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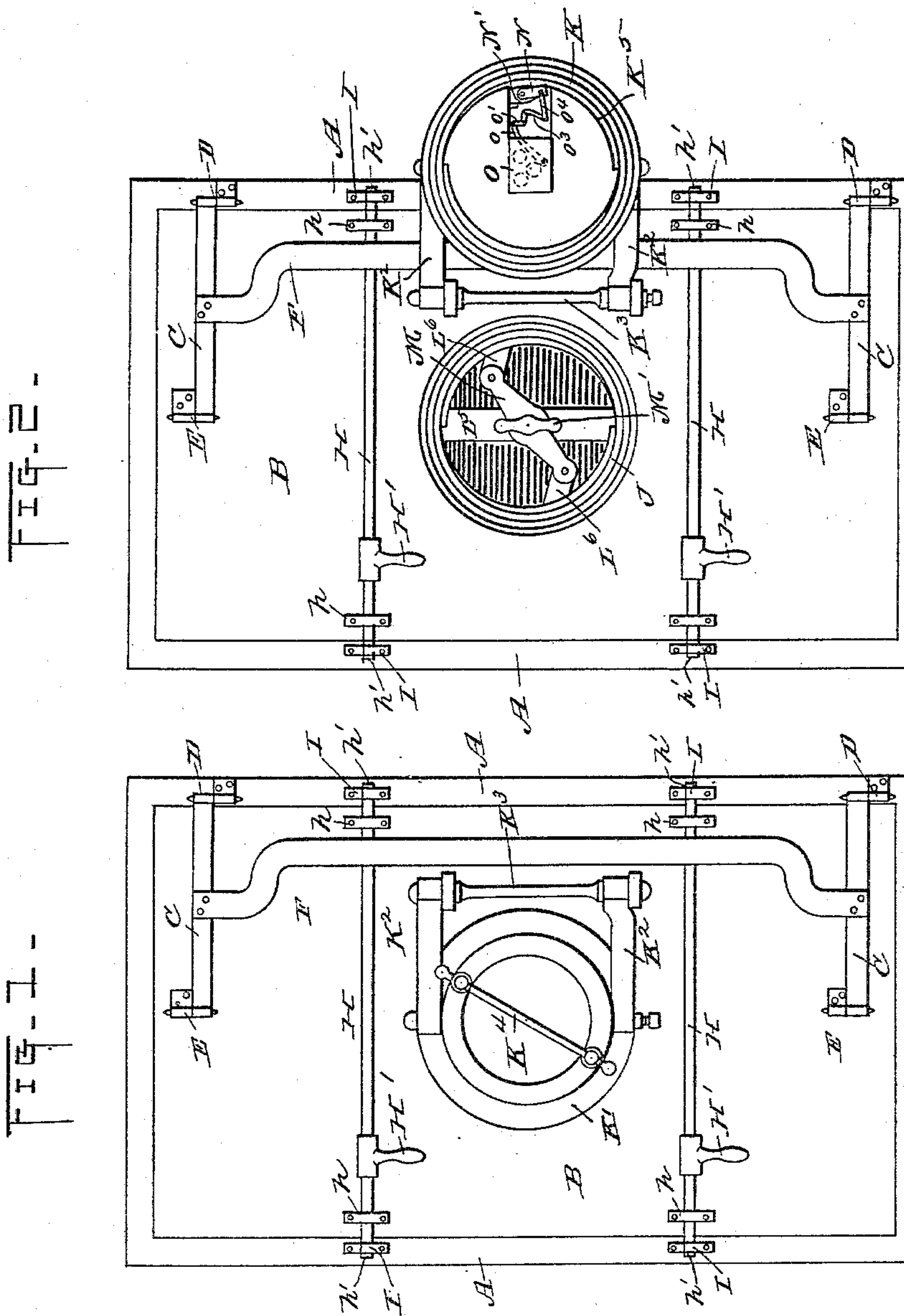
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J. H. MYERS.

VAULT OR SAFE.

No. 411,669.

Patented Sept. 24, 1889.



Witnesses

E. D. Smith

Thomas Durant.

Inventor

Jacob H. Myers,
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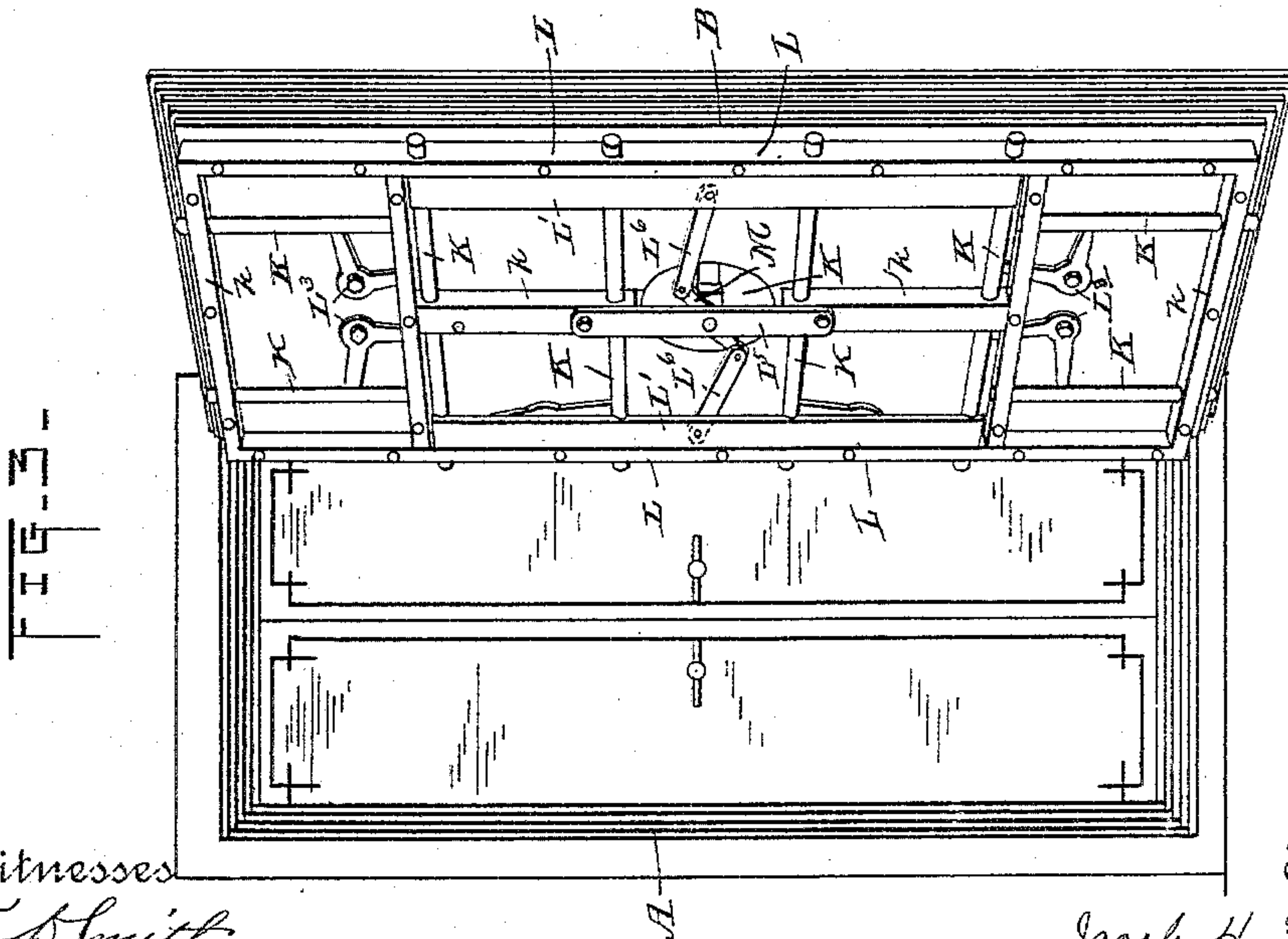
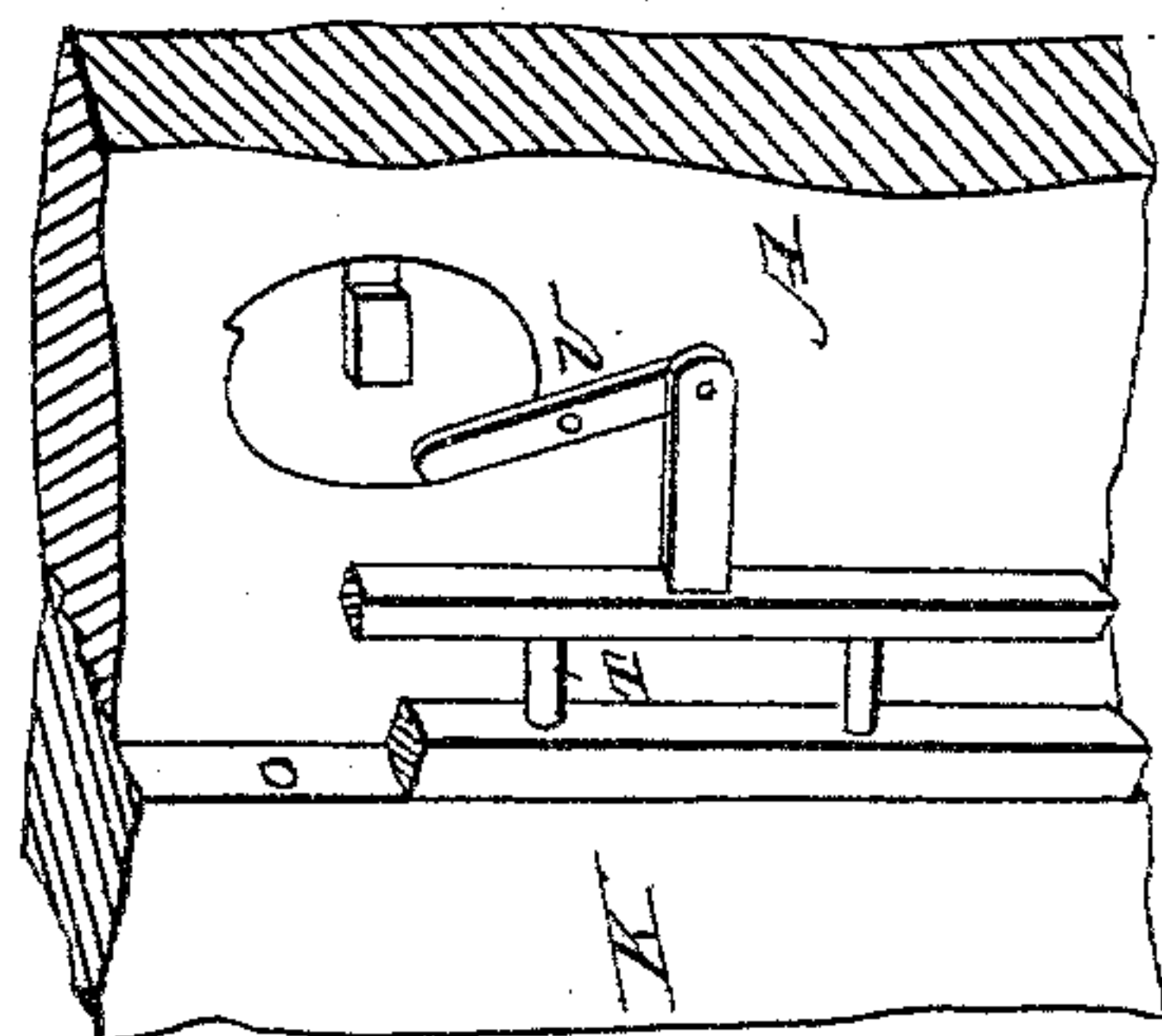
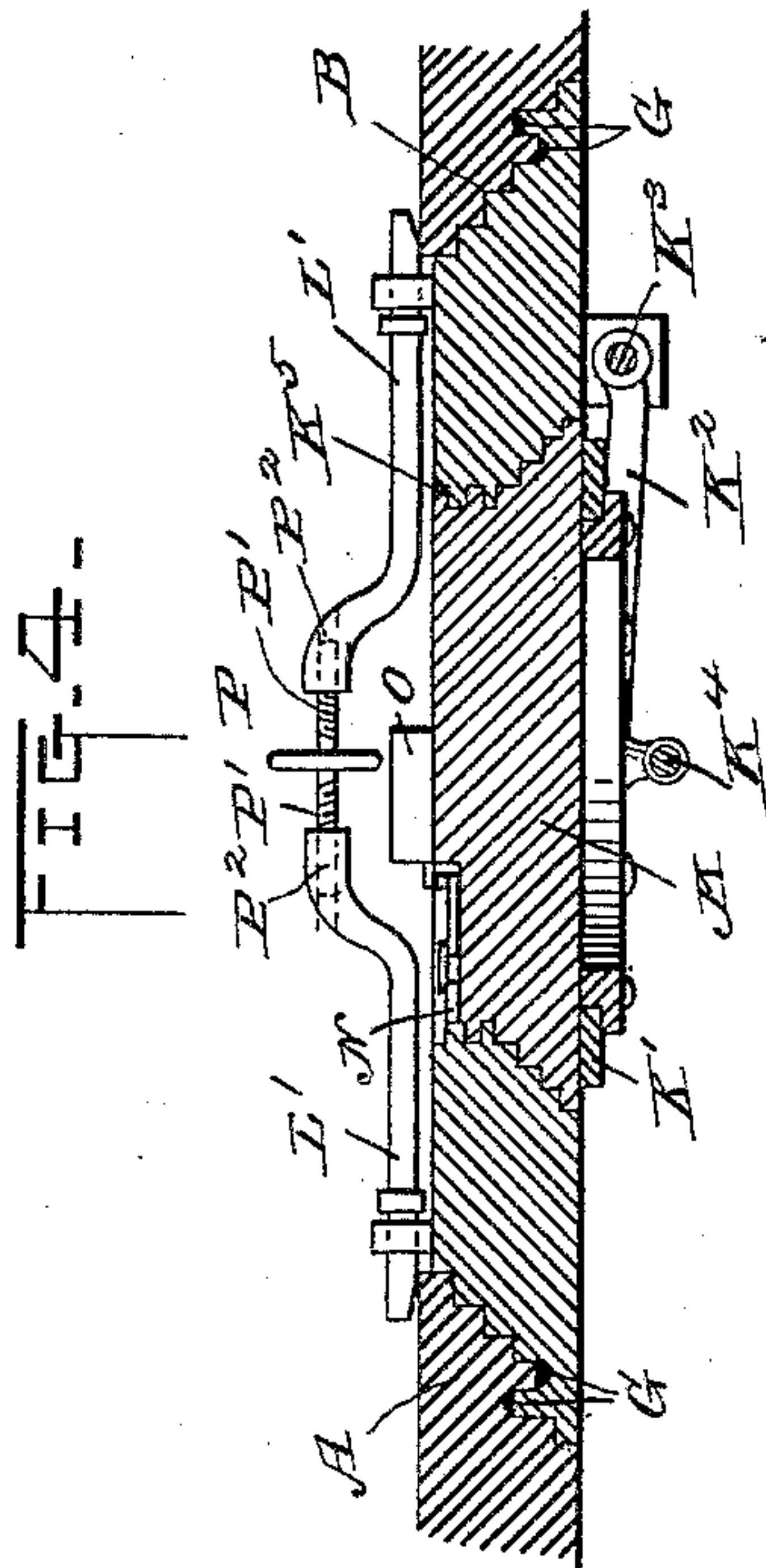
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UNITED STATES PATENT OFFICE.

JACOB H. MYERS, OF ROCHESTER, NEW YORK.

VAULT OR SAFE.

SPECIFICATION forming part of Letters Patent No. 411,669, dated September 24, 1889.

Application filed January 25, 1889. Serial No. 297,510. (No model.)

To all whom it may concern:

Be it known that I, JACOB H. MYERS, of Rochester, in the county of Monroe and State of New York, have invented certain new and
5 useful Improvements in Burglar-Proof Vaults or Safes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of
10 this specification, and to the figures and letters of reference marked thereon.

My present invention relates to improvements in burglar-proof vaults or safes, and has for its object to increase their security, rendering them incapable of being opened by any
15 external force short of the entire destruction of the door or vault-walls; and to this end it consists in so constructing the parts that access cannot be had to the interior to retract the
20 bolt mechanism save through an aperture closed by a solid door or partition, which is guarded by a suitable locking device—such as a time or electric lock—that cannot be
25 opened by manual operation; and it further consists in certain novelties of construction and combination of parts, as will be hereinafter described, and pointed out particularly in the claims at the end of this specification.

Heretofore it has been customary to provide
30 safes and vaults with time or permutation locks, that dog the projected bolts when the door is closed, preventing their retraction until the time for which the time-locks are set or the tumblers are arranged in proper
35 position; but in all such arrangements of which I am aware provision is made for retracting such train-bolts, either by means of a spindle extending to the exterior of the safe or vault, or else the bolts are automatically
40 retracted by a weight or spring when the dogging mechanism is in proper position to unlock.

Recent burglaries have developed the fact that the use of spindles penetrating the door
45 or walls of a safe or vault, either directly or indirectly, are the vulnerable points of attack, as the spindles can be driven or broken out and the aperture through which they passed, or even the slight spaces around the
50 spindles, permit the introduction of pulverized or liquid explosives, by the explosion of

which the door can be forced. The employment of the complicated automatic bolt-retracting devices was designed to obviate this; but a serious objection to these is their liability
55 to become damaged by concussion, caused by their own operation when applied to the heavy bolt-work of a large safe or vault, or their liability to become deranged and rendered inoperative by the concussion of
60 dynamite or similar explosives against the door, causing a lockout and resulting in great expense and delay to the owners; and a further objection to this form is that should the time-lock controlling the bolt-work become
65 deranged or blown from its fastenings the automatic device would operate to retract the bolt-work and thus permit an entrance. By my invention, however, it is proposed to operate the bolt-work manually only after access
70 to it is permitted by the time or electrical locking device before mentioned.

In the drawings, Figure 1 represents an exterior view of a safe or vault door when in closed position and locked; Fig. 2, a view with
75 the auxiliary door open, permitting access to the bolt-operating devices; Fig. 3, a view showing the safe-door open and illustrating the construction and arrangement of a preferred form of bolt-work; Fig. 4, a sectional
80 view showing the construction of the bolts and the manner of co-operating with the jambs with a modified form of bolt-retracting device. Fig. 5 is a view of a modified form of bolt-operating device, looking from the in-
85 side of the safe.

Similar letters of reference in the several figures denote similar parts.

The letter A represents the jamb of an ordinary safe or vault, and B the door thereof,
90 formed of any desired number of steel plates and hinged in any desired manner upon the frame. As a convenient means, however, of supporting the door, and also of permitting it a slight oscillating motion, so as to cause it
95 to fit more accurately the door-opening, which forms an advantageous construction in connection with the bolts further on described, I prefer to hang the door upon hinge-links C C, pivoted to suitable pintles D D E E upon
100 the frame and door, respectively, and to connect these links by a bar F, as shown; which

causes their parallel movement, but will not interfere with the slight oscillation permitted the door on the pintles E E to enable it to closely fit the door-jamb. The edge of the door on the inside and in some instances a portion of the jamb are preferably provided with felt or other elastic packing G, adapted, when the door is closed, to be compressed between the jamb and door for the purpose of making a tight joint all around the edge and preventing the admission of an explosive in the form of liquid or powder for the purpose of forcing the door. On the outside of the door I preferably provide ordinary eccentric pressure-rods H, mounted in the bearings h h on the door, and having handles H' for operating them, their outer ends being provided with eccentric h' h' , engaging suitable lugs or brackets I I on the door-frame, which, when the door is to be opened, can be turned out of the lugs, and operating when engaged with the lugs and turned to press the door tightly against the jambs. If desired, these rods might be dispensed with; but I prefer to employ them, as shown.

The bolt-work arranged to confine the main safe-door is in the present embodiment of my invention located upon the inside of the main door B, and consists of a number of bolts K, operating in suitable guides k and adapted to be projected from the top, bottom, and sides of the door to co-operate with the jambs. In the construction shown the bolts are arranged to slide in a suitable frame L, secured to the door, the side bolts being attached to connecting-bars L', and their inner ends guided in bar k , attached to the door, while the end bolts are connected to the upper and lower side bolts by bell-crank levers L³, pivoted on the door, the connection being such that when the bars L' are moved outward all the bolts will be shot into engagement with the jamb. The train-bolts are adapted to be operated only from the inside of the safe, and, as one form of operating device, I preferably pivot an oscillating lever M upon a cross-bar L⁵ on the door and connect the ends of said lever with the connecting-pieces L' of the train by means of links L⁶, the construction being such that when the lever is turned on its pivot by means of a handle M', located thereon, the bolts will all be shot or retracted, depending on the direction of operation. Instead of using the handle forming a part of the lever an angular recess or projection might be formed on the lever, and a key having a correspondingly-shaped recess or projection be employed to co-operate with it and operate the bolt-work or any other form of device employed that will serve to retract the bolts.

While access could readily be had to the bolt-operating handle through an aperture closed by a door in any portion of the safe-body, I prefer to provide one in the main door directly in front of the handle, represented by the letter J in the drawings, adapted to be

closed by auxiliary door K, which is secured by some form of automatic time or electric lock not requiring a spindle or handle projecting through from the exterior of the safe. In the present instance this door K is constructed after the manner of the safe-door manufactured by the Mosler Bank Safe Company, under Patent No. 153,348, granted to P. F. King, as it answers all the requirements mentioned. The door is circular in form, being made up of any desired number of plates of steel and hung upon a yoke K', so as to be capable of rotation thereon, the yoke being in turn pivoted upon hinge-link K² K² at top and bottom, as shown, the other ends of said links being pivoted upon a pin or pins K³, attached to the door, so that the door can be swung around and into position closing the aperture J and then rotating it by means of a suitable bar-handle K⁴. The inner portion of the door is provided with a double screw-thread K⁵, adapted to co-operate with corresponding threads on the inside of aperture J, for drawing the door in tightly when rotated, and as a means for locking this auxiliary door when screwed in, a suitable dog N, operated by a spring N', is provided, adapted to be held retracted against the tension of its spring by the sides of the thread in the main door when the auxiliary door is being screwed in, but permitted to project into a suitable recess when fully closed, preventing backward rotation and the opening of the auxiliary door. This dog N is adapted to be retracted and permit the opening of the auxiliary door by means of a time or other automatic lock O, operated without the use of an outwardly-projecting spindle, preferably, though not necessarily, arranged on the inside of the auxiliary door, its operating-lever o being connected by suitable links o' o' and lever o^4 with the dog, as in Fig. 2, the connection being such that the dog will be retracted when the proper time arrives and the lever o is forced upward or the lock is by any other means operated.

For the purpose of tightly closing the main door and causing a better compression of the elastic packing by the operation of the locking-bolts, which enables me, if desired, to dispense with the eccentric door-closing rods H, I chamfer or bevel off the outer sides of the bolts L', as shown in Fig. 4, said beveled portion being adapted to engage with the door-jambs, and thus draw the door in more tightly when the bolts are projected. When it is desired that these chamfered bolts alone cause the drawing in of the door, and for the purpose of causing their more powerful projection, I prefer to substitute for the lever M a hand-wheel P, having reversely-threaded projections P' on the sides, engaging nuts P², connected to the train-bolts, said wheel being preferably located in proximity to the opening J, closed by the auxiliary door, as shown, so as to be accessible when the latter is opened.

I am aware that hinged doors have been provided with beveled bolts projected from the top and bottom at right angles to the hinges; but the employment of bolts of this description in connection with safe-doors movable in all directions, as herein shown, is desirable, in that this form can be forced in by the presser-bars, and then, when the bolts are shot in all directions, they will tightly hold the door to the extreme position, and should a burglar release the presser-bars there will not be any, even slight, movement of the door, as the same means that locks it keeps it pressed tight to its seat.

By employing the chamfered bolts in connection with devices for operating them inaccessible from the exterior of the safe I receive the benefits of the automatic bolt projecting and retracting devices before mentioned employing springs or weights—that is, decrease the possibility of the safe being forced through spindle-openings—and, also, a further benefit in being enabled to use locking-bolts which need powerful positive projection and serve to draw the door in more tightly to its seat. In employing the automatic devices there must be very little friction between the bolts and their sockets, as otherwise they will not work, and these bolts therefore cannot be relied upon to properly seat and fasten the door; but by my arrangement, as the bolts are positively operated, the more friction there is (within certain limits) the better, as the bolts can be shot and the door fastened and seated without allowing any looseness to permit their proper operation.

Instead of providing the bolt-work on the main door, it might be arranged in the jambs, and the auxiliary door arranged in such proximity to its operating devices, so as to be accessible when the latter is open, as shown in Fig. 5, T representing one set of the side bolts, arranged to be operated by a lever U, arranged in proximity to the opening closed by the auxiliary door, which is located in the casing in this instance beside the main door. I prefer, however, to employ the arrangements shown in the other figures.

The main vault or safe-door is closed by being swung around into as nearly a closed position as possible, and the eccentric pressure-rods are engaged with their co-operating lugs and the door forced tightly in. Then through the auxiliary door-opening the operator causes the projection of the main bolts by means of the handle M' on the lever M, or a removable handle or wrench, the beveled ends of the bolts drawing the main door tight and securing it, and the main bolts may then further be secured by a suitable dog, also operated through the auxiliary doorway. If a removable wrench or bar be employed to operate the main bolts, this is removed, and the auxiliary door swung into position, screwed in, and locked by its automatic lock.

To open the safe, the auxiliary door is

opened at the proper time, the train-bolts retracted, and the main door opened, as will be understood.

The advantages of my invention, which is not necessarily confined to the application of an auxiliary door in a main door of a safe, but comprehends any auxiliary door guarding the manually-operated bolt-operating devices, will be readily appreciated, as not only safes and vaults of medium but those of the largest size can be effectually guarded, so that the chances of their being opened by the use in any way of high explosives will be entirely eliminated, and, further, without the necessity of employing automatic bolt-retracting devices, which, as before stated, are liable to get out of order from various causes.

While the auxiliary door and the means for locking it may be of any desired form, I prefer those shown, as they fulfill the conditions required, in that no projecting spindles are used, and the door itself when rotated serves the office of a bolt.

I am aware that it has been proposed to cover the handles of the spindles for operating the bolts of safes with light doors or covers secured by ordinary key-locks; but such covers are merely to protect the handles from unauthorized interference during business hours, and are so light as not to be burglar-proof, nor is it designed that they should be, and, further, the locks are accessible from the exterior, and either present spindles which are open to the same objection that ordinary permutation-locks are, or else a key-hole is provided in which explosives or forcing-tools can be placed. My invention differs from this and all others in providing a safe with practically an imperforate exterior when the doors are in place, the latter constituting in effect one of the walls of the safe and, as far as opportunity for burglarizing is concerned, practically as solid.

I claim as my invention—

1. The combination, with a vault or safe, a door for affording access thereto having suitable bolts and a manually-operated device for operating them located inside the vault, of an aperture through which the bolts of the main door may be operated, an auxiliary door for closing said aperture, and a locking device for said door located entirely within the vault, substantially as described.

2. The combination, with a vault or safe, a door for affording access thereto having suitable bolts, and a manually-operated device located inside the vault for retracting them, of an aperture through which the bolts of the main door may be operated, an auxiliary door for closing said aperture, and a time-lock for guarding said auxiliary door located within the vault, substantially as described.

3. The combination, with a vault or safe, a door for affording access thereto, suitable bolts for securing it, and a manually-operated device located inside the vault for operating them, of an aperture in the main

door through which the bolts of the main door may be operated, an auxiliary door for closing said aperture, and a lock for guarding said auxiliary door located within the vault.

4. The combination, with a vault or safe, a door for affording access thereto having suitable bolts, and a manually-operating device for retracting them located on the inside of the safe-door, of an aperture in the main door through which access may be had to the bolt-operating device, an auxiliary door for closing said aperture, having suitable projections thereon for co-operating with the sides of the aperture when rotated; a hinged supporting-yoke on which the auxiliary door is supported, a dog for preventing the rotation of said door when in closed position, and an automatic lock for retracting said dog located on the inside of the door, substantially as described.

5. The combination, with a vault or safe, a

door for affording access thereto having the packing at the edges, and a pivoted supporting link or links upon which it is hinged, of the locking-bolts adapted to be projected from both sides of said door, having their outer sides chamfered or beveled, substantially as described, whereby the projection of the bolts will tightly compress the packing and hold the door closely to its seat, as set forth.

6. The combination, in a vault or safe, of a main door having suitable locking-bolts inaccessible from the exterior, an aperture through which access may be had to the interior of the safe, an imperforate auxiliary door for closing said aperture, and a locking device for said door located within the safe-walls, substantially as described.

JACOB H. MYERS.

Witnesses:

FRED F. CHURCH,
T. E. TRUE.