

Dec. 1, 1936.

W. S. EDGE

2,062,408

HIGHWAY GUARD

Filed Nov. 30, 1934

4 Sheets-Sheet 1

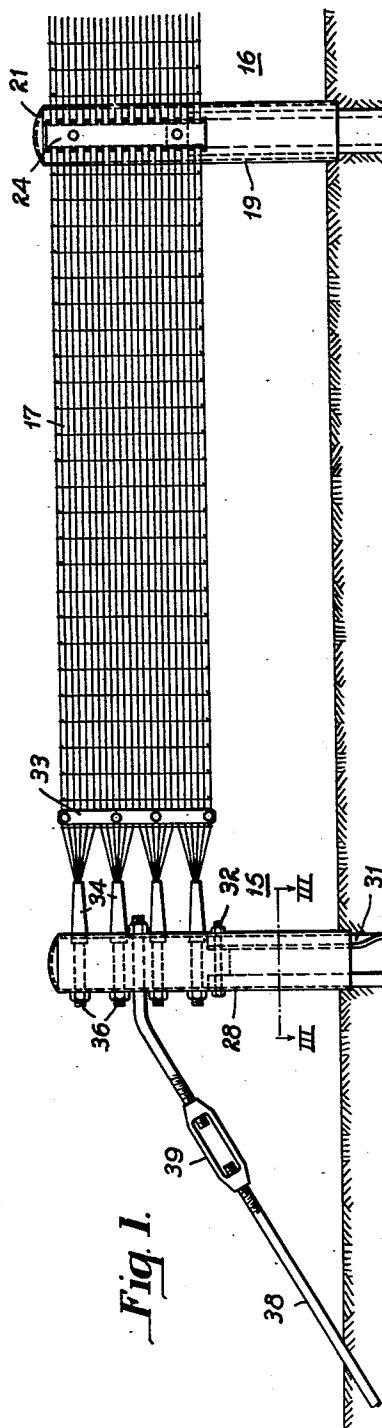


Fig. 1.

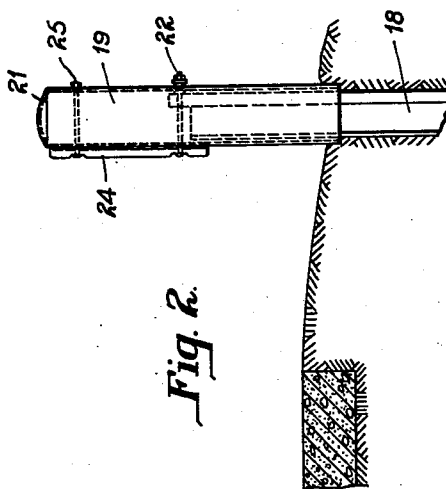


Fig. 2.

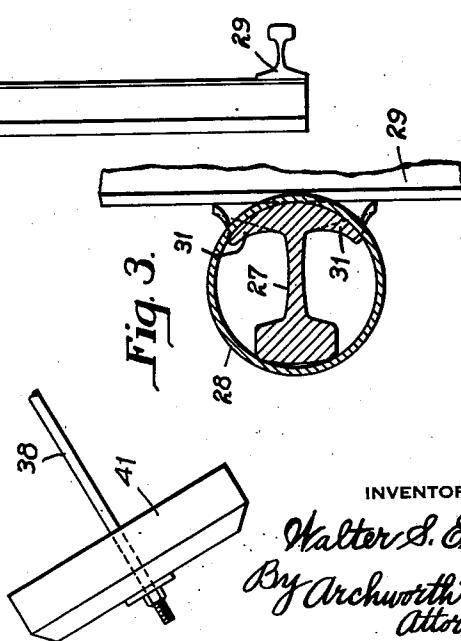


Fig. 3.

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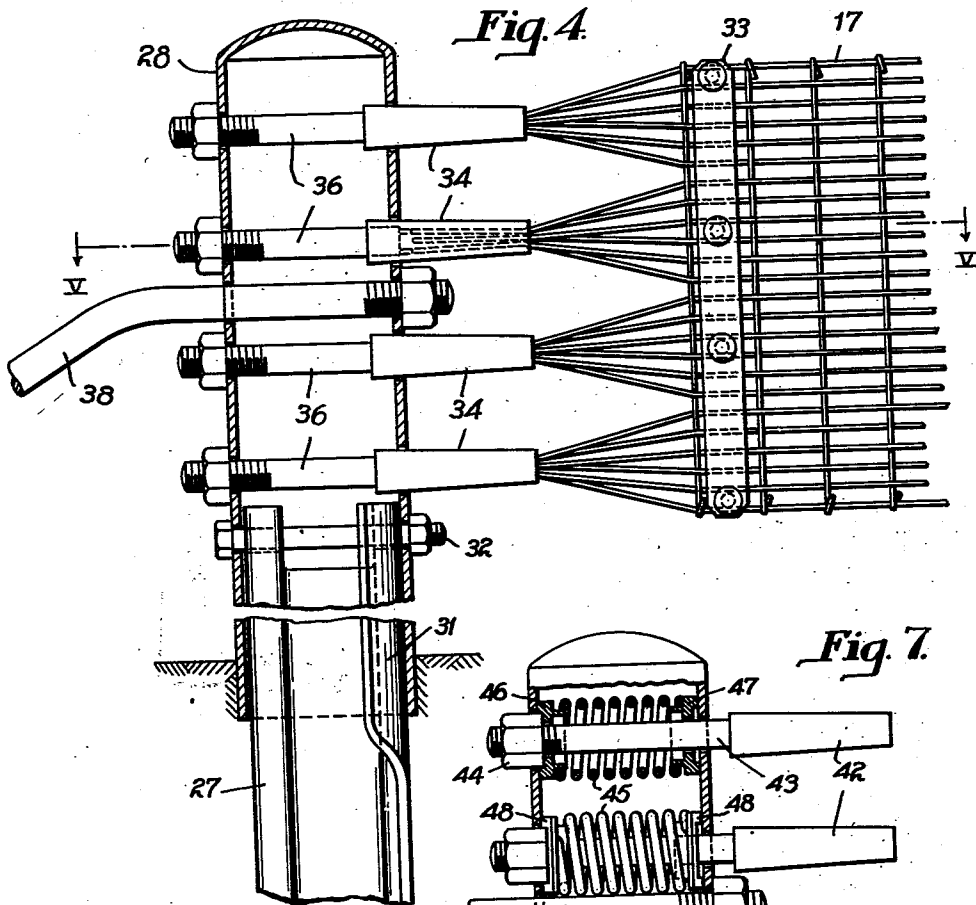


Fig. 6.

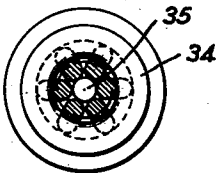


Fig. 5.

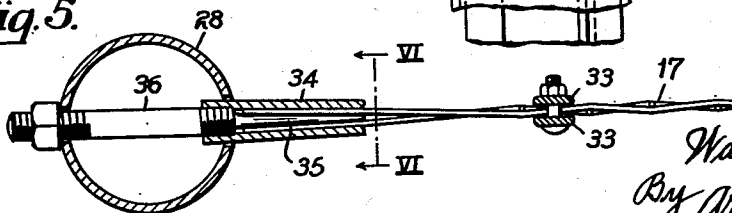
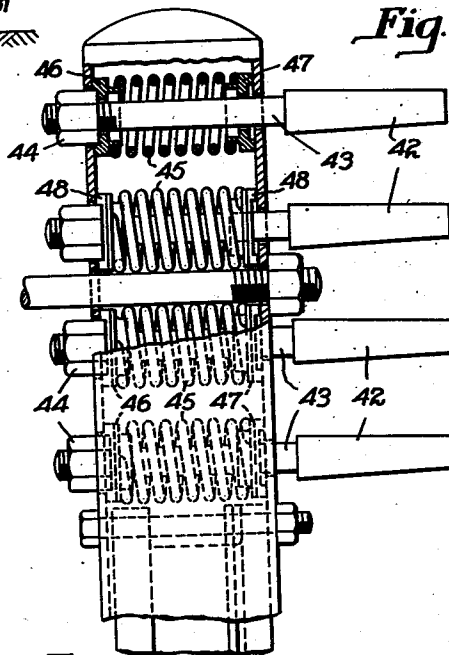


Fig. 7.



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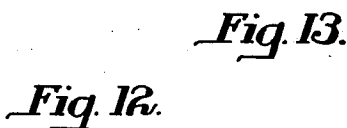
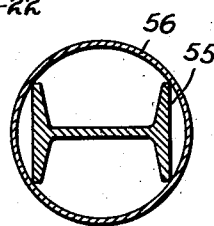
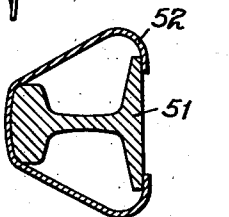
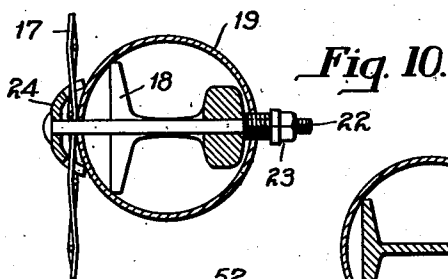
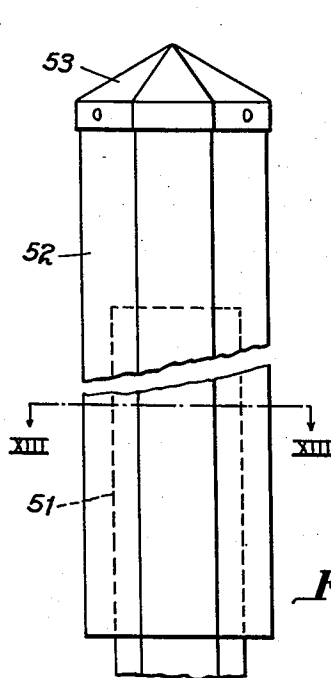
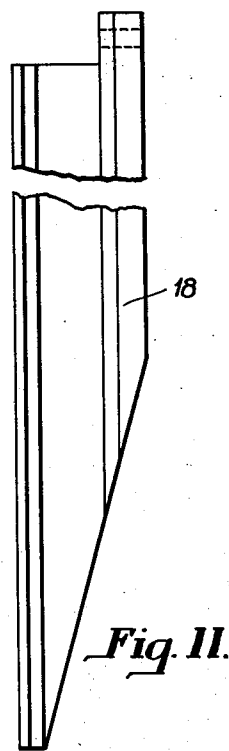
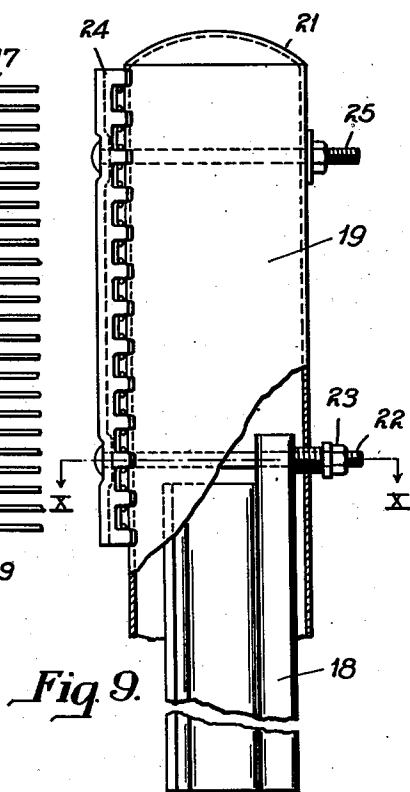
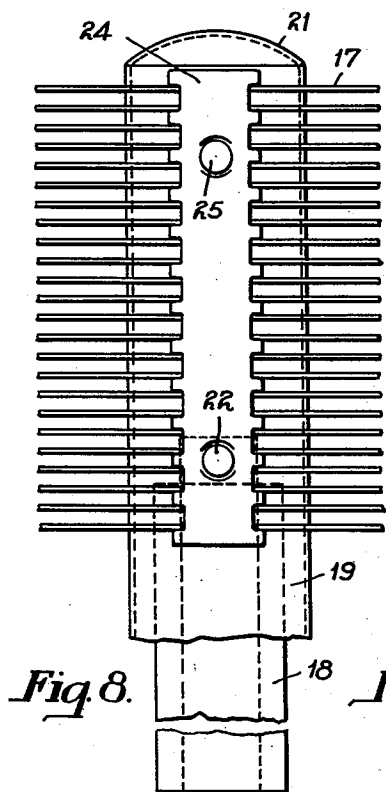
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4 Sheets-Sheet 3



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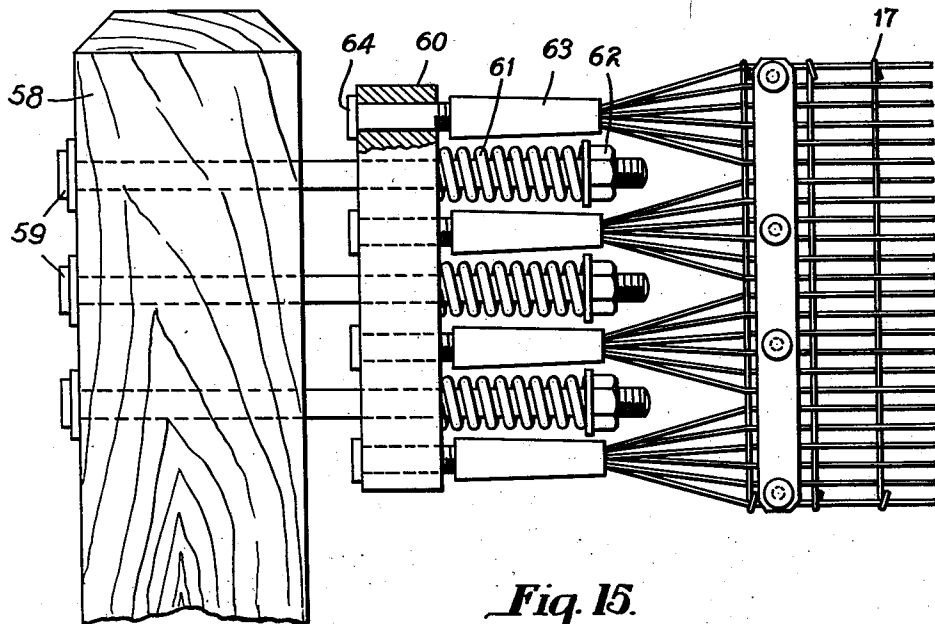


Fig. 15.

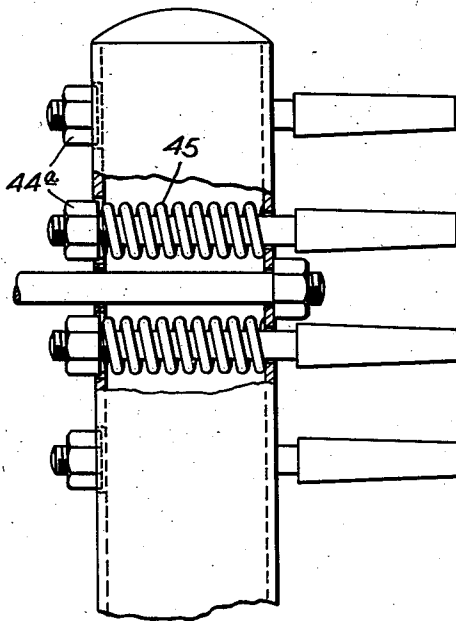


Fig. 16.

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UNITED STATES PATENT OFFICE

2,062,408

HIGHWAY GUARD

Walter S. Edge, Pittsburgh, Pa., assignor to Pittsburgh Steel Company, Pittsburgh, Pa., a corporation of Pennsylvania

Application November 30, 1934, Serial No. 755,388

4 Claims. (Cl. 189—26)

My invention is hereinafter described as employed particularly in the making of highway guards or safety barriers which are employed for protection at dangerous points along highways, but it will be understood that various features of the invention are suitable also for use in the construction of fences generally.

Heretofore, it has been common practice to employ wooden posts for supporting barrier elements such as cables or bands, and metal posts have also been employed particularly in fences. The wooden posts even when treated with creosote or other preserving materials have been of too short life, and in some sections of the country, have been too expensive. In the case of metal posts, they have, in the interests of economy, generally been made of light section, with the result that their life is short, especially as to those portions which are imbedded in the earth. Also, difficulty has been experienced in properly securing the barrier elements such as railings and bands thereto.

One object of my invention is to provide a guard or fence having a metal post of such form that the barrier elements can be conveniently and effectively mounted thereon.

Another object of my invention is to provide a metal post structure of such form that it will have great strength and be long-lived, without employing an excessive amount of metal.

Another object of my invention is to provide a metal post structure in two parts, one of which can be driven into the ground, and the other of which can be readily attached thereto at points above the ground.

Another object of my invention is to provide a metal post formed in upper and lower sections, either of which may readily be replaced in case of deterioration or damage.

Still another object of my invention is to provide a metal post structure of such form that portions thereof will yield under impacts, thus reducing damage to the post from impacts, and also reducing danger of the post being displaced in the ground.

A further object of my invention is to provide posts with surfaces of such contour that shearing action on wire or other bands, through impacts against the band, in the vicinity of said posts is reduced.

Some of the forms which my invention may take are shown in the accompanying drawings wherein Figure 1 is a face view of a portion of a highway guard; Fig. 2 is a vertical sectional view thereof; Fig. 3 is a view taken on the line

III—III of Fig. 1; Fig. 4 is a sectional view, on an enlarged scale, of a portion of the structure of Fig. 1; Fig. 5 is a view taken on the line V—V of Fig. 4; Fig. 6 is a view taken on the line VI—VI of Fig. 5; Fig. 7 is a view showing a modification of the structure of Fig. 4; Fig. 8 is a face view of the intermediate post of Fig. 1; on an enlarged scale; Fig. 9 is a view thereof partially in side elevation and partially in section; Fig. 10 is a view taken on the line X—X of Fig. 9; Fig. 11 is a side view of the lower section of a post, which may be driven into the ground; Fig. 12 is a face view showing a modification of the intermediate post of Fig. 8; Fig. 13 is a view taken on the line XIII—XIII of Fig. 12; Fig. 14 shows a modification of the structure of Fig. 13; Fig. 15 shows another means for fastening the guard band to a post, and Fig. 16 is a modification of the structure of Fig. 7.

Referring first to Figs. 1 to 11, I show a structure which may have an anchoring post 15 at each end of the structure and a suitable number of intermediate posts 16, a band or barrier element 17 being secured to said posts, for the purpose of stopping vehicles which leave the highway along which the guard structure is mounted. The barrier element 17 can be made of any suitable material, and be of various forms, but is here shown as being composed of strand and stay wires of the structure shown in my Patent No. 1,970,954, issued August 27, 1934.

The intermediate posts are each composed of a bottom section 18, preferably in the form of a rolled shape, and an upper section 19 of tubular form. I have found that discarded railway track rails are quite suitable as lower post sections, because of their low cost, and because of their heavy cross section and great strength. The bottom section 18 can either be buried in the ground or set in concrete, or may be pointed at its lower end, as shown in Fig. 11, and driven into the ground. The upper post section 19 is formed from a tube of steel or other suitable metal, it being of sufficiently light gauge that it will yield slightly under heavier impacts. It may suitably have a wall thickness of approximately .148 inch. The top of the post is closed by welding a cap 21 thereto or in some other suitable manner.

As shown more clearly in Figs. 9 and 10, the lower section 18 extends into the tubular section 19 for only a short distance, and is secured thereto by a bolt 22, the base flanges and web of the rail being cut away to permit the bolt to pass through the rail head. The tubular section 19

is preferably extended slightly into the ground, as shown in Fig. 1, primarily as a matter of appearance, and is of such diameter that it will have somewhat snug fit with the head and the base of the section 18, as shown in Fig. 10. A nut 23 has a sleeve-like extension that passes through a hole in the rear side of the tube 19 and abuts against the head of the section 18.

The bolt 22 also extends through a clamping bar 24 which has teeth that lie between the strands of the band 17 and abut against the front side of the post. Tightening of the nut 23 will draw the bar 24 tightly against the post 19 and will hold the post in snug engagement with the base flanges of the post section 18. The bar 24 also serves to retain the band 17 in place on the post and permits sliding movements of the band, in order that stresses may be transmitted throughout the full length of the band. Near the upper end of the bar 24 a second bolt 25 passes through the bar and the post, to assist in holding the bar in place. The curved contours of the clamping bar 24 and the post 19 at their front sides serve to deflect vehicles which strike the guard structure in the vicinity of the post, thus reducing damage to the vehicles, as well as to the guard structure itself. Also, there is less danger of shearing or cutting of the wire strands by vehicles which engage the same at the posts.

The anchor posts 15 are composed of lower and upper sections 27 and 28, respectively, which are of the same general form as the intermediate posts 16. However, the end posts require a more rigid support than the intermediate posts, and to this end I find it preferable to dig holes for the reception of the lower ends of the anchor posts, and at the lower ends weld thereto cross bars 29 of suitable length, which will resist displacement of the posts. Also, I find it desirable to have the sections 27 fit the tubular sections 28 more snugly, and to this end may use either rails of larger cross section, or tubes of smaller diameter, so that the base flanges 31 of the rails 27 can be bent at their upper ends to closely fit the interior wall of the tube 28, as shown in Figs. 1 and 3.

The sections 27—28 are secured together by a bolt 32, and I prefer to extend the sections 27 further up into the tubes 28 than the sections 18 extend into the sections 19. The upper portion of the web of the section 27 may be cut away to permit the bolt 32 to pass through the middle of the rail head and the rail base.

The strands of the band 17 are clamped at their ends between clamping plates 33 (Figs. 4 and 5). The ends of the strands are arranged in vertically-spaced groups, the strands of each group extending into a clamping sleeve 34 and distributed around a tapered clamping pin 35. Owing to the tapered form of the sleeve 34, a pulling force exerted on the strands will cause them to be wedged tightly between the pin 35 and the inner wall of the sleeve, in a manner usual with anchoring devices of this character.

Bolts 36 extend through the post section 28 and at their inner ends have threaded engagement with the sleeves 34 that also extend into the post. At their opposite ends, the bolts 36 are provided with nuts whereby tension may be applied to the band 17 by drawing the sleeves 34 farther into the post.

A guy rod 38 of a well-known form is connected to the post through the usual turn buckle 39, and to an anchor 41 that is imbedded in the ground.

In Fig. 7, I show yieldable tensioning devices for the band, instead of rigid connections to the posts. In this structure, the anchoring sleeves 42 are of substantially the same construction as are the sleeves 34, and bolts 43 are suitably connected at their inner ends to the sleeves 42. However, the nuts 44 of the bolts 43 do not seat against the side of the post, but extend through openings therein. The nuts 44 will be made of suitable axial dimension so that they can be conveniently operated, even though they extend for some distance into the post.

A spring 45 surrounds each bolt 43 and at its one end bears against a spring seat 46 that has engagement with the nut 44. As shown in Fig. 16, if the spring is made of smaller diameter it may seat directly against the nut 44, which corresponds to the nut 44, so that the spring can be inserted through one side of the post. At the other end of the spring is a seating member 47 which bears against the inner wall of the post. The outer faces 48 of the spring seats 46 and 47 are curved to the contour of the inner wall of the post. It will be seen that when a nut 44 is turned inwardly, against the expansive force of the spring 45, the anchor sleeve 42 will be drawn toward the post, thus tightening the band, and the tautness of the band will depend upon the extent to which the springs 45 are depressed by the nuts 44. By this arrangement, the band may be maintained sufficiently taut, and there will be less danger of displacement of the end posts, or breaking of parts through temperature changes or through impacts against the band.

Referring now to Figs. 12 and 13, I show a structure wherein the bottom section 51 of a post may be of substantially the same form as the sections 18 and 27, but in this instance, instead of employing a tubular upper section, I bend a sheet metal strip or plate 52 in such manner as to partially surround the section 51, a cap 53 being provided to keep out water and other foreign matter.

It will be understood that rolled sections of other than T form may be employed. For example, in Fig. 14, I show a post composed of an H section 55, and an upper tubular section 56.

Referring now to Fig. 15, I show the band 17 secured to a post 58, by means of bolts 59 that extend through the post and through a bracket or casting 60. Springs 61 surround the inner ends of the bolts and seat against the inner face of the bracket 60, and against the nuts 62, that may be adjusted, to provide the desired tension. The ends of the wire strands are held by a clamping device 63 that corresponds to the clamping device 34—35, and screws 64 extend through the bracket 60 and have threaded engagement with the sleeves of the clamps 63, so that one group of strands can be adjusted relative to the other groups, independently of the adjustment of the nuts 62. The opposite end of the band 17 may be similarly anchored, although in some cases it may be sufficient to anchor one end of the band rigidly, and not adjustable, and make adjustments only at the other end thereof.

I claim as my invention:—

1. Guard structure comprising a metal post having a tubular upper portion, and a lower portion of generally I-beam form partially extending into the lower end of the tubular member, the flanges at one edge of the I-beam sec-

tion being curved to fit the inner wall of the post.

5 2. Guard structure comprising a metal post having a tubular upper portion, and a lower portion of generally I-beam form partially extending into the lower end of the tubular member, an upper part of the web of the I-beam being cut away, and a fastening member extending through the tubular section and through the
10 said beam and the cut-out space in the beam, in a direction generally parallel to the plane of the said web.

15 3. Guard structure comprising a metal post having a tubular upper portion, and a lower portion of generally I-beam form partially extend-

ing into the lower end of the tubular member, the flange portions at each edge of the beam web extending upwardly beyond said web, and a fastening member extending through the upper parts of the flange portions and disposed in the plane of the web. 5

4. Guard structure comprising a post having a tubular upper portion, and a lower portion of generally I-beam form partially extending into the tubular member, a part of the web of said lower portion being cut away, and a fastening member extending through the tubular portion and through the I-beam at the cut-out space. 10

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