P. ZIRON.

LOCK.

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945,664.

Patented Jan. 4, 1910.

Fig. 1.

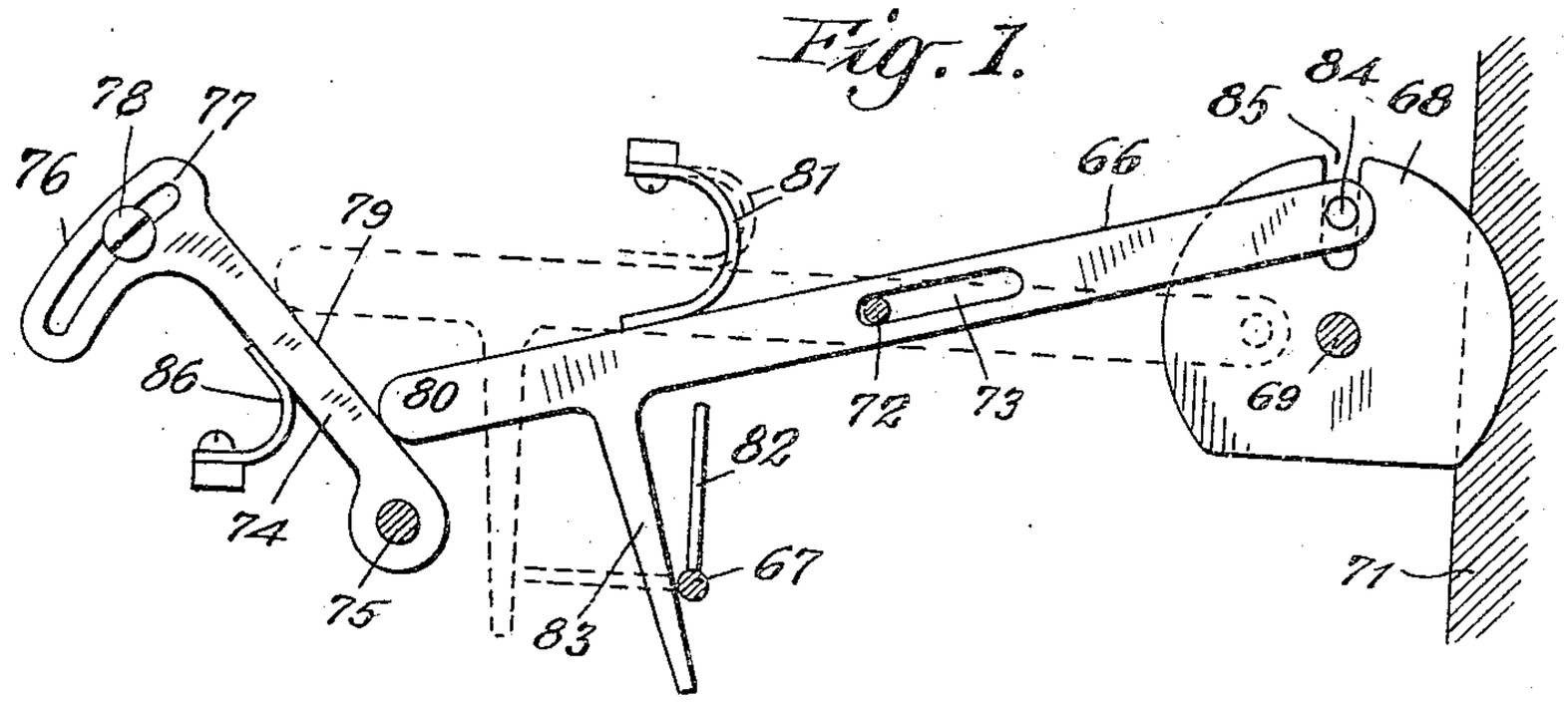


Fig. 2.

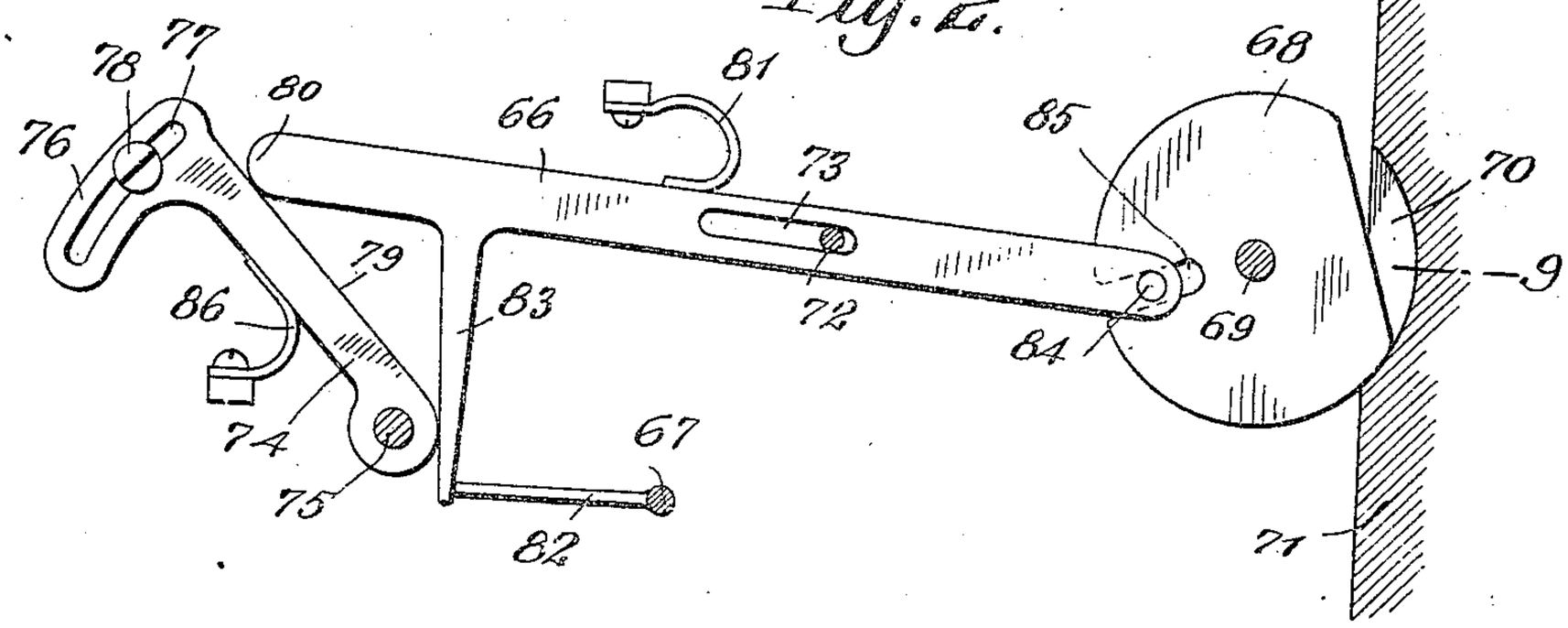
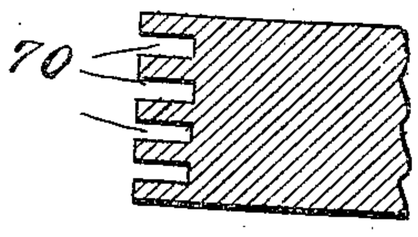


Fig. 3.



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UNITED STATES PATENT OFFICE.

PAUL ZIRON, OF NEW YORK, N. Y.

LOCK.

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Application filed April 1, 1909. Serial No. 487,196.

To all whom it may concern:

Be it known that I, PAUL ZIRON, a citizen of the United States of America, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Locks, of which the following is a specification.

This invention relates to multiple key or permutation locks, and certain parts of the invention may also be used with locks that are not multiple key or permutation locks.

One of the objects of the invention is a lock, the parts of which are few and simple, and which is small and compact in structure, although permitting of a vast number of permutations or combinations.

The invention is equally adaptable as a key lock or a keyless lock, such as a safe lock, and the like. Furthermore, as will hereafter appear, the lock is capable of extreme accuracy of adjustment in that all lost motion and play of parts is eliminated; and the size of parts is reduced to a minimum.

The invention is distinguished in that permutations are effected by changing the relative positions of certain elements, which last-named elements control the movement of the tumblers along and around a stationary pivot.

Another object of the invention is to have the tumblers or equivalent elements act directly upon the bolt without the intermediary of a fence or fences.

Another object of the invention is to provide a lock bolt and means for actuating the bolt, said means having a bolt-releasing position and bolt-locking positions on both sides of said releasing position.

The objects of the invention will presently appear in connection with the accompanying drawings.

I desire it to be distinctly understood that I do not limit myself to any particular mode of construction, but claim as my own any application of the broad principles of my invention.

Having briefly set forth the objects and nature of the invention, I will now describe in detail certain applications of the same in connection with the accompanying drawings, in which—

Figure 1 represents the invention as applied to a key operated lock. Fig. 2 is a view of the invention shown in Fig. 1, the parts being in another position. Fig. 3 is a sectional detail view of the door frame on the line 9 of Fig. 2, showing the recesses for engaging the bolt members.

Referring now to the drawings, the pivoted members 66 operated from the key 67 engage the bolt members 68 without the intermediary of the ordinary fences. The bolt is in effect comprised of one or more members 68, which rotate around an axis 69 and which when in locking position, as shown in Fig. 7, project into recesses 70 in the door or safe frame 71. The members 68 are so shaped that when in one position they are clear of the frame 71 and the door may then be opened. Until, however, the members 68 are sufficiently rotated by the levers 66, or if turned too far by these levers, as shown in Fig. 8, the door cannot be opened.

As shown in Figs. 1 and 2 the members 66 not only turn on their pivots 72, but by virtue of the slot 73, have a movement along the pivot. The chief function of the slot 73 is to permit the lock to be set for different keys or combinations, and for this purpose acts in conjunction with certain members 74. The members 74 are angularly adjustable around pivot 75, and at their outer ends carry extensions 76 having slots 77 engaging a set screw or bolt 78, which, when tightened, holds the members 74 in fixed position. The edge 79 of the members 74 acts as a cam or guide surface for the end 80 of the members 66. The members 66 by virtue of springs 81 bear on the edges 79 of the members 74 and travel up the latter when the key is turned to cause the key ward 82 to engage and move the projection 83 on the member 66. According to the angular position of the member 74 and to the length of the key ward the position of the member 66 is determined when the key is operated. The lock is so set, that is to say the member 74 is so set, for each key ward that the member 66 when acted upon by the proper key on the one hand, and on the other hand by the properly set member 74, will assume a final position in which the bolt member 68 is withdrawn from its recess 70. A key ward for which the member 74 is not set will cause an insufficient, or as shown in Fig. 2, a too great angular movement of the member 66, so that when in final position, the member 68 is still in the recess 70, and the door locked. In order that the members 66 may engage and move with the members

68, no matter what the angular position of the latter, the connecting pins 84 in the members 66 engage slots 85 in the members 68.

From the above construction it will be noted that the members 74 are essential to the proper and final positioning of the members 66 and 68 for the operation of the lock. If the members 74 are disarranged or destroyed in an effort to improperly open the door, then the only means of controlling the members 68 is gone; and, upon movement of the extensions 83 by some lock picking device or false key, the members 66 will assume a false position, as shown in Fig. 2, frustrating the effort to open the door.

Preferably there will be a plurality of members 74, 66 and 68, and the members 74 will be variously set for the several wards of the key or according to the combination intended to open the door. In order to change the combination and reset the lock for another key, the bolt (or bolt members) 68, are held by hand or otherwise, in the unlocked position. The members 66, when in this position (shown by dotted lines in Fig. 1), are impelled by their respective springs 81, not only toward the members 74, but also toward the bolt members 68. The result of this is that pins 84 on the members 66 will slide into slots 85 of the bolt members 68 as far as the said slots extend into the bolt members. Then the set screw 78 is loosened, and freeing the members 74 to the action of their respective springs 86, which tend to swing them around their pivot 75, until they come into contact with their corresponding members 66. Then the new key is inserted and turned. The wards of the key engage the fingers 83 of the members 66, and according to their different lengths, force the members 66 back against the members 74, thereby depressing the latter against the action of their respective springs 86. After the key has been turned as far as it is to turn, the set screw 78 is tightened, locking all the members 74 in their new positions for the new combination or key, and the lock is ready for use.

Other variations of the lock structure within the scope of the invention will be obvious to any skilled mechanic or locksmith, and further illustration of the invention is deemed unnecessary.

Having described my invention, what I now claim is:

1. In a lock, the bolt, means movable by the key or its equivalent for positively actuating the bolt, said means having but one bolt throwing position, and being movable to both sides of said position.

2. In a lock, a tumbler, a key or its equivalent acting upon said tumbler, adjustable means controlling the movement of said tumbler along and around a stationary pivot so as to bring said tumbler into a bolt-operating position, said adjustable means so constructed as to be capable of being set for different keys.

3. In a lock, tumblers, a key or its equivalent acting upon said tumblers, adjustable means controlling the movement of said tumblers along and around a stationary pivot so as to bring said tumblers into a bolt-operating position, said adjustable means so constructed as to be capable of being set for different keys.

4. In a lock, a bolt consisting of several sections independently movable in a plane transversely to the axis of the bolt, each of said bolt-sections so constructed that only in one position it releases its hold on the door frame, and means controlled by the key or its equivalent for moving said several bolt members different distances to bring each to its respective hold releasing position.

5. In a lock, a bolt, tumblers actuated by the key or its equivalent to control the operation of the bolt, a bearing for the tumblers on which the tumblers have both pivotal and sliding movement, means for moving said tumblers on their bearing, and adjustable means controlling the movement of said tumblers along and around their bearing to bring the tumblers to a bolt-operating position, said adjustable means comprising a plurality of elements independently adjustable to different relative positions, said positions corresponding respectively to the different keys which operate the lock.

6. In a lock, the bolt, movable means for actuating the bolt, said means having a bolt-releasing position at an intermediate point of its path of movement and bolt locking positions on both sides of said intermediate point, and means for arresting said movable means at said intermediate point when the proper key is employed but permitting the movement of said movable means beyond said intermediate point when an improper key is employed.

7. In a lock, a bolt comprised of a plurality of independently movable sections, independently movable means, each for actuating one section of the bolt, each of said movable means having at an intermediate point of its path of movement a position for releasing from the door frame its respective section of the bolt, and having positions on both sides of said intermediate point for locking its section with the door frame, and means for arresting said movable means at said intermediate point when the proper key is employed, but permitting the movement of said movable means beyond said intermediate point when an improper key is employed.

8. In a lock, a bolt comprised of a plurality of independently rotatable cam-shape elements, a plurality of independently

movable means, each for actuating one element of the bolt, each of said movable means having at an intermediate point of its path of movement a position for releasing from the door frame its respective bolt-element, and having positions on both sides of said intermediate point for locking its bolt element with the door frame, and means for arresting said movable means at said intermediate point when the proper key is employed, but permitting the movement of said movable means beyond said intermediate point when an improper key is employed.

9. In a lock, a movable bolt controlling member, means by which said member is guided and its movement controlled, and means for adjusting said guiding means so that the control member may have various predetermined movements to accord to different keys.

10. In a lock, a movable bolt controlling member, means normally stationary during the operation of the lock for controlling the movement of the movable control member, and means for adjusting the position of said stationary means so that the movable control member may have various predetermined movements to accord to different keys.

11. In a lock, a movable bolt controlling member, pivotally adjustable means by which said member is guided and its movement controlled, and means for adjusting said guiding means so that the control member may have various predetermined movements to accord to different keys.

12. In a lock, a bolt composed of a plurality of independently movable parts, means whereby said parts may be differentially operated by a single actuating device, and means whereby the several bolt parts may be individually set for different keys.

13. In a lock, a bolt composed of a plurality of independently rotatable parts, means whereby said parts may be differentially rotated by a single actuating device, and means whereby the several bolt parts may be individually set for different keys.

14. In a lock, a bolt composed of a plurality of independently rotatable, irregularly shaped parts each of which, in one position only, releases its hold on the door, means whereby said parts may be differentially rotated by a single actuating device, and means whereby the several bolt parts may be individually set for different keys.

Signed by me at New York city, county and State of New York, this 31st day of March 1909.

PAUL ZIRON.

Witnesses:
W. H. HEAGERTY,
CHAS. D. EDWARDS.