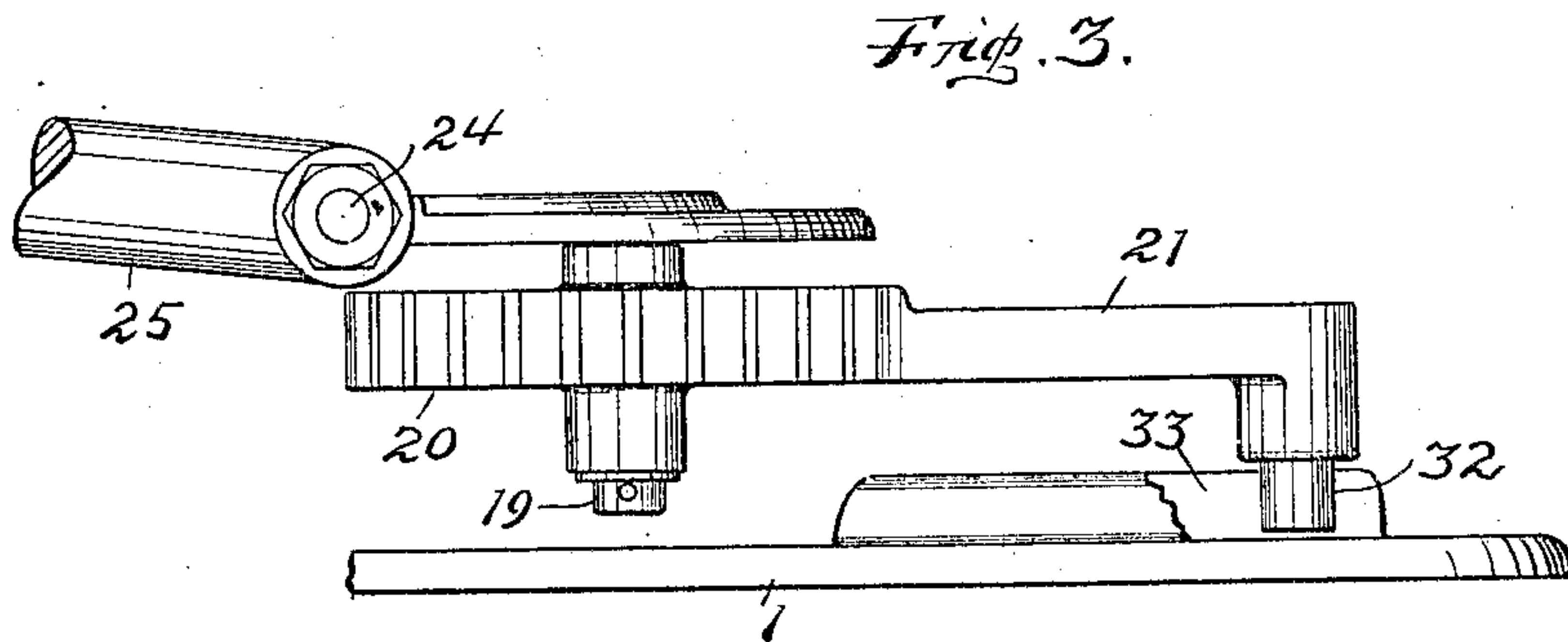
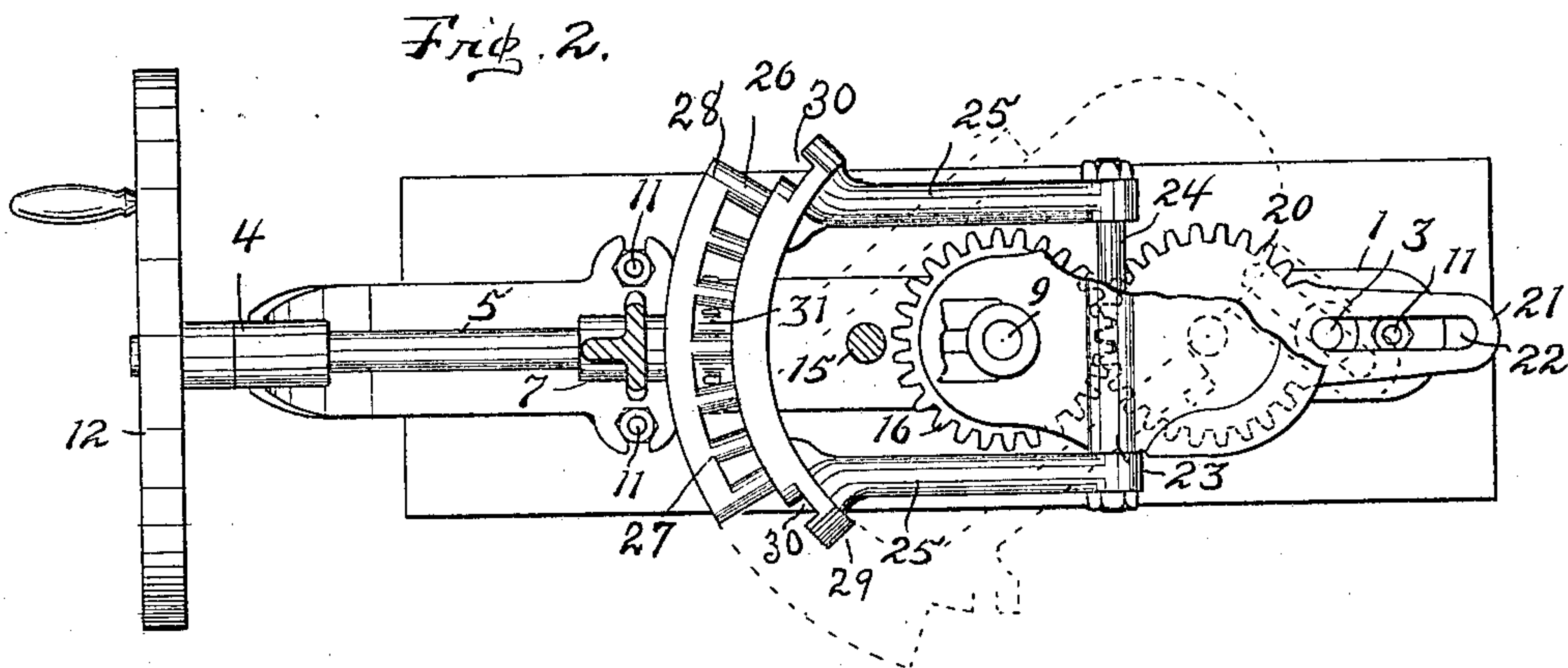
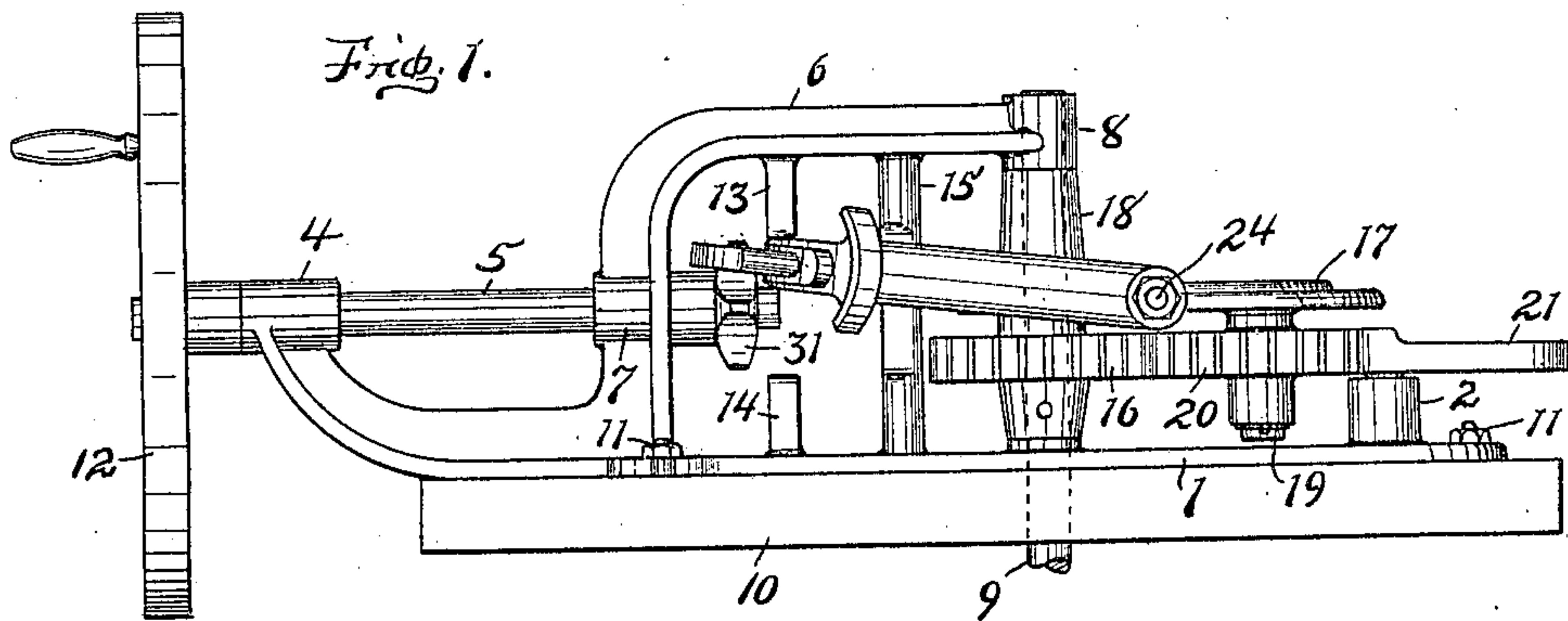


No. 837,334.

PATENTED DEC. 4, 1906.

W. NAHRWOLT.
GEARING FOR WASHING MACHINES.
APPLICATION FILED DEC. 15, 1905.



WITNESSES:

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GEARING FOR WASHING-MACHINES.

No. 837,334.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed December 15, 1905. Serial No. 291,814.

To all whom it may concern:

Be it known that I, WILLIAM NAHRWOLT, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Gearing for Washing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in gearing for washing-machines of that type adapted for an alternate reversal of the agitator-shaft.

My invention consists of a horizontal plate loosely provided upon the upper surface of the inner end with a vertical sleeve which is loosely mounted on the upper end of the agitator-shaft and is provided upon its outer end with a pendent stud carrying a loosely-mounted rack having an integral radial longitudinally-slotted lever adapted for a sliding engagement with a fixed coöperative guide or fulcrum by means of which the rotary motion of the said rack is alternately reversed, a gear-wheel fixed on the agitator-shaft immediately below the said plate and having a meshing engagement with the said loosely-mounted rack, and a yoke-shaped rack-bar pivotally mounted at its inner end to the said plate at or near the center of its length adapted to be actuated by a meshing engagement with a fixed pinion on the inner end of the power-shaft, thereby actuating the agitator-shaft through the medium of the said meshing gear-wheel and rack.

The object of my invention is to provide an improved mechanism of simple and economical construction adapted to transform the rotary motion of the power-shaft into an alternating motion in the agitator-shaft in washing-machines by a positive, efficient, convenient, and reliable operation.

The principal novel feature of my present invention resides in the means for alternately reversing the rotation of the agitator-shaft.

In the accompanying drawings similar reference-numerals indicate like parts throughout the several views, in which—

Figure 1 is a side view of my invention in position in a proper supporting-bracket and

in operative relation with the driving-shaft 55 carrying an operating hand-wheel. Fig. 2 is a plan view of the same with the upper portion of the supporting-bracket and a portion of the horizontal plate cut away to show the relative arrangement of the meshing gear 60 and rack and of the pivoted rack-bar. Fig. 3 is an enlarged detail of the loosely-mounted rack having a modified form of means for reversing the direction of motion of the meshing gear and rack and through them of the 65 agitator-shaft.

The bracket or upright standard on my improved mechanism is operatively mounted and has a base-plate 1, carrying at or near one end a short upright lug 2, having a reduced end 70 3 for the purpose hereinafter described. This base-plate 1 has its other end upturned, as shown, and provided with a bearing 4, in which the outer end of the power-shaft 5 is rotatably mounted, and has an overhanging 75 arm 6, having a lateral bearing 7 for the other end of the power-shaft, and has upon its free end a bearing 8 for the upper end of the agitator-shaft 9, which passes loosely through the suds-box lid 10 in the usual manner. In 80 this lid 10 the bracket base-plate 1 is rigidly secured by proper bolts 11 or other proper manner. The outer end of the power-shaft 5 has a fixed hand-wheel 12 of the usual form for operating the same. 85

The supporting-standard is provided upon its inner faces with the opposite vertically-aligned lugs 13 and 14, adapted to limit the vertical play of the free end of the pivoted rack-bar about to be described, and is also 90 provided with a vertical integral bar 15, rigidly connecting the overhanging arm 6 with the base-plate 1 near the outer end of the said arm for the purpose of imparting increased strength and rigidity to the arm and 95 resisting the torsional strains thereon in use.

A gear-wheel 16 is rigidly fixed on the agitator-shaft 9 between the plate 1 and the free end of the arm 6. Directly above this gear 16 is arranged a horizontal plate 17, 100 loosely mounted on the agitator-shaft and having a sleeve-bearing 18 at or near its inner end. To the lower face of this plate 17 and at or near its outer end is fixed a pendent stud 19, on which is rotatively mounted 105 a rack 20, in mesh with the gear 16. This rack 20 is provided with an integral radial peripheral arm or lever 21, having a longitu-

dinal slot 22, in which is loosely arranged the reduced end 3 of the lug 2, Fig. 2, which forms a fulcrum for the gear 20 to actuate the agitator-shaft through the medium of the gear-wheel 16 in the manner hereinafter described.

In a suitable transverse bearing 23, fixed on the plate 17, is loosely mounted the pin 24, on whose opposite projecting ends are mounted the apertured arms 25, on whose forward ends is arranged the fixed or integral sector-like rack-bar 26, having a plurality of teeth or pins 27, united at their outer ends by the curved plate 28 and united at their inner ends to the sector-plate 29, having their extended ends provided with the curved tracks 30, whose inner faces serve as guides for the extended inner end of the power-shaft in the manner hereinafter described.

The power-shaft 5 has a fixed pinion 31 on its inner end adapted for an actuating engagement with the rack-bar 26.

A slightly-modified form of fulcrum is shown in Fig. 3, in which the lever-arm 21 instead of being slotted is provided upon its outer end with a pendent lug 32, adapted for a sliding engagement with a longitudinal slot 33 in the adjacent upper face of the base-plate 1. The only difference between this construction and that shown in Fig. 2 resides in the fact that in one case the slot is movable on a fixed pin, and in the other case the pin is movable in a fixed slot.

The operation of my invention thus described is obvious and briefly stated is as follows: Continuous rotation of the power-shaft in either direction by means of the hand-wheel or other means imparts to the rack-bar 26 a correspondingly uniform oscillatory movement through its engagement with the power-shaft pinion 31, which traverses first one face of the rack-bar and then the other in a well-understood manner, being guided in rounding the ends thereof by the curved tracks 30. All danger of disengagement of the rack-bar from its actuating-pin is obviated by the lugs 13 and 14, which securely limit the vertical play of the rack-bar in use. These oscillatory movements of the rack-bar cause a like movement of the rear end of the plate 17, carrying with it the rack 20, which is thereby forced by the slidable connection of the pin 3 with the slotted arm 21 to travel to and fro in its meshing engagement with the gear-wheel 16, which movement in turn correspondingly actuates the agitator-shaft. Obviously the pin 3 during the oscillatory movement of the rack 20 will be first in one end of the slot 22 and then at or near the other end thereof, as shown by dotted outline in Fig. 2, and the operation is the same whether the slot 22 is movable on the fixed pin 3 or the pin 32 is movable in the fixed slot 33, the essential feature being a sliding engagement of the lever-arm with a

fixed fulcrum. A fulcrum for the oscillating rack 20, consisting of a slotted arm having a sliding connection with a fixed pin, is more simple and efficient and more easily operated and less liable to get out of repair than a fulcrum consisting of a rack-bar, as heretofore employed. The gear-wheel 16 and rack 20 are preferably of substantially the same size; but obviously their relative sizes can readily be arranged to secure the desired speed of the machine.

In the above-described construction any lost or broken part can readily, conveniently, and economically be replaced at a merely nominal expense.

Having thus described my invention and the manner of operating the same, what I desire to secure by Letters Patent is—

1. In a washing-machine gearing, an upright agitator-shaft; a gear-wheel fixed on the agitator-shaft; a plate loosely mounted on the agitator-shaft above the said gear-wheel, and provided with a pendent stud; a rack loosely mounted on the stud in mesh with the said fixed gear-wheel, and provided with a radial lever-arm having a longitudinal slot therein; a fixed upright pin in coöperative relation with the said slot to impart to the said loose gear an oscillatory movement; a rack-bar pivoted on the said plate and moving therewith; a power-shaft; an actuating-pin on the power-shaft adapted for an alternate meshing engagement with the upper and lower faces of the said rack-bar; and means for limiting the vertical play of the meshing end of the rack-bar.

2. The combination in a washing-machine gearing, of a vertical agitator-shaft rotatably mounted in a supporting-frame; a gear-wheel fixed on the agitator-shaft within the said frame; a horizontal plate loosely mounted on the agitator-shaft above the said gear-wheel, and having a pendent stud at or near its other end; a rack rotatably mounted on the stud in mesh with the said fixed gear-wheel, and provided with a radial peripheral arm adapted for a sliding engagement with a fixed fulcrum; a rack-bar pivotally mounted on the said plate and laterally movable therewith; a power-shaft; a fixed pinion on the power-shaft adapted for an actuating engagement with the opposite faces of the rack-bar alternately; means for limiting the vertical play of the rack-bar; and means for guiding the pinion in its turning movements upon the rack-bar.

3. A vertical agitator-shaft; a gear fixed upon the shaft; a plate loosely mounted on the shaft and having a pendent stud near its outer end; a rack loosely mounted on the stud and in mesh with the fixed gear and provided with a peripheral horizontal lever-arm adapted for a sliding engagement with a fixed fulcrum; a rack-bar pivotally mounted on the said plate and provided with curved guides

at its opposite ends; a power-shaft; a rigid pinion on the power-shaft adapted for an actuating engagement with the opposite faces of the rack-bar alternately; means for limiting the vertical play of the rack-bar; and means for resisting the torsional strain of the actuating mechanism.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 12th day of December, A. D. 1905.

WILLIAM NAHRWOLT.

Witnesses:

AUGUSTA VIBERG,
WATTS P. DENNY.