

June 8, 1926.

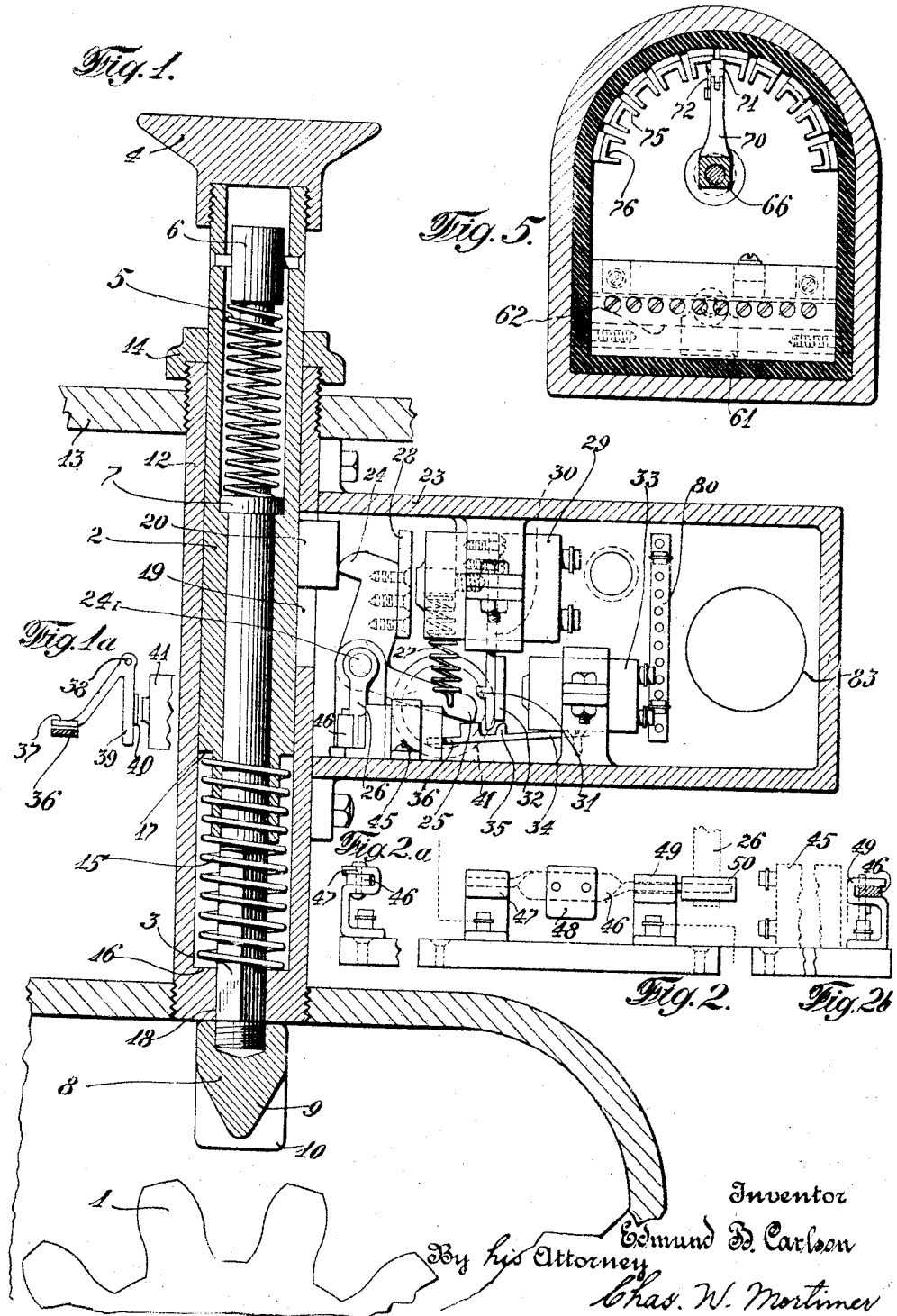
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1,587,757

AUTOMOBILE LOCK

Filed Nov. 15, 1921

3 Sheets-Sheet 1



June 8, 1926.

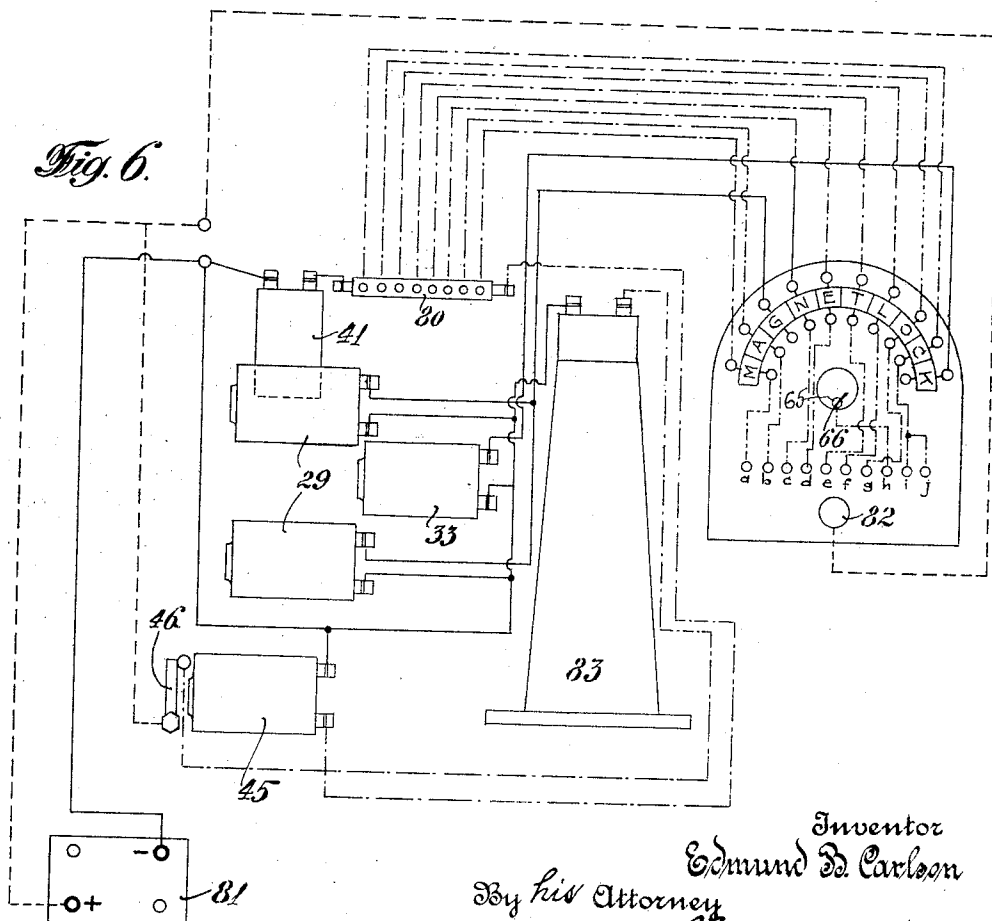
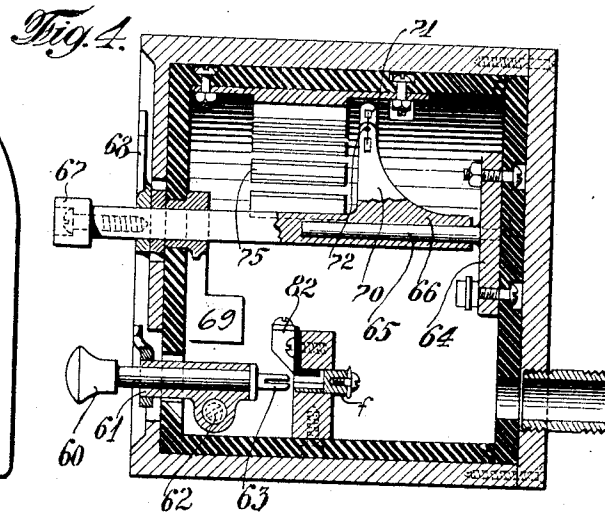
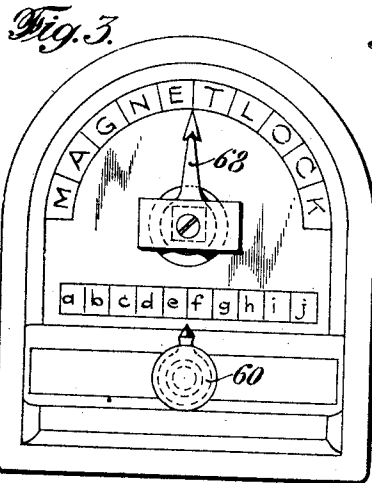
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

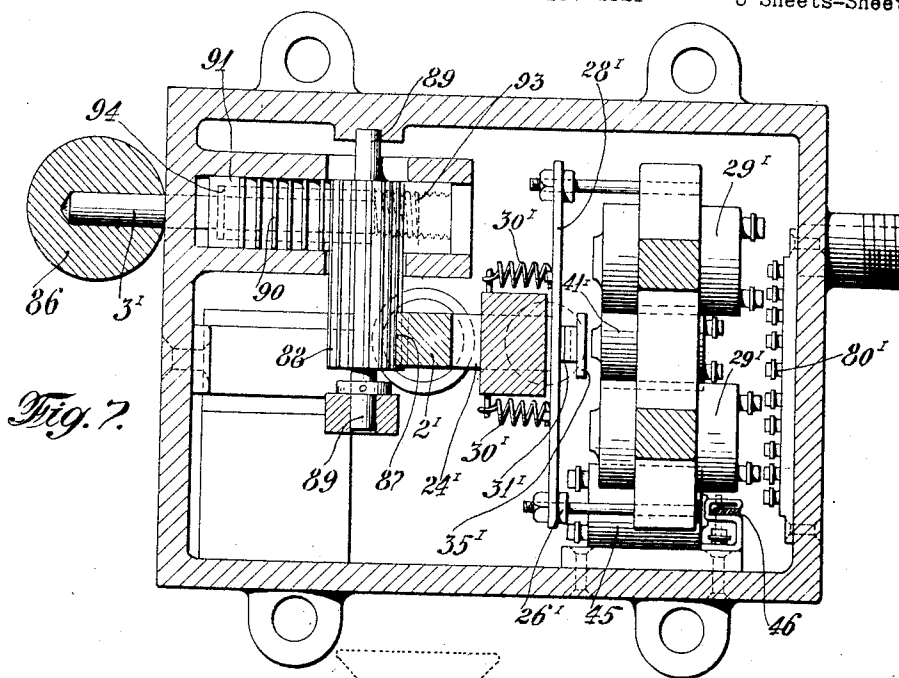


Fig. 7.

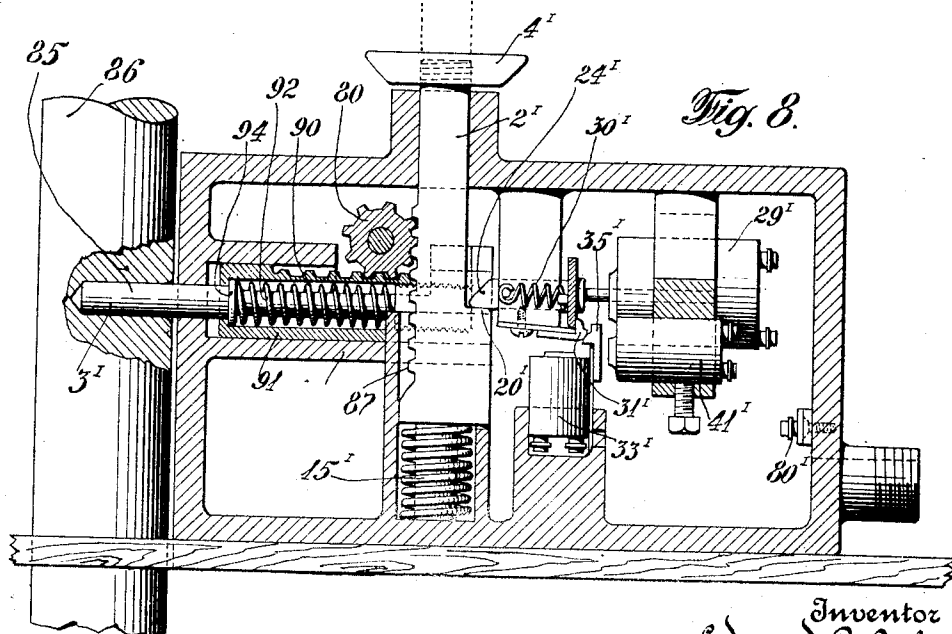


Fig. 8.

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AUTOMOBILE LOCK.

Application filed November 15, 1921. Serial No. 515,256.

This invention relates to a device for preventing thefts of automobiles. It relates more specifically to a device that can be easily and rapidly manipulated by the owner, or one who has been properly instructed, so as to lock and unlock the same without requiring the use of a key or other external appliance. At the same time it is practically impossible for an unauthorized person to find out how to release the locking mechanism or steal the car. Provision is also made by which an alarm will be sounded when an improper attempt is made to unlock a car that has been locked with this device. The device can be applied, for example, to a driving or revolving part of the machine, such as a gear, to securely lock the same against rotation, or in places where it is forbidden by law to lock a car so that it cannot be moved even a short distance, this device can be used to lock the steering post in such a position that the car can proceed only on a fixed course preferably in a curved or circular direction, thereby preventing any thief from moving it a long distance from where it was left stationed, but permitting it to be moved a short distance in case of fire or other emergency.

An important feature of this invention is the provision of means by which a car can be easily locked with certainty and also the provision of a certain number of electrical contacts that must be closed in a predetermined manner in order to unlock the car. A sufficiently large number of other similar electrical contacts are provided so as to make it practically impossible for an unauthorized person to find the proper sequence of the correct ones to be closed and so as to render it practically certain that he will set off the alarm in his attempt to unlock the car. In case he should succeed in getting a portion of the sequence correct a subsequent mistake will not only set off the alarm but will also render the preliminary success abortive and make it necessary to repeat the sequence in proper order. The sounding of the alarm can be caused to cease by the owner properly manipulating the contacts.

The invention will be understood from the description in connection with the drawings illustrating an embodiment of the in-

vention, in which the same reference characters refer to the same parts in the different views.

Fig. 1 is a vertical section through the locking device.

Fig. 1^a is a detail of one of the parts.

Figs. 2, 2^a and 2^b are details of a switch.

Fig. 3 is a front view of the operating mechanism.

Fig. 4 is a longitudinal vertical section of the same.

Fig. 5 is a sectional end view of Fig. 4.

Fig. 6 is a diagram of the electrical connections.

Fig. 7 is a horizontal section of a modification of the locking mechanism.

Fig. 8 is a vertical section of Fig. 7.

In the drawings reference character 1 indicates a gear of the transmission system of an automobile. The locking bolt of this device comprises two portions, the upper one 2 of which consists of a hollow sleeve, and the lower portion 3 of which is a rod. The upper portion 2 of the locking bolt is provided with a head 4 for the operator's hand or foot, and near the upper end the hollow portion 2 is enlarged for the reception of a spiral compression spring 5, one end of the spring 5 bearing against the stop 6 which is securely fixed in the sleeve 2, while the other end of the spring 5 bears against the upper end of the head 7 of the rod 3. The lower end of the rod 3 screws into a plug 8 having a V-shaped portion 9 to engage between the teeth of the gear 1 and flanges 10 to engage the ends of the teeth to prevent the gear from revolving or being shifted longitudinally when the plug 8 is in its locking position.

The locking bolt is mounted in a casing 12 which may extend slightly above the floor 13 of the automobile and has a tight fitting closure 14 to prevent the ingress of dirt. The lower end of the spiral compression spring 15 bears against a shoulder 16 of the casing 12 and its upper end bears against a shoulder 17 of the portion 2. The lower end of the rod 3 is preferably made square to fit the square opening 18 of the casing 12, thus holding the plug 8 in proper position to cooperate with the teeth of the gear 1 for locking the same. The casing 12 is provided with a slot 19 on one side,

through which slot the lug 20 rigidly attached to the portion 2 of the locking bolt extends.

The housing 23 contains the operating mechanism for releasing the lock and also contains an alarm. In the housing 23 a catch 24 is pivotally mounted at 24₁ and carries extensions 25 and 26 rigidly connected so as to turn with the catch 24. A spring 27 is attached to the extension 25 and tends to turn the catch 24 in a counter-clockwise direction. Back of the catch 24 is an armature 28 for the magnets 29.

A spring 30 is mounted so that the detent 31 thereof will catch below the extension 25 when the catch 24 is turned to the proper position. The spring 30 is also provided with an armature 32 for the magnet 33. A spring 34 provided with a detent 35, is adapted to catch the spring 30 when it is pulled to the right by the magnet 33. The end 36 of the spring 34 may be pressed downwardly by the arm 37 of the bell-crank shown in Fig. 1^a pivoted at 38, the end 39 of which is provided with an armature 40 that may be attracted by the magnet 41. The extension 25 also bears upon a lug on the spring 34, thereby pressing the detent 35 below the end of the spring 30 when the catch 24 is in the position shown in Fig. 1.

A magnet 45 is provided to attract the switch 46. One end of the switch 46 is pivoted at 47, as more plainly indicated in Figs. 2, 2^a and 2^b, and it is provided with an armature 48 for the magnet 45, and a portion thereof is adapted to engage in the spring contact 49. The end 50 of the switch 46 rests behind the extension 26 so that the switch will be opened when the catch 24 is turned to the position indicated in Fig. 1.

The contact closing mechanism is shown in Figs. 4 and 5 consisting of the plug 60 mounted in a sleeve 61 which can be made to slide horizontally along the rod 62 and be pushed inwardly into any of the sockets *a-j*. The end 63 of the plug 60 is bifurcated to insure better contact. Only one of the sockets *a-j* (namely the socket *h*, as indicated in Fig. 6) is electrically connected to the plate 64 which carries a metal rod 65. The rod 65 is surrounded by a metal sleeve 66 which terminates in a knob 67 for the operator and carries a pointer 68 which can be turned to point to the letters M-K, shown in Fig. 3. A weight 69 depends from the sleeve 66 and normally holds it in the position indicated. The sleeve 66 carries an extension 70 at the upper end of which is pivotally mounted a contact member 71 which is normally held by the spring 72 in an upright position. Metal contacts 75, corresponding in number and position to the letters M-K, (Fig. 3) are insulated from each other and mounted in such positions that the contact 71 can be turned and

drawn into contact with the channel portions 76 of the same, while the spring 72 yields to prevent binding. All of the contacts 75 corresponding to the letters M-K except two, namely those corresponding to the letters G and K, are electrically connected to the distributor 80 (Fig. 6), which is in turn connected to the two magnets 41 and 45 in parallel. The contact 75 corresponding to the letter G is connected to the magnets 29 and the contact 75 corresponding to the letter K is connected to the magnet 33. A battery 81 has one of its terminals electrically connected to the contact plate 82, which can in turn be electrically connected by the plug 60 to any one of the sockets *a-j*. One terminal of the battery 81 is also connected, when the switch 46 is closed, to the horn or alarm 83.

The operation is as follows:

When an automobile stops, the operator presses the head 4 downward a sufficient distance to cause the lug 20 to move downwardly far enough to cause the catch 24 to snap over the upper edge of the same. At the same time the detent 31 snaps below the lower edge of the extension 25, thereby securely holding the catch 24 in its locking position. In case a tooth of the gear 1 is in the way so that the plug 8 rides on the top of the tooth, the springs 5 and 15 will both be compressed and retained in their compressed position. As soon as the gear 1 moves slightly in either direction the plug 8 drops into position, being forced therein by the spring 5 expanding, and the car is locked. As soon as the catch 24 releases the lug 20, the spring 15 withdraws the plug 8 from between the teeth, thus unlocking the device.

The catch 24 is withdrawn from behind the lug 20 by the operator establishing a series of electrical connections in a prescribed way. He first inserts the plug 60 into the socket *h* thereby establishing electrical connection from the battery 81 through the plate 82 and socket *h* (Fig. 6) to the contact 66. He then turns the knob 67 until the pointer 68 is opposite the letter K and then pulls the knob 67 outwardly, thus establishing electrical connection by means of the contact 71 with the contact 75 corresponding to the letter K, thereby completing the circuit to energize the magnet 33. The energization of the magnet 33 attracts the armature 32 (Fig. 1), thus withdrawing the detent 31 from under the extension 25 of the catch 24, the armature 32 snapping behind the spring-pressed detent 35 and being held in this position. The operator then pushes the knob 67 inwardly until it ceases to contact with the contact 75 and then turns the knob 67 until the pointer 68 comes opposite the letter G and then pulls the knob outwardly, thus establishing

electrical contact between the electrical contact 66 and the contact 75 corresponding to the letter G, thus energizing the magnets 29 which attract their armature 28 to withdraw the catch 24 from the lug 20 to permit the spring 15 to raise the plug 8 away from the gear teeth. The turning of the catch 24 by the armature 28 being attracted by the magnets 29 causes the extension 26 to open the switch 46, if the same had previously been closed, and at the same time the extension 25 presses the spring 34 downwardly, thus permitting the spring 31 to snap back to normal position, ready to engage under the extension 25 when the device is again locked.

In case a thief or unauthorized person attempts to unlock the device, the chances are that he will first insert the plug 60 into the wrong socket *a-j*, thus establishing electrical contact between the post 82 and the distributor 80, thereby energizing the magnets 41 and 45. The energization of the magnet 45 will close the switch 46, thereby connecting the alarm 83 to the battery 81, which alarm will continue to sound until the switch 46 is opened by a correct manipulation of the mechanism. Even if the thief accidentally inserts the plug into the correct socket, namely the socket *h*, the chances are that in his attempt to complete the unlocking operation he would turn the knob 67 so as to establish contact with a contact other than the correct one of those corresponding to the letters M-K. In such a case electrical connection would also be made to the distributor 80, thereby energizing the magnets 41 and 45, thus causing the alarm 83 to sound by the closing of the switch 46 and also nullifying the preliminary correct switch closing, due to the fact that this energization of the magnet 41 would cause the arm 37 to press downwardly on the end 36 of spring 34 (see Fig. 1^a), thus permitting the spring 30 to snap into position so that the detent 31 would catch below the extension 25 and prevent the device from being operated even if the magnets 29 should be subsequently energized.

Even if the thief could succeed in the meager chances of first plugging the plug 60 into the correct socket *a-j*, and should then succeed in closing the proper contact K, he would be foiled if he subsequently closed any contact other than that corresponding to the letter G. It is thus practically impossible for anyone unfamiliar with the combination to unlock the device.

In the modifications shown in Figs. 7 and 8, the locking device is so arranged that the locking bolt 3' is caused to project in its locking position into a socket 85 in the steering post 86. This socket 85 is preferably in such a position that when the bolt 3' projects into the same, the steering post

is in such a position that the automobile will travel in a circular path, thus permitting it to be moved a short distance but preventing it from being carried away very far. The parts in Figs. 7 and 8 correspond somewhat closely to those in Fig. 1 and are designated by the same reference characters with primes. The portion 2' of the locking bolt is pressed upwardly by the spring 15'. The portion 2' is provided with a ratchet 87, the teeth of which mesh with teeth 88 of a gear mounted in the bearings 89. The teeth 88 also mesh with a ratchet 90 on the sleeve 91 which carries a spring 92, one end of which bears against the stop 93 screwed into the sleeve 91, and the other end of which bears against a shoulder 94 carried by the rod 3'. The catch 24' is adapted to snap behind the shoulder 20' when the device is in the locked position as shown. The springs 30' tend to draw the catch 24' into its locked position. The armature 28' of the magnets 29' is attached to the catch 24'. The spring pressed detent 31' holds the catch 24' in locked position and the spring pressed detent 35' is adapted to hold the detent 31' in its lower position when caught thereby. The magnets 33' and 41' perform functions very similar to the correspondingly numbered magnets in Fig. 1, and it is thought unnecessary to describe the same more in detail. The armature 28' carries a rod 26' for opening the switch 46' in a manner similar to that already described, the magnet 45' serving to close the switch 46' to set off the alarm when incorrect electrical connections are made.

It is evident that by slightly changing the wiring as indicated in Fig. 6, one can readily change the combination for unlocking the device. The device can also be provided with a larger or smaller number of plugs *a-j* and also with a larger or smaller number of contacts 75, thus providing a wide choice of combinations which would render it practically impossible for an unauthorized person to unlock the device without setting off the alarm.

I claim:

1. In an automobile lock, a bolt for locking an operating part of an automobile against turning, a catch for holding said bolt in locking position, a detent for retaining said catch in holding position, and means for releasing said detent and catching it in its released position.

2. In an automobile lock, a bolt, a catch therefor, a detent for retaining said catch in holding position, and a spring actuated detent for catching said first named detent in its inoperative position and parallel electrical circuits for operating said retaining detent and said catch in succession.

3. In an automobile lock, a bolt, a catch

therefor, a detent for retaining said catch in holding position, and a spring actuated detent for catching said first named detent in its inoperative position, said catch being
5 provided with an arm for withdrawing said spring actuated detent from behind said retaining detent.

4. In a lock, a bolt, a catch therefor, a
10 spring detent for said catch, magnets for operating said catch and detent, said detent operating magnet being energized by closing two electrical contacts in series, and
said catch operating magnet being energized by current passing through one of
15 said first named contacts and another contact in series.

5. In a lock, a bolt, a catch therefor, a spring detent for said catch, magnets for operating said catch and detent, said detent operating magnet being energized by
20 closing two electrical contacts in series, said catch operating magnet being energized by current passing through one of said first named contacts and another contact in series, a second detent for holding said first
25 named detent in inoperative position, and a magnet capable of being energized through a plurality of contacts and, when energized, releasing said second named detent.

In testimony whereof I affix my signature.

EDMUND B. CARLSON.