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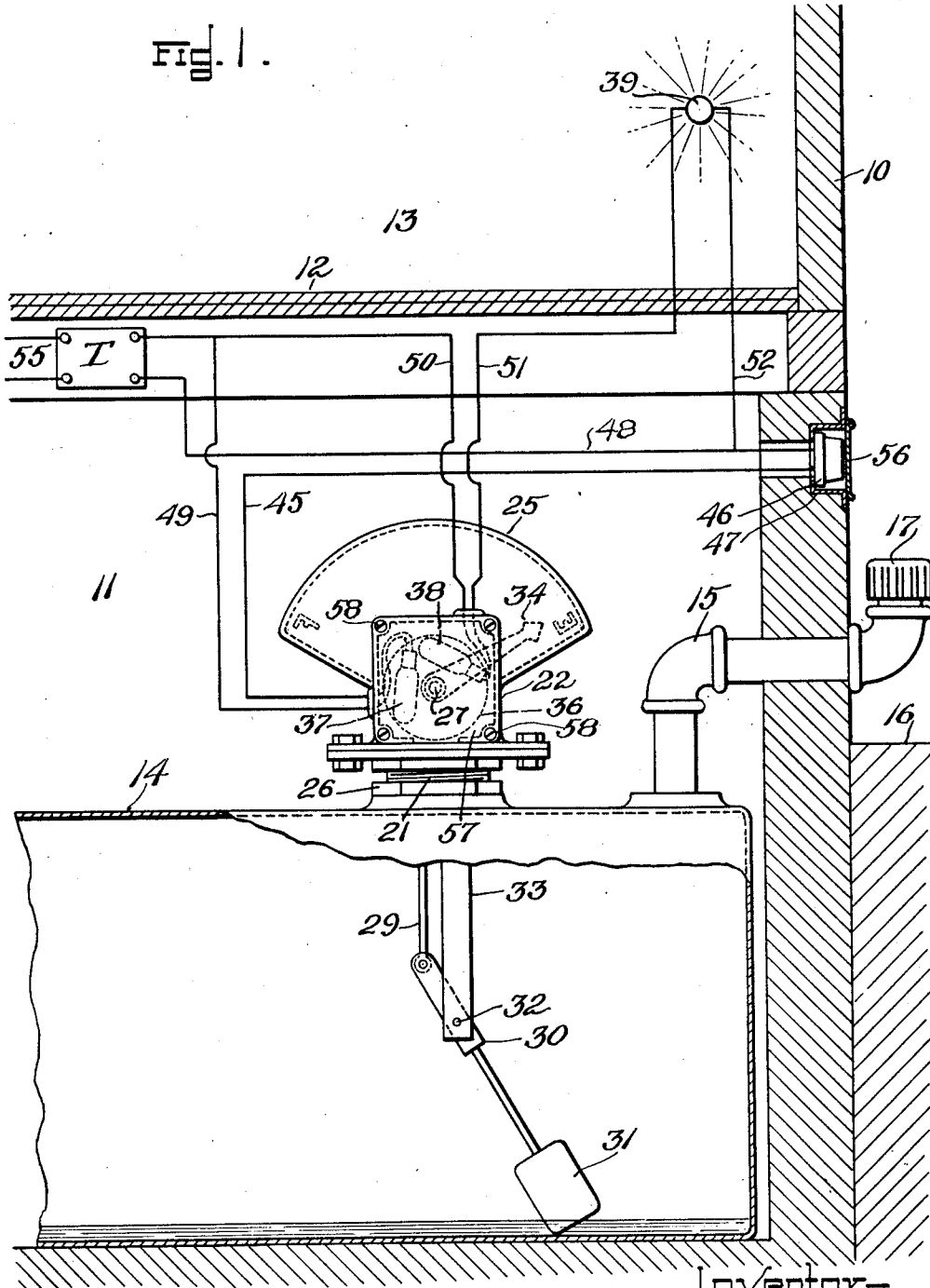
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2,127,422

SIGNAL SYSTEM FOR STORAGE TANKS

Filed Nov. 22, 1934

2 Sheets-Sheet 1



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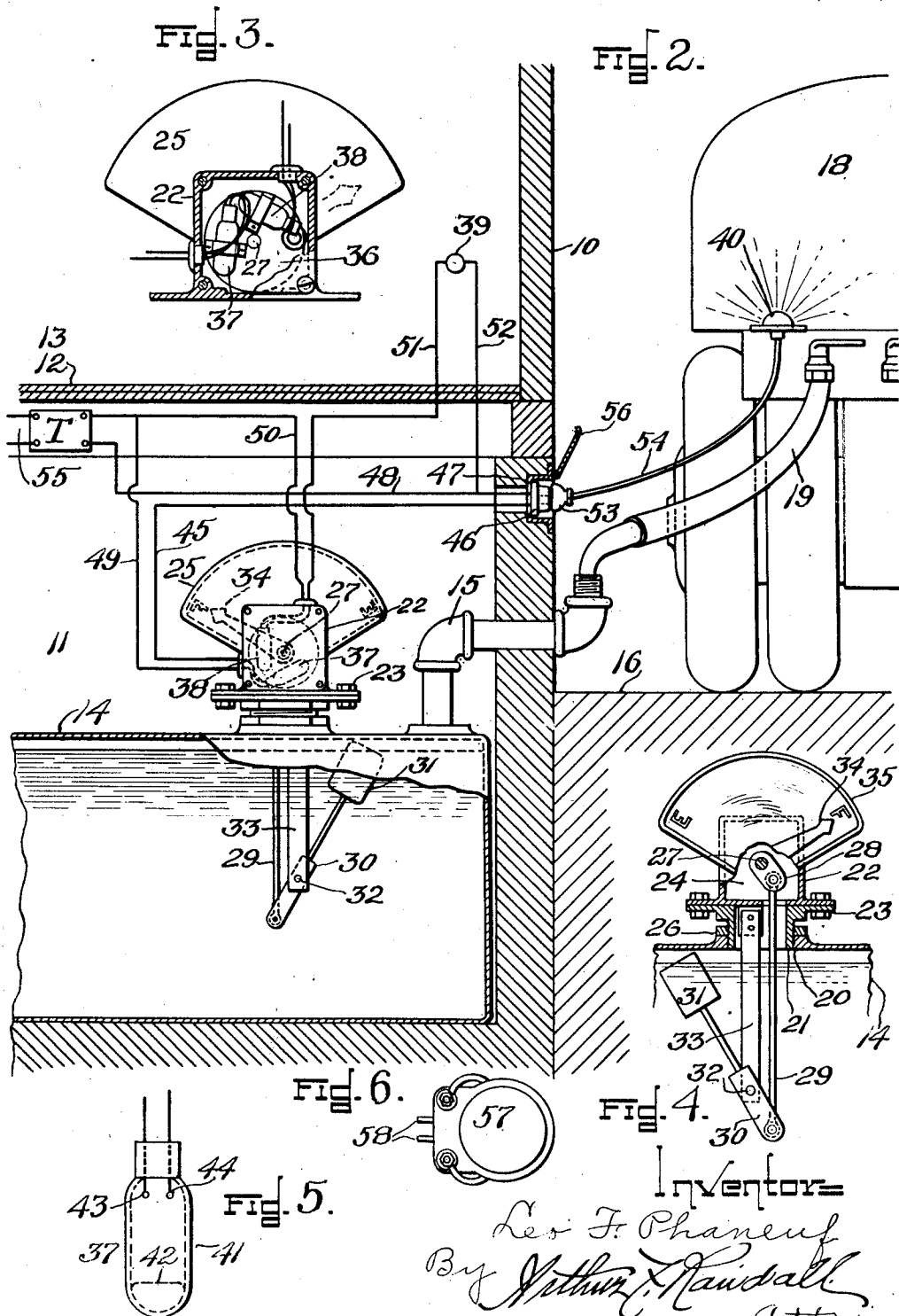
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UNITED STATES PATENT OFFICE

2,127,422

SIGNAL SYSTEM FOR STORAGE TANKS

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1 Claim. (Cl. 177-311)

My invention relates to a signal system for a storage tank, particularly the fuel oil storage tank of an oil heating apparatus such as is provided within a building.

The invention has for its object to provide an improved system of this class which will operate automatically to inform an occupant of the building of the fact that the supply of oil within the tank is depleted or low when such is the case, and which will also operate automatically to inform a person outside of the building who is engaged in refilling the tank that the latter is full when such as the case.

To this end I have provided a signal system of the class described having the peculiar features of construction and mode of operation set forth in the following description, the several novel features of the invention being particularly pointed out and defined in the claim at the close thereof.

In the accompanying drawings:—

Figure 1 is a vertical sectional view of a building equipped with a signal system constructed in accordance with this invention.

Figure 2 is a similar view but illustrating other features of the invention.

Figure 3 is an elevation, partly broken away, of the switch hereinafter described viewed from one side.

Figure 4 is an elevation, partly broken away, of the switch viewed from the opposite side and including the float mechanism for operating the same.

Figure 5 is a detail showing one of the mercury switch elements hereinafter described.

Figure 6 illustrates a modification.

In the accompanying drawings, 10 represents one of the walls of a building, 11 a basement room, 12 the first floor, and 13 an upper room which may be the kitchen and which may be equipped with a range oil burner (not shown) that is supplied with fuel oil from a tank or reservoir 14 within which it is necessary to maintain a supply of fuel oil. Or the reservoir 14 may supply oil to the oil burner of an air, hot water, or steam, heating system.

The supply of oil within tank 14 is replenished through a filler pipe 15 whereof one end is connected with the tank and which extends therefrom through the wall 10 of the building to the outside of the latter where its opposite end is disposed above the level of the ground 16 and provided with a removable closure cap 17.

The supply tanks 14 of oil burner heating systems vary in size according to the type of heat-

ing system of which they form part, but the smallest will ordinarily have a capacity of several hundred gallons. Therefore when the supply of oil within tank 14 is to be replenished it is customary to convey oil to the building in a tank wagon or truck 18 from which a measured quantity of oil is delivered through a delivery hose 19 into the upper end of filler pipe 15.

In accordance with my invention the tank 14 is constructed at its top with a threaded hole 20 into which is screwed an exteriorly threaded flanged nipple 21 forming part of a switch-box 22 to which it is fastened by bolts 23. A nut 26 on nipple 21 holds the latter against accidental rotative displacement.

The box 22 is interiorly constructed with two compartments and also with bearings in which is journaled a rock-shaft 27. Within the box 22 and fast on shaft 27 is an arm 28 connected by a link 29 with a lever 30 carrying a float 31, said lever being arranged within the tank 14 and fulcrumed at 32 on the lower end of a bracket 33 depending from the switch-box 22.

It will be clear that as the level of the oil within tank 14 varies the float lever will be swung on its fulcrum and act through link 29 and arm 28 to rotatively adjust shaft 27.

Fixed in position upon the outer end of shaft 27 is a pointer 34 whose free end traverses a path across the outer face of a segmental flat wall 25 forming part of box 22. At one end of the path of said free end the wall 25 is provided with the letter F indicating "full" and at the opposite end of said path with the letter E indicating "empty". Thus the position of the pointer 34 relatively to the letters F and E serves at all times to visually indicate the level of the oil within the tank.

Fixedly mounted upon the shaft 27 within the switch-box 22 is a disk 36 on one face of which are fastened two mercury switch circuit operating elements 37 and 38 positioned relatively and with respect to shaft 27 so that as pointer 34 is moved into register with the letter E through exhaustion or depletion of the oil within the tank 14 the mercury switch element 38 is tilted and automatically closes an electric circuit through a signal lamp 39 fixed in position on one of the walls of the upper story room 13, and so that as pointer 34 is moved into register with the letter F during the operation of refilling tank 14 the mercury switch element 37 is tilted and automatically closes another circuit through a signal lamp 40 outside of the building and preferably mounted on tank wagon 18 as shown in Fig. 2.

It will be understood that rotative adjustment

of the carrier disk 36 in either direction to close one of the two circuits at one of the mercury switch elements, as described, is accompanied by an angular adjustment of the other mercoild element in a direction to open its circuit, and it will be observed that the opening of the one circuit is effected near the start of the movement of pointer 34 in one direction and that the closing of the other circuit does not occur until near the end of the swing of pointer 34 in that direction. Therefore, the pointer 34 can be moved for a considerable distance in either direction between the limits of its movements without operating either circuit so that the signal lamp 39 is lighted only when the supply of oil within tank 14 is nearly exhausted as shown in Fig. 1, while signal lamp 40 is lighted only when the supply within tank 14 has been completely replenished from tank wagon 18 as shown in Fig. 2.

Fig. 5 illustrates the construction of the mercury switch element 37 and the element 38 may be similarly constructed. Each consists of a sealed hollow glass body 41 containing a body of mercury 42 to co-operate, as usual, with a pair of circuit terminals 43 and 44.

The terminal 44 of element 37 is connected with one end of a conductor 45 whose opposite end is connected with one of the terminals of an ordinary socket fixture 46 fixed within a housing 47 that is part of the wall 10. The other terminal of this socket fixture is connected by a conductor 48 with one of the output terminals of a transformer T, of ordinary construction. The other output terminal of the transformer is connected by a conductor 49 with the terminal 43 of element 37.

One of the terminals of element 38 is connected by a conductor 50 with conductor 49 leading to one of the output terminals of the transformer, while the other terminal of this element 38 is connected by a conductor 51 with one of the terminals of the electric lamp 39 the opposite terminal of the latter being connected by a conductor 52 with the conductor 48 leading to the other output terminal of transformer T.

In Fig. 2 of the drawings a connector plug 53 made with a pair of circuit terminal contacts, as usual is shown as separably engaged with the socket fixture 46 which, as usual, is also provided with a pair of circuit terminal contacts, not shown. The terminal plug is provided at one end of a cable 54 each of whose wires or conductors is connected at its one end with one of the prongs of plug 53 and at its opposite end with one of the terminals of the electric lamp 40 on the truck.

The two input terminals of the transformer T are connected, as shown, with the conductors of a current supplying circuit 55.

In lieu of the lamp 40, cable 54 and terminal plug 53 the driver of the truck 18 may be provided with an electro-magnetic buzzer 57 of ordinary construction having a pair of circuit terminals or contact prongs 58 adapted to be inserted in the socket fixture 46. When this buzzer is used of course an audible signal will be given outside of the building to inform the operator of the truck that the tank 14 is full. The buzzer instrument 57 is intended to be carried by the driver while making his deliveries.

The box 47 which forms part of the wall 10 may be provided with a hinged lid 56 so that when the socket fixture 46 is not in use said lid may occupy its closed position shown in Fig. 1 where it serves to shield the interior of the box from the weather.

When my signal system is installed in a building as part of a heating system, or in connection with any other service where oil or the like is dispensed or delivered from a supply tank or vessel located in the basement or cellar, it will be clear that when the signal on the upper floor is automatically operated the housewife, or other person receiving the signal, can telephone to the oil distributor. The oil distributor will then refill the tank and as soon as the operation of refilling is completed a signal outside of the building is operated to inform him of that fact. During the refilling operation the electric lamp within the building is automatically extinguished through adjustment of the float within the tank which informs the occupant of the house that the tank is being refilled.

What I claim is:

The combination with a liquid fuel consuming system within a building having a fuel supply reservoir equipped with provision for filling from the outside of the building, of an electric circuit portion having therein a switch equipped with operating means responsive to the fluid level in said reservoir and having a coupling terminal accessible from the building exterior, and a complementary circuit portion formed as a portable unit equipped with a signal and with a co-operative coupling terminal adapted to be applied at will to the first coupling terminal to complete the circuit subject to the closing of said switch and cause operation of said signal when a predetermined fluid level exists in said reservoir.

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