Oct. 6, 1970 E. G. PARTRIDGE 3,532,315

ANTENNA WIRE SUPPORT STRUCTURE

Filed March 6, 1967

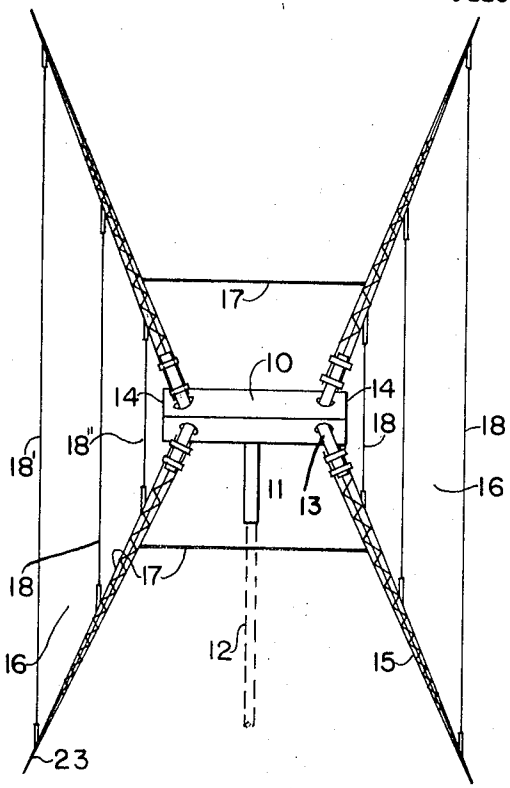


FIG. 1

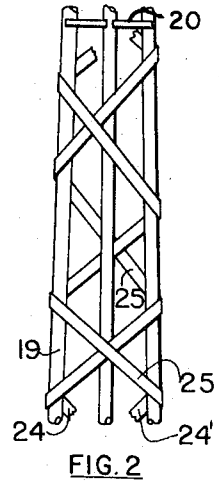


FIG. 2

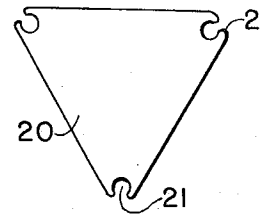


FIG. 3

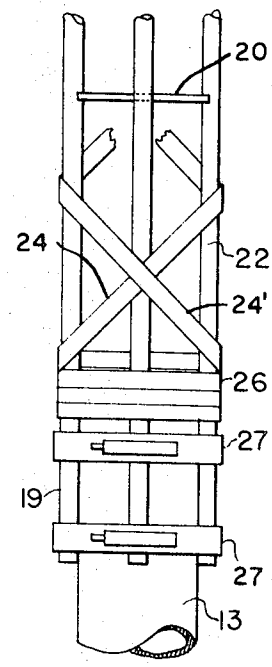


FIG. 4

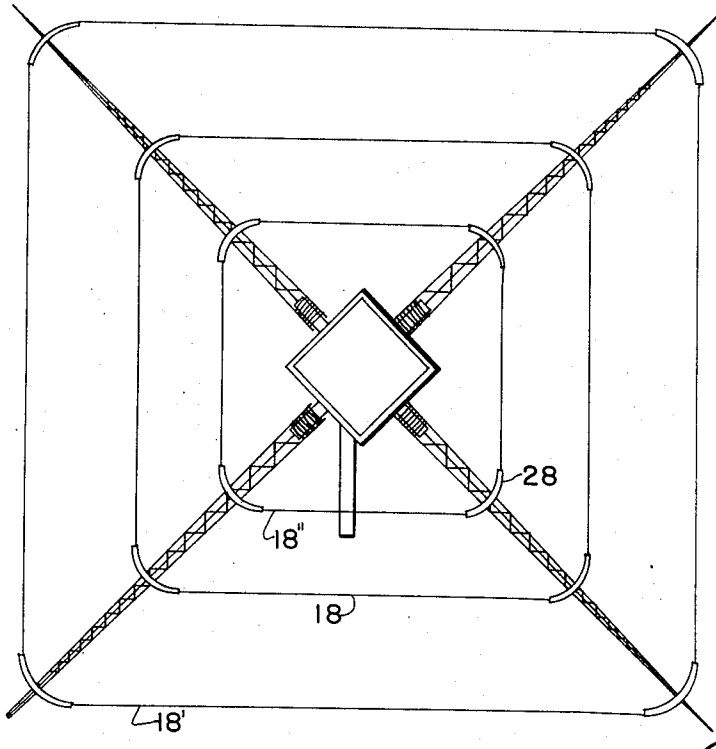


FIG. 5

INVENTOR:
EMERSON GLEN PARTRIDGE
By
HIS ATTORNEYS

United States Patent Office 3,532,315 Patented Oct. 6, 1970

3,532,315

ANTENNA WIRE SUPPORT STRUCTURE

Emerson G. Partridge, Winnipeg, Manitoba, Canada, assignor to Structural Glass Limited, Winnipeg, Manitoba, Canada

Filed Mar. 6, 1967, Ser. No. 620,802
Int. Cl. H01q 1/14
U.S. Cl. 248—205 1 Claim

ABSTRACT OF THE DISCLOSURE

Antenna wire supporting elements arranged in radial formation upon each end of a supporting tube thus forming recessed pyramidal areas which are back to back. The individual elements are made from a plurality of glass reinforced plastic or the like rods held in spaced apart relationship by means of spacers and being wound around spirally with resin impregnated glass fiber filaments or the like which become bonded to the rods in open formation thus making a rigid integral open meshed element.

This invention relates to new and useful improvements in antennae and the elements therefor, particularly antennae used for radio reception.

In order to obtain the reception required under the majority of conditions, it is necessary that the antenna wire be mounted in a certain pattern upon arms or elements of one form or another. It is essential, under many conditions, to maintain a pattern accurately and this lack of being able to maintain the pattern is one of the faults of conventional antennae.

The present invention overcomes this advantage by the provision of two back to back sets of elements which enable the antenna wire to be strung in the desired pattern and to maintain this pattern under conditions of heavy wind and the like.

In conjunction with the foregoing, the individual elements contain novelty inasmuch as strength and rigidity is combined with an open type construction so that they offer considerably less wind resistance than would a solid element. This together with the fact that they are light weight and corrosion resistant, enables an antenna to be made which is weather resistant, maintains the rigid form and is light weight with minimum resistance.

With the foregoing in view, and such other objects, purposes or advantages as may become apparent from consideration of this disclosure and specification, the present invention consists of the inventive concept in whatsoever way the same may be embodied having regard to the particular exemplification or exemplifications of same herein, with due regard in this connection being had to the accompanying figures in which:

FIG. 1 is a side elevation of my antenna construction.

FIG. 2 is an enlarged fragmentary side elevation of one of the elements.

FIG. 3 is a plan view of one of the spacers.

FIG. 4 is an enlarged fragmentary side view showing the inner end of one element attached to the stub of the main support.

FIG. 5 is a view substantially at right angles to FIG. 1.

In the drawings like characters of reference indicate corresponding parts in the different figures.

Proceeding therefore to describe the invention in detail, reference should be made to the accompanying drawings in which **10** illustrates a main supporting member taking the form of a short length of square tubing. A cylindrical piece of tubing **11** is secured to this main supporting member **10** and extends downwardly therefrom by which the device can be secured to a conventional mast **12**.

Stubs **13** are welded to the outer walls of the square

tubing **10** adjacent the ends **14** thereof, said stubs inclining outwardly and being situated at 90° to one another extending in a radial arrangement.

Elements collectively designated **15** are secured to these stubs and extend radially outwardly from each end of the supporting member **10**, the four elements at one end of a supporting member constituting a set.

Due to the location and position of the stubs **13**, the elements extend radially outwardly from the ends and define a recessed pyramidal area **16** at each end of the support **10** and these areas defined by the two sets of elements, are back to back as clearly shown.

Plastic rods **17** extend between opposing elements of each set thus locking the two sets together and maintaining the relationship between the various elements.

It is a characteristic of antennae that the smaller the antenna loops, the closer the two opposing loops should be together. By extending four antenna loops of antenna wire **18** around the elements **15** as clearly shown in FIGS. 1 and 5, it will be observed that the outer or larger loop **18'** is farther apart from loop **18** than the innermost or smaller loop **18"** is from loop **18** so that the antenna construction gives a very desirable signal receiving characteristic.

The individual elements **15** are manufactured preferably of fiberglass rods **19** and although the present device uses three such rods per element, it will of course be appreciated that a greater number can be used if desired.

The three fiberglass rods **19** are maintained in the substantially triangular relationship by means of triangular spacers **20** having recessed corners **21** within which the rods **19** engage. The spacers decrease in area from the inner ends **22** towards the outer ends **23** so that when the rods are engaged with the spacers **20**, they present a tapered element which tapers from the inner ends **22** towards the outer ends **23**.

Glass or plastic filaments **24** saturated with resin are then spirally wound around the three rods engaging the spacers and these spirally wound filaments are bonded to the glass fiber rods in the usual manner so that when they are cured, a rigid construction is formed.

I prefer to provide two spiral windings **24** and **24'**, one being left handed and the other right handed and being wound in overlapping relationship as clearly shown in the drawings.

One of the important characteristics of the present device is that these spiral windings are open. In other words, the individual filaments **25** are in spaced relationship from one another thus giving a substantially triangular open latticed construction.

Adjacent the inner ends **22** of the rods **19**, I wrap the filaments **24** and **24'** in overlapping relationship so that when it is bonded to the rods, a type of socket is formed identified by the reference character **26**. This engages over the aforementioned stubs **13** and conventional clamps **27** are used to clamp the elements to the stubs as shown in FIG. 4.

Depending upon the dimensions of the elements, the spacers **20** can be utilized all the way from the inner ends **22** to the outer ends **23** or, if the dimensions are relatively small, the spacers can terminate approximately two-thirds of the way along the elements, the three rods being in contact with one another for the remainder of the distance with the glass fiber filaments of course extending the full length of the elements.

The aforementioned antenna wire **18** is mounted upon the sets of elements in square formation as shown in FIG. 5.

A plurality of lengths of flexible plastic tubing **28** are clamped to the elements in the desired position and the antenna wire passes freely through these flexible lengths

of tubing so that the tension is equalized over the entire assembly.

The wind resistance, of course, is extremely low due to the open latticed work formation of the elements and the fact that they are manufactured from glass fiber gives the necessary rigidity and light weight to the antenna.

The process utilized in wrapping the glass fiber filaments around the glass fiber reinforced plastic rods is known as the "wet-out" process in which the filaments are passed through a bath of catalyzed resin and are then wrapped in a wet condition around the rods at which time the resin cures and bonds the filaments to the rods and also makes the filaments a relatively rigid element in itself.

The spacers **20** can either have recessed corners in which the rods rest, or alternatively, these corners can be shaped as indicated at **21** in FIG. 3 so that the rods snap in position and therefore form a relatively rigid element prior to the winding thereon of the processed filament.

What is claimed to be the present invention is:

1. An antenna wire support comprising a main support member, a plurality of stubs projecting laterally outwardly from said support member, and a plurality of elongated wire supporting elements mounted on the respective stubs and extending radially outwardly from the support member, each of said wire supporting elements being tapered longitudinally from its inner end to its outer end and comprising a set of juxtaposed rods of plastic material disposed in outwardly convergent relation, a plurality of spacer plates provided at longitudinally spaced points between said rods in planes normal to the longitudinal direction of the rods, plastic filaments wound spirally in opposite crossing directions around said rods with the spiral windings of the filaments being spaced to provide an open latticework, said filaments being bonded to said rods and being circumferentially overlapped adjacent the inner end of the supporting element to constitute a socket portion receiving the associated one of the stubs and thus mounting the supporting element on that stub, and clamp means provided on said socket portion of the supporting elements for securing the same on the respective stubs.

References Cited

UNITED STATES PATENTS

760,167	5/1904	Warner	52—654 X
1,328,927	1/1920	Lochman	52—654
3,273,159	9/1966	Holloway	343—867

FOREIGN PATENTS

850,974	10/1960	Great Britain.
325,758	1/1958	Switzerland.

OTHER REFERENCES

"Microwave Journal," January 1964, p. 104.

PAUL L. GENSLER, Primary Examiner

U.S. Cl. X.R.

52—654; 343—742, 878