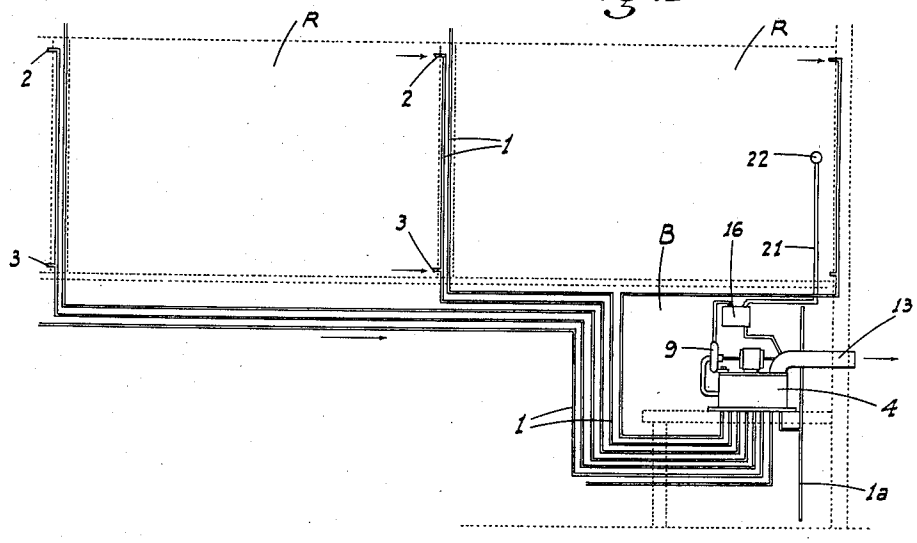
June 28, 1938. J. B. QUICK 2,122,070

COMBUSTIBLE GAS DETECTING SYSTEM

Filed May 4, 1937

Fig. 1



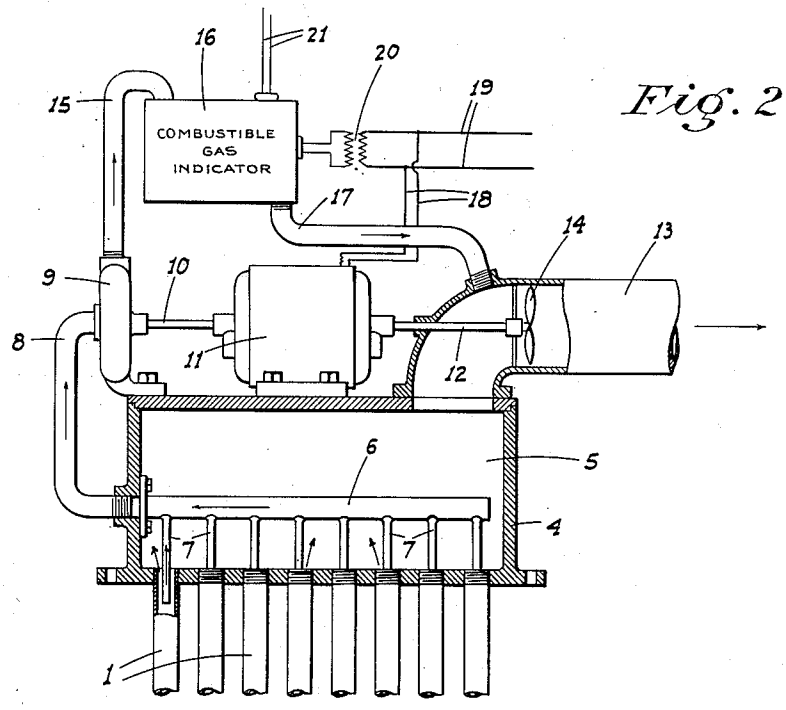


Fig. 2

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COMBUSTIBLE GAS DETECTING SYSTEM

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4 Claims. (Cl. 23—232)

This invention relates generally to a combustible gas detecting system and in particular relates to a combustible gas detecting system and incorporated apparatus designed for use in public and private buildings such as schools, factories, residences and the like.

The principal object of my invention is to provide a system for the detection, at a central station in a building, of the presence of combustible gas in any one or more rooms of the building; the system being operative to detect gas which is either lighter than air as natural gas or which is heavier than air as "butane". Many serious explosions due to gas leakage and resulting in heavy loss in life and great property damage have occurred since the advent of the use of combustible gases of different types for heating purposes, etc. To avoid such accidents, I have produced the combustible gas detecting system hereinafter described and which system will function to automatically give a warning signal upon the accumulation of gas in any room or rooms of a building in which the system is installed.

Another object of my invention is to provide apparatus in connection with the system which is arranged so that the system will be continuously operative and function to give an immediate warning signal upon the accumulation of gas in any room to which the system is connected and without material lapse of time.

A further object of the invention is to produce a simple and inexpensive system and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a diagrammatic view of the system.

Figure 2 is an elevation of the central station apparatus partly in section and also somewhat diagrammatic.

Referring now more particularly to the characters of reference on the drawing, the system comprises a plurality of conduits 1, each conduit leading to a separate room R of the building and being provided with two intake ports one of which, indicated at 2, is disposed adjacent the ceiling of the room and the other port, indicated at 3, being disposed adjacent the floor of the room. All of these conduits 1 lead to the central station apparatus which is preferably disposed in the basement B of the building as shown diagrammatically in Fig. 1. A conduit 1*a* is also located in the basement itself and is connected with the central station apparatus.

This central station apparatus comprises a housing 4 which forms an enclosed chamber 5. The conduits 1 and 1*a* are each connected into the housing 4 and in communication with the chamber 5; such conduits being arranged in a substantially straight row at the point of entry into the housing. A manifold 6 projects through one side of the housing and is disposed immediately above the points of entry of the conduits. A plurality of relatively small intake pipes 7 extend laterally and downwardly from the manifold 6, each of said intake pipes projecting some distance into one of the conduits in the manner shown. A supply pipe 8 is connected to the outer end of manifold 6 and extends upward to an air pump 9 driven by means of shaft 10 on an electric motor 11. Such motor is also provided with another shaft 12 which projects into an outlet conduit 13 which is of relatively large internal diameter and which leads from the chamber 5 to a point of discharge outside of the building as shown diagrammatically in Fig. 1. A suction fan 14 is fixed on the outer end of shaft 12 and serves to withdraw air from chamber 5 and to discharge the same out of the building through conduit 13.

From air pump 9 a pipe 15 leads to a combustible gas indicator indicated diagrammatically at 16. Such combustible gas indicator is of standard construction, and is of a type commonly used but only as a portable unit for transportation from place to place to make separate tests. In my system however the indicator is located at a central station and functions in the manner hereinafter described. A discharge conduit 17 leads from the combustible gas indicator 16 to a connection with outlet conduit 13 at a point on the suction side of fan 14.

The motor 11 is energized through leads 18 from electric supply lines 19 which also connect to a transformer 20 to supply current to the combustible gas indicator 16 at low voltage as is necessary. Wires 21 lead from the combustible gas indicator 16 to an electrically actuated signal 22 which may be disposed in any desirable place in the building as in the main office, superintendent's room, etc.

In use my improved combustible gas detecting system functions in the following manner: The motor 11 operates continuously to drive fan 14 and create a suction in chamber 5 and in all

the conduits 1 causing a continuous withdrawal of air from the rooms in the building through intake ports 2 and 3. At the same time a suction is created in supply pipe 8 by means of air pump 9 resulting in a withdrawal of a certain portion of the air from conduits 1 through the lateral intake pipes 7 and manifold 6. The air so withdrawn from conduits 1 passes through pipe 8, pump 9 and pipe 15 into the combustible gas indicator 16. The pitch of fan 14 is such as to effect a flow of air at relatively high velocity and of substantial volume through conduits 1.

Thus, in the event that gas accumulates in one of the rooms to which the system is connected, such gas, depending on its type, will either rise to the ceiling or fall to the floor and some of the same will immediately be drawn through either port 2 or 3 and into the connected conduit. A portion of this gas will then be conveyed in the manner above described to the combustible gas indicator. The indicator will then function to close the signal circuit 21 and actuate the signal 22 which may either be visual or audible as required. Such signal immediately gives a warning that gas is accumulating in one or more of the rooms of the building and steps can at once be taken to prevent such accumulation and locate the source of leakage. If desired, the intake conduits may be valved so that upon actuation of the signal, the valves may be closed one after the other until it is determined through which intake pipe the combustible gas is passing. This will give a definite indication as to the room in which the gas is accumulating as the conduits may carry suitable symbols indicating the room to which they are connected.

The purpose of withdrawing the air from the rooms at relatively high velocity is to supply an air sample to the combustible gas indicator as quickly as possible from the time of withdrawal. The withdrawal of a substantial volume of air in excess of that required for testing is to assure sufficient circulation of air in the rooms by reason of volumetric replacement to provide a representative air sample in the conduits 1 at all times.

From the foregoing description it will be readily seen that I have produced such a system as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the system, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. A central station combustible gas indicator assembly for a multiple pipe fluid withdrawal system, said assembly comprising a housing forming an enclosed chamber, a plurality of fluid withdrawal pipes projecting through the housing and opening into the chamber, a manifold disposed within the chamber, a plurality of open-ended intake pipes projecting from the manifold and each extending into the adjacent open end of one said withdrawal pipe, said intake pipes being of substantially less diameter than the diameter of the surrounding pipes, a double shaft motor mounted adjacent the housing, a fluid pump connected to one end of the shaft, a conduit leading from the manifold in the chamber to the intake of the pump, another conduit leading from the outlet of the pump, a combustible gas indicator arranged in communication with said other conduit, an exhaust pipe leading from the chamber, the other end of the motor shaft extending into one portion of said pipe axially thereof, and an exhaust fan fixed on said shaft within said pipe.

2. A system for detecting the accumulation of combustible gas in one or more rooms of a building, said system comprising a central testing station, air intake means in each room, conduits connected at one end to and leading from the intake means to said central testing station, said station including a housing forming an enclosed chamber, the conduits being of substantial internal diameter and opening into said chamber, a manifold extending into the chamber, a plurality of relatively small intake pipes projecting from the manifold into the open ends of the conduits in clearance relation thereto, a combustible gas indicator, a pipe establishing communication between the manifold and the indicator, means to create a suction in the chamber and draw air thereinto through said conduits at relatively high speed and in substantial volume, means to draw a portion of the air from the conduits into said intake pipes and manifold and convey such portion of air to the indicator through said communication pipe, and an exhaust pipe leading from the chamber.

3. A system for detecting the accumulation of combustible gas in one or more rooms of a building, comprising a central testing station, air intake means in each room, conduits connected at one end and leading from the intake means to said central testing station, said conduits being of substantial internal diameter; said station including a housing forming an enclosed chamber with which the conduits communicate, means to continuously draw a substantial volume of air from the rooms, through the conduits and into the chamber at relatively high velocity, a combustible gas indicator, means to continuously feed a relatively small volume of the air entering the chamber from the conduit to the gas indicator, and an exhaust pipe leading from the chamber and through which the remainder of such substantial volume of air continuously passes.

4. That method of detecting the accumulation of combustible gas in one or more rooms of a building comprising the steps of simultaneously withdrawing a substantial volume of air from the rooms, conveying the air so withdrawn at relatively high velocity to a central station, testing a relatively small portion of such air at the central station for combustible gas content, and by passing the remainder of such air; all as a continuous process.

JOHN B. QUICK.