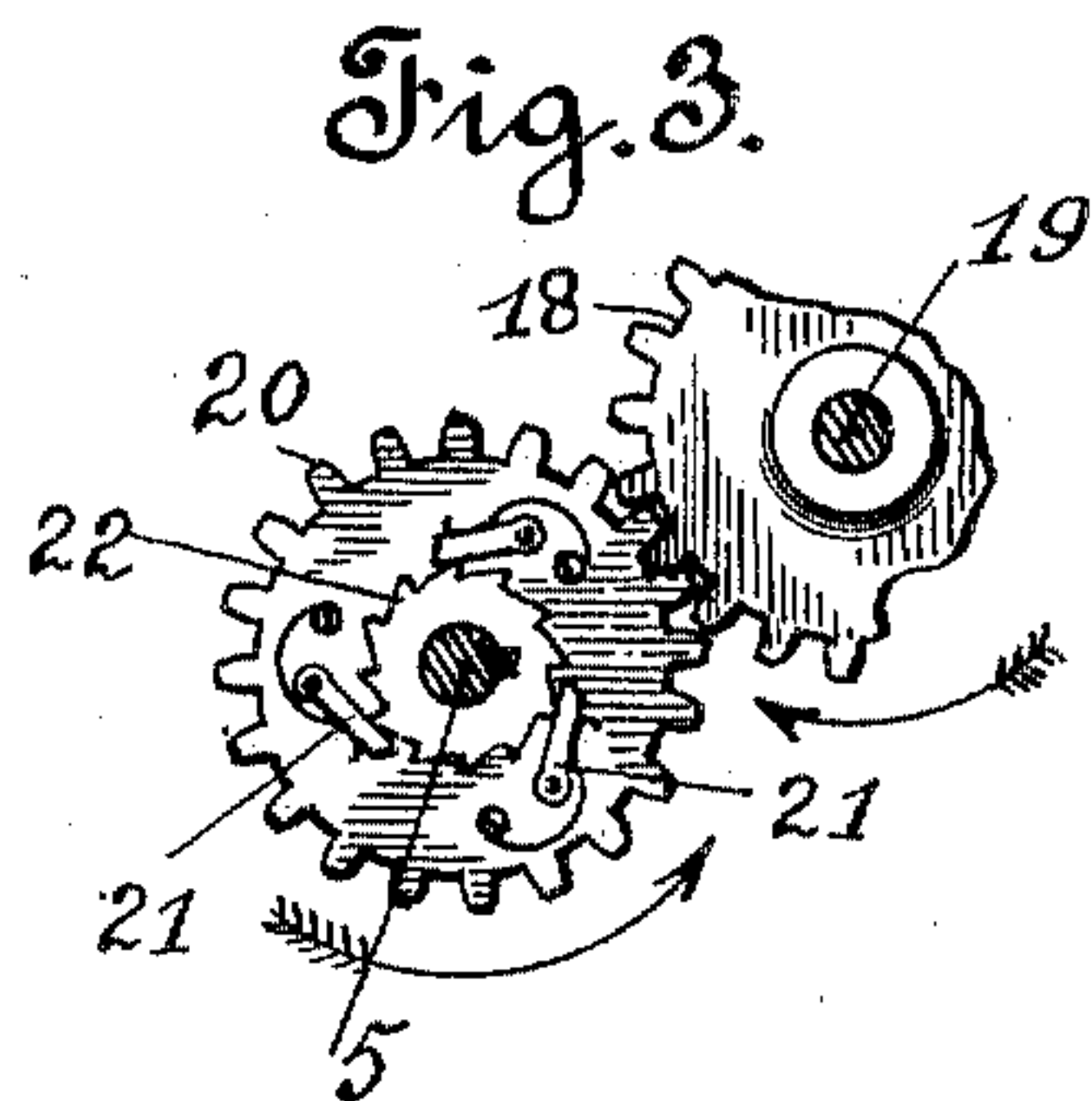
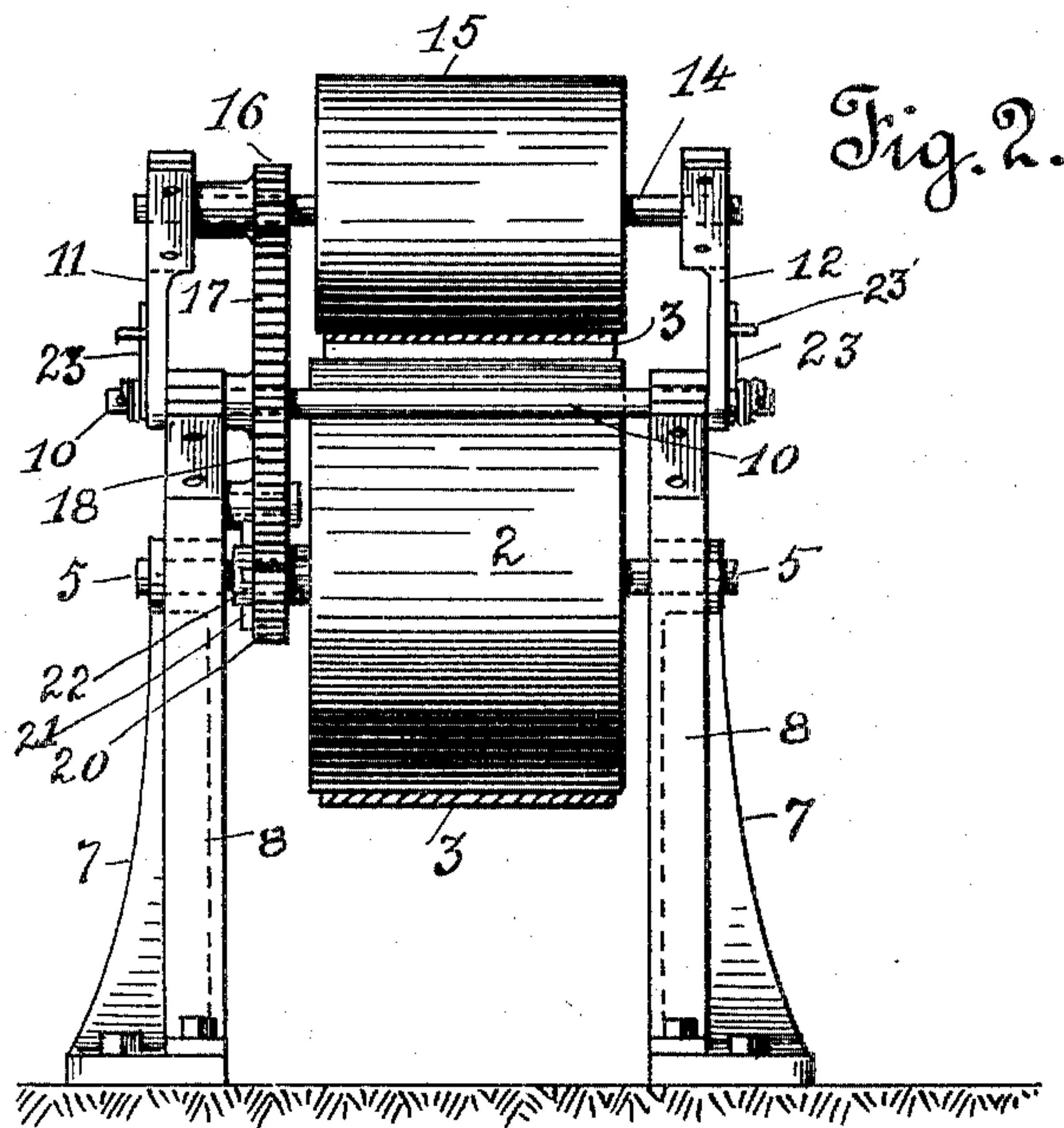
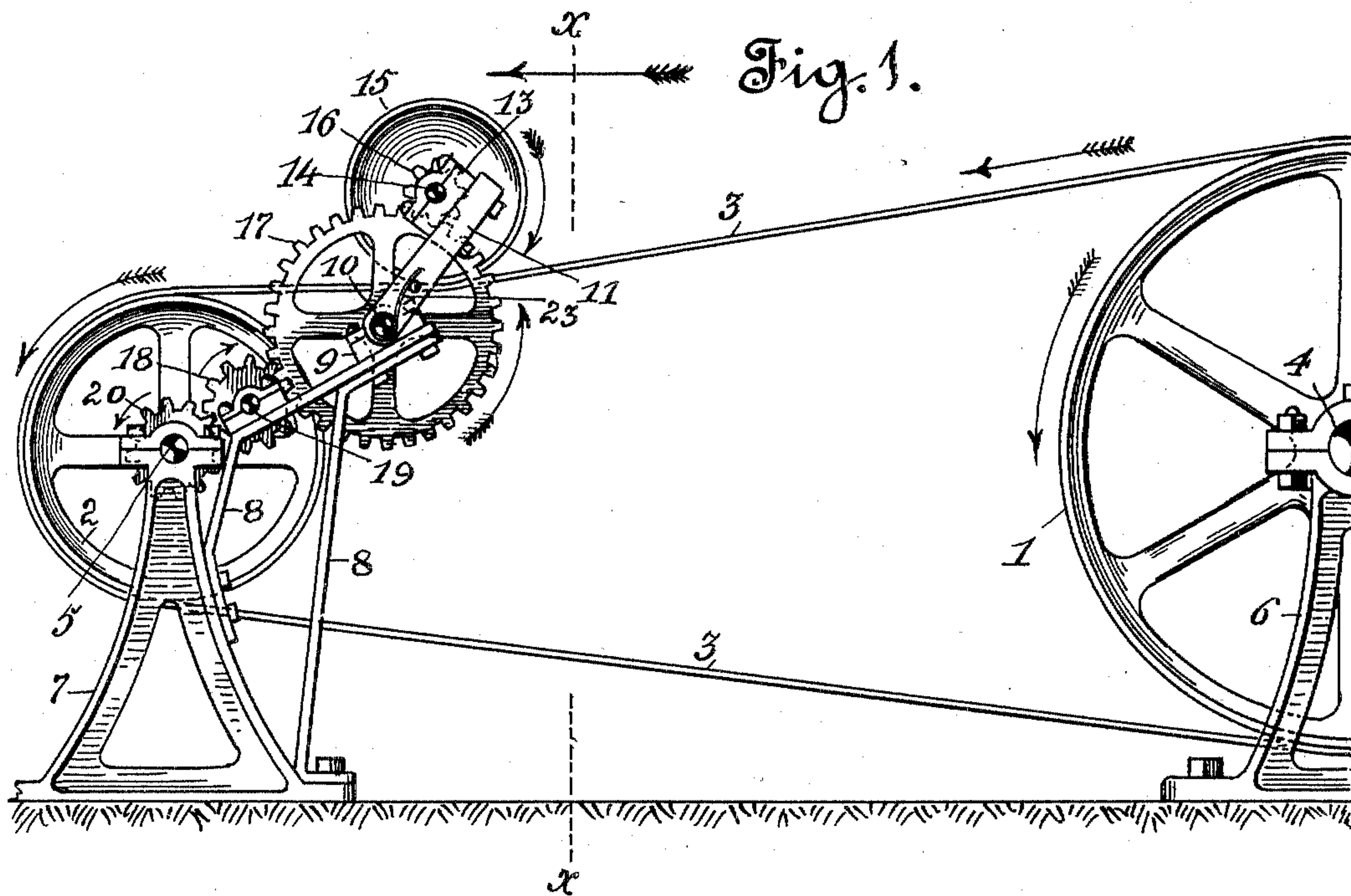


No. 776,827.

PATENTED DEC. 6, 1904.

H. E. CLARK.
AUTOMATIC BELT TIGHTENER.
APPLICATION FILED SEPT. 20, 1904.

NO MODEL.



Witnesses.

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UNITED STATES PATENT OFFICE.

HERBERT E. CLARK, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC BELT-TIGHTENER.

SPECIFICATION forming part of Letters Patent No. 776,827, dated December 6, 1904.

Application filed September 20, 1904. Serial No. 225,197. (No model.)

To all whom it may concern:

Be it known that I, HERBERT E. CLARK, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Automatic Belt-Tighteners; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to certain new and useful mechanism for automatically adjusting and regulating the tension of an endless drive-belt in accordance with variation in the load changes, the object being to maintain the proper degree of tension onto the said endless drive-belt irrespective of the load placed onto the power-drum, the invention consisting in certain details of construction and novel arrangement of parts hereinafter more fully set forth and described.

In order to comprehend the invention, reference should be had to the accompanying sheet of drawings.

Figure 1 is a side view in elevation of the tightening mechanism, said view disclosing the endless drive-belt and the drive-pulley and power-pulley over which the same works. Fig. 2 is a vertical sectional end view in elevation, taken on line *x x*, Fig. 1 of the drawings, and viewed in the direction of the arrow; and Fig. 3 is a detail view of the shaft for the power-drum, the gear thereon, and the pawl-and-ratchet connection with the shaft.

In the drawings the numeral 1 is used to indicate an ordinary drive-pulley; 2, the power-pulley, and 3 the endless drive-belt. The pulleys 1 2 are mounted on shafts 4 5, respectively, which shafts work in bearing-boxes supported by the standards or frames 6 7. Preferably to the standards or frame 7 the upwardly-extending brackets 8 are connected, which brackets at their outer end carry the bearing-boxes 9 for the cross-shaft 10. To the projecting ends of this cross-shaft the swinging arms 11 12 are fulcrumed, which arms normally extend upward at an angle to the brackets 8. These arms at their upper ends carry the bearing-boxes 13, in which work the cross-shaft 14. On the said cross-shaft 14 is mounted the idler-roll 15, which

roll rides or bears upon the upper face of the endless drive-belt 3, the tension of which belt it is designed to automatically control to prevent slippage thereof over the power-pulley 2. There is also secured on the cross-shaft 14 a cog-pinion 16, which pinion meshes with a larger cog-gear 17. The said cog-gear 17 is mounted on the cross-shaft 10, and the said cog-gear meshes with a smaller cog-gear 18, loosely mounted on an inwardly-projecting stud 19. The said cog-gear 18 in turn meshes with the cog-gear 20, loosely mounted on the cross-shaft 5.

The cog-gear 20 has secured to the outer face thereof a series of pawls 21, which pawls engage with the teeth of the ratchet 22, secured to and rotating with the cross-shaft 5. By means of the pawl-and-ratchet mechanism the cog-gear 20 is caused to rotate with and is positively driven in the same direction as that of the cross-shaft 5. Hence the moment rotation is given the said cross-shaft 5 corresponding motion or rotation is imparted to the said cog-gear 20, which in turn transmits its motion to the larger cog-gear 17 through the medium of the intermeshing cog-gear 18.

It will be understood that the idler-roll 15 is driven by the frictional contact therewith of the endless drive-belt 3, the upper surface of which, as stated, bears upon or against the peripheral surface of the said roll 15.

The arms 11 12 have a constant downward tension or strain exerted thereon by means of the springs 23, which springs are attached to the cross-shaft 10, the outer or free end thereof bearing against the pins 23', projecting from the said fulcrumed arms 11 12. The purpose of this spring tension is to enable the arms 11 12, carrying the idler-roll 15, to offset the tendency of the idler-roll 15 toward vibration and at the same time to hold the said idler-roll firmly down to and against the surface of the endless drive-belt 3.

The operation of the device is as follows: Presuming that motion is being imparted to the endless drive-belt 3 and the same to be slipping over the power-drum 2, the frictional contact of the said endless drive-belt with the idler-roll 15 imparts rotation thereto. As this

idler-roll is rotated the cog-pinion 16, which is rotated therewith, engaging with the larger gear 17, gradually works over the said gear, causing the arms 11 12 to move downward and forcing the idler-roll 15 to gradually tighten down onto the endless drive-belt 3 in order to tighten the same until the tension thereof onto the drum 2 is sufficient to impart rotation thereto. The moment rotation is imparted to the drum 2 a corresponding motion is transmitted to the described train of gear mechanism, thus transmitting a speed to the train of gears proportionate to the speed at which the power-drum 2 is driven. The moment rotation is imparted to the train of gears the downward movement of the idler-roll 15 ceases, and said roll and the train of gears will be driven proportionately at the same rate of speed. It is thus obvious that the tension of the endless driven belt is automatically regulated in proportion to the load changes of the power-drum 2, for any change or variation of said load will cause a proportionate change in the tension of the endless driven belt onto the power-drum, which necessitates automatic regulation of said tension, which is accomplished through the medium of the described mechanism. So long as the tension of the endless driven belt 3 onto the surface of the power-drum 2 is sufficient to cause rotation of the said power-drum at the requisite speed for the working load the position of the idler-roll 15 will remain normal and the train of gears will be rotated at a speed proportionate to that of the power-drum 2. However, the moment there is a change or variation in the working load placed onto the power-drum 2 the idler-roll 15 will automatically adjust the tension of the endless driven belt proportionately thereto.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

1. A belt-tightener, the same comprising an idler-roll which is frictionally engaged by the endless drive-belt, and connections between the said roll and the shaft of a power-drum,

said connections being positively driven by the rotation of the power-drum shaft and serving to hold the idler-roll in its adjusted position as long as the tension of the belt is proportionate to the working load.

2. The combination with an endless drive-belt, of a power-drum over which the same works, an idler-roll mounted above the endless drive-belt and frictionally driven thereby, swinging means for supporting the idler-roll, a train of gear mechanism driven from the shaft of the power-drum when rotation is imparted thereto, and connection between said mechanism and the idler-roll, which permits of the said roll being lowered or raised to regulate the tension of the endless drive-belt proportionate to the working load of the power-drum.

3. In a belt-tightener, the combination with the idler-roll which bears onto the endless drive-belt, and connected mechanism for automatically raising and lowering the idler-roll to adjust the tension of the endless drive-belt proportionately to the working load of the means driven thereby.

4. The combination with the power-drum, of the endless drive-belt, an idler-roll which bears onto the drive-belt, swinging support for the idler-roll, a cog-gear loosely mounted on the shaft for the power-drum, pawl-and-ratchet connection between the said gear and the shaft so as to positively drive the gear with the shaft, an intermediate gear driven by the gear mounted on said shaft, a larger gear with which the intermediate gear meshes, and a cog-pinion operated by the rotation of the idler-roll, said pinion meshing with the larger cog-gear and working thereover to raise and lower the idler-roll to adjust the tension of the endless drive-belt proportionate to the working load of the power-drum.

In witness whereof I have hereunto set my hand.

HERBERT E. CLARK.

Witnesses:

N. A. ACKER,
D. B. RICHARDS.