Feb. 21, 1956 H. E. SOREF ET AL 2,735,165

METHOD OF ASSEMBLING LOCK TUMBLER PINS OR THE LIKE

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Fig. 1.

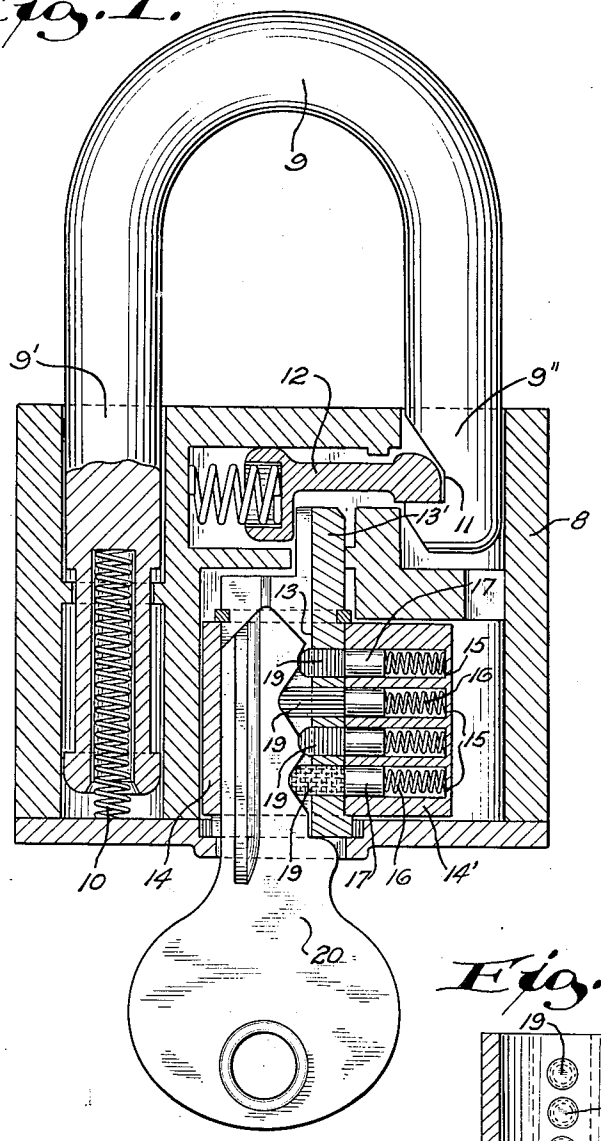


Fig. 2.

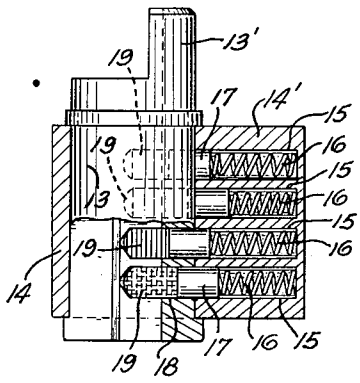


Fig. 3.

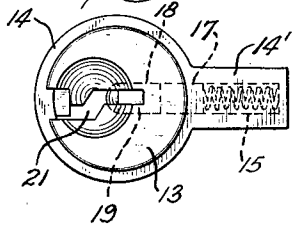


Fig. 5.

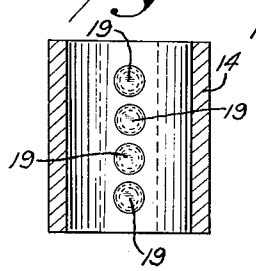
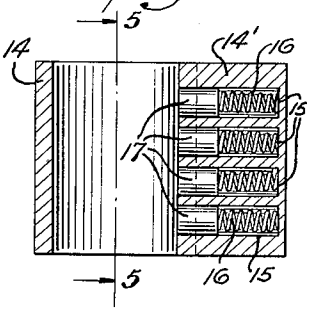


Fig. 4.



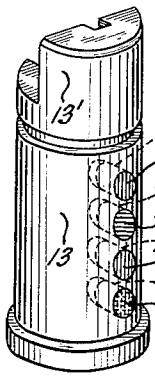


Fig. 6.

INVENTORS
Harry E. Soref &
Daniel J. Foote,
BY
Morsell & Morsell
ATTORNEYS

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METHOD OF ASSEMBLING LOCK TUMBLER PINS OR THE LIKE

Harry E. Soref and Daniel J. Foote, Milwaukee, Wis., assignors to Master Lock Company, Milwaukee, Wis., a corporation of Wisconsin

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10 Claims. (Cl. 29—407)

This invention relates to improvements in the method of assembling lock tumbler pins or the like.

In certain types of locks the lock body or casing contains a cylinder assembly into which a particularly shaped key is inserted to actuate certain tumbler pins or the like to operate and release the lock. In locks of this type, the cylinder assembly includes a cylinder or shell having reciprocatably mounted in transverse bores therein spring actuated driver pins, and a cylindrical plug is rotatably mounted within the shell or cylinder, which plug has transverse bores therein alining with the bores in the shell and adapted to reciprocatably hold a series of different length tumbler pins.

Rotation of the plug for lock releasing purposes is made possible by the insertion of a proper key in the plug key slot which then retracts the tumbler pins to a position wherein the breaks between the tumbler pins and alined driver pins correspond with the outer surface of the plug. The lengths of the tumbler pins in a given lock, to provide individuality for said lock, vary according to the predetermined cuts, notches or serrations in an edge of the key shank.

Heretofore, in the lock manufacturing industry it has been the practice to store the different classes of tumbler pins or like actuating parts, in different containers in order to segregate the pins or the like according to their particular sizes or lengths. The tumbler pins or the like of different classes vary minutely in size or length and the various sizes are not readily discernable or distinguishable to the assembler, with the result that wrong sized tumbler pins or the like may be improperly assembled in the plug, resulting in a defective or inoperative lock. This conventional mode of assembling lock tumbler pins or the like is extremely slow and tedious, requires unduly skilled and expert help, and many defective lock assemblies unavoidably result.

With the foregoing in mind, it is a general object of the present invention to provide an improved method of assembling lock tumbler pins and the like wherein the various classes of tumbler pins or like operating members bear different surface coloring and are hence readily distinguishable by the assembler for insertion in the proper portions of the cylinder plug according to the requirements for the lock being assembled as prescribed by a color chart or the like.

While it has heretofore been the practice to assemble different size tumbler pins or the like in a lock by means of numbers assigned to each size of tumbler pin, the present invention aims at the simplification of this procedure by having the tumbler pins or the like distinctively colored whereby said members may be assembled according to color, which is simpler for the assembler to follow.

A further object of the invention is to provide a method of assembling lock tumbler pins or the like whereby an inspector can check the colors of the pins assembled in a given lock against a chart and thus easily determine whether or not the particular lock has been properly assembled.

A further object of the invention is to provide a method of assembling lock tumbler pins or the like which is commercially practical and expeditious, which is simple and reduces the hazard of errors, and which is well adapted for the purposes described.

With the above and other objects in view the invention consists of the improved method of assembling lock tumbler pins or the like, and all of the parts, steps and combinations incident thereto.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a longitudinal view of a lock assembled with the improved different colored tumbler pins, parts being broken away and in section;

Fig. 2 is a longitudinal sectional view of the shell and plug assembly with the driver springs, driver pins and tumbler pins in place, parts being broken away and in section;

Fig. 3 is a bottom end view of the subassemblage shown in in Fig. 2;

Fig. 4 is a longitudinal sectional view of the shell with the driver springs and driver pins therein;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4; and

Fig. 6 is a perspective view of the plug with the properly colored different length tumbler pins therein before the assembly of the plug with the shell.

Although the invention is more generally applicable and is not to be restricted thereto, the improved method of assembling lock plug pins or the like will be described in connection with a lock of the type illustrated in Fig. 1 of the drawings. The lock body or casing is indicated by the numeral **8** and the interior of the same has partitions and walls to define cavities for certain of the lock mechanisms. As is conventional in locks of this type there is mounted in the body and extending outwardly of the inner or upper end thereof, a shackle **9** having an extension arm portion **9'** thereof extending into a cavity in the body **8** and being mounted on a shackle spring **10** to permit yielding reciprocatory movement of the shackle, when released, and swinging movement thereof. The shorter arm portion **9''** of the shackle is adapted, for locking purposes, to enter another cavity in the body and to have a shouldered portion **11** entered by a spring urged lock lever **12**. The latter is set and released by means of the mutilated projecting inner end portion **13'** of a slotted cylindrical plug **13** shown in detail in Fig. 6 and forming part of a cylinder assembly, which assembly also includes a shell **14**. The shell **14** is of less length than the plug **13** and encloses the plug in a manner so that the plug may turn in the shell, with the shell being anchored against turning movement by a lateral extension portion **14'** on the shell, confined within a suitable recess therefor in the body, when the lock mechanism is completely assembled.

The lateral extension portion **14'** of the shell is provided with a series of bores **15** closed at their outer ends but opening at their inner ends through the inner wall of the main cylindrical portion of the shell **14**. Each bore **15** has mounted therein, against a spring **16**, a reciprocatable driver pin **17**, said driver pins all being of the same length.

The plug **13** is also provided in one wall portion with a series of transverse bores **18** open at both ends and which, when the plug and shell are assembled, aline with the shell bores **15** and form continuations thereof. Adapted to be reciprocatably mounted within the plug bores **18** are tumbler pins **19** which, in a given assemblage, are of predetermined varying lengths and which, due to their

individual coloring, are of the utmost importance in the present invention. It may be further stated that when the assemblage is locked the spring urged driver pins **17** may project the tumbler pins **19** radially inwardly so that the condition of Fig. 2 results with the driver pins extending partially into the bores **18** of the plug to thereby prevent relative turning movement between the plug and shell. However, when a proper key **20** is inserted into the slot **21** therefor in the plug, the tumbler pins **19** are forced outwardly to urge the driver pins **17** out of the plug bores **18** so that the abutting ends of the series of pins **17** and **19** lie along the line of separation of the plug **13** and shell **14** to permit turning movement of the plug relative to the shell, whereby the mutilated end **13'** of the plug can operate the lever **12**.

The individuality of the lock above described and illustrated is, of course, dependent upon the series of different length tumbler pins **19** fitted into the plug **13** to cooperate with the mating notches of a proper key **20**. In the embodiment illustrated, the tumbler pins **19** as assembled in the plug from top to bottom are colored respectively red, blue, red and yellow. The two red pins are, of course, of the same length while the blue and yellow pins are of different lengths. The lengths of the tumbler pins used in the various bores of a plug **13** in a given lock vary according to the predetermined serrations or notches in the particular key **20** therefor. The individuality of the particular lock illustrated is, therefore, dependent upon the lengths of the tumbler pins **19** utilized therein.

It will, of course, be appreciated that in other types of locks the body or casing **8** may be bored to receive the driver springs and driver pins with the plug being operable within the case. However, the present invention is concerned primarily with the different coloring of predetermined sized tumbler pins or equivalent members which, for a given lock, must be selected from a range of sizes and then be operatively mounted in the plug or its equivalent.

Heretofore, in the lock manufacturing industry, it has been the practice to provide the various classes or sizes of tumbler pins or the like in separate containers from which the assembler, pursuant to a particular specification for the lock being assembled, would successively pick from the individual containers the proper tumbler pins or the like for insertion into the proper bores **18** of the cylinder. The tumbler pins and equivalent devices are, however, of small size and, because of slight differences of length up to one-thousandths of an inch, size differentiations in respect to pins or the like are not easily discernible to the assembler. Consequently, erroneous sized tumbler pins or the like are not recognized and improper assemblies often result which require scrapping. The conventional method of assembly is furthermore very slow and requires unduly expert assemblers.

In the present invention, each class of tumbler pins or the like bears a different surface coloring making each group of pins of a certain length readily distinguishable from groups of pins of other lengths. Therefore, the assembler, for a particular lock, need only select the pins of predetermined lengths according to a color chart or other specification provided for the lock being assembled, and insert the properly selected pins into proper bores **18** of the plug **13**.

As will be observed from the drawing, Fig. 6 illustrates a plug **13** after the particular pins for the lock being assembled have been inserted into the proper bores **18** pursuant to a specification, the illustrated embodiment having from top to bottom, pins colored respectively red, blue, red and yellow. After the selected pins are thus easily and quickly chosen and inserted into the proper bores **18** of the plug **13**, the plug is telescoped into the shell **14**, as shown in Fig. 2, the shell extension **14'** having previously been arranged with the driver springs **15** and driver pins **17**, as in Fig. 4.

The plug and shell assemblage with the proper tumbler pins, is then mounted in the lock case **8** in the manner shown in Fig. 1 and the lock, with the proper series of tumbler pins therein, is in operable condition. Moreover, the lock, and/or the plug and shell assemblage is susceptible of easy and quick inspection. An inspector need ony check the series of different colored pins **19** in the shell against the color chart or specification for that particular lock and if the colors of the pins match with the chart of specifications, the inspector can be satisfied that the plug and shell assemblage has been properly made.

By having the various classes or sizes of tumbler pins distinctively surface colored, the identification of parts stored in stockrooms, bins, pans or containers is also greatly simplified and the ready identification of the various classes of pins minimizes errors, speeds up production, and relieves eyestrain.

It should, of course, be understood that in a given lock assemblage any desired number of tumbler pins may be utilized and that the identification of the characteristic parts of a lock by the coloring system utilized is applicable not only to tumbler pins, but also to operating discs, levers or other component parts which are of varying lengths.

The improved method of assembling lock tumbler pins or the like is simple, practical, time and error saving and well adapted for the purposes set forth.

What is claimed as the invention is:

1. In a method of assembling a lock wherein the individuality of the lock is dependent upon the spaced mounting within the lock of different sized key actuated movable elements, the steps of providing different precolored, different sized elements with all of the elements of the same size bearing the same color, preparing a specification which designates by color the elements to be used in certain positions in the specific lock assemblage, and finally operatively mounting the prescribed colored elements in the lock assemblage pursuant to the specification.

2. In the method of assembling a lock wherein the individuality of the lock is dependent upon the spaced mounting within the lock of different sized movable elements cooperable with a specially shaped key, the steps of providing groups of different sized precolored elements with all of the elements of the same size bearing the same color and the color of the elements of each group being different from the color of the elements of the other group, and then operatively mounting different colored elements in predetermined positions in the lock assemblage pursuant to a specification.

3. In the method of assembling and checking a lock wherein the individuality of the lock is dependent upon the selective mounting within the lock of different sized key actuated movable elements, the steps of providing segregated groups of different sized precolored elements with all of the element of the same size bearing the same color and the color of the elements of each group being different from the color of the elements of the other groups, then successively operatively mounting different colored elements in predetermined positions in the lock assemblage pursuant to a color chart, and finally checking the assembled lock by visually comparing the colored elements therein and their positions with the specifications of the color chart.

4. In the method of assembling a lock, the steps of forming a lock plug with a series of transverse bores therein, providing groups of different length tumbler pins with all of the pins of the same length bearing the same color, and the color of the pins of each group being different from the color of the pins of the other groups, providing a specification which designates by color the pins to be mounted in the various plug bores, operatively mounting the prescribed pins in the designated plug bores pursuant to the specification, and then mounting the pin-loaded plug in the lock.

5. In the method of assembling a lock wherein the individuality of the lock is dependent upon the spaced mounting within the lock of different sized key actuated movable tumbler pins, the steps of applying different coloring to the surface portions of each sized pin with all of the pins of the same size bearing the same color, providing a specification which designates by color the sized pins to be used in certain positions in the specific lock assemblage, and finally operatively inserting the prescribed pins in the lock cylinder plug pursuant to the specification.

6. In the method of assembling a lock wherein the individuality of the lock is dependent upon the selective mounting within the lock of different sized key actuated movable elements, the steps of providing segregated groups of different sized precolored key-controlled elements with all of the elements of the same size bearing the same color and the color of the elements of each group being different from the color of the elements of the other groups, and then selecting from the segregated groups different colored elements pursuant to a prepared color chart and mounting the same in predetermined positions in the lock assemblage.

7. The method of preparing a lock cylinder assembly for installation in a lock controlled by a special key which comprises, providing a cylinder plug with a series of transverse bores therein, providing groups of different length tumbler pins with all of the pins of the same length bearing the same color, and the color of the pins of each group being different from the color of the pins of the other groups, providing a specification which designates by color the pins to be mounted in the various plug bores, operatively mounting the prescribed pins in the designated plug bores pursuant to the specification, and then operatively mounting the pin-loaded plug in a driver-pin equipped cylinder shell.

8. The method of preparing a special lock cylinder assembly for installation in a lock controlled by a special key which comprises, providing a cylinder plug with a series of transverse bores therein, providing groups of different length precolored tumbler pins with all of the

pins of the same length bearing the same color, and the color of the pins of each group being different from the color of the pins of the other groups, providing a specification which designates by color the pins to be mounted in the various plug bores, operatively mounting the prescribed pins in the designated plug bores pursuant to the specification, and then operatively mounting the pin-loaded plug in a driver-pin equipped cylinder shell in a manner so that the outer ends of the colored tumbler pins in the plug aline with and are engaged by the ends of driver pins in the shell.

9. In the method of assembling a lock wherein the individuality of the lock is dependent upon the selective mounting within the lock of different sized key actuated movable pins, the steps of providing groups of not readily discernible different sized, but precolored key-controlled pins with all of the pins of the same size bearing the same color and the color of the pins of each size group being different from the color of the pins of the other groups whereby they may be readily visually differentiated, and then selecting from the groups different colored pins pursuant to a prepared color chart and mounting the pins in predetermined positions in the lock assemblage.

10. In the method of assembling a lock wherein the individuality of the lock is dependent upon the selective mounting within the lock of movable elements of different classes, the steps of providing the different classes of said movable elements in different colors, and then visually selecting different colored elements and operatively mounting the same in the lock assemblage in a predetermined relationship pursuant to a color specification applicable to the lock being assembled.

References Cited in the file of this patent

UNITED STATES PATENTS

1,204,410	Christoph	Nov. 14, 1916
1,437,832	Bradley, Jr.	Dec. 5, 1922
1,738,710	Jones	Dec. 10, 1929
1,953,535	Hurd	Apr. 3, 1934