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McCurdy

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[54] **SINGLE AND DOUBLE CYLINDER DEADLOCKS**

[75] Inventor: **Donald L. McCurdy,** Rockford, Ill.

[73] Assignee: **Amerock Corporation,** Rockford, Ill.

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[52] **U.S. Cl.** **70/370,** 70/418, 70/451, 70/DIG. 60

[51] **Int. Cl.** **E05b 9/08**

[58] **Field of Search** ..... 70/370, 371, 416, 417, 70/418, 448, 449, 451, 452, 461, DIG. 39, DIG. 43, DIG. 60

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Primary Examiner—Robert L. Wolfe

Attorney, Agent, or Firm—Wolfe, Hubbard, Leydig, Voit & Osann, Ltd.

[57] **ABSTRACT**

The deadlocks are characterized by the following features:

1. A decorative escutcheon and a lock cylinder supporting barrel which are cast as a one-piece unit.
2. The use of a simple screw to anchor the lock cylinder in the barrel.
3. The adaptability of the lock to use lock cylinders of different lengths.
4. Elongated guard fingers cast integrally with the interior and exterior escutcheons and shielding against jimmying of the lock by means of a sharp instrument inserted through the door.
5. Tubular posts cast integrally with the interior and exterior escutcheons and rigidifying the screws for holding the parts of the lock in assembled relation.
6. The construction permitting the same dies to be used to cast the exterior unit of a single-cylinder deadlock and to cast both the exterior and interior units of a double-cylinder deadlock.

10 Claims, 9 Drawing Figures

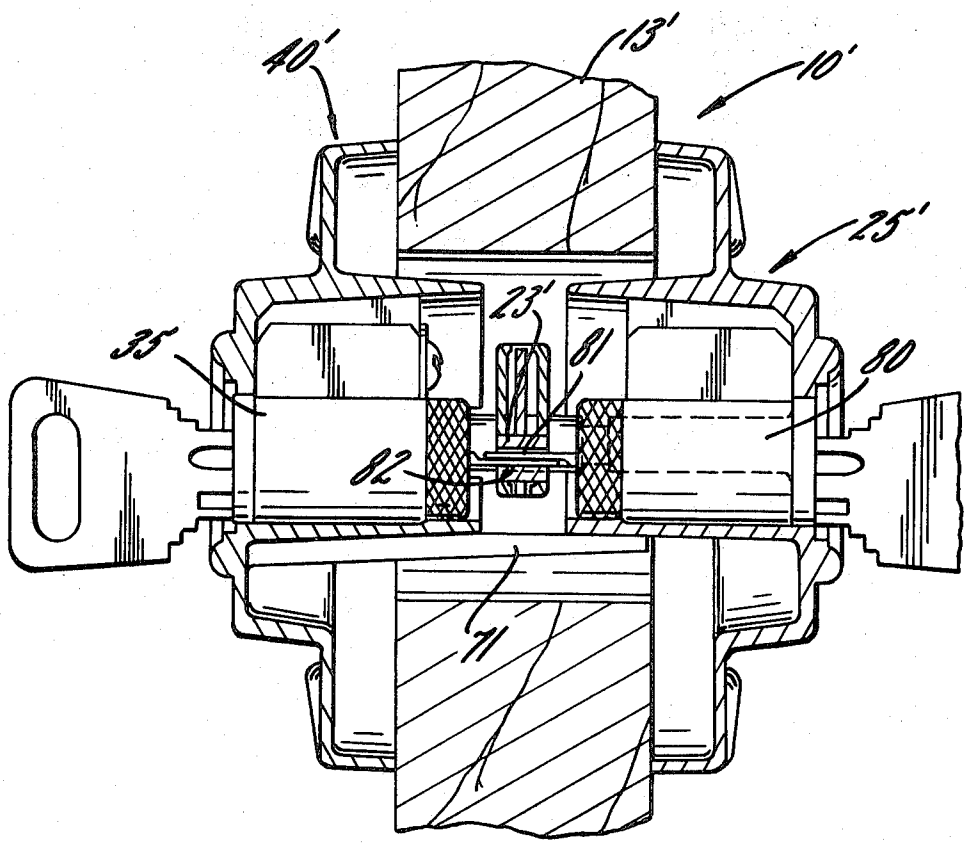


Fig. 1.

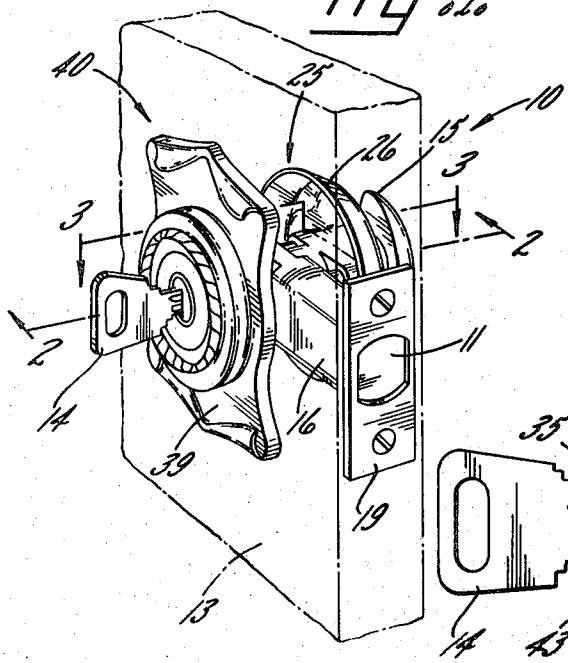


Fig. 2.

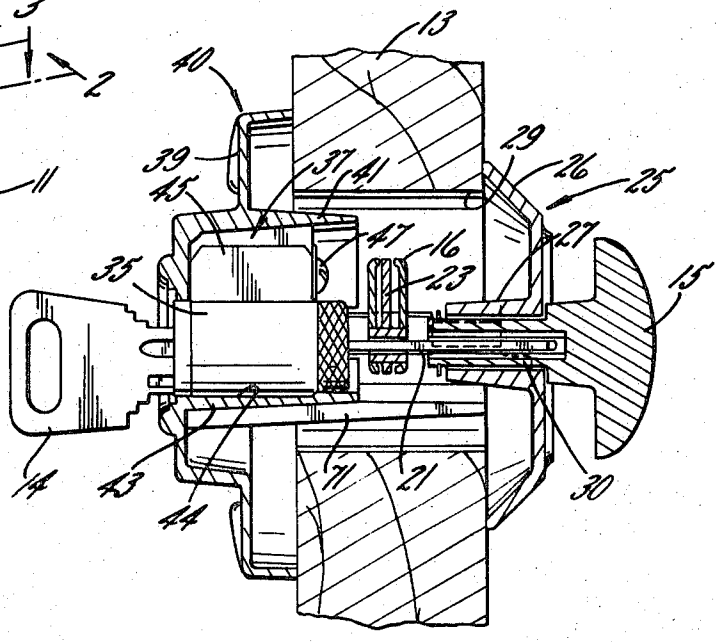


Fig. 3.

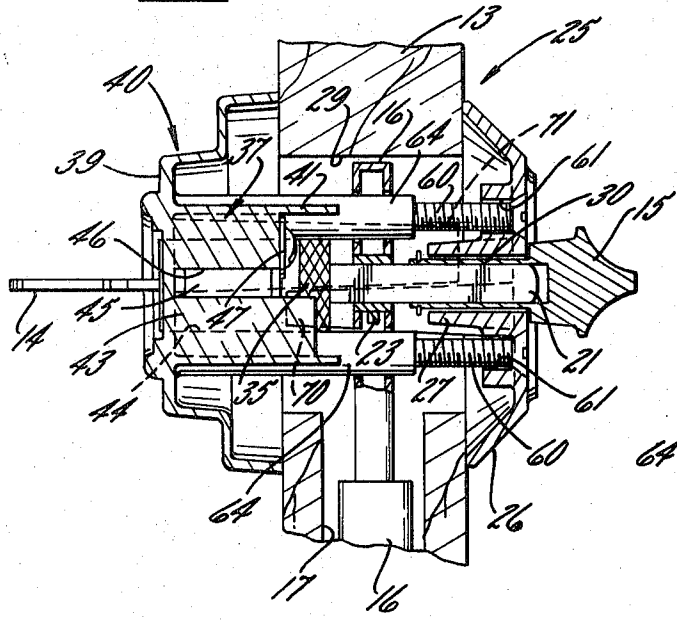
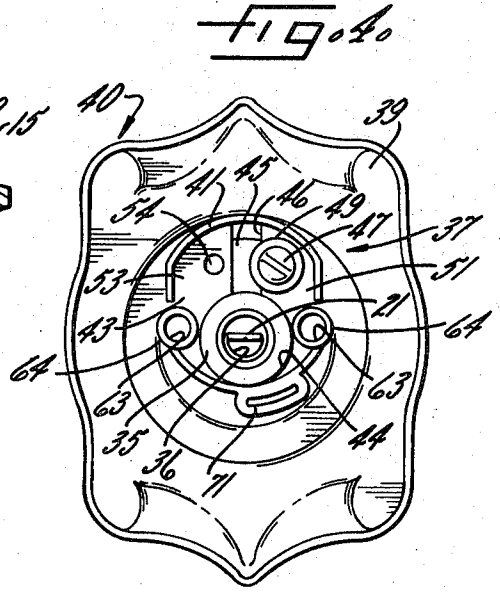


Fig. 4.



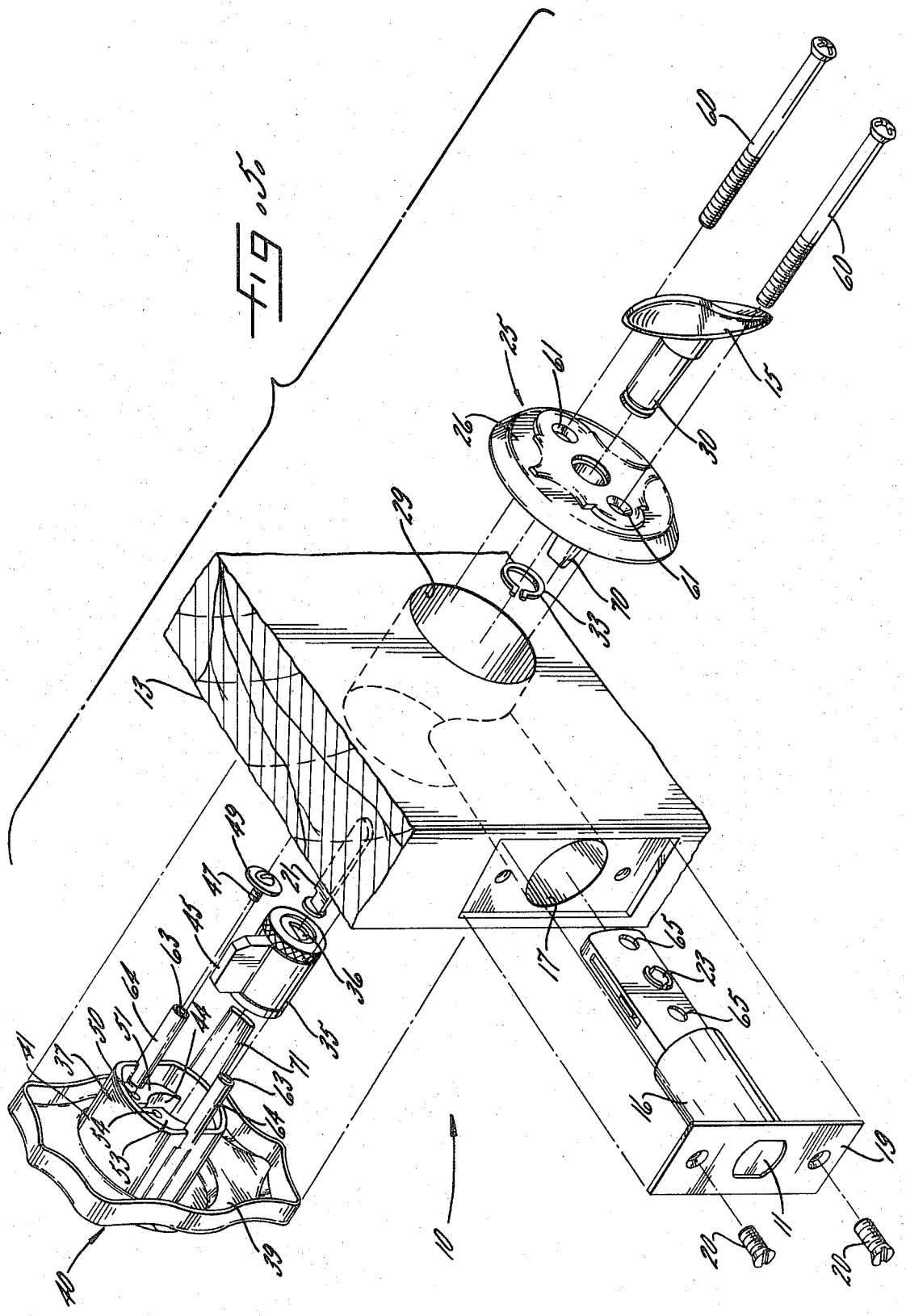


Fig. 6.

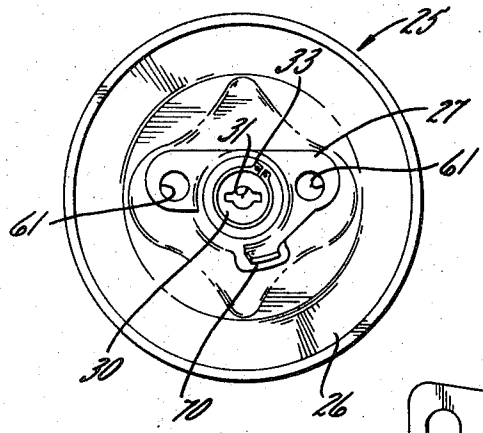


Fig. 7.

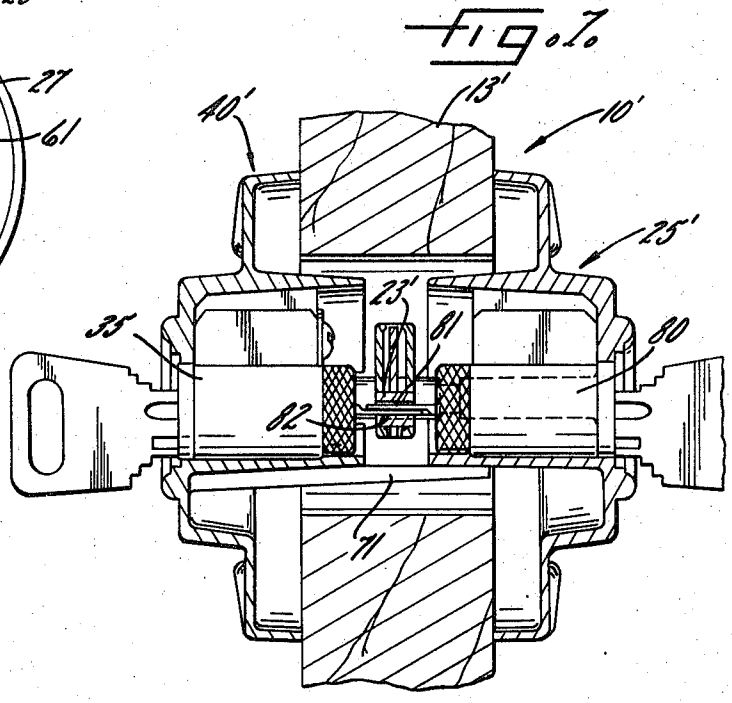


Fig. 8.

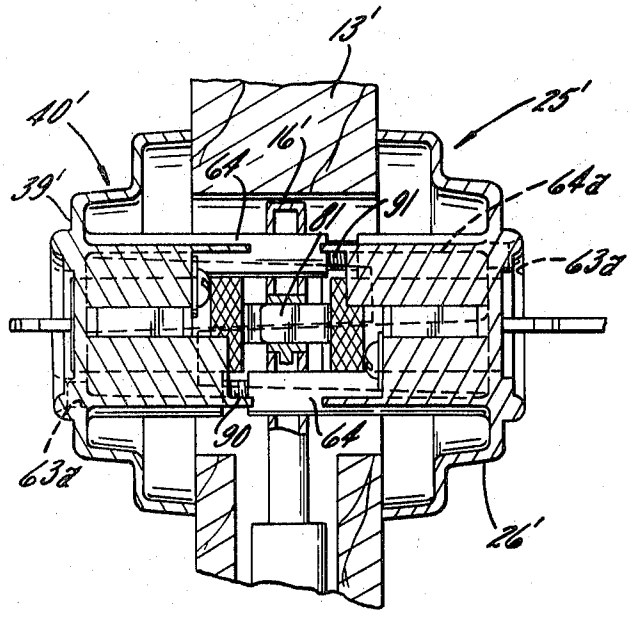
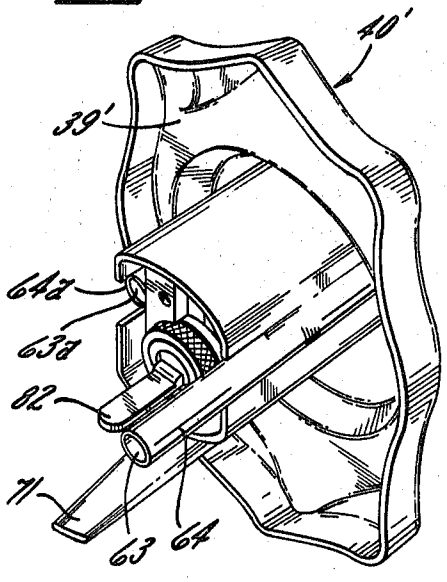


Fig. 9.



SINGLE AND DOUBLE CYLINDER DEADLOCKS

BACKGROUND OF THE INVENTION

This invention relates to a deadlock having a latching bolt and having a lock cylinder with key-operated mechanism for moving the bolt between latched and unlatched positions. The invention more specifically pertains both to single-cylinder deadlocks, and to double-cylinder deadlocks. In a single-cylinder deadlock, latching and unlatching of the bolt from the outside of the door is effected by a key while latching and unlatching from the inside is effected simply by turning a knob, lever or the like. A double-cylinder deadlock includes two lock cylinders and requires the use of a key to effect latching and unlatching both from the outside of the door and from the inside thereof.

SUMMARY OF THE INVENTION

The general aim of the present invention is to provide new and improved deadlocks which are simpler in construction, require fewer parts and may be more easily manufactured, assembled and installed than prior deadlocks of the same general type. In large, these ends are achieved through the provision of a novel deadlock having an escutcheon, a lock cylinder supporting barrel and preferably other parts formed integrally with one another as a single casting so as to eliminate the need of manufacturing and assembling multiple parts.

A further object of the invention is to provide a simplified means for anchoring the lock cylinder within the cylinder supporting barrel, these means preferably being in the form of a simple threaded fastener.

A related object is to provide a deadlock which is capable of accommodating either a comparatively short lock cylinder with a given number of tumblers or a longer cylinder with a greater number of tumblers without need of making any structural modifications to the deadlock.

A further object is to provide a deadlock having tubular posts for enshrouding and rigidifying the fasteners which secure the deadlock to the door, the tubular posts being characterized by their integral formation with the escutcheon and the cylinder supporting barrel.

Still another object of the invention is to provide a deadlock with unique means for preventing jimmying of the lock by a sharp piercing instrument (e.g., an ice pick) inserted through the door, these means also being cast integrally with the escutcheon and the cylinder supporting barrel.

An important object of the invention is to construct the deadlock in such a manner that the same dies can be used not only for casting both the interior and exterior units of a double-cylinder lock but also for casting the exterior unit of a single-cylinder lock.

These and other objects and advantages of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a new and improved single-cylinder deadlock incorporating the novel features of the present invention.

FIGS. 2 and 3 are enlarged fragmentary cross-sections taken substantially along the lines 2—2 and 3—3, respectively, of FIG. 1.

FIG. 4 is an elevational view of the exterior unit of the deadlock as viewed from the inner side of the exterior unit.

FIG. 5 is an exploded perspective view of the deadlock shown in FIG. 1.

FIG. 6 is an elevational view of the interior unit of the deadlock as viewed from the inside of the interior unit.

FIGS. 7 and 8 are sectional views similar to FIGS. 2 and 3, respectively, but showing a double-cylinder deadlock incorporating the features of the invention.

FIG. 9 is a perspective view of the exterior unit of the deadlock shown in FIGS. 7 and 8.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in the drawings for purposes of illustration, the invention is embodied in a deadlock 10 having a latching bolt 11 which may be selectively actuated to hold a hinged door 13 in a locked condition relative to a jamb (not shown). The deadlock shown in FIGS. 1 to 6 is of the so-called single-cylinder type in that locking an unlocking of the bolt from the outside of the door are carried out by means of a key 14 while locking and unlocking from the inside may be accomplished without the use of a key by actuating a manually turnable member which herein is shown to be a generally oval-shaped thumb knob 15.

The latch bolt 11 is of the usual construction and is supported to slide back and forth within a housing 16 (FIG. 5) mounted in a hole 17 opening out of the edge of the door 13, the housing being attached rigidly to a face plate 19 which is anchored to the door by screws 20. Movement of the bolt between its latched and unlatched positions is effected by turning a driver bar 21 which extends through a hole in the bolt housing 16 and which is connected to the bolt by conventional linkage 23 (FIGS. 2 and 5), the latter serving to reciprocate the bolt in response to turning of the driver bar. The driver bar 21 and the linkage 23 may be considered to be key-operated mechanism since they are actuated when the key 14 is turned.

The thumb knob 15 is used to turn the driver bar 21 from the inside of the door 13 and forms part of the interior unit 25 of the deadlock 13. As shown in FIGS. 2 and 5, the interior unit includes a die cast escutcheon 26 having an inner side adapted to lie adjacent the interior face of the door and having a decorative outer side. Cast integrally with and extending inwardly from the inner side of the escutcheon is a tubular boss 27 (FIG. 2) which projects into an opening 29 extending through the door and communicating with the hole 17. An elongated shank 30 on the inner end of the thumb knob 15 is rotatably journaled within the boss 27 and is formed with a drive slot 31 (FIG. 6) which telescopically receives one end portion of the driver bar 21, the slot being shaped to cause turning of the bar when the thumb knob is rotated. A snap ring 33 is fitted around the inner end of the shank 30 and prevents the latter from being pulled out of the boss 27.

To enable latching and unlatching of the bolt 11 from the outside of the door 13 by means of the key 14, the deadlock 10 includes a conventional tumbler-type lock cylinder 35 (FIGS. 2 and 5) which is adapted to rotate

the driver bar **21** when the key is inserted into the cylinder and turned. The outer end portion of the driver bar **21** is fitted into a specially shaped slot **36** (FIG. **5**) in the inner end of the rotatable part of the cylinder and thus is turned when the key is turned.

The lock cylinder **35** is rigidly supported within a novel barrel **37** (FIG. **5**) which, in accordance with the present invention, is cast as an integral unit with an exterior escutcheon **39,** the barrel and the exterior escutcheon constituting part of the exterior unit **40** of the deadlock **10** and preferably being formed by a die casting operation. Because the cast barrel **37** is all that is needed to support the cylinder **35** and because the barrel and the escutcheon **39** are formed as a single, integral unit, the deadlock is simplified and the need for separately making and then assembling multiple parts is eliminated.

More particularly, the exterior escutcheon **39** is cast from zinc alloy or the like and includes a decorative outer side formed with a fanciful design. In this instance, the escutcheon is generally dish-shaped and its inner edge lies against the outer face of the door as shown in FIG. **2.** The barrel **37** projects inwardly from the central portion of the escutcheon **39** and is sized to telescope loosely into the opening **29** in the door **13.** The two sides of the barrel are generally flat while its upper and lower ends are curved on a radius somewhat smaller than that of the opening **29.**

As shown in FIGS. **2** and **5,** the barrel **37** is defined by a shell **41** which is considerably larger in diameter than the lock cylinder **35** and whose inner end portion is substantially hollow. A considerable mass of metal, however, is located within the outer end portion of the shell and defines a housing **43** for the lock cylinder **35.** The latter is fitted into a hole **44** extending through the housing and is held in a fixed angular position by a key **45** fitting into a keyway **46** formed in the housing. The key is formed integrally with the cylinder **35** and abuts the inner side of the escutcheon **39** to prevent the cylinder from being pulled outwardly of the hole **44.**

Thus, the cylinder **35** is supported in the housing **43** defined within the shell **41** of the barrel **37** which, in turn, is cast integrally with the escutcheon **39.** Accordingly, except for the lock cylinder **35** and a part **47** to be described, the entire exterior unit **40** of the deadlock **10** is formed by a single piece.

According to another aspect of the invention, extremely simple means are used to anchor the lock cylinder **35** in a fixed axial position within the hole **44** in the housing **43.** Herein, these means comprise a fastener in the form of a self-tapping screw **47** (FIGS. **4** and **5**) having an integral washer **49** around its head. As shown in FIG. **5,** the screw **47** is adapted to be screwed into a hole or aperture **50** which is formed in and opens out of the inwardly and axially facing end wall **51** of the housing. When the screw is tightened, the washer **49** bears against the wall **51** and against the inner end of the key **45** to clamp the latter rigidly against the inner side of the escuthcheon **39.** Thus, installation of the cylinder requires only the telescoping of the cylinder into the hole **44** followed by insertion of and tightening of the screw **17** in the aperture **50.** Also, replacement of the cylinder can be carried out quickly and easily.

The lock cylinder **35** which has been illustrated is a five-tumbler cylinder and has an overall length of about 1-3/16 inches. Advantageously, a longer cylinder (e.g., a six-tumbler cylinder) can be used with the deadlock **10** without making any structural changes to the deadlock. For this purpose, the housing **43** is formed with a second axially facing end wall **53** (FIGS. **4** and **5**) spaced angularly from the end wall **51** and located inwardly of the latter end wall. A second aperture **54** is formed in the end wall **53** and thus, if a longer lock cylinder is used, it is necessary only to thread the screw **47** into the aperture **54** (rather than into the aperture **50**) to anchor the cylinder in place, the clamping being effected in the same manner as described previously. Accordingly, the deadlock readily lends itself to use with lock cylinders of different lengths.

Two fasteners in the form of threaded screws **60** (FIG. **5**) are used to connect the interior and exterior units **25** and **40** to the bolt housing **16** and to anchor the deadlock **10** to the door **13.** As shown in FIGS. **3** and **5,** the screws are disposed with their heads located on the inside of the door and are adapted to extend through a pair of horizontally spaced holes **61** in the interior escutcheon **26** and the boss **27.** At their threaded ends, the screws are threaded into holes **63** (see FIG. **5**) which are formed in a pair of angularly spaced and horizontally projecting posts **64** extending inwardly from the exterior escutcheon **39.** In keeping with the invention, these posts are cast integrally with the escutcheon **39** and the barrel **37** and thus they need not be separately formed and then assembled to the exterior unit **40** of the deadlock **10.**

The posts **64** extend through a pair of holes **65** (FIG. **5**) in the bolt housing **16** and serve to enshroud and rigidify the screws **60** and to reinforce the regions between the screws and the holes **65.** As a result, the screws are less likely to fail when subjected to shearing stresses and thus there is less danger of the deadlock **10** being broken open by a person inserting a pry between the bolt **11** and the jamb or twisting on the exterior escutcheon **39** with a pipe wrench or the like. Also, the posts facilitate the establishment of proper alinement between the interior and exterior units **25** and **40** and the bolt housing **16.** The posts thus serve several advantageous purposes and yet are incorporated in the deadlock in a comparatively inexpensive manner as a result of being cast integrally with the escutcheon **39** and the barrel **37.**

Rather than attempting to "pick" the lock cylinder **35** in the usual fashion, a burglar seeking to unlock the bolt **11** may try to use the so-called "ice pick" technique to turn the driver bar **21** or the linkage **23.** That is, unauthorized entry is sometimes attempted by first piercing the door with an ice pick or other sharp instrument and then by engaging and turning the driver bar or linkage to move the bolt to its unlocked position.

According to still another aspect of the invention, the deadlock **10** is provided with relatively simple means which shield the driver bar **21** and the adjoining part of the linkage **23** from contact with a sharp instrument such as an ice pick. Preferably, these means are in the form of a pair of elongated guard fingers **70** and **71** (FIGS. **2** to **6**) which are cast integrally with and project inwardly from the inner sides of the escutcheons **26** and **39,** respectively.

As shown in FIG. **5,** the guard finger **71** is located adjacent the lower side of the barrel **37** and is offset angularly from the vertical centerline of the barrel. The guard finger **70** is formed adjacent the lower side of the boss **27** (see FIG. **6**) and is offset angularly from the vertical centerline of the hole which extends through

the center of the boss. When the interior and exterior units 25 and 40 are assembled to one another, the two fingers 70 and 71 are disposed in closely adjacent edge-to-edge relation and extend across the underside of the bolt housing 16 in underlying relation with the driver bar 21 and the adjoining part of the linkage 23. The free inner end of the finger 70 overlaps the inner end portion of the barrel 37 while the free inner end portion of the finger 71 overlaps the inner end portion of the boss 27. The two fingers thus coact to establish a shield around the lower side of the driver bar and the linkage to prevent an ice pick from contacting and turning these elements to unlatch the bolt 11. Because of the overlapping relation of the fingers with the barrel and the boss, the deadlock 10 can be installed on doors of different widths while still maintaining an effective shield against an ice pick.

An important feature of the invention resides in the fact that the same dies which are used for casting the exterior unit 40 of the single-cylinder deadlock 10 shown in FIGS. 1 to 6 can also be used for casting both the interior and exterior units 25' and 40' of a double-cylinder deadlock 10' of the type illustrated in FIGS. 7 to 9.

In the double-cylinder deadlock 10', the interior unit 25' also is provided with a key-operated locking cylinder 80 (FIG. 7). Instead of employing a single driver bar 21, the double-cylinder deadlock utilizes two overlapping driver bars 81 and 82, there being one extending from each locking cylinder.

As shown in FIG. 9, the exterior unit 40' of the double-cylinder deadlock 10' is identical to the exterior unit 40 of the single-cylinder deadlock 10 except for a difference in the arrangement of the tubular posts. That is, one of the posts 64*a* (FIG. 8) of the unit 40' is shortened significantly so that the unit 40' includes one standard post 64 of normal length and one short post 64*a*. The aperture or hole 63*a* in the short post 64*a* is unthreaded and extends completely through the exterior escutcheon 39', the hole thus opening out of the outer side of the exterior escutcheon.

The interior unit 25' of the double-cylinder deadlock 10' is precisely identical to the exterior unit 40' and thus includes a standard post 64 and a short post 64*a* whose hole 63*a* is unthreaded and extends completely through the interior escutcheon 26'. When the interior and exterior units 25' and 40' are assembled, the standard post 64 of the exterior unit 40' is disposed end-to-end with the short post 64*a* of the interior unit 25' while the standard post 64 of the interior unit 25' is disposed end-to-end with the short post 64*a* of the exterior unit 40'. The two units are then connected to one another and the bolt housing 16' and are anchored to the door 13' by a pair of screws 90 and 91 (FIG. 8). The screw 90 is located with its head disposed adjacent the outer side of the exterior escutcheon 39', extends through the hole 63*a* in the exterior unit 40', and is threaded into the hole 63 in the standard post 64 of the interior unit 25'. Conversely, the screw 91 is located with its head disposed adjacent the decorative or exposed side of the interior escutcheon 26', extends through the hole 63*a* in the interior unit 25' and is threaded into the hole 63 in the standard post 64 of the exterior unit 40'. Thus, only one screw can be removed from either side of the door so as to prevent unauthorized entry by disassembling the deadlock 10'.

With the foregoing arrangement, the same dies can be used for casting the exterior unit 25 of the single-cylinder deadlock 10 and the interior and exterior units 25' and 40' of the double-cylinder deadlock 10'. As originally cast, each unit is exactly the same and includes two tubular posts 64 of normal length. If the cast unit is to be used with the single-cylinder deadlock 10, both posts are tapped to form the threaded apertures 63. If the cast unit is to be used either as the interior unit 25' or the exterior unit 40' of the double-cylinder deadlock 10', one of the posts is partially cut off to form the shortened post 64*a*. The hole 63*a* in such post is left untapped and is drilled out through the appropriate escutcheon 26' or 39' to accommodate the screw 90 or 91. Accordingly, separate sets of dies are not required and only relatively simple machining operations are necessary to produce the different types of units after the latter have been cast.

Since the same dies are used for producing all of the units 25, 25' and 40', each, of course, is formed with a comparatively narrow guard finger 71. With the double-cylinder deadlock 10', the guard fingers of the assembled interior and exterior units 25' and 40' are disposed edge-to-edge with one another in the same manner as the guard fingers 70 and 71 on the interior and exterior units 25 and 40 of the single-cylinder deadlock 10, the free inner end portion of each finger overlapping the inner end portion of the opposite barrel. The fingers thus shield the undersides of the driver bars 81 and 82 and the underside of the adjoining linkage 23'.

It should be appreciated that effective shielding of the driver bar 21 and the adjoining part of the linkage 23 in the single-cylinder deadlock 10 could be achieved by forming a single wide guard finger on either the interior unit 25 or the exterior unit 40 and completely omitting the finger on the other unit. It is preferred, however, to form a narrow finger on each unit so that the exterior unit can be used as the exterior unit 40' of the double-cylinder deadlock 10' and will properly interfit with an interior unit 25' cast from the same dies.

I claim as my invention:

1. A deadlock having a latching bolt and a lock cylinder, key-operated mechanism connected between said cylinder and said bolt and operable when turned to move said bolt between latched and unlatched positions, the improvement in said deadlock comprising, a metal escutcheon having an inner side adapted to lie adjacent one face of a door and having a decorative outer side, a metal barrel projecting inwardly from the inner side of said escutcheon and adapted to telescope into an opening extending through the door, a hole extending through said barrel and sized to receive said cylinder, and a fastener for securing said cylinder to said barrel to anchor the cylinder within said hole, said fastener extending between said cylinder and said barrel and securing said cylinder to said barrel independently of the door, the inner end portion of said barrel being formed with first and second axially facing walls spaced angularly and axially from one another, apertures opening out of each of said walls, said fastener being threaded into the aperture in one of said walls and having a portion bearing against such wall and said cylinder to anchor the latter within said hole, said fastener being selectively threadable into the other aper-

ture to anchor a cylinder of different length within said hole.

2. A deadlock as defined in claim 1 including at least one elongated post cast integrally with said barrel and projecting inwardly from the inner end thereof, and an axially extending threaded hole formed in said post and adapted to receive a threaded fastener for securing said barrel and said escutcheon to the door.

3. A deadlock as defined in claim 2 further including an additional elongated post cast integrally with said barrel and projecting inwardly from the inner end thereof, said additional post being spaced angularly from said one post, and an axially extending threaded hole formed in said additional post and adapted to receive an additional threaded fastener for securing said barrel and said escutcheon to the door.

4. A deadlock as defined in claim 1 further including an elongated guard finger cast integrally with and projecting inwardly from said barrel, said guard finger extending toward the inboard end portion of said bolt and shielding said key-operated mechanism to prevent a sharp instrument inserted through the door from turning said mechanism and moving said bolt to said unlatched position.

5. A deadlock as defined in claim 4 further including a second metal escutcheon adapted to lie adjacent the opposite face of the door, a manually turnable member journaled in said second escutcheon and operably connected to said key-operated mechanism whereby said bolt may be moved between said latched and unlatched positions by turning said member, a second elongated guard finger cast integrally with the inner side of said second escutcheon and projecting inwardly therefrom, said second guard finger extending toward the inboard end portion of said bolt in angularly disposed relation with said first guard finger and located side-to-side with said first guard finger to assist the latter in shielding said key-operated mechanism.

6. A deadlock as defined in claim 4 further including a second metal escutcheon having an inner side adapted to lie adjacent the opposite face of the door and having a decorative outer side, a second metal barrel projecting inwardly from the inner side of said second escutcheon and adapted to telescope into the opening in the door, a hole extending through said second barrel, a second lock cylinder secured within said hole in said second barrel, said second cylinder being connected to said key-operated mechanism and being operable to turn said mechanism and move the bolt between its latched and unlatched positions, a second elongated guard finger cast integrally with and projecting inwardly from said second barrel, said second guard finger extending toward the inboard end portion of said bolt in angularly disposed relation with said first guard finger and located side-by-side with said first guard finger, said guard fingers coacting with one another to shield said key-operated mechanism so as to prevent a sharp instrument inserted through the door from turning said mechanism and moving said bolt to said unlatched position.

7. A deadlock as defined in claim 2 further including a second metal escutcheon having an inner side adapted to lie adjacent the opposite face of the door and having a decorative outer side, a second metal barrel projecting inwardly from the inner side of said second escutcheon and adapted to telescope into the opening in the door, a hole extending through said second barrel, a second lock cylinder secured within said hole in said second barrel, said second cylinder being connected to said key-operated mechanism and being operable to turn said mechanism and move the bolt between its latched and unlatched positions, a second elongated post cast integrally with said second barrel and projecting inwardly therefrom, said second post being spaced angularly from said first post and being formed with an axially extending threaded hole for receiving a second threaded fastener, and first and second holes formed in said first and second escutcheons, respectively, and alined with the threaded holes in said second and first posts, respectively, for receiving said threaded fasteners.

8. A deadlock having a latching bolt and first and second lock cylinders, key-operated mechanism connected between said cylinders and said bolt and operable when turned to move said bolt between latched and unlatched positions, the improvement in said deadlock comprising, first and second metal escutcheons each having a decorative outer side, said first and second escutcheons having inner sides adapted to lie adjacent first and second faces, respectively, of the door, a metal barrel projecting inwardly from the inner side of each escutcheon and adapted to telescope into an opening extending through the door, a hole extending through each barrel and sized to receive the respective cylinder, and a fastener for securing each cylinder to its respective barrel to anchor the cylinder within the respective hole, each fastener extending between its cylinder and its barrel and securing the cylinder to the respective barrel independently of the door, the inner end portion of each barrel being formed with first and second axially facing walls spaced angularly and axially from one another, apertures opening out of each of said walls, each fastener being threaded into the aperture of one of the walls of the associated barrel and having a portion bearing against such wall and the associated cylinder to anchor the latter within the respective hole, each fastener being selectively threadable into the other aperture of the respective barrel to anchor a cylinder of different length within the respective hole.

9. A deadlock as defined in claim 8 further including first and second elongated posts cast integrally with and projecting inwardly from said first and second barrels, respectively, said posts being spaced angularly from one another and having their free inner ends spaced axially from one another, the free inner end of each post being located adjacent the inner end of the opposite barrel, axially extending threaded apertures formed in said posts, first and second holes extending through said first and second escutcheons, respectively, and alined with the threaded apertures in said second and first posts, respectively, and first and second threaded fasteners extending through said first and second holes and threaded into said second and first apertures, respectively, to anchor said escutcheons to said door.

10. A deadlock as defined in claim 9 further including first and second elongated guard fingers cast integrally with and projecting inwardly from said first and second barrels, respectively, said guard fingers being spaced angularly from one another and having their free inner ends spaced axially from one another, the free inner end portion of each guard finger overlapping the inner end portion of the opposite barrel, said guard fingers being disposed side-by-side and shielding said key-operated mechanism to prevent a sharp instrument inserted through the door from turning said mechanism and moving said bolt to said unlatched position.

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