Nov. 4, 1924. 1,513,980

R. E. FROELICH

FLASH LAMP FOR CAMERAS

Filed Oct. 2, 1920

Fig. 1.

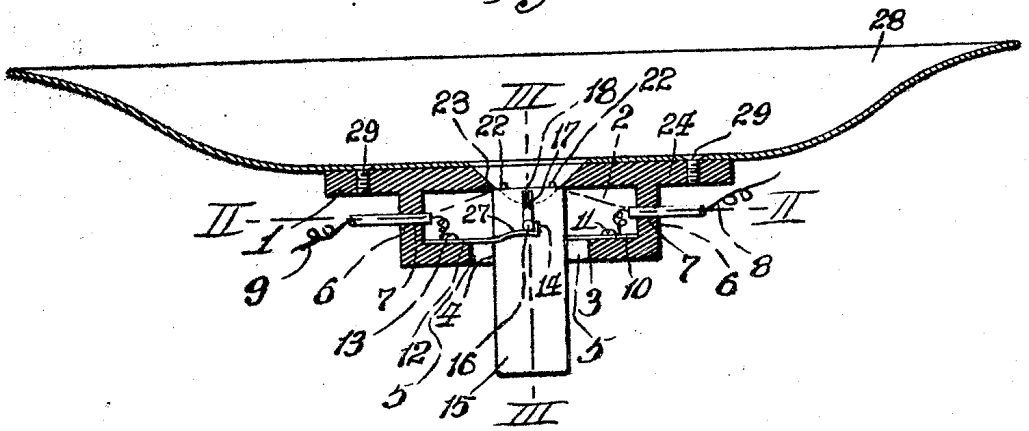


Fig. 2.

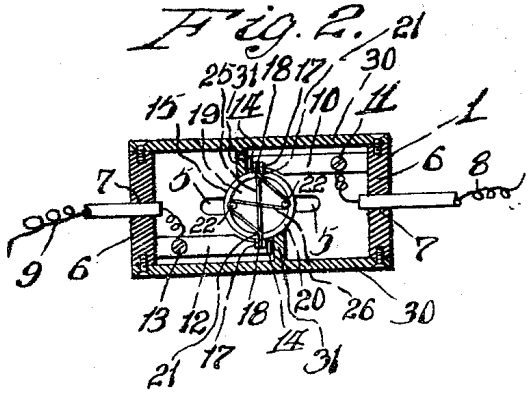
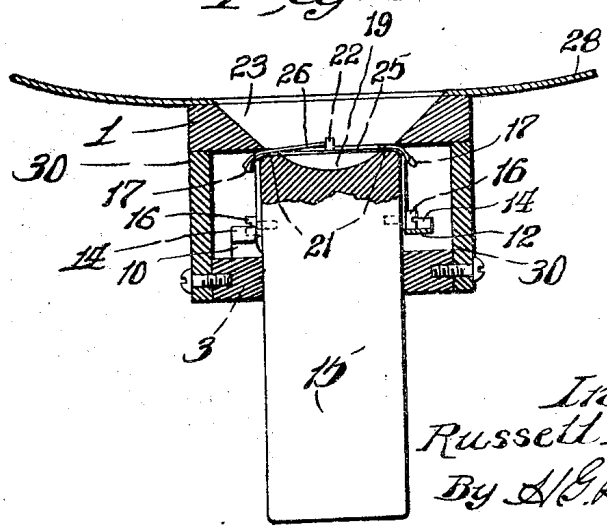


Fig. 3.



Inventor:
Russell E. Froelich.
By H. G. Fletcher
Atty.

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UNITED STATES PATENT OFFICE.

RUSSELL E. FROELICH, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-SIXTH TO MARION F. PARKER, OF WEBSTER GROVES, MISSOURI.

FLASH LAMP FOR CAMERAS.

Application filed October 2, 1920. Serial No. 414,305.

To all whom it may concern:

Be it known that I, RUSSELL E. FROELICH, a citizen of the United States of America, and a resident of the city of St. Louis and State of Missouri, have invented a certain new and useful Improvement in a Flash Lamp for Cameras, of which the following is a specification.

The primary object of this invention is to provide an improved reloadable or renewable plug which is to be used in connection with the production of flashing or exploding lights.

Another object of this invention is to provide an improved removable plug forming part of a flash producing outfit.

A further object of the invention is in providing a flash light plug with a plurality of fusing wires for the purpose of insuring positiveness in firing.

A still further object of the invention is in providing an improved flash light plug of such a character in which means are provided whereby when a number of plugs are used in a series, the fusing construction of each plug will not permit any one plug of the series to create a controlling arc wherein all of the remaining plugs would be robbed or deprived of electrical ignition energy.

Other and further objects will appear in the specification and be specifically pointed out in the appended claims, reference being had to the accompanying drawings exemplifying the invention, and in which,

Figure 1 is a vertical longitudinal section taken through the flashing plug and its holder, and showing them attached to a receptacle.

Figure 2 is a horizontal section taken approximately on the line II—II of Fig. 1.

Figure 3 is an enlarged transverse vertical section taken approximately on the line III—III of Fig. 1.

Referring to the drawings, this improved device comprises a holder 1 which is preferably constructed of insulated material, and formed in said holder is a chamber 2, the bottom 3 of said holder having a circular opening 4 formed therein, and formed in said bottom and extending from opposing sides of said opening 4, is a pair of recesses 5. Formed in each of the end walls 6 of said holder is an opening 7, each of said openings being for the reception of circuit wires such as 8 and 9, the wire 8 connecting with a contacting member 10 which is secured to the bottom 3 by the screw 11, whereas the wire 9 is connected to a contact member 12 which is secured to the bottom 3 by a screw 13, said contacting members 10 and 12 being preferably constructed of a resilient material, each of said members having a stop 14 formed on their extending ends.

Adapted to be removably secured in the opening 4 of the holder 1 is a circularly formed plug 15, which is constructed of insulated material, and extending from opposite sides of said plug adjacent the upper end thereof, is a terminal 16, said plug when being mounted in the opening 4 being positioned so as to have the terminals 16 thereof in vertical alinement with the opposing pair of recesses 5, so that said terminals can pass through said recesses. Secured to the plug 15 by each of the terminals 16 is an inverted hook shaped member 17, and formed on the upper surface of each of said hooks is a groove 18. The upper end of the plug 15 is countersunk as shown more clearly in Fig. 3, thereby providing a pocket 19, and in which an annular ridge 20 is formed around said pocket, and formed in said ridge in oppositely disposed positions are a pair of grooves 21 each of said grooves being in alinement with a respective groove 18 of each of the hooks 17.

Extending upwardly from the pocket 19 of the plug 15 and oppositely disposed from one another is a pair of projections 22, said projections being located adjacent the ridge 20, and are each arranged so as to be located in equi-distant disposed positions between the pair of grooves 21 which are formed through the ridge 20, said projections 22 adapted to extend within the opening 23 which is formed in the upper portion 24 of the holder 1, the ridge 20 of said plug 15 adapted to seat against the under side of the upper portion 24. See Fig. 1.

The primary use of this invention is in connection with flash lamps, although the principle contained therein and more particularly in connection with the plug may be used in connection with other devices where it is required to create powder explosions, in which a suitable holder such as disclosed is required for the peculiar construction of this improved plug, which is

removable and reloadable, and in which a number will be kept on hand ready for adaptation in the plug.

In reloading or renewing this improved plug, a fuse wire 25 is engaged and wrapped over one of the hook shaped portions 17, then the wire is laid in the groove 18 of the hook to which it has been engaged as well as in the adjacent groove 21 in the ridge 20 from where it is extended diametrically across the pocket 19 into the opposite disposed groove 21 and the groove 18 of the oppositely disposed hook 17, the extending end of the wire then being wrapped around the last engaged hook. Another wire such as 26 is then engaged and wrapped around one of the hooks 17 and entrained through the groove 18 thereof and adjacent groove 21 of the ridge 20, then said wire 26 is led over to one of the projections 22, and after being bent around said projection it is led over to the second projection 22 from where it is extended to within the groove 21 of the ridge 20 which is in opposite disposition from the first mentioned groove 21 where said wire was first engaged and is then engaged within the adjacent groove 18 of the second hook 17 where the end of said wire 26 is secured.

After the plug has been wired or loaded by attaching the fuse wires 25 and 26 as just described, the plug is then ready for introduction into the holder 1, in which after the terminals 16 of said plug have been engaged within the respective recesses 5 of said holder, the plug is turned in a right hand direction so that each terminal will engage a respective inclining portion 27 which is formed on each of the contact members 10 and 12, said inclining portions firmly securing the ridge 20 of the plug against the underside of the upper portion 24 of the holder, the plug being prevented from further turning by engagement of the terminals with the respective stops 14. Exploding or flashing powder is then placed within the pocket 19 of the plug through the opening 23, said opening having access to the receptacle 28 which is secured to said holder by screws such as 29.

In the operation of using a single plug in a circuit in which the wires 8 and 9 are placed in circuit with an electrical supply such as a battery, when the circuit is closed the fuse wire 25 which is shorter in length than the fuse wire 26 will be the first to begin to burn on account of the electric current taking the shortest course across the pocket 19 of the plug, and at the instant that said fuse wire 25 begins to burn to the breaking point, the electric current will follow the path of the longer wire 26, thereby fusing immediately after the shorter wire 25 has fused, in which a greater and better spark will be produced, thereby guaranteeing positiveness of ignition to the powder contained in the pocket 19 of the plug.

When a number of plugs are used in a series in connection with their respective holders and receptacles or flash pans such as designated as 28, the conducting or circuit wires 8 and 9 are connected with adjacent plugs, all of which form part of an electric circuit, and in the event that the series of flashes or explosions required are for the purpose of producing a photographic flashlight said pans are spread out covering a certain area and in which it is essential that all of the flashes of the series be produced simultaneously. In this connection when electrical energy is entered into the circuit, the current will immediately taverse through all the short wires 25, and in ordinary practice each short wire of each plug will be simultaneously fused, and immediately thereafter the second or longer wire of each plug will take up the load and fuse, both wires of each plug practically fusing together, in which a large spark will be created in the pocket of each plug.

If however a short wire of a certain plug fused before the other short wires of the remaining plugs, the companion long wire of the fused short wire will immediately take on and carry the electric load to the remaining other short wires, said companion long wire providing assurance for the flashing or exploding of the charge of powder contained above each plug, in which all of the flashes or explosions will be created in the circuit within one five-thousandths part of a second.

As an illustration of the necessity of two fuse wires in connection with this improved plug in which one is longer than the other, assume that only one wire was used instead of two wires, and a number of plugs were used in a series, in the event that any wire of a single plug fused before the other wires, the fusing of a single wire ahead of the other would create an arc of such a size which would use so much energy from the circuit in which the other wires would not fuse, and therefore would be unreliable.

Attention is called to the position of the terminals 16 of each plug which are located below the upper surface 24 of the holder 1, and inasmuch as the ridge 20 of the plug is securely seated against the underside of said surface 24, a perfect insulation is provided between each pair of terminals of each plug.

In the usage of a device of this character, a number of loaded plugs are always kept on hand by the operator, and after a plug has been used, the burnt fuse wires 25 and 26 are removed and the plug is reloaded or renewed by the introduction of new wires on the plug.

In order to prevent the terminals 16 of

each plug from arcing therearound in the event that a plug or series of them are placed in a circuit in which a heavy voltage is carried, partitions such as 31 are provided in the chamber 2, each partition at its inner end bearing against the plug, thereby providing an insulation between each of the terminals 16 within the chamber 2, said chamber being closed on its side by the plate 30.

What I claim is:—

1. An electric flash plug having a pair of fusing wires one of which is tortuose, a pair of terminals borne by the plug to which the respective ends of said wires are secured, and a holder for said plug bearing a pair of contacting members for engagement with said terminals.

2. An electric flash plug having a pair of fusing wires, a pair of contacting members to which the ends of said wires are secured, said wires intermediate of their ends being spaced apart, and a holder for said plug bearing contacting means to which the contacting members of said plug are removably connected.

3. An electric flash plug having a pair of fusing wires, a pair of contacting members borne by said plug to which the ends of said wires are detachably secured, one of said wires being longer in length than the other said wire.

4. An electric flash plug having means for extending a fuse wire thereacross, and other means provided on said plug whereby a second fuse wire of longer length than said other wire can be extended across said plug.

5. An electric flash plug bearing a pair of electric terminals, a pair of fuse wires extending across said plug, each being connected at a respective end to a respective one of said terminals, one of said wires being longer in length between said terminals, and a holder for said plug bearing a pair of contacting members for engagement with said terminals of said plug.

6. An igniting instrument comprising in combination a holder bearing a pair of electric contacting members, a plug removably secured to said holder, and a pair of fuse wires, one of which is longer than the other extending across said plug in electrical communication with said members of said holder and means provided on said plug whereby said longer wire is held tortuose.

7. An igniting instrument comprising in combination, a holder bearing a pair of electric contacting members, and a plug removably secured to said holder bearing a pair of fusing wires of different lengths which are spaced apart from one another intermediate of their connecting ends, said wires forming a circuit with said members of said holder.

RUSSELL E. FROELICH.