This invention relates to tower type antennas for broadcasting transmitters, and has for its primary object the provision of a construction and arrangement whereby the current distribution from the same is constant along the length of the tower.

Another object of the invention is to provide an improved radiation pattern having higher efficiency.

A further object of the invention is to provide, in addition to the foregoing, a construction for the even current distribution referred to, and an unusually strong antenna tower as well.

These and other objects of the invention will become apparent from the following description of the accompanying drawings, wherein:

Figure 1 is a broken elevational view of a radio tower antenna embodying the features of the present invention.

Figure 2 is an enlarged elevational view of a portion of the tower shown in Figure 1.

Figures 3 and 4 are lateral sectional views taken, respectively, on lines 3—3 and 4—4 of Figure 2; and Figure 5 is a similar sectional view taken on lines 5—5 of Figure 1.

Figure 6 is a broken sectional view of the means employed for joining the sections of the tower.

The form of the invention shown includes a base 1 which is well secured and supported in the ground. Upon the base 1 there is a ball socket insulator 2 which supports the tower to be described and to provide pivotal movement of the tower at its outer end when the latter is flexed by the wind.

The tower herein described is generally designated by the numeral 3 and is comprised of sections 4, each positioned one upon the other, end to end, and each section having four equally spaced vertical corners 5 of angle steel. Each section 4 includes spaced level struts 6, also of angle steel, for securing the said corners in fixed relation, and additionally include diagonal struts 7 between adjacent level struts 6, all of the said parts 5, 6 and 7 being welded in place. Horizontal ladder steps 8 of angle steel may be welded intermediate the ends of the diagonal struts 7 and between the corners 5 for climbing the tower to make repairs.

The lowermost section 4 is tapered towards its lower end where it is secured, by suitable means, on the insulator 2. This portion of the invention is conventional, and is not, therefore, described in detail. Although a tapered lower section is illustrated, it is to be understood that the invention applies to other uniform cross sectional towers as well as the tapered one herein described.

The sections 4 are joined, end upon end, in the manner illustrated in Figure 2. The outer surface of each angular corner 5 is provided with upward projecting splices or bars 9 at their upper ends; said bars or splices being welded in place, and the corners thus formed by the said splices receive the lower ends of the corners 5 of each above section 4. As particularly shown in Figure 6, the projecting splices 9 and corners 5 received therein are secured by groups of three bolts on the one side of the corner, and two bolts on the adjacent side of the corner. All bolts are indicated by the numeral 10. Opposing copper disks 11 are separately welded to the respective faces of the splice bars 9 and the lower outer surfaces of the received corners 5 at locations around the center bolt 10 of the referred to group of the bolts. As will be seen, the described arrangement of copper disks 11 has to do with maintaining electrical contact between the sections 4.

Certain of the described horizontal struts 6, which form square arrangements in lateral cross section, as illustrated in Figures 4 and 5, are provided with crossed horizontal diagonals 12 to form what is herein referred to as frequency bonds 13, and which bonds are spaced from each other along the length of the tower at ten foot intervals.

At various levels on the assembled tower 3 there are guy frames 14 around the said tower, as particularly illustrated in Figure 5. Each frame 14 is comprised of horizontal straps 15 which are outwardly flanged at their ends where they are bolted to each other but receive shackles 16 therebetween for engaging insulators 17. Preferably, multiples of insulators 17 are employed at each corner of each guy frame 14. Guy straps 18 are secured to the ground by suitable means, not shown, at distances from the base of the tower 3 and have their upper ends secured to the referred to insulators 17. To prevent the frames 14 from slipping downwardly on the tower 3, the frame straps 15 may be welded to the corners 5.

The described tower may be provided with obstruction lights 19 and a beacon 20 at the top of the structure.

Ordinarily, tower type antennas are operated on a physical dimension of approximately one-quarter to one-half the wave length of the transmitter frequency.

The input radio frequency energy fed into the tower should be equally distributed, but due
to the conventional joining of the corners 5, a relatively large radio frequency resistance can exist at the joints. For this reason there will be an uneven distribution of the radio frequency and, accordingly, a corresponding condition will exist in the radiation pattern. The copper bonds 11 between the splices 9 and the received corners 5, secured under tension by the bolts 10, provide a very low resistance bonding between the sections 4, and thereby overcomes the above referred to objects.

By reason of the described horizontal diagonals 12, there will be a radio frequency bonding between the corners 5. Thus, if any difference in potential should tend to exist, it will be balanced and equally distributed at the bonds 13. Moreover, if any of the described splices should fail, the current is readily conducted through an adjacent diagonal 7 to the nearest above diaphragm 13 where the current is again equally distributed in all of the corners 5. Since standard broadcast wave lengths are usually not multiples of ten, a spacing of ten feet between the bonds 13, as referred to, will not produce undesirable harmonics or parasitic oscillations at these locations. Since ten foot spacing between bonds 13 is relatively small as compared with conventional broadcast transmitter wave lengths, the radio frequency potential gradient will be small and can be more easily balanced at the said diaphragms. In view of the described construction for equal distribution of radio frequency current over the tower, it follows that a more stable condition for antenna tuning will exist.

The described form of the invention is not restrictive, but may be made in many ways within the scope of the appended claim.

What is claimed is:

In a tower antenna, vertical sections connected end to end and in which the sides of the upper said sections are parallel with respect to each other, each said upper section being comprised of corners of angle steel, together with horizontal and diagonal struts connecting and supporting the adjacent said corners of each said section, horizontal frequency bonds arranged diagonally of said sections and spaced at 10 foot intervals one above the other in the upper end of said tower and each said bond being electrically conductively connected with its adjacent said corners, and low resistance electrical bonds connecting the ends of said sections in their described relation.

JOHNNIE ANDREWS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>768,005</td>
<td>Stone</td>
<td>Aug. 16, 1904</td>
</tr>
<tr>
<td>1,521,422</td>
<td>Boyd</td>
<td>Dec. 30, 1924</td>
</tr>
<tr>
<td>1,897,373</td>
<td>Gerten et al.</td>
<td>Feb. 14, 1933</td>
</tr>
</tbody>
</table>