

O. VOGEL.

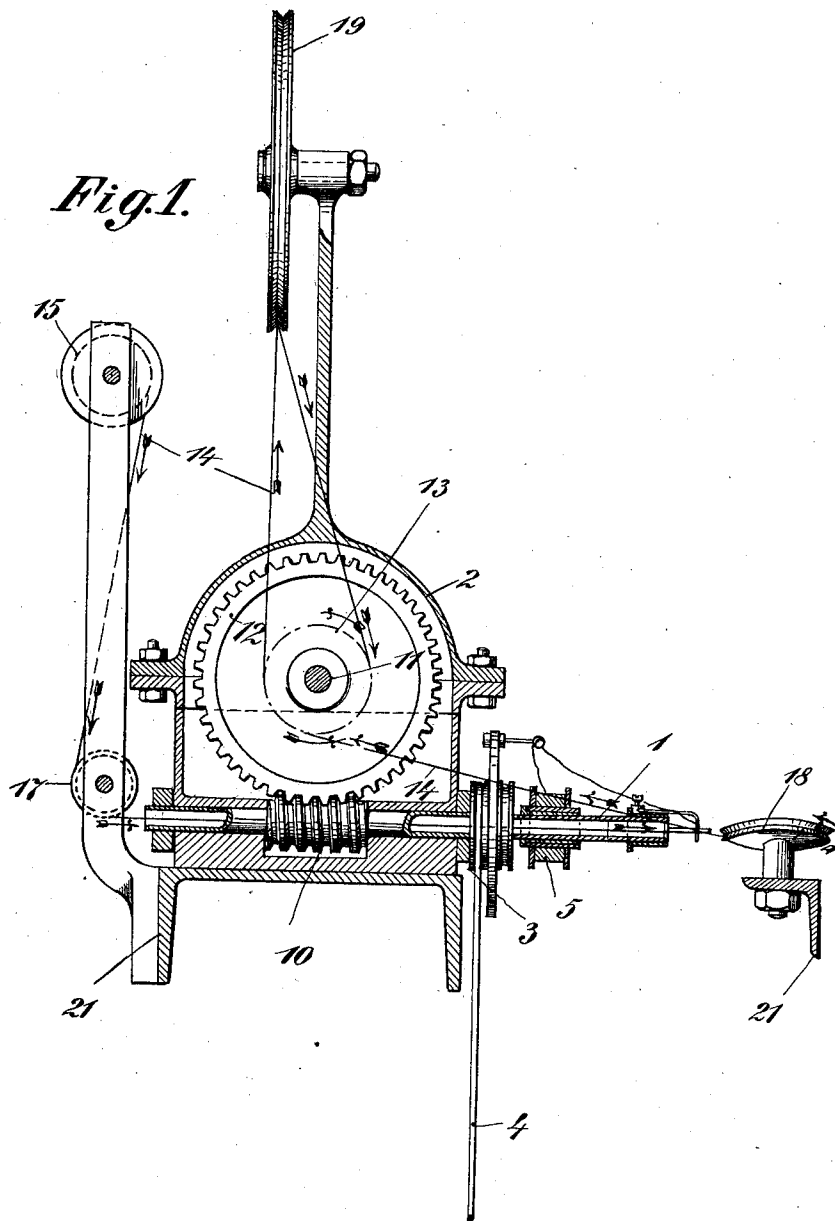
WIRE CABLE AND THE LIKE COVERING MACHINE.

APPLICATION FILED SEPT. 9, 1908.

1,002,475.

Patented Sept. 5, 1911.

2 SHEETS—SHEET 1.



Witnesses:

Albert Grünfeld
Georg Otto

Inventor:

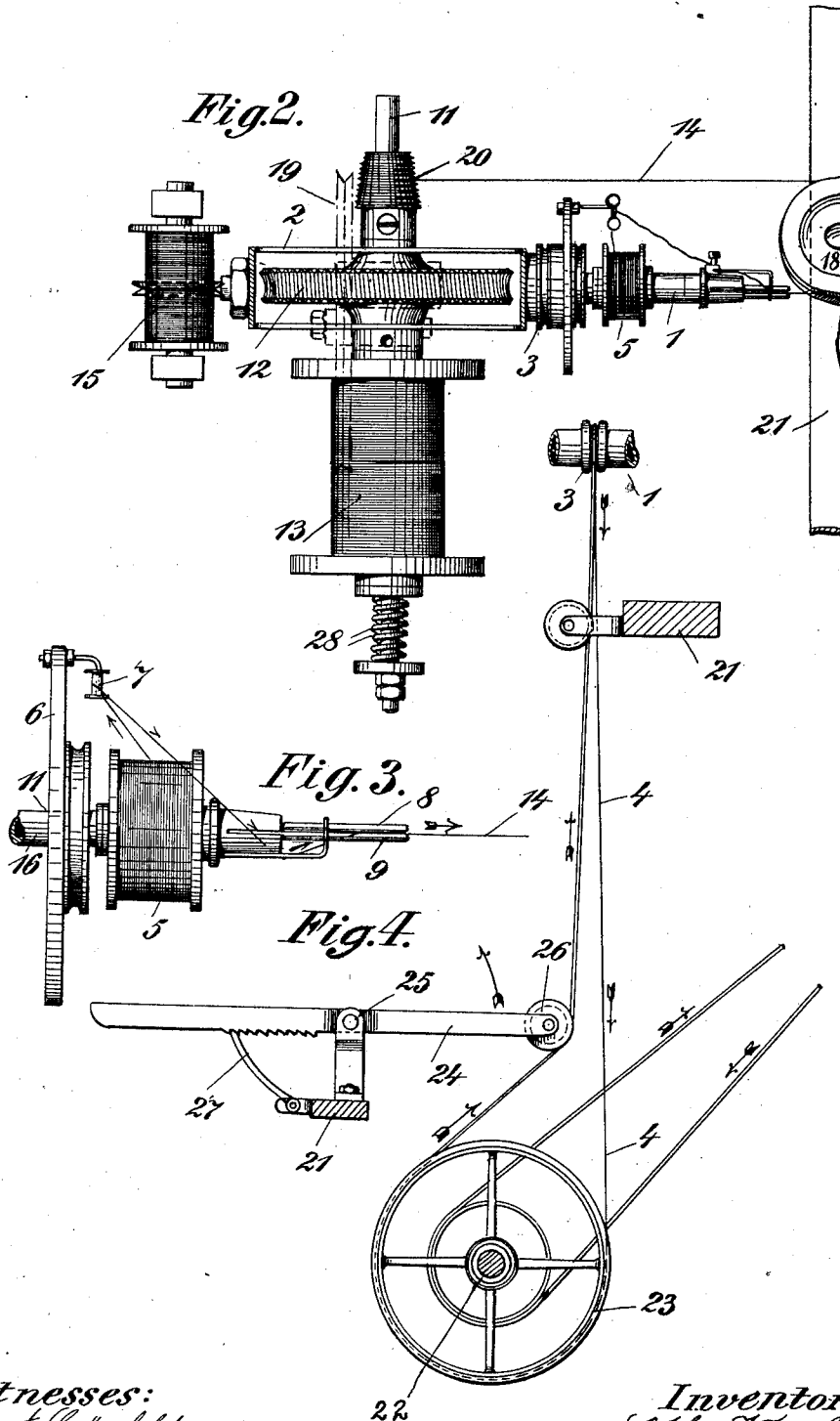
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UNITED STATES PATENT OFFICE.

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WIRE-CABLE AND THE LIKE COVERING MACHINE.

1,002,475.

Specification of Letters Patent.

Patented Sept. 5, 1911.

Application filed September 9, 1908. Serial No. 452,200.

To all whom it may concern:

Be it known that I, OTTO VOGEL, director, citizen of Germany, subject of the King of Prussia and Emperor of Germany, residing at Görlitzerstrasse 74, Berlin, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in Wire-Cable and the Like Covering Machines, of which the following is a full, clear, and exact description.

In covering the so-called core of cables and electric conducting wires with insulating material, such for instance as silk, cotton, flatted wire and the like, the drawback is experienced that the flier does not always show the same constant number of revolutions but will at times run more slowly owing to inequalities in the drive, for instance slacking of the belt, or during starting, and the like; the drawing roller on the contrary, that is to say, the device by means of which the core is drawn through the covering machine, retains its speed at a constant. This gives rise to the deficiency that the material used for covering is unequally distributed over the core and partly fails to cover the latter. If for instance for a unit length of 1 centimeter a covering of about 4000 windings of the silk thread is allowed, the case very frequently happens that, say 3000 windings only are used on this unit of length. These 3000 windings are distributed over the length of 1 centimeter and leave between them uncovered and unpolished parts of the wire. In another case again the flier is in more rapid rotation, and instead of the intended and desired 4000 windings of the thread per centimeter of length, delivers a larger quantity. This represents a material loss to the manufacturer in the first place, and in the second place results in an undesirably dense covering of the wire, so that the covering and consequently the wire are not uniform throughout. These defects are due to the circumstance that the movement of the flier and of the drawing roller which serves to regulate the tension with which the covered wire is drawn off, are independent of each other in respect to their speed of rotation, that is, the flier describes a lesser or greater

number of revolutions than is requisite for a definite covering, while the drawing roller retains its normal speed, the latter consequently drawing through the stipulated normal quantity of wire per unit of time. The flier however has during this time supplied too little or too much insulating material, and this results in the wire being partly uncovered or too closely covered thus turning out a defective product. The present invention removes these defects, inasmuch as, at all rates of rotation of the flier and also in the event of variable and non-uniform drive, it produces a uniform covering in consequence of the fact that the speed of rotation of the drawing roller and that of the flier are automatically interregulated, that is to say, that if the flier inevitably runs more slowly, and to keep to the example given, makes only 3000 revolutions instead of 4000 per unit of length, by means of the present invention only such length of wire will be drawn off by the drawing roller as would have to be put through the machine if the flier had been making 3000 revolutions and producing a normal covering, that is only $\frac{3}{4}$ of the unit length of wire will be drawn off. The speed of drawing off the wire consequently is in direct ratio in the present invention to the delivery of thread.

The arrangement by means of which the object specified is attained is exhibited on the inclosed drawings, Figures 1 to 4, namely:

Fig. 1 represents a side view of the machine with part section, Fig. 2 represents a plan of the same, Fig. 3 represents a part of the covering device on an enlarged scale, Fig. 4 represents the drive with engaging gear for the machine.

The hollow shaft 1 open at both ends is rotatably carried in the case 2 of the machine, which case is fastened on the fixed machine frame 21. The shaft has, firmly keyed on it, a grooved pulley 3 (Figs. 1 and 3) over which the driving belt 4 runs, and further the spool 5 with the insulating material for covering and also a distributing roller 7 fixed to the pulley 6 and at its right end two pins 8 and 9 (Fig. 3) called the fliers, between which the insulating ma-

terial is guided and carried when running out. In the case 2 is a worm 10 fixed on the shaft 11, which worm is in engagement with a worm wheel 12 fitted on shaft 11. On this shaft is a spool 13 held by spring 28 and friction driven, on which the covered cable is wound. On the same shaft 11 is likewise keyed a drawing roller 20 for driving the cable, which roller is provided with several grooves of different diameters. In one of the grooves of this roller 20 the covered cable is guided and repeatedly coiled, so that the rotating shaft 11 carries the cable 14 with it. According as the cable is placed in a groove of large or small diameter on the carrier roller 20, the speed with which the cable passes through the machine can be regulated. On the spool 15 the cable, still uncovered, is coiled. For guiding the cable there are arranged various guide pulleys 17, 18 and 19. Machines of the design described may moreover be arranged in any desired number next to each other on a continuous machine frame 21. They all receive their drive in the same way from a common shaft 22 running right through beneath the machines (Fig. 4), which shaft transmits its movement by means of the groove pulleys 23 and the belts 4 in a suitable ratio of revolution to the shaft 1 (Fig. 4). In order to engage or disengage any particular covering machine with or from the shaft 22, there is a belt tightener provided at each belt 4. These belt tighteners consist of a two-armed lever 24 to be operated by hand, the pivoting points 25 of which are firmly fixed to the machine frame. One arm of the lever 24 has a running roller 26 on its end with which the belt engages. If the opposite arm of the lever 24 is raised the roller 26 presses against and tightens the belt 4 to any desirable extent. A toothed locking device 27 allows of holding the lever in any desired position (Fig. 4).

The mode of operation of the machine is as follows: From the reel 15 the uncovered cable 14 is centrally conducted over the guide pulley 17 through the hollow shaft 1, and over the roller 18 through a groove of suitable diameter on the drawing roller 20, coiled around the latter and conducted over the guide pulley 19 to the spool or reel 13 on which the cable is fastened. The insulating material and the like to be wound on is laid on the distributing and feed devices 7, 8 and 9 (fliers) from the roller 5, and attached to the cable. If the machine is now connected up with the transmission shaft 22 by means of the lever 24 (Fig. 4) the hollow shaft 1 together with the spool 5 for the insulating material and the like begin to rotate very rapidly and to wind the insulating material on the non-rotating part of the cable 14 (Fig. 3). By means of the worm gear

10, 12, the drawing roller 20 is at the same time set slowly revolving, so that the covered cable is slowly drawn from the spool or reel 15 and through the covering contrivance. The friction driving spool or reel 13 then winds up the covered cable and is enabled to entirely adapt its speed to the drawing speed of the cable 14 and the roller 20. Owing to the mechanical connection of the covering device 1, 5, 8, 9 (fliers) with the drawing device 20 for the cable, the uniform covering referred to at the outset is achieved in such wise that it is entirely independent of the speed of the entire machine, whether the latter is starting or whether the driving belt is running irregularly.

What I claim is:

1. A machine for covering wire and the like, comprising a tubular shaft, means for conducting the wire from the source of supply through the tubular shaft, a flier fixed to one end of said shaft, a spool for containing covering material for that wire mounted concentrically on the same shaft near the flier, a second shaft, worm gearing between said shafts, a drawing-off roller fixed on the second shaft, a receiving reel mounted on the same shaft and frictionally rotated thereby, a guide pulley located in a plane parallel to the said shaft for conducting the covered wire directly from the drawing roll to the receiving reel, and means for driving the tubular shaft.

2. A machine for covering wire comprising a tubular shaft through which is drawn wire to be covered, a flier fixed on one end of said shaft, a spool for containing covering material mounted concentrically on the same shaft near said flier, means for guiding said covering material from the spool to the flier, a second shaft situated at a right angle to the tubular shaft and provided with a worm wheel, a worm on the tubular shaft engaging that worm wheel, a drawing roller fixed on said second shaft, a receiving reel frictionally mounted on the same shaft on which reel is wound the finished product, a guide pulley located in a plane parallel to the said shaft for conducting the covered wire directly from the drawing roll to the receiving reel, and means for rotating the tubular shaft.

3. A machine for covering wire comprising a tubular shaft through which is drawn the wire to be covered, a flier fixed on one end of said shaft, a spool for containing covering material mounted concentrically on the same shaft near said flier, means for guiding said covering material from the spool to the flier, a second shaft arranged at a right angle to the tubular shaft, driving gear between said shafts, a drawing roller and a storing reel mounted on said second shaft, the roller being rigidly and the reel

frictionally mounted thereon, a guide pulley
located in a plane parallel to the said shaft
for conducting the covered wire directly
from the drawing roll to the storing reel,
5 means for rotating the tubular shaft and
means for guiding the finished product from
the flier to the drawing roller.

In witness whereof, I subscribe my signature, in presence of two witnesses.

OTTO VOGEL.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."