

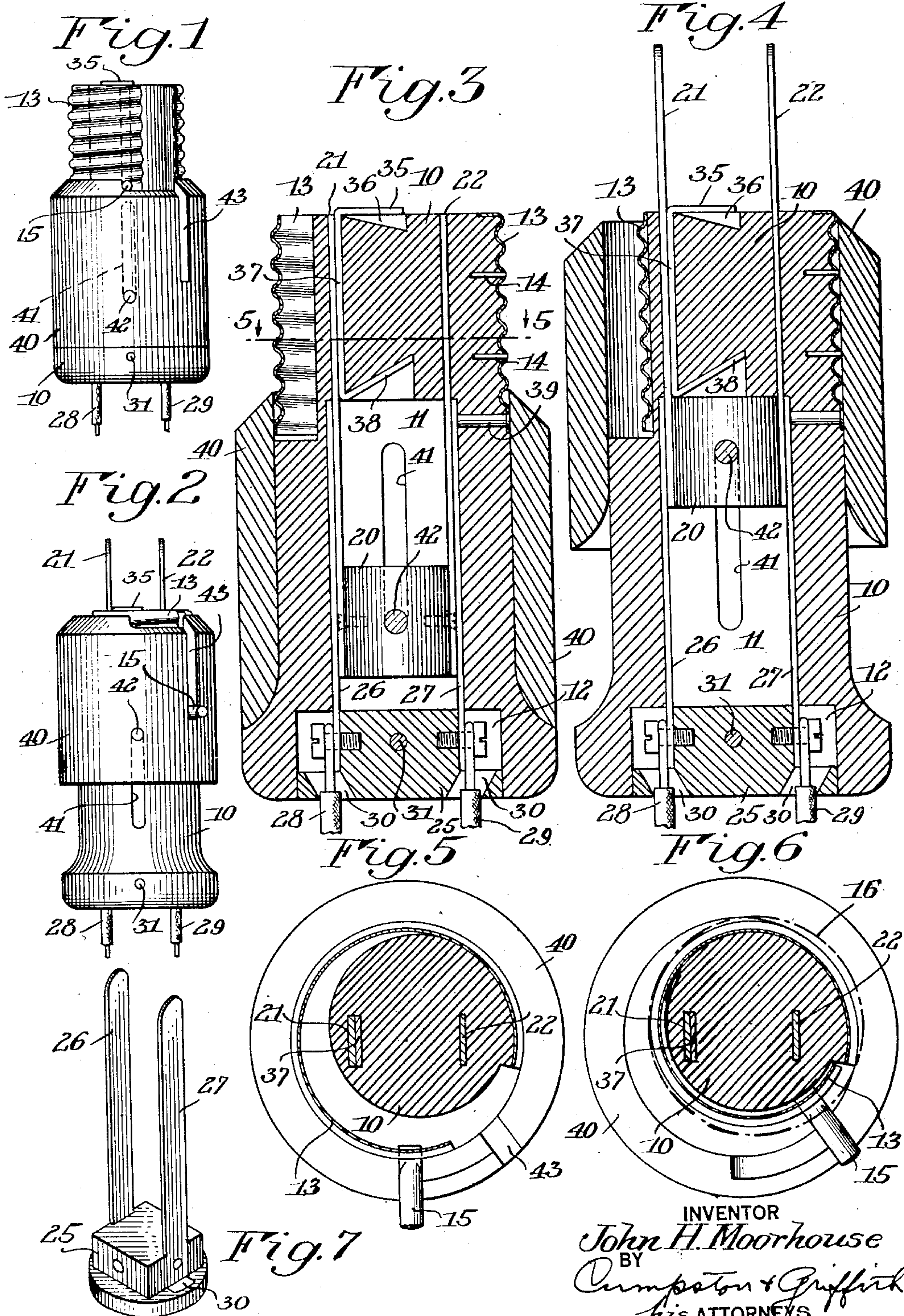
Feb. 14, 1933.

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1,897,323

ELECTRICAL PLUG

Original Filed March 9, 1929



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ELECTRICAL PLUG

Application filed March 9, 1929, Serial No. 345,625. Renewed January 27, 1932.

This invention relates to an electrical plug such as is used, for example, to connect the cord of an electrical lamp or electric appliance of any kind to a socket supplied with electric current. The principal object of the invention is the provision of a simple and satisfactory plug which may be used either with a screw threaded socket or with a socket of the prong receiving type.

Another object of the invention is the provision of a satisfactory plug so constructed that it may be inserted in a threaded socket by a straight longitudinal motion, without rotating the plug and consequently twisting the cord to which it is attached, and which will be firmly and satisfactorily held in the socket when it has been thus inserted.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawing:

Fig. 1 is a side elevation of a preferred embodiment of the plug, illustrating it ready for use with a threaded socket;

Fig. 2 is a side elevation showing the plug ready for use with a prong receiving socket;

Fig. 3 is a sectional view taken longitudinally through the center of the plug, showing the prongs withdrawn so that the plug may be used with a threaded socket;

Fig. 4 is a view similar to Fig. 3 showing the prongs in position to cooperate with a prong receiving socket;

Fig. 5 is a transverse section substantially on the line 5—5 of Fig. 3, showing the threaded portion of the socket in expanded position;

Fig. 6 is a view similar to Fig. 5 showing the threaded portion contracted so that the plug may be inserted longitudinally in a threaded socket, and

Fig. 7 is a perspective view of a closure member and a pair of electrical conductors.

Similar reference numerals throughout the several views indicate the same parts.

The novel plug comprises a body 10 of suitable insulating material such as hard

rubber or the like, and has a central cavity 11 extending axially of the body, and opening into a slightly larger cavity 12 at the lower end thereof. The upper end of the body has a shape which is somewhat spiral in cross section, as illustrated most clearly in Fig. 5, and around this spiral portion there is an arcuate metallic member 13 which has screw threads formed thereon of the proper size to cooperate with the threads of a standard threaded socket. The threaded member is suitably anchored near one end of its arc to the body 10 of the plug, by means such as the pins 14 which are embedded in the body.

The greater part of the arc of the threaded member 13 is normally spaced from the body 10, as illustrated in Fig. 5, and when in this position it is of the proper diameter to engage snugly with the threads of a threaded socket. The threaded member is provided with a handle 15 near the free end of the lower edge thereof, and is made of metal which is sufficiently resilient so that this handle may be moved rightwardly to collapse or contract the threaded member 13 to a smaller diameter, as illustrated in Fig. 6. When the diameter of the threaded member is thus contracted, it is sufficiently small so that it may be inserted in a standard threaded socket by a straight longitudinal motion, without turning the plug. The dot dash circle 16 in Fig. 6 illustrates diagrammatically the position of a threaded socket when the contracted threaded member of the plug is being inserted into it, and illustrates the ample clearance provided. When the plug has been thrust longitudinally into the socket, the contracting handle 15 is then released and the resilience of the threaded member 13 causes it to expand, resuming the arcuate shape shown in Fig. 5, so that it engages effectively and firmly with the threads of the socket.

It will be noted especially from Fig. 5 that when the threaded member 13 is expanded to engage the threads of a socket, it would come into contact with almost the entire circumference of the socket, there being only a comparatively small gap between the ends of the member 13. Thus the plug is held securely

in the socket and is prevented from wobbling in any direction.

To enable the plug to be used with a prong receiving socket as well as with a threaded socket, a slide member 20 is movably mounted within the central cavity 11, and two prongs 21 and 22 are secured to this member 20, which is made, of course, of insulating material. These prongs 21 and 22 are of the standard size and standard distance apart to cooperate with a standard prong receiving socket, and they extend through slots in the body 10 of the plug, so that when the slide member 20 is moved upwardly within the cavity 11, the prongs will be projected from the end of the plug as shown in Fig. 4. When the slide member 20 is moved downwardly to the position shown in Fig. 3, the prongs are then withdrawn so that their ends are substantially flush with the end of the plug, or even somewhat within the plug.

A closure member 25, of the shape best shown in Fig. 7, fits within the enlargement 12 at the lower end of the plug and serves to close the cavity 11. This closure member 25 is also of insulating material, and carries two upwardly extending conducting members 26 and 27 which lie along the sides of the cavity 11 and in contact with the prongs 21 and 22, respectively. Thus the prongs have a sliding electrical contact with the conducting members so that in all positions of the prongs they are electrically connected to these members. The conductors 26 and 27 are connected at their lower ends to wires 28 and 29 respectively which extend out through openings 30 in the closure member 25, and which lead to the lamp or appliance to which it is desired to furnish current. The closure member 25 is held in place by a pin 31 which passes through this member and through the body 10 of the plug.

A central contact is provided on the plug to cooperate with the central contact of a standard threaded socket. This central contact is preferably formed by a strip of metal having a portion 35 at the upper end of the plug, which portion overlies a recess 36 in the body, so that the portion 35 may be depressed slightly by contact with the cooperating part of the socket. The strip of metal of which the portion 35 is formed extends downwardly at 37 alongside of and in contact with the prong 21, and the extremity of this strip is bent upwardly at 38 so that it is locked to the body of the plug. The sliding contact between the strip 37 and the prong 21 thus provides an electrical connection between the central contact 35 of the plug and the prong 21 at all times, and since this prong is always electrically connected to the conductor 26 and to the wire 28, it follows that the central contact 35 is always electrically connected to the wire 28.

An electrical connection between the other

wire 29 and the threaded member 13 may be provided by a pin 39 passing through the wall of the plug, one end of the pin being connected to the threaded member 13 and the other end thereof being in contact with the conductor 27, as shown in Figs. 3 and 4.

For shifting the prongs 21 and 22 back and forth from an effective to an ineffective position and vice versa, and also for shielding the threaded member 13 when the plug is being used in connection with a prong receiving socket, there is provided a sleeve 40 arranged to slide longitudinally on the body 10. Slots 41 are provided at diametrically opposite points in the walls of the cavity 11 of the plug, and a pin 42 passes through the sleeve 40, the slots 41, and the slide member 20. Thus any motion imparted to the sleeve 40 in a longitudinal direction is transmitted to the slide member 20, and the prongs 21 and 22 may easily be projected or withdrawn simply by grasping the sleeve 40 and moving it longitudinally in one direction or the other. When the prongs are projected, as in Fig. 4, the sleeve member 40 surrounds the threaded portion 13 of the plug, preventing accidental contact therewith, the sleeve member being of insulating material. When the prongs are withdrawn to an ineffective position, as in Figs. 1 and 3, the sleeve 40 is withdrawn from the threaded member 13, so that the latter may be inserted in a threaded socket.

A slot 43 is provided in the sleeve 40 in position to receive the handle 15. Preferably this slot is so placed that the handle 15 must be brought to the position shown in Fig. 6, in which the threaded member is contracted, before the sleeve may be moved upwardly. Rotation of the sleeve relative to the body of the plug is prevented, of course, by the passage of the pin 42 through the slots 41. When the handle 15 has been shifted to contract the threaded member 13, and when the sleeve 40 is then moved upwardly, the handle 15 enters the slot 43 and moves relatively thereto to the bottom of the slot, to the position shown in Fig. 2. When the handle 15 is then released, the resilience of the member 13 will tend to move this handle leftwardly so that it will press against the left hand side of the slot 43, thus frictionally engaging the sleeve 40 and holding it frictionally in its upper position. When the sleeve is shifted to its lower position to withdraw the prongs, the handle 15 normally overlies the sleeve as shown in Fig. 1, and thus locks the sleeve in this position. It is apparent that the prongs cannot be projected to an effective position until the threaded member 13 has been contracted, and thus it is practically impossible to project the prongs accidentally while the plug is still within a threaded socket.

In assembling the device, the slide mem-

ber 20 with the prongs 21 and 22 may first be inserted in the open end of the cavity 11, and the sleeve 40 may then be placed on the body and the pin 42 driven in to connect the sleeve to the slide member 20. The closure member 25, with the conductors 26 and 27 and the wires 28 and 29 attached, may then be inserted in the end of the plug and the pins 31 put in place to hold the parts in this position.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive idea may be carried out in a number of ways. This application is therefore not to be limited to the precise details shown, but is intended to cover all variations and modifications thereof falling within the spirit of the invention or the scope of the appended claims.

I claim as my invention:

1. An electrical plug comprising a body having a screw threaded portion to cooperate with a threaded socket, a prong member to cooperate with a prong receiving socket, said prong member being movable from an ineffective to an effective position, and a guard member for the screw threaded portion, said guard member being controlled by movement of said prong member.

2. An electrical plug comprising a body having a screw threaded portion to cooperate with a threaded socket, a prong member movably mounted relative to said body and arranged to be projected to an effective position to cooperate with a prong receiving socket or retracted to an ineffective position substantially within said body, and a movable shield arranged to surround said threaded portion when said prong member is in an effective position and to be withdrawn from said threaded portion when said prong member is moved to an ineffective position, so that said threaded portion may be inserted in a threaded socket.

3. An electrical plug comprising a body having a screw threaded portion for cooperation with a threaded socket, said threaded portion being formed of resilient material normally tending to expand to predetermined size, and an actuating member mounted on said threaded portion for moving one part of said threaded portion in a generally circumferential direction relative to another part thereof to collapse said portion to a diameter less than the internal diameter of a threaded socket so that it may be inserted in said socket by a straight longitudinal motion.

4. An electrical plug comprising a body having a screw threaded portion to cooperate with a threaded socket, said threaded portion comprising a resilient member formed in an arc of a circle and provided with threads for cooperation with the threads of a socket, means for holding one part of said member substantially fixed, and means

connected to said member adjacent one end of the arc thereof for moving such end in a circumferential direction to change the diameter of said arcuate member so that it may be inserted in said socket by a straight longitudinal motion and may be retained therein by engagement of the threads of said threaded portion with the threads of said socket.

5. An electrical plug comprising a body having a screw threaded portion to cooperate with a threaded socket, said threaded portion being so formed that it may be contracted to a diameter less than the diameter of the socket with which it cooperates, means for contracting said threaded portion, a prong member for cooperation with a prong receiving socket, said prong member being movable from an ineffective position to an effective position, and means interlocking said prong member with said contracting means so that said prong member may be moved to effective position only when said threaded portion is contracted.

6. An electrical plug comprising a body having a cavity and a screw threaded portion to cooperate with a threaded socket, a pair of electrical conductors within said cavity, a pair of prong members slidably mounted for movement to a position projecting from said body to cooperate with a prong receiving socket or to an ineffective position substantially within said body, each of said prong members being in sliding contact with one of said electrical conductors, an electrical connection between said screw threaded portion and one of said electrical conductors, a central contact to cooperate with a central contact of a threaded socket, and a sliding contact connection between said central contact and one of said prong members.

7. An electrical plug comprising a body having a central cavity and a screw threaded portion to cooperate with a threaded socket, a sliding member mounted for movement within said cavity, a pair of prongs mounted on said sliding member and movable therewith, said prongs being movable to an effective position projecting from said body to cooperate with a prong receiving socket and being movable to an ineffective position substantially within said body, a closure member, and a pair of electrical conductors mounted on said closure member and extending into said cavity, said electrical conductors forming electrical connections for said prong members.

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