

(No Model.)

3 Sheets—Sheet 1.

W. S. HUNTER & W. H. AVIS.  
SPINNING MACHINE.

No. 481,278.

Patented Aug. 23, 1892.

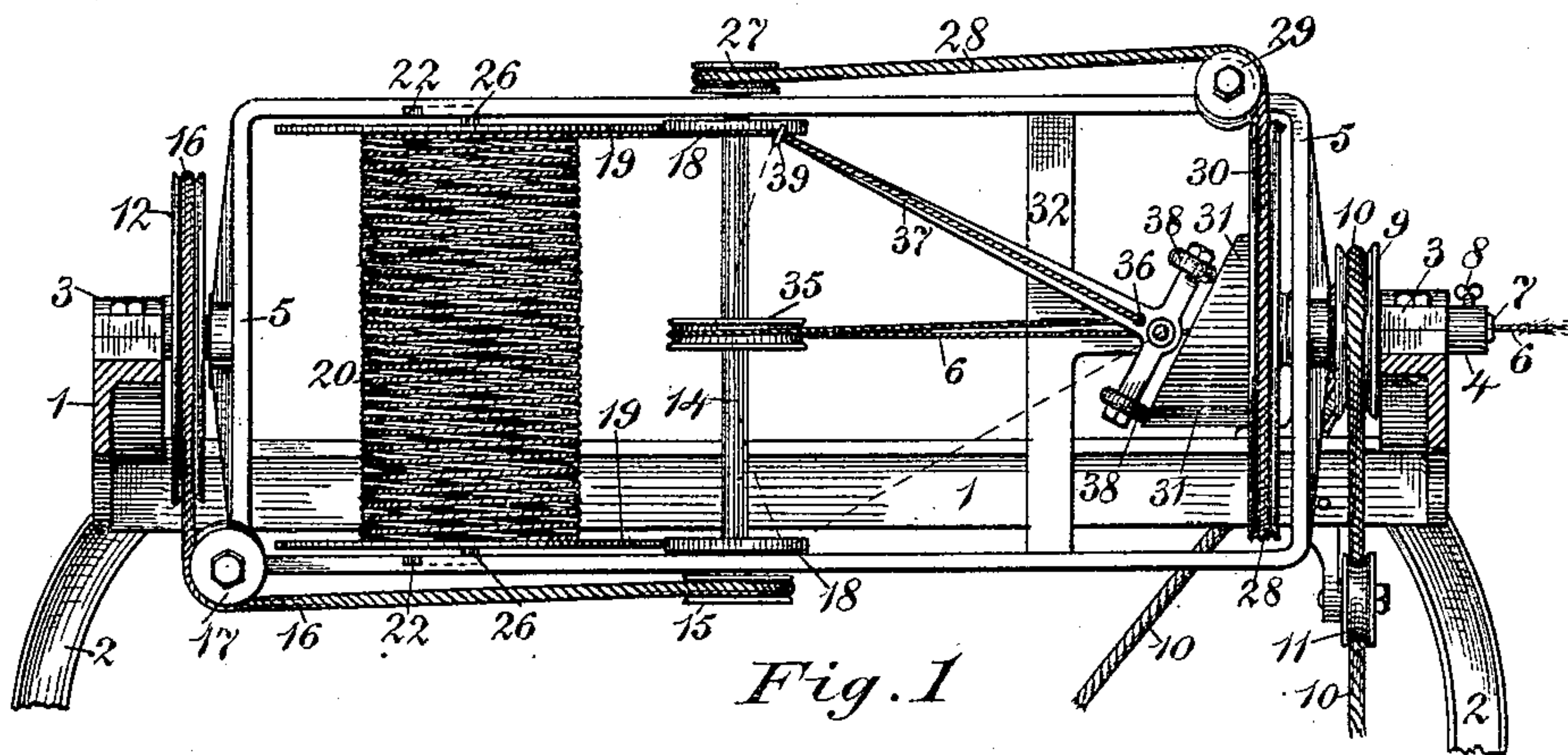


Fig. 1

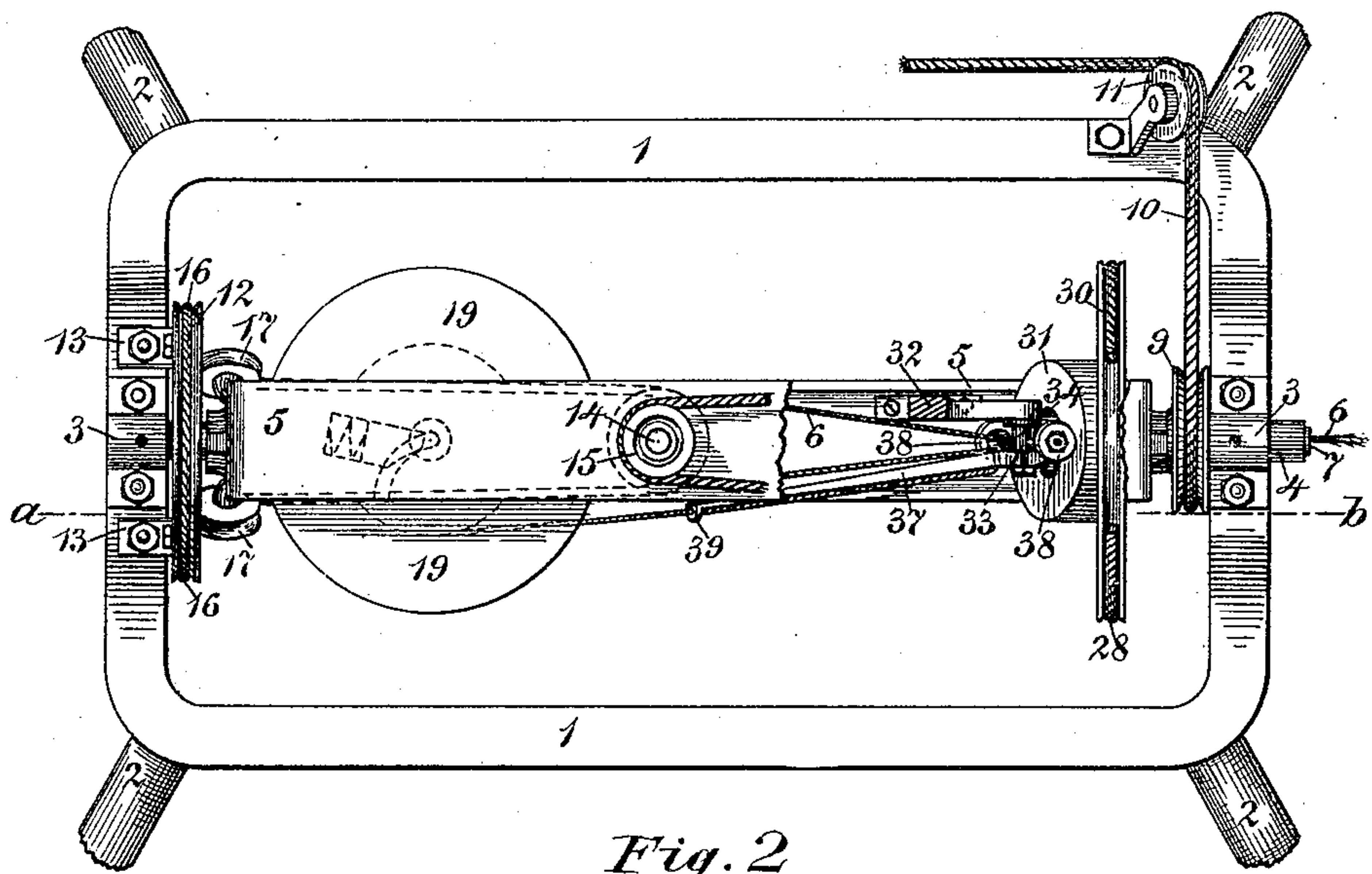


Fig. 2

Witnesses

C. H. Riggs.

J. Rice

Inventors

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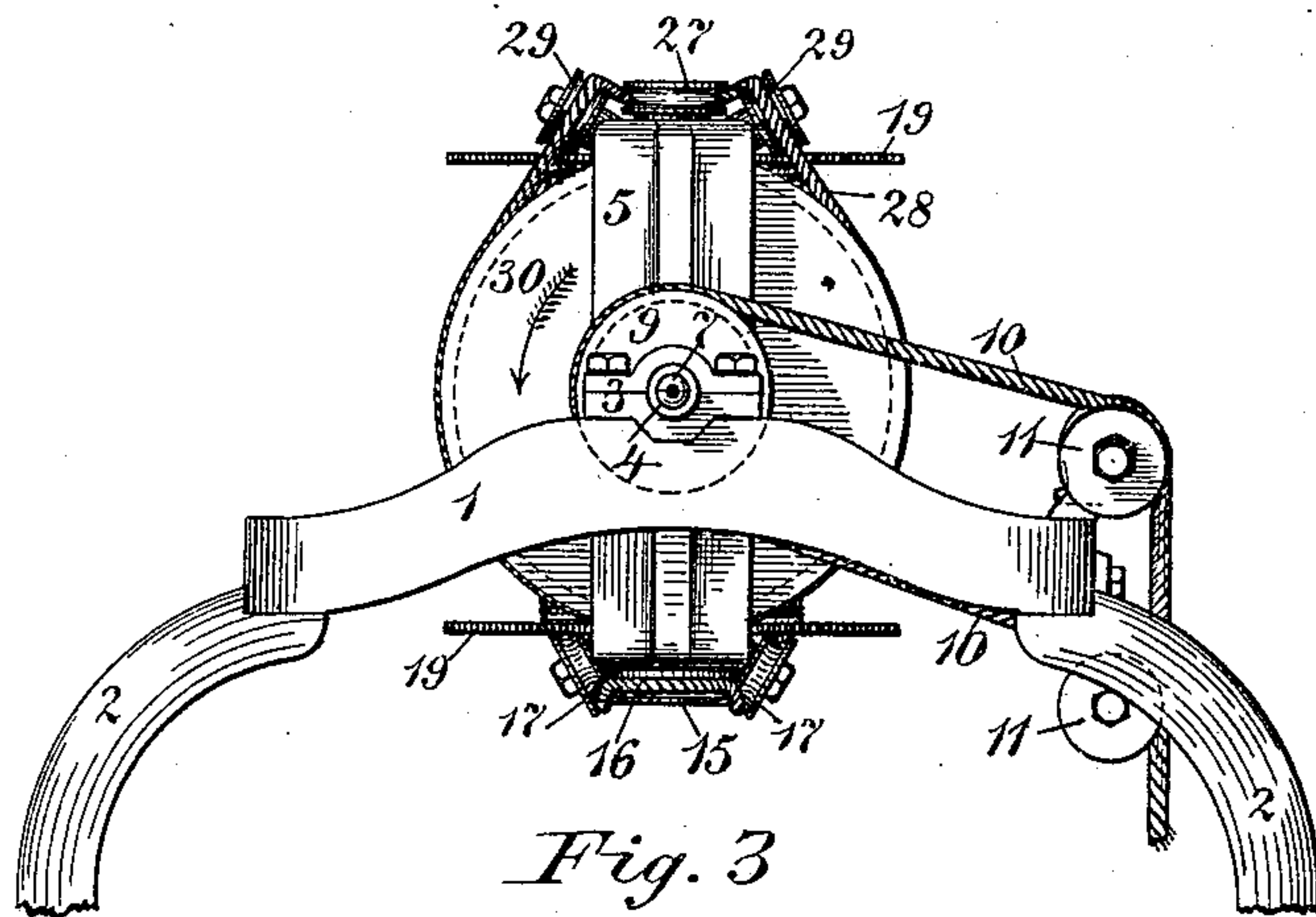


Fig. 3

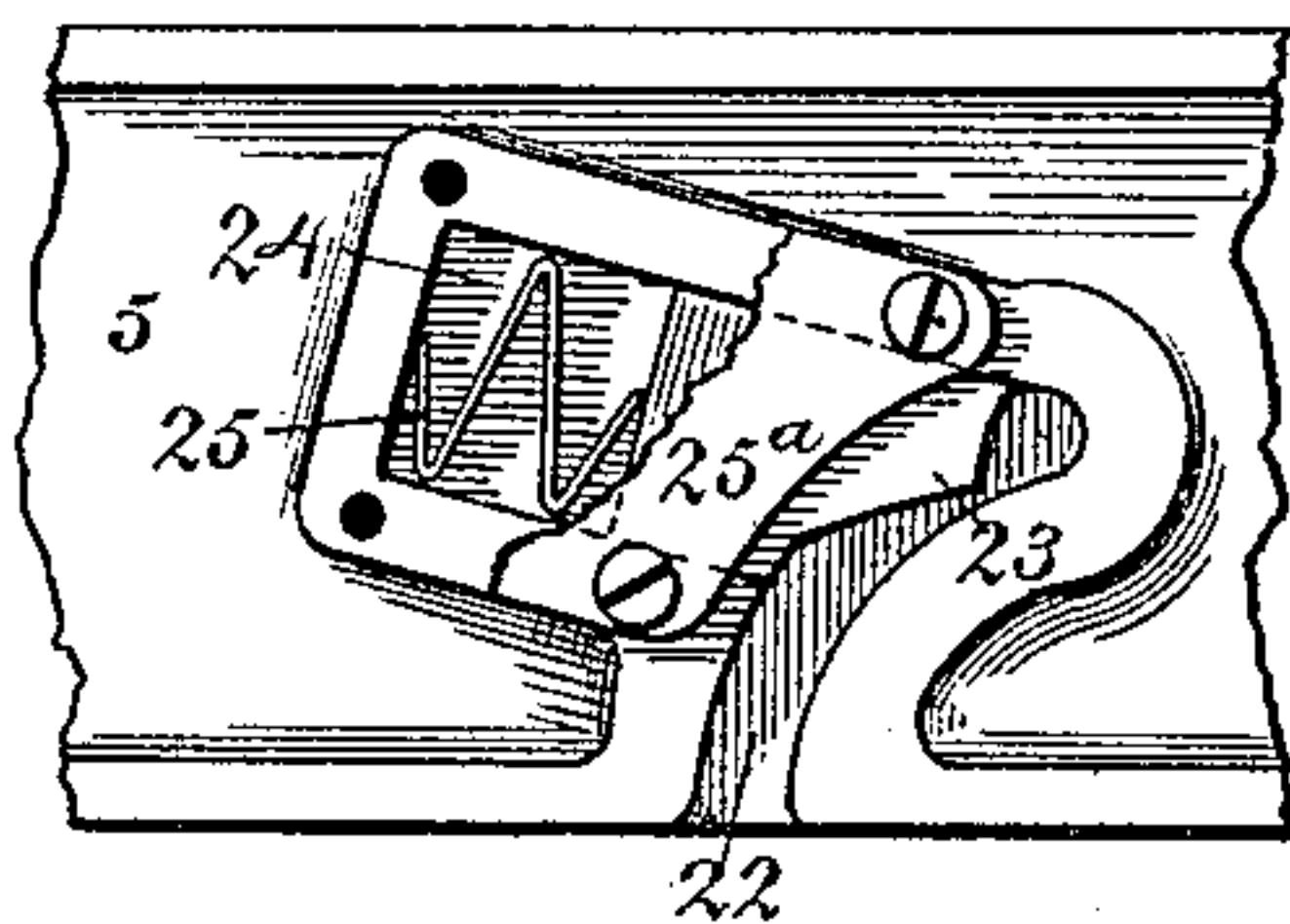


Fig. 4

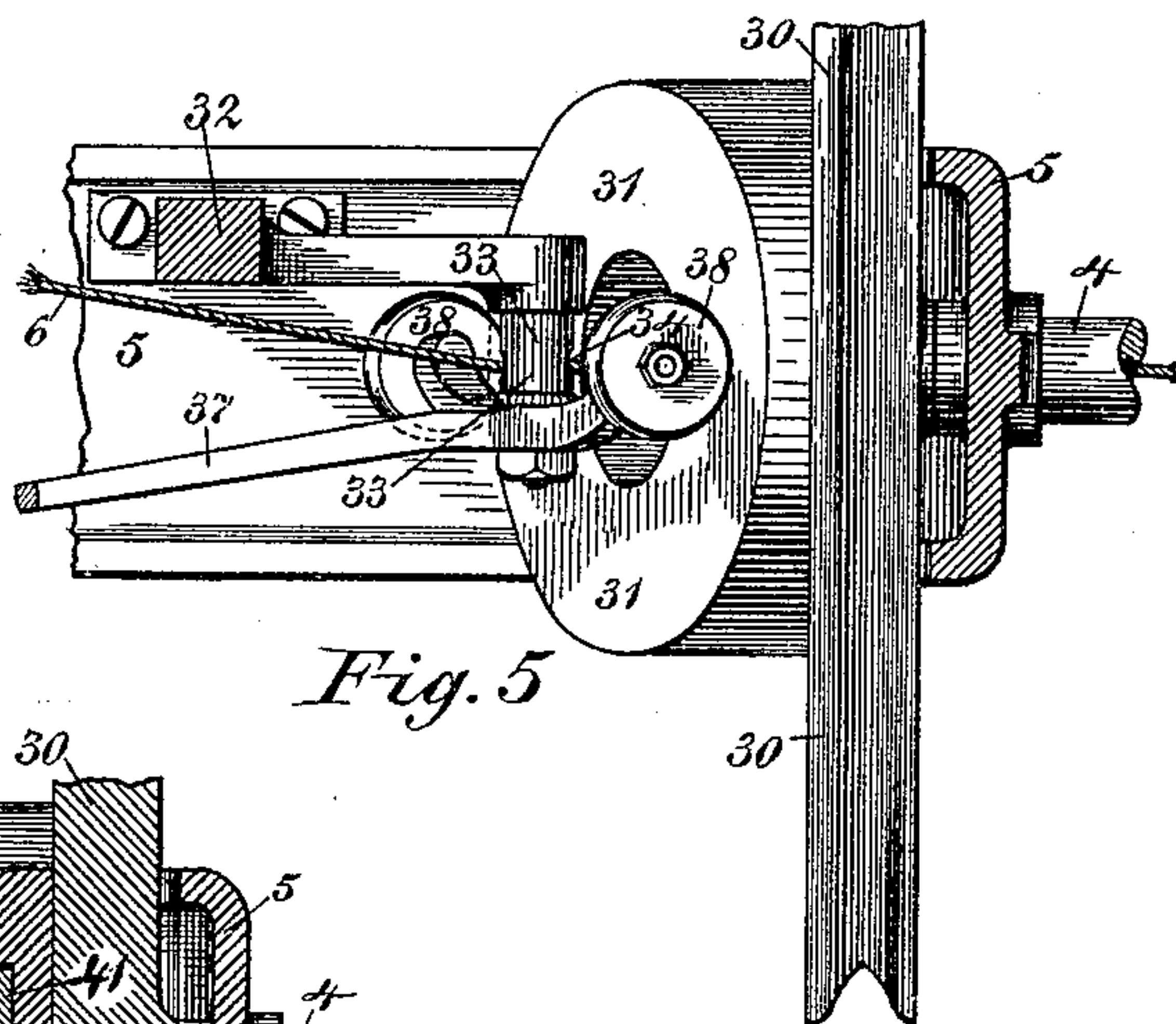


Fig. 5

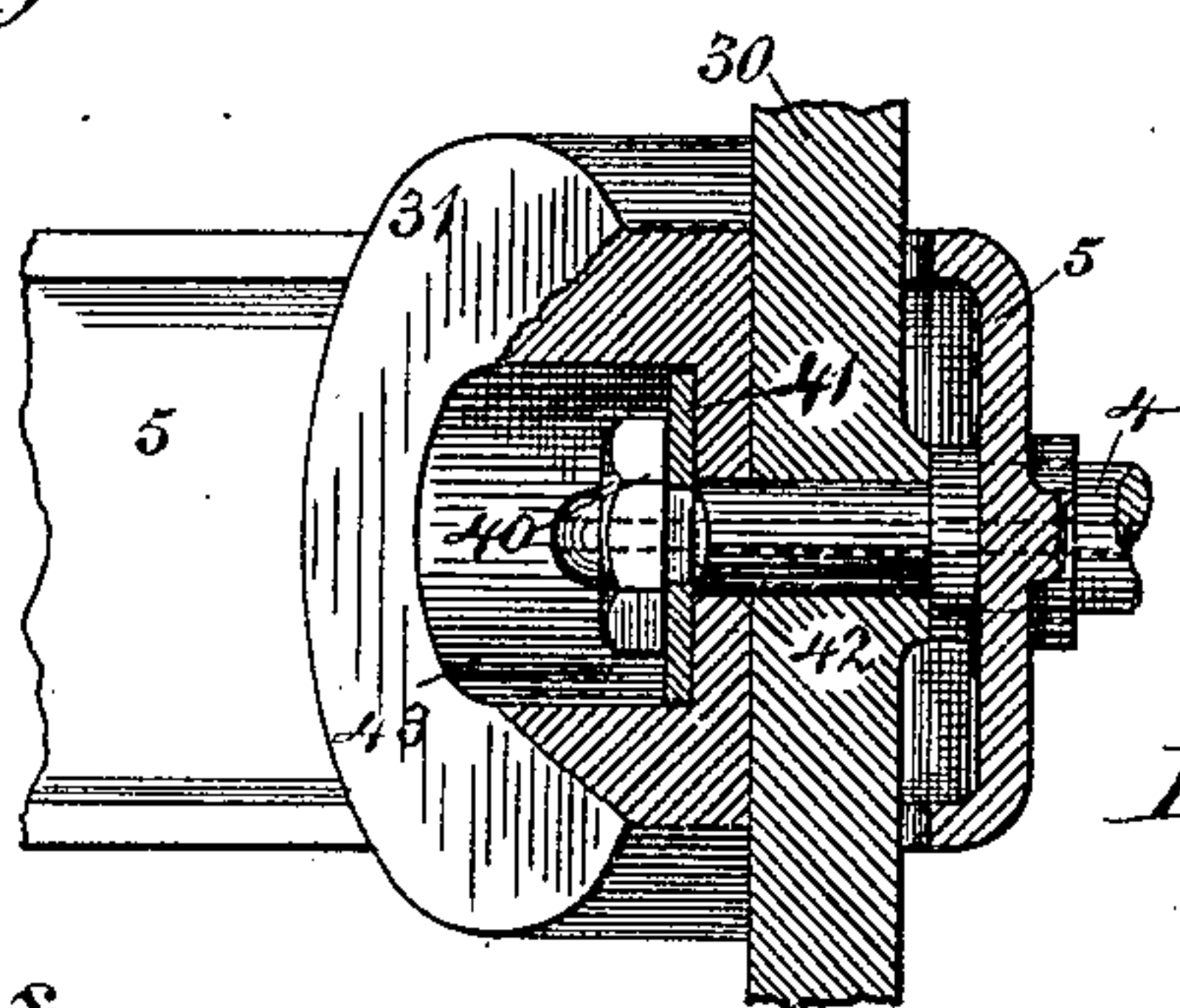


Fig. 6

Witnesses  
C. H. Riggs  
J. Brier

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(No Model.)

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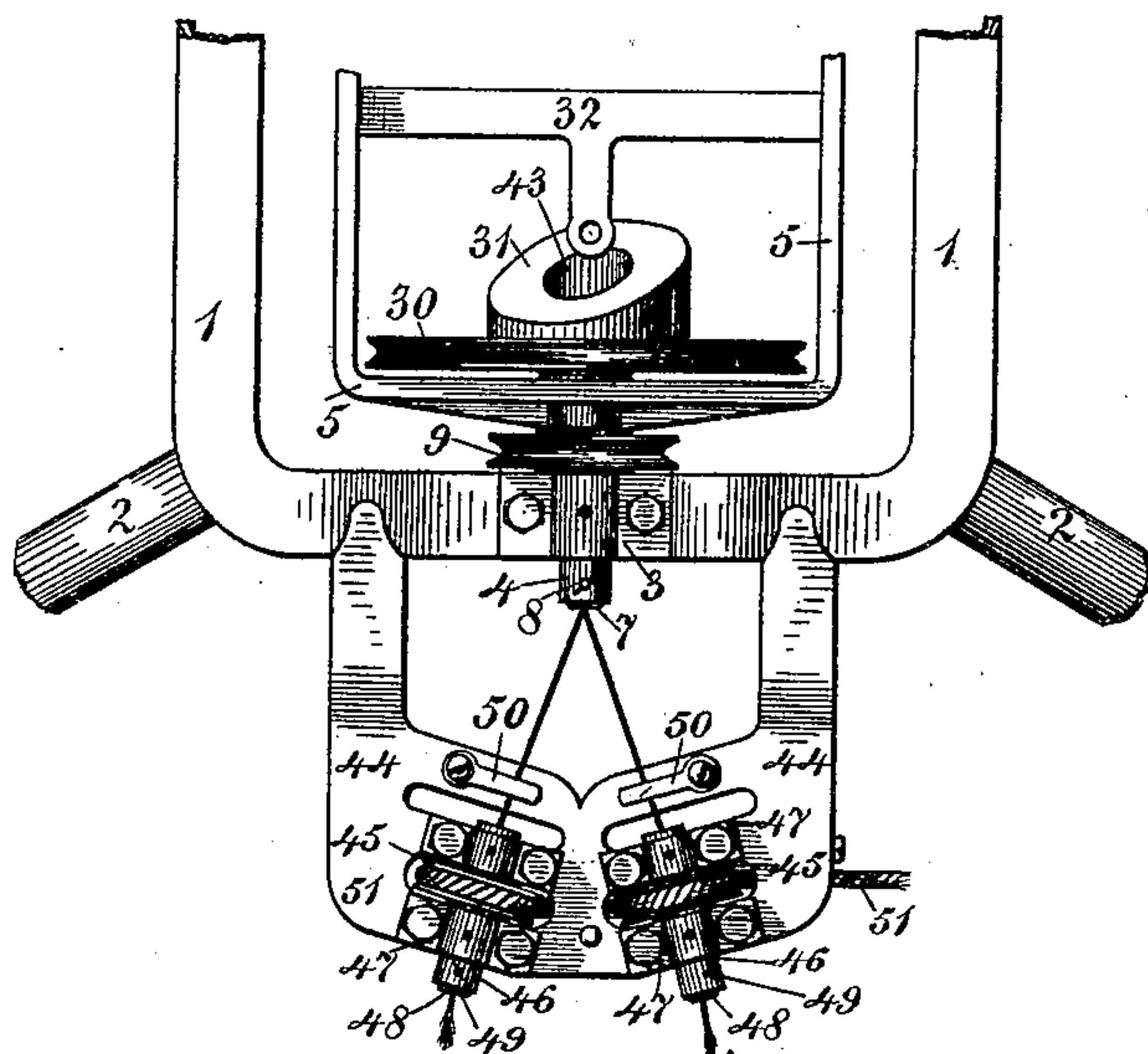


Fig. 7

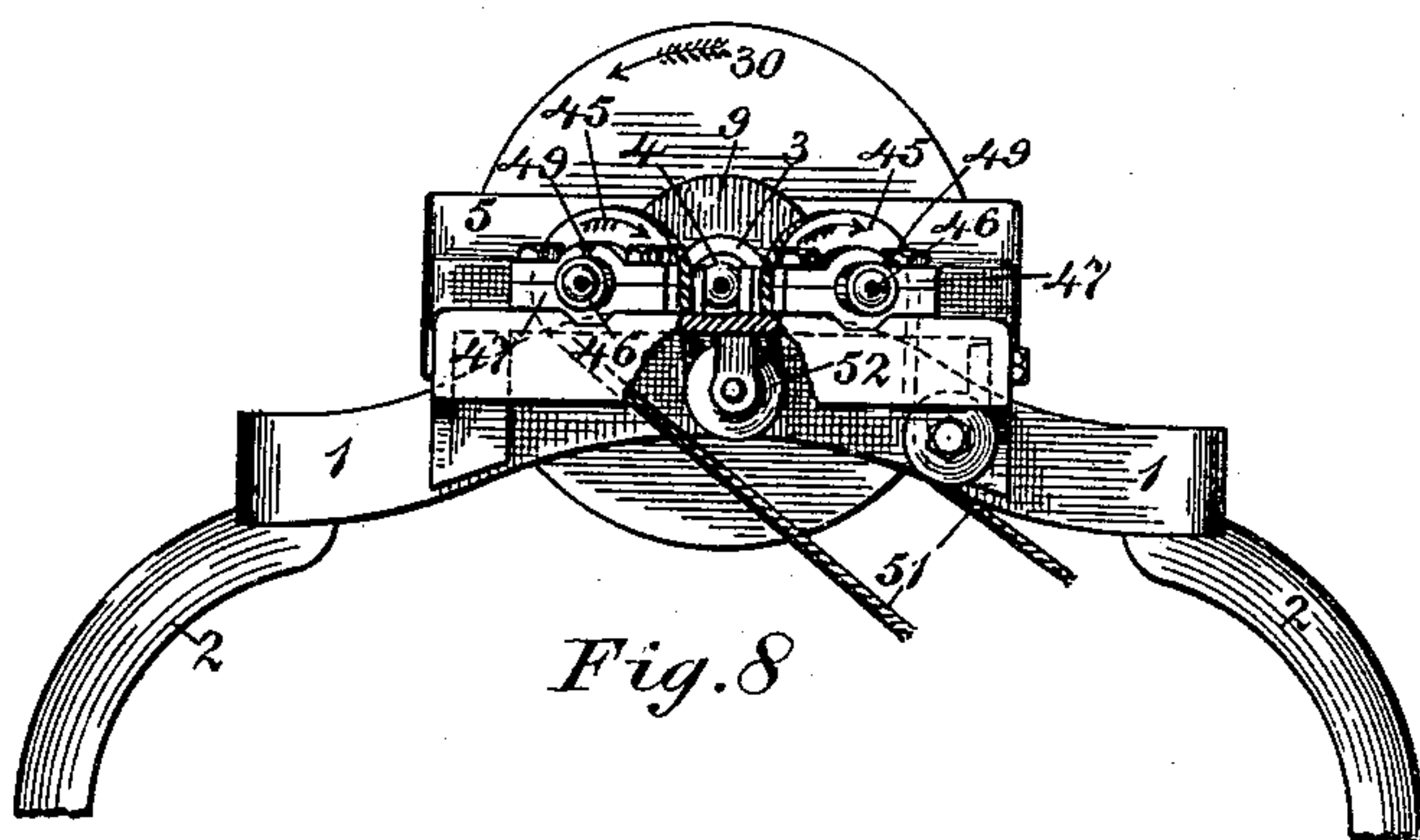


Fig. 8

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# UNITED STATES PATENT OFFICE.

WILLIAM STUART HUNTER, OF BELLEVILLE, AND WALTER H. AVIS, OF  
TORONTO, CANADA.

## SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,278, dated August 23, 1892.

Application filed December 30, 1890. Serial No. 376,296. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM STUART HUNTER, a resident of the city of Belleville, in the county of Hastings, and WALTER HERBERT AVIS, a resident of the city of Toronto, in the county of York, in the Province of Ontario, Canada, subjects of the Queen of Great Britain, have jointly invented new and useful Improvements in Spinning-Machines, of which  
10 the following is a specification.

Our invention relates to improvements in spinning-machines applicable to the spinning of twines of single or multiple yarn or yarns; and its object is to provide a machine that  
15 will spin and twist by manual or other power twine of one or more yarns from the various fibers used in twine manufacture.

We attain the above object or objects by means of the mechanism illustrated in the accompanying drawings, in which similar numbers of reference refer to similar parts throughout the different figures, and in which—

Figure 1 represents a side elevation of our machine having the legs and the driving mechanism for manual power removed and the framework in section at the line *a b* of Fig. 2. Fig. 2 represents a plan of the machine shown in Fig. 1. Fig. 3 represents a front end elevation of the machine. Fig. 4 represents a detail of a portion of the flier-frame to exhibit the means for holding the bobbin. Fig. 5 represents a detail view of a portion of the flier-frame to more fully illustrate the distributing device for filling the bobbin-spool. Fig. 6 represents a detail view of the pulley and cam on the side thereof to more fully explain the means by which they are both secured on the hollow axle. Fig. 7 represents a plan of a portion of the flier and the main  
35 frame adapted to the spinning of twines of multiple yarns, and Fig. 8 represents a front end elevation of the portion of the machine shown in Fig. 7.

The frame 1 of our machine is preferably  
45 of the suitable rectangular form, (shown best in Figs. 2, 3, and 8,) having legs 2 to support it. At the center of each end of the said frame 1 is provided a journal-bearing 3, in which the trunnions 4 on the corresponding ends of the flier-frame 5 revolve and are supported.  
50 The trunnion 4 at the front end of our ma-

chine is hollow for the twine 6 to pass through and is provided with the tubing 7, secured by a set-screw 8 in the end; but on this we do not claim any invention. The tubing 7 is composed of two semi-cylindrical pieces of wood, which match and form a tube, as though composed of one piece having a hollow axis. The flier-frame 5 is also rectangular in form and secured rigidly on the said trunnions 4, by which it is supported. At the front end a pulley 9 is secured on the trunnion 4 just outside the said flier-frame 5, and by which the said frame is driven by a belt 10, carried over idlers 11, as shown, when foot-power is employed to drive the machine. When steam or other power is employed, the said belt 10 would pass directly to a pulley on shafting above or below the machine. At the opposite or rear end of the frame 5 a large pulley 12 is secured by means of brackets 13, as shown, or any equivalent device maintained fixedly to the frame 1, and is not, like the pulley 9, fixed on the trunnion 4, but is loosely mounted on the rear trunnion 4 of frame 5, so as to allow the said frame 5 to revolve within it for the purpose of revolving the shaft 14, (carried about the center of the said flier-frame 5,) which it does by means of a pulley 15, carried on the end of the said shaft 14 and just outside the said frame 5, and over which the belt 16 passes, thence over idlers 17, secured on the corners of the said frame 5, to and over the fixed pulley 12. On the said shaft 14 and near the sides of the frame 5 are fixed the friction-wheels 18 for the purpose of revolving by frictional contact the spool-heads 19 of the spool 20, which is composed of the said heads 19, connected by the ordinary shank, on which the yarn is wound.

In the frame 5 are provided at each inner side curved grooves 22, having in their convex sides a sliding block 23, secured in suitable recesses 24, which contain, also, a multiple V-spring 25 to press on the said blocks 23, which form a stop against the spool 20 coming out of position until desired, and also a means of maintaining the spool 20 in contact at its heads 19 with the friction-wheels 18. The journals 26 on the spool 20 are the means by which it is held to revolve on its center. A suitable form of plates 25<sup>a</sup> maintain the blocks



23 and the springs 25 in and cover the said recesses 24.

To remove the spool 20, it is only necessary to draw it backward, so that its journals 26 5 traverse the grooves 22, whereby the blocks 23 are compressed into the recesses 24 and the journals 26 allowed to pass out. To replace the same, the journals 26 are directed each into its corresponding groove 22 and 10 pressed home, reversing the action of removal.

On the opposite end of the shaft 14 from the pulley 15 is carried a similar pulley 27, over which a belt 28 passes, thence over idlers 29, secured on the frame 5, and thence to and 15 over a large pulley 30, carried on the inner end of one of the trunnions 4, so as to revolve thereon, as shown by Fig. 6.

On the side of the pulley 30 is formed or secured a hub 31, the side face of which is 20 oblique to its axis for the purpose of forming a cam, hereinafter referred to.

On a support formed at the center of a cross-bar 32, which is secured at its extremities to the flier-frame 5, is a rigid stud-pin 33, 25 having a hole 34 through it on the axial line of the flier-frame 5, through which hole 34 the twine passes to a fixed spool-shaped wheel 35, carried on the center of the shaft 14, thence over the wheel 35 and back to and 30 through a hole 36 in the T-headed laying-arm 37, which is supported to vibrate on the stud-pin 33. On the extremities of the transverse arm of said T-headed laying-arm 37 are secured anti-friction rollers 38, which bear 35 on the oblique face of the hub 31 and cause the opposite extremity of said arm 37 to vibrate from side to side of the frame 5. On the extremity of the said laying-arm 37 is formed an eye 39, through which the twine 40 passes after passing the hole 36 in said arm, and thence to the spool 20, on which it is wound by motion imparted through the frictional contact of the wheels 18 on the heads 19 of the bobbin 20.

45 Fig. 6 illustrates the method of securing the hub 31 and pulley 30 in position by means of a nut 40, securing a washer 41, having a square hole to fit over the squared portion 42 of the trunnion 4, which extends internally 50 from the frame 5. The nut 40 and washer 41, securing the said hub 31, are countersunk in a recess 43 in said hub 31 to remove them from contact with the T-headed laying-arm 37 and its bearing on the cross-bar 32.

55 To adapt our machine to the spinning of twine composed of double or multiple yarns and adapt it to use by two-handed operators or to spin from a carding-machine, we show by Figs. 7 and 8 our doubling device, com- 60 posed of a frame 44, attached to the end of the main frame 1 and supporting a pair of pulleys 45, fixed each on short axles 46, carried in journal-bearings 47. The axles 46 have tubings 48, similar to the tubing 7, and 65 set-screws 49, similar to that in the trunnion 4, secure them in the said axle 46. In rear of the axles 46 grip-springs 50 are secured to the

frame 44 to grip or clamp the yarn and maintain the twist in the twine between said springs 50 and the hollow axle 4, where the 70 strands unite to form the twine. The pulleys 45 are driven by the belt 51, passing over them and under the immediate idler 52 in a reverse direction from that of the flier-frame 5, as shown by arrows. The belt 51 would in 75 a foot-power spinning-machine pass over idlers and to the same driving-wheel as the belt 10, driving the pulley 9 on the flier-frame 5.

As two-handed operators who can spin a 80 yarn from each hand are not uncommon, we will describe the operation of the yarns going through our machine. The yarn enters the tubings 46 and becomes twisted by their ro- 85 tary motion to form two separate yarns, which meet at the tubing 7 and are there united and twisted into a twine of two yarns, which is by the bobbin-spool 20 (to which the end was pre- 90 viously secured) drawn successively through the holes in the trunnion 4, the stud-pin 33, over the wheel 35, through the hole 36 in the laying-arm 37, thence through the eye 39 and by the traversing motion of the said laying-arm 37 distributed spirally in layers from end 95 to end of the bobbin-spool 20.

Having now described our machine, what we claim as our invention, and desire to secure by Letters Patent, is—

1. In a twine-spinning machine, the combination of the fixed main frame having a 100 flier-frame journaled to revolve therein, the hollow axis in one of the trunnions being provided with a tubing device, as described, the pulley fixed on the hollow trunnion as a means by which the flier-frame is revolved, 105 the fixed pulley at the other end of the flier-frame and secured to the main frame, the belt passing over said fixed pulley on the main frame and over a pulley on a transverse shaft carried near the center of the flier-frame, the 110 transverse shaft belted to said fixed pulley, and the friction-wheels carried on said transverse shaft to revolve the bobbin-spool, substantially as shown and described.

2. In a twine-spinning machine, the com- 115 bination of the fixed main frame having a flier-frame journaled to revolve therein, the hollow axis of one of the trunnions being provided with a tubing device, as described, the pulley fixed on the hollow trunnion as a 120 means by which the flier-frame is revolved, the fixed pulley at the other end of the flier-frame and secured to the main frame, the belt passing over said fixed pulley on the main frame and over a pulley on a transverse shaft, 125 the transverse shaft belted to said fixed pulley, the friction-wheels carried on said transverse shaft to revolve the bobbin-spool, and the grooved wheel on the center of the transverse shaft to draw the twine, substantially 130 as shown and described.

3. In a twine-spinning machine, the combination of the fixed main frame having a flier-frame journaled to revolve therein, the



hollow axis in one of the trunnions being provided with a tubing device, as described, the pulley fixed on the hollow trunnion as a means by which the flier-frame is revolved, 5 the fixed pulley at the other end of the flier-frame and secured to the main frame, the belt passing over said fixed pulley on the main frame and over a pulley on a transverse shaft, the transverse shaft belted to said fixed pulley, 10 the friction-wheels carried on said transverse shaft to revolve the bobbin-spool, the grooved wheel on the center of the transverse shaft to draw the twine, the pulley on the opposite end of the transverse shaft, the belt passing 15 over said pulley and a pulley having a cam thereon, the pulley having a cam on its side, said cam on said pulley to operate a laying-

arm, and the laying-arm supported in the flier-frame and vibrated by said cam on the pulley, substantially as shown and described. 20

4. In a twine-spinning machine, the removable platform on the front of the main frame, having a number of hollow axes journaled to revolve therein, each provided with a tubing, a pulley on each hollow axis, by which it is 25 revolved, and a nipper-spring on the platform in the rear of each axis to maintain the twist imparted by said axis, substantially as shown and described.

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