

(No Model.)

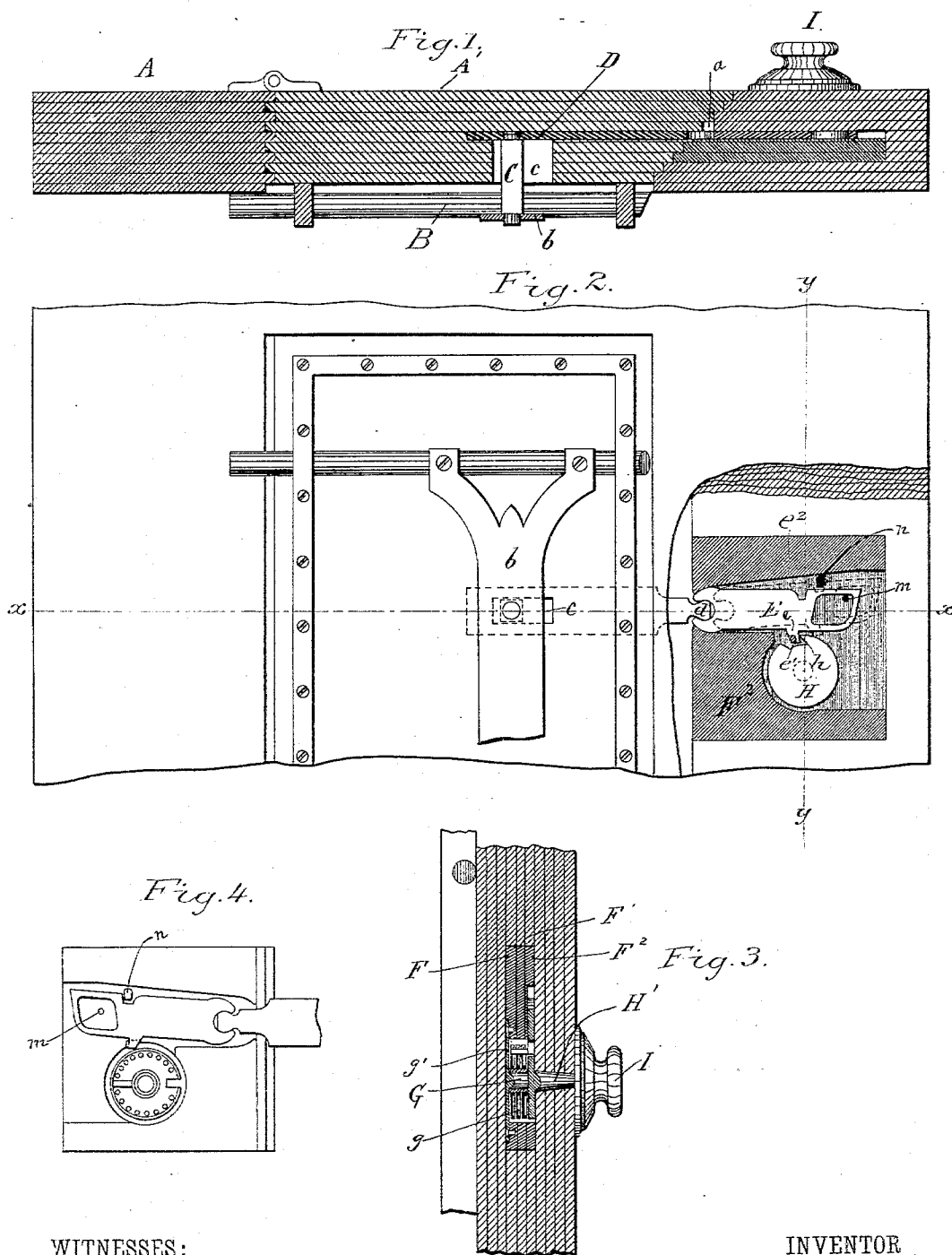
2 Sheets—Sheet 1.

H. GROSS.

LOCK MECHANISM FOR SAFES.

No. 315,613.

Patented Apr. 14, 1885.



WITNESSES:

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Douglas Dyrenforth

INVENTOR

Harry Gross
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

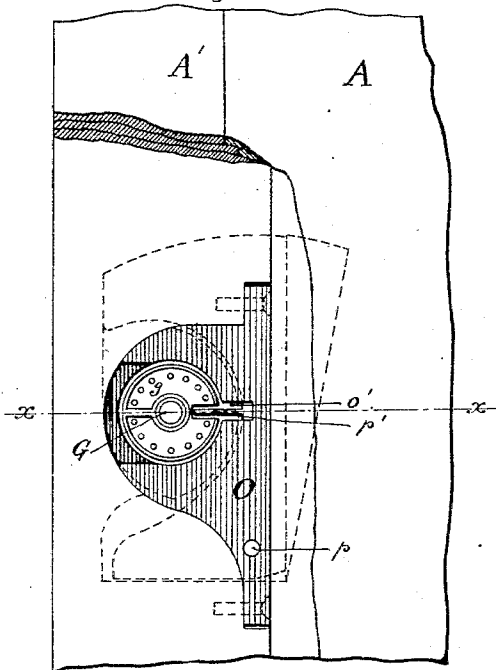


Fig. 6.

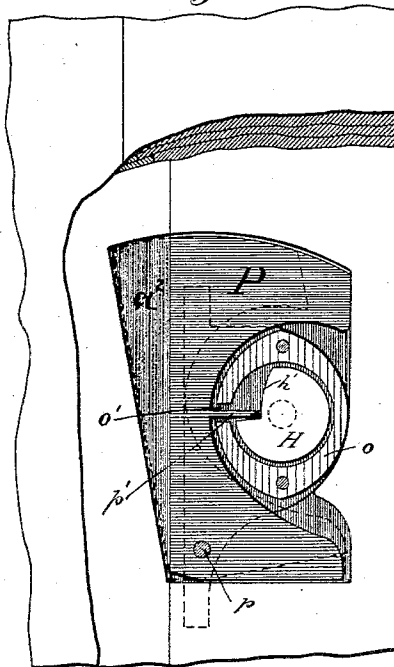


Fig 7.

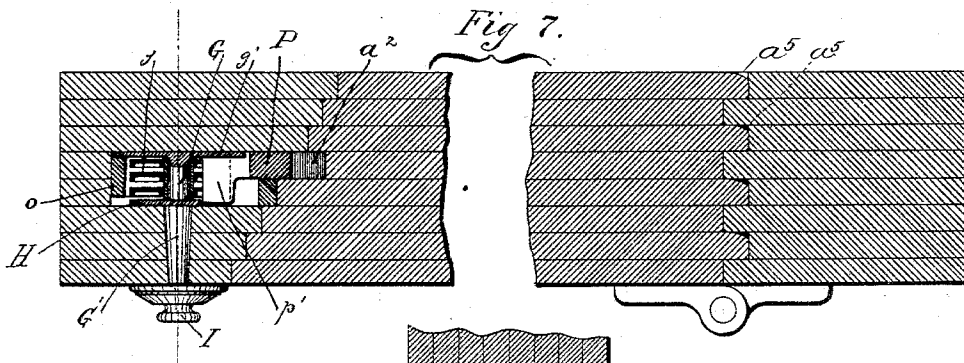
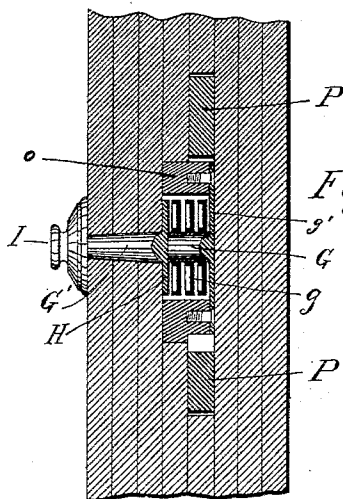


Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY GROSS, OF CHICAGO, ILLINOIS.

LOCK MECHANISM FOR SAFES.

SPECIFICATION forming part of Letters Patent No. 315,613, dated April 14, 1885.

Application filed April 3, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY GROSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lock Mechanism for Safes, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In applying lock mechanism to burglar-proof safes it is customary to attach the bolt-work and the permutation or other lock to the inner face of the safe-door and to extend through the door suitable arbors or spindles whereby the bolts may be operated. A serious objection to this construction is that the arbors passing through the door or jamb materially diminish the security of the safe, as it is by knocking out or driving in or drilling these arbors that the burglar usually obtains an opening through which to introduce explosives for blowing open the door. Various attempts have been made to overcome this objection by forming the arbors and their openings of such peculiar shape that they cannot be readily displaced; but notwithstanding these the fact remains that the arbors are the weak points of the safe.

The purpose of my present invention is to overcome the above objection; and to this end the invention consists in placing the lock mechanism by which the bolt-work of the safe is controlled within the wall of the safe or safe-door, so that the operating arbor or spindle shall not extend through such wall, and so that no opening through the safe-wall can be obtained, even were it possible to displace the arbor.

My invention further consists in placing within the recessed wall of the safe or door a permutation-lock having an outwardly-tapering operating arbor or spindle.

My invention also consists in holding within a recess in the wall of the safe or door a permutation-lock in such manner that the lock may be readily withdrawn from the recess for the purpose of changing the combination on which the lock is set.

My invention further consists in placing within the wall of the safe or door a permuta-

tion-lock having an outwardly-tapering operating spindle or arbor, which shall bear against the end of the arbor on which the lock-tumblers are held, so that any inward movement of the operating-spindle will be resisted.

The invention also consists in combining with the usual bolt-work upon the inner face of the door a permutation or other lock located within the wall of the safe and connected with the bolt-work in such manner that it can operate the same.

The invention also consists in certain details of construction, to be hereinafter fully described, and particularly defined in the claims at the end of the specification.

In the accompanying drawings, Figure 1 is a view in longitudinal transverse section on line *xx* of Fig. 2. Fig. 2 is a view of the inner side of the safe door and wall, the portion of the wall above the lock being removed for the purpose of better illustration. Fig. 3 is a view in vertical transverse section on line *yy* of Fig. 2. Fig. 4 is a front view of the lock removed from the wall of the safe. Fig. 5 is a view from the outer side of a portion of the safe wall and door, parts being broken away to expose the lock within the wall. Fig. 6 is a view from the inner side of a portion of the safe wall and door, parts being broken away and parts removed for the purpose of better illustration. Fig. 7 is a view in longitudinal transverse section on line *xx* of Fig. 5, the hinge side of the door being also shown. Fig. 8 is a view in vertical transverse section on line *yy* of Fig. 7.

A designates the front wall of the safe, formed of chilled plates to which is hinged the door A', of like construction. The plates of the safe-wall and the door at the hinged side of the door are alternately of different lengths, so as to form, when the door is closed, the zigzag joint, as seen in Figs. 1 and 7. The outer edges of the longer door-plates are rounded, as at *a'*, to permit the plates to enter the spaces of the door-opening. By this zigzag joint a most secure connection between the door and the safe-wall is obtained, and at the same time a much larger door-space is formed than in the old method of constructing the rear edge of the door with inclined steps, as shown at the front edge of the door in the drawings.

Upon the inner face of the door is held, in usual manner, the bolt-work B, and to the striking-bar *b* of this bolt-work is connected the square link-pin C, that moves within the slot *c*, extending partially through the door from its innerside. The inner end of the link-pin C is attached to the rear portion of the latch-bar D, which is adapted to slide within a suitable long seat or slot that extends to the front edge of the door, as shown. The forward end of this latch-bar is cut away, as seen at *d*, to form a knob that is caught by the hook-lever E of the permutation-lock, by which the bolt-work will be operated. This permutation-lock is carried by the small plates F, F', and F'', connected together and adapted to fit within a suitable recess in the jamb of the safe, and provided with recesses to receive the parts of the lock. The tumblers *g*, of usual construction, are carried by a suitable sleeve on the stud or hub G, that is formed preferably integral with the plate *g'*, attached by screws to the rear plate, F.

Against the end of the stud or hub G bears the drive-wheel H, that is formed integral with the operating arbor or spindle H', which extends through the face of the jamb and connects with the dial-knob I, by which the lock is worked. The operating spindle or arbor H' is formed outwardly tapering, as shown, to prevent its withdrawal, and as it bears against the end of the stud or hub G it cannot be forced inward, and is hence securely held against displacement.

In the periphery of the drive-wheel H is formed the notch *h*, which serves to engage with the hook or lug *e* of the hook-lever E, when the several tumblers of the lock have been brought into such position as to allow the angle-bar *e'* of this lever to drop into the notches of the tumblers. The rear portion of the hook-lever E is cut away, as shown, and within the space thus formed is the pin *m*, that serves to limit the movement of this lever.

The hook or lug *e* of the lever E is rearwardly inclined, and the notch of the drive-wheel is formed correspondingly oblique, as seen in Fig. 2, so that the hook-lever may be forced forward with certainty, and may be retracted until the slot *e''* in the upper edge of the lever comes opposite the pin *n*, when, by reason of the inclination of the notch *h* and the lug *e*, the lever will be lifted until the lug rides out of the notch and the arrangement of the tumblers is so displaced as to prevent its return. The front plate, F'', is cut away, as shown in Fig. 2, so that the plates with the tumblers, may be withdrawn from the wall when it is desired to change the combination of the lock. It will be seen that one of the plates of the door-jamb is cut away, as at *a*, so as to permit the end of the latch-bar to enter the hook-lever when the door is closed.

From the foregoing description the operation will be understood to be as follows: The door of the safe being closed, the end of the latch-bar rests within the cut-away end of the

hook-lever, and by turning the dial-knob the drive-wheel will force this lever backward, causing it to retract the bolt-work and lock the safe.

In Figs. 5, 6, 7, and 8 is illustrated a modified form of lock embodying certain features of my invention. In this construction, as in that already described, the jamb or wall A is recessed to receive the permutation-lock, which is carried by the plate or casing O, removably held within the jamb by means of screws, as shown in dotted lines in Fig. 5. Within the enlarged recessed portion *o* of this plate or casing are held the tumblers *g*, of usual construction, which fit on the hub G, formed integral with the plate *g'*, that is screwed to the inner side of the plate O, as seen in Fig. 8. The tapering arbor G', connected to the dial-knob I, has upon its inner end the drive-wheel H for operating the bolt-plate P. This bolt-plate is preferably pivotally connected by the pin *p* to the lower part of the plate or casing O, the pivotal point of the bolt-plate being such that the plate will be normally held by gravity in the upright retracted position when the safe is unlocked. The central portion of the plate P is cut away, as shown in Fig. 6, to admit the recessed portion *o* of the casing O, and is provided with the angle-bar *p'*, which passes through the slot *o'* of the portion *o* of the casing, and will drop into the notches of the tumblers *g* when brought coincident, so as to be in position to be acted upon by the cam-shoulder *h'* of the drive-wheel H. The front edge of the door is provided with the recess *a''*, in which the bolt-plate will rest when thrust forward by the drive-wheel.

The operation of this form of lock is as follows: Assuming the parts to be in the unlocked position indicated in Fig. 6, the angle-bar *p'* being in the notches of the tumblers and the drive-wheel, a movement of the drive-wheel in the direction of the arrow, Fig. 6, will force the bolt-plate into the recess *a''*, and will disarrange the tumblers so that it cannot be retracted. If, now, the notches of the tumblers be brought coincident, the weight of the bolt-plate will force the angle-bar therein and the safe will be unlocked.

It will be readily seen that if it is desired to change the combination of the lock, it can be quickly done by withdrawing plate-casing O and the tumblers from the recess of the door-jamb.

While I have stated in the foregoing description what I regard as the best embodiments of the invention, it will be understood by the skilled mechanic that the details of construction can be varied within wide limits without departing from the spirit of the invention, and the invention is not to be regarded, therefore, as limited to such details.

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

1. In a burglar-proof safe, the combination,

with a recessed wall, of a lock located wholly within said wall, substantially as described.

2. In a burglar-proof safe, the combination, with a recessed wall, of a permutation-lock
5 located wholly within said wall, and having a spindle extending through the front face of the wall for operating the lock, substantially as described.

3. In a burglar-proof safe, the combination,
10 with a recessed wall, of a permutation-lock located wholly within said wall, and having a conical arbor tapering toward its end extending through the front face of the wall, substantially as described.

15 4. In a burglar-proof safe, the combination, with a recessed wall and a permutation-lock located within said recess in the wall, of a recessed door and a bolt adapted to be moved within the recess of the door, substantially as
20 described.

5. In a burglar-proof safe, the combination, with a recessed door and jamb, of a lock located within the recess of the jamb, and a latch-bar in
25 connection with the bolt-work, whereby said lock shall throw the bolt-work, substantially as set forth.

6. In a burglar-proof safe, the combination, with the recessed door and jamb, and the bolt-work having the latch-bar connected there-
30 with, of the permutation-lock having the hook-bar adapted to engage with said latch-bar and throw the bolt-work, substantially as described.

7. In a burglar-proof safe, the combination, with a wall having a recess of suitable size and
35 shape to receive a permutation-lock, of said lock located wholly within said wall and removably held therein, substantially as described.

8. In a burglar-proof safe, the combination,
40 with a recessed wall, of a permutation-lock located wholly within the said recess, and having a spindle and a drive-wheel and a hub for its tumblers, adapted to bear against said spindle, substantially as described.

9. In a burglar-proof safe, the combination, with a recessed wall, of a permutation-lock lo-
45 cated wholly within said wall, and having a spindle with a driving-wheel distinct from the lock, whereby the lock may be removed with-
50 out removing the drive-wheel and spindle, substantially as described.

10. In a burglar-proof safe, the combination, with the recessed door and recessed jamb, and the bolt-work upon the inner face of the door,
55 of the lock located within the recess of the jamb, the latch-bar connected to the bolt-work, the hook-lever for engaging with the latch-bar, and a drive-wheel and spindle for operating the hook-lever, substantially as de-
60 scribed.

HENRY GROSS.

Witnesses:

GEO. P. FISHER, Jr.,
JAMES H. PEIRCE.