May 16, 1933. W. J. GAGNON 1,909,263

METHOD OF MAKING A TUBULAR PIN

Original Filed Sept. 11, 1928

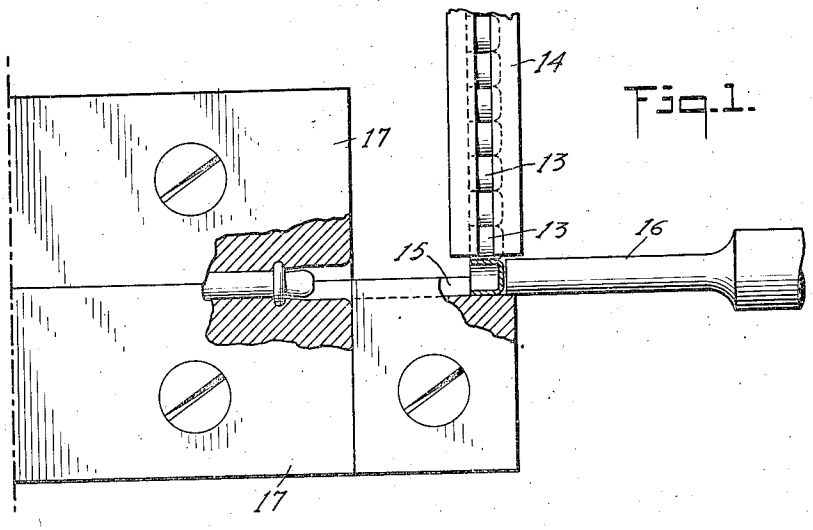


Fig. 1.

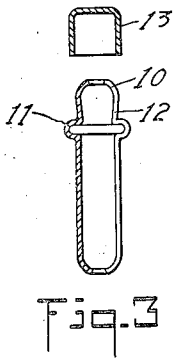


Fig. 3

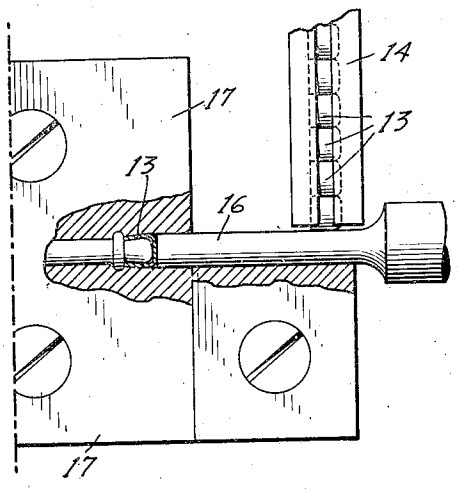


Fig. 2.

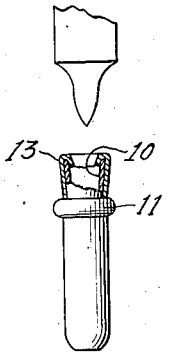


Fig. 4.

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UNITED STATES PATENT OFFICE

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METHOD OF MAKING A TUBULAR PIN

Original application filed September 11, 1928, Serial No. 305,296, now Patent No. 1,812,743, dated June 30, 1931. Divided and this application filed March 2, 1931. Serial No. 519,616.

My invention relates to tubular pins, especially pins made of sheet metal and closed with a longitudinal seam such as are used as contact pins for radio tubes and it is an object of this invention to provide an improved method of manufacturing pins of the class described.

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 pressure under which this has been done has been sufficient to cause the head of the pin to open at its seam and allow some of the insulation to leak into the pin. 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 as such material within the pin obstructs the passage of the conductor in the pin. Furthermore, the present process of molding pins into insulation bases of such material 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 may spread 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 cap, 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.

A pin of this type is described and claimed in my prior application Serial No. 305,296, filed September 11, 1928 which resulted in Patent 1,812,743, issued June 30, 1931 of which application this application is a division.

In the drawing—

Figure 1 illustrates a method of making the capped tubular pin the apparatus being shown ready to press the cap upon the pin top;

Figure 2 shows the parts illustrated in Figure 1 as the cap is attached to the pin top;

Figure 3 is a sectional elevation of the pin and cap; and

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

In the embodiment of the invention illustrated in the drawing, 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 or tapered slightly on one side of and toward 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 cap 13 closed at one end and having a cylindrical skirt, somewhat like the metallic shell of a cartridge and best seen in Figure 3 is placed over the top of the pin, and its lower portion is contracted about the neck 12 as the cap is forced into place, so that it is solidly attached to the pin. The relative positions of the pin top and cap will be seen in Fig. 4.

The top of the pin is thus provided with a cap 13, which strengthens the pin and closes the seam above the abutment shoulder.

The preferred method of capping the pin is illustrated in Figures 1 and 2 in which the caps 13 are fed from a chute 14 into a feeding slot 15, along with a plunger 16 moves each cap into position on the pin end, while the pin is held in dies 17. The conformation of the dies adjacent the pin head is that of the pin head with only sufficient clearance being left between the dies and the pin head to receive the cap so that the cap is shaped to conform to the pin head as it is forced onto the pin head. This contracts the portion of the cap adjacent the free edge thereof about the neck of the pin and secures the cap firmly in place on the pin. Figure 2 shows the position of the cap after the plunger 16 has forced 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 cap permits no leakage into the pin top of the material 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 the seam and permit leakage into the pin. Instead it pierces the cap top and makes a perfect valve seat in its downward travel. Leakage of the tube base material into the pin is thus prevented. (See Figure 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 method of forming a capped pin comprising shaping a pin with a portion of reduced diameter adjacent one end, applying a cap to said end and shaping the cap to conform to the portion of reduced diameter as the cap is moved longitudinally of the pin on the end of the pin while retaining the shape of the portion of the pin to which the cap is applied.

2. A method of forming a capped pin comprising shaping a pin with a portion of reduced diameter adjacent one end, shaping a cap to fit said portion of reduced diameter while moving the cap longitudinally of the pin on the said end and retaining the shape of the portion of the pin on which the cap is placed during the shaping of the cap thereto.

3. A method of forming a capped seamed tubular pin comprising shaping from sheet metal a pin tapering inwardly from one end, applying a cap to the tapered end and shaping the cap to conform to the tapered end as the cap is moved longitudinally of the pin on the tapered end of the pin.

4. A method of forming a capped pin comprising shaping a pin which tapers inwardly from one end to a contracted neck and simultaneously moving a cap longitudinally of the pin on said tapered end and tapering the cap to fit the tapered end of the pin.

5. In the method of forming a capped pin the step of simultaneously moving a cap longitudinally of the pin on a head of the pin and shaping the cap to fit a portion of the pin of reduced diameter while retaining the shape of the portion of the pin on which the cap is placed.

6. In the method of forming a capped pin, the step of simultaneously moving a cap longitudinally of the pin on an inwardly tapered end of the pin and shaping the cap to fit the tapered end of the pin.

7. A method of forming a capped pin comprising forming a pin with a head shaped to retain a cap and simultaneously shaping the cap to fit the pin head while forcing the cap on the pin head and retaining the shape of the pin head.

8. A method of forming a capped pin comprising shaping a pin with an inwardly tapering end portion, applying a tubular cap to said pin and tapering said tubular cap to fit said tapered end portion of said pin as the cap is forced longitudinally onto said pin.

9. A method of forming a capped pin comprising shaping a pin with an inwardly tapering end portion, applying a cap having a tubular skirt portion and tapering said tubular skirt portion to fit the tapered end portion of the pin as the cap is forced longitudinally onto said pin.

10. A method of forming a capped pin comprising shaping a pin with an inwardly tapering end portion, applying a cap having a cylindrical skirt portion and shaping said cylindrical skirt portion throughout its length to fit the tapered end portion of the pin as the cap is forced longitudinally onto said pin.

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

WILLIAM J. GAGNON.