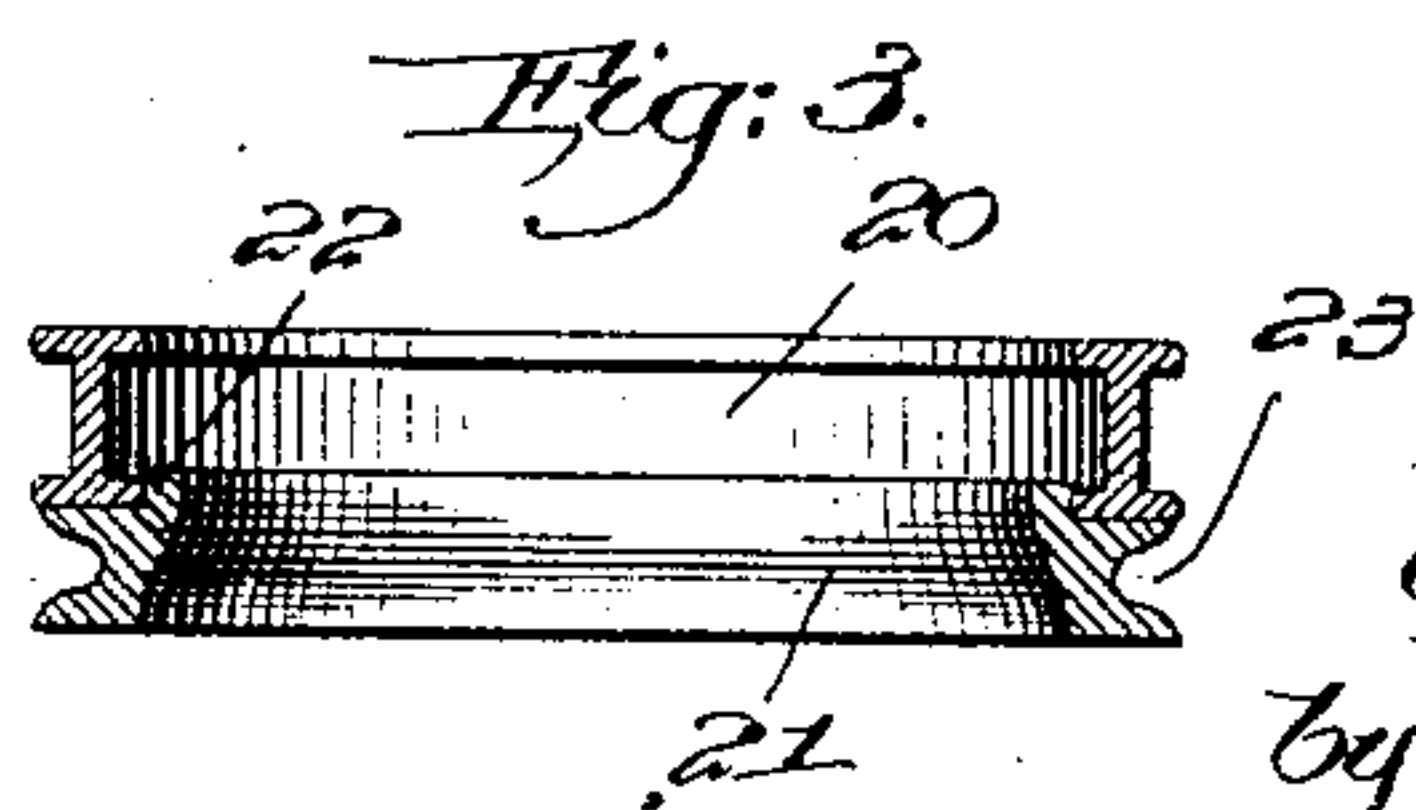
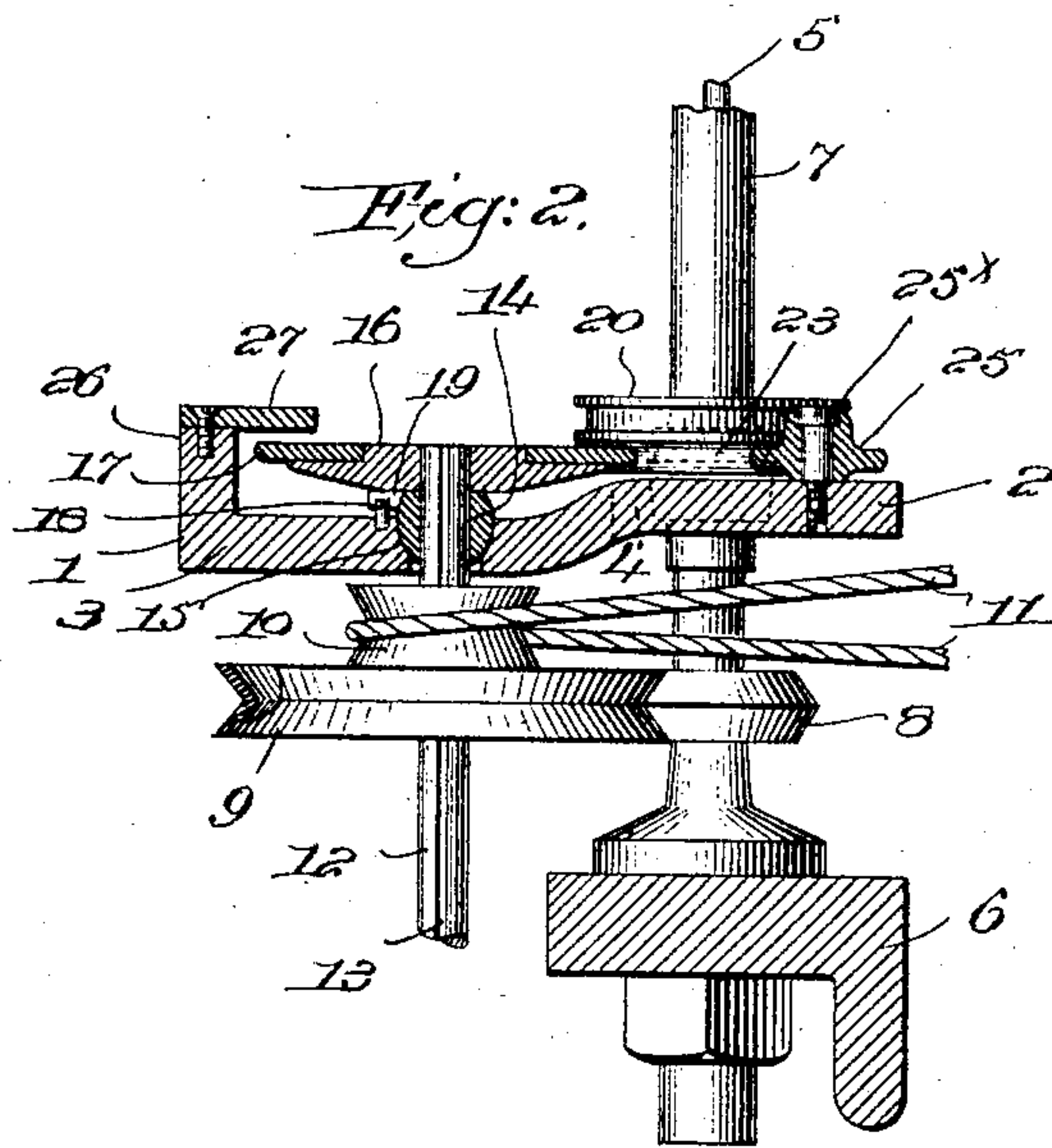
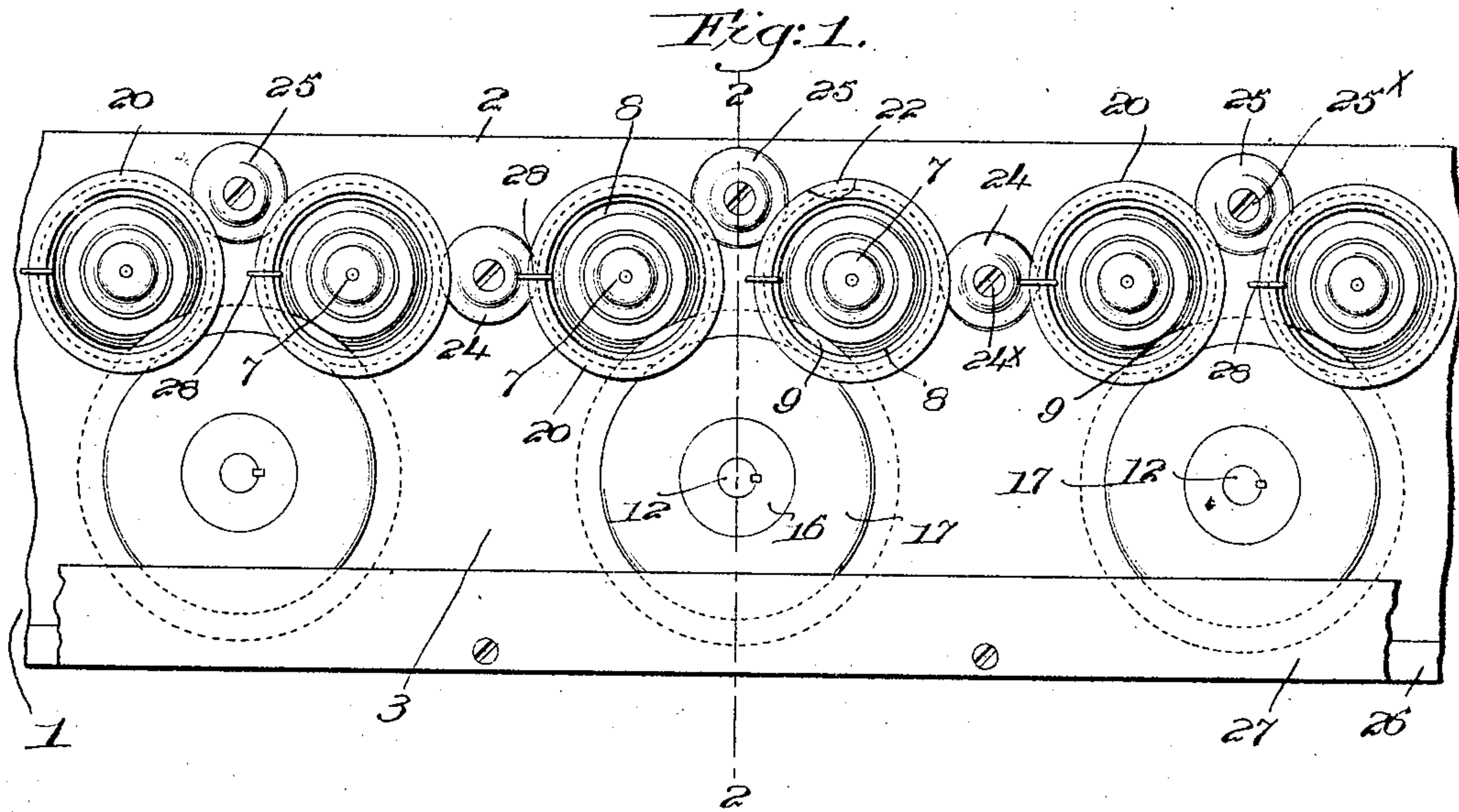


No. 774,743.

PATENTED NOV. 15, 1904.

G. O. DRAPER.  
SPINNING APPARATUS.  
APPLICATION FILED DEC. 29, 1903.

NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## SPINNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 774,743, dated November 15, 1904.

Application filed December 29, 1903. Serial No. 187,082. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE OTIS DRAPER, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Spinning Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like figures on the drawings representing like parts.

This invention relates more particularly to ring-spinning apparatus wherein the rings are revolved by driving mechanism at a predetermined and uniform speed having a constant ratio to the spindle speed.

My invention has for its objects certain novel features in construction and arrangement, the elimination of oil or similar lubricant for the bearings, a peculiar construction of the ring-rail, and other features of detail, which will be fully described in the specification hereinafter and particularly pointed out in the following claims.

Figure 1 is a top or plan view of a portion of the ring-rail, rings, driving and supporting means therefor, and spindles embodying one form of my present invention. Fig. 2 is a transverse sectional detail thereof on the line 2-2, Fig. 1, looking toward the left; and Fig. 3 is a diametral section, enlarged, of one of the revolving rings and its detachable holder.

Referring to Fig. 1, the ring-rail 1, which may conveniently be made of cast-iron, is divided longitudinally into two portions 2 and 3, which, as best shown in Fig. 2, are located in two different horizontal planes, the rear portion 2, which is the higher portion, having openings 4 therein for the rotatable spindles 5, mounted in suitable bearings on a spindle-rail 6. Bobbins 7 are carried by the spindles, the latter projecting through the openings 4 and having whirls 8 located below the ring-rail, the whirl shown in Fig. 2 having a double beveled transversely convex periphery. As shown in Fig. 1, the spindles are arranged in a series of pairs, and, as will appear hereinafter, each pair is driven by a common driver which engages the whirls 8.

The driver is shown as a large disk 9, having a grooved periphery shaped to receive the

periphery of the spindle-whirl, said driver 50 having an attached band-whirl 10 for the driving-band 11, operated from a drum or cylinder of usual construction and not shown. Each driver is symmetrically located with relation to the two spindles driven thereby by 55 frictional contact of the driver and spindle-whirls, (see Fig. 1,) and the band pull draws the driver snugly against the whirls, as will be obvious. The driver and its attached whirl 10 are keyed to a driving-shaft 12, having a 60 longitudinal groove 13 for the key, (not shown,) so that shaft and driver have a sliding connection while rotating together. As shown in Fig. 2, the upper end of the shaft is extended through a ball-like bearing 14, 65 seated in a socket 15 in the front lower portion 3 of the ring-rail, said shaft having secured to it above the bearing a disk 16, having a friction-ring 17, of leather or other suitable material, secured thereto. The bearing 70 14 is made of wood boiled in hot-wax solution to thoroughly impregnate the pores and interstices of the bearing, thereby dispensing with oil, the treatment causing the wood to last for a long time without wear and being 75 cheap to replace when worn out. A pin 18 in the rail bears against a lateral lug 19 on the bearing, Fig. 2, preventing rotation, while permitting a slight rocking of said bearing and the shaft. This obviates finely-adjusted 80 bearings and permits slight variations in band pull without detriment to the apparatus.

The disks 16 constitute ring-driving members, one for each pair of rings, so that there is a combined spindle and ring driving mechanism for each pair of spindles and their co- 85 operating rings 20. The latter are shown as double-flanged of a well-known type, and being made of hardened steel they are not absolutely true, so I have provided a detach- 90 able holder 21 for each ring, shown as an annular casting having a ring-retaining lip 22 and an accurately-turned deep peripheral groove 23. (Clearly shown in Fig. 3.) Each ring-holder is vertically supported and later- 95 ally positioned by its driver and two rotatable idlers 24 25, shown as rotatably mounted on headed studs 24<sup>x</sup> and 25<sup>x</sup>, respectively,



screwed into the ring-rail on the high portion 2 thereof. The idlers are preferably made of wood treated with hot-wax solutions and are disk-like to enter the grooves 23 of the ring-holders, the hubs rotating on the studs without lubricant other than that afforded by the wax in the wood.

Referring to Fig. 1, the idlers 24 are arranged in line with the series of spindles and are located between adjacent pairs of ring-holders, entering the grooves 23 of the contiguous holders and rotating with them, while at the same time assisting the drivers in vertically supporting the same. The other series of idlers 25 are located behind the line of spindles, but opposite the driving-shafts 12, so that each idler coöperates with the two ring-holders of a pair. Consequently each ring-holder is peripherally engaged at three points, the two idlers for any one holder being substantially equidistant from the driver and about one hundred and twenty degrees from each other.

By making the rear portion 2 of the ring-rail on a higher plane than the front portion the rail is permitted to descend lower along the bobbin without hitting the driving-band 11.

The several ring-drivers rotate at high speed above and near the front of the ring-rail, and to protect the operative therefrom the front edge of the rail has an upright flange 26, to the top of which is attached a rearwardly-extended plate 27, constituting a guard which overhangs the ring-drivers. This guard also serves to push the driving shafts and disks 16 down when the ring-rail descends, provided their own weight is insufficient. As a matter of fact they weigh enough to retain their places unless for any cause there should be some sticking of the parts.

The ring-rail is raised and lowered by usual traverse mechanism. (Not herein shown, as it forms no part of my invention.) In Fig. 1 travelers 28 of any usual or desired construction are mounted on the upper flange of the rings to operate in well-known manner.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In spinning apparatus, a revolving ring, a combined driving and supporting member therefor, a rocking, non-oiling bearing from which said member is suspended, a plurality of rotating idlers coöperating with the driving member to vertically support and laterally position the ring, and non-oiling bearings for the idlers.

2. In spinning apparatus, a revolving ring, a combined driving and supporting member therefor, a rocking bearing for and from which said member is suspended, and a plurality of disk-like wooden idlers having fixedly-positioned fulcra and coöperating with the driving member to vertically support and laterally position the ring.

3. In spinning apparatus, a revolving ring, a metallic, peripherally-grooved holder for the ring, a driving-disk in engagement with the groove of the holder, to revolve the latter by frictional contact, a rotatable shaft on which said disk is mounted, a rocking bearing from which the shaft is suspended, a plurality of wooden idler-disks in engagement with the grooved portion of the holder, the driving and idler disks vertically supporting and laterally positioning the holder and ring, and fixed metallic studs on which the wooden idler-disks are rotatably mounted.

4. In spinning apparatus, a series of spindles, a ring-rail, a series of revolving rings, a set of combined spindle and ring driving mechanisms each coöperating with two adjacent spindles and their rings, each mechanism including a rotating driving-disk, and a guard on the ring-rail overhanging the front portions of the several driving-disks.

5. In spinning apparatus, a ring-rail, a series of revolving rings, rotatable driving-disks for the rings, located above the rail, and a guard extended longitudinally on the rail and overhanging the outer portions of the driving-disks.

6. In spinning apparatus, a ring-rail having an upturned flange along its front edge, a series of driving-shafts depending from the rail, a ring-driving disk on each shaft above the rail, and a guard mounted on the rail-flange and overhanging the adjacent portions of the disks.

7. In spinning apparatus, a ring-rail provided with spindle-openings, revolving rings supported above the rail concentric with the spindle-openings, and a series of ring-driving disks supported above the rail, said rail having its rear portion elevated above the front portion above which the driving-disks are supported.

8. In spinning apparatus, a ring-rail having openings therein arranged in pairs, rotatable spindles extended through said openings, a revolving ring and its holder concentric with each spindle, a series of driving-shafts in front of the spindles and supported from the ring-rail, each shaft carrying a ring-driver and a spindle-driver, the same coöperating with the adjacent pair of ring-holders and spindles, to drive them, rotatable idlers in alignment with the line of spindles, located between pairs of rings and coöperating with a ring-holder of each pair, and a second series of idlers behind the rings, each of said idlers coöperating with the two rings of a pair.

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

GEORGE OTIS DRAPER.

Witnesses:

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ERNEST W. WOOD.