J. CRUMP.

Safes and Vaults.

No. 146,048. Patented Dec. 30, 1873.

Fig 1.

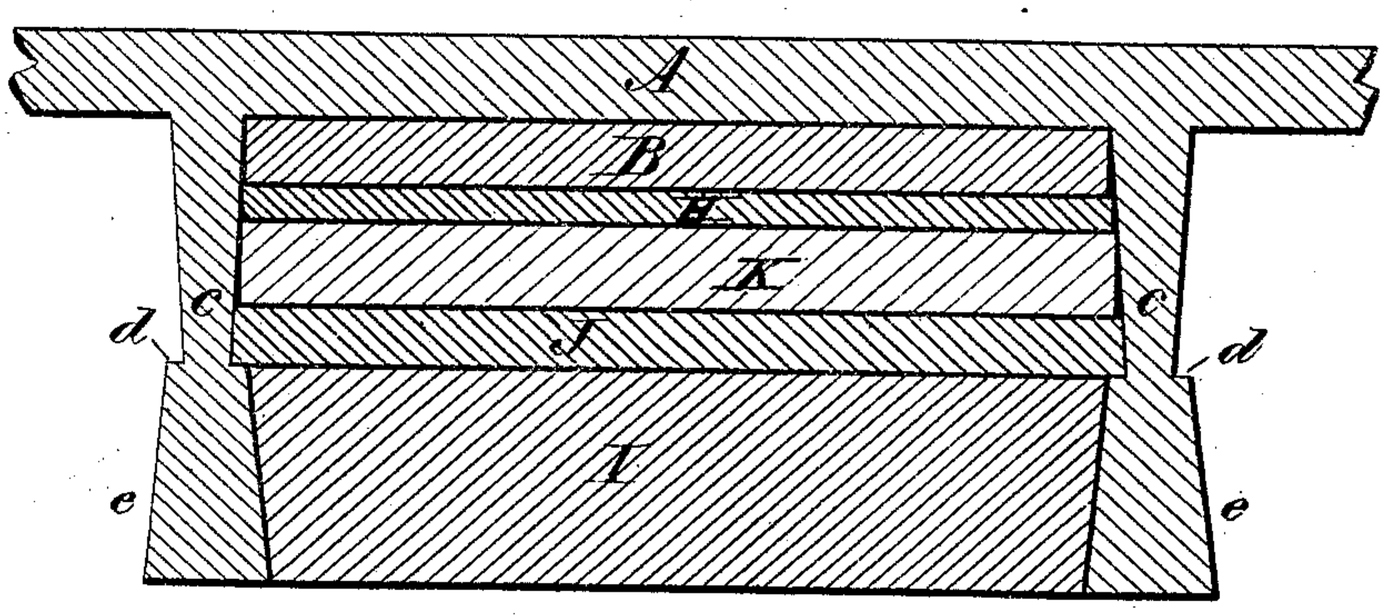


Fig 2.

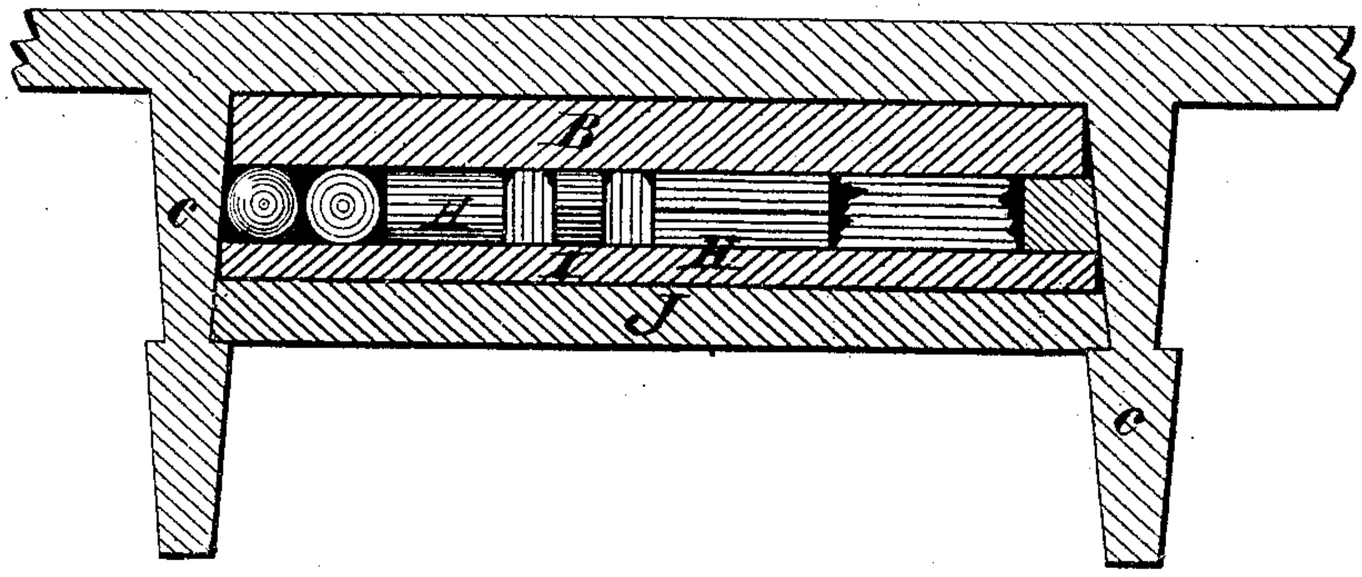
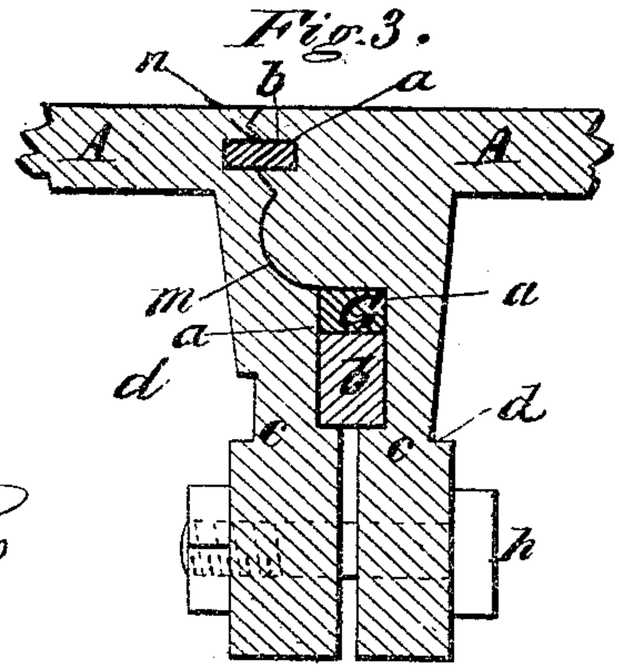


Fig 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN CRUMP, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SAFES AND VAULTS.

Specification forming part of Letters Patent No. **146,048**, dated December 30, 1873; application filed April 8, 1873.

CASE A.

To all whom it may concern:

Be it known that I, JOHN CRUMP, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Safe-Vaults, of which the following is a specification:

My present invention relates to certain improvements in the vault for which Letters Patent were granted to me on the 23d day of July, 1872, numbered 129,795; and the improvements consist in the employment of hardened steel bars in the joints between the body-plates; in a peculiar manner of securing rubber strips in the joints of the body; in arranging between the ribs of the body-plates a drill-proof backing and a non-conducting filling held by the ribs; in making the ribs with shoulders and securing the drill-proof backing in place by casting metal between the ribs in such manner as to engage under their shoulders, and in the peculiar arrangement of the drill-proof material, as hereinafter more fully explained.

Figure 1 is a cross-section through one of the cells of my improved vault; Fig. 2, a section through a modified form of the same; and Fig. 3, a cross-section through one of the joints between the body-plates.

I construct my present vault in the same general manner as the one already patented—that is to say, of a series of iron plates having their flanged edges bolted together and their inner faces provided with intersecting ribs, forming cells, in which chilled-iron plates are secured, to check the entrance of drills. I now provide the edges of the plates, as before, with a tongue-and-groove joint, *m*, and a V-shaped joint, *n*, as shown in Fig. 3, to lock the plates together and prevent the insertion of wedges. In addition to these joints, I now provide the edge of each plate with two longitudinal grooves, *a*, so arranged that those in one plate are directly opposite those in the other, and then insert in said grooves hardened steel bars or joggles *b*, as shown in Fig. 3, each bar fitting into the two plates and extending across the joint or seam between them. Any suitable number of the bars may be used, and they may be located at any desired distances from the outer face of the plates; but, in practice, I have found it best to employ two bars, one through the V-joint and the other just behind the tongue and groove, as shown. When two or more bars are employed they are set to the right and left out of line with each other, as shown, so as to leave no point through which a drill can be inserted clear of the bars. The tongue and groove and the V-joint may be omitted and the steel bars alone used, but I consider it desirable to use them, as they give additional strength and security without materially increasing the cost. The steel bars inserted as shown are an effectual safeguard against the separation of the plates by wedges, as the wedges can neither be driven through nor around the bars, and it is impossible to force the bars from their places. In order to prevent the introduction of powder or other explosive material either into the joint or through the joint into the interior of the vault, I insert in the adjoining edges of the plates a rubber strip, G, which closes the joint perfectly, so that there is no space left in the joint to hold explosive material, nor any crack left through which access can be had to the interior. The rubber also serves, of course, to prevent moisture from entering. In the present instance I have inserted the rubber against the front side of the inner steel bar *b*, in the same grooves therewith, but it may be inserted in separate grooves at any desired point. By means of the steel and rubber strips in the joints, I render it impossible for burglars to effect an entrance through the joints, or at least from doing so in the limited time to which they will be confined in their operations. The body-plates A are provided, as in my patent, with inside cells, containing chilled-iron plates B, to resist the entrance of drills. The plates were, however, unsupported except by pins passed through the ribs, so that a hole could be drilled through the plates A, and the chilled plates then broken by driving a punch inward through the hole. After the chilled plate was broken it would fall or could be readily pushed out of its cell, and thus an opening left through to the inside of the body, so that it could be easily opened either by tools or explosives. In order to prevent this danger, I now place behind the chilled plates a drill-

proof backing, H, consisting of round balls or loose blocks of metal of any desired shape; or of a single plate of hardened steel, franklinite, or other like material, which will resist the action of a drill; or of several thin plates of different materials; or of a compound plate having a hard face to resist a drill and a soft fibrous backing to hold the parts of the face together in case it is cracked or broken. In short, I place behind the chilled plates a backing, H, of such nature that, in case the chilled iron is broken, the backing will still stop a drill. Behind the backing H I place a layer, K, of some material which is a non-conductor of heat—such, for example, as asbestus, alum and plaster, oxide of zinc, paper pulp, or other fibrous material—and I then cast into the cell, behind the non-conducting material, a plate of iron, J, which serves to hold said material, the backing H, and the chilled plates all in place. In order that the plate J may take a firm hold, and be solidly supported, I provide the ribs, which form the walls or sides of the cells, with shoulders *d*, under which the plate engages, as shown. Instead of holding the plate J by a simple shoulder, the ribs may be provided with grooves to receive the edge of the plate, so that it will be held from moving inward in case the non-conducting material shrinks, as well as from moving outward. A groove for this purpose is shown on the left hand in Fig. 3. The non-conducting material is introduced for the purpose of preventing the molten iron J from softening the hard drill-proof materials in the front of the cell; but it also answers as an elastic cushion for the hard plates and prevents them from being as readily broken as if they were supported by a solid backing. When desired, the rear edges of the ribs may be widened or thickened, as in Fig. 1, so as to render the cells wider at the bottom than at the top, and then the cells may be filled up flush, with any suitable composition or concrete, I, which, owing to the shape of the cells, will be held firmly in place. The concrete filling will give a smooth interior finish to the vault, and when composed of non-conducting substances it will add materially to the fire-proof qualities of the safe or vault. When the filling is not to be used, the edges of the ribs will be reduced in thickness, as shown in Fig. 2, in order to decrease the weight and the expense consequent thereon.

By backing up the chilled plates in the manner described, and then securing them and the backing in place by casting the metal into the cells behind them, I fasten them with far greater security and solidity than in my patent, prevent them from being driven in or broken and taken out, prevent a drill from entering the interior in case the chilled plates are broken, and materially reduce the expense of securing the chilled plates in place.

Having thus described my invention, what I claim is—

1. The hardened steel bars *b* inserted between the body-plates A of an iron safe or vault, substantially as and for the purpose set forth.

2. The cast-iron body-plates or sections A, having their abutting edges provided with grooves *a*, in combination with the rubber strips G inserted therein, as shown and described.

3. The safe or vault body consisting of the ribbed body-plates A, provided with the drill-proof backing, arranged as described, and with the concrete lining or backing I of non-conducting material, applied between and held by the ribs, all combined and arranged as shown.

4. In combination with the cells having shoulders *d*, a hardened plate or layer and a layer of non-conducting material, K, arranged therein, and a plate of metal cast therein, substantially as shown and described.

5. The combination of the chilled plate B, backing H, non-conducting material K, and cast-metal plate J, when arranged in the cells of an iron vault or safe wall, substantially as described.

JOHN CRUMP.

Witnesses:
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