LOCK PLUG CONSTRUCTION


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12 Claims. (Cl. 70-364)

This invention relates to improvements in cylinder locks, and more particularly to the construction of the tumbler plugs thereof, and is filed as a substitute for the abandoned application to Olson, Serial No. 728,734 filed June 2, 1934 for Lock Plug Construction.

An object of the invention is to provide a lock which can be manufactured economically in large quantities for use in automobiles and the like. More specifically, objects of the invention are to provide a lock tumbler cylinder which can be made largely by die-casting, die-cast metal, although quite accurate when first produced, is subject to warping and becoming distorted, and is much too soft to withstand the wear of the insertion of the key and movement of the tumbler with the retention of the requisite accuracy in guiding and aligning the tumblers for unlocking, and for guiding the key in accurate relation with the tumblers. Therefore I provide a die-casting having bar inserts which provide guiding surfaces for the tumblers, define the keyway in cooperation with the inner sides of the tumblers, retain the tumblers in the plug, and facilitate the assembly of the lock.

Other objects and advantages will become apparent from a full understanding of the invention, which is illustrated in the accompanying drawings, taken with reference to the accompanying drawing, in which:

Fig. 1 is a cross section of a cylinder lock plug embodying my invention, and is taken substantially on the line 1—1 of Fig. 2;

Fig. 2 is a side elevation of the plug, looking from the right side of Fig. 1;

Fig. 3 is a front end elevation of the plug, with a portion broken away to the plane of the line 3—3 of Fig. 1;

Fig. 4 is a longitudinal section looking up on the line 4—4 of Fig. 1;

Fig. 5 is a perspective view of the body portion of the plug, with the near half broken away to the line 5—5 of Fig. 4;

Fig. 6 is a cross section of the plug, as shown in Fig. 1;

Fig. 7 is a cross section of a modified form of the lock plug; and

Fig. 8 is a fragmental elevation of the form shown in Fig. 7.

Referring particularly to the first six figures, I provide a cylindrical body portion 9 which is die-cast solid in one piece so that it has a central longitudinally extending slot 10 of one section, and two rows of transversely extending tumbler slots 11 which intersect the central slot at either side thereof, as more clearly shown in Fig. 6.

The inner side 12 of one end of the tumbler slots coincides with the adjacent side of the enlarged end portion 10a of the slot 10, and the slot is enlarged or widened to provide a spring seat step 13, and to overlap the opposite end of the central slot. The tumbler slots may be oppositely arranged, as shown, to more evenly distribute the metal in the body.

The plate tumblers 14 are slidably mounted in the transverse slots so that one end thereof will normally project from the surface of the plug for locking, and the tumblers are withdrawn and positioned so that the ends are flush with the surface of the plug by the insertion of a suitable key which has lateral surfaces for engaging lugs 15, as will be understood, the lugs being formed on the inner edge of the tumblers and project into the keyway formed in the center slot.

The outer sides of the tumblers are stepped at 16 to accommodate a small coiled spring 17 which is inserted in the slot and compressed against the shoulder 13 for pressing the tumbler outwardly from the plug. The inner edge 18 of the larger end portion of the slots 11 overlies the end of the central slot so that the tumblers may be inserted; and shoulders 18a formed by raised portions 18b adjacent the lugs 15, are provided on the tumblers so that, by inserting bars 19 in the slots provided by the end sections 10a of the slot 10, the tumblers are locked in the plug, and their outward movement is limited, and their normal position is determined by the abutment of the shoulders 18 against the inner corners of the bars 18.

The outer end of the plug is provided with a circumferential flange 20 to which is secured, as by spinning, a cover plate 21 which covers the ends of the bars 19 and thus secures them in position. The plate has a central keyway aperture 22 which coincides with and is a continuation of the keyway which is defined in the slot 10 by the bars 19 and the raised surfaces 18b of the tumblers which may or may not coincide with the corresponding sides of the slot 10. Thus, wearing surfaces of brass, of which the tumblers and bars are preferably made, are provided on all sides of the keyway, and the cover may be of steel and hardened so that the insertion aperture will not wear.

Manifestly the assembling is very simple and easily accomplished, by inserting the desired combination of the tumblers in the slots, with their springs 17, pressing in the bars 19, and
spinning on the cap 21. The essential guiding and wearing surfaces are furnished by the insert bars 19 and the tumblers, and no machinery of the body is required for the long wear and ability to withstand frequent use and much abuse is assured.

In the form shown in the last two figures, double tumblers 23 are inserted in straight tumbler slots 22, and the tumbler plates have operating apertures 26 for receiving coil springs 26 for pressing the plates apart so that their ends project outward.

The transverse slots 24 are cut out at one end 26 to permit the passage of the tumbler lug 21 in inserting the plates, and the tumblers are retained in the plug by the insertion of the longitudinal bars 27 in the same manner as described for the first form.

Thus the plugs are constructed of but a few standardized parts, and no individual fitting is required in producing the plugs. Obviously the tumblers may be selected and arranged so that the key may be inserted either side up.

Having thus described my invention, I claim:

1. In a lock construction, a cylinder plug comprising a body portion having a longitudinal keyway slot and transverse tumbler slots therein, widened slots formed at the ends of the keyway slot, bars of wear resisting metal inserted in said widened slots and forming sides of the keyway, and a cover member secured to the end of the body portion for retaining the bars in position.

2. In a lock construction, a cylinder plug having therein a longitudinal keyway and transverse tumbler slots intersecting the keyway, bars longitudinally insertable in the plug for forming sides of the keyway, and a cover secured to the end of the plug covering the ends of the bars and having an aperture registering with and forming a continuation of the keyway.

3. In a lock, a cylinder plug having a longitudinal keyway and a plurality of transverse tumbler slots laterally intersecting the keyway, shouldered tumblers insertable in the tumbler slots, and longitudinal extending bars inserted in the plug to form the top and bottom of the keyway and for cooperating with said shoulders to retain the tumblers assembled in the plug.

4. In a lock, a cylinder plug having a longitudinal keyway and a row of transversely slidable shouldered tumblers at opposite sides of the keyway having key engaging portions projecting into the keyway, and a bar longitudinally insertable in the plug at one side of the keyway between tumblers at opposite sides thereof for engaging shoulder portions of the tumblers and thus limiting the outward movements thereof.

5. In a lock, a cylinder plug having a central longitudinal keyway and a row of plate tumblers slidable in the plug at opposite sides of the keyway and having key engaging portions projecting into the keyway, bars inserted longitudinally into the plug between the rows of tumblers for retaining the tumblers and forming the opposite sides of the keyway, and a cover plate fixed to the end of the plug and covering the ends of the bars.

6. A cylinder lock plug having a longitudinal keyway, a row of tumbler slots laterally intersecting the opposite sides of the keyway, lock tumblers insertable in the slots and having key engaging portions for projecting into the keyway, one end of said slots being widened to permit the insertion of the tumblers, the tumblers having reduced end portions and bars longitudinally insertable in the plug at the other sides of the keyway for restricting the widened ends of the slots and retaining the tumblers.

7. A cylinder lock plug of die-cast metal having a longitudinal keyway and a row of transverse tumbler slots at opposite sides of the keyway and communicating therewith, one end of the slots being widened to form a spring-seat in the side away from the keyway and overlap the keyway at one end of the inner side to permit the insertion of tumblers having key engaging portions projecting into the keyway, and longitudinal slots in communicating relation with the other opposite sides of the keyway and intersecting the widened portions of the tumbler slots and bars inserted in the longitudinal slots for restricting the widened ends of the tumbler slots to retain the tumblers assembled in relation to the plug.

8. In a lock, a solid cylindrical plug of die-cast metal, the plug having a longitudinal keyway centrally formed therein, rows of tumblers transversely slidable in the plug and having portions projecting into the keyway, and bars of wear resisting metal longitudinally insertable in the plug and forming sides of the keyway and providing retainers for limiting the outward movement of the tumblers.

9. A lock comprising a solid cylindrical plug having a central four-sided keyway, rows of transverse slots intersecting opposite sides of the keyway, and longitudinal slots intersecting the other opposite sides of the keyway, lock tumblers slidable in the transverse slots, the outer sides of the tumblers and slots being relatively stepped for accommodating springs for projecting the tumblers, the tumblers having portions projecting into the keyway, one end of the slots being widened to overlap the keyway to permit the insertion of the tumblers, and longitudinally insertable bars for restricting the widened ends of the slots to retain the tumblers.

10. In a lock, a solid lock cylinder plug having a central four-sided keyway, transverse slots on the opposite sides of and intersecting the keyway, a pair of plate tumblers inserted in each slot, the tumblers being apertured to receive and compress a spring therebetween and having wear resisting portions projecting into the keyway, one end of each transverse slot being widened to overlap the keyway to permit the insertion of the pairs of tumblers, a bar inserted in the plug at the other opposite sides of the keyway to form wear resisting surfaces and to restrict the widened ends of the transverse slots and limit the outward movement of the tumblers, and a cap fixed on the end of the plug for retaining said bars, the cap having an aperture forming a continuation of the keyway.

11. In a lock, a solid cylinder plug having a central slot of I section extending longitudinally therein, a row of transverse slots intersecting the end portions of the I section and communicating with the medial portion of the same.

12. In a lock, a solid cylinder plug having a central slot of I section extending longitudinally therein, a row of tumbler slots at either side of and intersecting the central slot, the outer sides of the tumbler slots being stepped to provide a spring seat, the inner sides of the slots coinciding with the side of the end portion of the I section of the central slot, at one end, and overlapping said side at the opposite end.

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