June 8, 1937.

W. B. WALLACE

2,082,992

MOLDED BASE WITH CONTACTS

Filed May 25, 1933

Fig. 1.

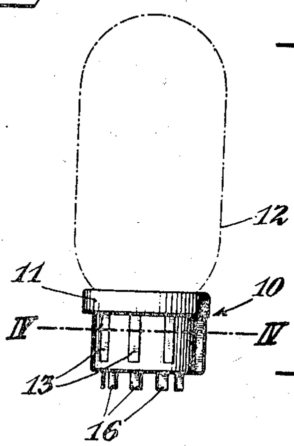


Fig. 2.

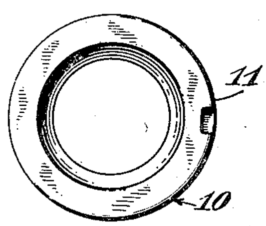


Fig. 3.

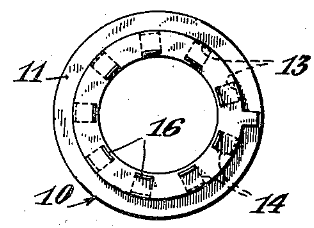


Fig. 4.

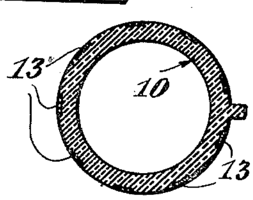


Fig. 5.

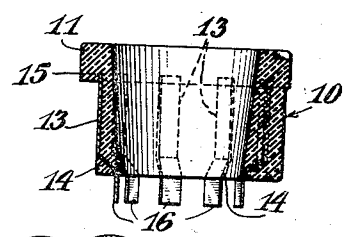


Fig. 7.

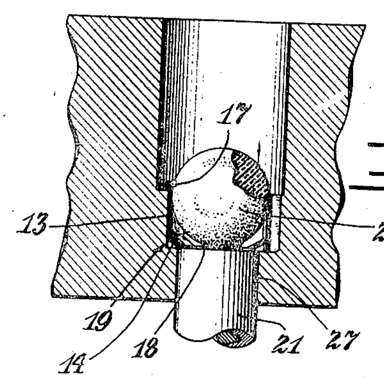


Fig. 8.

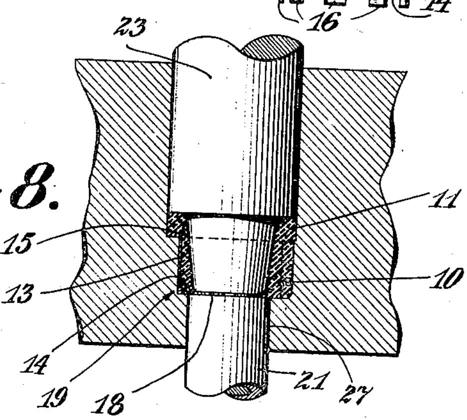


Fig. 9.

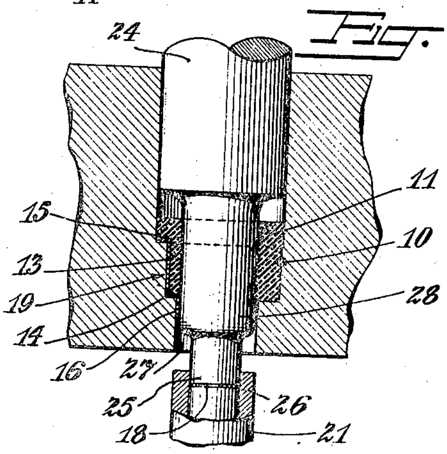
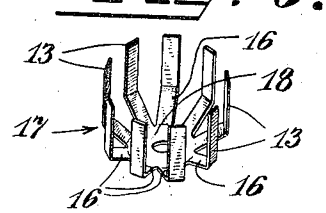


Fig. 6.



INVENTOR
W. B. WALLACE
BY M. F. Reger
ATTORNEY

Patented June 8, 1937 2,082,992

UNITED STATES PATENT OFFICE

2,082,992

MOLDED BASE WITH CONTACTS

Wilford B. Wallace, Bloomfield, N. J., assignor, by mesne assignments, to Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., a corporation of Pennsylvania

Application May 25, 1933, Serial No. 672,749

6 Claims. (Cl. 250—27.5)

This invention relates to an electrical device and more particularly to a base for a vacuum tube.

In the manufacture of bases for vacuum devices such as radio tubes it has been the practice to provide a cup-like vessel of bakelite or other insulative material having contact members projecting from the bottom wall of the base. The contact members were usually made of tubular form to receive the lead-in conductors extending from the bulb secured to the base. Bases as heretofore produced were made either by first molding the base to the proper form and then securing the contact members in the bottom wall or by molding the base and at the same time positioning the contact members so that they become secured in the moldable material when the same hardens.

The above practices met the manufacturing requirements for radio tubes in which a relatively small number of contact elements were employed. Recent developments in the radio tube art, however, have brought about certain changes in the tube construction whereby the number of contact members required has been greatly increased. Certain improved types of tubes are provided with additional internal elements making it necessary to provide a tube with from seven to nine or even a greater number of external contacts. Furthermore, the tendency is to reduce the size of the tube in order to meet the proportions of small-sized receiving sets and consequently the size of the required base becomes exceedingly small and it is necessary to economize room to accommodate the large number of contacts employed.

Inasmuch as it is difficult to properly space the contacts in the bottom wall of the base, owing to the limited amount of room, it has been proposed to utilize the side or cylindrical wall and arrange the contact members in spaced parallel relation. A construction showing this arrangement of contacts is disclosed in copending application Serial No. 667,215 filed April 21, 1933 by William Makenny and assigned to the assignee of the present invention. In the said copending application the contacts are secured by reason of their frictional engagement with slots formed in the surface of the wall. With this construction it is necessary to first form the insulative portion of the base and subsequently assemble or insert the contact members.

It is an object of the present invention, therefore, to provide a base which may be molded and contact members secured therein in a substantially single operation.

Another object of the invention is to provide a base having metallic members molded in the wall thereof, with portions exposed to the outer surface of the wall, and portions projecting from the lower edge of the wall.

A further object of the invention is to provide a method of molding a radio tube base, and simultaneously securing contact members therein, with portions projecting from the cylindrical wall of the base.

Other objects and advantages of the invention will be more clearly understood from the following description together with the accompanying drawing in which:

Fig. 1 is a side elevational view of a base constructed in accordance with the present invention;

Fig. 2 is an enlarged top view of the base as shown in Fig. 1;

Fig. 3 is an enlarged bottom view of the base shown in Fig. 1;

Fig. 4 is a view taken on line IV—IV in Fig. 1;

Fig. 5 is an enlarged vertical cross sectional view of the base shown in Fig. 1;

Fig. 6 shows a plurality of connected contact members ready to be molded in a base;

Fig. 7 shows the contact members in a mold with the moldable material in position to be shaped into the form of a base;

Fig. 8 is a view similar to Fig. 7 but shows the forming plunger of the mold in position to shape the moldable material about the contact members; and

Fig. 9 is a view showing a shearing and forming die for separating the contact members after they have been molded in a base.

The present invention may be practiced to provide a base 10 of suitable insulative material such as bakelite. The base may be of substantially tubular form having one end provided with a flange 11 to receive the neck or end portion 12 of a radio tube or the like, shown in dotted lines in Fig. 1. A tube or bulb may be secured to the base in the usual manner as for example, by means of a suitable adhesive basing cement.

The base may be provided with a plurality of contacts 13 arranged in parallel spaced relation around the cylindrical wall of the base and substantially on the surface thereof to expose portions of the contacts for engagement with other contacts when the base is applied to a socket. The contacts 13 are embedded in the wall and are also held in position by having portions 14 extending through the base material, and by means of end portions 15 extending into the flange 11. It has been found, however, that if desirable, the contacts need not have the end 15 extending into the flange as shown, but that the contacts may be substantially shorter, depending on the practical requirements.

The lower ends 16 of the contacts may project downwardly so as to provide a convenient means for attaching the lead wires to the bulb which may be welded or otherwise secured to the lower ends or taps 16. As shown in Fig. 4, contact portions 13 are embedded in the insulative material, and, by reason of the pressure exerted during the molding operation, they are held firmly in place.

The selected method of forming the base with the contacts molded therein is shown in Figs. 7, 8 and 9 and a practical form of assembled contacts is shown in Fig. 6. These contacts are provided as a formed blank 17 having the extensions 16 integral with a common connecting ring or disk 18. It will be appreciated that the formed blank 17 may be readily made of a flat sheet of material by a simple piercing and forming operation.

The blank 17 is of the proper dimensions to fit a mold 19 the bottom surface of which includes a plunger 21. When the blank 17 is in position a pellet 22 of bakelite is disposed in the mold, as shown, and a plunger 23 descends causing the bakelite to flow to the mold cavity and embed the contact members.

It will be understood that the molding operation is performed while the mold and bakelite is at high temperature and that extremely high pressure is employed during the molding operation. These pressures and temperatures employed are well known to those skilled in the art of bakelite molding. After the base has been molded, as shown in Fig. 8, a piercing and forming plunger 24 may be employed to disconnect and form the ends of the contacts. The lower end 25 of the plunger 24 is provided with a shearing edge which cooperates with a female shearing member 26. The member 26 may be moved into passage 27 and against the bottom of the formed blank 17. When the shearing plunger descends, connector ring 18 will be sheared from the lower ends 16 of the contacts leaving the said ends projecting inwardly. A continued downward movement of the plunger 24, however, will bring a forming shoulder 28 into contact with the extensions 16 bending them downwardly to provide taps, as shown in Figs. 1 and 5.

The present invention makes it possible to manufacture radio tubes at a relatively high rate of speed and by arranging the contacts, as shown in the formed blank, the spaced relation and definite relative positions of the contacts are fixed and maintained throughout the molding operation.

Although a preferred embodiment of the invention is shown and described herein, it is to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A base for a vacuum device comprising a tubular body having a flange, a metallic contact member disposed on the outer surface of the side wall of said body, one end of said member extending into said flange the portion intermediate the ends of said member being embedded in the wall with the outer surface of the contact member substantially flush with the outer surface of said wall and the other end of said member extending through said wall.

2. A base for a vacuum device comprising a tubular body having a flange about one end, a plurality of elongated metallic contact strips disposed in parallel relation and embedded in the outer surface of the side wall of said body, each of said strips having an end extending under said flange and the other end extending through said wall and a surface of the strip between the ends being exposed to serve as a contact surface.

3. A base for a vacuum device comprising a tubular body of insulative material and metallic contact members embedded in the side wall of said body with exposed portions extending through the outer surface of the wall of said body and providing surfaces continuous with said outer surface of said wall and substantially in the same plane as the surface of said wall, portions of said contact members adjacent their ends extending diagonally entirely through said wall, completely covered by insulative material, and terminating in exposed portions for connection with lead wires.

4. A base for a vacuum device comprising a tubular body of insulative material and metallic contact members embedded in the side wall of said body with exposed portions extending through the outer surface of the wall of said body and providing surfaces continuous with said outer surface of said wall and substantially in the same plane as the surface of said wall, said contacts having other portions extending entirely through said wall, completely covered by insulative material, and terminating in end portions projecting from the inner surface of said wall for attachment to lead wires.

5. A base for a vacuum device comprising a tubular body of insulating material, a metallic contact member imbedded in the outer surface of the side of said body and extending for approximately the full height thereof, with its outer surface exposed and substantially flush with said insulating body, one end portion of said contact member extending diagonally through said insulating body and terminating in an exposed portion for attachment to a lead wire.

6. A base for a vacuum device comprising a tubular body of insulating material, a plurality of metallic contact strips imbedded in the outer surface of the side of said body and extending parallel to one another for approximately the full height of said body, one end portion of each of said strips extending diagonally through the wall of said body and terminating in an exposed portion adapted to serve for connection with a lead wire.

WILFORD B. WALLACE.