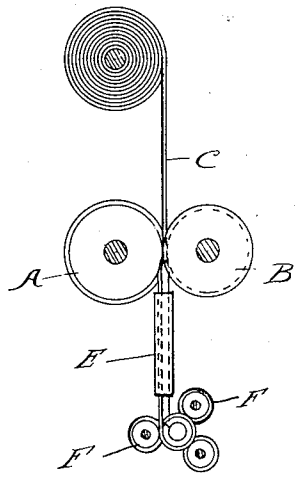
May 28, 1929. J. H. HUNTER 1,714,787

MACHINE FOR FORMING ARMORED INSULATED CONDUCTORS

Filed April 20, 1925

Fig. 1.



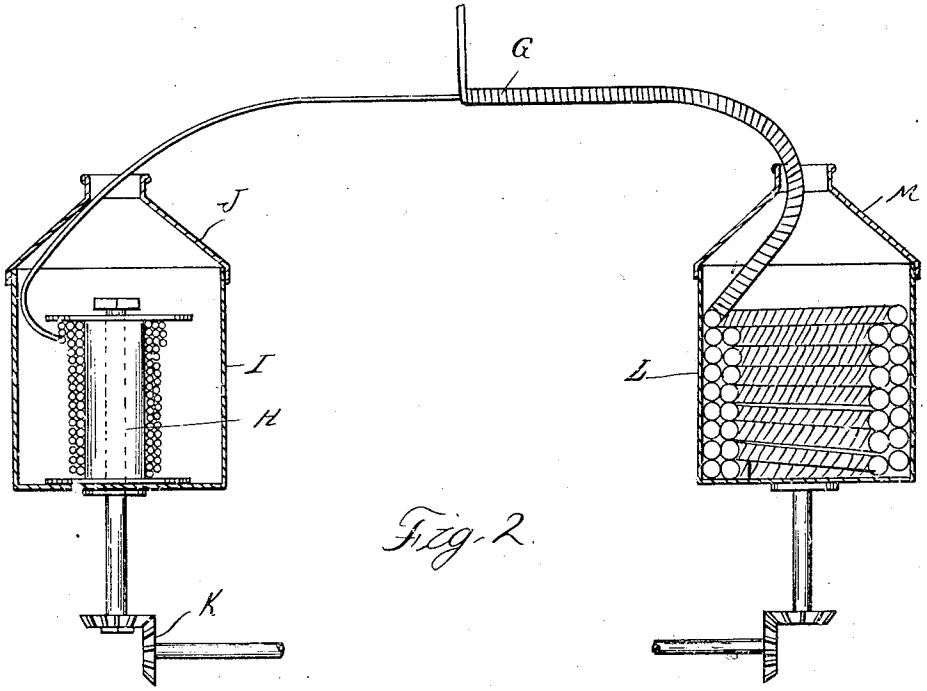


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOSEPH H. HUNTER, OF DETROIT, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GENERAL CABLE CORPORATION, A CORPORATION OF NEW JERSEY.

MACHINE FOR FORMING ARMORED INSULATED CONDUCTORS.

Application filed April 20, 1925. Serial No. 24,637.

The invention relates to the manufacture of armored insulated conductors of that type in which the insulated conductor wires are encased by a spirally wound metallic strip. It is the object of the invention to obtain a construction of machine which is capable of operating at a high rate of speed and which avoids certain difficulties incident to the operation of machines as heretofore constructed. To this end the invention consists in the construction as hereinafter set forth.

In the drawings:

Figure 1 is a diagrammatic cross section of the machine showing the armor-forming mechanism;

Figure 2 is a longitudinal section showing the means for feeding the conductor to the armor and for receiving the armored product.

In the present state of the art machines have been constructed for forming a flexible armor for electrical conductors consisting of a spirally wound metallic strip having the convolutions thereof overlapping and interlocking. As diagrammatically shown in Figure 1, such conduit forming mechanism comprises forming rolls A and B which fashion the metallic strip C to the desired cross sectional contour and deliver it through a guideway E to a series of rolls F, between which it is formed into a spiral tube. The specific construction of this mechanism forms no part of the present invention and will, therefore, not be described further in detail.

The spirally wound armor tube G which is delivered from the rolls F is revolving and axially advancing at a rate determined by the speed of the forming mechanism. Therefore, to encase a conductor in this armor without twisting or straining the same, it is necessary that it should be delivered into the tube revolving at substantially the same rate. This has been accomplished in machines heretofore used by feeding the conductor tangentially from a reel which is mounted on a spindle revolving at the same rate as the armor. However, with such mechanism, unless the speed of rotation is maintained relatively low, centrifugal action will interfere with the proper feeding off of the conductor.

To overcome this difficulty and to permit of speeding up the machine to a much higher rate than has heretofore been customary, I have devised a construction in which the conductor is delivered from a coil which is axially revolving. The speed of rotation of this coil is such that the conductor as delivered into the armor conduit is revolving at substantially the same rate as the conduit and from the fact that the coil revolves about its own axis, there will be no interference due to centrifugal action.

As shown in Figure 2, I preferably place the reel H, which contains the coiled conductor, in a revolving drum I which has a cover J centrally apertured for the outward passage of the conductor. The reel H may be suitably mounted within the drum to have its axis coincident therewith so that the coil, as well as the reel itself, will be in substantial balance when revolving. Thus centrifugal action will tend to throw the conductor as it is drawn off from the reel outward against the walls of the drum, which serve as a shield to limit the outward swing of the conductor and from which the conductor passes radially inward guided by the sloping walls of the cover into axial alignment with the coil and through the aperture in the cover and is then directed into axial alignment with the armor. The drum I is positively driven by mechanism indicated at K, which is timed with the forming mechanism for the armor, and this timing is such that the average speed of rotation of the delivered conductor is the same as that of the armor when delivered. In determining this speed, compensation must be made for the rotation which is due to the uncoiling of the conductor from the reel, which alters the angular speed of the delivered conductor from that of the revolving drum. Also the fact that the conductor on the reel has convolutions of varying diameters will alter the speed of rotation at the delivery end. However, by so calculating and timing the speed of the drum that the average angular speed of the conductor as delivered is the same as that of the armor, any variations incident to difference in diameter of the coils may be safely taken care of by the twisting of the conductor itself.

The armored conductor as delivered from the machine is preferably received by a revolving drum L passing into the same through a centrally apertured cover M and being coiled against the outer wall of the drum by centrifugal action. Such receiving drums have, however, been employed in machines as heretofore constructed.

With the construction as described, the machine may be driven at the highest rate of

speed which the armor forming mechanism will successfully operate and which is much greater than that heretofore used and which, therefore, largely increases the output of the machine.

What I claim as my invention is:

1. In a machine of the character described, the combination with means for forming a metallic strip into a spirally wound revolving and longitudinally advancing armor conduit, of a revolving drum for receiving a coiled conductor to be armored, a centrally apertured conical cover for said drum through which the end of the conductor is passed out and from which it passes to the armor-forming mechanism, and means for driving said drum in timed relation to the armor-forming mechanism and such that the average rotary speed of the conductor as delivered into the armor is the rotary speed of the armor tube.

2. In a machine of the character described, the combination with means for forming a metallic strip into a spirally wound revolving and longitudinally advancing armor conduit, of a rotary drum, means for securing within said drum and in axial alignment therewith a reel for holding a coiled conductor to be armored, said reel providing a clearance between the same and the walls of the drum, a cover for the drum centrally apertured for the passage of the conductor out therefrom, and means for driving said drum and reel therein in timed relation to said armor forming mechanism such that the average rotary speed of the conductor as delivered into the armor is substantially the rotary speed of the armor.

3. In a machine of the character described, the combination with means for forming a metallic strip into a spirally wound revolving and longitudinally advancing armor conduit, of means for rotating a coiled conductor to be armored about the axis of the coil, a shield surrounding the coil for freely directing the conductor as drawn from the coil into axial alignment with the coil, and means for timing the rotation of said coil with that of the armor forming mechanism such that the average rotary speed of the conductor as delivered into the armor is substantially the rotary speed of the armor.

4. In a machine of the character described, the combination with means for forming a metallic strip into a spirally wound revolving and longitudinally advancing armor conduit, of means for revolving a coiled conductor to be armored about the axis of the coil at a sufficient speed to throw the conductor outwardly by centrifugal force away from the coil, means for limiting the outward swing of the conductor and for directing the same as drawn from the coil into axial alignment with the coil, and means for timing the rotation of said coil with that of the armor forming mechanism such that the average rotary speed of the conductor as delivered into the armor is substantially the rotary speed of the armor.

In testimony whereof I affix my signature.

JOSEPH H. HUNTER.