

(No Model.)

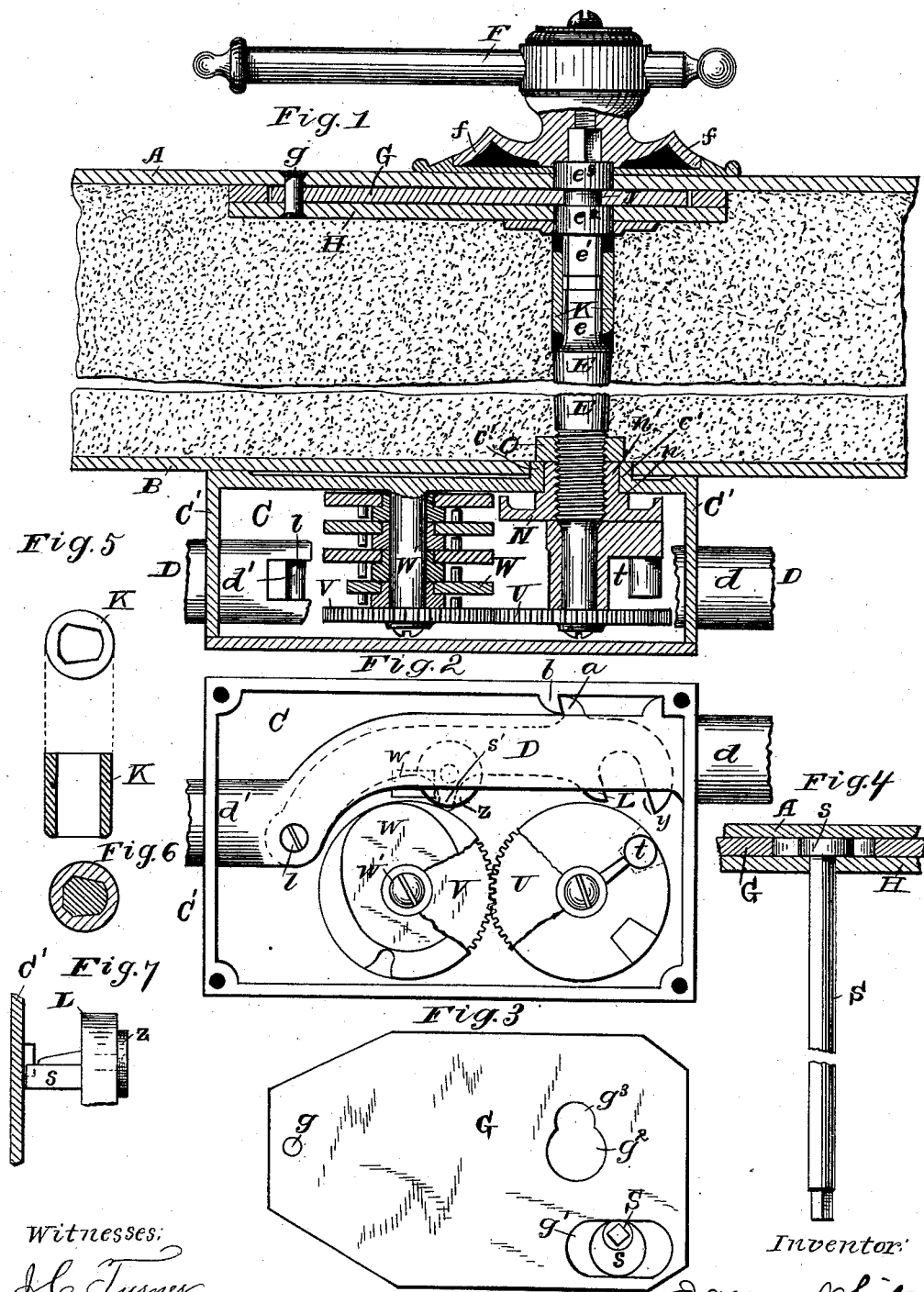
2 Sheets—Sheet 1.

J. WHITE.

SAFE LOCK.

No. 381,893.

Patented Apr. 24, 1888.



Witnesses:

J. C. Turner.

J. L. Doubleday.

Inventor:

James White.

J. Doubleday & Co.
attys.

(No Model.)

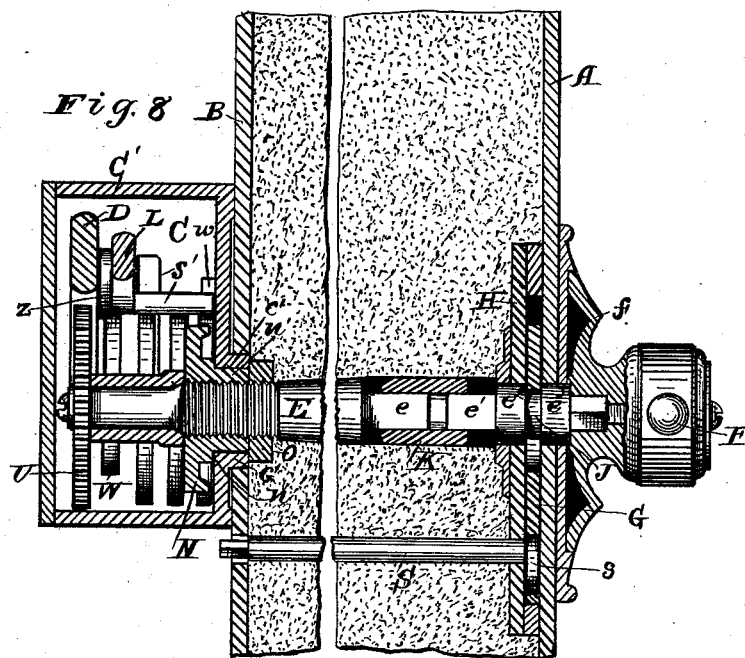
2 Sheets—Sheet 2.

J. WHITE.

SAFE LOCK.

No. 381,893.

Patented Apr. 24, 1888.



Witnesses:

J. C. Turner.
J. L. Doubleday.

Inventor:

James White.
J. Doubleday & Bliss.
attys.

UNITED STATES PATENT OFFICE.

JAMES WHITE, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL SAFE AND LOCK COMPANY, OF SAME PLACE.

SAFE-LOCK.

SPECIFICATION forming part of Letters Patent No. 381,893, dated April 24, 1888.

Application filed December 8, 1886. Serial No. 221,009. (No model.)

To all whom it may concern:

Be it known that I, JAMES WHITE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have
5 invented certain new and useful Improvements in Safe-Locks, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a sectional view of a portion of
10 a safe and of a lock. Fig. 2 is an elevation of the lock, the cover being removed and parts being broken away. Figs. 3, 4, 5, 6, and 7 show some of the details. Fig. 8 is a vertical section in the plane of the arbor.

15 In some respects the improvements herein relate more particularly to locks of the character shown in my former patent, No. 293,388, of February 14, 1884, and reference may be made to that patent to understand details of
20 construction which may be employed but which do not form the essential parts of the present invention.

In the drawings, A represents the outer plate, and B the inner plate, of a safe-wall.
25 Between these there can be any desired number of supplemental plates or a filling of any desired thickness.

The improvements herein shown and described can be applied to locking mechanisms
30 supported upon either the stationary wall of a safe or upon the door, which may be regarded as a movable wall.

C represents generally the lock mounted in case C' and provided with one or more bolts, D.

35 E indicates the arbor as a whole, it being for some purposes made in two parts, *ee'*. At the outer end it is provided with a handle, F, and dial *f*, which may be of any usual or preferred construction.

40 G is a movable plate situated inside of the plate A, and H is a stationary plate arranged upon the inside of said movable plate G. The plate H is secured to the plate A by any suitable fastening devices, it being so held relatively thereto as to leave a chamber or space
45 within which the plate G can move to a limited extent. At *g* there is a rivet-hinge, which supports one end of the plate G and allows it to turn.

50 At or near the other end of the plate G there

are formed two apertures, one at *g'* and the other at *g'' g'''*, the latter being bounded by two curved lines of different radii.

The arbor is provided with a cylindrical bearing part at *e'' e'''*, between which it is reduced to a smaller diameter, forming a groove,
55 as shown at J. The part *e''* is of the diameter of the part *g''* of the apertures *g'' g'''* in plate G, and the part of the arbor at J is of the diameter of the smaller part, *g''*, of the said apertures
60 *g'' g'''*. Hence the arbor, or a part thereof, can be passed longitudinally in through the aperture at *g''*, and then if the plate G be dropped, so that the part of the wall at *g'* enters the groove at J, it will be seen that the said plate
65 G will operate to lock the arbor against longitudinal movement.

To effect the raising and lowering of the plate G sufficiently for this purpose, (although said plate is so situated that there is no access
70 to it directly, because of the filling or of the superposed metal plates,) I mount a shaft or spindle, S, on a line passing through the aperture *g'* in plate G, the inner end of this shaft or spindle projecting through the inner plate,
75 B, of the door, and the outer end being mounted in a bearing in the plate H, and having an eccentric, *s*, secured to said outer end, this eccentric lying in the plane of the plate G and being situated in the said aperture *g'*. Said
80 aperture is of such shape that when the shaft or spindle S is rotated or rocked the eccentric *s* bears against the upper or lower wall of aperture *g'* and lifts or lowers the plate G.

When the arbor is to be inserted into position, a key is applied to shaft S, and it is
85 turned sufficiently to cause eccentric *s* to lift plate G until aperture *g''* registers with the arbor-holes in plates A and H. Then the arbor is inserted until the groove J is in the
90 plane of plate G, whereupon the shaft S is turned so as to throw plate G down, bringing the wall at *g'* into the groove at J, which effects the locking of the arbor longitudinally,
95 but can be rocked or rotated.

For some purposes it is desirable to be able to separate safe-arbors into two or more parts longitudinally in such way that while one
100 part is allowed to remain in position relatively to the lock another can be withdrawn; and it

is also desirable that when the parts are again joined they should, after being brought together, occupy exactly the same position relatively to each other that they had before separation, so that there shall be a guarantee that the combination which has been set up with the tumblers can be still utilized and can be readily followed in opening the door, notwithstanding the separation of the parts of the arbor.

The arbor shown consists of two parts, *e e'*, inner and outer, above mentioned. They are joined by a socket-piece or sleeve-coupling, *K*, which consists of a tube or socket-piece, having a socket of such shape that the ends of the arbor-pieces must necessarily be introduced in one, and only one, way. The socket shown is in cross-section, of the form of a trapezoid, and the opposing ends of the arbor parts *e e'* are correspondingly shaped in section, so that the said ends can be inserted into the socket only when they are in one position relative to their direction of rotation. Sockets of other shapes will accomplish the same end; but I prefer one of about the character shown, as the metal can be easily worked into the required shapes and as it accomplishes the desired purpose.

The socket-piece *K* may be attached to or formed with one of the parts of the arbor; but I prefer to make it separate and so arrange it that both of the other parts can be detached therefrom. The ends of the parts *e e'* are generally left separated, so as to prevent the arbor from conveying heat from the outer to the inner side.

The inner end of the arbor is fitted to the lock, and is secured therein by means of a nut, *N*, screwed onto it. The nut *O* is employed for the purpose of adjusting the lock and all its parts and getting them in proper position before securing them to the safe-door.

The plate *G* is large enough to cover those parts of the lock which are ordinarily attacked and assists in preventing such attack from being successful. The arbor *E* and its plate *G* are made of steel and tempered drill-proof.

The safe-walls vary somewhat in their depth or thickness, and therefore the employment of a socket-piece, like that at *K*, is advantageous, inasmuch as all of the arbors can be made of one size and yet be adapted to the differing doors.

The gearing and tumbler mechanism within the lock may be of any suitable character. As shown, the movement is conveyed by the arbor *E* and wheel *U* to wheel *V*, which is adapted by means of a pin to set in motion the cam-tumbler *W* and the others of the series mounted on the tumbler-shaft *W'*.

Above the tumblers and the arbor there is mounted the bolt *D*, it having an end, *d*, projecting through the case at one point and the end *d'* projecting through the casing at another point, the two parts of the casing providing the bearings for the bolt. This bolt is recessed,

and in the recess is fitted the vertical swinging lever *L*, pivoted at *l* to the bolt *D*, said lever carrying the fence *s'* and the roller *z* above the cam-tumbler *W* and having the jaws at *y* adapted to engage with the pin *t*. This pin is carried by a sleeve, which is mounted on the arbor. When the tumblers are brought in proper position in relation to each other, the fence will drop into the recesses thereof, and the lever *L* can drop, so that the pin *t* shall engage with said lever, after which a further turning of the arbor can be made to slide the bolt *D* in one direction or the other. When the lever *L* is up, and held there by the tumblers under the fence or by other device, the arbor cannot be utilized to slide the bolt. To prevent the bolt from being thrown back by jars or blows, I form upon the lever a dog, *a*, adapted to engage with an opposing part, *b*.

The bolt *D*, as above-described, extends entirely across the lock-chamber, and is adapted to project at either end beyond the same, the opposite sides of the casing providing two bearings for it. I can use either end of the bolt, as circumstances may demand—that is to say, the device, as a whole, may be employed either as a right-hand or as a left-hand lock. I prefer to shape the bolt so that one end shall be somewhat lower than the other, whereby the bolt and its attachments can lie partly by the side of as well as above the arbor and tumbler mechanism.

w is a stationary rib or guide so situated that when the lever *L* drops, a part thereof or part of the devices carried thereby—as, for instance, the fence *s'*—can lie under this rib and engage upwardly with it, so that the lever cannot be raised while this engagement with the rib occurs; but the rib is short enough to permit the lever to rise either at one end of its throw or at the other, as occasion may demand.

The nut *N* serves as an abutment, bearing in one direction against a part of the lock, and the nut *O* is an abutment bearing in the opposite direction, the two together acting as fasteners, one to prevent the arbor from moving outward relatively to the lock and the other preventing inward movement; and as one or both of these parts are adjustable the arbor can be readily kept exactly in proper position in relation to the other moving parts. The nut *N* is in the construction shown formed with a shoulder at *n*, which bears against a part of the lock casing or frame, it having also a prolonged thimble, as at *n'*, to provide a suitable bearing. The nut *O* is shown as bearing against a short tubular extension of the lock casing or frame at *e'*. With these devices the inner part, *e*, of the arbor can be adjusted longitudinally, independently of the outer part or parts, the above-described arbor-lock at *G* acting upon the outer parts of the arbor independently of the inner.

I am aware of the fact that heretofore an arbor has been constructed in two parts, of

which the outer could be withdrawn; but in the one referred to there are no means for locking the outer part of the arbor against longitudinal movement accessible only from the inner side of the safe wall.

It will be seen that the line on which the arbor is divided is between the inner and the outer plates of the door, and that the arbor-lock which holds the outer end is also between the said plates, and that therefore said lock can be so arranged as to be accessible only from that side of the safe-wall on which is situated the door-lock.

The arbor in my construction, considered as a whole, is, first, longitudinally extensible, and, secondly, is removable. By having it extensible the above-described adjustments in relation to the lock and the other parts can be readily attained. The devices which fasten the inner end of the arbor are more or less independent of those which secure the outer part from longitudinal movement.

I am also aware of the fact that heretofore use has been made in locks for ordinary doors of a continuous spindle extending through the door and provided on each side of the door with a knob in combination with a sliding plate on the inside of the door, which is adapted to engage with the arbor by means of a notch in such way as to prevent the arbor from sliding longitudinally and also from rotating. In the present construction the arbor and arbor-lock are so constructed and related as that rotation shall be possible at all times. The arbor-lock is arranged and related in a manner opposite to that followed in making the constructions last above referred to, in that it—the arbor-lock—engages with that part of the arbor adjacent to one side of the door, and is accessible from the opposite side of the door for actuating it.

What I claim is—

1. In a safe, the combination, with the wall, a lock upon the inside, and a dial upon the outside, of the removable arbor, the arbor-lock which engages with said arbor on lines between the inner and the outer plates of the wall, and means for operating the arbor-lock, arranged substantially as set forth, to be accessible from the inside only of the door, as set forth.

2. In a safe, the combination, with a lock on the inside thereof and devices on the outside for operating the lock, of a longitudinally-extensible arbor connected to the inside lock and rigidly connected to the lock-actuating devices outside, substantially as described.

3. In a safe, the combination, with the lock upon the inside thereof and the dial upon the outside, of the removable arbor, the lock-plate G, and the lock-operating devices extending to the inside of the safe door, substantially as described.

4. The combination, with the arbor, of movable plate G, mounted inside of the outer plate of the safe, and detachably engaging with the

arbor, and the shaft S, for operating said plate, substantially as set forth.

5. The combination, with the removable arbor, of stationary plate H, movable plate G, engaging with the arbor and both lying inside of the outer plate of the safe, and means for operating the movable plate G from the inside of the door, substantially as set forth.

6. In a safe, the combination, with the arbor made in two parts separable longitudinally, of means, substantially as described, for adjusting longitudinally and fastening one of the said parts independently of the other, substantially as described.

7. In a safe, the combination, with the lock on the inside thereof, and the arbor made in two longitudinally separable parts, one or both of which is removable, of means, substantially as described, for fastening the inner part of the arbor relatively to the lock, and means, substantially as described, for fastening the outer part longitudinally, as set forth.

8. In a safe, the combination, with the arbor divided transversely on a line between the inner and the outer plates of the wall, of a door-lock on the inside of the door, and an arbor-lock engaging with the outer part of the arbor, and adapted, substantially as set forth, to be operated from the inner side of the door, substantially as described.

9. In a safe, the combination, with the wall and the lock, of an arbor made in separable parts, one or both parts being removable from the wall, and a coupling constructed and arranged, substantially as set forth, to unite the said parts of the arbor only when they are in one predetermined position relatively to each other axially, as described.

10. The combination, with the arbor and the lock, of an adjustable nut, N, secured to and rotating with the arbor and bearing in one direction against a stationary part of the lock, and an adjustable nut, O, bearing in an opposite direction against a stationary part of the lock, substantially as described.

11. In a safe, the combination, with the wall, the lock upon the inside thereof, and the dial on the outside, of the arbor separable transversely into two parts, one of said parts being formed with a substantially circular groove, J, extending around it, a plate, G, adapted to fit into the said recess, whereby the arbor is prevented from longitudinal movement but is allowed to rotate, and means, substantially as described, for operating said plate G, substantially as described.

12. In a safe, the combination, with the wall, the locking mechanism upon the inside thereof, and the dial on the outside, of the arbor separable transversely into an inner part, e, and an outer part, e', the latter being formed with the bearings e² e³, fitted in the wall, the recess at J, between said bearings, and the locking-plate, adapted to fit between the said parts e² e³, substantially as described.

13. In a safe, the combination, with the wall,

the lock upon the inside of the door, and the dial upon the outside, of the arbor divided transversely at a point between the inner and the outer plates of the wall, the plate H, secured to the outer plate, A, the arbor-lock mounted between the said plate H and the outer plate, and means, substantially as set forth, for operating the said arbor-lock, substantially as described.

14. In a safe, the combination, with the wall, the lock upon the inside, and the dial upon the outside, of the arbor divided transversely upon a line between the inner and the outer plates of the door, the lock-plate G, the key-shaft S, and means, substantially as described, for uniting the key-shaft with the arbor-lock, as described.

15. In a safe, the combination, with the arbor and the tumbler mechanism, of the bolt, the lever pivoted to the bolt, a stationary guide, w, and a projection carried by the lever to engage with the said guide to hold the lever down, as described.

16. In a safe-lock, the combination, with the arbor, the tumbler mechanism, and the casing which surrounds them and is provided with bearings in its opposite sides for the bolt, of a bolt which is mounted in the said bearings, and is adapted to be projected from either side of the said casing, and the connecting devices which join the bolt to the arbor, substantially as described.

17. In a safe-lock, a sliding bolt having each end constructed to engage with a stationary wall of the safe, said ends lying on different lines longitudinally of the bolt, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES WHITE.

Witnesses:

J. B. FAY,

ED. C. GLASER.