

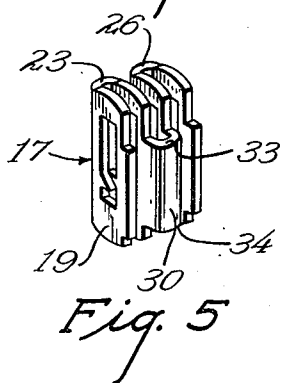
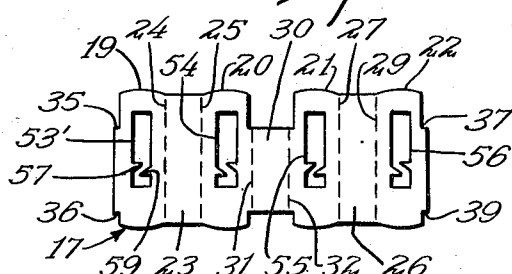
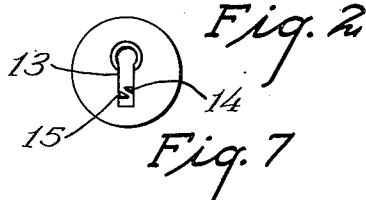
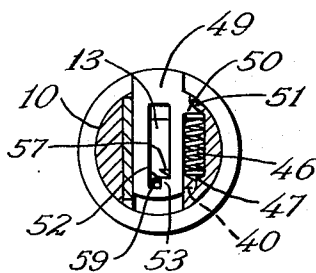
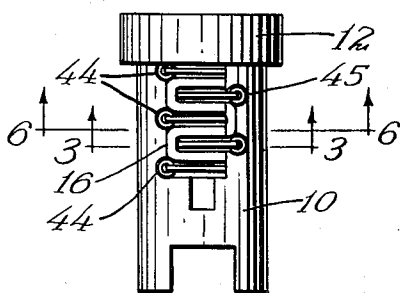
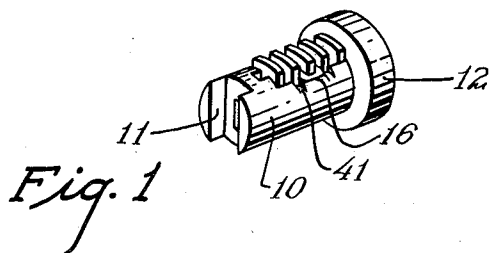
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L. J. JANNETTE

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TUMBLER LOCK

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INVENTOR

Lawrence J. Jannette

BY

Robert M. Dunning

ATTORNEY

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TUMBLER LOCK

Lawrence J. Jannette, St. Paul, Minn.

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This invention relates to an improvement in tumbler locks and deals particularly with a novel and unusual manner of constructing the tumbler partitions so as to simplify the manufacture and assembly operation.

Tumbler locks usually include a rotatable cylinder, having a series of radially slidable tumblers mounted in spaced relation therein. These tumblers are usually urged beyond the periphery of the cylinder by small individual compression springs. Between the individual tumblers, partitions are provided which confine the tumblers and hold them in proper relation. These partitions are usually provided with apertures to accommodate the key. The end portions of the cylinder is usually equipped with inwardly extending projections which engage into longitudinal grooves in the surface of the key. The various tumblers are also usually apertured to accommodate the key and the edges of the apertures are so arranged that the tumblers will all be retracted within the entire diameter of the cylinder through the use of a proper key.

The object of the present invention lies in the provision of a tumbler partition structure which is made in one piece. One of the most costly parts of a tumbler lock of the type described in the assembling of the lock. The cost of inserting a series of tumbler partitions of extremely small size in the cylinder and of anchoring them in place forms a substantial part of the cost of the lock. With the present construction, the entire partition assembly can be inserted as a unit.

Another object of the present invention lies in providing the partitions with inwardly projecting guides which extend into the longitudinal key grooves. These guides hold the key from tilting while within the cylinder and provide a smoother acting lock structure in which the key is at all times properly guided.

Cast plungers with integral partitions have been produced, but these castings are costly due to their intricacy. As the partitions must contain apertures through which the key extends the castings are difficult to produce.

A feature of the present invention resides in the provision of a tumbler lock having a series of tumblers spaced by partitions and in forming the partitions in spaced relation in an elongated strip and thereafter bending the strip to fold the partitions into parallel relation. The cylinder is shaped to accommodate this partition construction and after the partitions are in place the tumbler springs and the tumblers inserted may be anchored in place with comparative ease.

It is a feature of the present invention that through the use of my partition construction the cost of the resulting tumbler locks may be considerably reduced. Not only does the present construction simplify the lock assembly, but also it is possible to provide a single partition piece which takes the place of four separately formed individual pieces. As a result the tumbler assembly can be formed and the assembly bent into proper shape at a lower cost than would be the cost of forming the separate partitions.

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These and other objects and novel features of my invention will be more clearly and fully set forth in the following specifications and claims.

In the drawings forming a part of the specifications:

5 Figure 1 is a perspective view of a tumbler lock cylinder showing the same in assembled form.

Figure 2 is a top plan view of the tumbler cylinder, illustrated in Figure 1.

10 Figure 3 is a sectional view through the tumbler cylinder, the position of the section being indicated by the line 3—3 of Figure 2.

Figure 4 is a diametrical view of the blank from which the partition structure is formed.

15 Figure 5 is a perspective view of the partition structure in completed form.

Figure 6 is a view similar to Figure 3, the position of the section being indicated by the line 6—6 of Figure 2.

20 Figure 7 is a front elevation view of the tumbler lock. As tumbler locks are well known in the art, the complete assembly is not illustrated. It should be understood that the tumbler cylinder 10 illustrated in the drawings fits into a housing designed to accommodate it and that the tumblers mounted upon the cylinder 10 either 25 permit or else prevent the rotation of the cylinder, thereby permitting the lock to be operated or held from operation.

The cylinder 10 is held in its housing in the normal manner and includes a transverse slot or other such element as indicated at 11 to engage a latching element for operation. The cylinder 10 is shown with a flange 12 at one end which is normally used for holding the lock tumbler mechanism from longitudinal movement.

35 The cylinder 10 is provided with a key slot 13 extending axially into the cylinder, this slot being shaped to fit a suitable key. The key is normally grooved longitudinally and the slot 13 is provided with projections such as are indicated at 14 and 15 to fit into the key grooves and prevent the use of an improper key.

40 A generally rectangular aperture 16 extends diametrically into the cylinder from one side thereof to the other. Normally this aperture 16 is provided with shallow parallel grooves in its side walls to slidably support spaced partition members. However, in the present structure, the aperture 16 is shaped to accommodate the partition structure indicated in general by the numeral 17 and illustrated in Figures 4 and 5 of the drawings.

The structure 17 includes four spaced partition walls 19, 20, 21 and 22. In flat form, the partition walls 19 and 20 are connected by an integral connecting web 23 which is connected to the partition walls along potential lines of bend 24 and 25. The partition walls 21 and 22 are similarly connected by a connecting web 26 which is connected to the partition walls along potential lines of bend 27 and 29. The partition walls 20 and 21 are connected by a connecting web 30 which is connected to the partition walls by potential lines of fold 31 and 32. In actual practice the potential lines of fold need not be weakened lines or score lines but are shown in dotted lines to indicate the points at which the blank shown in Figure 4 is folded to produce the arrangement shown in Figure 5.

45 It will be noted that the various connecting webs are so arranged that the webs 23 and 26 are on one side of the assembly and the other connecting web 30 is on the opposite side thereof. The connecting web 30 is notched at its ends as indicated at 33 and 34 and is accordingly shorter than the height of the remainder of the partition structure. The partition wall 19 is similarly notched at 35 and 36 and the partition wall 32 is similarly notched at 37 and 39. The purpose of these notches is to provide 50 a means of anchoring the partition structure in position

in the cylinder. The aperture 16 is provided at its lower end with a shoulder 40 against which the projecting portions of the partition walls 19 and 22 as well as the connecting web 30 may engage to limit movement in one direction. The portion of the cylinder at the opposite side of the opening is riveted or peaned over as indicated at 41, in Figure 6, so as to hold the partition wall structure from movement in the opposite direction.

As is indicated in Figure 2 of the drawings, partially cylindrical sockets 44 are provided adjoining the aperture 16 and communicating therewith along one side of the aperture 16 and similar partially cylindrical sockets 45 adjoin the aperture 16 along the special wall thereof. The sockets 44 and 45 are in staggered relation and each socket is located at a point adjoining a space between the partition walls, or adjacent the end partition walls 19 and 22 and the end walls of the aperture 16. These sockets 44 and 45 are designed to accommodate compression springs 46 and the sockets terminate short of the under surface of the cylinder so as to provide a shoulder 47 at the base of each socket against which the springs may bear. A tumbler 49 is inserted in the space between the ends of the partition structure and the ends of the aperture 16 and also between each adjoining pair of spaced walls of the partition structure 17.

As is indicated in Figure 3, each tumbler 49 is equipped with a short lateral extension 50, which bears against the spring 46 so that the spring tends to project the tumblers beyond the support of the cylinder. The wall of the cylinder is riveted or peaned over the projections 50 as indicated at 51 so as to retain the tumblers in assembled condition.

Each tumbler, such as 49, is provided with a key receiving opening 52 therethrough and the lower edge of the opening 52 is properly shaped as shown at 53 to be retracted by a key of suitable design. The partition walls 19, 20, 21 and 22 are likewise provided with key receiving apertures therethrough, these being indicated by the numerals 53', 54, 55 and 56, respectively. These last named apertures are, in the particular construction illustrated, provided with inwardly extended projections such as 57 and 59, which correspond to the projections 14 and 15 to accommodate only a key having proper grooves therein.

Thus it will be seen that with my arrangement the entire partition wall structure may be inserted as a unit, the springs may be inserted in their proper apertures, the tumblers may be inserted in their proper slots, and the entire assembly may be held in place by peaning over the edges of the cylinder to prevent the removal of these parts. The arrangement saves the necessity of individually forming and inserting the partition walls and individually anchoring these walls in the cylinder body. Thus the assembly cost as well as the construction cost is substantially reduced.

In accordance with the patent statutes, I have described the principles of construction and operation of my tumbler lock, and while I have endeavored to set forth the best embodiment thereof, changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A prefabricated cylinder shaped tumbler piece for insertion in a lock structure comprising a supporting cylinder, a substantially rectangularly shaped slot forming walls in said cylinder, an integral one piece series of

spaced partition walls in parallel in said slot, a series of tumblers inserted between said partitions and at the cylinder walls at the ends of said slot, said tumblers being provided with short lateral extensions, springs within said slot normally bearing against said extensions to project the tumblers beyond the support of said cylinder, key receiving apertures in said cylinder, said partitions and said tumblers, and said series of partitions being provided with extensions for insertion into a key guide groove and said tumblers being provided with key retracting shoulders by which the tumblers are retracted against the expansion forces of said springs.

2. The structure of claim 1 wherein the integral one piece series of spaced parallel partition walls are joined by integral webs formed along lines of bend connecting said partitions in parallel relationship.

3. The structure of claim 2 wherein a web is notched in alignment with similarly notched partition walls to provide lateral projections shorter than the height of the rest of the partition structure.

4. The structure of claim 3 wherein the slot is provided with shoulders engageable with the lateral projections of said web and said notched partition walls to limit their movement in one direction.

5. The structure of claim 1 wherein the slot is provided with adjacent apertures in staggered relationship with each adjacent aperture located at a point adjoining a space between the partition walls.

6. The structure of claim 5 wherein the springs are mounted in the said adjacent apertures which are provided with spring supporting shoulders.

7. A plurality of tumbler partition walls for a lock structure comprising a number of parallel walls as a one piece structure formed from a blank provided with a plurality of apertures in the wall forming portions and connecting webs at the fold lines joining the wall forming portions, said apertures having shoulders projecting thereinto as integral portions of said walls, and at least one of said connecting webs, the walls adjacent thereto and the end walls being provided with notch portions so that in a bent relationship the said partition walls, said apertures, said shoulders and said notch portions are in aligned relationship.

8. A tumbler lock including a tumbler cylinder having a recess therein, a key aperture extending longitudinally of said cylinder, a tumbler partition structure in said recess, said partition structure including a series of spaced parallel partitions having key receiving apertures therein, and integral connecting means connecting the spaced partitions, alternate connecting means being on one side of said apertures and the remaining connecting means being on the opposite side of said apertures, and tumblers slidably supported between said partitions and movable outwardly beyond the periphery of said tumbler cylinder.

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