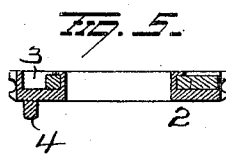
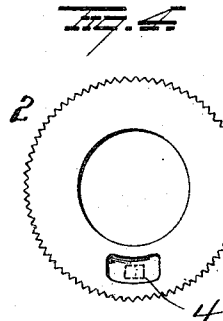
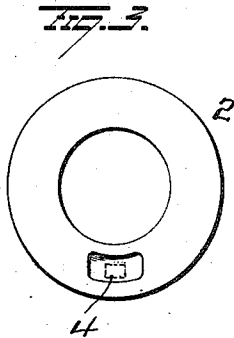
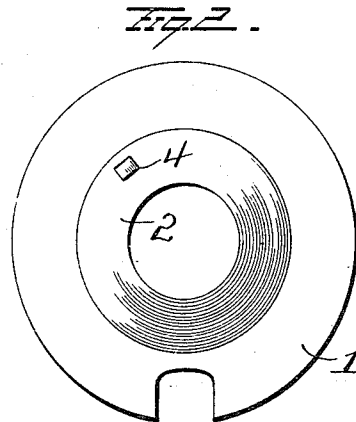
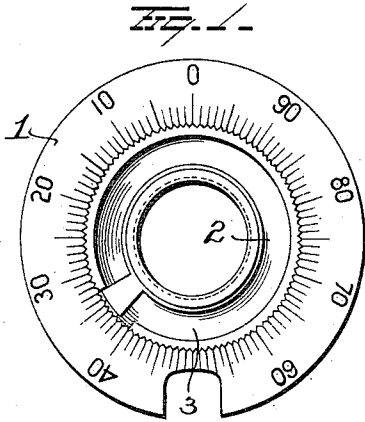


R. C. LEWIS.  
METHOD OF MAKING TUMBLERS FOR COMBINATION LOCKS.  
APPLICATION FILED JUNE 16, 1909.

985,609.

Patented Feb. 28, 1911.



WITNESSES  
E. Nottingham  
G. J. Downing

INVENTOR  
R. C. Lewis  
By H. A. Seymour  
Attorney

# UNITED STATES PATENT OFFICE.

ROLLIN C. LEWIS, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE & TOWNE MANUFACTURING COMPANY, OF STAMFORD, CONNECTICUT.

METHOD OF MAKING TUMBLERS FOR COMBINATION-LOCKS.

985,609.

Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed June 16, 1909. Serial No. 502,613.

*To all whom it may concern:*

Be it known that I, ROLLIN C. LEWIS, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Methods of Making Tumblers for Combination-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in method of making tumblers for combination locks. In tumblers for this type of lock each has a pin for engaging and turning the next tumbler of the series, the said pin resting and moving within a curved recess in the next adjacent tumbler, and heretofore it has been customary to make the pins independent of the tumblers and secure them to the latter. These pins work loose and are sometimes dislodged, thus causing trouble and in some instances a lock-out.

The object of this invention is to so construct the tumblers as to prevent the possibility of the dislodgment of the pins, and it consists in forming the engaging pin of the tumbler integral with the body of the tumbler.

In the accompanying drawings, Figures 1 and 2 are views in elevation respectively of the opposite sides of a combination lock tumbler. Fig. 3 is a view of the inner disk prior to the formation of the teeth. Fig. 4 is a view in elevation of the inner disk after the formation of the teeth, and Fig. 5 is a view in transverse central section of the inner disk completed.

The tumbler consists of an outer section 1 having an open center and a toothed inner wall, and an inner section 2 having an open center and a toothed periphery the two parts being assembled and detachably secured together in the usual and well known manner. The inner section 2 is provided with a central circular opening and with a groove 3 in one face concentric with the opening, and on its opposite face with an integral pin 4, which latter, when the tumblers of the lock are assembled, rests within the groove 3 of the next adjacent tumbler.

In the manufacture of these tumblers I punch from a sheet of metal of the proper thickness, a disk the full diameter of the

outer section 1, and from the center of this disk, I punch the smaller inner section 2. The section 2 is then swaged so as to increase its diameter slightly, so that after it has been finished it will still be of a size to snugly fit within the open center of the outer section.

Prior to the finishing operation the inner section or driving member 2 is operated upon by a series of dies and punches, the latter being of greater area than the area of the recess in the dies, by which the metal to form the pin is projected by the punch into the die or similar tool. The displacement of metal by the punch, forces the metal on the opposite side of member 2 into the die which imparts the general shape to the projecting pin. By using punches of greater size than the recesses in the dies, the metal projected to form the pin, is not cut or partly severed as it would be were the die and punch of the same size, but is simply displaced by the punch and caused to flow into the die without weakening the connection between the pin and its carrying member. By this displacement of metal a projection is formed on one side of the section 2 and a recess on the opposite side, and by subjecting the section 2 to a series of such operations, a projection sufficiently long to form the pin 4 is formed. After the pin has been formed, the periphery of section 2 is toothed to conform to the teeth of the outer section 1, and its face on the side opposite the pin is grooved as shown in Figs. 1 and 5 to receive the spring locking ring usually employed for holding the sections 1 and 2 in their proper relative positions, after which the inner section is placed within the outer section with the teeth of the two sections intermeshing. By forming an annular groove as shown, in the face of the driving member 2, the recess formed by the punch is enlarged or obliterated. By this method of forming the pin integral with its tumbler I provide against the possibility of any disarrangement of the lock due to the loosening up, or displacement of the pins, and simplify and cheapen the cost of manufacture.

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is:—

The method of making tumblers for com-

bination locks, consisting in punching the center from a metal disk, swaging said central section to increase its diameter, forcing a section of the metal of said central section  
5 outwardly from one face and shaping the metal so dislodged to form a pin, forming teeth on the outer edge of the central section and the edge of the opening in the outer section, and placing the inner section within

the outer section, with the teeth in the two 10 sections intermeshing.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ROLLIN C. LEWIS.

Witnesses:

EWART WESSON,

J. A. GAYLOR.

---

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

---