Nov. 25, 1924 1,516,837

C. F. WRIGHT

THERMIONIC TUBE ADAPTER

Filed April 4, 1923 2 Sheets-Sheet 1

Fig. 1.

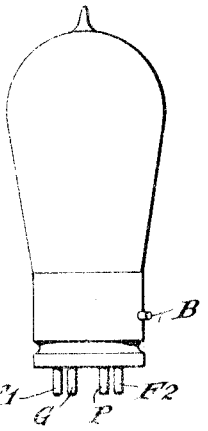


Fig. 6.

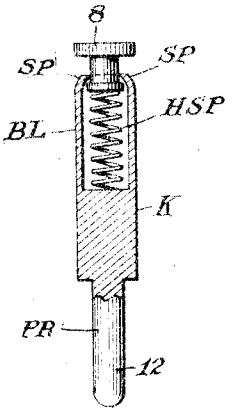


Fig. 2.

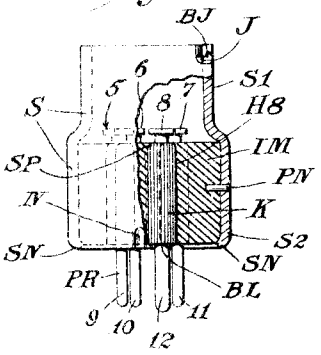


Fig. 5.

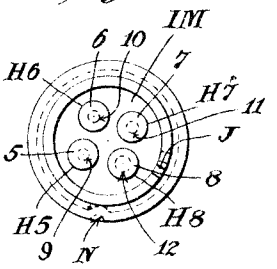


Fig. 4A.

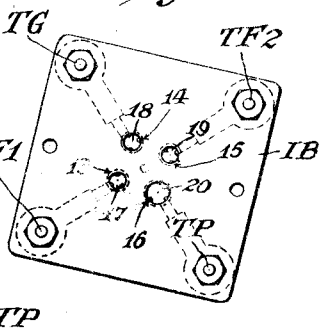


Fig. 3.

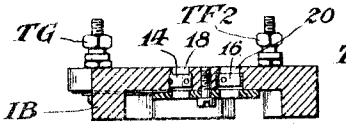
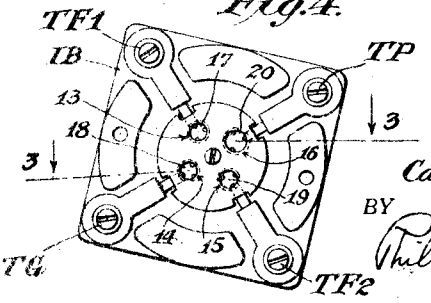


Fig. 4.



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Fig. 7.

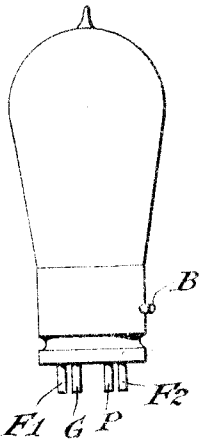


Fig. 10.

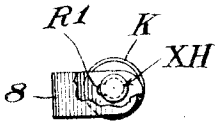


Fig. 11.

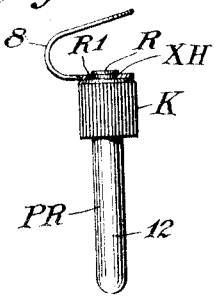


Fig. 8.

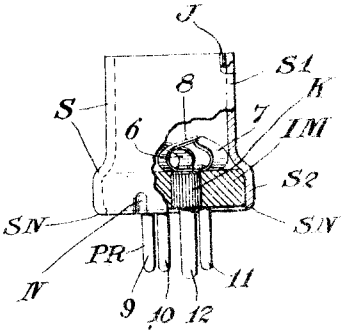
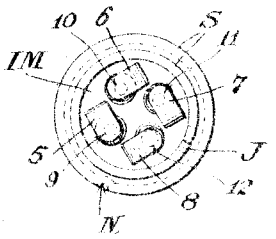


Fig. 9.



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Patented Nov. 25, 1924. 1,516,837

UNITED STATES PATENT OFFICE.

CARLETON FAY WRIGHT, OF PLYMOUTH, MASSACHUSETTS, ASSIGNOR TO WIRELESS SPECIALTY APPARATUS COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF NEW YORK.

THERMIONIC-TUBE ADAPTER.

Application filed April 4, 1923. Serial No. 629,743.

To all whom it may concern:

Be it known that I, CARLETON FAY WRIGHT, a citizen of the United States of America, and a resident of Plymouth, State of Massachusetts, have invented certain new and useful Thermionic-Tube Adapters, the principles of which are set forth in the following specification and accompanying drawings, which disclose the form of the invention which I now consider to be the best of the various forms in which the principles of the invention may be embodied.

This invention relates to thermionic tube adapters.

The object of the invention is a device which will afford convenience to the radio-using public in permitting the employment of a thermionic tube having a given construction of base and/or contact prongs, in association with a tube-socket constructed to receive a tube of different construction of base and/or contact prongs.

The invention consists of the various features disclosed herein and described below and in the association thereof in the adapter construction of the invention.

Of the drawings, Figs. 1–6 illustrate one form of the invention, and Figs. 7–11 illustrate another form, the form of Figs. 7–11 being preferred.

Figure 1 is a side elevation of an example of a thermionic tube which is to be accommodated by the adapter herein, shown below in Fig. 2, to a tube-socket construction arranged to receive a tube of different construction of base and contact prongs from those of the tube of Fig. 1.

Fig. 2 is a side elevation, partly in section, of the adapter itself embodying in one form the features of the invention.

Figs. 3, 4 and 4^{A} show an example of a tube-socket which is constructed to receive a tube base of different construction from the base of the tube of Fig. 1; Fig. 4 being a bottom plan of such base, Fig. 3 being a vertical section (right side up) on line 3—3 of Fig. 4, and Fig. 4^{A} being a top plan.

Fig. 5 is a top plan of the adapter of Fig. 2.

Fig. 6 is a side elevation, partly in section, of the construction of one of the four contact devices (each having a prong and spring contact arrangement) of the adapter of Figs. 2 and 5.

Of the second form of the invention shown on Sheet 2, Fig. 7 is like Fig. 1 a side elevation of a thermionic tube which is to be accommodated by the adapter-construction shown below in Fig. 8.

Fig. 8 is a side elevation, partly in section (similar to Fig. 2) of the adapter.

Fig. 9 is a top plan of Fig. 8.

Figs. 10 and 11 show the construction of one of the four contact devices (each with contact prong and spring) of the adapter of Figs. 8 and 9; Fig. 10 being a top plan of such contact device, and Fig. 11 being a side elevation.

Referring to Figs. 1–6, the adapter of Figs. 2, 5 and 6 is constructed to permit the mechanical and electrical co-ordination of the base and the contact prongs of the tube of Fig. 1 with the four circuit terminals TF^{1}, TG, TF^{2} and TP of the socket of Fig. 4, this socket being a form designed to receive a tube having a base and contact prongs of different constructions from those of the tube of Fig. 1. The base of the tube of Fig. 1 includes four contact prongs F^{1}, G, P, F^{2} of uniform size and extension below the base, and includes also a pin B adapted to engage a bayonet joint slot of a socket adapted to usual employment with said tube of Fig. 1, such socket not being shown. The socket of Figs. 3, 4 and 4^{A}, however, is constructed to receive a tube (not shown) having four contact prongs which are generally similar to those (1—4) of Fig. 1, but one of the prongs is of larger diameter and greater projection beyond the tube base than the other three contact prongs. Cf. prong 12 of the adapter of Fig. 2.) Also the prongs of the tube (not shown) to which the socket of Figs. 3, 4 and 4^{A} is adapted has its prongs spaced differently with respect to one another as compared with the prongs of the tube of Fig. 1, so that the latter will not enter into said socket. Also the diameter of each of the prongs of the tube of Fig. 1 is different from that of the three prongs of the tube to which said socket of Figs. 3, 4 and 4^{A} is adapted (other than the fourth prong of greater diameter and projection from the tube); which is another reason why the tube of Fig. 1 is not receivable in said socket. Also the tube normally directly receivable in the socket of Figs. 3, 4 and 4^{A} is not provided with a bayonet joint pin as B of Fig. 1; but the tube is held to the socket by certain springs to be described, which

grip the tube-prongs. (The tube normally receivable in the socket of Fig. 4 is not shown herein, being a standard commercial article. The socket, of construction suitable for the direct reception of the tube of Fig. 1, also is omitted herefrom, being likewise a standard commercial article.)

The socket of Figs. 3, 4 and 4A, also a standard commercial product, consists of an insulating base IB having a hollow lower portion (Fig. 4 is a bottom plan) and containing four hook-shaped contact springs 13—16 suitably supported as shown and electrically connected with the four circuit terminals TG, TF1, TP and TF2. Insulating base IB is formed with four vertical holes 17—20 for the reception of the contact prongs of the tube, the base of which is to be mounted on top of insulating base IB (Figs. 3 and 4A) so that the four contact prongs engage and are held tightly by the four hook-shaped springs 13—16 within said four holes.

Specifically, the adapter hereof is constructed to permit the use of thermionic tubes sold under the mark UV 199 in sockets sold for use with tubes sold under the mark WD 11; but the principles of the invention may be employed in adapting other tubes to use with other sockets. Both the above tubes are constructed to have their filaments heated by current from dry cells instead of from storage batteries; and both such tubes are constructed so that users cannot destroy their filaments by connecting them in sockets adapted for other tubes of which the filaments are heated by current from storage batteries. In the case of the UV 199 tube, which is the form shown in Figs. 1 and 7, the diameter of the base is made smaller than that of similar tubes constructed to have their filaments heated by current from storage batteries, in order to prevent users from destroying the filaments by inserting the tubes in sockets connected in receiving sets to storage batteries; also the contact-prongs separation is different, as is also the location of bayonet-joint pin B, in order to adapt the tube to a socket different from that which was adapted to storage battery tubes. An advantage of the adapter hereof in this respect is that it preserves the advantage of preventing the user from destroying the filament by connecting it in a set supplied with storage battery current, and yet permits either of these two dry cell tubes (UV 199 and WD 11) to be used with the socket of Figs. 3, 4 and 4A adapted itself to receive directly only one form of dry cell tube, i. e., the one sold under the mark WD 11. This is a very great advantage to the many thousands of persons using apparatus of this kind.

Although the bases and base-prongs of the above two types of dry-cell tubes are very different, as indicated above, yet it happens that the clockwise succession of the four base-prongs of the UV 199 tube of Figs. 1 and 7 is the same as the clockwise succession of the contact springs of the socket of Figs. 3, 4 and 4A; and on that fact the invention hereof is premised, as will be seen.

As shown in Fig. 2, the adapter hereof consists of a brass shell S having two different diameters, the internal diameter of the upper portion S1 being substantially smaller than the internal diameter of the lower portion S2 of the shell, a shouldered portion joining shell-parts S1 and S2. This shouldered two-diametered construction of the brass shell is obtained by the ordinary processes of cold-drawing or cold-pressing. The two different diameters are provided, (1) the upper one for adaptation to the tube-base of Fig. 1, and (2) the lower one to provide properly for the reception of contact devices suitable for engagement in the contact-springs of the socket of Figs. 3, 4 and 4A. Within the lower portion S2 of the shell is located a base of insulating material IM which preferably extends to the shoulder portion, where it has a rounded edge, as shown, fitting the shoulder. The internal diameter of the lower portion S2 of the shell and the diameter of insulating base IM generally correspond with the diameter of the base of the tube to which the socket of Figs. 3, 4 and 4A is adapted for normal use. The upper or smaller internal diameter is such as to furnish a lateral support for the base of the tube of Fig. 1. The shoulder also assists in holding base IM from vertical movement in shell S. The internal diameter of the upper portion S1 of shell S is slightly greater than the outside diameter of the base of the tube of Fig. 1; and this part of the shell is left hollow to receive said four-pronged tube-base. The upper edge of shell S is formed with a recess J adapted to receive pin B of the tube base of Fig. 1 as in a bayonet joint; and pin B bears a special relation to the base-prongs of this tube which permits proper connections to be made with the contact springs of the socket via the adapter hereof. Base IM is held up within shell S by means of a spinning of the lower edge of the shell around the edges of the bottom of the base as at SN, Fig. 2. Preferably, as shown, base IM is held in place between the spun lower edges of the shell and the shoulder between portions S1, S2 of the shell of different diameters.

Base IM may be made, for example, from bakelite rod or bakelite sheet, preferably canvas bakelite; but this base may be molded if desired.

Before insertion of base IM in the lower larger-diametered portion of the shell, this base, if not molded, is formed with four holes (H5—H8, Fig. 5) in which are locat-

ed four contact devices, the details of which are shown in Fig. 6, and which include four prongs PR (9—12, Fig. 2) which project rigidly down beyond base IM. The knurled larger-diametered portions K of the contact devices extend from top to bottom of base IM. One (12) of the prongs PR is of larger diameter and greater downward extension than the other three and thereby is adapted to engage in the larger-diametered hook-spring 16 of the socket of Fig. 4; the hook of this spring having a larger diameter than that of the other three hook-springs of Fig. 4. The greater length of extension of contact prong 12 of Fig. 2 permits its insertion in hook 16 of Fig. 4 a little in advance of the engagement of any of the other three prongs (9, 10 and 11 of Fig. 2) in their hook-springs 13, 14 and 15 respectively of Fig. 4. It is therefore impossible for the user to insert prongs 9—12 of the adapter of Fig. 2 into the socket of Figs. 3, 4 and 4^A in any other manner than in that which is prearranged by the designer, so that the user is prevented from making wrong circuit connections of the tube.

The contact devices of Fig. 2 shown in detail in Fig. 6 are identical with one another save for the larger PR prong 12 (Fig. 2). Each contact device comprises (Fig. 6) a brass structure consisting of a barrel portion BL formed of brass, integral with a prong PR (preferably of smaller diameter than barrel BL), and a helical spring HSP located inside barrel BL and topped by a contact member 8 held in position, below by spring HSP, and above by the spun upper edge SP of the upper and open end of barrel BL. In the construction of the adapter, the four contact devices are pressed into the four holes of equal diameter in bakelite base IM, each contact device being formed with a knurled surface K on the larger-diametered portion, to hold it tightly in base IM. If base IM is molded, it is molded around the four contact devices; the knurling K thereon being then also useful in retaining such devices in the base. These four contact devices are so positioned in their four holes in base IM that the top contact members 5—8, Fig. 2 (8 of Fig. 6) project freely to equal distances above the top of base IM and in the path of the proper contact prongs extending equal distances from the tube-base of Fig. 1, so that when said base is inserted in the hollow in the upper part of shell S, and its pin B is inserted in the J-shaped notch J and rotated anti-clockwise therein to hold the tube in place, the four contact prongs of the tube-base of Fig. 1 engage in good electrical contact against the contact members 5—8, the latter being depressed against their helical springs (Fig. 6), so that the springs act to press the tube of Fig. 1 upward and hold it in place in the bayonet joint B, J (Figs. 1 and 2). Insulating base IM is held from rotation within shell S by a part N of the shell (Figs. 2 and 5) which is punched into a notch or recess in an adjacent part of the base in preparation for such punching. This prevents such twisting of the base as might take place otherwise when (after the tube-base has been inserted in the shell and its contact prongs have engaged with the tops of the contact devices held in base IM) the tube is turned to engage its pin B in recess J, so that said prongs are turned while bearing on the upwardly spring-pressed contact devices. Also a pin PN (Fig. 2) may be extended through shell S and into base IM to prevent such relative rotation. Contact members 5—8 of the contact devices in the base of the adapter are T-shaped in cross-section, their upper parts constituting broad surfaces (much broader than the ends of the various contact prongs) so that although the centers of the hook-springs of the socket and the centers of the adapter prongs are not in line with the centers of the tube-prongs when in the adapter, yet there are points on said broad upper surfaces of the contact members which will be engaged by the lower ends of the tube prongs, not only when the tube first enters the adapter but after it has been turned to engage its pin B in recess J of the adapter. The construction and arrangement are such that the tube-base-prongs engage the centers of the top surfaces of contact members 5—8. The base IM may be no more than one-half inch in thickness (height); and the distance between (Fig. 6) the lower end of barrel BL and the top surface of contact member 8 when depressed against spring HSP by the tube of Fig. 1, may be three-quarters inch; so that member 8 projects one-quarter inch above the top level of base IM.

When the tube and adapter of Figs. 1 and 2 respectively are combined, the lower portion of the adapter is ready for insertion in the socket of Figs. 3 and 4, so that the filament, grid and plate of the tube of Fig. 1 are properly connected to the terminals of the socket of Figs. 3 and 4; whereas, in the lack of this adapter, the base of the tube of Fig. 1 could not be used with the socket of Figs. 3 and 4, either because none of the contact prongs of Fig. 1 would engage in the contact springs 13—16 of Fig. 4, or, if they did, it would be possible and more probable that they would engage with the wrong springs and that one of said contact prongs would not make contact with the hook-spring 16 of larger diameter in Fig. 4. In the tube of Fig. 1, prongs F^1 and F^2 are the filament terminals, prong G is the grid terminal,

and prong P is the plate terminal; in the socket of Fig. 4, springs 13 and 15 are the filament terminals, spring 14 is the grid terminal, and spring 16 is the plate terminal; and in the adapter of Fig. 2, prongs 9 and 11 are the filament terminals, prong 10 is the grid terminal, and prong 12 is the plate terminal.

All the above is made possible by the establishment in the adapter of a proper relation between recess J and the larger contact prong 12, thus. The larger-diametered hookspring 16 of Figs. 3, 4 and 4A is in practice the terminal for the plate of the tube, as stated. The joint-pin B of the base of the tube of Fig. 1 in practice extends from a point between plate-terminal-prong P and that one of the two filament terminals (F^2) which precedes prong P in a clockwise sense. Also, as first above-stated, the clockwise succession of the contract prongs of the tube of Fig. 1 is the same as the clockwise succession of the springs of the socket of Figs. 3, 4 and 4A. In the adapter of Fig. 2, the bayonet-joint recess J is so located at the perifery of shell S that when it is engaged by pin B of the tube of Fig. 1, the plate-prong P of Fig. 1 will make contact with contact member 8 of that contact device in base IM which comprises the larger adapter-prong 12; so that when said larger prong 12 is engaged in the larger spring 16 of the socket of Figs. 3, 4 and 4A, the plate-prong P of the tube of Fig. 1 will be in electrical connection with said spring 16 and therefore with the plate terminal TP of the socket. Thereupon the other three tube prongs of Fig. 1 will be connected to the proper socket terminals, because of the like order of clockwise succession of the tube-prongs and the socket springs; i. e., the grid-prong G of the tube (Fig. 1) will be connected to the grid terminal TG of the socket; and the two filament terminals F^1, F^2 of the tube (Fig. 1) will be connected to the socket filament terminals TF^1 and TF^2.

In the use of the adapter, it and the Fig. 1 tube are mechanically supported in the socket of Figs. 3, 4 and 4A, by hook-springs 13—16 gripping prongs 9—12 of the adapter, in position in the holes in the socket, in the same manner in which said socket supports the tube which it is designed directly to receive.

In the modification of Figs. 8–11, which generically resembles the form of Figs. 2 and 6, the shell S, having portions S^1 and S^2 of different inner diameters, has the lower portion of larger diameter of less vertical height that is shown in Fig. 2, and insulating base IM therein of like vertical height. Also the spring members (5—8) of each of the four contact devices in base IM are the contact-members, and each is in the form of a phosphor-bronze leaf-spring bent to U-shape and having a broad top surface like the top contact members 5—8 of Figs. 2 and 6. Each of the four U-shaped springs 5—8 (8 in Figs. 10 and 11) has its lower leaf-portion riveted at R (integral with K) to the rest of the contact device, and its upper end free in the hollow of shell S to be engaged directly by one of the prongs of the tube-base of Fig. 7. The hole XH (Fig. 10) in the lower portion of the spring through which passes rivet R (Fig. 11) is offset, i. e., formed nearer one side of the spring, so that, as shown in Fig. 9, when the four broad-topped contact devices are pressed into the holes in base IM and held therein by their knurled lateral walls K, the four springs 5—8 are set close together in small compass without engagement with one another, and yet each with ample top space for engagement by the tube prongs which are off-center relative to the corresponding adapter-prongs of Fig. 2 and the socket spring hooks 13—16 of Fig. 4. The construction and arrangement are such that the tube-prongs of Fig. 1 will engage the centers of spring contact members 5—8. The eccentric rivet-hole XH (Fig. 10) is formed with a lateral slot R^1 which permits extension into it of a part of the flare of rivet R when the rivet is forced home; and this prevents pivotal movement of spring 8.

As in Figs. 1–4, the upper part of shell S of Fig. 8 is provided with a recess J so disposed in the perifery of shell S as properly to receive pin B of the tube-base of Fig. 7 as a bayonet joint, and the four prongs 9—12 of the adapter of Fig. 8 (prong 12 being the big one as before) are constructed to be adapted to engage the socket of Figs. 3 and 4. Likewise, the shell S and base IM are held from relative rotation by a notch, nick or indentation N in base IM into which is punched or forced an adjacent part of shell S. Base IM is held between (above) the shoulder between the two parts S^1, S^2 of different diameter and (below) by a lower spun edge SN of the shell around the lower edge of base IM.

The form of the invention shown in Figs. 8–11 is the preferred form.

In both forms of the invention shown, the shell S has a circular cross-section (Figs. 5 and 9) and its upper interior diameter preferably is only very slightly greater than the outside diameter of the circular base of the tube of Figs. 1 and 7, so that the inner wall of brass shell S serves as a lateral support for the tube-base of Fig. 1,—neither the broad-topped contact member 8 of the contact devices of one of the forms disclosed (Fig. 6) nor the broad-topped flat U spring 8 of the other form (Fig. 11) performing any function in hold-

ing the tube and adapter together, but each serving only as a means for establishing electrical connection between the prongs of the tube-base of Fig. 1 and the spring hooks of the socket of Figs. 3, 4 and 4A.

In both forms shown, the upper portions of all four contact devices have the same diameter where they lie in the four holes in base IM (it is only the prong-part of one of the contact devices which has a different diameter from the other three prongs.)

Thus the adapter hereof provides to the many users at small cost the convenience of employing in the same socket (of Figs. 3, 4 and 4A) a dry cell tube of either the UV 199 (Fig. 1) or WD 11 type (to which the socket Fig. 4 is adapted); and that without defeating the purpose of the manufacture of either type of tube in making it non-adapted to a storage-batery tube-socket, so as to make it impossible for a careless user to destroy the filament of a dry-cell tube by connecting it to a storage battery.

I claim:—

1. A thermionic tube adapter for a tube having four contact prongs and a bayonet-joint pin, to a socket constructed with four prong-contacts having the same clockwise arrangement as but different separation distances from such tube-prongs, said adapter comprising an insulating base in which are mounted four contact-devices including contact-prongs projecting from one side of the base in line with the prong-contacts of the socket; a metal shell surrounding said base and extending beyond one side of the base to form a hollow receptacle for the tube, said shell being constructed with a bayonet-joint recess in its edge to receive the pin of the tube; and four U-shaped metal leaf-springs having their lower sides offset-secured to the tops of said contact devices and their upper sides free and lying within the hollow of the shell in the path of the contact-prongs of the entering tube.

2. A thermionic tube adapter for a tube having four contact prongs, to a socket constructed with prong-contacts having the same clockwise arrangement as but different separation-distances from said tube-prongs, said adapter comprising an insulating base of larger diameter than the base of said tube and in which are mounted the larger-diametered portions of contact devices having smaller-diametered portions constituting contact-prongs projecting from one side of said base in line with the prong-contacts of the socket; a metal shell surrounding and secured to said base and projecting beyond the other side of the base in the form of a hollow receptacle for the tube of smaller internal diameter than the diameter of said base; and U-shaped metal leaf springs having their lower sides secured to the tops of said contact devices and their upper sides free in the hollow of the shell in the path of the prongs of the entering tube.

3. A thermionic tube adapter for a tube having four contact prongs and a bayonet-joint pin, to a socket constructed with four prong-holding contacts having the same clockwise arrangement as but different separation distances from said tube-prongs, one of which contacts is constructed larger than the others to receive a contact prong of larger diameter than the other three, said adapter comprising an insulating base of larger diameter than the base of said tube and in which are mounted the larger-diametered portions of contact devices having smaller-diametered portions constituting contact-prongs projecting from one side of said base in line with the prong-contacts of the socket, one of said prongs being of larger diameter than the other three and projecting further than the other three to engage the larger prong-holding contact of the socket; a metal shell surrounding and secured to said base and projecting from one side of the base in the form of a hollow receptacle for the tube of smaller external diameter than the diameter of said base; and U-shaped metal leaf springs having their lower sides secured to the top of said contact devices and the upper sides free in the hollow of the shell in the path of the prongs of the entering tube.

4. A thermionic tube adapter for a tube having four contact-prongs and a socket constructed with four prong-contacts having the same clockwise arrangement as but different separation-distances from said tube-prongs, said adapter comprising an insulating base formed with four holes having separation-distances corresponding with those of the prong-contacts of the socket; four contact devices located in the holes in said base and including contact-prongs projecting out of and beyond said base; and a metal shell embracing said insulating base and forming a hollow space on the side of the base opposite to said projecting contact-prongs, said shell being constructed to hold the tube within said hollow space; and said contact-devices being provided on their tops with U-shaped metal leaf springs having free flat ends lying in the hollow of the shell in the path of the contact-prongs of the entering tube.

5. A thermionic tube adapter for a tube having contact prongs and a bayonet-joint pin, to a socket having springs adapted to hold in place a second tube having contact-prongs out of alinement with the prongs of said first tube, said adapter comprising a metal shell, an insulating base located in the lower part of the shell the upper edge of the shell being constructed with a bayonet joint recess to receive the pin of said first

tube; and contact devices located in said insulating base and comprising contact prongs extending out of the base and beyond the shell in alinement with the socket-springs; said contact devices comprising also contact members having broad surfaces extending into the hollow of the shell above the insulating base and in positions to be engaged by the prongs of said first tube when its base is inserted in the shell and turned to engage its pin in the recess of the shell.

6. A thermionic tube adapter for a standard four-pronged tube and a four-contact socket for a different four-pronged standard tube, which comprises a cylindrical metal shell having an upper internal diameter slightly greater than the external diameter of the tube to be employed with it; an insulating base located within the lower portion of the shell; the upper portion of the shell being left hollow to receive within it the four-pronged base of the tube, and constructed with a bayonet-joint notch to receive the bayonet-joint pin of the base of the tube; said base and the adjacent portion of the shell having diameters generally corresponding with that of the base of the tube to which the socket itself is adapted; and said base being constructed with four holes parallel to the axis of the shell; and four contact devices located in the holes of said base, said contact devices extending equal distances beyond the insulating base into the hollow portion of the shell in the paths of the tube-prongs, and each contact device comprising a spring yielding to the tube-prongs and comprising also socket-contact prongs extending unyieldingly beyond the insulating base and out of the shell in positions to engage contact-devices in the socket, one of said prongs being of larger diameter and of greater extension than the other three, and said insulating base being constructed with a notch into which an adjacent part of the shell is indented, the lower edge of the shell being spun around the lower edge of the base.

7. A thermionic tube adapter for a four-pronged standard tube and a four-contact socket for a different four-prong standard tube, which comprises a cylindrical metal shell having an upper internal diameter slightly greater than the external diameter of the tube to be employed with it; an insulating base located within the lower portion of the shell; the upper portion of the shell being left hollow to receive within it the four-pronged base of the tube, and constructed with a bayonet-joint notch to receive the bayonet-joint pin of the base of the tube; said base and the adjacent portion of the shell having diameters generally corresponding with that of the base of the tube to which the socket itself is adapted, and said base being constructed with four holes parallel to the axis of the shell; and four contact devices located in the holes of said base, said contact devices extending equal distances beyond the insulating base into the hollow portion of the shell in the paths of the tube-prongs, and each contact device comprising a spring yielding to the tube-prongs and each contact device comprising also socket-contact prongs extending unyieldingly beyond the insulating base and out of the shell in positions to engage contact-devices in the socket, one of said prongs being of larger diameter and of greater extension than the other three; and said shell having its lower edge spun around the lower edge of said insulating base to retain the base within the shell.

8. A thermionic tube adapted for a four-pronged standard tube and a four-contact socket for a different four-pronged standard tube, which comprises a cylindrical metal shell having an upper internal diameter slightly greater than the external diameter of the tube to be employed with it; an insulating base located within the lower portion of the shell; the upper portion of the shell being left hollow to receive within it the four-pronged base of the tube, and constructed with a bayonet-joint notch to receive the bayonet-joint pin of the base of the tube; said base and the adjacent portion of the shell having diameters generally corresponding with that of the base of the tube to which the socket itself is adapted, and said base being constructed with four holes parallel to the axis of the shell; and four contact devices located in the holes of said base, said contact devices extending equal distances beyond the insulating base into the hollow portion of the shell in the paths of the tube-prongs, and each contact device comprising a spring yielding to the tube-prongs and each contact device comprising also socket-contact prongs extending unyieldingly beyond the insulating base and out of the shell in positions to engage contact-devices in the socket, one of said prongs being of larger diameter and of greater extension than the other three; and said insulating base being constructed with a notch in which an adjacent part of said shell is indented to prevent rotation of the base within the shell by the engagement of the tube prongs with the contact devices when the tube is turned to engage the bayonet joint.

9. A thermionic tube adapted for a standard four-pronged tube and a four-contact socket for a different four-pronged standard tube, which comprises a cylindrical metal shell having an upper internal diameter slightly greater than the external diameter of the tube to be employed with it; an insulating base located within the lower portion of the shell; the upper portion of the shell being left hollow to receive within

it the four-pronged base of the tube, and constructed with a bayonet joint notch to receive the bayonet-joint pin of the base of the tube; said base and the adjacent portion of the shell having diameters generally corresponding with that of the base of the tube to which the socket itself is adapted; and said base being constructed with four holes parallel to the axis of the shell; and four contact devices located in the holes of said base, said contact devices extending equal distances beyond the insulating base into the hollow portion of the shell in the paths of the tube-prongs, and each contact device comprising a spring yielding to the tube-prongs and each contact device comprising also socket-contact prongs extending unyieldingly beyond the insulating base and out of the shell in positions to engage contact-devices in the socket, one of said prongs being of larger diameter and of greater extension than the other three.

10. A thermionic tube adapter which comprises a metal shell of different upper internal and lower internal diameters; an insulating base located within the lower portion of the shell, the upper portion of the shell being left hollow to receive within it a four-pronged tube-base of corresponding diameter; said insulating base being constructed with four holes parallel to the axis of the shell; and four contact devices in the holes of said base, each contact device comprising a socket-contact prong at one end which extends out of the shell and beyond the insulating base and each contact device also comprising a spring located above the prong end, and each contact device extending out above the insulating base in position to be conductively engaged by the prongs of the upper tube-base against the yielding action of the springs.

11. Means permitting a thermionic tube having a given construction of base and contact prongs to be electrically and mechanically associated with a tube-socket constructed to receive a tube having different construction of base and/or contact prongs, which comprises a metal shell; an insulating base located within the lower portion of the shell, the upper and smaller-diametered portion of the interior of the shell being left hollow to receive a tube-base of corresponding diameter; said insulating base being constructed with four holes parallel to the axis of the shell; and four contact devices located in the holes of said base, each contact device comprising a socket-contact prong at one end extending out of the shell and beyond the insulating base and each contact device also comprising a spring; each contact device extending beyond the other end of the insulating base and into the upper hollow interior of the shell in the path of movement of the contact prongs of the tube-base inserted therein.

12. Means permitting a thermionic tube having a given construction of base and contact prongs to be electrically and mechanically associated with a tube-socket constructed to receive a tube of different construction of base and/or contact prongs which comprises a metal shell of smaller upper internal diameter than lower internal diameter; an insulating base located within the larger-diametered portion of the shell, the upper and smaller-diametered portion of the shell being left hollow and constructed to detachably receive a four-pronged tube-base of corresponding diameter; said insulating base being constructed with four holes parallel to the axis of the shell; and four contact devices located in the holes of said base, each contact device comprising socket-contact prong at one end extending out of the shell and beyond the base and each contact device also comprising a spring located above the prong-end, and each contact device extending above the insulating base and into the hollow portion of the shell to be in position to be conductively engaged by the prongs of the upper tube-base against the yielding action of the springs.

13. A thermionic tube adapter which comprises a cylindrical metal shell; a cylindrical insulating base located within one end of the shell; the upper portion of the shell being left hollow and constructed with a bayonet joint recess to detachably receive a thermionic tube having a base provided with a bayonet-joint pin and four contact prongs; said base being formed with four holes parallel to the axis of said shell; and four contact devices each comprising a spring and extending into the hollow interior of the shell in position to be engaged under pressure of said springs by the contact prongs of the tube-base when the latter is held by the bayonet joint within said hollow portion of the shell; said contact devices each including also a contact prong extending out of the shell and beyond the insulating base, one of said contact prongs being of larger diameter and of greater extension beyond the insulating base and shell than the other three contact prongs.

14. A thermionic tube adapter which comprises a cylindrical metal shell having an upper internal diameter slightly greater than the external diameter of the base of the tube to be employed with it; a cylindrical insulating base located within the lower portion of the shell, the upper portion of the shell being left hollow to receive the tube-base; and four contact devices supported within said insulating base and extending to like distances above the insulating base and into the hollow portion of the shell in positions to be engaged by the prongs of the

tube; each of said contact devices including a socket-contact prong extending out of the shell and beyond the insulating base in position to engage in a contact device of the socket with which it is desired to use the tube held in the upper hollow portion of the shell.

15. A thermionic tube adapter which comprises a cylindrical metal shell having an upper internal diameter slightly greater than the external diameter of the base of the tube to be employed with it; said shell having a lower internal diameter corresponding generally with the external diameter of the base of a tube to which is adapted the socket to which the adapter hereof is adapted; an insulating base located within the lower portion of said shell, the upper portion of the shell being left hollow to receive the base of the tube to be used with the adapter hereof; and four contact devices in said insulating base, extending above the base into the hollow upper interior of the shell in positions to be engaged by the contact prongs of the tube to be employed, said contact devices also projecting down beyond the insulating base and out of the shell in positions to engage in the contact devices of the socket.

16. A thermionic tube adapter which comprises a cylindrical metal shell; an insulating base located within the lower portion of the shell; the upper portion of the shell being left hollow for the reception of the base of the tube to be employed; and contact devices located within the insulating base and extending above and below it; the lower edge of the shell being spun around the lower edge of the insulating base to hold the shell and base together; and additional means for holding the shell and base together.

17. A contact device for a thermionic tube adapter which comprises a rod having an upper knurled surface and a lower contact prong of smaller diameter, and an integral rivet projecting from the upper end of the rod; in combination with a U-shaped leaf-spring formed with an offset hole for the rivet in one side of the U and an adjacent recess to receive the flare of the rivet.

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