Feb. 18, 1930. H. A. DOUGLAS 1,748,013

ELECTRIC SWITCHING MECHANISM

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Fig. 1.

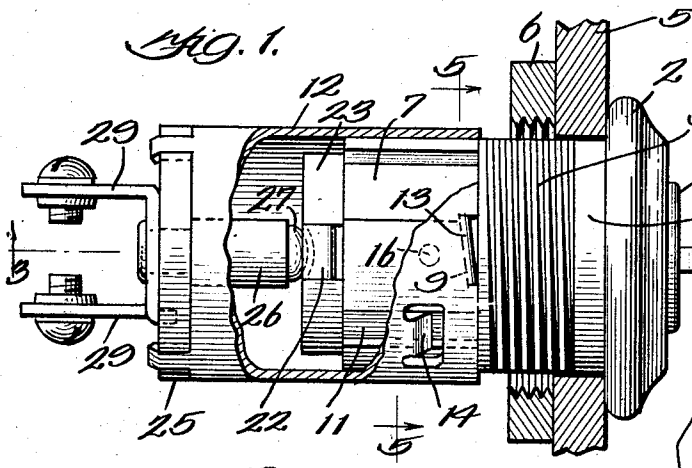


Fig. 2.

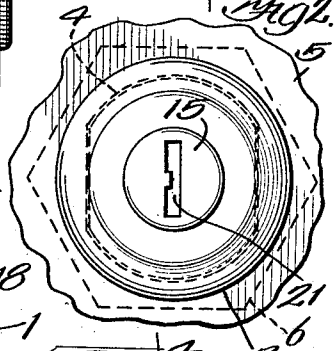


Fig. 3.

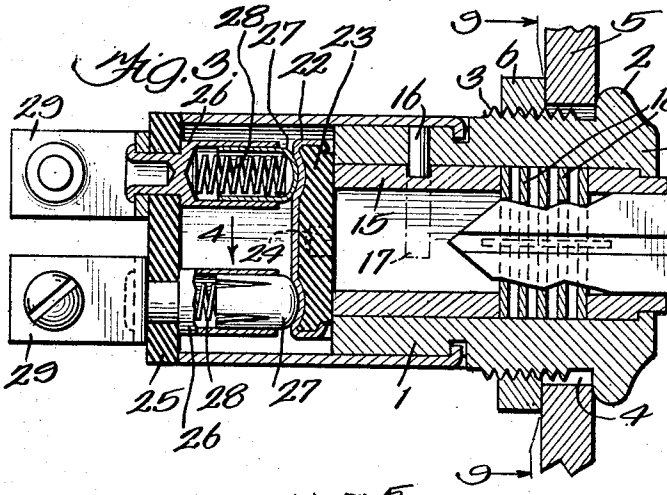


Fig. 4.

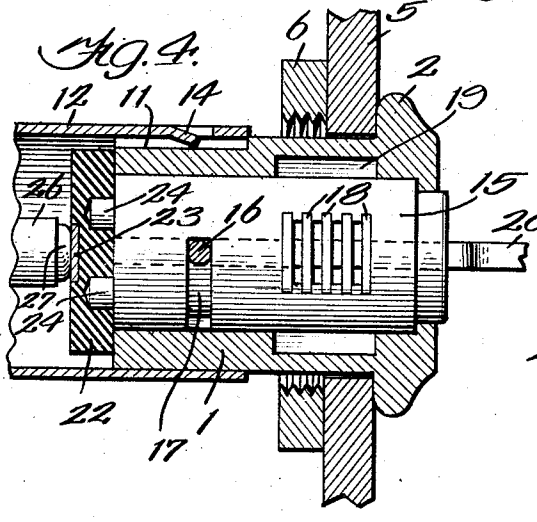


Fig. 5.

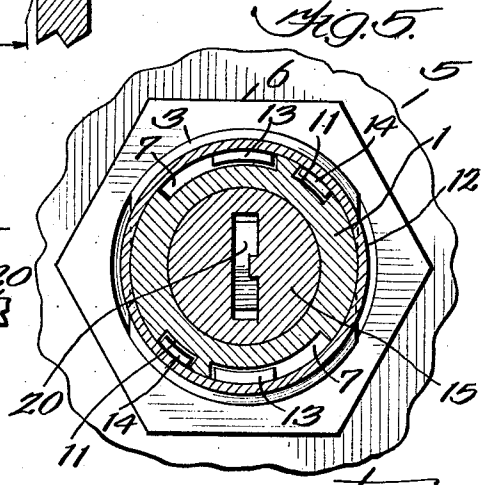


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Fig. 6.

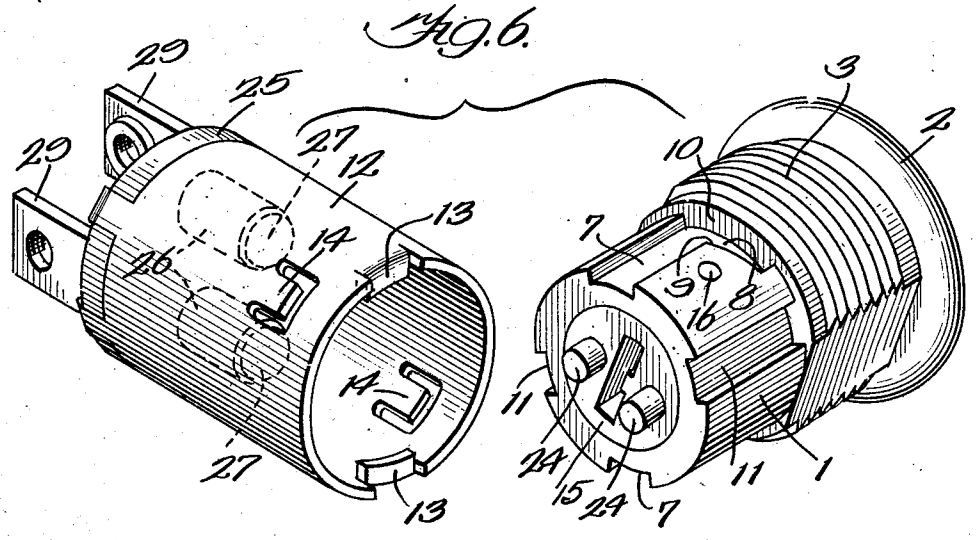
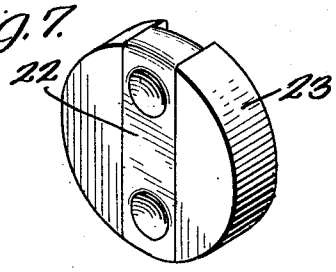



Fig. 7.



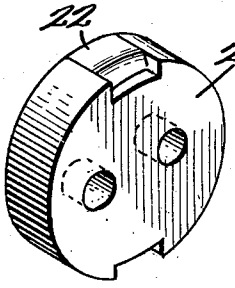




Fig. 8.

Fig. 9.

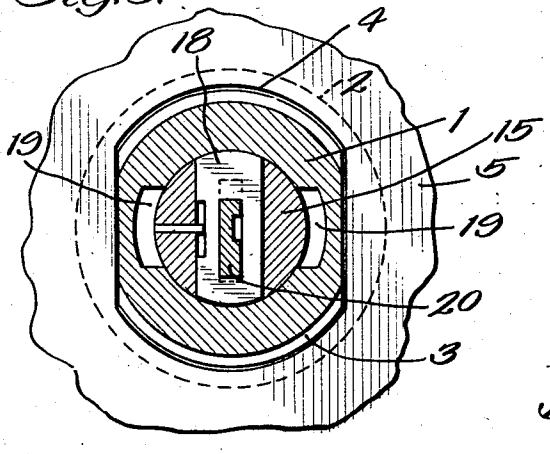
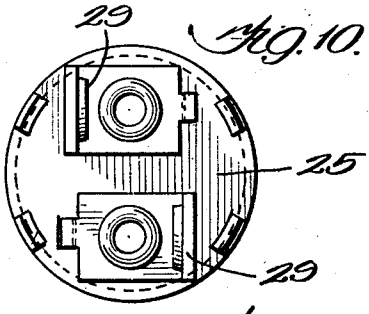



Fig. 10.

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# UNITED STATES PATENT OFFICE

HARRY A. DOUGLAS, OF BRONSON, MICHIGAN

## ELECTRIC SWITCHING MECHANISM

Application filed February 9, 1927. Serial No. 166,931.

My invention relates to electric switching mechanism and has for its object the provision of an improved construction and assembly of component parts thereof. A locking structure is also included in the preferred embodiment of the invention which holds the switching mechanism in one of its adjustments.

The structure of my invention includes a casing having a groove in its side shaped to form a shoulder preferably sloping from one end of the casing, a shell receiving the grooved portion of said casing, said shell having a tongue entering said groove and cooperating with the sloping shoulder to force the shell into position, an electric contact carried by the shell, and a contact complemental to the aforesaid contact. In the preferred embodiment of the invention the groove also extends to one end of the casing so that the tongue that is received in the groove may readily enter the same without having its shape modified for this purpose. The groove, where it slopes, also desirably forms a second shoulder spaced apart from the first, the shell being forced by the engagement of the tongue and sloping shoulder into abutting engagement with this second shoulder. The casing desirably also has a recess, preferably in the form of a groove, which receives a second tongue provided upon the shell to hold the first tongue in engagement with the first shoulder. A contact actuator is enclosed by the casing and is preferably rotatable therein to bring a contact or contacts controlled thereby into and out of engagement with a complemental contact or contacts. This contact actuator is preferably a rotatable locking device such as a tumbler barrel which carries tumblers adapted to be placed into and out of locking relation with the casing whereby the switch may be secured in a desired adjustment. The device of my invention may be employed in connection with the ignition circuits of automotive vehicles in which event the locking device serves to lock the ignition circuit in open adjustment or is freed to permit it to place the ignition circuit in closed adjustment.

I will explain my invention more fully by reference to the accompanying drawings in which Fig. 1 is a side view, partially in section and partially in elevation, of the preferred form of the invention showing one manner of mounting the device, a key being present; Fig. 2 is a front view of the structure appearing in Fig. 1 but with the key absent; Fig. 3 is a sectional view on line 3—3 of Fig. 1; Fig. 4 is a sectional view on line 4—4 of Fig. 3; Fig. 5 is a sectional view on line 5—5 of Fig. 1; Fig. 6 shows the shell and casing in perspective and in separated relation; Fig. 7 is one perspective view of the contact structure which is governed by the contact actuator within the casing; Fig. 8 is a reverse perspective view of the device shown in Fig. 7; Fig. 9 is a sectional view on line 9—9 of Fig. 3; and Fig. 10 is a rear view of the structure as it appears in Fig. 1, parts at the front end of the structure being omitted.

A cylindrical member in the form of a casing 1 is formed with an annular bead 2 at its front end and is threaded, as indicated at 3, behind the bead. The casing may be passed through an opening 4 in a board or other mounting device 5, a nut 6 being received by the threads 3 and serving to clamp said bead against the board 2, the casing projecting a considerable extent to the rear of the board. Two similar and diametrically opposite grooves 7 are formed lengthwise in the sides of the casing, these grooves extending from one end of the casing toward the other and having similarly directed lateral extensions 8 each shaped to form a shoulder 9 sloping from the rear end of the corresponding groove 7 toward the front end of the casing and a second shoulder 10 spaced from the first and located further from the rear end of the casing than the shoulder 9. The shoulder 10 is at the rear of the threaded portion 3 of the casing. The casing is also desirably provided with two diametrically opposite recesses 11 which are in the nature of longitudinal grooves in the casing that are parallel with the longitudinal parts of the grooves 7. The casing is cylindrical in contour in the zone of said grooves as it also is in the zone of the threads at 3. A cylin-

drical shell 12, preferably metallic, snugly receives the portion of the casing provided with the aforesaid grooves and the front end of the shell has abutting engagement with the shoulder 10. The shell has two diametrically opposite rigid tongues 13 which are bent inwardly and are adapted to enter the grooves 7 and the lateral extensions 8 thereof, these tongues cooperating with the sloping shoulders 9 to force the front ends of the shell into abutting engagement with the shoulder 10. Said shell desirably has additional diametrically opposite rigid tongues 14 which are initially disposed in the circle of the shell as illustrated in Fig. 6. These tongues are bent into the recesses 11 when the tongues 13 have been placed in their final positions, the tongues 14 engaging sides of the recesses or grooves 11 to hold the tongues 13 in the positions to which they have been finally brought so that the shell and casing are firmly assembled.

The casing desirably carries a tumbler barrel 15 which is rotatable within the bore of the casing and is prevented from axial movement by means of a pin 16 carried by the casing and projecting into an arcuate groove 17 formed in the tumbler barrel. This tumbler barrel contains tumblers 18 that are movable transversely thereof into and out of the diametrically opposite slots or recesses 19 formed in the casing. These tumblers are adjustable by a key 20 to be simultaneously out of said slots or recesses 19. The key is flat and enters an oblong opening 21 in the front of the tumbler barrel so that it not only serves to adjust the tumblers out of locking relation with the casing 1 but may be also employed as a handle to turn the locking barrel and thereby the switch closing metallic bar 22 which is mounted upon an insulating disc 23 that receives the pins 24 carried by and projecting rearwardly from the tumbler barrel whereby said disc is turned. The rear end of the shell is closed by an insulating disc 25 with which the metallic spring barrels 26 are assembled. Metallic contacts 27 are pressed forwardly by the springs 28 in said spring barrels to engage either the metallic circuit closing contact bar 22 or the insulating disc 23, according to whether the switch is in opened or closed adjustment. The bar 22 is positioned by the key 20 to engage the contacts 27 when the key is turned to bring the tumblers 18 out of register with the slots 19. When the key is reversed to bring the tumblers 18 into register with said slots, the tumblers enter the slots to hold the switch in the corresponding adjustment in which adjustment the contacts engage the insulating disc 23 instead of the contact bar 22 that is on this disc. Any suitable form of terminal connectors such as that indicated at 29 may be suitably assembled with said spring barrels.

Changes may be made without departing from the invention.

Having thus described my invention, I claim:

The combination with a cylindrical member having a groove in its side extending from one end thereof toward the other and laterally continued in a direction to form a shoulder sloping from said groove toward the latter end of said member, said member having an additional shoulder spaced apart from the aforesaid shoulder and interposed between this shoulder and the latter end of the aforesaid cylindrical member; of a shell receiving the grooved portion of said member and abutting said additional shoulder, said shell having a rigid tongue entering said groove and forcibly engaged by said sloping shoulder to engage said shell with said additional shoulder, said shell having an additional rigid tongue which enters a holding recess that is provided in the side of the cylindrical member and is in fixed engagement with a side of this recess to hold the first aforesaid tongue and the aforesaid sloping shoulder in fixed engagement to maintain the shell in abutting engagement with the aforesaid additional shoulder upon the cylindrical member.

In witness whereof, I hereunto subscribe my name.

HARRY A. DOUGLAS.