

(No Model.)

L. W. DOWNES.

APPARATUS FOR INSULATING ELECTRICAL CONDUCTORS.

No. 544,847.

Patented Aug. 20, 1895.

Fig. 2.

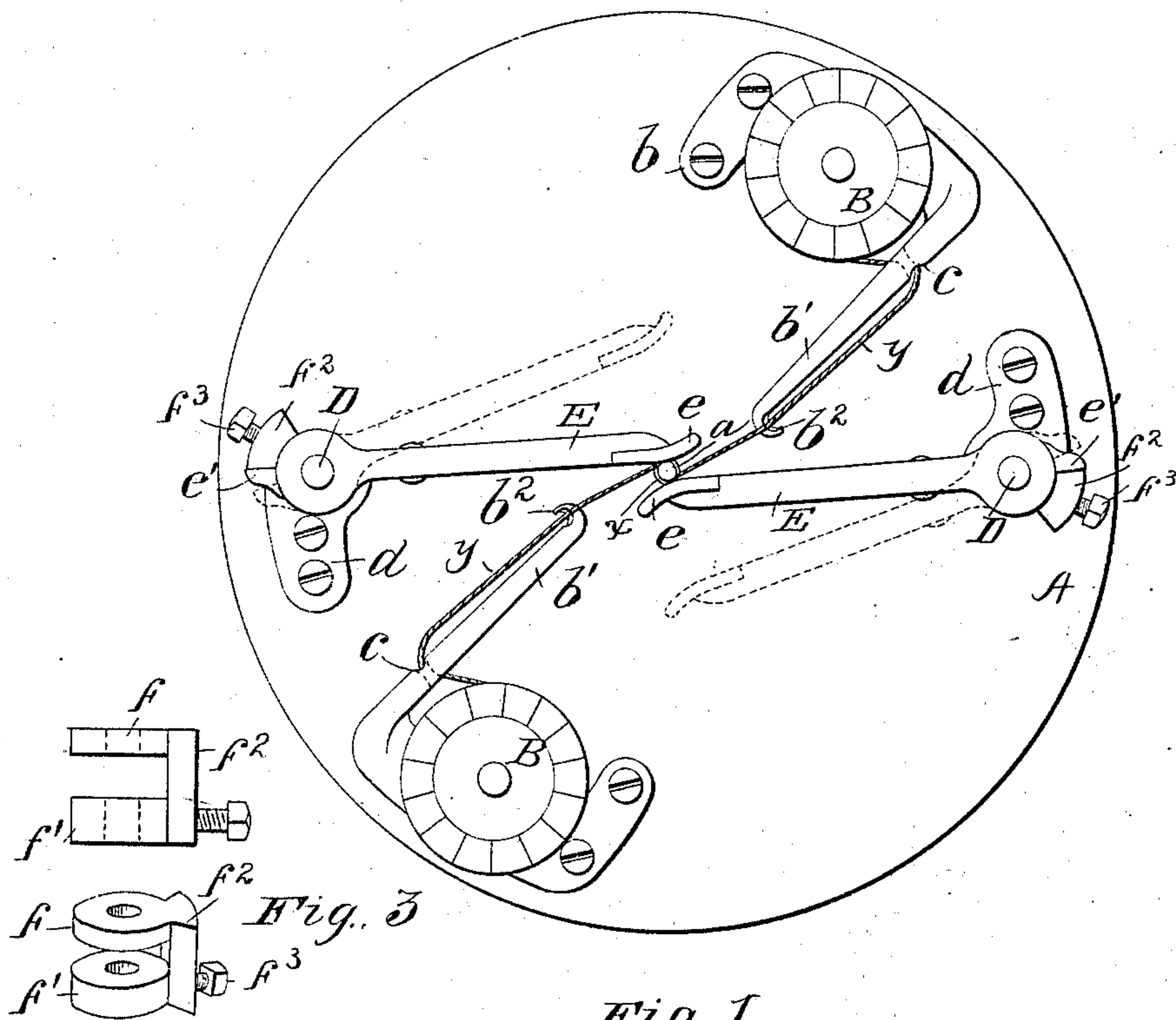
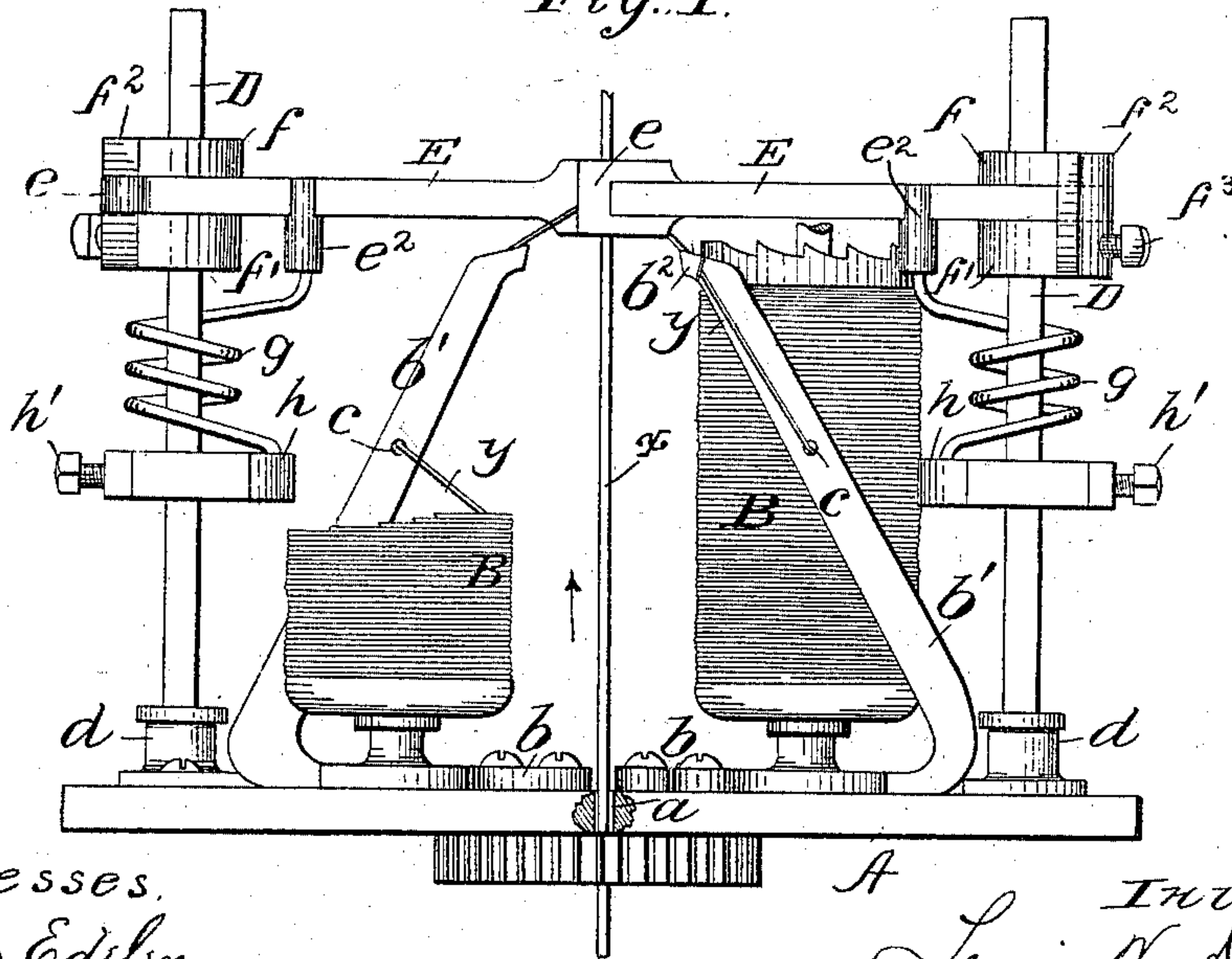


Fig. 1.



Witnesses.
W. Ras Edlin.
Geo. Lewis.

Inventor.
Louis W. Downes.
by J. J. Mauro,
his attorneys.

UNITED STATES PATENT OFFICE.

LOUIS W. DOWNES, OF PROVIDENCE, RHODE ISLAND.

APPARATUS FOR INSULATING ELECTRICAL CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 544,847, dated August 20, 1895.

Application filed April 6, 1895. Serial No. 544,815. (No model.)

To all whom it may concern:

Be it known that I, LOUIS W. DOWNES, of Providence, Rhode Island, have invented a new and useful Improvement in Apparatus for Insulating Electrical Conductors, which improvement is fully set forth in the following specification.

This invention has reference to improvements in apparatus for the manufacture of insulated electrical conductors, particularly such as are described and claimed in my Patent No. 534,785, dated February 26, 1895, wherein the insulation consists of an asbestos covering applied to the wire. One of the steps in the formation of an insulated conductor of the kind described in said patent is the coiling or winding of the asbestos-yarn upon the wire (previously coated, if desirable, with an adhesive substance, such as some form of gum,) in such manner that the coils of the yarn are laid closely together and as tightly as possible. From the coiling apparatus the wire passes to the finishing devices, quite a length of the thoroughly-coated wire intervening between the coiling mechanism and the first of such apparatus—the combing or brushing apparatus, as shown in my patent. Under such conditions, particularly when a coarse asbestos yarn is applied to the wire, difficulty has been experienced in reducing the covering by the succeeding operations of combing, pressing, &c., to the extreme thinness of insulation necessary or desirable. This is due to the inability to compact and spread the yarn upon the conductor to any considerable extent, owing to the resistance thereto offered by the adjacent or contiguous coils of yarn. The only way, therefore, to reduce the thickness of the covering is to remove the fiber, which cannot be effectively accomplished to any considerable extent without marring the covering. According to my present invention I overcome these difficulties and am enabled still further to reduce the thinness of insulation by applying pressure to the strand of yarn immediately upon its being laid upon the wire, or so soon thereafter that the adjacent or contiguous coils are not wound in sufficient number or tightness to resist the compacting and spreading out of the yarn upon the application of pressure.

In order that the yarn may remain in the

flattened condition produced by the preliminary pressure above referred to, I have found it very advantageous to moisten the yarn just before it is wrapped upon the wire, employing for this purpose a steam jet or other suitable means. When the yarn is so moistened, it is preferable to employ glue-size as the adhesive substance with which the wire is previously coated.

The apparatus for effecting the steps above referred to will be more fully understood by reference to the accompanying drawings, wherein—

Figure 1 is a front elevation of such an apparatus. Fig. 2 is a top plan view thereof, and Fig. 3 is a view showing some details.

In an organized machine such as illustrated in Figs. 1 and 2 of my patent hereinbefore referred to the apparatus about to be described would be so mounted as to operate in advance of the brushing or combing device.

Referring to the drawings, A represents a rotatable disk, driven from any suitable source of power, having an opening *a* at the center thereof, through which the wire *x* is fed in the direction of the arrow, Fig. 1.

The coiling mechanism for applying the yarn to the wire as well as the pressure-applying means are mounted on one side of the disk A. The coiling mechanism comprises two bobbins B B, each mounted upon a plate *b b*, said plates being secured to the face of the disk diametrically opposite each other. Formed integral with each of the base-plates *b* is an arm *b'*, projecting in an oblique direction toward an imaginary perpendicular from the center of the disk A, so as to bring the extremity thereof into proximity with the wire passing through the center of the disk. At its end each of said arms *b'* is formed with a hook *b²*, in which the yarn lies as it is fed to the wire, being first passed through an opening *c* in said arms.

For applying the desired pressure I employ the following mechanism: Two upright rods D D are set in base-plates *d d*, which are diametrically disposed upon and secured to the face of disk A, so that said rods project perpendicularly from the latter. Slidingly fulcrumed at one end upon each of the rods D D is a pressure-lever E, carrying at its free

end a contact-plate *e*, which bears against the yarn as it is coiled upon the wire. The levers *E E* are fulcrumed upon the rods *D D* between plates *f f'*, sleeved upon each of said rods and joined together by a bridge-piece *f²* extending across the end of the lever. A set-bolt *f³* serves to adjustably secure these parts upon the rods *D D*. Upon each of the levers *E E* is a projection or tooth *e' e'*, adapted to make contact with the bridge-piece *f²* to limit the movement of the levers, so that in case of a variance between the pressure exerted upon the levers, owing to one of the springs being set at greater tension than the other, they will not be permitted to move a distance sufficient to throw the wire out of center; also, by proper adjustment the bridge-piece *f²* can be brought to such a position as to retain the levers *E E* in the position shown in dotted lines, Fig. 1, when access to the conductor is desirable, upon occasions such as the breaking of the yarn, &c. The coiled springs *g g* respectively encircle the rods *D D*, being each secured at one end to a block *h*, adjustable on rods *D* by set-bolts *h'*, and at the other end in a bushing *e²* on the lever *E*. The tension of the springs may be regulated by suitable adjustment of the blocks *h h*.

It will be observed that the devices just above explained are adjustable along the rods *D D*, so that the pressure-levers can be so adjusted relatively to the arms *b' b'* as to conform with requirements in case of change in the speed at which the wire is fed, or a variance in the angle of inclination of the coils on the wire, &c.

The preliminary moistening or dampening of the yarn may be effected by immersing the bobbins (upon which it is wound) in water or by subjecting the same to a steam-bath previously to placing them upon the coiling apparatus.

It will be observed that the relative location and arrangement of the arms *b' b'* and the pressure-levers *E E* is such that the contact-plates *e e* press against the strand of yarn *y* at or close to the point where it first makes contact with the wire as it is laid thereupon, for reasons hereinbefore explained. The contact-plates *e e* exert their pressure in diametrically-opposite directions to equalize the effect produced thereby.

From the foregoing description it will be understood that as the wire, previously coated when desirable with a quick-drying adhesive material—such as some form of gum, or preferably glue-size when the yarn is moistened previously to its application to the conductor—is fed through the disk *A* in the direction of the arrow, Fig. 1, the strands *y y* of yarn from the bobbins *B B* are coiled thereon through the rotation of the disk *A*; and, further, that as the yarn is laid upon the wire, the pressure (which may be regulated by adjustment of the tension of springs *g g*, as before

explained) of levers *E E* thereupon has the effect of flattening or spreading the same upon the wire, thereby reducing its thickness.

Although reference is made herein to the application of asbestos to a wire as an insulating medium, the present invention also appertains, with equally advantageous results, to the employment of any other suitable insulating material. It also embraces analogous uses for which the improvements herein described may be employed.

What I claim is—

1. In an apparatus for applying a fibrous covering to a central core, the combination of a rotatable disk or support perforated for the passage of said core, coiling fingers carried by said support for applying the covering strands to said core, a pair of pressure levers, separately fulcrumed on said disk to swing in opposite directions transversely to the axis of said core, and springs pressing the free ends of said levers toward each other to press the fibrous covering between them, substantially as described.

2. In an apparatus for applying a fibrous covering to a central core, the combination of a rotatable disk or support perforated for the passage of said core, coiling fingers carried by said support for applying the covering strands to said core, a pair of pressure levers, separately fulcrumed on said disk to swing in opposite directions transversely to the axis of said core, springs pressing the free ends of said levers toward each other to press the fibrous covering between them, and means for varying the pressure of said springs, substantially as described.

3. In an apparatus for applying a fibrous covering to a central core, the combination of a rotatable disk or support, perforated for the passage of said core, coiling fingers carried by said support for applying the covering strands to said core, a pair of pressure levers each fulcrumed on a rod perpendicular to said support, means for adjusting said levers lengthwise of said rods, and springs pressing the free ends of said levers toward each other to press the fibrous covering between them, substantially as described.

4. In an apparatus for the purpose specified the combination with means for wrapping or coiling the fiber upon the conductor, of spring actuated levers for compacting or flattening out the fiber, pressing upon the latter in diametrically opposite directions and means for preventing the movement of said levers past the axis of the conductor, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

LOUIS W. DOWNES.

Witnesses:

GILMAN E. JOPP,
THOS. A. MILLETT.