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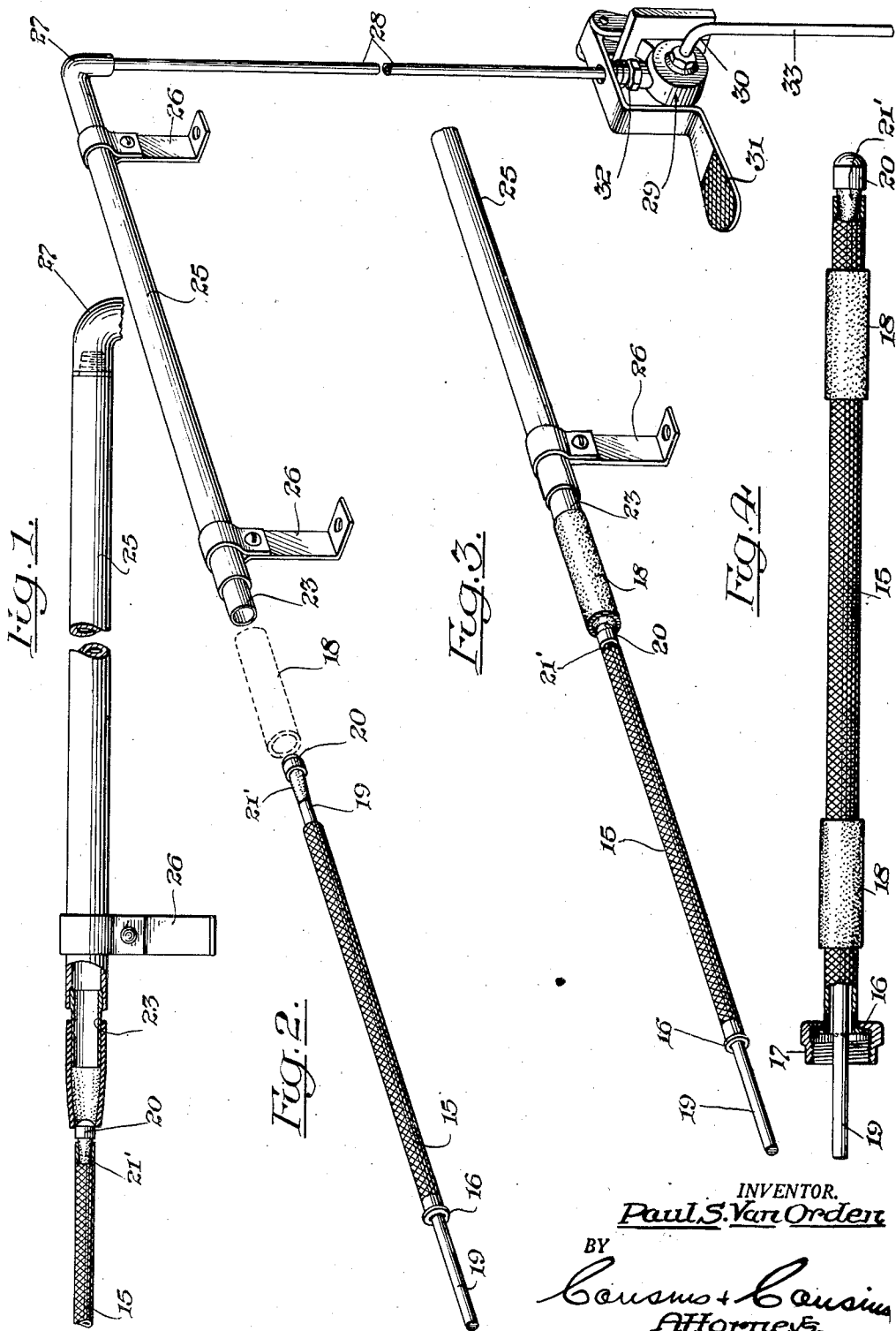
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APPARATUS FOR ENCASING TUBULAR CONDUITS

Filed March 22, 1944

3 Sheets-Sheet 1



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Fig. 10.

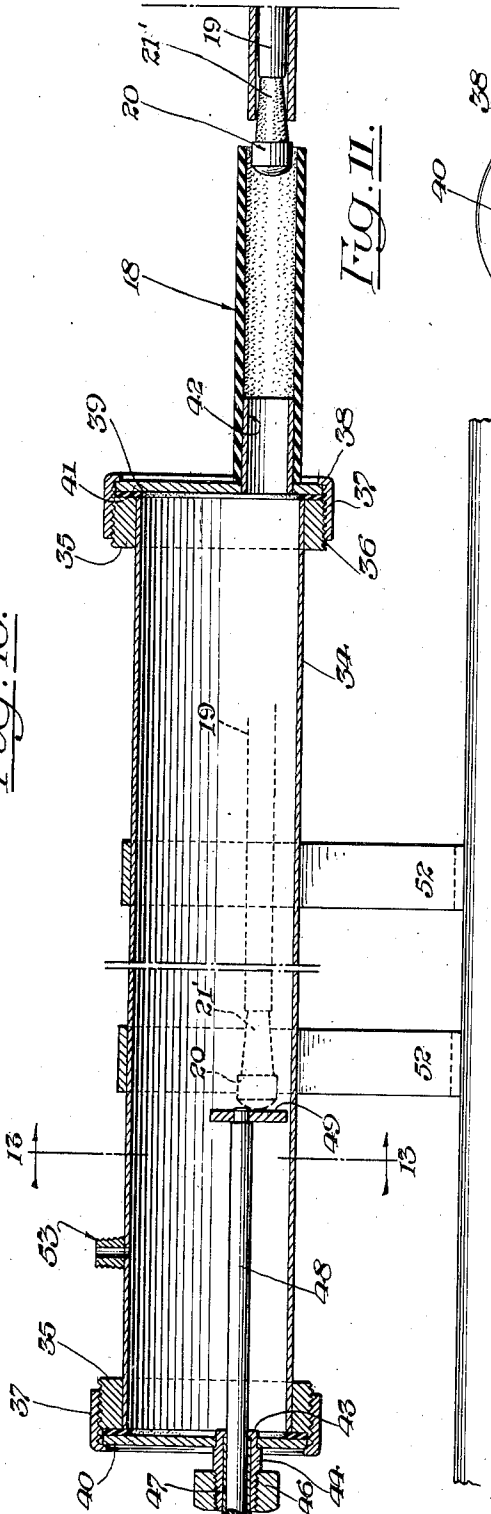


Fig. 11.

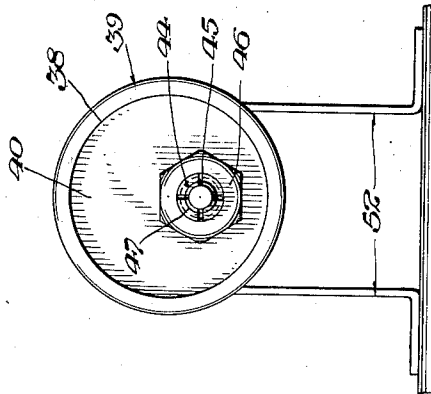


Fig. 13.

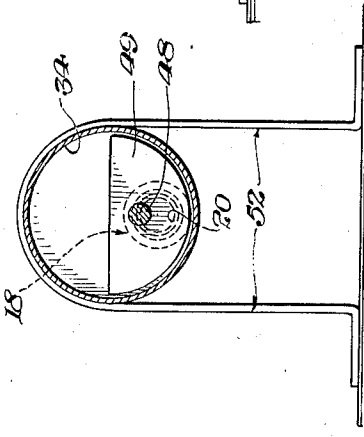
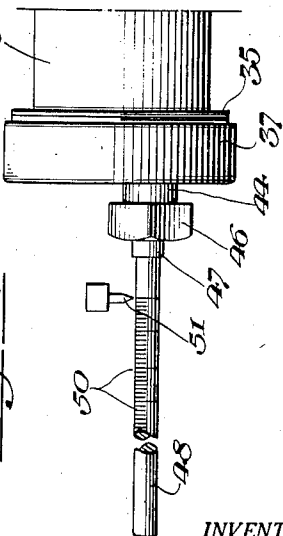


Fig. 12.



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APPARATUS FOR ENCASING TUBULAR CONDUITS

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2 Claims. (Cl. 29—234)

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This invention relates to instrumentalities for temporarily expanding an elastic sleeve whereby it may be easily applied to the exterior of a cylindrical object of greater diameter than that of the interior of the sleeve.

More particularly, the invention has reference to a device for encasing a flexible metallic conduit, completely or at predetermined intervals, within a supple shield to prevent abrasion of the conduit, at points subject to friction and wear, whereby it would be damaged.

The main object of the invention is to provide an efficient apparatus for the above purpose, capable of easy operation, by inexperienced labor, accurately and rapidly.

Another purpose is in the provision of an essentially simple apparatus for this purpose composed of few parts, which are easily changed to accommodate varying sizes of conduits, and capable of long continued service.

These objects are attained by the novel construction, arrangement and combination of parts hereinafter described and illustrated in the annexed drawings, forming part of this disclosure, and in which:

Figure 1 is a side elevational view of a complete embodiment of the invention, parts being in section.

Figure 2 is a perspective view of the main parts of the same.

Figure 3 is a perspective view of the device, showing an inflatable tube in position to be expanded.

Figure 4 is a side elevational view, partially in section, of a conduit as provided with shielding sleeves.

Figure 5 is an enlarged fragmentary sectional view showing the manner of applying the shielding sleeve.

Figure 6 is a sectional view of the air supply tube and interchangeable connecting nipple.

Figure 7 is a side elevational view showing the manner of inserting a conduit to receive a sleeve near one of its ends.

Figure 8 is a similar view showing a second sleeve being applied.

Figure 9 is a transverse sectional view taken on line 9—9 of Figure 7, drawn to an enlarged scale.

Figure 10 is a longitudinal sectional view of a modified form of the device.

Figure 11 is an end view thereof.

Figure 12 is a fragmentary side elevational view of the adjusting means used to control the position of the guard sleeve.

Figure 13 is a transverse sectional view taken on line 13—13 of Figure 10.

Referring in further detail to the drawings, the numeral 15 designates throughout a flexible metallic conduit, usually finished by braiding a tight fitting covering of fine metal strands thereover.

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Such conduits are used to enclose electric conductors from a supply source to the spark plugs of an internal combustion engine, being connected in various manners at one end to such source and having at their opposite end an outturned annular flange 16, by which is connected a nut 17 adapted to engage with whatever the conduit leads to.

It is known that such conduits under the influence of vibration are brought into physical contact with rough and rigid parts of the motor, or its environments, causing abrasion and ultimately impairing their efficiency.

It is therefore found necessary to provide one or more supple shields, such as rubber tubes, at liable points of abrasive contact, such shielding sleeves being so tightly fitted over the braided covering as to fixedly remain in the position in which they are placed.

In the present embodiment a rod 19 is passed through the conduit 15, toward its flanged outer end 16, this rod having attached at its inner end a pilot plug 20 equal in diameter to that of the conduit, the pilot having a convex outer end, a tapered shank 21 which is covered by a soft rubber sleeve 21' and a threaded inner portion 22 adapted to screw into the adjacent end of the rod. It will be understood that after one or more elastic sleeves have been applied to the conduit 15 a complementary flanged ferrule 16 together with collar nuts 17 are applied to the opposite end of the conduit 15.

The rounded end of the pilot is forced into the open end of the shielding sleeve 18, as best shown in Figures 3 and 5, the normal internal diameter of which is slightly less than the external diameter of the conduit 15 and plug 20.

The opposite end of the sleeve 18 is suited to receive a nipple 23, interchangeably engaged by screw threads 24 with an air tube 25, supported by stands 26 fixed on a bench, and connected by an elbow 27 or like fitting with an air pipe 28 leading to an air supply source.

The pipe 28 may be engaged with an air valve 29, mounted on a support 30, and controlled preferably by a pedal 31, which, upon being depressed, compresses a spring 32 and opens the valve, which is normally closed and supplied by a pipe 33 leading to a source of compressed air, as will be understood.

In operation the end of a sleeve 18 is forced over the end of nipple 23 into the position shown in Fig. 5. The rod 19 is then passed through conduit 15 in the manner above described until the end of the conduit abuts rubber sleeve 21' which, together with the plug 20, forms a sealed joint at the end of the conduit. The assembly of rod and conduit is then brought up to sleeve 18, the end of plug 20 entered a small distance into the sleeve and the pedal 31 depressed. This causes air un-

der pressure to flow into the shielding sleeve and against the end 21 of plug 20, the pressure on the plug sealing the joint more tightly between the sealing sleeve 21' and end of the conduit. The air pressure also expands the shielding sleeve sufficiently to allow the conduit to enter freely to such distance as may be required to position the sleeve 18 wherever it may be required along the length of conduit.

Upon release of the air pressure, the sleeve 18 becomes deflated and adheres to the conduit with sufficient tenacity to prevent any displacement. If more than one sleeve is to be applied, the outermost is first located, the assembly of conduit, rod and plug withdrawn from nipple 23, another shielding sleeve 18 attached to nipple 23 and applied to the desired position on the conduit as above described.

For operating on conduits of different diameters the only parts necessary to change are the rod 19, pilot plug 20, rubber sleeve 18 and nipple 23, all others remaining as described.

Obviously, the air control means may be changed and such other modifications made as may come within the scope of the appended claims.

In the modification shown in Figures 10 to 13, a hollow cylinder 34 has rigidly attached collars 35 on each end, these collars being provided with external screw threads 36 by which are engaged sleeves 37 having annular flanges 38.

These flanges contact circular pressure plates 39 and 40 to compress gaskets 41 against the ends of the cylinder and collars 35. The plate 39 has an offset opening in which is secured a nipple 42 around which is drawn an end of the flexible shielding tube 18 which is to be applied to the conduit 15 in the manner above described.

At the opposite end of the cylinder 34, the plate 40 has an opening, offset from the center, in which is secured the base 43 of a tapered screw threaded plug 44, its outer portion being plurally split, as at 45, and having fitted to it a nut 46 adapted to close the split portions of the plug upon an elastic grommet 47.

Slidable through the grommet 47 is a rod 48 having fixed at its inner end a thin plate 49, acting as a limit stop for the plug 20, thereby determining the position of the guard tube on the conduit 15.

The rod 48 may be clamped firmly in adjusted position by tightening the nut 46 and may be provided with graduations 50, and a pointer 51 arranged to indicate the position of the stop 49 within the cylinder, which is supported by brackets 52 mounted on any convenient support.

A compressed air connection, from a source of supply, as previously described, enters the cylinder by way of an inlet 53 set in the cylinder, as seen in Figure 10.

In operation, the end of elastic tube 18 is drawn over the nipple 42; the plug, rod and conduit assembly is passed through the tube and nipple, into the cylinder 34 until plug 20 contacts the stop 49, thus accurately determining the position of the tube on the conduit and assuring uniformity when shielding tubes are to be applied to several conduits.

Having thus fully described the invention, what is claimed as new and sought to secure by Letters Patent is:

1. In apparatus for encasing a flexible conduit at a desired position with an elastic sleeve, a nipple adapted to receive the end of the sleeve, an elongated hollow member to one end of which said nipple is attached, a conduit supporting member adapted to enter said sleeve and nipple, a stop device disposed in said hollow member, a rod connected to said stop device and having a portion extending outside of said hollow member whereby said stop device may be adjusted to different positions along the path of the end of said supporting member, means forming a sealed joint between said rod and hollow member, and means for admitting air under pressure into said hollow member.

2. In an apparatus for applying an elastic sleeve to a flexible metallic conduit, a hollow member to receive the conduit, a nipple thereon to hold an elastic sleeve, a rod to enter the conduit, a pilot plug on said rod, said plug having a tapered body and a resilient sleeve thereon to make an air seal with the end of the conduit and a source of air under pressure to expand the elastic sleeve to permit passage therethrough of the conduit.

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