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RETAINER FOR SPRING BIASED TUMBLERS OF A CYLINDER LOCK

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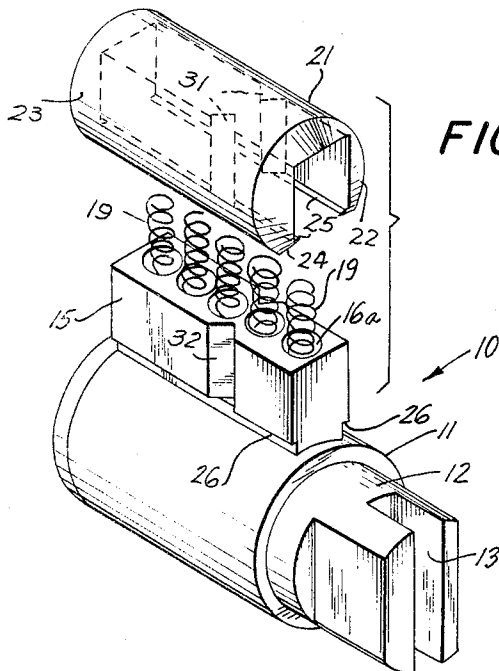


FIG. 1

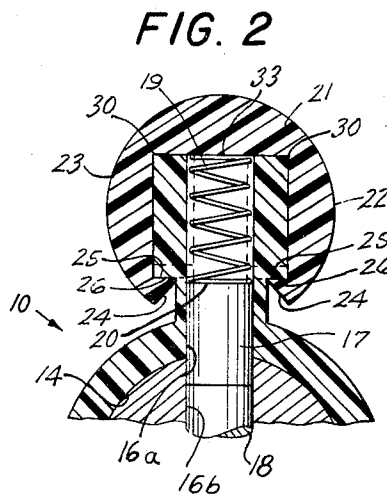


FIG. 2

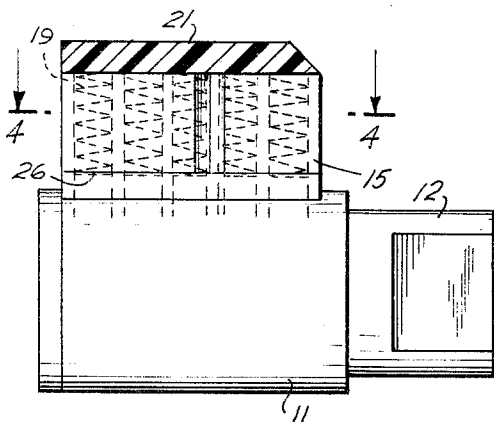


FIG. 3

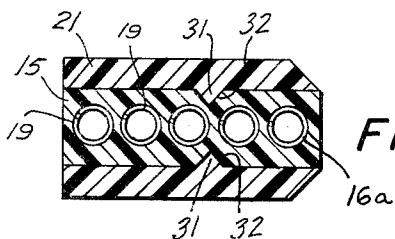


FIG. 4

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1

2

3,209,568

RETAINER FOR SPRING BIASED TUMBLERS OF A CYLINDER LOCK

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1 Claim. (Cl. 70—373)

This invention relates to a lock, and more particularly to a pin tumbler lock of the type in which a lock plug is rotatably mounted within a casing and wherein rotation of the plug within the casing by unauthorized persons is prevented by a plurality of pins reciprocally mounted within the plug casing.

Still more particularly, this invention relates to an improved lock plug having a novel capping element whereby assembly of the locking pins and the springs for operating the locking pins into the unit as a whole is greatly facilitated.

Still more particularly, this invention relates to a lock assembly and capping element of novel construction whereby the capping element may be permanently assembled to the casing by relative movement between the capping element and the casing in a direction normal to the axis of rotation of the plug.

In locks of the type described, generally known as pin tumbler locks, the plug and lock casing are provided with a row of mating cross bores, in which cross bores there are charged driver and follower pins, and driver springs for actuating the same. The springs have their innermost end biased against the outermost end of the driver pins, the outermost ends of the springs being pressed against a backing element carried by the casing. In the normal pin tumbler lock, the backing element constitutes a plate, the side edges of which are supported in opposed grooves or slots formed in the casing. As it is necessary for the driver springs to be compressed when in operative position, it will be understood that the same normally project beyond the outer end of the cross bores until the backing element or plate is inserted.

In locks of the type heretofore known, the insertion of the backing plate has been relatively time consuming, due to the fact that each spring must be individually depressed to a point within the casing beneath the level of the plate before the plate can be slid over or in covering position of the spring. Various forms of jigs have been devised to facilitate holding the springs down for insertion of the slide plate. However, despite such jigs, the application of such plate has, in all instances, remained a difficult and time-consuming step.

In view of the above, it is an object of the invention to provide a lock assembly wherein the driver springs need not be individually depressed in completing the assembly of the plug.

A further object of the invention is the provision of a lock wherein the capping element against which the outer end of the driver springs are biased may be applied by a linear sliding movement in the direction normal to the axis of rotation of the plug.

Reference will now be made to the accompanying drawings, forming a part hereof, in which

FIGURE 1 is a preassembled perspective view of a lock in accordance with the invention;

FIGURE 2 is a fragmentary magnified vertical transverse section of the parts in assembled condition;

FIGURE 3 is a longitudinal section through the lock device in accordance with the invention;

FIGURE 4 is a horizontal section taken on the line 4—4 of FIGURE 3.

In accordance with the invention, there is provided a

lock assembly 10 including a casing 11 and a rotatable plug 12. The plug, on its innermost end, bears the usual latch operating connector 13.

The casing 11 is provided with a longitudinally extending main bore 14, within which the cylindrical body portion of the plug 12 is rotatably mounted. The casing 11 is provided with a pin tumbler housing extension 15, which extension may be formed integrally with the casing or, if desired, may be a separate element fastened to the casing.

The extension 15 is provided with a row of radially extending cross bores 16a which communicate with the main bore 14. The plug 12, in the standard manner, is provided with a row of cross bores 16b which, in the locked condition of the plug, form continuations of the bores 16a.

In the usual manner, driver pins 17 and follower pins 18 are reciprocally mounted in the cross bores 16a, 16b. The usual driver springs 19 are disposed within the extension 15 above the driver pins, the innermost end 20 of the springs bearing against the outer end of the driven pins 17.

It will be understood that when the springs 19 are compressed, they act in the usual manner to project the driver pins across the shear line defined between the outer periphery of the plug and the inner periphery of the main bore, at which position rotation of the plug will be impossible. A properly bitted key, engaging the follower pins, raises the junction of the driver and follower pins to the shear line, thereby permitting rotation of the plug.

After the pins and springs have been positioned in the manner shown in FIGURE 1, the springs are compressed against a portion of capping element 21. In known structures, the outer ends of the springs are pressed against a plate or like abutment which must be inserted longitudinally, i.e. by sliding the same into position by movement in the direction of the axis of rotation of the plug. It will be understood that to accomplish such sliding movement, the springs 19 must be serially depressed as the plate passes thereover.

The present capping element 21 is susceptible of rapid assembly with the lock by a radial movement, i.e. a movement in the direction of the cross bores. The capping element 21 is resilient and may preferably be fabricated of a nylon or similar plastic. The element 21 includes a pair of downwardly extending legs 22, 23, portions 24, 24 of the lowermost ends of said legs being formed to define cam surfaces.

Directly inward from the portions 24, 24, the legs 22, 23 are provided with inwardly extending locking shoulders 25, 25. The casing extension 15 is similarly provided with opposed locking shoulders 26, 26. Application of the capping member 21 to the lock is effected by forcing the capping member 21 downwardly over the extension 15.

It will be readily recognized from FIGURES 1 and 2 that as the capping element 21 is shifted downwardly, cam surfaces 24, 24 will engage the uppermost edges 30, 30 of the extension 15, which will act as followers, cooperating with said cam surfaces to spread the legs 22, 23. The legs will remain spread until the cooperative locking shoulders 25 of the cap come adjacent the locking shoulders 26 of the extension 15, whereupon legs 22, 23 will snap together, maintaining the locking shoulders in abutting relationship.

In order to facilitate the accurate alignment of the capping element 21 and the extension 15, the capping element 21 is provided with inwardly extending ribs 31, 31, which mate with conforming grooves 32, 32 in the extension 15. It will be understood that once the cap element is applied, the mating ribs and grooves will pre-

3

vent any longitudinal forward and rearward movement of the capping element in respect of the lock body. The locked position of the cap is to be contrasted with assemblies heretofore known wherein the spring retainer plate is either shiftable or requires an additional manufacturing step to limit the longitudinal shiftable thereof.

The springs 19 will be pressed against the inner surface 33 of the capping element between the legs 22, 23, thereby compressing the spring so that the latter may provide the pin driving function aforesaid.

It will be recognized that with the construction aforesaid, the capping element may be applied by a single downward movement, and no progressive depression of the springs is required.

Likewise, the customary holding jigs for the springs may be dispensed with.

Should it be necessary to remove the capping element, such removal may be effected by the use of a sharp tool inserted between the capping element and the extension, such tool being used to pry one or both of the legs 22, 23 laterally.

Having thus described the invention and illustrated its use, what is claimed as new and is desired to be secured by Letters Patent is:

A lock assembly comprising a casing having a cylindrical bore, a pin chamber extension member on said casing, a cylindrical plug rotatably mounted in said cylindrical bore, a row of radial cross bores extending through said extension member and into said plug, a plurality of

4

locking pins in each of said cross bores, coiled driver springs in each of said cross bores, each having an inner end bearing against the outermost pin in a cross bore, a resilient, generally U-shaped capping element insertible into assembled position on said extension member by relative movement of said capping element over said extension radially in the direction of the axes of said cross bores, said capping element including leg members, cooperative cam and follower portions on said members positioned to engage and spread said leg members as said capping element is moved radially over said extension and cooperative locking shoulders on said extension and said leg members, a bottom portion of said capping element between said leg members bearing against said outer ends of said springs in the assembled position of said capping element on said extension member, said capping element and extension member including mating rib and groove portions extending parallel with the axes of said cross bores for preventing relative sliding movement of said capping element and said casing in the direction of the axis of said main bore.

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