

Jan. 9, 1951

E. G. GAYNOR
SOCKET AND SWITCH
Filed May 7, 1946

2,537,581

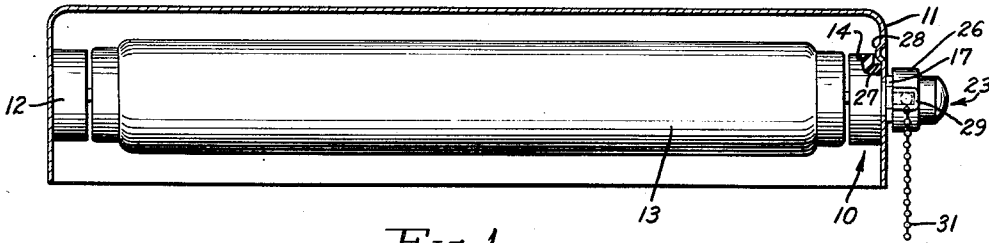


Fig. 1

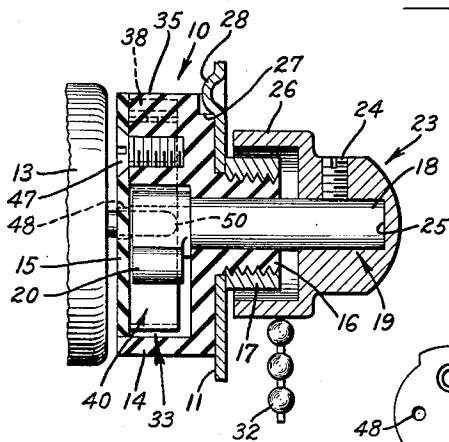


Fig. 2

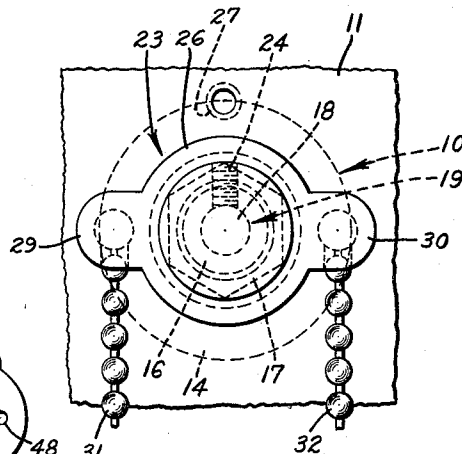


Fig. 3

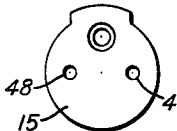


Fig. 4

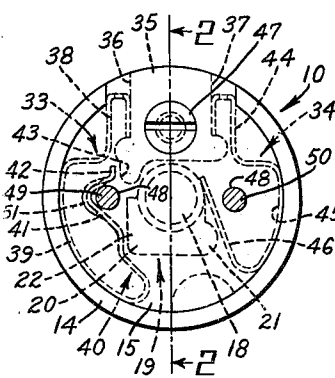


Fig. 5

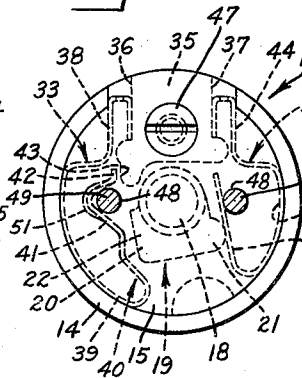


Fig. 6

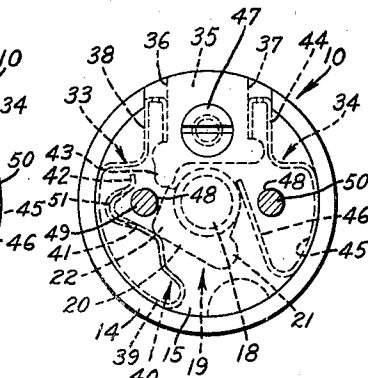


Fig. 7

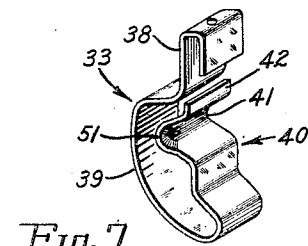


Fig. 8

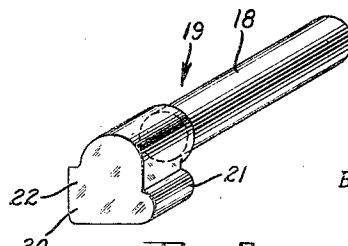


Fig. 9

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2,537,581

SOCKET AND SWITCH

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Application May 7, 1946, Serial No. 667,753

14 Claims. (Cl. 200—51.12)

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This invention relates to new and useful improvements in fluorescent lighting equipment and has particular relation to a combination switch and socket especially adapted for fluorescent lighting.

An object of the invention is to provide a combination socket and switch for use in fluorescent lighting and which is of simple and inexpensive construction comprising but a minimum of sturdy parts, and which in its completed form is of neat and attractive appearance.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawing:

Fig. 1 is a view showing a switch of the invention in elevation and applied to a lighting assembly and comprising a fluorescent tube, sockets, and reflector, the latter being in section;

Fig. 2 is a longitudinal sectional view through the switch, the view being taken substantially along the line 2—2 of Fig. 4;

Fig. 3 is an end elevational view of the switch as applied to a reflector housing, the view being on the scale of Fig. 2;

Fig. 4 is an end view showing the switch parts in position as when the lamp is operating;

Fig. 5 is a similar view but showing the switch parts positioned when the lamp is being started;

Fig. 6 is a similar view showing the position of the switch parts when the lamp is being extinguished and after it is extinguished;

Fig. 7 is an isometric view of a contact element of the switch;

Fig. 8 is a similar view of an operating part of the switch; and

Fig. 9 is an elevational view of a cover plate employed.

Referring in detail to the drawing, my combination socket and switch, generally designated 10, is shown as mounted on one end of a reflector 11. Within the other end of the reflector is a socket 12 and such socket, together with the combination socket and switch 10, supports a fluorescent lamp or tube 13.

The invention here is concerned solely with the combination socket and switch 10 and fur-

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ther description of the socket 12 will therefore be omitted with the statement that this socket may be of any desired type of construction. Socket and switch 10 comprises a circular body 14 of insulating material and which body is closed at its forward side as by a plate 15, also of insulating material. At its rear side body 14 carries a tubular extension or nipple 16 which passes through an opening in an end wall of reflector 11 so that the rear flat side of the body may be against said reflector wall. The extension or nipple 16 is externally screw threaded and the socket is conveniently held in place by the threading home of a nut 17 on said extension whereby the socket is clamped in place against the mentioned wall of the reflector.

An opening passes entirely through the socket body 14 and the nipple 16 and located partly in but passing entirely through such opening is a stem 18 of a switch operating device, generally designated 19. Such device, in addition to the stem 18, includes a head-like portion 20 located within the hollow side of body 14 and comprising a toe portion 21 and a thickened wall portion 22. Beyond the nut 17 an operating head 23 is secured fast to the stem 18, as by a set screw 24. Head 23 includes a socket 25 which receives the outer end portion of stem 18 and in addition includes a cylindrical portion 26 which extends substantially over the nuts 17 and into relatively close relation to the end wall of the reflector 11.

To insure that there will be no casual movement of the body 14 relative to the reflector, said body may be provided with a notch 27 and the reflector may have an inwardly offset portion 28 entering said notch. The head 23 is adapted to be moved to impart a turning movement to the device 19 to bring about energizing and de-energizing the lamp 13 and it is important that the socket body 14 be held against movement at such time and also to properly locate the entrance openings of the socket for reception of the usual end contact pins of the lamp 13.

Extending laterally from each side of the head 23 are arms 29 and 30 to which are connected operating devices such as the pull chains 31 and 32. It will be understood that means other than the chains may be provided, and, in fact, the switch may be operated by manually grasping and turning the head 23 when the location is such that the head may be conveniently reached. However, the pull chains shown add considerably to the appearance of the actual product.

Within the hollow insulated body 14 are a pair

of contacts generally and respectively designated 33 and 34. The body 14 is essentially hollow but toward one edge includes a step portion or block 35 which spaces and assists in defining a pair of slots 36 and 37 entering through an edge of the body. Contact 33 includes a relatively U-shaped portion 38 which is located in the slot 36 and then includes a curved spring arm 39 following the inner contour of the body 14 and at its free end carrying a generally upwardly directed arm 40 which toward its upper end is bent to provide a V-shaped portion 41 above which is but a short lip 42. When this contact 33 is positioned as in Figs. 4 through 6, lip 42 is located opposite a short lug-like extension 43 of the part 25 and therefore movement of the entire arm 40 toward the center of the body 14 is limited.

The contact 34 is of somewhat the construction of contact 33 and includes a U-shaped portion 44 located in the slot or entrance 37 of the body 14 and further includes an arcuate portion 45 generally following the interior contour of the body and a spring arm 46 normally tending to move outwardly away from the arcuate portion 45. Suitable leads are connected with the U-shaped portions 38 and 44 of the contacts 33 and 34 but since the wiring circuit does not constitute a part of the invention these leads are not shown. When the contacts 33 and 34 are in place and the device 19 is in place it will be clear that the head 20 is located between the arm 40 of contact 33 and the arm 46 of contact 34. At this time the cover plate 15 is secured in place as by the screw or the like 47.

After the contacts 33 and 34 are in place, the device 19 located, and the cover 15 over the body, the combined switch and socket is ready to be mounted on the reflector 11 or other support and the head 23 secured in position. Attention is given to the proper location of the body 14 and this is keyed or guided by the lug 28 entering the notch 27 of said body to properly locate a pair of entrance openings 48 in the cover 15. Thereafter the head 23 is positioned and since it is simply secured by the screw 24 it is located with its lugs 29 and 30 horizontally disposed. The head may thus be located regardless of the positions of any of the other parts of the body 14.

With the socket 12 in place the lamp 13 is mounted and the relation of the lamp to the socket 12 is here of no importance. However, the pins 49 and 50 on one end of lamp 13 pass through the openings 48 in the cover plate 15 of the body 14. These pins enter the body in the relation to the other parts as best shown in Fig. 4. That is, one pin (49) is disposed at the inner side of contact arm 40 and the other pin (50) is disposed at the outer side of contact arm 46. When the lamp 13 is operating the parts assume the relative positions in which they are shown in Fig. 4. In such instance, the contact arm 40 has its V-shaped portion 41 embracing or receiving contact pin 49 while the arm 46 of contact 34 is spaced from the contact pin 50. In this instance the lamp 13 is operating in the customary manner, the current passing through the vaporized contents of the lamp from one socket to the other.

Now when it is desired to extinguish the lamp, the chain 31 is pulled rocking the device 19 in a direction to have the thickened wall portion 22 of the device 19 engage the contact arm 40 and force it outwardly or away from the contact pin 49 of the lamp. At this time contact arm 46 is already out of engagement with the lamp pin 50 and so the circuit through the lamp is completely broken

and the same extinguished. The position of the head 20 when the lamp is being extinguished and when the lamp is extinguished is as shown in Fig. 6 and there it will be clear that a slight movement of the head 20 results in sufficient deflection of the arm 40 to open the lamp circuit. Further the lower face of the thickened edge portion 22 of the head or cam 20 rides up onto the lower arm or surface of the V-shaped portion 41 of arm 40 and is there held or resiliently wedged. When chain 31 is now released the spring arm 40 cannot move back to its normal position as in Fig. 4 and so there is no potential on the lamp terminals.

When it is desired to again start the lamp the chain 72 is pulled to rock the device 19 in the opposite direction as to the position of Fig. 5. This causes the head or cam 20 to release the arm 40 and the latter springs back to the position of Fig. 4. Then the toe 21 of the head 20 of said device 19 engages the spring contact arm 46 and forces it into engagement with the contact pin 50 of the lamp. At this time contact arm 40 remains in contact with the lamp pin 49 and so a starting circuit is established and the lamp 13 is started by the heating of the usual filaments, etc. When the lamp is heated sufficiently the chain 32 is released and the spring arm 46 acting on the head 20 rocks the device 19 back to the neutral position shown in Fig. 4. This leaves an operating circuit through contact 40 and pin 49 of the lamp and through the gaseous contents of the lamp in the usual manner.

From the foregoing description it will be seen that I have provided a combination socket and switch for a fluorescent lamp which socket and switch is of simple and inexpensive construction and of attractive appearance. The means of the invention is easily and quickly assembled and contains no parts likely to get out of order. Additionally, it includes but a minimum of parts since in any construction some contact means for engagement with the pins of the lamp must be provided, and in addition, means must be provided for opening and closing a circuit through said pins. As herein disclosed, the means of the invention avoids any special spring or springs for the operation of the switch and avoids the separate structures comprising a socket and a switch.

When the lamp and socket are separated the contact arm 40 tends to move inwardly or toward the head 23. Engagement of the lip 42 of said arm with the extension or lug 43 prevents the arm moving to a position across the opening 48 for the lamp pin 49 and so the insertion of the lamp pins into the socket is not prevented. Additionally, if desired, the arm 40 at one edge of its V-portion 41 may be flared outwardly, as at 51, so as to catch the free end of an inserted pin and insure movement or insertion of the pin at the inner side of the arm 40. The round holes 48 in the cover 15 insure correct location of the insert contact pins of the lamp, relative to the contact arms 40 and 46.

Having thus set forth the nature of my invention, what I claim is:

1. In a combined socket and switch, a body having entrances to removably receive a pair of contact pins of a lamp, first and second contacts in said body, said first contact normally positioned to be engaged by the first pin of a pair of contact pins when such first pin is inserted into said body through one of said entrances, said second contact normally positioned to be spaced from the other pin of said pair when such

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other pin is inserted through the other of said entrances, said contacts each including a spring arm, and movable manually operable means adapted on movement in one direction to flex the spring arm of the first contact and electrically disconnect the first contact from the first lamp pin and adapted on movement in the opposite direction to flex the spring arm of the second contact to electrically connect the second contact with the other lamp pin.

2. In a combined socket and switch, a body adapted to removably receive a pair of contact pins of a lamp, first and second contacts in said body, said first contact normally positioned to be engaged by the first pin of a pair of lamp pins inserted into said body, said second contact normally positioned to be spaced from the other pin of said pair of lamp pins, said contacts each including a spring arm, a cam between said spring arms, and means manually operable to move said cam to selectively shift said spring arms whereby to move the first into open circuit relation with the first pin and the second into closed circuit relation with the other pin.

3. In a combined socket and switch, a body adapted to receive a pair of contact pins of a lamp, first and second contacts in said body, said first contact including a spring arm normally positioned to be engaged by the first pin of a pair of lamp pins inserted into said body, said second contact including a spring arm normally positioned to be spaced from the other pin of said pair of lamp pins, a cam located between said spring arms, a shaft operable to rock said cam and extending to the outer side of said body, means to rock said shaft in one direction to have said cam flex the spring arm of the second contact into a position to engage the other pin, and means to rock said shaft in the opposite direction to have said cam flex the spring arm of the first contact out of position to engage the first pin.

4. In a combined socket and switch, a body adapted to receive a pair of contact pins of a lamp, first and second contacts in said body, said first contact including a spring arm normally positioned to be engaged by the first pin of a pair of lamp pins inserted into said body, said second contact including a spring arm normally positioned to be spaced from the other pin of said pair of lamp pins, a cam located between said spring arms, a shaft operable to rock said cam and extending to the outer side of said body, and said spring arm of the second contact adapted to move away from said other pin and return the cam to a neutral position on release of said shaft following operation thereof to move the cam to bring the said spring arm of the second contact into engagement with said other pin.

5. In a combined socket and switch, a body adapted to receive a pair of contact pins of a lamp, first and second contacts in said body, said first contact including a spring arm normally positioned to be engaged by the first pin of a pair of lamp pins inserted into said body, said second contact including a spring arm normally positioned to be spaced from the other pin of said pair of lamp pins, a cam located between said spring arms, a shaft operable to rock said cam and extending to the outer side of said body, means to rock said shaft in one direction to have said cam flex the spring arm of the second contact into a position to engage the other pin, and means to rock said shaft in the opposite direction to have said cam flex and retain the spring

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arm of the first contact out of position to engage the first pin.

6. In a lighting apparatus, a housing including a wall having an opening therethrough, a socket against the inner side of said wall and having entrance openings for receiving the contact pins of a lamp, an extension on said socket and passing through said wall, means on said extension at the outer side of the wall and clamping the socket against the inner side of the wall, a switch means in said socket and including first and second contacts of which the first contact is normally in closed circuit relation to a contact pin of a pair inserted into said socket through one of said entrance openings and the second is normally out of circuit closing relation to the other pin of said pair when said other pin is inserted through the other of said entrance openings, a switch operating means in said socket and including a cam for selectively shifting said contacts from their normal positions, a shaft connected with said cam and extending from the interior of said socket out through said extension, a head on the outer end of said shaft for manipulating the same and thereby said cam.

7. In a lighting apparatus, a housing including a wall having an opening therethrough, a socket against the inner side of said wall and having entrance openings for receiving the contact pins of a lamp, an extension on said socket and passing through said wall, means on said extension at the outer side of the wall and clamping the socket against the inner side of the wall, a switch means in said socket and including first and second contacts of which the first contact is normally in closed circuit relation to a contact pin of a pair inserted into said socket through one of said entrance openings and the second is normally out of circuit closing relation to the other pin of said pair when said other pin is inserted through the other of said entrance openings, a switch operating means in said socket and including a cam for electrically disconnecting the first contact and a pin and for electrically connecting the second contact and a pin, a shaft connected with said cam and extending from the interior of said socket out through said extension, and means on the outer end of said shaft for manipulating the same to move said cam for electrically disconnecting and connecting said contacts and pins.

8. In a combined socket and switch, a body adapted to receive a pair of contact pins of a lamp, first and second contacts in said body, said first contact including a spring arm normally positioned to be engaged by the first pin of a pair of lamp pins inserted into said body, said second contact including a spring arm normally positioned to be spaced from the other pin of said pair of lamp pins, a cam located between said spring arms, a shaft operable to rock said cam and extending to the outer side of said body, means to rock said shaft in one direction to have said cam flex the spring arm of the second contact into a position to engage the other pin, means to rock said shaft in the opposite direction to have said cam flex and retain the spring arm of the first contact out of position to engage the first pin, and said spring arm of the second contact adapted to rock said cam back to a neutral position when the cam and shaft are released following rocking of the cam to flex said spring arm.

9. A switch for a fluorescent light bulb having a pair of terminals extending from one end there-

of, said terminals being connected with each other inside the bulb, said switch comprising a pair of contact members which lie on a common plane, said plane being perpendicular to the longitudinal axes of the bulb terminals, said contact members being movable independently of each other in the same common plane, one of said contact members being normally out of engagement with the first terminal and the other of said contact members being normally in engagement with the second terminal, and means movable in the same common plane with said contact members for moving the first contact member into engagement with the first terminal to close a circuit through said first contact member, said first terminal, said second terminal, and said second contact member, said means being also movable in said same common plane in the opposite direction to release the first contact member from engagement with the first terminal and thereby to break the circuit through said first contact member and said first terminal, said means being further movable in the last-mentioned direction in the same common plane into engagement with the second contact member to move said second contact member out of engagement with the second terminal to break the circuit therethrough.

10. In a combined socket and switch, a hollow body having a pair of entrance openings of a size to each receive a pin of a fluorescent lamp and said openings spaced to receive the pair of contact pins at one end of a fluorescent lamp, a first contact in said body and positioned to engage a pin of a fluorescent lamp inserted through one of said openings, a second contact in said body and positioned to be spaced from a fluorescent lamp pin inserted through the other of said openings, and a single manually operable means selectively operable to move the second contact into engagement with its lamp pin and the first contact out of engagement with its lamp pin.

11. In a combined socket and switch, a body having entrances to receive a pair of contact pins of a lamp, first and second contacts in said body and adapted to be connected with leads, means whereby the first of said contacts is normally electrically connected with one of a pair of lamp pins when such lamp pin is inserted into said body through one of said entrances, means whereby the second contact is normally electrically disconnected from the other of a pair of lamp pins when the latter is inserted into said body through the other of said entrances, and a single manually operable means for electrically disconnecting the first contact and a pin and for electrically connecting the second contact and a pin.

12. In a combined socket and switch, a body having entrances to receive a pair of contact pins

of a lamp, first and second contacts in said body, said first contact including a spring arm normally positioned to be engaged by the first pin of a pair of lamp pins when such first pin is inserted into said body through one of said entrances, said second contact including a spring arm normally positioned to be spaced from the other pin of said pair of lamp pins when said other pin is inserted through the other of said entrances, and a single means manually operable to selectively flex said spring arms to move the second into position for engagement with said other pin and the first from position for engagement with the first pin.

13. In a combined socket and switch, a body adapted to removably receive a pair of contact pins of a lamp, first and second contacts in said body, said first contact normally positioned to be engaged by the first pin of a pair of lamp pins inserted into said body, said second contact normally positioned to be spaced from the other pin of said pair of lamp pins, a cam between said contacts, and means manually operable to move said cam to selectively shift said contacts whereby to move the first into open circuit relation with the first pin and the second into closed circuit relation with the other pin.

14. In a combined socket and switch, a body having entrances to removably receive a pair of contact pins of a lamp, a switch means in said socket and including first and second contacts of which the first contact is normally in closed circuit relation to a contact pin of a pair inserted into said socket through one of said entrance openings and the second is normally out of circuit closing relation to the other pin of said pair when said other pin is inserted through the other of said entrance openings, a switch operating means in said socket and including a cam for electrically disconnecting the first contact and a pin and for electrically connecting the second contact and a pin, and means manually operable to move said cam.

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