Jan. 6, 1970 S. W. LEE 3,488,649

GAS DETECTOR

Filed Dec. 27, 1967 2 Sheets-Sheet 1

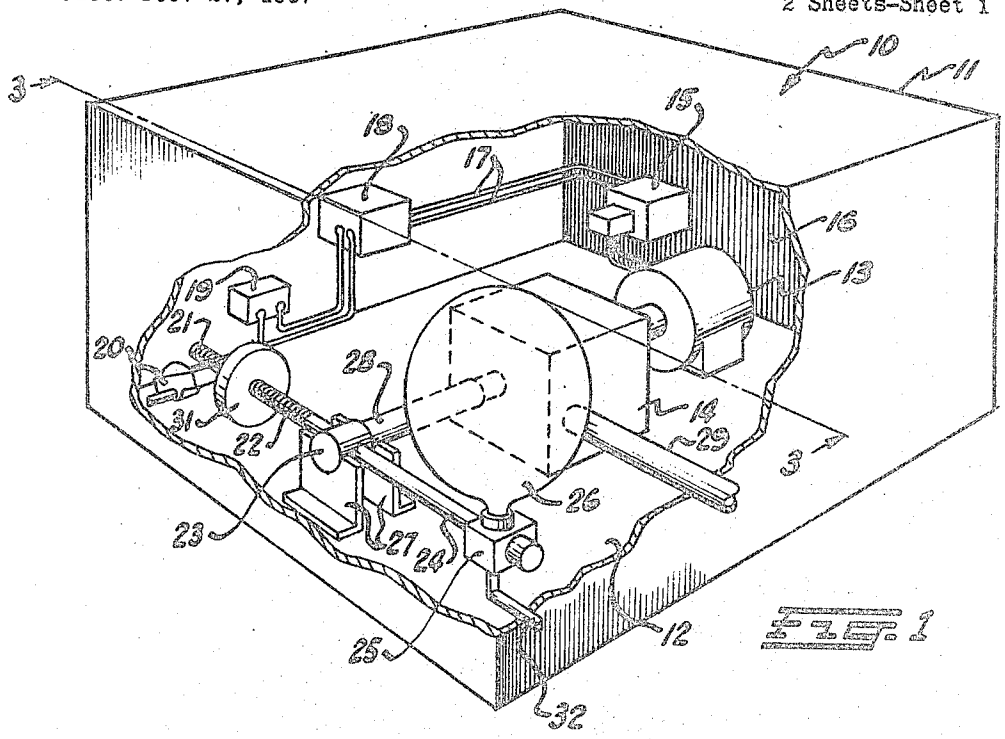


FIG. 1

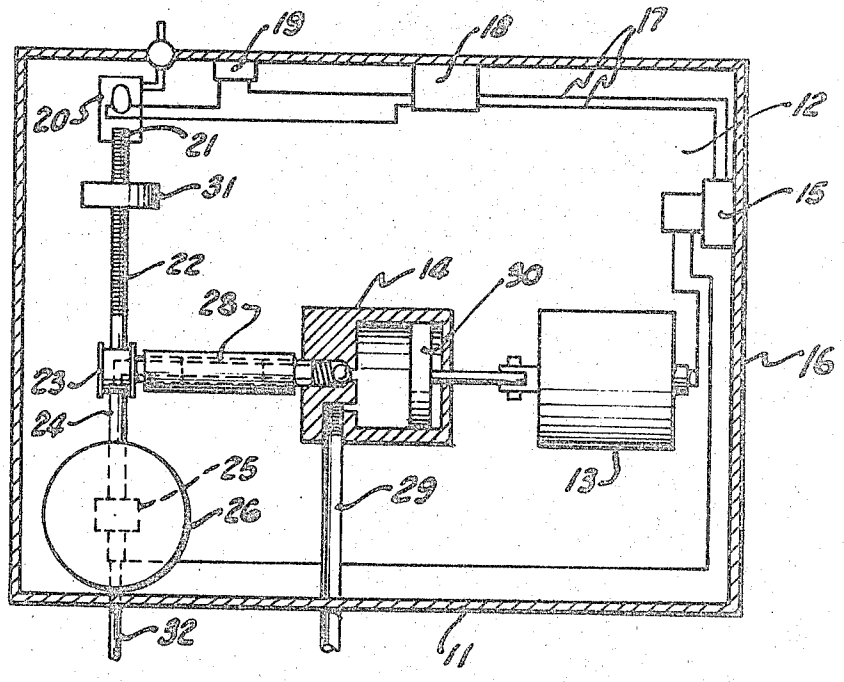


FIG. 2

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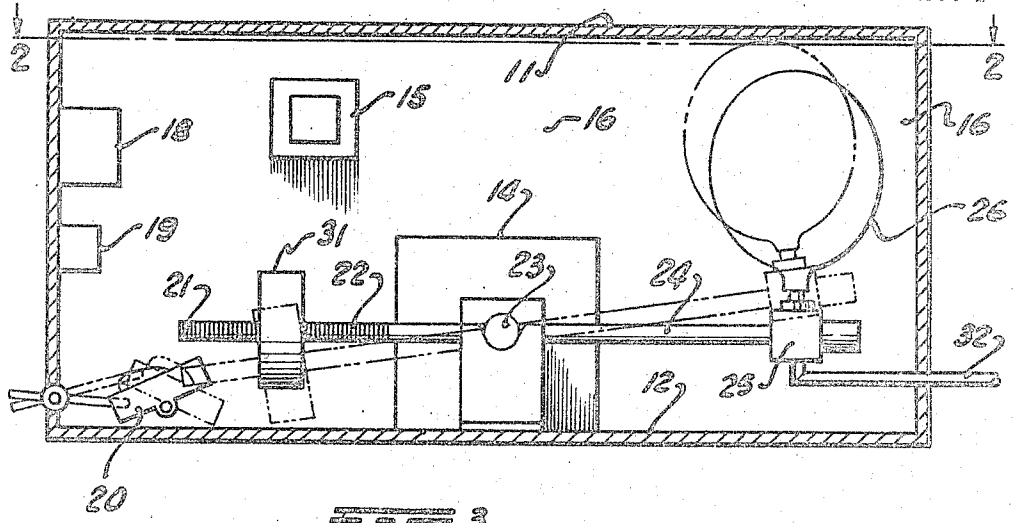


FIG. 3

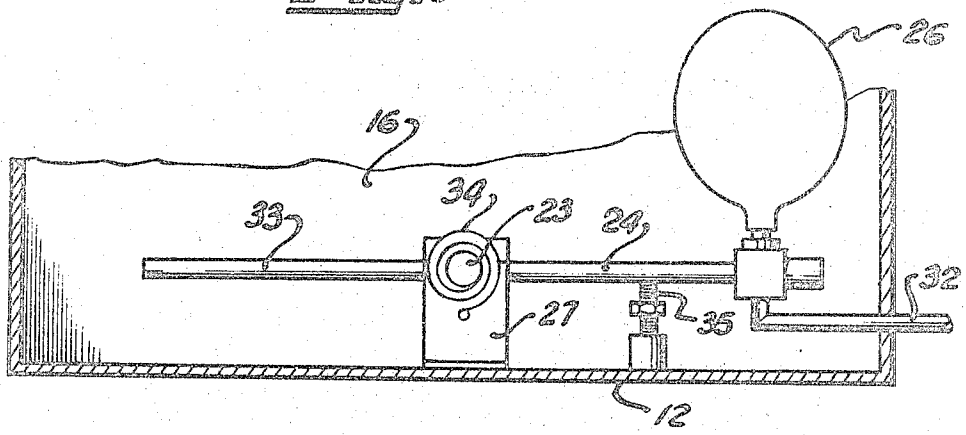


FIG. 4

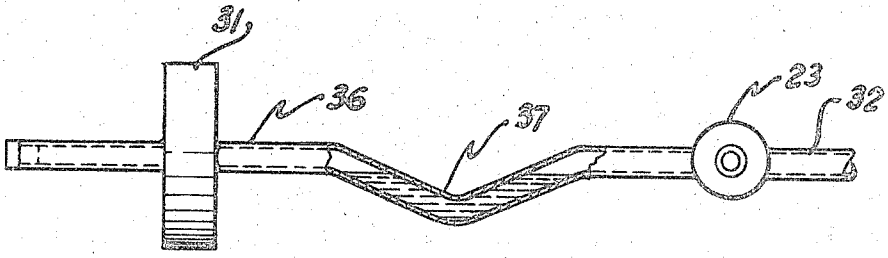


FIG. 5

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GAS DETECTOR

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U.S. Cl. 340—237 2 Claims

ABSTRACT OF THE DISCLOSURE

This invention consists of a hollow container in the form of a box in which is located an electric motor and a pump, the pump is adapted to draw in atmosphere from outside of the aforesaid box and transmit it through a pipe to two balanced tubular arms to an inflatable container secured to one end of the aforesaid tubular arm which, if the atmosphere is lighter in weight than air, will cause the tubular arm to move in such a way as to activate an electrical signal device.

It is the principal object of this invention to provide a gas detector of the character herein described that will automatically activate any desired type of alarm when there is gas in the atmosphere.

Another object of this invention is to provide a gas detector of the character herein described that can be used anywhere there is electricity to operate the mechanism of the detector.

Another object of this invention is to provide a gas detector of the character herein described that has a minimum number of parts enclosed in a container that can be placed where one may want to detect gas in the atmosphere.

Still another object of this invention is to provide a gas detector of the character herein described that can be provided with any desired type of alarm, such as a bell, buzzer, light and/or a combination of any two or more alarms that can be located in any desired place.

Other objects of this invention of a gas detector will no doubt come to mind as the reading of this specification and its appended claims proceeds and the appended drawings are examined.

In the drawings:

FIG. 1 is a pictorial view of this invention of a gas detector with its case broken open in part in order to show its internal mechanism.

FIG. 2 is a top sectional view of this invention of a gas detector, taken substantially along line 2—2 of FIGURE 3, and viewed in the direction indicated by the arrows.

FIG. 3 is an end sectional view of this invention of a gas detector, taken substantially along line 3—3 of FIGURE 1, and viewed in the direction indicated by the arrows.

FIG. 4 is an end sectional view of this invention of a gas detector, similar to that of FIGURE 3, but showing an alternate form of its mechanism, having the upper portion of its case removed for reasons of clarity.

FIG 5. is a longitudinally disposed view of a modified form of the tubular balance arm that has been partly broken open to better show its internal construction.

In the several views of the accompanying drawings, like parts are indicated by like reference numbers.

The reference number **10** indicates this invention in its entirety, while the reference number **11** indicates a rectangular case having a flat bottom **12** on which is mounted the electric motor **13** that is connected to the pump **14**. The aforesaid electric motor is electrically connected to the timer **15** which is mounted on one end wall **16**

of the aforesaid case **11**. The just-mentioned timer **15** is connected by electric wires **17** to the side wall mounted power terminal **18**. Electric wires connect the just-mentioned power terminal **18** to the electric alarm **19** and the toggle switch **20** that is reset by the reset arm **20'**. The aforesaid toggle switch **20** is activated by the lower and outer end **21** of the balance arm **22**, which I personally call a fulcrum arm. The balance arm **22** has its inner end secured to the coupling **23** which is a hollow member that also provides support for one end of the tubular balance arm **24** which has its other and outer end terminating in the flexible container support **25**. The flexible container being indicated by the reference number **26** in the accmpanying drawings. The aforesaid coupling **23** that provides a swingable balance point for the two balance arms **22** and **24** which are diametrically opposite one another, as one can readily see by examination of FIGURES 1, 2, and 3 of the accompanying drawings, is supported by the vertically disposed supporting structure **27** which is mounted on the previously-mentioned flat bottom **12** of the case **11**. A pipe **28** connects the aforesaid coupling **23** with the aforesaid pump **14** which is also connected by an atmosphere intake pipe **29** with the outside of the aforesaid case **11**, thereby providing the necessary passage of the atmosphere from the outside of this invention, through the pump **14**, on into the flexible container **26**, as is obvious from examination of the first two figures of the accompanying drawings. Although it is not shown in any of the views of the accompanying drawings, both pipes **28** and **29** must be provided with automatically operated check valves in order that the atmosphere will not be drawn in the opposite direction as the piston **30** of the pump **14** reciprocates.

The only two parts of this invention shown in the form illustrated in FIGURE 1 of the accompanying drawings that have not been mentioned are the longitudinally adjustable balance weight **31** that is located on the aforesaid balance arm **22** and the atmosphere disposal pipe **32** that projects out from the bottom of the aforesaid flexible container support **25** which will be provided with the necessary check valve. The check valve is connected to the aforesaid electric timer **15** by an electric wire since the check valve is electrically controlled by the timer. The just-mentioned electric wire is not shown in any of the views of the drawings for reasons of clarity.

Before going into some of the optional forms of construction of certain details of construction of this novel invention, the preferred form of this invention, illustrated in the first three figures of the accompanying drawings, works as follows:

This invention **10** has its power terminal **18** connected to any desired source of electricity, the electric motor **13** is then started by means of the timer **15**. The running of the aforesaid electric motor **13** will activate the pump **14**, which can be of any suitable and desired type, although the reciprocating pump type is shown in the accompanying drawings. The activated pump **14** will draw in atmosphere from the outside of the case **11** through the intake pipe **29** and pump the atmosphere through the pipe **28**, through the hollow member **23**, on into the tubular balance arm **24**, through the flexible container support **25**, and on into the flexible container **26**. If the atmosphere is lighter than air, the inflated container **26** will raise the outer end of the tubular balance arm **24**, thereby depressing the outer end of the aforesaid balance arm **22** which will now press downward on the toggle switch **20** and will thereby set off the electric alarm **19** which will now warn people of the presence of a lighter than air gas in the atmosphere.

Since the weight of gases vary, this invention is provided with an adjustment in order that the gas detector can be used in any kind of atmosphere, regardless of the weight of the gas contained therein. This adjustment is in the form of a balance weight **31** which is screwed longitudinally along the aforesaid balance arm **22** which is a threaded rod, as one can readily see on examination of FIGURES 1, 2, and 3 of the accompanying drawings. At the end of a predetermined cycle of operation of this gas detector **10**, the atmosphere in the flexible container **26** is released automatically from the container through the aforesaid atmosphere disposal pipe **32**.

Two optional forms of construction of the balance arms are shown in FIGURES 4 and 5 of the accompanying drawings. FIGURE 4 illustrates the replacement of the threaded balance arm **22** with the rod **33**, also the addition of a spiral balance spring **34** on the aforesaid hollow member **23**. The invention is also provided with a vertically adjustable stop **35** that is located under the longitudinal center of the tubular balance arm **24**. FIGURE 5 illustrates the tubular balance arm **36**. This type of balance arm, which is filled with either a liquid or grits in the V-shaped depressed portion **37**, can be used with either the general construction shown in the first three figures of the accompanying drawings or with the optional form of construction shown in FIGURE 4 to make the device more sensitive.

What I now claim as new and desire to secure by Letters Patent is:

1. A gas detector of the character described, comprising a case, an electrically activated pump connected to draw air from outside the case, a flexible container, a balance arm which is a hollow tube that has one end terminating in a hollow member that is movably supported by a vertically disposed supporting structure which is secured to the bottom of said case, the said hollow member being connected to the said pump by a pipe, the flexible container connected to the other end of said balance arm, a second balance arm that is diametrically opposite to the first mentioned balance arm and having one end secured to said hollow member, an electric switch connected to an electric alarm, the switch positioned to be activated by the other end of the second mentioned balance arm, and means of disposing of the atmosphere in said flexible container at a predetermined interval of operation of the said gas detector.

2. The invention of claim **1**, wherein the second mentioned balance arm is a threaded rod on which is adjustably screwed a balance weight that has the configuration of a disk.

References Cited

UNITED STATES PATENTS

1,308,626	7/1919	Crowell	73—30 XR
2,673,339	3/1954	Gray et al.	340—237

FOREIGN PATENTS

15,464	1884	Great Britain.
7,846	1891	Great Britain.

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U.S. Cl. X.R.

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