June 30, 1931. W. J. GAGNON 1,812,743

TUBULAR PIN AND METHOD OF MAKING SAME

Filed Sept. 11, 1928

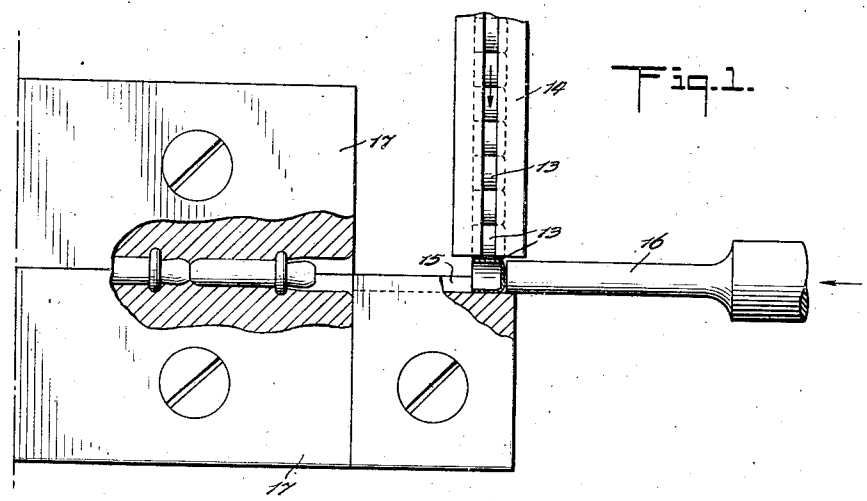


Fig. 1.

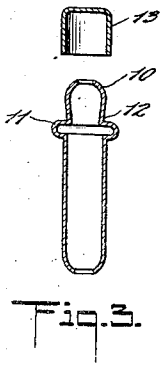


Fig. 3.

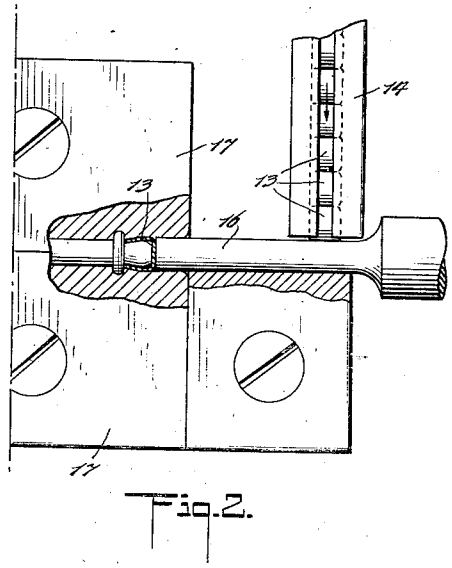


Fig. 2.

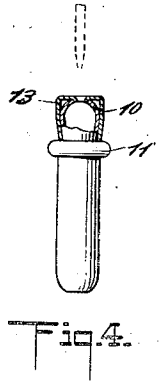


Fig. 4.

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UNITED STATES PATENT OFFICE

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TUBULAR PIN AND METHOD OF MAKING SAME

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My invention relates to tubular pins, especially pins made of sheet metal and closed with a longitudinal seam. The invention is particularly useful in connection with contact pins for radio tubes.

Among the objects of my invention may be mentioned the manufacture of a tubular pin from sheet metal which will have greater strength than the usual pin so constructed at the present time, and the provision of such a pin which will not be subject to leakage into its interior of electrical insulating material into which it may be molded. Other objects will appear from the following description.

Heretofore when pins formed of sheet metal and closed with a seam have been molded into the insulation forming the base of a radio tube the hydraulic pressure of liquid insulation amounting to 6,000 or 7,000 pounds has been sufficient to cause the head of the pin to open at its seam and allow some of the insulation to leak through the pin into its interior. Since it is customary to pass a wire conductor through such a pin after the pin has been molded into the base of the tube and solder the end of the conductor to the lower end of the pin, the presence of insulation within the pin is objectionable. Such material within the pin, obstructs the passage of the conductor through the pin. Furthermore, the present process of molding pins into insulation bases, such for instance as bakelite, makes it necessary to use a conically shaped punch in a process well-known in the art. In this process the punch spreads open the seam of the pin as it travels downward to press the insulation into shape thereby causing leakage sufficient to impair the usefulness of the pin.

I have discovered that if the top of the pin be given a special shape and if a cup, having no seam, be closed over and suitably attached to the pin top, this leakage of insulation may be completely eliminated and a stronger and more useful pin produced.

One form of the invention is illustrated in the accompanying drawings, in which—

Figure 1 illustrates a method of making the capped tubular pin, the apparatus being shown ready to attach the cup upon the pin top,

Fig. 2 shows the parts illustrated in Figure 1 as the cup is attached to the pin top,

Fig. 3 is a sectional elevation of the pin and cup, and

Fig. 4 is an elevation of the capped pin with its top punched, the upper part of the pin and cup being shown in section.

In the embodiment of the invention illustrated in the drawings, there is first formed a sheet metal tubular pin having a seam running longitudinally thereof. An abutment shoulder 11 is formed integrally with and surrounding the pin. The top of the pin 10 is necked down slightly on one side of and next to the abutment shoulder. In other words the pin is given a smaller diameter above the abutment shoulder 11, as best illustrated in Fig. 3. A neck 12 is thus formed completely surrounding the pin. A cup 13 somewhat like the metallic shell of a cartridge (best seen in Fig. 3), is inverted and placed over the top of the pin, and its edge is compressed about the neck 12, so that it is solidly attached to the pin. The relative position of the pin top and cup will be seen in Fig. 4.

The top of the pin is thus capped by the cup 13, which strengthens the pin by closely surrounding its top, and also closes the seam above the abutment shoulder.

A convenient method of capping the pin is illustrated in Figs. 1 and 2 in which the cups 13 are fed from a chute 14 into a feeding slot 15, along which a plunger 16 moves each cup into position over a pin end, while the pin is held in dies 17. The conformation of the die adjacent the pin head is such that the edges of the cup are forced together about the neck as the cup is pushed upon the pin end. Thus the cup is firmly attached to the pin. Fig. 2 shows the position of the cup as the die forces it into place about the pin end.

Capped radio pins constructed in accordance with the invention are admirably suited for being molded into radio tube bases. As is well-known, only the top of the pin, as far down as the abutment shoulder, is molded

into the tube base. The pin top being surrounded by an unbroken cup permits no leakage into the pin top of the fluid into which it is molded. Furthermore, when the usual conically-shaped punch is applied to the pin top to open up a wire way, and press the molded base into shape, it does not open up the seam and cause leakage into the pin. Instead it pierces the cup top and makes a perfect valve seat in its downward travel. Leakage of the tube base material into the pin is thus prevented. (See Fig. 4).

Pins constructed in accordance with the present invention, therefore, will be seen to be free from the objections to which other sheet metal pins are subject, in that the insulation will not leak into them during the process of molding and their strength will be sufficient for all practical purposes. The process of capping the end of the pin is simple, effective and inexpensive, and many of the advantages of the solid pin are present in sheet metal pins constructed in accordance with the invention.

With the understanding that the specific description and illustrations are given merely to indicate how the invention may be applied,

I claim:

1. A tubular pin formed of sheet material comprising a shank having a longitudinal seam therein and an abutment shoulder intermediate of and unitary with said shank, said shank being necked down on one side of and next to said abutment shoulder, in combination with a cup closed over the end of the pin adjacent the necked down portion, substantially as described.

2. A sheet metal tubular pin having a seam running longitudinally thereof, an abutment shoulder formed integrally with and surrounding said pin, said pin being necked down on one side of and adjacent said abutment shoulder, and a seamless cup capping said pin, the edges of said cup being compressed about the neck.

In testimony whereof I have signed my name to this specification.

WILLIAM J. GAGNON.