March 22, 1932. F. K. HEYER 1,850,323

LOCK

Filed Aug. 23, 1929

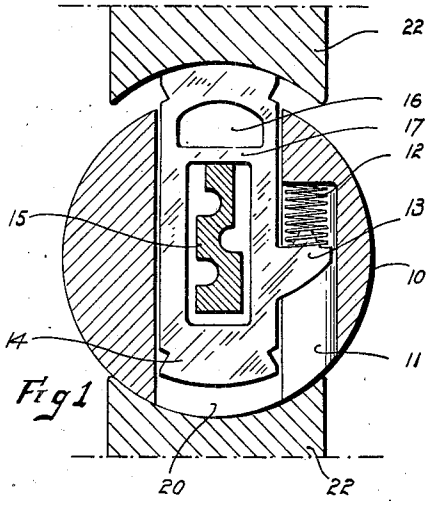


Fig 1

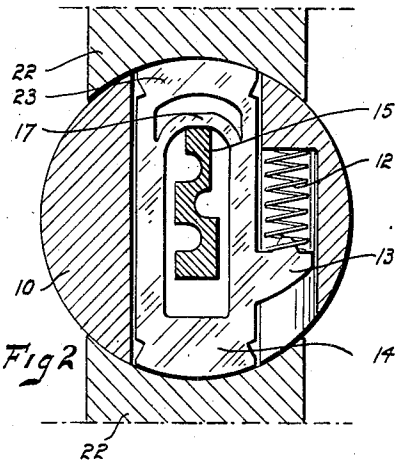


Fig 2

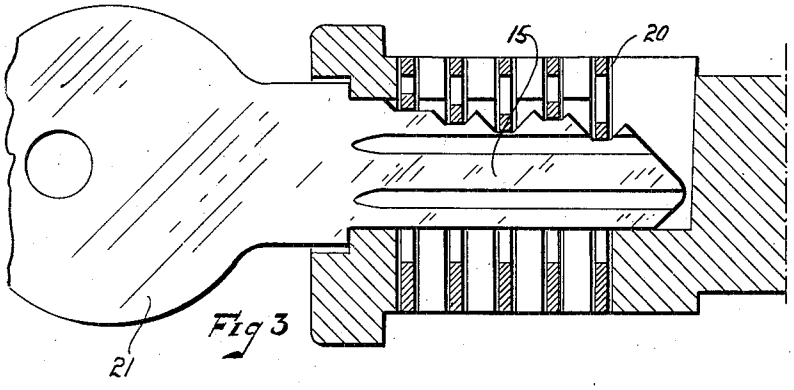


Fig 3

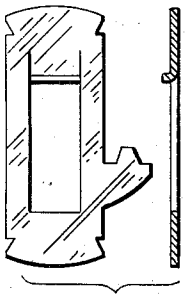


Fig 9

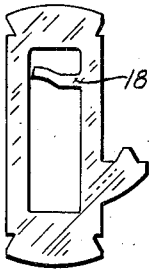


Fig 4

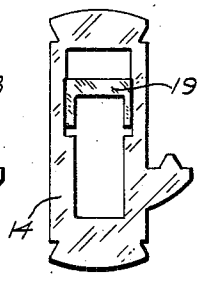


Fig 5

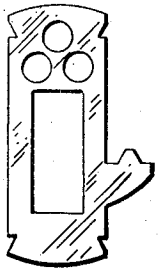


Fig 6

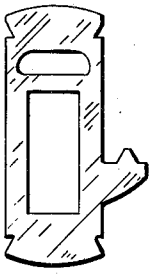


Fig 7

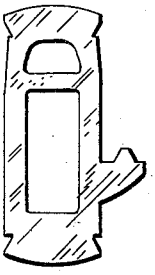


Fig 8

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UNITED STATES PATENT OFFICE

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LOCK

Application filed August 23, 1929. Serial No. 387,912.

This invention relates to cylinder plugs of the type employing spring pressed sliding tumblers adapted to be operated by a key.

In the manufacture of plugs of this type, it has been common to employ a specific number of different tumblers corresponding to the key changes available at each bitting of the key, and to assemble the particular tumblers required by the particular configuration of the key used. It will be readily appreciated that this method of assembly involves a great deal of labor and necessitates much skill in the matching up of the key bittings and the various tumblers corresponding to the key changes.

It is the object of my invention to devise a lock of the sliding tumbler type in which all of the tumblers are to be of the same construction and wherein the tumblers will be adjusted relatively to the key after assembly. In carrying out this object I use a series of adjustable tumblers which are inserted and held within the plug. To adapt any plug for any particular key, it is merely necessary to insert the key and then compress or adjust the tumblers relatively to that key so as to line up the tumblers with the plug periphery while said tumblers are in contact with the key.

My invention is particularly adaptable to the automobile business, wherein it is desirable to insert key plugs into various locking devices while the automobiles are on the assembly line. For instance, if it is desired to insert a series of plugs into four different locking devices of an automobile, all to be operated by the same key, the operator need have but one key which is readily insertible successively into four different plugs which may at that time be adjusted to the same key, and then inserted into the locking devices. Thus, my lock may be sold to the various automobile manufacturers in a form embodying a key plug having a series of tumblers all of the same size and configuration, each of the tumblers being readily operable by a key to occupy a definite position in the plug, each of the tumblers having a specially manufactured and prepared portion adapted to facilitate the simultaneous adjustment or other adaptation of the tumbler to the key contour and the plug periphery. This invention has broad possibilities, and while I will show and describe one modification of a specially prepared tumbler and plug, it should be understood that many adaptations of the basic principle may be devised by one skilled in the art, without departing from the scope of the invention, as defined in the appended claims.

My invention is more particularly described in the following specification and in the drawings wherein Fig. 1 is a section through my plug and the tool for assembling and adjusting the tumblers. Fig. 2 is a view similar to Fig. 1 showing the tumblers in adjusted relation relatively to the key and plug. Fig. 3 is a longitudinal cross section of my plug showing the relation of the key thereto. Figs. 4, 5, 6, 7, 8, and 9 are plan views of modifications of tumbler constructions available for use with my invention.

Referring more particularly to the drawings, reference numeral 10, indicates a sliding plug lock having a vertical bore 11 adapted to carry a compression spring 12 which operates on the shoulder 13 of a sliding tumbler 14 in the usual manner common to such locks. The sliding tumbler is adapted to be actuated by the bitted key shank 15 against the pressure of the spring 12 so as to set the tumbler in accordance with the bitting of the particular key used.

It will be observed that my tumbler is of peculiar construction having a cut-away portion 16 leaving a shoulder 17 which is adapted to be actuated by the key. Looking at Figs. 4 to 9, other modifications of this type of tumbler will be observed. Fig. 4 shows a tumbler having a weakened shoulder 18. Fig. 5 shows a tumbler having a key actuated portion 19 which is frictionally held in contact with the main tumbler 14. This frictional contact may constitute a sort of rabbeted or other type of contact. Figs. 6, 7, 8 and 9 show similar portions weakened for allowance of adjustment of the tumbler.

In assembling the plug, the tumblers are all inserted into their various chambers 20 as seen more particularly from Fig. 3 and the

key 21 is then inserted to contact with the various tumblers as shown. The plug with the key and tumblers in position is then inserted between two jaws 22 of an assembly tool. These jaws are then brought together so as to conform with the circular configuration of the plug 10. It will be readily understood that when the upper jaw 22 comes down against the plug body, it will compress the tumblers 14 so that the cross bar 17 will be made to conform with the bitting of the key, while the outside controlling portion 23 of the tumbler is made to conform with the plug contour. The same method of operation will apply to the various other modifications of the tumblers. While I have shown this particular method of adjusting the tumblers, it is possible to strengthen the key actuated shoulder and compress the outer peripheral portions of the tumblers to correspond with the plug configuration.

I claim:

1. In a key plug, a tumbler having a relatively strong peripheral controlling portion, and a weak key actuated portion, whereby it may be compressed against the key to adjust the peripheral controlling portion to maintain a releasing position, while the key actuated portion is in contact with the key.

2. A one-piece tumbler having a key actuable central portion and an outer controlling portion adjustable relatively to said central portion.

3. A tumbler having a key contacting central portion, and an outer portion adjustable relatively to said central portion.

4. A tumbler having a key contacting portion and an outer controlling portion, said key contacting portion being adjustable relatively to said outer portion.

5. A tumbler of the sliding plate type having a central cut-out portion for traversal by a key, said tumbler having also an upward cut-out portion forming a shoulder with said central cut-out portion for cooperating with the key.

6. In a lock, a key plug, a one-piece plate tumbler having a key actuable portion and a controlling peripheral portion and slidably mounted in the plug, said tumbler being cut-out adjacent to said key actuable portion to allow for the adjustment of said portion relatively to the main body and the controlling portion of the tumbler.

7. A tumbler of the sliding plate type having a controlling peripheral portion and a central cut-out portion for the passage of a key, the key being cooperable with one edge of said cut-out portion for operating said tumbler, said tumbler being further cut out to form an opening between the key operating edge and the peripheral controlling portion so as to permit adjustment of said key actuable edge and said peripheral portion relatively to each other.

8. In a tumbler plug, a tumbler adapted to be actuated by a key, said tumbler having a part thereof adjustable by compression against the key, and a second part simultaneously adjustable to the plug periphery.

9. In a tumbler plug, a tumbler chamber, a tumbler adapted to operate in said chamber and to be actuated by the plug key, said tumbler having a part thereof adjustable by compression against the key.

10. In a tumbler plug, a tumbler chamber, a tumbler adapted to operate in said chamber and to be actuated by the plug key, said tumbler having a part thereof adjustable by compression of the tumbler against the key.

11. In a tumbler lock, a tumbler adapted to be actuated by a key, the key actuated portion of said tumbler being adjustable relatively to said tumbler by compression of the tumbler against the key.

12. In a tumbler lock, a tumbler having a key actuated portion and a controlling peripheral portion, said key actuated portion being adjustable relatively to said peripheral portion by compression of said tumbler.

13. In a tumbler plug, a tumbler having a key actuated portion and a controlling peripheral portion, said key actuated portion being adjustable relatively to said peripheral portion by a compressing action against said peripheral portion while said key actuated portion is in contact with the key.

14. In a tumbler plug, a tumbler having a key actuated portion and a controlling peripheral portion, said peripheral portion being adjustable relatively to said key actuated portion by compression of said tumbler against the key.

15. In a tumbler plug, a tumbler having a key contacting portion and a peripheral controlling portion, said portions being adjustable relatively to each other and to the plug and key contours.

16. In a tumbler plug, a tumbler having a key actuated portion and a peripheral controlling portion, said tumbler being adjustable by compression against said peripheral portion so as to adjust each of said portions relatively to the plug and key contours.

17. In a tumbler plug, a tumbler having a key actuated portion and a peripheral controlling portion, the tumbler body between said portions being weakened so as to facilitate adjustment of said portions relatively to each other and the plug and key contours.

18. In a tumbler plug, a tumbler having a key actuated portion and a peripheral controlling portion, the tumbler body adjacent one of said portions being weakened so as to facilitate adjustment of said portions relatively to each other and the plug and key contours, while said key actuated portion is in contact with the key.

19. In a tumbler plug, tumbler chambers, key operated tumblers adapted to operate in

said chambers, said tumblers, having key actuated and peripheral controlling portions, said tumblers being specifically prepared for facilitated adjustment to the contour of the key plug while said key actuated portions are in contact with the key.

20. In a tumbler plug, a plurality of tumbler chambers, tumblers in said chambers, said tumblers being adjustable and initially upstanding beyond the plug periphery when actuated by a key, said tumblers being specially prepared for facilitated adjustment said tumblers to conform to the key contour and the plug periphery.

21. In a tumbler plug, a plurality of tumbler chambers, a keyway for the key of said plug, key operable tumblers in said chambers, said tumblers being compressible and initially held upstanding beyond the plug periphery when in contact with the lowest bitting of the key, said tumblers being compressible against said key to conform to the plug periphery.

22. In a tumbler plug, a plurality of tumbler chambers, plate sliding tumblers mounted in said chambers and spring pressed in an outward direction, said tumblers being key operable against the pressure of said springs, said tumblers being compressible and initially held upstanding beyond the plug periphery when actuated by the key, said tumblers being compressible against said key to conform to the plug periphery.

23. The method of assembling a tumbler plug which consists in inserting the key and tumblers, and then compressing the tumblers to conform to the plug periphery.

24. The method of assembling a tumbler plug which consists in inserting the key and a group of tumblers having portions thereof specially prepared for adjustment, and then adjusting the tumblers to conform to the key and plug contours.

25. The method of assembling a tumbler plug which consists in inserting adjustable tumblers into their chambers, placing the key in the plug keyway, and compressing said tumblers to conform to the key contour and the plug periphery.

26. As an article of manufacture, a key plug having a series of tumbler chambers, spring pressed tumblers mounted in said chambers, certain of said tumblers being compressible but of such initial size as to project beyond the plug periphery when actuated against said spring pressure by the lowest bitting of a plug key.

27. As an article of commerce and independent sale, a key plug having a series of tumblers all of the same size and configuration, each of said tumblers being readily operable by a key to occupy a definite position in said key plug, said tumblers being specially manufactured and prepared so that when manipulated into a definite position by a key, they may be readily operated upon to conform simultaneously to the periphery of the plug and the bittings of the key.

28. As an article of commerce and independent sale, a key plug having a series of tumblers of the same size and configuration, each of said tumblers being centrally cut out for operation by a key to occupy a definite position in said key plug, said tumblers being specially manufactured and prepared so that portions of the same are weakened for ready adjustment and adaptation to different keys, whereby when manipulated into a definite position by a key, they may be operated upon to conform simultaneously to the periphery of the plug and the bittings of the key.

29. As an article of commerce and independent sale, a key plug having a series of tumblers all of the same size and configuration, and adapted to operate in said plug, each of said tumblers being readily operable by a key to occupy a definite position in said key plug, each of said tumblers having specially manufactured and prepared portions to facilitate simultaneous adjustment and adaptation of said tumblers to the key contour, and the plug periphery.

30. As an article of commerce and independent sale, a key plug having a series of tumblers adapted to operate in said plug, each of said tumblers being readily operable by a key to occupy a definite position in said key plug, each of said tumblers having specially manufactured and prepared portions to facilitate simultaneous adjustment and adaptation of said tumblers to the key contour, and the plug periphery.

Signed at Stamford, in the county of Fairfield and State of Connecticut, this 17th day of August A. D. 1929.

FREDERIC K. HEYER.