Nov. 20, 1923. 1,475,033

H. SIMBOL

COMBINATION LOCK

Filed June 2, 1922

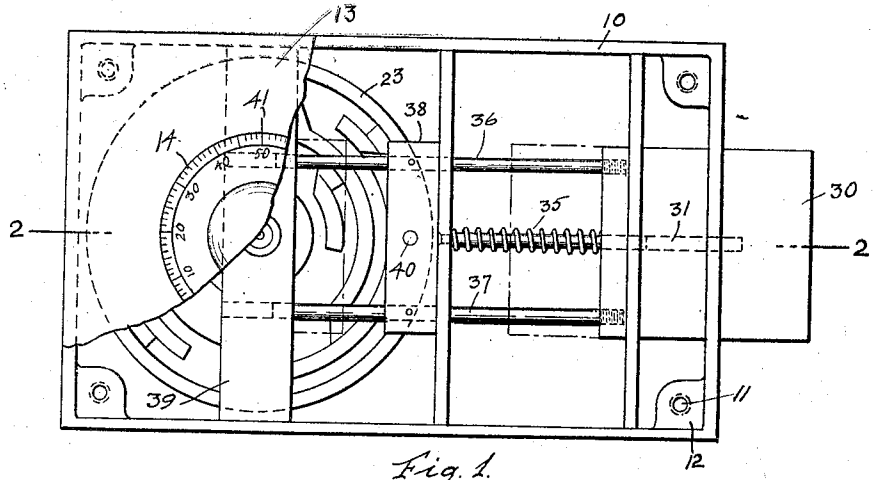


Fig. 1.

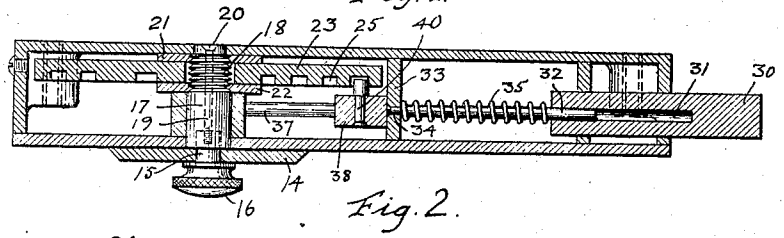


Fig. 2.

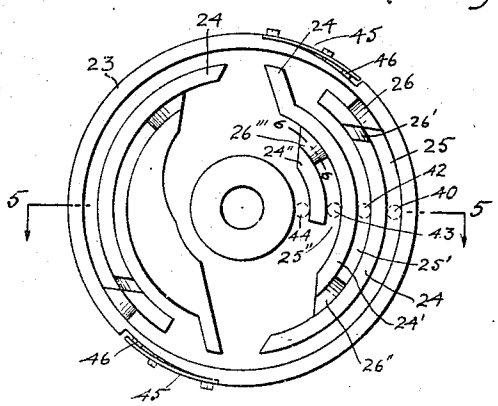


Fig. 3.

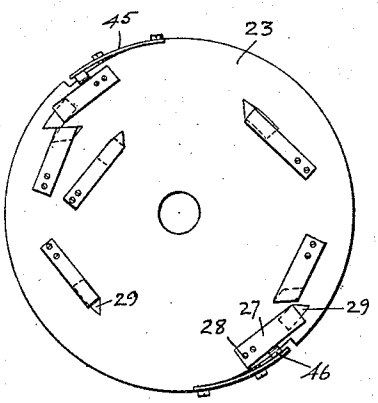


Fig. 4.

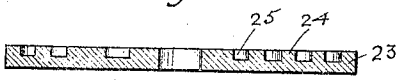


Fig. 5.

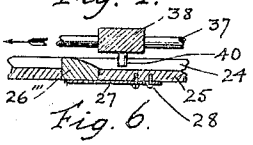


Fig. 6.

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UNITED STATES PATENT OFFICE.

HARRY SIMBOL, OF EDMONTON, ALBERTA, CANADA, ASSIGNOR OF ONE-THIRD TO JOHN G. BARILKO, OF EDMONTON, ALBERTA, CANADA.

COMBINATION LOCK.

Application filed June 2, 1922. Serial No. 565,343.

To all whom it may concern:

Be it known that I, HARRY SIMBOL, a citizen of Ukraine, formerly part of Russia, residing at Edmonton, Province of Alberta, and Dominion of Canada, have invented certain new and useful Improvements in Combination Locks, of which the following is a specification.

The present invention relates to improvements in combination locks, and it is the principal object of the invention to provide a lock of this type in which the successive operations of a knob and disc for properly setting the combination, impart to the locking bolt a step by step opening motion.

A further object of the invention is the provision of a safe lock of this character which is extremely simple and therefore inexpensive in its construction, but nevertheless performs positively and with great accuracy all task of complicated combination locks providing an equal amount of security.

Another object of the invention is the provision of a lock of this character which may also be used as a box lock or the like.

These and other objects of my invention will become more fully apparent as the description thereof proceeds, and will then be specifically pointed out in the appended claim.

In the accompanying drawing, forming a material part of this disclosure,

Figure 1 is a front elevation of a combination lock constructed according to the present invention, after removal of part of the front cover to illustrate the interior arrangement.

Figure 2 is a longitudinal section through a combination lock according to the present invention on line 2—2 of Figure 1.

Figure 3 is a detail front view of a combination disc.

Figure 4 is a rear view of this disc.

Figure 5 is a cross-section through the disc on line 5—5 of Figure 3.

Figure 6 shows detail sectional views of the cam faces and operating pin, the section being taken on line 6—6 of Figure 3.

The lock comprises a casing 10 adapted to be secured to a door or the like by means of suitable fastening devices passed through holes 11 in corner brackets 12 within the casing. The cover plate 13 of the casing carries in the customary manner a dial plate 14, and a spindle 15 carrying at its front end an operating knob 16 is passed through said dial plate and the front wall of the casing into a sleeve 17 provided with a screw threaded rear part 18, while a pin 19 is screwed with its front end into spindle 15, passed through sleeve 17 and part 18 and ends at its rear end into a screw-head 20 embedded into the rear wall of the casing.

The threaded part 18 engages two spaced plates 21 and 22 for holding in the space between these plates, a disc 23 of a construction which shall presently be described in detail.

On its front face this disc, as illustrated in Figure 3, is provided with a plurality of ridges 24 forming grooves 25 in which cam lugs or abutments 26, 26′ are arranged which are pressed from the rear of the disc to the front by means of springs 27 secured at one of their ends by means of screws 28 to the rear of the disc and having their opposite end extending across openings 29 in the disc for a purpose hereafter to be more fully described.

The locking bolt 30 of the lock is adapted to slide in and out of the casing through a suitable opening in its end wall, and provided with a longitudinal groove 31 in which plays one end of a rod 32 secured with its opposite end to a transverse plate 33 of the lock casing as indicated at 34.

A spring 35 is wound around the rod 32 between the rear edge of bolt 30 and the plate 33, and this spring has the tendency to press the bolt outwardly.

Into the rear edge of bolt 30 are also screwed the ends of two bars 36 and 37 carrying a block 38 intermediate their ends normally resting against the inner face of plate 33, and the outer ends of these bars are movably guided in a transverse block 39.

A pin 40 is arranged in block 38 adapted to travel with said block 38 in a manner more fully to be described hereafter.

The cover plate 13 carries at its front the usual mark 41 for enabling the proper setting of the combination.

The device described so far operates in the following manner:

Upon the rotation of knob 16 in order to bring successively the proper combination numbers in line with the mark 41 on cover 13, the disc 23 will be rotated to bring the proper combination number on dial 14 into alignment with the mark during which op-

eration the pin 40 sliding in the first groove 25 in the front face of disc 23 will encounter the abutment 26 and glide along its base until it engages the next cam abutment 26′ on ridge 24 at its top, presses the same down against the action of spring 27 and passes into the next groove 25′ into the position indicated at 42, Figure 3, which is indicated by the first number of the combination. If now the disc 23 is operated in the opposite direction by the corresponding operation of knob 16, the pin 40 will engage the cam shoulder 26″ in this groove 25′ and will depress the same and slide along its rear edge into groove 25″ to avoid ridge 24′ and take up the position indicated at 43, indicated by the second number of the combination.

If now the knob 16 and dial 14 as well as disc 23 are turned again in opposite direction, the pin 40 will engage abutment 26‴ and depress the same against the action of its spring and slide along its rear edge to another ridge 24″, in order to take up the position indicated at 44 and represented by the last number of the combination.

During the step by step movement of the pin 40, the block 38 will move towards the left and will take along the bolt 30 to open the lock. If now the disc 27 is turned for 90° in either direction, the pin will slide back into its old position under the action of spring 35 and the lock will be locked again.

From Figure 3, it will be seen that two sets of grooves and ridges 25 and 24 are provided, one at each side of the center line of the disc. One combination is worked at a time and the other is made idle by a corresponding adjustment of spring 45 so that its block 46 engages the corresponding spring plate 27 to lock its cam block into unyielding position.

What I claim as new and desire to secure by Letters Patent of the United States is—

In a combination lock of the class described, a disc adapted to be operated by the combination lock knob, a plurality of open grooves, and ridges forming said grooves on said disc, said grooves and ridges arranged in two sets each provided with cam abutments, and means for yieldingly supporting said abutments, means for locking one of the sets of grooves and ridges against operation, and a lock bolt adapted to be normally pressed into locking position, a pin connected with said bolt adapted to alternately engage said abutments to slide from a groove across an adjoining ridge into the adjoining groove and along its bottom and to engage the top of the abutment on the next adjoining ridge to depress the same upon the rotation of said disc in one and the other direction to successively set the combination.

In testimony whereof I have affixed my signature.

HARRY SIMBOL.

Witness:
ALFRED GRANT.