

W. A. HOOD.  
SAFE LOCK.  
APPLICATION FILED FEB. 8, 1911.

993,067.

Patented May 23, 1911.

3 SHEETS-SHEET 1.

FIG. 1.

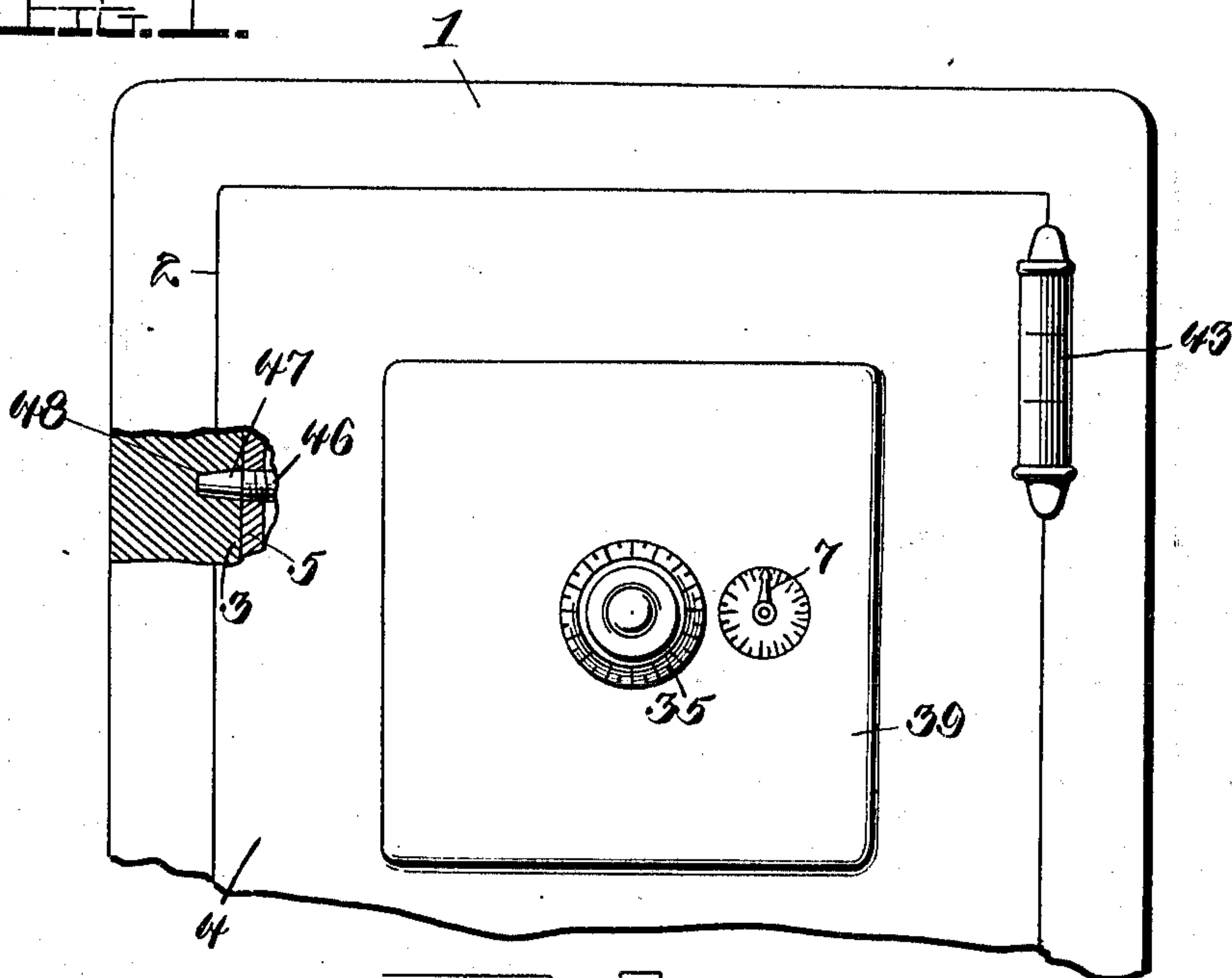
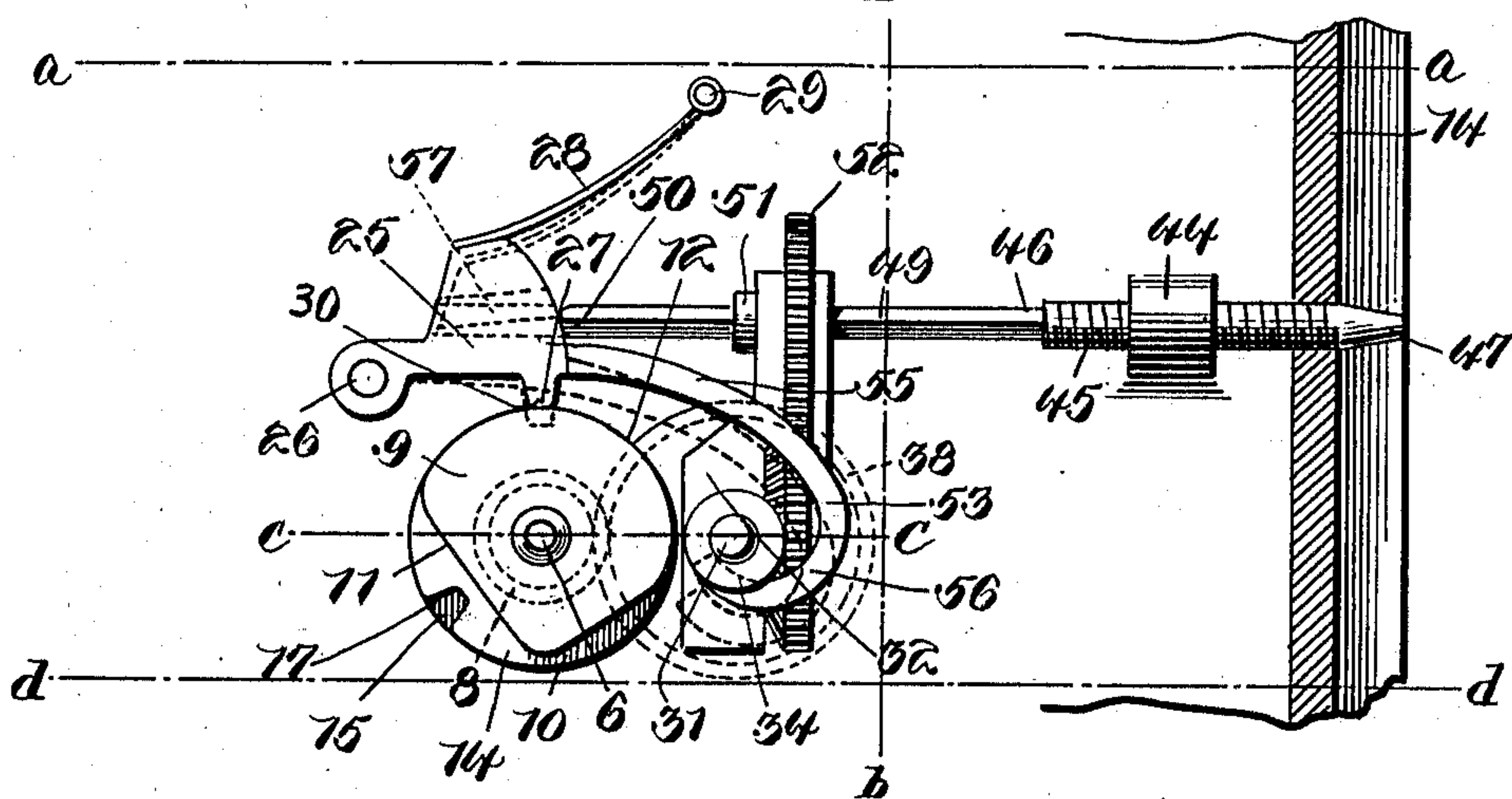


FIG. 2.



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Witnesses

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By

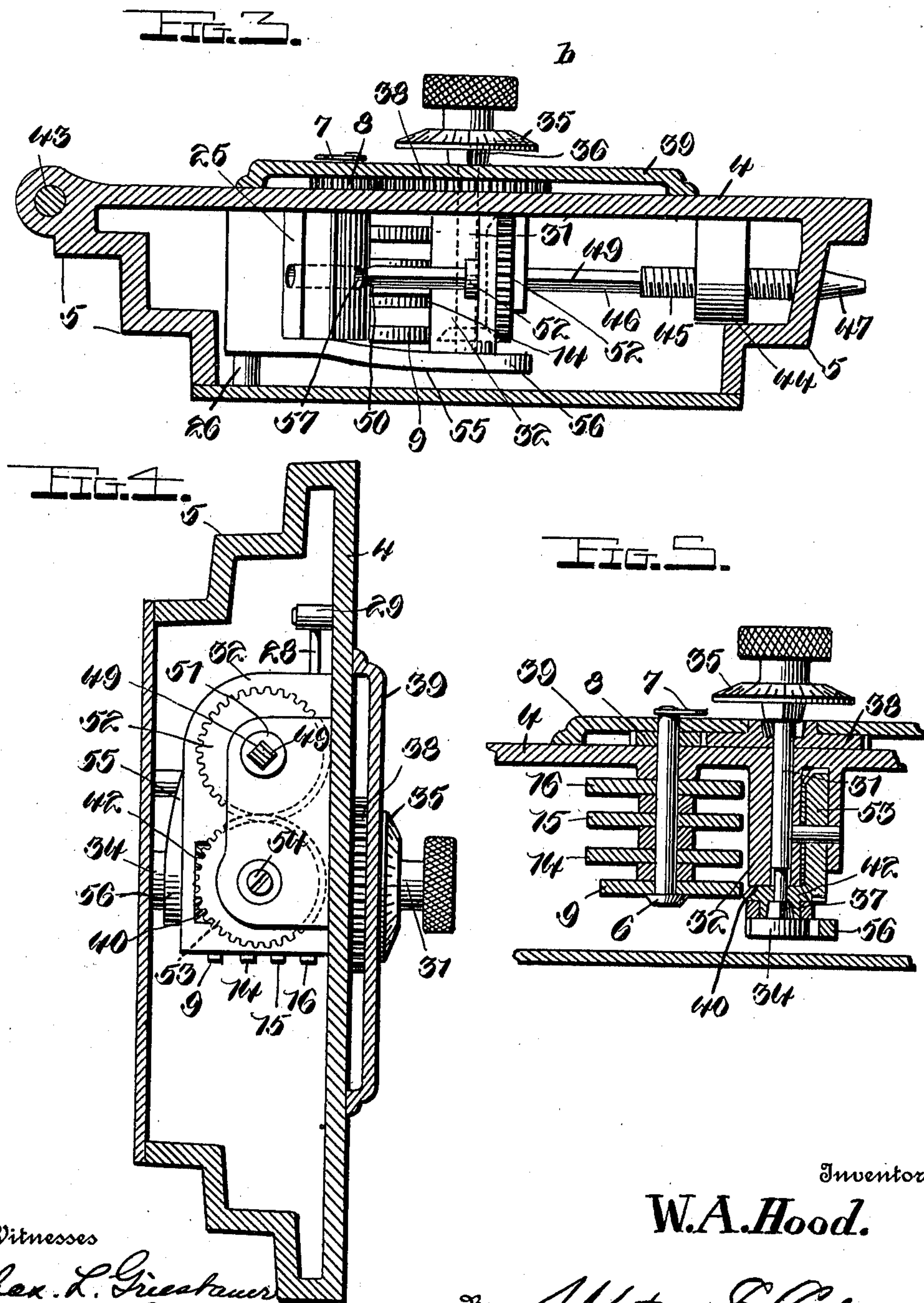
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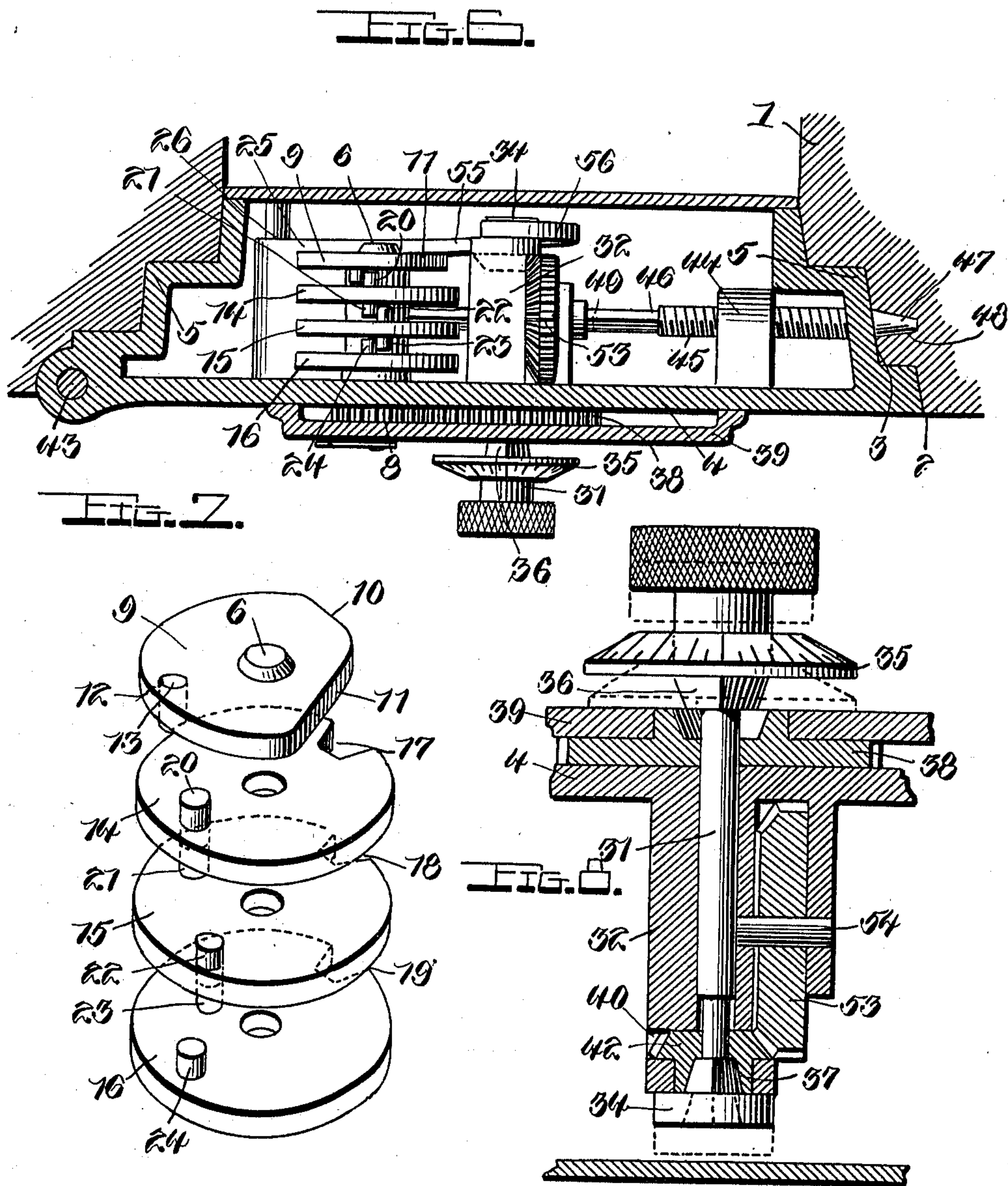
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3 SHEETS-SHEET 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM A. HOOD, OF CORBIN, KENTUCKY.

## SAFE-LOCK.

993,067.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed February 8, 1911. Serial No. 607,320.

*To all whom it may concern:*

Be it known that I, WILLIAM A. HOOD, a citizen of the United States, residing at Corbin, in the county of Whitley and State of Kentucky, have invented certain new and useful Improvements in Safe-Locks, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to improvements in safe locks of the kind known as combination or permutation locks, and consists in the construction, combination and arrangement of devices hereinafter described and claimed.

15 One object of my invention is to combine with a permutation mechanism, and a bolt for locking the safe door, a controlling element for the bolt operated by the permutation mechanism, operating means for the permutation mechanism, operating means for the bolt, and a common operating element engageable alternately with an element of the permutation mechanism operating means, and an element of the bolt operating means, whereby the bolt operating means cannot be actuated excepting when the elements of the permutation mechanism, and the said controlling element are in unlocked position.

30 A further object of my invention is to effect improvements in the construction of the bolt and to provide one wall of the safe with an opening for engagement by the bolt, whereby the bolt when in locked position exerts wedge action on the door of the safe and forces the latter so closely into the door opening as to close all cracks between the sides of the door, and the opposing walls of the safe.

40 A further object of my invention is to effect improvements in the construction of the parts of the lock whereby the bolt controlling element and the common operating element for the permutation mechanism operating means, and the bolt operating means are provided with means whereby said common operating element is automatically locked by said controlling element, when said common operating element is engaged with the permutation mechanism operating means.

55 In the accompanying drawings—Figure 1 is a front elevation partly in section, of a safe provided with a lock mechanism construction in accordance with my invention.

Fig. 2 is a detail elevation of the safe door showing the inner side thereof, and that portion of the lock mechanism which is disposed on the inner side of the door, the lock block or controlling element being shown in full lines with its lock arm engaged with the common operating shaft, and in dotted lines in disengaged position with respect to said common operating shaft. Fig. 3 is a horizontal sectional view on the plane indicated by the line *a—*a** of Fig. 2. Fig. 4 is a vertical sectional view on the plane indicated by the line *b—*b** of Fig. 2. Fig. 5 is a similar view on the plane indicated by the line *c—*c** of Fig. 2. Fig. 6 is a similar view on the plane indicated by the line *d—*d** of Fig. 2. Fig. 7 is a detail perspective view of the permutation disks and the master element. Fig. 8 is a detail sectional view on the plane indicated by the line *e—*e** of Fig. 2, and showing the common operating element for the bolt controlling mechanism, and the permutation mechanism, and the gears which coast with said common operating element.

For the purposes of this specification, a portion of a safe is indicated at 1, and provided with a doorway or opening 2, the sides of which taper inwardly and are shouldered as at 3, and the door of the safe is indicated at 4, and provided at its sides with shoulders 5 corresponding with those of the doorway. The door is provided with a lock shaft 6, the outer end of which extends beyond the outer side of the door, and is provided with an indicating hand 7, and also with a spur gear 8. At the inner end of the lock shaft and on the inner side of the door is a master element 9, which is here shown as a cam disk which is substantially circular in shape and is provided with angular tangential sides 10, 11, and a curved portion 12 in the angle between said sides. The master element is provided on the side which is opposed to the door with a tappet pin 13. A series of permutation disks 14, 15 and 16 are mounted for revolution on the said lock shaft, and are respectively provided with radial notches 17, 18 and 19.

The disk 14 has a tappet pin 20 which projects toward the master element 9, and a tappet pin 21 which projects toward the disk 15. Said disk 15 has a tappet pin 22 which extends into the path of the pin 21, and also has a tappet pin 23 which extends in the opposite direction. The disk 16 has a tappet



pin 24 which projects into the path of the pin 23.

On the inner side of the door is an angularly movable lock block 25 which is pivotally mounted as at 26, and is provided with a locking flange 27 to engage the notches of the permutation disks when the said notches align with one another. A spring 28 which is secured to the door as at 29, bears on the lock block and serves to hold the same with its flange 27 bearing on the peripheries of the permutation disks when the notches of the latter are out of alignment, and also serves to engage the said flange of the lock block with the said notches when they are in alignment, as will be understood. This flange 27 also extends laterally beyond the disk 14, so that its said extended portion forms a tappet 30 for engagement and operation by the master element 9.

An operating shaft 31 has its bearings in the door and also in a shoulder or flange 32, which projects from the inner side of the door, and the said operating shaft in addition to being mounted for revolution is also adapted to move end-wise, and the said shaft is provided at its inner end with a locking collar or flange 34, and is provided near its outer end with a similar collar or flange 35. The said operating shaft has at the inner side of the collar 35, a tapered cross sectionally rectangular portion 36 and is provided at a suitable distance from the inner end with a similar tapered rectangular portion 37. A gear 38 is mounted loosely on the shaft and has a central opening which is rectangular in form so that it may be engaged by the rectangular portion 36 of the shaft to lock the said gear to the shaft for rotation therewith, and when the shaft is moved in one direction so as to disengage the portion 36, from the opening of the said gear, the latter will be loose on the said shaft as will be understood. Said gear 38 engages the gear 8 of the lock shaft 6. A cover plate 39 which is here shown on the outer side of the door, bears against the outer side of the gear 38 so that said gear while free to turn with the shaft 31, is not free to partake of the endwise movement of said shaft. The shoulder or flange 32 has a slot 40 which is parallel with the inner side of the door, and in which slot is a gear 42 which is mounted loosely on the shaft 31, and has a rectangular central opening through which said shaft passes, and which may be engaged and disengaged by the rectangular portion 37 of said shaft. When the shaft 31 is moved inwardly, its shoulder or rectangular portion 36 engages the opening in the gear 38 and locks the latter to said shaft while its shoulder or rectangular portion 37 disengages the rectangular opening in the gear 42 and hence said gear 42 is loose on said shaft. When said shaft 31 is moved outwardly, the gear

42 is locked thereto and the gear 38 is loose thereon.

The door is shown as hinged at one side, as at 43. The door is provided on its inner side near that edge which closes in the safe with a lug 44 which is provided with a screw-threaded opening that is engaged by the threaded portion 45 of a bolt 46. The outer end of the bolt is tapered as at 47 to fit in a tapered opening 48 in one side of the doorway, and when the bolt is moved outwardly, by its wedge action, in connection with the tapered wall of said opening 48, draws the door so closely in the tapered doorway or opening of the safe, as to close all the space between the opposing side edges of the door, and the walls of the safe, and thereby prevent the possibility of the insertion of an explosive between the edges of the door and the door opening of the safe, and hence prevent the door from being blown out from the safe by burglars. The bolt 46 has a rectangular portion 49 which terminates in a tapered inner end 50, and extends through and fits in the hub sleeve 51 of a gear 52, the said hub sleeve of the said gear having its bearing in the shoulder or flange 32. The said gear 52 is engaged by an idler gear 53 which is mounted on one side of the flange 32 as at 54, and the said idler gear is also engaged by the gear 42.

The lock block 25 has an arm 55 which terminates in a hook 56 which is movable angularly on the inner face of the flange or shoulder 32 and may be engaged or disengaged with the inner side of the stop collar 34 of the operating shaft. The said lock block also has an opening 57 which, when the lock block is in the position required to lock the permutation disks and has its flange 27 engaged with the notches of said disks, aligns with the bolt 46 and enables said bolt to be moved inwardly so as to release the door. When the lock block is raised out of engagement with the notches of the permutation disk, its hook or lock arm 56 is in engagement with the inner side of the stop collar 34, and the operating shaft 31 is locked against endwise movement with its gear 38 engaged by the shoulder 36, and its gear 42 loose thereon, and disengaged by the shoulder 37, and the opening 57 of the lock block is out of line with the bolt 46 so that the lock block is interposed in the path of longitudinal movement of said bolt, and the latter cannot be possibly revolved and moved endwise so as to disengage its tapered end 47 from the correspondingly shaped opening 48 in one wall of the safe. Hence the lock shaft 46 may be turned by turning the operating shaft 31, by the coaction of the gears 38, and 8, so as to cause the master element 9 by means of the pins 13, 20 to revolve the disk 14, and communicate motion from disk to disk by the coaction of the tap-



pet pins with which they are provided so as to dispose all of the disks with their notches 17, 18 and 19 in alined position, and thereupon the master element releases the tappet 5 30 of the lock block, the flange 27 of the lock block engages the notches of the permutation disks, the opening 57 of the lock block moves into alinement with the bolt 46 so as to clear the latter, and the lock hook or 10 arm 56 of the lock block 25 disengages the stop shoulder 34. Thereupon the operator draws the operating shaft 31 outwardly, thus causing the gear 42 to be locked thereto, and the gear 38 to be released and he 15 then turns the said operating shaft in the required direction to cause the gears 42, 53 and 52 to revolve the bolt 46 in one direction, and hence cause the threaded portion 45 of said bolt by coaction with the threaded 20 ed opening of the lug 44 to move the said bolt endwise and inwardly and so as to disengage its tapered end from the tapered opening 48 and hence permit the door to be opened.

25 I claim:—

1. In a lock of the class described, the combination of a permutation mechanism, a bolt, a bolt controlling element operated by the permutation mechanism, operating 30 means for the permutation mechanism, operating means for the bolt, and a common operating element engageable alternately with an element of the permutation mechanism operating means and an element of the 35 bolt operating means.

2. In a lock of the class described, the combination of a permutation mechanism, a bolt, a bolt controlling element operated by the permutation mechanism, operating 40 means for the permutation mechanism, oper-

ating means for the bolt, and a common operating element engageable alternately with an element of the permutation mechanism operating means, and an element of the bolt operating means, the said control- 45 ling element and the said common operating element having coacting means to lock said common operating element in engagement with the said element of the permutation mechanism operating means, when said con- 50 trolling element is in one position.

3. In a lock of the class described, the combination of a permutation mechanism, a bolt, a bolt controlling element operated by the permutation mechanism, operating means 55 for the permutation mechanism and including a gear, operating means for the bolt including a second gear, and a common operating element engageable alternately with said gear, and with said second gear. 60

4. In a lock of the class described, the combination of an end-wise movable bolt, a permutation mechanism, a lock block for the permutation mechanism, and forming a 65 controlling element operated by the permutation mechanism, and movable into and out of the path of the bolt, operating means for the permutation mechanism, operating means for the bolt, and a common operating 70 element engageable alternately with an element of the permutation mechanism operating means, and an element of the bolt operating means.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 75

WILLIAM A. HOOD.

Witnesses:

O. W. STAMPER,  
J. W. Hood.