T. A. C. BOTH.

MECHANICAL MOVEMENT AND ELECTRIC LIGHT SOCKET.

APPLICATION FILED APR. 4, 1912.

1,046,411. Patented Dec. 3, 1912.

Fig. 1.

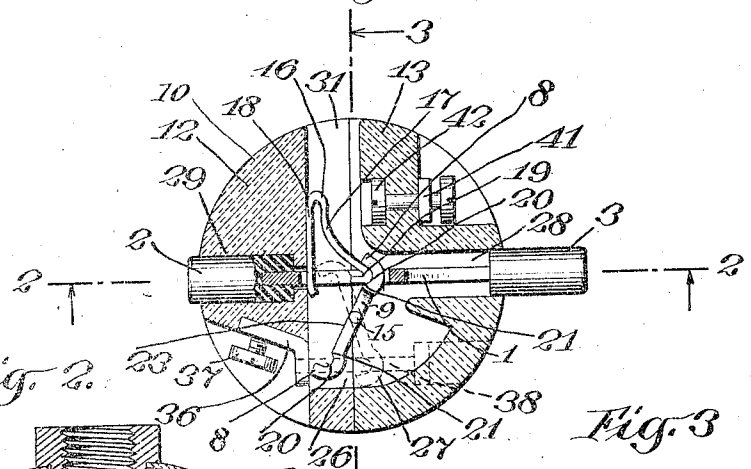


Fig. 2.

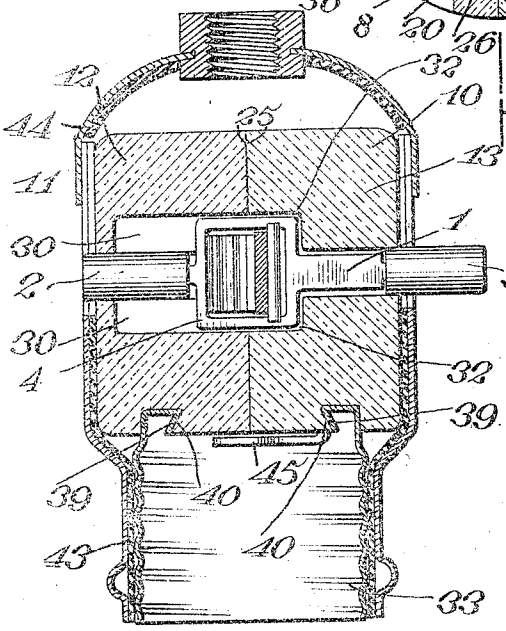


Fig. 3

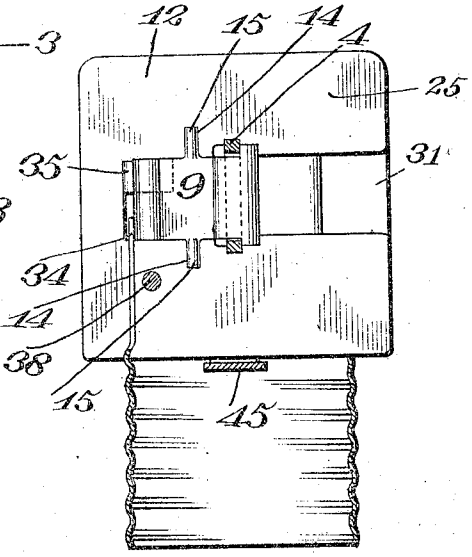
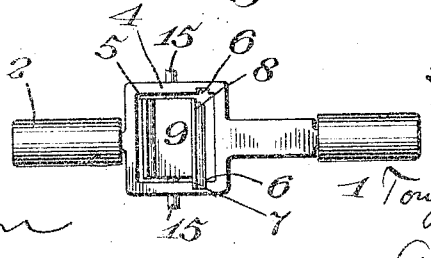


Fig. 4.



WITNESSES

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MECHANICAL MOVEMENT AND ELECTRIC-LIGHT SOCKET.

1,046,411. Specification of Letters Patent. Patented Dec. 3, 1912.

Original application filed December 30, 1911, Serial No. 668,632. Divided and this application filed April 4, 1912. Serial No. 688,857.

To all whom it may concern:

Be it known that I, TONJES AUGUST CARL BOTH, a citizen of the United States, and a resident of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Mechanical Movements and Electric-Light Sockets, of which the following is a specification, taken in connection with the accompanying drawing, which forms a part of the same, this application being a division of my copending application, Serial No. 668,632.

My invention relates to mechanical movements adapted for universal application. Further to electric light sockets and to certain details of construction of both the mechanical movement and the electric light socket, which will be more fully hereinafter described in the specification and pointed out in the claims.

I have shown my mechanical movement as a switch mechanism in an electric light socket, to which it is particularly adapted owing to its simplicity, the few parts, and the small space occupied by them. When so used it makes a quick make and a quick break of the electric current, without arcing, upon the operation of the driving member in either direction.

Among other advantages my mechanical movement permits the socket to be formed smaller and stronger for the opening in which the mechanical movement is mounted need not be so large as for other switch mechanism. In illustrating my invention I have, therefore, by way of example, shown it as a switch mechanism in an electric light socket, but it is to be understood, of course, that the mechanical movement is not to be limited to this use.

In the accompanying drawing showing an illustrative embodiment of my invention and in which the same reference numerals refer to similar parts in the several figures,—Figure 1 is a transverse horizontal section of an electric light socket equipped with my mechanical movement as the switch mechanism; Fig. 2 is a longitudinal vertical section through the electric light socket of Fig. 1, substantially on the line 2—2 of that figure, the customary socket casing being shown in Fig. 2; Fig. 3 is a vertical section substantially on the line 3—3 of Fig. 1, showing one of the insulating sections in side elevation; and Fig. 4 is a detail plan view, partly broken away, of the driving and intermediate members.

In the illustrative embodiment of my invention shown in the drawing, 1 is the driving member provided with the opposed buttons 2 and 3 and with an intermediate hollow portion 4 having an opening 5. I also preferably provide the driving member with engaging surfaces preferably in the form of notches 6, 6 to engage with one end 7 of the accelerator or kicker 8. This accelerator or kicker is mounted upon the intermediate rocking or hill and valley member 9 pivoted in any suitable manner on a support 10 which, as I have illustrated in my invention, is the insulating base of the electric light socket 11, the base being preferably formed of a plurality of parts as for example the complementary insulating members 12, 13, each of which are provided with recesses 14, 14 to receive the pivoting means of the intermediate rocking or hill and valley member 9. Preferably, though not necessarily, these pivoting means are trunnions or pins 15, 15 connected to the rocking member 9.

The engagement of the edges of the accelerator 8 with the openings 6, 6 in the enlarged portion 5 of the driving member 1 forms a pivoting connection between the rocking intermediate member 9 and the reciprocating driving member 1. Whichever way the driving member 1 is reciprocated, the intermediate member 9 is therefore caused to rock upon the pins or trunnions 15, 15.

Mounted in the support 10 is the resilient reciprocating driven member 16. This member may be formed in various ways but I preferably form it from sheet metal and bend it on itself forming the two arms 17 and 18. The former has a free end 19 which coöperates with the intermediate member 9. This intermediate member may also be formed in various ways. Preferably it is formed from a stamping and bent to form a "valley" 20 near each of its ends, each

valley having a ledge or shoulder 21 and preferably a kicker or accelerator 8. It is also preferably provided with the trunnions 15, 15 as previously described. That portion 23 of the intermediate member lying between the two valleys 20, 20 is the "hill" or inclined surface up which the free end of the driven member is forced by its resiliency when released from the particular "valley" it was in engagement with when it was being compressed.

From the mechanism so far described, movement of the driving member 1 to the left of the position shown in Fig. 1, by pressure upon the member 3 or a pull upon the member 2, will cause the intermediate member 9 to rock due to the pivoted engagement of this member with the driving member 1. During a certain portion of the lateral movement of the driving member 1, the resilient driven member 16 will be compressed and caused to store up energy by the intermediate member 9 causing the free end 17 to approach the other end 18. During this compression of the resilient driven member, the end 19 is held in the upper valley 20, Fig. 1. The ledge 21 serves to further hold this end from escapement from the valley until the driven member 1 has reached substantially its maximum movement when the slightest further movement of the driving member 1 will cause the kicker or accelerator 8, if one be used, to crowd or force the end 19 of the resilient driven member over the ledge 21 and out of the valley 20. When these parts so coöperate, the intermediate member 9 is in the opposite rocking position shown in dotted lines in Fig. 1. The moment that the end 19 of the resilient driven member is forced out of the valley, it comes in contact with the inclined surface 23 or hill and immediately moves up this inclined surface 23 to the other valley 20, Fig. 1, due to the elasticity of the driven member. This will cause the entire resilient driven member 16 to move with a quick and positive snap transversely to the direction of movement of the driving member 1. To cause the driven member 16 to then reciprocate back to the position shown in full lines in Fig. 1, it is merely necessary to move the driving member 1 in the opposite direction by pressure on the member 2 or a pull on the member 3, when the driven member 16 will be again compressed and again released in the same manner previously described. Alternate reciprocation of the driving member 1 will cause alternate reciprocation of the resilient driven member which will move with a quick and positive snap. It is further to be noted that in effect my mechanical movement comprises simply one reciprocating driving member, a transversely reciprocating resilient driven member and an intermediate member.

This mechanical movement may be used wherever such a movement is desirable. For purposes of illustration, I have shown it as the switch mechanism in an electric light socket for its simplicity and its few parts particularly adapt it for such use.

My electric light socket may be variously made. Preferably it includes the insulating base 10 formed as previously described of two complementary parts 12 and 13 having meeting surfaces 25, 25 arranged substantially longitudinally of the socket. Preferably each of the insulating members 12 and 13 is provided with recesses. By way of example, I have shown the insulating section 12 provided with the recesses 26 and 29, the latter being provided with vertically extending guide grooves 30, 30 to receive and guide the hollow portion 4 of the driving member 1 and prevent its rotation. The recess 26 preferably extends at one end 31 to the outer periphery of the insulating section 12. The other insulating section 13 is provided with a groove 27 which has a portion 28 extending substantially at right angles to the meeting faces 25 of the two complementary sections. It is also provided with guide grooves 32, 32 to guide the intermediate portion 4 of the driving member 2.

The driving member 1, when used as shown is a push through push button provided with the two push buttons 2 and 3, and extends through the complementary insulating sections 12 and 13, the push button 2 being received in the recess 29 while the push button 3 is received in the recess 28, the intermediate portion 4 being received in and guided by the recesses 30 and 32.

The driven resilient member 16 reciprocates, in the device shown by way of example, through the opening 5 in the intermediate portion 4 of the reciprocating driving member 1, its operation being the same as previously described at length.

My socket is provided with a screw shell 33 to which is connected in any suitable manner an electrical contact 34, Fig. 3, which extends up into the recess 26. Adjacent to but separated from the contact 34, I mount a contact 35, Fig. 3, carried in any suitable manner as for example by the binding post 36 on which is mounted the usual binding screw 37. This binding post 36 is secured to the insulating section 12 and that section to its complementary section 13 by the locking screw 38. This locking screw preferably also serves to hold the screw shell 33 to the insulating sections 12 and 13 by means of coöperating engaging surfaces upon the insulating sections and the screw shell as for example the dovetail surfaces 39 on the screw shell coöperating with the dovetail surfaces 40 on the insulating sections 12 and 13.

The center contact 45 is carried by the

binding post 41 which is secured to the insulating section 13 by means of the screw 42, Fig. 1. I also preferably inclose my socket in a socket shell 43 and cap 44 of any suitable construction.

It will, therefore, be apparent from the preceding description of the operation of the mechanical movement that by alternately reciprocating the push buttons 2 and 3 the resilient driven member 16 will alternately make both a quick make and a quick break of the electric current, without arcing, by connecting or disconnecting the electrical contacts 34 and 35.

Having thus described this invention in connection with an illustrative embodiment thereof to the details of which I do not desire to be limited, what is claimed as new and what it is desired to secure by Letters Patent is set forth in the appended claims.

1. In a mechanical movement, comprising a reciprocating driving member provided with an opening, an intermediate member provided with grooves or valleys, a connection between the intermediate member and the driving member, and a resilient driven member adapted to coöperate with the grooves and valleys of the intermediate member and to reciprocate through the reciprocating member.

2. In a mechanical movement comprising a reciprocating driving member provided with an opening, an intermediate member provided with grooves or valleys, a connection between the intermediate member and the driving member and with kickers or accelerators, and a resilient driven member adapted to coöperate with the grooves and valleys of the intermediate member and to reciprocate through the reciprocating member.

3. In electric switch apparatus the combination of an insulating support provided with apertures at an angle to each other, a sliding reciprocating driving member mounted in one of the apertures and provided with push buttons near its ends, spaced contacts, a driven contact member mounted in the other aperture in the insulating support and adapted to make a quick make and a quick break of the current through the spaced contacts, and means to transmit power from the driving reciprocating member to the driven member.

4. In electric switch apparatus the combination of an insulating support provided with apertures at an angle to each other, a sliding reciprocating driving member mounted in one of the apertures and provided with push buttons near its ends, spaced contacts, a resilient driven contact member mounted in the other aperture in the insulating support and adapted to make a quick make and a quick break of the current through the spaced contacts, and means to transmit power from the driving reciprocating member to the resilient driven member.

5. In electric switch apparatus the combination of an insulating support provided with apertures at an angle to each other, a sliding reciprocating driving member mounted in one of the apertures and provided with push buttons near its ends, spaced contacts, a driven contact member mounted in the other aperture in the insulating support and adapted to make a quick make and a quick break of the current through the spaced contacts, and pivoted means to transmit power from the driving reciprocating member to the driven member.

6. In electric light sockets, the combination of an insulating base formed of a plurality of parts provided with grooves to form a pivoted bearing for an intermediate member and with two apertures substantially at right angles to each other, a sliding reciprocating driving member mounted in one of the apertures and provided with push buttons at each of its ends, an independent sliding resilient driven member mounted in the other aperture, a movable intermediate member having means to cooperate with the grooves in the insulating member and transmitting power from the driving to the resilient driven member and spaced contacts coöperating with the independent resilient sliding driven member.

7. In electric light sockets, the combination of a socket, a reciprocating driving member extending through the socket and provided with push buttons at both ends, a resilient driven contact member mounted independently of the driving member and adapted to have a relative movement with relation to it, spaced contacts, and means to transmit power from the reciprocating driving member to the resilient driven member.

8. In an electric light push-through button socket, the combination of a reciprocating member provided with opposed push buttons and with an intermediate hollow portion, a movable intermediate member, a resilient reciprocating driven member adapted to coöperate with the intermediate member and to reciprocate through the reciprocating driving member, and electrical contacts adapted to coöperate with the resilient driven member.

9. In electric light sockets, the combination of a socket, a reciprocating driving member extending through the socket and provided with push buttons at both ends, a resilient driven contact member, spaced contacts, and a pivoted member provided with valleys adapted to coöperate with the resilient driven member and a connection between the driving member and the pivoted member permitting the latter to be operated by the reciprocating driving member.

10. In electric light sockets, the combination of a socket, a reciprocating driving member extending through the socket and provided with push buttons at both ends, a resilient driven contact member, spaced contacts, and a pivoted member provided with valleys and with kickers or accelerators adapted to coöperate with the resilient driven member and a connection between the driving member and the pivoted member permitting the latter to be operated by the reciprocating driving member.

11. In electric light sockets, the combination in a socket of an insulating base formed of a plurality of parts provided with means to form a pivoted bearing for an intermediate member and a sliding bearing for the driving and driven members, a sliding reciprocating driving member provided with push buttons at each of its ends and with an opening between the push buttons, an independent sliding resilient driven member adapted to slide through the opening in the driving member, an intermediate pivoted member pivoted in the insulating base and provided with means to coöperate with the driving and driven members and spaced contacts coöperating with the independent resilient sliding driven member.

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