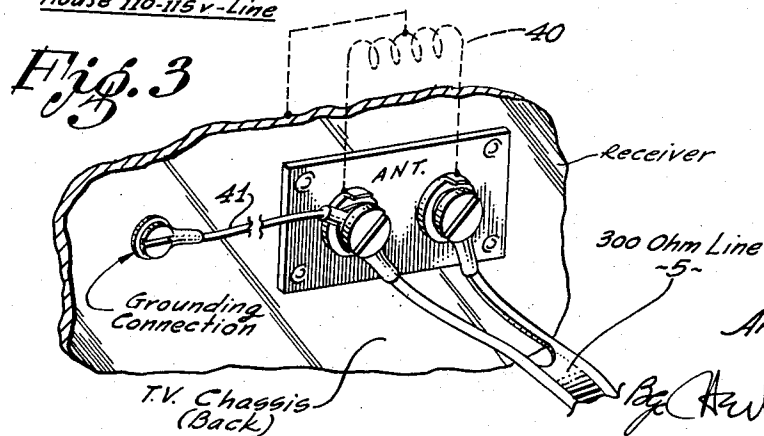
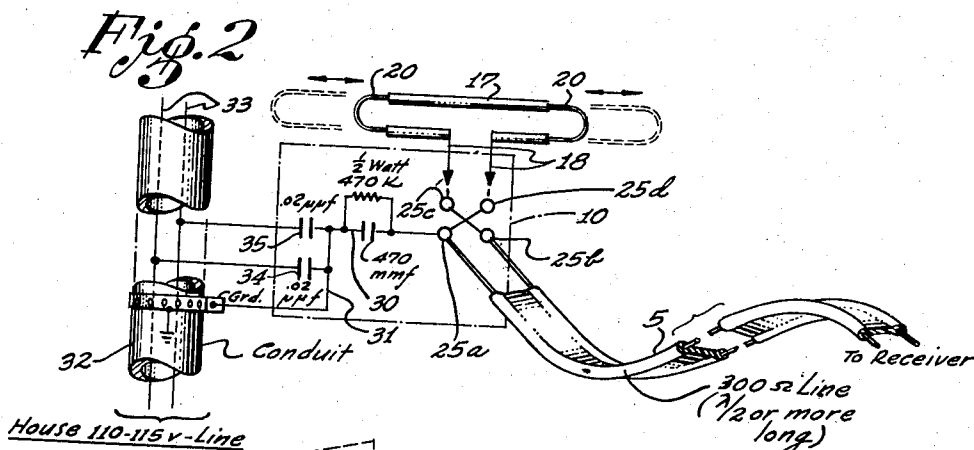
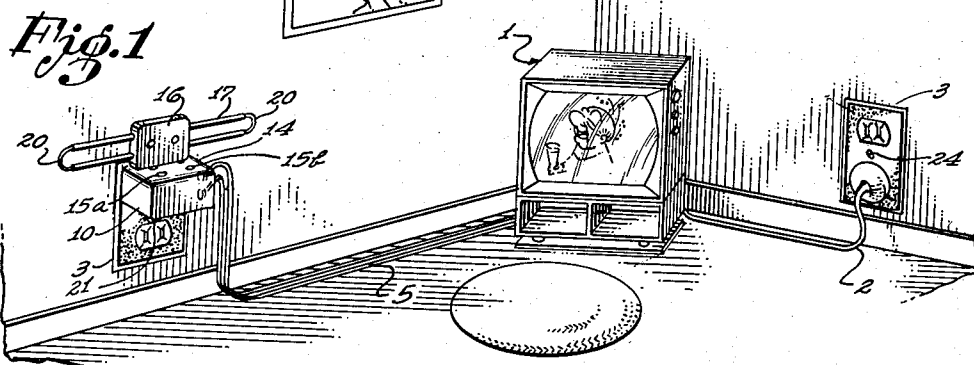
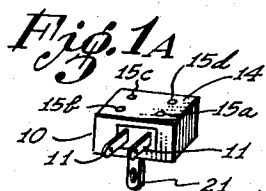


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ELECTRIC ANTENNA
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ELECTRIC ANTENNA

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My invention relates to indoor signal antennas and more particularly to a means for matching a twin lead radio transmission line to the 110 v. house wiring system for the efficient reception of television signals.

Even in geographic locations relatively close to television signal transmitters there are local conditions affecting good signal reception. Many times conventional indoor or outdoor antennas do not provide proper signal strength. In many such locations ample signal voltages exist as standing waves on the house or building 110 v. A.C. power and light mains, and it is an object of this invention to provide a matching device to be inserted at one end into a conventional house wiring receptacle and then to be connected to a television receiver, whereby a satisfactory television signal is obtained from the A.C. line.

Another object of the invention is to provide means for tuning such a matching device.

Still another object of the invention is to provide an efficient television antenna energized by signal voltages existing in a house wiring system.

Briefly stated my invention in one form, comprises a transmission line preferably a 300 ohm twin lead line, connectable at one end to a television receiver, and connected at the other to a folded dipole. Means are provided to capacitatively connect the dipole to the A.C. house mains and in some forms of the invention, to tune the dipole.

My invention may best be understood by reference to a description of a preferred form of the invention as shown in the drawings, in which:

Figure 1 is a perspective view (not to scale) of the outward aspects of a matching device of the present invention, shown in use.

Figure 1a is a rear perspective view of the antenna casing to show prongs and grounding lug.

Figure 2 is a wiring diagram of the device of Figure 1.

Figure 3 is a perspective diagram of a preferred receiver connection.

Referring first to Figures 1 and 1a, a television receiver 1 is provided with the usual power cord and plug 2 for insertion in a house wiring receptacle 3 in its usual place in a room wall 4. The receiver 1 is also provided with the usual twin lead transmission line 5, usually a 300 ohm line. This line 5 which should be one-half wave or more long at the lowest frequency to be received, say from 6 to 10 feet long, enters a casing 10 preferably formed from insulating material. This casing 10 has on the rear thereof a pair of prongs 11 of the usual type to enter a standard house wiring receptacle 3 (see Figure 1a).

On the top 14 of casing 10 are four holes 15a, 15b, 15c and 15d.

An insulating block 16 is provided clamping therein a folded dipole 17 having lower projecting lugs 18 not seen in Figure 1 but indicated diagrammatically in Figure 2. The folded tips 20 of each pole of dipole 17 telescope into the dipole body so that the dipole can be

changed in length as desired, to tune the dipole. As shown in Figure 1a, the casing is also provided with a ground lug 21 which, when prongs 11 are inserted in a receptacle 3, will be in position to receive receptacle cover screw 24 of the receptacle, this screw being in most homes connected to the metal conduit in which the house mains are carried.

Inside the casing 10 the elements of the match as described above are connected as shown in Figure 2.

The casing end of the twin lead line 5 is connected with one lead to connection 25a and with the other lead to connection 25b. Connections 25a and 25b are then cross-connected to connections 25c and 25d. Each connection 25a, 25b, 25c and 25d are located within casing 10 to be contacted in the order 25a and 25b or 25c and 25d by dipole lugs 18 through respective registering casing holes 15a, 15b, 15c and 15d. Thus the phase of dipole 17 can be reversed with respect to the transmission line 5.

Connection 25a, representing the casing end of one lead of transmission line 5 is connected through resistance-capacity filter network 30 through a common connection line 31 attached to the conduit 32 enclosing the house mains 33. This is done through casing ground lug 21 and receptacle screw 24, and takes advantage of standing waves on the conduit system.

Casing 10 also contains a pair of condensers 34 and 35 one side of each being connected to common connecting line 31 the other capacity leads being connected one to each side of the house power wires in house line 33.

Filter network 30 is useful for keeping extraneous line noises from reaching the receiver while permitting signals of the proper frequency to enter the receiver. Network 30 is therefore desirable but not necessary in the operation of the antenna.

In one satisfactory specific example of the antenna as manufactured and sold, the value of capacities 34 and 35 are .02 mmf., the capacity in network 30 is 470 mmf., and the resistance is 470K. Dipole 17 is 12 inches wide closed, 20 inches open.

In operation, the twin lead transmission line 5 is connected to the receiver 1. Some sets have a push pull input coil 40 as seen in Figure 3 and it may be found helpful to short out one side of this coil by a ground wire 41 attached to one side of the line 5, at the receiver. Casing 10 is then plugged into a power receptacle 3.

It is preferred that the receptacle 3 used for the signal take off not be the same receptacle as used for the power cord and plug 2. Further, it may well be found that the standing waves on one receptacle in a room will be more useful than those on another receptacle, so the casing 10 should be plugged in where the receiver performs best.

As some signal may be picked up directly by dipole 17 this signal should be in phase with the signal taken off the house mains. The dipole should be placed in the holes 15a and 15b or 15c and 15d where the best signal is obtained.

As the best signal will also be received when the line termination impedance Z_o equals the characteristic impedance Z_s of the transmission line, the dipole can be readily tuned by changing its length until $Z_o=300$ ohms at the signal frequency desired, thereby providing the best impedance match and resultant signal for each television channel tuned in on the television receiver. It is also possible to compromise, however, and find one or two length settings of the dipole 17 which will work satisfactorily for all the available television channels in a particular area.

It has been found that in a large number of instances

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a satisfactory television signal can be obtained from the use of the device herein described and claimed, where unsatisfactory conditions have prevented good signals from conventional indoor or outdoor antennas.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprises a preferred form of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

What is claimed is:

1. An indoor television antenna comprising a casing, a pair of prongs sized to enter a standard 110 v. house wiring receptacle extending from the rear of said casing, a folded dipole mounted on top of said casing and a length of 300 ohm twin lead signal transmission line extended from said casing terminating outwardly in a television receiver connection, said dipole being connected across the inward end of said transmission line, and a capacitive connection between one side of said dipole and each of said prongs.

2. An indoor television antenna comprising a casing, a pair of prongs sized to enter a standard 110 v. house wiring receptacle extending from the rear of said casing, a folded dipole mounted on top of said casing and a length of 300 ohm twin lead signal transmission line extended from said casing terminating outwardly in a television receiver connection, said dipole being connected across the inward end of said transmission line, and a capacitive connection between one side of said dipole and each of said prongs, and means for changing the physical length of each pole of said folded dipole.

3. An indoor television antenna comprising a casing, a pair of prongs sized to enter a standard 110 v. house wiring receptacle extending from the rear of said casing, a folded dipole mounted on top of said casing and a length of 300 ohm twin lead signal transmission line extended from said casing terminating outwardly in a television receiver connection, said dipole being connected across the inward end of said transmission line, and a capacitive connection between one side of said dipole and each of said prongs, and means for changing the physical length of each pole of said folded dipole to tune said dipole to where the line terminating impedance equals 300 ohms at the desired reception frequency.

4. Apparatus in accordance with claim 1 wherein the dipole side of each of said capacitive connections is connected to a conduit enclosing the house wiring.

5. Apparatus in accordance with claim 1 wherein means are provided to connect the dipole side of each of said capacitive connections to a conduit contact making connection mounted on said casing.

6. Apparatus in accordance with claim 1 wherein means are provided to connect one lead of the receiver end of said transmission line to the receiver chassis ground.

7. Apparatus in accordance with claim 1 wherein said casing contains two pairs of adjacent parallel receptacle contacts in the top thereof cross-wired across said transmission line inward end, and wherein said dipole has two projecting contact pins at the feed points thereof, which mate with each pair of said receptacle contacts, whereby changing the dipole mounting from one pair of receptacle contacts to the adjacent pair reverses the phase of said dipole with respect to said line and thus with respect to said capacitive connection.

8. Means for matching a radio receiver to alternating current power mains to obtain a radio signal therefrom comprising a capacitive connection to each side of said mains, said connections having a common connection, a 300 ohm transmission line connected at one end to said receiver, one side of the other end of said line being connected to said common connection; an impedance matching device, the other side of said other end of said line being connected to said common connection through said impedance matching device, and a direct conducting connection from said common connection to a conduit enclosing said alternating current power mains.

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