(No Model.)

J. FARREL.

BOLT WORK FOR SAFES.

No. 451,417. Patented Apr. 28, 1891.

FIG 1.

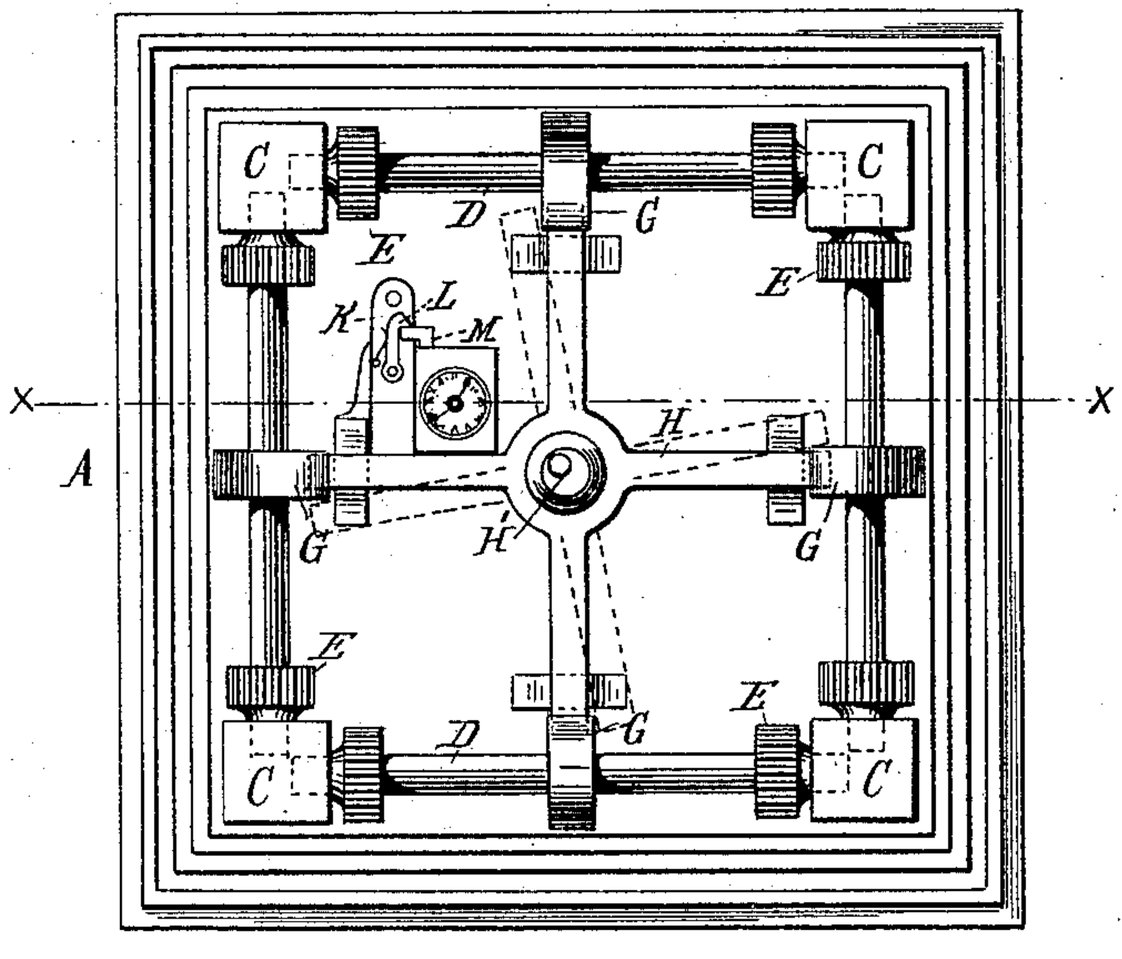
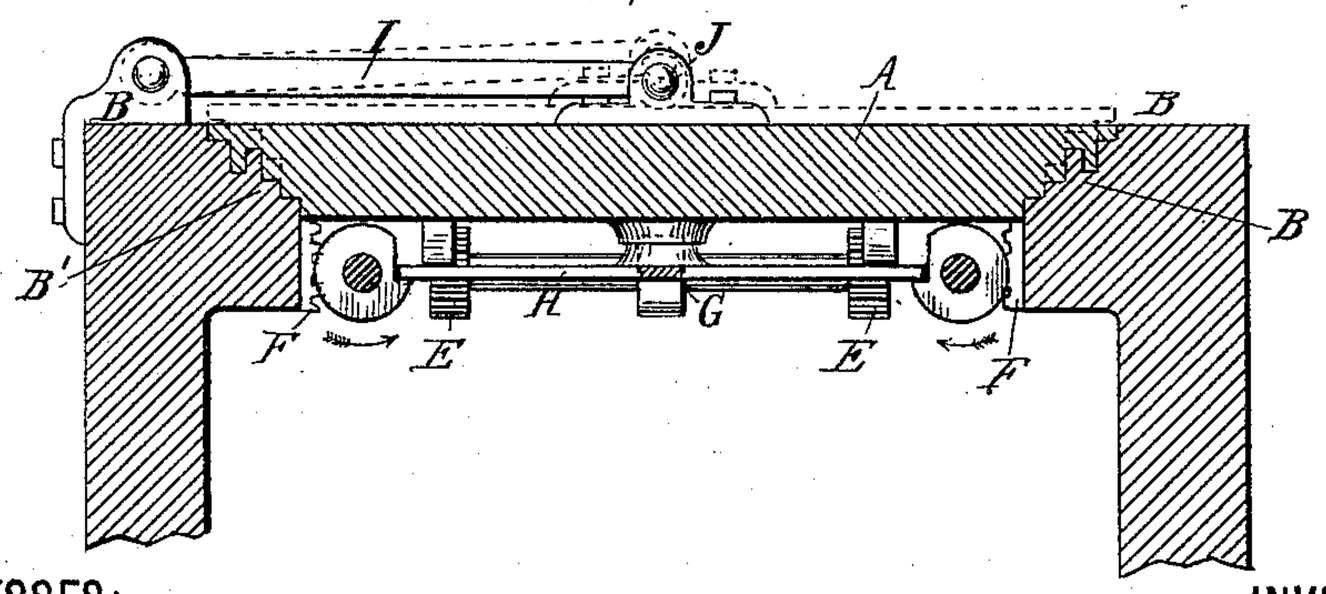


FIG. 2.



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BOLT-WORK FOR SAFES.

SPECIFICATION forming part of Letters Patent No. 451,417, dated April 28, 1891.

Application filed January 23, 1891. Serial No. 378,837. (No model.)

To all whom it may concern:

Be it known that I, JOHN FARREL, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Bolt-Work for Safes, of which the following is a specification.

My said invention relates to an automatic bolt-work for tongue-and-grooved safe-doors, wherein the bolt or bolts carried by the door are spur wheels or pinions and the holdings for such bolts in the jambs of the door-frame consist of cogged racks, with which the said pinion-bolts engage as the door is closed.

In the annexed drawings, Figure 1 shows the inside face of the door and the bolt-work as with the door detached. Fig. 2 is a transverse section of the door shown as closed, and also indicating the jambs of the door-frame.

A is the safe-door. It is formed with step-flanges and tongue and groove on all four sides or edges.

B indicates the door-frame, having a corresponding tongue and groove in the jambs thereof B′.

Blocks C, made fast to the door, furnish bearings for shafts D, fitted to turn on their axis in such bearings independently of each other. Fixed on these shafts and rotating therewith are toothed pinions E, which constitute the bolts of the bolt-work.

F F are cogged racks made fast to the door frame or jambs at right angles to the face of the door, and these are the holdings for receiving the pinion-bolts, and they engage with and hold said bolts when the door is closed. The door is hung and swings on double hinges, (represented by arm I,) of which it is understood there are two, one at the top and the other at the bottom of the door, such arms being pivoted to ears J on the door, allowing the door to enter and leave its seat in the jambs bodily in nearly parallel lines on all sides, whereby to provide for completely disengaging the bolts from their holdings and separating the tongues and grooves before swinging the doors fully open.

The pinion-bolts E and their shafts have a limited rotary motion around their axes, and the pinions are set in such a position that when the door, having been swung opposite its place for closing it, is pushed into the jambs B′ in the final closing movement thereof, the several pinion-bolts, all moving in substantially parallel lines, will engage directly with the cogs of their respective racks F and all be revolved, whereby they are self-operating by the act of closing the door. On drawing the door from the jambs in like manner for opening it the pinion-bolts revolve in the opposite direction until the tongue and groove in the door and jambs have been fully disengaged.

On each pinion-shaft made fast thereto is a stop-collar G, having a recess therein adapted for coaction with any contrivance which, when brought into gear therewith, will stop the shafts D and pinion from revolving and lock the bolts fast. Such means here consist of a pivoted cross-bar H, having in this instance four arms, one for each pinion-shaft or set of bolts.

In operation the cross-bar oscillates on a pivot H′, made fast on the inside of the door, the operation of the locking means being effected wholly within the safe. Such locking contrivance is to be operated in any convenient manner, and, if desired, may be moved both for locking and unlocking the bolts by the agency of a time-lock; but in the present case the locking device is self-acting for locking and is operated by a time-lock mechanism in unlocking. The pivot H′ is placed eccentric to the center of the cross-bar H, throwing it out of balance and giving it a tendency to turn on the pivot by its own gravity, and when the door is open and the cross-bar is in the unlocked position (indicated in dotted lines in Fig. 1) the end of each arm rests against the blank side of the collars G. When the door has been closed and the bolts thrown or operated as aforesaid, the rotation of the shafts and the collars G brings the recess in such collars opposite the extremities of the cross-bar, whereupon the latter slip into said recesses, preventing the shafts and their pinion-bolts from revolving, whereby they are locked fast.

As illustrating the unlocking action of the cross-bar effected by a time-lock, K represents a weight placed above one of the arms of the cross-bar and tending to oscillate the cross-bar and overcome its gravitation aforesaid. On the weight K is a catch L, working in con-

nection with the dog or bolts of a time-lock M. Before closing the door the weight is raised up and dogged with the time-lock by the catch L. When the set time arrives for opening the safe, the time-lock releases the weight, which moves with sufficient force against the arm of the cross-bar to overcome its own gravitation and turn it to the unlocked position, releasing its hold of the collars G and permitting the pinion-bolts to turn and allow the door to be opened.

I claim as my invention—

1. In a bolt-work for safes, the combination, with the door and door-frame, of rack-and-pinion bolt-work wherein the door-bolts are pinions and the jamb-holdings of the bolts each consist of a rack of cogs.

2. The combination, with the tongue-and-grooved door hung on double hinges to permit a direct motion thereof bodily in right lines, of independent pinion-bolts each rotated on the final closing movement of the door by engagement with cogged racks, and a self-acting device for preventing rotary motion of the pinion-bolts after the door is closed.

3. The combination of pinions E, fixed on shafts D, turning in bearings C on the door and meshing into cogged racks F in the door-frame in the act of closing the door, stop-collars G on the shafts, a pivoted cross-bar H, that engages and coacts with said catches to lock the pinion-bolts and prevent them from rotating, and a time-lock to dog and release the cross-bar, substantially as set forth.

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