

(No Model.)

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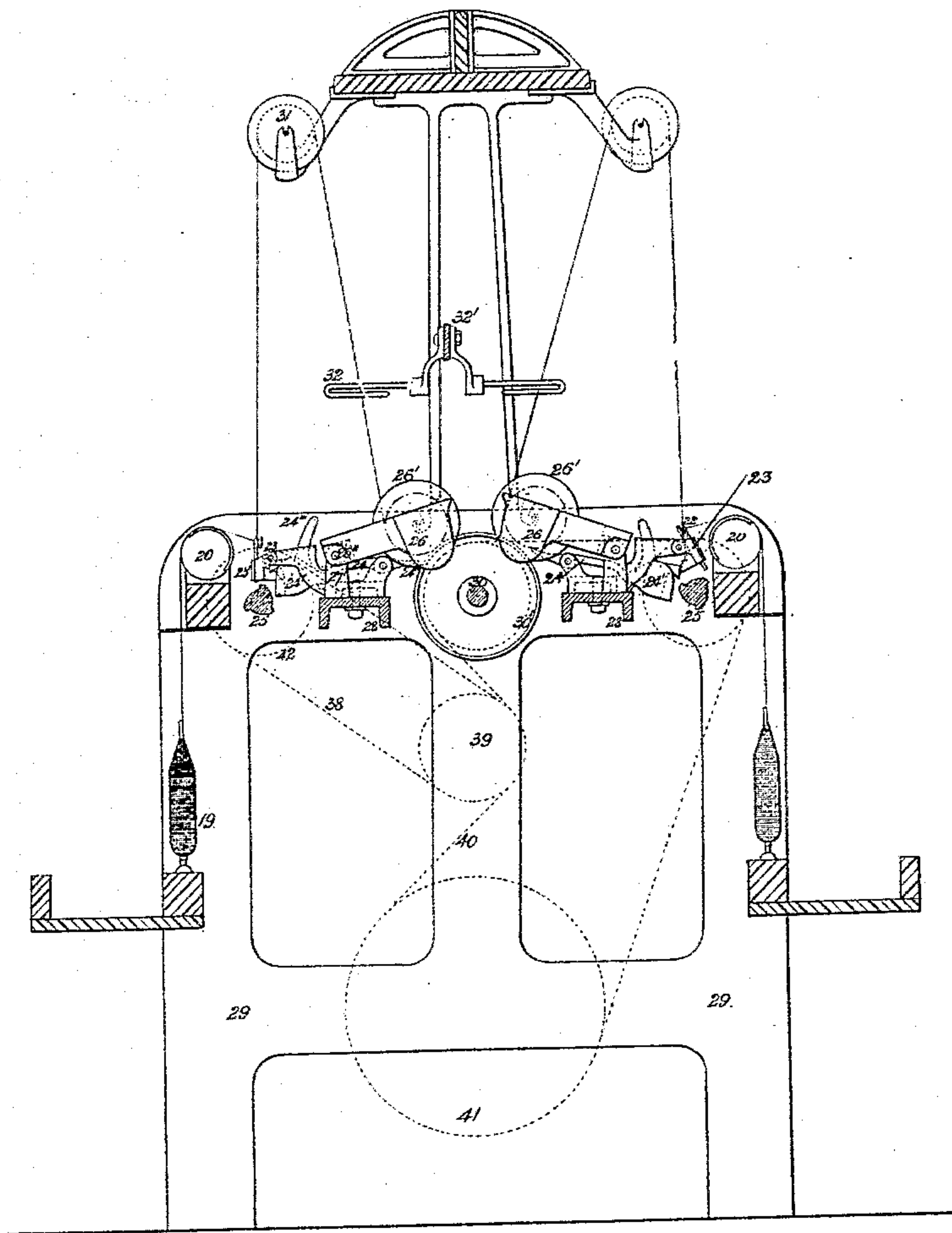
J. BOYD.

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

No. 359,839.

Patented Mar. 22, 1887.

Figure 1.



Witnesses:
Alex. Barkoff
William D. Courner

Inventor:
John Boyd
by his Attorneys
Howson & Sons

(No Model.)

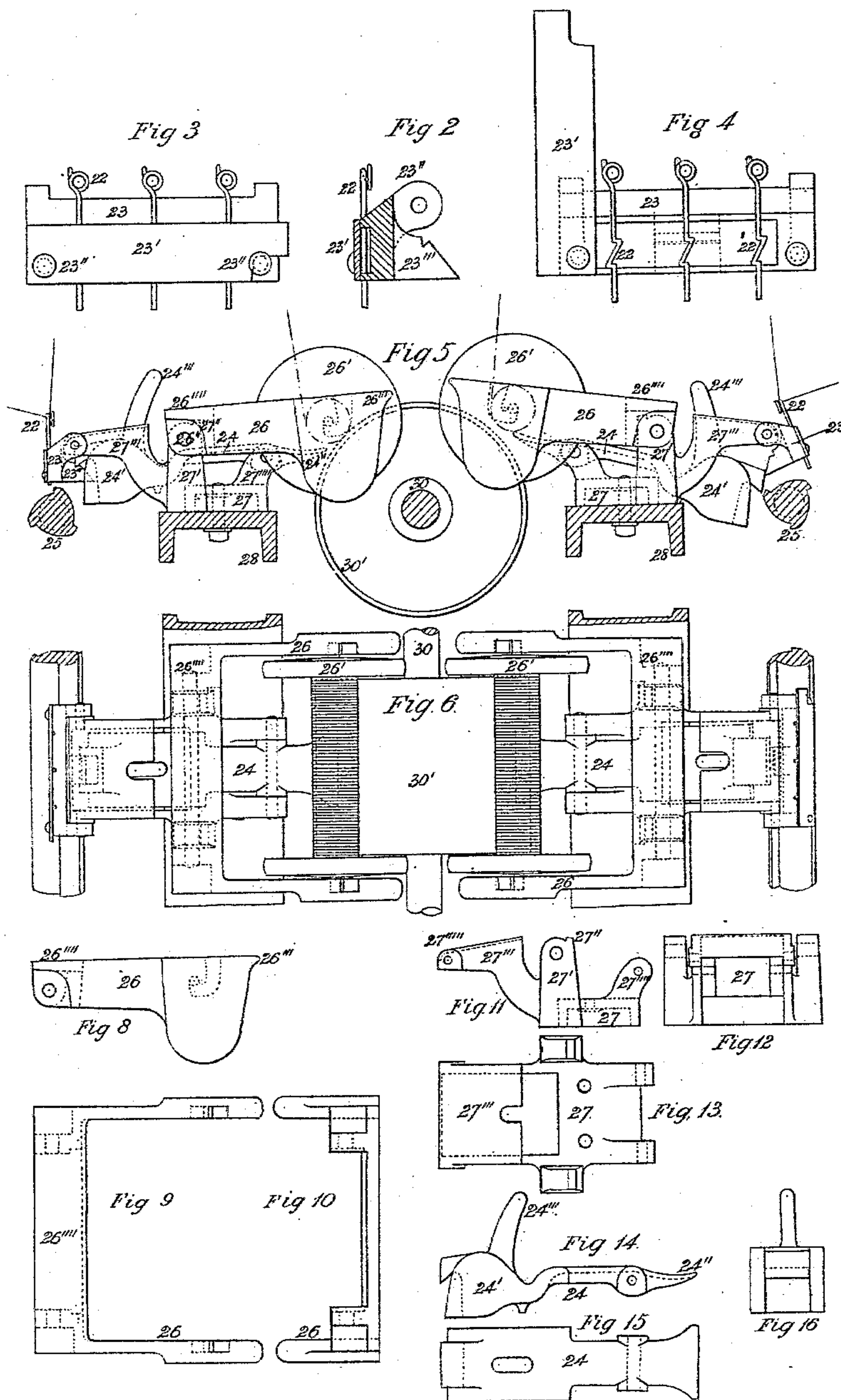
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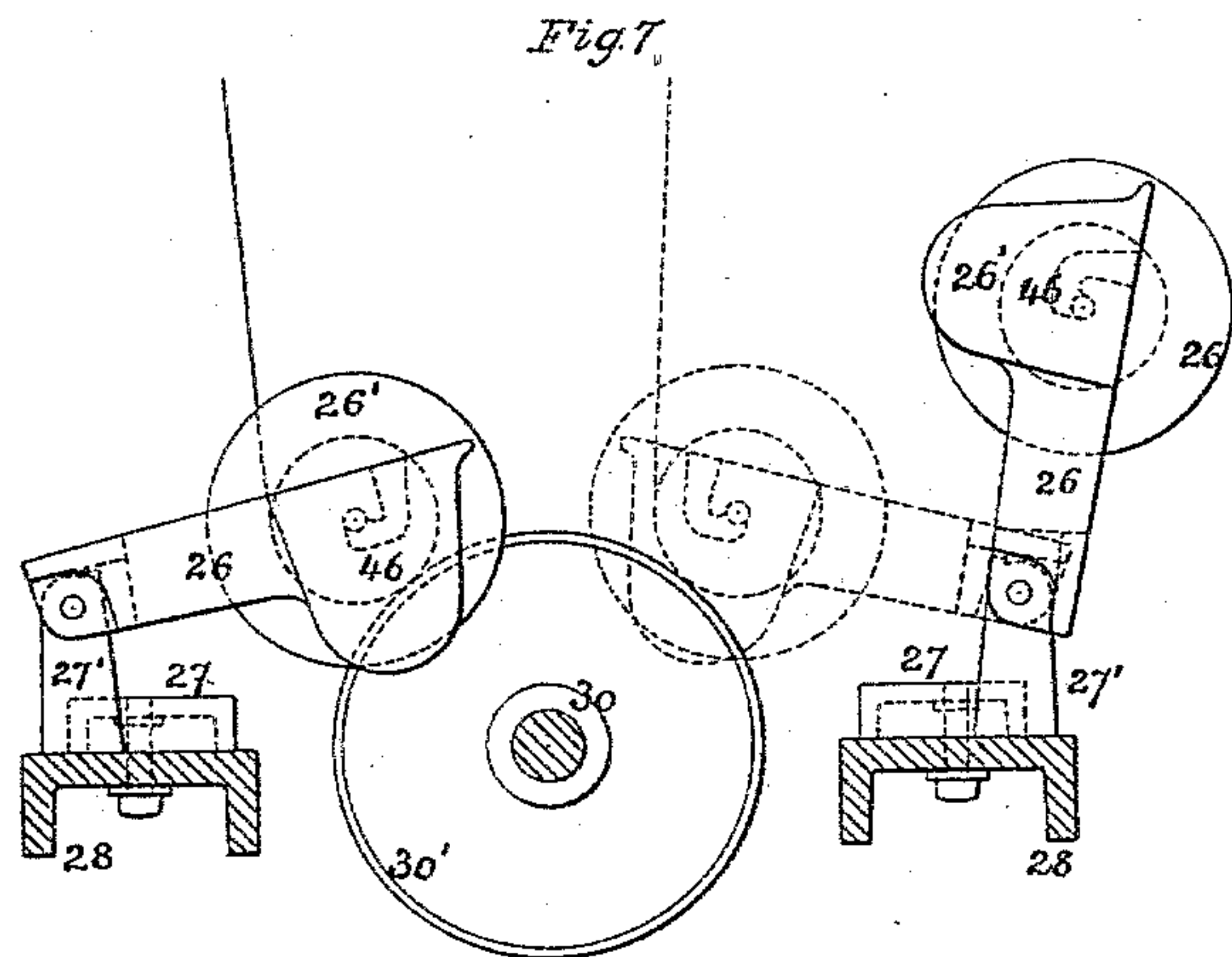
3 Sheets—Sheet 3.

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

No. 359,839.

Patented Mar. 22, 1887.



Witnesses
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Inventor:
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UNITED STATES PATENT OFFICE.

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

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

SPECIFICATION forming part of Letters Patent No. 359,839, dated March 22, 1887.

Application filed June 16, 1886. Serial No. 205,350. (No model.) Patented in England April 29, 1886, No. 5,811.

To all whom it may concern:

Be it known that I, JOHN BOYD, a subject of the Queen of Great Britain and Ireland, and a resident of Glasgow, county of Lanark, Scotland, have invented certain Improvements in Stop-Motion and Winding Mechanisms of Winding, Twisting, and Analogous Machines, (for which I have obtained British Patent No. 5,811, dated April 29, 1886,) of which the following is a specification.

My invention consists of certain improvements applicable to the drum winding, twisting, and analogous machines for which I have obtained British Letters Patent No. 2,986, dated October 10, 1872; No. 790, dated February 27, 1877; No. 4,241, dated November 13, 1877, and No. 2,404, dated June 17, 1878; and also United States Patents No. 217,769, dated July 22, 1879; No. 236,766, dated January 18, 1881, and No. 240,957, dated May 3, 1881.

In the accompanying drawings, Figure 1 is a transverse vertical section of drum-winding machines similar to those described in the patents referred to, but embodying my present improvements. Figs. 2 and 3 are a sectional view and front view, respectively, of the swinging catch carrying the detectors and cover-plate therefor. Fig. 4 is a front view similar to Fig. 3, but with the cover-plate lifted up so as to show the form of the improved detectors more clearly. Fig. 5 is a transverse section similar to the main part of Fig. 1, but drawn to a larger scale. Fig. 6 is a plan view of the same. Fig. 7 is a view of the winding-drum, bobbins, and bobbin-holders when arranged for single winding, one bobbin being shown as lifted away from the drum and resting in that position. Figs. 8, 9, and 10 are different detached views of the bobbin-holder. Figs. 11, 12, and 13 are detached views of the improved rail-bracket, which carries the bobbin-holder and all the stop-motion and winding details for each bobbin. Figs. 14, 15, and 16 are detached views of the lever for lifting and braking the bobbin.

In Figs. 1, 5, and 6 the devices at the left-hand side are shown in positions as when the winding is in progress, while on the right-hand side they are shown as when the winding is stopped by the breakage or failure of a thread.

Some of the principal parts of the machine

are similar in their construction and operation to those shown and described in my patents above referred to, and I will first, therefore, briefly describe those parts.

As the operative parts on one side of the machine are duplicates of those on the other, a description of one will apply to both. There is a central longitudinal shaft, 30, provided with drums 30', fixed to it, and each drum is adapted to act on two winding-bobbins, 26', one on each side. Each bobbin is carried by a bobbin-holder, 26, having curved grooves 46, Fig. 7, for the reception of the opposite ends of the bobbin-spindle, as usual. The cop-yarns 19 pass from the cops or bobbins up to and over the adjustable friction-bars 20, thence through the detectors 22, from which they pass to elevated pulleys 31, and thence downward through the usual traverse-guides, 32, to the bobbin. The same traverse-bar, 32', carries the guides for both sides of the machine. At each side of the machine, below the detectors, is a rotating ratchet-shaft, 25, for acting on the detectors.

As described in my British Patent No. 4,241 of 1877, the detector-wires are carried in a swinging catch and detector-holder, which supports or holds up the front weighted arm of a pivoted lever, so that when a yarn or thread breaks or fails the corresponding detector drops into the path of the rotating ratchet-shaft 25. This shaft, then acting on the lower end of the detector, moves the swinging holder, so as to release the lever referred to, which falls and carries the bobbin clear of the winding-drum, and also at the same time takes the detector-wire clear from the ratchet-shaft.

The parts above referred to do not differ materially in their combination from what is described in my patents before mentioned. In the present instance, the detector-wires 22 are carried by a swinging catch and detector-holder 23, which, in the construction shown in Figs. 1 to 16, inclusive, supports and holds up the front weighted arm, 24', of the lever 24. The opposite end, 24'', is beneath the bobbin 26', so that when the front end of the lever 24 is released its inner arm lifts the bobbin slightly upward, and thereby stops the winding action. This combined catch and bobbin-

lifting lever 24, together with the swinging catch and detector-holder 23, which works in concert therewith, are carried by a bracket, 27, mounted on a longitudinal rail, 28, of the frame 29. The catch or engaging part 23' of the holder 23 is vertically below the suspension-point 27'', Figs. 2 and 11, of the said holder, so that when the parts are engaged there is practically no strain which will tend to move the detector-holder out of position, and no separate stop is required to insure its taking or keeping its position. Each detector-wire 22 carried in the swinging catch and detector-holder is formed with an S-shaped or double bend adapted to a recess in the holder, as shown in Fig. 4, and these detector-wires are held in place by a cover-plate, 23'. This plate is made of thin metal, and is secured by two round-headed pins, 23'', at opposite ends. On one of these pins the plate can be made to turn, as indicated in Fig. 4, while the notched opposite end of the plate engages with and is secured by the head of the other pin when the plate is turned down to the position Fig. 3.

The S-shaped parts of the detector-wires 22 do not touch, and therefore have no friction against the back of the recess in the holder, as seen in Fig. 2. The straight parts of each wire pass through guide notches or grooves in upper and lower projections or ribs of the holder, the two guide-grooves for each wire being in the same straight line. The S-shaped part being between the upper and lower ribs, in which the guide-grooves are formed, limits the up and down or longitudinal movement of the wire. When the cover-plate 23' is closed, the latter, acting in combination with the S-shaped part, prevents the wire from turning—one side of the S part encountering the plate if there is a tendency to turn in one direction, and the other side of the S part doing so if there is a tendency to turn in the opposite direction.

In the construction shown in Figs. 1 to 10, the bobbin-holder, which is preferably made with curved projections 26'' at its inner top corners for convenience in lifting, is centered on a pair of lugs, 27', formed with stops 27'', projecting up from the bracket 27. The stops 27'' are in such positions with reference to the cross-bar 26'', Figs. 8 and 9, of the bobbin-holder 26 that when the bobbin is removed from the holder the latter will be prevented from falling down, and will be sustained by said cross-bar 26'' coming into contact with and resting on said stops 27''. On the other hand, when it is desired to elevate the bobbin-holder and throw it back out of position, as indicated at the right-hand side of Fig. 7, the backs of the lugs 27' act as stops, in connection with the cross-bar 26'', to sustain the holder, with or without its bobbin, in that elevated position. The bracket 27 is, in the construction referred to, also formed with a forwardly-projecting box-like portion, 27'', from which the swinging catch and detector-holder 23 is suspended.

This box-like portion 27'' of the bracket covers or incloses the catching parts of the holder 23 and lever 24. This lever 24 may be centered on the same axis, 26'', as the bobbin-holder; but it is by preference mounted in separate lugs, 27'', on the same bracket, so as to have its center nearer to the winding-drum and under the bobbin-holder and bobbin.

The short inner arm, 24'', of the lever for lifting and braking the bobbin, is made to extend as far in as possible toward the point of contact of the bobbin and drum in winding, so that by pivoting this lever in the separate lugs 27'', instead of forward on the pivoting-point of the bobbin-holder, an increased leverage is allowed, and the front arm need not be made so heavy for lifting the bobbin and its holder.

An upwardly-projecting handle, 24'', is formed on the front arm of the said lever, so that the latter may be conveniently lifted to restore the parts to their normal working positions.

It will be seen that by the construction described I obtain a very compact arrangement of stop-motion and winding mechanism, since the swinging catch and detector-holder 23, the catch and bobbin-lifting lever 24, and the bobbin-holder 26 are all mounted on one bracket, 27, which is also provided with stops to sustain the bobbin-holder in either the depressed or elevated position, as before described.

In Fig. 7 I have shown this improvement of the stops for sustaining the bobbin-holder without the stop-motion devices and with only one bobbin in use at a time for single-winding.

In Fig. 1 I have shown by dotted lines the means I prefer to use for driving the moving parts. This is accomplished by two endless belts, 38 and 40. One of these belts, 38, passes around a pulley, 42, on one of the ratchet-shafts 25 and around a pulley, 39, on a fixed stud on the frame, while the other endless belt, 40, passes in contact with the first belt, 38, on the stud-pulley, around a pulley on the drum-shaft 30, a pulley on the other ratchet or wiper shaft 25, and also around a pulley, 41, on a shaft which works the traverse motion. I prefer to drive the several parts from the drum-shaft 30; but any of the shafts may be the driving-shaft. These pulleys and belts are all arranged in a boxed-up space at one end of the machine, and are thereby protected and guarded.

I claim as my invention—

1. The combination of detector-wires, each having an S-shaped part and straight parts on each side thereof, with a stop-motion detector-holder recessed to receive the S shapes of the detector-wires and having guide-notches for the straight parts of the wires, and a cover-plate, against which the S shapes may bear to prevent turning in either direction, all substantially as set forth.

2. The combination of the swinging catch and detector-holder 23, bobbin-lifting catch

lever 24, and bobbin-holder 26 with a bracket, 27, carrying the several parts, and provided with stops to sustain the bobbin-holder in either its elevated or depressed position, substantially as set forth.

3. The bracket 27, having lugs 27', provided with a stop or stops, 27'', in combination with the bobbin-holder 26, having a cross-bar, 26''', as and for the purpose set forth.

10 4. The combination of the swinging catch and detector-holder, bobbin-lifting and catch lever, and the bobbin-holder with a bracket, 27, having a box-like part, 27'', to cover the catches of the detector-holder and lever, substantially as set forth.

15 5. The combination of the swinging catch and detector-holder, lifting and catch lever 24, and bobbin-holder with a bracket, 27,

having an extension, 27''', lugs 27', and lugs 27'', to which the several parts are pivoted, 20 substantially as described.

6. The combination of the drum-shaft and ratchet-shafts of a doubling, winding, and stop-motion machine with pulleys on the several shafts, two endless belts adapted to be 25 driven in contact with each other, and two pulleys, 39 and 41, over which the belts pass, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two sub- 30 scribing witnesses.

JOHN BOYD.

Witnesses:

WILL. GIBSON,
WILLIAM KILGOUR.