Jan. 10, 1928. 1,656,009

L. K. McMULLIN

RADIO AMPLIFIER UNIT

Filed Jan. 15, 1925

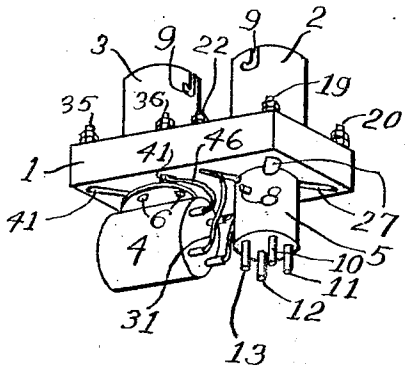


Fig. 1.

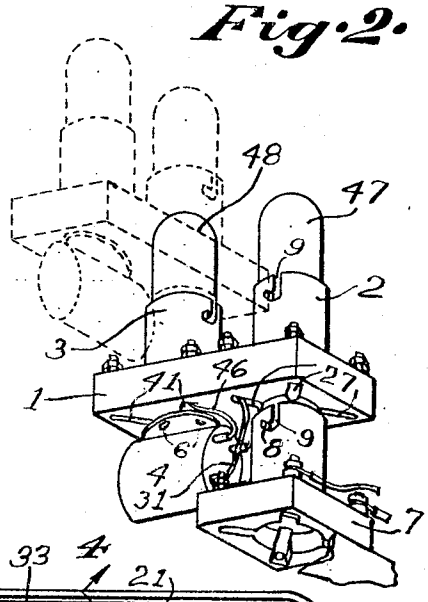


Fig. 2.

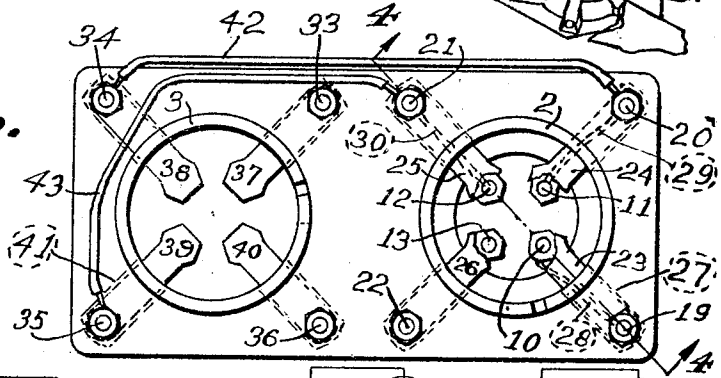


Fig. 3.

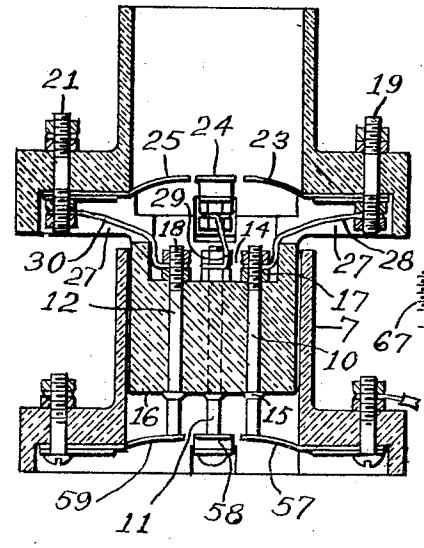


Fig. 4.

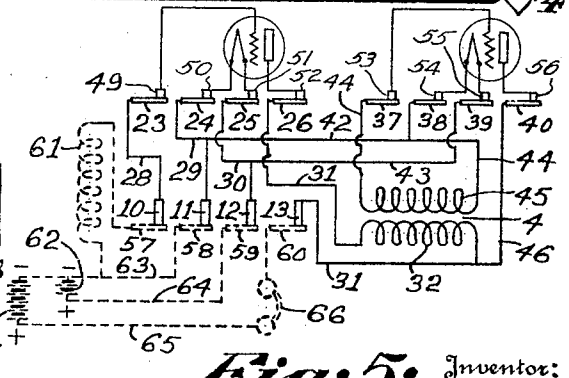


Fig. 5.

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UNITED STATES PATENT OFFICE.

LEROY KING McMULLIN, OF ST. LOUIS, MISSOURI.

RADIO AMPLIFIER UNIT.

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This invention relates to radio amplifying or modifying units, and has for its principal purpose to provide an improved unit of the character described which may be readily attached to a radio set by applying the same thereto in a simple manner, and without requiring the preliminary drilling of holes and other mechanical fitting hitherto essential in adding additional stages or units to a set in the conventional manner.

A further object is to provide arrangements for effecting automatically the connection of the various circuits or the amplifier unit in proper relation to the circuits of the set simultaneously with the mechanical attachment of the unit to the set.

Another object is to provide means whereby the addition of other successive stages to the first unit or stage may be likewise facilitated.

The objects above set forth and advantages incident to the invention will be best understood and appreciated from a description of one of the divers potential embodiments of this invention. The particular embodiment thus selected for the purpose of illustrating this invention includes audio amplifying means, though the invention is manifestly capable of use in the amplification of radio frequencies, ultra audio frequencies, and the like, and may either precede or follow the detector, or even function as a detector, departures from the particular circuit arrangement thereof being permissible to accommodate the invention to the purpose of the user. The invention is, also, capable of use in line communication, such as that of the telephone, telegraph, and the like.

In the accompanying drawing forming part of this specification, in which like numerals of reference denote like parts wherever they occur,

Figure 1 is a perspective view of the amplifying unit as it appears detached;

Figure 2 is a similar view exhibiting the unit attached to a radio set, the dotted lines showing the manner in which an additional unit may be superimposed on the first unit if the addition of another stage is desired;

Figure 3 is a plan view of the unit on a larger scale;

Figure 4 is a sectional view of the same, taken on the line 4—4 in Figure 3, and showing in detail the manner of its co-operation with a socket of the radio set to which it has been applied; and

Figure 5 is a diagrammatic view illustrating the circuit arrangements of the amplifier unit, and the manner in which the amplifier circuits are automatically accommodated without alteration to the existing circuits of a radio set, the latter circuits being illustrated in the dotted lines, and only so much thereof being shown as is necessary to show the connection of this invention therewith.

The unit preferably comprises a block 1, having a plurality of sockets 2 and 3 thereon, arranged to receive thermionic bulbs or valves therein in the conventional manner. The sockets 2 and 3 are preferably arranged on one side of the block 1, and a transformer 4 and a contactor plug 5 extend from the other side of the block 1, the plug 5 preferably being concentric with the socket 2. Transformer 4 may be secured to block 1 in any common manner, preferably by means of screws 6.

Plug 5 is adapted to fit the bulb socket 7 of a radio set, and bears a lateral projection 8, adapted to engage the conventional L-shaped slot 9 of the socket 7 to secure the plug 5 therein. Plug 5 and the various sockets 2, 3 and 7 are preferably constructed of insulating material. Contacting elements 10, 11, 12 and 13, preferably in the form of metal studs or stems, extend through the plug 5 from the other end thereof and into the recess 14 in the inner end thereof. Shoulders 15 of the studs 10, 11, 12 and 13 are drawn against the outer face 16 of plug 5 by means of nuts 17, threading on the inner externally threaded ends 18 of the studs.

Socket 2 bears binding posts 19, 20, 21 and 22, which secure contact blades 23, 24, 25 and 26, respectively, in place in their respective recesses or channels 27, extending laterally from the interior of the socket on the underside of the block 1. Lead 28 connects grid post 19 to grid contacting element 10 of the plug 5; leads 29 and 30 connect filament posts 20 and 21 with filament contacting elements 11 and 12 respectively; and circuit 31 connects plate post 22 and plate contacting element 13, the said circuit including the primary winding 32 of the transformer 4.

Socket 3 bears binding posts 33, 34, 35 and

36, which retain in place the grid contact blade 37, filament blades 38 and 39, and plate contact blade 40, respectively, in their respective channels 41, preferably formed on the underside of the block 1. Leads 42 and 43 connect plug elements 11 and 12 with filament binding posts 34 and 35, respectively; circuit 44 leads from grid binding post 33 to filament binding post 34, and includes the secondary winding 45 of transformer 4; and plate binding post 36 is connected through lead 46 to plug element 13.

Thermionic bulbs 47 and 48 are inserted into the sockets 2 and 3, respectively; bulb 47 having grid terminus 49, filament termini 50 and 51, and plate terminus 52; and bulb 48 embodying grid terminus 53, filament termini 54 and 55, and plate terminus 56.

For the purpose of illustration, I have shown the unit of this invention as being applied as an additional or second stage audio amplifier to a radio set already provided with a first stage of audio frequency amplification. So much of the circuit of this set as is necessary to show the connection of my invention therewith is illustrated in dotted lines in Figure 5. The socket 7, prior to the attachment of the plug 5 thereto, contains the usual type of amplifying bulb, the grid contact blade 57, filament blades 58 and 59, and plate blade 60 functioning to convey current to the respective circuits of the bulb in the well known manner. The grid blade 57 is connected to the secondary 61 of a first stage audio frequency transformer. The A or filament battery 62 supplies current through leads 63 and 64 to filament blades 58 and 59. Plate circuit 65 includes phones or loudspeaker 66 and B or plate battery 67. With a bulb in the socket 7, speech, music or other sounds emanate from the phones 66 when the set is in operation.

Preparatory to adding the amplifying unit of this invention, the said bulb is first removed from the socket 7. Plug 5 may then be inserted in socket 7, and the set including the stage thus added thereto, is ready for immediate use, no further preparations or alterations of the set being required. It will be noted that the plate current of bulb 48 is added to the plate current of bulb 47 to augment the sound in the reproducer 66. Should additional amplification be desired, bulb 48 is removed, and a plug 5 of an additional unit is inserted therein, as depicted in dotted lines in Figure 2. Still further amplification may be extended in like manner.

Having thus fully described this invention, I hereby reserve the benefit of all changes in form, arrangement, order, or use of parts, as it is evident that many minor changes may be made therein without departing from the spirit of this invention or the scope of the following claims.

I claim:

1. A radio amplifying unit comprising a supporting member, sockets disposed in pairs on one side of said member, a contactor plug connected to one of said sockets and a transformer operatively connected to said sockets, said contactor plug being adapted for connection to a communication set.

2. A radio amplifying unit comprising a body provided at one side with a contactor plug, sockets arranged on the opposite side of said body, one of said sockets being directly connected to said plug and a transformer connected to said sockets, said plug being adapted for connection to a communication set, said socket remote from said plug being adapted for connection with another unit for purposes specified.

In testimony whereof I hereunto affix my signature.

LEROY KING McMULLIN.