Aug. 8, 1967 C. M. SMITH 3,335,395

ANGLE PLUG

Filed March 19, 1965

FIG. 1.

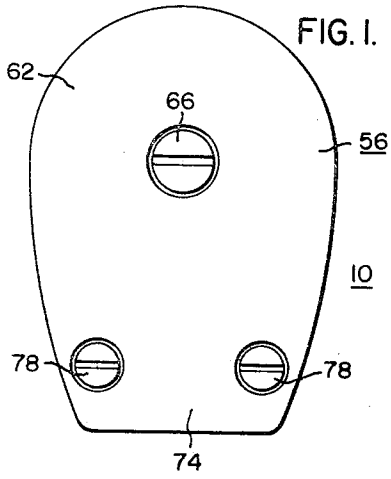
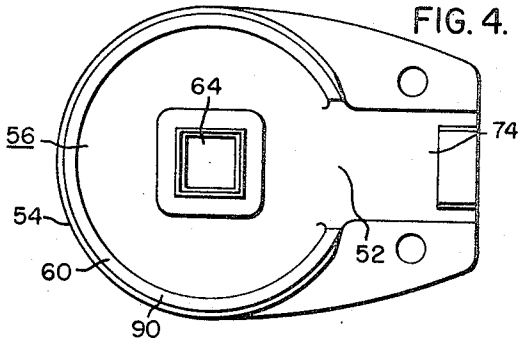


FIG. 4.



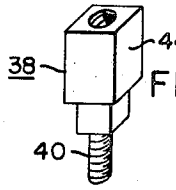


FIG. 6.

FIG. 7.

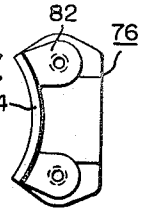
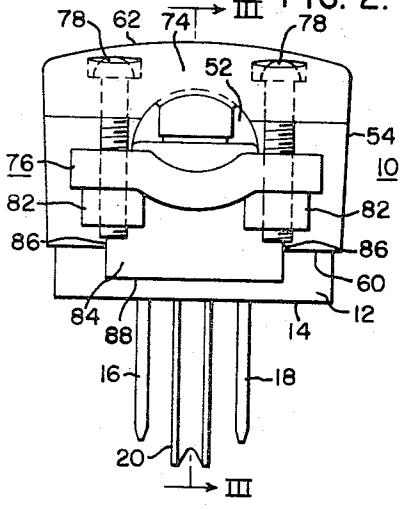


FIG. 2.



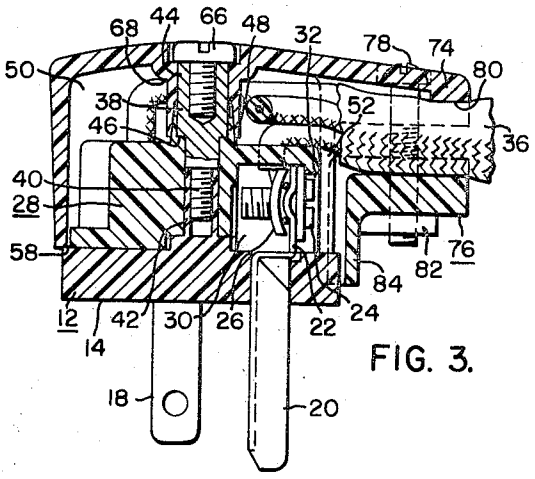
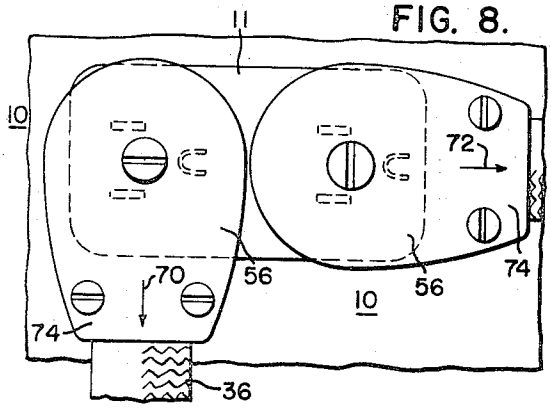


FIG. 3.

FIG. 8.



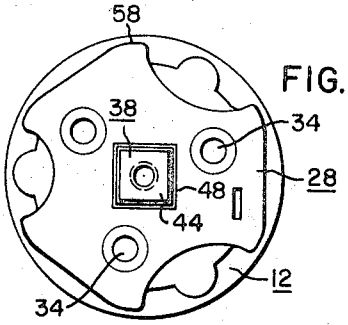


FIG. 5.

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3,335,395

ANGLE PLUG

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Filed Mar. 19, 1965, Ser. No. 441,066
9 Claims. (Cl. 339—107)

The present invention relates to wiring devices and, more particularly, to plugs in which a cord is extended from the plug at an angle to the extending direction of the plug blades.

Angle plugs of the type described have special utility, for example, where limited space is available in front of a wall-mounted receptacle to which it is desired to attach a plug. In addition to generally desirable plug features such as manufacturing facility, convenient wiring and "dead-front" construction, an angle plug desirably should have relatively small depth outwardly from the face of the receptacle to maximize its special space utility, a relatively flat outer face to minimize the possibilities of accidental dislodgement, and an indexable cap which provides the user with a choice of directions in which the cord extends from the plug along the face of the receptacle.

In accordance with the broad principles of the present invention, an angle plug comprises a body member having a face side through which the plug blades extend to provide dead-front construction. Each of the plug blades has a terminal portion disposed on an inner side of the body member, and a retaining member is disposed against the body and over the terminals to provide for longitudinal insertion of a cord wire into engagement with each terminal and to secure the blades in place.

A cover member is disposed over the retaining member and it is secured to and indexed in place by a fastener which in turn secures the retaining and body members together. The cover has a side opening for angular or lateral extension of the cord. A cord clamping member preferably is insulative and operates with an insulative portion of the cover to clamp the cord and further includes a portion for enclosing a part of the cord opening in the cover.

It is, therefore, an object of the invention to provide a novel angle plug characterized with efficiency in construction and utilization.

Another object of the invention is to provide a novel angle plug characterized with manufacturing economy in the use of parts.

A further object of the invention is to provide a novel cord clamp angle plug which is characterized with relatively small depth to provide favorable space utilization when attached to a receptacle.

It is an additional object of the invention to provide a novel cord clamp angle plug which is characterized with a relatively flat outer surface to minimize the risk of its dislodgement when attached to a receptacle.

It is another object of the invention to provide a novel cord clamp angle plug in which a cover thereof is readily indexed in a variety of positions to provide the user a choice of directions in which the cord can extend from the plug.

It is a further object of the invention to provide a novel cord clamp angle plug which provides for convenient longitudinal wiring and reliable conductor isolation even though the cord is extended angularly or laterally from the plug.

An additional object of the invention is to provide a novel cord clamp angle plug which provides for efficient cord clamping.

These and other objects of the invention will become more apparent upon consideration of the following detailed description along with the attached drawing, in which:

FIGURE 1 is a top plan view of an angle plug constructed in accordance with the principles of the invention;

FIG. 2 is an end elevation view of the plug shown in FIG. 1;

FIG. 3 shows a vertical section of the plug of FIG. 1 to illustrate the internal construction thereof and it is taken along the reference line III—III of FIG. 2;

FIG. 4 is a bottom plan view of a cover employed as a part of the plug of FIG. 1;

FIG. 5 shows a top plan view of the plug of FIG. 1 with the cover removed;

FIG. 6 shows a perspective view of an indexing fastener employed in the assembly of the plug of FIG. 1;

FIG. 7 shows a bottom plan view of a clamping member employed with the cover of FIG. 4 to clamp a cord extending from the plug; and

FIG. 8 shows a wall-mounted receptacle and the manner in which the plug cover can be oriented in different directions to provide different extending directions for the plug cord.

More specifically, there is shown in FIGS. 1 and 2 a cord clamp angle plug **10** constructed in accordance with the principles of the invention. It includes an insulative body member **12** having slots through a face side **14** thereof for outward extension of conductive power blades **16** and **18**. In this case, a conductive grounding prong **20** also extends through the plug face side **14** to characterize the plug **10** as a grounding plug. Since the plug face side **14** is an integral enclosing part of the plug **10**, "dead-front" construction is provided. Each blade **16** or **18** or prong **20** is provided (FIG. 3) with a terminal portion **22** seated against a rearwardly facing side of the body member **12** and having a wire attachment screw **24** and nut **26** secured thereto.

An insulative retaining member **28** is disposed over the body portion **12** and provides respective pockets **30** or the like within which the terminal portions **24** are located in isolation from each other. As generally described in relation to a device similar to the plug **10** in a copending application entitled "Grounding Wiring Device and Contact Structure," Ser. No. 275,972, filed by C. M. Smith on Apr. 26, 1963, now Patent No. 3,237,145, issued Feb. 22, 1966, and assigned to the present assignee, the body member **12** itself can have the pockets **30** or similar pockets formed in it and retention of the blades **16** and **18** and grounding prong **20** then can be achieved by the use of a disc member (not shown) which fits over the terminal pockets.

In any event, side openings **32** to the terminal pockets **30** give convenient lateral access to the screws **24** for wire attachment and detachment, and openings **34** are provided in the retaining member **28** for convenient longitudinal isertion of wires from a cord **36** into the respective pockets **30**. The word "longitudinal" is used as a convenient term of reference and by its use it is meant generally to refer to the direction in which the plug blades extend.

The retaining member **28** is secured to the body member **12** preferably by means of a fastener or drive screw **38** having threads **40** securely engaged with a boss **42** of the body member **12** and having a head portion **44** with shoulder means **46** engaging the retaining member **28** in a secure position. In this instance, an insulative shield member **48** is molded as an integral part of the retaining member **28** to isolate or to aid in isolating the fastener **38** electrically, but in this or other applications it may be desirable to employ a heat shrink tube (not shown) or the like about the fastener head **44** for this purpose.

Once the wires are longitudinally inserted into the pockets **30** for attachment to the terminal portions **22**, they are bent as indicated by the reference character **50**.

A cover **56** is disposed over the retaining member **28** and the cord **36** is angularly or laterally extended through an opening **52** in a sidewall **54** of the cover **56**. The cover sidewall **54** is seated on a circumferential shoulder **58** of the body member **12** substantially to enclose the retaining member **28** and the otherwise exposed screws **24** therewithin. The sidewall **54** is generally circular and extends circumferentially around the body **12** in engagement with the shoulder **58** except at one side where the sidewall is interrupted by the opening **52**, as shown in FIG. 4.

Preferably, the cord opening **52** in the cover sidewall **54** extends to a frontally located or lower edge **60** of the cover **56**. The cord opening **52** thus is in the form of a slot extending upwardly or rearwardly from the cover edge **60**. In this manner, molding of the cover **56** is simplified through the elimination of side wedges or similar expedients.

A rear or top wall **62** of the cover **56** is relatively flat and generally extends in the lateral direction to minimize the risk of dislodging the plug **10** when it is attached to a receptacle **11** as shown in FIG. 8. An opening **64** is provided through the cover wall **62** for insertion of a screw **66** which is threadedly engaged with the fastener head **44** thereby to secure the cover **56** as a part of the plug assembly. A boss **68** extends inwardly from the top cover wall **62** and extends over the retaining member shield **48** to assure total electrical isolation of the fastener **38**.

The fastener head **44** is a plural sided head portion and is shown as being of square configuration with four sides. The opening **64** extends through the boss **68** and is also of square configuration to mate with the head **44**. In assembling the cover **56**, therefore, it can be mated with the fastener head **44** in any of four positions so that the opening **52** through which the cord extends can be located in four different positions with respect to the body **12**. The head **44** could of course have more or less than four sides, with a corresponding configuration of the opening **64**, if a different number of possible positions of the cover **56** is desired. The cord **36** can thus extend from the plug **10** in any of four (or more or less) directions with two such positions shown in FIG. 8 as indicated by the reference characters **70** and **72** respectively.

To clamp the cord **36** in place and thereby provide strain relief, a portion **74** of the cover **56** extends laterally outwardly of the sidewall **54** and is employed as one clamping element. A separate insulative clamping member **76** is adjustably secured to the clamping element **74** by means of screws **78** to operate as an opposed clamping element. Thus, a channel **80** is provided between the clamping elements **74** and **76** for passage of the cord **36**, and when the screws **78** are tightened the cord **36** is securely clamped by the elements **74** and **76**. Special bosses **82** can be formed on the clamping member **76** to provide the required or desired length of threading for mating with the screws **78**.

To enclose the inner area of the plug **10** otherwise exposed by the cord opening or slot **52** in the cover sidewall **54**, the clamping member **76** preferably includes an arcuate wall portion **84** which fits against the cover sidewall **54** and over the cover slot **52**. The arcuate extent of the wall portion **84** is preferably sufficient to provide some overlap with the cover sidewall **54** as indicated by the reference character **86**. When the clamping member **76** is fully drawn to the cover clamping portion **74** (minimum clampable cord size position) lower arcuate wall edge **88** previously extends at least to edge **90** of the cover sidewall **54** (not illustrated in this position). When the clamping member **76** is extended to the maximum clampable cord size position, the arcuate wall edge **88** is in or just short of the plane of the plug face side **14**.

Since a single fastener holds the plug retainer and body parts together and simultaneously provides an indexing function for the cover **56** and since a single separate cord clamp part is employed, it is clear that manufacturing efficiency is achieved for the plug **10**. The advantages of longitudinal wiring with angular or lateral cord extension, ready cord clamping, relatively small plug-depth and a relatively flat outer plug side provide efficiency for the user.

The foregoing description has been set forth only to illustrate the principles of the invention. Accordingly, it is desired that the invention be not limited by the embodiment described, but, rather, that it be accorded an interpretation consistent with the scope and spirit of its broad principles.

What is claimed is:

1. A cord clamp angle plug comprising a body portion having at least one slot through a face side thereof, a blade extending longitudinally through said slot and having a terminal portion secured rearwardly of said body member face side, a retaining member disposed over said terminal sertion of a cord wire into engagement with said terminal portion, a fastener securing said retaining member to said body member and having a plural sided head portion disposed rearwardly of said retaining member, cover means disposed over said retaining member and secured to said fastener head, said cover means having a sidewall with an opening therein for extension of the cord from the plug interior in a direction angularly disposed to the blade longitudinal direction, means on said cover means for mating with said fastener head to index said cover cord opening in any of several predetermined positions in relation to said body member blade slot, and means for clamping said cord to said plug.

2. A cord clamp angle plug as set forth in claim **1** wherein said body member is provided with a pair of power blade slots and a grounding prong slot, and a pair of power blades and a grounding prong extending through said slots.

3. A cord clamp angle plug comprising a body portion having a least one slot through a face side thereof, a blade extending longitudinally through said slot and having a terminal portion secured rearwardly of said body member face side, a retaining member disposed over said terminal portion and having a wire opening for longitudinal insertion of a cord wire into engagement with said terminal portion, a fastener securing said retaining member to said body member and having a plural sided head portion disposed rearwardly of said retaining member, cover means disposed over said retaining member and secured to said fastener head, said cover means having a sidewall with an opening therein for extension of the cord from the plug interior in a direction angularly disposed to the blade longitudinal direction, means on said cover means for mating with said fastener head to index said cover cord opening in any of several predetermined positions in relation to said body member blade slot, means for electrically isolating said fastener head, and means for clamping said cord to said plug.

4. A cord clamp angle plug comprising a body portion having at least one slot through a face side thereof, a blade extending longitudinally through said slot and having a terminal portion secured rearwardly of said body member face side, a retaining member disposed over said terminal portion and having a wire opening for longitudinal insertion of a cord wire into engagement with said terminal portion, a fastener securing said retaining member to said body member and having a plural sided head portion disposed rearwardly of said retaining member, cover means disposed about said retaining member and secured to said fastener head, said cover means having a sidewall with an opening therein for extension of the cord from the plug interior in a direction angularly disposed to the blade longitudinal direction, means on said cover means for mating with said fastener head to index said cover cord opening in any of several predetermined positions in relation to said body member blade slot, a shield member integrally molded with said retaining member and disposed about said fastener head to provide at

least partial electrical isolation therefor, and means for clamping said cord to said plug.

5. A cord clamp angle plug comprising a body portion having at least one slot through a face side thereof, a blade extending longitudinally through said slot and having a terminal portion secured rearwardly of said body member face side, a retaining member disposed over said terminal portion and having a wire opening for longitudinal insertion of a cord wire into engagement with said terminal portion, a fastener securing said retaining member to said body member and having a plural sided head portion disposed rearwardly of said retaining member, cover means disposed about said retaining member and secured to said fastener head, said cover means having a sidewall with an opening therein for extension of the cord from the plug interior in a direction angularly disposed to the blade longitudinal direction, means on said cover means for mating with said fastener head to index said cover cord opening in any of several predetermined positions in relation to said body member blade slot, a shield member integrally molded with said retaining member and disposed about said fastener head, said mating means on said cover including an integrally molded boss extending inwardly thereof into mating engagement with said fastener head and having a portion thereof extending over said shield member to provide full electrical isolation for said fastener head, and means for clamping said cord to said plug.

6. A cord clamp angle plug as set forth in claim 5, wherein a threaded fastener is engaged with said fastener head to secure said cover means in relation to said body member.

7. An angle plug comprising a body portion having at least one slot through a face side thereof, a blade extending longitudinally through said slot and having a terminal portion secured rearwardly of said body member face side, a retaining member disposed over said terminal portion and having a wire opening for longitudinal insertion of a cord wire into engagement with said terminal portion, a fastener securing said retaining member to said body member and having a plural sided head portion disposed rearwardly of said retaining member, cover means disposed about said retaining member and secured to said fastener head, said cover means having a sidewall with an opening therein for extension of the cord from the plug interior in a direction angularly disposed to the blade longitudinal direction, and means on said cover means for mating with said fastener head to index said cover cord opening in any of several predetermined positions in relation to said body member blade slot.

8. A cord clamp angle plug comprising a body portion having at least one slot through a face side thereof, a blade extending longitudinally through said slot and having a terminal portion secured rearwardly of said body member face side, a retaining member disposed over said terminal portion and having a wire opening for longitudinal insertion of a cord wire into engagement with said terminal portion, a fastener securing said retaining

member to said body member and having a plural sided head portion disposed rearwardly of said retaining member, cover means disposed about said retaining member and secured to said fastener head, said cover means having a sidewall with an opening therein for extension of the cord from the plug interior in a direction angularly disposed to the blade longitudinal direction, means on said cover means for mating with said fastener head to index said cover cord opening in any of several predetermined positions in relation to said body member blade slot, a portion of said cover disposed laterally outwardly of said cover sidewall and formed to operate as a cord clamp portion, and a separate insulative clamp member cooperating with said cover clamp portion to clamp the cord.

9. A cord clamp angle plug comprising a body portion having at least one slot through a face side thereof and having a rearwardly facing peripheral shoulder, a blade extending longitudinally through said slot and having a terminal portion secured rearwardly of said body member face side, a retaining member disposed over said terminal portion and against said body member and having a wire opening for longitudinal insertion of a cord wire into engagement with said terminal portion, a fastener securing said retaining member to said body member and having a plural sided head portion disposed rearwardly of said retaining member, cover means disposed about said retaining member and secured to said fastener head, said cover means having a sidewall in engagement with said body shoulder and having an opening in its sidewall for extension of the cord from the plug interior in a direction angularly disposed to the blade longitudinal direction, said cover sidewall cord opening extending to an edge of said cover sidewall and to said body shoulder, means on said cover means for mating with said fastener head to index said cover cord opening in any of several predetermined positions in relation to said body member blade slot, a portion of said cover disposed laterally outwardly of said cover sidewall and formed to operate as a cord clamp portion, a separate insulative clamp member cooperating with said cover clamp portion to clamp the cord, and said insulative clamp member having an arcuate portion thereof disposed against said cover sidewall substantially to enclose said cord opening from said body member shoulder to a predetermined distance between the rearmost extent of said cord opening.

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Examiners.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,335,395 Dated August 8, 1967

Inventor(s) Clarence M. Smith

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In Column 4, between lines 17 and 18, insert:

-- portion and having a wire opening for longitudinal in- --

Signed and sealed this 25th day of January 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

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