

Feb. 18, 1958

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2,824,291

ADAPTER FOR ELECTRON DISCHARGE TUBE

Filed May 16, 1955

FIG.1.

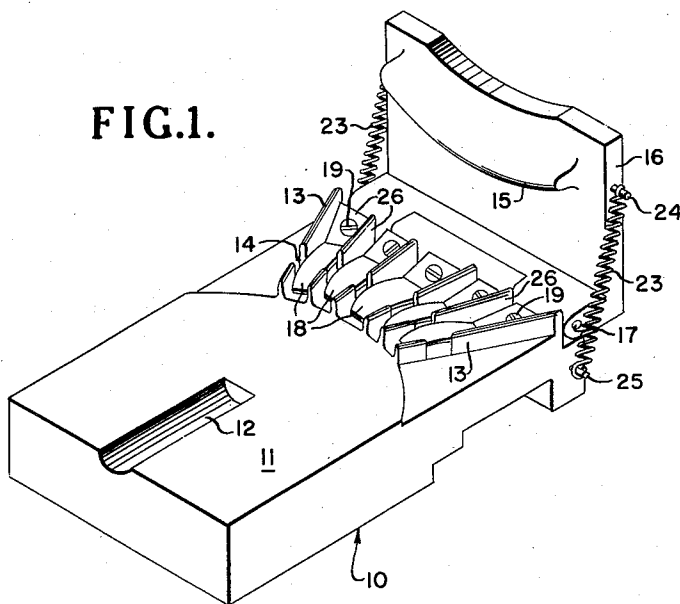
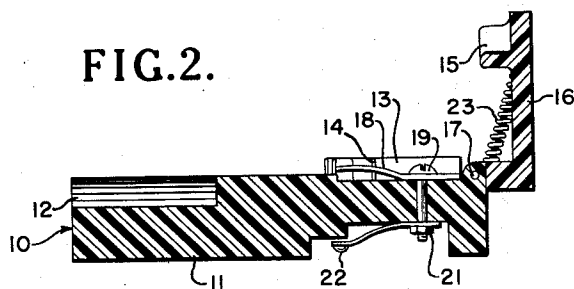


FIG.2.



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ADAPTER FOR ELECTRON DISCHARGE TUBE

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Application May 16, 1955, Serial No. 508,833

4 Claims. (Cl. 339—174)

This invention relates to adapters for electron discharge tubes and more particularly to adapters for use in production testings of tubes of the miniature or sub-miniature type such, for example, as those employed in hearing aids, pocket radios, or other portable devices intended to be carried on the person or in the firing mechanisms of said types of ordnance devices.

It is the usual practice in tubes of this character to employ lead-in wires for the tube elements which are sealed to the envelope of the tube and project therefrom. Tubes of this type usually supplied by manufacturers as finished products do not ordinarily include pins or rigid prongs soldered to the lead-in wires since the tubes are not ordinarily furnished with a base to which such pins or prongs may be attached. The lead-in wires usually extend for a length on the order of 2 inches beyond the envelope and the lead-in wires ordinarily are relatively stiff although somewhat flexible.

Although such tubes are ordinarily given a manufacturer's test and production, it may be desirable or necessary to make tests on these tubes at other times or after they have been put into service. In addition, certain tubes of this type are usually placed on an aging rack for the purpose of making a life test thereon.

Various types of adapter fittings for readily connecting the lead-ins of such tubes to pin-type stockage for test purposes have previously been devised. One example of such a fitting is disclosed and claimed in Patent No. 2,481,207, issued to L. G. Lawrence on September 6, 1949. Such adapters usually comprise a plurality of linearly disposed pairs of spring fingers or spring contacts between which the lead-in wires are forced after being formed into aligning relation therewith. This procedure requires a considerable portion of the time of an operator in straightening and aligning the wires and forcing the same between the pairs of spring contacts, which operations add materially to the total cost of the labor.

The adapter of the present invention obviates the foregoing disadvantages. In accordance with the preferred embodiment of the present invention the tube to be tested is laid on the base of the adapter and the lead-in wires thereto are placed in channels individual thereto. The closing of a cover completes the electrical connections to the lead-in wires as will more clearly appear as the description proceeds.

It is an object of this invention to provide an electrical connecting adapter for a miniature tube which is simple in construction and capable of accurately and reliably making and breaking electrical connections to the lead-in wires thereof as the adapter is closed.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing wherein:

Fig. 1 is a view in perspective of an adapter in ac-

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cordance with a preferred embodiment of the invention; and

Fig. 2 is a central elevational view in section of the device of Fig. 1.

Referring now to the single sheet of drawing on which like numerals of reference are employed to designate like parts throughout the several views and more particularly to Fig. 1 thereof, there is shown thereon an adapter embodying a preferred form of the invention and indicated generally by the numeral 10. The adapter comprises a plate or base 11 composed of insulating material suitable for the purpose such, for example, as fiber, rubber, or any of the synthetic varieties thereof possessing the required rigidity and having an arcuate slot 12 formed therein adapted to receive and retain the miniature tube under test. The base is provided with a plurality of upstanding portions or barriers 13 in converging arrangement with respect to the base of the tube, each of said portions having a slot 14 formed therein adapted to receive a projecting lip 15 secured to a movable clamping member 16 composed of insulating material suitable for the purpose and pivotally secured to the base as at 17.

Intermediate each adjacent pair of upstanding barriers is disposed a contact spring 18 secured to the base in a suitable manner as by a screw 19 passing through the base and having a nut 21 thereon for securing a contact element or terminal 22 thereto whereby an external electrical connection is established to each of the contact springs 18.

A pair of springs 23 secured at the ends thereof as at 24 and 25 to the cover and base respectively substantially as shown whereby the springs maintain the cover open when in an open position and maintain the cover or clamping member securely in a closed position by reason of the toggle action of the springs illustrated.

In operation, the tube to be tested is placed within the slotted portion 12 and the leads thereof are placed within the channels 26 formed by adjacent pairs of upstanding base portions 13. The clamping member 16 is now closed and the lip 15 thereof passes within the slot 14 of the upstanding members and engages the lead-in wires of the tube causing them to be clamped in firm electrical engagement with the respective contact springs 18. When the test has been completed it is merely necessary to raise the clamping member 16 and remove the tube.

Whereas in the illustrative form of the invention five contact springs are shown, this is by way of example only as a greater or lesser number of springs may be employed without departing from the spirit or scope of the invention. Furthermore whereas the means for establishing an electrical connection to the contact springs 18 is shown as a spring contact 22 it will also be understood that, although this arrangement is particularly suitable for engaging conveyor contacts in conveyor aging and testing of miniature tubes, the invention is not so limited as any suitable means may be employed for establishing external electrical connections to the contact springs 18.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. An adapter for use with a miniature electron discharge tube having flexible leads, comprising, in combination, a plate having a recessed portion for receiv-

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ing and retaining the tube to be tested, a plurality of radially disposed baffle sections on said plate and converging toward said recessed portion, said baffle sections forming a plurality of radial channels, a plurality of contact springs disposed respectively within each of said channels for engaging and establishing contact with said leads; a plurality of slots formed respectively in said baffle sections adjacent to the movable end of said contact springs, a clamp member hinged to one end of said plate and having a lip formed thereon in such manner as to pass within said slots and force the leads into firm electrical contact with said spring contact members when the clamping member is in closed position, and resilient means pivotally secured to said base and clamp for yieldably urging the clamp against said leads when the clamp is in closed position.

2. A claim according to claim 1 in which said resilient means is so arranged as to yieldably maintain the clamp in open position.

3. An adapter for use with a semi-cylindrical miniature tube having flexible lead-in wires, including, in combination, a base having a recessed portion of the same configuration as the envelope of said tube for receiving the tube under test, a plurality of upstanding barrier portions on said base and converging towards said recess portion, each of said barrier portions having a slot formed therein, a plurality of spring contact elements, each of said elements being disposed between adjacent pairs of said barrier portions and secured to said base, means for establishing an external electrical connection to each of said spring contact elements, a clamping member pivotally secured to said base and having a curved lip formed integrally therewith for clamping the lead-in wires of said tube to said spring

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contact elements as the clamping member is closed, said lip being configured to be received by the slots when the clamping member is closed, and resilient means including a pair of extensible spring elements pivotally secured at the ends thereof to said member and base respectively for maintaining the clamping member in tightly clamped relation with said lead-in wires.

4. An adapter for use with an electron tube having flexible lead-in wires comprising a base having a semi-cylindrical recessed portion therein of the same configuration as the envelope of said tube to receive and retain the tube under test, a plurality of resilient contact elements secured to and arranged on said base arcuately with respect to said recessed portion, each of said contact elements having a convex surface for receiving and engaging one of said flexible leads, a spring urged clamping member pivotally secured to said base and movable from an open position to a closed position selectively at will for clamping the leads to the resilient contact elements at the convex surfaces thereof when the member is in said closed position, and extensible spring means pivotally secured at the ends thereof to said member and said base respectively in a manner to yieldably maintain the member in each of said positions selectively as the member is moved thereinto, said base and clamping member being composed of rigid insulating material.

References Cited in the file of this patent

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