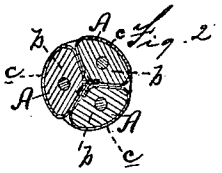
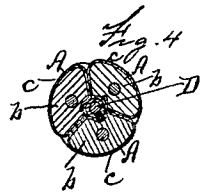
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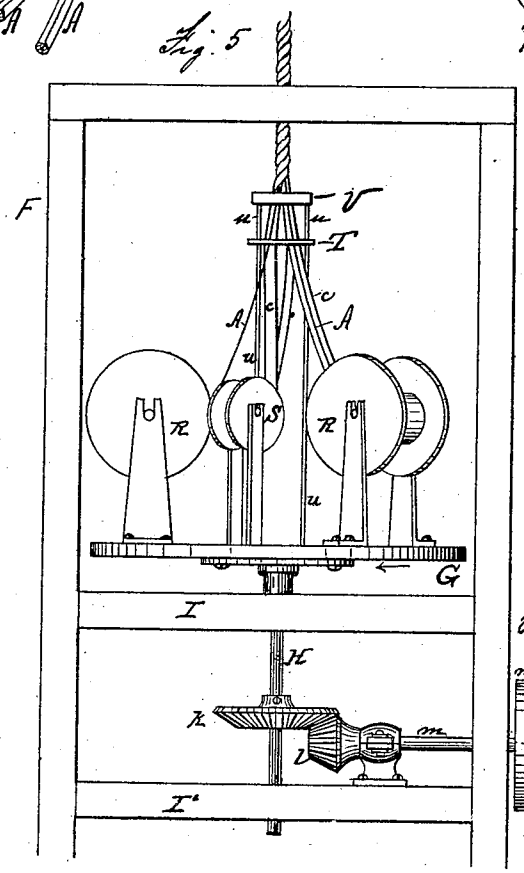
W. H. SAWYER.

MACHINE FOR THE MANUFACTURE OF ELECTRIC CABLES.

No. 267,597. Patented Nov. 14, 1882.







Witnesses—
W. B. Hale
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6

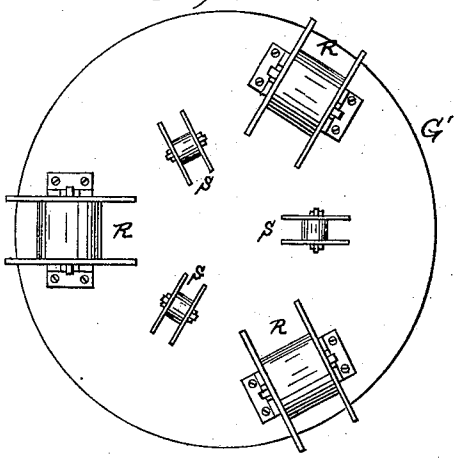


Fig. 7.

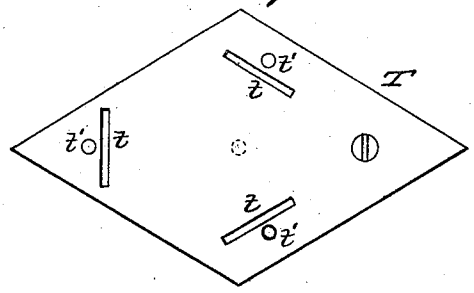


Fig. 10.

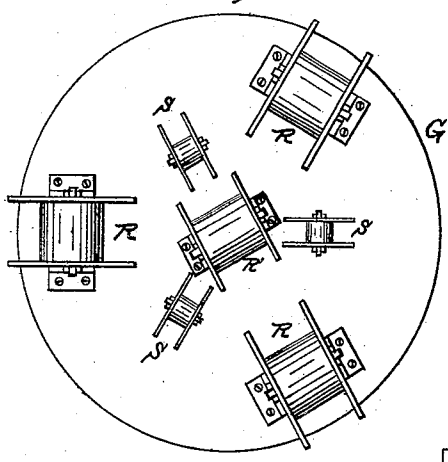


Fig. 8.

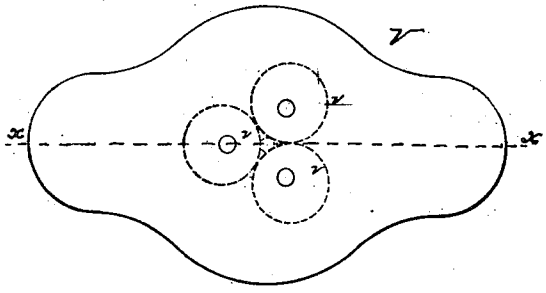
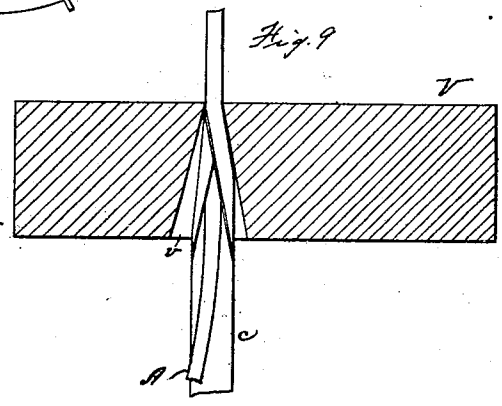


Fig. 9



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UNITED STATES PATENT OFFICE.

WILLIAM H. SAWYER, OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR THE MANUFACTURE OF ELECTRIC CABLES.

SPECIFICATION forming part of Letters Patent No. 267,597, dated November 14, 1882.

Application filed February 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SAWYER, a citizen of Providence, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for the Manufacture of Electric Cables; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a machine for the manufacture of an improved electrical cable composed of several insulated conducting-wires, each of which is provided with a metallic sheath for protecting it from the inductive influence of the other wires.

The improved cable which my machine is intended to produce I intend to make the subject of a separate application for patent; but a description of it here is necessary to the full understanding of my improved machine. The cable consists of an assemblage of insulated wires, each of which is provided with a longitudinal wrapper or sheath formed of a strip of pliable sheet metal folded around the wire and having its edges lapped on one side thereof, said wires being twisted together, with the lap-joints of their metallic coverings on their inner surfaces and concealed from view.

Instead of covering all the wires with separate metallic sheaths before twisting them together, I may leave one of said wires without a metallic sheath and give it a central position with respect to the others, which I twist around it, so that the sheathings of all the other wires come in contact with the central wire, and thus give it a complete metallic covering, which has the effect of preventing induction between the central and outer wires.

My improved machine consists in a novel combination of devices for placing the metallic sheaths upon the wires and twisting said wires together into a cable, so that the joints of the sheaths of the respective wires will all be turned inwardly, or toward the center of the cable, as will be hereinafter more particularly described.

In the accompanying drawings, Figure 1 is a view of a portion of my improved cable having three wires. Fig. 2 is a cross-section of the same enlarged. Fig. 3 is a view of a modified form of the cable having a central wire. Fig. 4 is a cross-section of the same. Fig. 5 is a side elevation of my improved cable-making machine. Fig. 6 is a plan view of the revolving platform carrying the reels. Fig. 7 is a top view of the guide-plate for the wires and metal strips. Fig. 8 is a top view of the folding-plate. Fig. 9 is a section of the said plate on the line *x x*, Fig. 8. Fig. 10 is a top view of a revolving platform having an additional reel for a central wire.

Referring to Figs. 1 and 2, the metal-covered insulated wires of the cable are indicated by the letters A A A. The letters *b b b* indicate the insulation of the wires proper, and *c c c* the metallic sheathing, composed of thin strips of sheet metal, preferably tin-foil, one of which is folded longitudinally around each wire, outside of its insulating-covering, and the edges of its strip meet in a joint along one side of the wire. When the wires are twisted together the joints of the respective strips are turned inwardly, or toward the center of the cable, which is composed of the twisted wires. The number of wires may be increased as desired.

Referring to Fig. 3, which illustrates a modified form of the cable, the letter D indicates a central wire, which is not provided with a separate metallic sheath, but is so surrounded by the sheathed wires A that induction between it and said wires is prevented. In this form of cable, as well as in that shown in Figs. 1 and 2, the joints of the sheathings of the outer wires are turned inwardly, so that the coiling of the wires will brace them against rupture, and they will be shielded from disarrangement by the contact of the cable with outside objects.

Referring to Fig. 5, which is a side elevation of the machine for manufacturing my improved cable, the letter F indicates the frame-work, and G is a revolving platform mounted upon the top of a vertical shaft, H, which has its upper bearing in a cross-beam, I, and its lower bearing in a cross-beam, I′. Between its upper and lower bearings this shaft carries a

bevel-gear wheel, *k*, which meshes with a bevel-pinion, *l*, upon the end of a shaft, *m*, journaled in suitable bearings and provided with the fast and loose pulleys *n* and *n'*.

Upon the upper surface of the horizontal revolving platform G are mounted three reels, R R R, which are for carrying the wires, which are to be covered with sheet metal and twisted into a cable. Upon said platform are also mounted the reels S S S, for carrying the metallic strips which are to be folded upon the wires.

Immediately above the reels R and S, and concentrically with respect to their relative positions, is arranged a guide-plate, T, supported by standards *u*, the lower ends of which are screwed to the platform. This guide-plate is provided with three slits, *t t t*, (see Fig. 7,) at equal distances apart and facing a common center, these slits being guides for the metallic strips, and outside of these slits guide-passages *t' t' t'* are formed for the wires.

At a little distance above the guide-plate T is arranged the folding-plate V, supported by extensions of the same standards *u*. The center of the folding-plate is in line with the center of the guide-plate, and about this center are formed three downwardly-flaring or conical passages, *v*, at equal distances apart and from the center of the plate. The upper ends of these passages are slightly inclined toward the center, about which they are arranged, so that the outer portions of the walls of the passages have a somewhat greater inclination than the inner portions, in order that they may easily guide the wires and strips together for twisting as they approach each other in inclined directions from the reels.

A reel may be arranged in any convenient location to take up the cable as made, the cable being passed to such a reel over guide-rollers or pulleys in the usual manner, requiring no particular description, and the speed of the take-up reel being regulated by any suitable means to give the twist of the cable the desired pitch.

The upper ends of the flaring passages *v* in the folding-plate are of such diameter as to permit the wires to pass freely through, with the metal strips folded around them, and said plate may be replaced by others having passages of proper size for any size of wires and strips that are to be used. The machine may be constructed for a cable of any number of wires.

In using the machine as now described the reels R R R, filled with the wires to be covered, are placed upon their supporting-standards and the wires led up therefrom separately through the guide-apertures *t'* in the guide-plate T. When one of the wires is passed through its guide-aperture the end of a metallic strip from the reel S to the right of it is passed up through the guide-slit *t* in front of the wire. The strip is then folded neatly around the wire, and the wire and strip are thus passed up through the nearest flaring passage in the folding-plate. After all the wires and strips are thus passed through the folding-plate the partially-sheathed wires are drawn up far enough to enable them to be twisted together, this twisting being performed by hand, and care being taken that the joints of the sheathing-strips are all turned inwardly or toward the center of the cable. The end of the cable, as thus twisted by hand, is then made fast to a take-up reel (not shown in the drawings) and the driving-belt of the machine shifted from the loose to the fast pulley on the driving-shaft *m*. The machine is thus put in operation, the platform G revolving in the direction of the arrow marked thereon, and the take-up reel should be put in motion at the same time to wind up the cable. The wires and foil strips pass from the reels R and S through the guide and folding plates, the conical passages in the folding-plate causing the metal strips to be folded snugly around the wires with their joints outward; but as the platform turns the wires are twisted together after leaving the folding-plate, and so turned in the act of twisting that the coils are all laid snugly together, with the joints of their sheathing-strips turned inwardly and thus concealed.

When a central wire is to be used, as hereinbefore described, the revolving platform G is provided with a central reel, R', as shown in Fig. 10, and the guide-plate T and folding-plate V are provided with central guide-apertures, as shown at t^2 and v' in Figs. 7 and 8, respectively. The central wire is drawn through these guide-apertures from its reel, and the outer sheathed wires are coiled around the central wire, with the joints of their sheathing-strips inward.

I am aware that in machines for manufacturing electric cables a revolving frame fixed upon a hollow shaft has been provided with spools or reels mounted on spindles and arranged to deliver wires which are wound spirally around the cable as it passes through said hollow shaft, and I do not claim such a device; nor do I claim broadly a series of reels arranged to deliver wires to guides, and devices for sheathing said wires and forming them into a cable, as such a combination of devices was known prior to my invention; nor do I claim the combination of reels for delivering a wire and metal strip with a guide or guides for folding the strip around the wire, such combination being old and well known.

Having now fully described my invention, what I claim is—

1. The combination of the platform provided with reels, as described, the guide-plates having perforations for wires and passages for metallic strips, the folding-plate having passages for the wires and strips, and means for revolving said platform, and the guide and folding plates, substantially as described.

2. The combination of the platform G and

means for revolving the same, the reels R and S, mounted on said platform, guide-plate T, provided with slits *t* and apertures *t'*, and the folding-plate V, provided with the flaring folding-passages *v*, said guide and folding plates being connected to and adapted to revolve with the platform, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. SAWYER.

Witnesses:
GILMAN E. JOPP,
THOMAS A. LAKE.