109. SAFES, BANK PROTECTION AND RELATED DEVICES.

DRAFTSMAN.

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(No Model.) 2 Sheets—Sheet 1.

H. GROSS.

FIRE AND BURGLAR PROOF SAFE.

No. 258,577. Patented May 30, 1882.

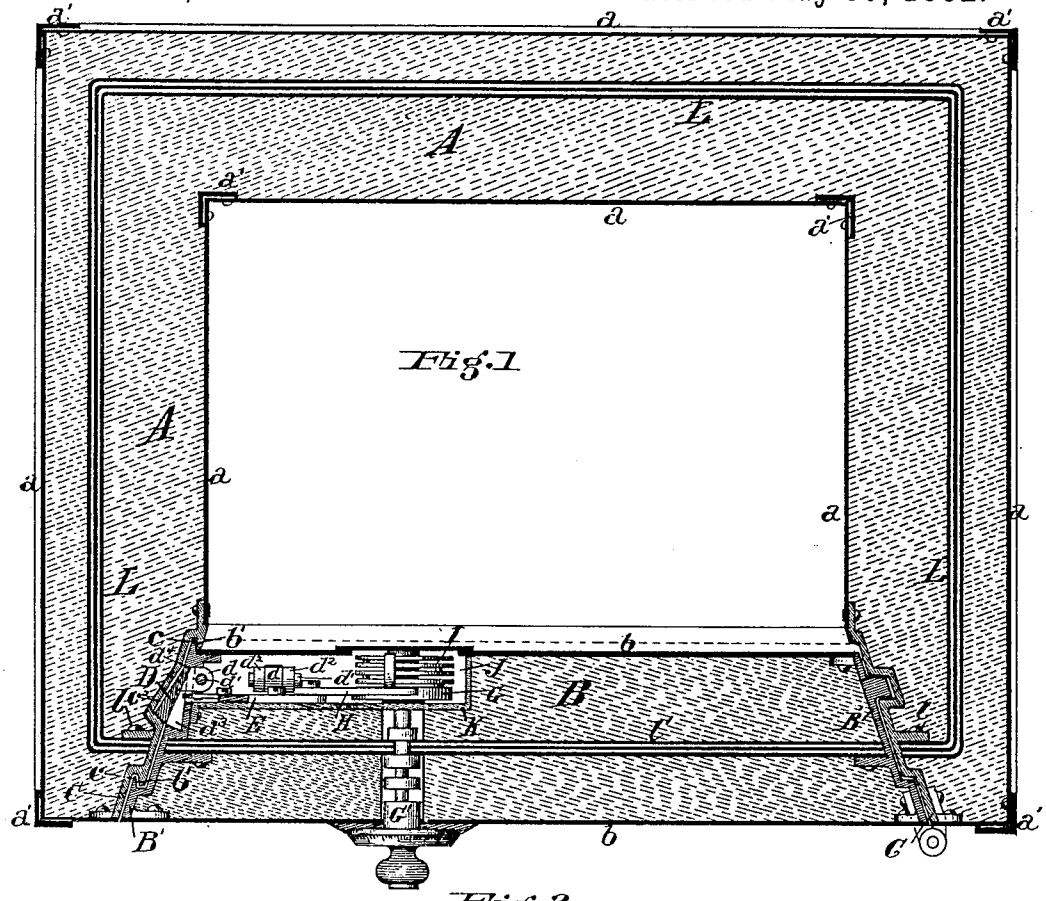


Fig. 1

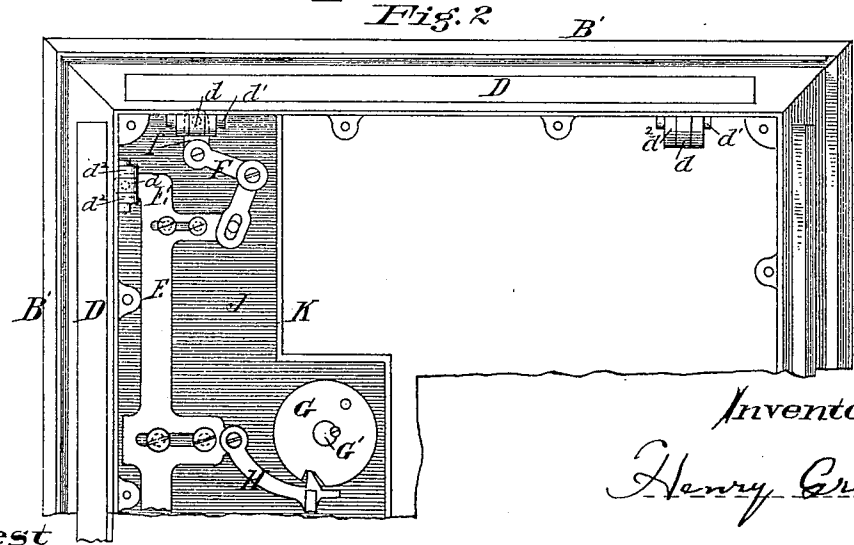


Fig. 2

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UNITED STATES PATENT OFFICE.

HENRY GROSS, OF TIFFIN, OHIO.

FIRE AND BURGLAR PROOF SAFE.

SPECIFICATION forming part of Letters Patent No. 258,577, dated May 30, 1882.

Application filed July 11, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY GROSS, a citizen of the United States, residing at Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Fire and Burglar Proof Safes; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has for its object to provide a safe which shall possess greater capability of resisting the destructive action of heat, shall be practically proof against burglarious attacks, and shall be of the most simple and inexpensive construction.

To this end my invention consists in a fire-proof safe having the door-frame and the jamb-frame composed of sections which are provided with projecting lugs to receive the connecting bolts or rivets and act as braces to stiffen the connection of the sections, whereby these frames can be made to more closely approximate or fit each other when the door is in a closed position, and therefore the fire-resisting quality of the safe is improved.

The invention further consists in a fire and burglar proof safe provided with burglar-proof plates composed of continuous pieces of welded iron and steel or steel plates, one of said plates extending continuously through the body of cement filling in the safe-body and the other plate extending through the cement filling in the door-frame, said plates having their ends connected respectively with the interior of the door or jamb and door-frame.

Figure 1 is a sectional plan of a safe embodying my improvements. Fig. 2 is a partial plan of the door of the safe, showing the bolt-work thereof. Fig. 3 is a partial plan of detached sections of the door-frame and door-jamb frame. Fig. 4 is a perspective view of a portion of the cast-iron door-jamb frame. Fig. 5 is a perspective view of a portion of the door-frame. Fig. 6 is a perspective view of a portion of the door-frame, showing the bolt-work attached thereto. Fig. 7 is a perspective view of a portion of the door-frame, showing a slight modification of the bolt-work.

Before describing my invention in detail I will call attention to some of the important defects of safes as at present constructed, and which it is the object of my invention to eradicate.

It is generally understood that the fit between the cast-iron frame which forms the edges of the door and the cast-iron which forms the jamb into which the door closes is not a very perfect one by reason of the inaccuracies developed in the casting of said frames, such as warping and shrinking of the metal naturally produce; and it has been customary to secure an approximately-close fit by means of putty, filing, scraping, and painting. In point of fact it became impossible to design the patterns so that a close fit could be secured in the castings, because of the uncertainty of securing uniform castings, and the looseness of fit which thus became necessary could never be perfectly overcome by the unworkmanlike means above referred to. The chief reason for this imperfection of the frame-castings was the fact that the frame was cast in a single piece, necessitating that it should be cast "upon edge," (with the greatest extent of metal in a vertical plane,) whereby the metal was liable to "cold short" and unequal shrinkage, and, furthermore, the length of the sides of the frame was controlled entirely by the action of the iron in cooling, and the size of the door or the corresponding opening in the safe became a matter for conjecture only. Again, in the present form of bolt-work, where the bolts are formed of round iron and their sockets in the jamb are merely holes bored through the thin cast-iron jamb-frame, it is very evident that the bolt is much stronger than its socket, and consequently it lacks that intelligent design which proportions all parts so as to be of equal strength. The result is that for a given strength of fastening the bolt is superfluously strong and expensive, and its form is also of the most expensive construction, requiring lathe-work and fitting. Then, again, according to present practice, in supplying a fire-proof safe with burglar-proof lining it has been customary to secure it immediately within the fire-proof walls, the result being that if attacked by burglars it can be got at by removing the cement filling from in front of a portion of it, and can then be punched in sufficiently to give access to the safe; or, if the burglar-proof plate be secured to the outside of the fire-proof cement filling, it can be "stripped off," so as to permit access to the filling, which can be easily penetrated.

The above are some of the defects of the present practice of safe construction, and in the following description I will try to explain how I propose to obviate them.

In the drawings, A represents the body or filling of a fire-proof safe, surrounded by the customary sheet-iron walls, *a a*, secured at the corners by the angle-irons *a' a'*. This filling may be of the ordinary cement, which is poured into the space between the sheet-iron walls in a liquid condition and allowed to harden.

B is the door of the safe, formed of sufficient depth to contain the proper amount of cement filling to resist heat, and having the usual sheet-iron front and back retaining-plates, *b b*. These plates are secured to a thin cast-iron frame of sufficient depth to secure the proper separation of the plates, and this frame forms the edges of the door. The walls *a a* of the safe are also secured in front to a thin cast-iron frame, which is of sufficient depth to make the front wall of the safe equal in thickness to the thickness of the door, and this frame is made to conform in shape and extent to the frame which forms the edge of the door, so that when the door closes into it there shall be a close and accurate fit, that will prevent the ingress of heated air, &c. These frames are made to incline somewhat from a right angle to the surface of the door and front of the safe in the usual manner, but instead of being broken by "steps" the surfaces of which are parallel to the surface of the door, as has heretofore been the custom, they are provided on all sides except the "hinge side" with continuous grooves and projections, which engage each other when the door is closed, the grooves *c* being located in the frame which forms the opening in the safe and the projections *b'* being located in the frame which forms the edge of the door. One of the continuous projections on the door-frame is located at its extreme innermost part, and the other is located near the front part and forms an offset or overhang in the frame, while the grooves in the frame which forms the door-opening are located to correspond with the projections, so that they shall receive them when the door is in a closed position.

In order to avoid the defects of safe construction referred to hereinbefore, I construct the door-frame of four distinct pieces or sections, B' B', of cast-iron, and these sections are provided with ears or lugs b^2 b^2, which mutually overlap, and when joined by bolts or rivets form a firm joint between two contiguous sections. Each section bounds one edge of the door, and the lugs b^2 are formed upon the sections at their ends, so as to lap each other at the corners of the door. These lugs are formed with straight edges on the side nearest the ends of the frame-sections and at right angles thereto, so as to rest firmly against the contiguous section and prevent any tendency in the frame-sections to "sag" at the rivet-joints.

The frame that forms the door-opening in the safe is also made of four distinct pieces or sections, C C, of cast-iron, and these sections are provided with lugs or projections *c' c'*, formed upon their sides near the end, which lugs overlap and are joined by rivets or bolts to secure the pieces or sections of the frame together. These lugs appear upon the outside of the corners of the jamb-frame when secured together, and they are formed with straight edges to rest against their contiguous sections of the frame and stiffen the joint between.

It should be stated that the lugs b^2 b^2 of the door-frame appear upon the inside surface of the corners when the sections of the frame are joined together, so that the outside surface of the corners shall present a smooth and unobstructed surface.

By constructing the frames in sections, as above described, I am enabled to cast them with the greatest extent of metal in a horizontal plane, whereby good casting is secured, and I am enabled to use lighter castings by reason of the fact that the iron will run much better in the molds. Then, again, the ends of the sections may be trimmed down at will to determine the most exact size of the door-frame, and both the sections of the door-frame and door-jamb frame may be surfaced down to secure as close a fit as desired between the door and jamb.

The bolt-work is composed of swinging plates D D upon the front and top and bottom edges of the door, said plates having lugs *d d*, by which they are secured at or near the inner edge of the frame by pivots *d' d'* passing through lugs d^2 d^2 upon the inside of the frame B' B'. The plates D D are adapted to swing outward from the surface of the frame B' B' and engage depressions c^2 c^2 in the jamb-frame, and when withdrawn from depressions c^2 c^2 or unbolted the said plates enter recesses d^3 d^3 in the frames B' B', so as to be clear of the jamb when opening the door. The plates are so attached to the door-frame that when their free edges engage the depressions c^2 c^2 in the jamb their hinge edges will rest against the shoulders d^4 d^4 at the base of the recesses d^3 d^3, and the strain will be transmitted directly to the frame and not through the pivots *d' d'*.

Secured to or formed upon the lugs *d d* of the hinged bolts D D are small pins or projections, d^5 d^5, which engage with the striking-bar E or through links *f* with the bell-cranks F, which in turn engage with the striking-bar. The striking-bar is operated by "drive-wheel" G on spindle G' through dog H, so as to impart the necessary motion to the bolts D D, and the dog is controlled by suitable tumblers, I, that can be operated by the drive wheel in the customary manner.

The bolts D D may be continuous, so as that one bolt will extend nearly the entire length of a side of the door, as shown in Fig. 6; or they may be in sections, so that two or more of them will be located in one side of the door, as shown in Fig. 7. In either case they may have sufficient extent to be amply strong to resist crushing strains when attacked forcibly, and they possess the marked improvement over the

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old style of bolt-work in that they distribute the strain along an extended portion of the jamb and enable the jamb to withstand much greater strains than it does under the present arrangement. Furthermore, the bolt-work as thus arranged is exceedingly simple and inexpensive, as the only fitting the bolts require is the fitting of the pivots d' d'.

The striking-bar E, dog H, drive-wheel G, and lock-tumblers, are located in a compartment, J, formed in the door by the partition K, which separates it from the cement filling.

L is the burglar-proof lining, formed of welded iron and steel or steel-plate. The back, two sides, and front of the safe are incased in one continuous sheet, bent around the safe and secured to the jamb-frame at l, as shown. The top, bottom, and top and bottom portions of the front not covered by the main plate are covered by plates which are secured to the main plate by angle-iron strips at the intersecting corners. The plate L is secured, as shown, in the center of the cement filling, and an extension, l', of it extends through the door in like manner, and is secured by its edges to the door-frame, as shown. By locating this armor within the body of the cement filling the following advantages accrue: The plate cannot be stripped off as it could if secured upon the outside of the safe, and it cannot be punched in as it could if located upon the inside of the safe by reason of the cement backing on both sides, which must be removed entirely before the said armor can be displaced. This is not the case when the plate is secured upon the inside of the safe in the ordinary way, for the removal of a very few square inches of cement will give access to the plate, and it can then be caused to yield with a punch, inasmuch as it has no backing.

This manner of making a fire and burglar proof safe I consider much cheaper and better than the practice of putting a burglar-proof box within a fire-proof shell, and it does not waste the room within the safe to the same extent.

Prior to my invention the door-frame of a safe has been provided with a recess and a hinged locking-plate arranged therein, and the door-jamb has in one instance been provided with a longitudinal rib for engaging the outer edge of said locking-plate, and in another instance with a recess for receiving a projection on said locking-plate. Hence these features are not herein broadly claimed.

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

1. In a fire-proof safe, the door-frame B' B' and the door-jamb frame C C, constructed in sections and provided with lugs b^2 b^2 and c' c', respectively, to receive the connecting bolts or rivets, and acting as braces to stiffen the connection of the sections, substantially as and for the purpose specified.

2. In a fire and burglar proof safe, the burglar-proof plates L and l', composed of continuous pieces of welded iron and steel or steel-plate, the plate L extending continuously through the body of cement filling in the safe-body and the plate l' extending through the cement filling in the door-frame, said plates having their ends connected respectively with the interior of the door-jamb and door-frame, substantially as and for the purpose described.

In testimony whereof I hereunto subscribe my name in the presence of the witnesses hereunto.

HENRY GROSS.

Witnesses:
HENRY CROMWELL,
A. C. BARBOUR.