

June 18, 1940.

R. V. POND

2,204,948

FUSE PLUG AND RECEPTACLE BASE THEREFOR

Filed Jan. 3, 1939

2 Sheets-Sheet 1

Fig. 1.

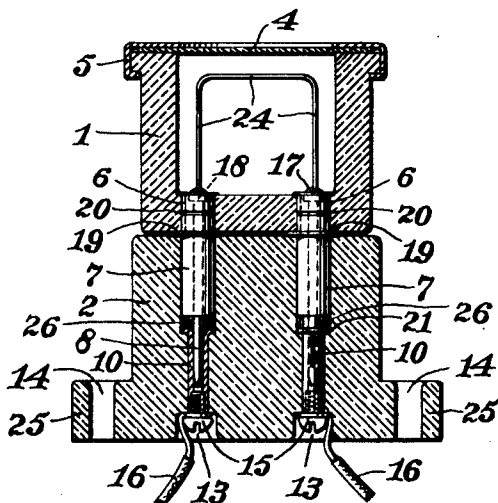


Fig. 2.

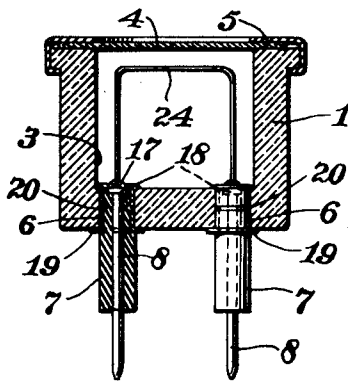


Fig. 3.

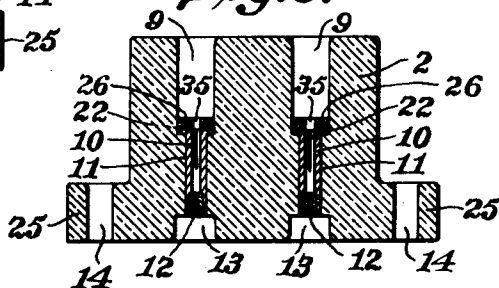


Fig. 5.

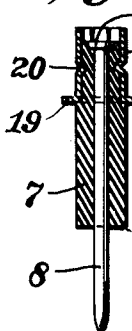


Fig. 6.

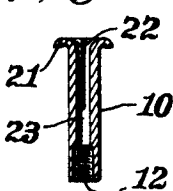


Fig. 4.

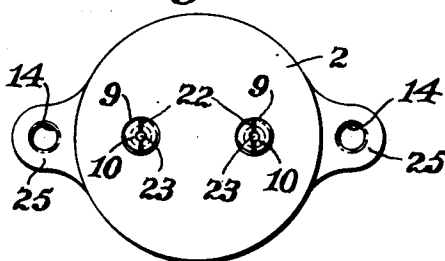
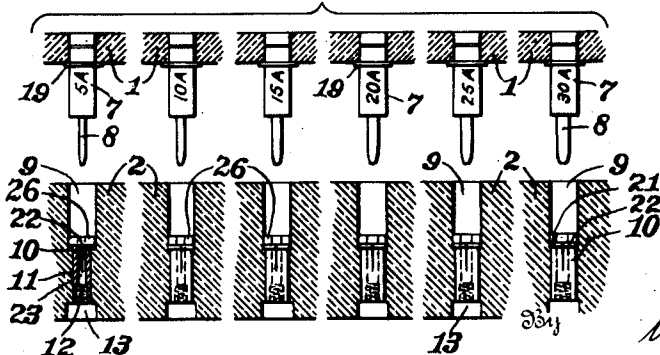


Fig. 7.



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2 Sheets-Sheet 2

Fig. 8.

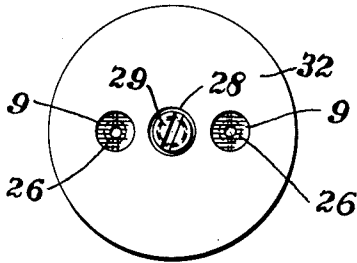


Fig. 9.

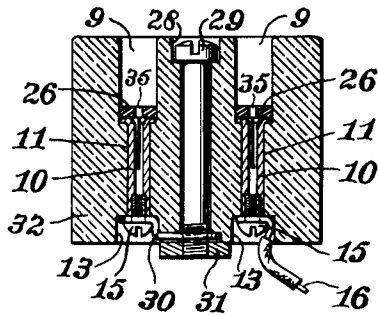


Fig. 10.

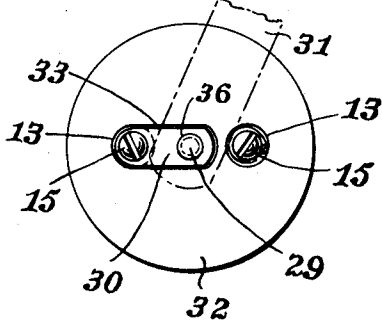


Fig. 11.

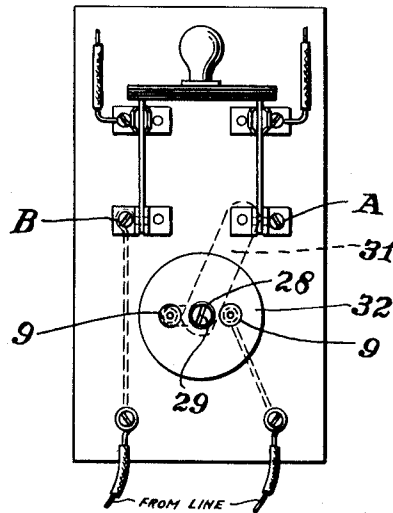
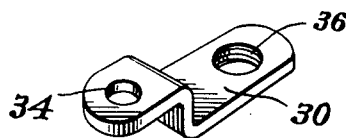


Fig. 12.



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UNITED STATES PATENT OFFICE

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FUSE PLUG AND RECEPTACLE BASE
THEREFOR

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Application January 3, 1939, Serial No. 249,081

2 Claims. (Cl. 200—119)

This invention relates to safety devices for use in connection with electrical circuits and more specifically to fuse plugs of the non-tamperable type which combine with a fuse block in such a manner as to prevent overfusing.

Many times through accident, mistake or by intention, fuse plugs having a resistance which permits a higher amperage of electrical current to pass therethrough than is desirable for the electrical circuit connected thereto, are inserted in place of a fuse plug designed to break at a desirable current strength. By so doing, the value of the fuse plug is lost and unneeded damage is the result. Further, means are sometimes placed within the receptacle for a fuse plug or attached to the fuse plug directly to eliminate the passage of the current through the fuse plug proper. This obviously eliminates the fuse plug and permits heavy current loads to continue through the electrical circuit which should have been interrupted by the rupturing of the fuse link. With these faults in mind, applicant has endeavored to provide a device which cannot be tampered with and, further, which will not permit fuse plugs having other than a desired resistance to be connected within the electric circuit.

A notable object of the present invention is to provide a non-tamperable device for preventing an electrical circuit from being subjected to excessive current strength.

Another object of the present invention is to provide a new and improved form of electrical fuse plug and a receptacle base therefor.

Another object of the present invention is to provide electrical fuse plugs having a desired resistance and fuse blocks therefor which both have structural features that prevent the combining of the fuse block with a fuse plug of a different resistance.

A still further object of the present invention is to provide an improved form of fuse plug and fuse block therefor, which combination has non-interchangeable contact parts and cannot be tampered with in order to substitute or combine therewith divers means for raising or lowering the possible current strength which may pass therethrough without causing a rupture of the fusible element of the fuse plug.

And another important object of the present invention is to provide an improved form of non-tamperable fuse plug and fuse block therefor, which combination has a minimum number of parts and a relative low cost of construction.

Other objects of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by persons skilled in the art, I have in the accompanying drawings and in the detailed following description based thereupon, set out an embodiment of the same.

In the drawings:

Fig. 1 is a cross sectional side view of the present invention.

Fig. 2 is a side cross sectional detail view of the fuse plug comprising a part of the present invention.

Fig. 3 is a side cross sectional detail view of the fuse base block comprising a further part of the present device.

Fig. 4 is a top elevation of said base block.

Fig. 5 is a side cross sectional enlarged view of the fuse prong in detail.

Fig. 6 is a side cross sectional enlarged view of the prong clip which is carried by said base block.

Fig. 7 is a detail view showing as examples a number of combination of fuse prongs and their respective prong clips.

Fig. 8 is a top elevation of a modified form of a base block.

Fig. 9 is a cross sectional view of the fuse base block shown in Fig. 8 mounted upon a bus bar.

Fig. 10 is a bottom view of the base block shown in Fig. 8 and with a bus bar shown in dotted lines for indicating the connection of the base block thereto.

Fig. 11 shows a modified form of the base block as connected to an electrical switch interposed within an electrical circuit, and

Fig. 12 is an enlarged view of the jumper bar of the modified form of the fuse block.

Referring now more particularly to the accompanying drawings wherein like and corresponding parts are designated by similar reference characters throughout the several views, I have herein illustrated a non-tamperable combination of fuse plug 1 and fuse base block 2 for receiving and supporting said fuse plug. The fuse plug consists of a casing 1 formed from an electrical insulation material such as hard rubber, Bakelite, glass or the like. Said casing 1 is formed with a recess 3 open at one end, which open end is covered by a transparent disc 4 which may be formed from mica, glass, or the like and which is retained upon and across said casing 1 by a metallic cap 5. Said cap 5 has a cylindrical opening centrally formed therein whereby a per-

son may observe through said disc 4 the interior 3 of the casing 1 while said cap 5 has the edges thereof engaging projections formed upon the upper periphery of the casing 1. Said casing 1 further has a pair of cylindrical openings formed through the bottom thereof in connection with said recess 3 for receiving a metallic eyelet 6.

As better shown in Fig. 5, the metallic eyelet 6 encases the upper end of a tubular-shaped member 7 formed of suitable electrical insulating material and the eyelet is crimped to form an undulation 20, whereby the eyelet and tubular-shaped member 7 are retained together in a given position. Said casing 1 has a metal fuse prong 8 extending through the bore thereof while the upper end of said prong 8 is enlarged as at 18 to prevent the downward movement of said fuse prong through the member 7. This assembly, of which the fuse plug has two, is mounted one within each of the openings formed in the bottom of casing 1. Said metallic eyelet 6 has one end thereof bent outwardly to form projections 19, which cooperate with the bottom of casing 1 to limit the inward movement of the fuse prong 8 and member 7. Each of said metal eyelets upon being mounted within the casing 1 has the upper edge thereof bent to form an overhanging lip, whereby the outward movement from within the casing 1 of the eyelet 6 is prevented. Situated within recess 3 and connected by solder at each end to one of said fuse prongs 8 is a fuse link 24 of the type common in electrical fuses and which more usually consists of a metallic ribbon or wire constructed to break at a given point thereof upon the passage therethrough of an electrical current having an amperage greater than is desirable to pass through the electrical circuit in which the fuse plug is interposed.

The base block 2 which is also formed of an insulating material, preferably porcelain, has a pair of diametrically opposed projections 25 formed therewith and which projections 25 each have a bore 14 formed therethrough. Screws or bolts may be passed through said bores 14 for retaining the base block 2 within a fuse box or upon a wall or other desirable support. Said base block 2 further has a pair of openings 9 extending therethrough and which openings have an intermediate portion 11 thereof sized and shaped to receive a tubular clip 10. Mounted within passages 9 directly above the tubular clips 10 are washers 26, which washers are formed from an insulating material and have a diameter substantially equal to the diameter of openings 9. Further centrally located through washers 26 are openings 35. Said opening 9 is of a diameter and length above said clip 10 and washer 26 equivalent to the diameter and length of member 7. Clip 10 is likewise of a diameter and length sufficient for receiving the portion of the fuse prong 8 extending beyond member 7 and through and beyond washer 26 and, as shown in Fig. 6, clip 10 has its bore 23 formed therethrough having a diameter sufficient for receiving the projecting end of fuse prong 8. This clip 10, which is of a metallic construction, has a slit 22 which permits the clip to be slightly forced apart by prong 8, whereby the prong 8 will be firmly gripped and be in good electrical contact with said clip. The lower end of bore 23 is enlarged and threaded to receive a screw 15 while the head of screw 15 fits within the lower end 13 of passageway 9 and an electrical wire 16, which is part of the electrical circuit in which the entire present apparatus is interposed, is

wound around the screw 15 and held therewith by tightening the screw against the lower end of the clip 10.

In order to prevent the insertion of a fuse plug having a greater amperage than desirable within an electrical circuit, applicant has found that by using a construction as herein set forth, this undesirable combination can be prevented. By changing the diameter of member 7 below the bottom of the fuse plug and also varying the diameter of the extending portion of the fuse prong 8 in each instance, the fuse plug can only be mounted upon a base block having a passage 9 of a depth and diameter equivalent to the length and diameter of member 7, a washer 26 having an opening 35 of a diameter equivalent to the diameter of prong 8 mounted therein, and, further, whose clips 10 are of a diameter equivalent to the diameter of the fuse prong 8. Members 7 and passages 9 are to have a given length in each case, whereby the fuse plug 1 cannot be raised sufficiently from the base block 2 to permit additional means, such as wires or the like, from being interconnected with members 7 while they are still each in contact with their respective clips 10.

By constructing all fuse plugs of a given resistance having members 7 of like diameters and also similar diameters for all prongs 8 and then constructing the fuse blocks 2 therefor with the upper portion of the passage 9 for receiving this particular sized member 7, also washers 26 with openings 35 for receiving this particular sized prong 8 mounted in passage 9 and at the same time mounting clips 10 within the passageway, which clips 10 are of a diameter of the extended portion of prong 8, it can be readily seen that only fuse plugs having these particular sized members 7 and prongs 8 can be inserted in this particular fuse block 2. Therefore, electricians can mount fuse blocks which are especially constructed to receive only fuse plugs 1 which rupture at a given amperage within the electrical circuit and thereby prevent others from mounting fuse plugs of a different amperage therein.

By way of example, Fig. 7 shows a number of members 7 mounted within the base, which members 7 are, in each case, of a similar diameter. However, the fuse prongs 8 extending from members 7 are, in each case, of a different diameter. Shown directly below each of these combinations is a portion of the fuse block 2 having the passage 9 formed therethrough, the upper portion of which is of a length and diameter sufficient for receiving the entire portion of members 7 extending from the fuse plug 1. Directly below this upper portion of passage 9 is mounted a washer 26 having an opening 35, which opening 35 has its diameter equivalent to the diameter of the particular fuse prong 8 shown therewith and below washers 26 are mounted clips 10, which clips, in each case, have a different sized bore, which bore is substantially equivalent to the thickness of prong 8. These clips 10 will thereby receive and tightly hold the entire portion of prong 8 extending from members 7 and through washer 26 and offer a good electrical connection for wires 16 to the prongs 8. As previously mentioned, each of the individual sections of Fig. 7 are designated, by way of example, as being for an electrical circuit through which the limit of amperage is designated upon the members 7. This is to clearly show that the members can be sized and combined in such a manner that the members 7 and prongs 8 for a twenty-five

amperage fuse cannot be inserted in the fuse block 2, for say a fifteen amperage fuse. That is, the fuse prongs for the higher amperage fuses will not fit through the washers 26 and into the metallic clips 10 of the fuse blocks 2 constructed especially for the lower amperage fuses. Further, members 7 are of sufficient length that upon their withdrawal from passages 9, the prongs 8 will also be removed from contact with clips 10. Whereas, Fig. 7 only discloses members 7 having similar diameters, it is to be understood that the diameters of said members 7 can be changed, which will of course necessitate a passage 9 having a corresponding diameter for receiving the same.

In view of the foregoing construction, it is impossible to insert any divers means for causing the current to pass from one clip 10 to the other clip 10 while the fuse plug 1 is positioned thereon. The prongs 8 are closely protected at all times and will not therefore permit additional members to be placed thereacross. With this device, it is therefore obvious that only fuse plugs for receiving a given amperage can be placed upon a fuse block which is expressly constructed to receive only a fuse plug having a desired amperage.

A modified form of the fuse block 2 is shown in Figs. 8, 9 and 10. This modified fuse block 32 has passages 9 and 11 together with washers 26, clips 10 and screws 15 similar to the corresponding members of fuse block 2 formed and mounted therein. However, in this modified form, a centrally located passage 28 is formed therethrough, which passage is shaped to receive a bolt 29 countersunk therein. In the base of block 32 there is formed a slot 33 for permitting a metallic jumper 30 to be mounted therein. Slot 33 extends from opening 13 to opening 28 of the block 32. Metallic jumper 30, which has a pair of openings each formed in an extremity thereof, is substantially shaped as shown in Fig. 12. Bolt 29 is connected to a jumper bar 30 by being screwed through threaded opening 36 of the jumper 30 and the opposite end of the jumper 30 is connected to one of the metallic clips 10 by screw 15 being inserted through opening 34 and screwed into metallic clip 10. A bus bar 31 connected to one pole A of a switch, as shown in Fig. 11, has block 32 mounted thereon by screwing bolt 29 through a threaded opening in the bus bar. Therefore, one of the metallic clips 10 through jumper bar 30 is connected to the bus bar 31 and pole A. The wire 16 of an electrical circuit which would normally be connected to pole

A is connected to the other of the metallic clips 10. The other pole B of the switch is connected to the remaining wire of the electrical circuit. In this manner, fuse block 32 is interposed within an electrical circuit within a switch box also interposed within the said circuit. In this manner, fuse plugs 1 of a given amperage only can be mounted on the fuse block 32, which fuse plugs 1 will rupture only for a given amperage of the current passing through the electrical circuit.

It is to be understood that the applicant considers it well within his invention to change the positions of the various parts of the present device and, further, the construction herein shown is capable of considerable modification and such modifications and changes as come within the scope of my claims, I consider within the spirit of my invention.

I claim:

1. An improvement in electrical fuse plugs consisting of an insulator casing, a recess formed within said casing, a transparent disc mounted upon said casing for closing the open end of said recess, a pair of openings formed through said casing and being in connection with said recess, a pair of eyelets each fixedly mounted within one of said openings, a pair of insulator members each fixedly mounted within and extending from one of said eyelets, a pair of prongs each fixedly mounted within and extending from one of said insulator members and an electrical fuse element situated within said recess and having each end mounted upon and supported by one of said prongs.

2. An article of manufacture comprising a casing of electrical insulating material, an electrical fuse element carried by said casing, a series of insulator projections carried by said casing, a series of prongs each of a given diameter and in connection with an end of said fuse element and extending through and from one of said insulator projections, a second casing of electrical insulating material, a series of openings formed in said second casing each of a configuration and position for receiving one of said prongs and its respective insulator portion, a series of electrical insulating discs each mounted in and across one of said openings, said discs being formed having an opening therethrough of said given diameter and positioned to permit one of said prongs of a similar given diameter to pass therethrough and a series of electrical conducting clips each mounted below the disc in one of said openings.

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