

No. 724,776.

PATENTED APR. 7, 1903.

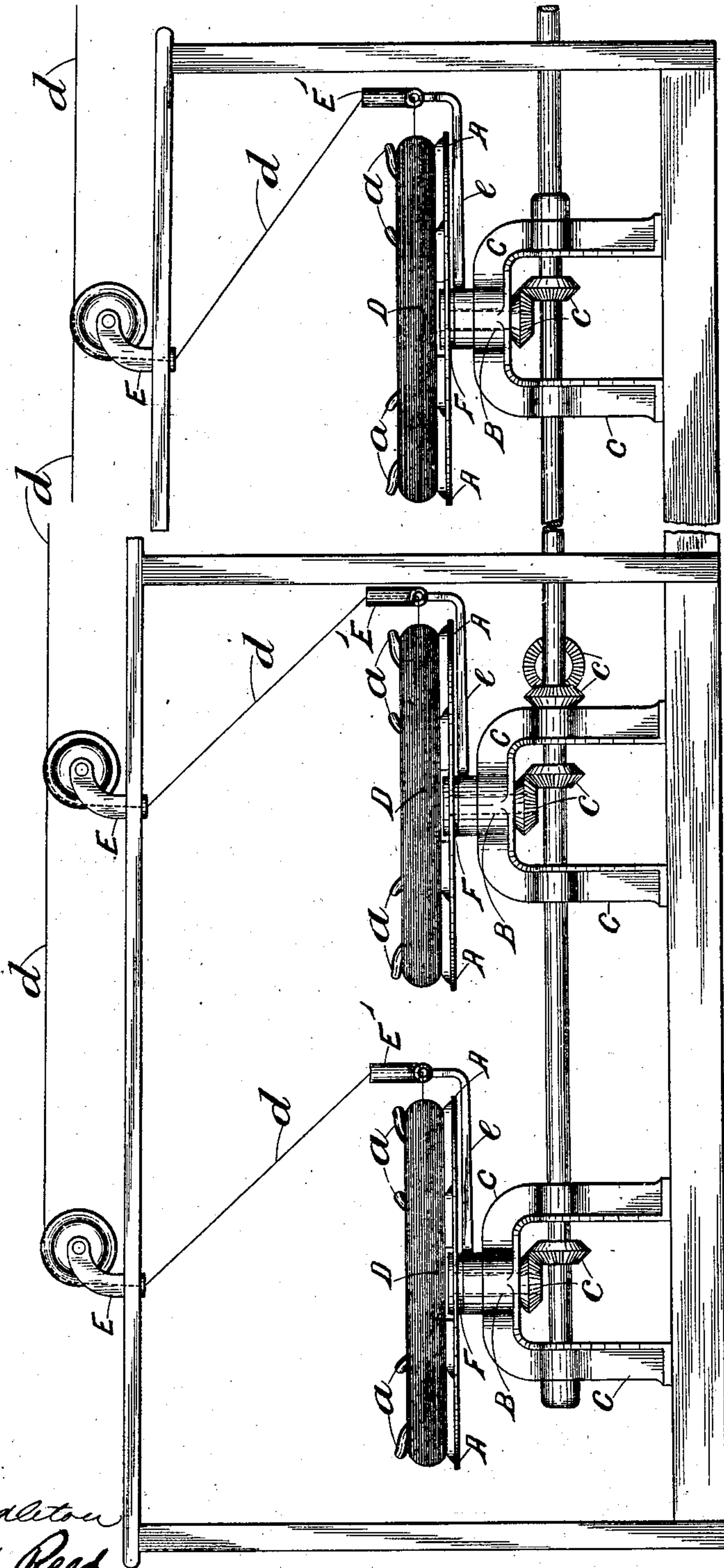
C. J. BANKS.
ROPE MACHINE.

APPLICATION FILED SEPT. 16, 1901.

NO MODEL.

2 SHEETS—SHEET 1

Fig. 1.



Attest:
Comptroller
Edw. L. Reed.

Inventor:
Chas. J. Banks

Jy Richards & Co
Attys

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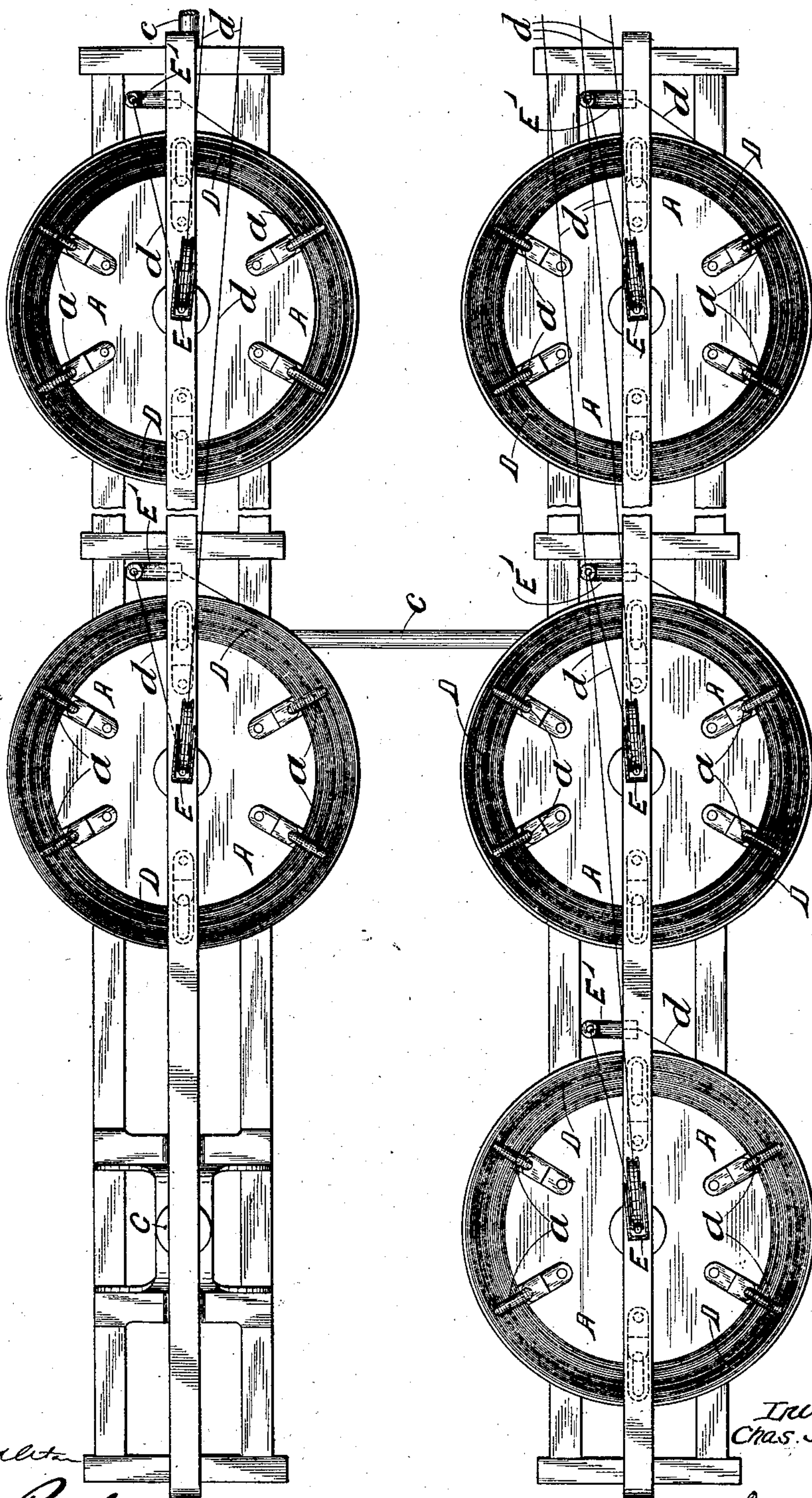
PATENTED APR. 7, 1903.

APPLICATION FILED SEPT. 16, 1901.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.



Attest:
Edw. L. Reed

Inventor:
Chas. J. Banks.

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UNITED STATES PATENT OFFICE.

CHARLES JOHN BANKS, OF LIVERPOOL, ENGLAND.

ROPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,776, dated April 7, 1903.

Application filed September 16, 1901. Serial No. 75,632. (No model.)

To all whom it may concern:

Be it known that I, CHARLES JOHN BANKS, a subject of the King of Great Britain and Ireland, residing at and whose post-office address is Chelsea Lee, Orrell Lane, Aintree, Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in and Relating to the Manufacture of Wire or other Ropes, (for which I have applied for a patent in Great Britain, under No. 3,358, dated February 16, 1901,) of which the following is a specification.

My invention relates to the manufacture of wire or other ropes, and it refers to the spinning of the wires or yarns into strands and of the strands into ropes; and the object is to remove therefrom the torsion set up in spinning without the necessity for winding onto bobbins and arranging the bobbins in fliers and the other expensive and complicated methods hitherto adopted. Hence economy accrues.

I have chiefly devised my invention for the making of wire strands. Therefore I will, by way of example, describe it in reference thereto.

To attain my end, I revolubly mount the swifts or equivalent devices carrying the hanks of wire and draw or remove the wires therefrom through, over, or under appropriately situated and shaped guides or pulleys directly into the spinning-machine, which may be of any suitable type, such as that used in hemp rope or strand making, and in this way I am able to twist or untwist the wires individually, and thereby compensate for or counteract the torsion set up by the spinning-machine. Consequently strands of untwisted wires result.

One way in which the invention may be carried into practice is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, and Fig. 2 a plan, of the front and after ends of that part of a machine which embodies my improvements, the central portion being removed or broken away.

According to this way I arrange the swifts A A in series and dispose each on a spindle B, which is supported in one bearing only at C and is revolved by bevel-gearing c or other mechanism simultaneously with the spinning-

machine (which is not shown) and at a suitable speed relatively thereto, the swift A being disposed loosely on the spindle B, so that it is free to revolve at a different speed or independently thereof as the wire *d*, which is arranged exteriorly around same, is drawn off. A tubular or other conveniently-fashioned guide E is placed over or opposite the center of each swift A, but is not attached thereto or in any way connected therewith, and through it the wire *d* from the outside of the hank D is passed before it is led to the lay-plate in connection with the spinning-machine, and, if desired, other guides are interposed—such, for example, as that shown at E'—in connection with each swift, said guide being carried at a point beyond the periphery thereof by an arm *e*, secured to the spindle B. These guides are adapted to reduce friction to a minimum, for which purpose they may be constituted by or furnished with wheels or rollers, as shown applied to the guides E E.

Means are furnished on or about the swifts A A for holding the hanks D D and permitting their ready placement and displacement, consisting, for instance, of a number of hooked carriers *a a*, pivoted or adjustably secured by bolts to the swifts, so that they can be moved inward or outward to carry or free the hanks, and, if necessary, a friction-washer F, disposed between the swift and the boss of the arm carrying the guide E', for controlling the movement of every swift.

In operation, assuming a hank of wire to be on the swift and the wire to have been threaded through the guides E' and E to the lay-plate and the spindle B, carrying the guide E', to have been set in motion, the friction between the swift and the spindle causes the swift to rotate at the same speed as the spindle, and the effect of each revolution is to impart a twist to the wire without necessarily unwinding it, the arrangement being such that when there is relative motion between the swift and the guide E' the wire is or can be wound or unwound on the swift. Assuming now that the hank is so placed on the swift that a pull on the wire tends to revolve the hank in the direction of the hands of a watch and that the spindle B is set in motion in the opposite direction, any pull on the wire will tend to lessen the speed of the

swift and cause it to move relatively to the guide E' to the extent to which the wire is drawn off, and there is one twist or turn imparted in that length of wire so drawn off.

5 Assuming now that the hank is so placed on the swift that a pull on the wire tends to revolve the hank in the direction opposite to the hands of a watch and that the spindle B is set in motion also in the direction opposite to the hands of the watch, any pull on
10 the wire will tend to increase the speed of the swift and cause it to move relatively to the guide E' to the extent to which the wire is drawn off, and there is one twist or turn
15 imparted in that length of wire so drawn off.

In addition to the relative speeds depending on the length drawn off per revolution there is a slight gradual variation of speed of the swift depending on the decreasing diam-
20 eter of the hank.

During the operation of drawing off wire placed upon a horizontal swift there is some liability of the hank shaking down over the running part so that the wire will not draw
25 off freely, and it is then necessary to stop the machine in order to free the wire. In my machine since there is no upper bearing or support to the spindle the overlying laps can in such case be lifted off clear of the swift with-
30 out unwinding or removing the hank. When the running part of the wire is freed, such laps can be replaced similarly—i. e., over the top of the swift—or they may be wound back thereupon, as may be convenient. This is
35 an essential feature of my machine and is one in which it differs from all machinery hitherto constructed in which hanks of wire or spooled wire are employed for the purpose of making strand.

40 It may here be pointed out that the cost of spooling the wire rapidly increases the cost of the finished rope in proportion to the fineness of the wire used, and consequently, but especially in the case of fine wire, it is of very
45 great importance to be able to spin wire direct from the hanks, and by my invention this can be done.

It will of course be understood that any number of such swifts A A may be comprised
50 in a machine, the two end portions of which have been illustrated in the drawings, and that they may be disposed in various ways.

Instead of locating the hanks D D outside the swifts A A, as described, they may be
55 situated within them, in which event the wires can be drawn off from the inside thereof without arranging the swifts to be capable of rotation apart from the spindles B B.

In the other application of my invention
60 the method, arrangement, and operation will be the same or practically the same as explained. Therefore further description is unnecessary.

What I claim as my invention, and desire
65 to secure by Letters Patent, is—

1. In apparatus for the manufacture of wire and other ropes and strands, a swift

carrying a hank of wire or yarn, a vertical spindle, said swift being loose on said spindle
70 and free to rotate thereon in the same plane as the winding of the hank, said hank when placed on said swift being in such frictional contact therewith as to rotate with it, a bearing below said swift wherein said vertical
75 spindle is mounted and whereby said spindle and swift are entirely supported independently of any upper bearing or support, a guide attached to said spindle and through which the wire or yarn is led from the exterior of the hank, said guide extending beyond the
80 axis of rotation but not over the upper surface of the hank, a fixed guide disposed in line with the axis of rotation but in no way attached to or connected with the swift or spindle and through which the wire or yarn
85 is led from the first-mentioned guide, and means for rotating said spindle, all substantially as and for the purpose set forth.

2. In apparatus for the manufacture of wire and other ropes and strands, a swift car-
90 rying a hank of wire or yarn, a vertical spindle, said swift being loose on said spindle and free to rotate thereon in the same plane as the winding of the hank, said hank when placed on said swift being in such frictional
95 contact therewith as to rotate with it, a bearing below said swift wherein said vertical spindle is mounted and whereby said spindle and swift are entirely supported independently of any upper bearing or support, a fric-
100 tional device between said swift and spindle for controlling the movement of the swift on said spindle, a guide attached to said spindle and through which the wire or yarn is led from the exterior of the hank, said guide ex-
105 tending beyond the axis of rotation but not over the upper surface of the hank, a fixed guide disposed in line with the axis of rotation but in no way attached to or connected with the swift or spindle and through which
110 the wire or yarn is led from the first-mentioned guide, and means for rotating said spindle, all substantially as and for the purpose set forth.

3. In apparatus for the manufacture of
115 wire and other ropes and strands, a series of rotatable swifts carrying hanks of wire or yarn, vertical spindles whereon said swifts are respectively mounted and free to rotate in the same plane as the winding of the hank,
120 said hanks when placed on said swifts being in such frictional contact therewith as to rotate with them, bearings below said swifts wherein said vertical spindles are mounted and whereby said spindles and swifts are en-
125 tirely supported independently of any upper bearings or supports, means for rotating said spindles, guides fixed to said respective spindles below the swifts and through which the wire or yarn of each hank is led, said guides be-
130 ing extended outwardly and upwardly so that their guiding members are situated beyond and conveniently near the circumference of the hanks when these are placed on the

swifts, but not extending over the upper surface of the hanks, and fixed guides disposed in line with the respective axes of rotation of the hanks but in no way attached
5 to or connected with the swift or spindle and through which the wire or yarn is led from said first-mentioned guides respectively, all substantially as and for the purpose set forth.

10 4. In apparatus for the manufacture of wire and other ropes and strands, the combination with a swift A carrying a hank of wire or yarn, a spindle B upon which said swift is loosely mounted, a bearing C below the
15 swift and in which the spindle B is mounted and whereby said spindle and swift are entirely supported; means for revolving said spindle simultaneously with a spinning-ma-

chine, a guide E' fixed to said spindle and extending to conveniently near the hank but
20 not over the upper surface thereof by which guide the bight of wire is carried around with the swift and the wire is thereby twisted without necessarily being unwound from the
25 hank or spool when the swift is revolved, means for rotating said spindle and guide, a fixed guide E through which the wire is drawn off in line with the axis of the swift and hank,
30 a friction-washer F between the swift and spindle B, all substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

CHARLES JOHN BANKS.

Witnesses:

JAMES ANDREW HARVEY,
ARTHUR FREDERICK BURGESS.