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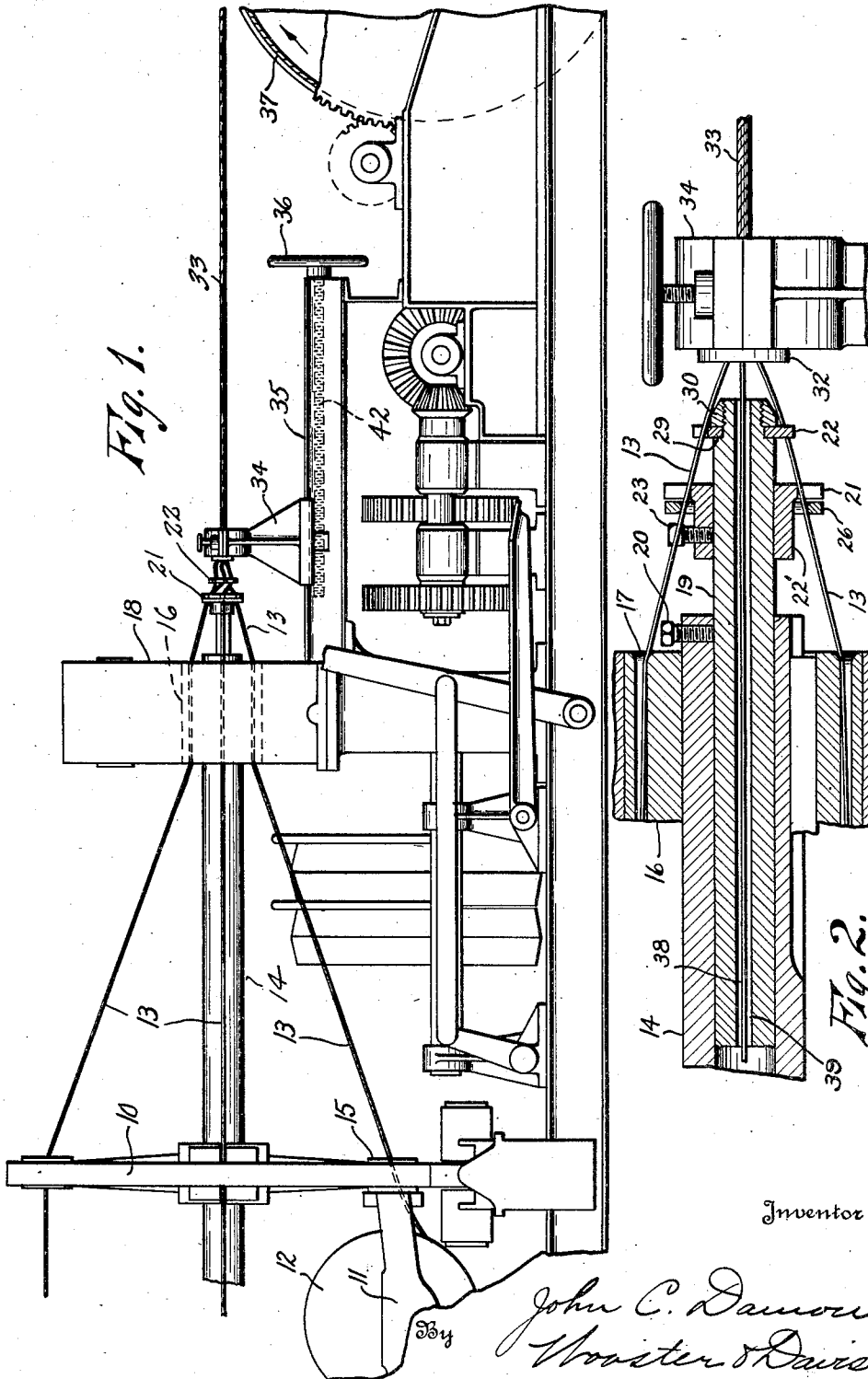
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MACHINE FOR MAKING WIRE CABLE

Filed July 14, 1928

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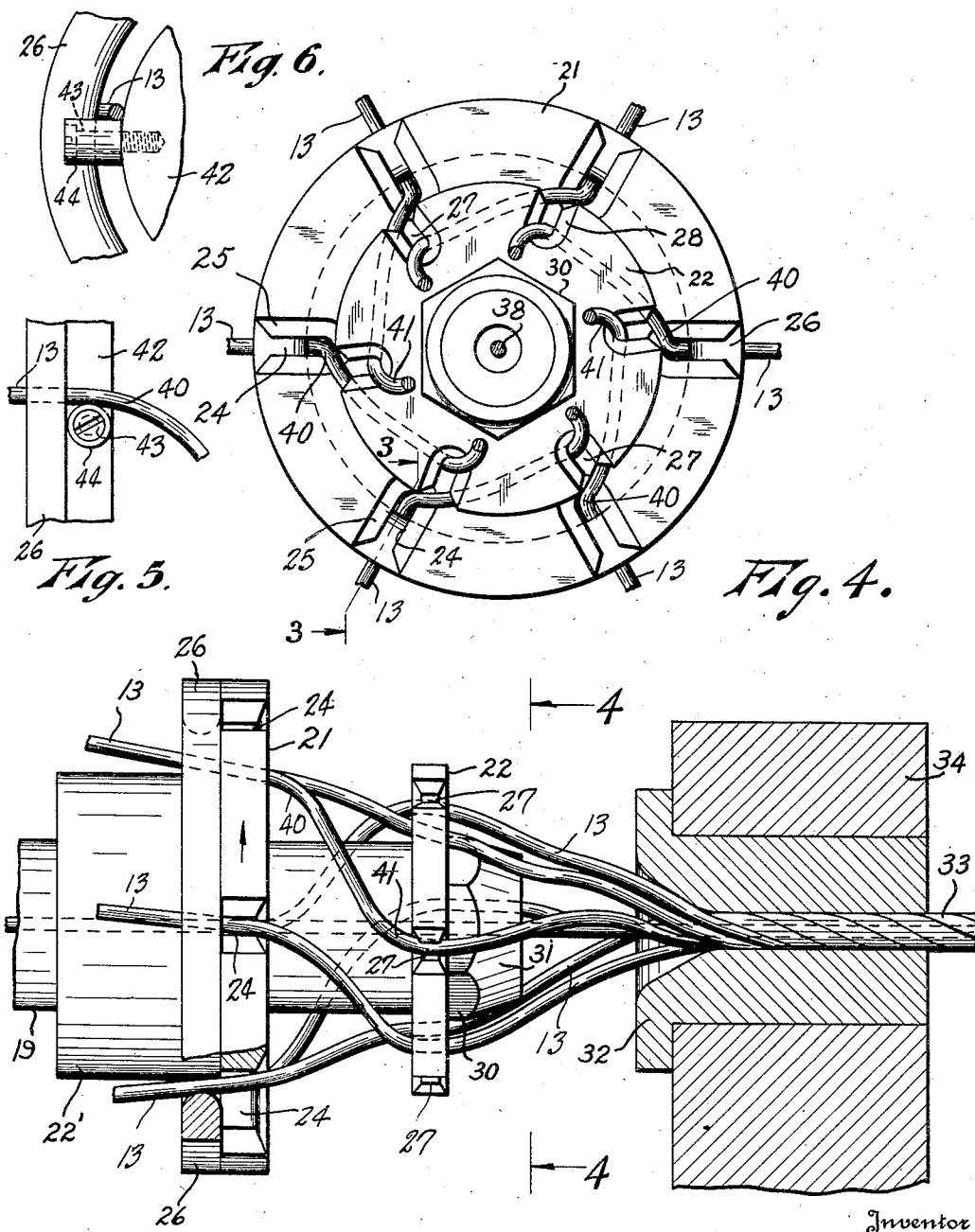


Fig. 3.

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MACHINE FOR MAKING WIRE CABLE

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This invention relates to a machine for making wire cable, and has for an object to provide an improved machine in which the dies are of simpler construction than those ordinarily employed, and which are so arranged that on drawing the wire through them it will be bent to a curve which will approximate the curve otherwise given to a wire when laid into a strand, and therefore, the wires when laid on the cable will not spring away from the core.

It is also an object of the invention to provide dies which may be adjusted for different pitches of the spirally laid wires.

With the above and other objects in view, the invention consists in certain novel features of construction, combinations and arrangements of parts as will be more fully described, a construction illustrating one form of the invention being shown in the accompanying drawings. In these drawings,

Fig. 1 is a side elevation of the forward end of a cable making machine showing my invention applied thereto.

Fig. 2 is a longitudinal section through the shafts and dies.

Fig. 3 is a side elevation of the wire bending dies with a portion broken away substantially on line 3—3 of Fig. 4 to more clearly show the construction, and showing the forming die used therewith in section.

Fig. 4 is a transverse section substantially on line 4—4 of Fig. 3.

Fig. 5 is an edge view of a portion of a die showing a different construction of bending guide for the wire, and

Fig. 6 is a front elevation of the construction of Fig. 5.

The machine as illustrated is a planetary machine comprising a bobbin frame the forward end of which is illustrated at 10, and extending between this member and the rear member of the frame, not shown, is a plurality of supports 11, only one of which is illustrated, carrying spools or bobbins 12 for supplying the covering wires 13. In this type of machine the spools or bobbins are carried bodily about the axis of rotation of the frame while the axes of the spools or bobbins remain horizontal. This frame may be mount-

ed on a tubular shaft 14 and carries guides 15 for the wires. Keyed to the shaft 14 is a rotatable head 16 having guide openings 17, one for each wire, and this head is mounted to rotate in the stationary head or housing 18 of the machine. Mounted within the tubular shaft 14 is a tubular sleeve or spindle 19 and it may be adjusted either longitudinally or by turning it in the shaft 14, and is secured in adjusted position by the set screw 20 or other suitable means.

Mounted on the tubular spindle 19 are two wire bending dies 21 and 22. These dies are preferably substantially in the form of circular plates of suitable thickness although the invention is not limited to this construction. The die 21 is adjustably mounted on the spindle 19 and is secured in desired position by any suitable means, such as a set screw 23 in a collar 22'. This die has bending guides for the wires which may be openings there-through preferably in the form of recesses 24 opening from the edge of the plate, and at their outlet side are preferably beveled, as indicated at 25. It will be understood there is one of these openings for each of the wires 13 and there may be a ring 26 on the rear or inlet side of this die and embracing the wires 13 to retain them in the openings or notches and thus prevent their flying out during the operation of the machine. The die 22 is spaced forwardly from the die 21 and is of somewhat smaller diameter. It is provided with transverse guides for the wires such as openings 27 also preferably in the form of notches to facilitate threading of the wires through them, and they are also preferably beveled as shown at 28, at their opposite sides. There is one guide or opening 27 for each guide or opening 24. A convenient means of mounting this die is to reduce the forward end of the spindle 19 to form a shoulder 29 against which the die may be clamped by a nut 30 threaded onto the reduced portion of the spindle. This nut is beveled at 31 so as not to interfere with the passage of the wires 13. It will be apparent that by loosening the nut 30 the die 22 may be given angular or rotary adjustment on

the spindle 19 and then clamped in adjusted position.

Forwardly of these dies is a finishing die 32 of wood or other suitable material through which the formed cable 33 passes, this die being carried on a suitable die holder 34 which is adjustably mounted on the support 35, and may be adjusted toward and from the bending dies by the hand lever 36 operating a screw 42 having threaded connection with the holder 34. The cable leads to a capstan drum 37 on which the cable is wound and which acts to draw the wires through the various dies it, of course, being understood that this drum is driven from a suitable source of power.

In operating the machine the central or core wire 38, or bundle of wires, twisted strip, cable or rope, if such a core is used, is drawn through the opening 39 through the center of the sleeve or spindle 19 from any suitable reel or bobbin, not shown, and the covering wires 13 are laid in spirals on this core as it passes between the dies 22 and 32. In setting up the machine the dies 21 and 22 are so mounted that the openings 24 and 27 for any given wire are not in alignment with each other but the respective openings 27, as will be apparent from Figs. 3 and 4, are located to one side of the corresponding opening 24 for the same wire so that as the wires pass through the dies they will be bent. This offset will be in a direction opposite to the direction of rotation of the dies or in the same direction as the direction of rotation of the dies depending on the pitch and the distances between the dies. For the location of the die plates shown in Fig. 3 where the distance between dies 21 and 22 and between dies 22 and 32 is approximately one-half the pitch of the covering wire as laid in the cable, the offset of die plate 22 relative to die plate 21 is in a direction opposite to the direction of rotation of the dies so that as the wires pass through the dies they will be bent to conform to their ultimate position in the cable. Thus, for instance, in the arrangement illustrated, as a wire 13 passes through an opening 24 in the die 21 it will be bent laterally, as shown at 40, opposite to the direction of rotation of the die and then will pass through an opening 27 in the die 22 considerably to one side of the opening 24 and offset relatively to 24 in a direction opposite to the direction of rotation of the dies. As the wire passes through the opening 27 in the die 22 it will again be bent as indicated at 41, and these different bending operations working with the turning movements of the dies and the forward travel of the wires will so act upon respective covering wires 13 that as they are drawn through the parts they will be bent and given a permanent set to a curve which shall approximate the curve otherwise given to a wire when laid into a strand. We best secure this effect when

the distance between the dies is approximately one-half the pitch of the wire when laid in the cable. Thus the wires are bent and given a permanent set to the proper shape before being laid in the cable, and therefore, they retain their proper positions in the cable and do not tend to spring away from the core.

It will be apparent that by loosening the set screw 20 the sleeve or spindle 19 together with the dies 21 and 22 may be adjusted with respect to the head 16 both longitudinally of the core 38 and also to secure the proper angular position of the dies 21 and 22 with respect to this head. By loosening the set screw 23 the die 21 may be adjusted longitudinally or angularly on the sleeve or spindle 19 to bring the wire bending openings 24 in proper relation to the side openings 17 and also locate the die at the proper distance from the head 16 and from the die 22, and then may be secured in adjusted position. By loosening the nut 30 the die 22 may be adjusted angularly by a turning movement to bring the openings 27 therein in proper relation to the openings 24 in the die 21 to give the proper bending action to the wires as they pass through the dies, and to properly arrange the dies for the desired pitch for the wires, and in respect to the size of the cable being wound. It will be noted the dies 21 and 22 are very simple in construction and easily mounted, and due to the fact that they are separate and are relatively adjustable as indicated the same dies may be used for forming different size cables and cables composed of wires wound in different pitches. It will, of course, be understood that the finishing die 32 will press the covering wires together and hold them in proper relation as they are laid by the rotating dies 21 and 22 so as to give a uniform cable as it is drawn through the die 32.

In Figs. 5 and 6 is shown a slightly different construction of bending guide for the wire. In this arrangement the die plate 42 is made of a somewhat smaller diameter and instead of using openings 24 or 27 as in Figs. 3 and 4 for bending the wire, radial pins 43 are secured to the rim of the plate 42 and carry rollers 44 for guiding and bending the wire 13. The movement of the wire will revolve the rollers which will prevent scratching or marring the surface of the wire during the bending operation. The ring 26 may be used with this form the same as with the first form.

Having thus set forth the nature of my invention, what I claim is:

1. In a machine for making wire cable, a revolving head having guides for the wires, a pair of die plates mounted to rotate with said head and extending transversely of the axis of rotation, said plates being spaced from each other longitudinally of the direction of movement of the cable and provided

with guides forming bending means for the wires comprising notches extending inwardly from the peripheries of the plates.

2. In a machine for making wire cable, a
5 revolving head having guides for covering wires, a hollow spindle mounted to rotate with said head, means to move a core for the cable through said spindle, and a pair of die plates mounted to rotate with the head and
10 extending transversely of the axis of rotation, said plates being spaced from each other longitudinally of the core, and provided with guides arranged to bend the covering wires to a curve approximating the curve given
15 to a wire when laid into a strand and comprising notches extending inwardly from the peripheries of the plates.

3. In a machine for making wire cable, a revolving head having guides for the covering wires, a tubular spindle mounted to rotate with the head and adjustable in respect thereto, a pair of dies mounted on the spindle and comprising plates extending transversely of the spindle and having forming guides for
25 passage of the wires comprising notches extending inwardly from the peripheries of the plates, said dies being spaced from each other longitudinally of the spindle and one of them being mounted for rotary adjustment relative
30 to the other, and means for drawing a core for the cable through the spindle.

In testimony whereof I affix my signature.

JOHN C. DAMON.

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