Feb. 4, 1936. L. KOPINSKI 2,029,430

TUBULAR CONDENSER

Filed May 14, 1934

Fig. 1

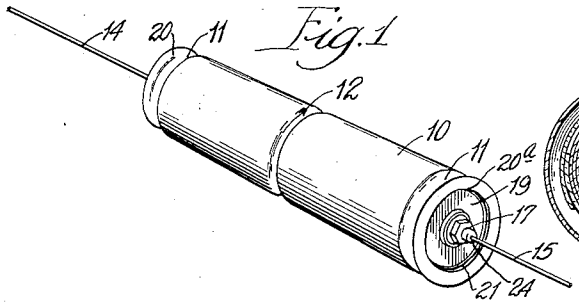


Fig. 4

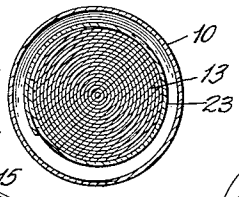


Fig. 5

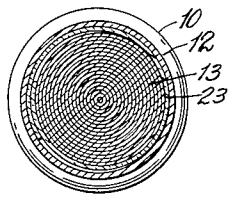


Fig. 2

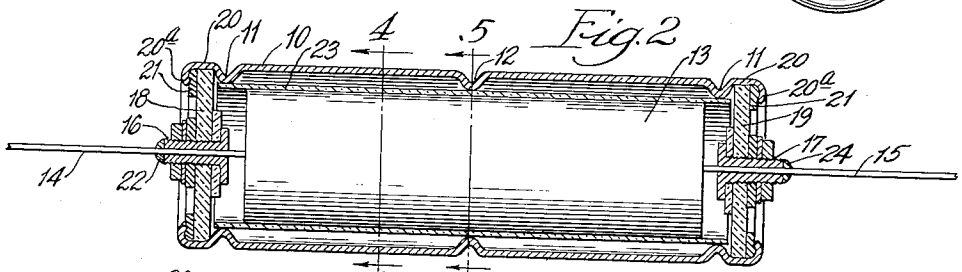


Fig. 3

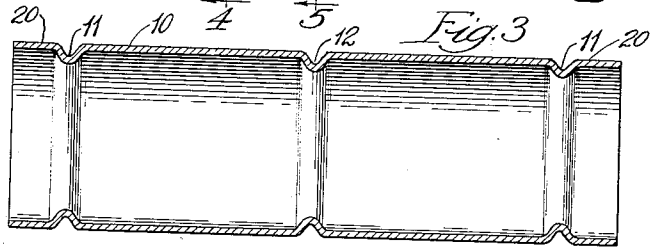


Fig. 6

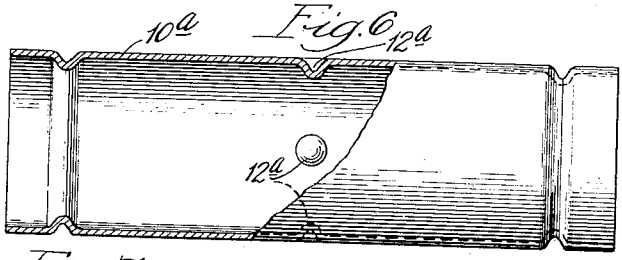
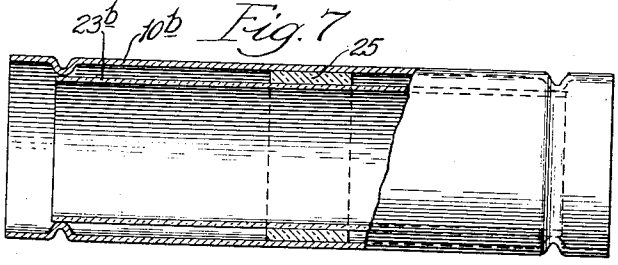


Fig. 7



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UNITED STATES PATENT OFFICE

2,029,430

TUBULAR CONDENSER

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Application May 14, 1934, Serial No. 725,511

7 Claims. (Cl. 175—41)

An object of this invention is to provide a condenser having a wound paper and metal foil body with a tubular metal shell wherein the body is substantially uniformly spaced from the shell, so that the capacity between the condenser body and shell is reduced to a minimum.

Another object is to provide a condenser of this type wherein the capacity between the condenser body and its metal enclosing shell is greatly reduced and is constant.

These and other objects, as will hereinafter appear, are accomplished by this invention which is fully described in the following specification and shown in the accompanying drawing, in which—

Figure 1 is a perspective view of a condenser embodying the invention;

Fig. 2 is a longitudinal section through the same;

Fig. 3 is a longitudinal section through a metal tube adapted to form the housing for the condenser;

Figs. 4 and 5 are transverse sections on the lines 4—4 and 5—5 respectively of Fig. 2;

Fig. 6 is a view similar to Fig. 3 showing a modified form of the metal tube; and

Fig. 7 is a similar view showing another modified form of the tube.

The embodiment illustrated in Figs. 1 to 5 inclusive comprises a tube 10 preferably of aluminum, although it may be made of any other suitable metal, such as brass nickel plated. This tube is preferably provided with rolled grooves 11 at its ends, together with a central groove 12 whose purpose will later be explained. A condenser body 13 which is preferably of the wound type having alternate layers of paper and metal foil has condenser terminals 14, 15 extending one from each end, and preferably axially thereof. These terminals extend through metal guides 16, 17 which are hermetically sealed in suitable insulating closures 18, 19 of bakelite, or the like, which are placed in the overhanging end 20 of the tube with a gasket 21 of any suitable material, such as cork, after which the end of the tube is spun or pressed inwardly as at 20a (Fig. 2) to make an air-tight joint.

One of these closures is first assembled in the tube above described after which the condenser body is set in place with the wire terminal 14 extending through the guide 16, after which it is sealed in place by means of a drop of solder 22. The condenser body is surrounded by a sheet of heavy paper or other suitable insulator 23 which is supported near the center by the inwardly formed groove 12, while the ends of the insulator rest upon or are guided by the inwardly grooved portions 11, 11. Thus the insulator which makes fairly close engagement with the condenser body is firmly supported so as to keep the condenser at substantially a uniform distance from the metal tube at substantially all points, thereby insuring that the capacity between the condenser and the metal tube which surrounds it will not be greater than a predetermined maximum.

The opposite end of the condenser is then closed in the same way after which the end of the tube is rolled in place, thereby completely sealing it except for the space between the wire terminal 15 and the hole through the guide 17. The condenser is then heated, exhausted and filled with oil as explained in my co-pending application Serial No. 696,772, filed November 6, 1933, after which it is completely closed by a drop of solder 24.

In Fig. 6 is shown a modified form of the device in which the central groove 12 of Fig. 3 is replaced by a plurality of inwardly extending depressed portions 12a which serve the same purpose of holding the condenser body spaced with respect to the metal tubular shell 10a. In Fig. 7 is shown still another modification of the invention in which the insulator 23b is spaced from the tubular shell 10b by means of a central band 25, or the like, which may be of any suitable insulating material.

Thus it will be seen that a very simple and effective form of condenser is provided which is particularly adapted to stand the bumps and vibration incident to the use of condensers of this kind on automobile radio sets.

While I have shown and described but a few embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. A condenser comprising a metal tube, closures of insulating material secured in the ends of the tube, the tube being rolled inwardly on both sides of the closure, a rolled paper condenser body enclosed by the tube and closures and having a metal lead extending from each end of the body and through a closure, an insulating envelope between the condenser body and the metal tube, and means for maintaining a substantial annular space between most of the metal tube and said envelope, whereby the capacity between the condenser body and the metal tube is reduced.

2. A condenser comprising a metal tube, closures of insulating material secured in the ends of the tube, the tube being rolled inwardly on both sides of each closure, a rolled paper condenser body enclosed by the tube and closures and having a metal lead extending from each end of the body and through a closure, an insulating envelope between the condenser body and the metal tube having a bearing at each end on the inwardly rolled portion of the tube on the inside of each closure, and means near the center of the condenser for spacing the envelope from the tube, whereby the capacity between the condenser body and the metal tube is reduced and the condenser body is positioned in the tube.

3. A condenser comprising a metal tube, closures of insulating material secured in the ends of the tube, the tube being rolled inwardly on both sides of the closure, a rolled paper condenser body enclosed by the tube and closures and having a metal lead extending from each end of the body and through a closure, an insulating envelope between the condenser body and the metal tube for insulating and positioning the body with respect to the tube, and portions of the tube extending inwardly for spacing the condenser body from the tube.

4. A condenser comprising a metal tube, closures of insulating material secured in the ends of the tube, the tube being rolled inwardly on both sides of the closure, a rolled paper condenser body enclosed by the tube and closures and having a metal lead extending from each end of the body and through a closure, an insulating envelope between the condenser body and the metal tube for insulating and positioning the body with respect to the tube, and the tube being inwardly deformed near its center for spacing the condenser body from the tube.

5. A condenser comprising a metal tube, closures of insulating material secured in the ends of the tube, the tube being rolled inwardly on both sides of the closure, a rolled paper condenser body enclosed by the tube and closures and having a metal lead extending from each end of the body and through a closure, a relatively long insulating envelope between the condenser body and the metal tube for insulating and positioning the body with respect to the tube, and a relatively narrow spacing member positioned between the condenser body and tube for spacing the condenser body from the tube.

6. A condenser comprising a metal tube, closures of insulating material secured in the ends of the tube, the tube being rolled inwardly on both sides of the closure, a rolled paper condenser body enclosed by the tube and closures and having a metal lead extending from each end of the body and through a closure, an insulating envelope between the condenser body and the metal tube for insulating and positioning the body with respect to the tube, and portions of the tube extending inwardly for spacing the envelope from the tube.

7. A condenser comprising a metal tube, closures of insulating material secured in the ends of the tube, the tube being rolled inwardly on both sides of the closure, a rolled paper condenser body enclosed by the tube and closures and having a metal lead extending from each end of the body and through a closure, an insulating envelope between the condenser body and the metal tube for insulating and positioning the body with respect to the tube, and the tube being inwardly deformed near its center for spacing the envelope from the tube.

LOUIS KOPINSKI.