

(No Model.)

4 Sheets—Sheet 1.

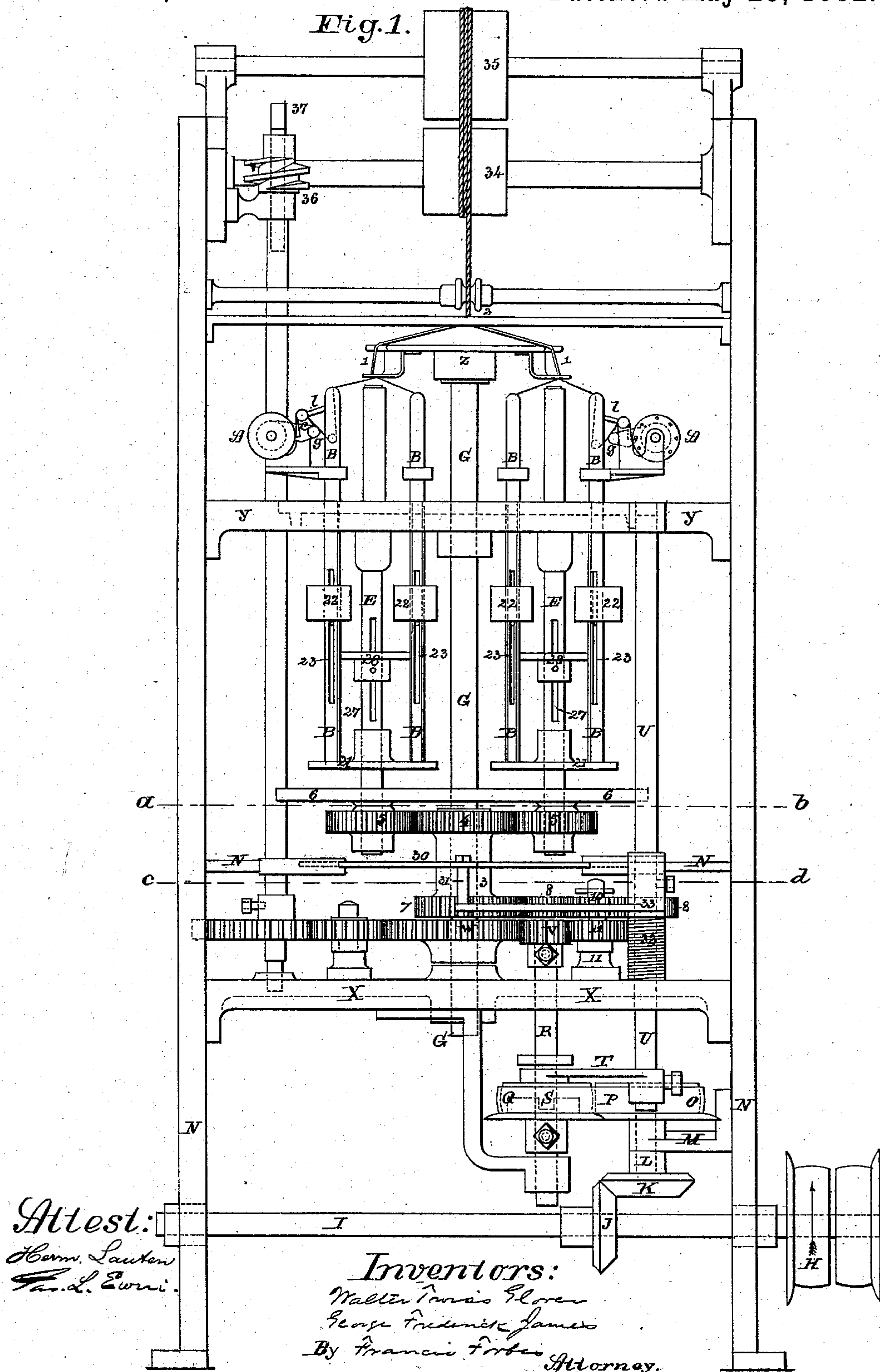
W. T. GLOVER & G. F. JAMES.

MACHINERY FOR TWISTING WIRE, &c.

No. 258,292.

Patented May 23, 1882.

Fig. 1.



(No Model.)

4 Sheets—Sheet 2.

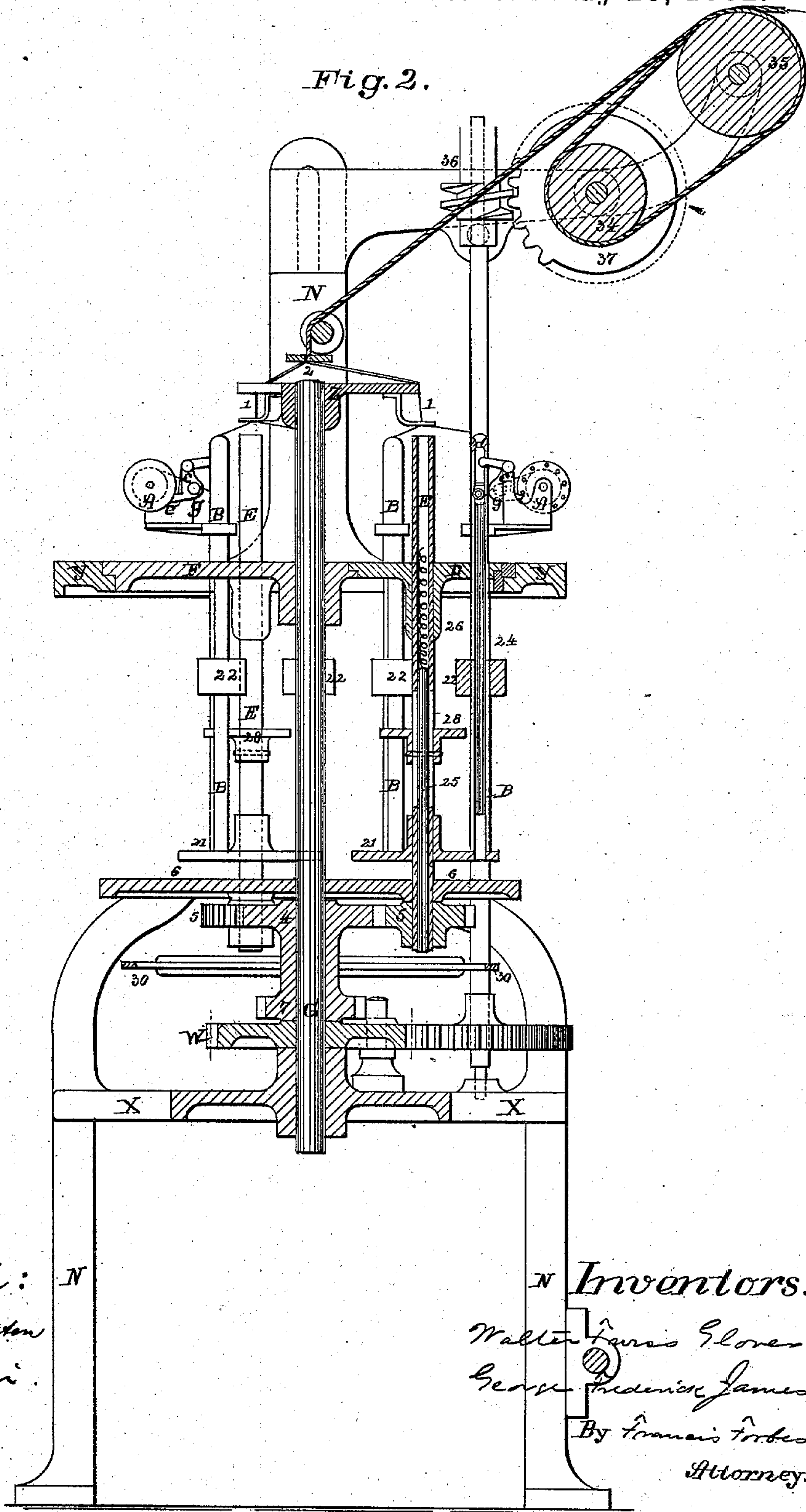
W. T. GLOVER & G. F. JAMES.

MACHINERY FOR TWISTING WIRE, &c.

No. 258,292.

Patented May 23, 1882.

Fig. 2.



Attest:

Herm. Lauton
Thos. L. Ewin.

Inventors:

Walter Tavis Glover
George Frederick James
By Francis Forbes,
Attorney.

(No Model.)

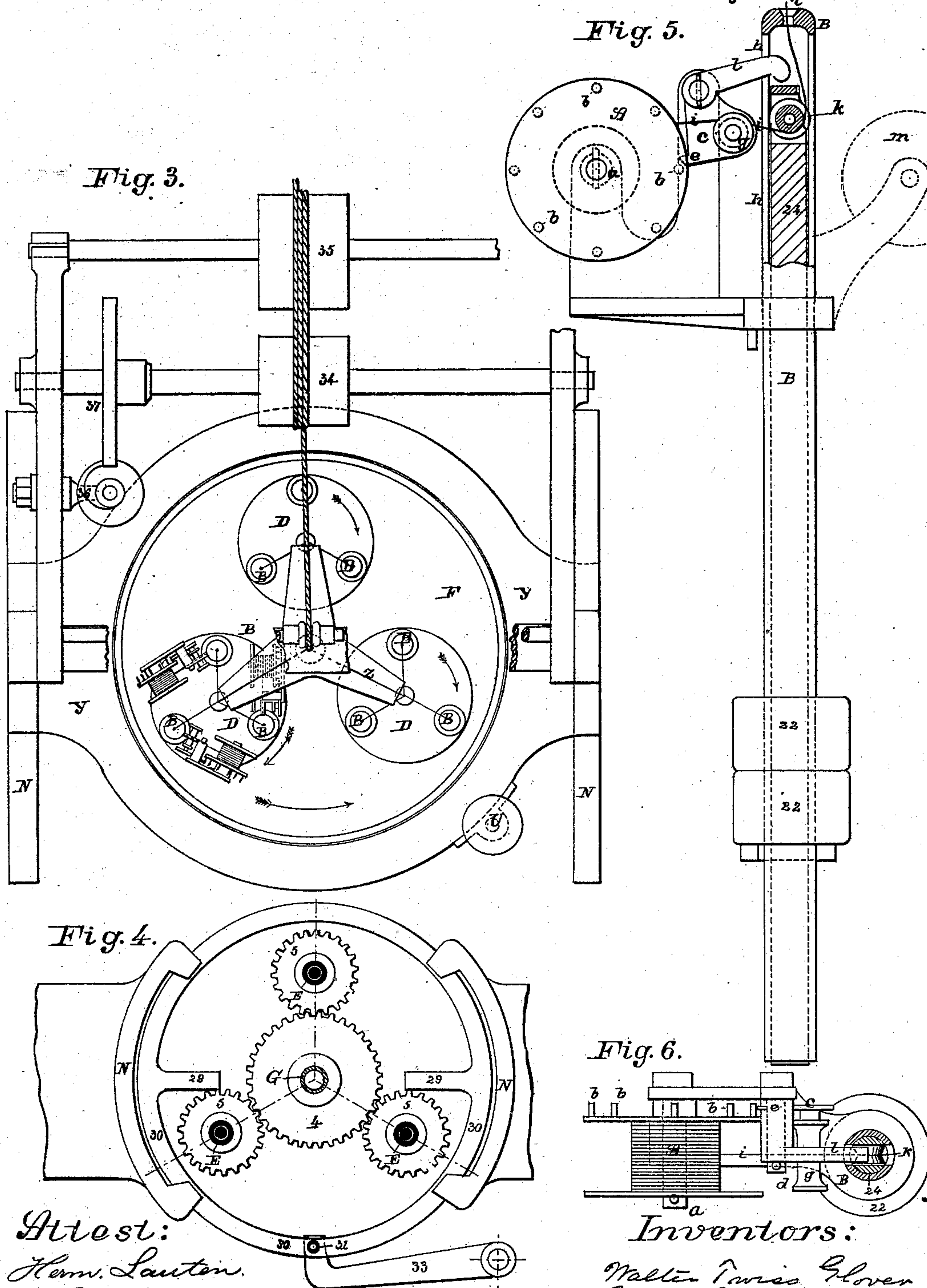
4 Sheets—Sheet 3.

W. T. GLOVER & G. F. JAMES.

MACHINERY FOR TWISTING WIRE, &c.

No. 258,292.

Patented May 23, 1882.



Attest:
Horn. Lantier.
Thos. L. Ewin

Inventors:
Walter Travis Glover
George Frederick James
By Francis Forbes,
Attorney.

(No Model.)

4 Sheets—Sheet 4.

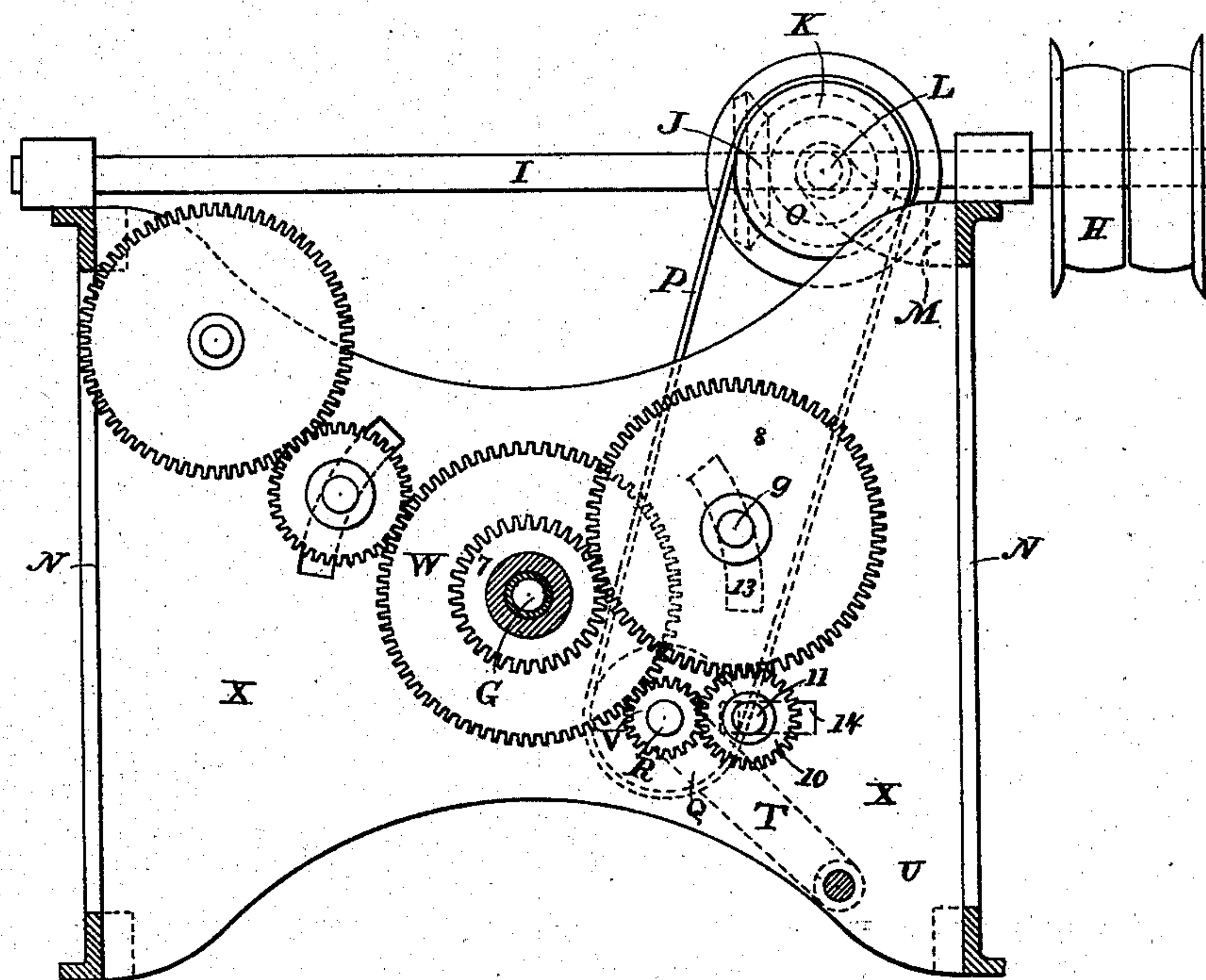
W. T. GLOVER & G. F. JAMES.

MACHINERY FOR TWISTING WIRE, &c.

No. 258,292.

Patented May 23, 1882.

Fig. 7.



WITNESSES

Wm A. Skinkley,
J. S. Latimer

INVENTORS:

Walter T. Glover,
George Frederick James,
By Francis Forbes
Attorney.

UNITED STATES PATENT OFFICE.

WALTER T. GLOVER AND GEORGE F. JAMES, OF MANCHESTER, COUNTY OF LANCASTER, ENGLAND.

MACHINERY FOR TWISTING WIRE, &c.

SPECIFICATION forming part of Letters Patent No. 258,292, dated May 23, 1882.

Application filed May 2, 1881. (No model.) Patented in Belgium February 28, 1881, No. 53,963, in England March 3, 1881, No. 913, and in France September 3, 1881, No. 144,705.

To all whom it may concern:

Be it known that we, WALTER TWISS GLOVER and GEORGE FREDERICK JAMES, subjects of the Queen of Great Britain and Ireland, residing at Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Machinery for Twisting and Lapping Wire and other Materials; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates particularly to machinery for twisting wires together in the manufacture of wire ropes, but is equally applicable to machinery for twisting or lapping wires or other required material round a central core—for instance, in insulating or covering telegraph-wires or for sheathing an internal rope or other core with wire or other continuous metal ribbon or other material.

The invention consists, first, in certain improvements in the spindles and bobbins employed in such machinery; and, secondly, in a novel combination of parts for stopping the machine in case of a wire or strand breaking or becoming exhausted.

In the accompanying drawings, Figure 1 represents a front elevation, Fig. 2 a vertical section, and Fig. 3 a plan, of a wire-rope-making machine fitted with our improved spindles and bobbins. Figs. 4 and 7 represent longitudinal sections on the lines *a b* and *c d*, Fig. 1. Fig. 5 is a side view, partially in section, and Fig. 6 is a plan, of one of our improved spindles and bobbins on a larger scale.

We will first describe the construction and action of one spindle and bobbin and then proceed to explain its application to the other mechanism.

In Figs. 5 and 6, A is the bobbin or reel (upon which the wire or other material is first wound) mounted upon a horizontal stud, *a*, carried by the spindle B. This bobbin A has on one of its sides or edges a series of pins or projections, *b*.

c is an anchor or escapement capable of os-

cillating to and fro upon the horizontal stud *d*, and having a catch, *e*, which escapement is designed to come in contact with each of the pins *b* in turn, and so prevent the bobbin A from revolving faster than one pin at a time. This escapement *c* also carries a roller, *g*, over which the wire *i* passes in being drawn off its bobbin A on its way to the spindle. This wire *i* also passes through a slot, *h*, formed in the spindle B, which is hollow and is fitted internally with a weighted drop-rod, 24, having a pulley, *k*, at its upper extremity, round and beneath which the wire has now to pass before it can emerge from the point of the spindle B. An arm, *l*, branching from the escapement *c*, also passes through the slot *h* and rests upon the top of the weighted drop-rod 24.

The action of this improved spindle is as follows: So long as the weighted drop-rod 24 is supported by the wire *i* the downward pressure upon the roller *g* serves to keep the escapement *c* in contact with the teeth *b* of the bobbin A, and thus prevent the latter from revolving more than the space of one tooth at a time, while by the upward action of the drop-rod 24 upon the arm *l* the escapement *c* is lifted, and so allows the wire *i* to be drawn off the bobbin A as it is required by the machine.

In Figs. 1, 2, 3, and 4 my improved spindles are shown as arranged for forming a wire rope of three strands, each strand being composed of three wires *i* twisted together. In this case the spindles B are fixed rigidly in sets of three in the small tables D, and their lower ends are supported in the small tables 21, fast upon the spindles E, (hereinafter called the "intermediate axes,") and around which the tables D revolve in the direction of the arrows. These three tables D D D have their bearings in a main table, F, which also has a rotary motion, and is driven by the hollow shaft G, but in the contrary direction to the small tables.

It will thus be observed that the function of the spindles B is to draw off the wire *i* from the bobbins A, and by rotating round the intermediate axes, E, to lay three of the wires *i* into one strand, while at the same time by the rotating of the three tables D around the com-

mon central shaft, G, the three strands are themselves twisted together, so forming a rope or cable of nine wires or three strands at one operation.

5 Revolving motion is communicated to the central shaft, G, from the horizontal shaft I, which is provided with fast and loose pulleys H.

J is a miter-wheel fast upon the horizontal shaft I, gearing with the miter-wheel K upon the vertical shaft L, mounted in the bearing M, attached to the main frame N.

10 O is a pulley upon the vertical shaft L, which, by means of a strap, P, drives the pulley Q, running loose upon the vertical shaft R, mounted as illustrated. This pulley drives the shaft R through the clutch S.

A clutch-fork, T, mounted upon the rod U, is provided for operating the clutch, as will be hereinafter explained.

20 V is a spur-pinion fast upon the end of the shaft R, which drives the spur-wheel W, secured upon the main shaft G, the lower end of which is carried in the lower plate, X, while the main table F, supported in the upper plate, Y, acts as the bearing for the upper end.

25 Upon the top of the central hollow shaft, G, I mount an eyelet-frame, Z, fitted with eyelets 1, each eyelet being immediately over the center of an intermediate axis, E, for guiding the strands as formed, and from whence they are again gathered for the final laying operation, which takes place in the aperture 2, which in its turn is situated over the center of the main shaft G. The intermediate axes, E, are driven from a sleeve, 3, running loose upon the main shaft G, for which purpose the upper end of the sleeve 3 carries a spur-wheel, 4, gearing with the spur-pinions 5 on the ends of the intermediate axes, E. (See Fig. 4.) These intermediate axes E have their bottom bearings in the lower table, 6, fast upon and revolving with the main shaft G, while the small tables D, resting in the upper revolving table, F, serve to carry the upper ends of the said axes. The sleeve 3 is at its lower end provided with a spur-pinion, 7, which receives motion from a wheel, 8, gearing in turn with a pinion, 10, upon the stud 11. This latter pinion is fast upon and driven by an under pinion, 12, upon the same stud 11, and this last pinion gears with the pinion V upon the end of the vertical shaft R, driven as hereinbefore described. (See Fig. 7.) The result of this combination is that while the intermediate axes are themselves carried round the main shaft G they are driven round on their own axes at an accelerated rate and in the opposite direction.

55 The wires *i*, in passing from the bobbins A, are maintained at one uniform tension by means of the weighted drop-rods 24, the weights 22 of which rest upon pins passing through the slots 23 in the spindles B, in the manner well known in connection with braiding machinery, and the amount of tension can thus be regulated by the weights 22, which can be varied at pleasure.

In case of one of the wires *i* breaking or be-

coming exhausted it will be obvious that the weight 22 appertaining to such wire will drop until the pin supporting it comes to the bottom of the slot 23, and this is utilized to stop the machine in the following manner: 70

The intermediate spindles, E, are hollow and provided with drop-rods 25, (see Fig. 2,) which are held up by springs 26. These drop-rods, 75 through the medium of transverse pins working in slots 27, (see Fig. 1,) support small tables 28, sliding upon the intermediate spindles, so that when a wire breaks the weight appertaining to it drops upon the corresponding small table, 28, and, overcoming the spring 26, causes the drop-rod 25 to protrude through the end of the intermediate spindle. As the protruding rod 26 is carried round it strikes against a finger, 29, upon a ring, 30, supported from the main frame N, (see Fig. 4,) carrying it round with it. From the ring 30 a stud, 31, projects. (See Figs. 1 and 4.) 85

The setting-on rod U is provided with a spring, 32, giving it a tendency to fly upward and pull the clutch S out of gear. 90

When the attendant sets on the machine he pushes down the setting-on rod U, so allowing the clutch S to go into gear, and places a trigger-finger, 33, (branching from the rod U,) under the stud 31, so that if a wire breaks and the drop-rod of any one of the intermediate axes E strikes either of the fingers 29 the stud is carried off the trigger-finger 33, so allowing it to fly upward and draw the clutch S out of gear, and so stopping the machine. 95 100

We provide friction-drums 34 and 35 for drawing forward the finished rope at a suitable speed, driven by the worm 36 and worm-wheel 37, said worm being carried by a vertical shaft which is operated by gearing from the spur-wheel W, fast upon the main shaft G. 105

In case the wire is too rigid and strong to pass through the mouth or point of the hollow spindle B it can be arranged to pass direct over a larger roller, *m*, (seen dotted in Fig. 5,) and thus join the other wires with which it is to be twisted or laid without being bent. 110

We would observe that these improvements are applicable in the construction of a machine in which two or more galleries of spindles are arranged one over the other, where it is required to twist, lay, or lap more than one set of wires or other material together or round any desired central core. 115 120

The general features of our improved machinery, as hereinbefore specified, apart from the combinations hereinafter claimed, are substantially identical with those described and claimed by one of us as his sole invention in an application for Letters Patent of the United States heretofore filed, and are hereby disclaimed in favor of George Frederick James. (See Letters Patent No. 251,118, dated December 20, 1881.) 125 130

What we desire to claim as our invention, and to secure by Letters Patent of the United States, is—

1. The combination of a hollow spindle hav-

ing an internal drop-rod, a bobbin having pegs or projections on one of its ends, and an escapement having a lever-arm to engage with said drop-rod, a catch-projection to engage with said pegs, and a guide-roller, all mounted and operating substantially as hereinbefore specified, for the purpose set forth.

2. A weighted drop-rod, 24, arranged and operating substantially as hereinbefore specified, in combination with a bobbin-escapement, c, coacting with the upper end of said drop-rod, a drop-rod, 25, having a table, 28, to

engage with the weight of the former, clutching and unclutching mechanism, and mechanism connecting said drop-rod 25 with said clutching and unclutching mechanism, substantially as shown and described, for the purposes set forth.

WALTER TWISS GLOVER.
GEORGE FREDERICK JAMES.

Witnesses:

JOHN I. ROYLE,
EDW. JOYCE.