

No. 689,614.

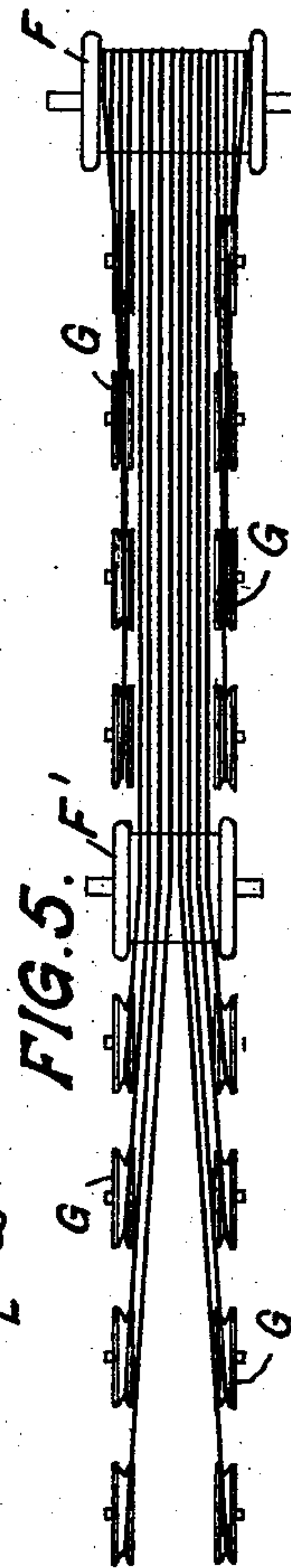
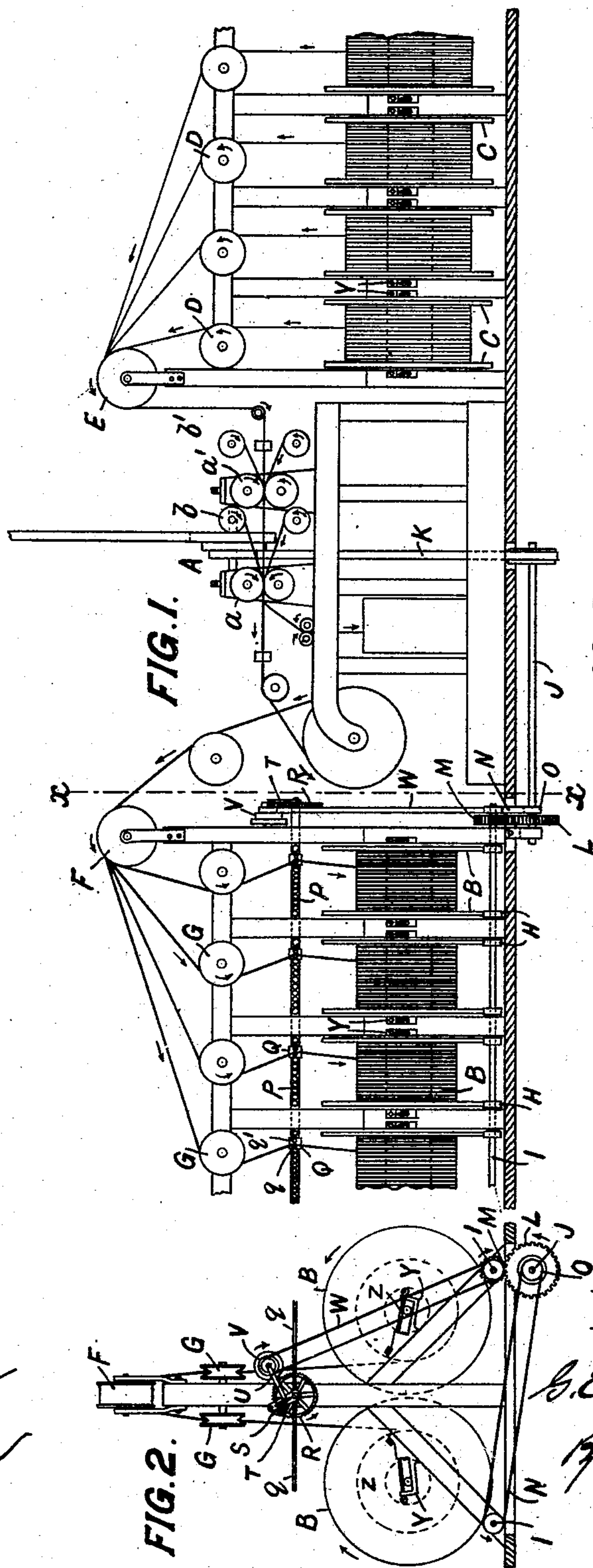
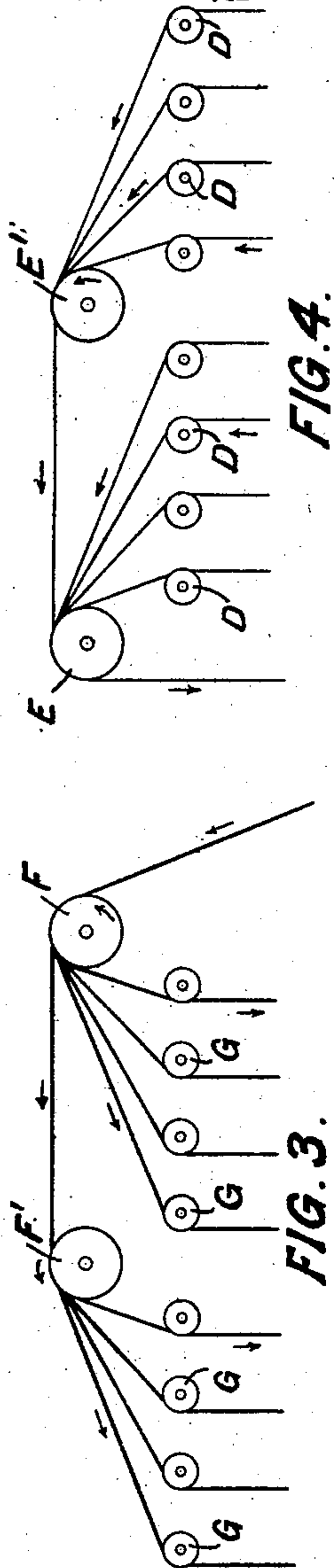
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G. E. HEYL-DIA.

APPARATUS FOR COVERING ELECTRIC CONDUCTORS WITH INSULATION.

(Application filed June 8, 1901.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR COVERING ELECTRIC CONDUCTORS WITH INSULATION.

SPECIFICATION forming part of Letters Patent No. 689,614, dated December 24, 1901.

Application filed June 3, 1901. Serial No. 62,980. (No model.)

To all whom it may concern:

Be it known that I, GEORGE EDWARD HEYL-DIA, engineer, a subject of the King of Great Britain, and a resident of Warrington, (private address Birk Crag, 286 Great Clowes street, Higher Broughton, Manchester,) in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for Covering Electric Conductors with Insulation, (for which application for patent has been made in Great Britain, where provisional protection has been obtained under No. 20,201, dated November 9, 1900,) of which the following is a specification.

This invention relates to apparatus or machines for covering electric wires or conductors with insulation of the kind in which a number of conductors are covered longitudinally by being passed, together with insulation material, between grooved rollers instead of being wound spirally with the insulation; and the object of the invention is to obtain an increased output and an even tension on the wires, while also obviating the liability of such machines to kink the wires.

To this end the invention consists in mounting the feeding and take-off drums with their axes of rotation at right angles to those of the actual covering-rollers instead of parallel, as hitherto, whereby a greater number of drums can be used and also arranged in a narrower space, so as to avoid the fan-shaped spread of wires into and out of said covering-rollers, which is apt to kink and place uneven tension on the wires.

The invention also comprises a convenient arrangement of friction driving-gear for the take-off drums, which insures a uniform motion of the latter, and an automatic traverse mechanism for guiding the wires onto same.

To facilitate description, the invention will be described with reference to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of a covering apparatus constructed with the novel features of my invention. Fig. 2 is a transverse section on the line xx of Fig. 1. Figs. 3 and 4 are diagrammatic views, in side elevation, of the guide-rollers, showing how the wires of the receiving and take-off drums,

respectively, may be grouped. Fig. 5 is a diagrammatic view in plan of the grouped arrangement of guide-rollers and wires drawn to a larger scale for greater clearness.

In carrying the invention into effect I arrange in front of and behind the rollers $a a'$ of the covering apparatus A, Fig. 1, which may consist, as shown, of the ordinary longitudinal covering-machine, a number of drums B and C, mounted with their axes at right angles to those of the covering-rollers $a a'$, as before mentioned, and arranged, for instance, as shown in Figs. 1, 2, and 5, in two long rows longitudinal of the machine, which is preferable, although any number of rows may be used. The wires from the feed-drums C thus arranged are carried to the covering-machine A over suitable guide-pulleys D E, and as they emerge covered by the rollers $a a'$ with the insulation from the rollers $b b'$ they are similarly guided by other pulleys F G to the take-off drums B. Where a large number of wires are to be covered simultaneously in the one machine, the guide-pulleys D and G from both the feed and the take-off drums may be grouped, for instance, as shown in Figs. 3 and 4, with extra guide-pulleys E' F', so as to have a guide-pulley for each group, while when the number of wires is small a single pulley E and F will be sufficient, as shown in Fig. 1.

Fig. 5 shows clearly the parallel arrangement of the wires due to the novel construction of my invention, which obviates the fan-shaped spread of the wires, as found in the usual form of apparatus.

The drums B and C are preferably each mounted in separate bearings Y in a suitable frame, and the take-off drums B are driven by a number of friction-rollers H engaging the periphery of the drum ends, for which purpose I mount the friction-rollers H on shafts I, running parallel with each row of drums B, one shaft I being arranged for each row. The feed-drums C need not be driven. Said shafts I, carrying the friction-rollers, may be conveniently driven by belt-gearing from the driving-shaft of the covering-machine or in any convenient manner. For instance, as shown in Figs. 1 and 2, a counter-shaft J, driven by a belt K from the driving-shaft of the cover-

ing-machine A, may operate one of the shafts I directly by spur-gearing L M and the other of the shafts I by means of belt-gearing N O.

I provide the take-off drums B with an automatic traverse mechanism for the wires, which consists of a shaft P, running parallel with the drums and having a number of worms arranged one for each drum or each pair of drums, the actual guides Q, through which the wires run, being slidably mounted with a tooth to engage its respective worm, whereby the guides Q and wires are given a traverse movement to and fro during the winding, the reversal at the end of each layer taking place by forming the worm with both a right and a left hand thread intersecting each other and connected at each end, as shown in Fig. 1. The worm-shaft P may be driven by suitable gearing from one of the friction-roller shafts I, either directly or by a ratchet-gearing, imparting a step-by-step movement to it. This is shown in Fig. 2, in which R is a ratchet-wheel mounted on the worm-shaft P, and S the operating-pawl, carried by a loose radial arm T, which receives a to-and-fro movement by a connecting-rod U from a crank-wrist on a stepped pulley V, driven, for instance, by a belt W from the shaft I. The radial arm T may be slotted to allow of the end of rod U being adjusted therein to vary the throw of the pawl as a means of adjusting the traverse to the rate of feed, a set-screw being provided to fix the pivot-block of the connecting-rod at the desired position in the slot. The wire-guides Q are formed with a pair of arms q q' on each side, as shown, which may each be covered with a loose sleeve to reduce friction, and the wires pass each between the arms q q' of a pair which are of sufficient length to allow the required play of the wire to suit the increasing amount of wire on the drum. The traverse may be obtained, however, by other suitable mechanism, provided the speed is adapted to the speed of rotation of the drums B.

It will be seen that by having each drum mounted on a separate shaft they can be readily removed and replaced, and for this purpose the bearings or brackets Y are formed open at the top to allow of the shafts being dropped in, and screwed rods Z, Fig. 2, are provided to screw across the bracket Y above the shaft to retain the latter in position.

My improved arrangement of feed-drums and take-off drums may be built as separate machines adapted to be placed or mounted in front of and behind any existing covering apparatus.

I declare that what I claim is—

1. An apparatus for covering electric conductors with insulation, having a plurality of feeding and take-off drums arranged one behind another in series running parallel to the plane of the direction in which the wires are passed through the covering device, with the object of maintaining uniform the total width

of the wires into and out of the covering device, substantially as described.

2. In apparatus for covering electric conductors with insulation, the combination with the covering device, of a plurality of feeding and take-off drums arranged one behind another in series with their axes of rotation parallel to the plane of the direction in which the wires are passed through the covering device, substantially as described.

3. In apparatus for covering electric conductors with insulation, the combination with the covering device, of a plurality of feeding and take-off drums arranged one behind another in series in parallel rows running parallel to the plane of the direction in which the wires are passed through the covering device, substantially as described.

4. In apparatus for covering electric conductors with insulation, the combination with the covering device, of a plurality of take-off drums arranged one behind another in series with their axes of rotation parallel to the plane of the direction in which the wires are passed through the covering device, means for revolutely driving said take-off drums, a shaft mounted parallel to the axes of said drums and having a series of intersecting right and left hand threads, means for rotating said shaft relatively to the speed at which the wires are drawn onto the drums, and wire-guides adapted to engage and receive a to-and-fro movement from said threaded shaft to traverse the wires to and fro longitudinally of the drums, substantially as described.

5. In apparatus for covering electric conductors with insulation, the combination with the covering device, of parallel shafts I mounted parallel to the plane of the direction in which the wires are passed through the covering device, friction-rollers mounted on said shafts, drums B mounted in bearings on shafts parallel to said shafts I to bear on said friction-rollers, means for rotating the shafts I and therewith the drums, and guide-pulleys adapted to guide the wires from the covering device to their respective drums B with a uniform width of the total wires, substantially as described.

6. In apparatus for covering electric conductors with insulation, the combination with the covering device, of parallel shafts I mounted parallel to the plane of the direction in which the wires are passed through the covering device, friction-rollers mounted on said shafts, drums B mounted in bearings on shafts parallel to said shafts I, to bear on said friction-rollers, means for rotating the shafts I and therewith the drums, guide-pulleys adapted to guide the wires from the covering device to their respective drums B, with a uniform width of the total wires, and means for traversing the wires to and fro longitudinally of the drums relatively to the speed at which they are drawn onto the drums, substantially as described.

7. In apparatus for covering electric conductors with insulation, the combination with the covering device, of parallel shafts I mounted parallel to the plane of the direction in which the wires are passed through the covering device, friction-rollers mounted on said shafts, drums B mounted in bearings on shafts parallel to said shafts I to bear on said friction-rollers, means for rotating the shafts I and therewith the drums, guide-pulleys adapted to guide the wires from the covering device to their respective drums B, with a uniform width of the total wires, threaded shaft P mounted parallel to the shafts I, means for rotating shaft P relative to the speed at which the wires are drawn onto the drums, and wire-guides adapted to engage and receive a to-and-fro movement from the threaded shaft P to traverse the wires to and fro longitudinally of the drums, substantially as described.

8. An apparatus for covering electric conductors with insulation, comprising a covering device of usual construction, feeding-drums C mounted in front of said covering device one behind another in series running parallel to the plane of the direction in which the wires are passed through the covering device, take-off drums B similarly mounted behind said covering device, means for revolvably driving the drums B from the driving-shaft of the covering device, guide-pulleys adapted to guide the wires from the drums C to the covering device and from the latter to the drums B with a uniform width of the total wires, and means for traversing the wires to and fro longitudinally of the drums B relatively to the speed at which they are drawn onto said drums, substantially as described.

9. An apparatus for covering electric conductors with insulation, comprising a covering device of usual construction, feeding and take-off drums C and B mounted respectively

in front of and behind said covering device one behind another in series running parallel to the plane of the direction in which the wires are passed through the covering device, means for revolvably driving the drums B from the driving-shaft of the covering device, wire-guide pulleys G and D located one for each drum, and additional guide-pulleys adapted each to receive and guide the wires from a group of said guide-pulleys G and D with a uniform width of the total wires and out of the covering device, substantially as described.

10. An apparatus for covering electric conductors with insulation, comprising a covering device of usual construction, feeding and take-off drums C and B mounted respectively in front of and behind said covering device one behind another in series on independent shafts running parallel to the plane of the direction in which the wires are passed through the covering device, brackets Y formed open at the top to receive and support said independent shafts, means for retaining said shafts in the brackets Y, means for revolvably driving all the drums B at the same speed, guide-pulleys adapted to guide the wires from the drums C to the covering device, and from the latter to the drums B, with a uniform width of the total wires, and means for traversing the wires to and fro longitudinally of the drums B relatively to the speed at which they are drawn onto said drums, substantially as described.

In witness whereof I have hereunto signed my name, this 25th day of May, 1901, in the presence of two subscribing witnesses.

GEORGE EDWARD HEYL-DIA.

Witnesses:

FRANK E. ALLEN,
SIDNEY W. DOD.