Dec. 5, 1939.

M. O. BEHNKE

2,182,307

LOCK

Filed March 24, 1937

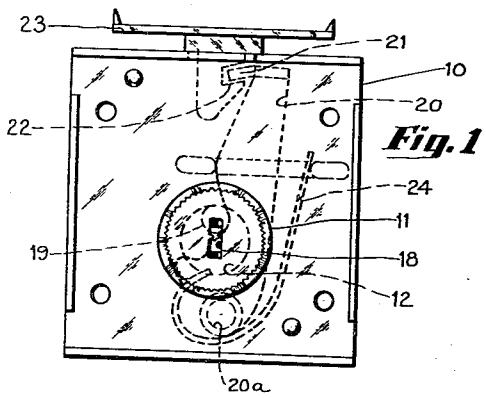


Fig. 1

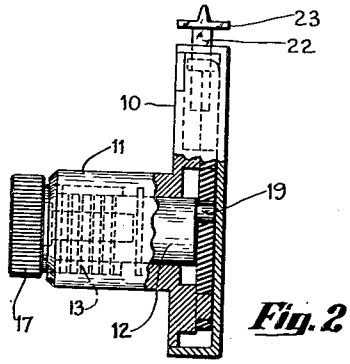


Fig. 2

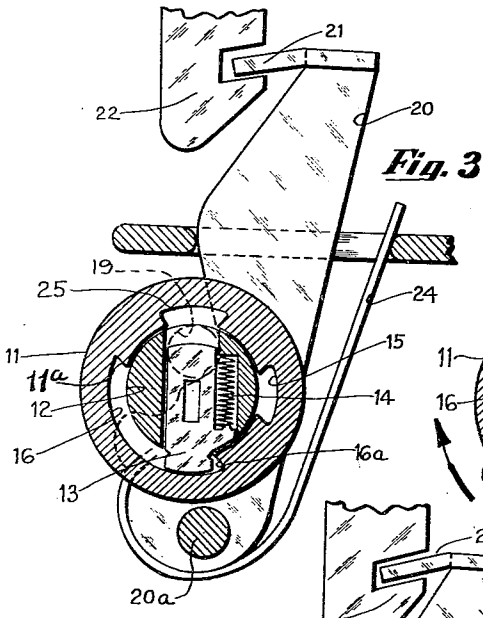


Fig. 3

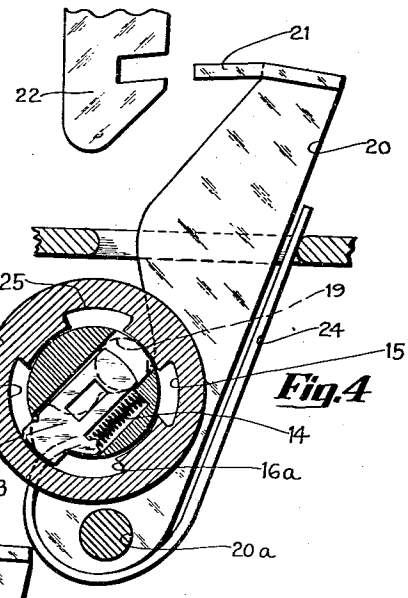


Fig. 4

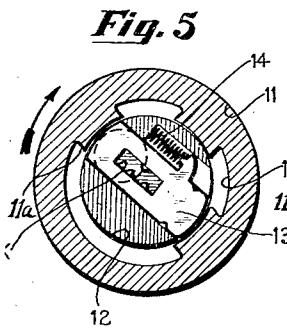


Fig. 5

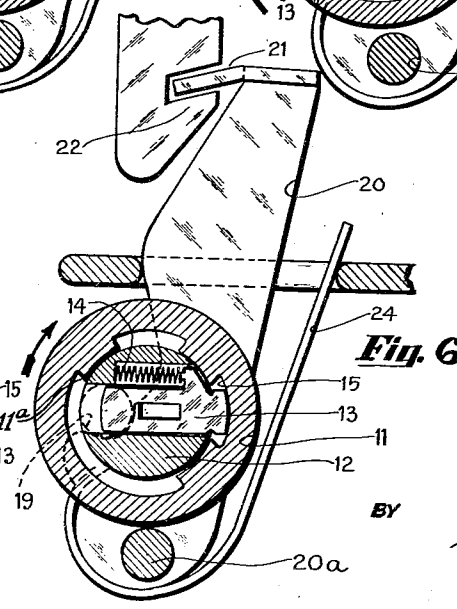


Fig. 6

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LOCK

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Application March 24, 1937, Serial No. 132,700

2 Claims. (Cl. 70—80)

This invention relates to locks of the type used for locking cabinets, cedar chests, closets, etc.

It is very desirable that a lock of this type be operable manually under certain conditions without the use of a key, and that under other conditions, the lock be rendered inoperable except by a key. While locks having this operation have been developed and used in the prior art, such locks have usually utilized a considerable number of parts and have been quite costly. By a novel arrangement of elements, I have been able to obtain a very desirable operation with an extreme minimum of parts, as will be quite obvious from a reading of the description of my invention.

Before describing in detail my invention, I should like to indicate the construction generally. I have a lock in which the case carries a cylinder, the cylinder in turn having mounted therein a key plug preferably equipped with a knob at its extreme end whereby it may be easily operated manually. The key plug has a series of tumblers and a keyway, the tumblers normally locking the plug to the cylinder and being retractible by key operation to release the plug from the cylinder so that the key plug may be rotated freely. When so rotated, it operates to move a locking lever to release position.

In one position of the key plug, the tumblers lock it relatively to the cylinder against any movement whatsoever. By the insertion of the key for which the tumblers are formed, the plug may be rotated in a particular direction to a second position and the key withdrawn. When in this second position, the tumblers allow limited rotation of the key plug in the same particular direction, this being sufficient to enable the plug to operate the locking lever. The tumblers prevent rotation of the key plug back into its original locked position, however, until the key is inserted once again. Thus, the key is used to put the plug in a locked position and then into an unlocked position.

Having now described my invention generally, I shall refer to the drawing for a detailed description thereof. In the drawing, Fig. 1 is an elevation of my lock, while Fig. 2 is a side view and partial section of the lock assembled relatively to a strike. Figs. 3, 4 and 6 show the relation of the locking lever to the key plug in various operating positions of the key plug. Fig. 5 shows the key plug in a position intermediate Figs. 3 and 6.

Referring now more particularly to the drawing, my lock comprises a casing 10 to which is attached a cylinder 11 in which is mounted a key plug 12. This key plug is preferably of the sliding tumbler type, having a series of sliding tumblers 13, best shown in Figs. 3–6 inclusive, which may be spring pressed by a series of springs 14 into a narrow locking slot 15, shown in Fig. 6, and into a relatively wide locking slot 16, shown in Fig. 3.

The head of the key plug carries a knurled knob 17, whereby the key plug may be readily rotated manually. A keyway 18 is formed in the knob portion and in the key plug body, as is probably best shown in Figs. 1 and 2. The inner end of the key plug has a pin 19 formed thereon whereby the key plug operates a locking lever 20 pivoted at 20*a* and having a locking nose 21 for interlocking with the hook 22 of a strike 23, as will be understood by those skilled in the art.

The locking lever 20 is spring pressed by a spring 24 so as to bring its nose 21 within the locking slot of the hook 22, rotation of the key plug 12 being effective through its pin 19 to move the lever 20 from its position in Figs. 1 and 3 to the position of Fig. 4 whereby to release the strike 23 from the lock.

The normal locked position of the key plug 12 is probably best illustrated in Fig. 6, which shows the tumblers 13 all resting in the narrow locking slot 15 and the locking lever 20 with its nose 21 in the slot of the hook 22. When a key is inserted into the keyway 18, each of the tumblers 13 is retracted against the pressure of the individual tumbler springs 14 into a position entirely within the key plug, as is best illustrated in Fig. 5. Should any one of the tumblers be moved somewhat beyond the periphery of the plug, as by picking, or by a wrong key, the abutment 11*a* will prevent rotation in the direction of the arrow to the position of Fig. 5.

It is obvious that with the tumblers properly set the key plug 12 may now be rotated from its position of Fig. 6 to the position of Fig. 5, and then to the position of Fig. 3, bringing the spring projected ends of the tumblers 13 opposite the wide slot 16. This motion of key plug 12 is independent of locking lever 20 which is actuated only after the key plug and its pin 19 rotate beyond the position of Fig. 3. In Fig. 3, if the key is removed, all of the tumblers will press into the slot 16 under the influence of springs 14. The slot 25 is formed to allow removal of the key, since some of the tumblers may be required to ride into the slot 25 as higher and lower bittings of the key engage the various tumblers 13, as will be understood by those skilled in the art.

Incidentally, in Fig. 5, the key K is shown in section engaging one of the tumblers 13.

With the parts in the position of Fig. 3, it is quite obvious that the key plug 12 may be rotated clockwise to the position of Fig. 4 from the position of Fig. 3 without the use of a key, the tumblers resting in the wide slot 16. This movement of the key plug will of course cause pin 19 to move locking lever 20 to the release position of Fig. 4. Counterclockwise movement of key plug 12 from the position of Fig. 3 back to the positions of Figs. 5 and 6 will be quite impossible, however, since the tumblers 13 will abut the surface 16a defining one end of the slot 16.

If it is desired to move the key plug back into its locked position of Fig. 6, the key must be inserted, retracting the tumblers relatively to the key plug 12, to a position somewhat like that of Fig. 5, after which the key plug may be rotated to the position of Fig. 6 and the key withdrawn.

Those well skilled in the art will readily appreciate that I am able to obtain extremely desirable results through my invention, while using an extreme minimum of parts. For instance, I have but a single locking lever, a single key plug with an integral pin for operating the lever, and a cylinder in which the key plug rotates. Through a novel association of the key plug, tumblers and cylinder, I am able to obtain novel operations normally obtainable only through the use of many additional parts.

I now claim:

1. In a lock of the class described, a key plug, releasing means operated by rotation of said key plug, a cylinder relatively to which said key plug rotates, a series of tumblers carried by said key plug and projecting into a slot in said cylinder whereby to lock said plug against rotation in said cylinder, said tumblers being of a length equal to the diameter of the key plug and retractible by a key out of said slot whereupon said key plug is rotatable in a releasing direction to operate said releasing means, an abutment on said cylinder for preventing rotation of said key plug in a release direction if said tumblers are retracted out of said relatively narrow slot a distance projecting the tumblers beyond the key plug, said cylinder having a second slot into which said tumblers may be projected by withdrawal of the key once said key plug is rotated by said key a predetermined amount from its locked position, said second slot allowing free rotation of said key plug in a releasing direction without the key maintaining the tumblers retracted, while cooperating with the projected tumblers to prevent rotation of said key plug back to its locked position.

2. In a lock of the class described, a key plug, a spring pressed locking lever, means whereby rotation of said key plug moves said spring pressed locking lever against its spring into release position, a cylinder relatively to which said key plug rotates, a series of tumblers carried by said key plug and projecting into a locking slot in said cylinder whereby to lock said plug against rotation in said cylinder, said tumblers being retractible by a key out of said locking slot whereupon said key plug is rotatable in a releasing direction to operate said releasing means, said cylinder having a second slot into which said tumblers may be projected by withdrawal of the key once said key plug is rotated a predetermined amount from its locked position, the said key plug being adapted for rotating said predetermined amount independently of said spring pressed locking lever, said second slot allowing free rotation of said key plug in a direction to move said locking lever to release position without the key maintaining the tumblers retracted, while cooperating with the projected tumblers to prevent rotation of said key plug back to its locked position.

MAX O. BEHNKE.