

J. B. CORNELL.

Vault or Safe-Door Fastenings.

No. 146,575.

Patented Jan. 20, 1874.

Fig. 1.

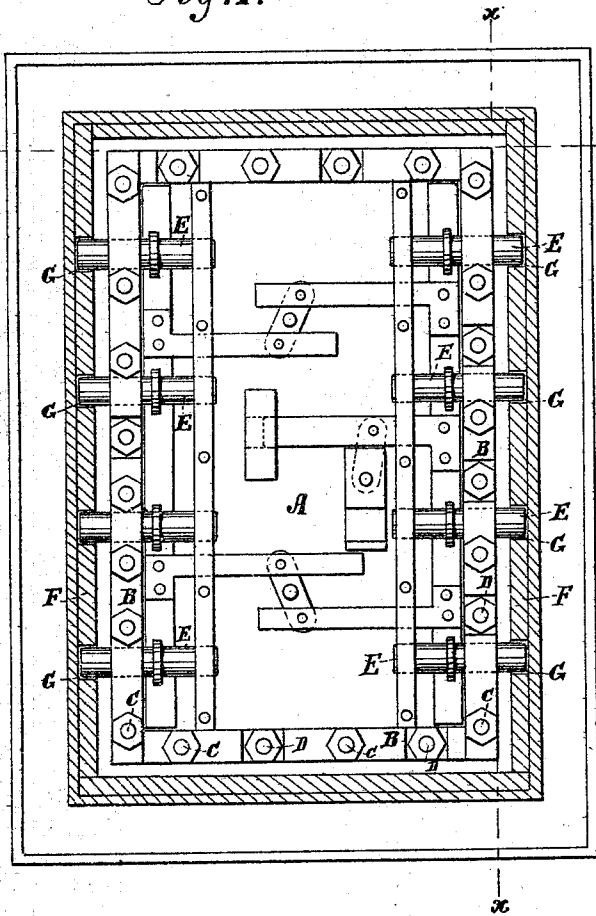


Fig. 2.

Fig. 4.

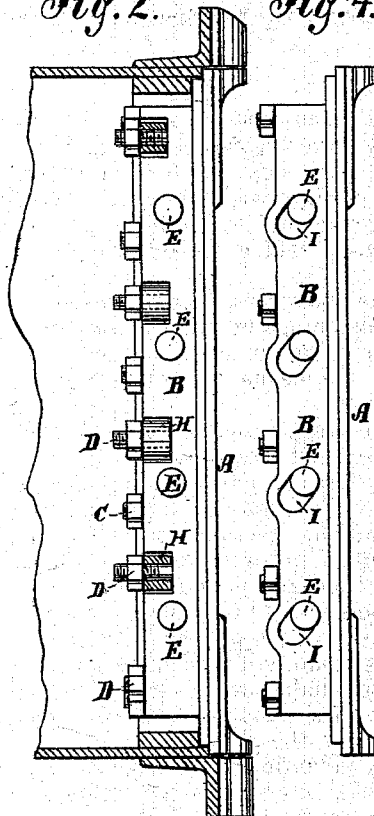
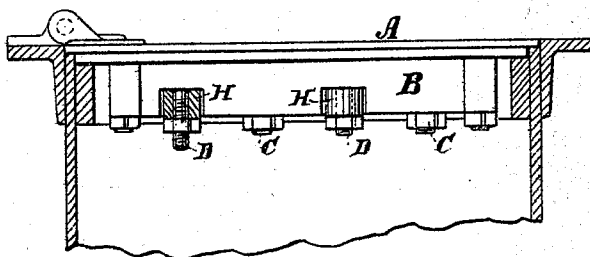


Fig. 3.



WITNESSES:

A. Bennerhof,
Alex. J. Roberts

INVENTOR:

J. B. Cornell
BY *Munnell*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN B. CORNELL, OF NEW YORK, N. Y.

IMPROVEMENT IN VAULT OR SAFE DOOR FASTENINGS.

Specification forming part of Letters Patent No. **146,575**, dated January 20, 1874; application filed November 15, 1873.

To all whom it may concern:

Be it known that I, JOHN B. CORNELL, of New York city, in the county and State of New York, have invented a new and useful Improvement in Vault or Safe Door Fastenings, of which the following is a specification:

The object of my improvement is to render the fastenings of vault or safe doors more efficient when it is attempted to burst them open by means of gunpowder or other explosives.

It is well known to those familiar with the phenomena attending the use of explosives that they are powerful only as they are confined. For instance, in the use of gunpowder in cannon, when fine-grained powder is used, the initial pressure has been known to exceed sixty thousand pounds per square inch; but, as soon as the projectile has moved forward a few inches, the pressure falls instantaneously to less than half that amount before commencing the diabatic-pressure curve which obtains during the remainder of the discharge of the shot from the gun.

My invention takes cognizance of this general characteristic of the action of explosives, and provides a secure fastening for the vault or safe door after it has been blown open far enough to enlarge the space filled by the gas resulting from the explosion, and makes a vent for it.

The mode which I have represented in this case of carrying out my invention consists of auxiliary bolts connecting the locking-bolt frame to the door, so that when the primary bolts, which hold the frame and door in intimate contact, have been broken by the explosion, the auxiliary bolts, first allowing the door to be opened far enough to give vent to the force of the explosives, then arrest the further movement, and hold the door so nearly closed that access to the safe cannot be gained without cutting or breaking the door or bolts with tools, and so firmly that the protracted and laborious work cannot be performed with safety to the burglars after the noise of the explosion has been heard abroad.

I have also represented another plan, which

consists of slots from the locking-bolt holes in the frame extending obliquely upward or downward toward the inside of the frame a certain distance, said slots being so made that, while they will secure the locking-bolts with ample security against the efforts of the burglars to pry and wrench the door off, yet the tremendous force of an explosive inside of the safe will force the frame along the bolts to the ends of the slots, and thus afford the necessary vent to dissipate the force of the explosion and still hold the door so as to demand too much labor for gaining access to be performed with safety after the noise of the explosion.

I also contemplate other contrivances of different modes of accomplishing the same object that have suggested themselves to my mind; and I do not, therefore, limit myself to any special arrangement.

Figure 1 is a sectional elevation of the door-frame of the safe, and an inside elevation of the door, showing my proposed arrangement of the auxiliary bolts by which the locking-bolt frame is connected to the door. Fig. 2 is a vertical section of Fig. 1, taken on the line x x of Fig. 1. Fig. 3 is a horizontal section taken on the line y y ; and Fig. 4 is an elevation of the edge of a door, showing the arrangement of the oblique relief-slot for the locking-bolts in the locking-bolt frame which I have suggested above.

Similar letters of reference indicate corresponding parts.

A represents the door-plate; B, the locking-bolt frame; C, the bolts by which said frame is held in intimate contact with the door; D, the auxiliary bolts; F, the door-frame; and G the holes in the frame into which the locking-bolts enter and remain when the door is locked. The nuts of the bolts D are adjusted as much in advance of the frame B as it is designed to let the door open to vent the gases evolved by the explosion, where they are freed from the great force of the confined gases, and only receive the lighter shock after the initial force has become greatly reduced by the vent and by the resistance of the bolts C, which are to be allowed to break. Thus the door comes against the nuts of bolts D, and is stopped. H

represents springs of rubber, which may be used or not on the bolts as a further means of lessening the shock upon bolts D; also, to force the door partly back after the explosion. Other springs may be used.

Instead of the auxiliary bolts, I propose, as before stated, the use of slots I in the locking-bolt frame, extending a certain distance inward obliquely to the plane in which the door swings open, to allow the door to be forced outward a little, either up or down on the bolts, to afford the necessary vent, said slots being sufficiently oblique to hold the door closed against prying it open without the previous action of the explosives. The extent to which the door will open will be governed by the length of the slots, its movement being stopped when the ends of the slots come to the locking-bolts.

The burglar seeks to force off the door by explosives introduced through any small hole that can be made, and fired inside with sufficient force to break the bolts C, or strip off the threads, which it is not difficult to do; but, at the same time, he takes care not to employ a charge much in excess of what is needed, because he is in danger of throwing the building down on himself, and of making an unneces-

sarily loud report, which is likely to attract the notice of people. A little experience enables him to gage his charge to the requirements of the case with remarkable accuracy. In view of the limits thus imposed upon the operators, I have conceived that, by contriving to let the door open far enough to let the force of any charge that the burglar can use with safety to himself escape, and then arrest the further opening, so as to compel him to resort to his tools after all, I shall provide much greater protection than is at present afforded in any other way, no matter what particular means may be employed for carrying it out.

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

The combination, with the door of a vault or safe held by the ordinary fastenings, of supplementary fastenings, which only come into play after the former have been destroyed or greatly impaired, and the door forced to stand slightly ajar, as and for the purpose described.

JOHN B. CORNELL.

Witnesses:

A. S. MEGQUIER,
THOS. CROCKER.