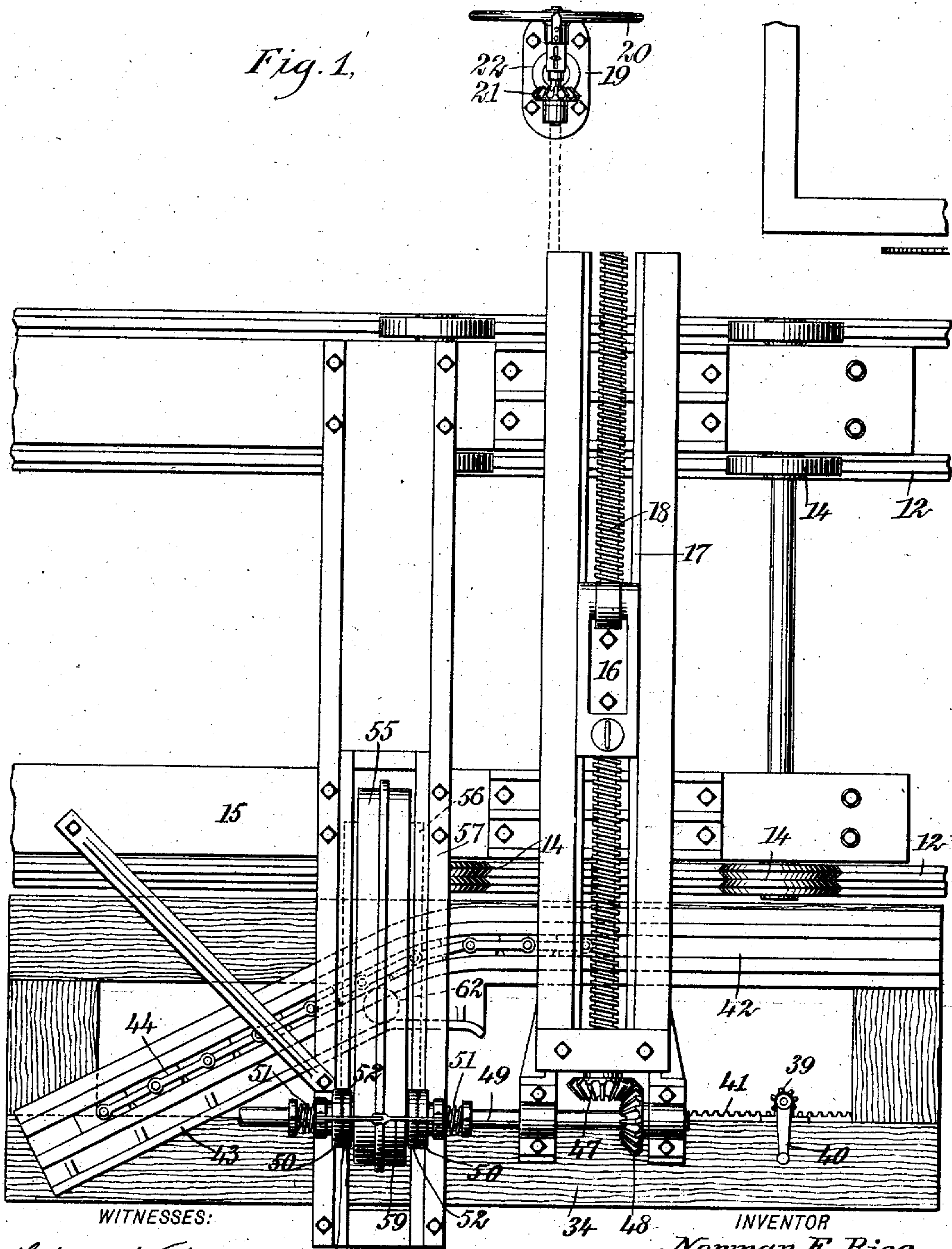


No. 884,209.

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N. E. RICE.  
SAWMILL SET WORKS.  
APPLICATION FILED APR. 17, 1906.

3 SHEETS—SHEET 1.



WITNESSES:

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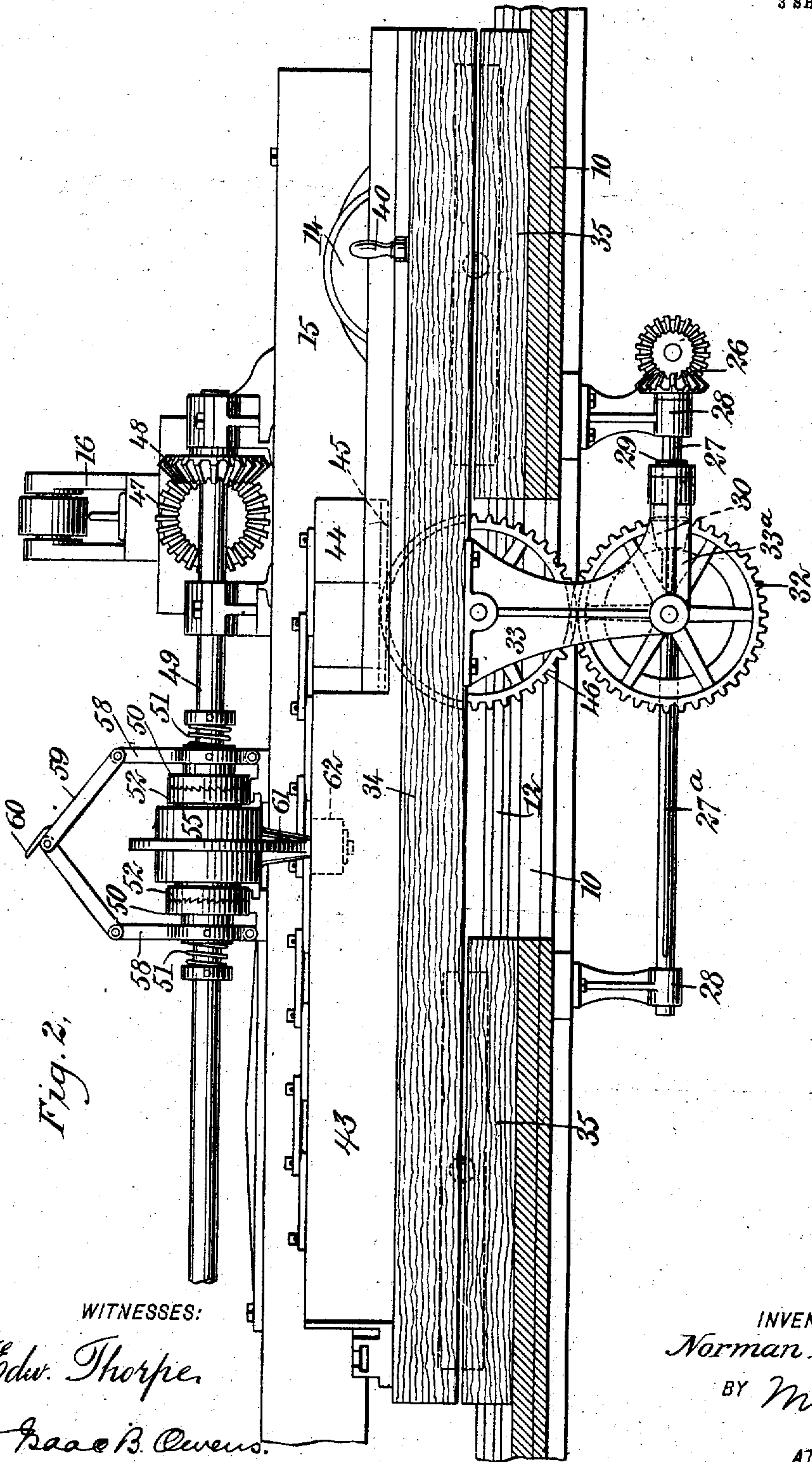


Fig. 2.

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3 SHEETS—SHEET 3.

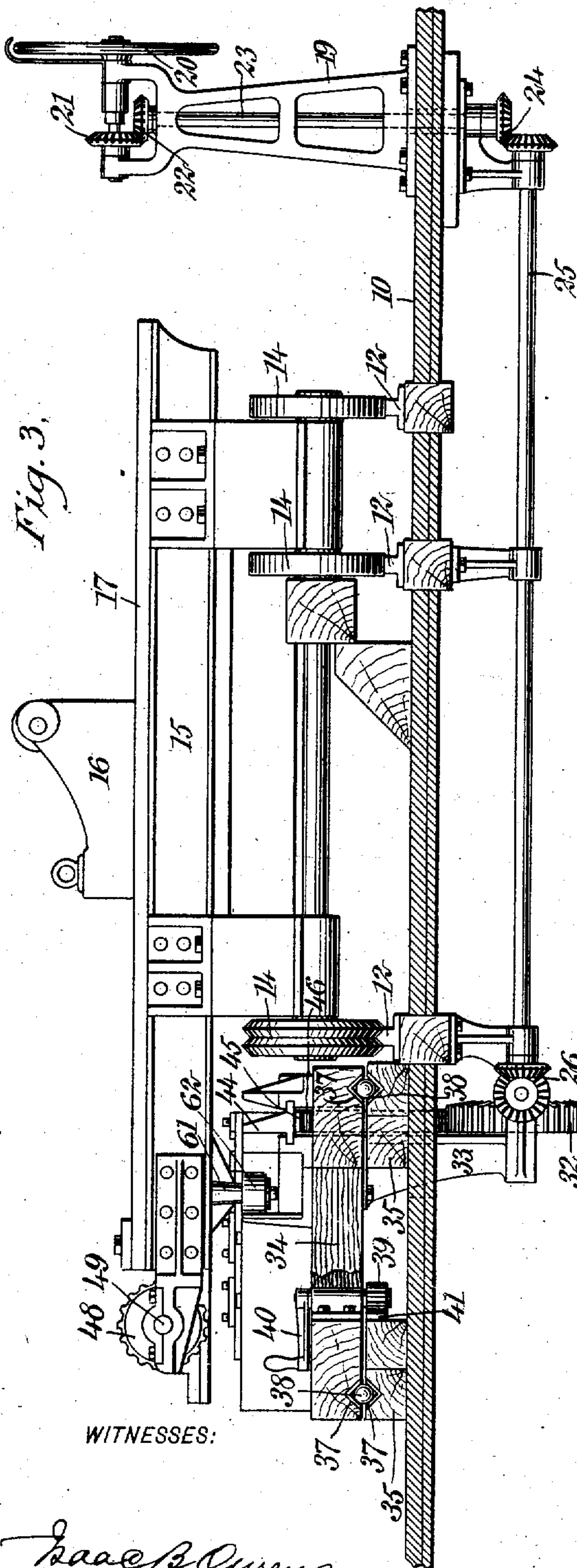


Fig. 3.

Fig. 5.

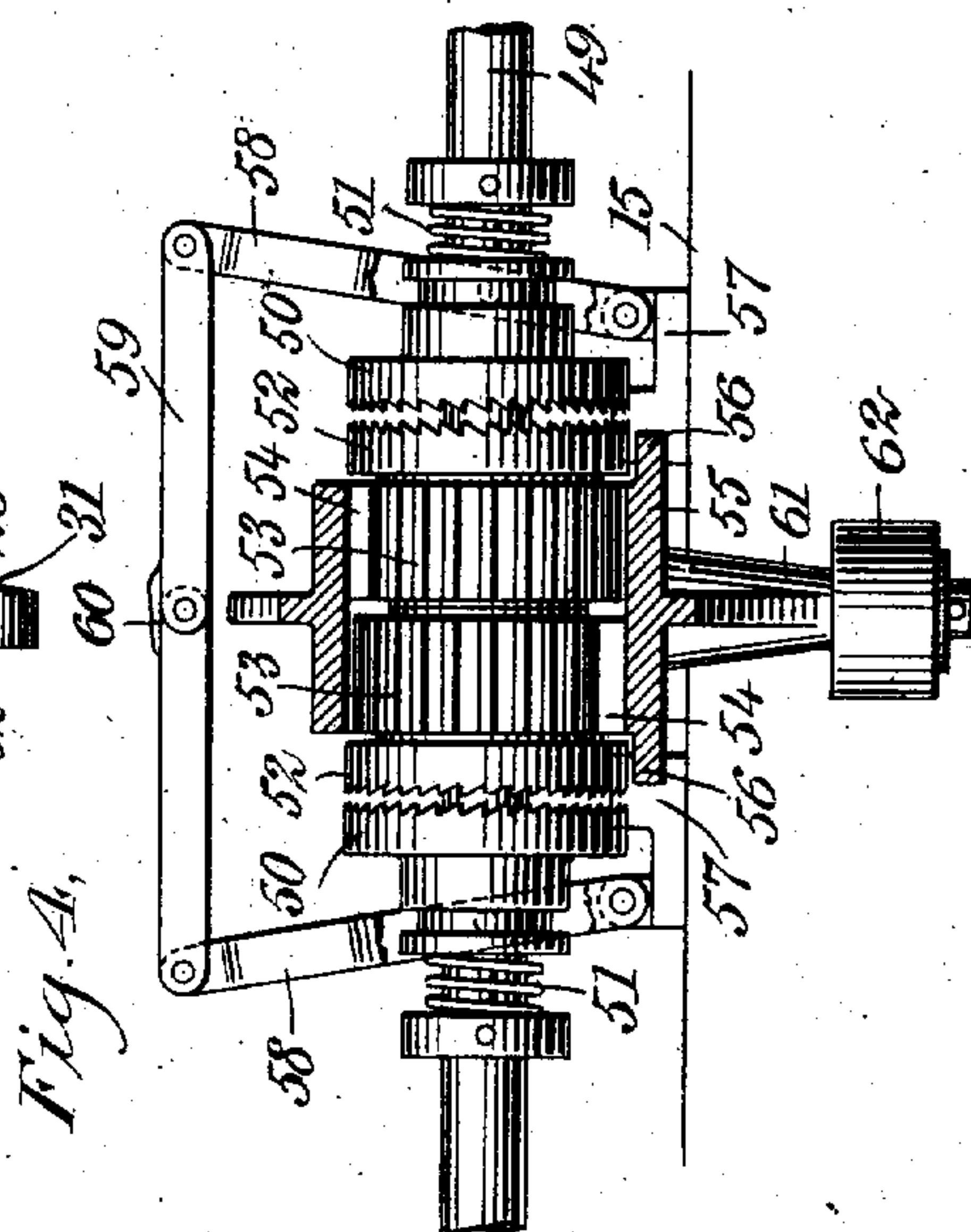
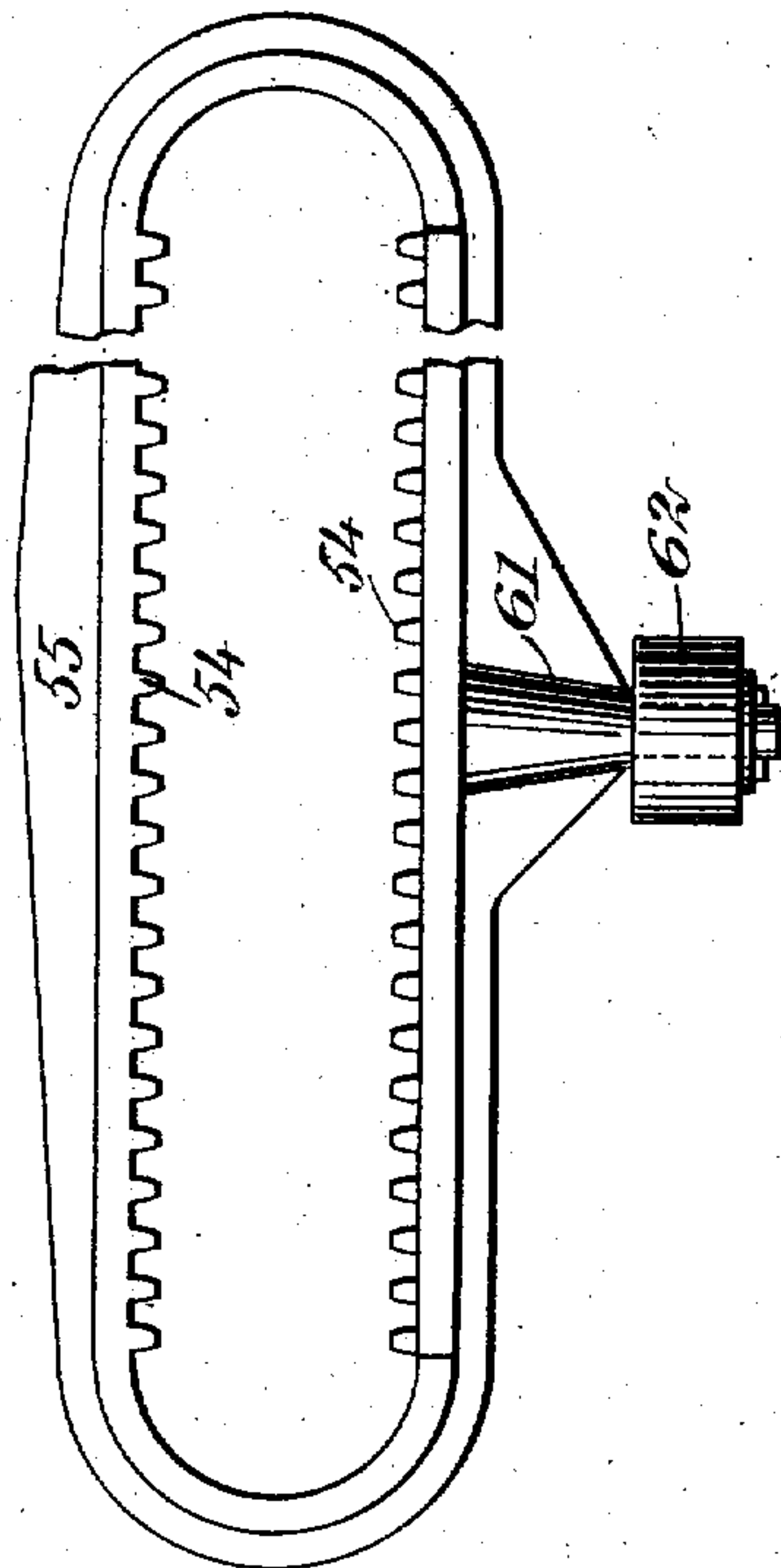


Fig. 4.

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# UNITED STATES PATENT OFFICE.

NORMAN EARL RICE, OF ZENIA, CALIFORNIA.

## SAWMILL SET-WORKS.

No. 884,209.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed April 17, 1906. Serial No. 312,158.

*To all whom it may concern:*

Be it known that I, NORMAN E. RICE, a citizen of the United States, and a resident of Zenia, in the county of Trinity and State of California, have invented a new and Improved Sawmill Set-Works, of which the following is a full, clear, and exact description.

The subject matter of my present invention relates to a set works of the general type shown in my co-pending application filed February 10, 1905, Serial Number 245,045, the main object of which is the provision of means by which the sawyer may readily and without interfering with the normal operation of the saw mill change the adjustment of the set works so that a cut of any desired thickness may be made, the arrangement dispensing entirely with the "setter", a hand commonly employed in saw mill work, and also insuring accurate results without in any way interfering with the regular operation of the saw mill.

As shown in my co-pending application, the knees of the carriage are provided with a shifting gear, and this is actuated and controlled by means of an adjustable track which may be made to operate the shifting gear to a greater or less extent as desired, thus advancing or setting out the log on the carriage to the degree desired, the said adjustable track being controlled by a hand wheel or other part at the sawyer's station.

A leading object of my present invention is to adapt the invention to use on mills, working logs of varying lengths, particularly long logs, and to avoid the possibility of the log being shifted or set out on the carriage before it is clear of the saw. I attain this end by mounting the said adjustable track on a bed which is itself adjustable without however, interfering with the gearing for independently adjusting the track, so that by adjusting the bed the position of the track with respect to the saw mill carriage may be regulated, and the set works caused to operate only when the log is clear of the saw.

It is also a leading object of my invention to provide means for increasing at will the set of the log which is made at each movement and return of the carriage, and I attain this end by providing a peculiar gear forming part of the means for shifting the knees, which gear coacting with the track and its appurtenant parts is caused to operate not only during the last of the receding movement of the carriage, but also during the first

part of the return movement, or that in which the carriage moves toward the saw, the result being a double and, therefore, a very much increased action.

Various other novel features are involved, and all will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings which illustrate as an example the preferred embodiment of my invention, in which drawings

Figure 1 is a plan view of the mechanism; Fig. 2 is a side elevation; Fig. 3 is a cross sectional elevation of the carriage and the setting mechanism; Fig. 4 is a detail view of the ratchet gears with the double rack in section; and Fig. 5 is a fragmentary elevation of the double rack.

10 indicates the bed or floor on which the mill is erected, this being provided with rails 12 on which run the wheels 14 of the saw mill carriage 15, all of which parts may be of any form desired. The knees 16 (of which one is shown in the drawing) are mounted to move transversely across the carriage in guides 17, and are adjusted by screws 18 engaged by nuts on the knees, all of which will be understood from the prior art. Arranged at the position or station of the sawyer is a stand 19 on which is mounted a hand wheel 20 having indicating devices in connection therewith, and the shaft of which carries a gear 21 in mesh with a gear 22 on the vertical shaft 23 revolvably mounted in the stand. The shaft 23 projects below the floor 10 and is connected by miter gearing 24 with a transverse shaft 25 extending under the floor, joined by miter gearing 26 with a shaft 27. This shaft is revolvably mounted in hangers 28 which depend from the floor 10 of the mill. The shaft is formed with a key-way 27<sup>a</sup> extending along its length, and fitted on the shaft with a sleeve 29 carrying a bevel gear which is indicated by the broken lines 30 in Fig. 2. This bevel gear meshes with bevel teeth 31 on a spur gear 32, which gear is mounted in a hanger 33 depending from the set works carriage 34. The said bracket 33 has an arm 33<sup>a</sup> which loosely embraces the sleeve 29 so as to maintain the gears 30 and 32 in fixed relation, the movement of the bracket 33 with the carriage 34 carrying said gears with it and causing the sleeve 29 to slide on the shaft 27 notwithstanding that said sleeve and its con-



nected gear 30 may be continuously rotated by the shaft.

The carriage 34 runs on bed pieces 35, the parts 34 and 35 being fitted with V-shaped rails 37 between which anti-friction balls 38 are arranged, thus permitting the carriage 34 to be readily adjusted longitudinally of the movement of the saw mill carriage 15. To facilitate this adjustment a pinion 39 is mounted on the carriage and has a handle 40 in connection therewith. This pinion is in mesh with a rack 41 which is fastened to one of the bed pieces 35. Any suitable device may be provided as a latch for locking the pinion 39 with the handle 40 against movement after the set works carriage has been adjusted to the desired position. Said carriage 34 carries a guide 42 which has a part extending longitudinally of the movement of the saw mill carriage, and has a contiguous part extending outward diagonally from said line of movement. On said diagonally extending part of the track a perpendicular flange 43 is arranged, and in the guide operates an adjustable set track 44 which, as disclosed in my copending application, is made up of a number of sections linked or otherwise articulated to each other. The adjustable set track 44 is provided on its under side with rack teeth 45, and these are in mesh with a gear 46 which is mounted on the set carriage 34 and meshed with the gear 32 to be driven therefrom.

As will fully appear hereinafter the track 44 actuates the setting gear of the knees, and the position of said track determines the extent to which said gear will be operated so that by adjusting the track the log may be set out to a greater or less extent as the sawyer may desire, and its adjustment, it will be observed, is directly controlled by the sawyer through the hand wheel 20 and the connected parts, which hand wheel is located at the sawyer's station. It will also be observed that the set works carriage 34 may be adjusted along the line of movement of the saw mill carriage, thus bodily moving the track 44 and flange 43 and determining the time when said parts shall act on the set works. This latter adjustment enables the apparatus to be adapted to mills of various forms, and to logs of various, particularly extreme, lengths, and by means of this adjustment I am enabled completely to avoid the possibility of the set works operating before the end of a long log has cleared the saw.

The screws 18 of the knees are mounted to turn in their respective guides 17, and have at the ends adjacent to the set works carriage 34 a miter gear 47. These gears 47 are in mesh with gears 48 fastened to a shaft 49 which extends longitudinally of the carriage and is mounted to rotate thereon. As shown best in Fig. 4 the shaft 49 has splined thereon two ratchets 50, the teeth of which are oppo-

sitely disposed, and which ratchets are by means of springs 51 respectively pressed toward coacting ratchets 52, the teeth of which coact with the teeth of the ratchets 50 but are oppositely disposed with respect to each other. Said ratchets 52 are respectively fast to pinions 53 which are loose on the shaft 49 and which respectively mesh with rack teeth 54 formed at opposite sides of the inner surfaces of a yoke 55. This yoke is mounted to slide transversely on the saw mill carriage through the medium of ledges 56 which fit in guides 57 secured to the carriage 15. The clutch members 50 have levers 58 connected thereto, and these levers are joined by a toggle 59, one of the links of which carries a stop 60 which forms with the joint between the links a knuckle limiting the setting movement of the toggle, as shown in Fig. 4. When the toggle is set the ratchets 50 are thrown back from engagement with the members 52, and the gears 53 are idle on the shaft 49. When, however, the toggle is broken, as shown in Fig. 2, the springs 51 are permitted to assert themselves and engage the parts 50 and 52 together, the result of which is that as the yoke 55 moves in one direction one of the gears 53 is locked to the shaft by its clutch device 50 and 52, while the clutch devices 50 and 52 of the other gear run idly over each other, so that the gear turns freely on the shaft and when the direction of movement of the yoke is reversed the operation of the gears and clutch members is reversed, the first named gear being rendered loose on the shaft and the other gear being locked thereto. Owing to the opposite positions of the racks 54 the gears 53 will be turned both in the same direction, and thus the shaft 49 will by back and forth reciprocation of the yoke be given a step-by-step movement in one direction. The yoke 55 has a bracket 61 depending therefrom, and this bracket carries an anti-friction roller 62 which, as indicated by the broken lines in Fig. 1, is engaged to run between the track 44 and flange 43 of the guide 42. It will thus be seen that as the saw mill carriage moves leftward, (as in Fig. 1) the anti-friction roller 62 will engage the track 44, and the yoke 55 will be moved outward on the carriage imparting rotation to the shaft 49. Upon the return of the carriage the roller 62 will engage the flange 43 and the yoke 55 will be moved backward, the second gear 53 being then active and a second rotation being imparted to the shaft 49. In this manner a double movement is given to the shaft 49, which in turn imparts a double movement to the screws 18, and this allows for a rapid and wide adjustment of the knees. Consequently as the saw mill carriage reaches the end of its receding movement a part adjustment is given to the knees, and as it returns to the end of its receding movement a second or



further adjustment is given. At the same time this adjustment may be made as slight as desired by adjustment of the track 44, and the time at which the adjustment takes place with respect to the movement of the saw mill carriage may be controlled by adjustment of the set works carriage 34, as before explained. It will, therefore, appear that I have not only provided for the ready adjustment of the set works without interfering with the regular operation of the mill, this adjustment being effected by the sawyer and dispensing with the "setter" usually employed, all of which is developed in my co-  
 10 pending application above referred to, but I have also provided for controlling the time of the adjustment so as to prevent the possibility of collision between the saw and log, and I have also provided means which  
 15 greatly increase the range of adjustment possible, putting it in the power of the sawyer by the mere adjustment of the hand wheels 20 to make a cut of any practicable thickness.

Having thus described the preferred form of my invention, what I claim as new and desire to secure by Letters Patent is:

1. A saw mill set works comprising a setting gear mounted on the saw mill carriage, a part adapted to be engaged by said gear to actuate the same, a set works carriage mounting the said part, gearing for adjusting the said part independently of the adjustment of the set works carriage, said gearing comprising an element moving with the set works  
 30 carriage, and a relatively stationary drive shaft on which said element is splined.

2. A saw mill set works comprising a setting gear mounted on the saw mill carriage, a part adapted to be engaged by said gear to actuate the same, a set works carriage mounting the said part, gearing mounted on the carriage and in connection with said part, a relatively stationary shaft on which an element of said gearing is splined, and means for rev-  
 40 olubly driving said shaft.

3. In a saw mill set works, a saw mill carriage, a knee mounted on the carriage, a shaft on the carriage, means for operating the

knee from the shaft, gears loose on the shaft, means for alternately connecting the gears 50 with the shaft, a yoke shaped-rack meshing with the gears, an adjustable bed at one side of the carriage, means on the bed for operating the rack, and gearing for operating the said rack operating means independently of 55 the adjustment of the bed.

4. In a saw mill set works, a saw mill carriage, a knee on the carriage, a shaft on the carriage, means for operating the knee from the shaft, gears loose on the shaft, means for 60 alternately connecting the gears with the shaft, a yoke shaped rack meshing with the gears, an adjustable bed at one side of the carriage, an adjustable track on the bed, and with which the said rack engages, and means 65 for adjusting the track independently of the adjustment of the bed.

5. In a saw mill set works, the combination with a saw mill carriage, a knee thereon, and means for operating the knee, of a bed, 70 an adjustable track on the bed for operating the knee operating means, a pinion carried by the bed and slidably mounted, means for operating the track from the pinion, and means for operating said pinion. 75

6. In a saw mill set works, the combination with a saw mill carriage, a knee thereon, and means for operating the knee, of a bed, an adjustable track on the bed for operating the knee operating means, said track being 80 provided with a rack, a gear wheel meshing with the rack, a second gear wheel carried by the bed and meshing with the first named gear wheel, said gear having beveled teeth on one side, a shaft, a bevel pinion mounted 85 to slide on the shaft and connected with the support of the last named gear wheel and meshing with the beveled teeth thereof, and means for operating said shaft.

In testimony whereof I have signed my 90 name to this specification in the presence of two subscribing witnesses.

NORMAN EARL RICE.

Witnesses:

DOUGLAS H. PRIOR,  
 FREDERICK N. HELMKE.