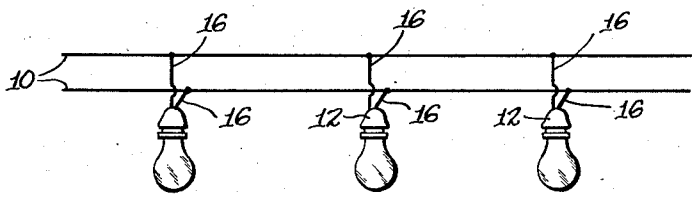
May 12, 1936. C. BATEHOLTS 2,040,235

METHOD OF MAKING WEATHERPROOF SOCKETS

Original Filed May 4, 1932

Fig. 1.



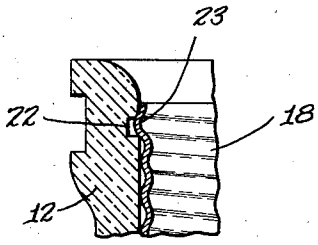


Fig. 4.

Fig. 2.

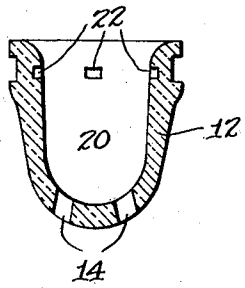
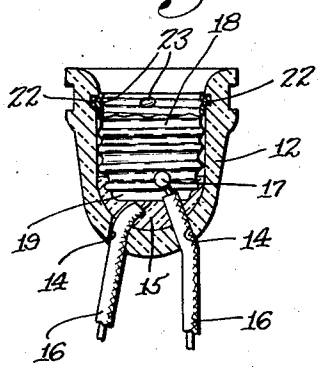


Fig. 3.



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2,040,235

METHOD OF MAKING WEATHERPROOF SOCKETS

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Original application May 4, 1932, Serial No. 609,067. Divided and this application May 28, 1935, Serial No. 23,840

3 Claims. (Cl. 18—59)

This invention relates to improvements in method of making weather-proof sockets. More particularly it relates to sockets for receiving electric light bulbs, cord plugs and the like, and especially to the weather-proof class of such sockets which are suitable for use out-of-doors, in connection with sign illumination, out-door decorations, and for other lighting or power connections.

Hitherto weather-proof sockets of this general description have been made of condensation material molded around the usual metallic sheet metal shell which is formed with a screw thread to receive the lamp. The shell wall constitutes one electric terminal; and the inner end of the shell is closed by a procelain insulating disk in the midst of which is set the brass pin which constitutes the other electric terminal. In the weather-proof type of socket with which the invention is concerned, these interior terminals are each at the inner end of an insulated wire, to which each is firmly connected by solder; and these wires lead out through the base of the molded housing and extend for a few inches for convenience of connection to a pair of feed wires by tapping those wires wherever required. The socket and its lamp will then be supported by suspension from the feed wires.

The socket herein disclosed is the subject of disclosure and claims in Letters Patent of the United States, No. 2,003,622, granted June 4, 1935, and this present application, claiming the method of making such a socket, is a division of the application which matured into the said patent.

The invention relates to the combining of the metallic shell with the molded insulating casing which houses it. Hitherto, in the making of such sockets, it has been customary to have a mold into which the shell unit would be set, having been previously prepared with wires attached, and being screwed upon a stud in the mold, and the wires being brought out through the top of the mold cavity; and the molded compound would then be filled in around the shell, making an operation that would have to be executed piece by piece and which therefore was slow and relatively quite expensive as compared with modern molding practice in general.

Efforts to improve upon this have been made by molding a socket body as a separate article, which would be a distinct advantage if successful, but it has been a problem to provide so that the inserted metal shell, in an assembled unit, would be held securely against relative rotation during use, and so that the union between them would be permanently weather-proof.

It is among the objects of the invention to provide a combination by which a standard metallic shell may be positively and effectively locked within a separately molded socket body or housing, so as to be permanently secured both against being pulled out from the molded socket and against rotating therein (turning with the lamp base when the lamp is to be put in or taken out), and permanently tight against entrance of moisture.

Another object is to provide so that a complete socket unit may be assembled quickly and economically, as regards material and labor costs of manufacture.

And at the same time the completed unit provided by the invention must be fully as durable as the best molded prior devices of the sort and as permanently strong, weather-proof and efficient.

The invention attains these objects and results by performing the molding operation on the socket body or housing independently of the shell. Consequently these housings can be made complete, each as a separate article, at very low cost, by moulding them in gangs or batches according to molding methods already known. The housing thus made has a pair of holes for the conductor wires to pass loosely through later when the metallic shell is inserted. The latter, which may be the usual standard metallic shell, fits nicely into the hollow of the housing. A suitable synthetic water-proof composition is put into the bottom of the housing to seal said holes around the conductors and to fill the lower space between the shell and housing. The shell being then pressed into place, the composition distributes itself, filling the necessary spaces, and in due course of time becomes solidified. Without waiting for the solidification, the shell may be made permanently secure in its position by denting its sheet metal wall outward at one or more points, opposite one or more cavities which were prepared for this purpose in the interior face of the housing. Although the dents are made through the screw thread of the shell, into which thread the lamp base has to enter, they do not interfere with its reception, for they are dented toward the other side of the screw metal from that on which the lamp in received. This fastening means becomes operative as a lug, which locks the shell against escape from the housing and against rotation therein; and in coaction with the sealing composition, when solidified,

makes the shell secure against rocking within the casing,—because the lug is effective at a side wall, near the mouth, and the sealing composition providing a solid space-filling seat and side enclosure for the base part of the shell. The deformation of the shell walls need only be relatively small, and thus they do not affect in the slighest the ability of the shell to receive a lamp base or electric plug in the same characteristic manner as do the present electric sockets.

By virtue of the invention each of the parts is therefore free to be made in the most economical way; and a completed socket is made by a simple and quick assembling operation, which leaves the parts locked together, mechanically; with a plastic body sealing the holes and autogenously becoming hard.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawing:

Figure 1 is an elevation of a series of my improved sockets connected for use;

Figure 2 is an elevation, in medial section, through the molded housing of a socket similar to those of Figure 1;

Figure 3 is an elevation, in medial section through a completed socket, except that the wire conductors and the greater part of the metallic shell are left intact; and

Figure 4 is an enlarged elevation of a fragment of Figure 3, illustrating the character of interengagement between shell and casing.

Referring to the drawing, three of my improved socket-assemblies are seen in Figure 1, as they may be connected in parallel to the feed wires **10**, for use in connection with an out-of-doors illuminating scheme where they may safely be exposed, whether to rain, to hot rays of the sun, or to rigors of wintry weather,—weather-proof as regards all natural temperature and moisture conditions.

The socket housing **12**, seen in detail in Figures 2, 3 and 4 is made by molding from any suitable composition material, such as phenolic condensation products, which is weather-proof and which also is an excellent insulator. The housing **12** which roughly is of cup shape, may be formed with two openings **14**, **14**, in its bottom or base end, which accommodate the insulated wire conductors **16**, **16**. These conductors are threaded through after being soldered as at **17** to the proper terminals on the standard type of metallic shell insert **18**.

According to the invention, the molded body **12** has its cup shaped hollow **20**, seen in Figure 2, of size to receive the shell **18** with nice fit around the side walls as seen in Figure 3, with a space below the insert, in the bottom part of the cup, through which space the conductors **16**, **16** extend to their respective openings **14**, **14** leading out of the unit. The body **12** is molded into a shape providing one or more small abrupt recesses **22** interiorly of its side walls, well up toward its mouth. In the drawing four such recesses **22** are illustrated, but, obviously, a less or greater number may be provided, as desired. Thus formed, the molded housing **12** is ready to receive its insert **18**, whose attached conductors **16** are at that time threaded through the openings **14** each of which is slightly larger in diameter than one of the conductors. A small amount of a viscous synthetic sealing composition **15** having been put into the bottom of the cup body **12**, preferably after the conductors **16** have been threaded through the openings **14** but before the shell **18** has been inserted in the housing **12**, all space remaining, around the conductors within the housing and in the holes **14**, is filled thereby as the shell insert **18** moves into the hollow of the housing **12** and its leading end portion **19**, which consists of a porcelain disk, becomes pushed into the plastic sealing medium **15**, expressing it into all small spaces which need sealing, and holding the inner end of the brass shell **18** steady within the housing when the sealing medium has hardened.

While any suitable sealing composition may be used for this purpose, I have found it satisfactory to employ the molding material disclosed in Patents 1,251,862 and 1,251,863 of January 1, 1918, granted on application of William W. Carter, a composition which is commonly characterized as a synthetic rubber substitute. When used for the purpose herein stated the composition is made so that it will mold in a softer degree than the usual hard products and is solidified by the application of heat at the time the metal shell is forced into the molded housing.

My invention contemplates the reinforcing of the union by providing positive mechanical engagement or locking of the shell against movement relative to its housing member **12**. This may be accomplished simply, quickly and economically by denting points on the shell walls outward into the cavity recesses **22** of the housing **12**. Said recesses are located near the mouth of the socket, and the shell walls conveniently may be deformed into them, by local expansion as at **23** in Figure 3, without destroying the utility of the shell threads for receiving a lamp base, or the like. In fact a very small spreading of shell walls into a pair of such recesses at opposite locations is sufficient to lock the shell effectively and permanently against rotatory movement, and also against being pulled axially out of the molded body **12**. If preferred, the metal at **23** may be semi-punched and a tongue of the metal bent outward into the recess **22**.

In either case this outward punching or denting of shell wall sets a portion of the shell directly into contact with barriers, viz, against that recess wall which is toward the mouth of the casing, and against the side walls of the recess. The shell and sealing medium thus become unmobile within the housing,—unwithdrawable, and with no possible looseness or play, as the base of the shell came into superficial contact with the sealing medium when the shell was pressed into it. In this position the sealing medium co-acts with the lug as a barrier to prevent any rocking of the shell within the housing, and so makes the assemblage perfectly and permanently tight.

The invention thus provides for molding socket housings into which standard screw shells can be inserted, both housings and shells being made, and the two put together, on principles of mass production; with economies in production, with standard efficiency, and with permanent weather-proof durability.

I claim as my invention:

1. A method of making a socket for electrical connection, comprising the forming, independently of each other, of a hollow cup insulating housing having a recess in its interior wall spaced from the mouth of the housing, and a metallic terminal shell to be housed thereby; the connecting of conductor wires permanently to the ter-

minals of said shell; inserting the conductor wires through holes in the bottom of the formed housing; depositing a plastic sealing compound in the housing; drawing the shell into the housing, thereby expressing the compound into sealing position; deforming a portion of the shell into the said recess of the housing, to lock the shell within the housing; and allowing the sealing compound to harden in said sealing position.

2. A method of making a socket for electrical connection, comprising the forming, independently of each other, of a hollow cup insulating housing and a metallic terminal shell to be housed thereby; depositing a plastic insulating substance in the hollow of the housing; settling the shell into the plastic substance; mechanically locking together the side walls of housing and metallic shell, with the shell thus engaged in the substance; and then letting the plastic substance solidify; whereby the shell is firmly held in the housing between the substance and the mechanical locking.

3. A method of making a socket for electrical connection, comprising the forming, independently of each other, of a hollow cup insulating housing, having conductor holes in its bottom, and a metallic terminal shell having a closed bottom to be housed thereby, with conductor wires for protruding through said holes; depositing a plastic insulating substance in the hollow of the housing; settling the closed bottom of the shell into the plastic substance, with wires passing out through the holes, thereby forcing that substance into the spaces around the conductors in the holes, and into space intervening between side walls of housing and of shell; mechanically locking together the side walls of housing and metallic shell; and then letting the plastic substance solidify.

CLINTON BATEHOLTS.