H. H. ASHINGER.

FILM SOCKET.

APPLICATION FILED JUNE 16, 1917.

1,274,495. Patented Aug. 6, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

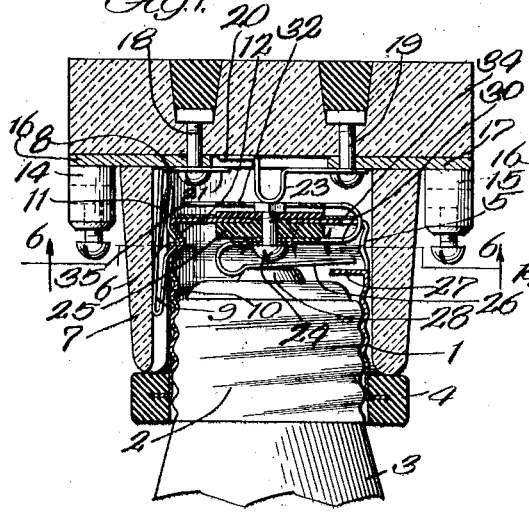


Fig. 2.

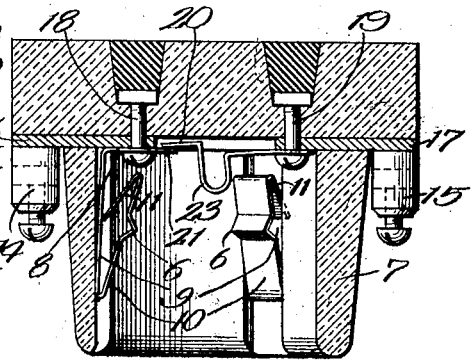


Fig. 3.

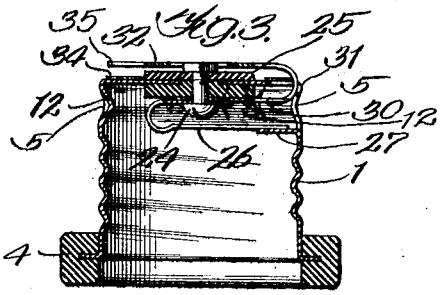


Fig. 4.

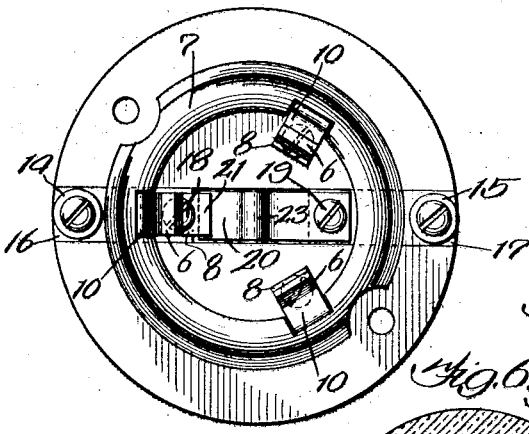


Fig. 5.

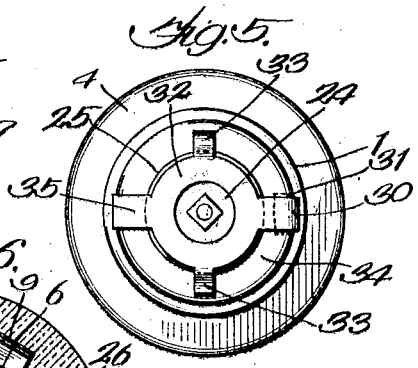
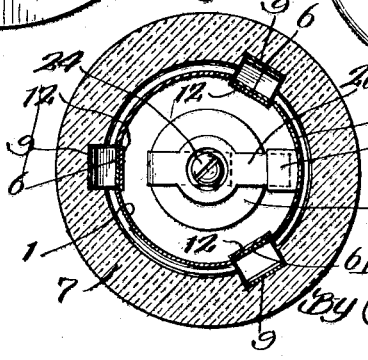


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 7.

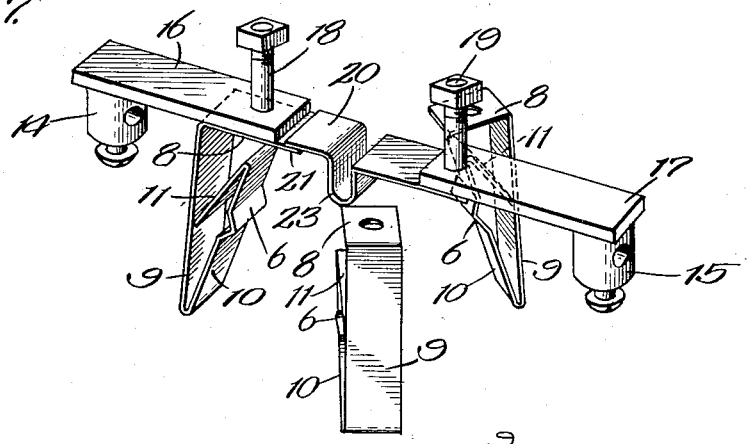


Fig. 8.

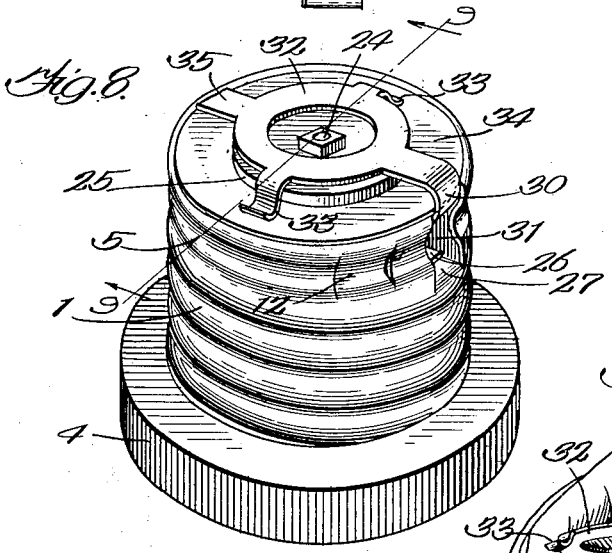


Fig. 10.

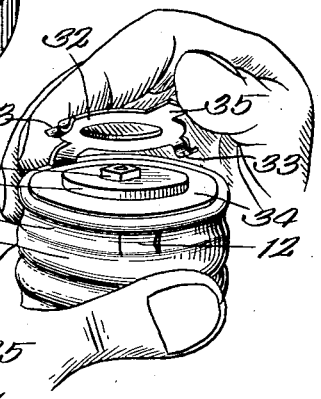
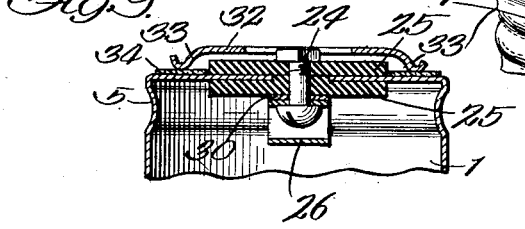


Fig. 9.



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UNITED STATES PATENT OFFICE.

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FILM-SOCKET.

1,274,495. Specification of Letters Patent. **Patented Aug. 6, 1918.**

Application filed June 16, 1917. Serial No. 175,113.

To all whom it may concern:

Be it known that I, HERMAN H. ASHINGER, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented a certain new and useful Improvement in Film-Sockets, of which the following is a specification.

My invention relates to film sockets, especially of the type used in series lighting. Devices of this class usually have an automatic short circuiting switch which is closed when the lamp is absent and automatically opened when the lamp is inserted. They also have an insulating film which becomes punctured when the voltage becomes excessive. In the form of device selected to illustrate the invention, the lamp screws into a shell or socket which carries the film and film retainer. This shell is designed to enter and be supported by an insulating base provided with binding posts for attachment to the supply conductors. The objects of the invention are first, to provide a construction by which the film may be instantly removed or replaced by a simple manipulation of a simply constructed part; second, to provide a construction by which the pressure upon the film remains constant regardless of the distance to which the lamp is inserted into the shell or the shell is inserted into the base; third, to provide a construction by which a single film may be used over again a number of times after it has been punctured; fourth, to provide means whereby the shell, with or without the lamp in place in it, may be inserted into the base or withdrawn therefrom by a straight line push or pull, respectively; fifth, to provide means for preventing the shell from being jarred loose from the base; sixth, to provide means for automatically preventing rotation of the shell after it has been inserted; seventh, to provide certain advantageous details of construction which will be explained in the following description.

These objects are accomplished by the construction illustrated in the accompanying drawings, in which:

Figure 1 is an assembly view taken in section upon an axial plane.

Fig. 2 is similar to Fig. 1, but shows simply the base with the shell and lamp absent.

Fig. 3 is an axial section of the shell.

Fig. 4 is a front or face view of the base.

Fig. 5 is a front or face view of the shell.

Fig. 6 is a sectional view on the line 6, 6, Fig. 1.

Fig. 7 is a perspective view of the terminals and spring clips of the base. In this view the parts are shown to be unsupported, the purpose being to more graphically represent the relative position of the parts.

Fig. 8 is a perspective view of the shell looking at the inner end thereof and showing clearly the construction and arrangement of the film and film retainer.

Fig. 9 is a sectional view on the line 9, 9, Fig. 8.

Fig. 10 is a perspective view illustrating the manner of manipulating the film retainer.

Similar numerals refer to similar parts throughout the several views.

In the particular embodiment of the invention here illustrated, the shell is of metal, preferably copper, and has screw threads 1 for receiving the threaded base 2 of the lamp 3. The shell has a ring 4 of insulating material by which it is manipulated. At the inner end the shell has an annular groove 5 for receiving the shoulders 6 formed upon the spring clips mounted in the base 7. By preference, the walls of the base are annular and the clips are formed in four parts or sections, the section 8 forming a foot by which the clip is secured in place, the section 9 lying adjacent to the inner surface of the wall of the base, the section 10 containing the shoulder 6 and the section 11 being mounted at the free end of section 10 and extending toward the section 9. Sections 10 and 11 form spring elements, the outer end of section 11 sliding upon section 9 and supplementing the spring action of section 10. The parts are so arranged that when the shell is given a straight line push toward and into the base, the shoulders 6 automatically slip into the groove 5 and hold the shell securely in position. By preference, the spring clips are three in number and arranged equidistantly in the base. Pockets 12 are formed in groove 5 to receive the shoulders 6. The result is that by rotating the shell a short distance, the shoulders will drop into the pockets 12 and prevent further rotation in either direction.

Consequently, when the shell is once in place and the shoulders are in the pockets a lamp may be screwed in or out without changing the position of the shell.

The base is provided with two binding posts 14, 15 for connection to the external supply conductors. These posts are electrically connected to conductive straps 16 and 17 respectively, which are held in place by bolts 18, 19, respectively. The bolt 18 serves to electrically connect strap 16 with one of the spring fingers, while bolt 19 serves to electrically connect strap 17 to spring switch 20. When the shell is absent, switch 20 engages the extended end 21 of one of the clips as best shown in Figs. 2 and 7. This short circuits the binding posts and completes the circuit through the device so that the other lamps in the circuit may continue to glow.

The spring line switch 20 has a bend 23 in position to be engaged by the center screw 24 of the lamp shell. When the lamp shell is in position in the base, this screw raises said switch from the extension 21 and thus breaks the circuit at this point. Screw 24 is fastened to the inner end of the shell through the agency of insulating disks 25, as shown in detail in Fig. 9 and elsewhere. The inner end of said center screw is in electric connection with the spring switch 26 which engages the lip 27 formed on the side of the shell, as best shown in Figs. 1 and 3. When the center screw is in engagement with the bend 23, it is in electric contact therewith and this puts the spring switch 26 in electric connection with switch 20. Switch 26 which will be referred to as the "socket switch" to distinguish it from the "line switch" 20 is in position to be engaged and lifted by the center contact 28 of the lamp, as shown in Fig. 1. Thus, it will be seen that when the lamp is absent from the shell the socket switch 26 will engage the lip 27 and thus complete the circuit from the center screw 24 to the shell itself. Hence when all the parts are assembled the two switches 20 and 26 will be open and the circuit will be completed through the lamp while if the lamp is absent, the circuit will be completed through the socket switch 26 and if the socket or shell is absent the circuit will be completed through the base switch 20.

Electrically connected with the center screw 24 is a strip 30. It consists of resilient conductive material and passes out through an aperture 31 in the side of the shell as shown in perspective in Fig. 8. It connects with and forms an integral part of the film retainer. Said retainer consists of a ring 32 having feet 33 which press upon the annular film 34 and hold it in position against the end of the shell or socket. The film retainer has an ear 35 by which it may be lifted in the manner indicated in Fig. 10. As the ring 32 is open in the center, it affords a space through which the center screw 24 may engage the bend 23 of the base switch 20.

In operation, when the lamp is absent and the shell or socket is absent from the base, the base and the shell will appear as shown in Figs. 2 and 3. The line switch will be closed and thus hold the line circuit closed. Let it be assumed that the operator introduces the lamp base into the shell before inserting the shell into the base receptacle. By so doing, he will cause the lamp to open the socket switch 26. The operator then pushes the shell in a straight line into the base, thereby opening the line switch 20 and putting the lamp in circuit. By rotating the shell slightly, the shoulders 6 of the spring clip will drop into the pockets 12 and thus prevent the shell from being rotated any further. This makes it possible to remove the lamp by unscrewing it, for the socket will be prevented from rotating in unison with the lamp. It will be noted that the film retainer being circular, surrounds and clears the center screw 24 and is at all times free from physical interference with any of the surrounding parts of the device. It makes no difference how hard the shell is pushed into the base nor how tightly the lamp is screwed into the shell, there is nothing to vary the pressure of the film retainer on the film. The result is that the only pressure exerted by the retainer upon the film is the pressure generated by its own resilience. In other words, the retainer is spring actuated and the pressure never varies no matter how the device is used. This is important, for it will be understood that the greater the pressure upon the film the more easily will it puncture under a given voltage. In my device, as the pressure always remains the same, the film will be punctured or disruptured always at substantially the same voltage, thus making it possible to design the parts more accurately and make it possible to more accurately control the voltage at which puncturing will occur. The replacing or removal of a film is a very simple matter. All that is necessary is for the operator to lift the retainer by applying his thumb to the ear 35, as illustrated in Fig. 10. The film may then be placed or removed by simply laying it in position or lifting it off. When for any cause the voltage becomes excessive, the film will be punctured at the points where the feet 33 engage it. Only a small area of the film will be broken down and consequently, after a film has thus been punctured, all that is necessary is to raise the retainer and rotate the film slightly so that the feet will contact a fresh surface of the film. As a result of my construction, a single film may be used a number of times

by merely shifting it angularly in this way. The saving effected is not so much in the cost of the films as in the trouble of replacing.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A film socket having a base provided with a self closing line switch, a dielectric film, a metallic shell adapted to be inserted into the base and thereby open the line switch and put said shell in circuit, said shell being internally threaded to take a standard electric lamp base, the inner end of the shell being adapted to support the dielectric film, and a resilient film retainer inherently tending to press the film against the external surface of the inner end of the shell, said retainer being fastened to the shell at a point other than the external surface of the inner end of said shell.

2. A film socket having a base provided with a self closing line switch, a dielectric film, a metallic shell adapted to be inserted into the base and thereby open the line switch and put said shell in circuit, said shell being internally threaded to take a standard electric lamp base, the inner end of the shell being adapted to support the dielectric film, and a resilient film retainer secured to said shell, the film bearing directly on the external surface of the inner end of the shell itself, and the retainer passing around over the edge of said inner end, and being fastened at a point beneath.

3. A film socket having a base provided with a self closing line switch, a dielectric film, a metallic shell adapted to be inserted into the base and thereby open the line switch and put said shell in circuit, said shell being internally threaded to take a standard electric lamp base, the inner end of the shell having a flat surface at right angles to the axis of the socket for supporting the film, and a resilient film retainer, one portion of which overlies the film, and presses upon it, for retaining it, said retainer passing thence over and around the edge of the end surface of the shell and being fastened at a point underneath.

4. A device of the class described having two terminals, one making electric connection with the center contact of the lamp when the lamp is in place and the other making connection with the outer contact of the lamp, a disruptable dielectric, and a retainer therefor, said retainer being in series with one of said terminals and separated from the other of said terminals by said dielectric, said dielectric being annular and the terminals upon which it rests having an annular surface for supporting it, whereby the dielectric may be angularly shifted to a new position, and one of the elements between which the dielectric is disposed having puncture defining projections directed toward the other of said elements.

5. In a film socket, a base, a metallic shell secured thereto and internally threaded to take the base of an electric lamp, there being an annular surface at the inner end of the shell, a film retainer mounted on the shell and in electric connection with the center contact of the lamp when the lamp is in place, an annular film inserted between the shell and the retainer, and one of the elements between which the film is disposed having puncture-defining projections directed toward the other of said elements.

6. A structure as specified in claim 5 in which the puncture-defining projections are in the form of feet formed upon the film retainer.

7. In a film socket, the combination of an insulating base having terminal binding posts, a conductive socket fitting into said base, said socket being screw threaded to receive the base of the lamp, means for electrically connecting said socket to one of the binding posts, a conductor for connecting the center contact of the lamp to the other binding post, a circular dielectric film adjacent to the inner end of the socket and a film retainer having feet in electric connection with said conductor, said retainer having a spring at one side for pressing the retainer feet against the film in a direction toward the end of the socket, the other side of the retainer being liftable to permit the film to be shifted to thereby bring a new surface into contact with said feet.

8. In a film socket, the combination of an insulating base having binding posts, a conductive socket fitting into said base and having an internal thread for receiving the base of the lamp, means for electrically connecting said socket to one of the binding posts, a center conductor for connecting the center contact of the lamp with the other binding post, an annular dielectric film resting upon the inner end of the socket, an annular film retainer surrounding said center conductor, said retainer being in electric connection with said center contact and having a spring at one side and a lifting ear at the other, and feet between the spring and the ear, pressing upon the film, whereby, when the voltage becomes excessive, the current will pass through from the feet to the socket.

9. A film socket having a base provided with a self closing line switch, a metallic shell adapted to be inserted into the base and thereby open the line switch and put the shell in circuit, said shell being internally threaded for the reception of a standard lamp base, the inner end of the shell having an annular surface, an annular dielectric film adapted to contact said surface, and a film retainer for holding the film in place, said retainer being in circuit with the

center contact of the lamp when the lamp is in place and having projections of restricted area for contacting the film, to thus define the points at which the rupture of the film shall occur.

10. In a device of the class described, the combination of an insulating base having terminals for connecting to the external supply conductors, a conductive screw socket fitting into said base, means for electrically connecting said socket to one of the terminals, a center conductor in position to engage the center contact of the lamp, means for connecting said center conductor to the remaining terminal on the base, a film adjacent to the inner end of said socket, and a film retainer in electric connection with said center conductor, said retainer passing around over the edge of the end of the socket and fastened to the socket through the medium of a resilient strip, whereby the retainer may be swung up away from the inner end of the socket and leave the end surface thereof clear.

11. In a series lighting device, an insulating base, a threaded shell adapted to be removably inserted into the base and having internal screw threads for making contact with and supporting the outer contact of a standard electric lamp base, the inner end of said shell being substantially flat and at right angles to the axis of the device, an annular film adapted to rest directly upon the inner end of the shell, and a film retainer adapted to back up the film, said retainer being mechanically fastened inside of the shell and passing out through an aperture in the side of the shell and there resiliently connected to the external portion of the retainer.

12. In a device of the class described, the combination of a base, a screw socket adapted to receive the threaded base from a standard electric lamp, spring clips for yieldingly engaging or releasing the socket when a straight line push or pull is exerted on the socket, and non-yielding means for locking the socket against rotation in the base when the lamp is being screwed into the socket or unscrewed from it.

13. A structure as specified in claim 12, in which the clips are permanently mounted inside the base.

14. A lighting socket having an insulating base having binding posts, spring clips in said base, a conductive socket having an internal screw thread for receiving a lamp base, said socket being adapted to be engaged by said clips when a straight line push is exerted upon the socket, one of said clips being electrically connected to one of the binding posts, means for establishing electric connection between the center contact of the lamp and the second binding post, a dielectric film lying against the socket and a film retainer yieldingly pressing upon said film, said film retainer being in electric connection with said second binding post, said socket having a pocket into which one of the spring clips may drop to prevent rotation of the socket.

15. A series lighting device having an insulating base provided with line terminals and a self closing line switch, an internally threaded metallic shell adapted to receive the lamp base, said shell carrying a center contact adapted to engage the center contact of the lamp, and to automatically open the line switch in the base when inserted into the base, and spring clips mounted in said base and adapted to yieldingly engage the shell when the latter is inserted with a straight-in push, the shell and the clips having laterally engaging shoulders for positively preventing rotation of the shell when the lamp is screwed into it or unscrewed from it.

16. A structure as specified in claim 15, further characterized in that one of the spring clips is electrically connected to one of the terminals in the base and thereby forms an electric conductor to energize the shell.

In witness whereof, I have hereunto subscribed my name.

HERMAN H. ASHINGER.