Sept. 2, 1958 P. G. ROHLAND 2,849,771

ROPE CLAMPS UNDETACHABLY PRESSED ONTO WIRE ROPES AND SUCH LIKE

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FIG. 1

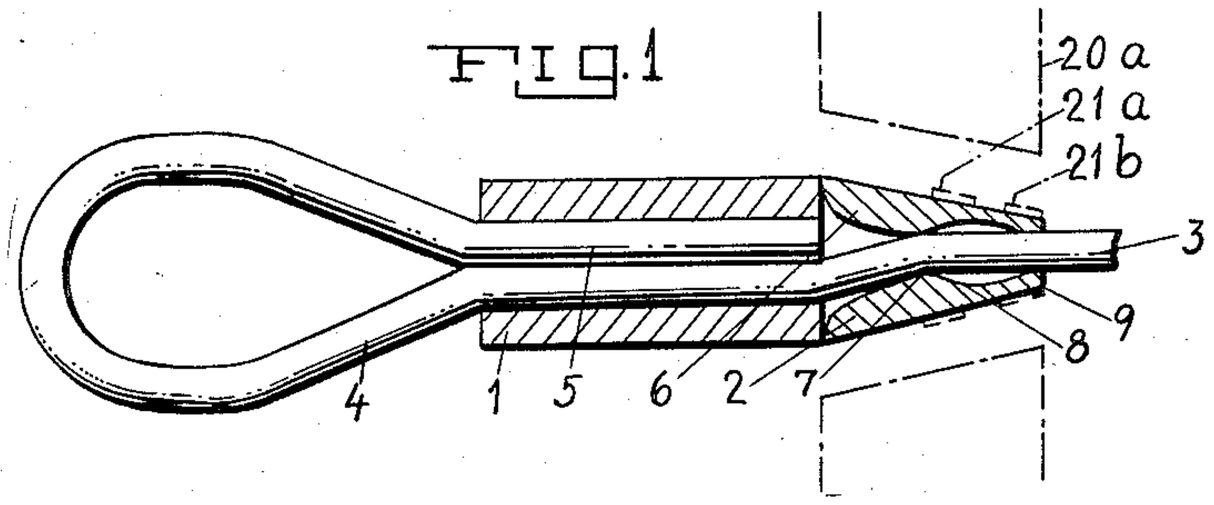


FIG. 4

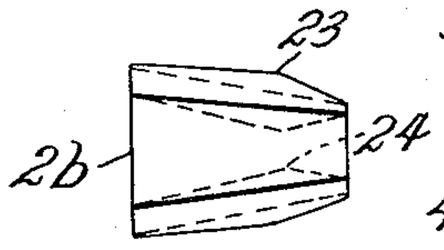


FIG. 2

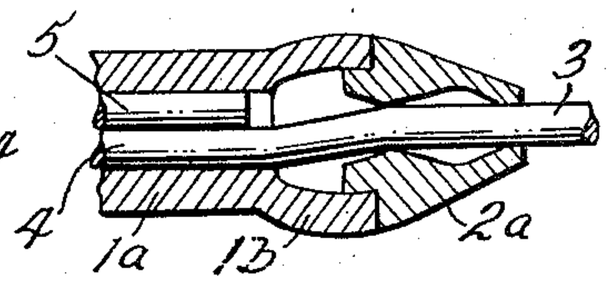
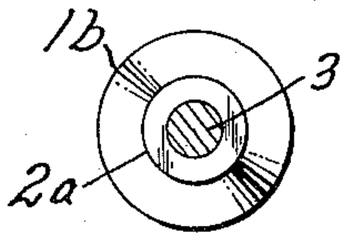


FIG. 3



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ROPE CLAMPS UNDETACHABLY PRESSED ONTO WIRE ROPES AND SUCH LIKE

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3 Claims. (Cl. 24—123)

The present invention relates to certain novel improvements in rope clamps which are undetachably pressed onto wire ropes, cables and such like under high pressure to connect the ropes or form loops.

The main object of the invention is to provide a device to counteract the injurious consequence of the hard pressure and strong pressure grip on the wire rope especially for the bearing portion thereof at the end of the clamp where the pressure suddenly ceases and where the wires and strands have undergone a sharp deformation that may be the cause of a break of a number of them followed by a reduction of the tensile strength, especially if the bearing rope is forced to an inclined direction.

A further object of the invention is to provide a device in a conical shape to counteract the tendency of the rope clamp to hook onto objects, said counteracting being carried through without any transmitting of the weak points of the rope from the end of the clamp onto the end of the conical device.

Other objects will appear hereinafter.

The invention essentially consists in a supplementary end piece which, arranged as a continuation of the clamp and stretching itself further along the rope from the end of the fastened clamp, where the high pressure on the rope is ceasing, is itself or by means of the clamp undetachably fastened by pressure to the rope preferably guiding the rope at the same time to centric position.

In the accompanying drawing:

Figure 1 is a longitudinal sectional view of the rope clamp with an attached stiff end piece;

Figure 2 is a longitudinal section of the end piece in another embodiment;

Figure 3 an end view thereof, and

Figure 4 is a longitudinal section of a further embodiment of the end piece as a modification of the embodiment of Figure 1.

It will be seen in Fig. 1 that a stiff supplementary end piece **2** is applied to load bearing rope portion **3** by pressing close to the end of a rope clamp **1**. The clamp **1** is pressed onto the rope with high pressure and at the other end holds, for example a loop **4** of the rope, and free end **5** of the rope is fastened under pressure within the clamp.

The end piece **2** is provided with a coaxial boring for the rope formed with a conical widening **6** towards the end of the clamp **1** guiding the rope in a smooth curve to a coaxial position near middle **7** of the end piece, at which location, the end piece **2** is fastened by a light pressure, the attaching surface, being interrupted, if desired as shown at **8**, and continued to free end **9** of the end piece.

On account of a conical outer surface of the end piece and the corresponding shape of the press dies the material of the piece is by the pressing driven towards the end of the clamp and into any uneven portions of the clamp end surface, and the end piece will, pressed on in this way maintain its position under load.

Due to this form of the pressing and the shape of the supplementary end piece, which guides the rope to a central position, the bend of the rope on account of an inclined drawing force is transmitted to the coaxial end of the end piece where the rope and the strands of the same have undergone only a light compression and have on account thereof maintained their shape and tensile strength so that no risk is present for wear and breakage. At the same time the possibility of breakage is removed from the end of the clamp itself, and the smooth conical outer shape of the supplementary end piece prevents every tendency of hooking on. The dies **20***a*, **20***b* of the press shown in Figure 1 have a smooth conical surface, and the intermittent attaching surfaces of the end piece on the rope obtained therethrough are low ringshaped ridges **21***a*, **21***b* on the outer surface of the piece which during the pressing cause the material to transform inwards in these attaching portions.

The embodiment of Figures 2 and 3 is a variation of the embodiment in Figure 1. In this form, the clamp **1***a* is a tube, preferably of oval cross section and shortened end portion **1***b* of the clamp is pressed to its circular shape, and separate supplementary end piece **2***a* is pressed on to its end in the position shown. The end piece guides the rope **3** to a coaxial position and is by a light pressing attached to the rope in accordance with the form of Figure 1 and in a watertight manner surrounding the rope.

Fig. 4 shows a modification of the end piece embodiment in Figure 1. The end piece **2***b* of Figure 4 prior to pressing has the shape shown by the full lines, and the outer surface follows a broken cone line due to an increasing of wall thickness at **23** in the middle portion of the piece, and the inner surface follows a straight cone line. After the pressing, the material has undergone such a deformation inwards that the outer surface is stretched along a straight cone line and the inner surface along a broken cone line broken at **24** as indicated by pointed lines for the light attaching of the end piece upon the rope.

It is to be noted that it also is possible to give to the clamp a conical end shape before the clamp is applied to the rope. Thus the clamp sleeve provided with such a previously shaped end is being pressed onto the rope, said conical end being if necessary at the same time or before or afterwards exposed to a watertight pressing at the top end of the cone, the rope freelying within the inner room of the cone.

To facilitate the watertightening at the piece end a rubber sleeve may be inserted between the piece end and the rope, and held in position by the pressure. If desired rubber sleeves may also be drawn on upon the outer surface of the end piece.

As several modifications are possible with the same effect I do not wish to be limited to solely the construction set forth but desire to avail myself of such variations as come within the scoop of the appended claims.

I claim:

1. Rope clamping means comprising a swaged tubular rope clamp within which parallel strands of wire rope are clamped with the strands forming a loop beyond one end of said tubular rope clamp and one strand only extending beyond the other end of said rope clamp, the rope clamp being combined with a rope end positioning and guiding separate end piece surrounding said one strand, said strands within said swaged tubular clamp lying on opposite sides of the axis of said tubular rope clamp, said guiding end piece having a bore with an outlet opening for the rope strand coaxial with said rope clamp and having in unswaged state internal conical surfaces along essentially its entire length to guide in

unswaged state the projecting strand from its position at one side of the axis of said tubular rope clamp to a position coaxial with said tubular rope clamp, said rope end guiding end piece being radially swaged at portions only of its length into engagement with said projecting strand leaving the strand free lying within the base portion of said separate end piece.

2. An end piece for rope clamps of the type comprising a ferrule swaged over the rope end and the rope to form a loop, said rope and rope end lying on opposite sides of the axis of said ferrule, the end piece consisting of a separate piece of swageable material of generally conical shape and having a concentric generally conical passage therethrough, said supplementary piece of material being swaged at portions only of its length on the rope with its large end abutting said clamp whereby said rope is free lying within the base portion of the supplementary end piece and is lead to a position coaxial with said ferrule.

3. Rope clamping means comprising a swaged tubular rope clamp within which parallel strands of wire rope are clamped, with the strands forming a loop beyond one end of said tubular rope clamp and one strand only extending beyond the other end of said rope clamp, a rope end positioning and guiding supplementary separate end piece of outer conical shape surrounding said projecting strand, said strands within said swaged tubular clamp lying on opposite sides of the axis of said tubular rope clamp, said supplementary end piece having a bore with an outlet opening for the rope strand coaxial with said rope clamp to guide the projecting strand to coaxial position with said tubular rope clamp through the outer end of the end piece, said rope clamp and said supplementary end piece being by radial swaging brought into holding engagement with each other causing a material deformation of at least the rope clamp.

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