

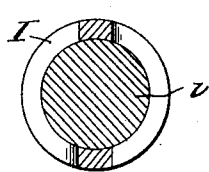
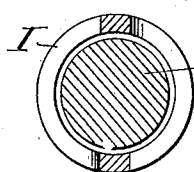
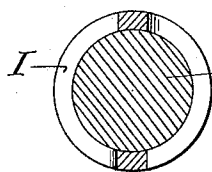
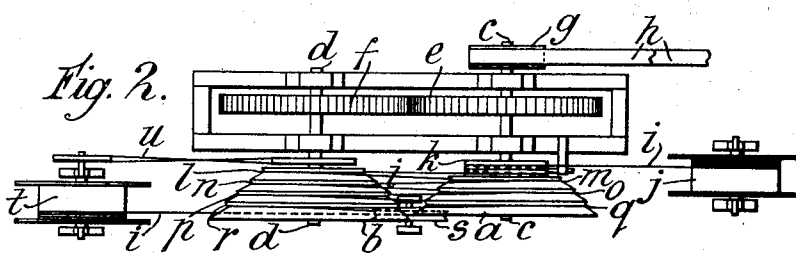
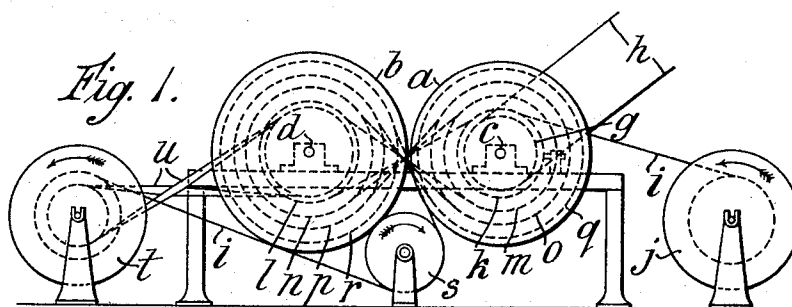
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W. S. SMITH ET AL

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MANUFACTURE OF TELEGRAPH AND TELEPHONE CABLES

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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF TELEGRAPH AND TELEPHONE CABLES.

Application filed January 2, 1925, Serial No. 293, and in Great Britain May 6, 1924.

This invention relates to the manufacture of telegraph and telephone cables of the type in which a conductor is surrounded by a spiral of wire or strip of magnetic material.

In order to obtain the highest possible permeability in the magnetic material it has been found advantageous to anneal it after it has been wound on the conductor.

In order that this annealing may be fully effective, it is necessary that the winding be very loose, as otherwise the shrinkage of the material due to annealing sets up strains which are detrimental to its permeability.

According to this invention we subject the conductor and the loading material, which has been laid around it in the usual way, that is, with a reasonable tension, to a special treatment by which the loading wire or strip is loosened before the annealing process, so that the shrinkage of the wire or strip due to annealing may not induce in it harmful strains.

We loosen the wire or strip by stretching the conductor so as to make it smaller in cross section than it was when the wire or strip was laid upon it.

The conductor may be stretched by passing it over a pair of cones which are mounted on parallel axes so that they can be rotated in opposite directions and which are provided with a number of circular grooves. The conductor surrounded by the loading material is passed partly around a groove of one cone, next round a groove of slightly larger diameter on the other cone, thence round a groove of still larger diameter on the first cone, and so on, until it is finally wound off.

Alternatively the grooves on one cone are all larger in diameter than the corresponding grooves on the other cone and it will be understood that each time that the conductor is passed from one groove to another of larger diameter it will be stretched by an amount depending on the difference in the diameters of the two grooves and thus any desired elongation may be obtained and therefore a corresponding decrease in diameter of the conductor and a corresponding slackening of the magnetic wire or strip.

The accompanying drawing illustrates apparatus suitable for use in carrying out the invention. Figure 1 is an elevation and Figure 2 a plan of an apparatus in which the conductor is stretched.

Figure 3 is a cross section of the cable when first loaded.

Figure 4 is a similar section after the cable has been stretched and the loading material is loosened.

Figure 5 is a view after the annealing when the loading material substantially contacts with the conductor due to its shrinkage.

a and *b* are two cones mounted on parallel shafts *c* and *d* on which are intermeshing gears *e* and *f*. On the shaft *c* is a pulley *g* running round which is a driving belt *h*. When the pulley *g* and shaft *c* are turned the gear *e* also turns causing the gear *f* to turn the shaft *d* in an opposite direction. The conductor *i* surrounded by the loading material passes from a reel *j* upon which it has been wound, round a cylindrical part *k* fixed to the end of the cone *a*, thence partially round a groove *l* on the cone *b* of larger diameter than the cylindrical part *k*, thence to a groove *m* on the cone *a* of larger diameter than the groove *l*, thence partially round another groove *n* of larger diameter than groove *m*, then partially round a groove *o* of larger diameter than groove *n*, thence partially round another groove *p* of larger diameter than the groove *o* and thence partially round another groove *q* of larger diameter than the groove *p*, and finally round a groove *r* of larger diameter than the groove *q* when it passes to a pulley *s* and thence to a reel *t*, upon which it is wound, the reel *t* being frictionally driven by means of a slipping belt *u* from the shaft *d*. It will be understood that each time the conductor *i* passes from the cylindrical part *k* or one of the grooves on the other cone it will be stretched an amount depending on the difference in the diameters of the two grooves.

By reference to Figures 3, 4 and 5, it will be noticed that when the conductor *i* is first wound with the loading strip *l* that the two are in close contact. If the conductor were then subjected to the annealing operation the shrinkage of the loading strip would set up objectionable strains. The conductor is then subjected to the stretching operation after which a cross section will have such an appearance as shown in Figure 4 in which the conductor *i* has been reduced in size and therefore is slightly separated from the loading strip *l*. The conductor is then annealed and the loading strip shrinks

until it substantially contacts with the conductor *i* as shown in Figure 5 which is substantially the same as the showing of Figure 3 except that the diameter of the conductor and cable is less.

What we claim is:—

1. A process for the manufacture of telegraph and telephone conductors which comprises first laying the loading material around the conductor, then stretching the conductor, and finally annealing the loaded conductor.

2. A process for the manufacture of telegraph and telephone conductors which comprises first laying the loading material around the conductor, then stretching the conductor by passing the cable around curves of increasing diameters in parallel cones, and finally annealing the loaded conductor.

In testimony that we claim the foregoing as our invention we have signed our names this 11th day of December 1924.

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