J. NAYLOR, Jr & E. BROOKS.

Bolt Works for Safe and Vault Doors.

No. 165,752. Patented July 20, 1875.

Fig. 1.

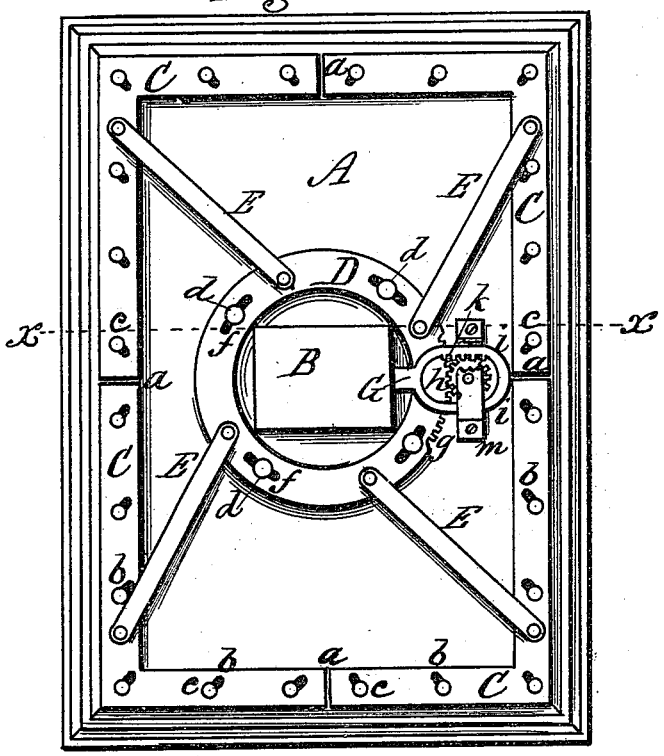


Fig. 2.

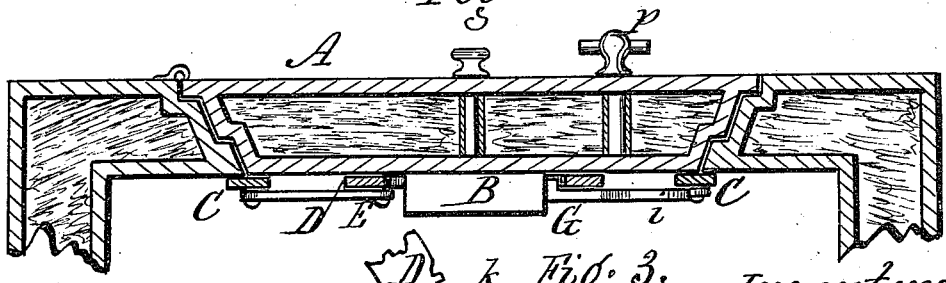
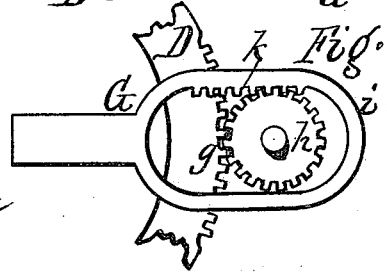


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES NAYLOR, JR., AND EDWARD BROOKS, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN BOLT-WORKS FOR SAFE AND VAULT DOORS.

Specification forming part of Letters Patent No. **165,752**, dated July 20, 1875; application filed May 26, 1875.

To all whom it may concern:

Be it known that we, JAMES NAYLOR, Jr., and EDWARD BROOKS, both of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Safe and Vault Doors; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of the inside of a safe-door, showing our improvement applied thereto. Fig. 2 is a cross-section in line *x x* of Fig. 1. Fig. 3 is a detail view.

Our improvement relates to the means for locking or securing the doors of safes and vaults by the use of plates attached upon the inner face of the door, and sliding over the joint between the door and jamb. Such plates have before been used, and we therefore make no claim to them, broadly; but our invention consists in the combination and arrangement of parts hereinafter described for operating and locking the plates, as will be more fully set forth.

A represents the door of a safe, which is of usual construction. B is the lock, which is situated centrally on the inner face of the door, and may be of any of the known kinds. C C C C are the four sliding plates, which constitute the door-bolts, situated on the outer edges of the inner face of the door, as shown clearly in Fig. 1, thus forming a rectangle or square. When the door is shut these plates are made to move outward across the joint between the door and jamb, as shown in Fig. 2, thus accomplishing the double object of locking the door and of closing the joint against the action of fire and heat. These plates differ from those ordinarily used in this respect, viz., the divisions or joints *a a* between them come midway of the length and width of the door, instead of at the ends, each section thus forming an elbow which is closed at the corner. By this means we obviate the square blanks or notches at the corners which are produced in ordinary safes when the plates are thrown out, and we also avoid the danger of the bending or warping of the corners, caused by striking the jamb when the corners are thinned by halving together. The ends of the sections at the joints *a a* may be halved together so as to leave no opening when the plates are expanded, and these joints, coming in the center, are not subject to bending or warping. The plates are provided with angular slots *b b*, in line with the movement of the plates, through which slots pass headed screws *c c*, which hold the plates in place. The plates are guided in their movements by these slots and screws, so as to be thrown out and in, in proper position, by a single connection attached to each.

D is an annular ring, which surrounds the lock B, and has a free turning movement. It is held by headed screws *d d*, which pass through eccentric slots *f f*. E E E E are four connections, pivoted at one end to the ring, and at the other end to the plates C C C C, about midway of their length. These connections stand somewhat tangentially, or in such position as to operate the plates easily when the ring is turned. *g* is a gear-segment upon one side of the ring D. *h* is a pinion on the spindle-shaft, which engages with the segment. G is a sliding bolt, resting at the inner end against the lock-bolt, and having at the outer end a loop or stirrup, *i*, which embraces the pinion *h*, and is provided with a rack-gear, *k*, which meshes with the pinion. The pinion and loop are retained in place by a bearing, *m*, fastened to the door.

To operate the mechanism it is only necessary to turn the spindle *p*. The pinion *h*, being geared with the ring D and stirrup-bolt G, will operate both simultaneously to throw out the plates and withdraw the end of the stirrup-bolt from the lock, so that the lock-bolt may be thrown out to meet it. In this case the door is locked, as shown in Fig. 2. The reverse action withdraws the plates and throws the stirrup-bolt G back into or against the lock-case. By this means the stirrup-bolt G is automatic or self-acting, being thrown by the pinion in unison with the motion of the ring D, and as it is connected with said ring by the gears *h*, *k*, and *g*, it forms an intermediate device connected with the lock, by which the door-bolts are locked out.

By the use of the simple stirrup-bolt G we save the cost of a complicated mechanism, such

is now used with bolt-works of this class, and greatly simplify the operation of the parts.

Another advantage of our invention is the few parts necessary to use, and their extreme simplicity, by which they can be applied upon most fire-proof and burglar-proof safes without the removal of the safe-lock. This lock is usually situated centrally, and the ring D can be fitted over it without trouble, while the stirrup-bolt, connections, and plates rest on uncovered spaces of the door, and the whole can be attached by simply screwing to the inner face of the door.

The complex mechanism heretofore in use, so far as we are aware, cannot be adapted to the lock without its removal.

Having thus described our invention, we do not claim, broadly, plates secured to the inner face of the safe-door, and shutting over the jamb to lock the door; nor do we claim, broadly, arms for operating such plates.

What we claim is—

1. The combination, with the lock B and ring D, of the stirrup-bolt G, connected with the ring through the medium of the pinion *h* and gears *k g*, and constituting an automatic shifting device for locking the door-bolts in position when the safe-lock is locked, as herein shown and described.

2. The toothed ring D, pinion *h*, stirrup-bolt G, connections E E, and elbow-plates C C, combined and arranged to operate in the manner and for the purpose specified.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JAMES NAYLOR, JR.
EDWARD BROOKS.

Witnesses:
R. F. OSGOOD,
E. B. SCOTT.