Oct. 14, 1952 S. T. DOERNER 2,614,220

TELEVISION ANTENNA

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Fig. 1.

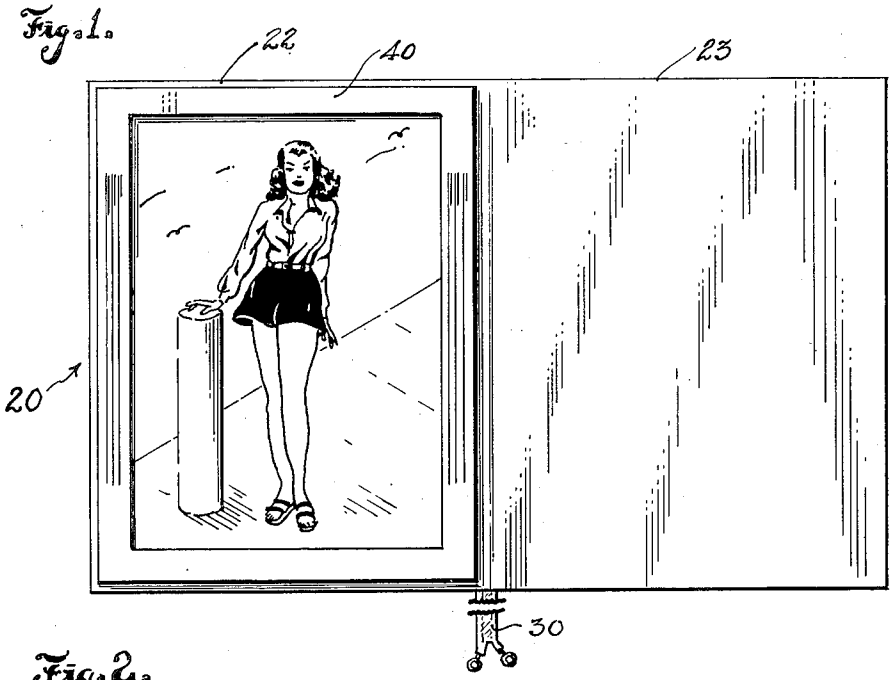
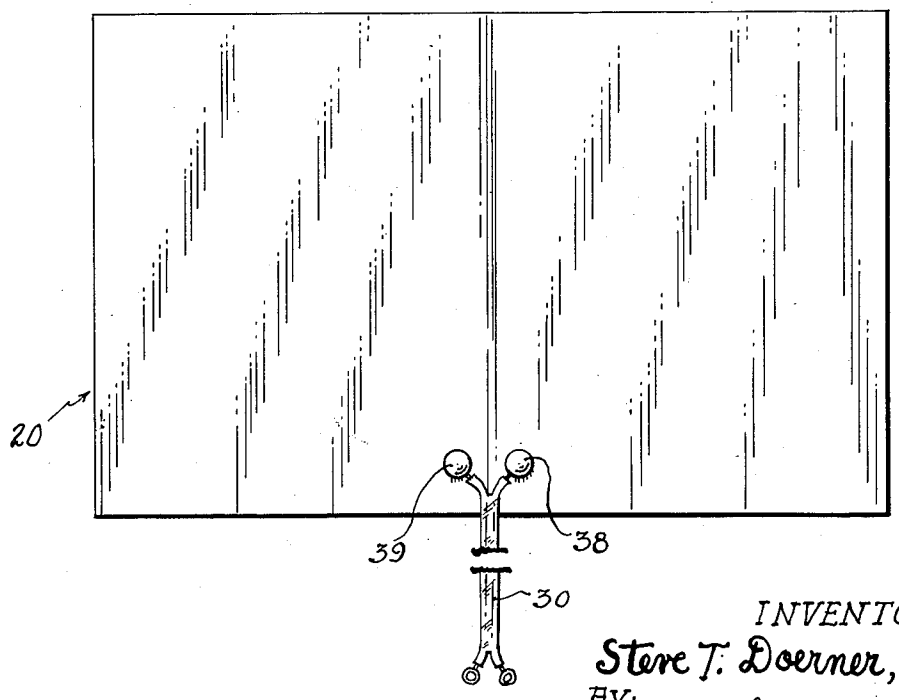


Fig. 2.



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Fig. 3.

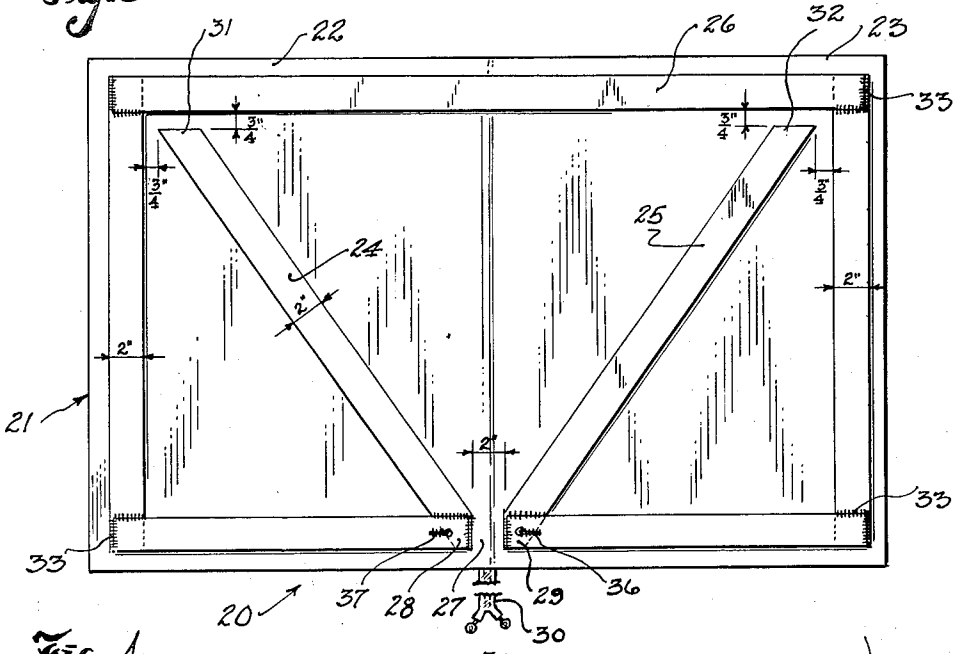
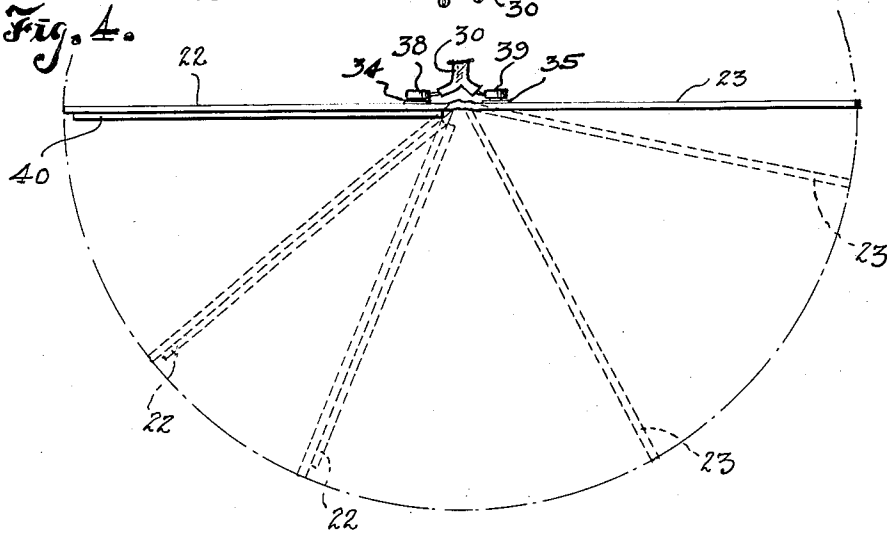


Fig. 4.



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Fig. 5.

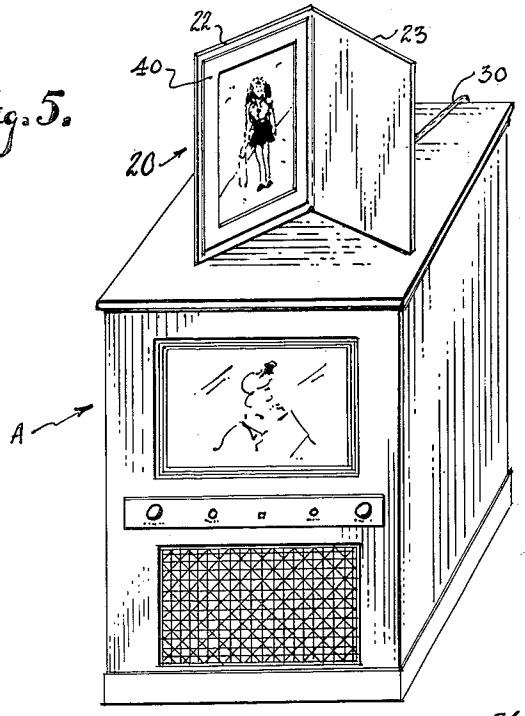


Fig. 6.

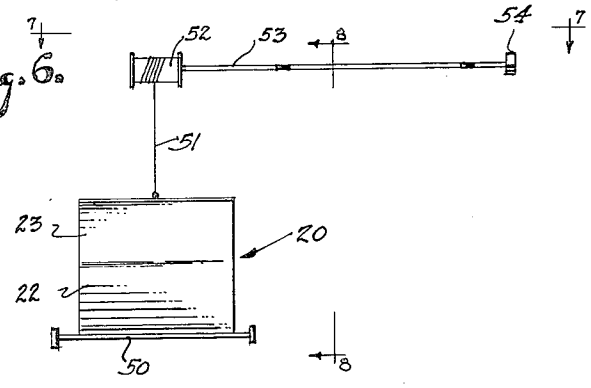


Fig. 8.

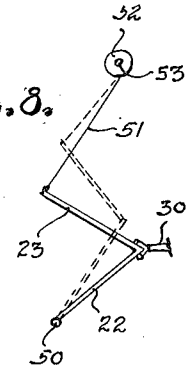
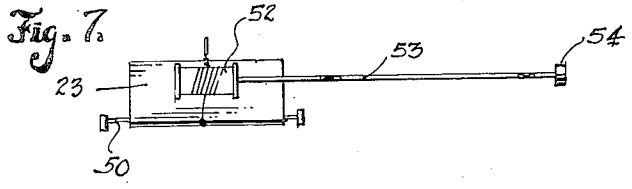


Fig. 7.



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UNITED STATES PATENT OFFICE

2,614,220

TELEVISION ANTENNA

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Application June 8, 1950, Serial No. 166,962

5 Claims. (Cl. 250—33)

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This invention relates in general to television antennas, and the invention is chiefly concerned with television antennas particularly adapted to indoor use and with a pleasing appearance appealing to the aesthetic senses of the user and providing certain improvements in the construction thereof to effect improved television reception.

Otherwise stated, the invention is embodied in an indoor television antenna combining a folded and straight dipolar arrangement to effect uniformity of matching frequencies of channels of the low band with the frequencies of the high band.

More specifically stated, it is a general object and accomplishment of the invention to provide an indoor television antenna which is balanced so as not to depend upon the lead wire to increase inductance and may be readily employed equally as well with television sets having 72 ohm matched impedance or sets having 300 ohm matched impedance.

Another aspect of the invention is to provide an indoor television antenna which may readily and conveniently be adjusted to change the inductance of the antenna and for obtaining maximum directional positions of the antenna with respect to the transmitting antenna.

An ancillary object and accomplishment of the invention is to provide a new and improved indoor television antenna which is adapted to be economically manufactured and which is so designed as to permit the manufacture and assembly thereof in accordance with present day large scale mass production manufacturing methods of construction and assembly.

The invention seeks, as a further object and accomplishment, to provide an indoor television antenna particularly characterized by a design arrangement to more advantageously and satisfactorily perform the functions required of it and adapted to provide a compact unit which will successfully combine the factors of structural simplicity and durability, and yet be economical to manufacture.

Additional objects, features and advantages of the invention disclosed herein will be apparent to persons skilled in the art after the construction and operation are understood from the within description.

It is preferred to accomplish the various objects of this invention and to practice the same in substantially the manner as hereinafter more fully described, and as more particularly pointed out in the appended claims.

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Embodiments of the invention are illustrated in the accompanying drawings forming a part hereof and wherein:

Fig. 1 is a front face elevational view of an indoor television antenna embodying the features of the present invention;

Fig. 2 is a back face elevational view of the indoor television antenna depicted in Fig. 1;

Fig. 3 is an elevational view of the indoor television antenna depicted in Fig. 1, but having the front face covering removed to more clearly illustrate the internal construction of the antenna;

Fig. 4 is a top view of the indoor television antenna depicted in Fig. 1 and showing the different positions to which the antenna may be adjusted;

Fig. 5 is a perspective view of a television set illustrating the position which may be assumed by the television antenna contemplated herein;

Fig. 6 is a diagrammatical view illustrating one possible form of mechanism which may be employed to effect adjustment of the antenna when the antenna is installed in the interior portions of a television cabinet;

Fig. 7 is a top plan view of the antenna and adjusting mechanism reference depicted in Fig. 6 and being taken substantially on the plane of the line 7—7 in Fig. 6; and

Fig. 8 is a side elevational view of the antenna and adjusting mechanism therefor depicted in Fig. 6 and being taken substantially on the plane of the line 8—8 in Fig. 6.

The drawings are to be understood to be more or less of a schematic character for the purpose of illustrating and disclosing typical or preferred forms of the improvements contemplated herein and in the drawings like reference characters identify the same parts in the several views.

In the exemplary embodiment of the invention depicted in Fig. 3, the television antenna is indicated in its entirety by the numeral 20 and comprises, in general, a book-like support 21 divided into two foldable sections 22 and 23 and formed of a suitable material such as, for example, leather, compositions imitating leather, plastic compositions, etc.; a straight dipolar circuit comprising angularly disposed metallic ribbon members 24 and 25; and a folded dipolar circuit comprising a metallic ribbon 26 formed to define a generally rectangular shape with an open portion 27 adjacent the central regions of one leg of the rectangle, said straight dipolar circuit and said folded dipolar circuit being interconnected to define terminals 28 and 29 to which 300 ohm lead wire 30 is connected.

The metallic ribbon defining the two circuits

may be one piece beginning, for example, at the top end **31** of the metallic ribbon member **24** and running around the circuit as shown in Fig. 3 and ending at the top end **32** of the metallic ribbon member **25**. Another example of assembly is illustrated in Fig. 3 which shows that the circuit pattern may be made up of individual segments which are secured together by any suitable practice such as, for example, soldering **33** and the like, to define the circuit pattern as shown.

The back face of the book-like support may be plain as shown in Fig. 2 and may be provided with the male members **34** and **35** of snaps suitably wired as shown as at **36** and **37** to the circuit pattern and adapted to receive, for snap on and off action, the snap button female members **38** and **39** which are suitably wired to the 300 ohm lead wire **30**.

The front face of the book-like support is covered with a relatively thin sheet of material similar to the back face to enclose the antenna circuits therein so as to effect an appearance as disclosed in Fig. 1 or 6. It is desirable to have the casing as moisture-proof as possible since humidity will change the inductance of the antenna. It is preferable that the enclosure be lacquered or provided with a similar finish to effectively seal the antenna within the support.

In Fig. 1 it can be seen that one of the foldable sections may be provided with a picture frame **40** so as to provide utilitarian purposes in addition to the functions hereinbefore described as an indoor television antenna. In this connection, it can be seen in Fig. 5 that the instant television antenna may be disposed on the top of a television receiver A and that the provision of the picture frame **40** adds to the pleasing appearance thereof effective to satisfying the aesthetic senses of the user.

The inductance of the instant antenna can be varied by folding the book-like support to various positions to obtain maximum directional positions of the antenna with respect to the transmitting antenna. The instant antenna will operate when folded or lying flat depending upon the directional circumstances between the instant antenna and the transmitting antenna. In general, it has been found that folding of the foldable sections increases the inductance of the antenna for the higher channels while opening of the foldable sections increases the inductance of the antenna for lower channels. Some of the various positions which may be assumed by the foldable sections are illustrated in dotted lines in Fig. 4.

By combining the straight dipolar circuit comprising the angularly disposed metallic ribbons **24** and **25** with the folded dipolar circuit comprising a metallic ribbon **26** formed to define a rectangular shape, in their respective positions as shown in Fig. 3, there is provided a balanced indoor television antenna not dependent upon the lead in wire to increase the inductance thereof. Moreover, the instant antenna may readily be employed equally as well with television sets having 72 ohm matched impedance or sets having 300 ohm matched impedance. An unmatched television antenna will interfere with picture reception because of the mis-match of the lead in wire or the antenna or the set. Otherwise stated, the television set, the lead in wire, and the antenna must be matched to obtain proper television picture reception. The instant antenna provides proper matching of the three aforementioned elements.

The indoor television antenna depicted in Figs. 6, 7 and 8 is of identical construction to that shown in Figs. 1, 2 and 3 with the exception that the picture frame **40** is omitted. In some cases it may be desirable to install the instant television antenna within the cabinet. This is advantageously accomplished by providing a rod **50** secured to the outside edge of the foldable section **22** and securing a string or wire **51** to the outside edge of the foldable section **23**, said string or wire **51** being adapted to be wound upon a drum **52** by virtue of the manual rotation of a rod **53** provided with a knob **54**, the rod **53** being suitably carried by and disposed within the cabinet of the television set A with the knob **54** exposed exteriorly of the set within convenient reach of the user.

It can be seen in Fig. 8 that the inductance of the television antenna may be varied by changing the relative position of the foldable sections **22** and **23**, this being accomplished by rotating the knob **54** which causes the wire **51** to be wrapped upon the drum **52**. By the same token, counter rotation of the knob **54** will permit the television antenna to fold by gravity, thereby to change the inductance of the antenna. The rod **50** may be secured to suitable portions of the cabinet so as to be held in a rotatable but a fixed position.

Although I have disclosed one form of an indoor television control as shown in Figs. 6, 7 and 8, it is obvious that other forms can be employed equally as well to effect the general purposes as herein stated. The instant invention is not particularly concerned with the manner of control but places emphasis upon the specific construction of the television antenna per se since it is obvious that the control would necessarily be of different construction to fit various sets of competitive manufacture. It is only necessary that mechanical means be provided to effect folding of the sections **22** and **23** and rotation of the entire unit.

The instant indoor television antenna, being formed of simple parts and readily available materials, lends itself to mass production manufacturing principles, thus affording a substantial saving in the manufacturing cost.

From the foregoing disclosure, it may be observed that I have provided an improved indoor television antenna which efficiently fulfills the objects thereof as hereinbefore stated and which provides numerous advantages which may be summarized as follows:

1. Structurally simple, efficient and durable;

2. Economical to manufacture and readily adaptable to mass production manufacturing principles; and

3. The provision of an indoor television antenna combining a folded and straight dipolar arrangement to effect uniformity of matching frequencies of channels of the low band with the frequencies of the high band thereby to provide a balanced antenna not dependent upon the lead wire to increase the inductance thereof and which may readily and conveniently be adjusted to change the inductance of the antenna and to obtain maximum directional positions of the antenna with respect to the transmitting antenna.

While I have illustrated preferred embodiments of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth but wish

to avail myself of all changes within the scope of the appended claims.

I claim:

1. A television antenna comprising metallic ribbon formed to define a generally rectangular shape with two angularly disposed segments of said metallic ribbon disposed on the same plane and within the confines of the rectangular shape, each of said angularly disposed ribbon segments having one end portions thereof respectively disposed in proximity to adjacent corners of said rectangle and the other end portions thereof respectively defining terminals for attachment of lead wire.

2. In a television antenna, the combination with a folded dipolar circuit formed of a metallic ribbon to define a generally rectangular shape, of a straight dipolar circuit formed of two angularly disposed metallic ribbon members disposed on the same plane and within the confines of the rectangular shape of the ribbon member of the folded dipolar circuit, each of said angularly disposed ribbon members having one end portions thereof respectively disposed in proximity to adjacent corners of said rectangle and the other end portions thereof respectively interconnected with the metallic ribbon member of the folded dipolar circuit to define terminals for attachment of lead wire.

3. A television antenna comprising a book-like support forming two foldable members, a straight dipolar circuit comprising angularly disposed metallic ribbon members respectively disposed in the same plane within said foldable members, and a folded dipolar circuit comprising a metallic ribbon disposed within said foldable members and formed to define a generally rectangular shape with an open portion adjacent the central regions of one leg of the rectangle, said straight dipolar circuit and said folded dipolar circuit being interconnected at the open portion to define terminals for attachment of lead wire.

4. A television antenna comprising a book-like support forming two foldable members, angularly disposed metallic ribbon members respectively disposed in the same plane and within said foldable members, a metallic ribbon disposed within said foldable members and formed to define a generally rectangular shape with an open portion adjacent the central regions of one leg of the rectangle, said angularly disposed metallic ribbon members being interconnected with said last-mentioned metallic ribbon at the open portion thereof to define terminals for attachment of lead wire.

5. A television antenna comprising a straight dipolar circuit formed of angularly disposed metallic ribbon members, and a folded dipolar circuit formed of a metallic ribbon to define a generally rectangular shape with an open portion adjacent the central regions of one leg of the rectangle, the ribbon members of each of said circuits being disposed on the same plane with the members of the straight dipolar circuit disposed within the confines of the rectangle defined by the ribbon member of the folded dipolar circuit, and said straight dipolar circuit and said folded dipolar circuit being interconnected at the open portion to define terminals for attachment of lead wire.

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