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HAND OPERATED LOCK

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16 Claims. (Cl. 70—46)

My invention relates to hand operated locks, of a type suitable for use upon doors, drawers, sliding plates and the like, and adapted to be actuated by a knob or a key, as required.

More particularly stated my lock comprehends improved locking mechanism including a bolt movable in the direction of its length, and controlling a pair of plungers located within the bolt, the parts being so arranged that the bolt normally prevents the withdrawal or other undesirable movements of the plungers, and thus promoting the security afforded by the lock.

My invention further contemplates giving the plungers such form and arrangement relating to other parts that with the flanges in locked position they cannot easily be broken out from the keeper.

This application is a division of my pending application for patent upon door locks, Serial No. 14,980, filed March 12, 1925.

Reference is made to the accompanying drawing forming a part of this specification and in which like reference characters indicate like parts throughout all of the figures.

Figure 1 is a side view, partly an elevation and partly a section, of my improved lock.

Figure 2 is a longitudinal section, taken on the line 2—2 of Figure 1, looking in the direction indicated by the arrows.

Figure 3 is a perspective of the bolt forming a part of my improved lock.

The lock casing is shown at 250, and revolubly mounted upon it are an actuating knob 251 and a cylinder lock 252. Connected with the knob 251 and cylinder lock 252 are a pair of crank levers 253 and 254, provided respectively with lugs positioned and arranged to be moved into recesses 255 and 256. These recesses are made in a slide 257, movable within the casing and adapted to travel in a rectilinear direction therein.

The slide 257 carries upon its front end a leaf 258, connected rigidly with it. A bolt 259 is carried by the slide, and is provided with a slot into which the leaf 258 extends.

The bolt 259 is provided with a substantially wedge shaped end, which extends through a bore 260, formed transversely through the bolt head.

The slide 257 is movable relatively to the bolt to a limited extent. A spring actuated detent 261 is arranged to retain the slide in adjustment.

Located axially within the bore 260 are a pair of plungers 262, 262, movable toward and from each other in opposite directions. These plungers are provided upon their inner ends with enlarged heads 263, the latter being beveled in

order to make contact with the wedge shaped end of the leaf 258. The parts are so located and arranged that the plungers are pressed outwardly and away from each other, thus compressing the springs 264, whenever the slide is moved to the left according to Figures 1 and 2.

The outer ends of the plungers extend through nuts 265, which are bored for the purpose, the plungers being thus adapted to engage the walls 266 of a keeper 267. This keeper is so disposed that the lock mechanism, carried by a door or the like, may be brought into registry with the keeper, in the manner well known in this art.

The operator, by turning either the knob 251 or the cylinder lock 252, causes one of the cranks 253 and 254 to rock, so that a lug carried by that crank enters one of the recesses 255 or 256, thereby causing the slides to travel to the right or left according to Figures 1 and 2.

Whenever the slide is moved to the left the bolt 258 is moved with it, so that the wedge shaped end of this bolt makes engagement with the plungers 262, 262, and drives the latter in opposite directions. These plungers prevent the withdrawal of the slide 259 and therefore prevent the device from becoming unlocked.

In order to cause the plungers to be released, the operator actuates either the knob 251 or the cylinder lock 252, and thus withdraws the slide to a limited extent. Thereupon the springs 264 press the plungers 262, 262 toward each other, so that the bolt is easily withdrawn.

As may be noted from the foregoing description, this lock is very secure, owing to the fact that the plungers 262, 262, cannot be moved toward each other except in the manner above described, and if they are moved by aid of the cylinder lock 252, a key must be used for the purpose. When the plungers are in locked position they cannot easily be broken out of the keeper, and hence the lock is quite secure.

I do not limit myself to the particular mechanism here illustrated and described, as variations may be made therein without departing from my invention, the scope of which is commensurate with my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:—

1. In a hand operated lock a casing, a bolt slidably mounted within said casing, and adapted to engage a keeper, said bolt being provided with a pair of openings, a pair of substantially cylindrical plungers located within said openings and extending from said bolt in opposite directions

into said keeper, resilient means retracting said plungers, a slide in said bolt and engageable with the inner ends of said plungers for extending them, and mechanism connected with said slide and controllable by hand for moving said slide back and forth to engage with or disengage from said plungers.

2. In a lock, a casing, a bolt located within said casing and movable back and forth, a keeper with which said casing can be brought into registry and into which said bolt may extend from said casing, a pair of substantially cylindrical plungers extendable from said bolt in opposite directions into said keeper, the inner ends of said plungers being formed with heads and apexes, springs acting between said heads and the bolt to urge the plungers inwards, a slide upon said bolt having a pointed end capable of engaging the apexes of the plungers to urge them outwards, and means for moving said slide relative to said bolt.

3. In a hand operated lock a casing, a bolt slidably mounted within said casing, said bolt extendible from said casing into a keeper, said bolt having a bore extending through the same at right angles to the direction of movement of said bolt, a pair of plungers located within said bore and extending from said bolt in opposite directions into said keeper, said bolt having a slot extending at right angles to said bore, a member slidable in said slot and having slanting surfaces operating on said plungers to project the same, a spring for retracting said plungers within said bolt, and means for projecting and retracting said bolt and said slidable member.

4. In a hand operated lock a casing, a bolt slidably mounted within the casing and adapted to engage a keeper, said bolt having a bore extending at right angles to the direction of movement of said bolt, nuts disposed adjacent the opposite ends of said bore, plungers slidable through said nuts to extend in opposite directions into locking engagement with a keeper, said plungers having enlargements, springs disposed between said nuts and the enlargements of said plungers and acting to retract the plungers within the bolt, said bolt having a slot disposed at right angles to said bore, a member slidable in said slot and having slanting surfaces acting on said plungers to project the same, and means for operating said bolt and said slidable member.

5. In a lock, a casing, a bolt movable in and out of said casing, adapted to engage a keeper, a locking plunger associated with said bolt, a wedging element located in the bolt, said element adapted to move said plunger into operative locking position and means for moving said plunger inwardly into inoperative position when disengaged by said wedging element, and spring pressed detent means mounted in the bolt for locking said bolt with the casing when the bolt is retracted into the casing, and a lever mounted in the casing to operate the bolt.

6. In a lock, a casing, a bolt mounted in said casing, adapted to enter a keeper, a horizontally movable wedging element slidably mounted within said bolt, said bolt being provided with a horizontal and transverse bore communicating with each other, a spring actuated plunger mounted in said transverse bore, said wedging element sliding within said horizontal bore and adapted to act on said plunger and to thrust the same outwardly into locking position with a keeper, and a lever mounted in the casing for operating the bolt.

7. In a lock, a casing, a bolt, adapted to engage a keeper, a wedging element slidably movable

relatively to said bolt, a plunger vertically movable within the bolt and adapted to be forced into locking position by said wedging element when the bolt is fully projected into the keeper, a spring detent interposed between the casing and bolt to lock said bolt when the bolt is fully extended into the keeper, and key operated means to operate the bolt.

8. In a lock, a casing, a main bolt, adapted to engage a keeper, a supplemental spring actuated bolt, manually operated means to move said main bolt into a keeper first and then project said supplemental bolt against the action of its spring, into the keeper to prevent retraction of said main bolt, and a spring pressed detent for locking said main bolt with the casing when said main bolt is fully projected out of the casing, and a lever rotatably mounted in the casing to operate the bolt.

9. In a door lock, the combination with a casing, a longitudinally movable bolt adapted to enter a keeper when in locked position, a reciprocating locking plunger adapted to be thrust outwardly in a keeper transversely of the bolt to lock the latter against forcible withdrawal from the keeper, spring means located in the bolt, a longitudinally movable wedging element mounted in the bolt for projecting said locking plunger against the action of the spring when said bolt is fully extended into the keeper, and rotatable means mounted in the casing for moving the bolt and the wedging element to operate the lock.

10. In a lock, a locking bolt, adapted to engage a keeper, means for actuating said bolt, a locking plunger adapted to be thrust outwardly from said bolt into locking position when said locking bolt is projected into a keeper, and spring means for retracting said plunger into unlocked position when locking bolt is moved into unlocked position and out of the keeper.

11. In a lock, a locking bolt, means for actuating said bolt to project it into a keeper, a reciprocating spring operated locking plunger carried by and movable with said locking bolt, said plunger being engageable with a keeper to prevent the retraction of said bolt, and manually operated means to operate said bolt.

12. In a lock the combination of a casing, a bolt, adapted to engage a keeper, a wedging element slidably mounted in said bolt, actuating means connected with the wedging element to move said element and bolt as one unit, means for interrupting the movement of said bolt while permitting a continued movement of said wedging element, a spring actuated plunger carried by said bolt and movable out of said bolt during said continued movement, means whereby a reverse movement of said actuating means will allow said plunger to retract and to subsequently retract the bolt out of locking position with the keeper.

13. In a lock the combination with a casing, a bolt, a wedging element slidable within said bolt, manually operated means connected with said element to move said element and bolt connected therewith first as one unit and subsequently to shift them relative to each other, a spring-actuated locking plunger movable transversely in said bolt and being actuated against the action of the spring by said wedging element when the bolt is fully projected into the keeper.

14. In a locking mechanism the combination with a casing, a carrier slidably movable within said casing, a pair of independently movable locking members slidably and snugly mounted in said carrier, an element to actuate said carrier and said locking members in unison and then to

impart bodily movement to said members with respect to said carrier while the carrier remains stationary, means formed in said carrier for guiding said locking members rectilinearly and transversely to the movement of the carrier, spring means associated with the locking mechanism to keep said locking members in inoperative position, a lever rotatably mounted in the front wall of the casing to actuate the locking mechanism against the action of the spring means, a knob connected to said lever to operate the lever from indoor side of the casing, a cover plate detachably secured to the lock casing, a second lever rotatably mounted in the cover plate to actuate the locking mechanism from the outdoor side of the casing and key operated means to rotate said second lever to operate the lock.

15. In a door locking mechanism the combination with a casing, a carrier slidably movable within said casing and adapted to move in a horizontal direction relative to the door structure, a pair of independently movable locking members associated with said carrier, an element to move the carrier and said locking members in one direction and then to impart translational movement with respect to the carrier, to each of said members in opposite direction and away from each other transversely to the first named direc-

tion, means formed in said carrier for guiding said locking members in an up and down movement, rectilinearly relative to the carrier, spring means associated with said locking mechanism for keeping said locking members in inoperative position, a lever rotatably mounted in the front wall of the casing for moving the locking members against the tension of the spring means, a cover plate detachably secured to the lock casing for keeping the mechanism against lateral displacement and a second lever rotatably mounted in the cover plate to operate the lock.

16. In a hand operated lock, a casing, a bolt slidable within said casing, adapted to engage a keeper, said bolt having a bore at each side thereof, a pair of independently locking members snugly fitted in each of said bores and arranged to move up and down for interlocking engagement with the keeper, a lever rotatably mounted in the front wall of the casing for actuating said bolt, spring means associated with said bolt for maintaining the locking members in inoperative position, a cover plate detachably secured to the lock casing, and a second lever rotatably mounted in the cover plate to move said bolt against tension of spring means to operate the lock.

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