

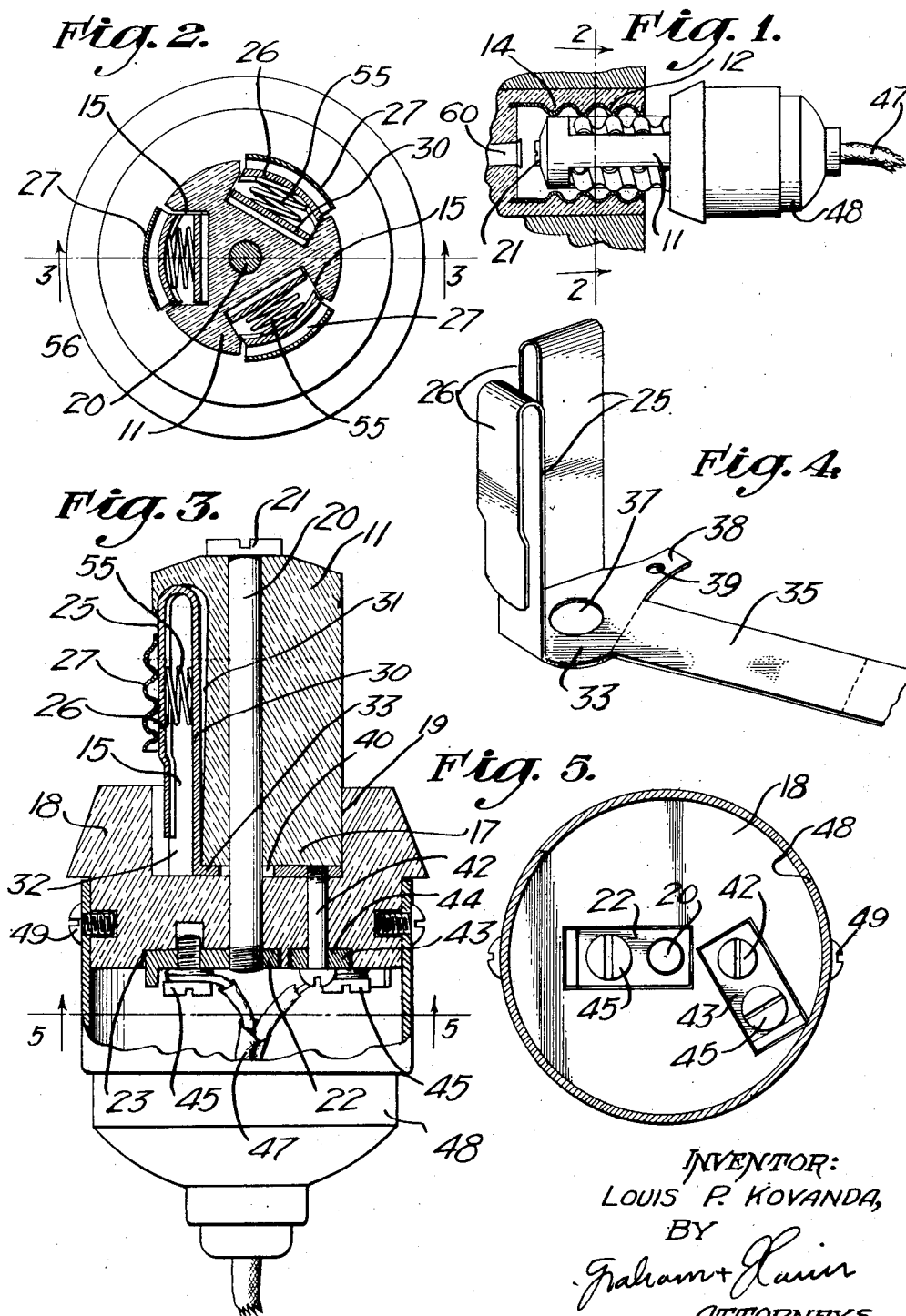
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EXPANDING PLUG

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EXPANDING PLUG.

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This invention relates to electrical fixtures and relates particularly to electrical connectors which are employed for connecting portable electrical devices into an electrical circuit. With the different electrical devices which are now in extensive use, an extension cord is provided, having a plug attached thereto, adapted to screw into a light socket or wall receptacle. In order to insert one of these plugs in the receptacle, it is necessary to rotate the plug five or six times in order that the threads formed on the plug will engage and enter into the threads formed upon the interior of the receptacle and bring the contact point on the end of the plug into engagement with the contact member in the body of the socket. This screwing in of the plug consumes time and twists the extension cord, causing kinks therein which are somewhat of a nuisance.

It is an object of the invention to provide a plug of this type which may be quickly inserted in the socket, and requires but a slight turn within the socket to cause the solid engagement of the contact elements.

It is a further object of the invention to provide a screw plug which requires considerable force to extract it from the socket.

It is a further object of the invention to provide a plug of this character which may be economically constructed, and which is of simple form.

The specific advantages of my invention and further objects thereof will be made evident hereinafter.

Referring to the drawing which is for illustrative purposes only:

Fig. 1 is an elevational view showing a plug, embodying the features of my invention, being inserted in a socket.

Fig. 2 is a section, through the body of the plug, taken upon the plane represented by the line 2—2 of Fig. 1.

Fig. 3 is a vertical section taken upon a plane represented by the line 3—3 of Fig. 2.

Fig. 4 is a perspective view showing the preferred form of stamping I employ in the formation of the expanding members of the plug.

Fig. 5 is an upwardly looking section upon a plane represented by the line 5—5 of Fig. 3.

In the construction of my device I employ a body 11, which is substantially the same diameter as the tops of the threads 12 of the socket indicated at 14, having a trio of channels 15 cut lengthwise in the outer face thereof as indicated in Fig. 3, these channels being undercut at the forward ends thereof and in open communication with the rearward end 17 of the body 11. A base or grip member 18 is provided, having a recess 19 in the face thereof, adapted to receive the rearward end 17 of the plug, and a brass screw 20 having a head 21 is extended axially through the body 11 and the member 18 and threaded into a plate 22 which is contained in a recess 23 formed in the back of the member 18.

In each of the channels 15, resilient members 25 in the form of U shaped springs are disposed, which support upon the outer legs 26 thereof, thread segments 27 which are formed to correspond to the standard socket thread. The inner leg 30 of the member 25 extends along the bottom 31 of the channel 15 and merges, at the rearward end 32 of the channel, with a plate 33 which is gripped between the rearward end 17 of the body 11 and the bottom of the recess 19, due to the screwing of the member 20 into the plate 22, which draws the members 11 and 18 tightly together. The resilient members 25 are all formed integrally with the plate 33 in a stamping press which provides them with a form indicated in Fig. 4, the members 25 first being stamped out in flat position, as indicated at 35, and thereafter being bent into the form shown at 36. A hole 37 is provided in the center of the plate 33 and a lug 38, having a threaded opening 39 therein, extends outwardly from the plate. The hole 37 is somewhat larger in diameter than the screw 20 so that it may pass therethrough without contact with the plate 33, as shown at 40 in Fig. 3, and the threaded opening 39 has a screw 42 threaded therein to which clamps a connecting plate 43 firmly in a recess 44 formed in the back of the member 18. The

plates 22 and 43 are provided with binding screws 44 and 45 to which the conductors of the extension cord 47 are attached. A stamped or spun metal cap 48 covers the back of the member 18, and is secured thereupon by screws 49, in the customary manner.

In order to provide a positive action to the resilient members 25, I employ a coil spring 55 between the legs 26 and 30 thereof, but if the springs 25 be made of stiff spring brass, the springs 55 may be omitted. It will be perceived that the bottom 31 of the channels 32 slope inwardly as they progress forwardly, thus providing a space of increasing width, between the bottom 31 and the inner leg 30. When pressure is placed upon the thread segments 27, the legs 26 are deflected inwardly with relation to the legs 30 which are also flexed inwardly against the bottom 31 thus allowing the threads 27 to remain substantially parallel to the cylindrical face of the plug body 11 as they move inwardly. The manner in which my device is employed is as follows:

When it is desired to connect into a socket such as that shown at 14, the forward end of the body 11 is placed in the mouth of the socket, and by giving the plug a short sudden push, the threads of the thread segments 27 will be caused to ride over the threads 12 of the socket 14, owing to the fact that the segments are resiliently supported by the members 25. The head 21 will come in contact with the contact member 60, situated at the bottom of the socket 14, and a two point electrical engagement made between the plug and the socket 14. It often occurs that the position of the plug is such that the threads of the segment 27 do not seat in the threads 12, when the plug is first pushed in and the head 21 of the screw is in engagement with the contact member 60. In order to seat the threads, it is necessary to give the plug a slight turn only, which will rotate the segments 27 within the threads 12, whereupon the threads of the segments and the socket will engage and thereafter exert a forward pressure which will cause the head 21 to be held firmly against the contact member 60.

From the drawing it will be perceived that the construction of such a device is very simple, and yet effective to the extent of making its use practical. I have found that a plug of this type will resist an extracting force of fifteen pounds, which is greater than the pull exerted thereupon due to the weight of the cord, or incurred by the ordinary handling of the cord while it is connected.

I claim as my invention:

1. In an expanding plug for electric light sockets having screw threads in the

walls thereof and a contact member at the bottom thereof, the combination of: a body adapted to be inserted in a socket; said body having longitudinal channels in the periphery thereof, the bottom walls of said channels sloping inwardly in a forward direction toward the entering end of the body; U-shaped spring members respectively disposed in said channels with their inner legs connected and their return bends toward the entering end of the body; threaded engagement segments mounted on the outer legs of said U-shaped spring members to be maintained in engagement with the threads in said socket; and a contact on the forward end of said body for engaging said contact member at the bottom of said socket.

2. In an expanding plug for electric light sockets having screw threads in the walls thereof and a contact member at the bottom thereof, the combination of: a body adapted to be inserted in a socket; said body having longitudinal channels in the periphery thereof, a plate connecting the inner ends of said spring members and extending over the inner end of said body; a grip member having a recess in one end to receive said plate and said inner end of said body; and a conductor member passing axially through said body, said plate and said grip member and holding said body and said grip member together with said plate therebetween in said recess, the forward end of said conductor forming a contact for engaging said contact member in the bottom of said socket; and a contact on the forward end of said body for engaging said contact member at the bottom of said socket.

3. In an expanding plug for electric light sockets having screw threads in the walls thereof and a contact member at the bottom thereof, the combination of: a body adapted to be inserted in a socket; said body having longitudinal channels in the periphery thereof, U-shaped spring members disposed in said channels with their return bends toward the entering end of the body; a spring between the legs of each of said U-shaped spring members; threaded engagement segments mounted on the outer legs of said U-shaped spring members to be maintained in engagement with the threads in said socket; and a contact on the forward end of said body for engaging said contact member at the bottom of said socket.

4. In an expanding plug for electric light sockets having screw threads in the walls thereof and a contact member at the bottom thereof, the combination of: a body adapted to be inserted in a socket; said body having longitudinal channels in the periphery thereof, the ends of which channels being undercut at their forward ends; U-shaped spring members mounted on the plug in

said channels with inner legs connected and their forward ends extending into the undercut ends of said channels; separately threaded engaging segments mounted on outwardly disposed free ends of said spring members adapted to be sprung by said spring members into engagement with the threads

in said socket; and a contact on the forward end of said body for engaging said contact member at the bottom of said socket. 10

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 18 day of Sept. 1922.

LOUIS P. KOVANDA.