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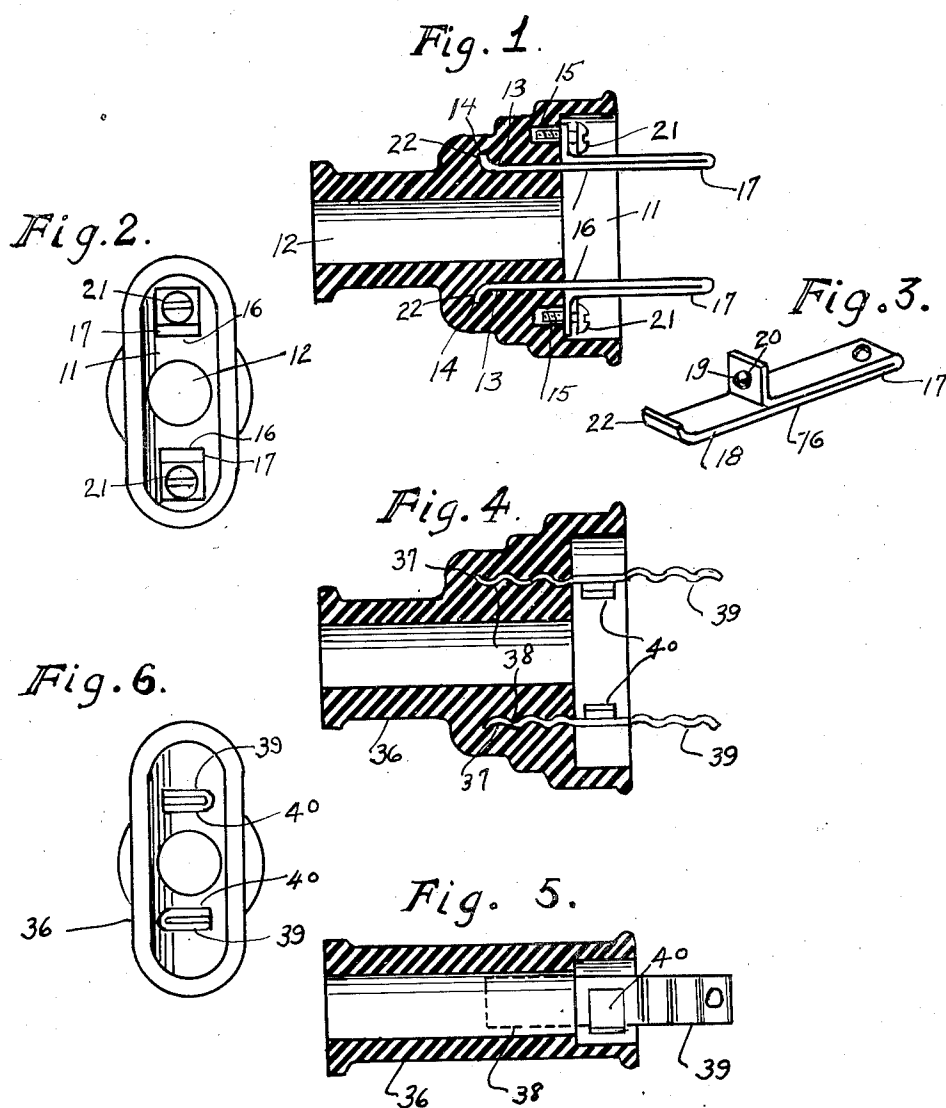
E. G. SCHAEFFER

2,445,537

METHOD OF PRODUCING ELECTRICAL OUTLET PLUGS

Filed July 14, 1945

2 Sheets-Sheet 1



INVENTOR.

EDWARD G. SCHAEFFER

BY

Clark & Ott

ATTORNEYS

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Fig. 7.

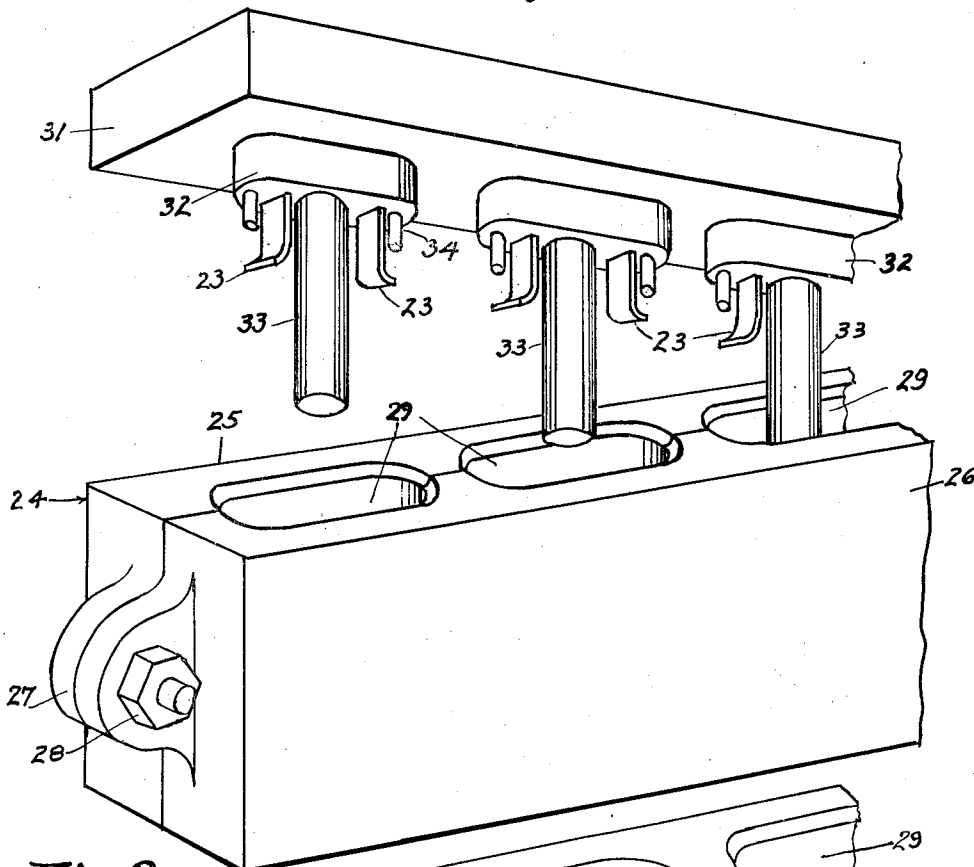
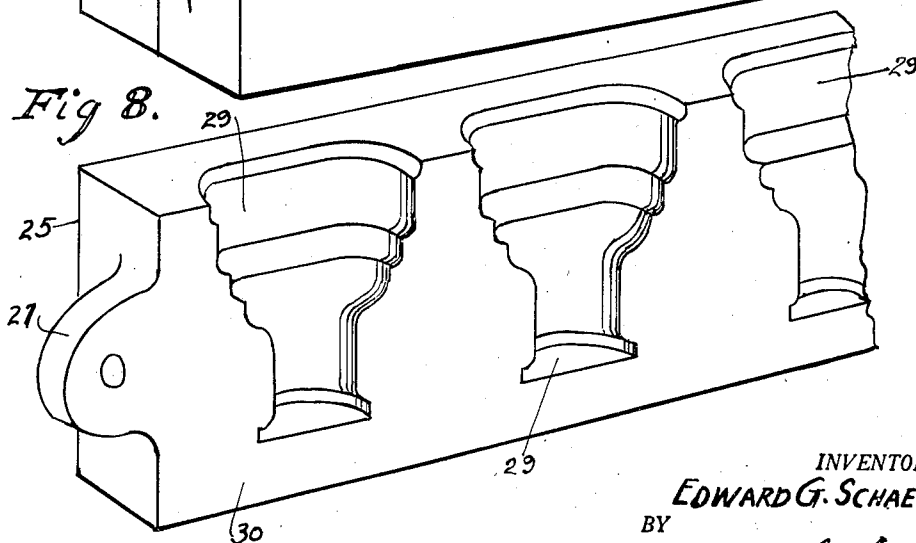


Fig 8.



INVENTOR.
EDWARD G. SCHAEFFER
BY
Clark & Ott
ATTORNEYS

UNITED STATES PATENT OFFICE

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METHOD OF PRODUCING ELECTRICAL
OUTLET PLUGS

Edward G. Schaeffer, Holyoke, Mass.

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3 Claims. (Cl. 18—59)

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This invention has to do with electric outlet plugs of the type which include a body of insulation material and a pair of contact prongs of conducting material to which the terminals of the conductor wires are connected, and the invention is directed to an improved method of producing the same.

The invention primarily comprehends an improved method of producing an outlet plug of the character set forth by means of which the assembly of the contact prongs with the plug body is facilitated and a secure and lasting connection therebetween is insured as long as the body remains intact. More particularly the invention comprehends a method of producing an electric outlet plug which includes the steps of molding a plug body of rubber composition about a core having offset recess producing portions, subjecting said plug body to the application of heat to partially vulcanize the same whereby said plug body is resilient in character, inserting in the openings in the plug body the inner ends of contact prongs having offset portions with said offset portions disposed in the recesses produced by the offset portions of the core and subjecting said body and contact prong assembly to the application of heat to harden the same by vulcanization to thereby secure the prongs therein and prevent relative separation thereof.

With the above and other objects in view, the invention is set forth in greater detail in the following specification and illustrated in the accompanying drawings in which:

Fig. 1 is a longitudinal sectional view of an electric outlet plug constructed in accordance with the method.

Fig. 2 is an end view thereof.

Fig. 3 is a perspective view of one of the contact prongs.

Fig. 4 is a longitudinal sectional view illustrating a modification of the outlet plug constructed in accordance with the method.

Fig. 5 is a longitudinal sectional view taken approximately on the line 5—5 of Fig. 4.

Fig. 6 is an end view of the form of the outlet plug shown in Fig. 4.

Fig. 7 is a fragmentary perspective view of a mold for forming the plug body in accordance with the method with the top of the mold shown in separated juxtaposition.

Fig. 8 is a fragmentary view in elevation of the inner face of one of the mold sections.

Referring to the drawings by characters of reference and particularly to the form of the plug body shown in Figs. 1 to 3, inclusive, the same is

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constructed of any suitable insulation material such as natural or synthetic rubber or rubber composition. The plug body is formed with the usual recessed forward end 11 and axially extending bore 12 for receiving the conductor wires therethrough. The plug body is also provided with oppositely disposed openings 13 extending inwardly from the recessed end 11 thereof and which are formed with offset inner ends 14. Laterally of the openings 13, the plug body is provided with depressions 15 extending inwardly from the recessed end 11 thereof.

A pair of contact prongs 16 is provided which are formed from a strip of conducting material bent upon itself to provide a double ply forward portion 17 and a single ply rear portion 18, and a laterally projecting ear 19 having a threaded aperture 20 for receiving a binding screw 21 for detachably securing the conductor wires to the contact prongs, the depressions 15 in the plug body being designed to afford a clearance space for the inner ends of the binding screws. The rear portion 18 of the prongs is formed with a laterally offset terminal 22 which corresponds to and is complementary with the offset portion 14 of the openings 13, it being understood that the rear portions 18 are positioned within the openings 13 with the offset terminals 22 of the rear portions 18 of the prongs snugly fitting within the offset portions 14 of said openings when assembled.

In order to preform the openings 13 in the plug body so that when the contact prongs 16 are assembled therewith the same will be disposed in alignment and the proper distance apart for fitting into the openings in an electric socket, the method contemplates the forming of the openings 13 and the offset inner ends 14 by pairs of fingers 23 carried by the mold indicated generally by the reference character 24 which fingers 23 are disposed in fixed position and correspond in formation to the openings 13 and offset portion 14. The mold as illustrated in Figs. 7 and 8 of the drawings is preferably a gang mold adapted to produce any desired number of plug bodies at one time. The mold may be of any desired construction which as illustrated consists of oppositely disposed mating sections 25 and 26 having apertured lugs 27 at the opposite ends thereof adapted to receive through the openings thereof bolts 28 for securing the sections together in mating relation. The sections are each formed with one or more recesses 29 extending inwardly from the inner face 30 thereof and opening through the top wall, the recesses 29 being dis-

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posed in confronting relation when the sections 25 and 26 are secured together and providing a cavity having the contour and formation of the outer shape of the plug body. The mold also includes a cover section 31 adapted to engage over and cover the said cavities in the mating sections 25 and 26 and which is provided with one or more depending elongated extensions 32 of a form in configuration corresponding to that of the recess 11 in the forward end of the plug body and a depending cylindrical extension 33 of a form in configuration corresponding to that of the bore 12 in the plug body. The fingers 23 depend from the extension 32 so that when the cover section 31 is disposed in position upon the mating sections 25 and 26 the extension 32 together with the cylindrical extension 33 and the fingers 23 will be positioned within the mold cavity to produce the recess 11, the bore 12 and the openings 13 with the offset inner ends 14 in the plug body when the same is molded in the mold cavity.

The cover section 31 is also provided with a pair of cylindrical projections 34 for each mold cavity which projections depend from the extensions 32 thereof and form the depressions 15 in the plug body in which are freely received the inner ends of the binding screws 21.

In carrying out the method the plug bodies are molded to the form and configuration of the mold cavity in the mold 24 with the aforesaid openings and depressions formed therein by the said extensions and projections carried by the cover section 31. The plug bodies are then subjected to heat while in the said mold to thereby partially vulcanize the same into a yieldable resilient state after which the cover section 31 is removed from the mold and the inner ends of the contact prongs 16 inserted into the openings 13 with the forward portions 17 of the prongs projecting therefrom. The yieldable resilient character of the plug body permits the walls of the openings 13 to be expanded as the offset inner ends 22 of the contact prongs are inserted therein until the said offset inner ends 22 engage in the complementary offset portions 14 of the openings 13. The walls of the openings contract about the rear portions 18 of the contact prongs as the offset portions thereof enter the said openings so that when the contact prongs are completely inserted therein the same snugly fit into said openings. The plug body is then heated to harden the same by vulcanization which effects a permanent hardening of the walls of the plug body about the contact prongs and the offset portion thereof so as to permanently anchor the prongs in the plug body.

By this method the contact prongs 17 are assembled with the plug bodies so that the contact prongs are in alignment and the proper distance apart for fitting into the openings in an electric socket. The method facilitates the assembly and accurate location of the contact prongs with the plug body since the fingers 23 are always in the proper location for preforming the openings 13 and the offset portions 14 thereof in the plug bodies.

In the form of the plug body illustrated in Figs. 4 to 6 inclusive, the plug body 36 is substantially identical with that disclosed in the previous form. This form of plug body is provided with openings 37 extending inwardly from the recessed forward end thereof which openings are of longitudinally undulating formation to correspond with the longitudinally undulating forma-

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tion of the rear portions 33 of the contact prongs 39. The contact prongs 39 in this form are provided with binding clips 40 which are formed integrally therewith for attaching conductor wires thereto.

In producing the plug bodies illustrated in Figs. 4, 5 and 6 of the drawings the same are molded in a mold similar to that illustrated in Figs. 7 and 8 of the drawings. In this instance, however, the fingers 23 are of undulating formation corresponding to the formation of the inner ends of the contact prongs 39 and the projections 34 are eliminated from the cover section of the mold since a different type of means is provided for attaching the conductor wires to the contact prongs. The plug bodies are similarly heated to partially vulcanize the same into a yieldable resilient state after which the contact prongs are inserted in the undulating openings therein and the plug bodies are then vulcanized to harden and permanently secure the contact prongs in assembled relation with the plug bodies.

What is claimed is:

1. A method of producing electric outlet plugs which consists in molding a plug body of rubber insulation material with contact prong receiving openings extending inwardly from one end thereof, applying heat to said plug body to partially vulcanize the same into a yieldable resilient state, inserting into said receiving openings while the plug body is in said yieldable resilient state contact prongs having offset portions for expanding the walls of the openings as the prongs are inserted and the resilient character of the plug body functioning to return the expanded receiving openings into close engagement with the contact prongs after insertion therein and then heating said plug body to harden the same by vulcanization and permanently harden the walls of the plug body about the contact prongs and the offset portions thereof and effect permanent anchorage of the prongs in the plug body.

2. A method of producing electric outlet plugs which consists in molding of rubber composition material a plug body with contact prong receiving openings of undulating formation, applying heat to said plug body to partially vulcanize the same into a yieldable resilient state, inserting into said receiving openings while the plug body is in said yieldable resilient state contact prongs of corresponding undulating formation so that the same temporarily expand the walls of the said openings as they are inserted and the resilient character of the plug body functioning to return the expanded receiving openings into close engagement with the contact prongs when the same are fully inserted therein and then heating said plug body to vulcanize and permanently harden the same and the walls of the receiving openings about the contact prongs and permanently anchor the prongs in the plug body.

3. A method of producing electric outlet plugs which consists in molding a plug body of uncured rubber insulation material with contact prong receiving openings, partially curing said plug body to vulcanize the same into a yieldable resilient state, inserting into said receiving openings in the plug body while the same is in said resilient state contact prongs of a size adapted to expand the walls of the openings as the prongs are inserted and the resilient character of the plug body functioning to return the expanded receiving openings into close engagement with the contact prongs and then heating said plug body to

harden the same by vulcanization and permanently harden the walls of the plug body about the contact prongs to effect permanent anchorage of the prongs in the plug body.

EDWARD G. SCHAEFFER.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,900,139	Tregoning -----	Mar. 7, 1933
2,206,714	Benander -----	July 2, 1940
2,308,324	Benander -----	Jan. 12, 1943
2,314,021	Sladky -----	Mar. 16, 1943