Oct. 11, 1960 W. J. SCOTT 2,955,851

PULLING ELBOW

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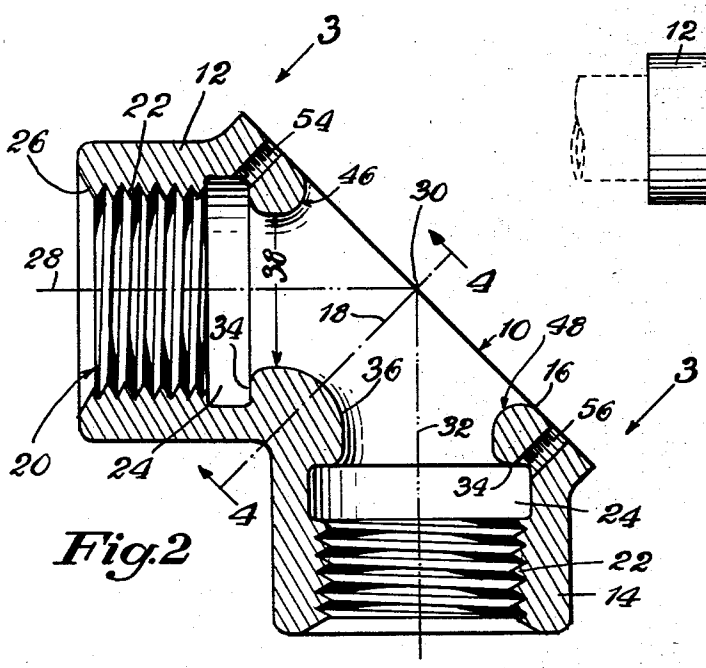


Fig. 2

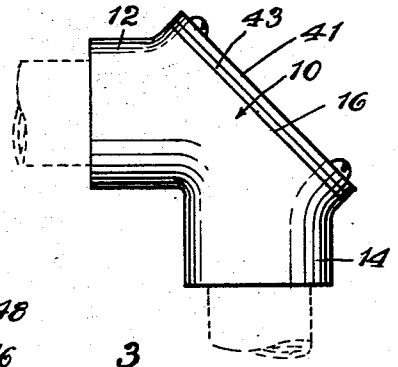


Fig. 1

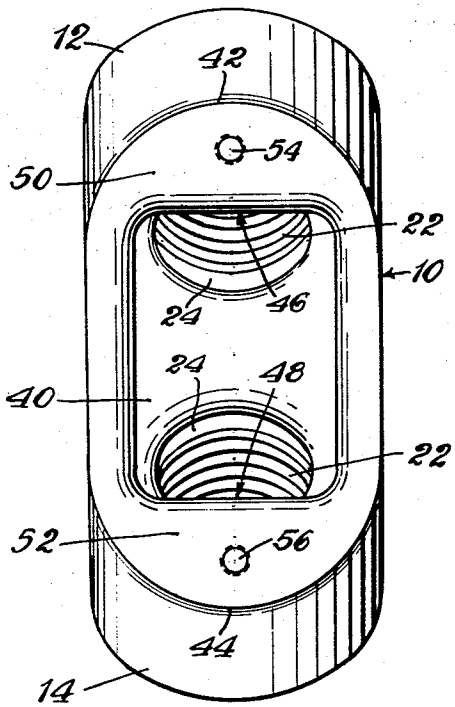


Fig. 3

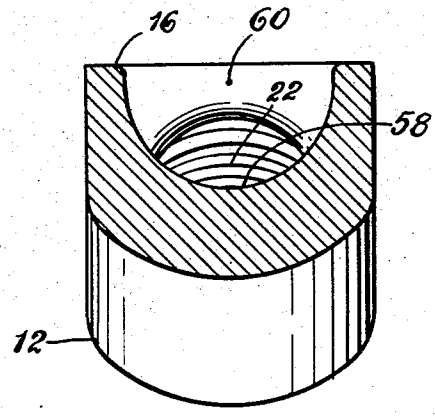


Fig. 4

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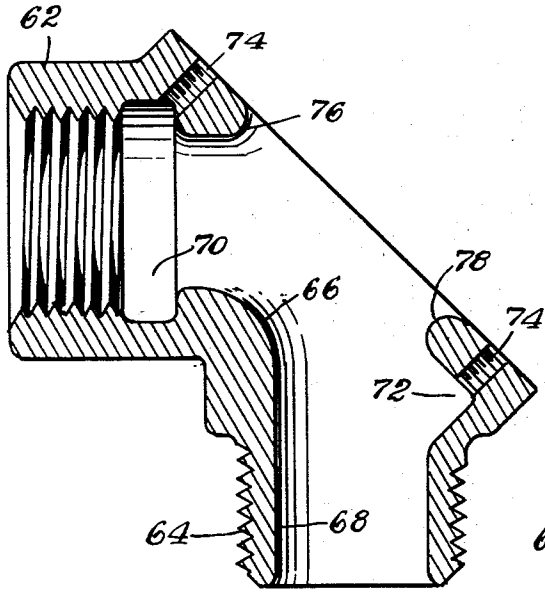


Fig. 5

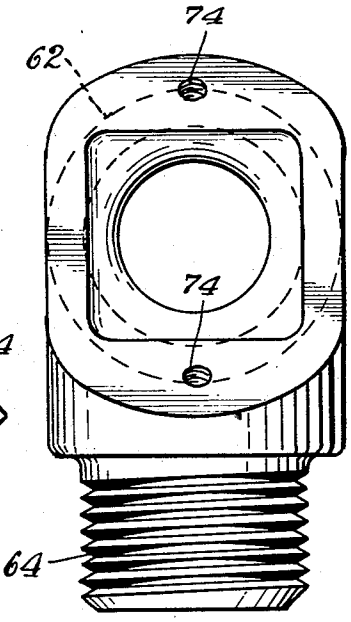


Fig. 6

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PULLING ELBOW

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3 Claims. (Cl. 285—127)

This invention is in the field of conduit fittings and is in the nature of what is referred to in the trade as a pulling elbow. The purpose of a pulling elbow is to connect two conduit pipes together at right angles and to turn the wires contained in the pipe around the thus formed corner. It is the usual practice to pull the wires through one conduit and then to stuff them through the other. The pulling elbow normally has two hubs disposed at right angles and formed integrally on what may be considered a unitary hollow body. A cover surface with an enlarged opening leading into the hollow body or housing is disposed at 45° to the axes of the two hubs and a suitable cover is removably attached to the cover surface. When the wires are being pulled through one conduit and stuffed into the other, the cover is removed and after the operation is complete the cover is replaced and secured. Connections are not made in the elbow.

A primary object of my invention is a new and improved pulling elbow constructed to protect the insulation on the wires to a maximum extent.

Another object is a pulling elbow of the above type which is simple and inexpensive to make.

Another object is a pulling elbow constructed to provide an unobstructed sighting through either hub.

Another object is a pulling elbow which will not choke at the throat.

Another object is a pulling elbow of the above type which may have two female hubs or one female and one male hub.

Another object is a pulling elbow with a cover mounting arrangement that protects both the threads of the hubs and also the insulation of the wires.

Another object is a pulling elbow of the above type with a well rounded convex throat to protect the wire insulation.

Other objects will appear from time to time in the ensuing specification and drawings in which:

Figure 1 is a side view of my elbow;

Figure 2 is an axial section of my elbow;

Figure 3 is a view in the direction of the arrows 3—3;

Figure 4 is a section along line 4—4 of Figure 2;

Figure 5 is a section, similar to Figure 2, of a modified form; and

Figure 6 is an end view of Figure 5.

In Figures 1 and 2 the body or housing of the pulling elbow has been indicated generally at **10** and includes two hubs **12** and **14** disposed at right angles and extending away from a cover surface **16**. The exterior of each hub may be somewhat cylindrical and since, in the form shown in Figure 3, the housing and hubs are symmetric on each side of a center plane **18**, I may apply the same reference numerals to each hub and its adjacent parts.

Considering the hub **12**, it has a central bore **20** which is generally open and extends through into the interior of the housing or body. A portion or area of the bore is threaded, as at **22**, and terminates in an annular

groove **24**. The entrance to the bore may be tapered, as at **26**, if desired, defining an included angle of approximately 120° or the like.

The axis **28** of the hub **12** intersects the cover surface **16** at the point **30**. It should be noted that the axis **32** of the other hub **14** also intersects the cover surface at the point **30**. This is to say that the two axes **28** and **32** of the two hubs intersect at a point that lies in the general plane of the cover surface, which is important for reasons to be set forth hereinafter.

The annular groove **24** at the end of the threaded section or area **22** has an abrupt upstanding annular wall or shoulder **34** which functions as a pipe stop. This is to say that when a threaded conduit pipe is fully screwed into the section **22**, the forward edge will abut the shoulder **34**. Between the bores of the two hubs, I provide a well rounded internal convex shoulder **36**, which on each side flows smoothly into the pipe stop or shoulder **34**. The diameter **38** of the bore between the pipe stop or shoulder **34** and the convex corner **36** is an important feature. This diameter is related to the dimensioning of the threads **22** such that the internal diameter of the conduit pipe will always be greater than the diameter **34**. Accordingly, when insulated wire passes around the well rounded corner **36** from one conduit pipe to another, it will not contact the edge of the pipe, which is often rough and burred, but will rest on the well rounded shoulder and will flow tangentially off of the diameter **38** into the inside of the pipe.

Since the axes **28** and **32** of the bores for the hubs intersect at the point **30** in the plane of the cover surface, each hub will not be interrupted by any projecting portions of the housing or body that rise above the general plane of the cover surface **16**. This is to say that if the pulling elbow is viewed along either the axis **28** or the axis **32** straight through the bore of the hub, the sight will not be obstructed. In other words, the extension of either bore would not strike a portion of the housing since it is totally aligned with the opening **40** in the cover surface.

As shown in Figure 3, the opening **40** in the cover surface is elongated in the direction of the plane through the hub axes **28** and **32**. I provide a suitable cover **41** and gasket **43** of rubber or otherwise which closes the opening **40** and conforms to the cover surface. While the cover surface is well rounded at each end, as at **42** and **44**, the sides of the opening **40** do not follow but are rather square cut, as at **46** and **48**, thereby providing areas or surfaces **50** and **52** for mounting the cover plate. In each such area, I provide screw holes **54** and **56** which lie on or in the general plane of the hub axes **28** and **32** and, as shown in Figure 3, open into the annular groove or channel **24**.

This has the distinct advantage that when the screw hole is bored and tapped, the burrs around the surface where the hole opens into the bore will not interfere with the threads **22**. Nor will these burrs in any way contact the insulation of the wires since it will be noted in Figure 2 that the opening of the screw hole is set back from the bore of the hub.

To prevent choking of the elbow at the throat, I provide a well rounded cross section throat **58**, in Figure 4, which is swung on a circle about the point **60**. It should be noted that the center point **60** lies on the line or plane **18** perpendicular to the cover surface at the intersecting point **30** of the two hub axes, but is spaced below the cover surface **16** or between the curved throat surface **58** and the cover surface. It is important that the pivot point or center **60** of the curved throat surface **58** be spaced well below the cover surface, as shown in Figure 4.

In Figures 5 and 6 I have shown a variant form in which one hub **62** may be internally threaded or female while the other **64** may be externally threaded. In this case, it will be noted that the well rounded internal convex corner **66** flows smoothly into the interior of the bore **68** for the male hub and an annular groove, as at **70**, for the female hub is not necessary. In this case, I provide a cavity or offset **72** which lies outside of the cylindrical bore **68**. The screw hole **74** for the cover opens into this cavity. Thus, the burred opening of the screw hole will not in any way interfere with the movement of wire through the smooth bore of the hub, but will be offset in a cavity of its own. The details of this female hub **62** as to the annular groove or channel **70**, the dimensioning, and the screw hole may be much the same as in the previous form.

In both cases, as shown for example in the Figure 3 species, I find it convenient to round the edges **46** and **48** of the opening **40** through the cover surface, as indicated at **76** and **78** in Figure 5.

The use, operation and function of my invetnion are as follows:

The invention is a pulling elbow with two hubs disposed perpendicular to each other with their axes intersecting in the plane of the cover surface which is disposed at 45° to the two axes. Both hubs may be female with internal threads, but one might be male with external threads.

All of the female hubs with the internal threads are provided with an annular channel or groove just back of or behind the threads so that an abrupt shoulder is provided as a pipe stop. A well rounded convex corner interconnects the bore of the two hubs and the diameter of the bore of the hub at the corner is always less than the internal diameter of the conduit pipe. Thus, the insulation of the wires will flow tangentially off of the convex corner and will not touch the sharp burred edge of the pipe, but will pass over it and flow smoothly down the pipe.

The screw hole for the cover opens, in the case of a female hub, into the annular channel so that the burred exit does not in any way interfere with the threads or with the insulation or movement of the wires. If one of the hubs is a male hub, a separate cavity is provided so that the burred opening is offset and out of the way.

If a sight is taken down the axis of either hub, there will be no projections or obstructions in the way. This has the distinct advantage that when wire is being pulled through one of the pipes, it will not be bent over or in contact necessarily with a part of the housing. The same is true when the wire is being stuffed through the other hub. During any subsequent movement of the wire back and forth, its only point of contact will be the well rounded convex corner which, due to the back-to-back arcs **58** and **66** in Figures 4 and 5, provides a saddle effect. Additionally, the arc of the throat is swung about a circle which lies well below the cover surface, thereby preventing choking at the throat.

While I have shown and described the preferred form and suggested several modifications, it will be apparent that many additional changes, modifications, substitutions and alterations may be made without departing from the invention's fundamental theme. I, therefore, wish that my invention be unrestricted except as by the appended claims.

I claim:

1. In a pulling elbow, a hollow housing having a pair of open bored conduit receiving integral hubs disposed with their axes generally at right angles to each other, a cover surface on the housing generally at 45° to the hub axes, an aperture in the cover surface providing access into the housing, at least one of the hubs having an internally threaded area, an annular groove between the threaded area and a radially inwardly extending convex corner, an annular shoulder formed by said radially inwardly extending convex corner and said groove and functioning as a conduit stop, the aperture in the cover surface being elongated in the general plane of the hub axes, and screw holes spaced from each end of the aperture and disposed in the plane of the hub axes, each screw hole adjacent a hub with an internally threaded area opening into the annular groove in the hub bore.

2. The structure of claim 1 further characterized in that both hubs have internally threaded areas with an annular groove between the threaded areas and the convex corner with screw holes opening into the groove of each hub.

3. The structure of claim 1 further characterized in that the axial projection of the bore formed by the radially inwardly extending convex corner intersects the general plane of the cover surface within the peripheral outline of the cover surface aperture so that wires being pulled through the elbow will not have their insulation marred.

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