E. P. BAIRD.

LOCK.

APPLICATION FILED MAY 12, 1919.

1,352,239. **Patented Sept. 7, 1920.**

Fig. 1.

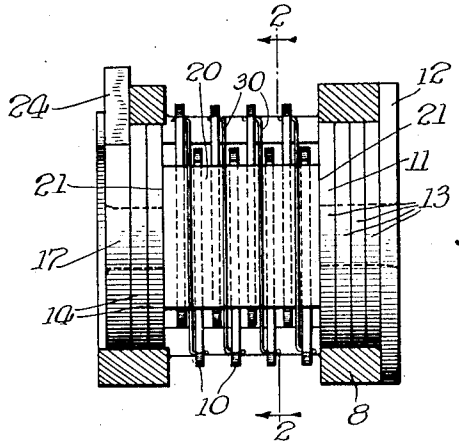


Fig. 2.

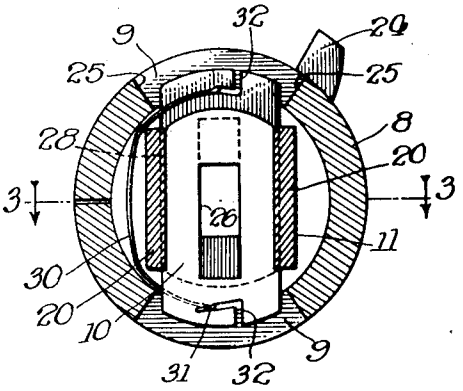


Fig. 3

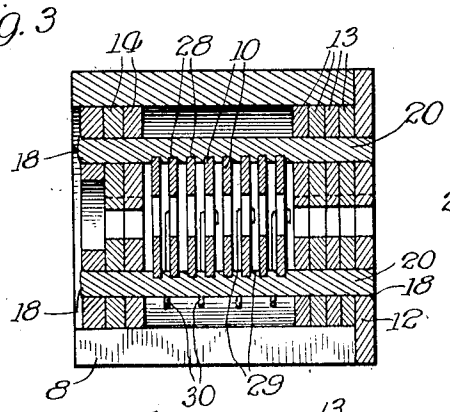


Fig. 4.

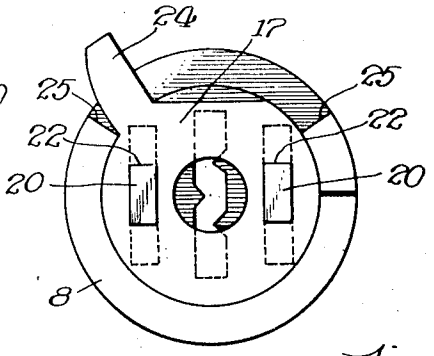


Fig. 5.

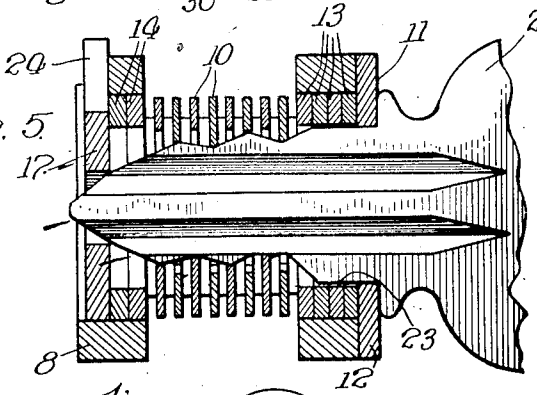
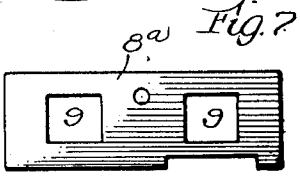


Fig. 7



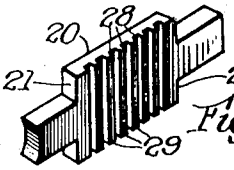
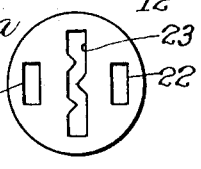


Fig. 6.

Fig. 7a



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UNITED STATES PATENT OFFICE.

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LOCK.

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Application filed May 12, 1919. Serial No. 296,288.

To all whom it may concern:

Be it known that I, EDWARD P. BAIRD, a citizen of the United States, and a resident of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Locks, of which the following is a full, clear, and exact description.

The invention relates to locks and more particularly to cylinder locks of that type in which the tumblers are formed of plates.

The object of the invention is to provide a lock which is efficient in operation and which is made of parts which can be easily and cheaply produced.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Figure 1 is a side elevation of a lock embodying the invention, the casing being shown in section. Fig. 2 is a section on line 2—2 of Fig. 1. Fig. 3 is a section on line 3—3 of Fig. 2. Fig. 4 is an inner end elevation. Fig. 5 is a central vertical longitudinal section. Fig. 6 is a detail perspective of one of the side-bars which guide the tumblers. Fig. 7 is a detail of the blank for the cylindrical casing. Fig. 7ª is a detail of one of the bearing disks.

A cylindrical casing 8 is adapted to rotatably sustain the operating mechanism, and to be secured in any suitable manner to one of the elements to be secured together, and is formed by bending the flat blank 8ª, shown in Fig. 7, into cylindrical form, with the blank-ends abutting, as shown in Fig. 2. Openings 9 in the blank are adapted, when the casing has been shaped, to receive and hold the tumblers against rotation.

Plate-tumblers 10 are slidably mounted in a rotatable carrier 11 which is rotatably mounted in the casing 8. This carrier is built up of parts which can be stamped from sheet or plate metal and comprises a front or escutcheon plate 12 which laps the casing 8, a series of circular disks or plates 13 fitting in the front of casing 8, a series of similar plates 14 fitting in the rear portion of the casing, and a pair of side-bars 20 which are shouldered, as at 21, to relatively space the front and rear series of plates 13 and 14 and have their front and rear ends extending through holes 22 in said plate respectively. The rear ends of said side plates also extend through a bolt-shifter and stop-disk 17, and are riveted or upset as at 18 to secure the disks 14 and 17 on said bars. The front ends of bars 20 are similarly riveted or upset to secure the plate 12 and disks 13 on the bars. The disks 13 and 14 serve as front and rear bearing-members for the carrier, and these disks and the plate 12 are each formed with a key-slot 23. An arm 24 formed on the disk 17 is adapted to operate a lock-bolt in manner well understood in the art, and to engage the edges 25 of a notch formed in the casing to limit the rotation of the carrier so it will be arrested at either of two predetermined points, at one of which the tumblers will be in registry with the openings and in the casing and at the other of which the tumblers will be disposed so as to be held within and unlocked from the casing.

The tumblers 10 are each formed with a key-slot 26 and when held in correct position by the key 27 are adapted to clear the opening 9 in the casing 8, and release the carrier for rotation in the casing. For the purpose of spacing the tumblers apart to prevent their rusting together or sticking together from any other cause, they are guided and confined in grooves 28, the ribs 29 between the grooves serving to space the tumblers apart. To cause all the tumblers to be normally pressed into operative position, resilient wire strips 30 having their terminals 31 extended into angular slots 32 in opposite ends of adjacent tumblers, the intermediate portions extending around the outside of one of the side-bars 20. These wires act as springs which cause two adjacent tumblers to be pressed in opposite directions as shown in Figs. 1 and 2. This makes it difficult to pick the lock because it is necessary to move the tumblers against spring-pressure in opposite directions to release the carrier for rotation.

Normally, each tumbler has one of its ends extended into one of the oppositely disposed openings 9 and collectively they secure the carrier against rotation in the casing and thus prevent the arm 24 from retracting the lock-bolt (not shown). When a correct key is inserted into the carrier, its edges will retract, against the force of springs 30, all the tumblers from the openings 9 in the casing and thus release the carrier for rotation by the key which is held in the slots 23.

The invention exemplifies a plate-tumbler cylinder lock which is efficient in operation, is built of stamped parts and can be produced at a low cost.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

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

1. In a cylinder lock, the combination of a casing, a rotatable carrier comprising a series of disks within the casing and journaled in the casing and side-bars secured together, and key-operable plate-tumblers transversely slidable in the carrier and into interlocking relation with the casing, the carrier comprising also a disk provided with a stop lug for engaging the casing to limit the rotation of the carrier.

2. In a cylinder-lock, the combination of a casing, a rotatable carrier comprising a plurality of disks forming a front bearing, a plurality of disks forming a rear bearing, and side-bars secured to and between the front and rear disks, and key-operable plate-tumblers transversely slidable in the carrier and into interlocking relation with the casing.

3. In a cylinder-lock, the combination of a casing, a carrier rotatable in said casing and comprising sides each having a series of transverse grooves spaced apart therein, and key-operable plate-tumblers slidable in said grooves and into interlocking relation with the casing, the grooves in one side being alined with those in the other, each tumbler having its margin guided in the two opposed grooves in the sides respectively and having its faces spaced from the faces of contiguous tumblers.

4. In a cylinder-lock, the combination of a casing, a carrier rotatable in the casing, and comprising sides each having a series of transverse grooves with intermediate ribs therein, and key-operable plate-tumblers spaced apart by said ribs and slidable in said grooves and into interlocking relation with the casing, the ribs and grooves on one side being alined with the ribs and grooves on the other respectively, each tumbler having its margin guided in two opposed grooves in the sides respectively and its faces spaced apart from the faces of contiguous tumblers by the ribs.

5. In a cylinder-lock, the combination of a casing, a rotatable carrier built up of separately formed front and rear members fitting in the casing and side-bars all secured together to form a rigid structure, the side-bars having grooves entirely across their inner faces and plate-tumblers slidable in said grooves and into interlocking relation with the casing.

6. In a cylinder lock, the combination of a cylindrical casing, a rotatable carrier built of separately formed disks and side-bars secured together to form a rigid structure, there being a plurality of disks at the rear and at the front forming bearing members, the side-bars having shoulders for spacing the front disks from the rear disks and transverse grooves extending entirely across their inner faces and key-operable plate tumblers slidably held in and spaced apart by the grooves.

7. In a cylinder-lock, the combination of a casing, a carrier rotatable in the casing, key-operable plate-tumblers transversely slidable in the carrier, and wire-springs, each extending around one side of the carrier and having its ends connected to the opposite ends of adjacent tumblers and to shift them in opposite directions.

8. In a cylinder-lock, the combination of a casing formed of a flat plate of metal bent into cylindrical form and having openings cut therein, a rotatable carrier in said casing and plate-tumblers transversely slidable in said carrier and into said openings.

9. In a cylinder-lock, the combination of a casing formed of a flat plate of metal bent into cylindrical form and having openings cut therein, a rotatable carrier in said casing, plate-tumblers transversely slidable in said carrier and into said openings, the casing having a notch in one edge, and means secured to the carrier and operating in said notch to limit the rotation of the carrier.

EDWARD P. BAIRD.