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[45] **Oct. 23, 1973**

[54] **LOCKING DEVICE**

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[21] Appl. No.: **189,363**

Related U.S. Application Data

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[52] **U.S. Cl.** **70/58,** 70/230, 248/203, 248/318, 312/245

[51] **Int. Cl.** **E05b 73/00,** F16b 41/00

[58] **Field of Search** 70/58, 101, 167, 70/230, 259; 211/4, 7, 8; 248/203, 318; 312/245, 265; 251/33, 41.7, 41.76, 70; 402/2

[56] **References Cited**

UNITED STATES PATENTS

3,497,281	2/1970	Wilde	312/223
612,436	10/1898	Razall	402/2
2,925,292	2/1960	Hirschle	287/52
3,446,046	5/1969	Randel	70/101
1,715,975	6/1929	Angell	151/44
1,774,833	9/1930	Komar	279/9
1,767,438	6/1930	Dranter et al.	70/230
2,722,822	11/1955	Thomas	70/167
3,410,122	11/1968	Moses	70/58

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[57] **ABSTRACT**

A locking device for securing electronic audio entertainment units to an interior support member within an automobile vehicle has an elongated partially threaded shaft that extends entirely through the housing of said unit and the support member, and a threaded bushing means that receives the threaded portion of said shaft which extends through the support member. The shaft is lockable within said housing to prevent rotation of said shaft with respect to said bushing means without first unlocking said shaft from within said housing, and said bushing means has a portion which extends into said housing and is adapted to be secured against rotation with respect thereto whereby rotation of said bushing means with respect to said shaft is prevented.

4 Claims, 9 Drawing Figures

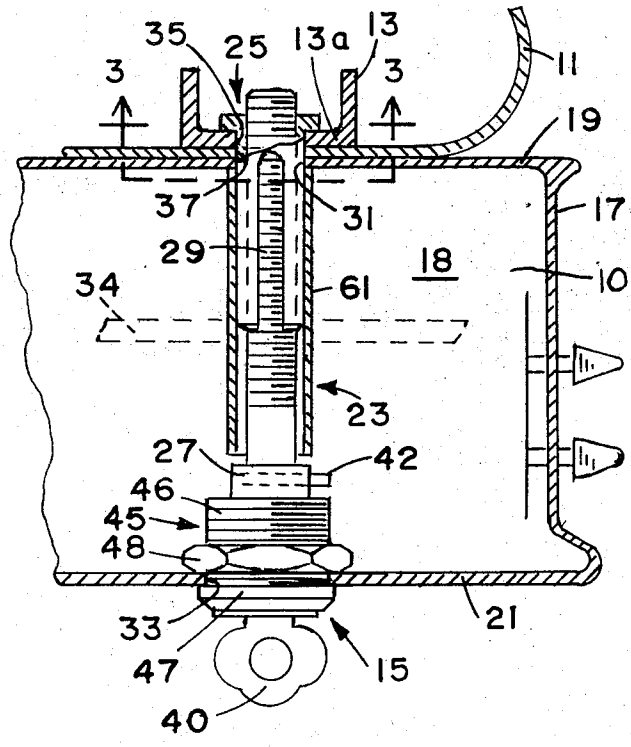


FIG. 1

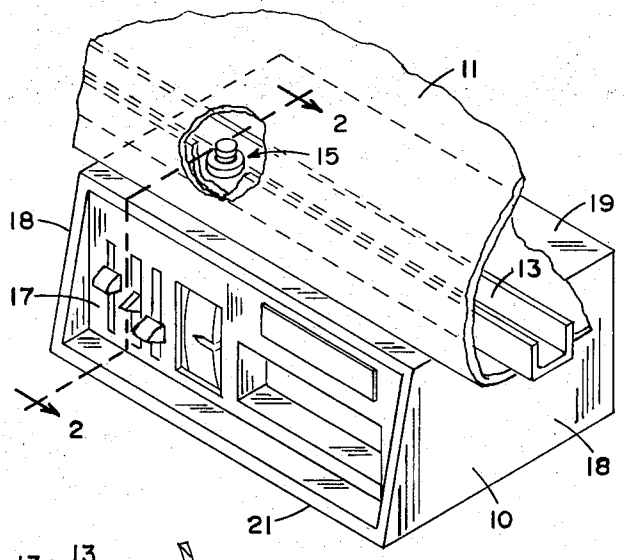


FIG. 2

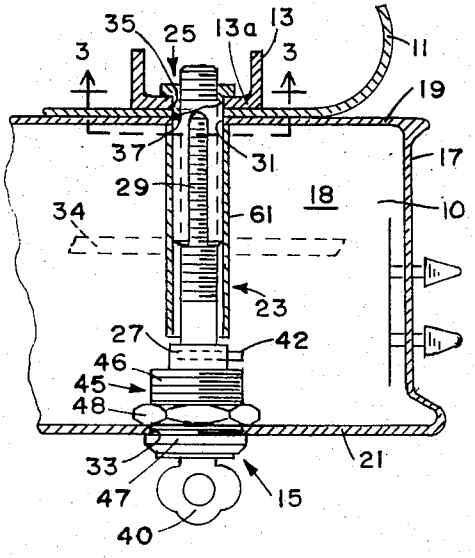


FIG. 3A

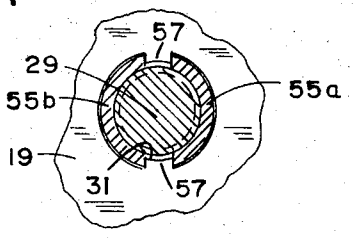


FIG. 3B

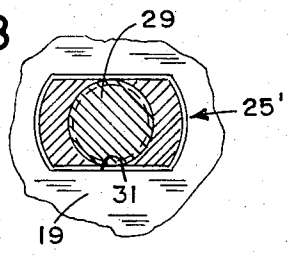
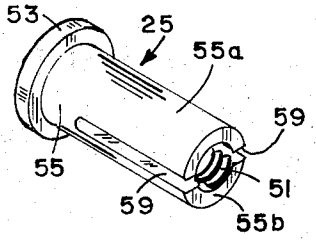


FIG. 4



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FIG. 5

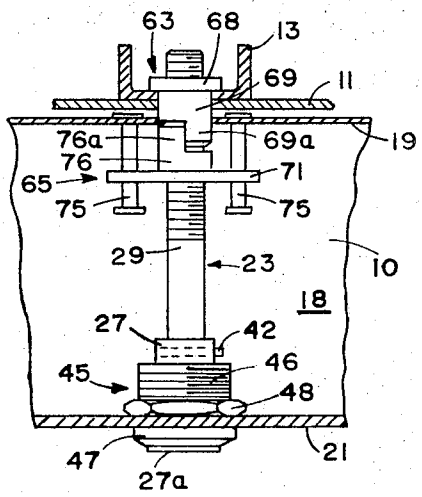


FIG. 6

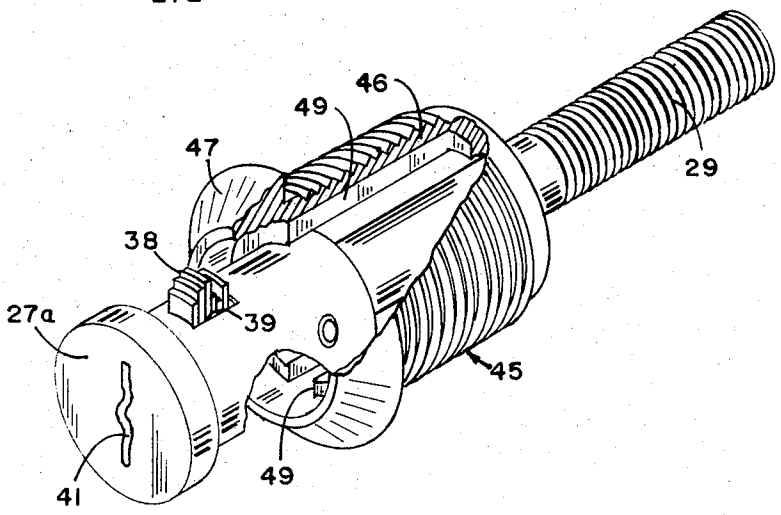


FIG. 7

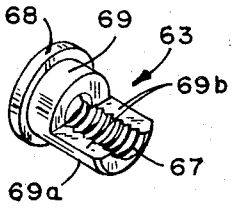
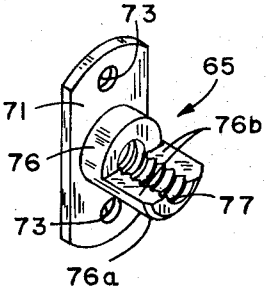


FIG. 8



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LOCKING DEVICE

This is a continuation of application Ser. No. 71,485, filed Sept. 11, 1970.

BACKGROUND OF THE INVENTION

This invention relates to locking devices, and more particularly, to a locking device for securing electronic type audio entertainment units to a generally inaccessible rigid support member within the interior of an automobile vehicle.

Audio entertainment units adapted for mounting within the interior of an automobile, such as radios and stereo tape players, are often the object of vandalism and thus, locking devices are needed that are difficult to defeat during improper removal and yet are readily removable for servicing and for other proper reasons. Many locking devices have been devised to accomplish this purpose, but suffer from one or more of the following disadvantages: (1) the device is generally exposed whereby it can be defeated by vandal's tools; (2) the device requires specially designed tools for the installation and removal thereof; (3) the locking devices are attached to non-critical operational portions of the entertainment unit housing which can be removed without destroying the unit; and (4) the devices are largely constructed of costly hardened metal alloys.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a locking device which is readily accessible for proper installation and removal thereof, but is generally inaccessible for removal by surreptitious means.

It is another object of the invention to provide a locking device which can be properly installed and removed from its locking engagement with said entertainment unit without the use of specially designed tools.

It is still another object to provide a locking device which is securable to a generally inaccessible interior support member of the automobile.

It is yet another object to provide a locking device that uses a minimum amount of costly alloys and is of low cost and simple construction.

Further, it is an object to provide a locking device which attaches to a critical operational portion of the entertainment unit housing so that the locking device cannot be defeated without first destroying the entertainment unit.

In a preferred practice of the invention, an elongated partially threaded shaft is inserted entirely through the thickness of a housing for an audio entertainment unit and a generally inaccessible interior support member to be rotatably received by a threaded bushing means extending from the opposite side of said support member. The bushing means is comprised of a single-piece generally tubular bushing having a widened flange portion which engages the opposite side of said support member to retain said bushing, and a non-circular portion extending into said housing which is adapted to be secured against rotation with respect thereto by a complementarily matched non-circular portion of said housing to prevent said bushing from rotating with respect to said shaft. The shaft has a key-actuated lock cylinder on its opposite end thereof to be locked with respect to said housing with said shaft fully inserted to prevent said shaft from rotating with respect to said housing.

In an alternative practice of the invention, the bushing means is comprised of two separate generally tubular bushings adjacently received along the threaded portion of said shaft. The two bushings have non-circular or arcuate protrusions, respectively, on their adjacent ends which are oppositely disposed along said shaft and extend toward the adjacent bushing so as to present an interlocked orientation. One of the bushings is non-rotatably mounted internally to the housing and the other bushing has its arcuate protrusion extending internally to the housing so that the interlocking protrusions are inaccessible and the bushings are non-rotatable with respect to the housing and to the shaft.

Other objects and advantages of the invention will occur to those skilled in the art as the invention is described in connection with the accompanying drawing.

THE DRAWING

FIG. 1 is a pictorial view of an entertainment unit secured to a support member behind an automobile dashboard by means of a locking device of the present invention, and showing a portion of a bushing received on the threaded end of a shaft;

FIG. 2 is a partial cross-sectional view taken along the line 2—2 of FIG. 1;

FIG. 3A is a partial cross-sectional view taken along the line 3—3 of FIG. 2;

FIG. 3B is an alternative partial cross-sectional view similar to FIG. 3A;

FIG. 4 is a perspective view of the bushing of FIGS. 1–3A;

FIG. 5 is a partial cross-sectional view of an alternative embodiment of the bushing of FIG. 4 and used with the shaft of the locking device of the present invention;

FIG. 6 is a perspective view of the elongated shaft of the locking device, and showing a lock cylinder on one end portion thereof lockable within an encompassing barrel portion to be secured to the entertainment unit;

FIG. 7 is a perspective view of a part of the bushing of FIG. 5; and

FIG. 8 is a perspective view of another part of the bushing of FIG. 5.

DETAILED DESCRIPTION

Referring to the drawings in which the same reference characters are used to indicate similar parts, FIG. 1 shows an electronic type audio entertainment unit **10**, such as a radio or stereo tape player or other audio type unit, mounted beneath a dashboard **11** within the interior of an automobile vehicle, and secured to an interior support member **13** by a locking device **15**. The support member **13** is shown in FIG. 1 as a U-shaped channel bracket but could be in any convenient form and constructed of any suitable material sufficiently rigid to reinforce the dashboard and to provide the structural integrity necessary for supporting a variety of standard dashboard attachments.

Additionally, it is desirable that the support member **13** be generally inaccessible for the purposes of preventing access to the locking device **15** of the present invention. Further, the entertainment unit **10** could be mounted within the vehicle other than beneath the dashboard, the dashboard being used herein only to illustrate one manner in which the entertainment unit **10** is securable within the vehicle by the locking device **15**.

The entertainment unit **10** is illustrated in the drawing as any popular type tape player, and typically has

a housing enclosure including a front display-control panel **17**, two side walls **18**, a top wall **19** and a bottom wall **21**. The internal operational parts of the entertainment unit **10** are not shown as they are not closely related to the present invention except from the standpoint of being electrically insulated therefrom and providing the spacial requirements for the passage of the locking device **15** entirely through the housing of the unit **10** in the manner to be fully described hereinafter. Also, while it is important that the shaft **23** not interfere with the operation of the entertainment unit **10**, it is desirable that the shaft **23** protrude through a main portion of the unit housing so as not to be readily detachable by forceful means.

FIG. **2** shows a preferred embodiment of the locking device **15** wherein an elongated shaft or bolt **23** extends entirely through the housing of the unit **10**, through the dashboard **11** and on through the support member **13** to be engaged opposite the support member **13** by suitably threaded bushing means such as the single-piece generally tubular bushing or sleeve **25**. The bushing **25** acts as a lock nut for the shaft **23** much like a standard lock nut-bolt combination type fastener. The elongated shaft **23** has a lock cylinder **27** on one end portion thereof which is lockable within the unit housing in a particular fashion to be set forth in detail, and another end portion thereof which has a circumferentially threaded length **29** for engaging the bushing **25**.

For the purpose of receiving the shaft **23** through the housing, the top wall **19** and bottom wall **21** are respectively provided with aligned apertures **31** and **33**. Ideally, the top and bottom walls **19** and **21** are parallel and oppositely spaced from each other as shown in the drawing, and any internal chassis members or plates, such as indicated at **34** in FIG. **2**, are provided with suitable apertures for the passage of the shaft **23**, the essence being to provide an aligned and continuous passageway through the thickness of the housing for receiving the shaft **23** of the locking device **15**.

In order to complete the provisions for securing the unit **10** to the support member **13**, the support member **13** is provided with an aperture **35** in a bottom wall **13***a*, and the dashboard **11** is provided with an aperture **37**. The apertures **35** and **37** are aligned with the apertures **31** and **33** of the unit **10** to form a continuation of the passageway through which the shaft **23** passes for engagement with the bushing **25**. Also, any other intermediate members in addition to the dashboard **11** that are positioned between the unit **10** and the support member **13** would obviously be provided with similar aligned apertures.

The lock cylinder **27** is a core-like member having a set of key-actuated tumblers **38** aligned along the length thereof, which tumblers are extendable from and retractable into a pair of suitable lengthwise openings **39** of the cylinder **27**, only one of which is shown in FIG. **6**, when actuated by a key **40** inserted into a standard key-fitting slot **41**. The lock cylinder **27** is made an integral part of the threaded portion **29** of the shaft **23** as by receiving an adjacent end of the threaded portion **29** internally thereof and being joined thereto by pin **42**. Alternatively, the cylinder **27** and the threaded portion **29** of the shaft **23** could be made as a single piece.

With the shaft **23** inserted through the aligned apertures **31**, **33**, **35** and **37** so as to be engageable by the bushing **25**, the lock cylinder **27** is substantially internal to the housing of the unit **10** and is encompassingly received and lockable within an open-ended barrel member **45**. The barrel member **45** is secured to the bottom wall **21** of the unit housing, and the lock cylinder is lockable within the barrel member **45** to provide a means of preventing the shaft **23** from rotating with respect to the unit housing.

For securing the barrel member **45** to the bottom wall **21**, the barrel member has a circumferentially threaded annular section **46** which is to be received through the aperture **33**, an enlarged head or flange portion **47** of slightly larger diameter than the diameter of the aperture **33** for limiting the insertion of the barrel member therethrough, and a suitably threaded nut **48** adapted to be received on the annular section **46** with the section **46** extended through the aperture **33** for tightening against the bottom wall **21** opposite the head portion **47** thereof. Additionally, the annular section **46** may be provided with a non-circular periphery on one portion thereof, and the aperture **33** provided with a complementarily matched non-circular periphery in order that the barrel member **45** will be non-rotatable with respect to the unit housing. When so mounted, the open ends of the barrel member **45** are in alignment with the aperture **33**.

For locking the lock cylinder **27** within the barrel member **45**, the barrel member further includes internal keyways **49** recessed within and extending lengthwise of the annular section **46**, a pair of which is to be aligned opposite of the openings **39** and the extendable tumblers **38** of the lock cylinder **27** for receiving the tumblers **38** when the key **40** actuates the tumblers to their extended position. Other locking configurations could as well be utilized, but the particular one set forth is simple and effective to prevent the rotational movement of the shaft **23** with respect to the barrel member **45** and to the housing of the entertainment unit **10**.

For limiting the extent of allowable insertion of the shaft **23** and lock cylinder **27** into the housing of the unit **10**, the free end of the lock cylinder containing the key slot **41** is shaped as a slightly enlarged head or flange portion **27***a* which strikes against the head portion **47** of the barrel member **45**. If desired, the head portion **47** could be provided with a slight recess within which to receive all or a portion of the head portion **27***a* of the cylinder **27** so as to provide a relatively flush mounting in the bottom wall **21**.

Prior to locking the shaft **23** within the unit housing, the threaded portion **29** of the shaft **23** is rotatably engaged by the threaded bushing **25**. For this purpose, the bushing **25** is internally threaded substantially along its entire length as indicated at **51** in FIG. **4**, but any length of internal threads that would satisfactorily engage the shaft **23** would suffice. Further, the bushing **25**, as shown in FIGS. **2–4**, includes an enlarged head or flange portion **53** of slightly larger diameter than the diameter of the aperture **35** in the support member **13** for retaining the bushing **25** by the support member **13**, and an elongated annular section **55** which contains the internally threaded length **51**.

The bushing **25** is designed to be non-rotatable with respect to the shaft **23** and the housing of the entertainment unit **10** with the shaft **23** fully inserted through the unit housing and the support member **13**. This is necessary to prevent the detachment of the unit **10** from the support member **13** by simply removing the bushing **25**. Accordingly, the aperture **31** in the top

wall 19 of the unit housing has a pair of oppositely aligned protruding tabs 57, FIG. 3A extending inwardly from the periphery of the aperture 31, and the bushing 25 has a pair of open-ended and oppositely aligned grooves or channels 59 for respectively receiving the tabs 57 whereby the bushing 25 is prevented from rotating with respect to the shaft 23 and the housing of the entertainment unit 10.

The grooves 59 are shown in the drawing as extending entirely through the thickness of the annular section 55 but could be provided at some depth less than the thickness thereof; and similarly, either one groove 59 or three or more grooves 59 could be matched to receive a corresponding number of complementary tabs 57. As shown in FIG. 3A, the tabs 57 cooperate with the edge portions of the grooves 59 to prevent any rotation movement of the bushing 25 so long as the tabs are received therein.

It is readily apparent that the particular embodiment shown is but one of many ways in which the bushing 25 could be made non-rotatable with respect to the housing of the entertainment unit 10, for example, the tabs 57 could be provided on the bushing 25 and the grooves 59 in the periphery of the aperture 31 of the top wall 19. Any non-circular periphery of the annular section 55 when matched with a complementary non-circular periphery of the aperture 31 will be effective to yield the advantages of the applicant's novel locking device 15, for example, as shown in FIG. 3B, the grooves in the bushing 25 are enlarged and the periphery of the aperture 31 includes two straight edges to provide the necessary complementarily matched non-circular fit between opposite and spaced portions of an alternative bushing 25' and the unit housing.

When it is not possible to mount the entertainment unit 10 directly beneath the dashboard 11 due to some obstruction, as is quite often the case in the crowded interiors of some modern vehicles, the bushing 25 must have an annular section 55 which is long enough to extend from the support member 13 to within the unit housing via the aperture 31 of the top wall 19. Therefore, the length of the annular section 55 and the lengths of the grooves 59 therein are variable and can be made to accommodate a range of mounting distances between the dashboard 11 and the entertainment unit 10. Any mounting of the unit 10 other than directly beneath the dashboard 11 will obviously result in a gap between the top wall 19 and the dashboard 11, which gap affords access to the bushing 25 and shaft 23 to expose the locking device 15 to a possible detachment by forceful means such as cutting with a blade or flame type device. Therefore, it is necessary to construct the bushing 25 of an extremely hardened metal or metal alloy such as a tool steel which is not readily susceptible to defeat by such forceful means. As shown in FIGS. 3A and 3B, the bushing 25 prevents the shaft 23 from being severed or materially weakened.

Additionally, the grooves 59 effectively divide the annular section 55 into a pair of oppositely diposed sections 55*a* and 55*b* comprising portions of a circle. To prevent these sections from possibly being pried apart enough to defeat the locking device 15 and thus allow access to the relatively vulnerable shaft 23 normally protected by the bushing 25, the sections 55*a* and 55*b* are reinforced by a section of flexible high-strength plastic sleeve or tubing 61 having a very high ultimate tensile strength. The tubing 61 is provided around the bushing 25 internal to the housing of the unit 10 when the parts of the locking device 15 are assembled; additionally, the tubing 61 provides electrical insulation from the operational parts of the unit 10. Similarly, the length of the annular section 55 within the housing should be sufficiently lengthy that the top wall 19 thereof could not be depressed or deformed enough to disengage the non-circular configuration of the sections 55*a* and 55*b* fom the complementarily matched non-circular aperture 31 of the top wall 19.

Another obvious modifiaation to the preferred embodiment of the present invention would be to provide for the apertures 31 and 33 of the top and bottom walls 19 and 21, respectively, to be situated in two parallel spaced and opposite frame or chassis members (not shown), as where the entertainment unit 10 would not have sufficient housing enclosure or the enclosure would be constructed of some low strength and relatively brittle plastic material.

In assembling the locking device 15 as described thusfar, the barrel member 45 is first secured to the bottom housing wall 21 within the aperture 33, the tube 61 is slipped over the shaft 23 and the combination thereof inserted through the aperture 33 and the barrel member 45, the busing 25 is inserted through the support member 13, the dashboard 11, and the complmentarily non-circular shaped aperture 31 in the top housing wall 19, and the shaft 23 is then rotatably threaded into the bushing 25 until the lock cylinder 27 is fully inserted and lockable within the barrel member 45.

An alternative embodiment of the bushing 25 for the locking device 15 is shown in FIGS. 5, 7 and 8 wherein the threaded bushing means is comprised of two separate generally tubular bushings or sleeves 63 and 65. Bushings 63 and 65 are designated as outer and inner bushings, respectively due to their position with respect to the top housing wall 19 in their assembled orientations. The two bushings 63 and 65 cooperate in a particular manner to comprise the same type bushing means as does bushing 25 of the preferred embodiment, namely, the bushings 63 and 65 lock with respect to the housing enclosure of the entertainment unit 10 and do so internally of said housing in order to prevent the defeat thereof by forceful means.

The outer bushing 63 is insertable through the apertures in the support member 13, the dashboard 11 and the top wall 19 and is threaded internally, as indicated at 67 in FIG. 7, so as to be engaged by shaft 23. The bushing 63 has an enlarged head or flange portion 68 similar to the head portion 53 of the bushing 25, and has an annular section 69 which has been approximately halved along a substantial portion of its lengthwise axis to present an arcuate protrusion 69*a* having edge faces 69*b* lying in the outting plane. The internally threaded length 67 is contained along the inner side of the arcuate protrusion 69*a* and within the annular section 69.

The inner bushing 65 has an enlarged head or flange portion 71 which may be shaped as shown in FIG. 8 or it may be any other convenient shape provided the size thereof is sufficient to contain suitable means by which the bushing 65 can be stationarily secured with respect to the housing of the unit 10. As shown in FIGS. 5 and 8, the head portion 71 is provided with apertures 73 for receiving a corresponding number of mountng posts 75, which posts are made stationary with respect to the unit housing as by being secured to the top wall 19 in

some convenient manner. The bushing **65** is slidably mounted on the posts **75.**

The inner bushing **65** also includes an annular section **76** extending from the head portion **71,** which annular section **76** is threaded internally, as indicated at **77** in FIG. **8,** and has been approximately halved along a substantial portion of its lengthwise axis to present an arcuate protrusion **76***a* having edge faces **76***b* lying in the cutting plane, thus complementarily matching the shape of the arcuate protrusion **69***a* of the outer bushing **63.**

In assembling the locking device **15** used with the alternative bushing means as described above, the inner bushing **65** is mounted within the unit housing on its mounting posts **75** and the outer bushing **63** is inserted through the support member **13,** the dashboard **11** and the top wall **19** so that a substantial portion of the arcuate protrusion **69***a* is internal to the unit housing. Next, the shaft **23** is inserted through the bottom wall **21** and the previously secured barrel member **45** to be rotatably threaded into the inner bushing **65** until the inner end of the shaft **23** enters into the arcuate protrusion **76***a*. Thereafter, the shaft **23** is further inserted causing the bushing **65** to slide along its mounting posts **75** in a direction toward the top wall **19.** The outer bushing **63** is rotated so that its arcuate protrusion **69***a* is disposed to receive the shaft oppositely from the arcuate protrusion **76***a*, and the shaft **23** is simultaneously rotatably threaded through the oppositely disposed arcuate protrusions **69***a* and **76***a* to provide a means for holding the two bushings **63** and **65** in locking engagement.

It is readily apparent that the two adjacently mounted bushings **63** and **65** are prevented from rotational movement with respect to each other by the engageable interacting faces **69***b* and **76***b*, and that the inner bushing **65** is prevented from rotating with respect to the unit housing by the mounting posts **75.**

The principles of the present invention have been illustrated in connection with the securement of entertainment units within the interior of an automobile vehicle but it is at once obvious that the applicant's locking device can as well be successfully used for securing a variety of machines, e.g., mobile communication equipment, to a variety of mounting structures in various locations.

It is to be understood that while the present invention has been shown and described with reference to the preferred embodiments thereof, the invention is not limited to the precise forms set forth, and that various modifications and changes may be made therein without departing from the spirit and scope of the present invention.

I claim:

1. A locking device for securing electronic audio entertainment units to an interior support member within an automobile vehicle, including in combination: a housing for an entertainment unit having a pair of opposte and spaced walls, a first wall to be positioned adjacent the support member, and said pair of housing walls and said support member having alignd apertures therein, an elongated threaded shaft to be inserted through said apertures in said pair of housing walls and said support member, means for locking said shaft with said housing with said shaft fully inserted to prevent said shaft from rotating with respect to said housing, and bushing means to threadedly received on said shaft and adapted to be extended through said support member and said first wall with said shaft fully inserted, said bushing means having a widened flange portion opposite said support member from said first wall to retain said bushing means by said support member, and further having another portion adapted to be secured against rotation with respect to said housing whereby rotation of said bushing means with respect to said shaft is prevented, wherein said bushing means includes a pair of bushings to be adjacently received on said shaft, one of said bushings has said widened flange portion on a non-adjacent end thereof and the other of said bushings has a portion to be secured to said housing to prevent said other bushing from rotating with respect thereto, the adjacent ends of said bushings have arcuate protrusions, respectively, extending toward the adjacent bushing with said bushings received on said shaft, and said protrusions interlocked to secure said one bushing against rotation with respect to said other bushing.

2. A locking device as claimed in claim **1** wherein said adjacent ends of the bushings are within said housing whereby said adjacent ends are generally inaccessible to prevent their defeat by forceful means.

3. A locking device for electronic audio entertainment units to be mounted in close proximity to an interior support member of an automobile vehicle, including in combination: a housing for an entertainment unit having a pair of opposite and spaced walls, one of said walls to be secured in abutting relation with the support member to minimize access therebetween, and said pair of housing walls and said support member having aligned apertures therein, an open-ended barrel member to be secured to the other of said housing walls, a portion thereof being mounted internally and within the confines of said housing with the open ends of said barrel member in alignment with the aperture in said wall, an elongated shaft having a lock cylinder on one end portion thereof and a circumferentially threaded length at the other end portion thereof, said shaft to be inserted through said aperture in said other wall, said barrel member, and said aligned apertures in said one housing wall and said support member, and said lock cyliner lockable within the portion of said barrel member located within said housing with said shaft fully inserted to prevent said shaft from rotating with respect to said barrel member and to prevent access to said lock cylinder from outside of said housing, and bushing means threaded to be received on said circumferentially threaded length of said shaft and adapted to be extended through said support member and said one housing wall with said shaft fully inserted, said bushing means having a widened flange portion opposite said support member from said one housing wall to retain said bushing means by said support member, and further having another portion interacting with said one housing wall to secure said other portion against rotation with respect to said housing whereby rotation of said bushing means with respect to said shaft is prevented.

4. A locking device for securing equipment units such as, for example, audio entertainment units to a support member located for example, in a vehicle, each unit including a first housing wall to be spaced from the support member and a second housing wall to be positioned in abutting relation with the support member to minimize access therebetween, including in combina-

tion: an elongated shaft having a free end portion to be inserted through one of said first wall and said support member into said unit, elongated bushing means having a free end portion to be inserted through the other of said first wall and said support member into said unit, said free end portion being engageable with said free end portion of said shaft in the inserted position, a locking arrangement for locking one of said shaft and said bushing means with respect to one of said first wall and said support member when said shaft and said bushing means are in engagement for preventing movement therebetween and movement with respect to said one of said first wall and said support member, said locking arrangement including means operable to locked and unlocked conditions, said means being located within the confines of said equipment unit between said first and second housing walls to prevent access thereto from outside of said unit, the other of said shaft and said bushing means having a widened flange portion external of said unit and said support member for retaining the same in an insorted position, and said free end portion of said bushing means further including means thereon cooperating with one of said first housing walls and said support member for preventing movement of said bushing means relative to said shaft whereby both the selective removal of said shaft and said bushing means from said mutual engagement and said inserted position within said unit is prevented.

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