Dec. 13, 1927.

1,652,644

D. W. SHIEK

LOCKING DEVICE

Filed May 28, 1926

3 Sheets-Sheet 1.

Fig. 1.

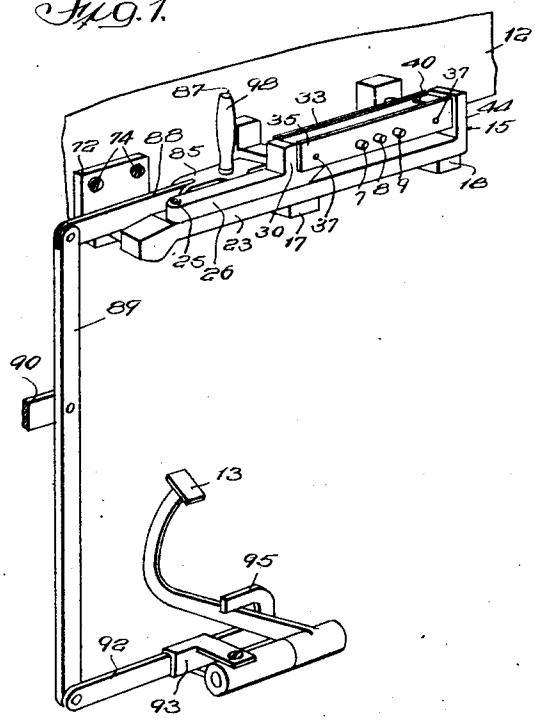


Fig. 4.

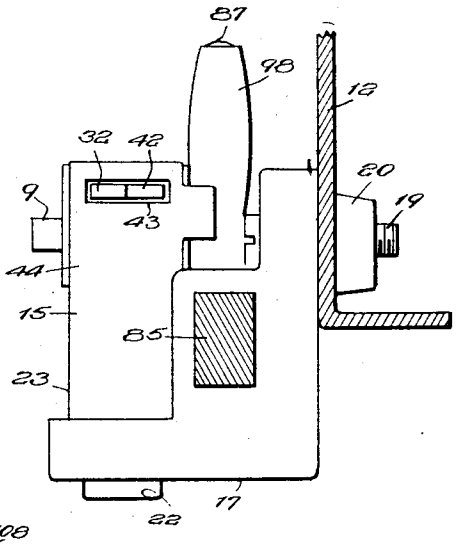


Fig. 5.

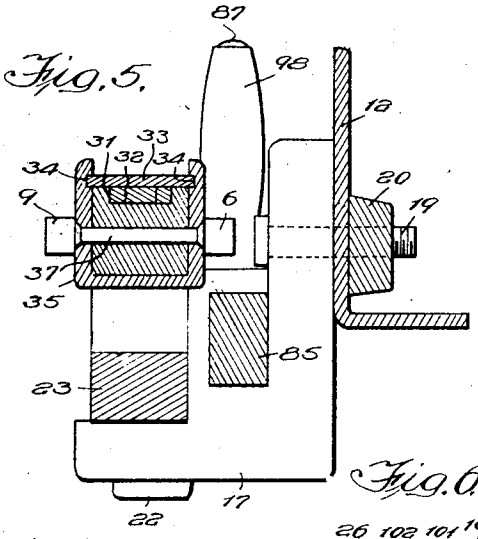
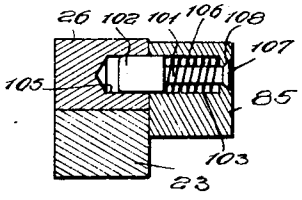


Fig. 6.



Witnesses:

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Harry R. White

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LOCKING DEVICE

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3 Sheets-Sheet 2

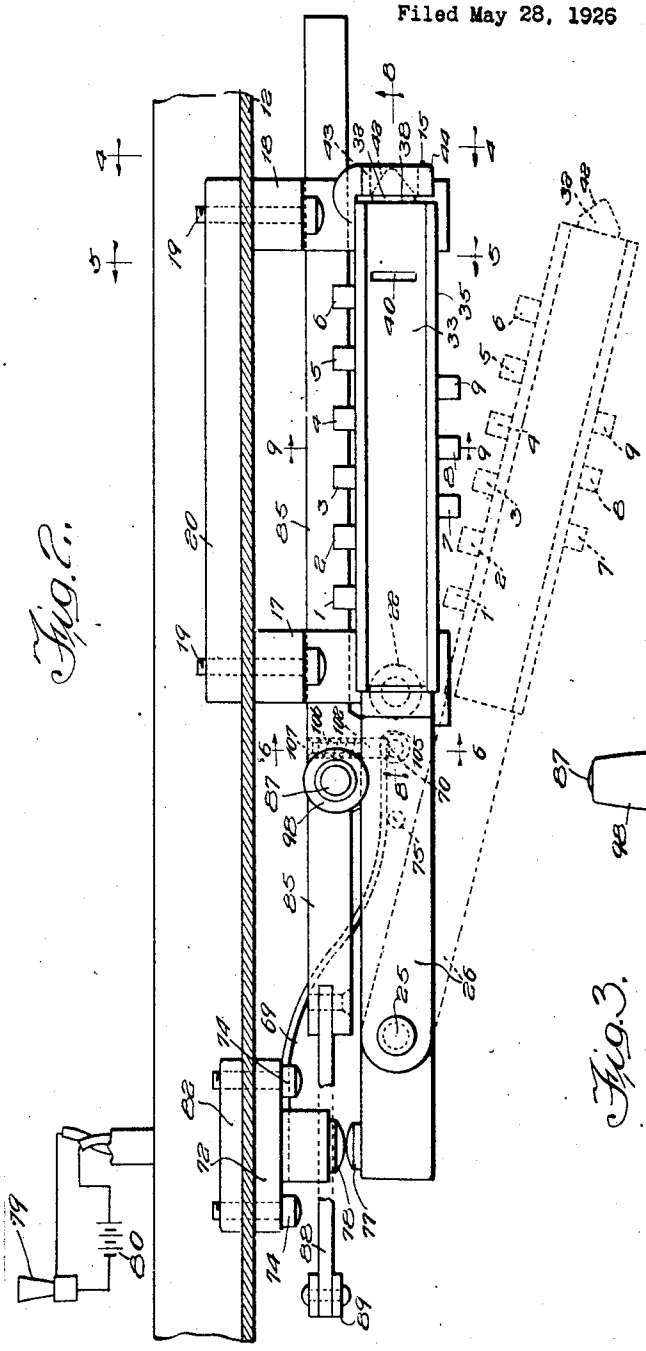


Fig. 2.

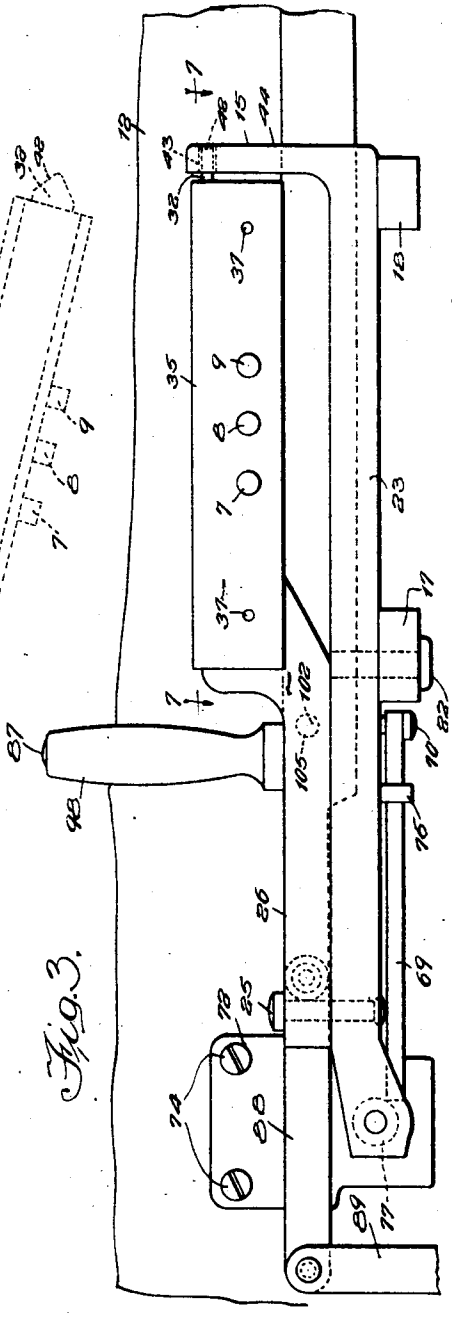


Fig. 3.

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LOCKING DEVICE

Filed May 28, 1926 3 Sheets-Sheet 3

Fig. 7.

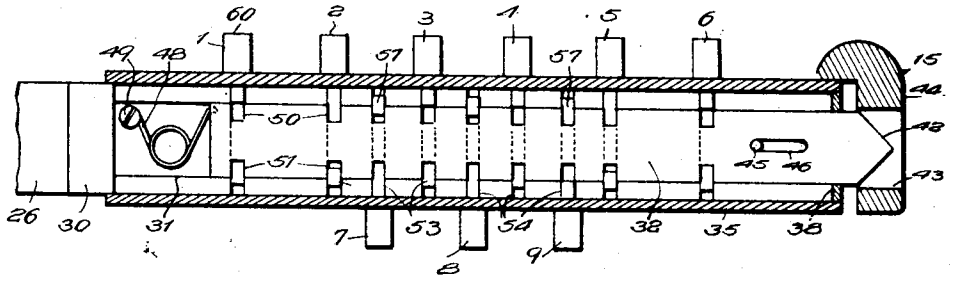


Fig. 8.

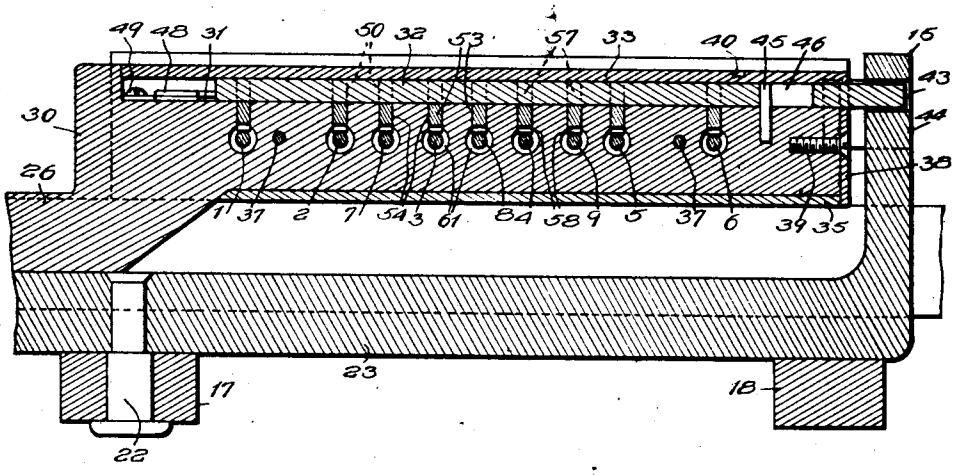


Fig. 9.

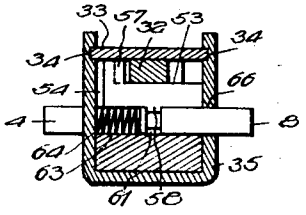


Fig. 10.

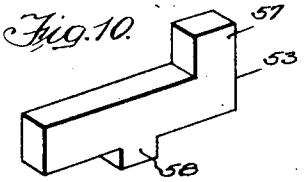
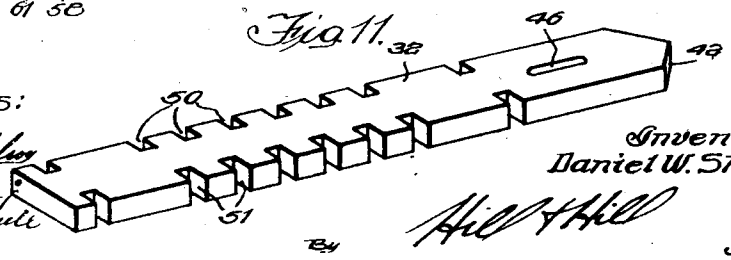


Fig. 11.



Witnesses:
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Patented Dec. 13, 1927. 1,652,644

UNITED STATES PATENT OFFICE.

DANIEL W. SHIEK, OF AURORA, ILLINOIS.

LOCKING DEVICE.

Application filed May 28, 1926. Serial No. 112,297.

My invention relates to locking devices and particularly to locking devices of the type generally known as combination locks.

The invention has among its other objects the production of devices of the kind described, which are convenient, durable, dependable and satisfactory for use wherever found applicable.

A particular object of the invention is to provide an improved device of the kind described whereof the combination may be quickly and easily changed.

Another particular object of the invention is to provide an improved device of the kind described which can be economically manufactured in commercial quantities.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a perspective view of a locking device embodying the invention, the locking device being shown in connection with the clutch pedal of an automobile;

Fig. 2 is a plan view of the improved locking device;

Fig. 3 is a front elevation of the improved locking device;

Fig. 4 is a section taken on line 4—4 of Fig. 2;

Fig. 5 is a section taken on line 5—5 of Fig. 2;

Fig. 6 is a section taken on line 6—6 of Fig. 2;

Fig. 7 is a section taken on line 7—7 of Fig. 3;

Fig. 8 is a section taken on line 8—8 of Fig. 2;

Fig. 9 is a section taken on line 9—9 of Fig. 2;

Fig. 10 is an enlarged perspective view of one of the tumblers of my improved lock; and

Fig. 11 is an enlarged perspective view of a latch bar forming part of the improved locking device.

I have elected to disclose my invention embodied in a locking device adapted to be used in connection with the clutch lever of an automobile, but it will become apparent as this description progresses that the invention may be embodied in locking devices employed in connection with other apparatus. Hence the invention is limited to be used in connection with a clutch pedal only to the extent indicated in the appended claims.

Referring to the drawings and particularly to Fig. 1, for the present, the reference character 12 designates in general the dash of an automobile and the reference character 13 designates the usual clutch pedal of the automobile. A locking device designated generally by the reference character 15 and mounted upon the dash 12 embodies a preferred form of the invention and is adapted to lock the clutch pedal 13 in a position wherein the clutch elements (not shown) are held disengaged from each other.

Any suitable means may be provided for mounting the locking device 15 upon the dash 12. Thus, I have shown brackets 17 and 18 secured to the dash 12 by means comprising screws 19 or the equivalent, the screws 19 being threaded into a bar 20 seated against the inner surface of the dash. This construction is advantageous as it prevents unauthorized persons from removing the brackets from the dash as the bar 20 cannot be revolved around either of the screws 19. Obviously, if a plurality of nuts were employed in lieu of the bar 20, these nuts could be removed from the screws 19 with very little trouble.

As best shown in Fig. 8, a pin 22 pivotally secures a bar 23 to the bracket 17, the pin 22 being so constructed that it cannot be readily removed from the bar and bracket. Pivotally secured to the bar 23 by a pin 25 is a bar 26, one end of the bar 26 being thus secured to the bar 23. The free end of the bar 26 is preferably offset, as indicated at 30, and the offset portion is preferably provided with a longitudinal groove 31 in which a latch bar or latch member 32 is slidably mounted, the latch member being retained in the groove 31 by a cover plate 33, which is slidably mounted in grooves 34 provided in a U-shaped member 35 fitted around the offset portion 30. The U-shaped member 35 is rigidly secured to the offset portion 30 by rivets 37 or the equivalent and the cover plate 33 is preferably provided with a flange 38 at one end whereby the cover plate may

be secured to the offset portion 30, a screw 39 or the equivalent being provided for this purpose. Obviously, if the screw 39 is withdrawn from the offset portion 30, the cover plate 33 may be withdrawn from the grooves 34. It will be noted that the cover plate 33 is provided with a transverse groove 40 which may be engaged by one's finger or a tool when the cover plate is to be withdrawn from the U-shaped member. As best shown in Fig. 7, the latch member 32 is provided with a pointed end 42 engageable with a slot 43 which is provided in a lug 44 formed integral with the bar 23. The pointed end portion 42 provides oppositely disposed cam faces adapted to engage one side wall of the slot 43 when the latch member is moved laterally relative to the support so as to impart a longitudinally sliding movement to the latch, thus providing a substantially cam actuated latch member. When the pointed end 42 of the latch member 32 engages the slot 43, the bar 26 cannot be angularly displaced around its pivotal axis. The travel of the latch member 32 is preferably limited by a pin 45 which projects from the offset portion 30 and rides in a slot 46 formed in the latch member. A spring 48 secured to the offset portion 30 by a screw 49, or the equivalent, yieldingly urges the latch member to the right (Fig. 7).

As best shown in Fig. 11, the latch member 32 is preferably provided with a plurality of detents or notches 50 and 51, or the equivalent, each notch 51 being disposed substantially opposite one of the notches 50. Cooperating with the notches 50 and 51 are a plurality of tumblers 53 which are slidably journaled in a plurality of grooves 54 formed in the offset portion 30, the grooves 54 being disposed transversely of the groove 31 and communicating therewith.

Referring now to Fig. 10, it will be noted that each tumbler 53 comprises an integral lug 57 formed at one of its ends and an integral lug 58 formed intermediate its ends, the lugs being disposed on opposite sides of the tumbler. The lugs 57 of the tumblers 53 may be arranged to engage either the slots 50 or 51 of the latch member 32. Engaging the lugs 58 are a plurality of plungers or pins which are designated generically by the reference character 60 and individually by the reference characters 1 to 9, inclusive, each of these pins being provided with an annular groove 61 engaging the lug 58 of one of the tumblers 53. The pins 60 are slidably journaled in bores 63 provided in the offset portion 30 and associated with each pin 60 is a compression spring 64 also disposed in the bore 63. It will be noted that the pins 1, 2, 3, 4, 5 and 6 project from one side of the offset portion 30 and that the pins 7, 8 and 9 project from the other side thereof, suitable apertures 66 being provided in the U-shaped member 30 so that the pins may project from the offset portion 30. The springs 64 urge the pins 1 to 9, inclusive, into positions into which they extend a maximum distance from the offset portion 30, but it is obvious that the pins may be urged into the offset portion against the action of the springs.

Referring now to Fig. 7, it will be noted that the tumblers 53 associated with the pins 1, 3, 4, 6 and 9 are positioned so that the lugs 57 thereof are adapted to enter the slots 50 if the pins 1, 3, 4 and 6 are depressed and to enter one of the slots 51 if the pin 9 is depressed. In other words, if one of the pins 1, 3, 4 or 6 is depressed against the action of its respective spring 64, the lug 57 of the tumbler 53 associated therewith will enter the associated slot 50 and if the pin 9 is depressed against the action of its spring 64, the lug 57 of the tumbler 53 associated therewith will enter the corresponding slot 51. The tumblers associated with the pins 2, 5, 7 and 8 are positioned so that their lugs 57 are disposed in the slots 50 and 51 when the corresponding springs are fully extended. Thus, if the pins 2 and 5 are depressed against the actions of their springs 64, the lugs 57 of the tumblers 53 associated therewith will be forced out of the corresponding slots 51 and if the pins 7 and 8 are depressed against the actions of their springs 64, the lugs 57 of the associated tumblers 53 will be forced out of the corresponding slots 50. It is readily understood that if the pins 2, 5, 7 and 8 are depressed against the actions of their springs, the corresponding lugs 57 will be brought out of engagement with the corresponding notches 50 and 51 and the latch member 32 may be moved longitudinally in the groove 31, such action being either against or with the action of the spring 48 and being limited by the pin 45 projecting through the slot 46. However, should any of the other pins be depressed, the corresponding lug 57 will enter any one of the slots 50 or one of the slots 51 and lock the latch member 32 against displacement relative to the offset portion 30. A feature of this invention is that the several tumblers 53 are substantially identical in form and are interchangeable. In addition, the combination may be readily changed by simply turning some of the tumblers end for end in the offset portion 30. Thus, if the tumbler 53 associated with the pin 1 is turned end for end, its lug 57 will normally lie in the corresponding slot 51 so that its pin must be depressed in addition to the pins 2, 5, 7 and 8 when the latch member 32 is to be unlocked. When the combination is to be changed, it is only necessary to remove the screw 39 and then the cover plate 33 after which the tumblers may be arranged as desired.

When the latch member 32 engages the slot

43 in the lug 44, the bars 23 and 26 are yieldingly urged as a unit in a counter-clockwise direction (Fig. 2) around the pin 22 by a leaf spring 69, which has one of its ends secured to the bar 23 by a screw 70, or the equivalent. The other end of the leaf spring 69 rests upon a bracket member 72 secured to the dash 12 by screws 74 or the equivalent. A pin 75 projecting from the underside of the bar 23 engages the leaf spring 69 intermediate its ends and tensions it, the arrangement being such that the spring 69 bears against the pin 75 and tends to urge the bars 23 and 26 in a counter-clockwise direction (Fig. 2). Projecting from the bar 23 is a pin 77 adapted to operate a push button switch 78 mounted in the bracket member 72, the construction being such that when the bars 23 and 26 are angularly displaced as a unit in a counter-clockwise direction (Fig. 2) the pin 77 will close the switch 78. In Fig. 2 I have illustrated an apparatus for giving an audible alarm when an unauthorized attempt is made to angularly displace the bars 23 and 26 in the manner above described, this means preferably comprising an electrically operated horn 79, or the equivalent, wired in series with the switch 78.

It will be apparent from the foregoing that if an unauthorized person attempts to release the clutch pedal without first releasing the latch member 32, the end of the bar 23 opposite the pivot 25 will be moved laterally with the latch member and bar 26, thus causing the pin 77 to press inwardly on the push button 78 for closing the circuit to the audible signal 79, this movement of the bar 23 taking place upon the pivot pin 22. This movement of the bar 23 with the bar 26 causes the signal to be sounded, readily indicating that an unauthorized person is attempting to release the bar 85 for movement to disengage the hook 95 from the clutch pedal. I have illustrated the circuit connecting the horn 79 to the push button switch 78 diagrammatically and it will be noted that it includes a battery 80, or the equivalent, so that when the switch 78 is closed the horn 79 will be operated. It will also be noted that the screws 74 are threaded into a bar 82 seated against the inner surface of the dash 12 so that the screws may not be removed from the bracket member by unauthorized persons.

Slidably journaled in the brackets 17 and 18 is a bar 85, one end of which is connected by a link 88 to a lever 89, the lever 89 being pivotally mounted intermediate its ends upon a bracket 90 mounted in any suitable manner upon the body of the automobile. The link 88 is pivotally connected to one end of the lever 89 and the other end of the lever is loosely pivoted to a slide 92 mounted in a bracket 93 and provided with a hook 95 engageable with the clutch pedal 13. The construction is such that when the hook 95 and clutch pedal 13 are brought into relative positions wherein they are shown in Fig. 1, the clutch elements (not shown) are held disengaged from each other and the automobile is functionally inoperative. Obviously, the automobile will remain functionally inoperative until the slide 92 has been displaced to the right (Fig. 1) so that the clutch pedal may be angularly displaced around its pivotal axis. For this purpose I provide a handle 98 upon the bar 85, whereby the bar may be shifted longitudinally in the brackets 17 and 18. If the bar 85 is moved to the left (Figs. 1 and 2), the slide 92 will be displaced to the right (Fig. 1) and the clutch pedal 13 will be released. However, when the bar 85 and the bars 23 and 26 occupy the relative position wherein they are shown in full lines in Fig. 2, the bar 85 is locked against movement relative to the bars 23 and 26 by means which preferably comprises a pin 101 having a head 102 slidably mounted in a bore 103 formed in the bar 85, the head 102 being engageable with a depression 105 formed in the bar 26. A spring 106 disposed in the bore 103 yieldingly urges the head 102 into the depression 105, the movement of the head 102 into the depression 105 being limited by a head 107 formed upon the pin and engageable with a counter-sunk depression 108 formed in the bar 85.

The operation of the above described apparatus is substantially as follows: Assuming that the several parts occupy relative positions wherein they are shown in Fig. 1, the clutch pedal 13 is locked against angular displacement and the automobile of which it forms a part is rendered functionally inoperative. If the pins 2, 5, 7 and 8 are now depressed against the actions of their respective members 64, the corresponding lugs 57 will be forced out of the corresponding slots 50 and 51 and the bar 26 may be brought into the position wherein it is shown in dotted lines in Fig. 2, the latch member 32 moving inwardly against the action of the spring 48 when its end 42 engages the lug 44. This movement of the bar 26 removes the head 102 from the depression 105 and the bar 85 may be moved to the left (Figs. 1 and 2) to disengage the hook 95 from the clutch pedal 13. The automobile is then functionally operative. If desired, the pins 2, 5, 7 and 8 may again be depressed and the bar 26 may be returned to the position wherein it is shown in full lines in Fig. 2. Then, if it is desirable to again lock the clutch pedal 13 against angular displacement, it is only necessary to shift the bar 85 to the right (Figs. 1 and 2), whereupon the hook 95 again engages the clutch pedal 13, the clutch pedal having been previously depressed into a position wherein it may be engaged by the

hook. Assuming that the hook 95 is thus returned to the position wherein it is shown in Fig. 1, the head 102 of the pin 101 snaps into the depression 105 when it comes into alignment therewith.

The screws 19 and 39 are not readily accessible when the bar 26 is in the position wherein it is shown in full lines in Fig. 2 and thus cannot then be removed by unauthorized persons to render the locking device ineffective.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. A lock comprising a cam actuated latch member having two rows of oppositely disposed slots, a plurality of tumblers engageable with said slots, each of said tumblers being reversible to engage either of two opposed slots, a plurality of pins engaging said tumblers, a plurality of springs for said pins, each pin being adapted to yieldingly urge one of said pins in a predetermined direction.

2. A lock comprising a supporting member, a movable member mounted upon said supporting member, a latch member carried by said movable member and engageable with said supporting member, a plurality of tumblers slidably mounted in said movable member and engageable with said latch member, and means for controlling said tumblers.

3. A lock comprising a supporting member, a movable member mounted upon said supporting member, a cam actuated latch member slidably mounted in said movable member and engageable with said supporting member, a plurality of tumblers slidably mounted in said movable member and engageable with said movable member and engageable with said latch member.

4. A lock comprising a supporting member, a movable member mounted upon said supporting member, a latch member slidably mounted in said movable member and engageable with said supporting member, a removable cover plate mounted upon said movable member, said latch member being accessible when said cover plate is removed, and a plurality of tumblers slidably mounted in said movable member for controlling said latch member, said tumblers being accessible when said cover plate and said latch member are removed from said movable member.

5. A lock comprising a latch member, a plurality of reversible tumblers, spaced lugs formed on each of said tumblers and extending from opposite faces thereof, one of said lugs of each tumbler being engageable with the latch member, and means engageable with the other lug on each tumbler for controlling the movement of said tumblers.

6. A lock comprising a latch member having a plurality of oppositely disposed slots therein, a plurality of tumblers, lugs on each tumbler with one of the lugs engageable with any one of said slots, said tumblers being reversible whereby one of the lugs is positioned for engagement with either of two opposed slots, and means engageable with the other lug on each tumbler for controlling the movement of the same.

7. In a locking device of the keyless type, a longitudinally movable cam actuated latch bar having a series of detents, a series of tumblers movable independently of and transversely to the latch bar, each of said tumblers having lugs thereon with one of the lugs of each tumbler adapted to engage one of the detents, and means engageable with the other lug of each tumbler for controlling the movement of the same.

8. In a device of the character described, a pivotally mounted supporting member, locking means carried by the supporting member and movable independently of the same, and means for locking the locking means against movement independent of the supporting member whereby an attempt to move one will impart movement to the other.

9. A lock of the character described including a support, a movable member mounted upon the support, a latch carried by said movable member and engageable with the support, a plurality of tumblers slidably mounted in said movable member and engageable with the latch, and means for controlling the movement of said tumblers.

In testimony whereof, I have hereunto signed my name.

DANIEL W. SHIEK.