

No. 670,317

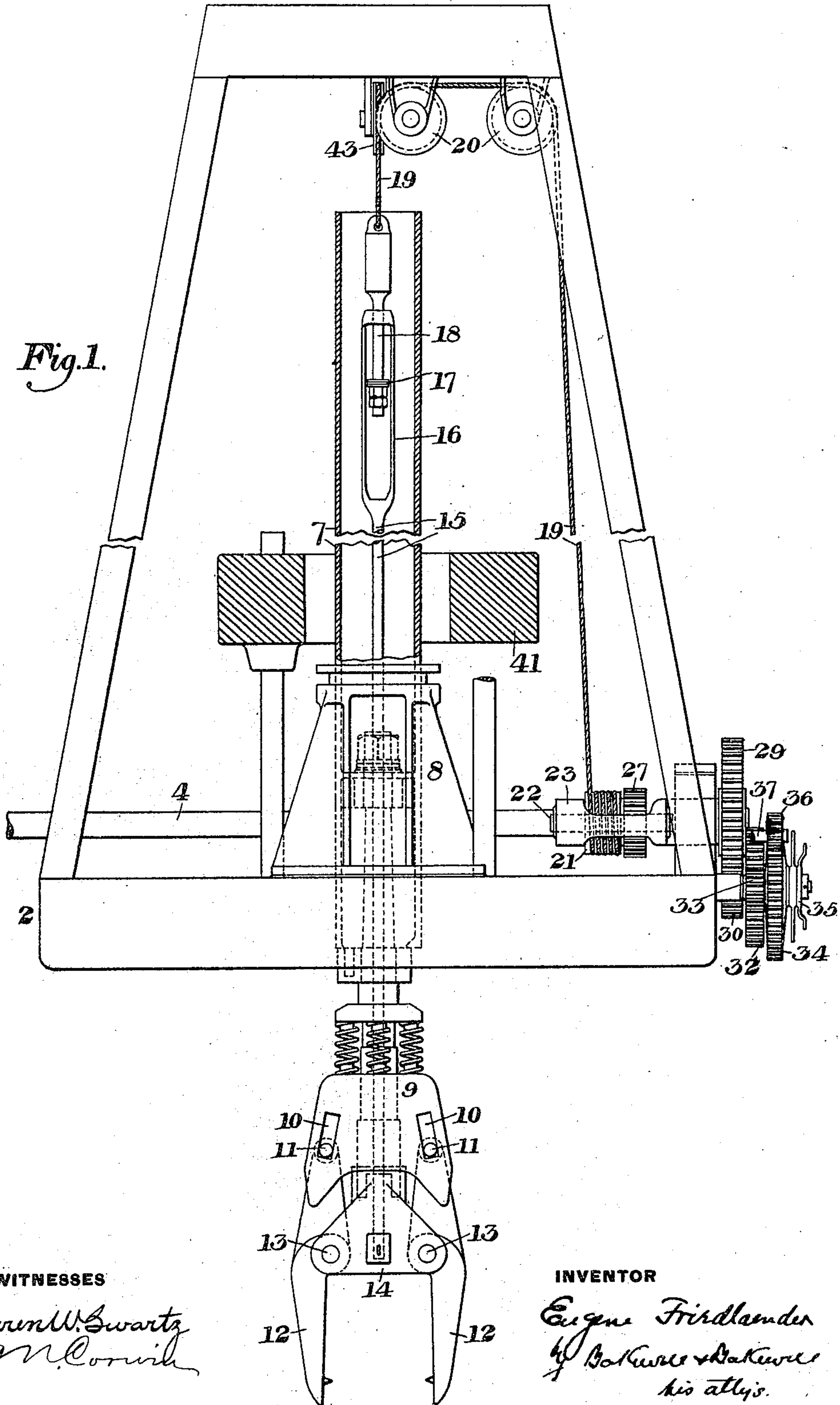
Patented Mar. 19, 1901.

E. FRIEDLAENDER.
TONGS ACTUATING APPARATUS.

(Application filed Oct. 13, 1900.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES

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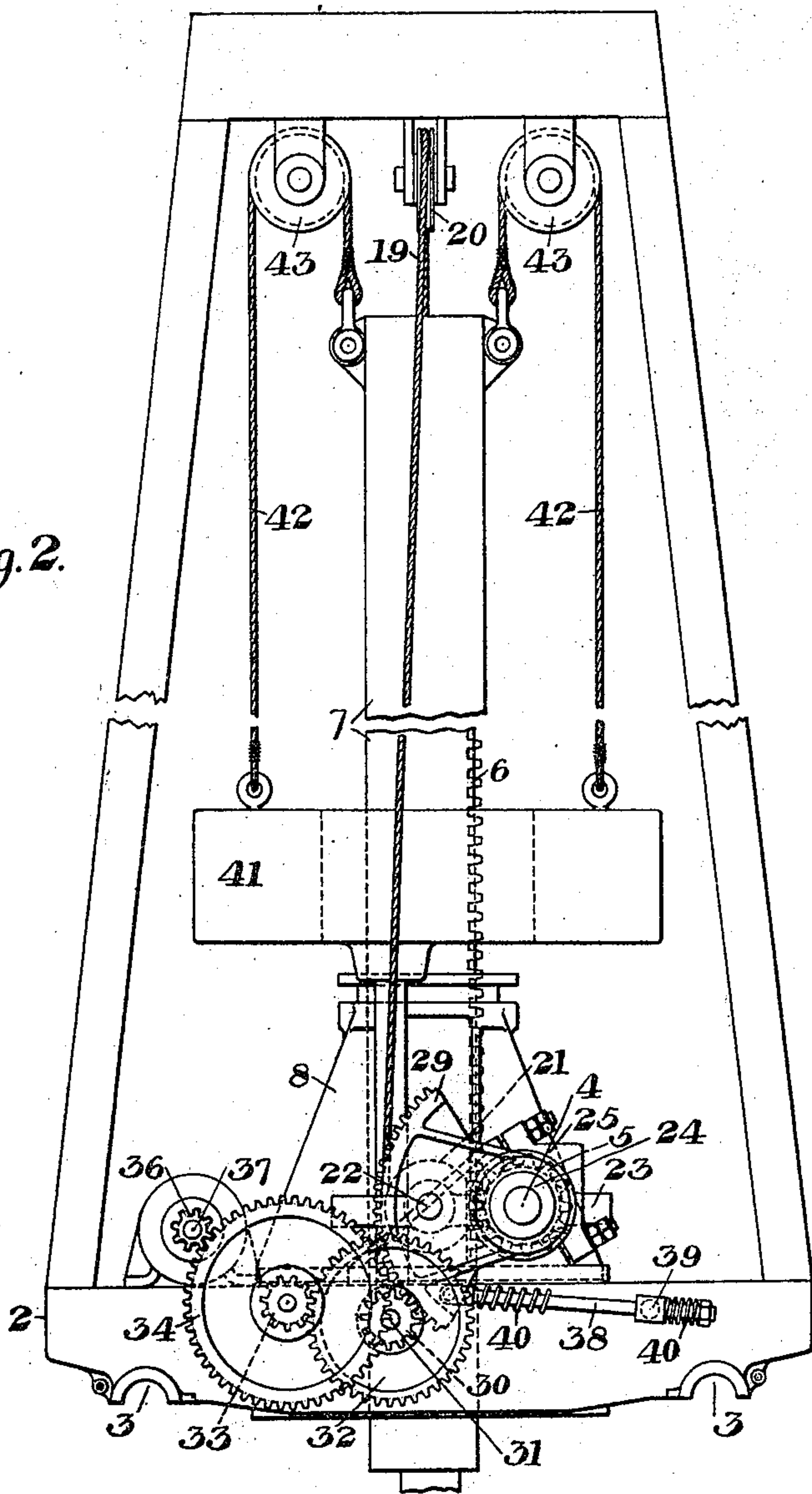
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Fig. 2.



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Fig. 3.

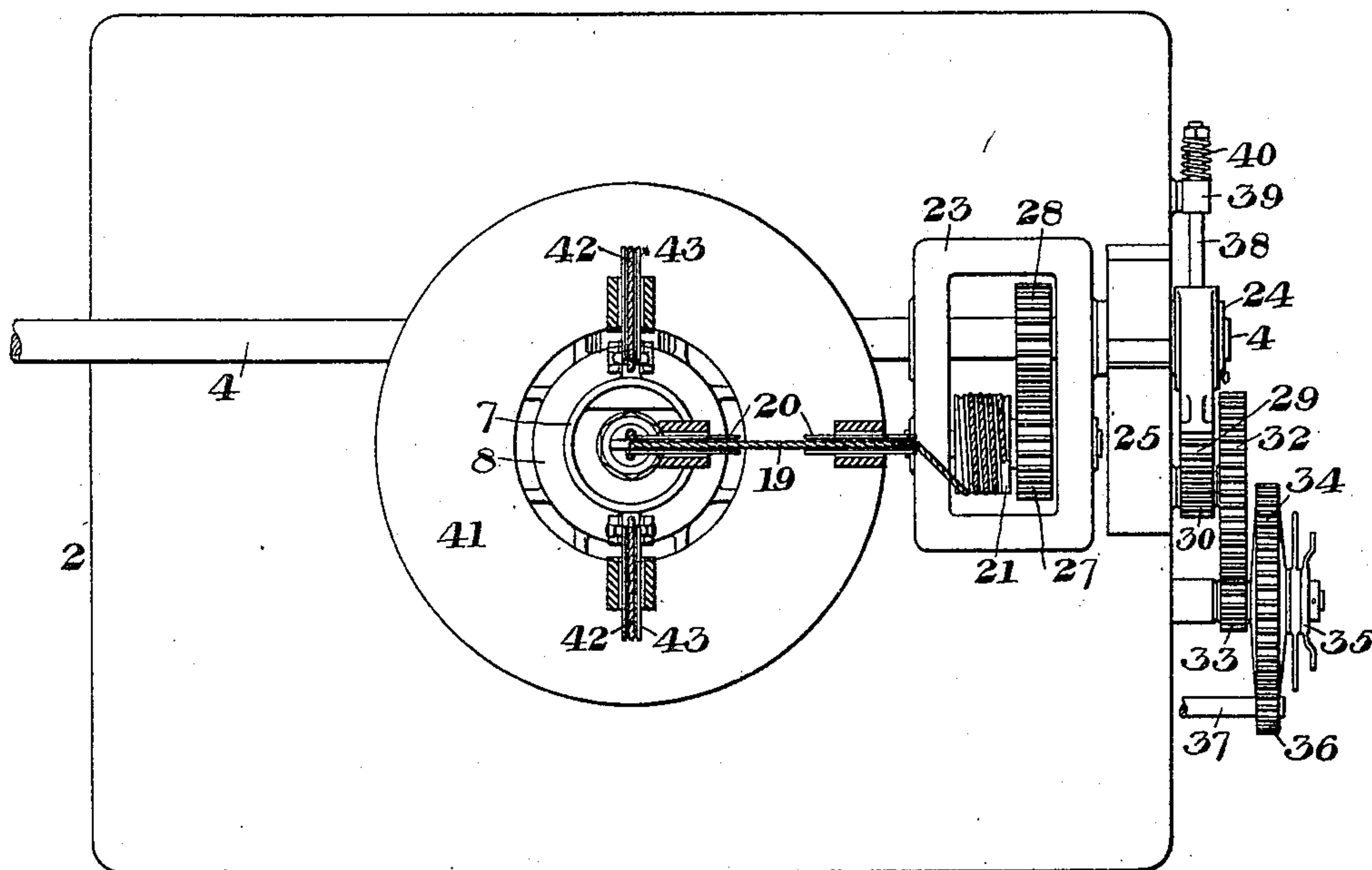
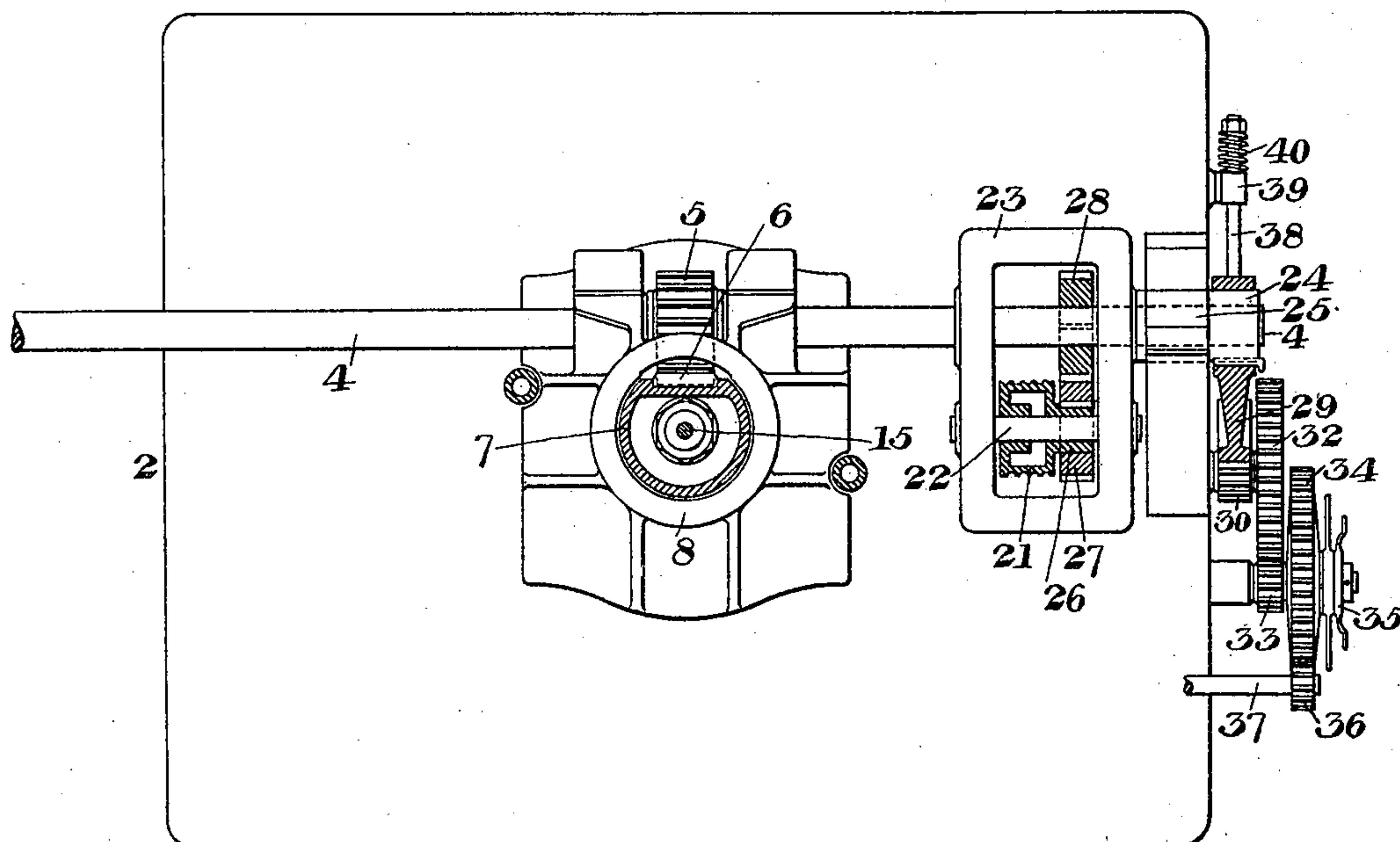


Fig. 4.



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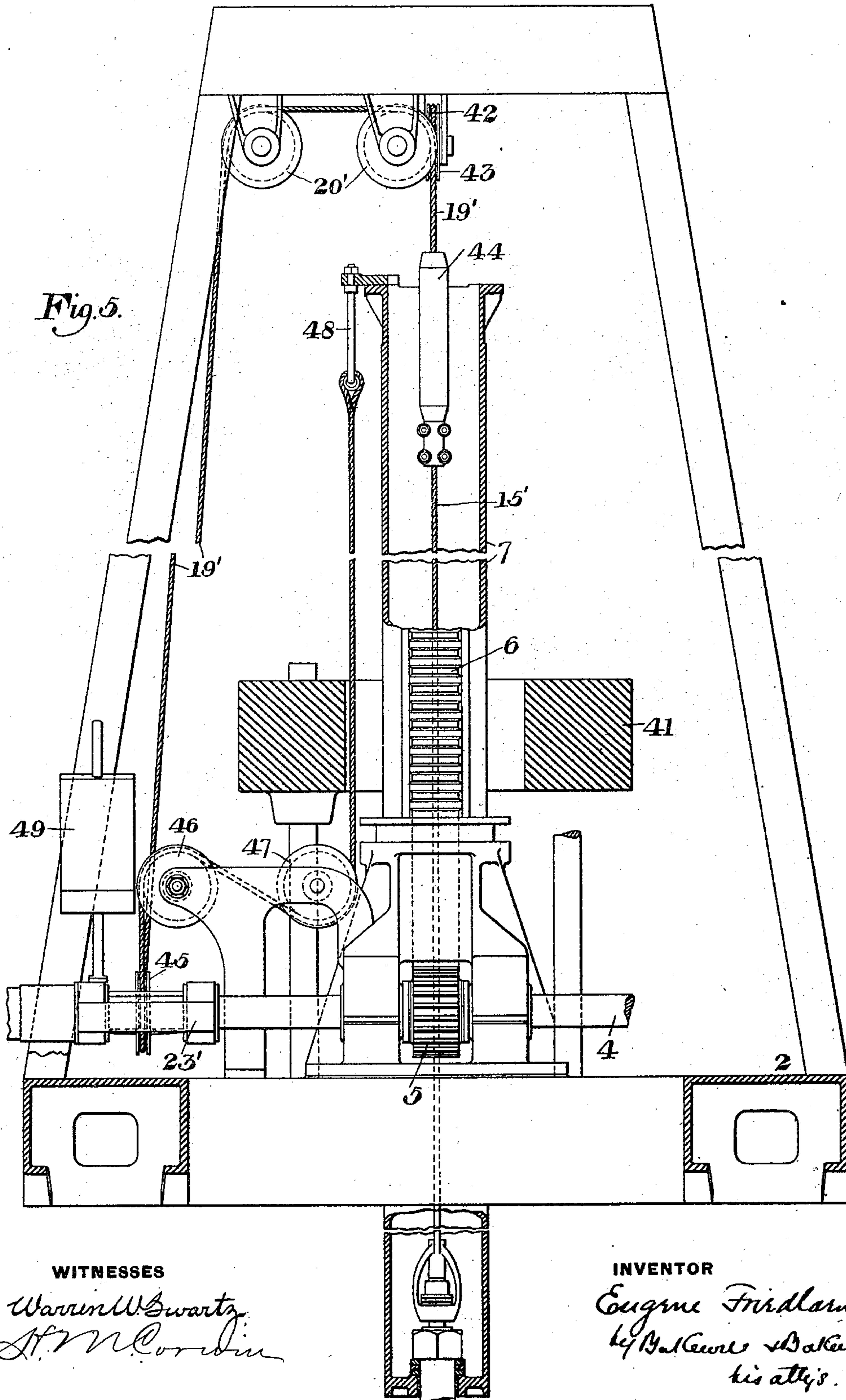
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(No Model.)

Fig. 6.

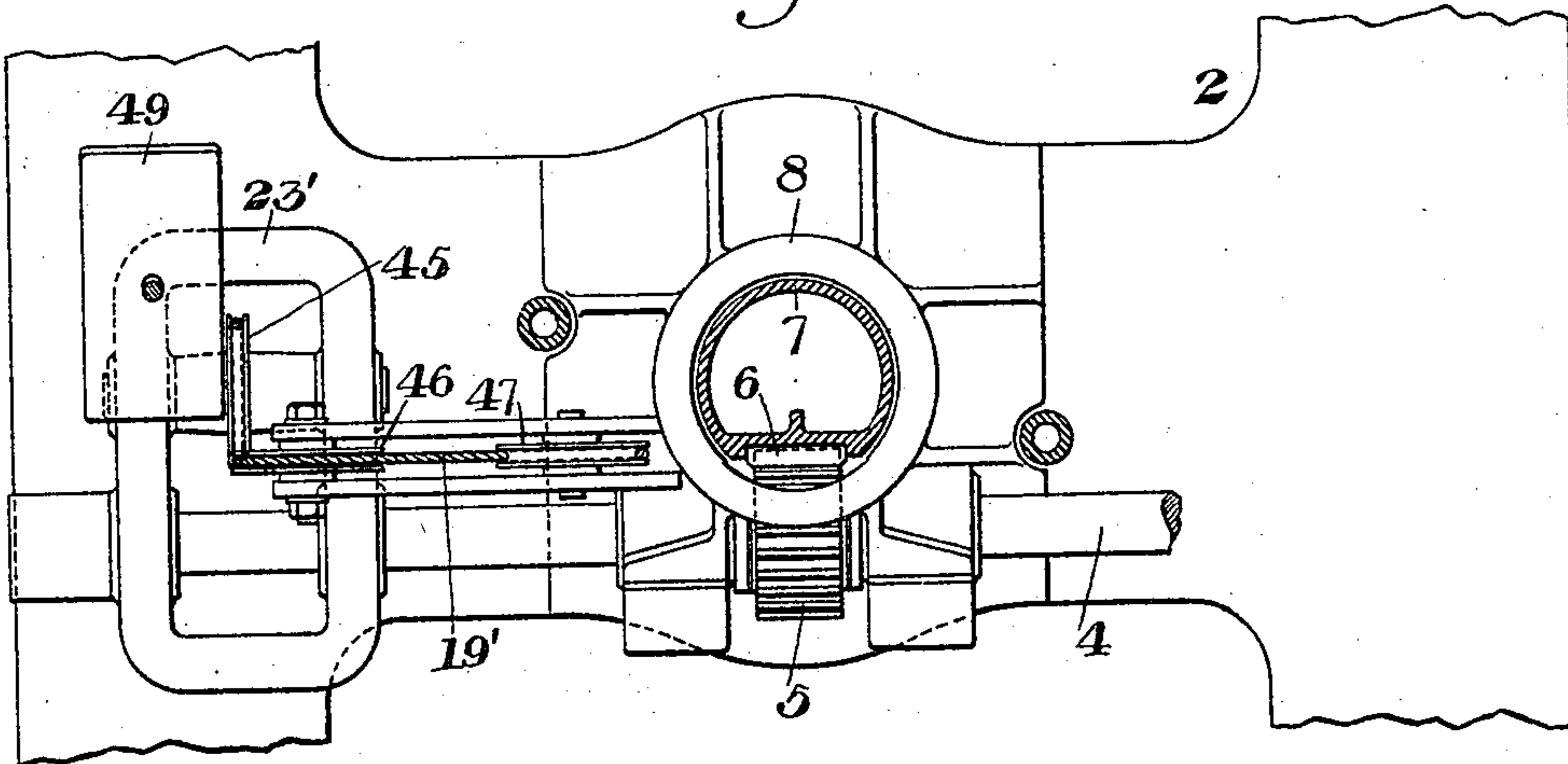
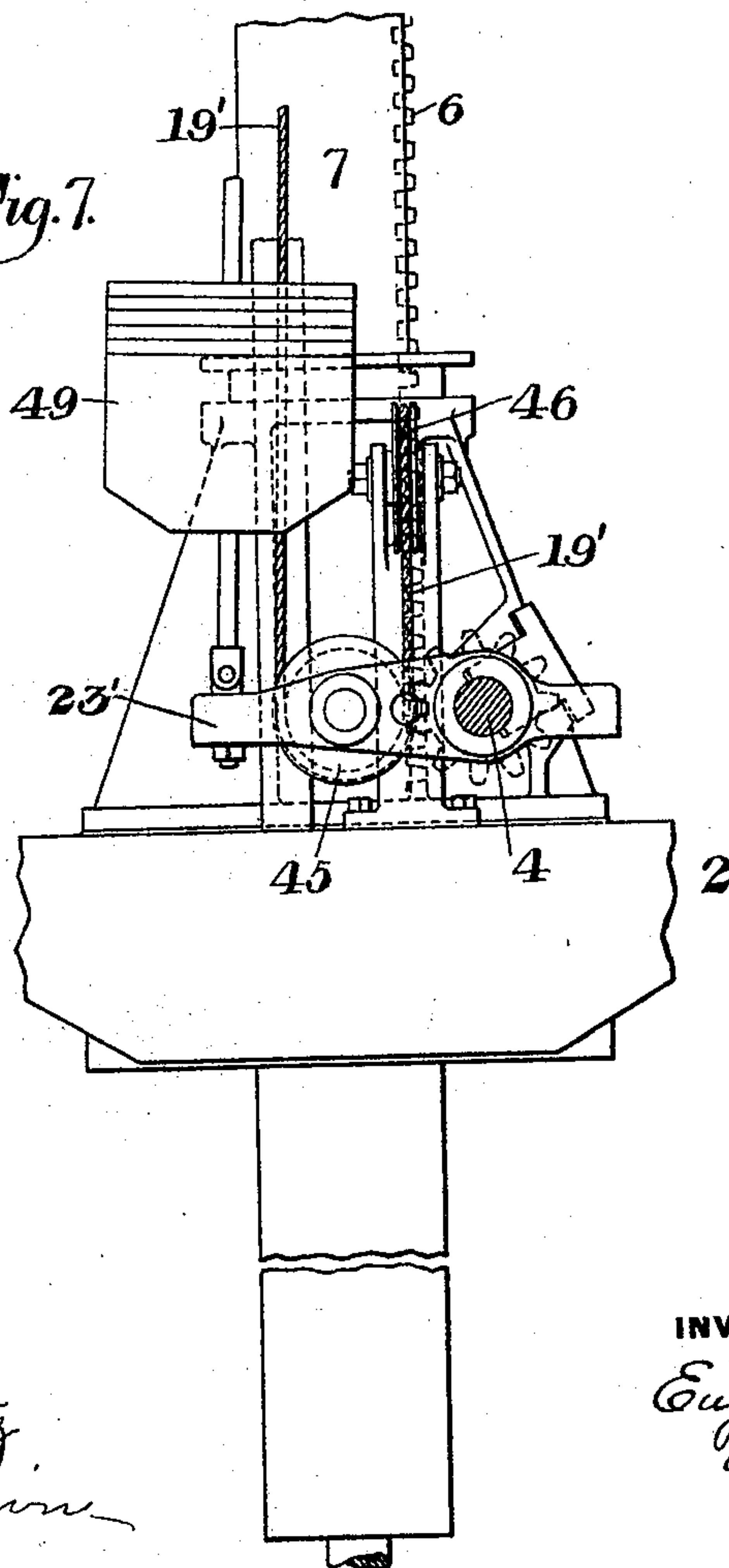


Fig. 7.



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UNITED STATES PATENT OFFICE.

EUGENE FRIEDLAENDER, OF DUQUESNE, PENNSYLVANIA.

TONGS-ACTUATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 670,317, dated March 19, 1901.

Application filed October 13, 1900. Serial No. 32,967. (No model.)

To all whom it may concern:

Be it known that I, EUGENE FRIEDLAENDER, of Duquesne, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tongs-Actuating Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, showing one form of my invention as applied to a stiff-post crane. Fig. 2 is an end elevation showing the drum-actuating connections. Fig. 3 is a top plan view, and Fig. 4 is a horizontal sectional view. Fig. 5 is a sectional side elevation showing a preferred form of my invention. Fig. 6 is a sectional plan view of the same, and Fig. 7 is an end detail view showing the swinging pulley-carrying frame.

My invention relates to that class of cranes wherein tongs are suspended from a jib or overhead support and are raised or lowered and opened and closed in different positions, and more particularly to the class of stiff-post cranes wherein a vertically-movable post carries the tongs. Heretofore in this class of apparatus flexible hose connections have been employed for conducting the power to the tongs opening and closing motor, and these have given much trouble from their short life, owing largely to the proximity of heated metal and their usually working over soaking-pits and heating-furnaces.

My invention is designed to do away with all connecting-pipes, whether flexible or jointed; and it consists, broadly, in employing a flexible connection which leads to the tongs-actuating element and is wound up or paid out automatically as the tongs are raised and lowered, mechanism being provided for actuating the cord independent of the movement of the tongs-carrier to open and close the tongs.

It further consists in the construction and arrangement of parts hereinafter more fully described, and set forth in the claims.

In the drawings, referring to Figs. 1 to 4, inclusive, 2 represents the frame of a trolley, which may be mounted upon a crane jib or arm in any suitable way, as upon wheels mounted in bearings, (indicated at 3 3.) A

power-shaft 4 is mounted in suitable bearings on the jib and driven through proper connections, this shaft carrying a pinion 5, which engages a rack 6, formed upon one side of a hollow stiff post 7. This stiff post moves vertically within a suitable bearing 8 upon the trolley and carries at its lower ends the ingot-tongs, which I have shown as having a base-plate 9, provided with oppositely-inclined slots 10 10, containing pins 11, secured to the upper end of the tong-levers 12 12. These tong-levers are mounted on pivots 13, carried in a vertically-movable plate 14, the actuating-rod 15 of which extends upwardly within the hollow post carrying the tongs. I have shown this rod 15 as terminating in a yoke 16, within which moves the enlarged end 17 of a bar 18, thus forming a loose sliding or jar connection between the actuating rope or cord 19 and the rod 15. The cord 19 extends over the upper pulleys 20 and thence down to a winding-drum 21, loose on a shaft 22, mounted in a frame 23, which frame is provided with bearings surrounding the power-shaft 4 and has an integral sleeve 24 extending through a supporting-bearing 25. The drum 21 is provided with an integral collar 26, surrounding the shaft 22, and to this collar is keyed a pinion 27, engaging a toothed wheel 28, fixed to and rotatory with the shaft 4. A toothed segment 29 is secured to the sleeve 24 of the swinging frame, this segment engaging a pinion 30 on shaft 31, having a toothed wheel 32 engaging a pinion 33 on another shaft, to which a toothed wheel 34 may be clamped by a suitable clutch 35. Toothed wheel 34 intermeshes with a pinion 36 on the shaft 37, which may extend to an electric motor on the trolley or may be driven by other suitable connections. To prevent jars at the end of the movements of the segment, I pivot to it a rod 38, extending through a pivoted block 39 and carrying springs 40, which will be compressed against the block at the ends of the swinging movement of the segment. The stiff post is shown as counterbalanced by a weight 41, of annular form, connected to its upper end by cords 42, extending over pulleys 43.

In the operation of the device the tongs are raised or lowered by power applied to the shaft 4, the pinion 5 moving the post verti-

cally to the desired point. During this movement the drum 21 is driven by its connection with the pinion 28 so as to wind up or pay out the cord 19 proportionately to the movement of the tongs-carrier. Any tendency of the drum to strain the cord, owing to momentum or improper proportioning of the gears, may be taken up by the loose connection or joint between the rod 15 and the cord. When the tongs are brought to the desired point by actuating the shaft 37, the segmental rack will be actuated, thus swinging the frame 23, which travels about the pinion 28, a short distance, thus driving the drum 21 and drawing up or slacking on the cord so as to open or close the tongs.

In order to avoid the necessity of the loose connection between the tongs-actuating member and the cord or rope, I prefer to employ the form shown in Figs. 5 and 6. In this form the cord 19' is secured rigidly to the actuating-rod 15', a small counterweight 44 being preferably employed. In this form the winding-drum for the cord is done away with and the cord extends downwardly from the pulleys 20' to and over a pulley 45, mounted in a swinging frame 23', and thence over pulley 46, under pulley 47, and upwardly to the upper part of the stiff post, to which its end portion is secured, as shown at 48. The pulleys 46 and 47 are mounted in stationary bearings upon the jib, and the rocking frame or arm 23' is preferably provided with a counterweight 49, secured beyond the bearing for the pulley 45. The mechanism for rocking the frame 23' may be the same in this as in the first form and is not shown. In the operation of this second form the cord is drawn over the pulleys by its end connection with the post, the counterweight 44 keeping the cord taut and in proper position as the stiff post is lowered. The winding-drum for the rope and the connections for driving it are thus done away with, and at the same time there is less liability of straining or breaking the rope.

The advantages of my invention will be apparent to those skilled in the art, since the use of all fluid-conducting piping is done away with and a simple and effective system provided for actuating the tongs at any desired point.

Many changes may be made in the form and arrangement of the mechanisms for carrying, lifting, and lowering the tongs and for opening and closing them without departing from my invention.

I claim—

1. A trolley having depending tongs, mechanism for raising and lowering the tongs, a tongs-actuating member, a flexible actuating connection therefor, and actuating connections arranged to positively and automatically take up and pay out the connection during vertical movement of the tongs; substantially as described.

2. A trolley having depending tongs, mechanism for raising and lowering them, a tongs-actuating member having a flexible actuating connection, a pulley over which the connection extends, means for moving the pulley to draw or slack on the cord, and actuating connections arranged to positively wind up and pay out the cord during vertical movement of the tongs; substantially as described.

3. A crane having a vertically-movable support, tongs secured thereto, a tongs-actuating member, a pulley mounted upon a rocking arm, a flexible connection for the tongs-actuating member extending over the pulley, and thence to a cord-actuating device driven by the movement of the tongs-support, and mechanism for swinging the rocking arm; substantially as described.

4. A stiff-post crane having tongs secured to the post, mechanism for moving the post vertically, a tongs-actuating member having a cord extending over intermediate pulleys, and thence to the post to which it is secured, and connections arranged to move one of said pulleys to actuate the tongs; substantially as described.

5. A trolley having a depending tongs-support with tongs carried thereon, a tongs-actuating member, a flexible connection therefor leading to the tongs-support, and mechanism for drawing or paying out the cord to actuate the tongs; substantially as described.

In testimony whereof I have hereunto set my hand.

EUGENE FRIEDLAENDER.

Witnesses:

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G. I. HOLDSHIP.