June 7, 1932. H. E. NORVIEL 1,861,713

COINCIDENTAL LOCK

Filed Feb. 27, 1928

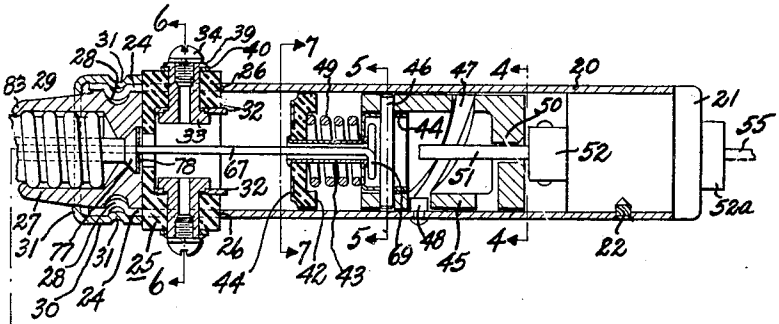


Fig. 2

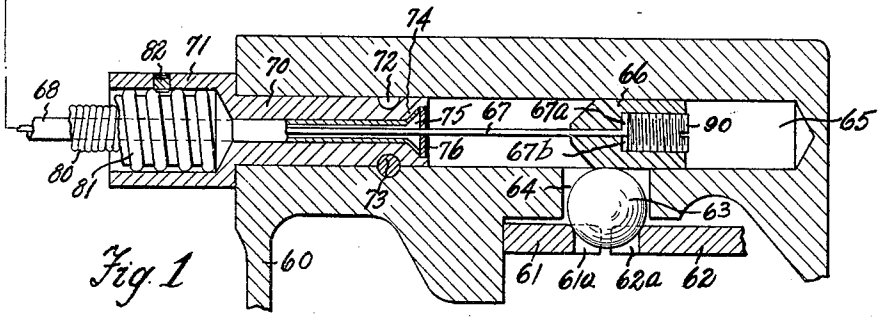


Fig. 1

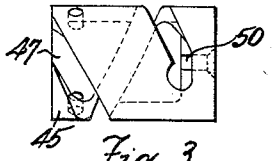


Fig. 3

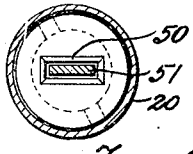


Fig. 4

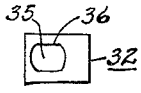
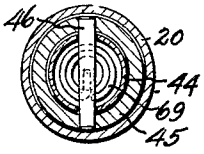


Fig. 10.



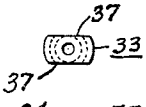


Fig. 11.

Fig. 5

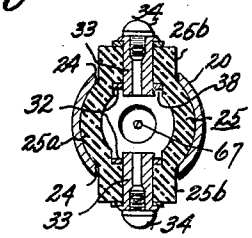


Fig. 6

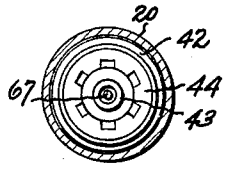


Fig. 7

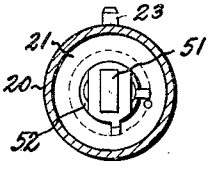


Fig. 9

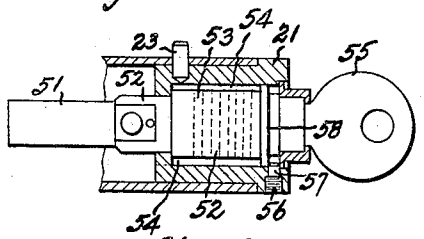


Fig. 8

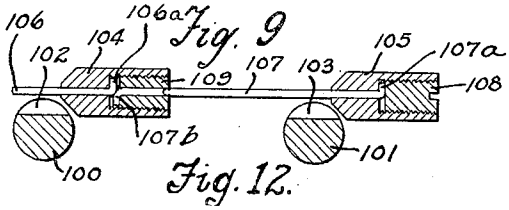


Fig. 12.

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UNITED STATES PATENT OFFICE

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COINCIDENTAL LOCK

Application filed February 27, 1928. Serial No. 257,136.

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 copending application of Carl W. Blossom and Elmer C. Peterson, Serial No. 202,210, filed June 29, 1927, and granted on June 19, 1928 as Letters Patent No. 1,674,315.

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 fragmentary view in longitudinal section of the operating portions of a coincidental lock embodying the present invention with the connecting portion being omitted, the section being taken partly along 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.

Fig. 3 is a side view of the cam sleeve included in the present invention.

Figs. 4, 5, 6 and 7 are sectional views on the lines 4—4, 5—5, 6—6 and 7—7 respectively of Fig. 1.

Fig. 8 is a fragmentary longitudinal sectional view of a portion of the device showing the key shaft and lock barrel.

Fig. 9 is a view looking in the direction of arrow 9 of Fig. 8.

Fig. 10 is a plan view of a switch contact.

Fig. 11 is an end view of a switch terminal.

Fig. 12 is a modified form of locking bolt.

In the drawing, 20 designates a metal tube which is formed preferably by bending sheet metal into cylindrical form and by holding the abutting ends together by suitable interlocking joint not shown. The tube 20 is closed at one end by a lock barrel or plug 21 attached to the tube 20 by a screw pin 22 and by a locating pin 23 shown in Fig. 8. The other end of the tube 20 receives the cylindrical portion 25*a* of a non-conducting terminal block 25 and is provided with oppositely disposed notches 24 for receiving terminal supporting portions 25*b* which bear against the portions 26 of the tube 20 which define the ends of the notches 24. A conduit support 27 is received by the tube 20 and bears against the block 25 and is retained in the position shown in Fig. 1 by deforming portions 28 of the tube 20 into a groove 29 provided by the conduit support 27. The end of the tube 20 adjacent the support 27 is reinforced by a collar 30 having a flange 31 closely surrounding the support 27 and having certain portions 31*a* deformed into recesses which are provided in the tube 20 when the portions 28 are deformed into the groove 29 of the support 27.

The block 25 insulatingly supports switch contacts 32 which are secured by terminal bushings 33, each receiving a terminal screw 34. As shown in Fig. 10 each contact 32 is provided with a hole 35 having flats 36 for receiving corresponding flats 37 provided by a portion of the bushing 33 as shown in Figs. 11 and 6. Each plate 32 fits within a recess 38 in the block 25 having parallel sides so that the plate 32 cannot turn while located within the recess 38. The terminal bushing 33 is held in engagement with a plate 32 as shown in Fig. 1 by riveting over a portion of it designated by numeral 39 against a washer 40 located on the outside of the block 25. Therefore the bushing 33 cannot turn when the screw 34 is turned.

The contacts 32 are engageable by a ring contact 41 insulatingly supported by a non-conducting block 42 which is slidable along the short tube 43 connected at one end with a cup-shaped member 44. The member 44 is located within a cam sleeve 45 and is attached thereto by a cross pin 46. The cam sleeve 45

is provided with a helical slot or groove 47 for receiving a stud 48 attached to the tube 20. Therefore when the sleeve 45 is turned it will move endwise in order to move the member 44 endwise. Motion is transmitted from the member 44 to the contact carrier 42 by a spring 49. Therefore the ring contact 41 will be moved by the turning of sleeve 45 into engagement with the contacts 32 and the contacts will be maintained in engagement by the pressure of the spring 49.

The cam sleeve 45 is provided with an oblong aperture 50 for receiving a lock cylinder tongue 51 which is attached to a lock cylinder 52 carrying a plurality of plunger plates or locking bars 53 adapted to move into either of two diametrically opposite longitudinal grooves 54 provided in the lock cylinder barrel 21. When the proper key 55 is inserted in the cylinder 52 the bars 53 will be withdrawn from the grooves 54 so that their ends will be flush with the cylindrical periphery of the cylinder 52 so that the cylinder may be turned. A set screw 56 which threadedly engages the barrel 21 has a shank 57 adapted to extend adjacent the flange 58 provided by the cylinder 52. When the screw 56 is located as shown in Fig. 8 the key cylinder 52 cannot be withdrawn from the barrel 21.

It is therefore apparent that when the cylinder 52 is turned by the proper key 55, the sleeve 45 will be moved endwise in order to move the contact 41 into and out of engagement with the switch contact 32. This endwise movement of the sleeve 45 is used to control a member which will prevent operation of the transmission mechanism to connect the engine with the driving axle of the vehicle. The transmission gear shift mechanism is not completely shown but it will be understood to be enclosed in a case, a fragment of which is shown at 60 in Fig. 1 and to include two plates 61 and 62 slidably supported by the case 60 and movable when the gear shift lever is used to connect the engine with the vehicle propeller shaft directly or through a certain gear train. It will be understood that when the gear shift lever is in neutral position, the plates 61 and 62 will be located so that notches 61*a* and 62*a* provided respectively by them will be located directly adjacent each other and so as to receive a ball 63 which is guided by an opening 64 in the case 60 and communicating with a bore 65 extending substantially at right angles to the direction of movement of the sliding plates 61 and 62. The bore 65 slidably supports a locking bolt 66 attached to one end of a Bowden wire 67 which extends through a Bowden wire tube 68 and also through the tube 43 which slidably supports the contact carrier 42. The end of the wire 67 within the tube 20 is formed into a flat coil 69 so that the wire cannot be pulled our from the cup-shaped member 44 and so that the wire 67 cannot be moved relative to the tube 43 but a slight amount since the flat coil 69 is confined between one end of the tube 43 and the cross pin 46. One end of the Bowden wire tube 68 is permanently attached to a shank 70 of a conduit support 71 which is attached to the case 60 by a pin 73 extending through a bore in the case 60 and into a groove 72 in the shank 70. The end of the Bowden wire tube 68 within the conduit support 71 is flared at 74 against a suitable counterbored recess 75 of the shank 70 so that it cannot be withdrawn. The counterbored recess 75 also receives a disc 76 through which the wire 67 is slidable. In a similar manner, the other end of the tube 68 is attached to the conduit support 27. It will be noted that the tube 68 is flared at 77 against a counterbored recess in the conduit support 27, said recess receiving a disc 78 through which the wire 67 is slidable. The Bowden wire tube 68 is protected by an inner cable 80 surrounded by an outer conduit 81. Each end of the conduit 81 is attached to one of the conduit supports 27 or 71 in any suitable manner. One manner of securing is by a screw pin 82 extending through the conduit support 71, and another manner of securing is by deforming an end portion 83 of the conduit support 27 into the helical groove provided by the conduit 81.

The construction described and illustrated permits separate assembly of the tube 20, the insulating block 25 carrying the stationary contacts 32, the conduit support 27, the reinforcing collar 30, the protecting cables 80 and 81, the Bowden wire tube 68 and the cable or conduit support 71. A separate sub-assembly may be made of the parts including the Bowden wire 67, the cam sleeve 45 and parts associated therewith and movable thereby. Another sub-assembly may be made of the lock barrel 21, lock cylinder 52 and tongue 51. The obvious method of assembling the sub-assemblies is to insert the free end of the wire 67 through the tube 68 and finally to move the sub-assembly of parts including the cam sleeve 45 and contact carrier 42 within the tube 20. Then the lock assembly is inserted in the tube and the tongue 51 is connected with the cam sleeve 45. After inserting the wire 67 through the locking bolt 66, its end is bent over at 67*a* and is clamped against an end wall of a recess 67*b* in the bolt 66 by a clamping set screw 90 threadedly engaging the lock bolt 66.

When the key 55 is turned in a clockwise direction as viewed in Fig. 2, the sleeve 45 will be moved endwise toward the left sufficiently to cause the contact 41 to engage the stationary contacts 32 and to cause the locking bolt 66 to move toward the right as viewed in Fig. 1 in order to release the ball 63. Under these conditions the ignition circuit will be closed to permit operation of the engine and the driver may then operate the gear shift lever to connect the engine with

the driving axle of the vehicle. The lock may be so arranged that the key may be removed from the lock when the ignition switch is on. To lock the automobile, the gear shift lever must be moved to neutral position in order that the plates 61 and 62 will be located so as to receive the ball 63 as shown in Fig. 1. By turning the key 55 counterclockwise, the sleeve 45 will be moved toward the right as viewed in Fig. 1, in order to disengage the contacts 41 from the contact 32 and to move the bolt 66 toward the left as viewed in Fig. 1 in locking engagement with the ball 63.

Fig. 12 shows diagrammatically a device for locking a transmission gear shift having shiftable rods 100 and 101 provided with notches 102 and 103 for receiving locking bolts 104 and 105 respectively. Each bolt has a central hole and central threaded recess. The bolts are operated by a single wire or rod 106 and are operatively connected by a wire 107. These wires and bolts are assembled in the following novel manner: The wire 107 is passed through the bolt 105 and the end to be attached to the bolt 105 is bent at 107*a*. The end 107*a* is clamped to the bolt 105 by a set screw 108. A screw 109 having a central hole is passed over the wire 107 and the end to be fastened to the bolt 104 is bent at 107*b*. The wire 106 is passed through the bolt 104 and is bent at 106*a*. Then the wire end 107*b* is passed into the threaded recess in the bolt 104 and is turned out of alignment with the wire end 106*a*. Both wire ends 106*a* and 107*b* are clamped to the bolt 104 by the screw 109, using a screw driver having a split blade which straddles the wire 107.

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.

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.

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 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, and means provided by the tube for limiting separation of the contact carrier and the sleeve.

4. In a coincidental lock for automotive vehicles, the combination of a tubular case, having a notched end portion, a non-conducting block having a part housed by the case and terminal supporting portions extending through said notches, switch contacts supported by the block within the case, terminal conductors connected with the contacts and carried by the terminal supporting portions of the block, means for retaining the block assembled with the case and for covering the parts of the notches not occupied by the terminal supporting portions, and means within the case for electrically connecting said contacts.

5. In a coincidental lock for automotive vehicles, the combination of a tubular case having a notched end portion, a non-conducting block having a part housed by the case and terminal supporting portions extending through said notches, switch contacts supported by the block within the case, terminal conductors connected with the contacts and carried by the terminal supporting portions of the block, a member for retaining the block within the case and for covering the parts of the notches not occupied by the terminal supporting portions, a longitudinally movable locking control member extending through said case-closing member and the non-conducting block, and means within the case for moving the locking control member and for electrically connecting said contacts.

6. In a coincidental lock for automotive vehicles, the combination of a tubular case, having a notched end portion, a non-conducting block having a part housed by the case and terminal supporting portions extending through said notches, switch contacts sup-

ported by the block within the case, terminal conductors connected with the contacts and carried by the terminal supporting portions of the block, a member for covering the parts of the notches not occupied by the terminal supporting portions and for retaining the block within the case and having a central recess communicating with the case through a central aperture in said member, a flexible armor attached at one end to the case-closing member and received by the recess therein, a Bowden wire tube attached at one end to the case-closing member and received by the aperture therein, a Bowden wire extending through the Bowden wire tube and the non-conducting block and into the case, and means within the case for moving the Bowden wire longitudinally and for electrically connecting said contacts.

7. In a concidental lock for automotive vehicles, the combination of a tubular case, a key controlled device movable endwise within the case, and yieldably supporting a bridging contact to be movable therewith, fixed contacts rigidly supported within the case situated in the path of the movement of said device, and means connecting said movable contact and device whereby movement of said device may be continued after engagement of said bridging contact with said fixed contacts.

8. In a coincidental lock for automatic 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 resiliently supporting a contact carrier for yieldably engaging the fixed contacts.

9. 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.

10. 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.

In testimony whereof I hereto affix my signature.

HARRY E. NORVIEL.