

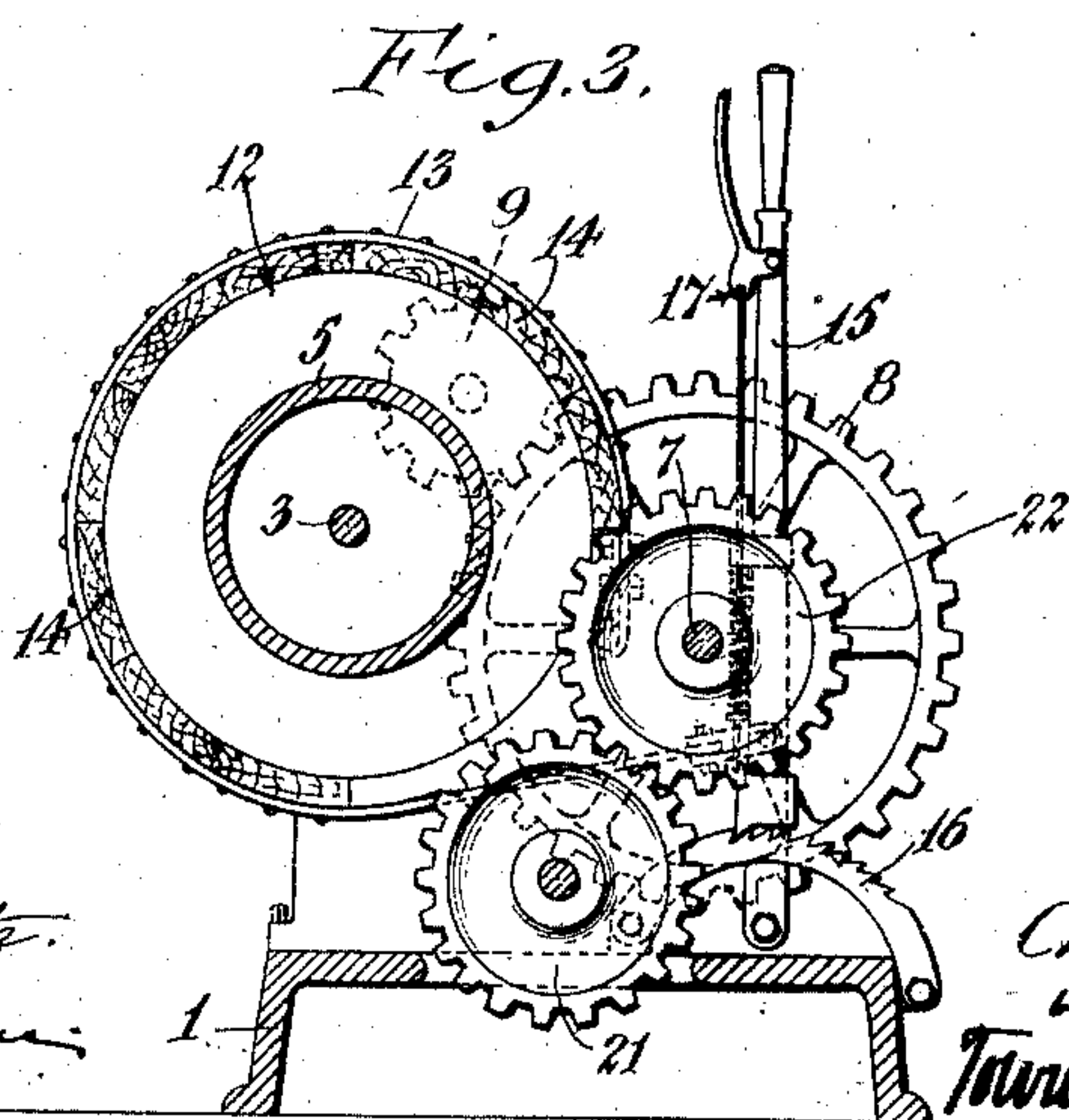
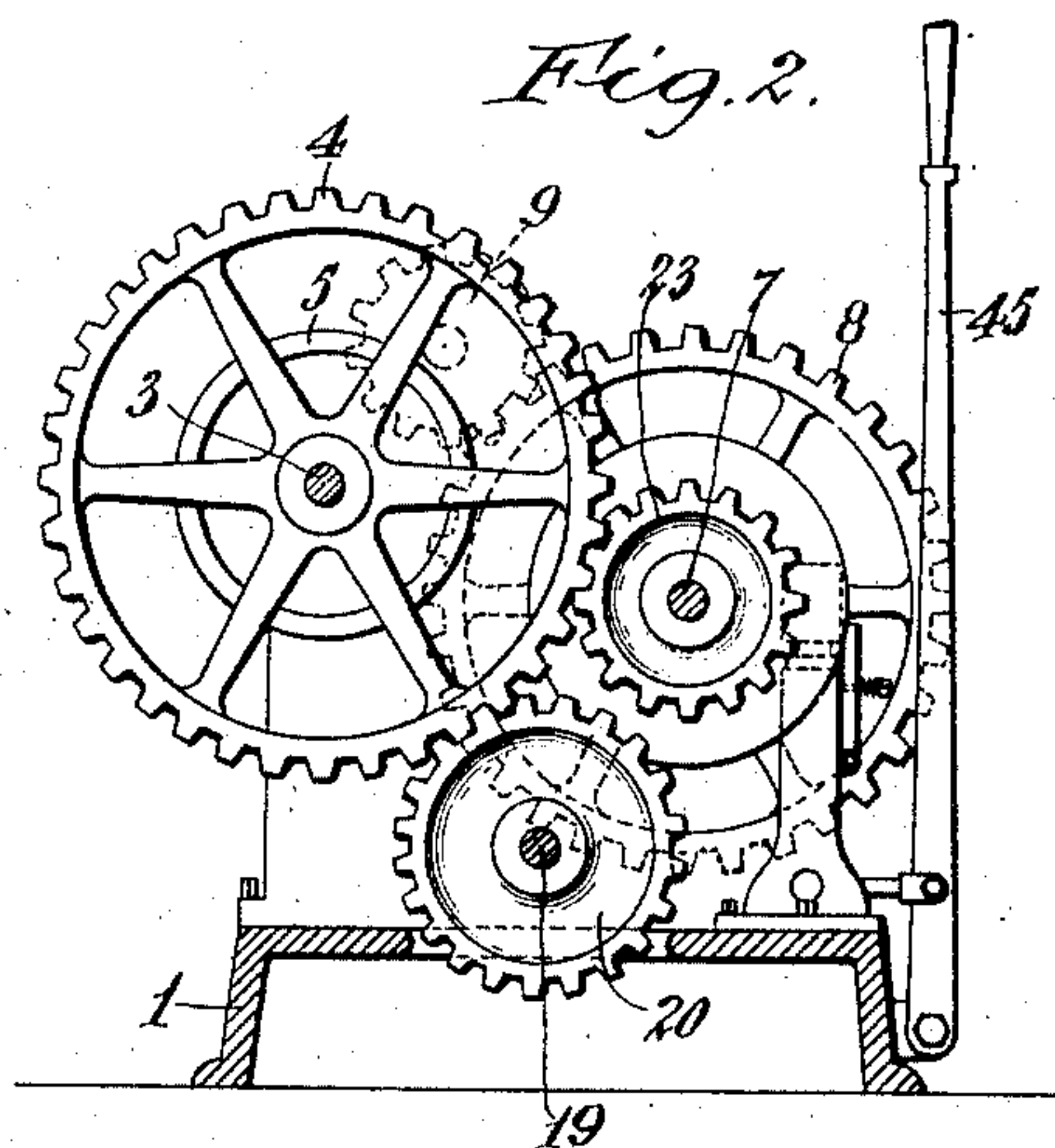
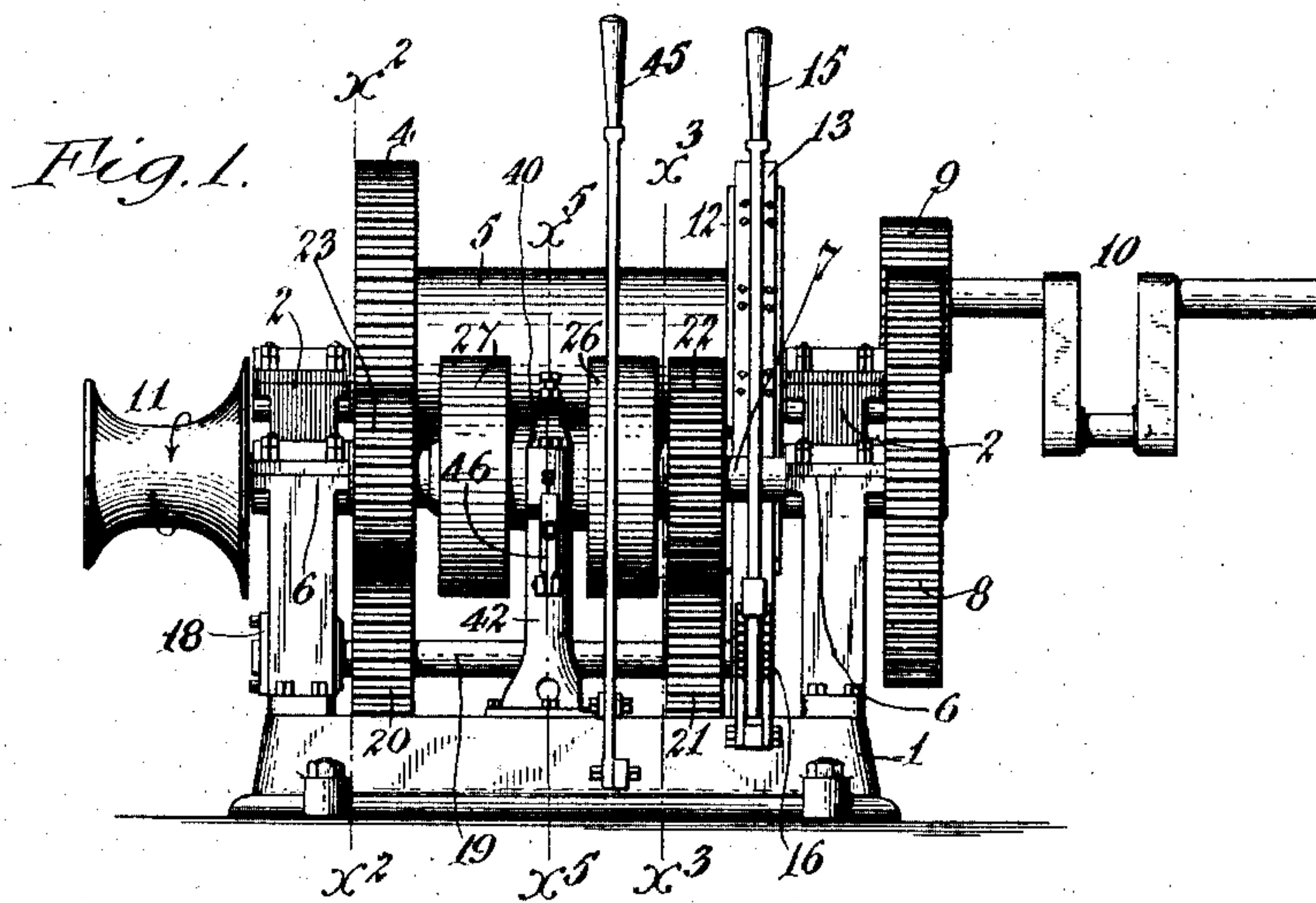
No. 864,492.

PATENTED AUG. 27, 1907,

C. E. STERNE.
HOIST.

APPLICATION FILED APR. 4, 1907.

2 SHEETS—SHEET 1.



Witnesses:
Louis W. Gratz.
Frank L. Graham.

Inventor
Charles E. Sterne.

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His atty

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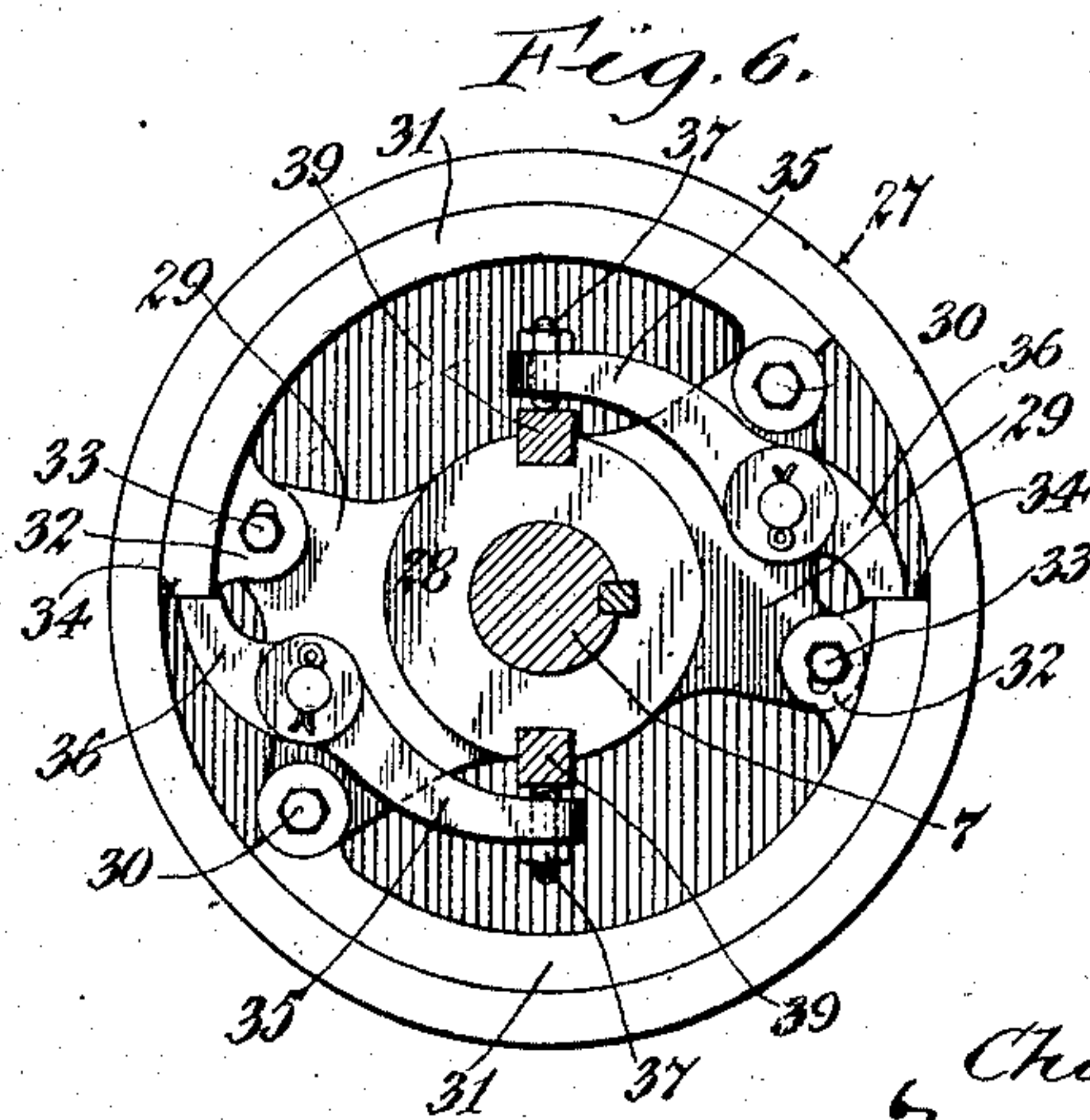
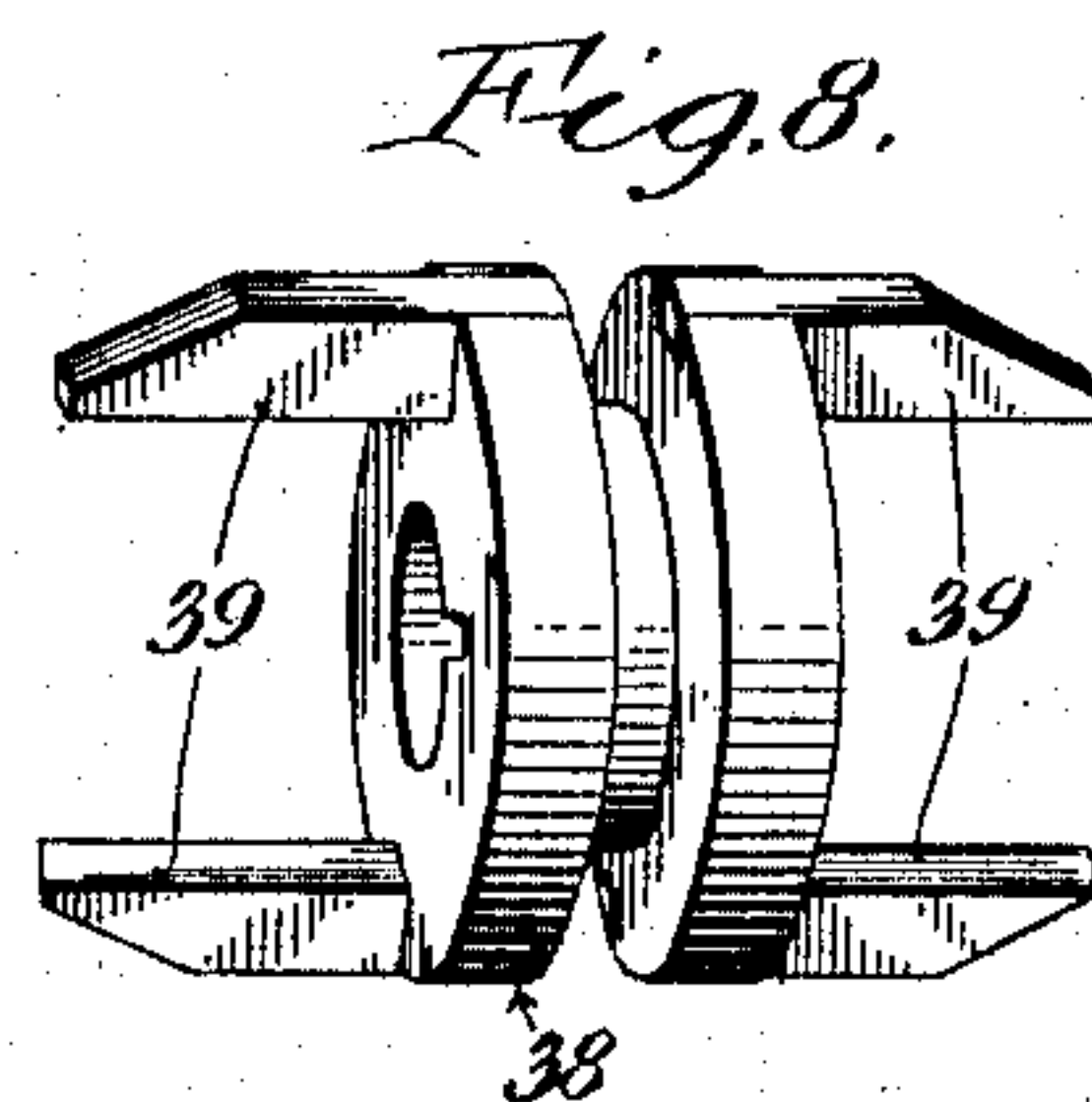
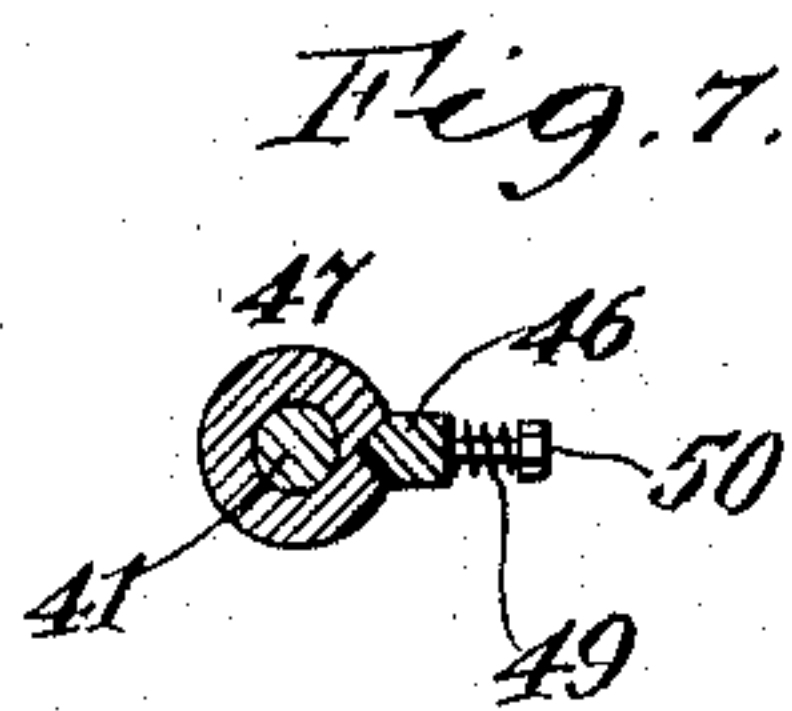
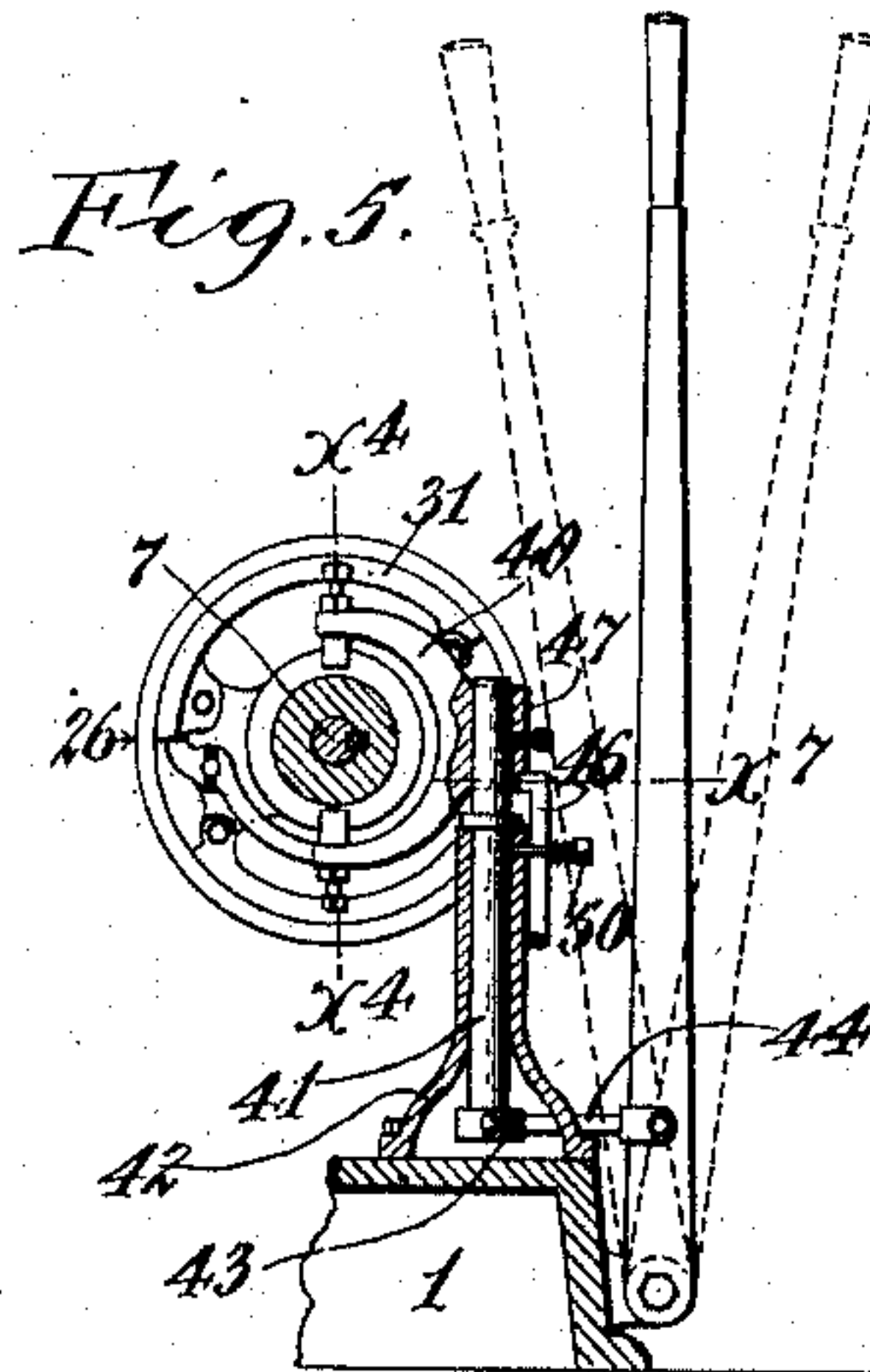
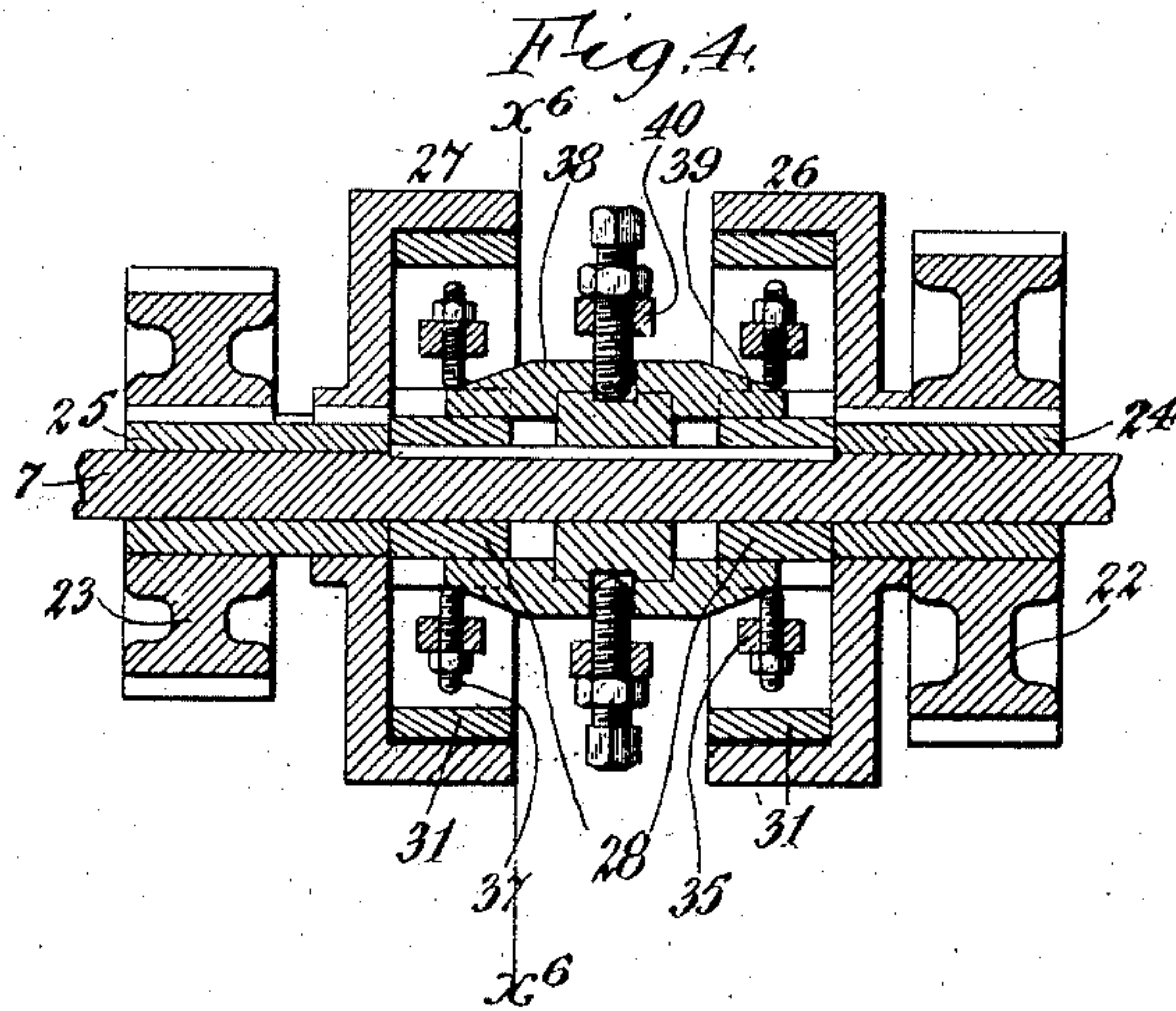
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C. E. STERNE.

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2 SHEETS—SHEET 2.



Witnesses:
Louis W. Gratz
Frank L. Graham

Inventor
Charles E. Sterne,
By Townsend & Huntley Knight
His Atty.

UNITED STATES PATENT OFFICE.

CHARLES E. STERNE, OF SAN DIEGO, CALIFORNIA, ASSIGNOR TO STERNE BROS. COMPANY,
OF SAN DIEGO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

HOIST.

No. 864,492.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed April 4, 1907. Serial No. 366,457.

To all whom it may concern:

Be it known that I, CHARLES E. STERNE, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented a new and useful Hoist, of which the following is a specification.

This invention relates to hoists, and one of the objects of the invention is to provide means for positively driving the hoisting drum in either direction.

Another object is to enable the hoisting drum to be started and operated in either direction or stopped by means of a single controlling lever.

Another object is to provide a constantly running pulley or spool whereby the hoist may be of general use and capable of transmitting continuous power for driving machinery and at the same time be used for hoisting purposes, the construction being such that both functions are afforded.

The accompanying drawings illustrate the invention, and referring thereto:—Figure 1 is a front elevation of the hoist, the engine for driving it being removed. Fig. 2 is a vertical section on line x^2-x^2 Fig. 1. Fig. 3 is a vertical section on line x^3-x^3 Fig. 1. Fig. 4 is a section on line x^4-x^4 Fig. 5. Fig. 5 is a section on line x^5-x^5 Fig. 1. Fig. 6 is an enlarged section on line x^6-x^6 Fig. 4. Fig. 7 is an enlarged section on line x^7-x^7 Fig. 5. Fig. 8 is a perspective view of the sleeve.

1 designates the base having journal bearings 2, in which bearings is mounted a main shaft 3. Mounted on the main shaft 3 is a large gear 4 and a hoisting drum 5, both of which are rigidly secured to shaft 3. The base 1 is also provided with journal bearings 6 in which is mounted an intermediate shaft 7 to one end of which is keyed a gear 8, the latter gear meshing with a pinion 9 which is mounted on the crank shaft 10. On the opposite end of the shaft 7 is a spool 11, and as the crank shaft 10 rotates continuously it drives the gear 8 through the medium of pinion 9 causing the shaft 7 and spool 11 to constantly rotate in one direction, thus permitting any desired machinery to be driven from the spool 11.

The hoisting drum 5 at one end is provided with a brake flange 12 around which passes a brake band 13 having a series of segmental shoes 14 which bear against the flange 12. One end of the brake band 13 is fixed while the other end is connected to a brake lever 15, the latter having a sector 16 and hand operated latch mechanism 17 for latching the brake lever in any position set on the sector. The frame 1 is also provided with journal bearings 18 in which is mounted a shaft 19, the latter carrying gears 20 and 21, both of which are keyed thereto.

As shown in Fig. 4 two pinions 22 and 23 are respectively keyed to sleeves 24 and 25, both sleeves being loose on the shaft 7, the pinion 22 being in mesh with

gear 21 and the pinion 23 being in mesh with the large gear 4 but not in mesh with the pinion 20 on shaft 19. Also keyed to the sleeves 24 and 25 are clutch drums 26 and 27. Keyed to the shaft 7 within each clutch drum are expanding clutch members each of which comprises, as shown in Fig. 6, a hub 28, both hubs being keyed tightly to shaft 7. Each hub 28 has arms 29, and pivoted at 30 to the respective arms 29 are segmental clutch shoes 31, each clutch shoe 31 having a slotted lug 32 which slidably engages a stud 33 projecting up from the adjacent arm 29, and the studs 33 thus serve to guide the segmental clutch shoes as they are swung out or in. Each segmental clutch shoe 31 has at its loose end an abutment or bearing face 34. Pivoted to the respective arms 29 are intermediate rock levers 35 having fingers 36 which bear against the shoulders 34 of the clutch shoes. The other end of each intermediate rock lever 35 is equipped with an adjusting screw 37.

Slidably mounted on the shaft 7 between the two hubs 28 is a grooved sleeve 38, shown in detail in Fig. 8. Each flange of the sleeve 38 is provided with a pair of tapered fingers 39, and the hubs 28 are each provided with a pair of notches adapted to partially receive the fingers 39, as shown in Fig. 6. Thus by sliding the grooved sleeve 38 in either direction, one or the other pair of tapered fingers 39 are forced under the adjusting screw 37 of the rock levers 35, thereby actuating the rock levers and causing their fingers 36 to act against the abutments 34 and expand the associated segmental clutch shoes 31 and cause them to grip the clutch drum 26 or 27 as the case may be according to the direction in which the sleeve 38 is shifted. When the sleeve 38 is moved into a central position both sets of tapered fingers are out of engagement with both sets of rock levers and both sets of segmental clutch shoes are free from their clutch drums, so that as the shaft 7 rotates no movement is imparted to either clutch drum 26 or 27. It will be observed that the grooved sleeve 38 with its tapered fingers rotate in unison with the rock levers 35 and clutch shoes 31, and there is no relative movement between any of these particular related parts except during the sliding motion of the grooved sleeve in one direction or the other, and that the tapered fingers 39 are securely held against twisting or lateral strain by reason of the notches in the hubs 28 in which the fingers slide.

The grooved sleeve 38 is shifted by means of a forked lever 40 which is carried on the upper end of a vertical post 41, as shown in Fig. 5, the post 41 being mounted in a hollow pedestal 42, the lower portion of the pedestal being flared and bolted to the base 1. Extending radially from the lower end of the post 41 is an arm 43 which is connected by a link 44 with a controlling lever 45, the arm 43 lying parallel with the shaft 7 when the

controlling lever 45 stands vertical or in a mid position. The sleeve 38 has three positions, and to latch it in mid position, a detent 46 is pivoted to the pedestal 42. A collar 47 is clamped to the upper end of post 41 and has

5 a notch 48 adapted to receive the detent 46, the latter being pressed in by a coiled spring 49 and retained by a bolt 50 which projects out from the pedestal and loosely through the detent 46. When the controlling lever is in mid position both clutches are loose and both

10 gears 22 and 23 are not driven by the shaft 7, the latter gears running idle and allowing the drum 5 to turn in either direction under the control of the brake lever 15. As the hoisting drum 5 moves freely as in unwinding, the gear 4 rotates therewith thus driving the now idle

15 gear 23 and the pinion, the pinion 20 in turn driving the shaft 19 and pinion 21, and the pinion 21 driving the idle gear 22, although the shaft 7 carrying the spool 11 is at the same time being driven in the opposite direction through the medium of gear 8 and driving pinion 9.

20 During this function it will be seen that the train of gears consisting of gears 4, 23, 20, 21 and 22 operate idly, being propelled by the unwinding hoisting drum 5, only the pinion 9 and gear 8 being driven by the crank shaft. By moving the controlling lever 45 forward, that is, toward the hoisting drum, the grooved

25 sleeve 38 is moved to the left thus causing the clutch drum 37 to lock the sleeve 25 to the shaft 7; this drives the pinion 23 in unison with shaft 7 and the latter meshing with gear 4 rotates the hoisting drum in one direction, and during this function the gears which are operating idly are gear 20, which is driven from gear 4, gear 21 and gear 22. By moving the controlling lever 45 into its opposite position away from the hoisting drum

30 5 the grooved sleeve 38 is thrown in the other direction to clutch the sleeve 24 with shaft 7, thereby causing the gear 22 to rotate with shaft 7, and the gear 22 drives gear 21 in a direction opposite to shaft 7, and gear 20 drives gear 4, thereby producing a reverse rotation of the winding drum 5. The detent 46 is V shaped so that

40 when the post 41 is turned into mid position the detent

easily clicks into the notch and thus latches the hand lever 45 in mid position, and a slight extra effort on the hand lever is required to cause the detent to disengage from the notch.

What I claim is:—

1. In a hoist, a shaft rotating always in one direction, a second shaft adapted to rotate in either direction, a hoisting drum on the second shaft, a gear fixed on the second shaft, a gear loose on the first shaft and meshing with the gear on the second shaft, a third shaft adapted to rotate in either direction, a gear fixed on the third shaft and meshing with the gear on the second shaft, another gear loose on the first shaft, another gear fixed on the third shaft and meshing with the last named loose gear, means for clutching either of said loose gears to said first shaft to cause the second shaft and hoisting drum to be driven in either direction and for unclutching both of said loose gears simultaneously from the first shaft to allow the drum and second shaft to rotate idly, and a brake for controlling the drum when idle.

2. In a hoist, a shaft rotating always in one direction, a second shaft adapted to rotate in either direction, a hoisting drum on the second shaft, a gear fixed on the second shaft, a gear loose on the first shaft and meshing with the gear on the second shaft, a third shaft adapted to rotate in either direction, a gear fixed on the third shaft and meshing with the gear on the second shaft, another gear loose on the first shaft, another gear fixed on the third shaft and meshing with the last named loose gear, and means for clutching either of said loose gears to said first shaft to cause the second shaft and hoisting drum to be driven in either direction, said last means including a sleeve slidable on the first shaft, and mechanism for actuating said sleeve comprising a forked arm engaging the sleeve, a vertical post carrying the forked arm, a pedestal in which said post is mounted, a hand lever, an arm projecting from said post, a link connecting said arm and hand lever, said post having a notch, and a spring pressed detent on a pedestal adapted to engage the notch when said sleeve is in mid position and the hoisting drum idle.

In testimony whereof, I have hereunto set my hand at San Diego, California this 1st day of March, 1907.

CHARLES E. STERNE.

In presence of—

GEORGE W. BOWLER,
M. B. LEAVENS.