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APPARATUS FOR PREVENTING EXPLOSIONS AND DANGER FROM THE ESCAPE OF GAS.

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993,283. Patented May 23, 1911.

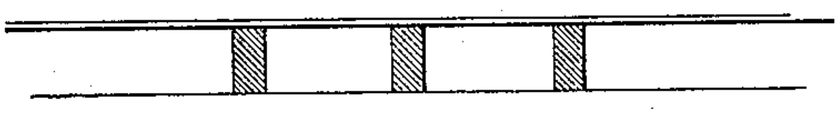


FIG. 1

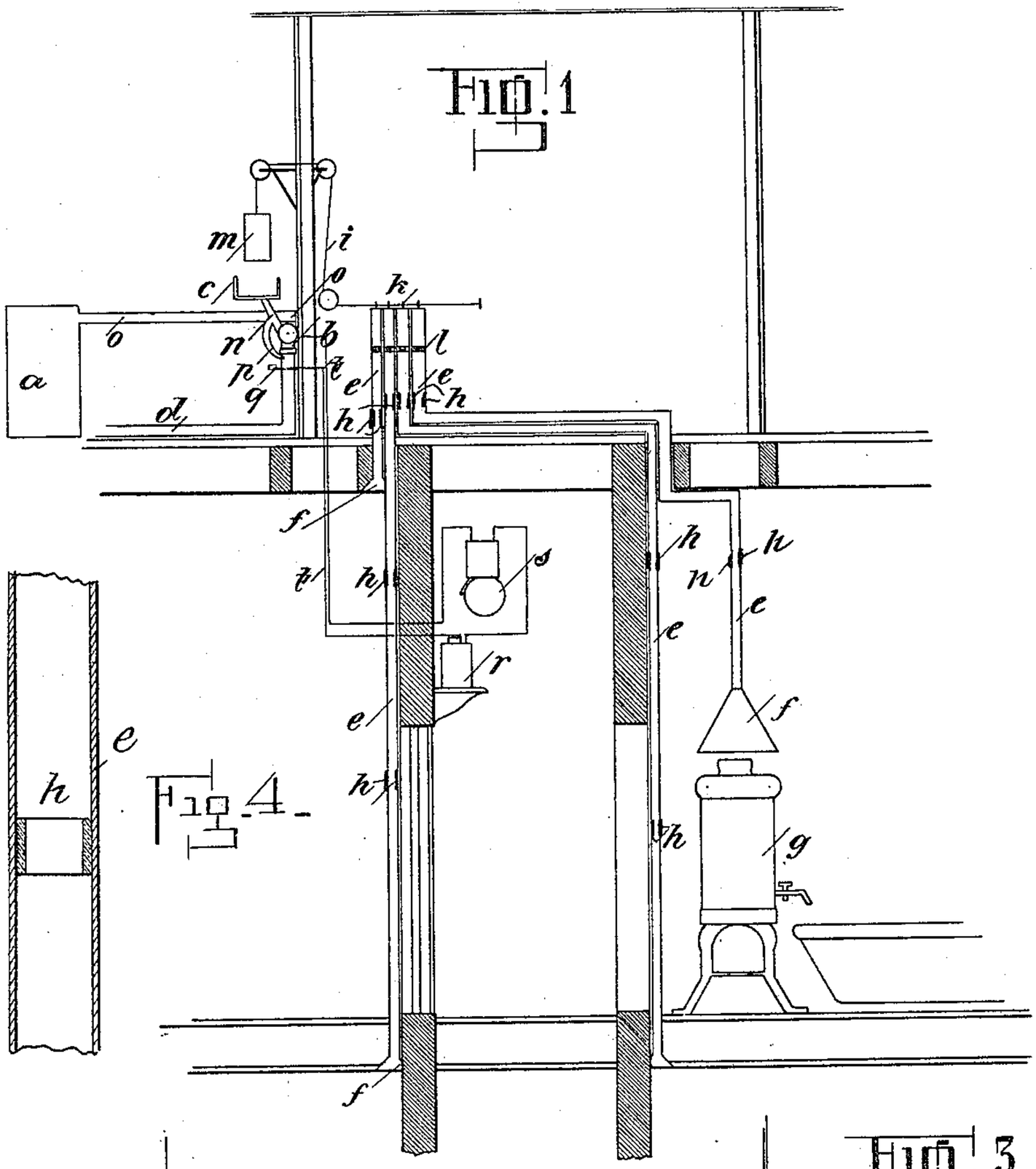


FIG. 4.

FIG. 2.

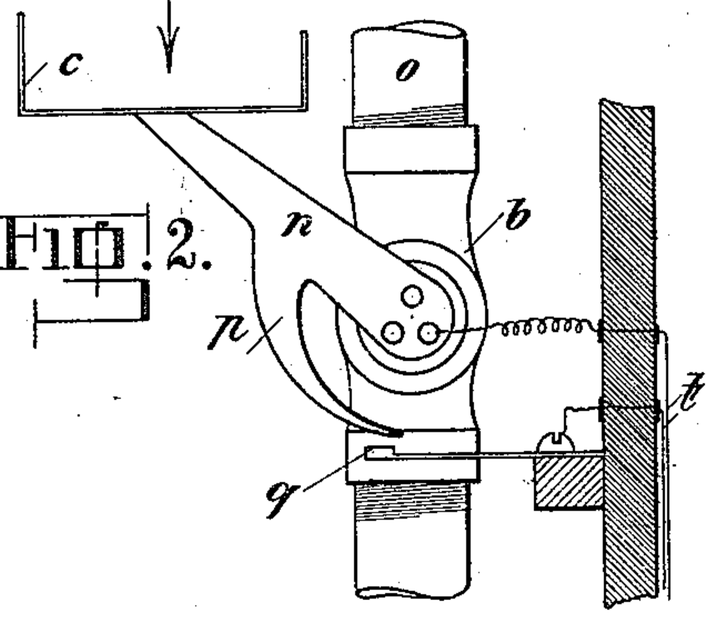
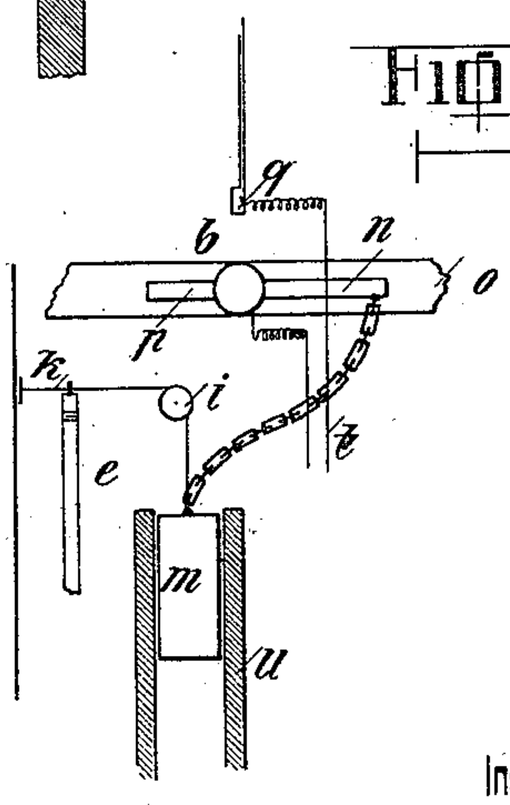


FIG. 3.



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APPARATUS FOR PREVENTING EXPLOSIONS AND DANGER FROM THE ESCAPE OF GAS.

993,283. Specification of Letters Patent. Patented May 23, 1911.

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To all whom it may concern:

Be it known that I, WILLEM ALBERTUS JOHANNES VAN DE KAMP, hotel proprietor, subject of the Queen of the Netherlands, residing at 20 Jansweg, Haarlem, in the Kingdom of the Netherlands, have invented certain new and useful Improvements in and Relating to Apparatus for Preventing Explosions and Danger from the Escape of Gas, of which the following is a full, clear, and exact description.

This invention relates to apparatus for preventing explosions and obviating the risk of poisoning by reducing the waste of gas due to unavoidable though unintentional escape from pipes in buildings and closed rooms, and for giving warning of the accumulation of dangerous gases in mines and the like.

The accidental escape of gas from pipes in buildings and closed rooms results not only in a loss of a by no means inconsiderable quantity of gas, but may result in great danger to life and limb from explosions or poisoning. Many proposals have already been put forward for avoiding the danger of poisoning by imparting to the gas a peculiar smell by means of which the fact of its escape would soon be rendered evident, but the adoption of these proposals cannot prevent a room from becoming filled with escaping gas and consequently cannot do away with the risk of explosion, should a room full of gas be inadvertently entered by a person carrying a naked light or the like. Should any escape of gas, moreover, occur during the night, when people are asleep, the occupants of the room will first be rendered unconscious and then killed, notwithstanding the fact that a penetrating odor may have been imparted to the escaping gas, such odor being thus of no avail in warning the individuals in question of the danger threatening them.

Now the present invention has for object to obviate all these risks and at the same time to decrease the amount of gas which can escape in this manner by causing the gas escaping from a pipe without ignition automatically to turn off the main cock of the gas supply and to actuate an alarm signal. This is effected by causing the escaping gas to be carried off from the upper portion of the room, into which it rises on account of its lower specific gravity, by means of suitably arranged funnels and pipes into rooms where it can be ignited without danger. The gas flowing out of these pipes is ignited by passing it over an igniting pellet, such for instance, as a platinum sponge and a wire suspended above the flame is thus caused to fuse and to set in operation a device which effects the closing of the main cock and actuates an alarm signal.

The accompanying drawing illustrates by way of example one constructional form of apparatus in accordance with this invention, wherein—

Figure 1 is a view of apparatus in accordance with this invention suitable for buildings and other closed spaces, Figs. 2 and 3 show on an enlarged scale constructional modifications of the device for effecting the closing of the main cock and for actuating the alarm signal, and Fig. 4 is a detail view, on an enlarged scale, of a collecting pipe and one of its glass tubes.

The operation of the apparatus is as follows: The gas passes from the outer piping through the meter *a* into the inner pipe *o* and, after passing the main cock *b*, is distributed by means of the pipes *d* to the pipes in the various rooms of the building. To simplify the drawings only one of the pipes last mentioned is shown. Within the building there are arranged special pipes *e* the lower orifices of which are preferably funnel-shaped to enable them to catch any unignited gas that may escape. These pipes are so arranged as to insure that the escaping gas will enter them, that is to say, the orifice of each would be either at the highest point of the room where the gas would accumulate, or directly over the spot where the escape would occur, as, for instance, in a bathroom over the stove *g*. In the upper outlets of these pipes *e* there are located igniting pellets *k* such for instance as platinum sponges and the like. Should gas now accidentally escape from the pipes this gas which, as above described, will be caught by the pipes *e* and which may be partially mixed with air will escape from the pipes *e* and thus render the ignition pellets incandescent and will then become ignited thereby.

To avoid any possibility of the flame produced by the ignition pellet flashing back into the pipes *e* filled with the mixture of gas and air these pipes are provided close to

the outlet orifice with a suitable material *l* such as wire gauze or the like. There may moreover be arranged within the pipes *e* other suitable safety devices such as small glass tubes *h*. The tubes *h*, by reducing the passages of the pipes, increase the velocity of the gas passing through said pipes, and this increased velocity of escaping gas acts to prevent the flame from burning back into the pipes. By means of these tubes also, if the flame should burn back and enter the tubes, the temperature of the explosive mixture will be so reduced that the flame will be extinguished.

By means either of the flame or of the incandescent ignition pellet the filament *i* arranged above the pellet and put in tension by a weight *m* is caused to fuse, whereupon the weight *m* falls, and either directly or by means of intermediate mechanism such for instance as a tray *c* on which the weight falls (Figs. 1 and 2) rocks the arm *n* of the main cock *b* thus cutting off the gas supply. The lever arm *n* is provided with a projection *p* which when the arm *n* is rocked, makes contact with a spring *q* and thereby closes the electric circuit of a bell or other alarm signal.

In the arrangement shown in Fig. 1 an electric battery *r* is connected by wires *t* with the contact *q*, the arm *p* and the bell *s* (Figs. 2 and 3). By the closure of the cock *b* of the main supply pipe further loss of gas is prevented while the occupants of the building are warned by the sounding of the signaling device of the fact that gas is escaping, the ignition pellet coming into action long before there is any real danger to the occupants.

The movements of the weight *m* may be utilized in any suitable manner for actuating the lower arm *n*, numerous alternative constructional arrangements for this purpose being obviously possible. For the weight, there may be substituted any other suitable means for automatically closing the main cock. The closure of the gas supply pipe may in some cases be effected by hydraulic, pneumatic or electric means in any suitable manner. In the case of a mine there would of course be only the signaling device to be actuated, as there would obviously be no gas supply to be automatically cut off.

What I claim is:

1. An apparatus of the class described, comprising a valve for controlling the flow of gas, means for collecting accidentally escaping gas, means for igniting the same, means controlled by the burning gas for operating the valve to close the same, a signaling device, and means for operating the signaling device by the closing of the valve.

2. An apparatus of the class described, comprising a valve for controlling the flow of gas, means for collecting accidentally escaping gas, means for igniting the same, a valve closing device, a filament or thread controlling the valve closing device and extending into the path of the burning gas to be severed thereby, a signaling device, and means for operating the signaling device by the closing of the valve.

3. An apparatus of the class described, comprising a valve for controlling the flow of gas, means for collecting accidentally escaping gas, means for igniting the same, a valve closing device, and a filament or thread controlling the valve closing device and extending into the path of the burning gas to be severed thereby.

4. An apparatus of the class described, comprising a valve for controlling the flow of gas, a pipe for collecting accidentally escaping gas, having a funnel-shaped end, means for igniting the gas as it escapes from the said pipe, a valve closing device, and a filament or thread controlling the valve closing device and extending into the path of the burning gas to be severed thereby.

5. An apparatus of the class described, comprising a valve for controlling the flow of gas, a pipe for collecting accidentally escaping gas, having a funnel-shaped end, an igniting pellet at the discharge end of the pipe, a valve closing device, and a filament or thread controlling the valve closing device and extending adjacent to the discharge end of said pipe.

6. An apparatus of the class described, comprising a valve for controlling the flow of gas, a pipe for collecting accidentally escaping gas, having a funnel-shaped lower end, an igniting pellet at the discharge end of the pipe, wire gauze in the discharge end of said pipe, a valve closing device, and a filament or thread controlling the valve closing device and extending adjacent to the discharge end of said pipe.

7. In an apparatus of the class described, a valve for controlling the flow of gas, provided with an arm, a weight independent of said arm for closing the valve, a filament or thread for suspending the weight, and means for severing the filament or thread to release the weight and allow it to drop and operate the arm to close the valve.

8. In an apparatus of the class described, a valve for controlling the flow of gas, a weight for closing the valve, a filament or thread for suspending the weight, means for collecting accidentally escaping gas and conveying it adjacent to said filament or thread, and means for igniting the gas.

9. In an apparatus of the class described, a valve for controlling the flow of gas, having an arm, a weight, a filament or thread for suspending the weight above the arm of the valve, a pipe for collecting and conveying accidentally escaping gas adjacent to the filament, and means for igniting the gas.

10. A device of the class described, comprising a valve for controlling the flow of gas, said valve being provided with two arms, a weight, a filament or thread suspending the weight above one of the arms of the valve, a pipe for collecting and conveying accidentally escaping gas adjacent to the filament, means for igniting the gas, a signaling device, an electric circuit, and a contact with which one of the arms of the valve engages when the valve is closed.

In witness whereof, I subscribe my signature, in presence of two witnesses.

WILLEM ALBERTUS
JOHANNES VAN DE KAMP.

Witnesses:
JAC. VAN DE KAMP,
V. H. HUESHOFF.