

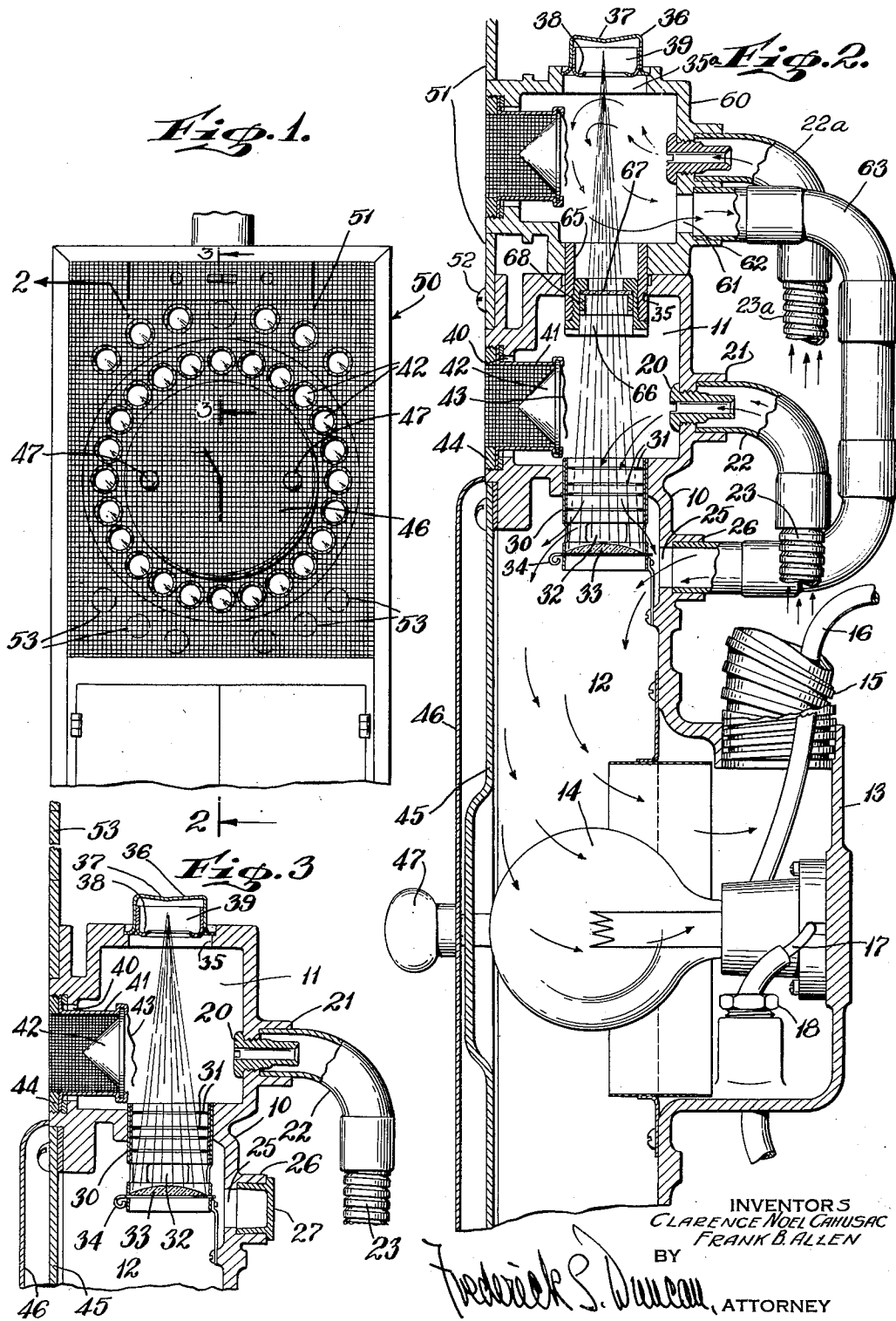
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SMOKE DETECTING APPARATUS

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SMOKE DETECTING APPARATUS

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5 Claims. (Cl. 88—14)

This invention relates to improvements in smoke detecting apparatus and has been illustrated as an improvement in the smoke detecting apparatus disclosed in our application Ser. No. 315,194 filed January 23, 1940, of which this application is a continuation-in-part.

The apparatus disclosed in said application is provided with a circular series of smoke detector chambers arranged about and communicating with a common central exhaust chamber and each detector chamber is provided with an observation window at the front of the cabinet. It has been found that in some cases a greater number of detector chambers is required and without increasing the size of the cabinet.

Among the objects of our invention is the provision of means facilitating adding one or more detector chambers without increasing the size of the cabinet and/or for adding an additional circular series of detector chambers or as many of such additional series as may be required.

Other objects of the invention consist in the use of a light beam which is of conical form and of sufficient length to project through two detector chambers arranged in tandem, in the provision of means for concentrating and directing the flow of air drawn from the compartments or rooms onto air detecting devices, and in the provision of means facilitating the addition of detector chambers when required.

Other objects of the invention will appear from the following description taken in connection with the drawing, in which—

Fig. 1 is a front elevational view of a portion of the cabinet;

Fig. 2 is a section on the line 2—2 of Fig. 1; and

Fig. 3 is a section on the line 3—3 of Fig. 1.

The apparatus comprises a housing or casting 10 which is provided with a circular series of detector chambers 11 whose axes extend radially of the casting and which communicate with a common central exhaust chamber 12 provided with a central rearwardly offset portion 13 at the center of which is supported a suitable source of light 14 and to the upper wall of which is connected a flexible hose 15 for air exhaust which is connected to a blower box not disclosed and which may be of any suitable construction and which may be motor operated, the current for which may be supplied through a cable 16 which together with the wiring 17 for light 14 may enter the lower wall of the offset portion and each may be sealed therein by any well known means as indicated at 18.

The rear wall of each detector chamber is provided with a port in which is threaded a nozzle 20. The port is surrounded by a cylindrical flange 21 in which may be secured as by seal welding if desired an elbow 22 in which is secured a flexible hose 23 which extends to a compartment or room

or the like. The rear wall of the common exhaust chamber 12 is provided with a circular series of ports 25 surrounded by flanges 26 and which may be closed by suitable frictionally held cups 27 which are preferably readily removable for purposes hereafter described.

Suitably supported in each of the ports establishing communication between the detector chambers 11 and the common exhaust chamber 12 is a lens holder 30 which is provided with beam controlling diaphragms or baffle rings 31 of the size, arrangement and location shown. The lens holder is provided with ducts 32 for the passage of air from detector chamber 11 to the common exhaust chamber 12. Supported in the inner end of each holder is a converging lens 33 which may be detachably supported therein in any suitable manner as by a sliding spring bar 34. In Fig. 2 is shown a beam controlling means disclosed in the application referred to and this may be used in the construction disclosed in this application especially in the regions where no auxiliary detector chambers will be added. It is preferred however to employ the beam controlling means disclosed in Fig. 3 especially in those regions in which auxiliary detector chambers may be added.

The outer end wall of each detector chamber 11 is provided with an opening 35 in which is mounted a cup-shaped light trap 36 preferably of the composite construction disclosed and which may be held in place by a spring snap engagement. The base of the cup is preferably of inverted conical shape as indicated at 37 to deflect the light divergingly against the walls of the cup which upon reflection is trapped by the flange 38 of an inner element 39 of the cup which is preferably of the form indicated.

In the front wall of each detector chamber 11 is an opening 40 in which is seated an observation window housing 41 in the inner end of which is supported a non-glare observation window 42 preferably of conical shape is indicated. Secured to the upper side of each window housing and freely suspended over the observation window is an air detecting member 43 which may be in the form of a thread as indicated. The housing 41 may be secured in position by a threaded ring 44.

The front of the common exhaust chamber 12 may be closed by a disc 45 which may be secured to the casting by any suitable means and if desired a finishing front cover plate 46 may cover the disc 45 and be secured to the cover plate 45 by any suitable means as indicated at 47.

The cabinet generally indicated at 50 may be of any suitable form and may comprise a face plate 51 to which the casting 10 may be secured by screw threaded bolts 52 as indicated. The face plate 51 may be provided with knockout pieces 53 in radial alignment with the window openings

in the casting provided for purposes about to be described.

The construction so far described is substantially disclosed in the application referred to. Our improvements consist in auxiliary detector chambers 60 which are individual units and are of substantially the same construction as the detector chambers 11 which are integrally formed in the main casting 10. The rear wall of the detector chamber 60 is provided with an additional port or outlet 61 surrounded by a flange 62 in which is secured as by seal welding or in any other suitable manner one end of a composite U-shaped connecting tube 63, the other end of which is connected in the flange 26 of the detector chamber 11 in radial alignment therewith. This connector tube establishes communication between the detector chamber 60 and the common exhaust chamber 12.

When it is desired to add a detector chamber 60 in any particular position, the light trap 36 is removed from the detector chamber 11 in the corresponding position and the corresponding knockout piece 53 is removed from the front plate 51 of the cabinet. The inner end of each auxiliary detector chamber may be provided with a hollow cylindrical member 65 which may be suitably secured therein and may project therefrom to extend into the opening 35 in the outer end of the detector chamber 11. Threaded in the inner end of the member 65 may be a glass separator holder provided with an opening 66 through which the beam of light projects and surrounded by a seat on which a glass separator 67 may be held by a retaining ring 68.

After the auxiliary detector chamber or chambers have been placed in position, the light trap removed from the chamber 11 is secured in the opening 35a in the outer end wall of the detector chamber 60, the detector chamber 60 is connected to the desired compartment by an elbow connection 22a and hose 23a as in the case of the detector chamber 11 and the U-shaped tube 63 is mounted in position to connect the detector chamber 60 to the common exhaust chamber 12.

When the apparatus is set in operation air is drawn through all of the detector chambers 11 and the auxiliary detector chambers 60 from the various compartments to which these chambers are connected. The air from the additional compartments served by the improvements of our invention is drawn through the hose connections 23a, elbows 22a, auxiliary detector chambers 60 and U-shaped connections 63 into the common exhaust chamber 12 from which air is exhausted as described. It will now be seen that our invention provides for the addition of auxiliary detector chambers to serve a larger number of compartments by means of connections which can be readily effected after removal of only readily removable parts without changing or disturbing the main construction.

While we have shown a preferred embodiment and described the same with particularity, it is to be understood that we reserve the right to all such changes as fall within the principles of this invention and the scope of the appended claims.

We claim:

1. In a smoke detecting apparatus, the combination of a circular series of radially extending smoke detector chambers, a common exhaust chamber with which the inner ends of said chambers communicate, an outer concentric circular series of smoke detector chambers, individual

chambers of which outer series are in radial alignment with chambers of said first mentioned series, a transparent separator between corresponding chambers of said two series, a source of light for transmitting light through the corresponding inner and outer chambers of said two series and conduit means connecting the sides of the detector chambers of said outer series to said common exhaust chamber.

2. In a smoke detecting apparatus, the combination of a circular series of radially extending smoke detector chambers, a common exhaust chamber with which said chambers communicate, an outer concentric circular series of smoke detector chambers the individual chambers of which are in radial alignment with chambers of said first mentioned series, a transparent separator between corresponding chambers of said two series, conduit means connecting the sides of the detector chambers of said outer series to said common exhaust chamber, and a source of light located in said exhaust chamber at the center and in the common plane of both of said series for transmitting light through the corresponding inner and outer chambers of said two series.

3. In a smoke detecting apparatus, the combination of a circular series of radially extending smoke detector chambers, a common exhaust chamber with which the inner ends of said chambers communicate, an outer concentric circular series of smoke detector chambers, individual chambers of which are in radial alignment with chambers of said first mentioned series, a transparent separator between corresponding chambers of said two series, conduit means connecting the sides of the detector chambers of said outer series to said common exhaust chamber, a source of light located in said exhaust chamber at the center of and in the common plane of both of said series for transmitting light through the corresponding inner and outer chambers of said two series, and a concentrating lens located between each inner detector chamber and said source of light for converging the rays of light to a focus at the outer end of the corresponding detector chamber of said outer series.

4. In a smoke detecting apparatus, the combination of a series of smoke detector chambers, a common exhaust chamber with which said detector chambers communicate, a second series of smoke detector chambers in the plane of said first mentioned series and said common exhaust chamber, the individual chambers of which are aligned with the chambers of the first mentioned series, a transparent separator between corresponding chambers of said two series, conduit means connecting the sides of the detector chambers of the outer series to said common exhaust chamber and a source of light located in said exhaust chamber for transmitting light through the corresponding chambers of the two series.

5. In a smoke detecting apparatus, the combination of two series of detector chambers, the individual chambers of which are aligned, a transparent separator between corresponding chambers of said two series, a common exhaust chamber with which all of said chambers of said two series communicate, and a source of light for transmitting light into a chamber of one series and through the transparent separator into the corresponding chamber of the other series.

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