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SMOKE DETECTOR

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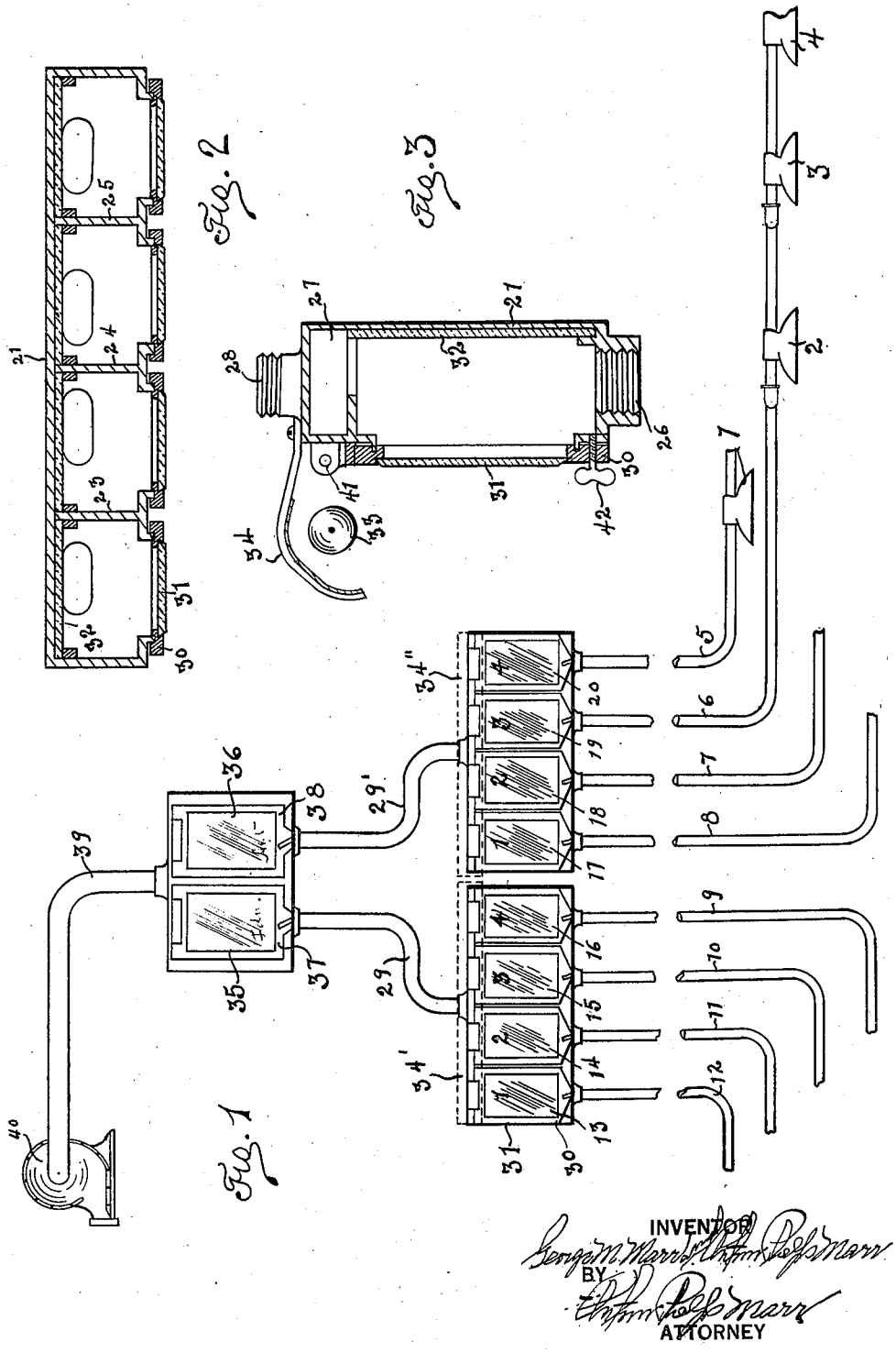


Fig. 1

Fig. 2

Fig. 3

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SMOKE DETECTOR

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The device, the subject of this invention is intended as a means for detecting the presence of smoke, gases, or excessive moisture in closed compartments, and as we have designed it, the device is particularly intended for use on ship board, and will be so described.

The object of this invention is to make the discovery of smoke easier and more positive than with other devices, of which we are aware several have been developed.

Another object of the invention is to provide means for readily and quickly determining in which one of several compartments the smoke is actually present, and from which compartment it is emerging into our device.

Another and important object of the invention is to simplify the construction of devices of this nature, and greatly reduce the size thereof without in any way detracting from the operability and efficiency.

Another object of the invention is to provide means whereby the presence of smoke may be detected at one of several different points even simultaneously if it should be so desired.

And a still further object of the invention is to provide means for determining through which of several observation cabinets smoke is actually passing and for arranging the observation cabinets side by side so that a comparison may be readily made between the smoke clouded cabinet and a clear cabinet.

The means for accomplishing all of these objects and others not herein before set forth, as well as the construction and operation of the device, will be fully set forth as the specification progresses, and the accompanying drawing should be referred to for a complete understanding of the specification which follows.

In the drawing:—

Fig. 1, is a diagrammatic view of an installation. Certain parts are in rather complete elevation.

Fig. 2, is an enlarged sectional view of one of the units shown in Fig. 1.

Fig. 3, is a sectional view taken at right angles to Fig. 2, and upon the line 3—3 in Fig. 2, the section being viewed in the direction of the arrows.

Similar reference numerals indicate like parts in all the figures where they appear.

In describing this device, we will proceed in the direction of traveling of the smoke, commencing with the domes in Fig. 1. These domes are indicated by the reference characters 1, 2, 3, and 4, and it will be noted that while only one dome is connected to the pipe 5, three domes are connected to the pipe 6. We have so shown them to indicate that any number of domes may be connected to any individual pipe, though we prefer that all of the domes connected to a single pipe shall be located in a single compartment.

Let us assume that the compartments are the hold compartments of a ship, and that the compartment controlled by the pipe 5 is of small area. In that compartment then, we may only have a single dome, as indicated at 1. Let us assume that the compartment controlled by the pipe 6, is a much larger compartment, here then we would place a plurality of domes, possibly even more than the three shown at 2, 3, and 4. The remaining pipes 7, 8, 9, 10, 11, and 12 each enters a compartment, and are there provided with domes not shown. The domes are merely inverted basins of any desired area, and having a passage therethrough, and to which passage the pipe is connected.

From the domes, as previously described, the pipes are led to the first observation point, which we prefer should be arranged in the engine room, and either at the watch station in the engine room, or on the engine room bridge, or on some other convenient point, although the first station may be placed elsewhere if desired.

We have considered that we are dealing with a ship having only eight hold compartments, four at the forward and four at the aft of the ship. The aft indicators, or observation chambers are shown at 13, 14, 15, and 16, and the forward indicators are shown at 17, 18, 19, and 20. It will be noted that each bank of indicators bears a numeral 1 to 4. These numerals are index numerals only, and assist in locating the hold compartment to which the pipe leading from the particular indicating chamber is connected.

By referring to Fig. 2, it will be noted that the forward or aft indicators, as shown on the first station are of integral formation. That is, we provide a casing 21, and sub-divide this casing with a series of transverse partitions, as shown at 23, 24, and 25. As we only have four hold compartments to control by this unit, we have only divided the casing into four separate parts, although it will be understood that a greater or lesser number of divisions may be made.

Each compartment is provided with an inlet passage, as shown at 26, and a manifold 27 connects with all of the compartments, though at the upper end thereof, and from the outlet 28, a pipe 29 extends to another indicator which will be later described.

Each compartment is provided with a door 30, in which is arranged a piece of glass, as shown at 31. The door should fit closely and make an air tight seal.

At the back of each compartment and directly opposite the door 31, we arrange a mirror 32, the mirror being directly back of the inlet passage 26, and is suitably supported, and we prefer that it shall be sealed in position. We provide means for illuminating each of the compartments, from a single source, and accomplish this by placing a lamp at about the position shown at 33. This allows sufficient light to enter each of the smoke cabinets to properly illuminate the cabinet. We provide a hinge 41 for each door, and a securing means, as shown at 42, and also provide that each door may be operated separately.

At 34, we show a reflector which may be nothing more or less than an ordinary semi-cylindrical reflector arranged over the lamp 33. The position of this reflector is shown in dotted lines in Fig. 1, and at 34′ and 34″.

The pipe 29, connected to the manifold 27, is led to the second observation point. At this point we provide a cabinet having but two chambers. This cabinet may be constructed very similar to the cabinet shown in Figs. 2 and 3, but will have but a single partition wall. The two portions of this cabinet, the portion indicated at 35, and the portion indicated at 36, will both be included in a single larger casing, and each is provided with a door, as shown at 37 and 38. On the glass in the cabinets 35 and 36, we may print the words "Forward" and "Aft".

The pipe 39 connected to the discharge or exhaust manifold of the cabinet 35—36, will be led to a suitable suction means, such as the blower shown at 40, and the blower may exhaust anywhere that shall be desired.

In the operation of our device, if smoke is present in the compartment wherein the domes 2, 3, and 4 are arranged, the smoke will enter one or more of the domes and travel through the pipe 6, will pass over the surface of the mirror in the compartment or observation chamber 19, passing out into the manifold 27, will pass through the pipe 29′, into the secondary observation chamber 36, and here let us call attention to one of the most important features of our invention. It is well known, and a simple experiment will demonstrate that the surface of a mirror is very easily clouded by smoke, acid fumes, or excessive moisture. Now if smoke, or acid fumes, or other causes clouds the mirror of the compartment 19, the clouding may be very readily discovered by a quick comparison of this mirror with the mirrors in the compartments 18 and 20; in fact merely by running the eye across the compartments, the operator will readily discover any slight clouding of any one of the mirrors, and this fact not only makes the device most sensitive, but makes it possible to discover untoward conditions before much damage can be done. We believe then, that by arranging our chambers side by side, and connecting a single pipe to each single compartment, we have constructed a device far more sensitive and far more efficient than would be otherwise possible.

If it is desired to know the nature of the fumes which are clouding any individual mirror, it is only necessary to raise the cover, or open the door of that particular compartment and smell the interior of the compartment. While we have only shown one secondary observation station, that indicated by the detectors 35 and 36, it will be understood that any number of such secondary or auxiliary stations may be provided and may be arranged wherever most desired. These stations only require, however, to have two chambers, and should be indicated "Forward" and "Aft", as are the chambers 35 and 36.

Other modifications than those set forth may be made within the scope of the appended claims without departing from the principle or sacrificing the advantages of this invention.

Having carefully and fully described our invention, what we claim and desire to secure by Letters Patent is:—

1. A smoke detector comprising a cabinet having a plurality of independent chambers in approximate alignment therein, a pipe leading to each of said chambers, a pipe leading from all of said chambers, a second single chamber into which said last mentioned pipe enters, and an exhausting means connected to said second chamber.

2. A smoke detector comprising a cabinet having a plurality of adjacent chambers in approximate alignment, means for illuminating all of said chambers, a reflecting surface in each of said chambers, and means for passing air currents across said reflecting surfaces.

3. In a smoke detector, a plurality of cabinets each having a plurality of independent chambers in alignment, a second cabinet hav-

ing a plurality of independent chambers, each of said last mentioned chambers being connected to a group of said first mentioned chambers, means for passing air current through all of said chambers, and a reflecting surface in each said chamber arranged so that the air passing through each chamber will pass over the reflecting surface therein.

4. In a smoke detector, a plurality of cabinets each having a plurality of independent chambers, and a second cabinet having a plurality of independent chambers in alignment, each of said last mentioned chambers being connected to a group of said first mentioned chambers, and means for passing air current through all of said chambers, and means for illuminating all of the chambers of each group from a single illuminating means, and a reflecting surface in each of said chambers.

5. In a smoke detector, a plurality of cabinets each having a plurality of independent chambers arranged side by side, and a second cabinet having a plurality of independent chambers, each of said last mentioned chambers being connected to a group of said first mentioned chambers, and means for passing air current through all of said chambers, and means for illuminating all of the chambers of each group from a single illuminating means, and a manifold common to all of the chambers of each individual group.

6. In a smoke detector, a cabinet having a plurality of independent chambers arranged adjacent one to the other, a reflecting surface in each said chamber, means for causing a current of air to pass across the faces of said reflecting surfaces so that foreign matter in the air will cloud one or more of said reflective surfaces.

7. In a smoke detector, a plurality of chambers, a reflecting surface in each said chamber, means for illuminating all said chambers, means for causing a current of air to pass through all of said chambers and means for associating said chambers in close proximity, one to the other so that a clouding of one reflective surface may be quickly discovered by a comparison of that surface with the next adjacent surface.

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