No. 649,693. Patented May 15, 1900.

W. H. HOLLAR.

SAFE OR VAULT.

(Application filed July 26, 1899.)

(No Model.) 4 Sheets—Sheet 1.

FIG. 1.

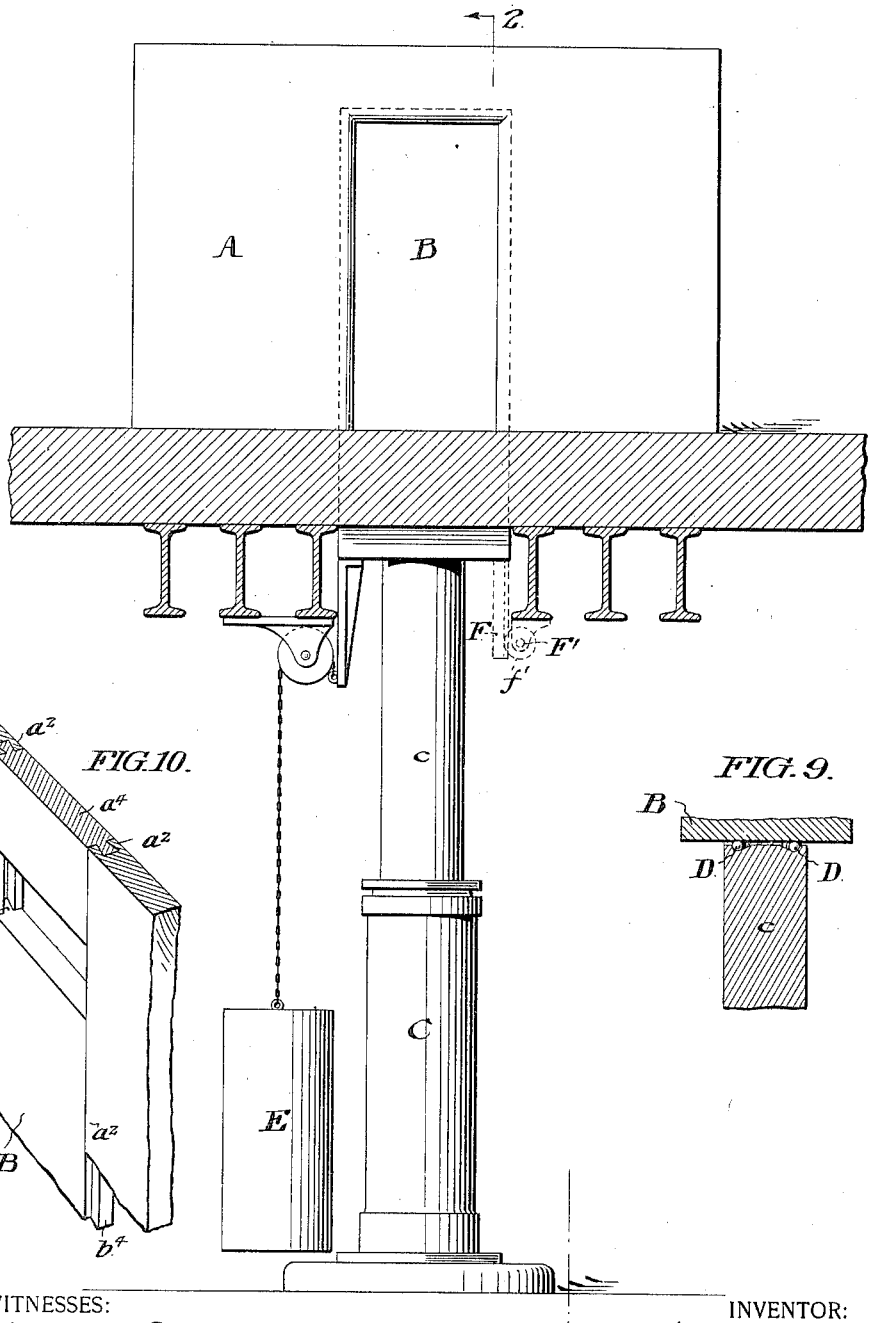

FIG. 10.

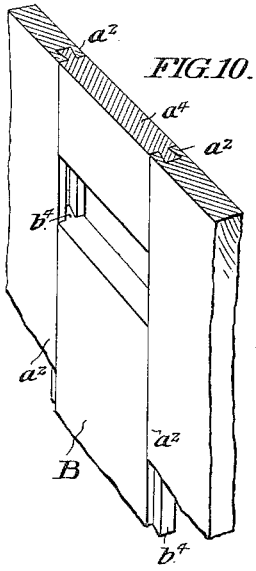

FIG. 9.

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FIG. 2.

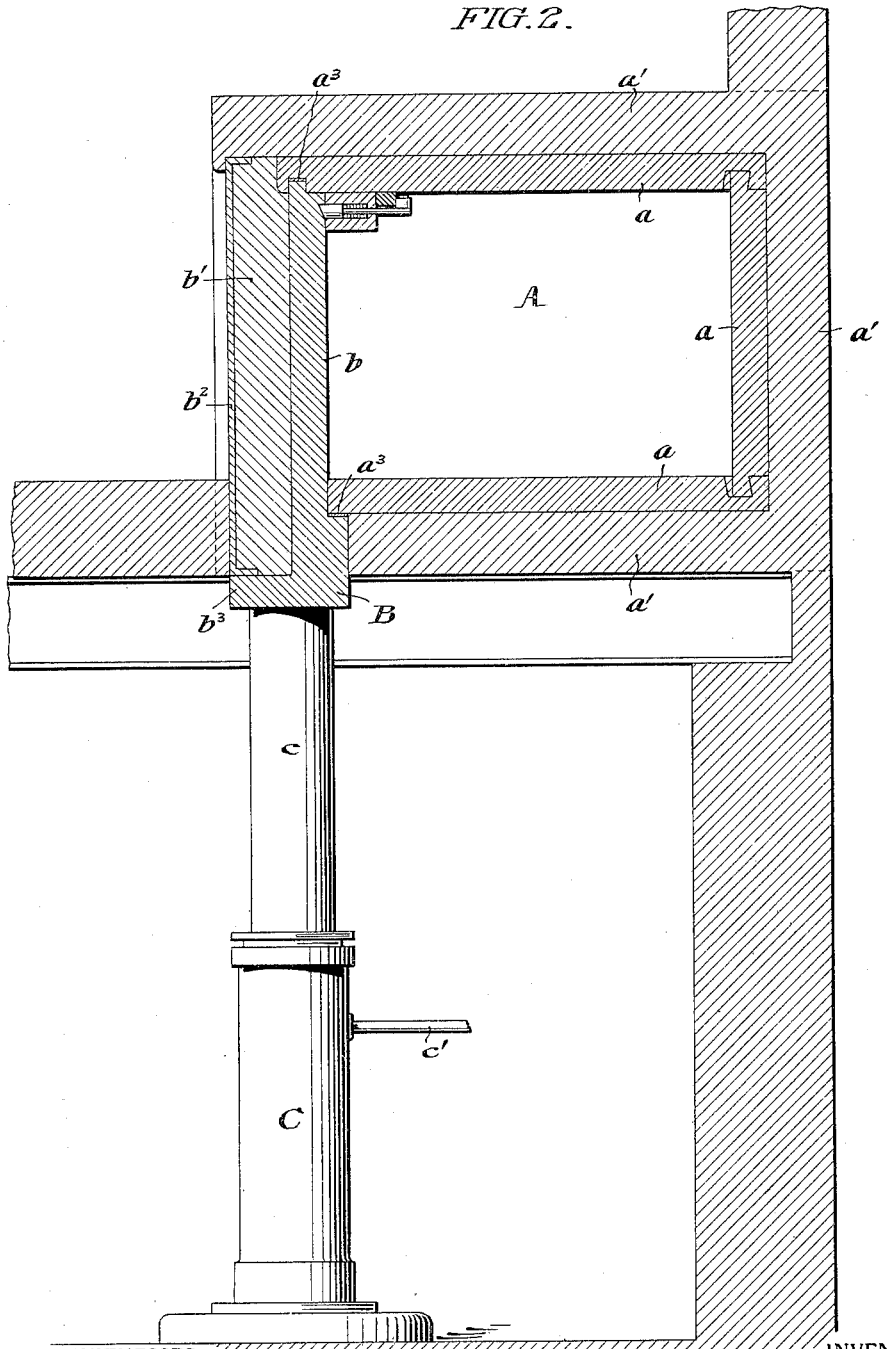

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FIG. 3.

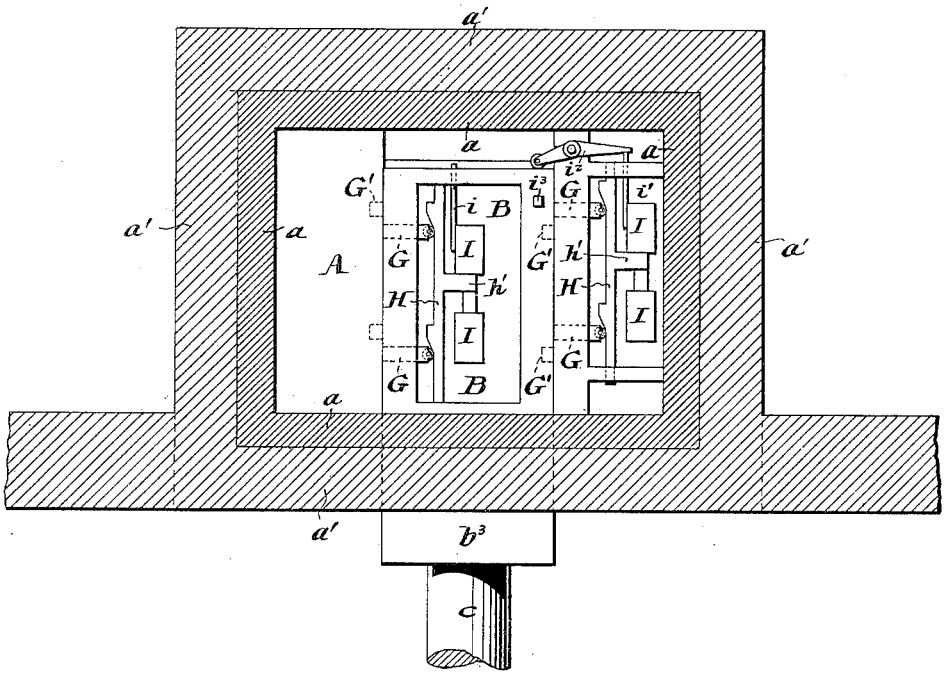
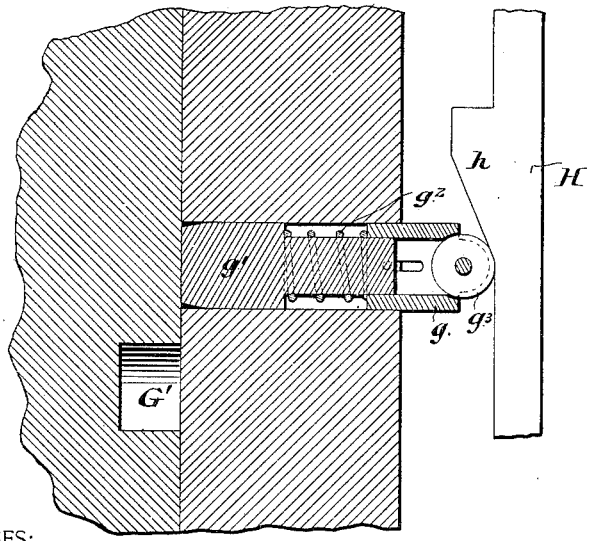


FIG. 5.



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(No Model.) 4 Sheets—Sheet 4.

FIG. 4.

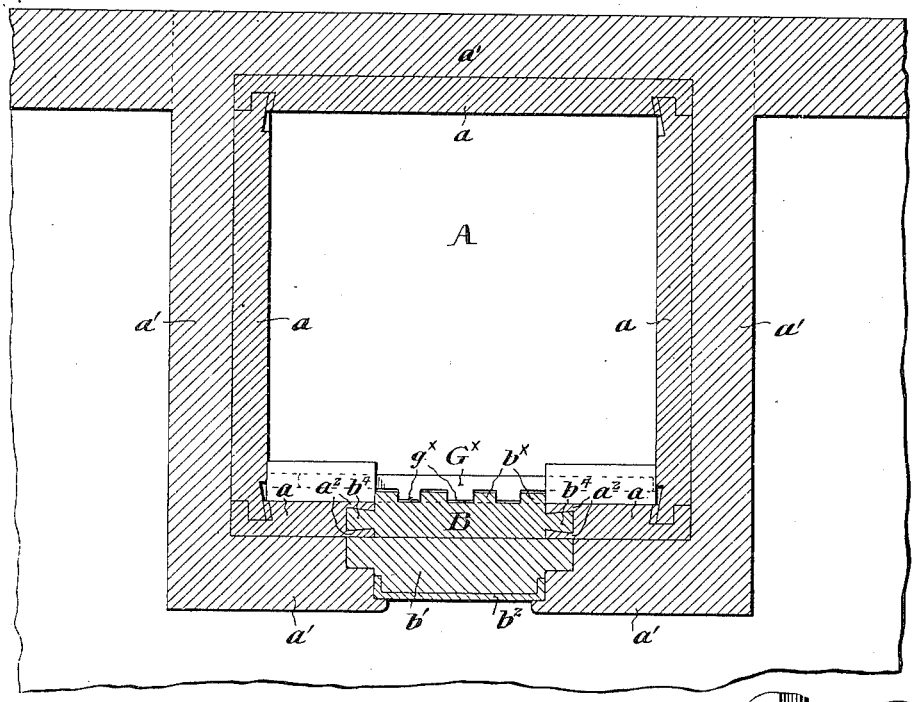

FIG. 7.

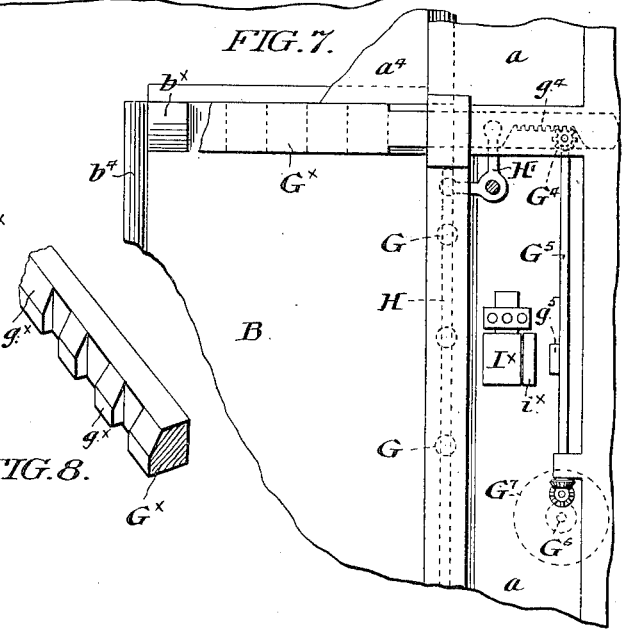

FIG. 6.

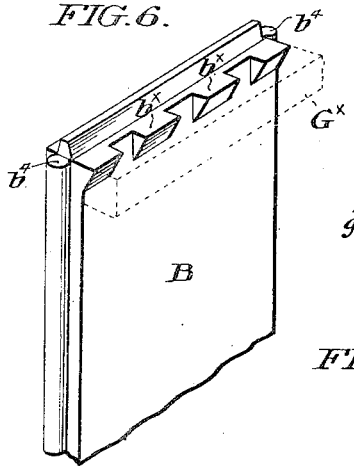

FIG. 8.

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UNITED STATES PATENT OFFICE.

WILLIAM H. HOLLAR, OF PHILADELPHIA, PENNSYLVANIA.

SAFE OR VAULT.

SPECIFICATION forming part of Letters Patent No. 649,693, dated May 15, 1900.

Application filed July 26, 1899. Serial No. 725,129. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HOLLAR, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Safes or Vaults, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to a safe or vault the door of which is reciprocated in slideways as distinguished from the ordinary construction wherein the door is swung upon hinges and comprises means whereby the door when opened is extended exterior to the safe or vault inclosure and preferably vertically below the same.

My invention also comprehends mechanism whereby the reciprocating motion of the door is effected, means whereby an explosive proof-joint between the door and its frame is obtained, and mechanism automatically actuated or othewise whereby the door when shut is locked in position.

Figure 1 shows a vertical section of a portion of a building fitted with a safe structure conveniently embodying my invention. Fig. 2 is a vertical sectional view taken on the line 2 2 of Fig. 1. Fig. 3 is a vertical sectional view of a safe-inclosure, showing an inner face view of the front wall, the door therein, and locking mechanism applied thereto. Fig. 4 is a plan sectional view of a safe-inclosure, showing a modified form of locking mechanism. Fig. 5 is a sectional view of parts of the locking mechanism shown in Fig. 3. Figs. 6, 7, and 8 show parts of locking mechanism of the type shown in Fig. 4. Fig. 9 shows a detail of construction of the door-actuating mechanism. Fig. 10 is a perspective view showing the detailed construction of the door-frame.

The safe-inclosure A is preferably constructed, as shown, with double walls $a\,a'$, the former being of interlocking armor-plate and the latter of masonry.

As shown in Fig. 2, the slide-door B consists of a metallic panel b and an exterior panel b' of masonry, the latter being preferably provided with a metallic face-plate b^2. The metallic panel b is flanged, as indicated at b^3, to support said masonry b'. The door B rests upon and is actuated by the plunger c of the hydraulic ram C. As ordinarily constructed such a ram is provided with a controlling-valve by which its actuation may be accurately predetermined, and as a matter of convenience the pressure-pipe c' may extend above the floor of the safe-inclosure to such a controlling-valve adjacent to the door B. As shown in Fig. 9, a series of balls D are interposed between the top of the plunger c and the bottom of the door B, so as to permit of perfect alinement of the door in its slideways despite slight variations in the relative position of the parts, due to expansion, contraction, &c. The weight of the door B may rest directly upon and be supported by the plunger c, as shown in Fig. 2. It is convenient under some circumstances to counterbalance or partially counterbalance the moving parts by a weight such as I have indicated at E in Fig. 1. Although I prefer to actuate the door hydraulically, as described, it may be otherwise actuated—for instance, as indicated in Fig. 1, it may be provided with a rack F and be engaged and shifted by means of the pinion f' and shaft F'.

As shown in Fig. 4, the vertical edges b^4 of the door B are so formed as to slide within and interlock with the edges a^2 of the plate forming the door-frame. Such a construction is advantageous in that a very close joint may be thereby secured through which it is impossible to insert explosive substances, such as nitroglycerin, the joint between the door and the frame-plates being sealed at the top and bottom thereof by packing a^3, of copper or other suitable material, compressed when the door is closed. Although I prefer that the interlocking parts of the door and frame be of the conventional dovetailed form, it is obvious that they may be otherwise shaped—for instance, as in Fig. 6.

In constructing vaults of small size the door may be the full height of the front plate of the inclosure; but in larger constructions I prefer to make the door of less height and to connect the door-frame plates or jambs above the top of the door by means of a lintel-plate a^4, as shown in Fig. 10. The latter construction is advantageous in that the jamb edges of the front plates may be made straight and the slideways for the door be conveniently formed therein, the insertion of the lintel-plate in similar dovetailed connection there-

with serving to interlock said plates and render the same as strong as any other portion of the structure.

In Figs. 3 and 5 I have shown means whereby the ram *c* or equivalent door-actuating mechanism may be used in combination to automatically effect the locking of the door B upon reaching its closed position. Referring to said figures, G G are bolts whose opposite end members *g g'* are adapted for telescopic movement, but are normally extended by means of springs g^2. The members *g'* of said bolts are adapted to enter sockets G', and thus lock the door and its frame against sliding movement. The slide-bars H, whose inclines *h* bear upon the friction-rollers g^3 of the bolts G, serve to compress the spring g^2, and thus project the bolt members *g'* within said sockets G' when in registry therewith. The bars H may be shifted in any convenient manner. I prefer, however, to connect the same with automatic devices I of the ordinary type, comprising springs adapted to be manually compressed and detained, which when released serve to shift said bars by the member *h'*, connected therewith. It is usual to provide such automatic devices with means to release the spring-detent upon the closure of the door, and I have shown upon the door in Fig. 3 a rod *i*, projecting from the device I above the shoulder at the top of the door. It is to be understood that the relation of the parts is such that when the top of the rod *i* encounters the top of the doorway said rod is shifted downwardly and releases said detent. The rod *i*, (shown at the right-hand side of Fig. 3) is arranged to be actuated through the rock-lever i^2, which is encountered by the projection i^3 upon the door when the latter is closed.

Although, as aforesaid, automatic bolt-actuating devices are usually employed, it is obvious that other means may be provided to secure the door B against sliding movement. For instance, as shown in Fig. 6, the door may be provided upon its inner face with projections $b^\times$, and a bolt-bar $G^\times$, provided with projections $g^\times$, (see Fig. 8,) be mounted upon the inclosure-wall for transverse reciprocation with respect to said door, so that when the projections $g^\times$ upon said bolt-bar are in vertical alinement with the projections $b^\times$ upon said door the latter is secured, and when said projections are shifted out of registry, as indicated in Fig. 4, the door may be opened. As indicated in Fig. 7, the bolt $G^\times$ may be reciprocated by means of a lever H', connected by a slide-bar H with an automatic bolt-shifting device. When, however, it is desired to construct a vault without such an automatic device, I provide said bolt $G^\times$ with the rack g^4, engaged by the pinion G^4 and connected by bevel-gearing and a shaft G^5 with a shaft G^6, the latter being extended exterior to the vault and provided with a wheel G^7, whereby said bolt $G^\times$ may be shifted manually or otherwise. The operation of the boltwork may be prevented, as usual, during certain hours by means of a time-lock mechanism $I^\times$, whose movable member $i^\times$ is arranged to engage with the detent-lug g^5 upon the shaft G^5.

I am aware that it is not broadly new to provide a safe or vault with a sliding door as contrasted with an ordinary swinging door. It is to be noted, however, that hitherto a vault provided with a sliding door also comprised a pocket or extension of the safe-inclosure within which the door is received when slid open. Such a construction is objectionable in that the so-called "pocket" is in communication with the interior of the vault and affords convenient means through which the whole structure may be attacked and opened by explosives. It is also to be noted that a structure such as I have described is advantageous over a structure in which the door is drawn up and suspended above the doorway in that whereas the former permits of the secure support of the door in immovable position the latter construction affords a constant menace to those passing through the doorway, as the failure of the device by which the door is kept suspended results in its instantly falling by its own weight to the closed position.

I do not desire to limit myself to the precise construction which I have shown and described, as it is obvious that various modifications may be made therein without departing from the spirit of my invention.

I claim—

1. In a safe or vault, the combination of a rectangular door-aperture; undercut grooves formed in the opposing faces of the two vertical sides of said aperture; a door reciprocating in the slideway thus formed and having its vertical edges exactly complemental to, and tightly interlocked with, said undercut grooves; and mechanism to raise and lower said door, substantially as set forth.

2. In a safe or vault, the combination of a rectangular aperture forming an entrance in one side thereof; slideways in the opposing vertical sides of the said aperture; a door reciprocating vertically in said slideways, and which when open drops so that its top is flush with or below the sill of the doorway; and means for raising or lowering the said door, whereby the said aperture is respectively closed or opened, substantially as described.

3. In a safe or vault, the combination of a rectangular aperture forming an entrance in one side thereof; slideways in the opposing vertical sides of the said aperture; a door reciprocating vertically in said slideways, and which when open drops so that its top is flush with or below the sill of the doorway; means for raising or lowering the said door, whereby the said aperture is respectively closed or opened; said means consisting of a piston upon the upper end of which the door rests; and a hydraulic ram by which the piston is operated, substantially as described.

4. In a safe or vault, the combination of a rectangular aperture forming an entrance in one side thereof; a slideway in the opposing vertical sides of the said aperture; a door reciprocating vertically in said slideways, and which when open drops so that its top is flush with or below the sill of the doorway; means for raising or lowering the said door, whereby the said aperture is respectively closed or opened, said means consisting of a piston upon the upper end of which the door rests and a hydraulic ram by which the piston is operated, and a counterweight which is raised when the door is lowered, substantially as described.

5. In a safe or vault, the combination of jambs with slideways; a door reciprocating vertically in said slideways; a hydraulic ram beneath the door and operatively connected therewith; and automatically-adjustable connections between the two, whereby variations in the alinement of said door and ram are permitted, substantially as set forth.

6. In a safe or vault comprising inner metallic walls and outer masonry walls, the combination of jambs with slideways; a door composed of metal and masonry reciprocating in said slideways; and mechanism whereby said door is reciprocated, substantially as set forth.

7. In a safe or vault, the combination of parallel wall-plates, the opposing edges of which form an undercut slideway; a lintel-plate permanently interlocked with said slideway near the top of the safe; and a door reciprocating in the remaining portion of the said slideway, substantially as set forth.

8. In a safe or vault, the combination of a rectangular aperture forming an entrance in one side thereof, the vertical edges of which are undercut so as to form a slideway; a door the vertical edges of which interlock with and slide in the slideway thus formed, and which when open drops so that its top is flush with, or below, the sill of the doorway; and a hydraulic ram situated immediately below said door by which it is raised into the closed position, substantially as described.

WILLIAM H. HOLLAR.

Witnesses:
JAMES H. BELL,
RANDOLPH SAILER.