

July 21, 1964

G. R. SHREWSBURY

3,141,643

TANGENT SUPPORT FOR MESSENGER CABLE

Filed Dec. 21, 1961

FIG. 1

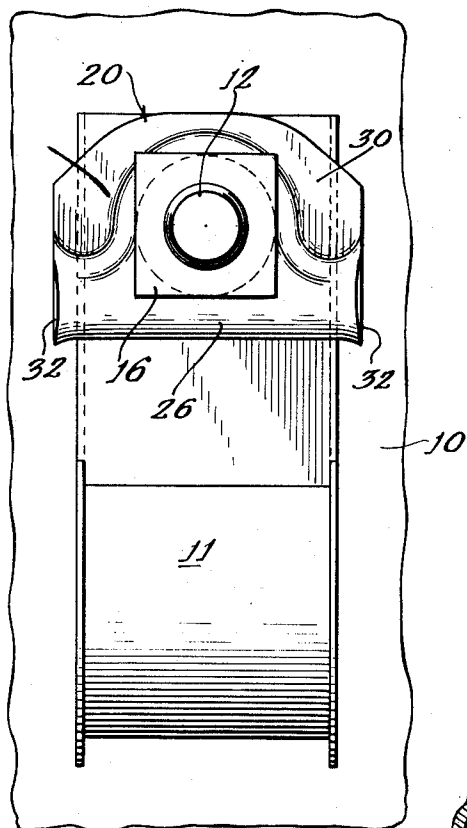


FIG. 2

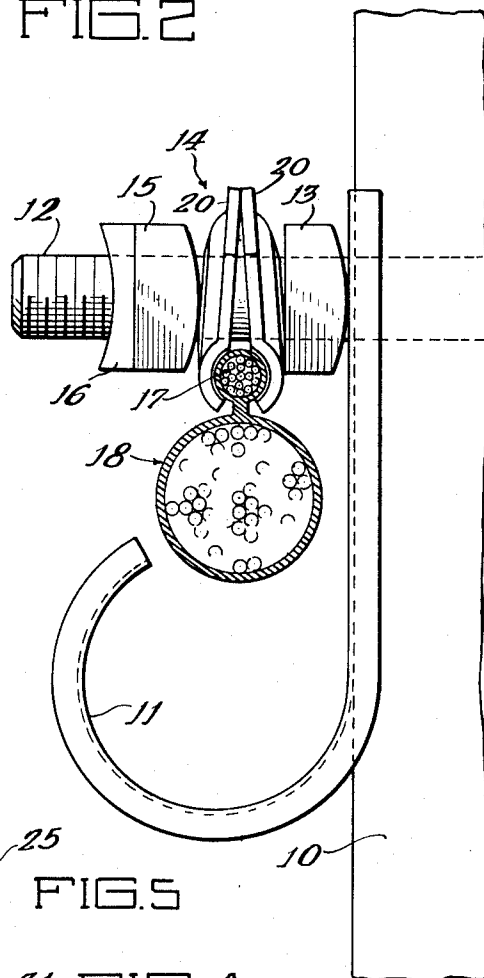


FIG. 3

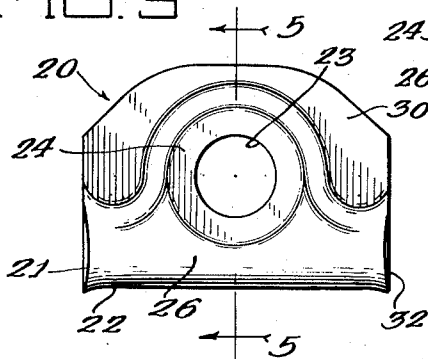


FIG. 5

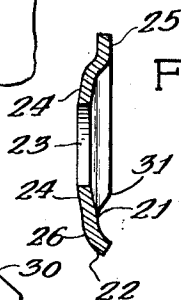
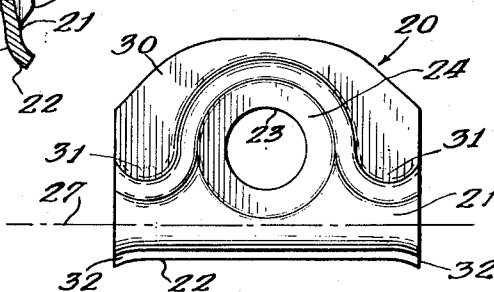


FIG. 4



Inventor:
George R. Shrewsbury
By: Zahl, Baker, York,
Jones & Githman
Attorneys

1

3,141,643

TANGENT SUPPORT FOR MESSENGER CABLE

George R. Shrewsbury, West Chicago, Ill., assignor to
Reliable Electric Company, Franklin Park, Ill., a corporation of Illinois

Filed Dec. 21, 1961, Ser. No. 161,170

6 Claims. (Cl. 248-74)

This invention relates to tangent clamps for messenger cable and is particularly well adapted for use on integrated messenger cable.

The term "messenger cable" refers to a combination of communication cable and a supporting steel strand or messenger. The cable and the messenger may be lashed to each other or, in the case of integrated messenger cable, the two are continuously connected to each other by a common extruded jacket of insulating material, such as polyethylene.

Such a cable is supported at intervals by clamps which engage only the messenger. The clamp is referred to as a "tangent" clamp for the reason that the messenger is gripped throughout a distance of about two inches so that the spans will take a reverse curvature in the vicinity of the point of support. It is necessary that the messenger be gripped firmly against longitudinal sliding movement so as to maintain necessary ground clearance.

It has been found that a tangent clamp made of cast metal tends to lose its grip over a period of months. This may be due to the lack of resilience of the cast metal parts, or to temperature changes, or it may be due to the cold flow of the polyethylene material of which the jacket is formed. Irrespective of cause, the cast metal clamp is not satisfactory as is evidenced by the occurrence of abrasion and wear of the messenger along the jaws of the clamps.

It is an object of my invention to provide a tangent clamp in which the screw threaded means directly overlies the jaw portions with the result that the clamping stress is transmitted directly to the jaw portions. This arrangement has been found to maintain the parts in clamped relationship much more satisfactorily than the devices previously proposed.

Another object is to so design the parts that there will be a slight amount of resilience so as to compensate for temperature changes and to provide a "follow through" clamping action which is sufficient to accommodate the extent of cold flow encountered in the jacket material.

Still another object is to provide a tangent clamp in which the clamping elements are sheet metal stampings, thus providing an improved clamping device at a somewhat lesser cost of fabrication.

Still another object is to provide an improved tangent clamp in which the clamping elements are formed from stainless steel. Stainless steel is desirable due to its corrosion resistant properties, but since stainless steel cannot readily be cast, it has been commonly assumed that this material was not available for use in tangent clamps.

According to my invention, the clamping members are stamped from stainless steel, but the parts are nevertheless arranged so that the clamping action is transmitted to the jaw portions in more or less of a straight line, as contrasted with an arrangement in which the clamping plates are stressed in flexure. In order to provide the desired gripping force, the use of an offset flexurally stressed arrangement would involve stresses which exceed the elastic limit of the material.

My invention is shown in combination with a J-hook which is oftentimes used in connection with a tangent clamp to facilitate the stringing of the messenger cable.

Other objects, features and advantages will become apparent as the description proceeds.

2

With reference now to the drawings in which like reference numerals designate like parts:

FIG. 1 is an elevation of a J-hook installation which includes my improved tangent clamp;

FIG. 2 is a side view of FIG. 1, but also showing the messenger cable;

FIG. 3 is an elevation of the outer surface of one of the clamping plates;

FIG. 4 is an elevation of the inner surface thereof; and

FIG. 5 is a section thereof taken along the line 5-5 of FIG. 3.

In FIGS. 1 and 2, the reference numeral 10 designates a telephone pole on which a J-hook 11 is mounted by means of a bolt 12 which passes through the pole. The hook is secured in place by a nut 13. Mounted on the bolt 12 is my improved tangent clamp 14, the parts being drawn up into clamping relationship by means of a nut 15 and a lock nut 16. The messenger 17 of a messenger cable 18 is gripped by the tangent clamp 14. The messenger 18 is of the integrated type previously described.

In stringing the messenger cable, it is first lifted up and loosely disposed within the J-hook 11, perhaps a half mile of cable being so supported so that the cable at each point of support can conveniently be adjusted longitudinally for the proper amount of sag and then lifted up a few inches for engagement by the tangent clamp 14. As shown in FIG. 2, it is the messenger 17 which is gripped by the two plates 20 of the tangent clamp, and the two plates are drawn up in gripping engagement by means of the nuts 15 and 16.

The tangent clamp 14 comprises two like plates 20, only one of which need be described in detail. The plate 20 is provided with a stamped jaw portion 21 along its lower edge 22. The plate is also provided with a hole 23 to receive the bolt 12. The annular portion 24 which surrounds the hole 23 is offset outwardly away from the plane of the inner surface 25 of the plate 20, so as to provide a bearing surface for the nut 13 or 15. The remote point of the outer jaw surface is designated in FIG. 3 by the reference numeral 26, and the term "remote" is used in respect to the distance through which such points are offset from the plane of the inner surface 25. The offsetting of the outer surface of the annular portion 24 is at least as great as the offset of remote point or points 26. Thus, the configuration of the jaw does not interfere with the rotation of the nut 15.

An important feature of my invention is the fact that the hole 23 is located so that it is as close as possible to the jaw portions. This results in a construction in which the annular bearing surface 24 definitely extends into or overlaps the jaw portion 21. As a result, the nuts 13 and 15 overlap the jaw portions 21 so that the compressive force is transmitted to the two jaw portions 21 in more or less of a straight line. In other words, if the hole 23 were located further away from the jaw portions 21, the plates 20 would be subjected to a flexural stress, and as previously indicated, the flexural stress necessary to provide the desired gripping engagement would exceed the elastic limit of the sheet metal. It is the embossing or offsetting of the annular bearing surface 24 which permits this arrangement of the parts.

In spite of the direct force transmission provided by this arrangement, I am nevertheless enabled to introduce the desired amount of resilience into the gripping action by dishing outwardly the annular portion 24. In other words, as shown in FIG. 5 the annular bearing portion 24 is of slightly conical shape. Compression of the conical portion develops a tensile stress in the annular portion 24 as contrasted with a flexural stress. Since the yield point of stainless steel is very high in tension, the arrangement herein shown permits me to apply to the messenger a resilient gripping force of very great magnitude.

Since the clamp is designed to accommodate different sizes of messenger within a limited range, the average radius of the jaw portion 21 may be somewhat greater than the radius of the messenger 17, with the result that somewhat less than the entire surface of the jaw portion actually is disposed in gripping relationship with the messenger 18 or its jacket. However, irrespective of the size of the messenger, it will tend to center itself with respect to the center line 27 of the jaw portions 21, and as shown in FIG. 3 the remote points 26 substantially coincide with the center line 27. Thus, the region of the jaw portions 21 extends for a substantial distance on either side of the center line 27. Since the peripheral portion 24 extends substantially to the center line 27, it is apparent that the peripheral portion 24 definitely overlaps the region of the jaw portion 21.

As shown in FIGS. 4 and 5, the marginal portions 30 of the plate 20 are disposed in the plane of the inner surface 25. These marginal portions extend downwardly at the sides to provide positioning shoulders 31 which form the boundary line between the jaw portion 21 and the remainder of the plate 20.

The ends of the jaw portions 21 are preferably flared at 32 to distribute the gripping stress and also to accommodate slight bends in the line.

To summarize the operation as previously described, when the nut 15 is tightened up, the dished annular portion 24 will be very highly stressed, and since the stressed peripheral portion overlaps the jaw portions 21, the stress will be transmitted more or less directly through the jaw portions to the messenger 17. Any slight change in the dimensions of the bolt 12, or of the messenger due to cold flow of the jacket will be taken up by the resilience of the highly stressed annular portion 24. Preferably, the plates 20 are formed of stainless steel so that they can withstand the exceedingly high stresses involved.

Although only a preferred embodiment of my invention has been shown herein it will be understood that various modifications and changes may be made in the construction shown without departing from the spirit of my invention as pointed out in the appended claims.

I claim:

1. A tangent clamp for integrated messenger cable comprising two like plates of stamped sheet metal and screw threaded means including a nut for actuating the same,

each plate having a transversely extending jaw portion formed along the lower edge thereof,

a hole formed in said plate immediately adjacent said jaw portion,

an annular nut bearing surface surrounding said hole, and offset outwardly from the inner surface of said plate to an extent at least as great as the corresponding offset of said jaw portion,

said annular bearing surface extending into said jaw portion to provide a direct transmission of force from said screw threaded clamping means to said jaw portion, and

5 said annular bearing surface being conically dished to impart resilience to the clamping action exerted by said tangent clamp on the jacketed messenger of said integrated messenger cable.

2. A tangent clamp as claimed in claim 1 in which the ends of said jaw portion are flared.

3. A tangent support for integrated messenger cable comprising

two like plates adapted to be disposed in opposing relationship,

15 the inner contacting surfaces of said plates comprising a plane of reference,

an edge portion of each plate being deformed to provide a substantially semicylindrical jaw portion, aligned holes passing through said plates,

20 the edge of said holes being close to said jaw portions, and

the central portion of each plate being embossed away from said reference plane so as to provide an annular bearing surface for a nut which will clear the outer surface of said jaw portion, said annular bearing surface being conically dished and extending into said jaw portion.

4. A tangent clamp as claimed in claim 1 in which said sheet metal is stainless steel.

30 5. A tangent clamp as claimed in claim 1 in which said plates have U-shaped contacting marginal portions which provide positioning shoulders for said jaw portions.

6. A clamping plate for a tangent support for integrated messenger cable comprising a plate member having a jaw portion formed along one edge thereof, a centrally located hole extending through said plate member, and being so located that the edge of said hole extends up to the region of said jaw portion, a conically dished annular portion surrounding said hole and extending into said jaw portion, said conically dished annular portion being offset away from the reverse surface of said clamping plate so that the obverse surface of said conically dished annular portion is at least as remote from said reverse surface as the obverse surface of said jaw portion adjacent to said offset portion.

References Cited in the file of this patent

UNITED STATES PATENTS

2,331,384	Flachousky	Oct. 12, 1943
2,981,511	Suozzo	Apr. 25, 1961
3,042,353	O'Mara	July 3, 1962

FOREIGN PATENTS

465,042	Germany	Sept. 14, 1928
840,721	Germany	June 5, 1952