

June 19, 1928.

1,673,811

H. DOWIE

COMBINATION VALVE

Filed Feb. 1, 1927

2 Sheets-Sheet 1

Fig. 1.

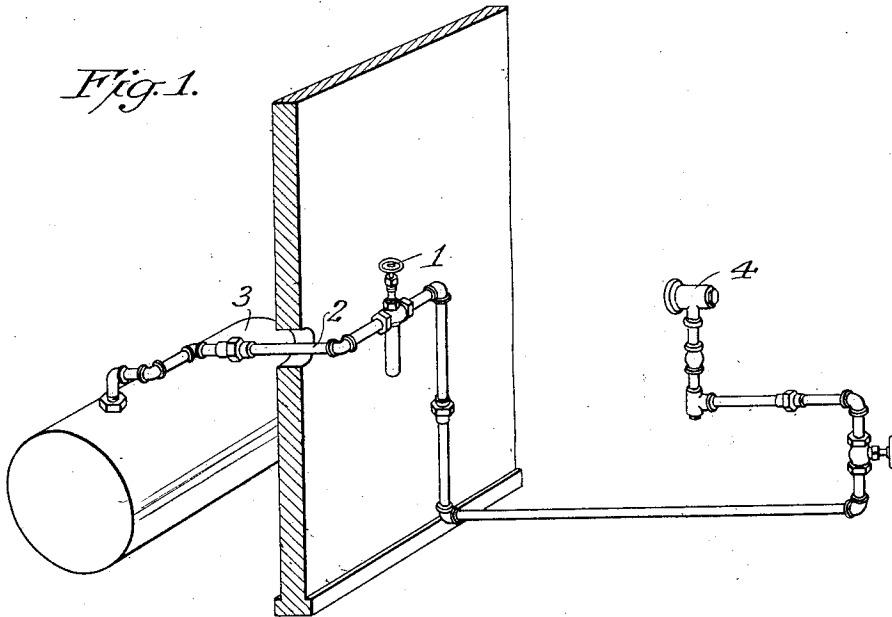
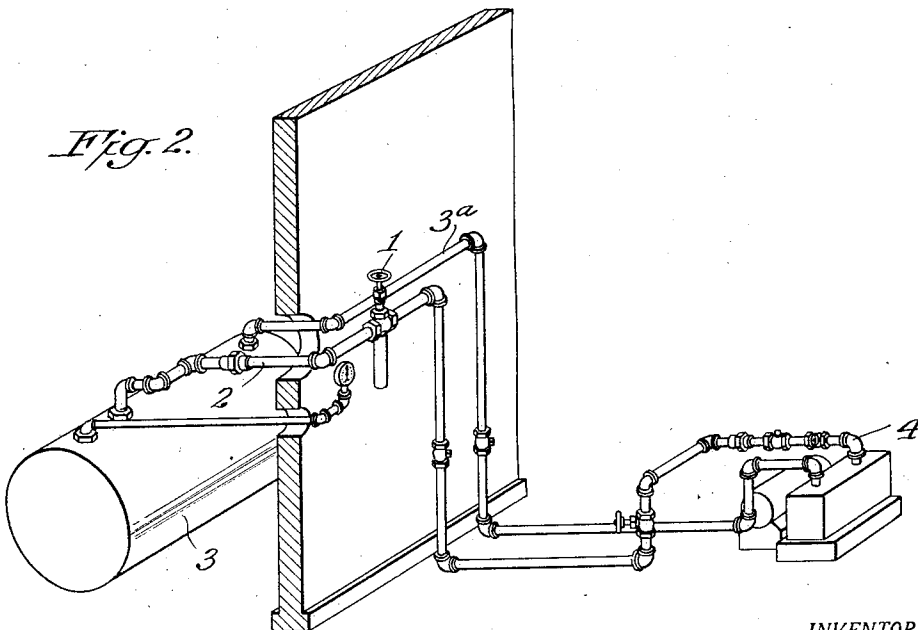


Fig. 2.



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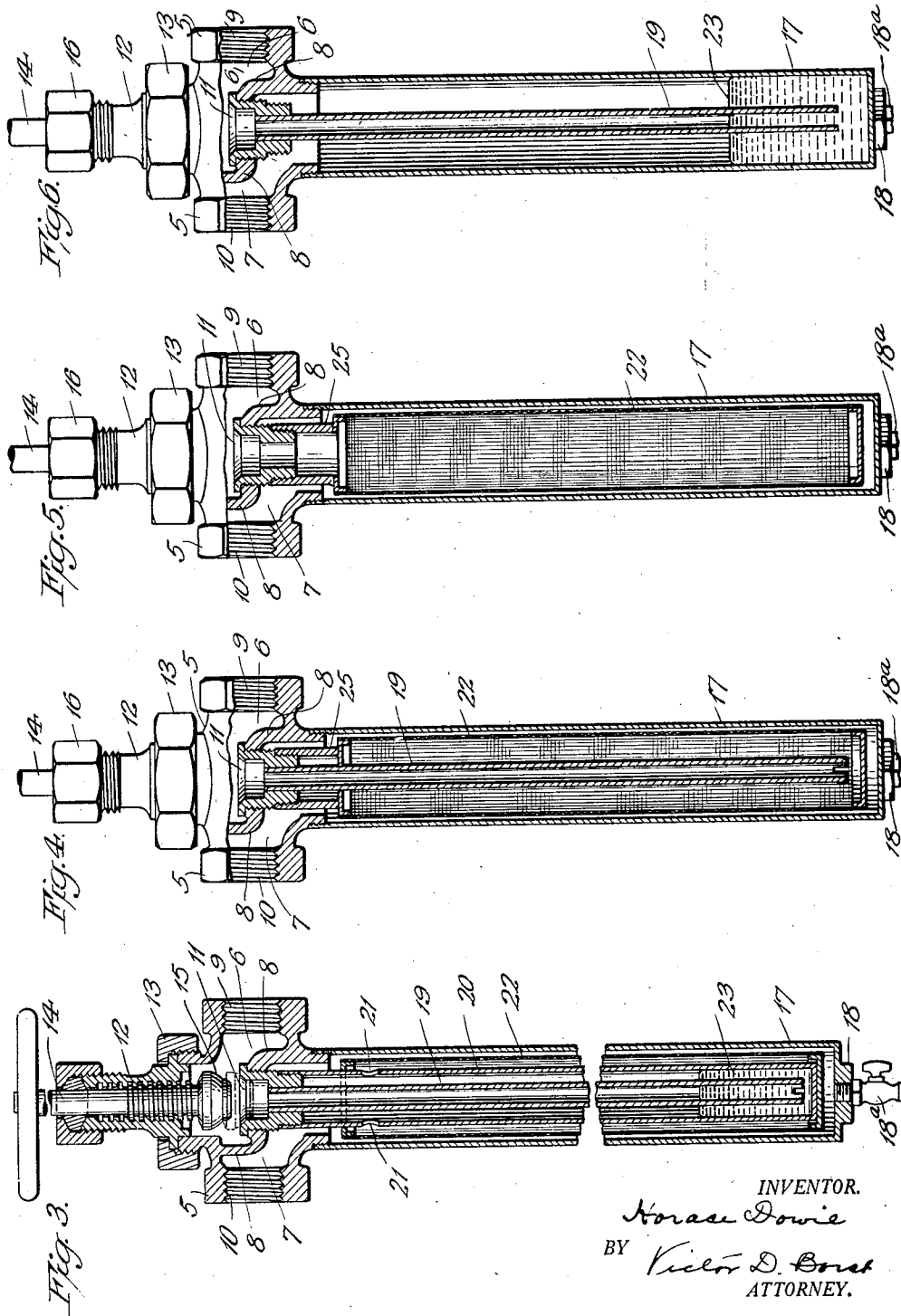
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2 Sheets-Sheet 2



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COMBINATION VALVE.

Application filed February 1, 1927. Serial No. 165,101.

This invention relates to devices for controlling the flow of liquids through a pipe line and particularly to the control of fuel oil in an oil burner installation.

5 In the installation of an oil burner system, provision must be made for shutting off the supply of fuel at will, for straining the fuel and for preventing siphoning action should the burner be positioned at a lower level than
10 the fuel level in the tank and a leak should occur in the supply line, that is, a "seal" must be provided.

Various methods of accomplishing these three desired results as by the use of separate valves, strainers and seals, the use of
15 enlarged stand pipes and other devices have been tried.

The present invention proposes to accomplish the desired results or the combination
20 of any two of them where only two are desired by the use of a combination valve comprising a valve, strainer and seal or any two of these all housed in a single casing. Use is made of a valve having its connection interval of standard distance so that the completed device may be substituted for the
25 standard valves now in use in oil burner installations. In carrying out this invention, the structure of a standard valve is utilized
30 but the flow of fuel therethrough is deflected through a chamber attached to a valve of otherwise standard structure and proportions wherein the fuel is passed through a seal and a strainer, both being under control
35 of the valve.

The detail structure and its application will be set forth more clearly in the accompanying drawings, in which

40 Fig. 1 is a diagrammatic sketch of an oil burner installation using a single supply line in which this invention is embodied;

Fig. 2 is a diagrammatic sketch of an oil burner installation employing a supply and return line and in which this invention is
45 embodied;

Fig. 3 is a vertical section of the combined valve, strainer and seal;

Fig. 4 is a vertical section of a combined valve and strainer;

50 Fig. 5 is a vertical section of a modified form of a combined valve and strainer, and Fig. 6 is a vertical section of a combined valve and seal.

In Fig. 1, it is seen that the combination

valve 1 of this invention is inserted in the 55 supply line 2 from tank 3 to a burner in lieu of the three units, namely, a shut-off valve, a strainer and a siphon check or seal which are ordinarily used.

In Fig. 2, the valve 1 is shown inserted in 60 the supply line 2 of a two pipe installation, the return line being indicated by 3^a.

Referring more particularly to Fig. 3, it is seen that the combination valve consists of a casing or body 5 divided into inlet 65 and outlet passages 6 and 7, respectively, by a partition 8 extending transversely of the casing. The two outer ends of the casing are internally threaded as at 9 and 10 to permit of the usual pipe connections. Partition 70 8 has an aperture or port therethrough to which is fitted a valve seat 11. The top of the casing or body has an opening therethrough to which the valve bonnet 12 is secured by means of a nut 13, through which 75 a valve stem 14 extends, carrying upon its inner end a valve face 15 adapted to seat upon the valve seat 11 to close the port through the partition. The customary packing nut 16 is threaded to the upper end of 80 the bonnet to prevent leakage along the valve stem. The parts thus far described constitute the usual elements of a standard valve and have relatively the same proportions as a standard valve so that a combination 85 valve of a given pipe size may be substituted in place for a standard valve of similar pipe size.

The casing 5 is also formed with an opening at the bottom thereof, somewhat similar to 90 the one at the top to which the bonnet is secured and to which a long closed tubular chamber 17 is fastened as by threaded engagement. A nut 18 is provided on the bottom thereof for the purpose of tightening 95 the chamber upon the casing and may be tapped to receive a pet-cock 18^a for purposes of draining the chamber or otherwise giving access thereto.

A slender tube or conduit 19 extends into 100 chamber 17 to substantially the bottom thereof and communicates at its upper end with the opening in the valve seat 11 to which it may be secured. A tube 20, somewhat larger in diameter than conduit 19 105 and closed at its lower end, surrounds conduit 19, and is secured to the partition 8 at its upper end as by threaded engagement

to the seat 11 or some other convenient means. A plurality of apertures 21 are formed through the walls of tube 20 near the upper end thereof giving access from the tube into the chamber 17. Surrounding the tube 20 and extending above apertures 21 is a tubular screen 22 closed at its bottom and open at its top only sufficiently to permit it to be slid over tube 20. The strainer rests upon the bottom of the chamber and is thereby held in place but if found desirable the strainer may be supported from the valve casing in any desired manner.

Mercury or other suitable fluid 23 is placed in the tube 20 in sufficient quantity, in accordance with the depth of the tank, to withstand the back suction of the oil whenever the flow ceases in the line so that the mercury will merely rise in conduit 19 and hold the seal and also prevent any siphoning action in event of a leak in the piping between the valve and the burner.

In Fig. 4, a slight modification is shown wherein the tube 20 is omitted and the strainer 22 has a ferrule 25 upon its upper end which is threaded to the valve seat. This modification is particularly adaptable where it is not desired to have a seal in combination with a valve and strainer but merely a valve and strainer and yet where it is desirable to feed the fuel or other liquid to the bottom of the chamber 17.

In Fig. 5, another and still simpler combined valve and strainer is shown wherein the design is similar to that shown in Fig. 4 except that the conduit 19 is omitted.

In Fig. 6, a combination valve and mercury seal is provided and where this combination alone is desired the strainer and tube both may be omitted.

It is to be noted that the chamber 17 provides a small reservoir or supply of fuel for immediate starting purposes inasmuch as the mercury will not permit its being drawn back into the tank. The mercury will also hold the supply line, up to the valve, full of oil thus in itself acting as a check valve, and eliminating the necessity of other checks or other devices to accomplish this purpose.

It is apparent that minor changes may be made in the details of the structure and that a special valve casing may be made which departs from standard dimensions without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A combination valve and anti-siphoning device comprising a unitary structure including a valve casing having separated inlet and outlet passages, a chamber extending from said casing having communication with one of said passages, means for checking the flow through said chamber a

conduit extending into said chamber and establishing communication with said chamber and the other of said passages, and a valve for controlling communication from inlet to outlet.

2. A combination valve and anti-siphoning device comprising a unitary structure including a valve casing having separated inlet and outlet passages, a third passage communicating with said outlet passage, a chamber extending from said third opening, a conduit extending into said chamber and opening into said inlet passage, and a valve for closing the passage means for checking the flow through said chamber into said conduit.

3. A combination valve and anti-siphoning device comprising a unitary structure including a valve casing having inlet and outlet passages, a partition separating said passages, a port in said partition, a chamber extending from said casing opening into one of said passages, means within said chamber for automatically interrupting flow therethrough upon predetermined conditions, and a valve for closing said port.

4. A combination valve and anti-siphoning device comprising a unitary structure including a valve casing having inlet and outlet passages, a partition separating said passages, a port in said partition, a valve seat in said port, a closed chamber extending from said casing and communicating with one of said passages, means within said chamber for automatically interrupting the flow therethrough, a conduit extending into said chamber and communicating with said valve seat, and a valve for closing said valve seat.

5. A combination valve and strainer comprising a valve casing having inlet and outlet passages, a partition in said casing separating said passages, a port through said partition, a valve for closing said port, a closed removable chamber supported from said casing having communication with one of said passages, a strainer supported from said partition extending into said chamber and having communication with the other of said passages and means within said chamber for automatically interrupting flow therethrough upon predetermined conditions.

6. In a combination valve, strainer and anti-siphoning device, a valve casing having a partition therein dividing said casing into inlet and outlet passages, a port through said partition, a valve controlling communication therethrough, a chamber supported by and extending from said casing having communication with one of said passages and having means therein for automatically interrupting the flow therethrough upon predetermined conditions, a conduit extending into said chamber and establishing com-

munication between said chamber and the other of said passages, and a strainer surrounding said conduit.

7. In a combination valve, strainer and anti-siphoning device, a valve casing divided into inlet and outlet passages by a partition, a port through said partition, a valve controlling said port, a chamber extending from said casing, a conduit extending into said chamber and communicating with said port, a tube closed at the bottom surrounding said conduit forming a well, a strainer surrounding said closed tube interrupting communication between said port and said passage.

8. In a combination valve, strainer and anti-siphoning device, a valve casing, having a partition therein dividing said casing into inlet and outlet passages, a port in said partition, a valve controlling said port, a removable chamber secured to said casing, having communication with one of said passages, a conduit extending from said port into said casing, a tube closed at one end forming a well and having openings communicating with said chamber surrounding said conduit and a strainer positioned between said chamber and the passage to which it communicates.

9. In a combination valve, strainer and anti-siphoning device, a valve casing, having a partition therein dividing said casing into inlet and outlet passages, a port in said partition, a valve controlling said port, a removable chamber secured to said casing, having communication with one of said passages, a conduit extending from said port into said casing, a tube closed at one end and having openings communicating with said chamber surrounding said conduit, and a strainer within said chamber intercepting flow between said two passages.

10. In a combination valve, strainer and anti-siphoning device, a valve casing, having a partition therein dividing said casing into inlet and outlet passages, a port in said partition, a valve controlling said port, a removable chamber secured to said casing, having communication with one of said passages, a conduit secured to said partition extending from said port into said casing, a tube closed at one end and communicating with said chamber at its other end surrounding said conduit, and a strainer within said chamber intercepting flow between said two passages.

11. In a combination valve, strainer and anti-siphoning device, a valve casing, a partition therein dividing said casing into inlet and outlet passages, a port through said partition, a valve controlling flow through said port, a removable chamber secured to said casing and extending therefrom, a conduit extending into said chamber having one end secured to said partition in communication

with said port, a tube surrounding said conduit closed at one end and having openings at the other communicating with said chamber supported from said partition, and a strainer within said chamber surrounding said tube and interposed between said openings and said chamber.

12. In a liquid fuel supply system, a fuel supply pipe leading to a burner, a combination valve in said supply pipe comprising a valve casing and a valve therein, a chamber extending from said casing containing a strainer and anti-siphoning means therein cooperatively associated with said valve.

13. A combination valve comprising a valve casing, a valve therein, a chamber extending from said casing, a mercury seal and a strainer within said chamber adapted to intercept the flow through said valve casing.

14. A combination valve and anti-siphoning device comprising a valve casing having separated inlet and outlet passages, means therein for checking the flow through said passages upon predetermined conditions, and additional valve means for controlling communication from said inlet to said outlet.

15. A combination valve and anti-siphoning device comprising a valve casing having separated inlet and outlet passages, a chamber extending from said casing, having checking means therein adapted to automatically control the flow through said inlet and said outlet passages upon predetermined conditions, and valve means for controlling communication from said inlet and said outlet.

16. A combination valve and anti-siphoning device comprising a valve casing having inlet and outlet passages, a partition separating said passages, a port in said partition, a valve seat in said port, a chamber extending from said casing, and communicating with one of said passages, an anti-siphoning and checking means within said chamber and communicating with said port, and a valve cooperating with said seat for closing said port.

17. In a combination valve, strainer and anti-siphoning device, a valve casing having a partition therein dividing said casing into inlet and outlet passages, a port through said partition, a valve controlling communication therethrough, a chamber extending from said casing and having communication with one of said passages, a checking device in said casing for automatically controlling the flow through said inlet and outlet passages upon predetermined conditions, and a strainer intercepting the flow between said inlet and outlet passages.

18. In a fluid transfer system a fluid transfer pipe, a combination valve in said pipe, comprising a valve casing and a valve

therein, a chamber extending from said casing containing a strainer and anti-siphoning means therein cooperatively associating with said valve.

- 5 19. A combination valve comprising a valve casing, a valve therein, a chamber extending from said casing, a seal and a strainer within said chamber adapted to intercept the flow through said valve casing.

20. A combination valve comprising a 10 valve casing, a valve therein, a chamber extending from said casing, a combined seal and checking device, and a strainer within said chamber adapted to intercept the flow through said valve casing. 15

In witness whereof, I hereunto subscribe my signature.

HORACE DOWIE.