

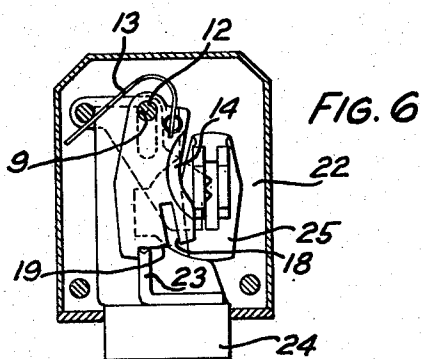
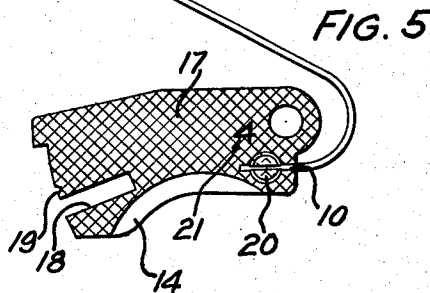
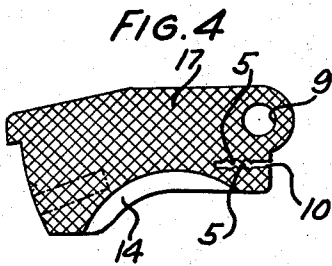
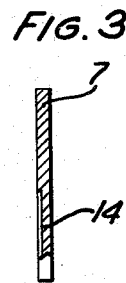
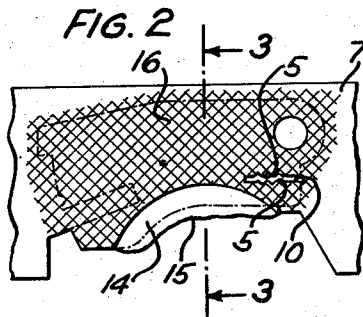
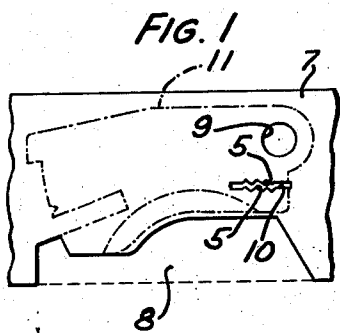
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2,114,032

LOCK PARTS AND METHOD OF FORMING THEM

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LOCK PARTS AND METHOD OF FORMING THEM

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7 Claims. (Cl. 29—148)

This invention relates to lock parts and a method of forming them, and more particularly to tumblers for rotor center tumbler type locks used in telephone pay stations and a method of manufacturing them.

In locks for telephone pay stations, of the type shown in the patent to O. A. Shann No. 1,793,254, patented February 17, 1931, movable and fixed tumblers are provided. The movable tumblers in this type of lock must be moved about a pivot through predetermined distances to bring their "code" notches into alignment and to position where a projecting portion of the bolt may pass into the aligned notches. It has been found that if the portion of the tumblers which pass into the notches or slots of a key are made thinner and the slots or notches are made narrower, the lock is harder to open with an improper key. However, the portion of the tumblers which will be engaged by the projecting portion of the bolt when an attempt is made to operate the lock with an improper key must be of sufficient thickness to prevent the bolt from being withdrawn.

It is an object of this invention to provide a simple and inexpensive tumbler for locks and an economical method of manufacturing it.

In accordance with one embodiment, it is proposed to provide a tumbler having a pivot hole, and code and safety notches perforated therein, a spring rigidly gripped in a toothed slot perforated in the tumbler and a semi-circular depression swaged in the tumbler at one edge thereof to cooperate with the slots or notches in the edge of a key. In accordance with the invention such a tumbler is formed by perforating the toothed slot and pivot hole in a strip of sheet metal stock and cutting away a portion of the strip, swaging a portion of the stock adjacent the cutaway portion and knurling or serrating a surface of the tumbler, cutting a blank tumbler from that area of the strip which includes the swaged portion, pivot hole and toothed slot, and staking a spring in the toothed slot and cutting the code and safety notches in the tumbler.

A better understanding of the invention will be had from the following detailed description when taken in conjunction with the accompanying drawing, wherein

Fig. 1 is a plan view of a section of sheet metal strip illustrating the first step of the improved method of forming tumblers;

Fig. 2 is another view of the same strip illustrating another step in the method contemplated by the invention;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a plan view of a blank in the third step of its formation into a tumbler;

Fig. 5 is a plan view of the tumbler shown in Fig. 4 after the final forming operation and assembly therewith of the spring, and

Fig. 6 is a plan view of a rotor center tumbler type lock with a tumbler formed according to the method illustrated in Figs. 1 to 5 assembled therein.

In Fig. 1 there is shown a fragment 7 of a strip of sheet metal stock from which a portion 8 has been cut by a punching operation, and in which a circular aperture 9 and a toothed slot 10 having cooperating gripping surfaces 5—5 have been perforated. The circular aperture 9 will serve in the finally formed tumbler which is indicated by dot and dash lines 11 (Figs. 1 and 2) as a pivot hole which will cooperate with a pivot pin 12 (Fig. 6) in a lock. The toothed slot 10 will in the completed tumbler receive and clamp a spring 13. The portion 8 of the sheet metal stock 7 is preliminarily cut from the sheet at the same time that the slot 10 and aperture 9 are punched therein.

The portion 8 of the strip is removed so that in the next succeeding operation as illustrated in Figs. 2 and 3, the material from the stock will be able to flow away from the formed portion of the tumbler as indicated by the dot and dash lines when a swaging operation is performed thereon. In the step illustrated in Figs. 2 and 3, the stock is swaged at 14 to reduce the thickness of the stock as shown in Fig. 3. This will tend to force some of the metal from the stock to the position as shown by the uneven line at 15. Simultaneously with the swaging of the lower portion (Figs. 2 and 3) of the sheet metal stock, a knurled or serrated pattern as indicated at 16 is embossed on the surface of the stock in the area roughly included by the outline of the part being formed. The serrations or knurling is embossed on the stock to minimize possibility of the stock curling due to the swaging operation.

After the sheet metal strip has been perforated, slotted, swaged and embossed with the design as shown in Fig. 2, a blank 17, of the configuration shown in Fig. 4, which it will be noted conforms to the outlines as shown in Figs. 1 and 2, will be punched from the blank and sheared or shaved along its lower edge as shown by the dot and dash line at the bottom of Fig. 2 and solid line of Fig. 4 to form the blank 17 to substantially its final outline.

After the blank 17 has been formed to the shape shown in Fig. 4, a spring 13 is positioned in the slot 10 and concurrently a code notch 18 and a safety notch 19 are cut in the blank 17 by a punch press operation which simultaneously ring-stakes the spring 13 in the slot 10 as indicated at 20 and embosses a code number as indicated at 21 by the digit "4".

After a tumbler has been formed in accordance with the steps outlined hereinbefore, it may be assembled as shown in Fig. 6 in a lock indicated generally by the numeral 22 wherein it is pivoted about a pin or rivet 12 and urged by its spring 13 to rotate in an anti-clockwise direction about said pin or rivet 12 and wherein the reduced portion 14 may cooperate with a key to rotate the tumbler about its pivot 12 until, if the proper key is used, the tumbler or tumblers of the lock will have moved in an arcuate path to permit a lug 23 on a lock bolt 24 to move under the actuation of the barrel or center 25 into the code notch 18.

A tumbler of the type disclosed hereinbefore and manufactured by the method disclosed hereinbefore may be used in locks of the types shown in the patent to O. A. Shann, No. 1,793,254, patented February 17, 1931.

What is claimed is:

1. In a lock, a tumbler having a circular aperture therein for pivotally supporting the tumbler in the lock, a code notch and a safety notch cut in the tumbler, a pair of cooperating gripping surfaces for receiving a spring, and a reduced portion of metal hardened by swaging.

2. In a lock, a tumbler having a circular aperture therein for pivotally supporting the tumbler in the lock, a code notch and a safety notch cut in the tumbler, a pair of cooperating gripping surfaces, a reduced portion of metal hardened by swaging, and a tumbler spring held in place between said gripping surfaces by ring-staking the metal of the tumbler into gripping engagement with the spring.

3. A method of forming tumblers for rotor center tumbler type locks comprising punching a circular aperture and a toothed slot in a strip of metal, forming an edge of the strip of metal to a predetermined contour, simultaneously knurling or serrating the surface of the strip and swaging a semi-circular depression along the edge formed to a predetermined contour, punching a blank from the strip within the area swaged and knurled, positioning a spring in the toothed slot,

and concurrently ring-staking the spring in place and cutting a plurality of notches in the blank.

4. A method of forming tumblers for rotor center tumbler type locks comprising punching a circular aperture and a toothed slot in a strip of metal, forming an edge of the strip of metal to a predetermined contour conforming at one portion of the configuration of the finally formed tumbler, simultaneously knurling or serrating the surface of the strip and swaging a semi-circular depression along the edge formed to a predetermined contour, punching a blank from the strip within the area swaged and knurled, positioning a spring in the toothed slot, and concurrently ring-staking the spring in place and cutting a plurality of notches in the blank.

5. A method of forming tumblers for rotor center tumbler type locks comprising simultaneously punching a circular aperture, a toothed aperture and an irregularly shaped segment from a strip of sheet metal stock, simultaneously swaging an edge of the sheet metal stock adjacent the place where said irregularly shaped segment was punched out and serrating or knurling the surface of said strip to flatten it, punching a blank from the strip within the area swaged and serrated or knurled, and simultaneously cutting a code notch and a safety notch in the blank and ring-staking a spring in the toothed slot.

6. A method of forming tumblers for rotor center tumbler type locks comprising punching a circular aperture and a toothed slot in a strip of metal, forming an edge of the strip of metal to a predetermined contour, swaging a semi-circular depression along the edge formed to a predetermined contour, punching a blank from the strip within the area swaged and knurled, positioning a spring in the toothed slot, and concurrently ring-staking the spring in place and cutting a plurality of notches in the blank.

7. A method of forming tumblers for rotor center tumbler type locks comprising punching a circular aperture in a strip of metal, forming an edge of the strip of metal to a predetermined contour, simultaneously knurling or serrating the surface of the strip and swaging a semi-circular depression along the edge formed to a predetermined contour, punching a blank from the strip within the area swaged and knurled, and cutting a plurality of notches in the blank.

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