

Oct. 16, 1962

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3,058,336

LOCKS

Filed April 12, 1960

2 Sheets-Sheet 1

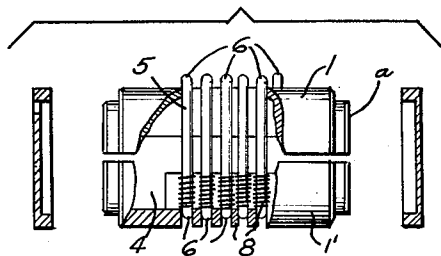


FIG. 1

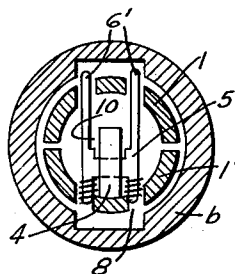


FIG. 4

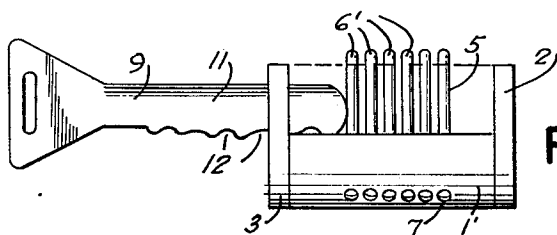


FIG. 2

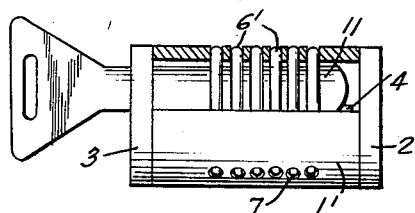


FIG. 3

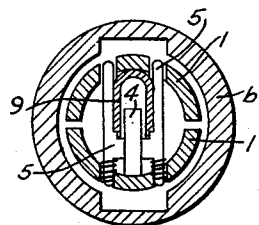


FIG. 5

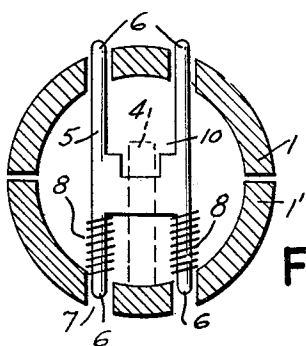


FIG. 7

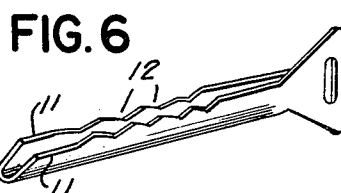


FIG. 6

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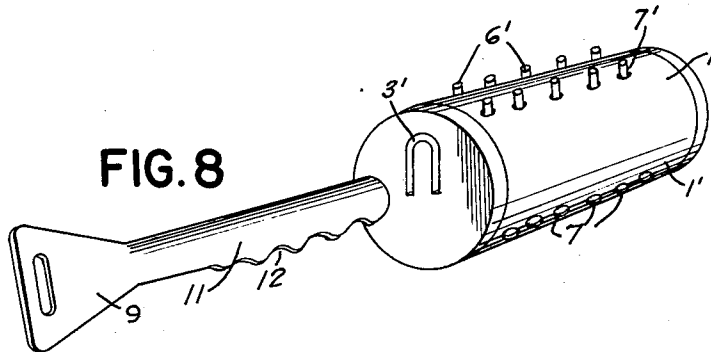
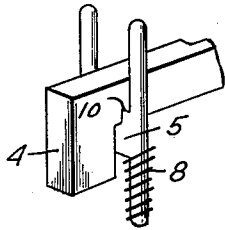


FIG. 9

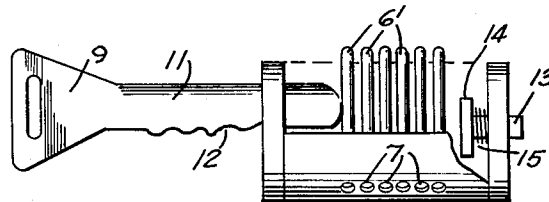


FIG. 10

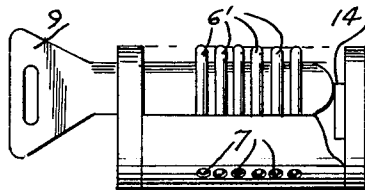


FIG. 11

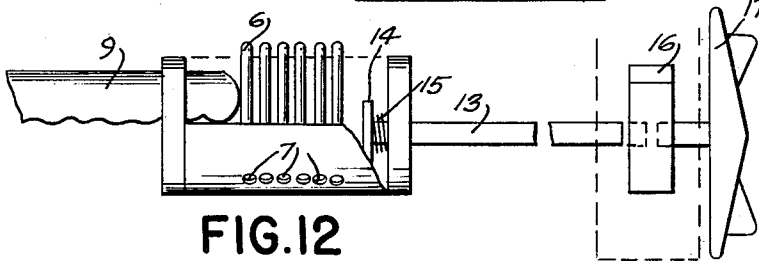


FIG. 12

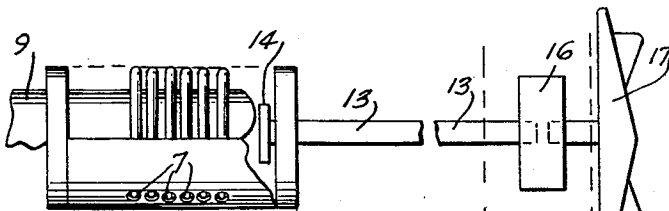


FIG. 13

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7 Claims. (Cl. 70—364)

This invention relates to improvements on locks of the type comprising a drum or axial drive cylinder, within which are located a group of elements distributed in a manner to allow an operation of blocking and/or opening by means of a key which, by its constitution and design, permits a series of combinations in direct relation to said elements.

The main characteristic of the group now under consideration is that it includes, among its constitutive elements, certain means which impart to the lock the conditions required for its inviolability, its outward appearance being that corresponding to the well-known types of locks, which include a drum or axial drive cylinder.

One of the advantages of the present invention, as compared with well known types of cylinder locks, is that the structure of the present invention permits more combinations or variations in the keys than can be obtained with the well known types of structures.

Another of the advantages is that the blocking elements, or tumblers, are located within an axial drum or hollow cylinder formed by two semi-cylindrical sections thereby permitting the operator to take the cylinder apart completely in order to make all kinds of repairs. Moreover, the elements employed as well as the corresponding key can be manufactured in larger or smaller sizes, while still obtaining excellent locking.

The lock of this invention is constituted by an axial drum or hollow cylinder formed by two identical semi-cylindrical sections, within which are located a number of tumblers equipped with small expansion springs which force these to stay in a specific position.

The above tumblers, which are formed by small pieces in H shape, protrude from the axial drum through small circular holes, that is, lateral perforations, distributed on its surface, in such a way that the protruding parts act as a bolt when they abut the walls of a groove made in the interior of a cylinder which covers the assembly of the cylinder and the tumblers and which defines the casing of the lock.

The key, formed by two bits placed in an inverted U shape, presents, in each of its edges a toothed or undulated area whose irregularities force by contact pressure, when it is inserted into the drum, the mentioned tumblers to withdraw or retract their protruding ends to the surface of the drum, so that the latter can rotate freely as the key is rotated. It is easy to deduce that if the toothed area of the key does not coincide exactly with the contact points of the tumblers this movement cannot be achieved, for it suffices for one of the tumblers not to retract to the extent required to act as a bolt and block the lock.

Within the general order, the rotation of said drum is related to the systems of locks by well-known means but, in particular, it can be effected, within one of the preferred realizations, by adding a control formed by a small rectangular connecting pin, equipped with an expansion spring, placed in the epicenter of the face of the drum opposed to the one where the mouthpiece for the key is located, so that the head of the pin is driven by the key at the end of its movement, thus helping to its displacement. The displacement of the pin permits the pin to be connected and/or disconnected with a bolting device and particularly the one illustrated in the enclosed drawings.

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To obtain the various combinations, each of the tumblers may be a different size from the tumbler adjacent thereto; or one or more of the tumblers can be of less height than other tumblers; or one of the rows formed by the ends of the tumblers may have a uniform height, and the next row be of irregular height, etc., thereby obtaining many different possible combinations.

On the other hand, the above combinations can be amplified by dimensioning the key so that this acts with respect to the connecting pin according to the thickness of the head of the latter, i.e., that only the key of appropriate dimension will be the one acting on the pin, thus resulting a possible double combination; one corresponding to the function performed by the pin itself as a means of direct contact with any bolting system and the one corresponding to the function of the drum independently, all this in a joint or separate combination.

The invention will now be described in connection with the accompanying drawings, in which:

FIGURE 1 shows an exploded side elevation, partly in section, of the cylinder showing the location of the tumblers therein and the adjusting covers for holding the sections of the cylinder in position.

FIGURE 2 shows a fragmentary side elevation with the covers in position, but showing only the lower half of the cylinder. In this figure, the key is partly inserted into the cylinder.

FIGURE 3 shows a view corresponding to FIGURE 2, but including the other half of the cylinder, and showing the key completely inserted into the lock.

FIGURE 4 shows a cross section of the lock with the tumblers in the bolting position relative to the casing of the lock.

FIGURE 5 is a cross section corresponding to that shown in FIGURE 4, but with the key inserted into the lock and with the tumblers in their retracted position.

FIGURE 6 shows a perspective view of the key.

FIGURE 7 is an enlarged cross section of the cylinder showing the arrangement of the tumblers in the cylinder.

FIGURE 8 shows a perspective view of the cylinder and the key, with the key about to be inserted into the keyway.

FIGURE 9 is a fragmentary perspective view showing the guide piece which keeps the tumblers aligned.

FIGURE 10 is a view corresponding to that of FIGURE 2, but showing the connecting pin for connecting the cylinder to the bolt.

FIGURE 11 shows a view corresponding to FIGURE 10 with the key completely inserted in the lock.

FIGURE 12 is a view corresponding to that showing the connection of the connecting pin with the bolt.

FIGURE 13 is a view corresponding to FIGURE 12, but showing the key completely in the lock.

Referring to the drawings, the lock of the present invention comprises a casing *b*, in which is rotatably mounted a hollow cylinder or axial drive drum *a* formed by two identical semi-cylindrical sections *1*, *1'*, which are maintained in position by a rear cover *2* and a front cover *3* which includes the corresponding mouthpiece or keyway *3'* for inserting the key.

Within the drum or cylinder thus constituted, is located, fixed to one of the parts *1'* which form the drum, a guide-piece *4* which keeps equi-distant a number of tumblers *5* in perpendicular position by passing adjustment of their ends *6*, *6'*, through circular lateral perforations *7*, *7'* made through the surface of the drum, the said tumblers being mounted on small compression springs *8*. The said expansion springs keep the tumblers in such a way that their ends protrude from the surface of the drum and they are only retracted by the pressure exerted by the key *9* on the small stirrups or lateral shoulders *10* which are on

said tumblers. The tumblers have an H shape seen from the front, the lateral shoulders defining the cross bar of the H. Such conformation gives four rows of tumblers, two of them pointing upward and two downward.

The key 9 is formed by two bits 11, 11', each of these has in its edges a toothed or undulated area 12 whose irregularities, when facing the stirrups 10 of the tumblers, impart to these a retractile movement so that their protruding ends, in relation to the surface of the drum, disappear and the lower ends are guided in the mentioned circular perforations 7, so that the said retractile movement takes place in a proper and alined way, thus permitting the rotation of the drum which will operate a bolting device.

The above arrangement permits an infinite series of combinations, for it is possible to modify the design of each of the edges of the bits with relation to the toothed area, and on the other hand to shorten the length of one or the other or both ends of the tumblers in such a way that, according to what is convenient, one of them or indistinctly a number of them are commanded in an alternate manner, or any other combination.

According to the preferred form of the invention, the axial drum is provided with a rectangular connecting pin 13 with head 14, mounted on a compression spring 15, placed slidingly in the epicenter of the adjusting face opposed to the one containing the mouthpiece of the key. When the key is inserted into the lock, the forward end of the key abuts the head 14 of the connecting pin, and thereby urges the connecting pin forwardly.

When the connecting pin is urged forwardly, the forward end thereof is received within a rectangular opening in block 16 to which is attached the bolt 17. When the key is rotated, the cylinder and the connecting pin also rotate, thereby rotating bolt 17 to lock or unlock the lock.

The above description is by way of example and not by way of limitation, the invention being only limited as defined in the accompanying claims.

I claim:

1. In a cylinder lock, a casing having mounted therein a hollow cylinder defined by two semi-cylindrical sections, securing means for holding said semi-cylindrical sections together, a plurality of tumblers slidably mounted in said cylinder, said cylinder having therethrough a first series of lateral perforations, the upper ends of the tumblers passing through said perforations, resilient means in the cylinder urging all the tumblers therein in one direction so that said upper ends of the tumblers normally project beyond the outer surface of the cylinder to lock the cylinder to said casing, each of the tumblers having thereon a lateral shoulder for coacting with a key when

the latter is inserted in the cylinder to move said tumblers downwardly to withdraw said ends of the tumblers into said cylinder.

2. A lock as defined in claim 1, wherein said securing means includes a cover for each end of the cylinder, said covers holding said semi-cylindrical sections together in a cylindrical shape, one of said covers defining a key way.

3. A cylinder lock as defined in claim 1, wherein said tumblers are H-shaped, the ends of the tumblers on one side of the cross-bar of the H defining said upper ends.

4. A cylinder lock as defined in claim 3, wherein said cylinder has a second series of lateral perforations there-through on the side of said cylinder opposite said first series, the lower ends of said tumblers being receivable in said second series of perforations, at least upon insertion of said key, both series of perforations guiding the tumblers during their sliding movement in the cylinder, said first series of perforations being through one of said semi-cylindrical sections and the second series of perforations being through the other semi-cylindrical section.

5. A cylinder lock as defined in claim 4, including axial extending guide means in said cylinder for guiding said tumblers.

6. A cylinder lock as defined in claim 5 wherein said securing means includes covers at each end of the cylinder for holding the semi-cylindrical sections in cylindrical position, one of said covers defining a key way.

7. A cylinder lock, as defined in claim 6, including an axially extending connecting pin slidably mounted in said other cover for sliding axial movement, said pin having an inner end being positioned within said cylinder, resilient means normally urging said inner end toward said key way whereby when a key is inserted into the cylinder, the forward end of the key will contact the inner end of said pin to urge said pin rearwardly of the cylinder so that the outer end of said pin will be forced into operative connection with the bolt of the lock.

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