April 27, 1965 W. C. J. ESSER 3,181,113

ROLLED METAL WIRE PIN

Filed July 2, 1963

Fig. 1

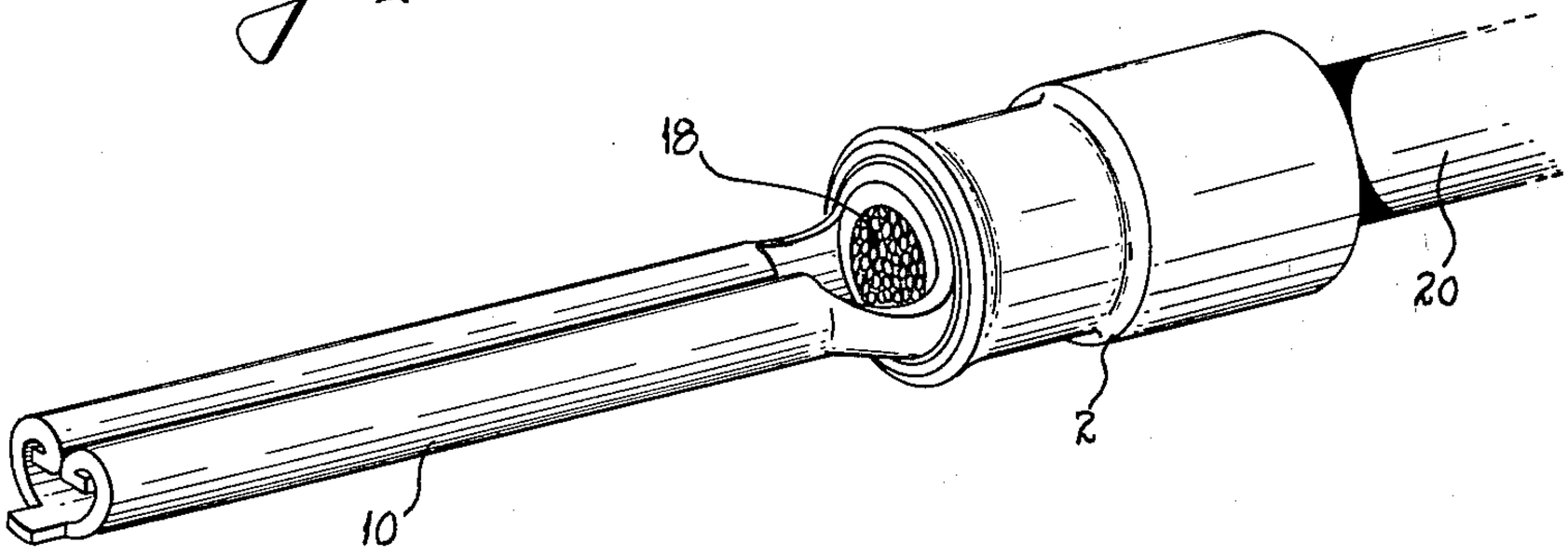
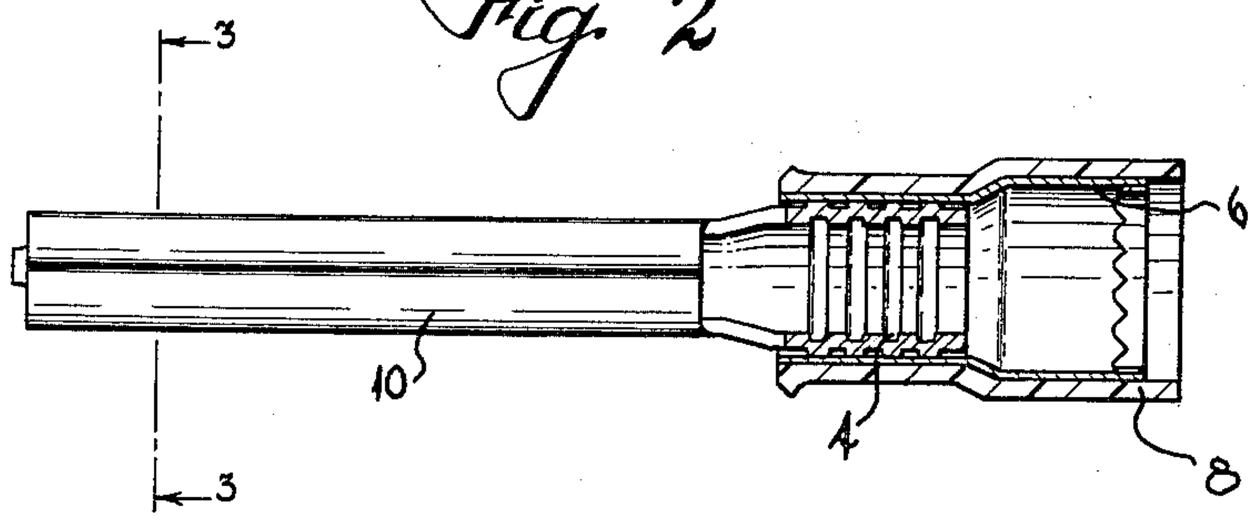


Fig. 2



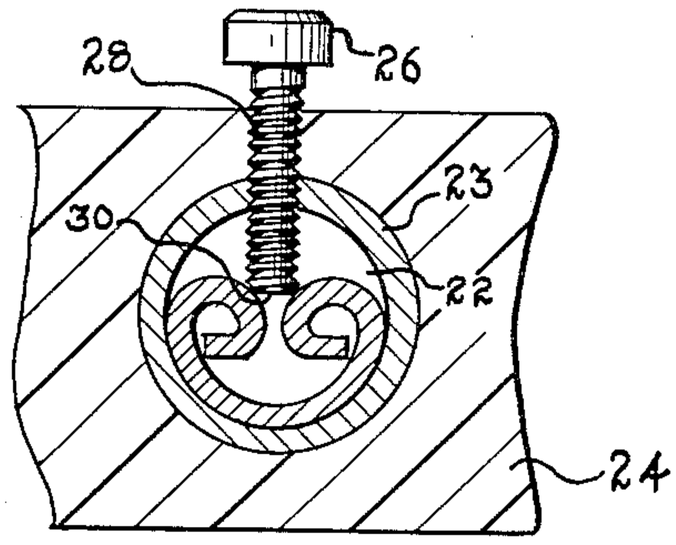


Fig. 4

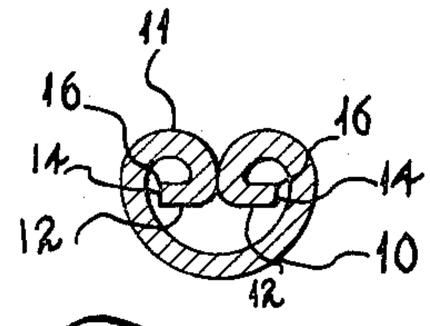


Fig. 3

United States Patent Office

3,181,113
Patented Apr. 27, 1965

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3,181,113

ROLLED METAL WIRE PIN

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Filed July 2, 1963, Ser. No. 292,411
Claims priority, application Germany, July 16, 1962, A 40,722
4 Claims. (Cl. 339—270)

This invention relates to electrical contact pins, and more particularly to a contact pin construction especially adapted to be releasably retained by a set screw in a pin receptacle block.

When the pins and receptacle block of a connector assembly as heretofore designed are subject to severe vibrations, as in a vehicle or aircraft, the set screws which hold the pins in place tend to become loosened, thus to result in unstable connections. If the screws are tightened so as to avoid this problem the pins may be disadvantageously permanently deformed.

According to the present invention the pin is formed from a sheet metal blank, longitudinally free edges of which are bent inwardly to provide a resilient seat for the screw. The screw is thus continuously urged radially outwardly of, and bound in, its seat. The end faces of the free edges of the blank preferably face in opposite directions and at right angles to the axis of the pin portion to provide a pair of parallel resilient tubes extending longitudinally of the pin portion.

A primary advantage of the pin contact of the present invention is, thus, that it is not easily damaged when tightening a set screw upon it, and it resiliently reacts against the set screw tending to bind the screw in its seat to enhance the resistance of the connection to separation, especially when subjected to vibrational stresses.

Other advantages and attainments of the present invention will become apparent to those skilled in the art upon examination of the following detailed description when taken in conjunction with the drawings of the invention; it is to be understood however, that the embodiment is not intended to be exhaustive nor limiting of the invention but is given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

The preferred embodiment will now be described by way of example with reference to the accompanying drawings in which:

FIGURE 1 is a perspective view of an electrical connector crimped to a conductor wire and embodying the principles of this invention.

FIGURE 2 is a partly sectional view of the connector prior to its being crimped on the conductor wire;

FIGURE 3 is a sectional view of the connector taken along lines 3—3 of FIGURE 2;

FIGURE 4 is a view of the connector as shown in a receptacle block with a set screw retaining it in place.

As shown in FIGURE 1 an electrical connector pin, preferably formed by conventional progressive die techniques from a sheet metal blank, has a ferrule portion 2 crimped to the bared end of an insulated electrical conductor wire 18, the ferrule portion 2 having interior serrations 4 (refer to FIGURE 2) for enhancing the electrical contact between the wire end and the ferrule portion. The ferrule portion 2 is surrounded by an outer metal sleeve 6 which in turn is surounded by an insulating

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sleeve 8, the right hand part (as seen in FIGURE 2) of the sleeves 6 and 8 being of increased internal diameter for crimping to the insulation 20 of the conductor wire 18.

Integrally formed with a ferrule portion 2 is a tubular pin portion 10, which is generally semi-circular as seen in cross-section in FIGURE 3 having one side relatively flat and the other side convexly curved. As will be apparent to those skilled in the art, pin portion 10 may be formed from a flat rectangular sheet metal blank, the sides of which are smoothly rolled up and inwardly bent towards one another in tight curls 11 at the top, the said curls meeting centrally of the pin near its axis. As shown in FIGURE 3 the free longitudinal edges 12 of the blank are turned inwardly of the pin portion 10 so that their end faces 14 are oppositely directed perpendicularly to the longitudinal axis of the pin portion 10 to provide a longitudinally extending pair of resilient parallel tubes 16 defining the relatively flat side of the pin section.

In use, the pin portion 10 is inserted into a receptacle of circular cross-section, formed by an aperture 22 in a cylindrical metal sleeve 23 in a connector block 24 (see FIGURE 4), the aperture preferably having a radius approximating that of the pin. Set screw 26 is driven through the tapped aperture 28 in sleeve 23 and block 24 which extends perpendicularly to and centrally of the pin receiving aperture so that the end 30 may symmetrically abut curls 11. Screw 26 is driven so as to deform resiliently the tubes 16, and thus is continuously urged radially outwardly of the receptacle, binding it against the threads of aperture 28.

In this manner, screw 26 is restrained from working loose upon vibration.

I claim:

1. An electrical connector having a pin portion rolled up from a sheet metal blank to form a pin portion having a substantially uniform transversal cross-section with one side convexly curved for engaging a pin receptacle and an opposite side forming a contact surface for the end of a screw, the contact surface being formed by edge portions of the metal blank rolled internally of the pin to define a pair of parallel tubes extending in contiguous relationship longitudinally of the pin, each tube being open internally of the pin at the edge of the blank, the edges facing in opposite directions and the tubes being integrally joined by a base portion defining the convexly curved side.

2. The connector of claim 1 wherein the pin portion is resilient in cross-section by elastic bending of the rolled-in portions of the sheet metal blank.

3. The connector of claim 1 wherein the base portion is convexly curved away from the rolled-in edges.

4. The connector of claim 1 wherein the pin portion is integral with a ferrule-forming portion at one end and a convex base portion of the pin for engaging a receptacle for the pin portion is a continuation of the ferrule-forming portion.

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JOSEPH D. SEERS, *Primary Examiner.*