Aug. 27, 1935. A. LOWY ET AL 2,012,453

SAFE AND VAULT PROTECTIVE DEVICE

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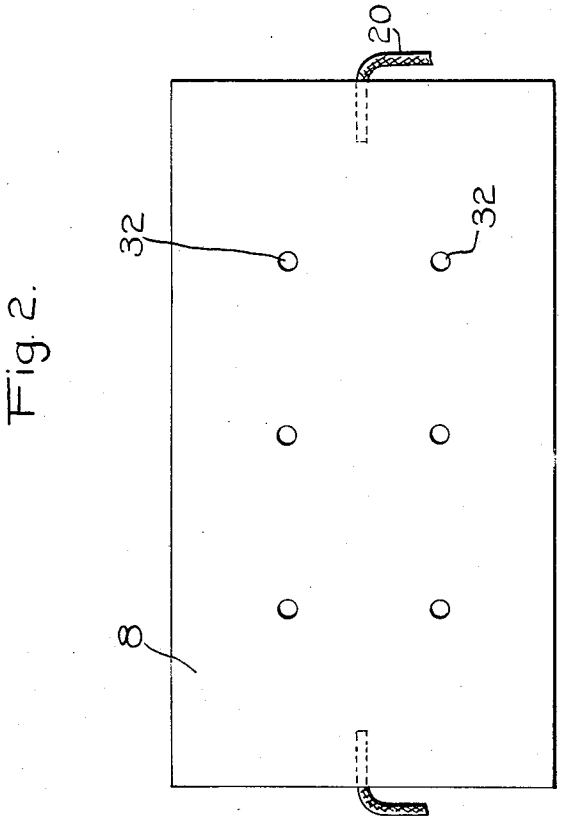

Fig. 2.

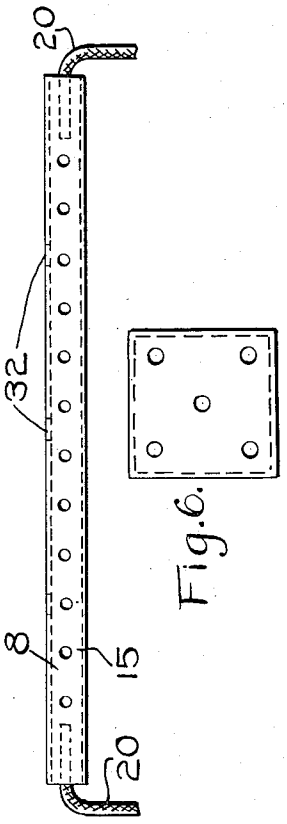

Fig. 3.

Fig. 6.

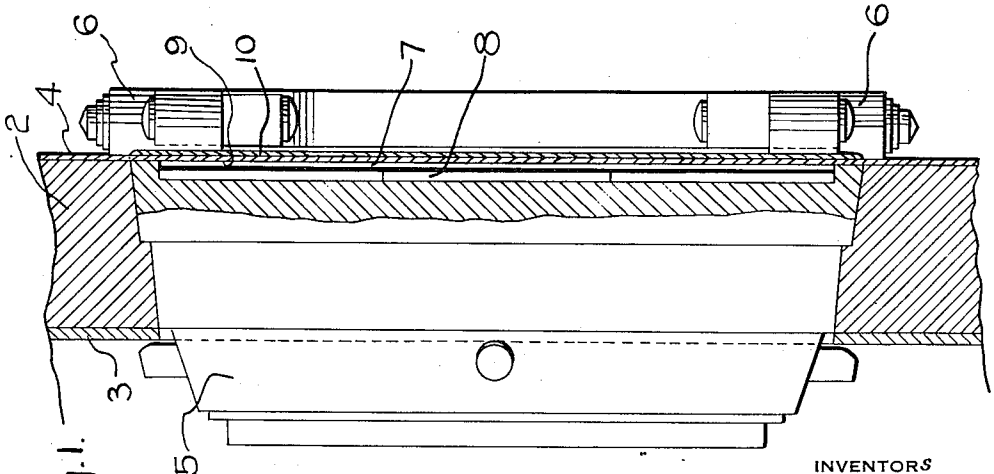

Fig. 1.

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Fig. 4.

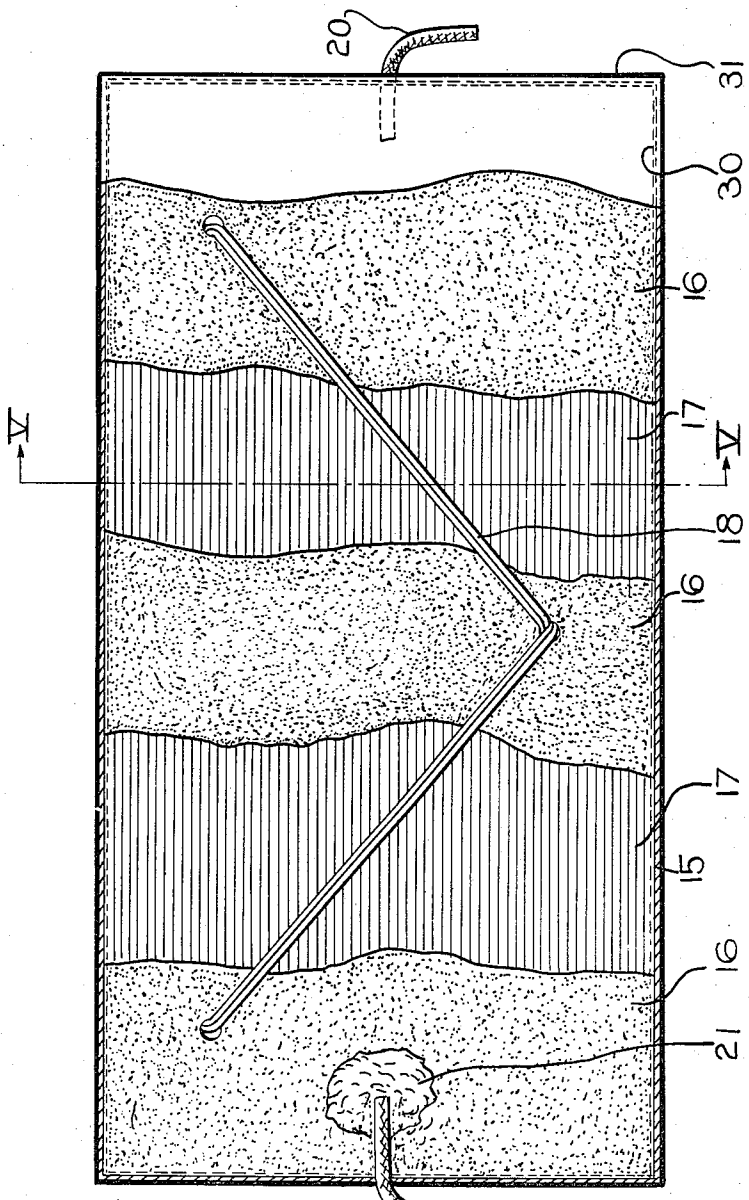
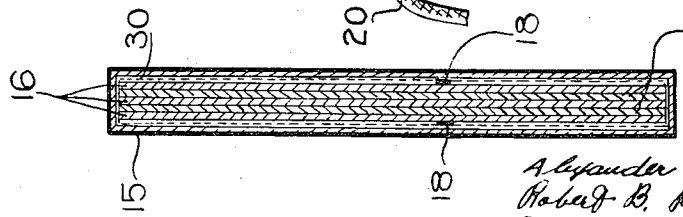


Fig. 5.



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SAFE AND VAULT PROTECTIVE DEVICE

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13 Claims. (Cl. 167—47)

This invention relates generally to safe and vault protective devices and more particularly to devices for protecting safes and vaults attempted to be burglarized by the use of a heating torch.

It has been proposed heretofore to provide a safe with a material which, when heated, liberates an incapacitating gas. This material may either be in liquid, gaseous or solid form, and if in liquid or solid form, it may be mixed with a fuel such as gun powder or nitro-cellulose which burns, thereby raising the temperature of the incapacitating material to a point where incapacitating gases are evolved. It has been found that where the incapacitating material and the fuel are intimately mixed together, they have a tendency to deteriorate quite rapidly. One object of the present invention is to employ the fuel and incapacitating material in a form which will prevent or decrease the rate of deterioration.

In accordance with this invention, the incapacitating material and the fuel are arranged in alternate layers within a container. The alternate layers are connected by an open fuse, or any combustible agent, such as cord dipped in potassium nitrate solution and dried, which insures that when the safe protecting device is heated, the combustion will proceed from one layer of incapacitating material to another. The incapacitating material liberates vapors which flow out of the openings provided in the container, and through openings in the safe to incapacitate the burglar. It has been found that certain fuels and incapacitating materials, when mixed according to prior practices, deteriorate to a substantial extent in about one to three years. If the alternate layer construction hereinafter more fully described is employed, the materials will not deteriorate to any substantial extent during a very long time.

In the accompanying drawings which illustrate the present preferred form of the invention,

Figure 1 is a section through the wall of a safe showing a safe door provided with the safe protecting device;

Figure 2 is a plan view of one of the safe protecting devices;

Figure 3 is a side elevation;

Figure 4 is a plan view of the device shown in Figure 2, parts being broken away to show the alternate layer construction,

Figure 5 is a section on the line V—V of Figure 4, and

Figure 6 is a plan view of a small perforated box adapted to contain anhydrous unslaked lime, or similar material, which box may be placed in the safe protective device to keep the chemicals in the device in an anhydrous neutral state.

Referring more particularly to the drawings, a safe wall 2 has an inner lining 3, and an outer casing 4 of hardened steel. The wall is provided with a door 5 supported by hinges 6. The door has a recess 7 in which the safe protecting devices 8 are arranged. The recess 7 is closed by a hardened steel plate 9 having a surface plate 10 on its outer side.

As shown in Figure 1, three of the safe protecting devices 8 are arranged in the recess 7 in the door. The safe protecting device comprises a metal container 15 having therein a plurality of layers 16 of fuel, each of the layers 16 being separated by layers 17 of material adapted to give off incapacitating gas when heated. The layers 16 and 17 are connected by a fuse 18, or any combustible agent, such as cord dipped in potassium nitrate solution and dried, which extends through the different layers so as to insure that the combustion will proceed through all of the layers.

The container also has other fuses 20 which have their inner ends extending between the layers 16 and 17. The inner ends have a charge or booster 21 which may be composed of a powder held together by a suitable binder. One end of the fuse 20 extends outside of the container, so that a plurality of containers may be employed within the recess of the safe door. The fuses 18 connect the different layers of fuel and incapacitating material in each container, and the fuses 20 connect the different containers.

The containers have a coating 30 of lacquer on the inside thereof in order to protect them from the chemicals contained therein. The outside of the container is coated with a layer 31 of a low melting point material, such as paraffin, as indicated by the heavy lines in Figures 4 and 5. The paraffin coats the outside of the container and also fills up the openings 32 through which the incapacitating gas escapes when the containers are heated. The holes may be also covered with adhesive tape. The heat of the blow torch used in burglarizing the safe melts the paraffin in the openings 32, or the vapors blow open the holes, and allows the vapors to escape therefrom.

The layers of incapacitating material may be composed of any one or a mixture of various chemicals, depending upon the type of gas which it is desired to liberate. Among the materials which have been found suitable are chloraceto-

phenone, brombenzyl cyanide, diphenyl chlorarsine, diphenylamine chlorarsine, or halogenated esters. The fuel layers 16 are composed of a combustible material which generates heat when ignited and an oxidizing agent. The combustible material is preferably a carbonaceous material, such as charcoal, or cellulose type material. The source of the cellulose material may be any commercial product containing cellulose, preferably thick paper of an absorbent variety.

We prefer to use a thick absorbent one hundred percent rag paper which has been soaked in potassium nitrate solution and subsequently dried, or ground carbonaceous material or cellulose material mixed with an oxidizing agent, such as potassium nitrate. Glue or casein, or other suitable binder may be added and the mixture compressed to form the fuel layer 16. The oxidizing agent may be any one or a mixture of several well known oxidizing agents—for example, permanganates, peroxides, chlorates, perchlorates, chromates, dichromates, nitrates, percarbonates, or persulfates of metals.

For most purposes, we prefer to use chloracetophenone as the incapacitating material, and a cellulose or carbonaceous material containing an oxidizing agent such as potassium nitrate as the fuel layer. The incapacitating material, chloracetophenone, is likewise preferably absorbed in one hundred percent rag paper of an absorbent variety. Where it is desired to produce smoke in addition to the incapacitating gas when the protective device is heated, ammonium chloride may be added.

In order to keep the contents of each protective device 8 in an anhydrous neutral state and thus prolong the life of the ingredients, a small perforated box, as shown in Figure 6, containing lumps of anhydrous unslaked lime is inserted in each device.

The arrangement of the incapacitating material and the fuel in separate layers decreases the rate of deterioration of the fuel and the incapacitating material, so that the protective device is effective even though it has been installed in a safe many years previous to the time of the attempted burglary. The arrangement of the incapacitating material and the fuel within a container provides a convenient means for transporting the protective device and for its installation within a safe. Since the individual containers are provided with fuses extending outwardly therefrom, any number of containers may be arranged within the safe according to the size of the safe which it is desired to provide with the protective device.

We have illustrated and described the present preferred form of our invention and have enumerated certain materials which we prefer to employ. It is to be understood, however, that the invention may be otherwise embodied within the scope of the following claims.

We claim:

1. A safe and vault protective device, comprising a layer of 100% rag absorbent paper containing chloracetophenone, said layer being substantially free from readily ignitable fuel, a layer of 100% rag absorbent paper containing an oxidizing agent, a fuse connecting the different layers, and a container provided with an opening.

2. A safe and vault protective device, comprising a container provided with an opening, the container having therein a layer of material adapted to liberate incapacitating gas when heated and a layer of fuel adjacent thereto, said incapacitating material being substantially free from readily ignitable fuel, and an agent adapted to maintain said layers in an anhydrous neutral state.

3. A safe and vault protective device, comprising a perforated container containing a layer of paper impregnated with an incapacitating material and a layer of paper impregnated with an oxidizing agent, and a fuse connecting the layers.

4. A safe and vault protective device, comprising a perforated container containing a layer of paper impregnated with chloracetophenone and a layer of paper impregnated with an oxidizing agent, and a fuse connecting the layers.

5. A safe and vault protective device, comprising a perforated container containing a layer of paper impregnated with chloracetophenone and a layer of paper impregnated with potassium nitrate, and a fuse connecting the layers.

6. A safe and vault protective device, comprising a perforated container, the container having therein a layer of material adapted to liberate incapacitating gas when heated and a layer of fuel adjacent thereto, and anhydrous unslaked lime in the container for decreasing absorption of moisture by the layers.

7. A safe and vault protective device, comprising a perforated container containing a layer of cellulosic material impregnated with an incapacitating material, a layer of cellulosic material impregnated with an oxidizing agent, and a fuse connecting the different layers.

8. A safe and vault protective device, comprising a perforated container containing a layer of cellulosic material impregnated with chloracetophenone, a layer of cellulosic material impregnated with an oxidizing agent, and a fuse connecting the different layers.

9. A safe and vault protective device, comprising a perforated container containing a layer of cellulosic material impregnated with an incapacitating material, said layer being substantially free from readily ignitable fuel and a layer of fuel.

10. A safe and vault protective device, comprising a perforated container containing a layer of cellulosic material impregnated with chloracetophenone, said layer being substantially free from readily ignitable fuel and a layer of fuel.

11. A safe and vault protective device, comprising a perforated container containing a layer of cellulosic material impregnated with an incapacitating material, and a layer of cellulosic material impregnated with an oxidizing agent.

12. A safe and vault protective device, comprising a perforated container containing a layer of cellulosic material impregnated with an incapacitating material, a layer of fuel, and a fuse connecting the layer of fuel with the layer of cellulosic material which is impregnated with the incapacitating material.

13. A safe and vault protective device, comprising a perforated container containing a layer of cellulosic material impregnated with chloracetophenone, a layer of fuel, and a fuse connecting the layer of fuel with the layer of cellulosic material which is impregnated with chloracetophenone.

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