

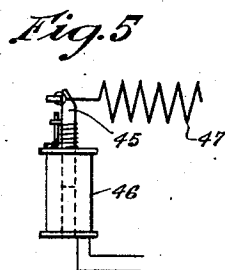
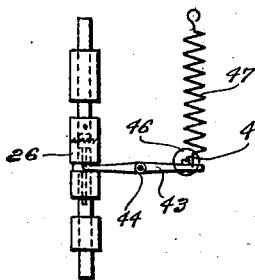
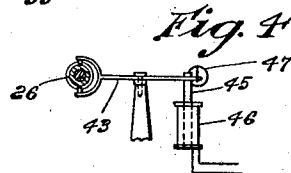
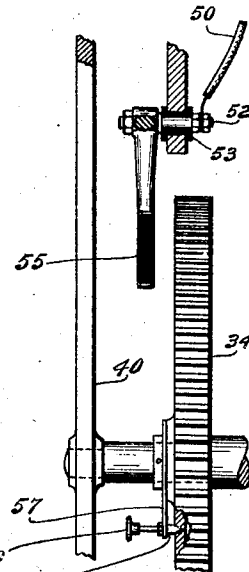
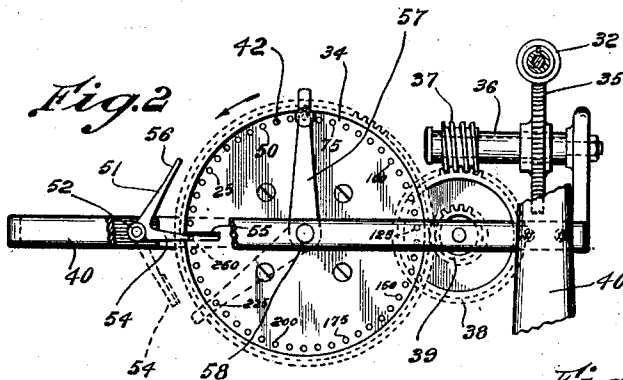
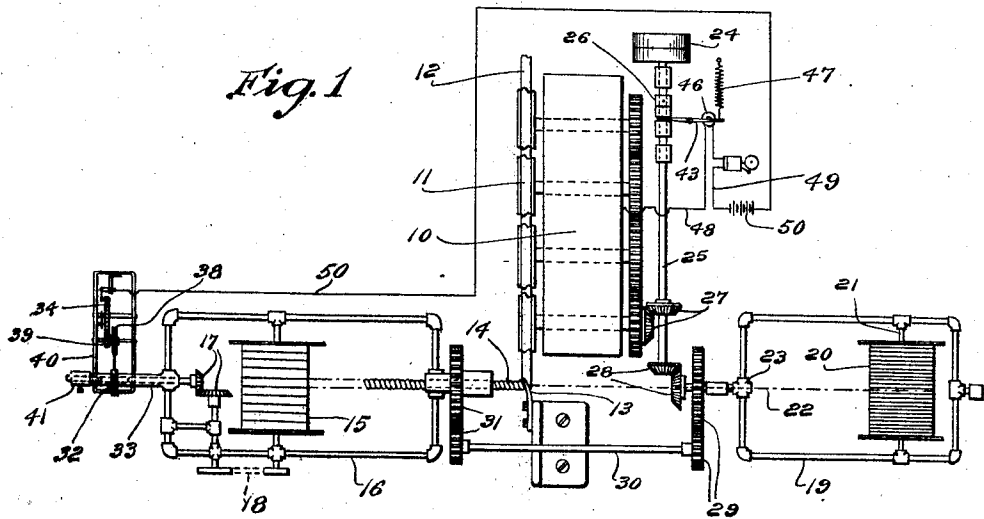
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S. W. BOURN

TUBULAR ARMORING CABLE MACHINE

Filed Jan. 27, 1923



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TUBULAR-ARMORING-CABLE MACHINE.

Application filed January 27, 1923. Serial No. 615,417.

This invention relates to improvements in the construction of devices for measuring lengths of work as formed on machines and for automatically stopping the machine when a predetermined length of such work has been formed thereon; and the object of this invention is to provide an attachment for such machines as those which form their work by rotating and simultaneously advancing the same as formed, such for instance as machines for forming tubular armored cable, rope-making machines and other machines in which the work is formed by a helical movement, or a combined rotating and advancing movement, and means being provided for automatically stopping the machine when a predetermined length of the work has been formed.

A further object of the invention is the provision of means which are electrically operated for stopping the work-forming machine, also the provision of adjustable means whereby the machine may stop when any given length of work has been formed.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings—

Figure 1 is a plan view illustrating one form of machine for producing work by a rotating and simultaneously advancing action and illustrating my automatic stop device for stopping the machine when a predetermined length of work has been formed.

Figure 2 is an end view of the automatic stopping attachment, illustrating the adjustable contact means for completing the circuit to automatically stop the machine when any given length of work has been formed.

Figure 3 is an enlarged edge view illustrating a portion of the index wheel carrying the contact arm also showing the contact member mounted to be positioned in the path of movement of the arm to complete the electric circuit.

Figure 4 is a detail showing the clutch mechanism positioned to be operated by a solenoid magnet.

Figure 5 is a side elevation of the controlling magnet and a portion of the tension spring adapted to withdraw the clutch from position when the magnet is energized.

Figure 6 is a top view showing the clutch

members and the clutch operating arm and the relative positions of the controlling solenoid and the clutch withdrawing spring.

It is found in practice of advantage in the operation of such machines as tubular armoring cable machines and other machines where the work is formed by a simultaneous rotation and advancing action, to provide simple and effective means for measuring lengths of the work as formed and to stop the machine automatically when the desired lengths have been produced; and the following is a detailed description of one means by which these results may be accomplished:—

With reference to the drawings, 10 designates the frame of a machine in part of which a set of strip-feeding and grooving rolls 11 are rotatably mounted for feeding the strip 12 to a point 13 where it is continuously wound into a tubular conduit or covering 14. The tube thus formed is taken up or wound upon a reel 15, which is mounted to rotate upon its axis in the frame 16, being driven through gears 17, and belt 18, and this frame 16 is caused to revolve by means presently described, to rotate the reel end over end to accommodate the twist or rotation of the tube as formed.

At the right of this machine is mounted a rotatable frame 19, on which is mounted a core supply reel 20, the same being adapted to rotate on a shaft 21, and to carry a wire 22 that is fed therefrom through guides 23 into the tube 14, which is being wound about this wire core.

The strip feeding and shaping rolls 11 and the revolving frames 16 and 19 are driven in unison from the main driving pulley 24 through main shaft 25, clutch 26, gears 27, 28 and 29, the two frames 16 and 19 being driven in unison through jack shaft 30 and gears 31.

The tubular armor 14 which is formed as a covering for the core 22 is constructed by a combined rotating and forwardly advancing movement of the cable, that is, it is wound helically, each turn of the strip overlapping the edge of the next preceding turn, the edges being interlocked to connect the turns together and to render the tube flexible.

It is found in practice very desirable in the manufacture of this tubular armor to form the same into different lengths and to measure these lengths and stop the machine

each time a desired length is formed, and owing to the fact that the tubing advances a predetermined amount at each revolution, which advancement is controlled by the pitch or lead of the former, I am enabled to effect the action of my counting or measuring device by the rotations of the frame on which the work is carried which is geared to rotate in unison with the work as formed.

To operate my measuring device, I have mounted a worm 32 on a hollow shaft 33 at the end of this winding frame 16 and the motion from this worm is transmitted to a toothed index carrying wheel 34 through a worm wheel 35, sleeve 36, worm 37, worm wheel 38 and small gear 39 all being mounted in the frame 40 secured to the end bearing post 41.

This index wheel is provided with a multiplicity of spaced apart holes 42 arranged around its periphery the distance between these holes representing a definite feed or advancement of the finished work, that is different plates having differently spaced holes may be attached to the index wheel, the different spaces corresponding to different leads of the formers, the spaces on the plate shown representing a length of five feet of cable formed, or if desired, instead of changing these index plates the drive gears may be changed to drive the index at different speeds to compensate for the different leads.

In order to control the operation of the clutch 26 to stop the machine, I have provided a clutch lever 43 which is pivoted at 44 and is caused to hold the clutch in operating position by the positioning of the core 45 of a solenoid 46 to prevent the clutch from being withdrawn by the tension of spring 47, whereby when this solenoid is energized the core is withdrawn from engagement with the yoke lever permitting the spring 47 to act and withdraw the clutch from operating position thus stopping the machine.

This solenoid is mounted in an electric circuit in which one wire 48 is grounded on the machine while the other wire 49 is connected through a battery or source of energy 50 to extend around to be connected to a two-arm contact member 51 which is pivotally mounted at 52 in the frame but is insulated therefrom as shown at 53 in Figure 3.

One of the arms 54 of this contact member is insulated on its face as at 55, while the other arm 56 serves as a conductor. In order to provide adjustable means whereby this circuit may be completed after any predetermined length of work has been formed, I have mounted a contact arm 57 on the pivot pin 58 in the frame, which is in the electric circuit. This arm is more or less resilient and at its outer end I have provided a pointer 60 adapted to enter any one

of the holes 42 in the index plate, and I have provided an operating handle 59 for this pointer whereby it may be engaged by the thumb and finger of the operator and the arm turned to any desired position about the index plate to measure off the desired length of work to be formed before the machine will be stopped, for instance one complete rotation of the disk represents 250 feet but in case 275 feet are desired the insulated arm 54 would be placed in the position shown in Figure 2, the pointer arm 57 would be placed at the hole 25 then as the disk rotates in the direction of the arrow this pointer would first come in contact with the insulated face of the arm 54 without completing the circuit to energize the magnet, and as the disk rotates this arm 54 would be moved down into the dotted position illustrated, bringing arm 56 into the position now occupied by arm 54 so that upon the next revolution of the disk the contact 57 would engage the conductor arm 56 of the contact, completing the circuit to energize the magnet and stop the machine. In this way it will be seen that any portion of a single revolution of the index wheel may be caused to energize the magnet to stop the machine, or the index may be caused to make a complete revolution or any portion thereof before the circuit is completed to stop the machine, by the simple positioning of the two-arm contact 51 and the contact arm 57.

My improved measuring device is extremely simple and practical in construction and effective in its operation and by its use any desired length of work which is formed by a combined rotating and advancing movement may be accurately measured and the machine automatically stopped when the desired length is produced.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a counting device, a shaft adapted to be rotated by a part of a machine operated in time with the work, an index wheel operated from said shaft, an electric circuit, a circuit control contact carried by said wheel and adjustable relatively thereto about the axis of the wheel, a contact member having an insulated portion and a current transmitting portion, a motor, said control contact being adapted to first engage the insulated portion of said member to move its transmitting portion and subsequently engage said transmitting portion to operate said motor to stop the machine.

2. In a counting device, a shaft adapted

to be rotated by a part of a machine operated in time with the work, an index wheel operated by said shaft, an electric circuit, a circuit control arm carried by said wheel
 5 and pivoted on the axis of said wheel for adjustment about said wheel, a member having a plurality of arms disposed at an angle to each other and pivoted adjacent said wheel to be independently and successively
 10 engaged by said control contact, one of said arms having a face of conducting material and the remainder having insulated faces, said control contact engaging one of said
 15 arms each revolution and positioning the next succeeding arm, said control contact upon engaging said face of conducting material completing said circuit to operate the motor to stop the machine.

3. A measuring device for cable armoring
 20 machines, comprising a rotatable graduated disc operably related to the machine, a radial arm adapted to rotate with the disc, an electric circuit and a pivoted contact member for closing the circuit lying in the path of
 25 rotation of the arm, said contact member being adapted to be moved into position for closing the circuit, and subsequently close the circuit, by contact with the arm.

4. A measuring device for cable armoring
 20 machines, comprising a graduated disc operably related to the machine, a radial arm adjustably related to the disc and adapted to rotate therewith, an electric circuit, a contact member for closing the circuit and lying
 35 in the path of rotation of the arm and an insulated member for adjusting the contact member.

5. In a measuring device for cable armoring machines, the combination with a graduated disc operably related to the machine,
 40 of a radial arm adjustably related to the

disc, an electric circuit, a pivoted contact member for closing the circuit, a portion of the contact member being insulated and lying in the path of rotation of the arm. 45

6. In a measuring device for cable armoring machines, the combination with a graduated disc operably related to the machine, of a radial arm adjustably secured to the disc, an electric circuit, a pivoted pronged
 50 contact member for closing the circuit and lying in the path of rotation of the arm, one of the prongs being insulated.

7. A measuring device for cable armoring machines, comprising a graduated disc operably related to the machine, a radial arm, means for adjustably securing the arm to the disc, an electric circuit, a contact member for closing the circuit and lying in the path
 60 of rotation of the arm, a portion of the contact member being insulated.

8. A measuring device for cable armoring machine, comprising a graduated disc operably related to the machine, a radial arm, means for adjustably securing the arm to
 65 the disc, an electric circuit, a movable contact member for closing the circuit and means lying in the path of the arm and adapted to be moved into position for closing the circuit, and subsequently close the
 70 circuit, by contact with the arm.

9. A measuring device for a linear material dispensing machine, comprising a rotatable disc operably related to the machine, a radial arm, means for adjustably
 75 securing the arm to the disc, an electric circuit, a pivoted V-shaped contact member lying in the path of movement of the arm for energizing the circuit, one of the legs of the V-shaped contact member being insulated. 80

In testimony whereof I affix my signature.
 STEPHEN W. BOURN.