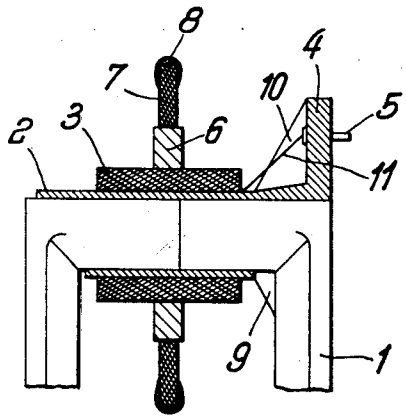
March 22, 1960 W. BRUCH 2,930,013

HIGH VOLTAGE TRANSFORMER

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(Prior Art)

Fig. 1

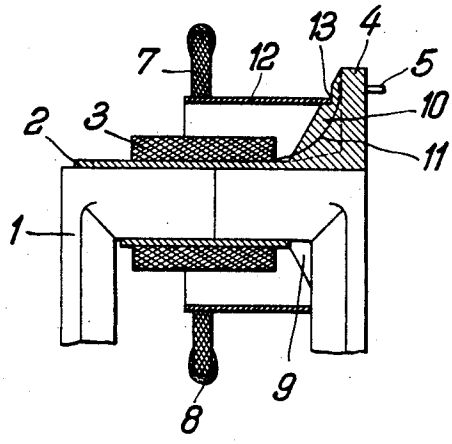


Fig. 2

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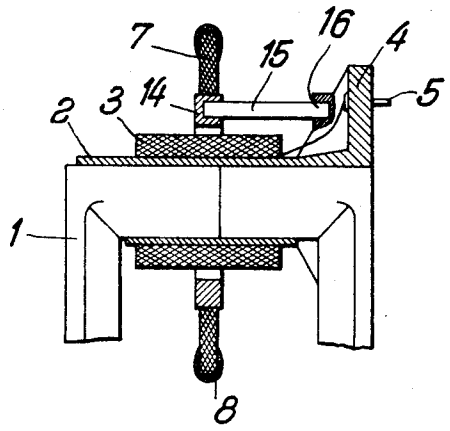


Fig. 3

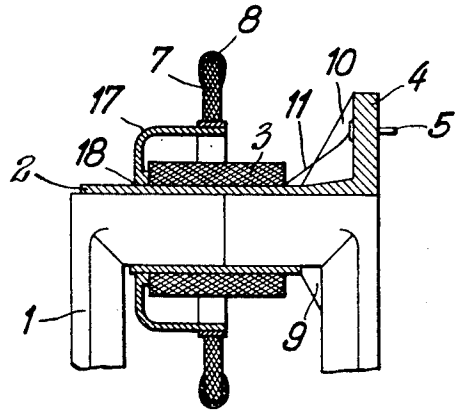


Fig. 4

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HIGH VOLTAGE TRANSFORMER

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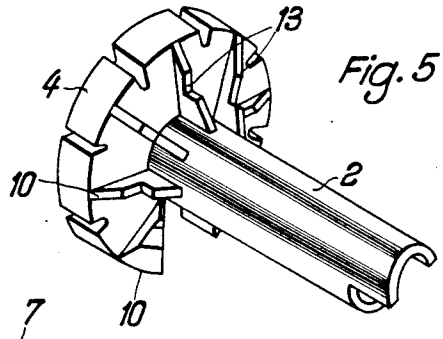


Fig. 5

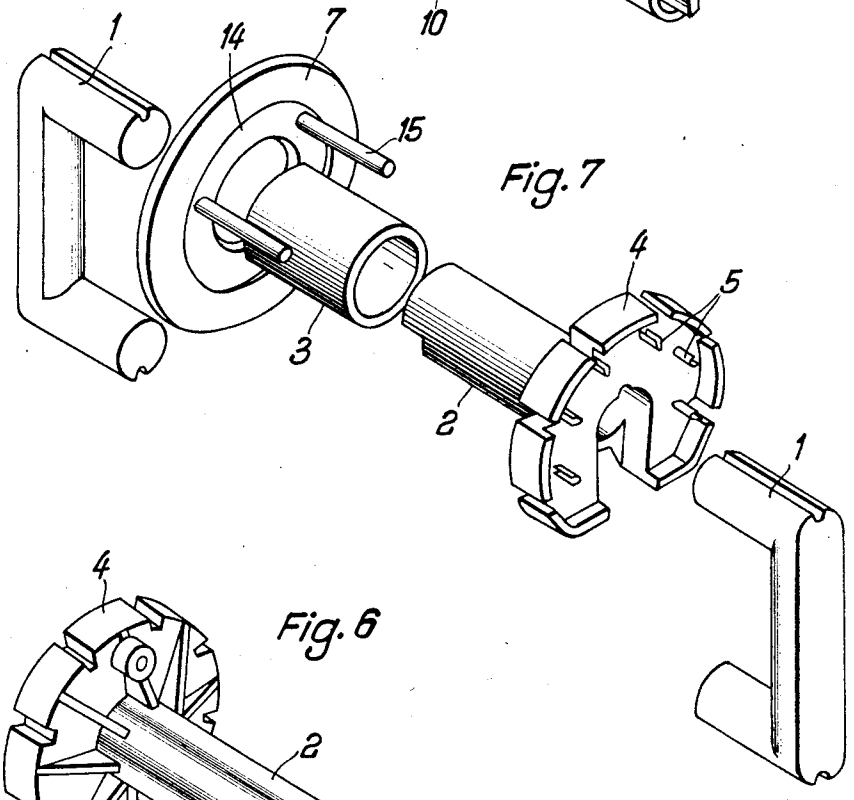


Fig. 7

Fig. 6

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United States Patent Office 2,930,013 Patented Mar. 22, 1960

2,930,013

HIGH VOLTAGE TRANSFORMER

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Application August 16, 1957, Serial No. 678,664

Claims priority, application Germany August 17, 1956

2 Claims. (Cl. 336—185)

The present invention relates to a high voltage transformer, particularly, for television receivers adapted to produce high voltage peaks from the horizontal sweep or flyback, these transformers having a rectangular, closed iron core and a clindrical winding form mounted on one of the legs of the core.

It has been known in such horizontal sweep transformers to wind a high voltage winding having a narrow width and a correspondingly increased height, in order to avoid corona effects and arcing-over to the low voltage windings, whereby the outmost winding layers, where the highest voltage pulses occur, have been spaced from the other layers by a distance as large as possible. Furthermore, it has been known to improve the insulation of the ends of the transformer windings by providing soldering terminals on a lateral flange of the winding form, said flange having an enlarged diameter and being provided with several reenforcing ribs.

In fastening the high voltage winding on the low voltage winding, wedge means have been used for obtaining a secure support. This has the disadvantage that, particularly in case of transformers in which a radial spacing between the low voltage winding and the high voltage winding is provided, the low voltage winding may be damaged. This radial distance may be filled by a ring of synthetic or plastic material.

It is an object of the present invention to avoid the foregoing disadvantages by mounting the winding form of the separately wound high voltage winding on the winding form supporting the low voltage winding.

Still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

In the drawings:

Figure 1 shows a side view partially in section of a prior art high voltage transformer for a television receiver, the lower part of the core being omitted;

Figures 2 to 4 show similar side views partially in sections of embodiments of high voltage transformers according to the present invention. Like parts in these figures are designated by the same reference numerals as in Figure 1.

Figures 5 and 6 show views of the winding form in perspective according to Figs. 2 and 3.

Fig. 7 is an exploded view in perspective of the elements of the transformer according to Figure 3.

In the prior art high voltage transformers of Figure 1, a rectangular, closed iron core 1 is formed of two U-shaped parts. A winding form 2, suitably made of synthetic or plastic material, supporting a low voltage winding 3 is provided on one of the core legs, one of the ends

of this winding form 2 having a flange 4 of large diameter carrying a number of soldering terminals 5. The low voltage winding 3 is first wound on the form 2 covering a relatively large width. A ring 6 of synthetic or plastic material is then mounted at the center of the winding 3 as a form to support a narrow high voltage winding 7 in order to obtain a large magnetic leakage. The circumference of the high voltage winding 7 is protected against corona effects by a bead 8 of sealing compound or the like, such corona effects readily occurring at the outer periphery, due to the high field intensities. The cross section of the core leg is circular within the form 2 in order to obtain better coupling, said cross section being approximately the same as that of the inner diameter of the form 2. The flange 4 of the form 2 is provided with a cut-out near reference character 9, intended to accommodate the leg of the core which is adjacent to the core leg carrying the windings. The flange 4 is provided with reenforcing ribs 10, between each of which one end of a winding 11 is passed to the respective soldering terminal. This known construction has the disadvantage that the ring 6 of synthetic or plastic material has to be wedged on the low voltage winding 3 to secure it in place.

In the high voltage transformer shown in the embodiment of Figure 2, the high voltage winding 7 is mounted on a separate cylindrical form 12 rather than on the ring 6 of synthetic material as in Figure 1, recesses 13 being provided in the reenforcing ribs 10 for centering the form 12 adjacent the flange 4. The one end of the cylindrical form 12 is mounted in these recesses 13. As a result of this construction, the low voltage winding is protected against mechanical damage and, in addition to this, a higher protection against arc-overs is obtained.

According to the embodiment of the invention shown in Figure 3, a ring 14 of synthetic or plastic material is provided as a support for the high voltage winding 7 in a similar manner as in Figure 1. However, in contrast to the transformer in Figure 1, the inner diameter of the supporting ring 14 is larger than the outer diameter of the low voltage winding 3. This supporting ring 14 of insulating material is mounted by means of a plurality of pins 15 which, at one of their ends, are fastened to the supporting ring 14 and are inserted at their other ends in holes 16 suitably provided in the flange 4 of the form 2, when the transformer parts are assembled.

Finally, in the embodiment of the high voltage transformer of Figure 4, a cylinder 17 inwardly flanged at one of its ends is provided as a form for supporting the high voltage winding 7. An opening 18 is provided through the flanged end of this cylindrical form 17, the diameter of this opening 18 being the same as the outer diameter of the form 2, whereby the cylinder 17 may be placed over said form 2 during assembly. The tolerance of the opening is selected in such a manner that a press-fit of the form 17 on the form 2 is assured.

I claim:

1. A high voltage transformer comprising, a core; a first coil form having an opening therethrough to receive said core; a low voltage winding on said first form and said winding being long in the axial direction as compared with its height on the first coil form; a second coil form having an opening therethrough of greater diameter than the outer diameter of said low voltage winding; a high voltage winding on said second coil form and said high voltage winding being short in the axial direction as compared with its height on the second form, said second form being disposed in spaced relation over said low voltage winding and being attached to and supported on a portion of said first form at locations offset from the ends of said windings, said second form comprising a cylinder having an inwardly disposed flange at one end, the inner

periphery of the flange being complementary in shape with the outer periphery of the first form and being a press-fit thereover.

2. A high voltage transformer comprising, a core; a first coil form having an opening therethrough to receive said core; a low voltage winding on said first form and said winding being long in the axial direction as compared with its height on the first coil form; a second coil form having an opening therethrough of greater diameter than the outer diameter of said low voltage winding; a high voltage winding on said second coil form and said high voltage winding being short in the axial direction as compared with its height on the second form, said second form being disposed in spaced relation over said low voltage winding and being attached to and supported on a portion of said first form at locations offset from the ends of said windings, said portion of said first form

comprising an outwardly disposed flange offset from one end of the low voltage winding and having an annular series of holes, the axes of which are parallel with the axis of the low voltage winding, and said second form comprising a ring coaxial with said low voltage winding and having an annular series of holes opposite and aligned with the holes of the first mentioned series; and a support pin transfixing the ring and the flange through each pair of aligned holes.

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