W. H. TAYLOR.

WIRE COVERING MACHINE.

APPLICATION FILED NOV. 2, 1907.

909,709.

Patented Jan. 12, 1909.

3 SHEETS—SHEET 1.

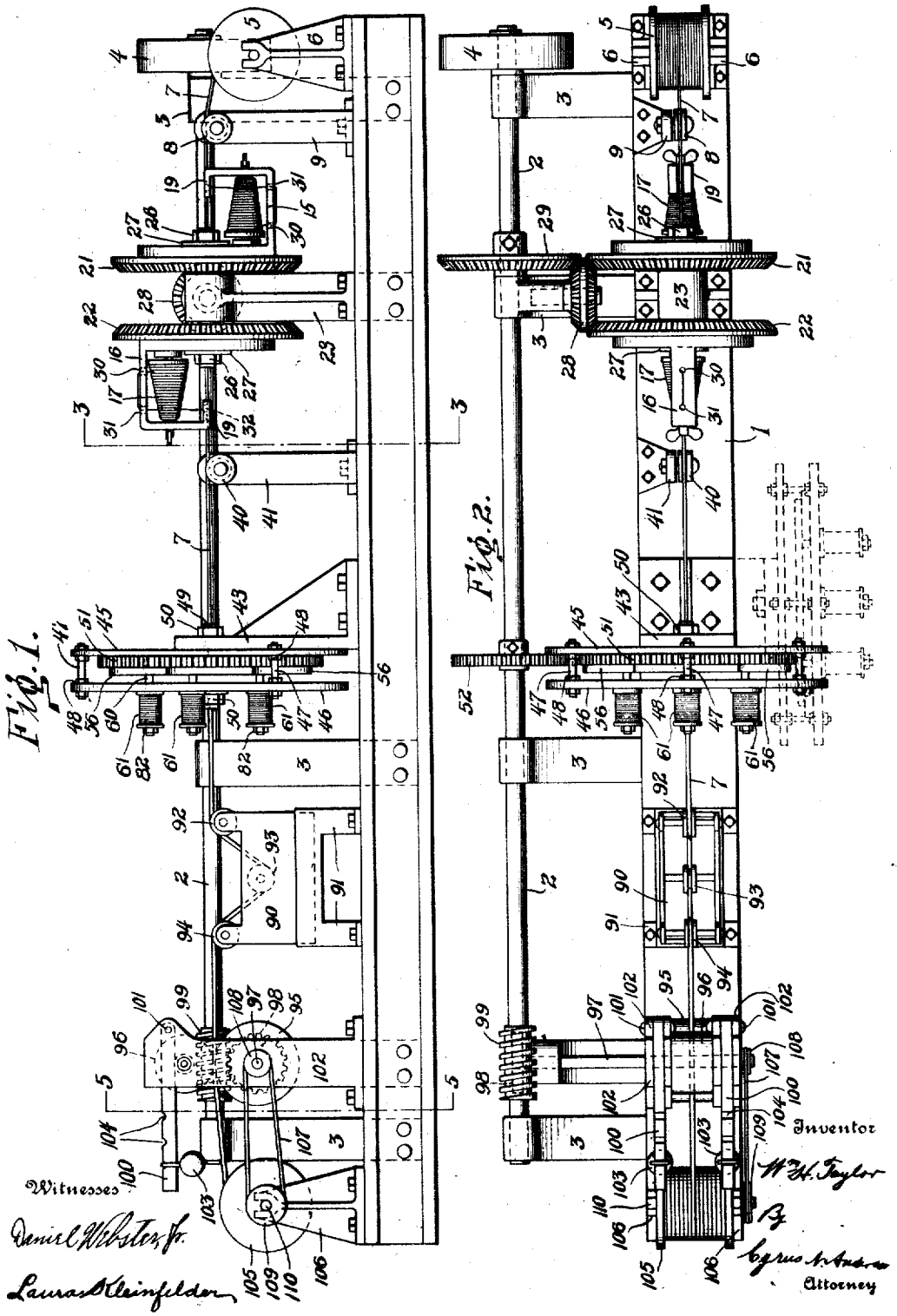


Fig. 1.

Fig. 2.

Witnesses

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3 SHEETS—SHEET 2.

Fig. 5.

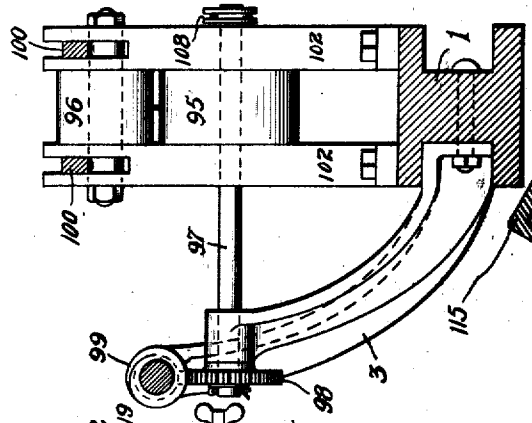


Fig. 12.

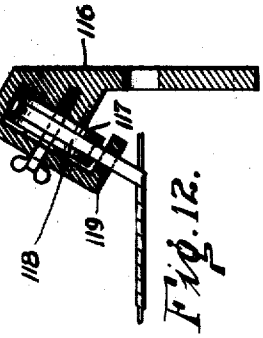


Fig. 4.

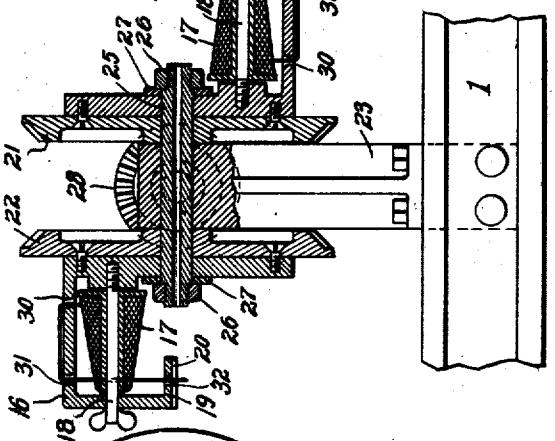
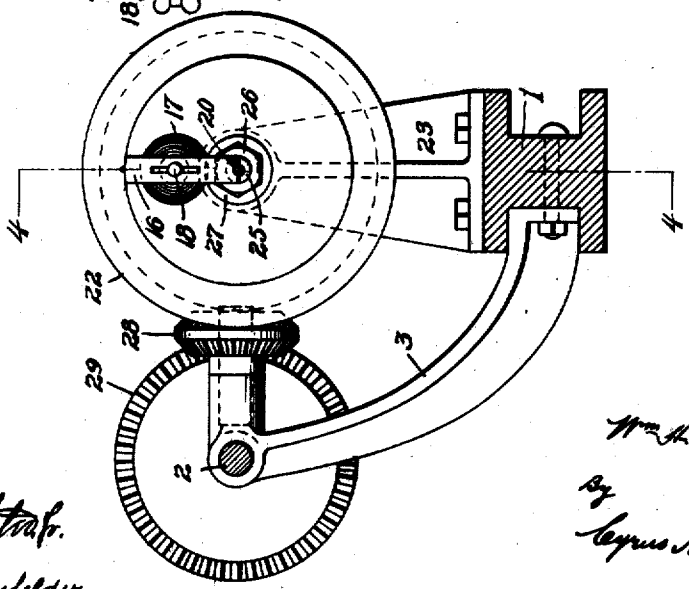


Fig. 3.



Witnesses

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3 SHEETS—SHEET 3.

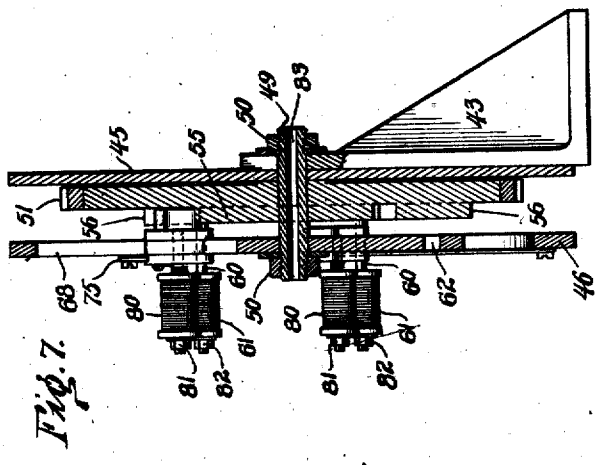


Fig. 7.

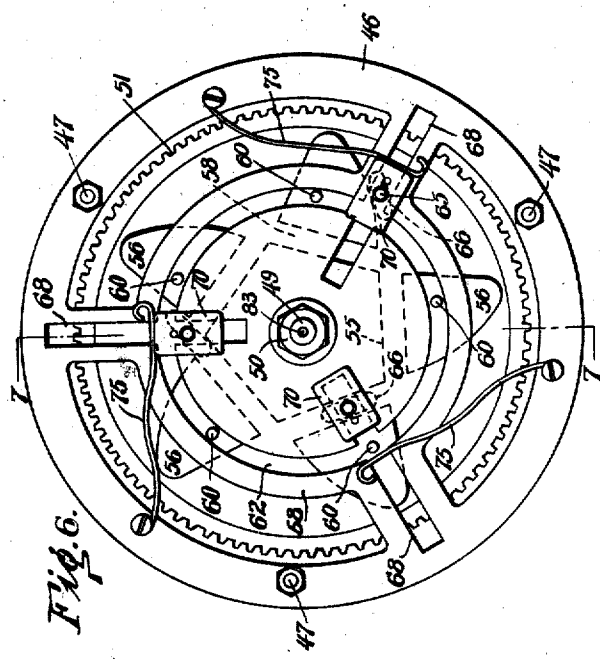


Fig. 6.

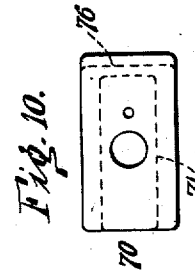


Fig. 10.



Fig. 11

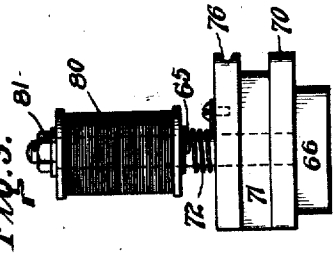


Fig. 9.

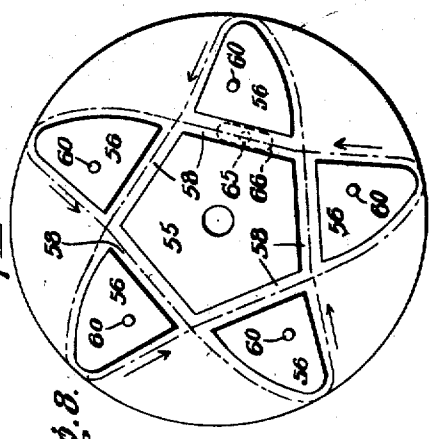


Fig. 8.

Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM HENRY TAYLOR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO HENRY BAUER AND ONE-THIRD TO GEORGE B. DREIZLER, BOTH OF PHILADELPHIA, PENNSYLVANIA.

WIRE-COVERING MACHINE.

No. 909,709. Specification of Letters Patent. Patented Jan. 12, 1909.

Application filed November 2, 1907. Serial No. 400,421.

To all whom it may concern:

Be it known that I, WILLIAM HENRY TAYLOR, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Wire-Covering Machines, of which the following is a specification.

My invention relates to an improvement in wire covering machines, and it has for its object to provide a machine in which a double or two-ply cover may be applied to a wire or bundle of wires simultaneously.

A further object is to wrap or twist the said separate coverings about the wire in opposite directions.

Another object of my invention is to provide means which may be associated with the means for applying a double or two-ply cover to a wire for the purpose of applying by weaving or otherwise an additional covering to the said wire or to a number of said wires brought or directed together within the region of the said means for applying by weaving or otherwise the third-mentioned cover.

The machine is also provided with means for applying a paste or asphaltum, or any suitable non-conducting material, to the covered wires.

My invention resides in the details of construction, and in the combination and arrangement of parts as hereinafter described in detail, and as specifically set forth in the claims, but it will be understood that changes in the details of construction may be made within the scope of the claims without departing from my invention.

In order that my invention may be more readily and clearly understood, reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevation of a wire covering machine embodying my invention; Fig. 2 is a top plan view of the same; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is a part section and part side elevation on the line 4—4 of Fig. 3; Fig. 5 is a section on the line 5—5 of Fig. 1; Fig. 6 is a view of the mechanism for applying by weaving or otherwise a covering to a wire or group of wires; Fig. 7 is a section on the line 7—7 of Fig. 6; Fig. 8 is a detail view of the cam wheel forming a part of the mechanism shown in Fig. 6; Fig. 9 is a side elevation of a bobbin and its supporting and operating mechanism; Fig. 10 is a plan view of the slide associated with certain of the bobbins; Fig. 11 is an end view of a cam engaging bobbin support; and Fig. 12 is a view of a modified construction of bobbin carrier adapted particularly for use in applying a covering of paper or similar material.

Referring to the drawings,—1 designates a base or support for the mechanism of my wire covering machine.

2 designates a driving shaft supported by means of brackets 3 bolted to the base or support 1. The driving shaft is provided with a driving or power wheel 4. The wire to be covered is wound upon a drum 5, which is revolubly supported upon the upright 6 connected to the base support 1. The wire 7 extends and is guided over a roll 8 located at the upper end of an upright 9 upon the base 1. The wire then passes through the region of the wire covering mechanism consisting of the revoluble bobbin carriers 15 and 16. These bobbin carriers are located out of alinement and are adapted to carry bobbins 17, which are supported upon rods 18, which pass through and are connected to portions of the bobbin carriers.

In the construction shown, each of the bobbin carriers consists of a yoke-shaped device between the legs of which the bobbins are supported. One of the sides of each of the yokes is bent inwardly, as indicated at 19, and the inwardly extended portion is provided with a groove or depression 20. These grooves or depressions in the two bobbin carriers are in horizontal alinement and the wire to be covered rests therein and passes therethrough, the bobbins being revolved about the said wire, preferably as an axis of revolution. The other side of the yoke-shaped bobbin carrier 15 is connected to a beveled gear 21, while the other side of the bobbin carrier 16 is connected to the beveled gear 22. These beveled gears are revolubly supported upon the upper end of the upright post or standard 23, which is removably secured to the base 1. In the construction shown, the gears 21 and 22 and their associated bobbin carriers are secured removably upon the opposite ends of a rod 25 passing through the upper end of the post 23, the said gears and bobbin carriers being held thereon by means of nuts and washers 26 and 27. The said beveled gears 21 and 22,

and the parts associated therewith, may, however, be secured to the upper end of the post 23 in any other suitable and desired manner. The beveled gears 21 and 22 are driven in opposite directions by means of the double beveled pinion 28, which in turn is driven by the driving beveled gear 29 secured to the shaft 2.

The bottom portion of each of the yoke-shaped bobbin carriers 15 and 16 is provided with holes 30 and 31 and the portion of the said bobbin carriers at 19 is also provided with a hole 32. The thread from the respective bobbins in the said carriers is carried through the respective holes 30, 31 and 32 and is then secured or connected to the wire 7 which is to be covered. The wire to be covered passes through a hole through the rod 25 upon which the gears 21 and 22 and their associated parts are revolubly supported. If the said gears 21 and 22 and their associated parts are supported in some other manner thought desirable, the perforation will be provided at a point preferably coincident with the axis of revolution of the said members including the bobbin carriers, so that the wire to be covered will be located coincident with the axis of revolution.

It will be seen that by the mechanism described, the threads of the bobbins 17 are wound simultaneously in opposite directions upon the wire 7 as it is fed through the machine so as to completely cover the same. After the wire has been covered by the mechanism described, it may pass over a roller 40 supported upon a post or standard 41 and thence through the mechanism for weaving or otherwise applying a third cover to the said wire. The mechanism for this purpose is supported upon a removable or detachable upright support 43, and if desired the mechanism itself may be detachably secured to the upright 43.

45 designates a plate or similar member which is secured to a slotted frame plate or similar member 46, by means of bolts 47. These bolts extend through the plate and are provided with nuts upon their opposite ends upon the outside of the respective members 45 and 46. The plates or similar members 45 and 46 are separated or spaced apart by means of nuts 48 located upon the said bolts 47 intermediate the said plates. The plates or equivalent members 45 and 46 are stationarily secured to and supported upon the rod 49, which is secured to the upper end of the post or standard 43. The plates or members 45 and 46 and the said post or standard 43 are clamped together by means of nuts 50 which have screw-threaded engagement with the opposite ends of the rod 49.

51 designates a cam wheel revolubly mounted upon the rod 49, which wheel is provided with gear teeth, and is driven by means of a gear 52 on the driving shaft 2. The cam upon the wheel 51 in general outline is the shape of a star, as most clearly indicated in Figs. 6 and 8 of the drawings.

In the construction shown, the cam is formed by providing a central raised portion 55 upon the said wheel of polygonal outline and the raised portions 56, which are located opposite the respective sides of the polygon 55. The portions 56 are of triangular shape and, taken as a whole, it will be seen that the contour of the combined portions 55 and 56 is substantially that of a star. The portions 56 are separated from the sides of the polygon 55 so as to form passageways 58.

Secured within the region of the triangular portions 56 upon the wheel 51 are spindles 60, which are adapted to support bobbins 61 provided with thread or other suitable material, with which it is desired to cover the wire. These spindles project through a circular groove 62 in the plate or member 46.

65 designates a bobbin spindle having an oblong or other shaped head 66 which is adapted to travel through the passageways 58 and upon the outside of alternate portions 56. The spindles 65 project through radial slots 68 in the plate or member 46, as indicated particularly in Fig. 6 of the drawings.

70 designates slides mounted respectively upon the spindles 65 so as to have pivotal movement in relation thereto. Each of the said slides 70 is provided with a groove 71 and the said slides are adapted to be fitted in the slots 68, the edges of the said slots projecting into the groove 71 upon the opposite sides of the slides 70. By this construction, it will be seen that the slides 70 and the spindles 65 are movable longitudinally of the slots 68 and radially of the axis of revolution of the wheel 51.

In the construction, the polygon or central portion of the cam is five-sided, so that there are five of the portions 56 and five revoluble bobbin spindles 60. There are three of the radially reciprocating bobbin spindles 65. The proportion of the number of the sides of the polygon or central portion of the cam and of the spindles 60 to the number of spindles 65, however, may be changed. For instance, the proportion may be changed five to three to seven to five and so on.

72 designates wire springs coiled about the spindles 65 and connected respectively to the said spindles and to the said slides 70. The purpose of the said springs is to hold the heads 66 in proper relation to the cam acting portions 55 and 56, so as to direct them along the proper path in relation to the cam. Although in the construction shown, the cam acting surfaces are produced

by providing the raised portions 55 and 56 upon the cam wheel 51, it will be understood that exactly the same effect may be produced by providing grooves in the body of the said wheel 51, the said grooves being arranged to direct the head 66 along the same relative path, as indicated by dotted lines in Fig. 8.

It will be observed upon reference to Fig. 8 that the head 66 travels alternatively over and under the portions 56 and the bobbin spindles and bobbins carried thereby, and that it travels the same path or road with respect to the cam on alternate revolutions of the cam wheel 51. It will be seen that rotation of the cam wheel, therefore, occasions a movement of reciprocation of each of the heads 66, their connected spindles 65 and the slides 70 carried thereon, in the slots 68 in the plate or similar frame member 46.

The spindles 60 carried by the cam wheel 51 travel in a circle and by reason of the fact that the portions 56 pass alternately over and under the spindles 65 and the parts connected thereto and supported thereon, the spindles 60 which are located within the regions of the portions 56 will do likewise.

The spindles 65, together with the parts connected thereto and supported thereon, are pressed inwardly by means of springs 75 connected at their outer ends to the plate or member 46, their inner ends resting upon the outer edges or ends of the slides 70. Preferably the said springs 75 rest in grooves 76 upon the outer edges or ends of the said slides. It will be seen, therefore, that as soon as a raised portion, that is, one of the portions 56 of the cam, has passed under a head 66 of a spindle 65, the spring 75 which may be in contact therewith, which is pressing it inwardly, occasions movement thereof along the slot 68 in which it may be located, such movement, however, being controlled by the cam. Each of the spindles 65 is provided with a bobbin 80 which is secured thereon by means of a nut and washer 81. The bobbins 61 may also be secured upon the spindles 60 by means of nuts and washers 82.

The rod 49 is provided with a hole 83 extending longitudinally thereof, which preferably is coincident with the axis of revolution of the cam wheel 51.

When it is desired to cover a wire by the use of this mechanism, the wire is passed through the hole 83 and the threads or covering material upon upon the bobbins 61 and 80 are secured to the said wire, and by reason of the fact that the bobbins 61 pass alternately under and over the bobbins 80 upon the spindle 65, the thread or other covering material is interlocked and woven around the said wire.

This mechanism may be used to place an additional covering upon wire which has been previously covered, for instance, by the covering mechanism, including the bobbins 17, or it may be used to cover wire which has not been previously covered.

After the wire has been covered, as described, preferably it should be drawn through a reservoir of coating paste, the character of which as a conductor or non-conductor of electricity should depend upon the use to which the covered wire is to be put. In the drawings, such a reservoir is shown at 90, supported upon the uprights 91. The wire passes over a roller 92 upon one end of the reservoir, thence under a roller 93 in the body of the reservoir, and thence over the roller 94 at the opposite end of the said reservoir. The wire is drawn through the machine by means of the feeding or drawing rolls 95 and 96. The roll 95 is supported upon a shaft 97 provided at one end with a gear 98, which meshes with a worm gear 99 upon the shaft 2. The positively driven roller 95 being in frictional engagement with the roller 96 occasions rotation of the latter. The roller 96 is held in contact with the roller 97 by the levers 100 pivoted at 101 upon the uprights 102 upon which the rollers 95 and 96 are supported. Pressure of the levers 100 upon the shaft of the roller 96 is occasioned by means of weights 103 supported upon the said levers 100. The amount of this friction is varied by changing the positions of the weights 103 to different notches 104 in the upper edges of the said levers. Any other suitable means may be provided for occasioning pressure between the rolls 95 and 96.

The covered wire is wound upon a drum 105 which in the illustration shown is supported upon an upright 106 upon the post 1. It will be understood, however, that this drum, as well as the other parts of the mechanism of this machine, may be supported in any other suitable manner, which may be found desirable. The drum 105 upon which the covered wire is wound is driven by means of a driving band 107, which passes over a sheave 108 upon the end of the driven shaft 97, the band also passing about a sheave 109 upon the shaft 110 upon which the drum 105 is supported.

In the use of my machine, both the covering mechanisms above described may be employed so that a covering of three thicknesses, that is, a three-ply covering, may be placed upon a wire, or on the other hand, either of the said mechanisms may be used separately and independently of the other. In some classes of work, the third covering is unnecessary and the wires may be used after having been covered by means of either of the mechanisms described. In any case, however, it will usually be found preferable to pass the covered wire through the reservoir 90.

It should be stated here that the term

"wire" as used herein is intended to include either a single wire or a bundle of wires moving and acting as a unit.

Heretofore, so far as I am aware, it has been necessary in order to provide a wire having a plurality of coverings, that is, a two-ply or a three-ply covering, as previously described, to pass the wire through the covering machine a number of times equal to the number of thicknesses with which it may be desired to cover the wire. Usually a different machine has been employed for the application of each ply or covering. Also, so far as I am aware, it has not heretofore been the practice to simultaneously wind the threads in opposite directions upon a wire to form a two-ply covering as is done with the mechanism first above described. By reason of this construction, the wire may be covered much more rapidly and the number of times that the wire must be handled during the process of covering it is very greatly decreased.

In my machine, as illustrated, I provide for the covering of a single wire or single unit of wires, but it is to be understood that a number of mechanisms similar to that shown at the right hand side of Fig. 1 of the drawings may be arranged and supported in a circle or otherwise, and each wire or group of wires covered in a manner exactly similar to that shown in the drawings, and the group of wires afterwards brought together and passed as a unit through the covering mechanisms shown at the center of the machine and including the bobbins 61 and 80, the entire unit group being covered and forming a single cable.

In Fig. 12, I have shown a modified construction of bobbin carrier which is adapted for holding a coil of paper and permitting it to be twisted diagonally around the wire to be covered. The bobbin carrier 115 is supported upon the rotatable wheel or disk 116. The carrier extends at an obtuse angle from the wheel or disk 116 so as to support the bobbin 117 and the coil of paper 118 thereon in a plane at an obtuse angle to the direction of a wire which is passing through the machine to be covered. The strip of paper is carried through a slot 119 in the bobbin carrier and extends to the wire to be covered, making an obtuse angle therewith so that as the bobbin is revolved about the said wire, the paper is wound about the same diagonally so that a compact and neat covering of the wire is effected.

It is to be understood that the bobbins in my machine may be provided with tension springs to prevent too rapid rotation thereof. These springs, however, are common and well known and are not shown in the drawings.

Having thus described my invention, I claim:—

1. In a wire covering machine, means for weaving or otherwise forming a cover upon a wire unit, the said means comprising a revoluble wheel having a cam in one face thereof, the said cam comprising a central polygonal figure and triangular figures adjacent the sides of the said polygonal figure, bobbin carrying means supported upon the said wheel within the region of the said cam, reciprocating means adapted to carry bobbins, the said means having a portion in engagement with the said cam, the said portion traveling alternately over different paths so that each of the said reciprocating bobbin carrying means passes alternately over and under the bobbin carrying means upon the said wheel.

2. In a wire covering machine, means for forming a cover about a wire unit, the said means comprising a revoluble wheel or similar device provided with means for supporting bobbins and having a cam in one face thereof, the said cam being of star-shape and having passageways around its several points and also across the said points, reciprocating means adapted to carry bobbins, the said means including a portion in engagement with the said cam, which portion is adapted to pass alternately around and across the said points whereby each of the said reciprocating bobbin supporting means passes alternately over and under the said bobbin carrying means upon the said wheel.

3. A machine of the character described, comprising a plate or equivalent member having radial slots or passageways therein, a slide member having grooves in its opposite sides in engagement with the edges of the said slots or passageways, a bobbin carrying device extending through the said slide member and having pivotal relation with respect thereto, and a cam adapted to engage one end of the said bobbin carrying device.

4. In a machine of the character described, the combination of a wheel having a cam in one face thereof, means for occasioning revolution of the said wheel, means for carrying bobbins supported upon the said wheel, a supporting member having slots or passageways therein extending radial of the axis of revolution of the wheel, slides secured in the said slots and being movable therein, pivotal bobbin carrying members extending through the said slides and being adapted to support bobbins or similar devices, and one end of each of the said bobbin carrying members being adapted to engage the said cam whereby reciprocating movement of the said bobbin carrying members and of the said slides is occasioned.

5. In a machine of the character described, the combination of a wheel having a cam in one face thereof, means for occasioning revolution of the said wheel, means supported upon the said wheel for carrying bobbins, a

supporting member having slots or passageways therein extending radial of the axis of revolution of the wheel, slides secured in the said slots and being movable therein, bobbin carrying members extending through the said slides and being in pivotal relation thereto, and the ends of the said bobbin carrying members being provided with elongated cam engaging devices and a spring connected to the said bobbin carrying members and the said slides whereby the said cam engaging devices are adapted to be held in proper relation to the said cam to occasion reciprocating movement of the said last-mentioned bobbin carrying devices so as to occasion their passage alternately over and under the bobbin carrying devices upon the said wheel.

6. In a wire covering machine, means for weaving a cover upon a wire unit, the said means comprising a revoluble cam, the said cam comprising a polygonal figure, the ends of each of the sides of which are extended, the said ends being joined together in couples to form triangular figures respectively surrounded by the said extensions and one of the sides of the said polygonal figure, bobbin carrying means supported upon and revolving with the said cam, reciprocating bobbin carrying means supported independently of the said cam, the said reciprocating bobbin carrying means having a portion adapted to engage the said cam and contacting with alternate sides of the said polygonal figure and passing alternately over and under the said triangular figures so as to occasion reciprocal movement of the said reciprocating bobbin carrying means.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 31st day of October A. D. 1907.

WILLIAM HENRY TAYLOR.

In the presence of—

LAURA KLEINFELDER,

CYRUS N. ANDERSON.