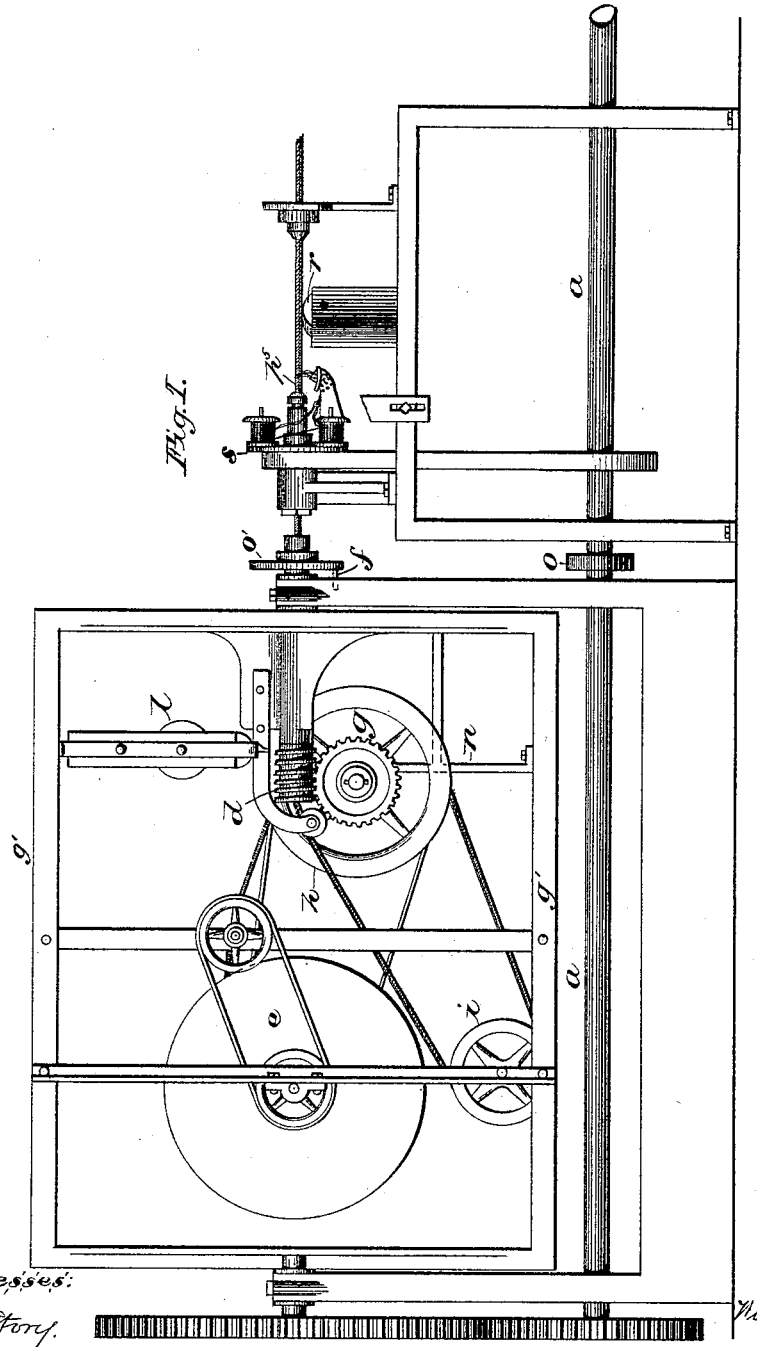
(No Model.) 3 Sheets—Sheet 1.

W. R. PATTERSON.

MACHINE FOR WINDING LEAD TAPE UPON TELEGRAPH CABLES.

No. 346,414. Patented July 27, 1886.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

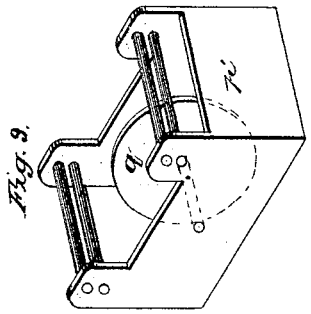
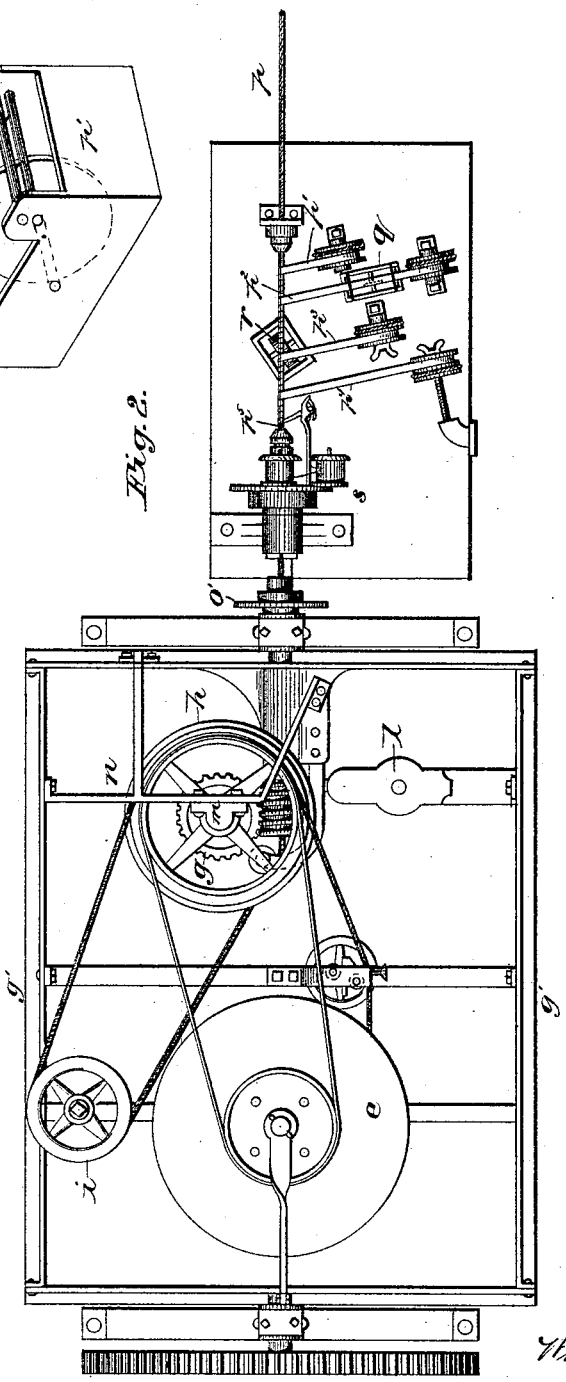


Fig. 2.



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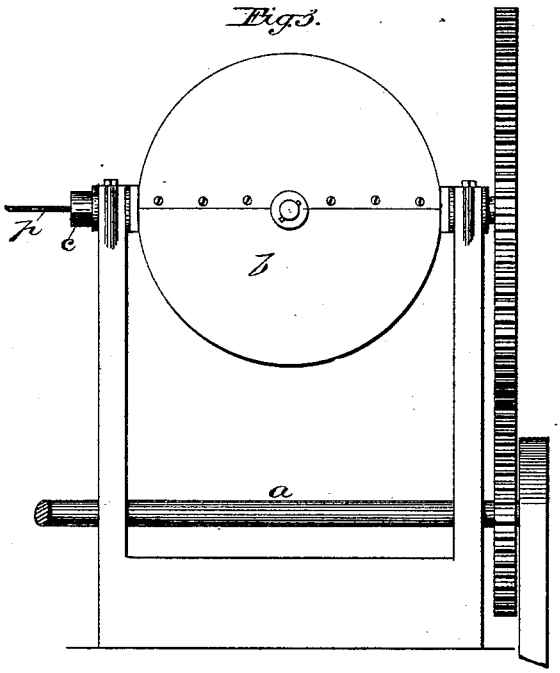


Fig. 5.

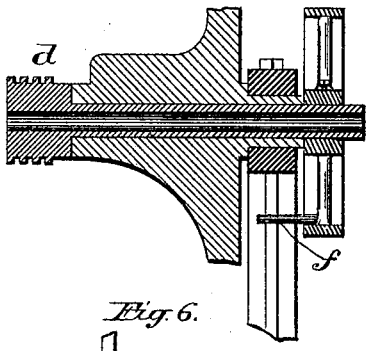


Fig. 6.

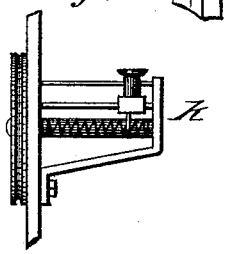


Fig. 4.

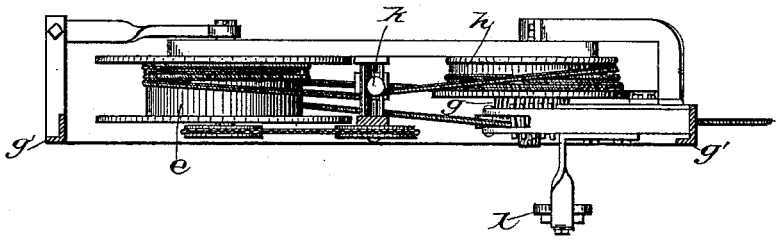
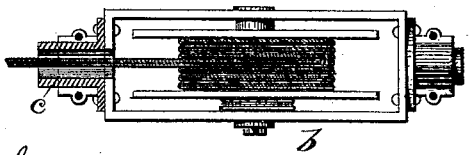


Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM R. PATTERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

MACHINE FOR WINDING LEAD TAPE UPON TELEGRAPH-CABLES.

SPECIFICATION forming part of Letters Patent No. 346,414, dated July 27, 1886.

Application filed March 28, 1885. Serial No. 160,453. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. PATTERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Machines for Winding Lead Tape Upon Telegraph-Cables, (Case 46,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to machines for covering telegraph-cables; and its object is to provide means whereby any number of layers of lead tape, paper, and yarn may be wound thereon, while paint and shellac may be applied to the lead tape as it is being wound on, so that the joints thereof may be made tight.

My invention herein is illustrated in the accompanying drawings, in which Figure 1 is a side elevation of a portion of my machine. Fig. 2 is a top view thereof showing the position of the bobbins and the reverse side of the revolving frame. Fig. 3 is a side elevation of the revolving reel from which the cable is unwound as it is covered, Figs. 1 and 3 taken together being a general view of the whole machine. Fig. 4 is a detailed view of the drum and reel for drawing through and taking up the finished cable. Fig. 5 is a detailed view of the bearings of the revolving frame and the pulley for regulating the motion of the worm or screw. Fig. 6 is a detailed view of the double-threaded screw and guide for distributing the cable upon the reel. Fig. 7 is a detailed view showing the cable and its coverings. Fig. 8 is a top view of the reel shown in Fig. 3, the cover being removed. Fig. 9 is a detailed view of the shellac-pot.

Like parts are indicated by similar letters of reference throughout the different figures.

The core of conductors to be covered consists of any number of wires insulated by fibrous material—as cotton and jute—and twisted together in the well-known way. I have heretofore used lead pipe as an outside covering for such cables, the interstices being filled with paraffine charged with gas under pressure.

The cable which I make with the apparatus herein described is not intended for underground or submarine purposes, but for use within buildings where large numbers of conductors are required to be run within a small space, and where great flexibility is desired, as in connecting multiple switch-boards of a telephone-exchange. Such flexible cable is described and claimed in Letters Patent No. 10,563, reissued to me as assignor February 24, 1885.

In the manufacture of flexible cables I have found that the lead tape and other coverings may be applied better and cheaper than heretofore by the use of my improved apparatus, which I will now describe in detail.

The shaft *a* may be driven by means of a belt, as shown. From this shaft, by means of suitable spur-wheels and pulleys, power is derived to run the operative parts of the machine. The core to be covered is wound upon a reel, *b*, as shown in Figs. 3 and 8, and from this reel is unwound, passing through the hollow axle *c* of the frame which supports said reel, thence through the covering mechanism and the hollow shaft of the screw *d*, over suitable pulleys to the reel *e*, which takes up the finished cable. The reels *b* and *e* are each carried upon their frames, and the different frames are kept revolving rapidly and at a uniform rate of speed by the spur-wheels in the same direction. The cable is therefore not twisted, though it is kept rapidly turning.

In order that the covering may be applied between the two reels, it is necessary that the cable be kept moving longitudinally at the desired rate of speed, while at the same time it is kept revolving, as before described.

I will now describe the apparatus for drawing the cable through the winding-machine longitudinally at the desired rate of speed. I will assume, first, that the screw *d* is held at rest by the stop or pin *f*. The worm-wheel *g*, carried upon the revolving frame *g'*, and meshing with the worm or screw *d*, will serve to drive the drum *h*, around which the cable is given two or three turns, so as to produce sufficient friction to draw the cable longitudinally as the drum is driven by the worm-gear. The cable is given the proper direction by means of pulley *i*, and as it is unwound from

the drum is taken up by the reel *e* and distributed in layers thereon by means of the guide *k*. The axis of revolution of the reel *e* should coincide as nearly as possible with the axis of revolution of the revolving frame *g'*, upon which it is carried, in order that the weight of the cable, as it is wound upon the reel, will not disturb the balance of the revolving frame. The sliding weight *l* serves to counterbalance the weight of the worm-wheel and drum and the fixed parts of the frame. The larger the worm-wheel the farther the weight *l* will be placed from the center of the frame, and vice versa. By using worm-wheels of different sizes the rate of motion of the drum may be varied, the different worm-wheels being adjusted to the worm by moving the box or bearing *m* upon the brace *n* toward or away from the worm, as may be required. In order to further regulate the longitudinal movement of the cable, I have provided for giving motion to the worm *d* by a belt (not shown in the drawings) running from pulley *o* on the shaft over a pulley, *o'*, keyed to the hollow worm shaft, as shown in Fig. 5. By means of different combinations of worm-wheels and pulleys of different sizes any desired rate of longitudinal motion may be given to the cable. Before applying the belt to pulley *o'* the pin or stop *f* must be removed. When the stop *f* is in, and the hollow shaft of the worm is stationary, the worm-wheel *g* is turned the distance of one tooth at each revolution of the frame. I have thus described apparatus whereby the cable may be kept turning rapidly without twisting while being wound from one reel onto another. The covering is applied during this movement of the cable between the two reels, as I will now describe.

As shown in Fig. 7, the core *p* is wound, first, with paper tape *p'*, the edges of the paper abutting; second, with lead tape p^2, the edges lapping; third, with lead tape p^3, the edges lapping and breaking joints with lead tape p^2; fourth, with paper tape p^4, and, fifth, with yarn p^5.

It is necessary to shellac the overlapping edge of the lead tape p^2, and to paint the lead tape p^3 as said tapes are being wound onto the core.

It is further necessary, in order to cover the cable properly with the yarn p^5, to apply a much greater number of convolutions thereof to cable than of the tape.

In Fig. 2 I have shown a top view of a table provided with fixed spindles carrying the spools, from which the different strands of tape are wound onto the core, and the devices for applying shellac and paint to the lead tape. The strands of paper tape p' and p^4 are drawn off from their bobbins onto the cable, as shown in Fig. 2, the tension of the bobbins and their angle with cable being so adjusted that said strands may form smooth beds for the lead tape and outside serving respectively. The strands of lead tape p^2 and p^3 are likewise drawn from bobbins, the tenson of the bobbins and the angles of their axes with the axis of the cable being capable of such adjustment as may be required.

As shown in Fig. 9, I provide a wheel, *q*, over which the lapping edge of the first lead tape, p^2, runs just before reaching the cable, the wheel being placed so that its lower edge runs in shellac. Enough will adhere to the periphery thereof to shellac the edge of the lead tape p^2 as it comes in contact therewith.

In order to paint the strand p^3, I have provided the paint-wheel *r*, which is placed at substantially the angle shown to the cable and the path of the tape p^3. The paint-wheel is thus kept turning by the impingement of the cable therewith, and enough paint is wiped off and adheres to the cable to close the joints of the lead tape p^3 as it is wound thereon.

The yarn which forms the outside serving is wound onto the cable from spools *s*, carried upon a head or support, *t*, which is kept very rapidly revolving.

I claim as new and desire to secure by Letters Patent—

1. In a machine for covering electric cables, the combination, with the reels *b* and *e*, of the frames carrying the same, said frames being driven uniformly, the worm-gear and spur-wheel mechanism, the bobbins placed at an angle to the cable for carrying the strands of tape, and the shellac-wheel *q*, driven by the impingement of the tape, whereby the cable may be covered with lead tape and the lapping edge thereof shellacked, substantially as and for the purpose specified.

2. The combination, with mechanism for drawing the cable longitudinally and revolving it at the same time without twisting, of the fixed bobbins placed at an angle to the cable, for carrying the lead tape, the wheel *q*, for shellacking the edge of the lead tape, and the paint-wheel, said wheel *q* and said paint-wheel placed at substantially the angle shown, whereby the cable may be covered with tape and the joints of the tape closed with shellac and paint, substantially as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 17th day of March, A. D. 1885.

WILLIAM R. PATTERSON.

Witnesses:

GEORGE P. BARTON,

W. A. KREIDLER.