July 5, 1932. A. E. WILSON 1,866,145

METHOD OF MAKING COMPOSITE TUBULAR MEMBERS

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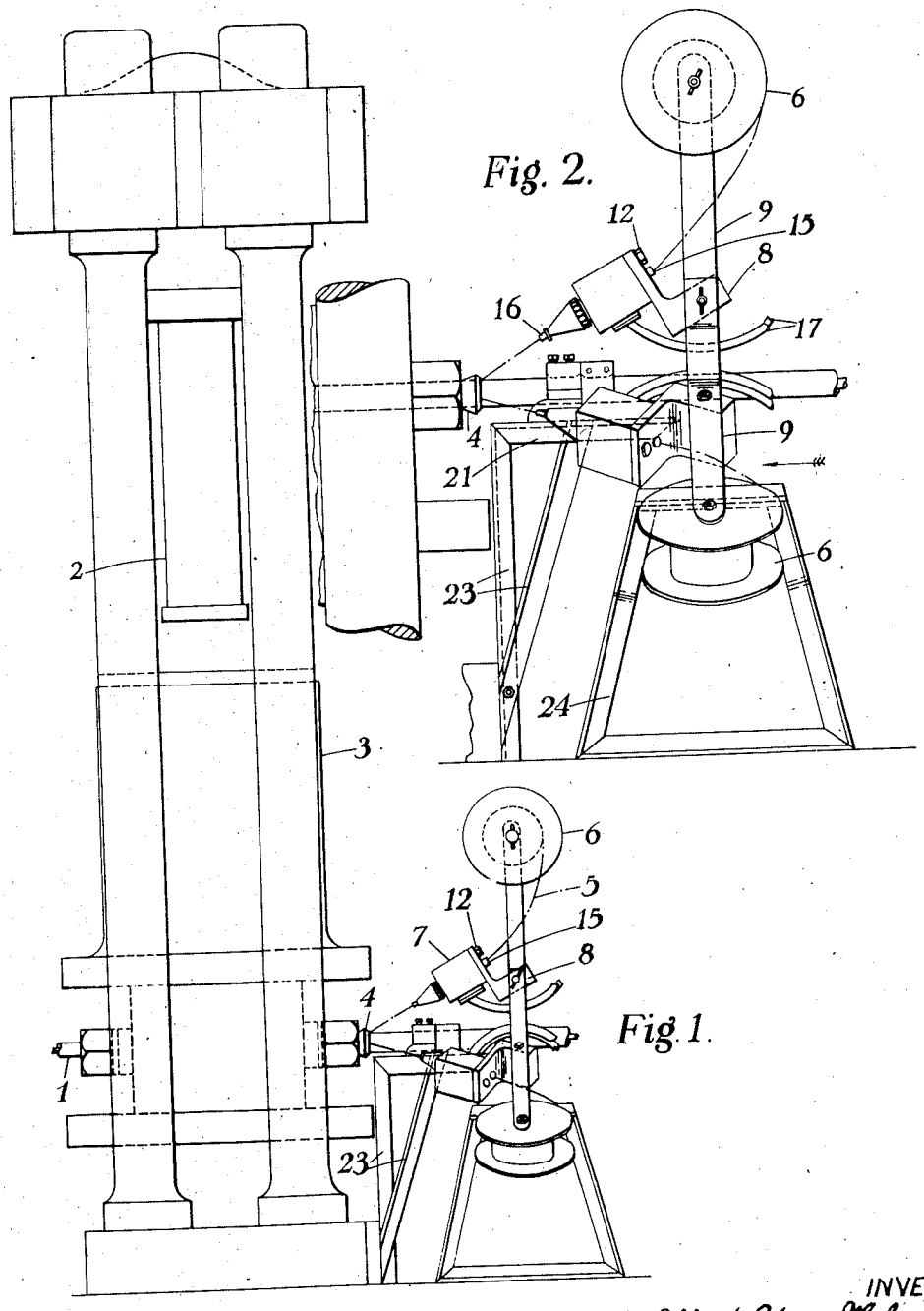


Fig. 2.

Fig. 1.

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Fig. 3.

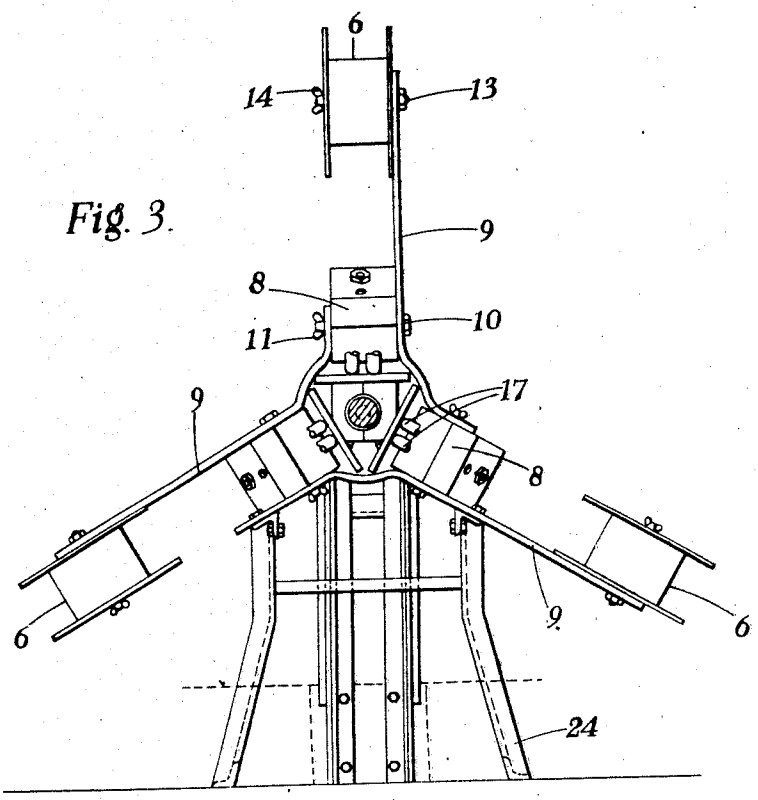
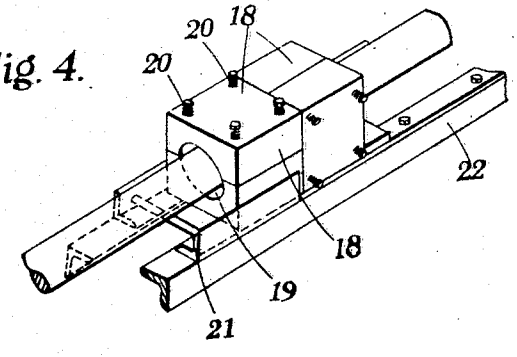


Fig. 4.



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UNITED STATES PATENT OFFICE

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METHOD OF MAKING COMPOSITE TUBULAR MEMBERS

Application filed February 13, 1931, Serial No. 515,572, and in Great Britain February 27, 1930.

This invention relates to the production of a tubular body of lead or lead alloy having on the outside a protective coating of some other metal. The tubular body is produced by extrusion and may be the sheath of an electric cable or may be a pipe. The protective coating is applied by spraying the metal on the surface of the tube as it leaves the extrusion die or immediately afterwards while the surface is still hot, plastic and clean. This spraying may be followed by drawing or forcing the body through a die so as to bring about forced intimate contact between the metal coating and the metal on which it is deposited.

The spraying may be carried out by a rotary pistol or by a group of pistols spread round the axis of the tube and either moving or stationary.

One form of apparatus for coating an electric cable is illustrated by way of example in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a press and spraying apparatus,

Figure 2 a side elevation of the spraying apparatus shown in Figure 1, but drawn to a larger scale,

Figure 3, an end elevation of Figure 2 looking in the direction of the arrow, and

Figure 4, a perspective view of a detail of the apparatus.

An electric cable 1 is provided with a lead sheath by passing it through a lead press of any suitable type. In Figure 1, the press is of the vertical type and has a movable ram 2 and a fixed receptacle 3 for the lead. As the cable, now covered with a lead sheath, emerges from the press, it passes through a baffle plate 4. This is in the form of an annular member with a conical surface tapering down towards the cable so as to provide the minimum space between the edge of the baffle and the cable in order to prevent the ingress of sprayed metal to the extrusion die of the lead press. The metal to be sprayed is in the form of wire 5 and in the arrangement illustrated in the drawings, there are three bobbins 6 for the wire, each bobbin serving to supply a spraying pistol 7. The latter are arranged at 120° apart and are adjustably supported around the cable. For this purpose each pistol has a bracket 8 secured to the appropriate members of a frame-work consisting of the three bars 9, adjustability being provided for by bolts 10 and wing nuts 11. The pistols are adjustably mounted on the brackets 8 by means of the bolts 12. Each bar 9 also serves to carry a bobbin 6 for the wire by means of bolts 13 and wing nuts 14. The wire passes into the rear of the pistols through the hollow members 15 and out through the nozzles 16. Pipes 17 are provided for the entry of the gases to melt and spray the metal in the usual way.

In order to ensure intimate contact between the metal coating and the cable sheath, the cable may be passed through dies 18, bell-mouthed at 19 at both ends. The dies may be made into two parts as shown and pressed together by springs 20. The dies are supported conveniently on a horizontal bar 21 supported by a bar 22. The latter is secured to bars 23 attached to the base of the press. The frame-work supporting the spraying pistols is supported by a frame 24.

When it is required to coat a cable sheath with a metal, the cable is sheathed in the usual way by passing it through the lead press, and then immediately afterwards while the surface of the sheath is still hot, plastic and clean, the pistols spray the coating metal on to the sheath. It has been found that a coated sheath or tube made in this manner is resistant to corrosion and to intercrystalline cracking due to vibration and to the attacks of boring insects.

In carrying out tests for corrosion by immersion of the samples in normal acetic acid solutions, the samples having been previously scratched, it was found that while deep pitting was produced in the pure lead sample, the corrosion of the copper-coated lead sample was considerably reduced. Also when subjected to vibration fatigue tests, the coated sample was found to be materially more resistant to the effects of vibration than the pure lead sample.

The choice of the metal for the coating is dependent naturally upon the object in view. Metals which may be chosen are aluminium,

copper or metals harder than copper and capable of being applied by the spraying process.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A method of producing a metal tubular member having on the outside thereof a protective coating of another metal, consisting in subjecting a body of metal containing lead to an extrusion process to form the tube and then immediately spraying the coating metal on to the surface of the tube while the latter is still hot, plastic and clean.

2. A method of producing a metal tubular member having on the outside thereof a protective coating of another metal, consisting in subjecting a body of metal containing lead to an extrusion process to form the tube, and then immediately spraying the coating metal on to the surface of the tube while the latter is still hot, plastic and clean, and then passing the coated tubular body through a die to effect more intimate contact between the coating and the metal upon which it is deposited.

In testimony whereof I affix my signature.

ALFRED EDGAR WILSON.