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E. G. GAGE

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ELECTRICAL CONNECTER

Filed April 12, 1926

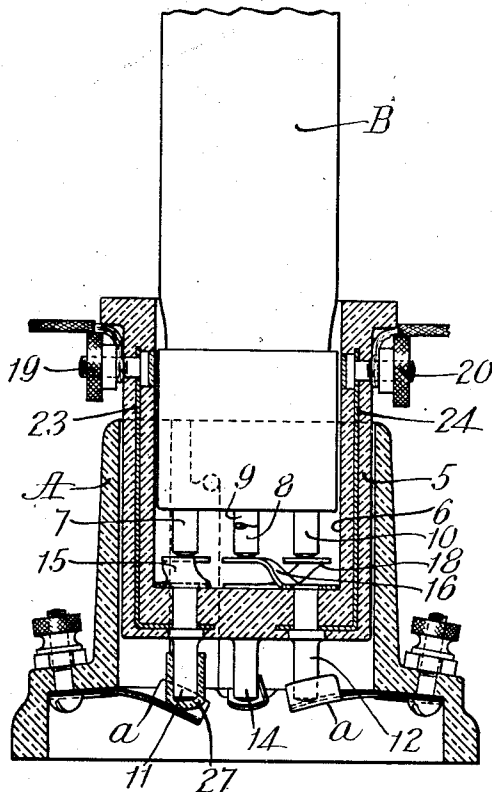


Fig. 1.

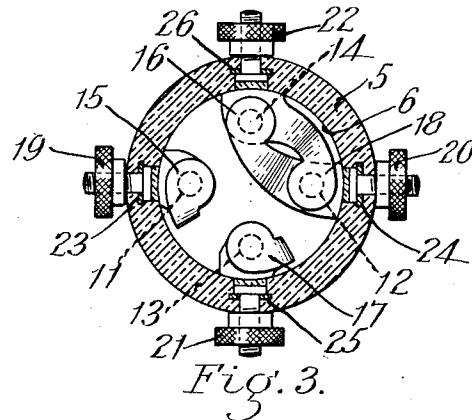


Fig. 3.

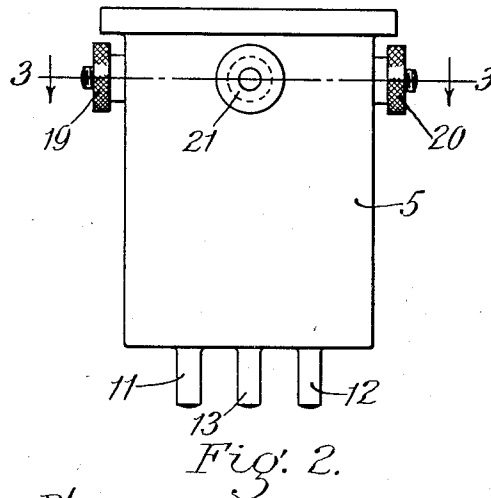


Fig. 2

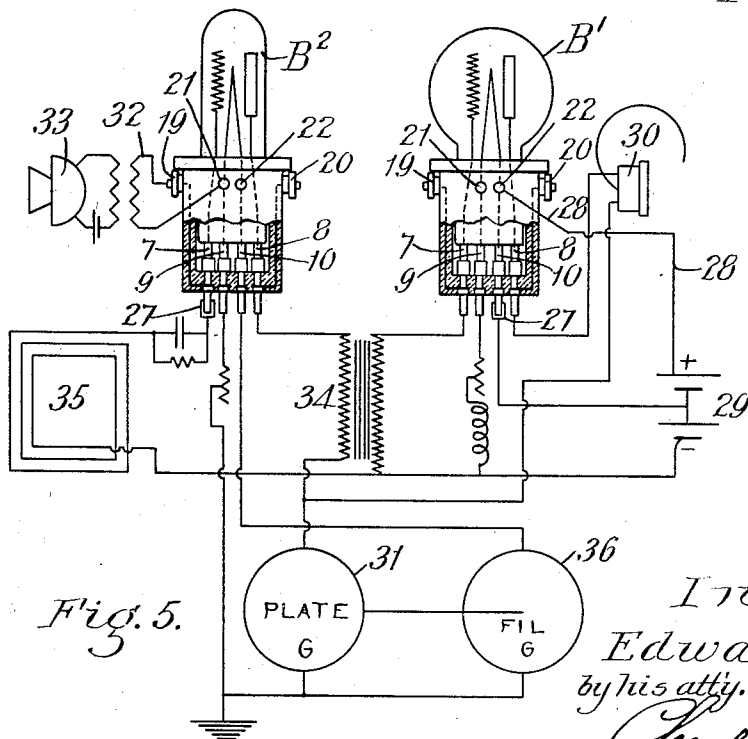


Fig. 5.

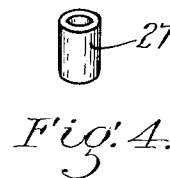


Fig. 4.

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UNITED STATES PATENT OFFICE

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ELECTRICAL CONNECTER

Application filed April 12, 1926. Serial No. 101,326.

This invention relates to an improved system for supplying current to a vacuum tube and to a special socket adapter for vacuum tubes and has for one of its objects to provide an adapter of the character set forth and constructed so as to permit any element of a vacuum tube to be connected independently to another circuit so that it may be used in a different manner if desired.

The subject-matter of this application is a continuation of an application made by me for "System for supplying current to vacuum tubes", Serial No. 704,966, filed April 8, 1924.

To enable different types of vacuum tubes to be used, which may differ as to their electrical constants, I have provided a type of socket adapter which allows any element of the tube to be used at will, so that it may be operated from a separate and independent source if desired. As an example, a special tube may be used in a set using tubes of a different type already supplied with generator current, and the special tube may be supplied with current from a dry battery or from a tap from a filter circuit.

The invention is disclosed in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings:

Figure 1 represents a central vertical section through an adapter embodying my invention, said adapter being illustrated in position within a socket and also having a vacuum tube mounted therein.

Fig. 2 represents a front elevation of the adapter.

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of an insulating sleeve.

Fig. 5 is a diagram illustrating two methods of employing my improved adapter.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, A represents a vacuum tube socket of well-known construction provided with a plurality of yielding contact members *a*, which are provided for the purpose of yieldingly engaging the terminal pins

of a vacuum tube when the latter is mounted directly in the socket.

5 represents the body or base of a cup-like adapter constructed of suitable insulating material such as molded plastic composition, and having a recess 6 formed therein for the reception of a vacuum tube B, the latter being of a different type from the vacuum tube previously mentioned. The vacuum tube B embodies therein a grid terminal pin 7, a plate terminal pin 8 and negative and positive filament terminal pins 9 and 10.

The adapter 5 has a grid terminal pin 11, a plate terminal pin 12 and negative and positive filament terminal pins 13 and 14 respectively, all of said pins being rigidly secured in said adapter and positioned to engage the contact members *a* of the socket A. The adapter 5 is provided with contact members 15, 16, 17 and 18, the member 15 being secured to the adapter 5 by the terminal pin 11 and being adapted to yieldingly engage the lower extremity of the terminal pin 7 of the vacuum tube B. The contact member 16 is fastened to the adapter 5 by the terminal pin 12 and is adapted to yieldingly engage the lower extremity of the terminal pin 8 of the vacuum tube B. The contact member 17 is fastened to the adapter 5 by the terminal pin 13 and is adapted to yieldingly engage the lower extremity of the terminal pin 9 of the vacuum tube B, and the contact member 18 is fastened to the adapter 5 by the terminal pin 14 and is adapted to yieldingly engage the lower extremity of the terminal pin 10 of the vacuum tube B.

Also mounted upon the outer end or rim of the adapter 5 are a plurality of auxiliary terminals 19, 20, 21 and 22, the terminal 19 being electrically connected with the terminal pin 11 by a connection 23 which is preferably located within the insulating wall of the adapter. The auxiliary terminal 20 is electrically connected with the terminal pin 12 by a connection 24 also located within the wall of the adapter 5. In like manner the auxiliary terminals 21 and 22 are connected with the terminal pins 13 and 14 respectively by connections 25 and 26 respectively.

An insulating sleeve 27 illustrated in de-

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tail in Fig. 4 and preferably constructed of soft flexible rubber, may be applied to the extremity of each of the terminal pins 11, 12, 13 or 14 of the adapter 5 as illustrated in Figure 1 and when so applied, said sleeve insulates the terminal pin to which it is applied from its contact member *a*.

In Figure 5 I have illustrated diagrammatically a vacuum tube B' mounted within an adapter 5, and the filament terminal pin 14 of said adapter has an insulating sleeve 27 located at its lower extremity, thereby disconnecting said terminal pin from its regular position in the circuit, and an independent connection 28 is attached to the auxiliary terminal 22 and connects with a higher voltage tap in the output set in a battery 29.

By this means the possibility of inserting a low-voltage tube in the high-voltage circuit is prevented. When it is desired to use the low-voltage tap the regular socket is used.

In the diagram, Fig. 5, 30 represents a head-phone set or sound reproducer in circuit with a high-voltage B battery generator.

Another method of utilizing my improved system and socket adapters 5 is illustrated in Fig. 5 in connection with a vacuum tube B². In this case the grid terminal pin 11 of the adapter 5 is disconnected from its regular position by an insulating sleeve 27 and an independent connection is made from the auxiliary terminal 19 through a wire 32 to the circuit of a voice transmitter 33, such as is used in instruments for the deaf. This allows the use of a regular radio instrument in the home as an aid to hearing, and the transmitter 33 may be a very sensitive pick-up means to respond to voices in the room, or other sound or vibration sources other than those within the radio set itself, a sound reproducer or special ear pieces being used for reception.

In the diagram, Fig. 5, 34 represents a transformer, 35 an antenna, and 36 a generator.

My improved adapter may be used to advantage in neutrodyne sets where it is desired to use an independent grid return for different types of tubes having different grid-filament capacity. The adapter may also be used where it is desired to test out various ratios of audio and radio frequency transformers in the same set. The adapter may also be used in introducing tubes requiring different C batteries or grid bias. The insulating sleeves 27 are supplied with each adapter 5 to be fitted over the terminal pin of the element desired for independent connection as shown in Figure 1.

The insulating portion 5 is made of sufficient length so that its upper end or rim when it is inserted in a socket as shown in Fig. 1 projects like a collar above the rim of the socket A. The auxiliary terminals 19, 20 and

so forth, therefore project laterally for convenience in handling and wiring.

I claim:

1. A socket adapter for a vacuum tube having, in combination, a receptacle of insulating material adapted to be inserted within a socket for a vacuum tube and also having a recess to receive a vacuum tube base, a plurality of terminal pins fast to said receptacle and adapted to have electric contact with the terminal pins of said last-mentioned vacuum tube, and a plurality of auxiliary terminals also mounted in said receptacle, each of said auxiliary terminals being electrically connected to one of said terminal pins.

2. A tube adapter comprising an insulating cup-like body adapted to receive a tube base and having contacts inside for the prongs of a tube, a terminal connected to one of said contacts and projecting from the lower end of the body, a circuit terminal at the open end of the body and a conductor embedded in a side wall of the body with a foot in the bottom of the body, said conductor being electrically connected to said terminals.

3. A tube adapter comprising an insulating cup-like body having a cylindrical wall and a bottom, a contact secured in the bottom of the body and a conductor having one end at the outer edge, said conductor being embedded in the wall of the body with one end connected to said contact, an external terminal on the bottom of the body connected to said contact, and a circuit terminal connected to said conductor at the outer edge of the body.

4. A vacuum tube adapter comprising a cup like body having a recess adapted to receive the base of a vacuum tube having prongs, interior contacts within said recess for the tube prongs, external projecting prongs carried by the body, a number of auxiliary circuit terminals located at the side of the body near the end opposite the prongs and each electrically connected to one of the prongs, some of the interior contacts being connected to some of said prongs.

5. A connector for a vacuum tube device comprising a cup shaped member having prongs in the bottom thereof electrical contact terminals and a number of auxiliary connection terminals secured to an integral rim portion of the cup shaped member and projecting laterally therefrom.

6. A connector for a vacuum tube device comprising a cup shaped body portion, prongs attached to the bottom thereof and constituting main electrical contact terminals, a terminal supporting means and auxiliary terminals thereon, and connector means between certain of said prongs and certain of said auxiliary terminals, said connector means being located in the body of said device.

7. A vacuum tube connector member com-

prising an integral member of molded insulation having a cup shaped portion, terminals in the bottom thereof and a side wall projecting from the bottom of the cup-shaped portion and constituting means for supporting
5 a connection terminal, a connector member mounted within said side wall and a connection terminal projecting from the side wall and connected by said connector means to one
10 of the terminals in the bottom of the cup shaped member.

In testimony whereof I have hereunto set my hand.

EDWARD G. GAGE.

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