

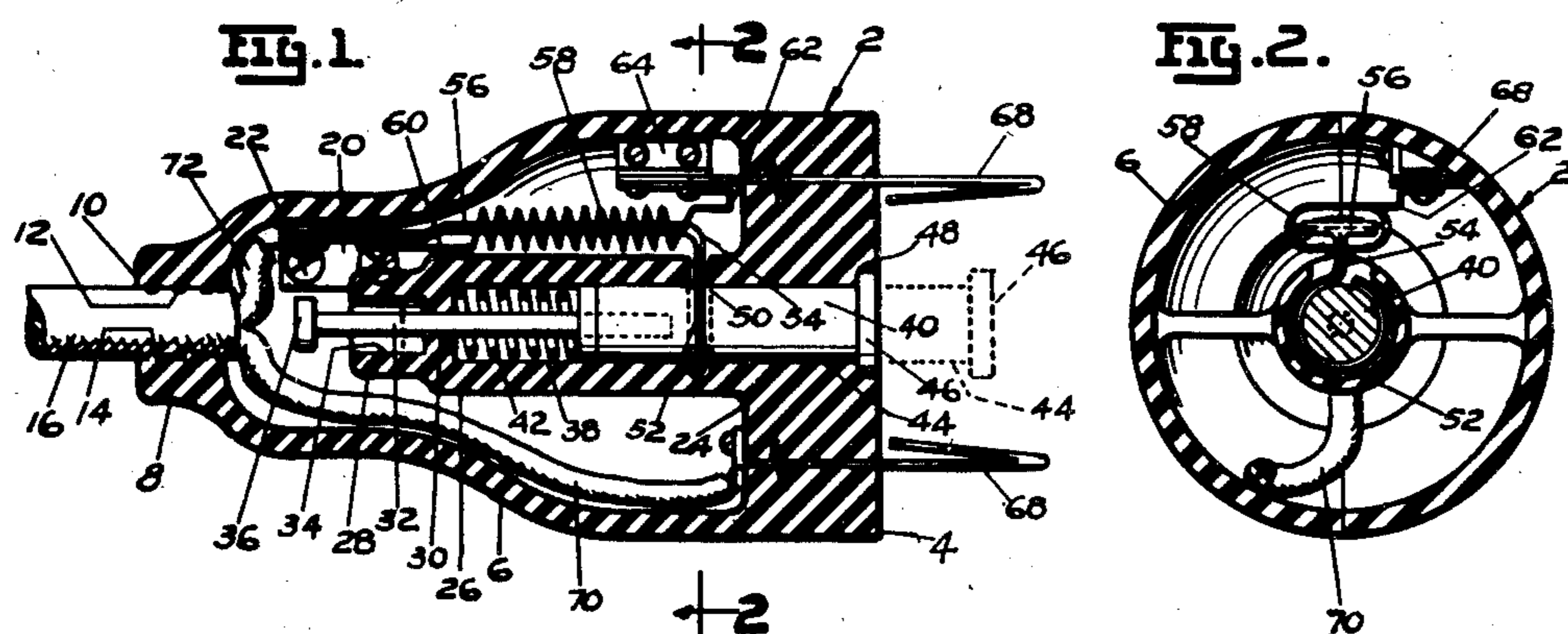
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T. A. DEAR

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OVER-LOAD CONTROLLING PLUG

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OVERLOAD CONTROLLING PLUG

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My invention relates to an over-load plug construction, in its operation, and more particularly to such devices which are especially adapted to be used for, or in connection with an electric current carrying line, and which is so arranged whereby any excessive load or voltage of electrical current may at all times be controlled, thereby preventing blowing of fuses or delays due to imperfect line connections, also preventing any interruptions of machine or appliance operations receiving electrical current from a main line, so as to permit an unimpeded continuation of operation of any particular device, motor, machine or appliance without delay and at its normal capacity.

Accordingly an object of my invention is to provide a suitable plug means, which is equipped with a pair of electrical current carrying wires, said plug having a pair of prong contact means which connect said current carrying wires, one of which is provided with a delay action bi-metal means adapted for controlling current flow there-through, and in addition having a suitable ejector means which is controlled by the action of said bi-metal means, so that in operation when an excessive electrical voltage or over-load is present in the line, said ejector will cause said prong means to be pushed out of its sockets and thereby disconnecting the contact of the line entirely.

Further object of my invention is to provide said plug means with a suitable ejector, said plug means having a suitable heat-resisting means disposed therein, the end of which is provided with a loop means adapted for functionally engaging said ejector means, so that in operation when an excessive voltage or over-load of current is present, said loop means will cause said ejector means to be released, thus pulling the prongs out of its sockets and thereby disconnecting the electrical connection line when over-loaded.

Another and further objects and advantages of my invention, as will hereinafter more fully appear, I will attain by the construction herein shown and the drawings and described in the specification, forming a part of my application.

Reference is had to the accompanying drawings in which the similar reference characters denote the similar parts.

In the drawings:

Fig. 1 is the longitudinal cross-sectional view of the plug means disclosing my invention wherein the bi-metal actuated by the heat produced by an over-load or excessive electrical voltage will cause the loop at its end to release the ejector.

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Fig. 2 is the fragmentary and vertical sectional view showing the loop of the bi-metal frictionally engaging the ejector taken on the line 2—2 of the Fig. 1.

Describing my invention more in detail in its broader aspects, said invention comprises a plug housing generally designated by numeral 2, which housing may, if so desired, be made in two or multiplicity of parts or sections and be held together in any suitable manner as in practise may be most desirable.

Said housing 2 comprises a base member 4, a mid-section 6, and a suitable end member 8, wherein a suitable passage 10 is provided, the interior section of which as at 12, is provided with suitable grippers 14 adapted for receiving and holding in place an electric wire or cable 16.

Between said end member 8 and said base member 4 said mid-section 6 is provided with a suitable cavity 18 wherein a suitable bracket member 20 is held in place by means of screws 22, while interiorly as at 24, said base member 4 is provided with a center extension 26 having its end 28 extending interiorly and terminating in close proximity to the end member 8, as shown in Fig. 1. Said center extension 26 is provided with a passage 30 adapted to receive therein a rod member 32 which is slidably positioned therein, having the end 28 provided with a recess 34 which extends to any distance which may be most desirable in practise, and is especially adaptable for permitting a passage of stop knob 36 therethrough, the purpose of which will be presently described.

Said center extension 26 is also provided with a passage 38 which extends through said base member 4 and which terminates within close proximity of said base 4, being adapted to receive therein a plunger member 40 which in comparison is larger in diameter as compared with said rod member 32, thereby permitting a spring 42 to be placed in said passage 38 and against the inner end of said plunger member 40, as shown, and thus allowing said plunger 40 to travel outwardly which movement is actuated by means of the action of said spring 42, the distance of which is controlled by the depth of the recess 34 and the position of the stop knob 36 upon the rod member 32.

In order to have a finished appearance, and also to provide additional plunger surface, said plunger member 40 at its end 44 is equipped with a plunger cap 46 and which is retained within a recess 48 as shown.

Then, to hold said plunger member 40 in posi-

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tion, said center extension 26 in close proximity to said base member 4 is provided with a cross-slot 50, the depth of which extends beyond the diameter of said plunger member 40 wherein a suitable loop 52 is positioned, the internal diameter of which encloses and grips said plunger member 40, as shown in Fig. 2.

Said loop member 52 rests freely within said cross-slot 50 and is provided with an extension 54, which is substantially a part of the bi-metal member 56, as shown in Fig. 1, which extends rearwardly and is connected to said bracket member 20.

In order to provide an expansion of said loop 52, the entire length of said bi-metal 56 is covered with a coiled heating element 58, one end of which as at 60 is connected to said bracket 20, while the end 62 is extending outwardly and is connected to a bracket 64.

Said base member 4 is provided with prongs 66 and 68 respectively, of which said prong 68 extends through said base member 4 and is connected to said bracket member 64 including said element end 62 while said prong 66 extends through said base member 4 connecting to a lead wire 70, which is a part of said electric wire 16, of which a lead wire 72 is connected to the bracket 20 and the end 60 of said heating element 58.

In operation when the plug 2 is connected to any electrical current carrying member, it will make a contact through said prongs 66 and 68 for allowing the current to pass through the lead wires 70 and 72 and then through the electric wire 16.

However, when an overload is present or developed in said electric wire 16, the heating element 58 will become heated, the heat so generated causing the bi-metal 56 to absorb the excessive heat which will cause said loop 52 to enlarge and thereby releasing the frictional grip so imposed upon the surface of said plunger member 40, whereupon said spring 42 will force said plunger member 40 outwardly and against the connector of the current carrying member (not shown) which action will cause said prong member 66 and 68 to be forced out and ejected from their sockets and thereby automatically disconnecting the current passing through them and into said electric wire member 16.

In order to re-set and replace said plug 2 within the sockets of the electrical current carrying member, the plunger cap 46 of said plunger member 40 is pushed back into its original position, thus compressing spring 42 and also permitting said loop 52 to frictionally engage the plunger surface, allowing the plug 2 to be replaced in the electrical current carrying member and thus permitting the electric current to pass through the prongs 66 and 68 as herein before described.

The frontward movement of said plunger member 40 controlled by said stop knob 36 and moving only the depth of said recess 34, causes the plug 2 to be forced rearwardly and thus causing removal of the prongs 66 and 68 from their respective sockets, which disconnects the electrical current passing through said plug 2 and the electric wire 16.

While I have thus described my invention with great particularity, it will be clear that the same may be modified in construction and in operation throughout a wide range.

I accordingly do not propose to be limited to the exact details of construction and operation here shown and described, but reserve the rights

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in practise to make any changes or modifications therein which may come through the appended claims.

I claim as my invention:

1. In a plug of the class described having a housing, a pair of electric wires at one end of said housing, a pair of prongs at the base of said housing adapted for connecting the sockets of an electric current carrying line and having one of said electric wires connected to one of said prongs, a bimetal element means in said housing having a loop disposed at its extended end, a coiled heating element means in said housing disposed in close proximity to said bimetal element means and connecting the other electric wire and one of the corresponding prongs, for transmitting the heat to said bimetal element means created by the overload electric current flowing therethrough, a plunger means slidably mounted in said base of said housing held normally in a set position by said loop of said bimetal element means, and means in said housing connecting said plunger means for forcing said plunger means out of its normal position and outwardly out of said housing, and when the normal position of said loop of said bimetal element means is expanded by the overload current passing through said heating element means and thereby releasing said plunger means and ejecting said prongs from their sockets, whereby the flow of electric current passing through said wires and from said electric current carrying line may be disconnected.

2. In a plug of the class described, as disclosed in claim 1, wherein, a center extension means is provided in said housing, for holding said plunger means in a slidable position, a spring means in said extension means for ejecting said plunger means out of its set position and when released by the expanded loop of said bimetal element means, a center rod means connecting said plunger means and extending rearwardly therefrom, and a knob means at the extended end of said center rod means for controlling and for restricting the extended position of said plunger means when released from its set position and moved outwardly out of said housing.

3. In a plug of the class described, comprising a housing having a base member, a pair of electric wires at one end of said housing, a pair of prongs at said base member for connecting the sockets of an electric current carrying line and having one of said wires connected to one of said prongs, a center extension in said housing, a cross slot in said center extension disposed in close proximity to said base member, a bimetal element means mounted in said housing having its extended end terminating with a loop and disposed in said cross slot, a plunger means slidably mounted in said center extension and extending through said base member, a groove in said plunger for connecting said loop of said bimetal element and for holding said plunger within said housing and in a set position, a heating element means disposed in close proximity to said bimetal element for transmitting the heat created by the overload electric current flowing therethrough and for expanding the normal position of said loop of said bimetal element and out of said groove in said plunger, and thereby releasing said plunger from its normally set position, and a spring means in said center extension for forcing said plunger outwardly and out of said base of said housing and for disconnect-

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ing said prongs of said plug from the overload electric current carrying line.

4. In a plug of the class described, as disclosed in claim 3, wherein, a rod member is provided in and extending rearwardly from said plunger and passing through said center extension of said housing, for supporting said plunger in its slidably mounted position, a stop knob at the extended end of said rod member, and a recess means within the end of said center extension for accommodating said stop knob and for gagging the frontward movement of said plunger by the depth of said recess means and when said plunger is released from its normally set position and released by said loop of said bimetal element means.

5. In a plug of the class described, as disclosed in claim 3, wherein, said base member of said housing is provided recess, and a plunger cap at the end of said plunger means resting within said recess and lying flush with the surface of said

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base member, for eliminating surface obstruction when said prongs of said plug are disposed within the respective sockets of the electric current carrying line.

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