

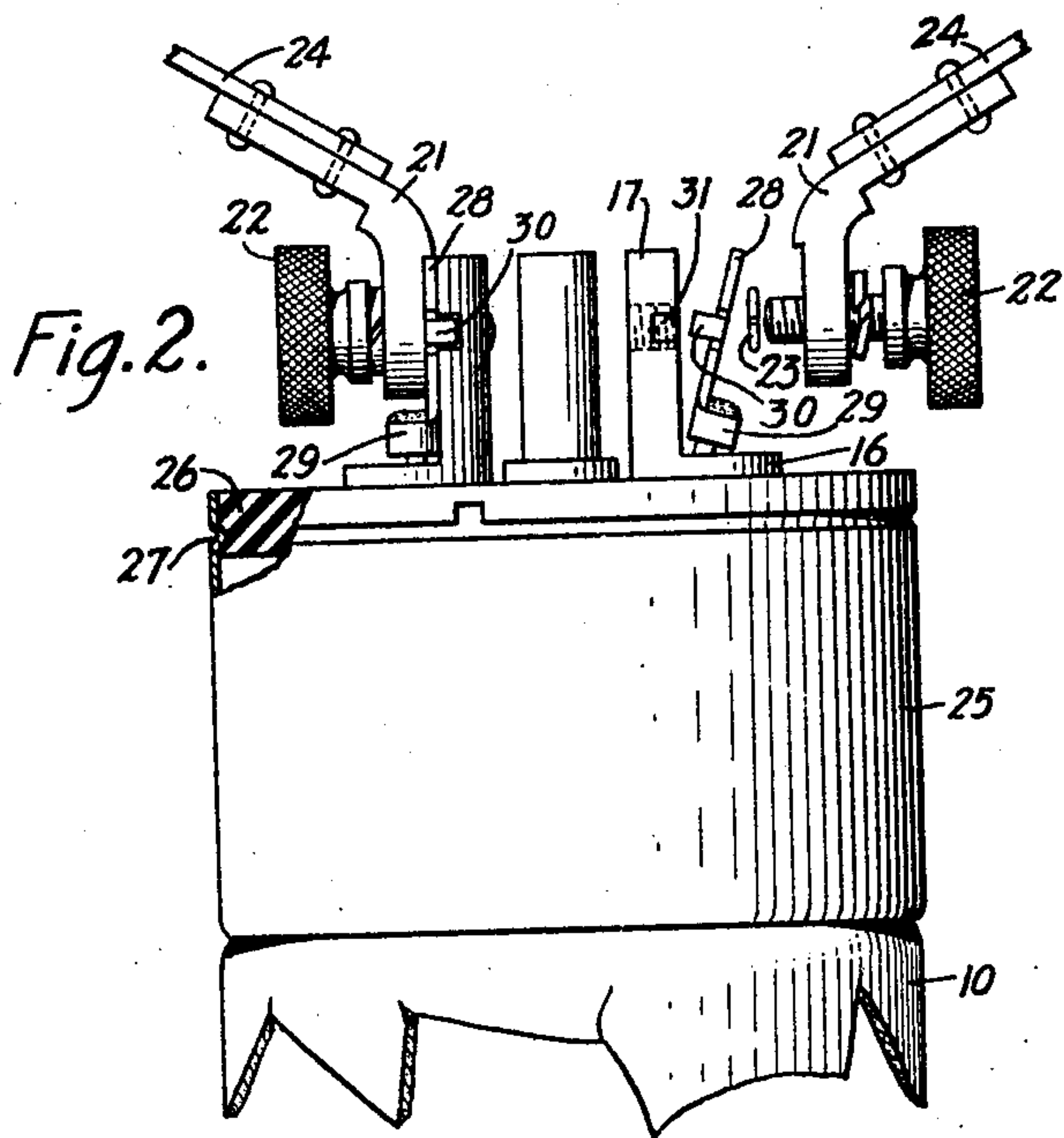
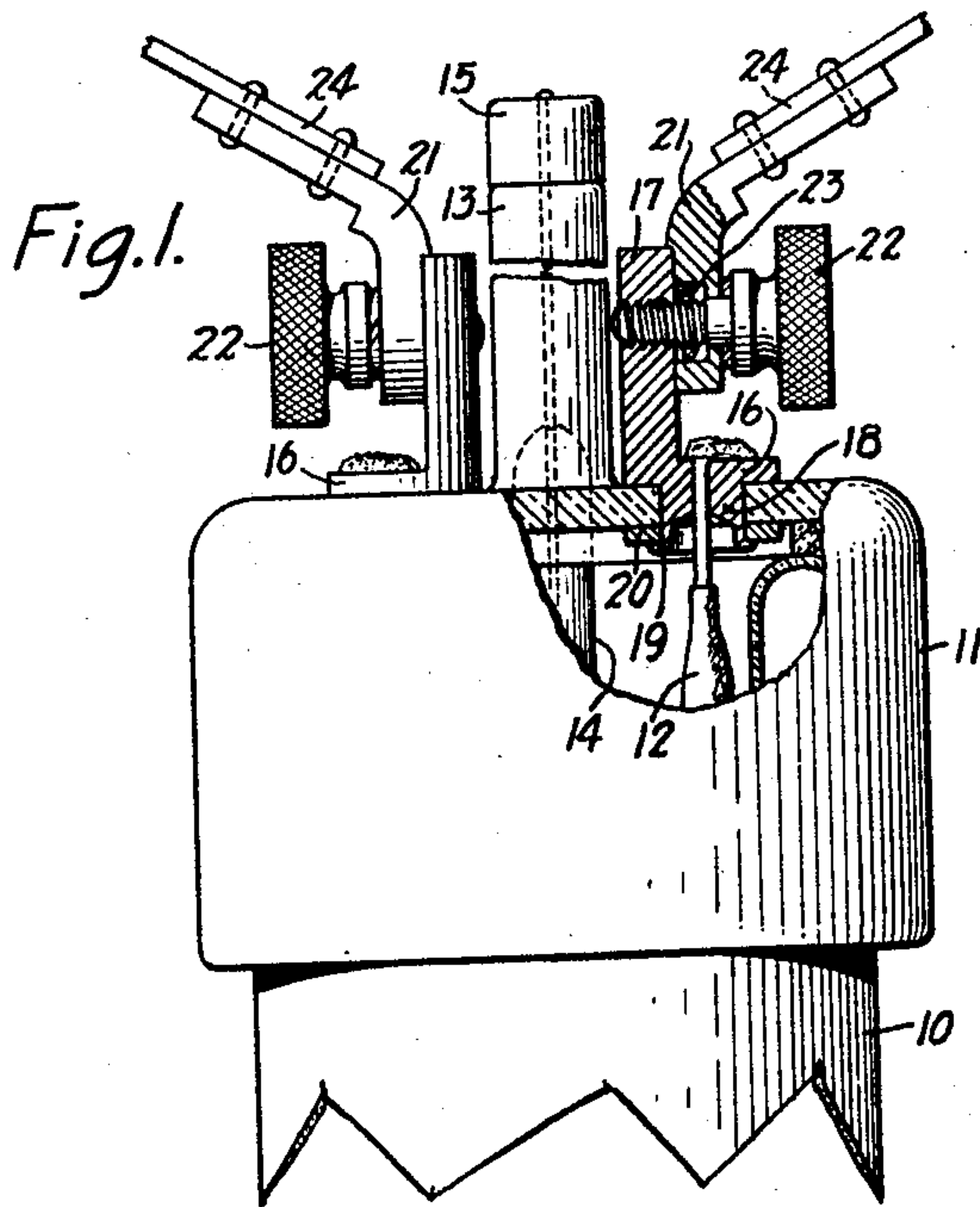
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A. I. CRAWFORD ET AL

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VACUUM TUBE BASE

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Att'y.

UNITED STATES PATENT OFFICE.

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VACUUM-TUBE BASE.

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This invention relates to vacuum tube bases and more particularly to such bases capable of carrying heavy current.

The extremely heavy currents used in the operation of high power, water cooled electron discharge devices of the external anode type, necessitate the employment of relatively large contact terminals on the base for the connections to the leading-in wires of the electrodes. Due to the large mass of the terminals it is difficult to solder or electrically connect the leading-in wires to the terminals without injuring the insulation of the base or loosening the terminals in the base. Furthermore, the type of terminal heretofore used required frictional connectors or other type straps or clips, to connect the terminals to the current carrying conductors.

The principal object of the invention is to provide a contact terminal for a vacuum tube base to which a leading-in wire may be attached without injuring the insulation of the base or causing a loose connection.

A further object of the invention is to provide a readily removable connection between the base terminal and the current conductor.

The invention, in one form, comprises a cup-shaped base which encloses a glass portion of an electron discharge device through which the leading-in wires are sealed. An L shaped contact terminal is rigidly fastened to the base and consists of a disc portion attached to the base and an eccentric upright portion integral with the disc portion. The leading-in wire extends from the glass seal to the disc portion and projects through an opening therein and may be either soldered thereto or to a separable punching which is frictionally attached to the eccentric portion of the terminal. A bus-bar or bus-bar conductor through which current is supplied to the tube has permanently attached thereto a contact member adapted to be clamped to the eccentric portion of the L shaped contact terminal by means of a screw which passes there-through and through the eccentric terminal portion. This arrangement provides an efficient connection between the leading-in wire within the tube base and the contact terminal on the base and eliminates the possibility of loosening of the terminal and the destruction of the insulated portion of the base. Furthermore, a large surface contact is obtained be-

tween the terminal on the base portion of the device and the removable member on the bus-bar conductor.

The invention can be more easily understood by referring to the following detailed description in connection with the accompanying drawing in which Fig. 1 illustrates one embodiment of the invention with a portion broken away to show the detailed construction and Fig. 2 is a modified form of the invention.

Referring more particularly to Fig. 1, a portion 10 of the glass enclosing vessel of an electron discharge device is shown, provided with a cup-shaped receptacle or base 11, of insulating material, such as porcelain or isolantite. This base is cemented or otherwise affixed to the end of the glass enclosing vessel 10 through which the leading-in wires 12 extend. An integral tubular extension 13 projects from the base 11 and is concentric with respect to said base to form a protective member for the glass tubular extension 14 projecting from the glass vessel 10. A metallic cap 15 attached to the extreme end of the extension 13 forms a contact terminal for the leading-in wire extending through the tube 14. An aperture on either side of the tubular extension 13 is provided in the base 11 to receive a terminal member to which the leading-in wire 12 is attached. This terminal member consists of an apertured disc portion 16 and an eccentric semi-cylindrical portion 17 projecting from the upper surface of the disc portion and at right angles thereto. A countersunk cylindrical extension 18 projecting from the lower surface of disc portion 16 projects through the aperture in the base 11 and is attached thereto by having the rim 19 of the countersunk extension 18, spun over a metal ring 20 within the base portion 11. This arrangement forms a rigid connection between the contact terminal and the base 11. The leading-in wire 12 extends through the disc portion 16 and may be electrically connected or soldered directly to the disc portion 16. The excessive heat necessary to provide a good soldered joint between the leading-in wire and the metal terminal will not injure the porcelain base because of its highly refractory nature. The flat surface of the eccentric semi-cylindrical portion 17 of the terminal affords a large contact surface

which is arranged to abut against a corresponding surface on the removable contact lug or terminal 21 these two members being securely clamped together by the knurled head screw 22 which threads into the portion 17 and has a shouldered portion bearing against terminal 21. A retaining ring 23 on the threaded portion of the screw 22 prevents the removal or loss of screw from the lug 21. The free end of the member 21 is bent at an angle and is riveted to a bus-bar conductor 24. This construction affords a direct, large surface contact between the current carrying conductor and the metallic terminal on the base and also provides a readily removable connection.

A modified form of the invention is shown in Fig. 2 in which the ordinary type base is shown. This base comprises a cylindrical metal shell 25 which is cemented or otherwise affixed to the glass portion 10 of the electron discharge device. At one end of the shell 25 is an insulating disc 26, which is held therein by means of an inwardly projecting ridge 27 on the shell. The contact terminals which are affixed to the insulating disc 26, in the same manner as disclosed in connection with Fig. 1, comprise the disc portion 16, the semi-cylindrical portion 17, together with the removable cooperating member 21, and the threaded connector 22. Due to the large mass of the contact terminal it is extremely difficult to solder or weld the leading-in wire to the terminal without injuring the insulating disc 26, which is usually of a low melting point, resinous material, such as bakelite. However, in the present structure this difficulty is overcome by soldering or welding the leading-in wire to a flat metallic punching, or intermediate member 28, provided with bent fins at the lower end which surround the leading-in wire and form a sleeve for making a good soldered joint between the punching and the leading-in wire. Projecting from each longitudinal edge of the punching 28 is an angular lug 30, which fits into a recess 31, on each longitudinal edge of the flat portion of the eccentric portion 17.

The assembly of this connector is clearly shown in Fig. 2, in which the right-hand terminal is shown in its dissected form and the left-hand terminal shows the complete assembly. The intermediate member 28 is attached to the eccentric portion 17 by registering the lugs 30 with the recesses 31, inserting the threaded member 22 through the aperture in member 28 and rotating the threaded member to engage the threaded portion of the eccentric portion 17. This arrangement securely clamps the member 28 between the removable contact member 21 and the terminal 17 and presents a large contact surface to the passage of current. Furthermore, the insulating portion of the base is not subject to

excessive heat during the soldering operation and therefore the contact terminal cannot become loose or defective.

While the invention has been disclosed with respect to a detailed assembly of parts, it is apparent that various modifications may be made in the structure without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

1. A base for electron discharge devices having a cylindrical portion and an apertured insulating portion closing one end of said cylindrical portion, metallic terminals attached to said apertured portion, each of said terminals having a circular portion abutting on said apertured portion and a semi-cylindrical portion projecting from said circular portion, separable metallic members and means for clamping said members to said semi-cylindrical portions.

2. In combination an electron discharge device having a glass enclosing vessel, a leading-in wire sealed in said vessel, a cup-shaped base attached to said vessel and enclosing said leading-in wire, a terminal carried by said base, said terminal having an apertured disc portion and an eccentric portion projecting at right angles from said disc portion, a removable contact lug, means for attaching said lug to said eccentric portion, said leading-in wire extending through said disc portion, and means connecting said leading-in wire to said terminal.

3. In combination an electron discharge device having an enclosing vessel, a leading-in wire sealed in said vessel, a cup-shaped base attached to said vessel and surrounding said leading-in wire, a terminal member carried by said base, said terminal member having a disc portion and an eccentric portion, a separable metallic member, an apertured intermediate member, said leading-in wire being attached to said intermediate member, and means for clamping said intermediate member between said eccentric portion and separable member.

4. In combination an electron discharge device having an enclosing vessel, a leading-in wire sealed in said vessel, a cup-shaped base attached to said vessel and surrounding said leading-in wire, a terminal carried by said base, said terminal having a disc portion and a notched semi-cylindrical portion, an intermediate metallic member having bent ears fitting into said notched portion, a bus-bar connecting lug, and a cooperating member clamping said intermediate member between said notched portion and lug.

In witness whereof, we hereunto subscribe our names this 16th day of March, A. D., 1926.

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