A. MANTANFEL.

CYLINDER LOCK.

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1,406,574. Patented Feb. 14, 1922.

Fig. 1

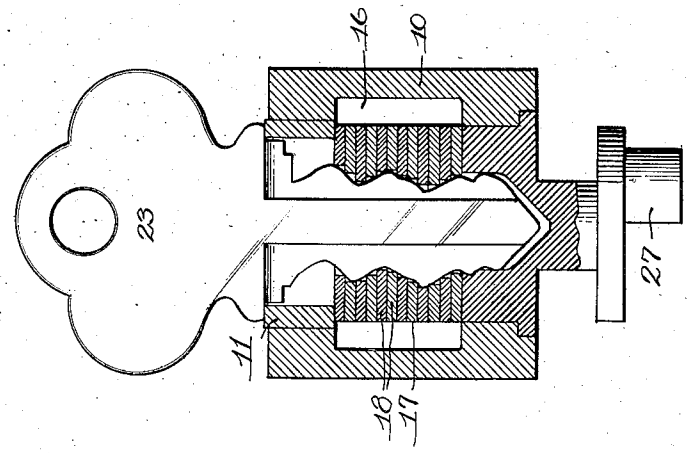


Fig. 2

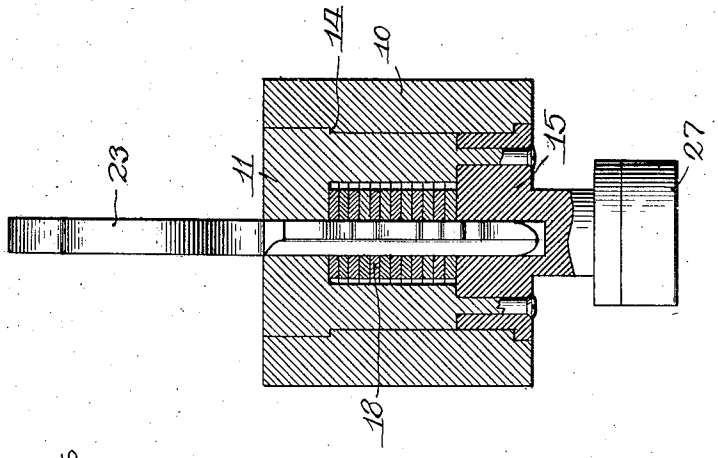


Fig. 3

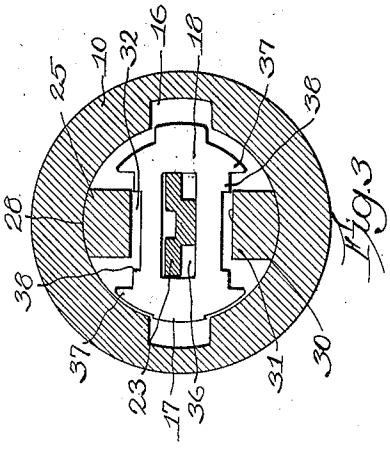
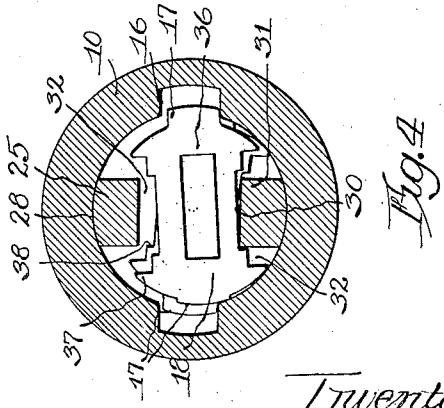


Fig. 4



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UNITED STATES PATENT OFFICE.

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CYLINDER LOCK.

1,406,574. Specification of Letters Patent. Patented Feb. 14, 1922.

Application filed February 26, 1921. Serial No. 447,933.

To all whom it may concern:

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

The invention relates to cylinder locks.

The object of the invention is to provide a lock with improved tumblers which will be locked to the plug against transverse movement in the plug when attempt is made to pick the lock by rotating the plug to frictionally hold the tumblers and the insertion of a wire to shift them out of interlocking position.

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

In the drawings: Fig. 1 is a longitudinal section of a lock embodying the invention, the key being shown in the lock. Fig. 2 is a section on line 2—2 of Fig. 1. Fig. 3 is a transverse section, the key being inserted. Fig. 4 is a similar view, the key being withdrawn.

The invention is exemplified in a lock comprising a barrel or cylinder 10 in which is rotatably mounted a plug 11 which is shouldered, as at 14, to engage a corresponding shoulder in the cylinder to hold the plug against backward longitudinal movement. The plug comprises sides 25 which extend longitudinally through the cylinder and a back-plate 15 is suitably secured, as by riveting, to the plug sides 25. The rear end of the plug is provided with a pin 27 or any other suitable means for operating the bolt to be controlled by the lock, as well understood in the art. The cylinder is provided with grooves 16 which are disposed at diametrically opposite points to receive the ends 17 of a series of plate tumblers 18 which are slidable transversely of the plug. The ends 17 of the tumblers are adapted to enter the recesses 16 and to be withdrawn therefrom when all of the tumblers are properly positioned by the correct key. The outer faces 28 of the sides 25 are curved to conform to the inner periphery of the cylindrical bore of the cylinder 10 and their inner faces 30 are straight to form a guideway for the tumblers. The sides terminate in shoulders or edges 31 so that the spaces 32 will be formed between the sides and the cylinder. The tumblers are formed of plates which fit loosely between the faces 30 of the plug sides 25 and are provided with slots 36, through which a suitable key 23 is adapted to pass, and by which they will be shifted in their planes and positioned to bring both of their ends within the plug. The tumblers are provided with stepped hooks or shoulders 37 and 38, and either of these shoulders is adapted to interlock with one of the edges 31 of the plug sides, depending upon the position in which the tumblers are left when the key is withdrawn. When any tumbler is shifted so that either of its ends will project from the plug, either one or the other of the stepped shoulders will be positioned to lock the tumblers against movement in its plane or transversely of the plug. The tumblers, being loose in the plug, may assume different positions depending upon the position in which they are left by the key terminal. The inner end of the key is tapered laterally as at 23^a and transversely, as at 23^b, so as to direct the key into the slots in the tumblers, notwithstanding any disarrangement resulting from looseness of the tumblers in the plug. The edges of the key are substantially parallel, as well understood in the art and the slots are differently positioned in the tumblers respectively, so that when the key is withdrawn, each tumbler will, at one end or the other, project into one of the recesses 16, except when it is centrally positioned by the key.

The proper key will engage the ends of the slots in all of the tumblers and position them centrally in the plug, as shown in Fig. 1.

The invention exemplifies a lock in which plate tumblers are loosely mounted in the plug and in which an interlock is effected between the plug and the tumblers by stepped shoulders or hooks which prevent the tumblers from being shifted to releasing position by any means except the proper key. An important characteristic of this construction is that the stepped lugs will hold the tumblers in different or irregular transverse positions, depending upon the position in which they are left when the key is withdrawn. In some instances, the hooks 37 will be positioned to prevent transverse movement of the tumblers and, in others,

the shoulders 38 will be positioned to do so. As a result, the tumblers will be locked in different relative positions which will make it practically impossible to pick the lock. Furthermore, the shoulders 37 serve to prevent the tumblers from slipping through the guide-way when the plug is withdrawn from the cylinder.

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 plug rotatably mounted in the casing, key-operable plate-tumblers transversely movable of and mounted in the plug and relatively stepped stop-devices between one side of the tumblers and the plug adapted to overlap when the plug is rotated relatively to the tumblers, to prevent the transverse movement of the tumblers in the plug.

2. In a cylinder lock, the combination of a casing, a plug rotatably mounted in the casing, key-operable plate-tumblers transversely movable of and loosely mounted in the plug and relatively stepped stop-devices between one side of the tumblers and the plug adapted to overlap when the plug is rotated relatively to the tumblers, to prevent the transverse movement of the tumblers in the plug.

3. In a cylinder lock, the combination of a casing, a plug rotatably mounted in the casing and provided with sides, key-operable plate-tumblers transversely movable of and mounted in the plug and relatively stepped stop-devices between one of the plug-sides and both ends of the tumblers adapted to overlap the plug-sides when the plug is rotated relatively to the tumblers, to prevent transverse movement of the tumblers in the plug.

4. In a cylinder lock, the combination of a casing, a plug rotatably mounted in the casing, key-operable plate-tumblers transversely movable in the plug, lugs on the tumblers adapted to overlap the plug when the latter is rotated relatively to the tumblers to prevent the transverse-movement of the tumblers in the plug, and additional lugs on the tumblers disposed outwardly of the first mentioned lugs.

5. In a cylinder lock, the combination of a casing, a plug rotatably mounted in the casing, key-operable plate-tumblers transversely movable of and loosely mounted in the plug, lugs on the tumblers adapted to overlap the plug when the latter is rotated relatively to the tumblers to prevent transverse movement of the tumblers in the plug, and additional lugs on the tumblers disposed outwardly of the first mentioned lugs.

6. In a cylinder lock, the combination of a casing, a plug rotatably mounted in the casing and provided with sides, key-operable plate-tumblers transversely movable of and loosely mounted in the plug, lugs on the tumblers adapted to overlap the plug-sides when the plug is rotated relatively to the tumblers to prevent transverse movement of the tumblers in the plug and additional lugs on the tumblers for preventing them from sliding through the plug.

7. In a cylinder-lock, the combination of a casing, a plug rotatably mounted in the casing and comprising a front, a back and side bars, key-operable plate-tumblers transversely movable of and loosely mounted in the plug, lugs on the tumblers adjacent both ends of said bars respectively adapted to overlap the side-bars when the plug is rotated relatively to the tumblers to prevent transverse movement of the tumblers in the plug, and additional lugs at both ends of the tumblers to prevent them from sliding through the plug.

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