

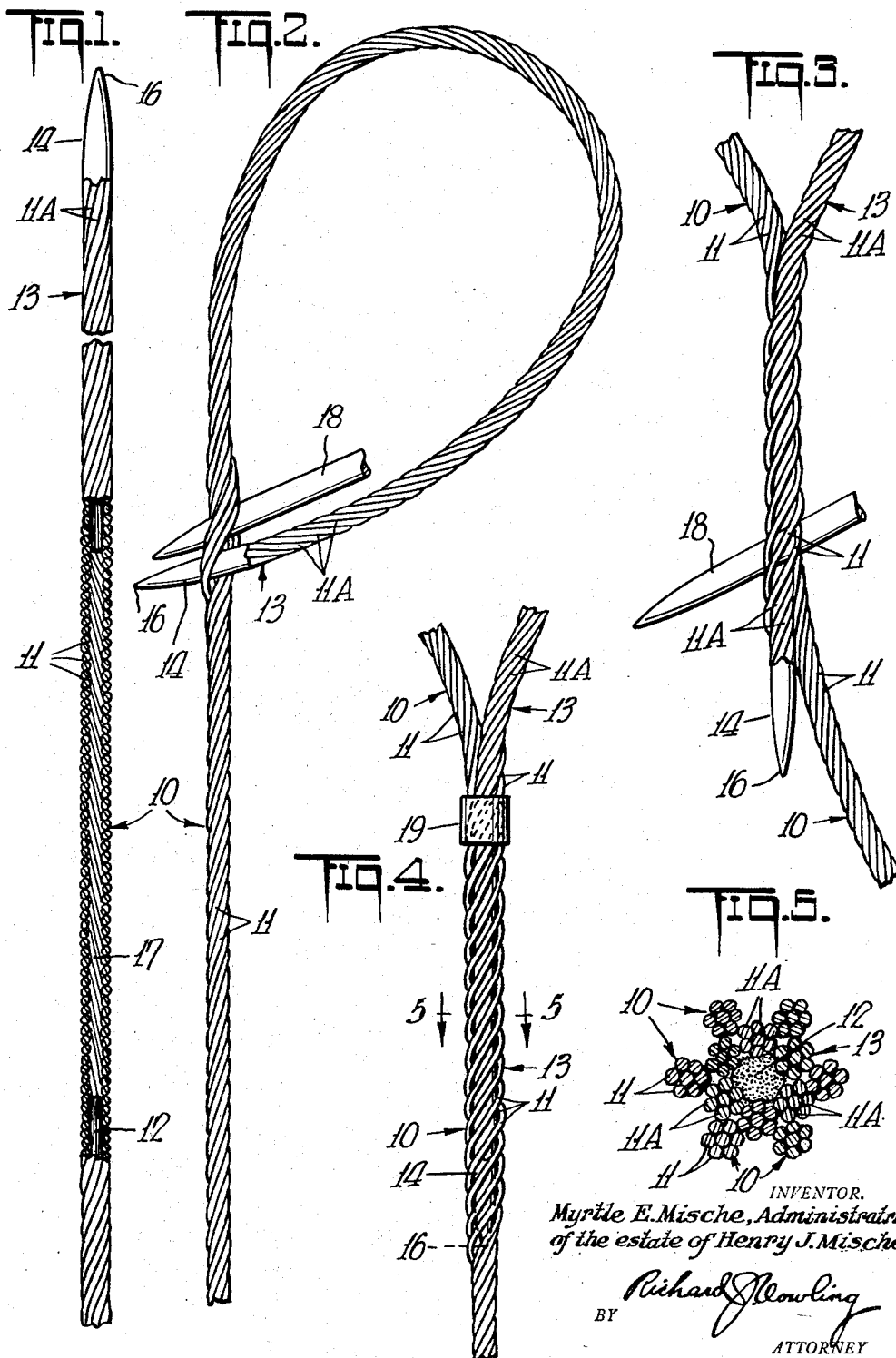
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H. J. MISCHE

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FULL GRIP CABLE SPLICE AND METHOD OF MAKING

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FULL GRIP CABLE SPLICE AND METHOD OF MAKING

Henry J. Mische, deceased, late of Belleville, N. J., by Myrtle E. Mische, administratrix, Belleville, N. J., assignor to Blair H. Wieggers, North Haledon, N. J.

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The present invention relates generally to the art of splicing, and it has particular relation to the art of splicing bights in wire ropes and/or cables.

Heretofore, the majority of splices for wire ropes and/or cables involved the bending of a section of wire rope or cable around a conventional thimble and then splicing the short end thereof into the main body. Such a splice is made customarily by unwinding the strands of wires at the short or bight end of the rope and then weaving and tucking the loosened ends of the strands of such short end under four or five strands of the long end or main body portion of the rope, whereupon the projecting ends of said strands are cut off close to the main body of the rope and the splice is wrapped with serving wire. Such splices required expert splicing technicians, were time consuming, bulky, and made the rope or cable much stiffer at the point of the splice.

The disadvantages of the aforesaid splices are obviated with the present invention, which provides a splice and process of making the same that requires little or no experience on the part of the splicer, requires about one-third to one-fourth the amount of time required for conventional splices of comparable sizes of rope or cable, retains the original flexibility of the rope or cable, and is free of broken wires and loose ends that may damage the hands of workmen handling the same.

An object of the present invention is to provide a simple, inexpensive and quick method for splicing wire ropes and/or cables economically, efficiently and effectively.

Another object of the invention is the provision of a novel and efficient method for splicing wire ropes and/or cables that requires no special tools or jigs, and may be easily and quickly accomplished in a very short period of time by an untrained or inexperienced worker as compared to the skilled technicians required for the conventional splices of the present time.

A further object of the invention is to provide a new and novel method of joining and/or splicing the end or ends of wire ropes or cables to provide a full grip splice that is flexible and free of loose ends and/or broken wires.

Another object of the invention is the provision of a simple, inexpensive and effective method for joining wire ropes or cables to provide a new and improved splice having a greater lifting load than the conventional splices, and providing an equalized load on the individual strands of the splice.

A further object of the invention is to provide a full grip splice for wire ropes or cables that not only does not impair the original form of the wire rope or cable, but is also free of loose or cut-off ends that can seriously hamper handling and damage the hands of the workmen manipulating the same.

Another object of the invention is the provision of a method of splicing wire ropes or cables that is adaptable for mass production operations, and requires between one-third and one-fourth of the time required by highly skilled technicians for making comparable conventional splices.

Other and further objects and advantages of the invention reside in the detailed construction of the splice, which result in simplicity, economy and efficiency, and which will be apparent from the following description, wherein a preferred embodiment of the invention is shown, reference being had to the accompanying drawings, forming a part hereof, wherein like numerals indicate like parts, in which:

Figure 1 is a fragmentary, front, elevational view, partly in section, of a wire rope or cable having its extreme outer

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end pointed and its central core of hemp or other resilient material removed for a distance equal to the desired length of the finished splice;

Figure 2 is another fragmentary, front, elevational view of the wire rope or cable shown in Figure 1, illustrating the next step in forming a splice, which consists of parting or dividing the strands of the standing or main part of the rope immediately above the section where the core has been removed with a marlin spike to facilitate the insertion of the pointed free end between said parted strands, which pointed free end is shown turned back to form a loop;

Figure 3 is a fragmentary, front, elevational view of the wire rope or cable shown in Figure 2, illustrating the step of laying in the free pointed end according to the principles of the invention, in which the marlin spike is rotated in the direction of the spiraling convolutions of the rope or cable to cause the free outer end projecting there-through to be laid into the hollow center of said standing part of the rope or cable from which the core has been removed;

Figure 4 is another fragmentary cable section in front elevation, showing the finished splice with the pointed end section laid completely within the main cable section at the point where its core has been removed; and

Figure 5 is a greatly enlarged, cross-sectional view taken through the rope or cable splice shown in Figure 4, the same having been taken substantially along the line 5—5 thereof, looking in the direction of the arrows.

Referring now to the drawings and particularly to Figure 1 thereof, there is shown a fragmentary section of a main wire rope or cable 10, consisting of a plurality of spirally coiled wire strands 11 wound around a central core 12, which is made of a resilient material and generally hemp.

One free end 13 of a main wire rope 10, such as the end shown at the top of Figure 1, is smoothed, as indicated at 14, and has its extreme outer end pointed, as indicated at 16. The smoothing is done by filling the spaces between the contiguous strands 11—A adjacent the free outer end with any suitable metal, as by soldering, welding or brazing, for a relatively short distance, which, in the case of a one-half inch cable, may be about one and one-half inches in length. This smoothed and filled end portion 14 is then tapered gradually to a point, as indicated at 16, as by grinding, filing, etc. The filling of the interstices of the wire rope 10 may be done before the rope is cut to facilitate cutting without distortion of the individual strands.

The main wire rope or cable 10 has an intermediate section of its axial core 12 removed for a distance equal to the length of the splice contemplated, as best shown in Figure 1. The length of the core 12 to be removed will depend upon the size and kind of wire being spliced, the strength of the wire and the strength of the splice desired. No exact figures can be given for each instance, but technicians skilled in the art of splicing will have no difficulty in determining the necessary length of the splice for any given set of factors.

After the core 12 has been removed from the main body section 10, a marlin spike 18 is inserted between the strands 11, dividing the same, if possible, into two substantially equal groups. The pointed end 16 of the free end 13 is then inserted between the groups of subdivided strands, as best shown in Figure 2, and said pointed end 16 and a sufficient length of cable 13 is then drawn between the subdivided groups of strands, which length will be equal to the length of the section of core 12 removed previously from the main body portion of the cable 10, which, in turn, is equal to the length of the hollow 17 provided in the cable 10. Thereupon, the marlin spike 18 is withdrawn.

The withdrawn marlin spike 18 is then re-inserted in the main body portion of the rope or cable 10 by subdividing the strands approximately two spirals or convolutions above the point where the free outer end 13 passes through the cable 10 in the same manner in which it was inserted originally, i. e., by subdividing the strands of the main rope or cable 10 into substantially equal groups. The marlin spike 18 is then rotated or twisted in the direction necessary to cause it to spiral

downwardly between the two groups of strands, following the line of the convolutions thereof, which, in the illustrations shown in Figure 3, is in a clockwise direction, since the strands are spiraled or coiled in such a direction. By continuing the rotation or twisting of the marlin spike 18 within the main body portion of the rope 10, the outer free end section 13 will be threaded or laid into the hollow extending axially of the wire rope 10, as best shown in Figure 3, whereby it will replace and occupy the position of the removed section of the resilient core 12. When the free tapered end 16 has been laid entirely within the wire rope 10, as best shown in Figure 4, the marlin spike 18 may be withdrawn. Should any strand 11 of the main section of the rope 10 be distorted out of its normal position during the laying operation, it may be laid back into position by striking it with the marlin spike 18 and driving it back into its normal spiraled or coiled position in the cable or rope 10.

The finished splice is shown best in Figure 4, and it will be noted that there is very little enlargement of the wire rope 10 at the junction of the splice and no deformity of the main body portion. The spiral section of the rope or cable 10 is flexible and there are no broken wires or loose ends to project through the surface of the cable 10 to damage the hands of workmen handling the same. If desired, a metal collar 19 may be swaged over the wire rope 10 at the joint or beginning of the splice, as best shown in Figure 4. The collar 19 is not essential to the strength of the splice, but will prevent any deformity in the splice due to rough handling of the wire rope or cable 10 in its subsequent use.

Referring now to Figure 5 of the drawing, there is shown a cross-sectional view of the finished splice, and attention is directed to the fact that the strands 11-A of the free end 13 of the tapered section 14 are mounted concentrically within the strands 11 of the main body portion 10, whereby there is an exact interfit providing a maximum surface area of frictional contact between adjacent strands 11 and 11-A of the ropes or rope ends 10 and 13. This arrangement of the strands 11 and 11-A permits a full grip splice, which retains a flexibility comparable to the flexibility of the original wire rope or cable 10. The greater the lifting load placed on the finished splice the greater will be the gripping strength generated, since the outer strands 11 of the main rope 10 will tend to contract proportionally tighter about the inner strands 11-A of the free end 13. It will also be apparent that substantially all of the strains placed on the splice will be distributed equally among all of the strands of the rope or cable.

The splice of the present invention has many advantages over known conventional splices. It does not require expensive holding equipment for the several sections of the cable or cables to be joined. The present splice may be made without any means for holding the several sections, but it has been found to be advantageous to secure the looped section within a conventional vise or other fixed holder (not shown) while making the splice. Obviously, splices in accordance with the present invention may be made in wire rope or cable anywhere and at any time without requiring special equipment. These splices lend themselves to mass production operations, can be made by workmen having no special technical training and experience in splicing, and can be completed by such workmen within one-third to one-quarter of the time required to produce any of the known conventional splices with cables of a comparative size. The finished splice requires no sizing of any kind.

Although I have only shown and described in detail one form which the invention may assume, it will be readily apparent to those skilled in the art that various other forms and modifications may be made therein without departing from the scope or spirit of the invention.

What is claimed is:

1. An eye for a length of laid metallic wire rope having a core comprising a bight formed in the rope, the laid free end of said bight lying axially of the standing part of said rope from which the core has been removed.

2. An eye for a length of laid metallic wire rope comprising a tapered free end of said bight projecting through one side of the main standing part of said rope and having its tapered free end extending axially of the main standing part with the strands of both sections inter-

fitting in a manner to provide an area of maximum surface contact with the taper of its free end extending away from said bight.

3. A bight for wire rope consisting of a pointed free end of a rope and an intermediate section of a standing body portion of said rope having its central resilient core removed which comprises said free end projecting through one side of the standing main body portion with its strands extending axially thereof whereby the strands of said free end interfit concentrically within the inner strands of said standing body portion and said point decreases in diameter away from the place where said free end projects through said side of said standing body portion.

4. A splice for wire rope comprising a free end of a wire rope projecting through one side of a main body section and having its strands extending axially of the main body section with the strands of both sections interfitting in a manner to provide an area of maximum surface contact.

5. The method of splicing wire rope which comprises removing a section of the core from a main body portion of said rope, passing a free end of rope through said main body at the point where said core has been removed, and laying said free end into said main body to replace the removed core.

6. The method of splicing wire rope which comprises removing a section of the core from an intermediate section of a main body of rope for a distance equal to the length of the desired splice, passing a free end of said rope through said main body at one end of said hollow provided by removal of said core, and laying said free end passing through said main body of said rope into the hollow therein to replace said removed core.

7. The method of splicing wire rope which comprises tapering a free end of a wire rope, removing a section of the core from the main body of said rope for a distance equal to the length of the splice desired, passing the tapered free end through the main body of said rope adjacent one end of said section from which the core has been removed, and forcing said tapered free end into the main body of said rope to replace said removed core and complete said splice.

8. The method of splicing wire rope which comprises tapering a free end of said rope, removing the core from an intermediate section of the main body of said rope for a distance equal to the length of splice desired, passing said tapered free end through said main body of said rope at one end of the hollow formed by removal of said core for a distance substantially equal to the length of core removed, and laying said free tapered end into the position occupied originally by said removed section of core.

9. The method of splicing wire rope which comprises filling the spaces between the strands adjacent a free end of said rope, tapering said filled section to provide a pointed end, removing the core from an intermediate section of the main body of said rope for a distance equal to the length of the desired splice, separating the strands of the main body of said rope into at least two groups adjacent one end of said section from which the core has been removed, passing said tapered free end between said divided groups of strands for a distance equal to the length of core removed, and laying said free tapered end into the center of said main body portion to replace said removed core.

10. The method of splicing wire rope which comprises filling the spaces adjacent the individual strands of wire rope contiguous to one of its free ends, tapering said filled section to a point, removing the core from an intermediate section of the main body of said rope for a distance equal to the length of the desired splice, dividing the strands of the main body of said rope at the top of said section from which the core has been removed, passing said pointed free end through said divided strands for a distance equal to the length of removed core, and laying said pointed free end into the center of said main body portion to replace said removed core.

11. The method of splicing wire rope which comprises filling the spaces adjacent the individual strands of a wire rope for a short distance, cutting the rope adjacent the end of said filled section, tapering said cut end to a point, removing the core from an intermediate section of the main body portion of said rope for a distance equal to the length of the desired splice, dividing the strands of the main body of said rope at one end of the hollow provided

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by removal of the core into substantially equal groups, passing said pointed free end through said divided groups of strands for a distance equal to the length of removed core, and laying said pointed free end into the center of said main body section to replace said removed core.

12. The method of splicing wire rope consisting of the steps of removing the hemp core from a section of the main body of said rope at the desired point of splice and for the length of the splice, filling the spaces between the strands of the rope at one free end and shaping said end to a point, sub-dividing the strands of the main rope at one end of the section from which the core has been removed into substantially two equal groups, inserting the pointed end between the groups of strands of said rope for a length sufficient to fill the hollow provided by removal of said core, laying the end projecting through said divided strands into the main body of said rope by continuously forcing the convolutions of strands apart in a direction towards the opposite end of said hollow, whereby the projecting free end is threaded into the center of said main body to fill up said hollow, and laying any strands that become distorted while making the splice back into their normal position.

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13. The method of splicing wire rope consisting of the steps of removing the hemp core from a section of the main body of said rope at the desired point of the splice and for the length of the splice, filling the spaces between the strands of rope at one free end thereof and shaping said end to a point, dividing the strands of the main rope at one end of the hollow provided by removal of the core, inserting the pointed free end between said divided strands and pulling through a section equal in length to the length of the core removed, laying said pointed free end into the center of said main body portion to replace said removed core, and placing a collar at the joint of the splice to prevent future deformity of the splice during use of said rope.

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