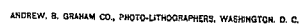


Patented Nov. 23, 1909.



UNITED STATES PATENT OFFICE.

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COMBINATION-LOCK.

941,028.

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To all whom it may concern:

Be it known that I, JAMES J. MURPHY, a citizen of the United States, residing at Terryville, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in Combination-Locks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the numerals of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a view in elevation of a combination locker lock constructed in accordance with my invention. Fig. 2 a view of the lock with its cap or front-plate removed showing the shank of its knob in section, as well as its key-center and key. In this view the parts are shown preparatory to the unlocking of the lock by the key. Fig. 3 a corresponding view showing the lock as unlocked by the key, a portion of the main-bolt being broken away. Fig. 4 a view of the lock in vertical section on the line *a-b* of Fig. 2. Fig. 5 a detached plan view of the oscillating plate or carrier. Fig. 6 a corresponding view of the key-bolt. Fig. 7 a corresponding view of the swinging plate by which the main-bolt is operated.

My invention relates to an improvement in combination locks of the class designed for use on lockers.

Combination locks as heretofore constructed have been objectionable as locks for lockers for the reason that as the combination of each lock is in the exclusive possession of the renter of it, if he forgets the combination, or leaves the club without notice, it is necessary to break the lock in order to open the locker.

The object of my invention is to provide a combination lock that can be operated by a key so that while the lock may be used as a combination lock, it may be opened at any time by a key in the hands of a responsible person, such as the manager of the club.

With these ends in view my invention consists in a combination locker lock having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In the first place I wish to say that I may employ a combination mechanism of any approved construction, my invention not being limited in that respect to any particular kind of combination mechanism.

In carrying out my invention as herein shown, I impose the combination mechanism upon an oscillating plate or carrier 2 normally held in a stationary position by a key-bolt 3 having a lug 4 entering a corresponding notch 5 in the plate 2 which oscillates upon the hollow stud or tube 6 on which the two perforated wheel-tumblers 7 are mounted for independent movement, the said plate 2 having a round opening 8 for the passage through it of the hollow stud 6 which enters a corresponding opening 9 in the bottom of the lock-case 10. In the ordinary use of the lock as a combination lock, the plate 2 remains stationary, as though it were a fixed part of the lock-case; but when the key-bolt 3 is operated the plate 2 is oscillated for the operation of the main-bolt 11. The key-mechanism of the lock may also be of any approved construction. As shown it comprises the said key-bolt 3 having a guide-slot 12 for the reception of a tumbler-post 13 on which pivotal tumblers 16 having springs 17 are mounted, these tumblers being formed with stump-slots 18 for the reception of the bolt-stump 19. Each tumbler is also formed with a key-sweep 20 for co-action with a key 21 entering a key-center 22 mounted in a tube 23, the inner end of which is secured to the cap 24 of the case 10. At its inner end the key-center 22 is provided with a cam 25 which enters a corresponding cam-sweep 26, so called, in the lower edge of the key-bolt 3 which is in this way given a longer throw than it could receive from the key-bitings which coast directly with the key-sweeps 20 of the pivotal tumblers 16. In its normal position the key-bolt 3 will lock the oscillating plate 2 in its normal position at which time, as aforesaid, the plate 2 is virtually fixed to the lock-case.

With reference now to the combination mechanism, each of its two perforated wheel-tumblers 7 is provided in its periphery with a notch 27 for the reception of the inner

edge of a locking-dog 28 operated by a spring 29 and swinging upon a pivot 30 in a swinging plate 31 mounted upon the hollow stud 6 aforesaid. The plates 2 and 31 therefore have the same center, *i. e.*, the axis of the hollow stud 6. The said plate 2 though normally stationary, oscillates by turning upon the stud 6 which turns with the plate 31 non-rotatably mounted upon it. When the stud 6 turns with the plate 31 the ends of the stud constitute, as it were, trunnions. The said edge of the dog 28 also enters a notch 32 in the periphery of a driving-wheel 33 which corresponds to the two wheel-tumblers 7 in diameter and has a central boss 34 formed with an irregular opening 35 for the reception of the flattened shank 36 of the knurled finger-button or knob 37 by means of which the combination is worked. The said knob carries the usual dial 38 which is inclosed in a tubular housing 39 mounted at its inner end in the cover 24 of the lock-case.

The driving-wheel 34 is provided with a driving-pin 40 which drives the wheel-tumblers 7 in the usual manner, the object being to bring their notches 27 and its notch 32 into registration with the inner edge of the dog 28 when its spring 29 immediately acts to swing the dog inward on its pivot 30 so as to clear its outer edge from a segmental abutment plate 41 on the oscillating plate 2. As long as the inner edge of the dog 28 rides upon the peripheries of the two tumblers 7 and wheel 33, the outer edge of the dog will be engaged with the adjacent edge of the abutment-plate 41, whereby the swinging-plate 31 in which the pivot 30 is mounted will be rigidly held with respect to the oscillating plate 2. As soon, however, as the inner edge of the dog drops into the said notches its outer edge will be cleared from the abutment-plate 41 when the plate 31, and hence the pivot 30, will be free to be turned by the knob 37, permitting the main-bolt 10 to be freely moved in one direction or the other by the pivot 30 which passes through a slot 42 in the shank 43 of the said main-bolt 10. Obviously as long as the plate 2 is locked against turning by the key-bolt 3, the main bolt 11 can be thrown only by unlocking the plate 31 so as to permit the same to be oscillated with reference thereto, because the said plate 31 carries the post 30 by which the main-bolt 10 is operated. But by employing the key 21 to throw the key-bolt 3, the plate 2 may be oscillated, and with it the plate 31 which is normally held against swinging movement in one direction by the dog 28, and in the other direction by a pin 44 mounted in the plate 2 in position to engage with the edge of the plate 31 opposite the dog 28. When the key 21 is employed for the operation of the key-bolt 3,

the plates 2 and 31, the combination mechanism and the tube or hollow stud 6 turn together as one piece, whereby the main bolt 11 is operated by the pivot 30 mounted in the plate 31 and passing through the slot 42 in the shank 43 of the main-bolt. On the other hand, when the combination mechanism is used for the operation of the main-bolt 11, the key-bolt 3 and the plate 2 remain at rest, while the plate 31 and the combination mechanism and the hollow stud or tube 6 are oscillated virtually as one piece to effect the longitudinal movement of the main-bolt. It will thus be seen that the key mechanism acts through the combination mechanism for operating the main-bolt, and that while the main-bolt is being operated by the combination mechanism in the ordinary usage of the lock, the key mechanism will, so to speak, be latent in the lock. This method of operation results from imposing, so to speak, the combination mechanism upon a swinging carrier 2 which is oscillated by means of a key-bolt.

I claim:—

1. In a combination lock, the combination with the main-bolt thereof, of a carrier, combination-mechanism imposed upon the said carrier and coacting with the said bolt for operating the same, and a key-mechanism acting through the combination-mechanism for operating the main-bolt.

2. In a combination lock, the combination with the main-bolt thereof, of a carrier, combination mechanism imposed upon the said carrier, and a key mechanism normally locking the carrier in a fixed position, and through it controlling the main bolt.

3. In a combination lock, the combination with the main bolt thereof, of an oscillating plate forming a carrier, combination mechanism imposed upon the said carrier and connected with the main bolt for the operation thereof, and a key mechanism including a key-bolt coacting with the said plate for operating the same and acting through the said carrier and combination mechanism to operate the main bolt.

4. In a combination lock, the combination with the main bolt thereof, of combination mechanism connected with the said bolt for operating the same, a carrier upon which the combination mechanism is imposed and connected therewith and operating there-through for operating the said main bolt, a key-bolt coacting with the carrier for moving the same, and the combination mechanism imposed upon it, and key mechanism for the key bolt.

5. In a combination lock, the combination with a main bolt, of a tubular stud, wheel-tumblers mounted thereupon, a driving-wheel for the said wheel-tumblers, a dog coacting with the wheel-tumblers and driving-

5 wheel, a swinging-plate mounted upon the said stud and carrying the said dog and connected with the said bolt, an oscillating-plate turning upon the said stud, an abutment carried by the said oscillating-plate and engaged by the said dog, means for turning the driving-wheel and hence the wheel-tumblers, a key-bolt coacting with the oscillating plate and normally holding it in a

fixed position, and key-mechanism coacting 10 with the key-bolt.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

JAMES J. MURPHY.

Witnesses:

OTIS B. HOUGH,
HARRY C. CLOW.