June 7, 1932. H. E. NORVIEL 1,861,714

COINCIDENTAL LOCK

Filed Jan. 5, 1929

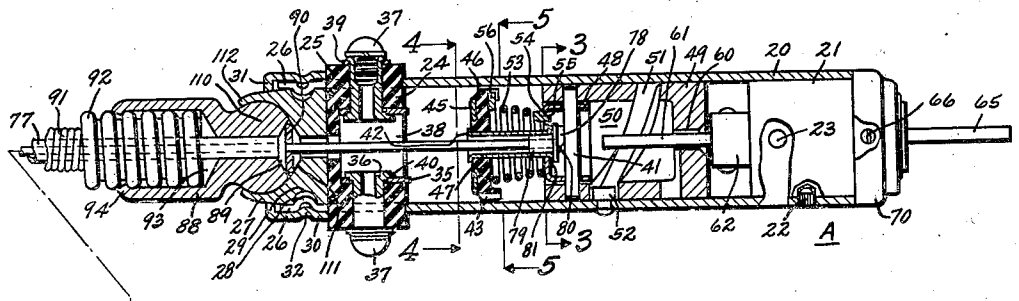
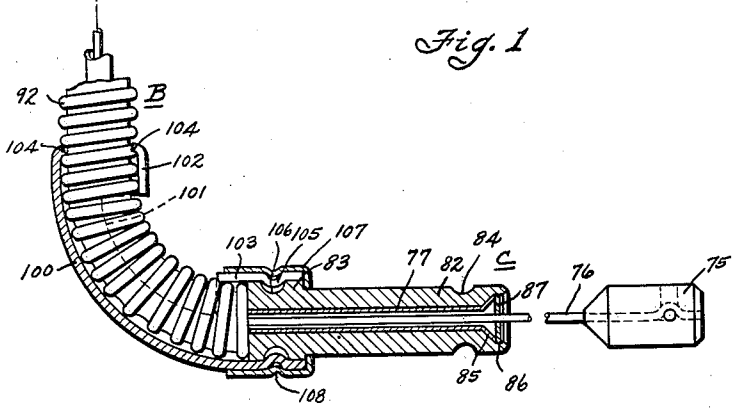


Fig. 1



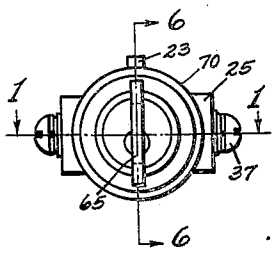


Fig. 2

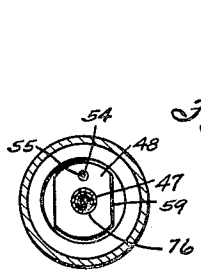


Fig. 3

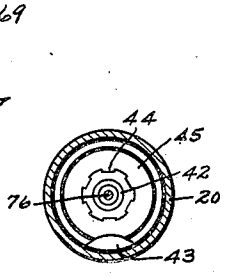


Fig. 4

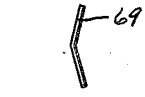


Fig. 7

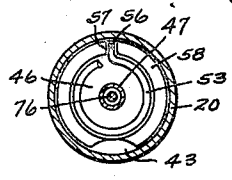


Fig. 5

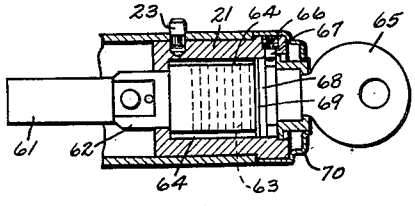


Fig. 6

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UNITED STATES PATENT OFFICE

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COINCIDENTAL LOCK

Application filed January 5, 1929. Serial No. 330,668.

This invention relates to coincidental locks for preventing theft or unauthorized use of an automotive vehicle, and particularly to a coincidental lock wherein a single key controlled member may be operated to open the ignition switch and to prevent the use of the gear shift lever to connect the engine with the transmission mechanism.

The objects of the present invention include the provision of a novel coincidental lock referred to which is durable and reliable and can be manufactured at low cost. More particularly, it is an object of the present invention to provide certain improvements conducive to economy and manufacture in the type of coincidental lock shown in the Patent 1,674,314 of Carl W. Blossom and Elmer C. Peterson, granted June 19, 1928.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred form of embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a view partly in longitudinal section of a coincidental lock embodying the present invention, and is taken partly on the line 1—1 of Fig. 2.

Fig. 2 is an end view of the end thereof which is mounted upon the instrument board of the automobile.

Figs. 3, 4 and 5 are sectional views on the lines 3—3, 4—4 and 5—5 respectively of Fig. 1.

Fig. 6 is a fragmentary longitudinal sectional view of a portion of the device showing the key shaft and lock barrel, as viewed on the line 6—6 of Fig. 2.

Fig. 7 is a detail view of the spring washer used in the lock cylinder assembly.

In the drawing there is illustrated a coincidental lock of the type referred to, which embraces the controller unit or device A, that has provision for operating, through the connecting or control unit B, upon the controlled device C, as will later be explained.

The controller device A, comprises in main, a shell or case as a metal tube 20, which is closed at one end by the lock cylinder and tongue assembly 21. Within the shell 20 and operatively associated with the key controlled device 21, there is provided the lock worm and contact actuator assembly 50, supporting and driving a bridging contact, and a control member. A terminal support 25, and an armored control means form a closure for the other end of the shell 20, as will presently be explained.

In the drawing 20 designates the metal tube which defines the shell, and it is formed preferably by bending sheet metal into a cylindrical form, and by holding the abutting ends together by suitably interlocking joints not shown, but familiar to those skilled in the art.

The lock cylinder assembly 21 is retained within the end of the shell 20 by means of the press pin 22, and by a locating pin 23. The other end of the shell 20 receives a cylindrical portion 24 of a non-conducting terminal support 25, received within the notches 26 by bifurcating the end of the shell 20. A conduit support 27 which supports one end of the control unit B, is received by the shell 20, and bears against the block 24. The support is retained in the tube as shown in Fig. 1, by deforming portions of the tube 20, as at 28, into a groove 29 provided by the conduit support 27. The end of the tube 20 adjacent the support 27, is reinforced by the collar member 30, of hard metal having a flange 31 closely surrounding the support 27, and having certain portions 32, deformed or staked into recesses which are provided in the shell 20, when the portions 28 are deformed into the groove 29, of the support 27.

The block 25 insulatingly supports contacts 35 which are secured thereto by terminal bushings 36, each receiving a terminal screw 37. Each of the contact plates 35 is received within a recess at substantially diametrically opposite points of the main central bore 38 of the block 25. The terminal bushing 36 is held in engagement with the contact plate 35 as shown in Fig. 1, by riveting over a portion of the bushing 36 against a washer 39 located on the outside of the block 25. For insuring proper electrical connection between the contact plates 35, and the bush-

ings 36, they are mechanically united as by means of solder applied at the juxtaposed portions thereof, as indicated at 40.

The contacts 35 are engageable by a ring contact or bridging member 45, insulatingly supported upon the assembly 50, as by a nonconducting block or contact support 46, which is molded about the central and depressed tangs 44. The block 46 is notched as at 43, and is centrally apertured to be slidable along the short tube 47 connected at one end with a cup shaped member 48. The tube 47 is flared as at 42, to form an end stop for the block 46. The member 48 is located within a cam sleeve 49 and is attached thereto by a cross pin 41.

The cam sleeve 49 is provided with a helical slot or groove 51 for receiving a stud 52 attached to the shell 20 for guiding the movement of the assembly 50 within the shell 20. Therefore, when the sleeve 49 is turned it will move endwise within the shell 20 and move the member 48 along the axis of the shell. Motion is transmitted from the cup 48 to the contact carrier 46, by a spring 53 which is disposed therebetween and encircles the tube 47.

The spring 53 has special provisions at each end thereof for engaging the cup member 48 and the contact carrier 46, so that the contact carrier 46 will be capable of both longitudinal and rotary movement with respect to the tube 47 on which it is mounted. These special provisions are afforded by forming the cup 48 with an eccentrically disposed aperture 54, in the bottom wall of the cup, for receiving the axial extension 55 of one of the end turns of the spring 53, as will be seen by reference to Figs. 1 and 3. The opposite end turn of the spring 53 is provided with the radial extension 56, which engages a notch 57 in a peripherial flange 58 of the contact carrier 46, as will appear upon reference to Figs. 1 and 5.

From this structure it will appear that a movement of the member 48 will be resiliently transmitted to the contact carrier 46, and also that rotary movement of the member 48 will resiliently urge the contact carrier 46 in a similar rotative direction. Therefore, the ring contact 45 will be moved by the turning of the sleeve 49 into engagement with the contacts 35, and will also be maintained in engagement therewith by the pressure of the spring 53. It will be noted that this movement of the bridging contact 45 against the fixed contacts 35 by the mechanism that has been described, presents a wiping movement between the contacts during the last portion of the circuit closing cycle.

The cup 48 is somewhat of elliptical form, as illustrated in Fig. 3, having the flats 59. These appointments with the notch 43 in the block 46, operate to reduce the pump action of the contact actuator assembly in its movement along the tube 20, since the air may quickly pass through the apertures thereby formed, from one end of the controller unit to the other.

The cam sleeve 49 is provided with an elongated aperture 60, for receiving a lock cylinder tongue 61, which is attached to a lock cylinder 62 carrying a plurality of plunger plates or locking bars 63, adapted to move into either of two diametrically opposite longitudinal grooves 64 provided within the lock cylinder barrel 21. When the proper key is inserted in the cylinder 62, the bars 63 will be withdrawn from one of the grooves so that their ends will be flush with the cylindrical periphery of the cylinder 62, permitting the cylinder to be turned within the barrel for actuation of the assembly 50.

A set screw 66 which threadably engages the barrel 21 has a shank 67 adapted to extend adjacent the flange 68 provided by the cylinder 62, and operates to retain the cylinder 62 within the barrel 21. In order to prevent rattle, and to provide close contact between the members, a spring washer 69, illustrated in Fig. 7, is interposed between the flange 68 of the cylinder 62, and the adjacent end wall of the intermediate bore of the barrel 21 receiving the cylinder 62. A ferrule or finishing plate 70, is press fitted over the end of the barrel 21 so as to protect the screw 66, and make disassembling of the parts more difficult. As shown in Fig. 6, when the screw 66 is located within the provisions designed for it, and the ferrule 70 is attached in the manner described, it will be practically impossible to remove the cylinder 62 from the barrel 21.

From this description of the controller unit A, it is apparent that when the cylinder 62 is turned, the sleeve 49 will be moved endwise of the shell 20, in order to move the contact 45 into and out of engagement with the fixed contacts 35. This endwise movement of the sleeve 49, is used to control a member which will prevent, at the will of the operator, actuation of the transmission mechanism to connect the engine with the driving axle of the motor vehicle. Or the device may be adapted to prevent the movement of any other operative necessary to the operation and control of the vehicle in general.

The part to be controlled is not herein illustrated, but may be understood, to embrace a member which provides a longitudinal bore for slidably supporting a locking bolt 75 attached to one end of a Bowden wire 76 similar to that illustrated in my copending application 275,136 filed Feb. 27, 1928. The wire 76 extends through a Bowden wire tube 77, and also through the terminal support assembly and contact support assembly or tube 47 which slidably supports the contact carrier 46. The end of the wire 76 within the shell 20, is formed into an angular extension 78 after

passing through the flanged eyelet 79, to which it is fixed as by means of solder indicated at 80.

It will be noted by reference to Fig. 1, that the tube 47 after passing through the central aperture in the cup 48, is flared outwardly as at 81 against which seats the flange of the eyelet 79. This construction provides a rotary connection between the eyelet 79 and its surrounding sleeve 47, and prevents withdrawal of the control wires 76 from the cup shaped member 48, yet provides for a slight longitudinal movement of the control wire relative to the tube due to the confined space between the end of the tube 47 and the cross pin 41, within which space is located the end of the control wire and its eyelet assembly.

One end of the Bowden wire tube 77 is permanently attached to a shank 82 of a conduit support 83, which is attached to a part of the structure containing the controlled element C, as by inserting within the longitudinal bore referred to, and by providing a pin to be engaged by the groove 84 in the shank 82. The end of the Bowden wire tube 77 within the support 83, is flared at 85 against a suitable countersink recess 86 of the shank 82 so that it cannot be withdrawn. The counter bored recess 86 also receives a disc 87 through which the wire 76 is slidable, the disc being retained in the counter bore 86 by staking against the washer or disc 87.

In a similar manner, the other end of the tube 77 is attached to the conduit support as by a connector 88 universally received by the conduit support 27. It will be noted that the tube 77 is flared at 89 against a counter bored recess in the connector 88, and that the recess secures a disc 90 through which the Bowden wire 76 is slidable.

The Bowden wire tube 77 is protected by an inner cable 91, surrounded by an outer conduit 92. Each end of the conduit 92 is attached to one of the coupling members 88 and 100 all of which cooperate to form the flexible control unit B, above referred to. In the present instance this is accomplished by providing the connector 88 with an enlarged bore 93, which telescopically receives the end of the conduit 92, and has a peripheral edge 94 swedged into the spiral grooves of the conduit 92 as illustrated in Fig. 1 forming a non-demountable connection therewith.

The conduit 92, is fixed to the support 83 by means of the coupling member 100. In the present instance the coupling 100 is formed from a blank of sheet metal into the novel formation exhibited in Fig. 1, in which there is a channel member embracing the conduit 92 in its angular association with its support 83, with the side walls of the channel and the bridging portion thereof, overlying the outer curve of the conduit 92, as indicated by dotted line showing at 101 in Fig. 1. The coupling 100 is provided with pairs of lugs 102 and 103 which may be formed to more substantially embrace the conduit 92 at the ends of the coupling.

In the instance illustrated in Fig. 1, the tongues 102 conform to lug like extensions at the terminating web of the channel member, and when bent or compressed about the conduit 92, have a terminating edge as 104, deformed or swedged into the grooves between the spiral turns of the conduit 92. The lugs 103 are similarly formed upon the opposite end of the coupling 100, but are wrapped around the enlarged portion of the support 83, and are deformed or staked as at 105 into the annular groove 106 of the support 83, in a manner simliar to the attachment of the conduit support 27 to the shell 20. A hard metal collar 107 is placed over the support 83 and the engaging end of the coupling 100, and is staked or deformed as at 108 to cooperate with the deformations 105 just described, as a further means of retaining the conduit 92 and support 83 in assembled relation and providing a non-demountable connection thereof.

In many instances it is necessary to place the controlled device C in such a position, that a sharp bend of the control unit B is made, in order to accommodate the coincidental lock structure in the available space and yet not obstruct the movement of the Bowden wire 76 within the tube 77. Where this is necessary, the coupling member 100 acts as a reinforcement of the bend of the control unit B in its angular association with the support 83, and precludes a breaking or rupturing of the protective covering 92, which would afford access to the interior of the control unit and which might defeat the purpose to which the coincidental lock structure is adapted.

In staking the collar 107 and the coupling 100 to the support member 83, it is desirable in some instances that the staking be done sufficiently to hold the members in the disclosed relation but also to provide for a swiveling connection between the unit B with its coupling 100 and the support 83, so that though the support 83 may be held rigid, the end assembly of the control unit B may be capable of revolving about the enlarged portion of the support 83. This may be accomplished by somewhat loosely staking the coupling 100 and the collar 107 to the support 83. By this structure, the angular association of the control unit B, and the controlled device C, is predetermined and maintained within operable working limits, for, by the swivel connection described, the control unit B between the two conduit supports 27 and 83 will assume a position of least curvature, and fewest bends, and thereby offer the least resistance to movement of control wire 76 within the tube 77.

The union of the other end of the control

unit B, with the controller unit A, is accomplished through a ball and socket or universal connection, in which the connector or coupling 88 is formed with the substantially spherical headed member 110, which is complementarily received by a similarly shaped recess 111 coaxial of the conduit support 27. The terminating edge or flange of the member 27 is swedged about the head 110 as indicated generally at 112 for securing the members together.

Since the members 20, 27, 30, 88, 100 and 107 are formed of hardened metal, and assembled in the manner herein described a non-demountable coincidental lock structure is provided, which can be efficiently operated to control the several devices to which it is adapted, and which will insure those devices against unauthorized use as by rupture of any of the parts. It is obvious that when this lock structure is assembled in operative relation with the mechanism which it is to control, that the association of the controller unit A, the connecting unit B, and the locking bolt or controlled device C, will always conform to relative positions of the least resistance for the movement of the control wire, and thereby insures the highest degree of efficiency in the operation of the device.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a coincidental lock for automotive vehicles, the combination of a tubular case, a key controlled device movable endwise within the case, stationary switch contacts insulatingly supported within the case, a bridging contact moved into and out of engagement with the stationary contacts by the key controlled device, and a spring transmitting pressure from the device for yieldingly maintaining the bridging contact in engagement with the other contacts, and for moving the bridging contact relative to the other contacts, while in engagement therewith.

2. In a coincidental lock for automotive vehicles, the combination of a tubular case, a key controlled device movable endwise within the case, stationary switch contacts insulatingly supported within the case, a bridging contact moved into and out of engagement with the stationary contacts by the key controlled device, a tubular member attached to the device and movable endwise with the device, a non-conducting contact carrier slidably supported by the tube and supporting the bridging contact and a spring surrounding the tube and located so as to transmit pressure from the device for yieldingly maintaining the bridging contact in engagement with the other contacts, and for moving the bridging contact relative to the other contacts, while in engagement therewith.

3. In a coincidental lock for automotive vehicles, the combination of a tubular case, a sleeve slidable and rotatable within the case and having a helical groove for receiving a part extending from an interior wall of the case whereby turning the sleeve will cause it to move endwise, a key operated shaft for turning the sleeve while permitting it to move endwise, stationary switch contacts insulatingly supported within the case, a bridging contact moved into and out of engagement with the stationary contacts by the key controlled device, a tube supported by the sleeve, a non-conducting contact carrier rotatably and slidably supported by the tube and supporting the bridging contact, a coil-spring surrounding the tube and tending to separate the contact carrier from the sleeve, means connecting the ends of the coil-spring with the sleeve and contact carrier respectively whereby the contact carrier will be rotated relative to the sleeve when the coil-spring is compressed, and means provided by the tube for limiting separation of the contact carrier from the sleeve.

4. In a coincidental lock for automotive vehicles, the combination of, a shell; a lock cylinder closing one end of the shell; a circuit closing assembly actuated by the lock cylinder; a terminal support assembly providing fixed contacts, and a conduit support closing the other end of the shell, said circuit closing assembly including a sleeve, a cup and tube drivingly connected to the sleeve and rotatably supporting a bridging contact, and a spring transmitting pressure from the sleeve for yieldingly maintaining the bridging contact in engagement with the fixed contacts, and for moving the bridging contact relative to the other contacts, while in engagement therewith.

5. In a coincidental lock for automotive vehicles, the combination of, a shell; a lock cylinder closing one end of the shell; a circuit closing assembly actuated by the lock cylinder; a terminal support assembly providing fixed contacts, and a conduit support closing the other end of the shell, said circuit closing assembly including a worm sleeve rotatably and longitudinally driven in the shell by the lock cylinder, a bridging contact supported and driven by the sleeve, and a spring transmitting pressure from the sleeve for yieldingly maintaining the bridging contact in engagement with the fixed contacts, and for moving the bridging contact relative to the other contacts, while in engagement therewith.

6. The combination with a coincidental lock and controller therefor, of a circuit closing device provided with means for yieldingly maintaining the contacts in engaging relation and means for wiping one of the con-

tacts over another at each instance the contacts are actuated to open or close a circuit therethrough.

7. The combination with a coincidental lock and controller therefor, of a plurality of contacts, and a circuit closing device provided with means for yieldingly maintaining the contacts in engaging relation, and for moving one of the contacts relative to another contact while in engagement therewith.

8. The combination with a coincidental lock and controller therefor, of contacts, and a circuit closing device provided with means for yieldingly maintaining the contacts in engaging relation, and means for moving one of the contacts relative to another contact while in engagement therewith.

9. In a coincidental lock for automotive vehicles, the combination of a tubular case, a key controlled device movable endwise within the case, stationary switch contacts insulatingly supported within the case, a bridging contact moved into and out of engagement with the stationary contacts by the key controlled device, a tubular member attached to the device and movable endwise with the device, a non-conducting contact carrier slidably supported by the tube and supporting the bridging contact, and a spring surrounding the tube and located so as to transmit pressure from the device for yieldingly maintaining the bridging contact in engagement with the other contacts and for rotating the bridging contact relative to the other contacts while in engagement therewith.

In testimony whereof I hereto affix my signature.

HARRY E. NORVIEL.