W. H. BUTLER.
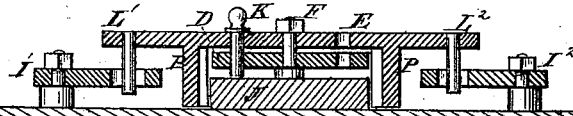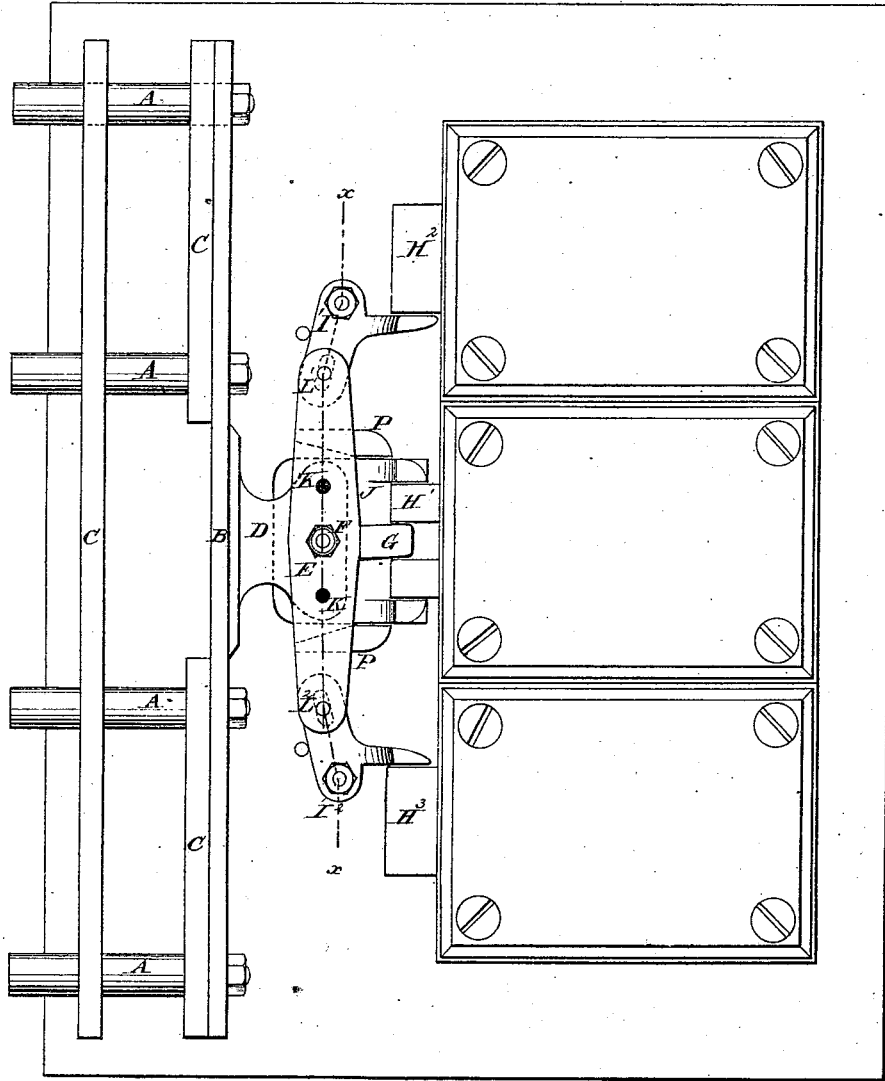## Bolt-Work for Safe-doors, &c.

No. 159,791.   Patented Feb. 16, 1875.

Fig. 1.

Witnesses:

James H. McDonough

J. C. Einsfeld Jr.

Inventor:

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Fig. 2.

UNITED STATES PATENT OFFICE.

WILLIAM H. BUTLER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN BOLT-WORK FOR SAFE-DOORS, &c.

CASE B.

To all whom it may concern:

Be it known that I, WM. H. BUTLER, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Devices for more Securely Locking Safes, Vaults, and other Inclosures; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

The object of my invention is to obtain greater security in the fastening of safes by means of locks which do not set in motion the main or train bolts, but which serve as obstacles to their being withdrawn unless unlocked. The main or train bolts are used to fasten the door to the frames or jambs of the safe, and are sometimes placed on all sides of the door, all of them being operated by a crank or knob from the outside of the door. They are entirely independent of the lock or locks. The use of the locks is to prevent the train-bolts from being moved back until they are unlocked. Heretofore two locks have been employed for this purpose, and so arranged that both can be locked, and that the train-bolts can be moved back in case either lock is unlocked, or that both locks be required to be unlocked before the main bolts can be moved.

My improvement consists in using three or more locks arranged in any way, (the one described I find the best,) so as to require the unlocking of at least two of the locks, but not of the whole number of locks, to release the train-bolts.

When only two locks are used and so arranged that the unlocking of either will permit the main bolts to be withdrawn and the door opened, the door is under the control of but one lock, which in many cases does not furnish the requisite security. When, however, the number of locks is increased to three or more, so arranged that at least two locks must be unlocked before the main or train bolts can be drawn back, the door is controlled by two or more locks, thus giving a much greater degree of security. If, by carelessness or accident, any of the locks should refuse to work, there still remain two locks which can be resorted to. If, on any especial occasion, it is wished to make the safe still more secure by means of a small mechanical contrivance, it becomes necessary to open all the locks before the door can be unbolted.

The following description will enable those skilled in the art to make and use my invention:

The main or train bolts A A A A move through holes in frames C C C, fixed to the door, and are moved by the bar B. To this bar B is fastened a bracket, D, which, extending to meet the lock-bolts, has the same movement as the safe or train bolts, and is itself put into motion by a crank or knob on the outside of the door. On the bracket D is pivoted a swing-bar, E, having a partial rotary motion about the pivot F. From the side of the swing-bar E opposite the main bolts is a projection, G, which enters a groove in one of the locks, H^1. When both the bolts of the safe and lock-bolt H^1 are thrown forward a small part of the projection G enters bolt H^1 enough to prevent the swing-bar E from turning until H^1 be withdrawn. When the safe-bolts are thrown back, the lock-bolt H^1 still being thrown forward, the projection G enters the groove entirely. The projection G tapers slightly and enters the groove a little obliquely, so that it cannot wholly enter the groove in H^1 without causing a slight turning of the swing-bar E, and, if the swing-bar be fixed, cannot wholly enter the groove in lock-bolt H^1. H^2 and H^3 are the bolts of the other locks. I^1 and I^2 are clutches pivoted on the inside surface of the door, and are free to move with the swing-bar E when the lock-bolts H^2 and H^3 are withdrawn, not otherwise. J is another clutch pivoted to the inside surface of the door, and free to move when the lock-bolt H^1 is withdrawn, but, when not, it allows the swing-bar E to move over it in a straight line. K K are two pins which pass through the swing-bar E and bracket D, to prevent the swing-bar from turning about the pivot F. The swing-bar E is provided with

pins L^1 and L^2, which enter slots in and move the clutches I^1 and I^2. P P are projections on the swing-bar to move the clutch J about its pivot when the lock-bolt H^1 is withdrawn.

The operation is as follows: When I wish the train-bolts to yield, when only two of the locks are unlocked, I take out the pins K K, so that the swing-bar E may turn about the pivot F. When all the lock-bolts are extended the train-bolts cannot be drawn back on account of the clutches being unable to move. If one of the lock-bolts be withdrawn, as H^1, it will be seen that two of the clutches I^1 and I^2 cannot move, and will prevent the train-bolts being withdrawn. If, however, H^2 or H^3 be now withdrawn, the swing-bar E will turn on the pin L^1 or L^2, which will move sufficiently in the slot in I^1 or I^2 to allow the pivot F, with bracket D, to move in a straight line and draw back the train-bolts. If H^1 be left thrown forward and H^2 and H^3 be moved back, the swing-bar E will move in a straight line on clutch J, turning slightly to allow the projection G to enter the groove in H^1, the clutches I^1 and I^2 will move freely, and the train-bolts can be drawn back.

It is easily seen, therefore, that when any two of the locks are unlocked the train-bolts may be withdrawn and the safe-door opened.

If it be desired to make it necessary to unlock all the locks in order to withdraw the train-bolts the pins K K are introduced, which prevent the swing-bar E from turning about the pivot F at all. In that case it will be seen that the train-bolts cannot be moved back when but one lock has been unlocked. If two locks be opened it will still be impossible to withdraw the train-bolts. If H^1 and H^3, or H^1 and H^2, be withdrawn, the swing-bar E, being fixed by the pins K K, cannot turn about L^2 or L^1, and consequently will prevent the bracket D from moving, and the train-bolts being withdrawn. If H^2 and H^3 be thrown back, owing to the inability of the projection G to wholly enter the groove in H^1 without, to a slight extent, turning the swing-bar, the bracket D cannot move nor the train-bolts be withdrawn. The door, therefore, when the pins K K are placed in position, cannot be opened unless all the locks are opened.

The system described above may be easily made applicable to a larger number of locks than three, thus giving to the safe the security of as many locks as may be considered most suitable, and leaving in reserve, in case of accident, as many as may be seen fit.

I do not claim the use of two locks to serve as obstacles to the withdrawing of the train-bolts of a safe; but

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

1. The combination of three or more locks on a safe or other door with the train-bolts, relatively arranged as described, so as to require the unlocking of at least two locks, but not of the whole number of locks, to release the train-bolts, as set forth.

2. The combination of the swing-bar E, with projection G and clutches I^1 and I^2, with bracket D, and bar B, so as to permit the withdrawal of the train-bolts by the unlocking of two or more of the locks.

3. The swing-bar E, pivoted upon the bracket D and provided with pins L^1 and L^2, so as to operate the clutches I^1 and I^2, as set forth.

4. The swing-bar pivoted to the bracket, and provided with holes for pins K K and projections P P, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WM. H. BUTLER.

Witnesses:
    JAMES H. McDONOUGH,
    J. C. EINSFELD, Jr.