

March 13, 1962

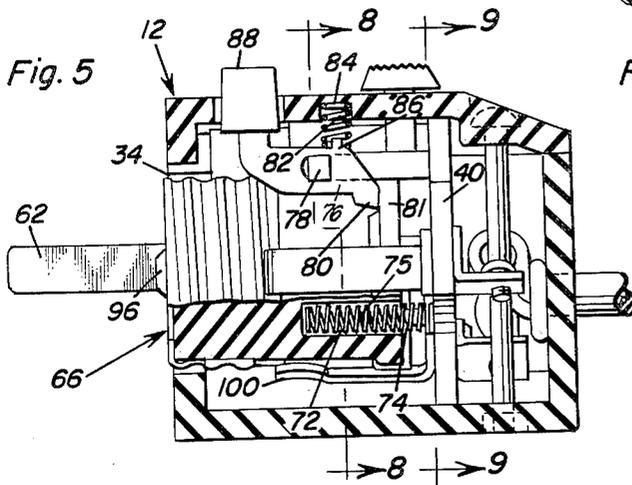
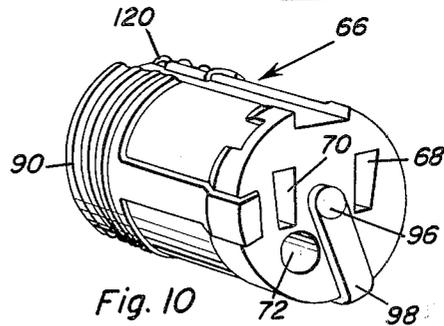
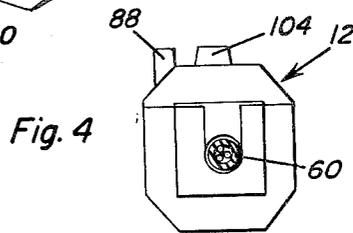
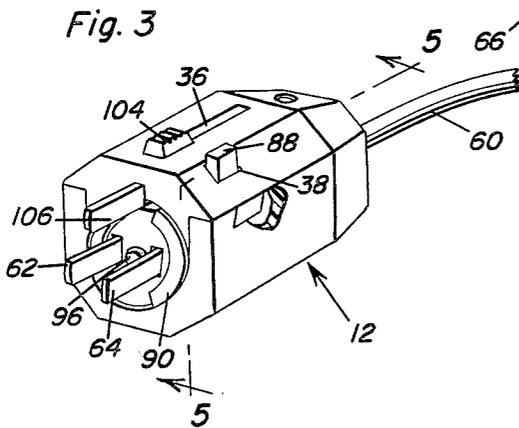
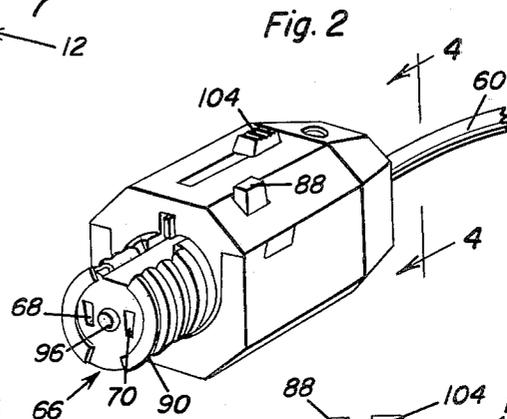
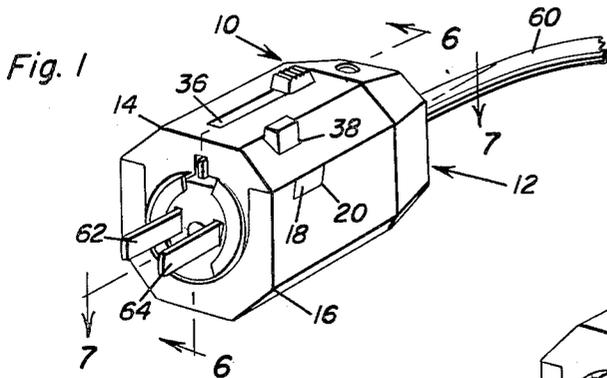
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3,025,486

THREE WAY ELECTRIC PLUG

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2 Sheets-Sheet 1



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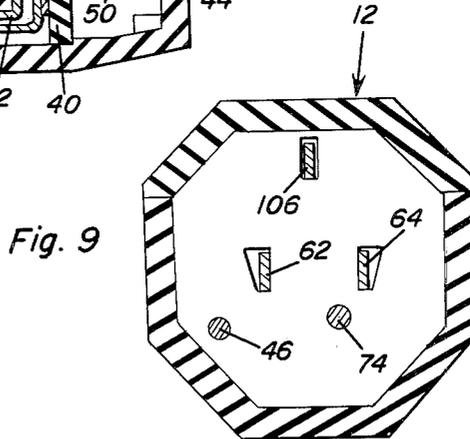
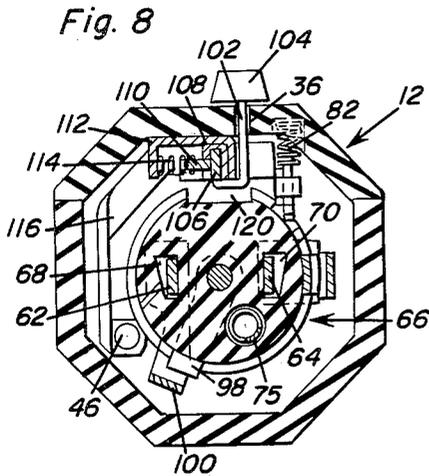
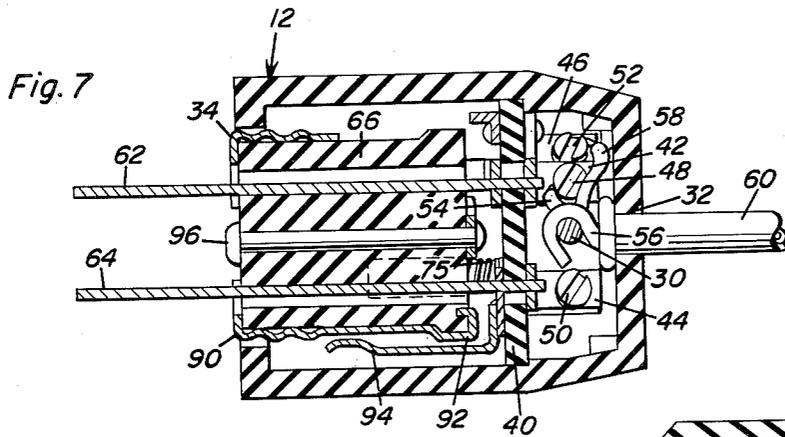
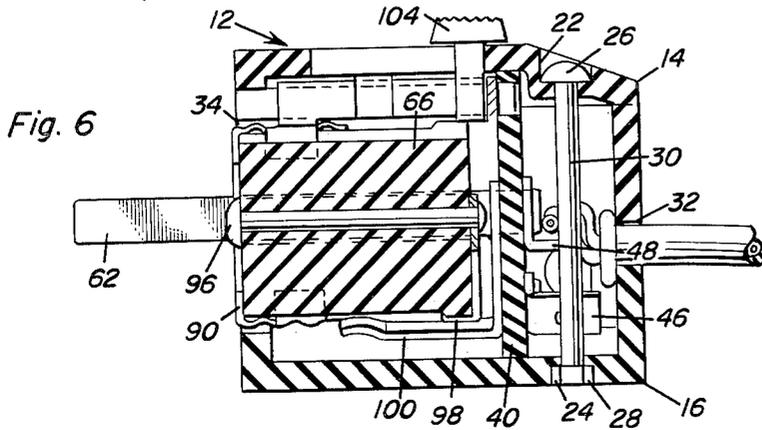
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THREE WAY ELECTRIC PLUG

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2 Sheets-Sheet 2



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## THREE WAY ELECTRIC PLUG

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8 Claims. (Cl. 339-31)

This invention relates generally to electrical equipment and more particularly to a novel plug construction to be utilized in connection with various electrical appliances, machinery, etc.

Generally, appliances are provided with a conventional electrical plug including a pair of prongs which are receivable in wall receptacles which include contacts across which a supply voltage is impressed. The receptacle contacts are resilient and become electrically connected to the plug prongs upon insertion in the receptacle. Accordingly, the supply voltage is impressed across the appliance associated with the plug. In certain instances, it is desirable to provide a third wire for the purpose of grounding the appliance being utilized. It is particularly desirable to take such action when utilizing, for example, power tools. In view of this, special three-pronged plugs are available which are substantially identical in construction to the two-pronged plugs exclusive of the additional prong.

In certain instances, wall receptacles are not available and the only source of voltage is to be found in the normal incandescent lamp receptacle. Devices are to be found on the market which include an externally threaded portion receivable in the incandescent lamp receptacle for impressing voltage across a pair of contacts. The device, in turn, is provided with a receptacle for receiving the conventional pronged plug enabling voltage to be provided to an associated electrical appliance.

From the above, it will be appreciated that several different devices may be required when an appliance is utilized under different circumstances. Although the two-pronged plug will suffice in most instances, a third prong may be desirable when work is being done outdoors and the screw-type plug may be desired when the conventional wall receptacle is not available. In view of this, it is the principal object of this invention to provide a novel and improved universal type electric plug which will serve to provide the appliance with any of the three types of electric plugs which may be utilized.

It is a further object of this invention to provide a novel electric plug construction which may be normally utilized with a conventional wall outlet but which may further be utilized in conjunction with a three pole receptacle wall outlet. Also, means are provided for enabling the invention to be utilized with the screw-type incandescent lamp receptacle.

It is more particularly an object of this invention to provide a universal type electric plug which includes means for allowing the simple conversion of the device so as to adapt it for any one of its three uses.

Still further, inasmuch as the construction of the invention is relatively simple, the invention may be manufactured at a comparatively low cost. It is, of course, the contemplation of the invention to be constructed in accordance with the requirements of the Underwriters Laboratory.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the invention illustrating the plug in a first position such that it may be received in a two pole receptacle wall outlet;

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FIGURE 2 is a perspective view of the invention illustrating it in a position enabling it to be utilized in connection with an incandescent lamp screw-type receptacle;

FIGURE 3 is a perspective view of the invention illustrating it in a position to be received within a wall outlet having a three pole receptacle;

FIGURE 4 is a rear sectional view taken substantially along the plane 4-4 of FIGURE 2;

FIGURE 5 is a vertical sectional view taken substantially along the plane 5-5 of FIGURE 3;

FIGURE 6 is a vertical sectional view taken substantially along the plane 6-6 of FIGURE 1;

FIGURE 7 is a horizontal sectional view taken substantially along the plane 7-7 of FIGURE 1;

FIGURE 8 is a vertical sectional view taken substantially along the plane 8-8 of FIGURE 5;

FIGURE 9 is a sectional view taken substantially along the plane 9-9 of FIGURE 5; and

FIGURE 10 is a perspective view of the core carried within the housing.

With continuing reference to the drawings, numeral 10 generally represents the universal or three-way electric plug comprising the invention and including a housing 12 having an upper housing section 14 and a lower housing section 16. The housing sections 14 and 16 define mating projections and recesses as at 18 and 20. Also, the sections 14 and 16 are recessed as at 22 and 24 for respectively receiving the head 26 and nut 28 associated with the bolt 30. The housing 12 also defines a rear opening 32 and a large forward opening 34. A slot 36 is defined on the top surface of the housing 12 while an opening 38 is defined to one side thereof.

The housing 12 is provided with a partition 40 best illustrated in FIGURES 6 and 7. Supported on the housing 40 are electric terminals 42, 44 and 46. Each of the terminals is provided with a screw 48, 50 and 52 for securing the conductors 54, 56 and 58. The conductors extend through the rear opening 32 in the housing and are enclosed in a sheath 60. The terminals 42, 44 and 46 are entirely electrically conducted and are supported on the insulating partition 40. Electrically connected with the terminals 42 and 44 and supported by the insulating partition 40 is a pair of prongs 62 and 64 extending forwardly through the housing and through opening 34.

In insulating core 66 is provided with a pair of longitudinal openings 68 and 70 for respectively slidably passing the prongs 62 and 64 therethrough. The core 66 is received in the housing 12 for movement therethrough. The prongs 62 and 64 may act as guides for the core 66. A cavity 72 is defined in the core 66 in alignment with a pin 74 secured to the partition 40. A spring 75 is supported on the pin 74 and extends into the cavity 72 and bears against the core 66. The spring 75 urges the core 66 out of the housing 12 through the forward opening 34. A member 76 is pivoted on bracket 78 in the housing 12. The member 76 is provided with a terminal projection 80 engageable with the flange 81 of core 66 as is best illustrated in FIGURE 5. A spring 82 is receivable between a recess 84 in the housing 12 and a protuberance 86 on the member 76. The member 76 extends externally of the housing 12 through the opening 38 and a button actuator 88 is terminally received on the member 76. It will be apparent that the spring 82 normally urges the member 76 and projection 80 into engagement with the core 66 so as to prevent the spring 75 from moving the core 66 through the opening 34. However, as shown in FIGURE 8 upon manually pivoting the member 76 about the bracket 78, the projection 80 will be disengaged from the core 66 to permit the movement of the core by the spring 75. This latter position is illustrated in FIGURE 2.

The core 66 is provided with an externally threaded collar 90. The collar 90 is secured to the core 66 by any means desired. A portion of the collar 90 extends rearwardly of the core 66 and terminates at the back thereof as indicated in FIGURE 7 at 92. A resilient member 94 is electrically connected to the terminal 44 as shown in FIGURE 7. The forward portion of the resilient member 94 is in alignment with the portion 92 electrically connected to the collar 90. Accordingly, when the spring 75 forces the core 66 outwardly to the position illustrated in FIGURE 2, the collar 90 becomes electrically connected to the terminal 44 through the resilient member 94.

The core 66 is further provided with a central contact pin 96 which extends entirely through the core 66 and terminates at either end in enlarged head portions. The pin 96 is connected to a conductor 98 at the rear portion thereof. The terminal portion of the resilient member 100 is in alignment with the conductor 98 on the circumferential portion of the core 66. Accordingly, when the core 66 assumes the position illustrated in FIGURE 2, the pin 96 moves into electrical contact with the member 100 through the conductor 98. The member 100 is, in turn, electrically connected to the terminal 42.

Extending through the slot 36 in the housing 12 is a rod 102 having an actuator or button 104 terminally secured thereon. The rod 102 is terminally connected to a prong 106 slidable in a sleeve 108. A conductive brush 110 extends through the sleeve 108 and is electrically engaged with the prong 106. A bracket 112 is rigidly disposed in the housing 12 and a spring 114 is supported between the bracket 112 and the brush 110 to urge the brush into engagement with the prong 106. Brush 110 frictionally holds prong 106 in any desired position. The bracket 112 is connected through conductor 116 to terminal 46 to which conductor 58 is joined.

It is thought that the construction of the invention should now be reasonably well understood. Initially, the plug may be utilized in the position suggested in FIGURE 1 wherein the prongs 62 and 64 may be received in a two-receptacle wall outlet with the prongs 62 and 64 being respectively connected to the terminals 42 and 44, thereby being connected to the conductors 54 and 56.

In the position illustrated in FIGURE 2, the button 88 has been depressed to pivot the member 76 about the bracket 78 to disengage the projection 80 from the core 66 so as to allow the spring 75 to urge the core 66 through the opening 34 of the housing 12. By so doing, the conductor collar 90 and pin contact 96 are exposed. The plug may then be received in a conventional screw-type incandescent lamp receptacle. The pin contact 96 is connected through conductor 98 to terminal 48 while the conductor collar 90 is connected through resilient member 94 to the terminal 44. It will be appreciated that neither the conductor collar 90 nor the pin contact 96 is connected to the conductors until the core 66 has been ejected from the housing 12 by the spring 75.

In order to place the invention in the position of FIGURE 3, it is necessary to press the core 66 inwardly sufficiently to allow the projection 80 of member 76 to engage the core 66 as at flange portion 81. The spring 82 urges the projection 80 into engagement with the core 66. The prongs 62 and 64 are then left exposed. By then sliding the rod 102 forwardly by manually moving the button 104 along the outside surface of housing 12, the prong 106 is projected from the housing 12. A groove 120 is provided in the core 66 to facilitate the slidable movement of the prong 106 from the housing 12. The invention then assumes the position shown in FIGURE 3 and may be utilized with a three pole receptacle wall outlet.

From the foregoing, it should be appreciated that applicant has disclosed a novel three-way or universal type plug which possesses triple the utilitarian value of conventional type plugs. The particular materials utilized

in the construction of the invention are not critical as long as the conductive portions are made of appropriate conductive material and the insulating portions have sufficient dielectric qualities.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An electric plug comprising a housing, first and second terminals in said housing having first and second conductors respectively connected thereto, first and second stationary prongs projecting outwardly from said housing respectively in electrical contact with said first and second terminals, a cylindrical core, means telescopically mounting said core in said housing, said first and second contacts on said core comprising respectively an externally threaded core and a central contact pin, spring means disposed between said core and said housing for urging said core out of said housing, and first and second electrical contacts on said core respectively connected to said first and second terminals when said core is out of said housing, detent means operatively connected between said housing and core resisting said spring urging, and detent release means carried by said housing for releasing said detent means to allow said spring to project said core from said housing, said detent release means comprising a lever pivoted to said housing and having a push button on one end and said detent on its other end.

2. An electric plug comprising a housing, first, second, and third terminals in said housing having first, second and third conductors respectively connected thereto, first and second stationary prongs projecting outwardly from said housing respectively in electrical contact with said first and second terminals, and a third prong slidably disposed in said housing projectible therefrom, said third prong in electrical engagement with said third terminal, a conductive brush, said brush electrically connected to said third prong, and a spring continuously urging said brush into contact with said third prong whereby the brush acts as an electrical conductor and a friction brake for holding the plug in any preselected position.

3. An electric plug comprising a housing, first, second, and third terminals in said housing having first, second, and third conductors respectively connected thereto, first and second stationary prongs projecting outwardly from said housing respectively in electrical contact with said first and second terminals, and a third prong slidably disposed in said housing projectible therefrom, said third prong in electrical engagement with said third terminal, a cylindrical core, means telescopically mounting said core in said housing for movement into and out of the housing, and first and second electrical contacts on said core respectively connected to said first and second terminals, when said core is out of said housing.

4. An electric plug comprising a housing, first, second, and third terminals in said housing having first, second, and third conductors respectively connected thereto, first and second stationary prongs projecting outwardly from said housing respectively in electrical contact with said first and second terminals, and a third prong slidably disposed in said housing projectible therefrom, said third prong in electrical engagement with said third terminal, a cylindrical core, means telescopically mounting said core in said housing for movement into and out of the housing, and first and second electrical contacts on said core respectively connected to said first and second terminals when said core is out of said housing, said core defining a pair of spaced longitudinal openings therein, said first and second prongs normally received in said openings.

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5. An electric plug comprising a housing, first, second, and third terminals in said housing having first, second, and third conductors respectively connected thereto, first and second stationary prongs projecting outwardly from said housing respectively in electrical contact with said first and second terminals, and a third prong slidably disposed in said housing projectible therefrom, said third prong in electrical engagement with said third terminal, a cylindrical core, means telescopically mounting said core in said housing for movement into and out of the housing, and first and second electrical contacts on said core respectively connected to said first and second terminals when said core is out of said housing, said core defining a pair of spaced longitudinal openings therein, said first and second prongs normally received in said openings, said core further defining a longitudinal groove, said third prong normally received in said groove.

6. An electric plug comprising a housing, first, second, and third terminals in said housing having first, second and third conductors respectively connected thereto, first and second stationary prongs projecting outwardly from said housing respectively in electrical contact with said first and second terminals, and a third prong slidably disposed in said housing projectible therefrom, said third prong in electrical engagement with said third terminal, a cylindrical core, means telescopically mounting said core in said housing for movement into and out of the housing, and first and second electrical contacts on said core respectively connected to said first and second terminals when said core is out of said housing, said core defining a pair of spaced longitudinal openings therein, said first and second prongs normally received in said openings, said core further defining a longitudinal groove, said third prong normally received in said groove, said first and second contacts on said core comprising respectively an externally threaded collar and a central contact pin.

7. An electric plug comprising a housing, first, second, and third terminals in said housing having first, second and third conductors respectively connected thereto, first and second stationary prongs projecting outwardly from said housing respectively in electrical contact with said

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first and second terminals, and a third prong slidably disposed in said housing projectible therefrom, said third prong in electrical engagement with said third terminal, a cylindrical core, means telescopically mounting said core in said housing for movement into and out of the housing, and first and second electrical contacts on said core respectively connected to said first and second terminals when said core is out of said housing, said core defining a pair of spaced longitudinal openings therein, said first and second prongs normally received in said openings, said core further defining a longitudinal groove, said third prong normally received in said groove, said first and second contacts on said core comprising respectively an externally threaded collar and a central contact pin, spring means disposed between said core and said housing for urging said core out of said housing, detent means operatively connected between said housing and core resisting said spring urging, and detent release means carried externally of said housing for releasing said detent means to allow said spring to project said core from said housing.

8. A plug as defined in claim 1 wherein a third prong connected to a third terminal is slidable in said housing, a second button connected to said third prong, both of said buttons extending through a side wall of said housing and lying adjacent each other,

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