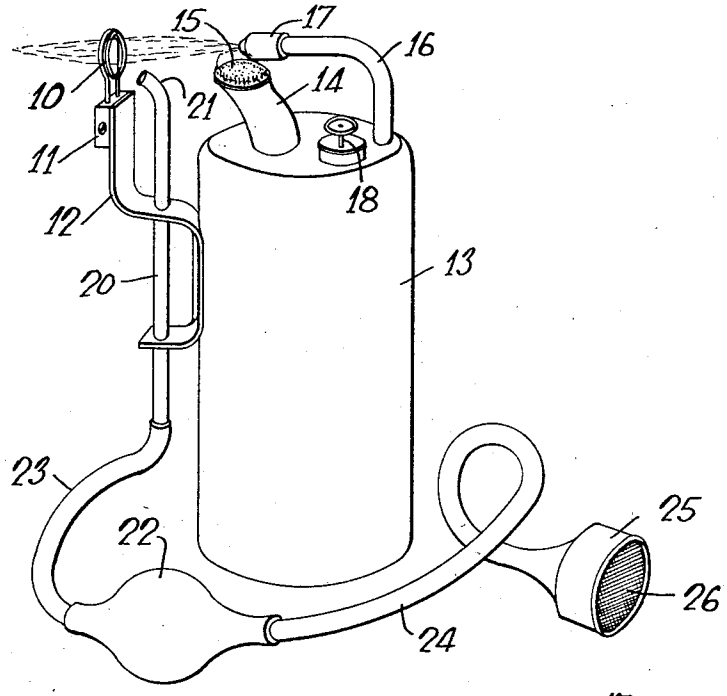
June 28, 1932. A. B. LAMB 1,864,544

DEVICE FOR DETECTING METHYL CHLORIDE

Filed Oct. 1, 1929

Fig. 1.



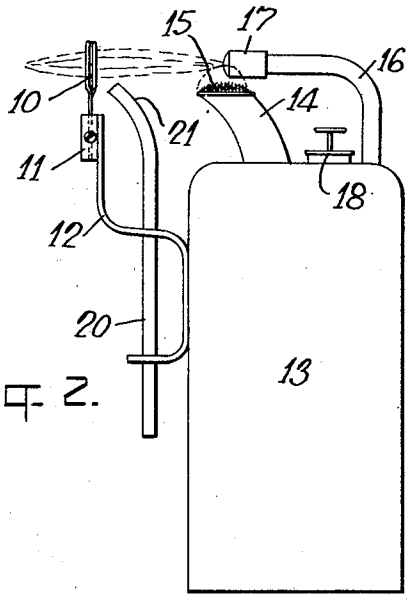


Fig. 2.

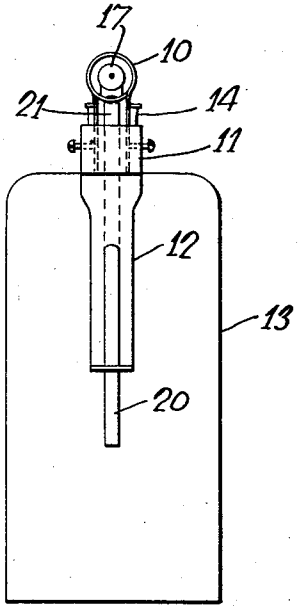


Fig. 3.

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UNITED STATES PATENT OFFICE

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DEVICE FOR DETECTING METHYL CHLORIDE

Application filed October 1, 1929. Serial No. 396,458.

This invention relates to devices for detecting methyl chloride and particularly to devices adapted to utilize the so-called copper-flame test for detecting gaseous compounds containing chlorine.

The invention has for its object generally, the provision of a device of the character indicated which is efficient, economical, and readily manufactured.

More specifically, an object is to provide a portable device having a copper coil adapted to be heated, so as to give the characteristic reaction for chlorine in detecting the presence of chlorine-containing gaseous compounds.

Still another object is to provide a portable device of the character indicated, with means for maintaining a copper coil at the desired temperature for yielding characteristic reactions.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the constructions hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a perspective view, showing a device constructed in accordance with the invention;

Fig. 2 is a side elevation of the same; and

Fig. 3 is a front elevation.

Referring now to the drawing, 10 denotes a coil of copper wire arranged to be heated and used for obtaining reactions by means of the so-called copper-flame to test gaseous media for the presence of chlorine. The coil has its ends supported in any suitable manner, for example in the block 11 which is mounted on the end of a bracket 12 which is associated with and is supported by the means which is here employed for heating the copper coil to the desired reaction temperature.

Any suitable means which is portable and gives a colorless flame of desired intensity may be used for heating the coil 10. The means preferred, however, is of the blow-torch variety, that shown comprising a casing 13 adapted to contain a suitable combustible agent, preferably in liquid form such as alcohol which is supplied through a burner tube 14. This tube may be of any suitable type, for example, a wick tube containing a wick 15. The wick thus arranged extends into the casing 13 and is supplied with combustible for supporting combustion in the usual manner. Adjacent the wick tube is a blast tube 16 having a nozzle 17 arranged to blow a jet substantially through the central portion of the wire 10, this nozzle being so disposed with reference to the flame as to project it through and about the coil 10 for heating the latter. The blast from the tube 16 may be supplied from any convenient source adapted to supply gaseous blowing medium under pressure, for example, from a reservoir in the top of the casing 10 containing for example vaporized alcohol or compressed air. A device for supplying the latter is here shown in the form of a small air compressing pump incorporated in the casing 13, as shown at 18.

Associated with the bracket 12 is a means for introducing gaseous material to be tested. This means may conveniently comprise a tube 20 shown as secured in the bracket 12 and having a bent-over tip 21 inclined toward the copper coil 10 and adapted to discharge into the flame which is projected through the coil 10. The gaseous material to be introduced into the flame at coil 10 is conveyed to the tube 20 by any convenient device adapted to produce a flow thereof, for example, by means of an aspirating bulb 22 having valved connections adapted to discharge into the tube 23 that is connected to the lower end of the tube 20. An inlet tube 24 is connected to the other valved end of the bulb. The free end of the tube 24 preferably has a flexible collecting tip 25 adapted to be fitted over a source of the medium deemed to contain the compound to be examined by the flame reaction as here provided. This tip is preferably screened by means of a sheet of gauze, as shown at 26, placed over its mouth.

By the present invention, it is seen that a convenient device is provided for the detection of the presence of small amounts of chlorine containing gaseous compounds otherwise difficult of detection, such as methyl-chloride which is now used extensively in certain types of refrigerating systems. Methyl-chloride is a colorless and substantially odorless gas at normal room temperatures, so that if leaks should occur in a refrigerating system utilizing this gas as the refrigerant, such leaks if small, would be substantially impossible of detection through any one of the five senses. Such leaks when in small quantities become diluted with the air and their detection by chemical analysis of the air collected from the vicinity of the supposed leak, is substantially impossible by ordinary chemical analytic methods. By the present invention, it is seen that a device utilizing a relatively delicate reaction for the detection of relatively small amounts of chlorine is provided, which can be relied upon to show the presence of a chlorine containing compound when passed through the flame.

In operation, it is seen that a substantially colorless flame is provided by means of the burner here employed, which flame is projected through the copper coil by a blast and caused to heat the copper coil to the proper temperature for giving a reliable copper-flame reaction for detecting the presence of chlorine. When it is desired to make a test, the flexible tip 25 is placed over the source of the gaseous compound to be tested and the bulb 22 squeezed in the manner ordinarily used to operate bulb-aspirators, whereupon the gaseous compound admixed with air is forced through the tube 20 and out of the tip 21 into the flame in the coil 10. If chlorine be present, the flame gives its characteristic colors. By this means, one is able to detect with ease and certainty the presence of methyl-chloride or similar chlorine-containing compound when leaking into the atmosphere at as low a rate as .0001 of a gram per minute.

To make the present device highly sensitive, it is desirable that the collecting tip shall collect a relatively large amount of gas from the leak with as little air as possible. This, of course, is accomplished by manipulating the aspirating bulb 22, so as to apply its suction over a relatively long period. This action can be obtained automatically from the bulb by providing a relatively restricted orifice at some point in the path of the gas drawn in, or by the provision of a capillary tube in one or both of the valves of the aspirator. By such construction, the present device may be made to have substantially any desired degree of inherent sensitiveness to small quantities of escaping gas.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description, or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a device of the character described, the combination with a copper coil, of a portable burner device supporting said coil, means for projecting a jet from said burner through said coil, and means for introducing a gaseous medium at will into said flame, said coil, said device and said means being combined to form a portable structure.

2. In a device of the character described, the combination with a copper coil, of a portable burner device supporting said coil, a blast device for projecting a jet from said burner through said coil, and aspirator means for introducing a gaseous medium to be tested into said flame, said coil, said devices and said means being combined to form a portable structure.

3. In a device of the character described, the combination with a copper coil, of a portable burner device supporting said coil, a nozzle supplied with a compressed blowing medium disposed over said burner and adapted to project its flame through said coil, and a bulb-aspirator having a connection disposed for introducing a gaseous medium to be tested into said flame, said coil, said device and said nozzle and said bulb-aspirator being combined to form a portable structure.

4. In a device of the character described, the combination with a copper coil, of a burner casing adapted to contain a combustible and having a burner tube, means on said casing for supporting said coil, a nozzle on said casing supplied with compressed blowing medium and adapted to project the burner flame through said coil, a tube supported by said casing and arranged to introduce a gaseous medium into said flame, and a bulb-aspirator adapted to force gaseous medium into said tube, the aforesaid elements being combined to form a portable structure.

5. In a device of the character described, the combination with a copper flame-reaction wire, of a portable burner device supporting said wire, a nozzle supplied with a compressed blowing medium disposed over said burner and adapted to project its flame through said wire, and a bulb aspirator having a restricted passage associated therewith and a pipe connection disposed for introducing a gaseous medium to be tested into said flame, the aforesaid elements being combined to form a portable structure.

6. In a device of the character described,

the combination with a copper flame-reaction wire, of a burner casing adapted to contain a combustible and having a burner tube, means on said casing for supporting said wire, a nozzle on said casing supplied with compressed blowing medium and adapted to project the burner flame through said wire, a tube supported by said casing and arranged to introduce a gaseous medium into said flame, a bulb aspirator having a restricted passage associated therewith, and a pipe connection leading from said bulb aspirator to a point adjacent said burner tube for introducing a gaseous medium to be tested into said flame, the aforesaid elements being combined to form a portable structure.

7. In a portable device of the character described, the combination with a copper flame reaction wire, of an aspirator and tube for directing a stream of gas to be tested, means to project a flame in a constant direction and a portable combustion device adapted to supply said means and to support said means, said wire and said tube in fixed relation, such that said stream, said wire and said direction meet at a point.

In testimony whereof I affix my signature.

ARTHUR B. LAMB.