May 17, 1932. W. E. SOMERVILLE 1,858,528

TWISTER OR STRANDER

Filed Aug. 28, 1931 3 Sheets-Sheet 1

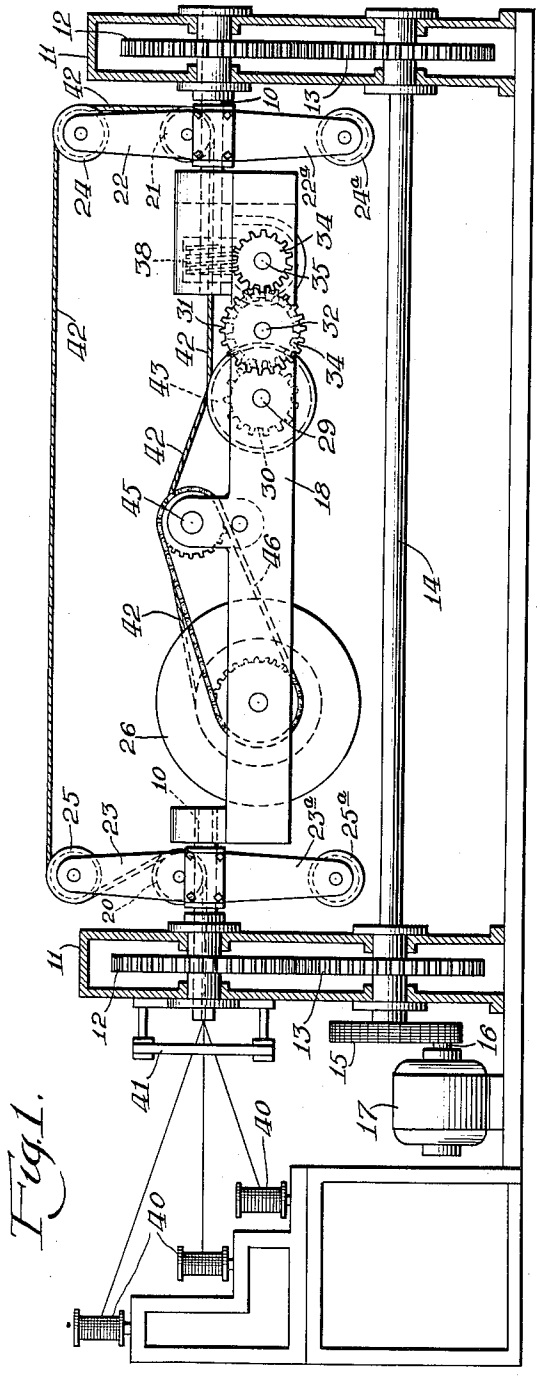


Fig. 1.

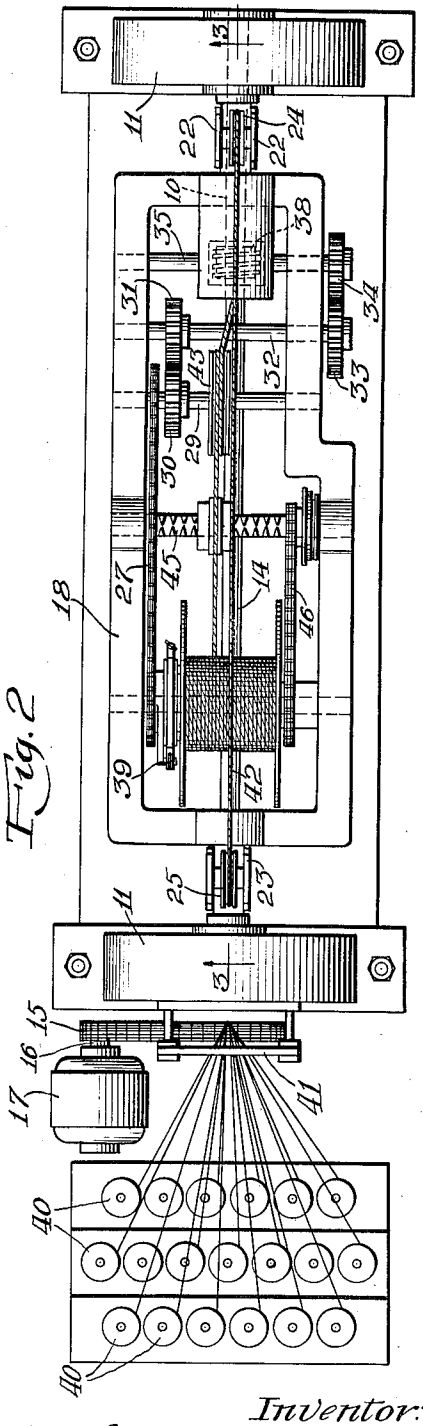


Fig. 2

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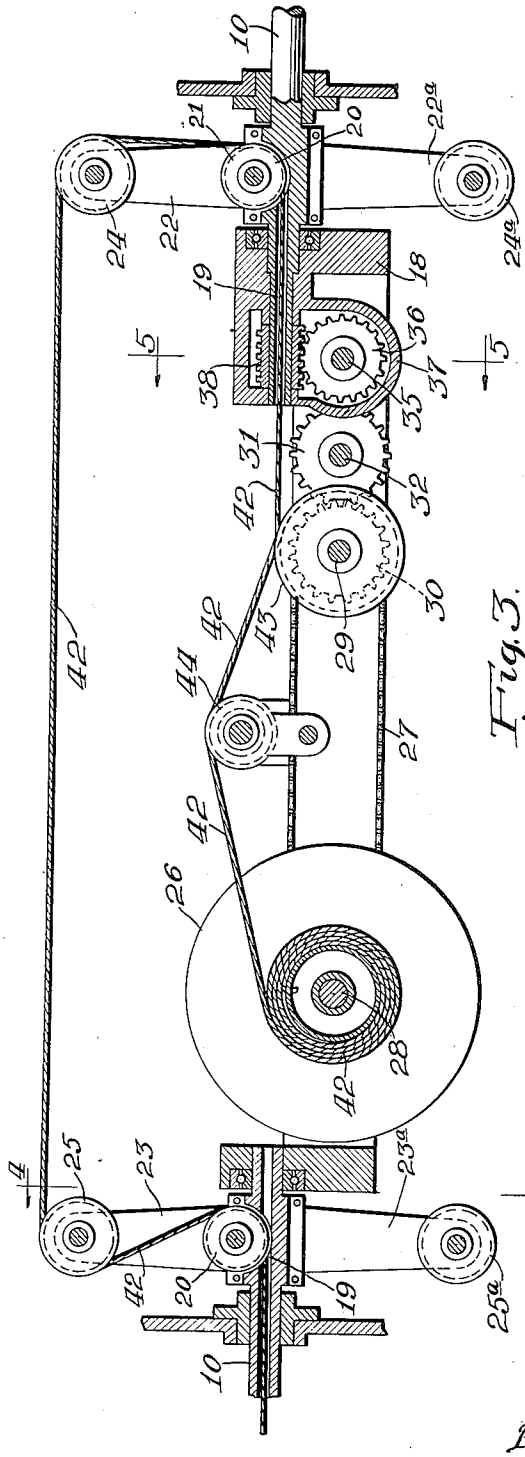


Fig. 3.

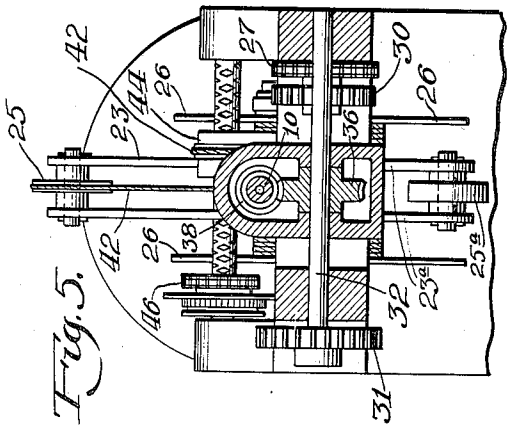


Fig. 5.

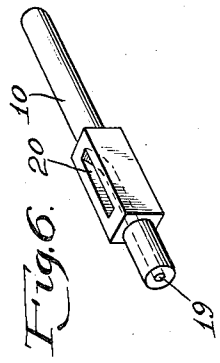


Fig. 6.

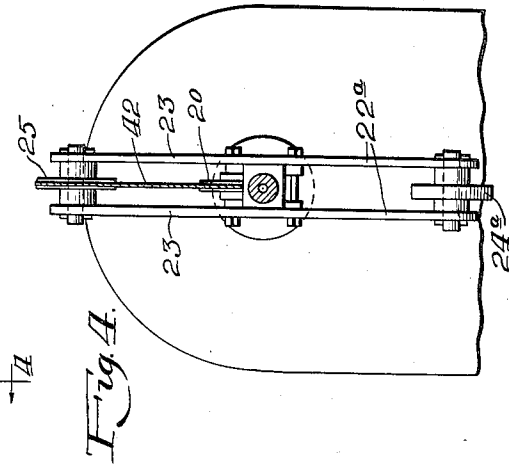


Fig. 4.

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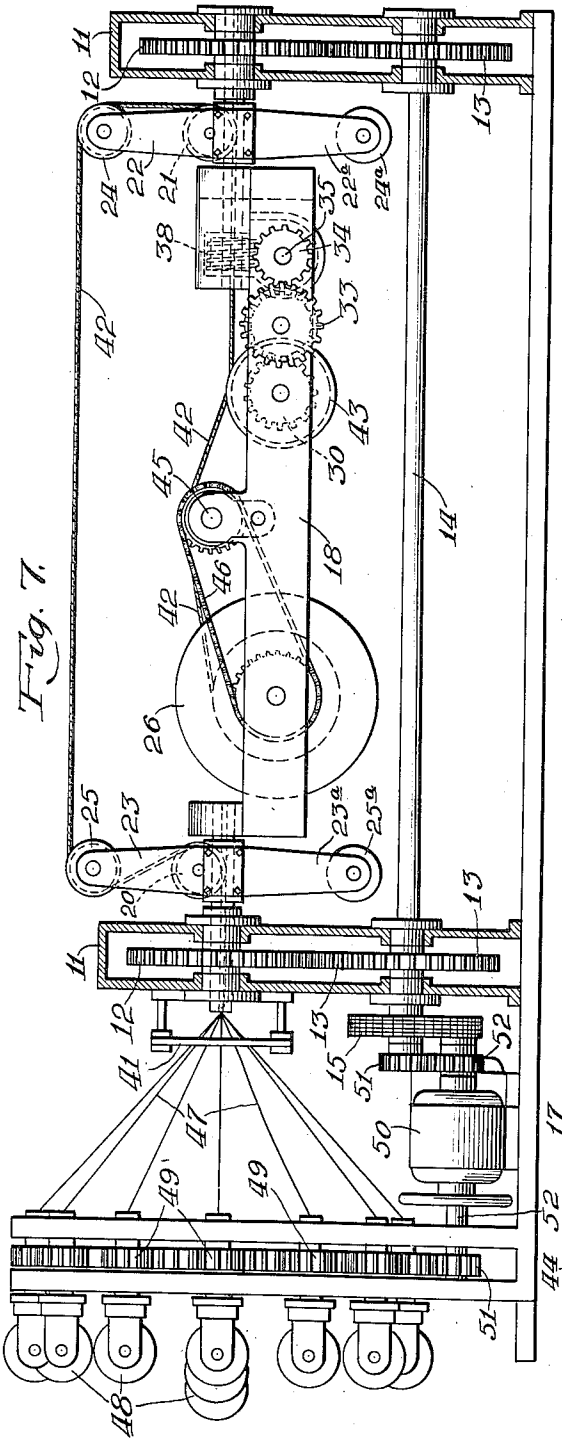


Fig. 7.

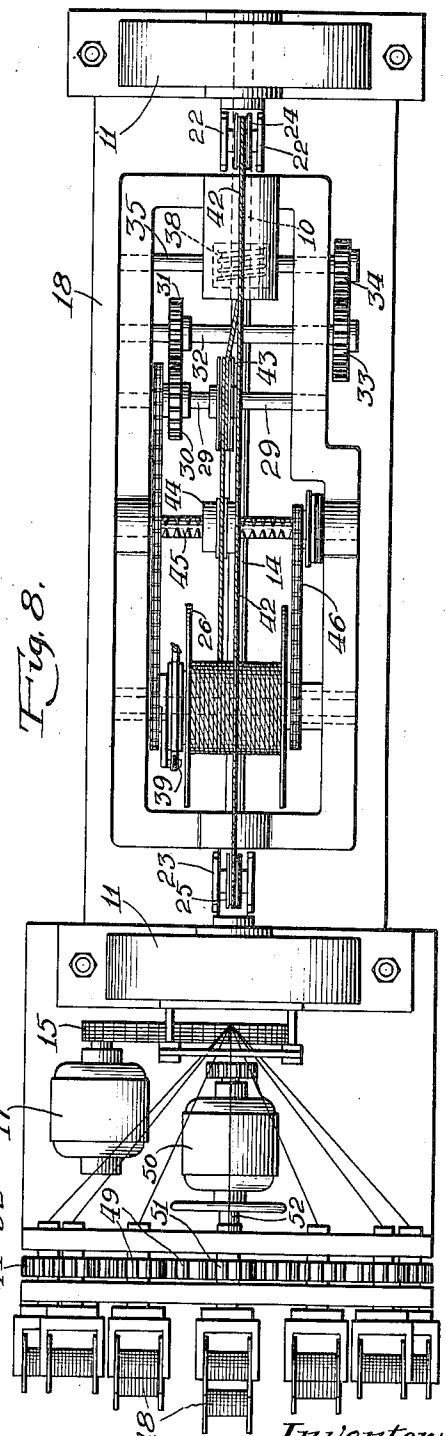


Fig. 8.

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Patented May 17, 1932 1,858,528

UNITED STATES PATENT OFFICE

WILLIAM E. SOMERVILLE, OF COAL CITY, ILLINOIS

TWISTER OR STRANDER

Application filed August 28, 1931. Serial No. 559,957.

This invention relates to improvements in twisting or stranding mechanism particularly adapted though not necessarily limited in its use in the manufacture of wire cable or rope.

Heretofore in machines of this character the twisting mechanism has been mounted upon a revolving cage, and as the cage has generally been in the form of a frame within which the mechanism is mounted, it has been necessary in order to produce the desired result, to rotate not only the twisting mechanism per se, but also the cage, and this has necessitated the employment of considerable power.

It is one of the objects of the present invention to produce a simple, inexpensive and light structure of this character, necessitating the employment of considerably less power to operate the same.

To that end the revolving cage usually employed is dispensed with, and in lieu thereof there are employed two arms which are disposed at the ends of a cradle fixed against rotation, the arms being rotatable with respect to the cradle to effect the twisting or stranding operation.

The cradle is preferably pivotally mounted at its ends in such a manner that there will be a low center of gravity which will hold the cradle substantially stationary.

The strands are run over pulleys carried by the arms, to a take up reel mounted upon the cradle, so that when the arms are rotated with respect to the cradle a twist will be given to the strands or wire in the head of the machine and another twist will be made at the opposite end of the cradle.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention and in which

Figure 1 is a side elevation of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a sectional view taken on line 3—3, Figure 2, on an enlarged scale.

Figure 4 is a sectional view taken on line 4—4, Figure 3.

Figure 5 is a view taken on line 5—5, Figure 3.

Figure 6 is a detail perspective view of one of the supporting axles.

Figure 7 is a view similar to Figure 1 of another form of the invention.

Figure 8 is a top plan view of Figure 7.

Referring more particularly to the drawings the numeral 10 designates supporting axles two of which are preferably employed, and are spaced from each other lengthwise of the axes thereof. Each of the axles is supported in suitable bearings preferably in the walls of housings 11, and connected to the axles within the respective housings are gears 12 which mesh with gears 13, the latter being secured to a shaft 14 for rotation therewith, and the shaft 14 is journaled in a suitable bearing preferably in the walls of the respective housings.

Connected also to the shaft 14 is a suitable pulley over which a drive belt 15 passes, and the belt also passes over a pulley secured to the shaft 16 of a motor 17 so that motion will be imparted from the motor to the shaft 14 and from the shaft 14 through the gears 13, to the intermeshing gears 12 to rotate the shafts 10. Arranged between the shafts 10 is a cradle 18 which is pivotally mounted upon the shafts and is supported thereby, the cradle 18 being provided with a low center of gravity so that the same will be held substantially stationary and against rotation with the shafts 10 when the latter are operated. Each of the shafts is hollow as at 19 and is preferably provided with a recessed portion 20, into which latter a suitable pulley 21 projects so that the periphery of a portion of the pulley will be in alinement with the opening 19 in the shafts 10.

Secured to one of the shafts 10 adjacent the respective end of the cradle 18, is an arm 22 and secured to the other shaft 10 adjacent its end of the cradle 18, is an arm 23, and these arms rotate with the respective shafts

10. A pulley 24 is carried by the end of the arm 22 and a pulley 25 is carried by the end of the arm 23, these arms 22 and 23 being of any desired length. A supplemental arm 22^a is secured to the shaft 10 adjacent the arm 22 and carries a counterweight 24^a, and a supplemental arm 23^a is secured to the other shaft 10 adjacent the arm 23 and supports a counterweight 25^a. These arms 22^a and 23^a together with the weights 24^a and 25^a respectively counterbalance the arms 22 and 23.

Mounted upon the cradle 18 is a take up reel 26 which receives its motion in any desired or suitable manner, preferably by means of a driving belt or chain 27 passing over a pulley connected with a shaft 28 upon which the reel is mounted. The belt or chain 27 passes over a sprocket wheel connected to a shaft 29 and secured to the shaft 29 for rotation therewith is a gear 30 which meshes with a gear 31 on a shaft 32.

Secured also to the shaft 32 for rotation therewith is a gear 33 which in turn meshes with a gear 34 secured to a shaft 35 for rotation therewith. Secured also to the shaft 35 is a worm gear 36 preferably arranged within the housing 37, and meshing with the worm gear 36 is a worm 38 which in turn is secured to the shaft 10 for rotation therewith so that when the shafts 10 are rotated motion will be imparted from one of the shafts 10 through the gear connection and drive belt or chain 27 to the take up reel 26, a suitable brake 39 being provided for controlling the rotation of the reel 26.

The strands of wire to be twisted in the form of the invention shown in Figures 1 to 5, when soft material is employed, are supplied from spools or bobbins 40 and pass through a suitable die plate 41 into and through one of the tubular shafts 10, thence around the adjacent pulley 20 to and over the pulley 25 on the arm 23, thence as at 42 to and over the pulley 24, thence over the pulley 21, through the other hollow shaft 10 to a draw off reel 43, passing one or more times therearound and from the draw off reel over a guide pulley 44 and thence to the take up reel 26 to be wound thereupon.

The guide pulley 44 controls the lay or wrap of the rope or cable upon the take up reel 26, and to that end the guide pulley 44 is adapted to be given a reciprocatory movement in directions lengthwise of the axis of the take up reel 26. This may be accomplished in any desired or suitable manner but preferably through the medium of a double screw shaft 45 which is given a rotary movement in any desired or suitable manner preferably by means of a belt or chain 46 which passes over a pulley connected with the shaft 28 and thence over a pulley connected to the shaft 45 so that when the take up reel 26 is rotated the shaft 45 will be correspondingly rotated and this will cause the guide pulley 44 to be moved backwardly and forwardly with respect to the shaft 45.

The form of the invention shown in Figures 7 and 8 is more particularly adapted to twist wires or strands of a harder nature, and in this instance the strands 47 are supplied from bobbins or spools 48 which are mounted upon a suitable support, and these bobbins or spools are rotated about their own axes from the motor 17 preferably through the medium of a variable speed reducer 50 of any well known or suitable construction, motion being imparted to the speed reducing element through the medium of a gear 51 secured to the shaft 14 and which gear 51 meshes with a gear 52 on the shaft of the speed reduction device 50, motion from the latter being connected to the gears 49 through the medium of a gear 51 mounted on the shaft 52 of the speed reduction device 50.

In a machine of this character it has been found that when the strands or wires 47 are formed of hard wire, such as steel, hard copper or the like, and are twisted by the arms 22—23 and the associated mechanisms to form the rope or cable, there is an actual twist made in the individual strands or wires, which is not desirable. In order to overcome or prevent such twisting of the individual strands or wires, the bobbins 48 must be rotated about their own axes in a direction suitable to take out or eliminate such twisting of the individual strands or wires. This is accomplished through the medium of the gears 49—51 and the transmission element 50, which rotate the bobbins at the proper rate of speed with respect to the speed of rotation of the arms 22—23.

The arms 22 and 23 may be of any desired construction but as shown more clearly in Figure 4 of the drawings, they are preferably formed of spaced members between which the pulleys are mounted.

With this improved construction it will also be manifested that there will be provided a cradle for the draw off and take up reels, which by reason of its low center of gravity will be maintained against rotation with the shafts 10 and substantially stationary with respect thereto so that the cradle will not be rotated but the arms 22 and 23 will be rotated, thereby reducing the weight of the parts to be rotated and providing a structure which will necessitate a considerable saving of power with respect to the power necessary to rotate the cradles and mechanisms of devices of this character heretofore employed.

It will also be manifest that as the strands pass over the pulleys 20 and 25 carried by the arm 23 they will be twisted with respect to each other, and as the cable 42 advances and passes over the pulleys 24 and 21 on the arm 22 to the draw off mechanism, the strands will be given a further twisting.

With this construction it will be manifest that there is provided a common shaft for rotating the arms 22—23 at the proper speed and as a unit without the usual fixed structure for rotating the cage, and with the further result that there will be produced of this rotary structure a unitary machine element.

While the preferred forms of the invention have been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. In a wire rope or cable making machine a cradle, supporting means for the cradle, said cradle being maintained against rotation, a take up reel and haul off mechanism mounted upon said cradle, rotatable twisting arms arranged adjacent the ends of the cradle, a shaft separate from the cradle supporting means and connecting the arms for rotating them independently with respect to the cradle, and means for rotating the said shaft.

2. In a wire rope or cable making machine a cradle maintained against rotation, a take up reel and haul off mechanism mounted upon said cradle, rotatable twisting arms arranged adjacent the ends of the cradle, a driving shaft, gear connections between the shaft and the respective arms for rotating them with respect to the cradle, and means for rotating the shaft.

3. In a wire rope or cable making machine a cradle, a support for the cradle, said cradle being maintained against rotation, a take up reel and haul off mechanism mounted upon the cradle, means constituting a unitary machine element for twisting the strands, the said means embodying arms supported adjacent the ends of the cradle for rotation independently with respect thereto, a driving shaft separate from the cradle supporting means, common to and operatively connected to the arms for rotating them, and means for rotating the said shaft.

4. In a wire rope or cable making machine, a cradle, a support for the cradle, said cradle being maintained against rotation, a take up reel and draw off mechanism mounted upon the cradle, twister arms mounted adjacent the end of the cradle for rotation with respect to the cradle, and a shaft separate from the cradle supporting means and common to the said arms for rotating them at the proper speed and constituting with said arms a unitary machine element.

5. In a wire rope or cable making machine, a cradle, a support for the cradle, said cradle being maintained against rotation, a take up reel and draw off mechanism mounted upon the cradle, twister arms mounted adjacent the end of the cradle for rotation with respect to the cradle, a shaft separate from the cradle supporting means and common to the said arms for rotating them at the proper speed and constituting a unitary machine element, and counterbalancing means for the arms.

6. In a wire rope or cable making machine a cradle maintained against rotation, a take up reel and haul off mechanism mounted upon said cradle, rotatable twisting arms arranged adjacent the ends of the cradle, a shaft, gear connections between the shaft and the respective arms for rotating them with respect to the cradle and at the proper speed, means for rotating the shaft, and housings for the gear connections between the shaft and arms.

In testimony whereof I have signed my name to this specification, on this 19th day of August, A. D. 1931.

WILLIAM E. SOMERVILLE.