

PROTECTIVE SYSTEM AND APPARATUS FOR SAFEGUARDING VAULTS, SAFES, AND THE LIKE.
APPLICATION FILED SEPT. 12, 1903.

Patented Oct. 18, 1910.

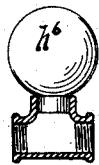
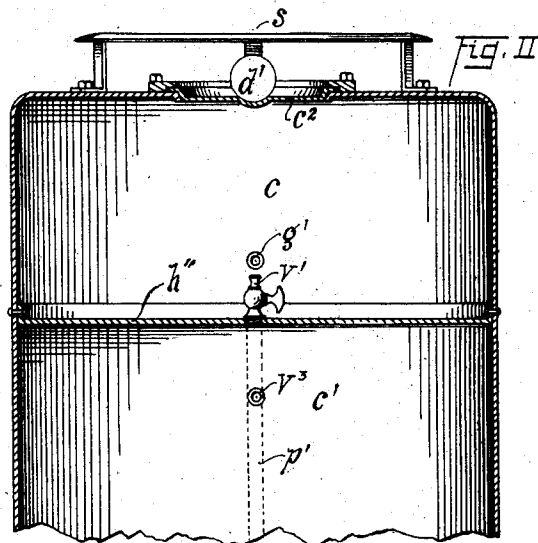
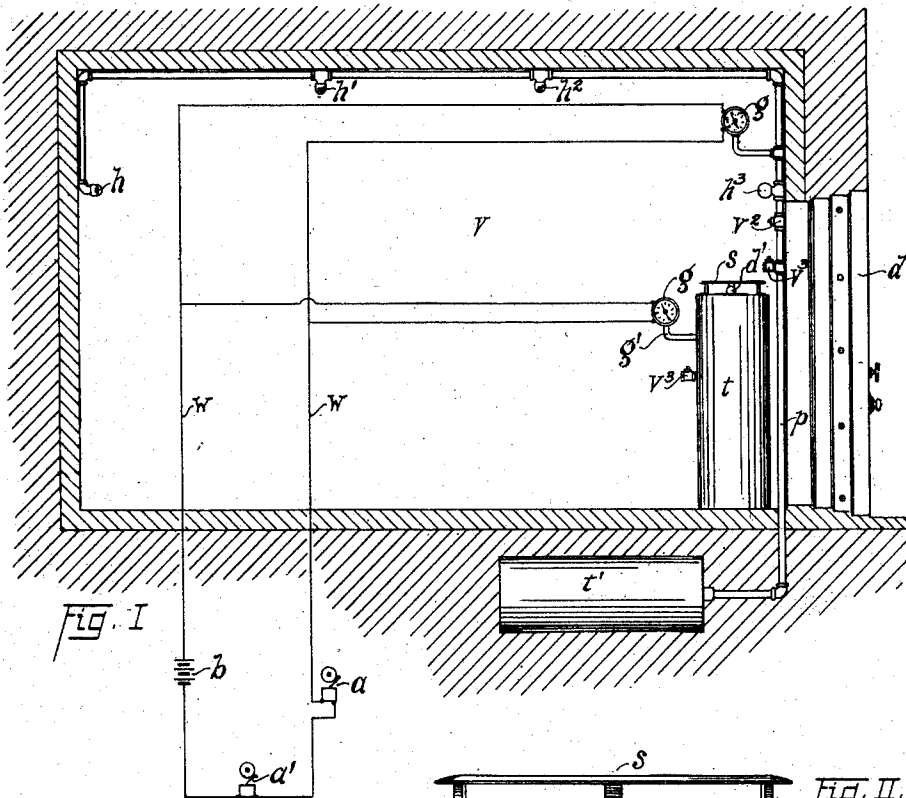


Fig. III.

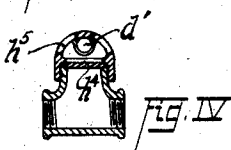


Fig. IV

Witnesses:

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UNITED STATES PATENT OFFICE.

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PROTECTIVE SYSTEM AND APPARATUS FOR SAFEGUARDING VAULTS, SAFES, AND THE LIKE.

973,033.

Specification of Letters Patent.

Patented Oct. 18, 1910.

Application filed September 12, 1903. Serial No. 172,866.

To all whom it may concern:

Be it known that I, JACOB CARVELL GOUGH, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Protective Systems and Apparatus for Safeguarding Vaults, Safes, and the Like, of which the following is a specification.

My invention relates to improvements in protective system and apparatus, for safeguarding vaults, strong-rooms, safes, treasure-chests and the like, and has for its object the provision of means for rendering inaccessible the contents thereof when the ordinary protection has been overcome or removed by unauthorized persons. The said invention thus affords separate and independent protection in reserve to that ordinarily provided in the form of permutation-locks, armor-plate vaults, so-called burglar-proof safes, electrical protective systems, and other means to the same end.

It is common knowledge that experts criminal or otherwise, can, under conditions satisfactory to themselves, gain access to the contents of practically any and all forms of vault or safe, and I have sought, accordingly, to nullify this merely comparative inaccessibility, by further and distinctly different means of protection.

Stated in brief, my invention contemplates the provision of means for automatically causing the vicinity in which the protected article or structure is situated, to be untenable by human beings, for varying lengths of time; the same being brought into action by an explosive cartridge, detonated through an unauthorized attempt to gain access improperly to said article or structure.

As applied to the vault herein shown for the purpose of illustrating my invention, my improvements are embodied in one or more gas or fluid-containing tanks, so associated with the vault, that the contents thereof, which preferably are noxious, or even destructive to life, shall be liberated whenever an attempt is made to gain access to the interior of the vault through im-

proper means. Such means, as is also commonly known, involves the use of some high explosive for the purpose of destroying in a comparatively brief time, the protective barriers afforded by the vault, and, in consequence, I have availed myself, preferably, of a principle or expedient I have repeatedly employed in blasting; viz. that of causing a secondary explosion, which will effect or cause the release of the noxious fluid or gas, and render the vault or containing-chamber incapable of sustaining life, or temporarily untenable.

I can better proceed with the explanation of my invention, by making reference to the accompanying drawings, constituting a part of this application, wherein:—

Figure I. is a longitudinal sectional view, somewhat diagrammatic in character, of a vault equipped with protective apparatus in accordance with my invention; Fig. II. is a transverse section of the upper portion of a gas or fluid-containing tank or reservoir used therein; and Figs. III. and IV. are similar views of distributing-heads, also employed in my protective system.

Throughout the several figures of the drawings I have designated similar parts by the same character of reference, that any confusion may be avoided.

In Fig. I., I have indicated an armor-plate vault *v* securely closed by the door *d*, equipped, we will say, with the usual time and combination locks and bolts. The feature I have sought to bring out, however, is the association with any valuable-containing receptacle of one or more suitable gas or fluid-containing tanks, as *t*, *t'*, disposed respectively, within, and beneath the vault. These tanks, pursuant to my improvements, preferably are charged with any suitable fluid or gas under relatively high pressure, of which I may mention chlorin, carbonic acid, carbon-monoxid or nitrogen as fulfilling the requirements. It will be understood that the pressure, and the position, size and details of such tank or tanks, naturally depend upon the cubic-contents, construction and surroundings of the vault or other protective structure. Said tank *t* may well be constructed as shown more in detail

in Fig. II; which tank has an inner dividing head h , separating it into two compartments or chambers c , c' , communicating by means of the vent v' , of restricted size. The top has an opening or hand-hole covered securely by the closure-part c^2 , preferably consisting of a relatively fragile or brittle casting, such as an antimony alloy. Upon this closure-part is shown the cartridge of dynamite d' , which safely may be about 40% nitro-glycerin, and of sufficient size to insure the breakage of part c^2 upon its explosion. Shield s covers the upper portion of the tank, protecting the cartridge from accidental jar and explosion, and also preventing its removal. One of the circuit-closing pressure-gages g is connected with chamber c by pipe g' , and during the continuance of normal or predetermined pressure therein, maintains upon open circuit the system of wiring w , which includes a battery b and alarm or signal-bells a , a' .

Quite obviously the tanks may be conveniently placed in or about the vault, safe, or other receptacle, but I have shown tank t disposed just within the door-way of the vault, and to the right; while tank t' is positioned beneath the vault floor, although this is quite arbitrary. Each, however, may not be tampered with, and tank t is near the zone of most likely attack upon the vault. Tank t' preferably is divided into communicating compartments, as just described, and is connected with a system of piping p having several distributing-heads or easily fractured connectors h , h' , h^2 , and h^3 ; shown in cross-section in Figs. III. and IV., which are disposed throughout the vault, or may be exterior thereto, if desired.

Distributing-heads h , h' and h^2 are substantially alike, having relatively fragile diaphragms h^4 of brittle metal or porcelain, and small dynamite cartridges d' adjacent thereto within the protective, perforated caps h^5 . Head h^3 , however, is provided with a gas-tight globe h^6 , of glass, porcelain, or the like, cemented or otherwise secured within the threaded pipe-connector; said globe being so constructed as to be relatively sensitive to any detonation, or severe jar or shock. The system of piping is also equipped with a shut-off valve v^2 , operated only by a key, and a circuit-closing pressure-gage g , electrically connected with the alarm-circuit w , which it normally maintains open. Either of these gas-discharging tanks may, with safety, be dispensed with, but I have chosen to show two separate tanks, illustrating two quite similar and auxiliary modes of securing protection. The tanks may advantageously be constructed of steel or copper, interiorly and exteriorly enameled to protect them from moisture and the action of the contained gases or chemicals.

Assuming that the tanks t , t' have been previously filled through their charging-valves v^3 (also by preference operated only by means of a key) with chlorin under suitable pressure, as for example 250 pounds to the square inch; the system at once is ready for service. After installation, the tanks are most conveniently charged by means of the well known gas-cylinder equipped with a reducing valve; the same being initially charged with the desired gas, often in liquid form, and under an initial pressure sufficient to deliver the required volume of gas at the lower pressure desired in the tanks t , t' . Should a successful attempt to explode the vault be made after it is thus protected, as by pumping nitro-glycerin into the fittings of the door and detonating the same; secondary explosions of each of the dynamite cartridges will immediately result, and the diaphragms h^4 in the distributing-heads, and the closure-part c^2 upon the tank t will all be broken;—any one of which will serve instantly to fill the vault with the volume of chlorin gas contained in the respective chambers c . Globe h^6 , likewise will be shattered by the concussion produced by the initial explosion, or by the attendant vibrations, and will assist in accomplishing the same result. It will be impossible, in consequence, for anyone to enter the vault to rifle it, for an indefinite period of time, and, meanwhile, the pressure-gages, being relieved of their normal gas-pressure, will independently act to close the alarm-circuit and ring the signal-bells a , a' . These may be situated, respectively, in or near the vault building, and at police-headquarters, whereupon immediate steps will be taken to apprehend the safe-blowers. In order to provide a large margin of safety, however, each of the tanks has a reserve supply of gas contained in its chamber c' , which, escaping through the small vent v , will serve to supply the natural waste of gas from the vault or room through ventilation, and thus prolong the period in which the vault may not be entered. This is not necessary, I may observe, since the volume of gas in an ordinary tank, or one comprising a single compartment, with no inner head and vent, ordinarily will serve every purpose. Quite obviously, it is only a question of the volume of gas-supply, should it be desired to flood the room containing, or upon which opens the vault; as would be demanded where a single safe or other receptacle is equipped with this form of protection. In some instances, it may be desirable to generate gas in the tank upon the occurrence of the secondary explosion. No alteration of the apparatus is rendered absolutely necessary to accomplish this, since the vent may be equipped with a pipe p' , shown in dotted lines, extending to the bottom of chamber c' , merely, which chamber

being enameled, will serve to contain sulfuric acid, let us assume, under a moderate gas pressure, and with chamber *c* filled with sulfid of iron; sulfureted hydrogen will be generated upon the breakage of the closure-part and escape of gas from the upper chamber. The addition of a sulfur-candle and igniting-fuse to the dynamite cartridge, would supply an initial and unbreathable gas. However, the possibility of an explosion of the first named gas must be taken into account, if the details of the suggestion above are to be followed.

One important function of the alarm-circuit may further be referred to. This is the detection of the accidental escape of gas from the tank, thereby safeguarding those entitled to make use of the vault, and giving notice, as well, should the protective apparatus be tampered with or become incapable of rendering the vault temporarily untenable.

Through the use of a system of piping and numerous distributing-heads or possible apertures associated with a fluid-discharge tank or device, it is apparent that the chances that the protective apparatus may not be brought into operation, are reduced to a minimum, and further, the discharge of the noxious fluid may be secured at any given point or position, and the range of protection be thereby enlarged.

From the foregoing, it will be appreciated that a substantial portion of my invention is independent of the illustrative details of construction and use herein set forth, and that the same may be practiced with widely differing types of apparatus utilizing numerous suitable gases or fluids for preventing access to the interior or contents of the protected receptacle or chamber.

I accordingly claim, and desire to secure by Letters Patent, the following:—

1. In a protective system of the class described, the combination with a chamber or receptacle for valuable property, a system of piping extending within said chamber to the more vulnerable positions therein, a tank of permanent construction, normally charged with noxious gas under pressure, and connected with said system of piping, readily disruptable heads or closure-parts, also associated with said system of piping, and an explosive charge associated with the latter, substantially as set forth.

2. The combination with a chamber or receptacle for valuables or valuable property, of a gas or fluid-discharging tank, of permanent construction, and means, comprising a readily disruptable closure-part, and associated explosive charge for bringing the same into operation, upon or by reason of an unauthorized attempt to gain access to the contents of said receptacle, substantially as set forth.

3. The combination with a retaining compartment for valuables and the like, of a gas-discharging tank or device of permanent construction proportioned to the size of the compartment associated therewith, and means, comprising a readily detonated explosive charge associated with a comparatively easily fractured or disrupted barrier, adapted to cause the discharge of the tank upon or by reason of an unauthorized attempt to gain access to the contents of the said compartment, substantially as set forth.

4. The combination with a retaining compartment or receptacle for valuable property, of a gas-discharging tank or device of permanent construction proportioned to the size of the retaining compartment associated therewith, and means, comprising a comparatively easily disrupted barrier of small size sealing said tank and an explosive charge or cartridge of the class discharged by a primary explosion, adapted to effect the discharge of the tank upon or by reason of an unauthorized attempt to gain access to the interior of said receptacle, substantially as set forth.

5. In a protective appliance of the class described, the combination with a gas-discharging tank or device, of a disruptable closure-part or seal, and an interior head or partition provided with a vent and dividing the tank into separate compartments, substantially as set forth.

6. In a protective appliance of the class described, the combination with two gas-holding compartments or chambers, of a communicating vent of reduced size of aperture connecting the same, and a closure-part easily disrupted or broken, associated with one of said compartments, substantially as set forth.

7. In a protective appliance of the class described, the combination with two gas-discharging compartments or chambers, of a communicating vent of reduced size of aperture, a closure-part or seal easily disrupted, but normally closing one of said compartments, and an explosive charge associated with said seal, substantially as set forth.

8. In a protective system of the class described, the combination with a vault, safe or the like, of a gas discharge tank associated therewith, and a pipe or system of piping extending between the tank and vault, equipped with a readily disruptable or fracturable portion adapted to give vent to the tank, and a cartridge associated therewith adapted to be detonated by a shock or explosion, substantially as set forth.

9. In a protective system of the class described, the combination with a vault, safe or the like, of a fluid-pressure or gas-charged tank, an easily disrupted closure-part or head, a pressure-actuated device, and an

alarm or signal adapted to be set in operation thereby upon the reduction of pressure in the tank, substantially as set forth.

10 10. The combination with a vault, safe or
5 the like, of a tank of permanent construction normally charged with noxious gas under pressure, an easily disrupted closure-part or head therefor normally sealing the same, and an explosive charge of the class
15 readily detonated by a shock or explosion, directly associated with the seal, substantially as set forth.

15 11. Protective means for safes or the like, consisting of a receptacle containing an air poisoning agent, a receptacle containing an

explosive explodable independently of any mechanical means and adapted to be set off by shock or concussion to effect disruption of the receptacle containing the air poisoning agent and liberate the latter, and a support for the protective means, substantially as set forth. 20

Signed at Cleveland, this tenth day of September 1903, in the presence of two subscribing witnesses.

JACOB CARVELL GOUGH.

Witnesses:

ALBERT LYNN LAWRENCE,
ISAAC C. TITUS.