April 3, 1956 R. K. GRAY 2,740,284

LOCK

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Fig. 1.

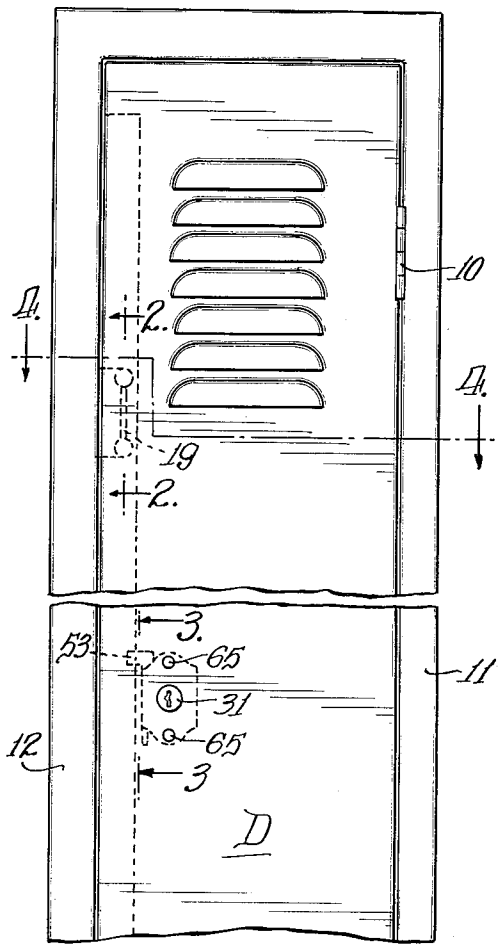


Fig. 2.

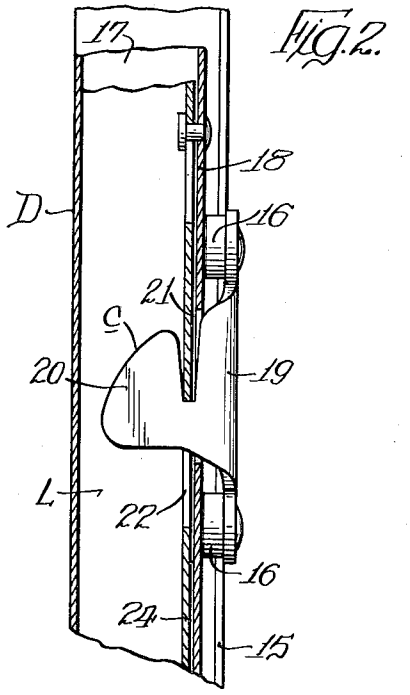


Fig. 3.

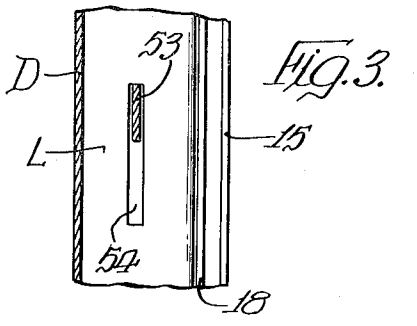
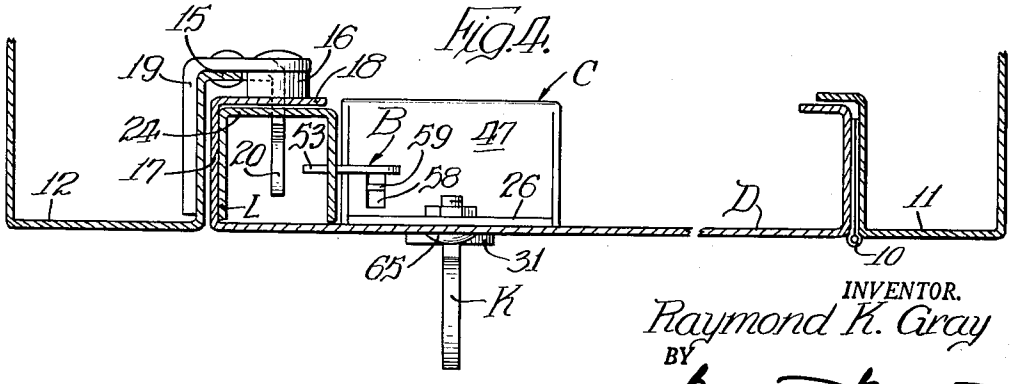


Fig. 4.



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Fig. 5.

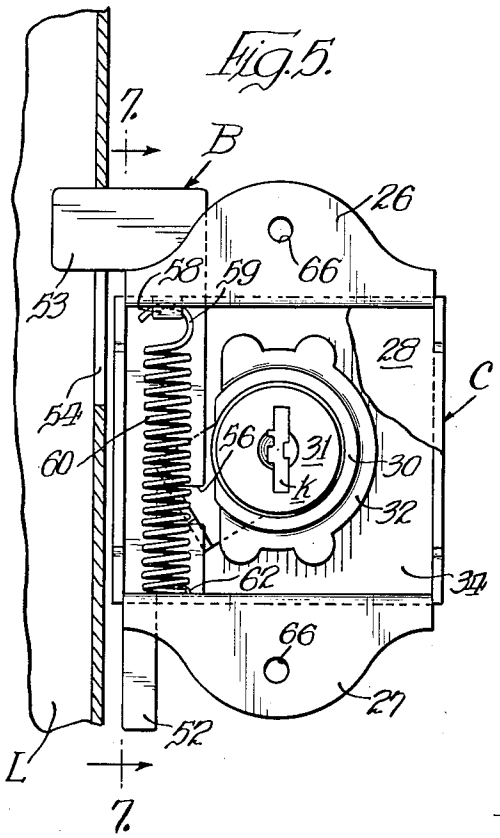


Fig. 6.

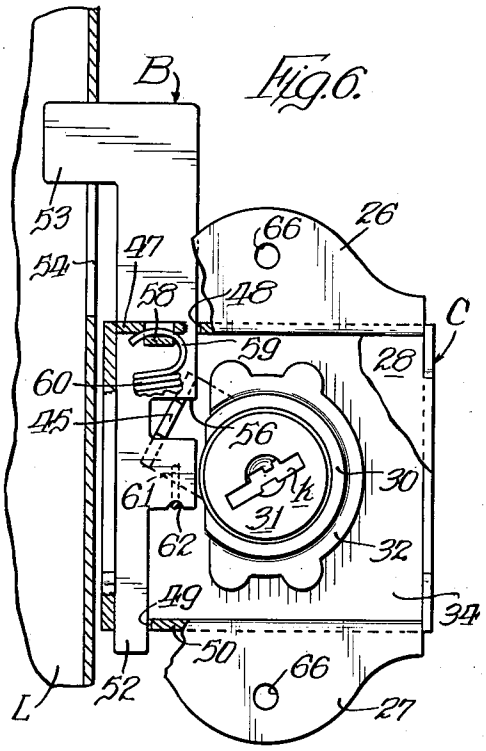


Fig. 7.

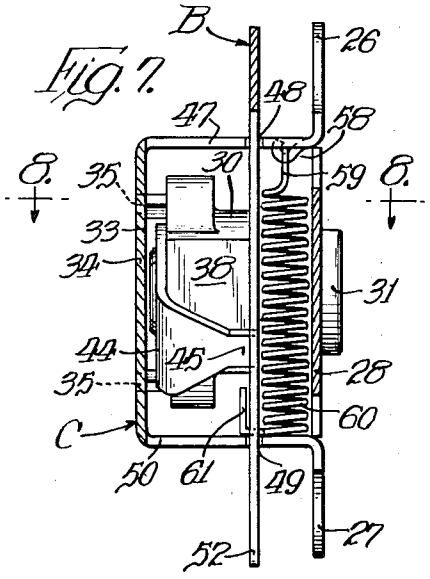


Fig. 8.

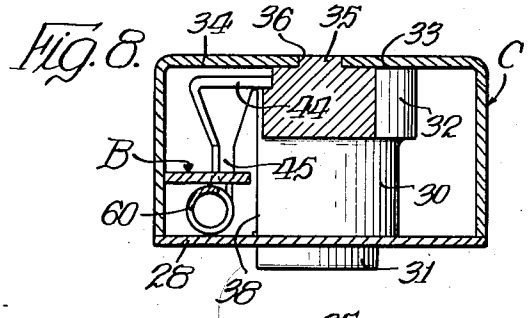
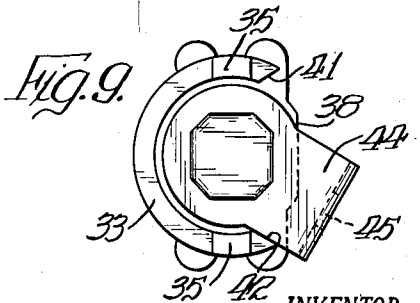


Fig. 9.



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2,740,284

LOCK

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Application October 30, 1951, Serial No. 253,905

3 Claims. (Cl. 70—79)

This invention relates to a mechanism which is especially adapted for use with a swinging door having a vertically slidable latch bar. Doors of this kind are commonly used in lockers and elsewhere.

The present invention involves the use of a key-operated rotatable lock having a crank arm which operates a vertically slidable bolt to which is connected a spring whose tension is counter to the force of gravity. The bolt is operatively connected to a vertically slidable latch bar carried by a door, to lift the bar from engagement relative to a catch (or catches). The key, upon rotating the lock for operation thereof, is prevented from withdrawal therefrom until turned back to its initial position where the bolt and latch bar are both lowered with consequent reengagement of the catch. In such an arrangement a door handle may be dispensed with since the key will serve adequately for this purpose.

The present invention is concerned primarily with the operative connections between the key-operated lock and the door latch bar. The construction is simple, and involves but few parts which may be readily assembled or disassembled. The arrangement is also one which minimizes the friction which occurs with each movement of the parts.

An exemplification of this invention is illustrated in the drawings in the manner following:

Figure 1 is a fragmentary elevational view of a door locker in closed position, the latch bar and associated key-operated lock being shown in dotted lines.

Figs. 2 and 3 are details in vertical section, taken, respectively, on lines 2—2 and 3—3 of Fig. 1;

Fig. 4 is a horizontal section, taken on the offset line 4—4 of Fig. 1;

Fig. 5 is a view in elevation showing the front of the casing containing the key-operated lock as it appears in operative relation to its associated latch bar which is illustrated in vertical section;

Fig. 6 which is a similar view shows the locking bolt operated to its up position;

Fig. 7 is a detail in vertical section, taken on line 7—7 of Fig. 5;

Fig. 8 is a detail in horizontal section, taken on line 8—8 of Fig. 7; and

Fig. 9 is a detail in elevation of the rear end of the key-operated lock.

Referring to Figs. 1–4, I have shown a door D hinged at 10 to the vertical jamb 11 of a frame which includes also a second vertical jamb 12 adjacent the free edge of the door. The door and its frame, as shown, are produced from metal with the two jambs each having a channel section. The jamb 12 adjacent the free edge of the door is provided with an out-turned flange 15 extending parallel with the door and rearwardly thereof to mount certain cushion buttons 16 which constitute stops therefor. At the free edge of the door there is a rearwardly disposed wall 17 from which is extended a flange 18 parallel with the door to provide an enclosing guide-

way for a channeled-shaped latch bar L. This bar is guided by the flanges 17 and 18 in its vertical movements and also by other confining means shortly to be described.

An angled fitting 19 is carried by and engaged with the jamb 12 and its flange 15 (see Fig. 4) and carries a forwardly extending catch 20 which protrudes through a vertical slot 21 in the flange 18 and also through a vertically elongated slot 22 in the base wall 24 of the channeled latch bar L so as to lie interiorly thereof (see Fig. 2). In the normal down position of the bar, engagement is made with the catch 20 so as to lock the door against opening movement. By raising the latch bar, however, the catch is cleared so as to free the door for opening movement.

To operate the latch bar I provide a key-operated lock mechanism which is enclosed within a casing C from which flanges 26 and 27 are oppositely extended vertically at its open front with which a removable closure plate 28 is interlocked. The casing encloses a key-operated lock comprising a cylinder 30 which encloses a rotatable plug 31 having a keyway *k* for reception of an operating key K. At its rear end the cylinder is enlarged to provide a base 32 which is characterized by a circular wall 33 in engagement with the rear wall 34 of the casing. A pair of bosses 35 extend rearwardly from the base to fit within openings 36 provided in the casing rear wall 34, thereby to support and center the lock non-rotatably in place. The front end of the plug 31 is protruded forwardly and outwardly through an aperture in the front plate 28 (see Fig. 8) so as to be exposed upon the front face of the door D.

The lock cylinder and base 32 are flatted at 38 upon one side thereof which is disposed closely adjacent a vertically extending slide bar B. The circular wall 33 is also interrupted adjacent this flatted portion to provide stops 41 and 42 (see Fig. 9). Fixedly secured to the rear end of the plug is a radially extending arm 44 which is rotatable therewith through a range that is fixed by the spacing between the stops 41 and 42. This arm extends outwardly toward the side of the casing which is proximate to the slide bar B, and then executes a bend to proceed forwardly and terminate at its end in a lug 45 (see Fig. 8). The position of this lug is medially of the length of the cylinder 30 where the slide bar B is also located.

The top wall 47 of the casing is slotted at 48 oppositely of a slot 49 in its bottom wall 50, thereby to provide guides through which the slide bar B is extended for vertical sliding movements. The slide bar, as shown, is made from flat stock, reduced in size in its lower end portion 52; in its upper end portion the bar is somewhat wider and at its upper end is formed with a laterally extending head 53 which is entered through an elongated vertical slot 54 to lie within the latch bar L.

Intermediately of its ends the slide bar B is formed with a notch 56 for reception of the lug 45 which is adapted to engage with its upper and lower edges thereby to transmit raising and lowering movements thereto when operated in response to rotation of the plug 31. In the casing top wall 47 is a downstruck lug 58 for connection therewith of a hook 59 at the upper end of a tension spring 60. At its lower end this spring is extended laterally and then upwardly at 61 (see Fig. 7) to engage a notch 62 in the lower edge of the slide bar body at a point above its narrowed lower end portion 52. The tension of the spring will exert a lifting force on the slide bar, causing it to advance upwardly and thereby transmit to the latch bar L a corresponding movement. By this counterbalancing means the resistance to upward movement of the latch bar, in response to operation of the lock will be reduced or possibly eliminated.

From the description up to this point it will be apparent that the locking mechanism constitutes a separate unit which may be affixed to the rear face of the door D as by means of fastening elements **65** which are inserted through openings provided therein and through registering openings **66** formed in the upper and lower flanges **26** and **27** of the casing. When operatively positioned, the head **53** of the slide bar B will lie within the bar slot **54** so as to normally engage with its upper end. The front of the plug **31** is exposed upon the front side of the door in the usual way so as to receive the operating key K within its keyway. When operated, the key will lift the latch bar L to free it from engagement with the catch **20** (or catches), thereby permitting the door D to be swung open. The key serves also as a handle for pulling the door outwardly. When the key is released, the bar will remain in its up position if the tension force of the spring **60** be sufficient, or will descend by gravity to its initial down position where it will remain indefinitely. When the door is swung to closed position, its flange **17** will strike the inclined face *c* of the catch **20**, if the latch bar be in down position, thereby camming the latch bar L upwardly to permit completion of the door closing movement; at this point the latch bar is free to descend, or may be subjected to a lowering force by reverse turning movement of the key K, whereby to coact with the catch to secure the door in its closed position (see Fig. 2).

I claim:

1. A lock comprising: a casing including a back wall with a hole therein and an apertured front wall; a cylinder extending between the front wall and back wall and confined therebetween against endwise movement; a boss integral with and extending rearwardly from the cylinder into the hole in the back wall to fix the position of the cylinder relative thereto; a rotatable plug supported within the cylinder and extending outwardly beyond the forward end of the cylinder to lie within the aperture in the front wall so as to fix the position of the cylinder relative thereto; and slide bar means projecting through an aperture in the casing and mechanically linked to said plug so that rotation of the plug will impart endwise movement to the slide bar means.

2. A lock comprising: a casing including a back wall with a hole therein and an apertured front wall, a cylinder extended between the front wall and back wall and confined therebetween against endwise movement and having an aperture therein; a boss extending rearwardly from the cylinder into the hole in the back wall to fix the position of the cylinder relative thereto; a rotatable plug supported in the cylinder and extending outwardly beyond the forward end of the cylinder to lie within the aperture in the front wall and fix the position of the cylinder relative thereto; a slide member supported in the casing with an end portion projecting outside the casing; spring means urging said slide member outwardly with respect to the casing; and a crank arm affixed to the plug within said casing and extending through the aperture in said cylinder into engagement with the slide member to impart endwise movement to the slide member upon rotation of the plug.

3. A lock comprising: a casing having parallel front and back walls and a pair of opposed guide walls disposed at right angles to said front and back walls, said guide walls having aligned transversely disposed guide slots adjacent a lateral margin and substantially midway between the front and back walls; a flate slide member extending through the casing in said guide slots, said slide member having a slot in its inner margin, and having a shoulder by which it is supported on one of said guide walls; a tension spring inside the casing between the front wall of the casing and the slide member, said spring being secured to the guide wall remote from the shoulder on the slide member and being secured to the slide member to urge said member outwardly of the casing; a cylinder supported in the casing on a horizontal axis alongside the slide member and having an aperture therein adjacent the slide member and terminating at the back wall of the casing; a key operated plug rotatably mounted in the cylinder; and a laterally extending crank arm secured to the plug for oscillation thereby, said crank arm being secured to the plug adjacent to and extending through the aperture in the cylinder, parallel to the back wall of the casing and having its outer end portion turned forward to engage the notch in the slide member.

References Cited in the file of this patent

UNITED STATES PATENTS

302,796	Taylor	July 29, 1884
1,070,178	Radford	Aug. 12, 1913
1,593,667	Murmann	July 27, 1926
2,197,103	Gray	Apr. 16, 1940

FOREIGN PATENTS

92,013	Austria	Apr. 10, 1923
401,036	Germany	Aug. 25, 1924