

No. 771,371.

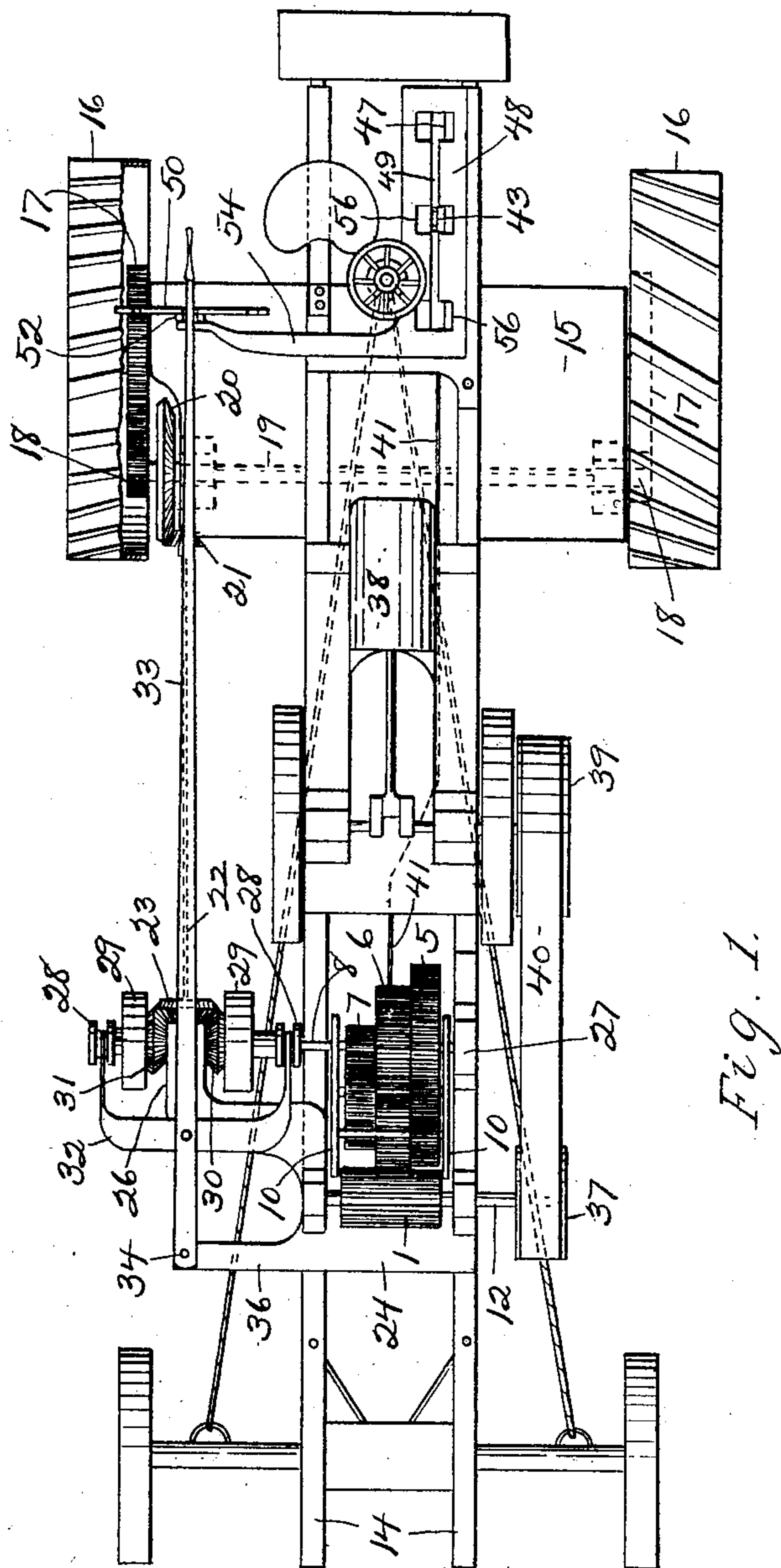
PATENTED OCT. 4, 1904.

J. H. & H. D. KAPPELMANN.
GEARING FOR TRACTION ENGINES.

APPLICATION FILED OCT. 22, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



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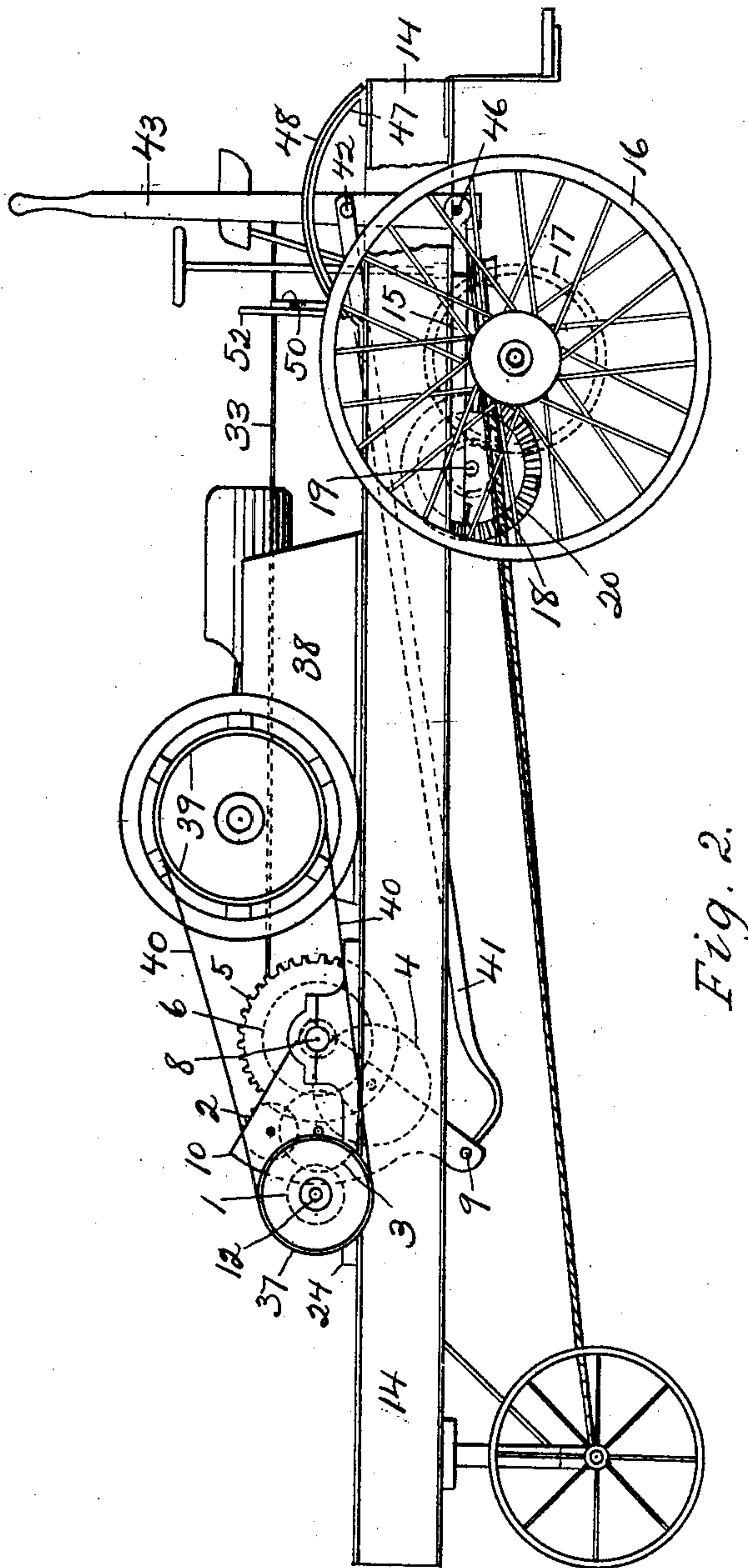
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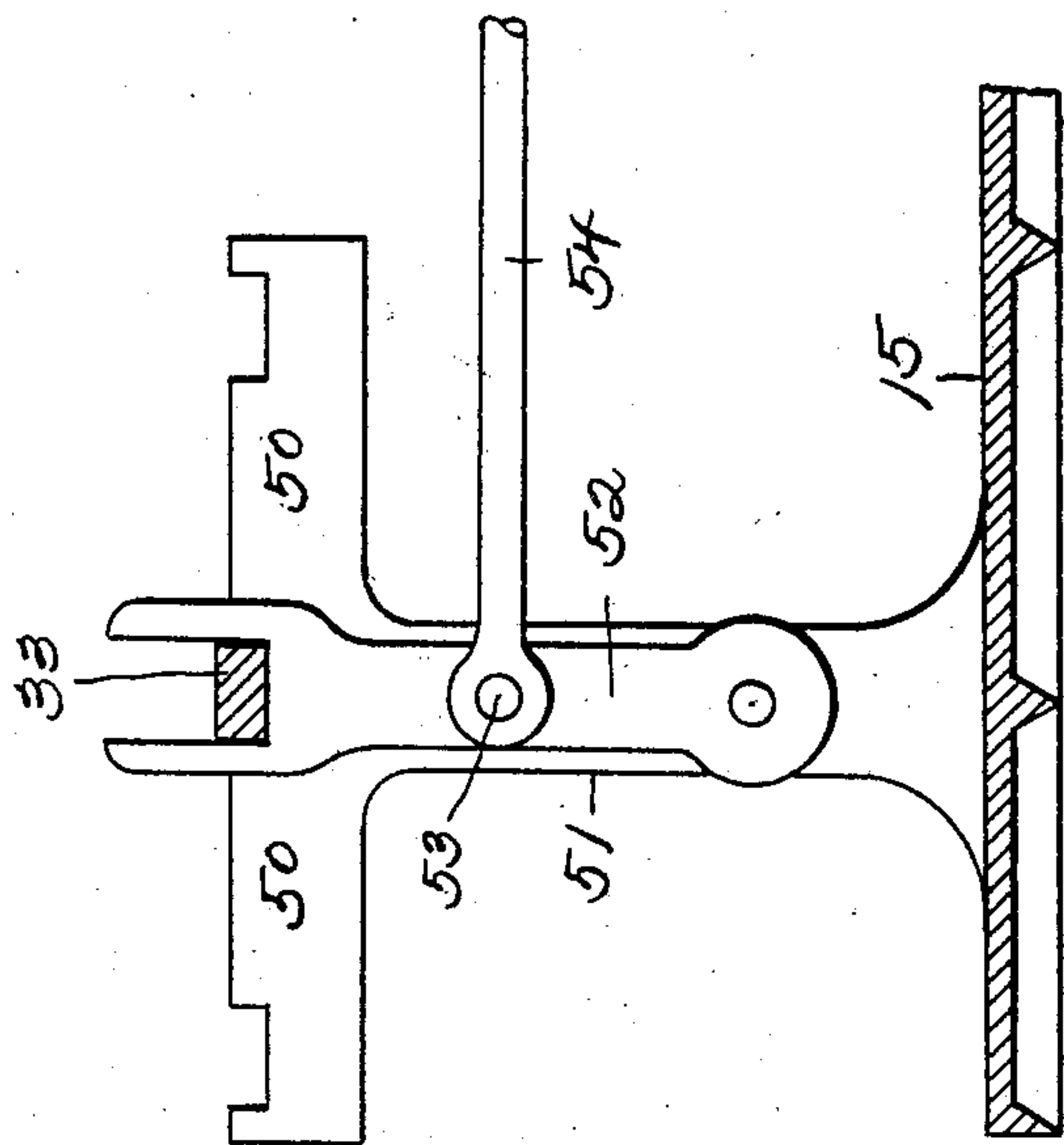
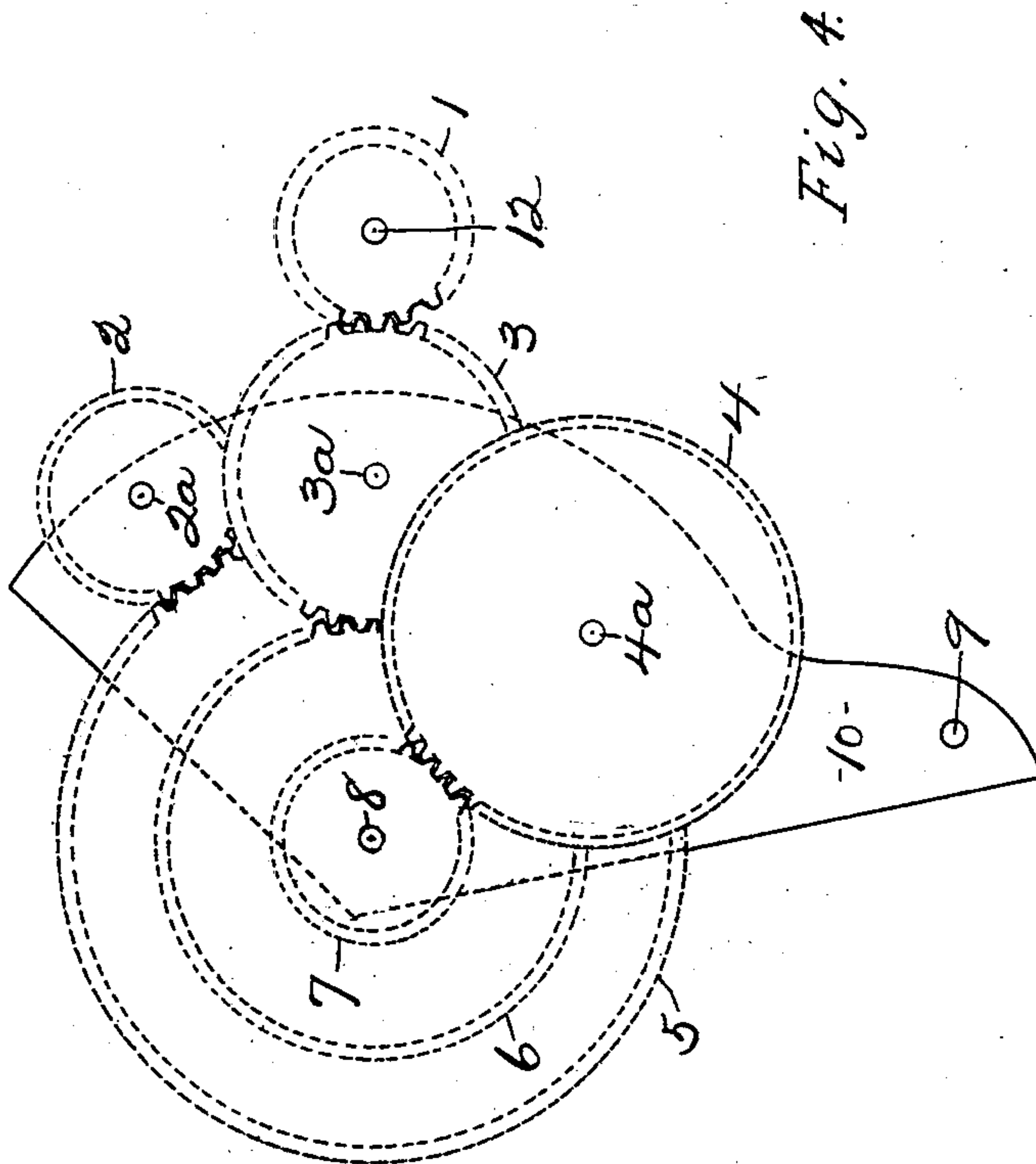
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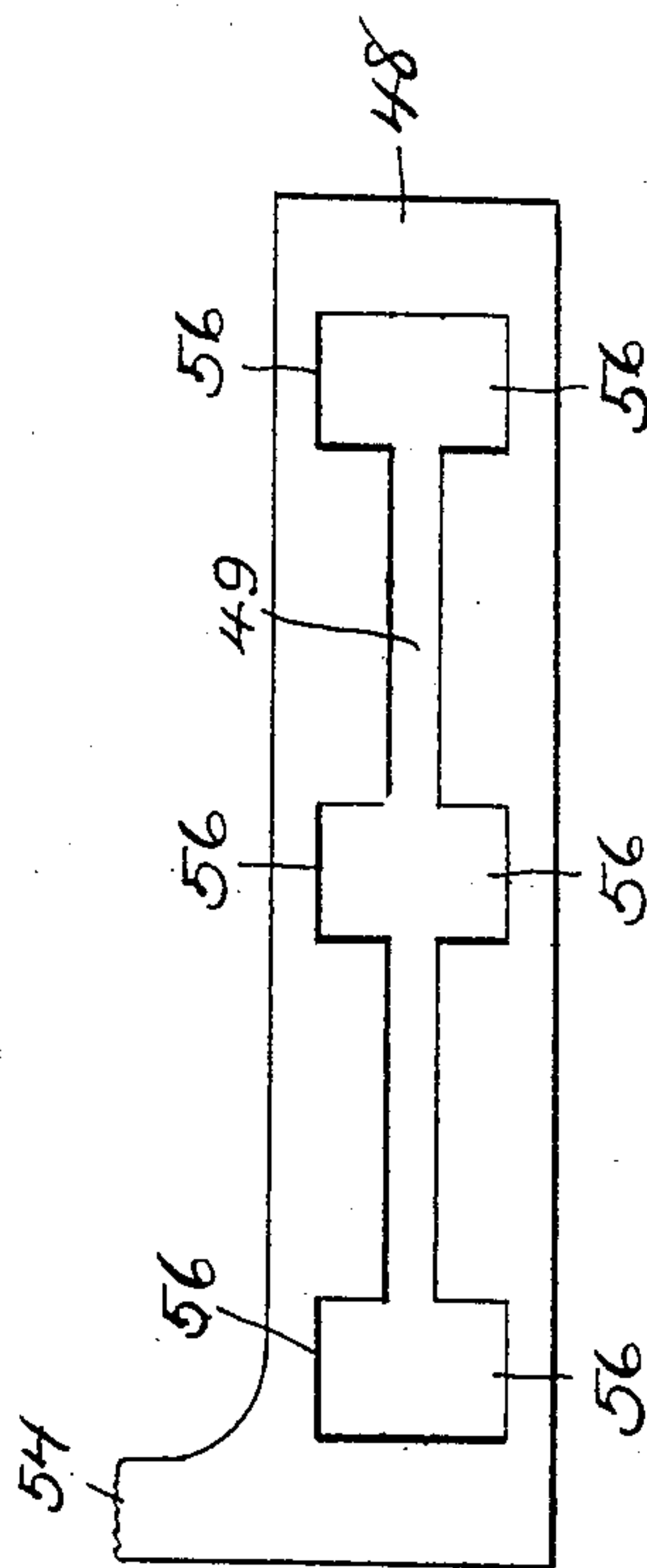
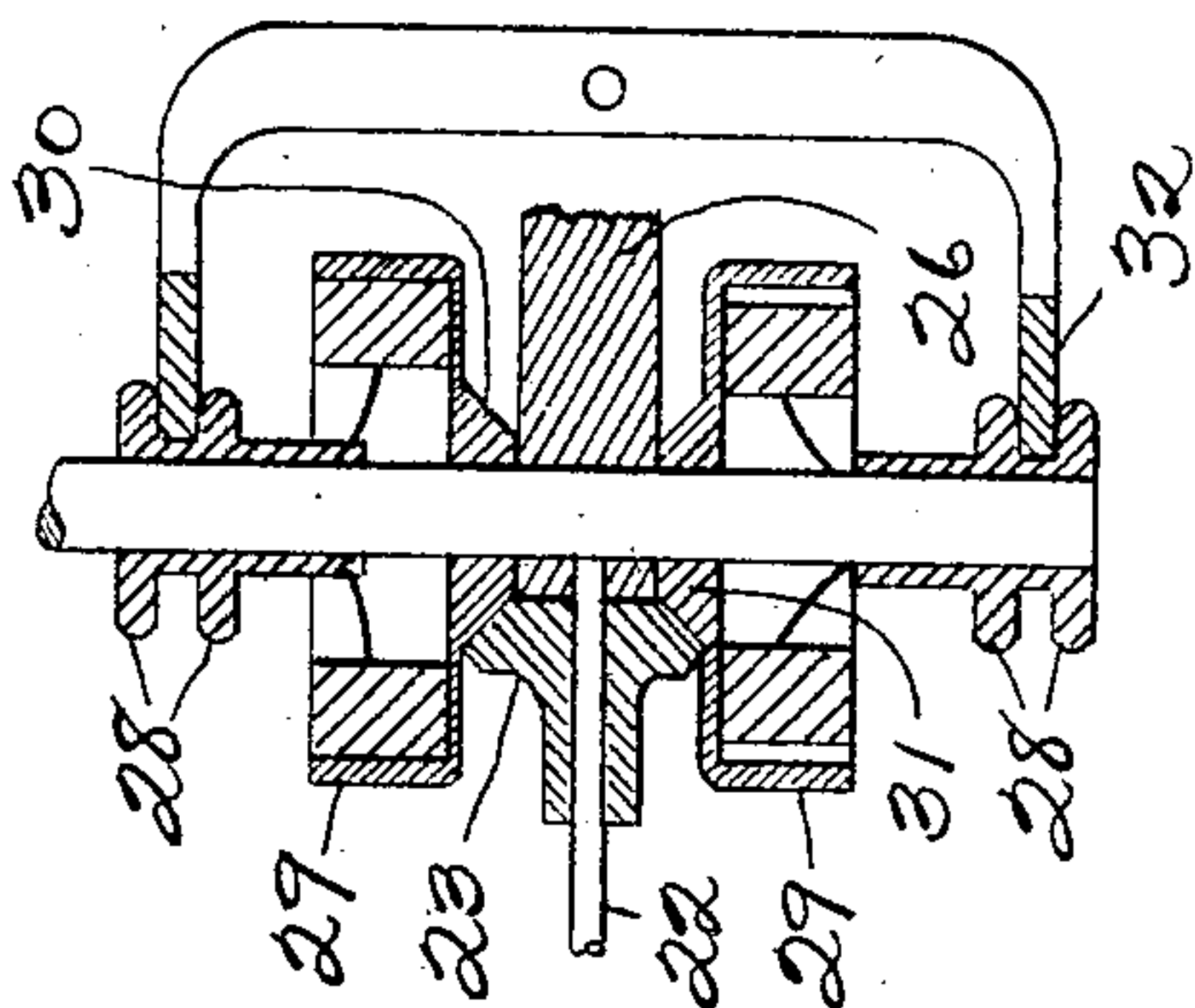
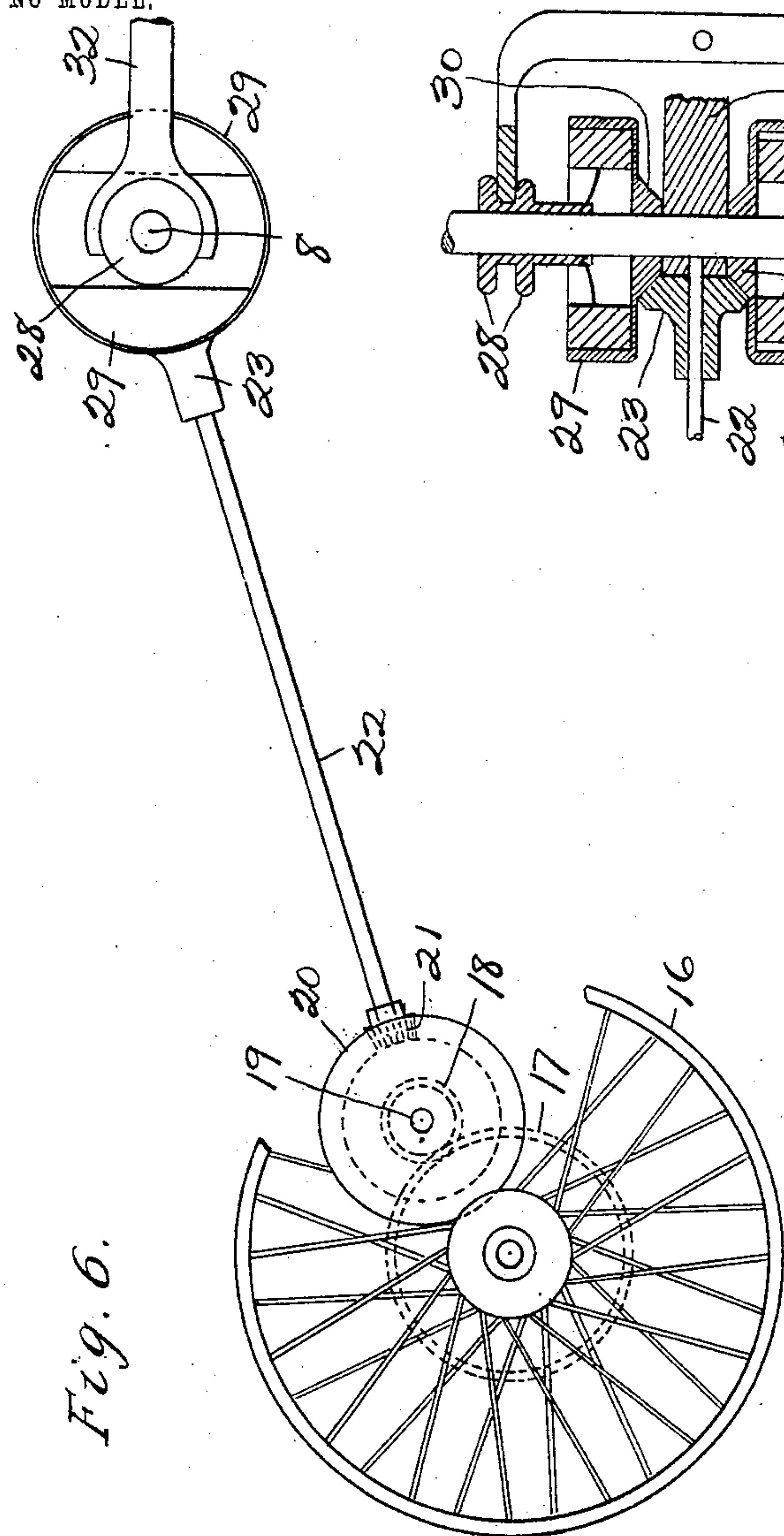
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOHN H. KAPPELMANN AND HENRY D. KAPPELMANN, OF LINN, KANSAS,
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GEARING FOR TRACTION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 771,371, dated October 4, 1904.

Application filed October 22, 1903. Serial No. 178,096. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. KAPPELMANN and HENRY D. KAPPELMANN, citizens of the United States, residing at Linn, in the county of Washington and State of Kansas, have invented new and useful Improvements in Gearing for Traction-Engines, of which the following is a specification.

Our invention relates to traction-engines, and it particularly relates to a running-gear and speed-changing and reversing mechanism adapted to be actuated by other than a steam-engine, preferably an engine the motive power of which is derived from explosions of a hydrocarbon vapor, in common terms a "gas" or "gasolene" engine.

Referring now to the accompanying drawings, Figure 1 is a plan view of a traction-engine constructed in accordance with our invention, a portion of one carrying-wheel being broken away. Fig. 2 is a side elevation of the same, a part of the frame being broken away. Fig. 3 is an enlarged rear elevation of a portion of the interlocking device. Fig. 4 is an enlarged diagrammatic side elevation of the speed-changing gears and the pinion driven thereby. Fig. 5 is an enlarged plan view of the locking-plate. Fig. 6 is an enlarged right-hand elevation of a part of the running-gear. Fig. 7 is an enlarged sectional plan of the clutches, one being open, the other closed.

The frame of the running-gear is composed of two longitudinal iron or steel beams 14, which are supported by the usual bogie truck in front and at the rear by a casting 15, which is supported by the rear axle and the carrying-wheels 16, said beams being strongly bolted to said casting 15.

Each carrying-wheel 16 is provided internally with the usual concentric gear-wheel 17, engaged by a pinion 18. The two pinions 18 are keyed on the same shaft 19, and fixed on said shaft, near one end thereof, is a bevel gear-wheel 20, which is engaged by a pinion 21, fixed on an inclined shaft 22, on the forward end of which is fixed a bevel-pinion 23. Secured to the top of the beams 14 is a casting 24, having a rearwardly-extending bracket 26,

in the end of which is journaled the front end of shaft 22.

Passing through said bracket 26 is a transverse shaft 8, one end of which is journaled in a bearing 27 on casting 24. Splined on said shaft 8 are two grooved collars 28, which are adapted to operate two friction-clutches 29. Secured to the outer members of said clutches, respectively, are two bevel-pinions 30 and 31, both of which engage bevel-pinion 23 on shaft 22. Said pinions 30 and 31 are loosely mounted on their shaft. The grooved collars 28 are respectively engaged by the two ends of a double shipper 32, which is actuated by a reversing-lever 33, fulcrumed at 34 on an arm 36 of casting 24.

Keyed on shaft 8 between the beams 14 are three differential gears 5, 6, and 7. Supported by said shaft 8 is a swinging frame, composed of two cheeks 10, through which pass, in addition to shaft 8, three shafts 2^a, 3^a, and 4^a, on which are mounted three differential gears 2, 3, and 4, which respectively engage the gears 5, 6, and 7 on shaft 8.

In front of differential gears 2 3 4 is a pinion 1, fixed on a counter-shaft 12, on which is a pulley 37.

38 designates an explosive-engine having a belt-pulley 39, which actuates pulley 37 through a belt 40. The bed of the engine is bolted to the beams 14. The swinging cheeks 10 have downward extensions connected by a cross-rod 9, to which is connected a rearwardly-extending reach-rod 41, pivotally connected at 42 to a hand-lever 43, fulcrumed at 46 on a rearwardly-projecting portion of casting 15. The position of this lever 43 determines which of the gears 2, 3, and 4 shall engage pinion 1. Said lever is provided with a sector 47, having a number of notches therein corresponding to the number of swinging differential gears, which in the present case is three. The lever itself will remain in any notch in which it is placed, thereby dispensing with a latch.

Fitting over and upon the sector 47 is a laterally-slidable locking-plate 48, in which is a longitudinal slot 49, through which the lever 43 may freely pass. Said slot is widened or

recessed at six points, which register with the notches in the sector, as shown in Figs. 1 and 5.

Beneath the reversing-lever 33 is a rigidly-supported plate 50, having three notches therein. When lever 33 is in the middle notch, the shipper 32 holds both clutches 29 disengaged from shaft 8. Pivoted on the support 51 of notched plate 50 is a lever 52, the top of which is bifurcated and straddles the reversing-lever 33.

Connected pivotally at 53 to lever 52 is a transverse extension or arm 54, which is integral with or secured to the locking-plate 48. (See Fig. 1.) Whenever the reversing-lever is thrown to the right or the left, it shifts the locking-plate 48 by means of the arm 54 of the latter, thereby causing one of the six notches 56 of the locking-plate to engage the gear-changing lever 43, and thereby prevents said lever 43 from being moved until the reversing-lever 33 is placed in middle (neutral) position. The effect of this arrangement is that the differential gears 2 3 4 cannot be shifted while the load is on the shaft 8—that is, while either clutch 29 is being actuated by said shaft.

Shaft 19 is shown below casting 15, but it may be mounted thereabove if so preferred.

The operation of the differential gears is as follows: For the highest speed, (say, four miles per hour,) lever 43 is thrown to the forward notch, thereby swinging the largest gear 4 into mesh with pinion 1. For the slowest speed (say, three-fourths mile per hour,) the lever is thrown to the rear notch, thereby bringing the smallest gear 2 into mesh with pinion 1. For a medium speed, said lever is set at the middle notch, thereby engaging the intermediate gear 3 with pinion 1.

The power is transmitted to shaft 22 through either clutch 29, according to whether the engine is to be propelled forward or backward.

A water-tank and other attachments may be mounted on or suspended from any convenient portion of the frame 14.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a gearing for traction-engines of the kind described, the combination of a driving-pinion, rocking differential gears adapted to engage said pinion, non-rocking differential gears engaging said rocking gears, a speed-changing lever, means for locking it in several positions, a reversing-lever, and means actuated by the reversing-lever for shifting the said locking means; substantially as described.

2. In a gearing for traction-engines of the

kind described, a reversing mechanism comprising a shaft, two clutches mounted thereon, bevel-gears controlled by said respective clutches, a third bevel-gear engaged by said gears, and a shipper operatively connected to both clutches, in combination with a speed-changing lever, means for locking it in several positions, a reversing-lever, and means actuated by the same for shifting the said locking means; substantially as described.

3. In a gearing for traction-engines of the kind described, a driving-pinion, rocking differentials adapted to engage said pinion, and non-rocking differentials engaging the rocking differentials, in combination with a speed-changing lever, a slotted locking-plate having lateral recesses in its slot, a reversing-lever, and means actuated by the latter for engaging and disengaging the locking-plate; substantially as described.

4. In a gearing for traction-engines of the kind described, a reversing mechanism comprising a shaft, two clutches mounted thereon, bevel-gears controlled by said respective clutches, a bevel-gear engaging said gears, and a shipper operating both clutches, in combination with a speed-changing lever, a slotted locking-plate having lateral recesses in its slot, a reversing-lever, and means actuated by the latter for engaging and disengaging the locking-plate; substantially as described.

5. In a gearing for traction-engines of the kind described, a driving-pinion, rocking differentials adapted to engage said pinion and non-rocking differentials engaging the rocking differentials, in combination with a speed-changing lever, a movable locking-plate having a recessed slot therein, a reversing-lever, and means actuated by the reversing-lever for shifting the locking-plate; substantially as described.

6. In a gearing for traction-engines of the kind described, a reversing mechanism comprising a shaft, two clutches mounted thereon, bevel-gears controlled by said respective clutches, a bevel-gear engaged by said gears, and a shipper operating both clutches, in combination with a speed-changing lever, a movable plate having a recessed slot therein, a reversing-lever, and means actuated by the reversing-lever for shifting the locking-plate; substantially as described.

In testimony whereof we affix our signatures in the presence of two witnesses.

JOHN H. KAPPELMANN.

HENRY D. KAPPELMANN.

Witnesses:

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