

R. F. VENNER.
 APPARATUS FOR PREVENTING SPARKING AT THE CONTACTS OF ELECTRICALLY ILLUMINATED SIGNS.
 APPLICATION FILED MAY 19, 1910.

1,021,907.

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Fig. 2.

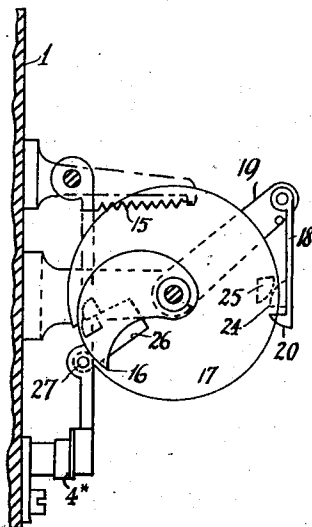


Fig. 1.

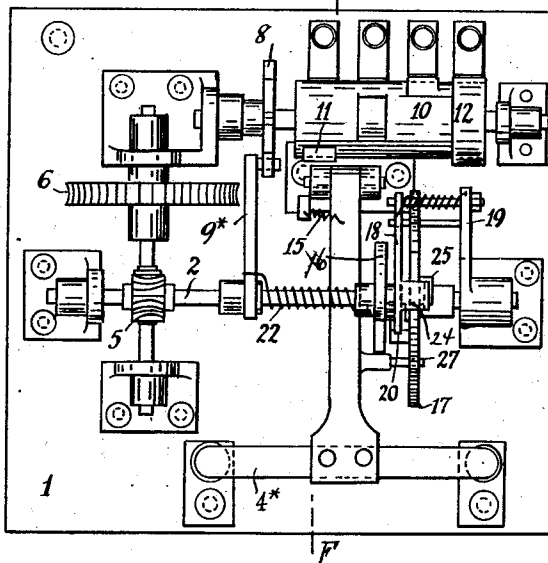


Fig. 3.

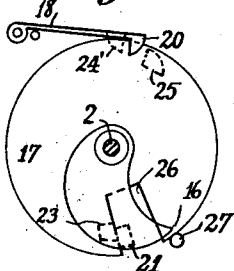


Fig. 4.

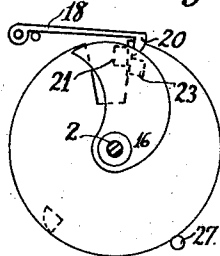


Fig. 5.

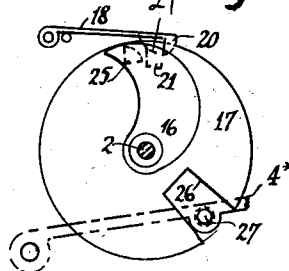


Fig. 6.

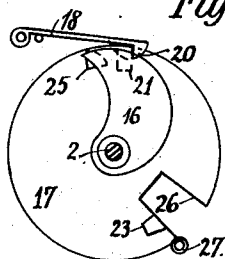
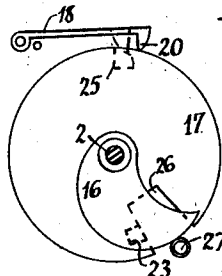


Fig. 7.



Witnesses:

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UNITED STATES PATENT OFFICE.

ROBERT FRANCIS VENNER, OF ADDISCOMBE, ENGLAND.

APPARATUS FOR PREVENTING SPARKING AT THE CONTACTS OF ELECTRICALLY-ILLUMINATED SIGNS.

1,021,907.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed May 19, 1910. Serial No. 562,242.

To all whom it may concern:

Be it known that I, ROBERT FRANCIS VENNER, a subject of the King of England, residing at Addiscombe, in the county of Surrey, in the Kingdom of England, have invented new and useful Apparatus for Preventing Sparking at the Contacts of Electrically-Illuminated Signs, of which the following is a specification.

10 This invention relates to an improved mechanism for making a quick make and break at the contacts of an electric circuit closing device whereby objectionable sparking caused by the formation of an electric arc, is effectually prevented.

15 In carrying out the invention, I provide a rotative cam and disk together with means for holding the cam for a predetermined period and during such period placing it under spring tension, and then releasing said cam to cause it to be impelled rapidly forward under the stored power of the spring to cause said cam to impart a very rapid closing movement to a switch member. Means are also employed for actuating, during the time the switch is in its open position, a separate switch member controlling a plurality of contacts, by means of which various combinations of letters and colors in the lamps controlled, and not shown, may be had. The latter switch member device may be made in the usual form of an insulated drum mounted on an auxiliary shaft which carries a fixed star-wheel, the drum being furnished with the requisite number of peripheral contact plates for the various circuits.

20 The accompanying drawings show a construction of apparatus embodying the aforesaid features.

25 Figure 1, is a plan of the contact making and breaking mechanism in combination with the cam-operated intermediate switch; Fig. 2, is a section taken on the line E—F of Fig. 1; Fig. 3, shows the same parts as Fig. 2, in a different position; Figs. 4, 5, 6, and 7 show different positions of the cam.

30 The same reference characters are applied to the same or similar parts throughout the various figures of the drawings.

35 Upon an insulating base board or slate 1 is mounted a shaft 2 fitted with a cam for opening and closing the intermediate switch 4*. Shaft 2 is driven through the intervention of worm-gears 5 and 6 from any suit-

able motor or other appropriate means. The shaft 2 through the intervention of a star-wheel 8 and an arm 9* transmits motion to a drum 10 fitted with peripheral contacts 11 and 12. The peripheral contacts 11 are of such a length and are so disposed as to give the said cam time to open the switch 4* just before each such contact 11 is broken, the switch quickly closing again to complete other circuits. The star wheel 8 and consequently the drum 10, which is fast therewith, receive intermittent motion from the arm 9, so as to allow sufficient time for each change of circuit and for the intervals between such circuit changes. For this purpose I find it advantageous to adopt a compound cam which comprises a co-acting wiper-cam 16, for rapidly closing the switch 4* and slotted disk 17 for opening the latter. The cam is loose and the disk is fast on the shaft 2. The cam 16 and disk 17 rotate together for about half a revolution of the shaft 2, while during the remaining period the cam is first kept stationary and then suddenly released for the instant closing of the switch 4*. This is effected by a spring-controlled arm 18 pivoted to a bracket 19 said arm having a claw 20 which intermittently catches a lateral block 21 provided on the cam 16 adjacent to the disk 17. The cam 16 normally travels with the disk 17 by reason of a torsion spring 22 mounted on the shaft 2 and held fixed to the arm 9* and the boss of cam 16 respectively which spring presses the block 21 of the cam 16 against the stop 23 on the disk 17. The stop 23 is sufficiently far enough from the edge of the disk so as to engage the block 21 of the cam without coming within range of the claw 20 of the arm 18. This arm has a lateral wing 24 which has a downturned inclined edge 24' and at the required moment is forced upward or outward by a stud 25 on the disk 17. The latter has a slot 26 and runs with its periphery on a stud 27 fixed in the side of the arm of the switch 4*. This stud 27 has a slightly enlarged portion against which the cam 16 acts, as hereinafter set forth. Thus, the rotation of the shaft 2 takes the cam 16 and its disk 17 around together until the block 21 of the cam is caught by the claw 20 and temporarily held while the disk alone moves around. During this time the switch 4* is held closed, against the ac-

tion of its spring 15 because the circumference of the disk presses on the stud 27. The retention of the cam 16 with continued motion of the disk 17 causes the spring 22 to be wound up. When the slot 26 of the continuously rotating disk 17 comes adjacent to the stud 27, the latter will enter same and so allow the spring 15 to open the switch 4*. Immediately thereon, the arm 9* acts on the star wheel 8 and thereby turns the drum 10 so as to shift it a definite distance for one of the contacts, the slot 26 of the disk being wide enough so as to allow for the continued rotation of the shaft 2 during the meantime. As soon as the said contact is made, the stud 25 of the disk 17 comes against the inclined edge 24' of the wing 24 and thus lifts the same out of engagement with the block 21 of cam 16. The cam is then swiftly moved around by the action of its spring 22 and effects the rapid closing of the switch 4* through striking the stud 27 thereof.

The various relations of the cam 16 and disk 17 are clearly shown in Figs. 2 to 7. In Fig. 2, the cam 16 has just acted against stud 27 to force the switch 4* to its closed position. In Fig. 3, the periphery of the disk 17 is holding the stud 27 and consequently the switch in closed position. In Fig. 4, claw 20 has engaged the lateral block 21 of cam 16 and is holding the cam against further movement during continued rotation of disk 17. In Fig. 5 such continued rotation of disk 17 has brought its slot 26 into such position that the stud 27 may enter said slot, whereupon spring 15 (see Fig. 2) acts to throw the switch 4* open, its stud 27 entering slot 26 at this time. Continued movement of the disk 17

causes the stud 25 of the disk 17 to act against the inclined edge 24' of wing 24 to lift the claw 20 out of engagement with block 21 to thereby permit spring 22 to throw cam 16 around with considerable speed to force the stud 27 out of slot 26 and consequently close switch 4*. This latter operation is illustrated in Fig. 7.

I claim:

1. In an electric switch, the combination with a continuously rotating shaft, of a disk having a slotted periphery fixed to said shaft, a cam loosely mounted upon said shaft, a detent member for engaging said cam to hold it for a predetermined period, a releasing member carried by the disk for engaging and releasing said detent member, a spring connected to the cam and arranged to be wound up during the stoppage of said cam, a switch member arranged in the path of movement of said cam, and a spring normally tending to throw said switch member in a direction opposite to that in which it is moved by the cam.

2. In an electric switch, means for imparting both a quick make and quick break movement to said switch, said means comprising a slotted disk, a continuously rotating shaft upon which said slotted disk is fixed, a spring controlled cam loose on said shaft, means for causing the disk and cam to turn together for part of a revolution and then temporarily stopping the cam and winding up its spring and subsequently releasing the same to cause said spring to urge the cam swiftly forward to close the switch.

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Witnesses:

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