

(No Model.)

2 Sheets—Sheet 1.

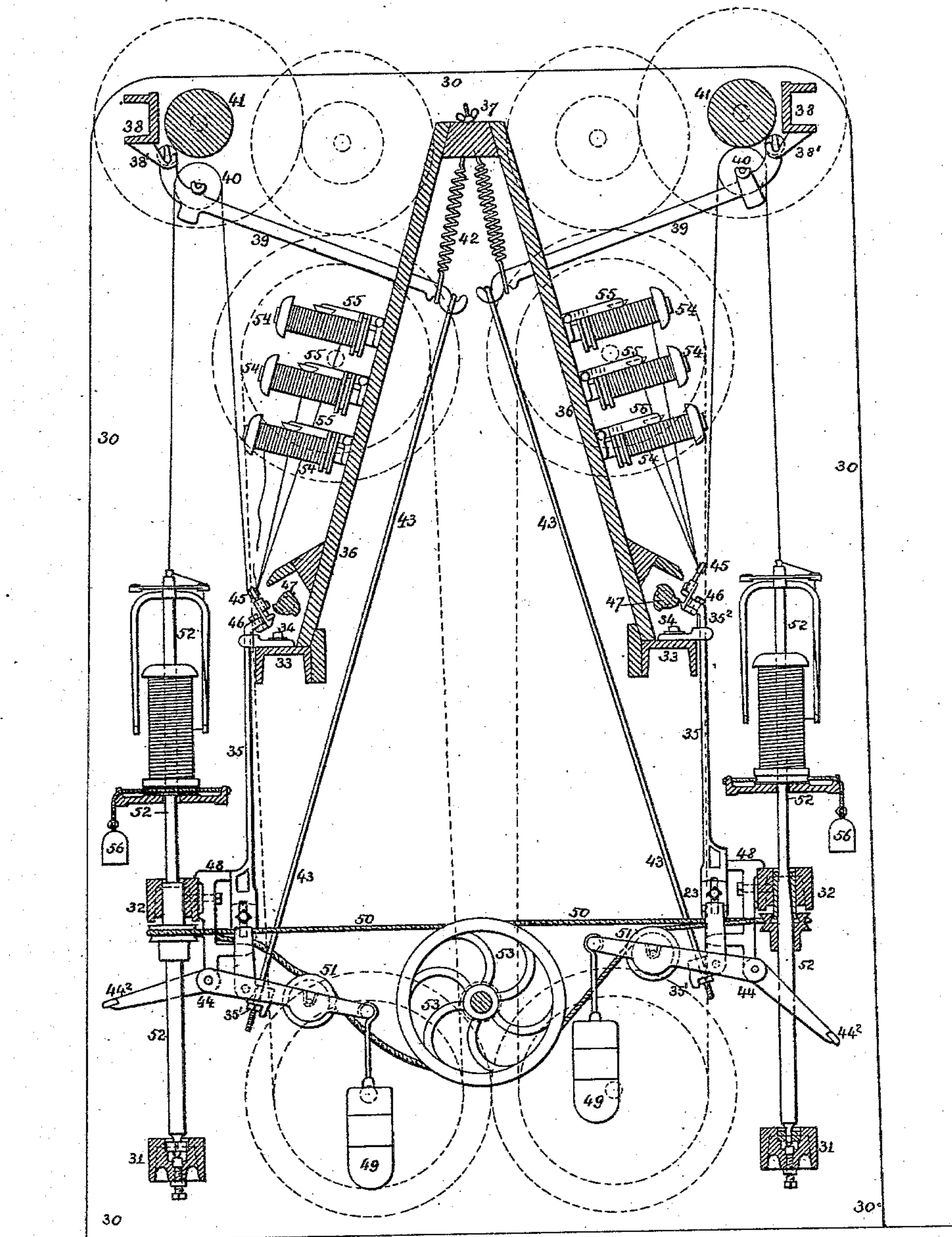
J. BOYD.

STOP MOTION MECHANISM FOR TWISTING AND WINDING MACHINES, &c.

No. 303,210.

Patented Aug. 5, 1884.

FIG. 1.



Witnesses

John E. Parker  
Harry Smith

Inventor

John Boyd  
by his attorneys  
Howison and Sons

(No Model.)

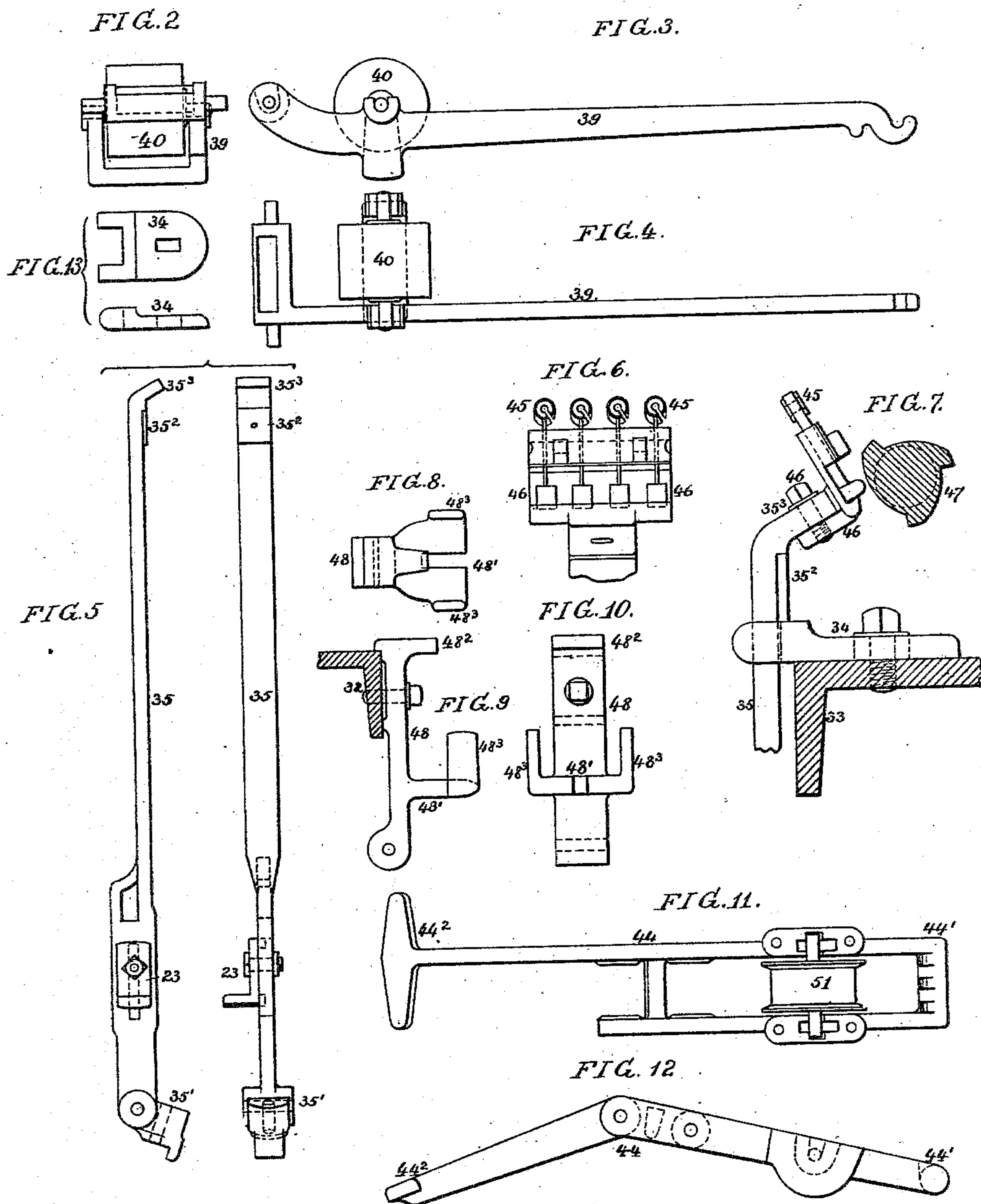
2 Sheets—Sheet 2.

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WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN BOYD, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

STOP-MOTION MECHANISM FOR TWISTING AND WINDING MACHINES, &c.

SPECIFICATION forming part of Letters Patent No. 303,210, dated August 5, 1884.

Application filed July 30, 1883. (No model.) Patented in England May 26, 1883, No. 2,619, and in Germany July 8, 1883, No. 27,373.

*To all whom it may concern:*

Be it known that I, JOHN BOYD, of Glasgow, county of Lanark, Scotland, in the Kingdom of Great Britain and Ireland, have invented a new and useful Improvement in Stop-Motion Mechanism for Twisting and Winding Machines, &c., of which the following is a specification.

My invention consists of certain improvements in the detailed construction of the stop-motion mechanism for winding, twisting, and doubling machines, such as are described in the Letters Patent granted to me May 3, 1881, No. 240,957, with which are combined features of improvements on some of the devices described in the Letters Patent granted June 7, 1881, No. 242,591, and November 28, 1882, No. 268,178, as more fully described hereinafter.

The improved mechanism is shown in the accompanying two sheets of drawings.

Figure 1, Sheet 1, is a transverse vertical section of a doubling, twisting, and winding machine with my improvements applied thereto. The figures on Sheet 2 are enlarged views of details, and will be most conveniently and intelligibly specified in the course of the following description.

The machine to which my improvements are applied is, in Fig. 1, represented as having the usual two sets of parts, and those on the right-hand side are shown as with the yarns unbroken and in action, while on the left-hand side the parts are shown with a yarn broken and all the parts in the positions they assume when stopped. In the figure, 30 is the external outline of a transverse frame of the machine. 31 and 32 are two longitudinal rails carrying the spindles. Higher up there are longitudinal rails 33, in which are fixed the catching and guiding plates 34 for the vertical rods 35. These rails also support the bottom ends of bobbin-bank boards 36, fixed at their upper ends to a rail, 37, supported by the transverse frames 30. At the top of the machine there is at each side a rail, 38, formed with projections 38' for carrying the fulcrum of levers 39, which carry the lower overhead feed-rollers, 40, and bear them up against the

continuously-rotating rollers 41. These rollers 41 are carried and driven as in former machines, the driving-gearing being indicated by dotted circles in Fig. 1. The inner ends of the levers 39 are drawn up by helical springs 42, adjustably fixed to the middle rail, 37, by screwed rods and nuts admitting of the pressure of the lower rollers, 40, against the upper feed-rollers, 41, being suitably adjusted. The lever 39 and its feed-roller 40 are shown detached in Figs. 2, 3, and 4, Sheet 2. Each lever 39 has hooked to its inner end a light rod, 43, the lower end of which is adjustably attached to a lug, 35', formed on the lower end of the vertical rod or bar 35, which is shown detached in side and back view in Fig. 5. At its lower end the vertical rod 35 is jointed to a lever, 44, (shown detached in Figs. 11 and 12,) and near its upper end the rod 35 has on its inner side a catch-plate, 35<sup>2</sup>, (described in the previous patents referred to,) which engages with another catch plate or piece, 34, (shown separately in plan and side views in Fig. 13,) adjustably fixed on the rail 33. This plate 34, besides acting as a catch, serves to guide the rod 35, and to regulate the distance between the detectors 45, carried in the holder 46 and the rotating cam 47. The lower part of the rod 35 is guided by a bracket, 48, bolted to the rail 32, and shown separately in Figs. 8, 9, and 10. The lower end of the bracket 48 has the lever 44 jointed to it, and the vertical rod 35 passes up from its point of attachment to the lever 44 through a slot in an inwardly-projecting part, 48', of the bracket 48, and in contact with the inwardly-projecting top 48<sup>2</sup> of that bracket. This part 48' of the bracket acts as, and is hereinafter termed, the "bottom grip" for the driving-cord. When the vertical rod 35 is raised so that its catch-plate 35<sup>2</sup> is above the fixed catch-plate 34, it is constrained by the projection 48<sup>2</sup> on the under bracket, 48, to move its upper end inward, so as to engage with the catch-plate 34. The top end of the rod 35 has an inclined part, 35<sup>3</sup>, to which the detector-holder 46 is fixed by a screw-pin, Fig. 7. The detector-holder is shown in inner side elevation in Fig. 6. The improved detectors 45 and



holder 46 form no part of the present invention, however, but are subjects of a separate application for a patent, filed July 30, 1883, Serial No. 102,319.

5 It will be sufficient to state here that when any one of the threads (drawn from the bobbins 54) which sustain the detectors breaks or fails its detector 45 drops, and the foot of this detector forming a projection on the face of  
10 the detector-holder 46, the latter is pushed outward by the continuously-rotating cam 47, so as to spring the vertical rod 35 sufficiently to take its catch-plate 35<sup>2</sup> clear of the fixed catch-plate 34, whereupon the weight, acting  
15 on the rod 35, draws it down, (against the resistance of the spring 42.) The weight 49, for drawing down the vertical rod 35, and which also effects the other movements necessary for stopping the twisting and winding  
20 action, is applied to the lever 44, to which the lower end of the rod 35 is jointed. This lever 44, as shown in Figs. 11 and 12, has at its inner end, 44', separate notches, into any of which the weight 49 is hooked, to keep it clear of the  
25 cord 50, which has a slightly different path in different cases. The lever 44 carries the pulley 51, for tightening the cord 50, by which the spindle 52 is driven. The driving-cord 50, of which there is one for each spindle, on its way  
30 between the double-grooved driving-pulley 53 and the spindle 52, passes on each side of the bracket 48, but on the inner sides of the vertical lugs 48<sup>3</sup>, formed on the bottom grip, 48', and when a stoppage is being brought  
35 about, the cord 50 is gripped between this part 48', Fig. 8, and a top gripping-bracket, 23, which can be bolted to either side of the descending rod 35, to suit the direction in which the cord is running. The cord, which  
40 is slack when not driving its spindle, is allowed to lie loose and slip in its groove on the driving-pulley 53. The weighted lever 44 has a projecting foot starting lever or treadle, 44<sup>2</sup>. The threads from the bobbin 54 are carried,  
45 as in the former patent referred to, each through a detector, 45, in the detector-holder 46, and up between the feed-rollers 40 and 41 and down to the spindle, to be wound and doubled or twisted. The inclined boards 36,  
50 carrying the bobbins 54, from which the threads are drawn, are narrowed and placed with small spaces between them, to allow of the passage of the levers 39. Hinged drags 55 are in some cases applied to the bobbins  
55 54, and cord-drags, with weights 56, to the flier-bobbins, on which the yarn is being twisted. When a thread breaks or fails, its detector 45 drops, and its foot forming a projection in the face of the detector-holder 46,  
60 the latter is pushed outward by the continuously-rotating cam 47, springing the vertical rod 35 and its catch-plate 35<sup>2</sup> clear of the fixed catch-plate 34, whereupon the weight 49 draws it down, bringing the detectors  
65 also down clear of the rotating cam 47, the same movement also lowering the top cord-

gripping bracket, 23, onto the under fixed cord-grip, 48', and also lowering the jointed lever 44 and its cord-pulley 51, and at the same time raising the treadle 44<sup>2</sup>, instantly  
70 causing the cord 50 to act as a brake on the pulley of the spindle 52, thus stopping the winding or winding and twisting action of the spindle very quickly. The same movement also acts through the lug 35' on the rod 35  
75 and on the lever 39 against the upward pull of the spring 42, lowering the under feed-roller, 40, from the upper feed-roller, 41, and causing the instant cessation of the delivery of threads. When these actions take place,  
80 all the parts are in the positions represented in the left side of Fig. 1. When the ends are properly pieced, a very slight pressure of the foot on the treadle instantly sets the spindle and feed-roller in motion, and the parts are  
85 then all as represented on right hand of same figure.

The described construction, whereby the bobbin-banks 36 are carried up to the middle rail near the top of the frame, and the levers  
90 39, which are centered in front of the top rollers, 41, have their inner ends passing behind the said bobbin-banks, gives room (among other advantages) for larger bobbins, and also for a larger number of them, and enables the  
95 threads to be carried direct from the bobbins to the detectors without the use of any intervening guide-rods, as in the prior machine patented May 3, 1881.

I claim as my invention—

1. The combination of winding mechanism, substantially as described, and a frame with bobbin-banks 36, rail 37, near the top of the frame, to which said banks are connected, top roller, 41, lower rollers, 40, levers 39, carry-  
105 ing the latter and rods 43, and means, substantially as set forth for operating the latter, the said levers being fulcrumed in front of the top roller, and extending between and behind the bobbin-banks, all substantially as de-  
110 scribed.

2. The combination of winding mechanism and stopping-rod 35 with feed-rollers 40 41, lever 39, carrying one of the feed-rollers, and a rod, 43, connecting the stopping-rod with  
115 the said lever 39, substantially as set forth.

3. The combination of winding mechanism, substantially as set forth, frame, detectors, and catch 34, with a rod, 35, carrying the detectors and a catch, 35<sup>2</sup>, bracket 48, in which  
120 said rod is guided, and by which it is strained against the catch 34, and cord-grips controlled by said rod 35.

4. The combination of winding mechanism, substantially as described, feed-rollers 40 and  
125 41, lever 39, carrying one of said rollers, with a stopping-rod, 35, lever 44, connected to said rod, and carrying a pulley for the driving-cord, and a rod, 43, connecting the lever 39 with the rod 35, substantially as set forth.  
130

5. The combination of a vertical rod, 35, having a catch-plate, 35<sup>2</sup>, frame, and guide-



bracket 48, with detectors carried by said rod 35, rail 33, and adjustable catch-plate 34, forming also a guide for said rod, substantially as specified.

- 5 6. The combination of rod 35 and a pivoted lever, 44, carrying a cord-tightening pulley, with rail 32 and bracket 48, having a slotted grip, 48', to guide said rod, and a part, 48<sup>2</sup>, to press thereon, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN BOYD.

Witnesses:

JOHN FRIEL,  
ROBERT BERRY.