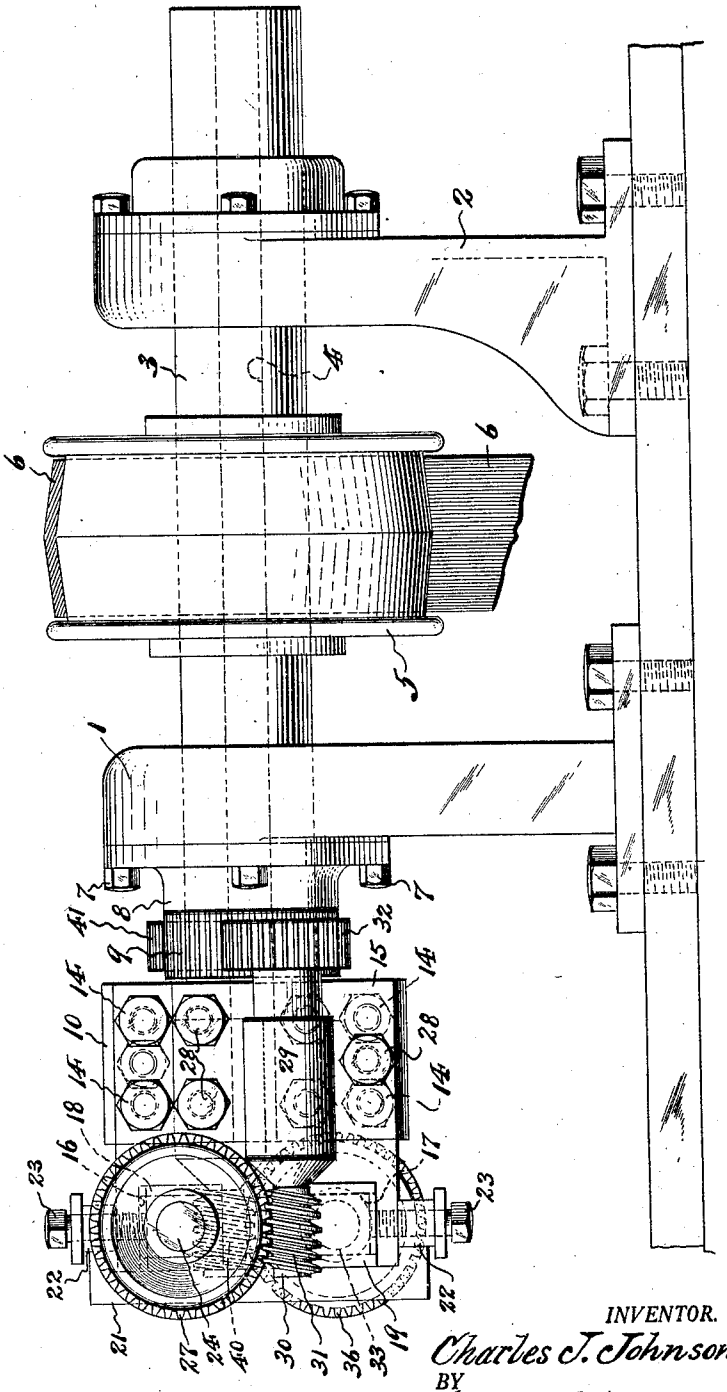
April 14, 1925. 1,533,864

C. J. JOHNSON

ATTACHMENT FOR FLEXIBLE TUBE MAKING MACHINES

Filed Oct. 26, 1923 3 Sheets-Sheet 1

Fig. 1



INVENTOR.
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Frantzel and
ATTORNEYS.

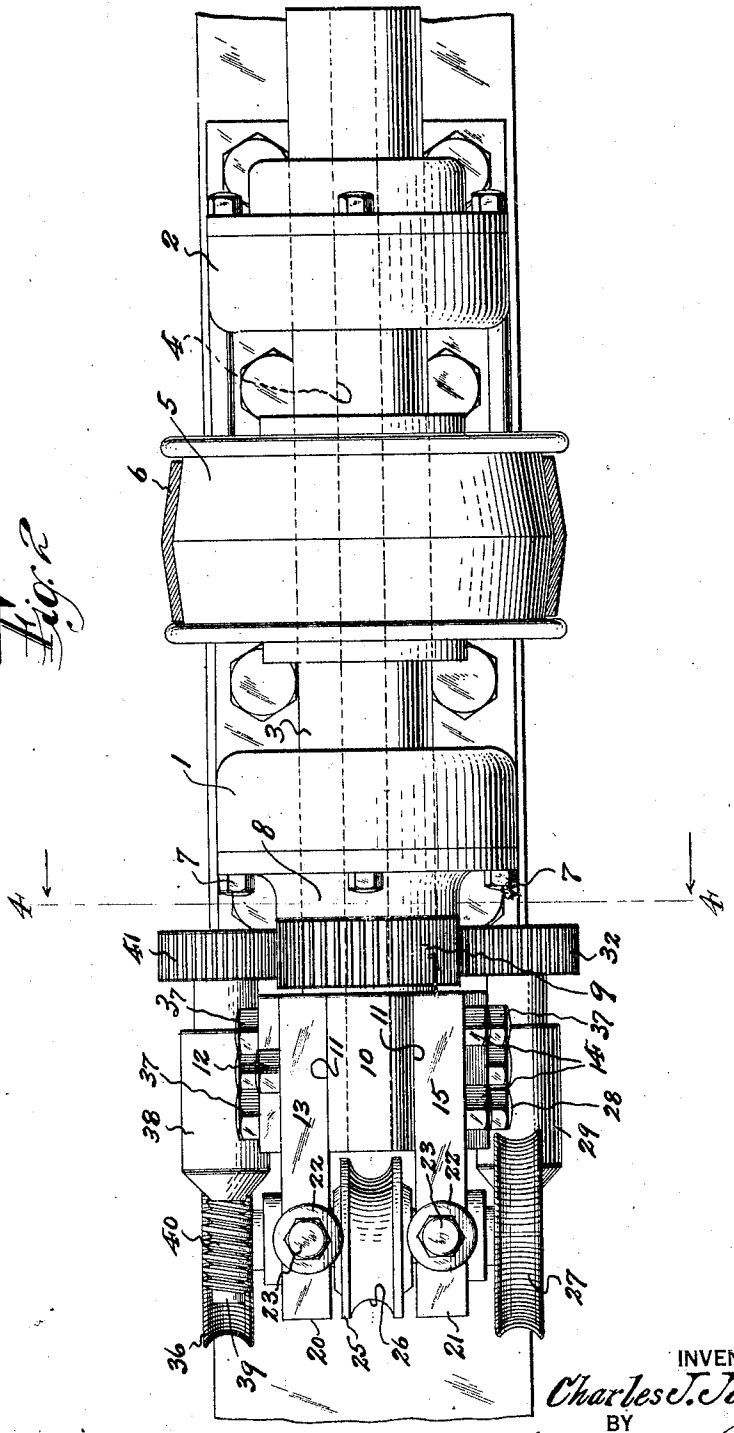
April 14, 1925. 1,533,864

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ATTACHMENT FOR FLEXIBLE TUBE MAKING MACHINES

Filed Oct. 26, 1923 3 Sheets-Sheet 2

Fig. 2



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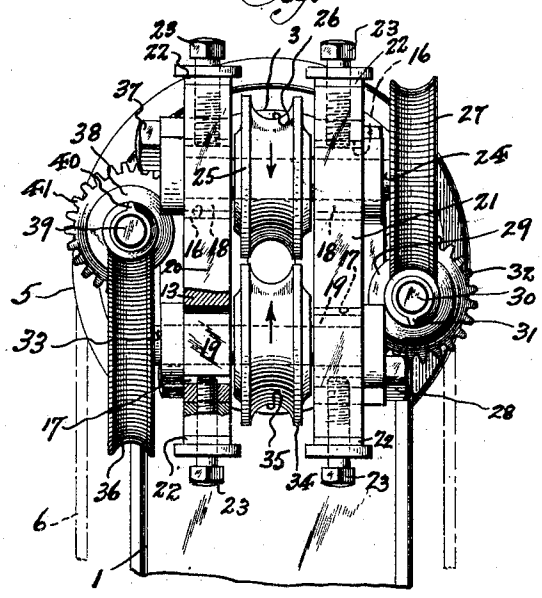
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C. J. JOHNSON

ATTACHMENT FOR FLEXIBLE TUBE MAKING MACHINES

Filed Oct. 26, 1923 3 Sheets-Sheet 3

Fig. 3



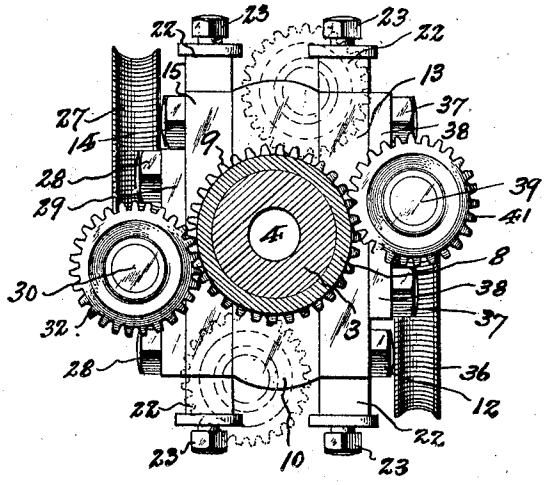


Fig. 4

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Patented Apr. 14, 1925. 1,533,864

UNITED STATES PATENT OFFICE.

CHARLES J. JOHNSON, OF BLOOMFIELD, NEW JERSEY.

ATTACHMENT FOR FLEXIBLE-TUBE-MAKING MACHINES.

Application filed October 26, 1923. Serial No. 671,056.

To all whom it may concern:

Be it known that I, CHARLES J. JOHNSON, a citizen of the United States, residing at Bloomfield, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Attachments for Flexible-Tube-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention relates, generally, to improvements in machines for manufacturing armored insulated electric cable, flexible metallic tubing, and the like; and the invention has reference, more particularly, to an auxiliary attachment or secondary forming means for receiving the cable from the primary armor winding and forming dies of the machine.

The invention has for its principal object to provide a novel means auxiliary to the main winding and forming dies of armored electric cable manufacturing machines, which is adapted to serve the following purposes, viz, to relieve from undue strains and stresses both the main forming dies and the armor material passed therethrough; to assure a uniform movement of the cable from the main forming dies so that the pitch of the convolutions thereof is maintained uniform and true; to prevent malformation of the cable; and to slightly squeeze the cable to free the joints intermediate the convolutions from tendency to bind, whereby any undue stiffness of the cable is eliminated and the same is rendered properly limber or flexible.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

With the various objects of this invention in view, the same consists, primarily, in the novel auxiliary or secondary forming means for armored electric cable manufacturing machines hereinafter set forth; and the invention consists, furthermore, in the various combinations and arrangements of the parts of said auxiliary or secondary forming means, as well as in the details of the construction thereof, all of which will be more fully described in the following specification, and then finally embodied in the claims which are appended hereto.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the novel auxiliary or secondary forming means for armored electric cable manufacturing machines; Figure 2 is a top or plan view of the same; Figure 3 is an elevation of the cable receiving end of the same; and Figure 4 is a transverse vertical section through the same, taken on line 4—4 in Figure 2.

Similar characters of reference are employed in all of the hereinabove described views, to indicate corresponding parts.

Since the main forming dies of the cable-making machine or the mechanism for feeding the material thereto are not parts of this invention, the general construction of the machine, including such parts, have not been shown in the accompanying drawings, particularly for the reason, that there are several types of cable-making machines, with any of which my novel auxiliary or secondary forming means may be used, as will be readily understood by those familiar with the art of armored electric cable manufacture and the machines utilized in said art.

The novel auxiliary or secondary forming means which is the subject of this invention and which is shown in the accompanying drawings is mounted in connection with the armored cable making machine so as to be alined with and spaced from but adjacent to the discharge end of the main forming dies of the machine, and so as to receive the formed cable as it issues from said main forming dies.

The novel auxiliary or secondary forming means comprises a pair of longitudinally spaced apart bearing standards 1 and 2, in which is journaled a hollow or tubular shaft 3 provided with an axial opening or way 4 through which the cable passes after issuing from the main forming dies of the machine. A suitable means is provided for rotating said shaft 3 at the desired speed. As shown in the drawings, this means may consist of a pulley 5 fixed on the shaft 3 at a point intermediate the bearing standards 1 and 2, and over which runs a drive belt 6 driven from

any suitable source of power. It will be understood, however, that any other form of means for rotating the shaft 3 may be employed, as may be found convenient or desirable.

Secured to the forward face of the bearing standard 1, by means of bolts 7 or other suitable fastening means, is a stationary hub or boss 8, through which the receiving end of the shaft 3 projects toward the main forming dies of the machine. The free end of said hub or boss 8 is provided about its circumference with gear teeth, so that the same constitutes a stationary or non-rotatable gear member 9.

The end portion of said shaft 3, beyond said gear member 9, terminates in a transverse T-head 10 having flat faces or seats 11 on its opposite sides. Secured to one face or seat 11, by bolts 12, is one frame-plate 13, and, in like manner, secured to the opposite face or seat 11, by bolts 14, is another frame-plate 15. The free ends of said frame-plates 13 and 15 extend longitudinally beyond the T-head 10. Said free ends of said frame plates 13 and 15 are each cut away to provide one pair of laterally opposed guide-ways 16 outwardly off-set to one side of the axis of the shaft 3, and another pair of laterally opposed guide-ways 17 outwardly off-set to the opposite side of the axis of said shaft 3. Supported in the respective guide-ways 16 are opposed adjustable bearing blocks 18, and supported in the respective guideways 17 are similar opposed adjustable bearing blocks 19. The ends of the frame plates 13 and 15 are provided with the respective end caps 20 and 21, for closing the outer sides of said guide-ways 16 and 17. Said end caps 20 and 21 are respectively provided with end lugs 22 through which extend adjusting screws 23, which respectively extend through the bodies of the frame-plates 13 and 15 so that their inner free ends may be brought to bear upon the bearing blocks 18 and 19 so as to adjust the same, and at the same time said screws 23 retain the end caps 20 and 21 in proper assembled relation to the frame-plates 13 and 15.

Journaled in said bearing blocks 18 is a transverse spindle 24, one end of which projects beyond the outer side face of the frame-plate 15. Fixed upon said spindle 24, intermediate the frame-plates 13 and 15, and so as to rotate in a vertical longitudinal plane, is one combined cable feed and squeeze roller 25, the same having a grooved periphery 26 to conform to the cross-sectional shape of the cable issued from the main forming dies. Fixed upon said outwardly projecting end of said spindle 24 is a worm-gear 27. Secured upon the face of said frame-plate 15, by means of bolts 28 or other suitable fastening means, is a bracket bearing 29 in which is journaled a longitudinal shaft 30. Fixed upon the outer end of said shaft 30 is a worm 31 which meshes with and drives said worm-gear 27. Secured upon the inner end of said shaft 30 is a spur gear 32 which meshes with the above-described stationary or non-rotatable gear member 9. In like manner, there is journaled in said bearing blocks 19 a transverse spindle 33, one end of which projects beyond the outer side face of the frame-plate 13. Fixed upon said spindle 33, intermediate the frame-plates 13 and 15, so as to rotate in a vertical longitudinal plane and in opposition to the combined cable feed and squeeze roller 25, is a second combined cable feed and squeeze roller 34, the same also having a grooved periphery 35 to conform to the cross-sectional shape of the cable issued from the main forming dies. Fixed upon the outwardly projecting end of said spindle 33 is a worm gear 36. Secured upon the face of said frame-plate 13, by means of bolts 37 or other suitable fastening means, is a bracket bearing 38 in which is journaled a longitudinal shaft 39. Fixed upon the outer end of said shaft 39 is a worm 40 which meshes with and drives said worm-gear 36. Secured upon the inner end of said shaft 39 is a spur gear 41 which also meshes with the above-described stationary or non-rotatable gear member 9.

As will be understood from the above description of the construction and assembly of parts, the opposed combined cable feed and squeeze rollers 25 and 34 are respectively offset relative to the axis of the opening or way 4 of the main shaft 3, so that as an armored cable is issued from the main forming dies of the machine to enter said opening or way 4, said cable will first pass between the said rollers 25 and 34 so as to be embraced by the grooved peripheries thereof.

In operating the novel auxiliary or secondary forming means above described, the shaft 3 is rotated whereby the T-head 10 thereof is also rotated to revolve the parts mounted thereon about the longitudinal axis of the shaft 3 and its opening or way 4. This revolution of the parts causes the respective spur gears 32 and 41 to travel around the stationary or non-rotatable gear member 9, to thereby rotate the same and in turn rotate the respective shafts 30 and 39 and worms 31 to 40, whereby the spindles 24 and 33 are rotated through the worm gears 27 and 36 which mesh with said worms 31 and 40, thus rotating the combined cable feed and squeeze rollers 25 and 34 in the direction of the arrows shown therewith in Figure 3 of the drawings. Since the worm 31 meshes with one side of said worm gear 27, and the worm 41 meshes with the opposite side of said worm gear 36, it follows

that the rollers 25 and 34 will be driven in respectively opposite directions as will be understood from an inspection of the accompanying drawings.

After the electric cable with its enclosing interconnected convolutions of metallic armor issues from the main forming dies of the machine, the end thereof is passed between the combined feed and squeeze rollers 25 and 34, the rotation of which tends to advance the cable through the way or opening 4 of the main shaft 3 at such speed that the main forming dies are relieved of undue strains and stresses, and the cable is moved to issue therefrom, or in other words is taken away therefrom, as soon as formed, and in such manner that the convolutions of the armor material are maintained uniform throughout the length of the cable. Furthermore since the cable is rotated about its longitudinal axis by the forming action of the main dies, the revolution of the rollers 25 and 34 about the longitudinal axis of the shaft 3 and its opening or way 4 causes the said rollers to accompany the rotating movement of the cable, whereby the said rollers will squeeze down upon the tops of the convolutions of the armor, as the same moves longitudinally, to thereby slightly flatten said convolutions so as to loosen or relieve from undue binding one upon the other of the interlocked edges or joints of said convolutions, to the end that the armor is relieved of undue stiffness and is rendered adequately flexible or limber at the said joints. The squeezing pressure of the rollers 25 and 34 upon the armored cable is regulated or adjusted by manipulating the adjusting screws 23 to set the bearing blocks 18 and 19 in such manner as to govern the set of the opposed rollers 25 and 34 relative one to the other.

The above described auxiliary or secondary forming means for armored electric cable manufacturing machines is simple in construction, but very efficient in operation, since it not only provides for a positive and uniform feeding or taking away of the cable primarily formed in the main forming dies of the machine, but also treats the preformed convolutions of the armor in such manner as to eliminate undue stiffness in the joints, whereby a cable of desired flexibility is assured.

I am aware that some changes may be made in the arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same, without departing from the scope of my present invention as set forth in the foregoing specification, and as defined in the appended claims. Hence, I do not limit my invention to the exact arrangements and combinations of the several devices and parts as described in said specification, nor do I confine myself to the exact details of the construction of said parts as illustrated in the accompanying drawings.

I claim:—

1. In a device of the kind described, a main shaft having an axial passage therethrough, bearings in which said main shaft is journaled, means for rotating said main shaft, a pair of opposed rotatable combined feed and squeeze rollers to engage an armored electric cable passing into and through said shaft passage, means for mounting said rollers in connection with said shaft adjacent to the receiving end of said shaft passage so that said rollers revolve with the shaft about the longitudinal axis of the latter, a worm and worm gear transmission means for each roller, each transmission means having a spur gear for driving the same, and stationary gear member supported in connection with a bearing of said main shaft with which said spur gears mesh and about which they revolve as the main shaft rotates, and means for adjusting said rollers toward one another.

2. In a device of the kind described, a main shaft having an axial passage therethrough, bearings in which said main shaft is journaled, means for rotating said main shaft, said main shaft having a T-head at its inner end, laterally spaced apart frame-plates secured to opposite sides of said T-head, adjustable bearing-blocks mounted in said frame-plates, spindles journaled in transversely opposed bearing-blocks, a pair of combined feed and squeeze rollers respectively mounted on said respective spindles so as to oppose one another and thus engage an armored electric cable passing into and through said main shaft passage, a stationary gear-member supported in connection with a bearing of said main shaft adjacent to the inner end of the latter, a transmission means mounted on each frame-plate and respectively arranged to drive the respective spindles and their rollers, and each of said transmission means having a driving spur gear to mesh with said stationary gear member and about which the same revolve as the main shaft rotates.

3. In a device of the kind described, a main shaft having an axial passage therethrough, bearings in which said main shaft is journaled, means for rotating said main shaft, said main shaft having a T-head at its inner end, laterally spaced apart frame-plates secured to opposite sides of said T-head, adjustable bearing-blocks mounted in said frame-plates, spindles journaled in transversely opposed bearing-blocks, a pair of combined feed and squeeze rollers respectively mounted on said respective spindles so as to oppose one another and thus engage an armored electric cable passing into and through said main shaft passage, a station-

ary gear-member supported in connection with a bearing of said main shaft adjacent to the inner end of the latter, the spindle of one roller being adapted to project through one frame-plate and having a worm gear secured thereto, the spindle of the other roller being adapted to project through the opposite frame-plate and also having a worm gear secured thereto, each frame plate having a bracket bearing, a transmission shaft journaled in each bracket bearing, one transmission shaft having a worm to mesh with said first mentioned worm gear, the other transmission shaft having a worm to mesh with the other worm gear, and each transmission shaft having on its inner end a driving spur gear to mesh with said stationary gear member so as to revolve about and so as to be rotated by the latter when said main shaft is turned.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 23rd day of October, 1923.

CHARLES J. JOHNSON.

Witnesses:
GUSTAVE A. JOHNSON,
GEORGE D. RICHARDS.