATUS.
APPLICATION FILED MAR. 4, 1912.

Patented Nov. 5, 1912.

2 SHEETS—SHEET 1.



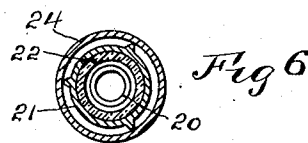
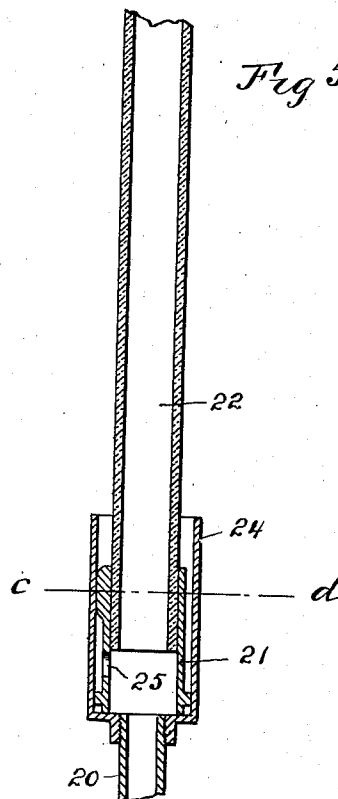
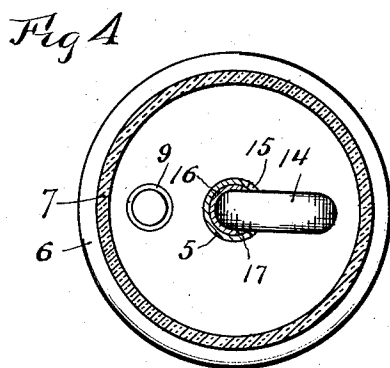
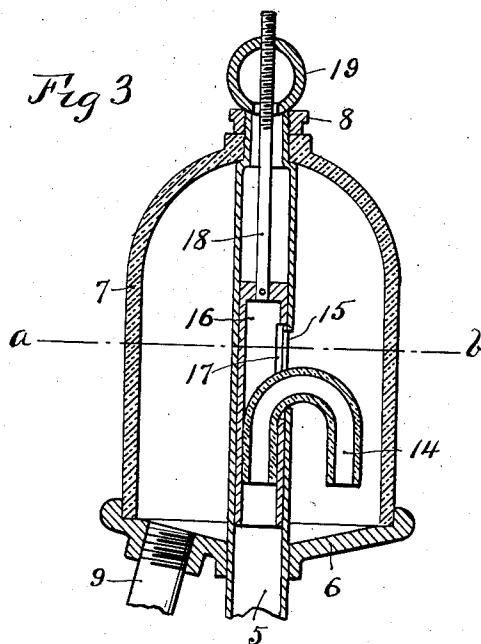
WITNESSES:

R. Hamilton
E. B. House

James C. Waugh INVENTOR.
BY *Warren D. House*
His ATTORNEY.

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FUEL FEEDING APPARATUS.
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JAMES C. WAUGH, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF TO JOSEPH A. FARQUHAR, OF KANSAS CITY, MISSOURI.

FUEL-FEEDING APPARATUS.

1,043,488.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed March 4, 1912. Serial No. 681,548.

To all whom it may concern:

Be it known that I, JAMES C. WAUGH, a citizen of the United States, and a resident of Kansas City, in the county of Jackson and State of Missouri, have invented a certain new and useful Improvement in Fuel-Feeding Apparatus, of which the following is a specification.

My invention relates to improvements in fuel feeding apparatus.

My invention is adapted to feed liquid fuel, such as oil, to a burner, and one of its objects is to provide an apparatus by which the feeding of oil to the burner will be automatically discontinued in case that the flame of the burner becomes accidentally extinguished, thereby preventing the flooding of the premises with oil and eliminating danger of fires from such cause.

In the accompanying drawings I have illustrated the preferred form of my invention.

Figure 1 is a view partly in elevation and partly in vertical section of my improved fuel feeding apparatus, the siphon, in this view being shown in the operative position. Fig. 2 is a view similar to that shown in Fig. 1, other portions being shown in section, and the siphon shown in the balanced or inoperative position. Fig. 3 is a vertical sectional view, enlarged, of the siphon and some of the parts connected with and adjacent thereto. Fig. 4 is a cross section on the line *a-b* of Fig. 3. Fig. 5 is an enlarged vertical sectional view of a portion of the by pass device and sealing receptacle. Fig. 6 is a cross section on the line *c-d* of Fig. 5.

Similar reference characters designate similar parts in the different views.

1 indicates an air tight tank adapted to contain liquid fuel. 2 designates a burner, which may be of any desired type, and which as shown in the drawings, is provided with an annular groove 3 for containing the oil which is to be burned.

Connecting the tank 1 and burner 2 is a conductor comprising the following described parts. A U shaped portion of the conductor has one vertical arm 4 connected to the bottom of the tank 1, the other vertical arm 5 has mounted on it a bottom member 6 of a vessel which has a casing 7, preferably of transparent material, such as glass, the upper end of which has a vertical hole through which extends the arm 5. The arm

5 is externally threaded above the casing 7 and has mounted on said threaded part a nut 8 which bears against the top of the casing.

A U shaped pipe 9 has one end connected to the bottom member 6 and the other end connected with the burner 2 and communicating with the annular groove 3. The pipe 9 may be provided with a drain cock 10 which is normally closed.

A shut off cock 11 may be provided in the arm 4, said cock being normally open.

The horizontal portion 12 which connects the arms 4 and 5 may have a clean out opening at one end, which is normally closed by a screw plug 13.

A siphon device is provided comprising an inverted U shaped siphon 14 which extends through a vertical slot 15 in one side of the arm 5 within the casing 7. The inner end of the siphon 14 is mounted in and secured to a vertical tube 16 slidably mounted in the arm 5 and provided with a lateral slot 17 through which extends the siphon 14. The upper end of the tube 16 is closed and has secured to it the lower end of a vertical rod 18 the upper end of which is screw threaded, and which extends through the upper end of the arm 5 and has mounted on it a nut 19, which rests upon the nut 8.

By adjusting the nut 19, the siphon 14 may be raised and lowered for the purpose of decreasing or increasing the flow of liquid through the siphon.

When the discharge end of the siphon is level with the top of the air inlet 25, the siphon will be balanced and inoperative and no liquid will flow therethrough.

A by pass has one end connected to the portion 12 of the conductor, the upper end being connected to the side of the tank 1 near the upper end thereof. The by pass preferably consists of a vertical pipe 20 the lower end of which is connected to the horizontal portion 12 of the conductor and the upper portion of which communicates with a vertical tube 21 in which is secured the lower end of a tube, 22, preferably of glass, and the upper end of which is secured in a pipe 23 the other end of which is connected to the tank 1. The tube 21 is encircled by a cup shaped receptacle 24, the upper end of which communicates with the atmosphere, and the lower end of which has a threaded hole in which is secured the up-

per end of the pipe 20. A space is provided between the inner wall of the receptacle 24 and the tube 21. The tube 21 is provided with a lateral air inlet 25 through which air may enter the by pass from the atmosphere for supplying the tank 1 with air as the liquid fuel is withdrawn from said tank through the conductor which connects with the burner 2.

10 The air inlet 25 is adapted to be seated by liquid which enters the receptacle 24 through the inlet 25.

15 The line $x-y$ in Figs. 1 and 2 denotes the level of the upper part of the air inlet 25. The siphon 14 is adjustable in the manner already described to positions in which the discharge or outer end may be on the same level with or below the line $x-y$. The upper end of the groove 3 of the burner 2 may be at the level of the line $x-y$ or above said line.

In the operation of my invention, the cock 10 is closed and the cock 11 is opened. The tank 1 is provided with a filling opening at its top, which is normally tightly closed by a cap 26. A supply of liquid fuel is placed in the tank 1 the height of which is such that the liquid will flow by gravity through the portions 4, 12 and 5 into and through the siphon 14, which is adjusted with the discharge end below the line $x-y$. The liquid will pass into the casing 7 and from thence by the pipe 9 to the burner 2 where it enters the groove 3. Oil will pass from the horizontal portion 12 of the conductor through the pipe 20 and into the tubes 21 and 22, the tube 22 being filled to the height of the surface of the liquid in the tank 1. The tube 22 thus becomes a gage by which may be determined the amount of oil in the tank 1. Oil will pass through the air inlet 25 into the receptacle 24 until the inlet 25 is immersed, thereby shutting off access of air to the tank through the by pass. This will occur as soon as the groove 3 of the burner 2 and the casing 7 become filled to the level of the line $x-y$.

If now the burner be lighted, the oil in the groove 3 will be consumed, thus lowering the liquid in the casing 7 so as to unbalance the siphon 14. The siphon 14 will thus begin discharging oil into the casing 7, the speed of delivery depending upon the distance of the discharge end of the siphon from the line $x-y$. As the liquid is discharged through the siphon 14, the liquid in the receptacle 24 will lower until the air inlet 25 is uncovered, at which time a bubble of air will enter the by pass through the inlet 25 and will be discharged into the tank 1 above the liquid contained in said tank. The pressure in the tank 1 being thus increased by the admission of the bubble of air, the liquid will flow from the tank to the burner 2 in the manner already described.

At the same time the air inlet will again become sealed by the fresh oil discharged from the tank, and will so remain until the siphon 14 has discharged more oil, at which time the liquid in receptacle 24 will again lower sufficiently to permit another bubble or bubbles of air entering the by pass through the inlet 25. Thus as long as oil is being withdrawn from the burner 2, oil will be discharged from the tank 1 in quantities depending upon the position of the discharge end of the siphon 14 relative to the line $x-y$.

In case the flame of the burner should accidentally be extinguished, the groove 3 will fill to the level of the line $x-y$ as will the casing 7, thereby balancing the siphon 14 and causing the air inlet 25 to be again sealed. As air can not now enter the tank 1 the liquid will stop flowing therefrom, and there will be no danger of flooding the premises with oil.

By reason of the siphon 14 being adjustable, the size of the flame produced by the burner 2 may be regulated as desired without requiring any reduction in the size of the passage of the conductor which connects the burner with the tank, such as would occur if a cock or valve were employed to regulate the passage of oil through the conductor. The cock 11 is used only when it is desired to prevent oil from the tank 1 passing below said cock. By elevating the siphon 14 to the position shown in Fig. 2, that is, level with the line $x-y$, the siphon will not be broken, nor will it discharge oil into the casing 7.

When the operator desires to put out the burner flame, he elevates the siphon 14 to the level of the line $x-y$, thus stopping flow of oil to the burner, so that there is not a large amount of oil in the burner when it is again started. Thus there will be produced no smoke or soot, due to an excess of oil in the burner, upon its being again lighted.

I do not limit my invention to the structure shown and described, as modifications, within the scope of the appended claims, may be made without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:—

1. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner, means controlled by the height of liquid in the burner for controlling admission of air to the tank, and regulatable means independent of the burner for adjusting said conductor and which leaves constant the size of the passage in the conductor for controlling the volume of liquid there-through.

2. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner, means controlled by the height of liquid in the burner for controlling admission of air to the tank, and regulatable means independent of the burner for adjusting said conductor and controlled by the height of the liquid in the burner for controlling the volume of liquid through the conductor and which leaves constant the size of the passage through the conductor.

3. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner and including a siphon as a part thereof, means controlled by the height of liquid in the burner for controlling admission of air to the tank, and means for vertically adjusting one end of the siphon and which permits the size of the passage in said conductor to remain constant.

4. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner and including a siphon as a part thereof, means for vertically adjusting one end of the siphon and which permits the size of the passage in said conductor to remain constant, and means controlled by the height of liquid in the burner for controlling the flow through the siphon and the admission of air to the tank.

5. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner and including a siphon as a part thereof, means for vertically adjusting one end of the siphon and which permits the size of the passage in said conductor to remain constant, air admission means having an air inlet communicating with the tank and conductor, and means controlled by the siphon for sealing said air inlet.

6. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner and including a siphon as a part thereof, means for vertically adjusting one end of the siphon, a by pass connecting the tank and conductor and having an air inlet, and a receptacle communicating with the atmosphere and with the air inlet for containing liquid for sealing said inlet, the inlet being located below the outlet of the burner.

7. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner and including a siphon as a part

thereof, the siphon having its discharge end vertically adjustable to and from a position level with the outlet of the burner, and means controlled by the height of liquid in the burner for controlling admission of air to the tank.

8. In a fuel feeding apparatus, a burner, an air tight tank located higher than the burner, a conductor connecting the tank and burner, means communicating with the conductor and with the tank and controlled by the height of liquid in the burner for controlling the admission of air to the tank, and regulatable means independent of the burner for adjusting said conductor and which leaves constant the size of the passage of the conductor for regulating the volume flowing through the conductor.

9. In a fuel feeding apparatus, an air tight tank, and means for discharging liquid from and admitting air to the tank and including an air inlet, a sealing receptacle, and a conductor which communicates with the tank and with the receptacle through the air inlet, the conductor including a siphon as a part thereof, the discharge end of the siphon being adjustable vertically from the level of the top of said inlet.

10. In a fuel feeding apparatus, an air tight tank, a conductor connected therewith for discharging the contents thereof, the conductor having a siphon as a part thereof, the siphon having one end vertically adjustable, a by pass connected with the tank and conductor and having an air inlet which in the operative position of the siphon is above the discharge end of the siphon, and a receptacle communicating with the atmosphere and with the conductor through said air inlet and bypass for containing liquid for sealing said inlet.

11. In a fuel feeding apparatus, an air tight tank, a conductor connected therewith for discharging the contents thereof, a by pass connected with the tank and with the conductor and having an air inlet and provided with a gage for denoting the height of liquid in the tank, and a receptacle communicating with the atmosphere and with the inlet for containing liquid for sealing said inlet.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

JAMES C. WAUGH.

Witnesses:

WARREN D. HOUSE,
R. E. HAMILTON.