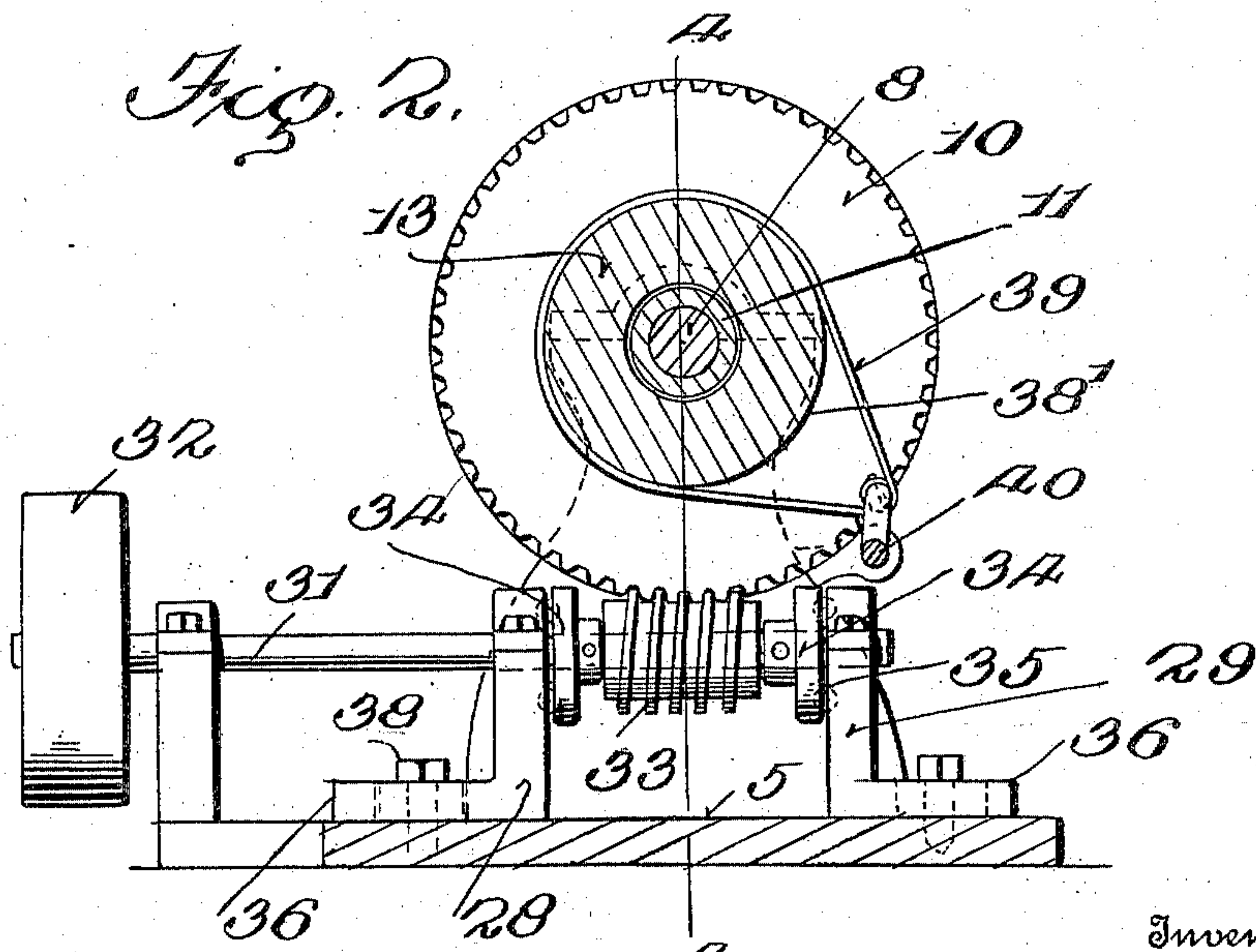
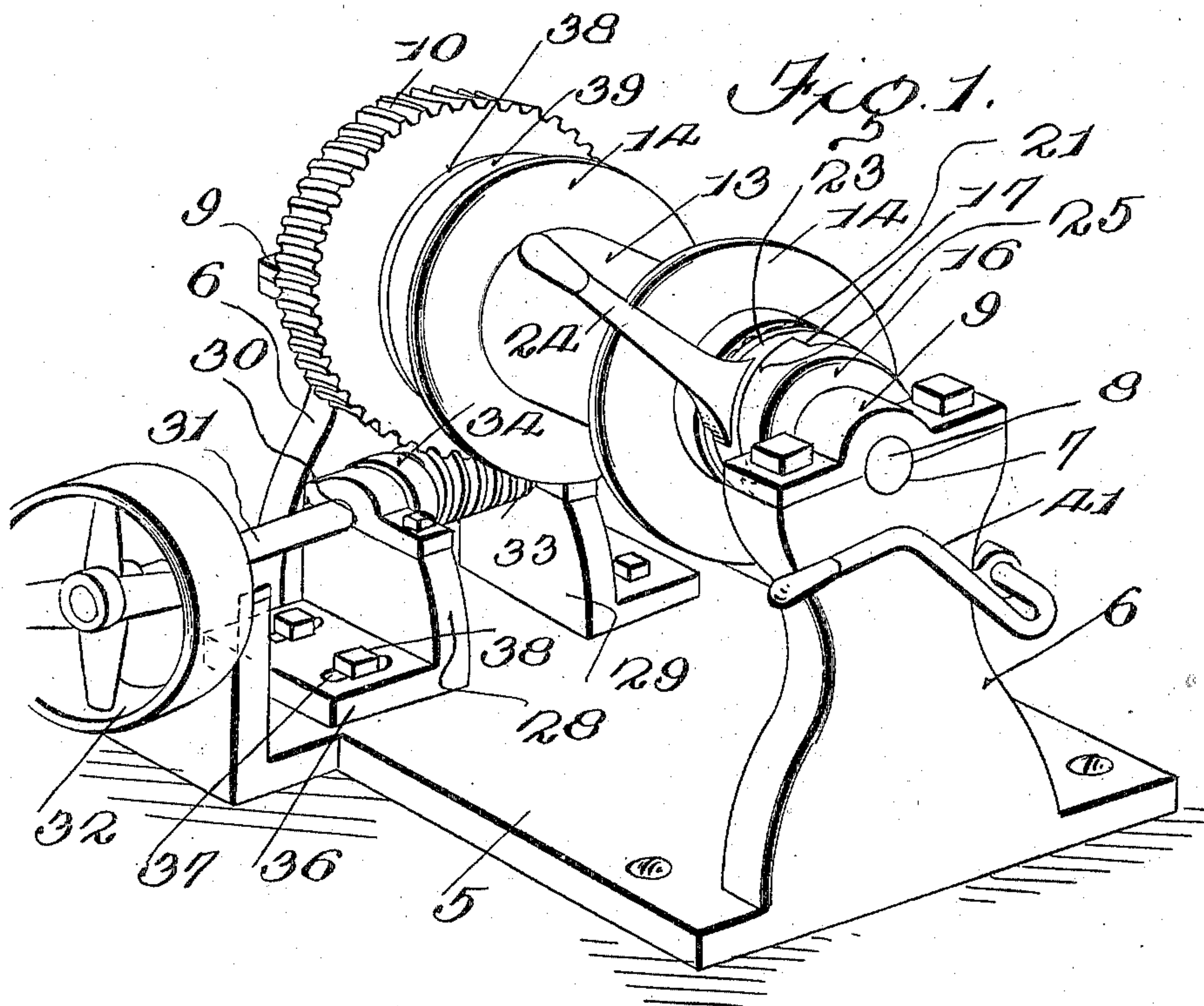


E. O. CARVIN.  
HOISTING DEVICE.  
APPLICATION FILED OCT. 26, 1909.

957,865.

Patented May 17, 1910.

2 SHEETS—SHEET 1.



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Fig. 3.

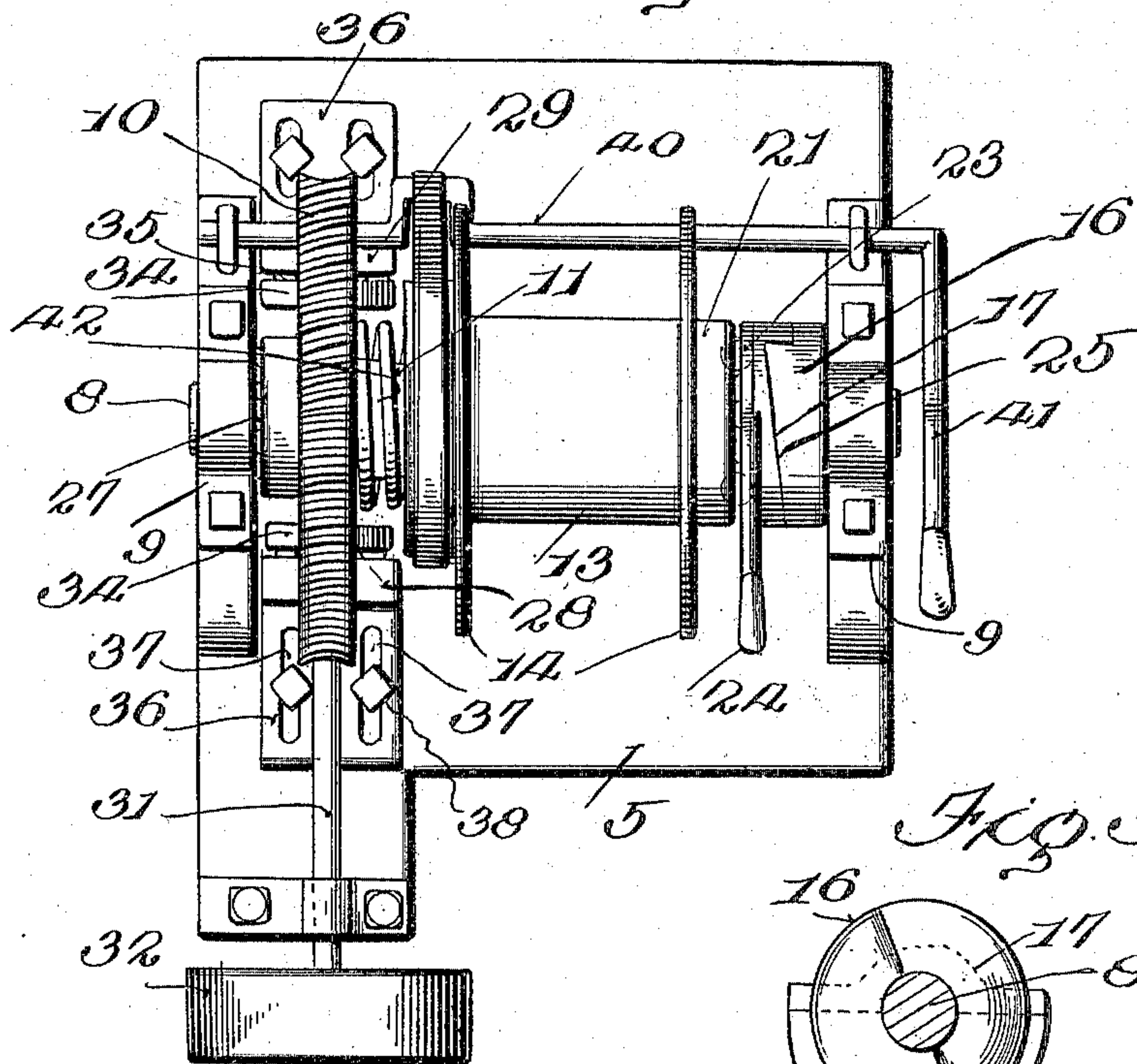


Fig. 5.

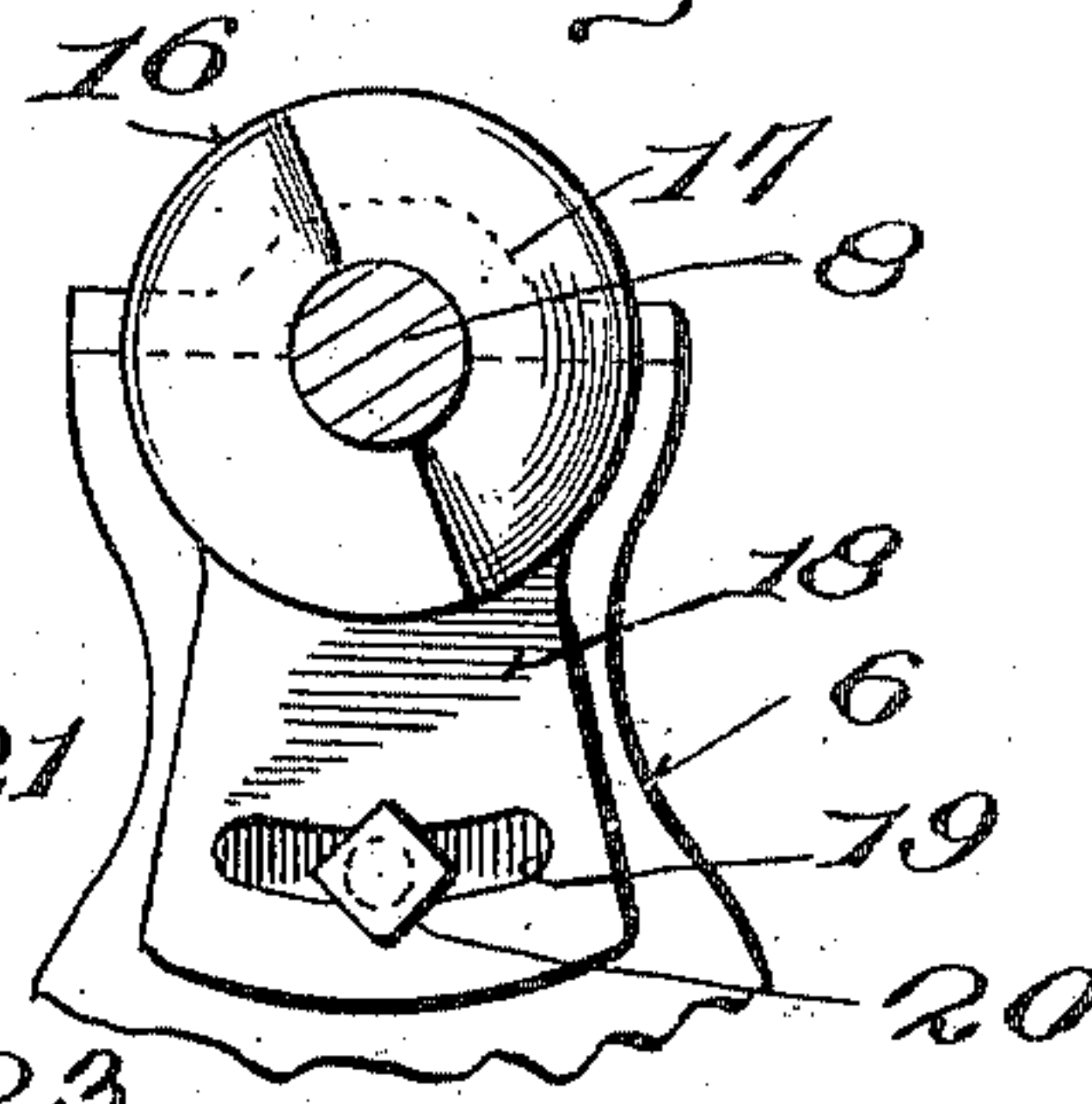
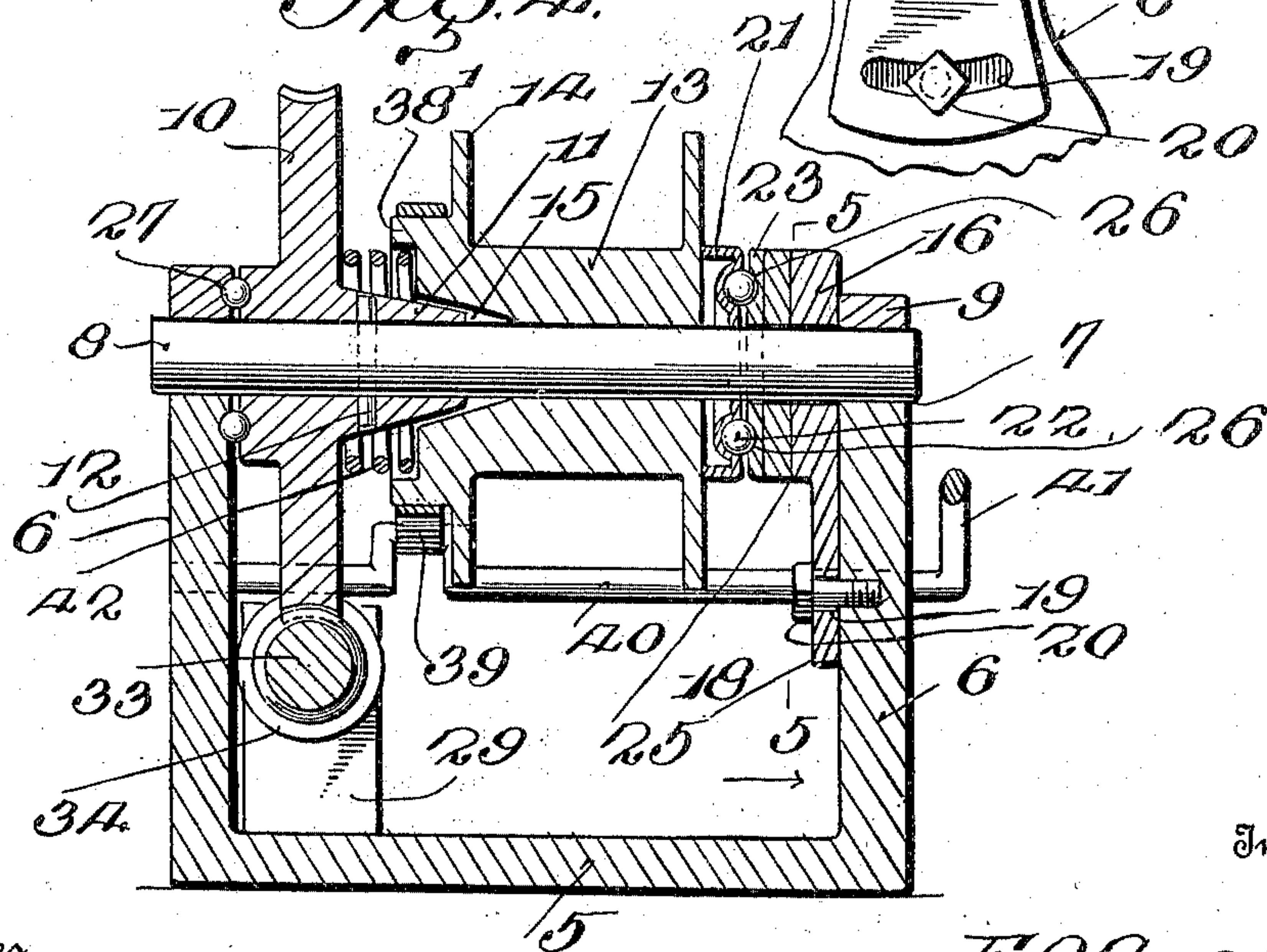


Fig. 4.



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# UNITED STATES PATENT OFFICE.

EDWARD O. CARVIN, OF MANHATTAN, NEVADA, ASSIGNOR OF ONE-FOURTH TO JAMES MCOSH SMITH, OF MANHATTAN, NEVADA.

## HOISTING DEVICE.

957,865.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed October 26, 1909. Serial No. 524,599.

*To all whom it may concern:*

Be it known that I, EDWARD O. CARVIN, citizen of the United States, residing at Manhattan, in the county of Ney and State of Nevada, have invented certain new and useful Improvements in Hoisting Devices, of which the following is a specification.

This invention relates to hoisting apparatus and has for its object to provide a hoisting device or winch which shall be light in weight, strong, durable and compact in construction, and which may be driven from any suitable source of power.

A further object is to provide a hoisting apparatus including a driven shaft having a worm gear secured thereto and meshing with a worm on the driving shaft, there being a drum slidably mounted on the driven shaft and movable into and out of engagement with said worm gear.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency, (as well as to reduce the cost of manufacture.)

Further objects and advantages will appear in the description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention reference is to be had to the following description and accompanying drawings, in which:—

Figure 1 is a perspective view of a hoisting apparatus constructed in accordance with my invention. Fig. 2 is a transverse sectional view of the same. Fig. 3 is a top plan view. Fig. 4 is a longitudinal sectional view. Fig. 5 is a detail side elevation of one of the adjusting cam members for actuating the winding drum.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

The hoisting apparatus forming the subject-matter of the present invention comprises a supporting base 5 having spaced uprights or standards 6 secured to the opposite ends thereof and provided with terminal bearings 7 in which is mounted for rotation a driven shaft 8. Suitable cap-pieces 9 are detachably secured to the upper

ends of the standards 6 for the purpose of retaining the opposite ends of the driven shaft 8 within the bearings 7. Mounted on one end of the driven shaft 8 is a worm gear 10 having a conical extension 11, the latter being pierced by a transverse pin 12 which also pierces the shaft 8 and serves to rigidly secure the worm gear 10 in position thereon.

Slidably mounted on the driven shaft 8 is a drum 13 having oppositely disposed circumferential flanges 14 to prevent accidental displacement of the winding cable, and provided at one end thereof with a conical shaped socket 15 adapted to receive and frictionally engage the conical extension 11 of the worm gear 10.

Mounted on one end of the driven shaft 8 is a sleeve 16 having a cam face 17 and provided with a depending extension 18, which latter bears against the inner face of the adjacent upright or standard 6 and is provided with a segmental slot 19, through which passes a bolt or similar fastening device 20.

Secured to one side of the drum 13 is a collar 21 having a plurality of anti-friction balls 22 mounted therein and which bears against a wear-plate 23 secured to the adjacent side of an operating lever 24. The pivoted end of the operating lever 24 surrounds the driven shaft 8 and is provided with a cam face 25 corresponding with and adapted to bear against the cam face 17 of the sleeve 16 for the purpose of moving the drum 13 into and out of frictional engagement with the conical extension 11 of the gear wheel, thus to actuate the drum to raise or lower the hoisting cable. The wear-plate 23 is provided with an annular groove 26 which constitutes a race-way for the balls 22, and thus serves to reduce friction between the parts when the operating lever 24 is actuated to rotate the drum on the driven shaft 8.

It will here be noted that by loosening the clamping device 20 and rotating the sleeve 16 on the driven shaft 8, as an axis, the relative position of the cam face 17 with respect to the cam face 25 may be varied at will, so as to regulate the throw or movement of the drum 13, said sleeve being held in adjusted position by tightening the clamping device 20, as before stated.

Suitable anti-friction balls 27 are also preferably interposed between the outer face of the worm gear 10 and the inner face of



the adjacent upright or standard 6 to assist in reducing friction between the parts.

Mounted on the base 5 beneath the worm gear 10 are supporting brackets 28 and 29 having bearings 30 formed therein for the reception of a driving shaft 31, the latter being provided with a pulley 32 which may be connected through the medium of a belt, chain, or the like, with an engine or other suitable source of power.

Keyed or otherwise secured to the driving shaft 31 between the brackets 28 and 29 is a worm 33 which meshes with the worm gear 10 so that motion may be transmitted from the driving shaft 31 through the medium of the worm gearing to the drum 13 to effect the hoisting of the cable.

Interposed between the opposite ends of the worm 33 and the inner faces of the adjacent brackets 28 and 29 are collars 34 carrying anti-friction balls 35, said collars serving to receive the longitudinal thrust of the driving shaft 31 and thus prevent stripping the teeth of the worm 33 and gear 10.

The brackets 28 and 29 are each provided with a lateral extension 36 having longitudinal slots 37 formed therein for the reception of clamping bolts 38, such a construction permitting the brackets 28 and 29 to be adjusted transversely of the supporting base 5 for the purpose of centering the worm 33 with respect to the gear 10.

One end of the drum 13 is extended to provide a cylindrical portion 38' which receives a clamping band 39, the latter being operatively connected with a crank-shaft 40 journaled in suitable bearings on the standards 6 and provided with an operating handle 41, so that by rotating the handle 41 the brake band 39 may be actuated to retard the rotation of the drum when desired. Thus it will be seen that by moving the operating handle 24 in one direction the drum 13 may be adjusted longitudinally of the driven shaft 8 so as to cause the extension 11 to frictionally engage the walls of the socket 15, and thereby transmit motion from the driving shaft 31 through the medium of the worm gear 10 to the drum.

When the operating handle 24 is moved in the opposite direction the cam faces 17 and 25 will be disengaged, thus permitting the drum 13 to revolve loosely on the shaft 8 and the gear 10 to rotate without effecting the drum, the movement of the drum being controlled by the brake band 39.

When the device is used for operating elevators, or the like, the starting lever, conical extension 11 and other actuating devices may be eliminated, and the winding drum keyed to the driven shaft, with the worm gear 10 and worm on the power shaft reversed.

A coiled spring 42 is preferably interposed between the winding drum 13 and

worm gear 10 for the purpose of assisting in disengaging the parts when the operating lever is released.

Having thus described the invention what is claimed as new is:—

1. A hoisting apparatus including a driven shaft, a worm gear secured to the shaft, a winding drum slidably mounted on the driven shaft, a sleeve carried by the driven shaft and provided with a depending extension having a segmental slot formed thereon, one side of said sleeve being provided with a cam face, an operating lever interposed between the sleeve and drum and having a corresponding cam face adapted to engage the cam face of the sleeve for moving the drum into and out of engagement with the gear, spaced brackets disposed beneath the driven shaft, a driving shaft journaled in said brackets and having a worm meshing with said worm gear, collars secured to the driving shaft on opposite sides of the worm and bearing against the brackets and a fastening device extended through the segmental slot of the sleeve extension for clamping the latter in adjusted position.

2. A hoisting apparatus including a base having spaced standards, and provided with spaced brackets arranged at right angles to the standards, a driven shaft journaled in said standards, a worm gear secured to one end of the driven shaft, a winding drum loosely mounted on the driven shaft and movable into and out of engagement with the worm gear, a collar secured to one end of the drum and provided with a series of anti-friction balls, a sleeve surrounding the driven shaft and provided with a depending extension having a segmental slot formed therein, one side of the sleeve being formed with a cam face, an operating lever encircling the driven shaft and having a cam face adapted to engage the cam face of the sleeve for moving the drum into and out of engagement with the worm gear, a wear-plate secured to the opposite side of the lever and having a race-way formed therein for the reception of the anti-friction balls, a fastening device extending through the segmental slot and engaging the adjacent standard, and a driving shaft journaled in the brackets and having a worm secured thereto and meshing with the teeth of the worm gear, and collars disposed on opposite sides of the worm and bearing against said brackets.

3. A hoisting apparatus including a base having spaced standards secured thereto, a driven shaft journaled in said standards, a worm gear keyed to one end of the driven shaft and provided with a conical extension, a drum loosely mounted on the driven shaft and having a conical socket formed in one end thereof and adapted to receive the conical extension of the worm gear, spaced



brackets secured to and adjustable transversely of the supporting base, a driving shaft journaled in said brackets, a worm carried by the driving shaft and meshing  
5 with the worm gear, collars interposed between the worm and the adjacent brackets for receiving the longitudinal thrust of the driving shaft, and means mounted on the driven shaft and interposed between one  
10 end of the drum and the adjacent upright for moving the drum into and out of engagement with the worm gear.

4. A hoisting apparatus including a base having spaced standards secured thereto,  
15 slotted brackets secured to the base and adjustable laterally in a plane at right angles to the standards, a driven shaft journaled in said standards, a worm gear secured to

said driven shaft, a drum slidably mounted on the driven shaft and movable into and  
20 out of engagement with the worm gear, a driving shaft journaled in the brackets and having a worm secured thereto and meshing with the worm gear, collars disposed on opposite sides of the worm and bearing  
25 against the adjacent brackets, and a fastening device extending through the slots in the brackets and engaging the base for clamping said brackets in adjusted position.

In testimony whereof I affix my signature  
30 in presence of two witnesses.

EDWARD O. CARVIN. [L.S.]

Witnesses:

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C. Z. WORK.