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WIRE ROPE MAKING MACHINE

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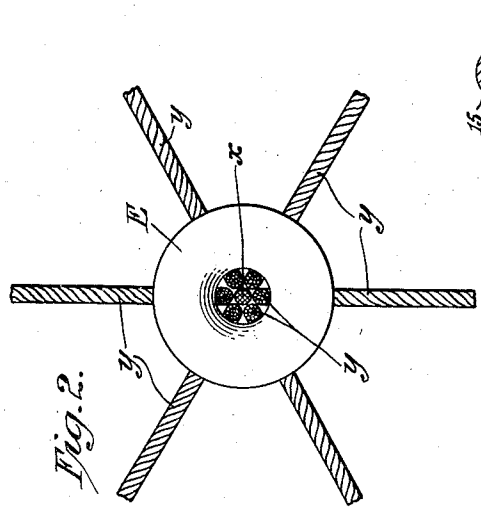


Fig. 2.

Fig. 1.

Fig. 3.

INVENTOR
Archibald J. Morgan
BY
Philip Sawyer Rice & Kennedy
ATTORNEYS

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WIRE ROPE MAKING MACHINE

Archibald J. Morgan, Trenton, N. J., assignor to John A. Roebling's Sons Company, Trenton, N. J., a corporation of New Jersey

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4 Claims. (Cl. 117—20)

This invention relates to an improved closing head for making wire strand or rope in which the individual wires or strands are laid up helically about a core and compressed by a squeezer in closing.

The object of the invention is to provide a construction which shall avoid the objections inherent in previous closing devices employing a squeezer, and further to provide a construction suitable by simple adjustment for being used for producing preformed rope, that is, rope in which permanent helices are formed as or before the wires or strands are laid up on the core, or the ordinary standard rope without such permanent helices.

In order to produce the required pressure on the strand or rope, the squeezer is necessarily split to form a gap between them so that one half may be forced towards the other to produce the pressure required. The two halves of the squeezer, therefore, do not fit together tightly enough to prevent the opening or edges on either side of the gap affecting the character of the strand or rope. Another difficulty with the squeezer has been found in the fact that the squeezer will lose its true circular interior form after a considerable period of use so that the strand or rope is not properly formed unless new squeezers be substituted comparatively frequently.

I avoid these difficulties with the squeezer closing construction by using with the squeezer a die made in the form of a continuous ring, through which the wires or strands pass before reaching the squeezer, the die opening through this ring being of such size as to properly close the wires or strands on the core, but not to exert the adjustable pressure thereon which is secured by the squeezer. The ring forming this die preferably has rounded edges on the side at which the wires or strands enter the die.

The die and squeezer are made adjustable axially of the machine, so that the die may be positioned with the squeezer at any distance desired from the guides over which the wires or strands pass to the die, and preferably such adjustment is sufficient so that either preformed or standard strand or rope may be made, the die being positioned so near the guides axially in making preformed strands or rope that the wires or strands are bent over the guides at such an angle as to form in combination with the die permanent helices as the head rotates, thus making a dead-lay strand or rope, that is, one in which the wires or strands will not spread out at the end or bird-cage. The die formed by the continuous ring preferably will be free to rotate under the pressure of the wires or strands or be mechanically rotated so as to relieve the friction thereon which otherwise would result from the rotating movement of the wires or strands in closing, and to present new surfaces of the die to the wires or strands continually and thus avoid unequal wear and deformation of the entrance portions of the die.

For a full understanding of the invention, there is shown in the accompanying drawing a closing head embodying the invention in a preferred form and this construction will now be described in detail and the features forming the invention then specifically pointed out in the claims.

In the drawing:

Figure 1 is a sectional elevation of the closing head; and

Figures 2 and 3 are sections on the lines 2, 3 of Figure 1, looking respectively to the left and right in Figure 1.

In the drawing, A is the closing head of a rope making machine, which may be of any suitable type, this closing head carrying guide rollers 10 mounted in blocks 11 secured in the closing head A by bolts 12, the core wire x passing centrally through the closing head A and the outside wires or strands y passing from the usual supply spools over the guide rollers 10 to the closing point on the core x.

The usual split squeezer B formed of two halves and mounted in the squeezer support C and adjustable to secure the required pressure on the strand or rope z by screw 13 is shown, this being adjustable axially in the frame D by screw 14 with hand wheel 15 and locking screw 16, as usual in such constructions. In advance of the squeezer B, so that the wires or strands x, y pass through this before reaching the squeezer, is a die E formed of a solid ring of metal preferably having the rounded entrance edges 17 on which the wires or strands y are bent in entering the die, and this die E preferably, as shown, is free to rotate on the entrance end of the squeezer B. It will be understood, however, that the die may be secured in position so as to prevent rotation. The die is not formed to substantially compress the strand or rope z as the strand or rope passes through it, but the squeezer is relied upon for securing the desired compression of the strand or rope.

As shown in the drawing, the squeezer and die are adjusted in such a relation axially to the guides 10 as to produce permanent helices in closing, but the die and squeezer may be adjusted

axially to any position desired for making either preformed or standard strand or rope.

It will be understood that the invention may be used in any type of rope making machine in which the wires or strands are laid up helically to form a strand or rope, either in machines in which the closing head is rotated for forming the helices or the rope is rotated and the closing head stationary. It will be understood, also, that the invention is not limited to the particular construction of closing head shown, but that many modifications may be made therein while retaining the invention as defined by the claims.

What I claim is:

1. In a strand or rope closing head, the combination with a split squeezer and guides relatively orbitally movable with respect to the squeezer over which guides the wires or strands pass to the squeezer, of a die formed of a continuous ring located between the squeezer and guides and acting to lay up the wires or strands helically to form strand or rope before passing to the squeezer, and means for varying the angle at which the wires or strands pass from the guides to the die by adjusting the die axially toward and from the guides.

2. In a strand or rope closing head, the combination with a split squeezer and guides relatively orbitally movable with respect to the squeezer over which guides the wires or strands pass to the squeezer, of a die formed of a continuous ring with rounded entrance edges for the wires or strands located between the squeezer and guides and acting to lay up the wires or strands helically to form the strand or rope before passing to the squeezer, and means for varying the angle at which the wires or strands pass from the guides to the die by adjusting the die axially toward and from the guides.

3. In a strand or rope closing head, the combination with a split squeezer and guides relatively orbitally movable with respect to the squeezer over which guides the wires or strands pass to the squeezer, of a die formed of a continuous rotatable ring located between the squeezer and guides and acting to lay up the wires or strands helically to form strand or rope before passing to the squeezer, and means for varying the angle at which the wires or strands pass from the guides to the die by adjusting the die axially toward and from the guides.

4. In a strand or rope-making machine, the combination with a closing die having a smooth cylindrical bore whose diameter is slightly greater than the maximum diameter of the finished strand or rope, and having a convexly rounded edge at the entrance end of said bore, a plurality of guides for the wires or strands, said guides being located in a plane in advance of the closing die and being relatively orbitally movable with respect to the axis of its bore, all of said guide devices being arranged to deliver directly wires or strands at a predetermined, constant but adjustable angle, into tangential contact with the rounded edge of the closing die, whereby each wire or strand just before it enters the cylindrical bore of the closing die is bent by said rounded edge, and a two-part squeezer having its two parts slightly separated, said squeezer being arranged to squeeze the strand or rope to its finished size immediately on its emergence from the closing die, of means for adjusting the closing die and the squeezer toward or from the orbital plane of the guide devices to vary the angle and point of tangency of each wire or strand at said rounded edge.

ARCHIBALD J. MORGAN.