

No. 818,058.

PATENTED APR. 17, 1906.

G. A. THODE.
WASHING MACHINE.
APPLICATION FILED AUG. 24, 1904.

5 SHEETS—SHEET 1.

Fig. 1

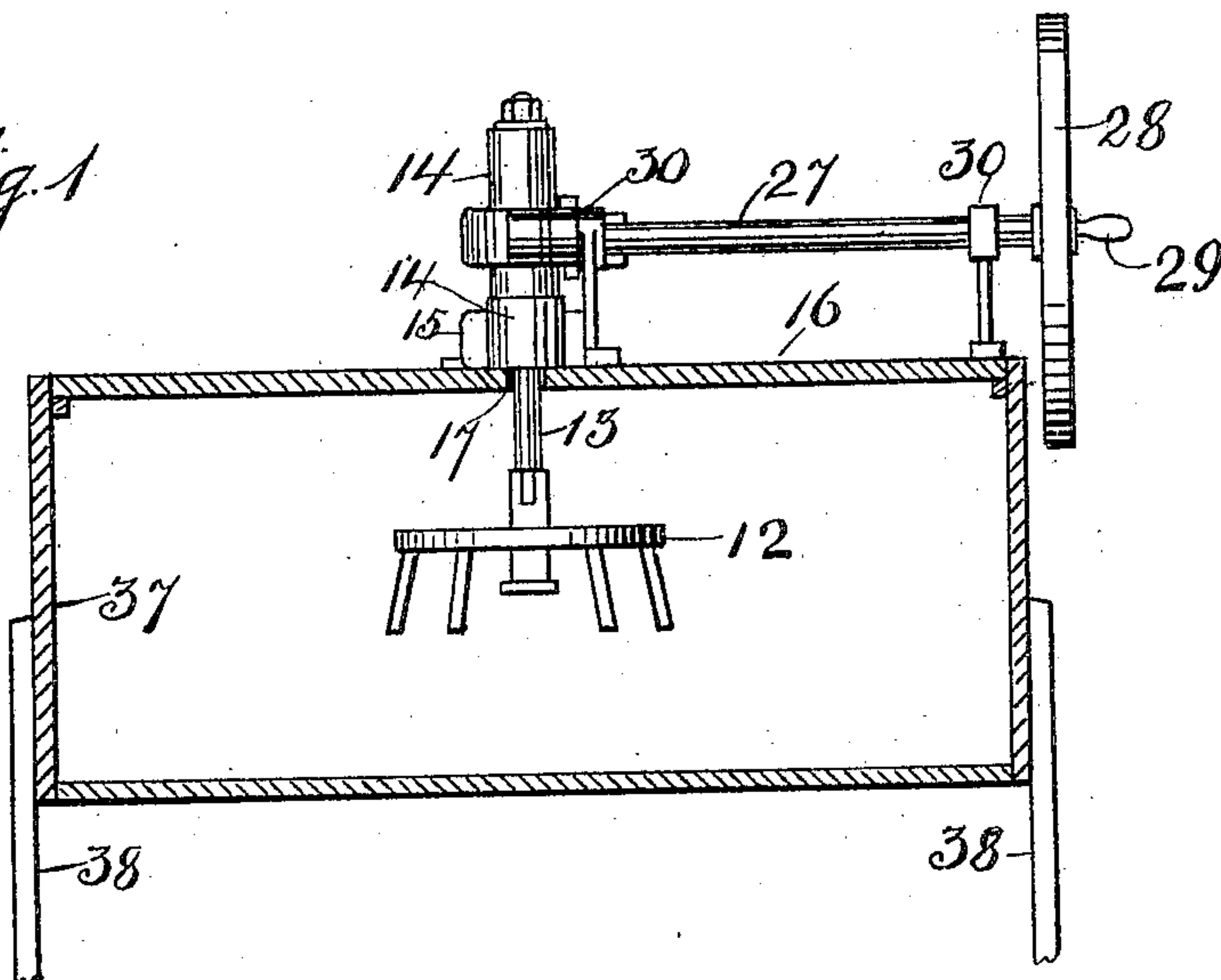
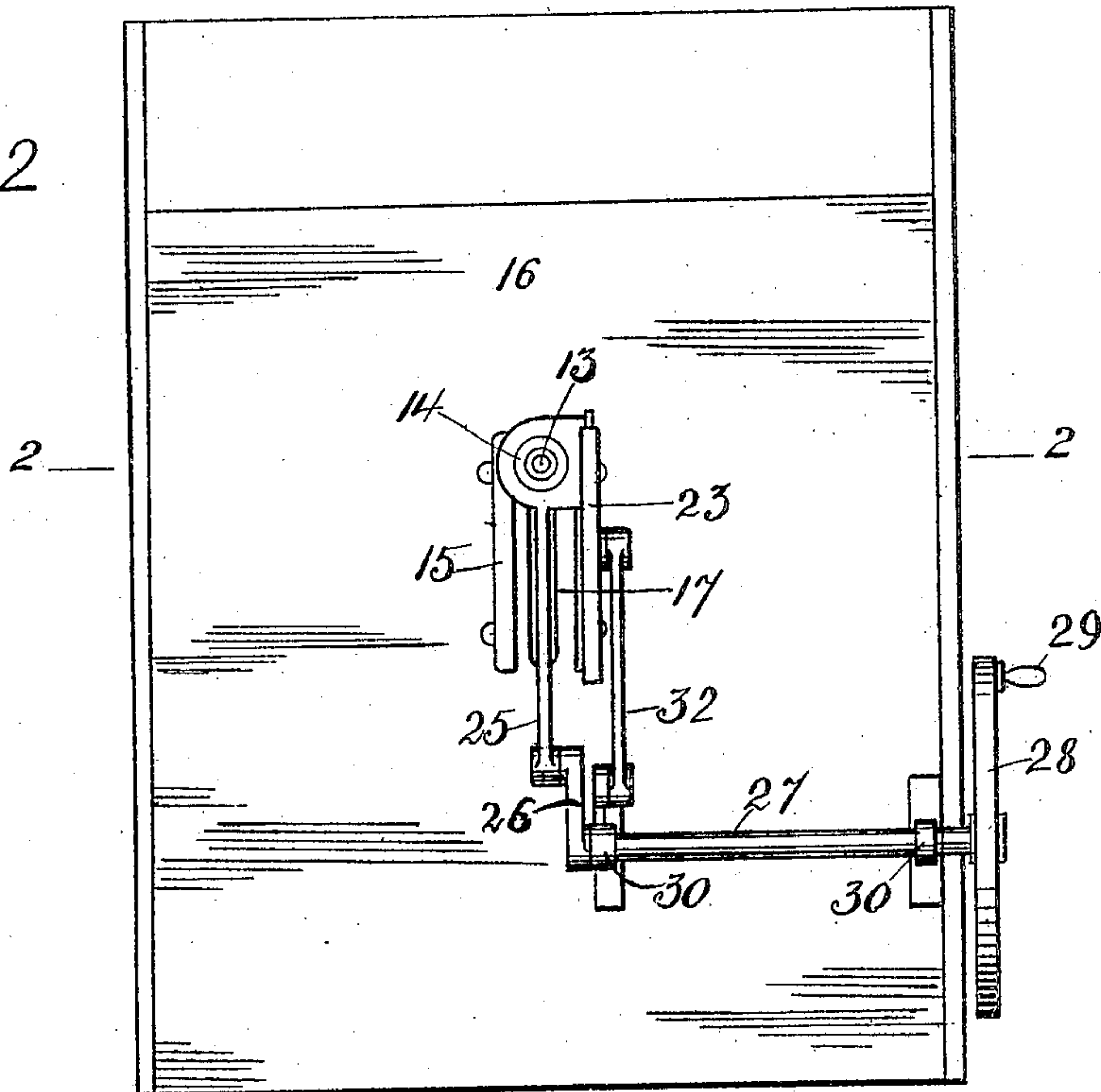


Fig. 2



Witnesses
J. de Romeville
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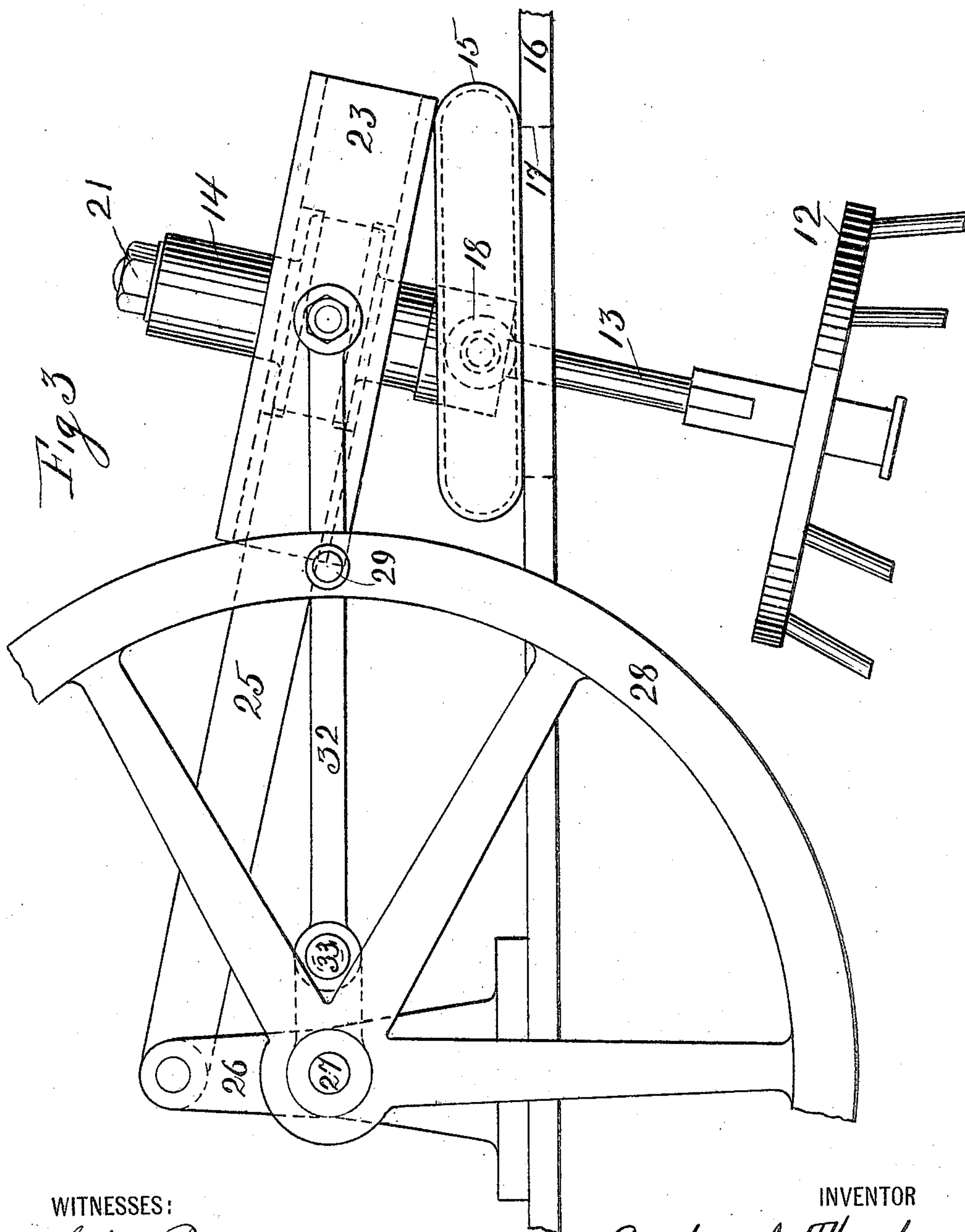
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6 SHEETS—SHEET 2.



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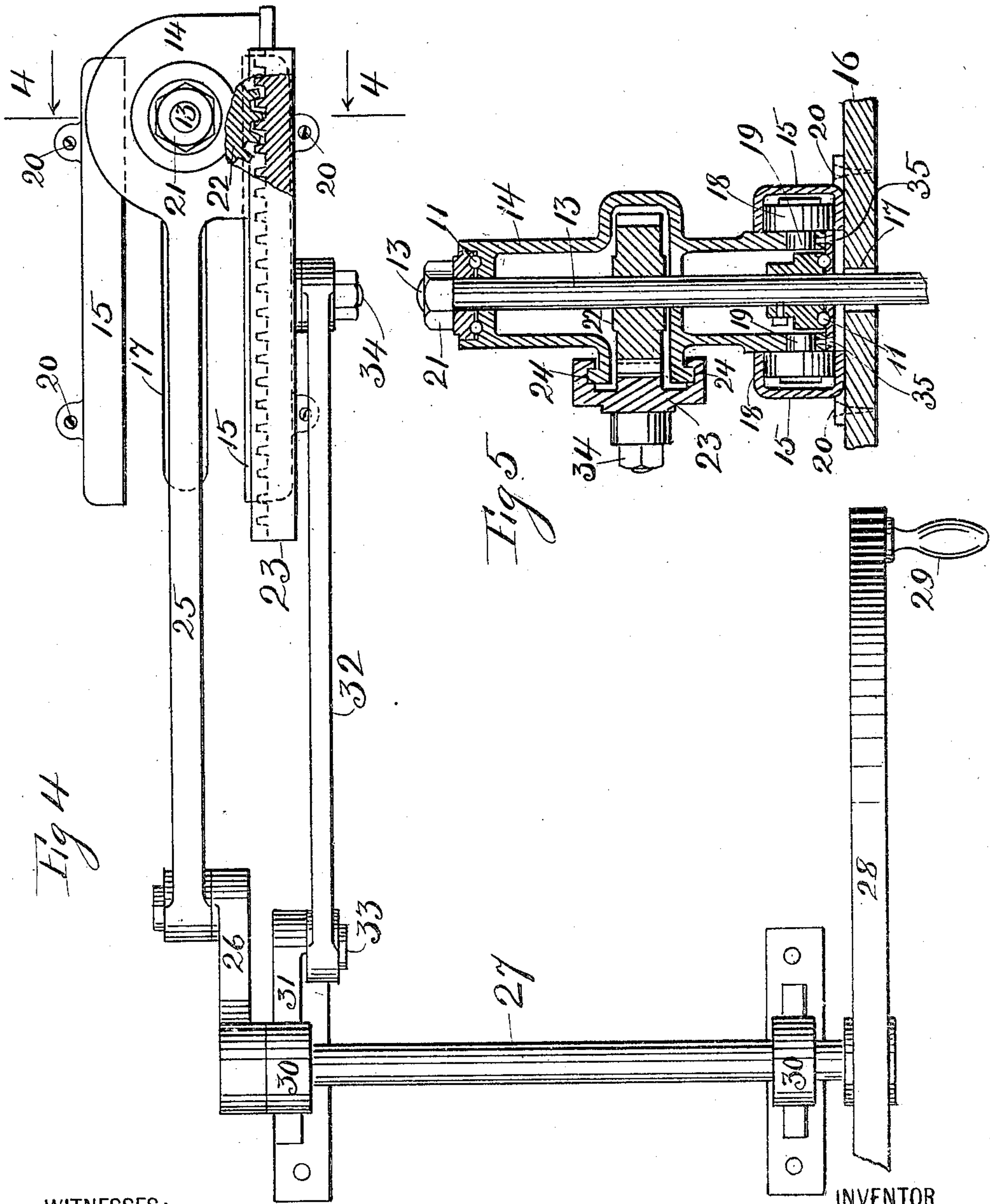
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5 SHEETS—SHEET 3.



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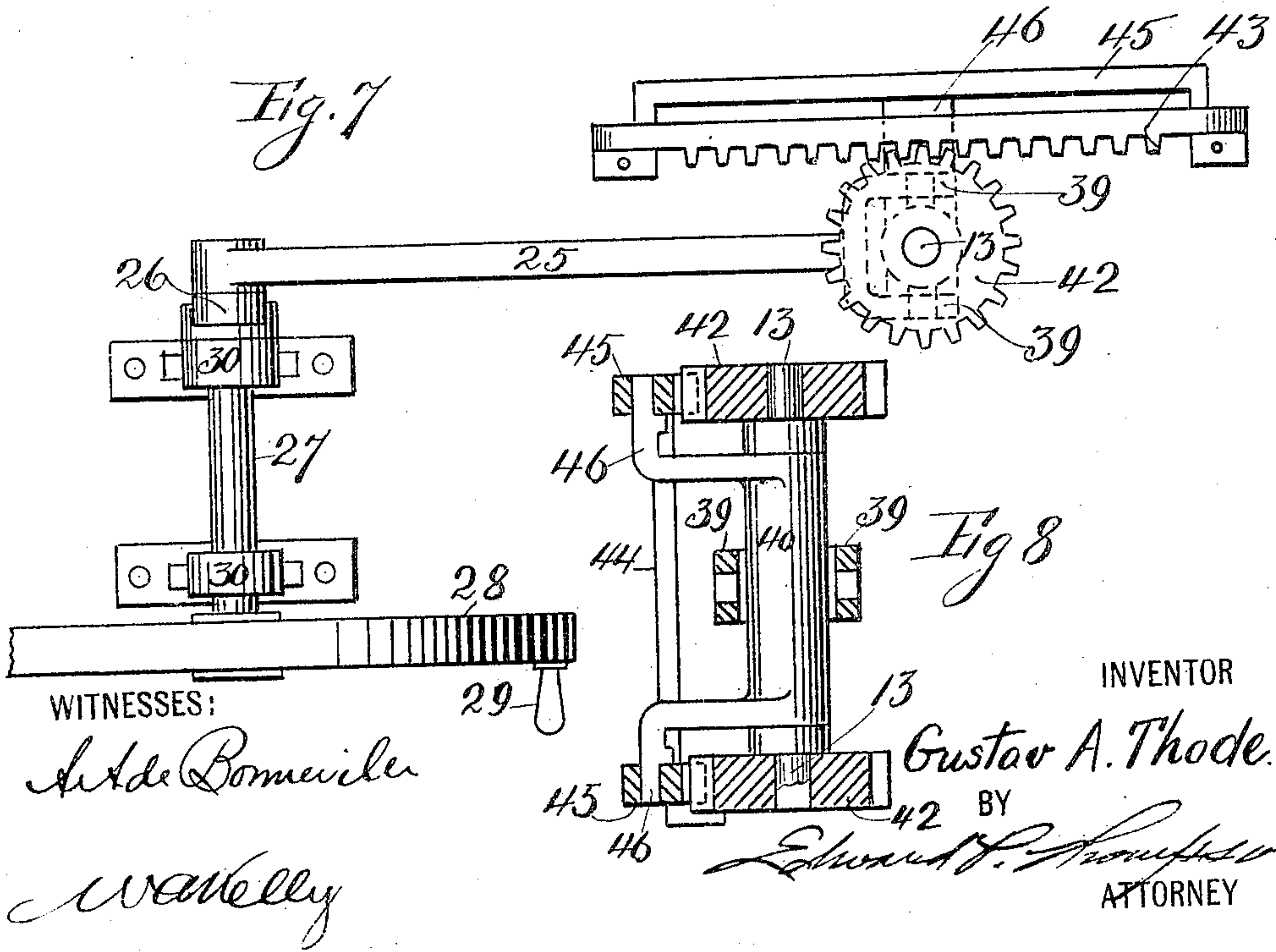
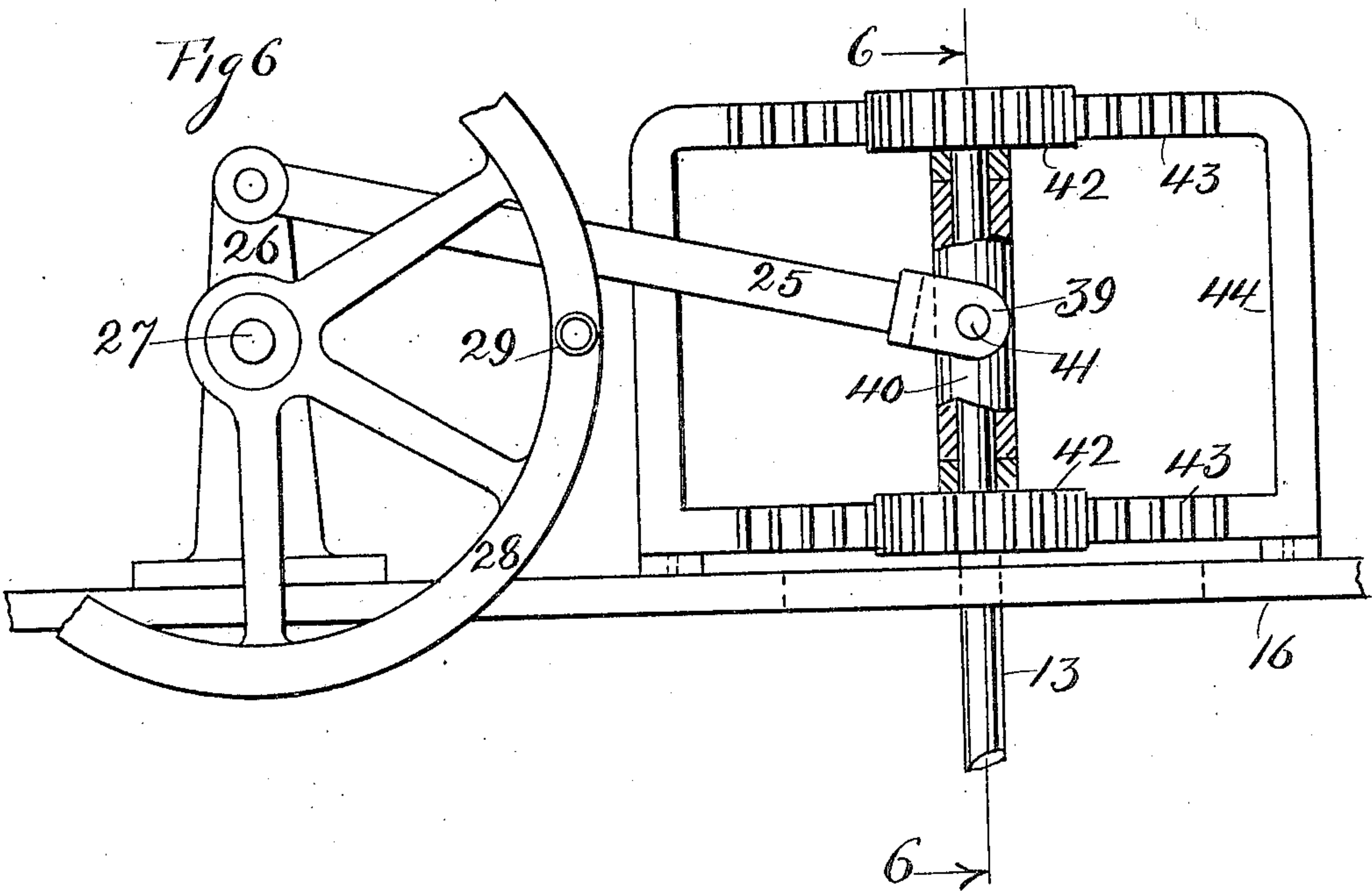
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5 SHEETS—SHEET 4.

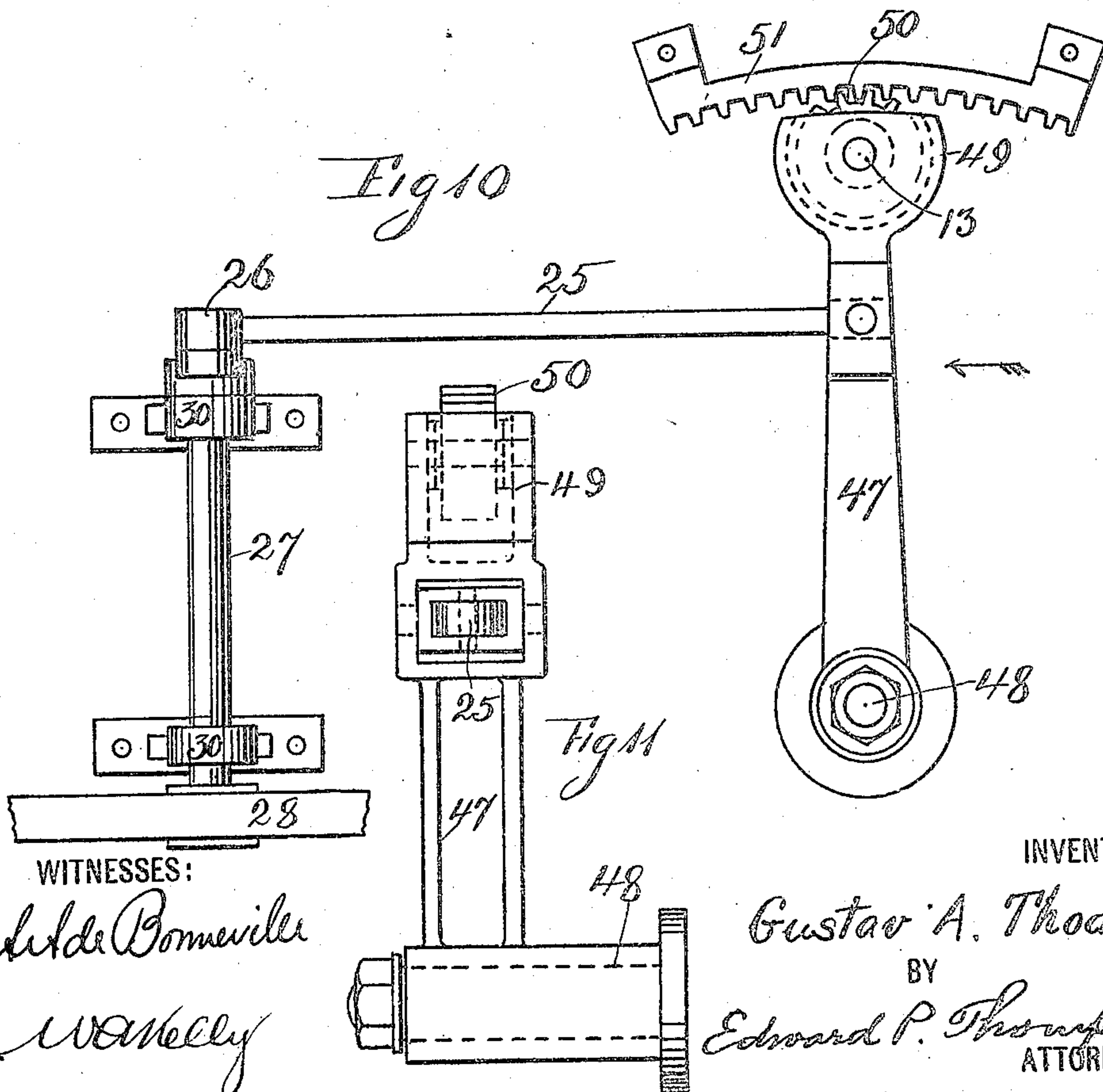
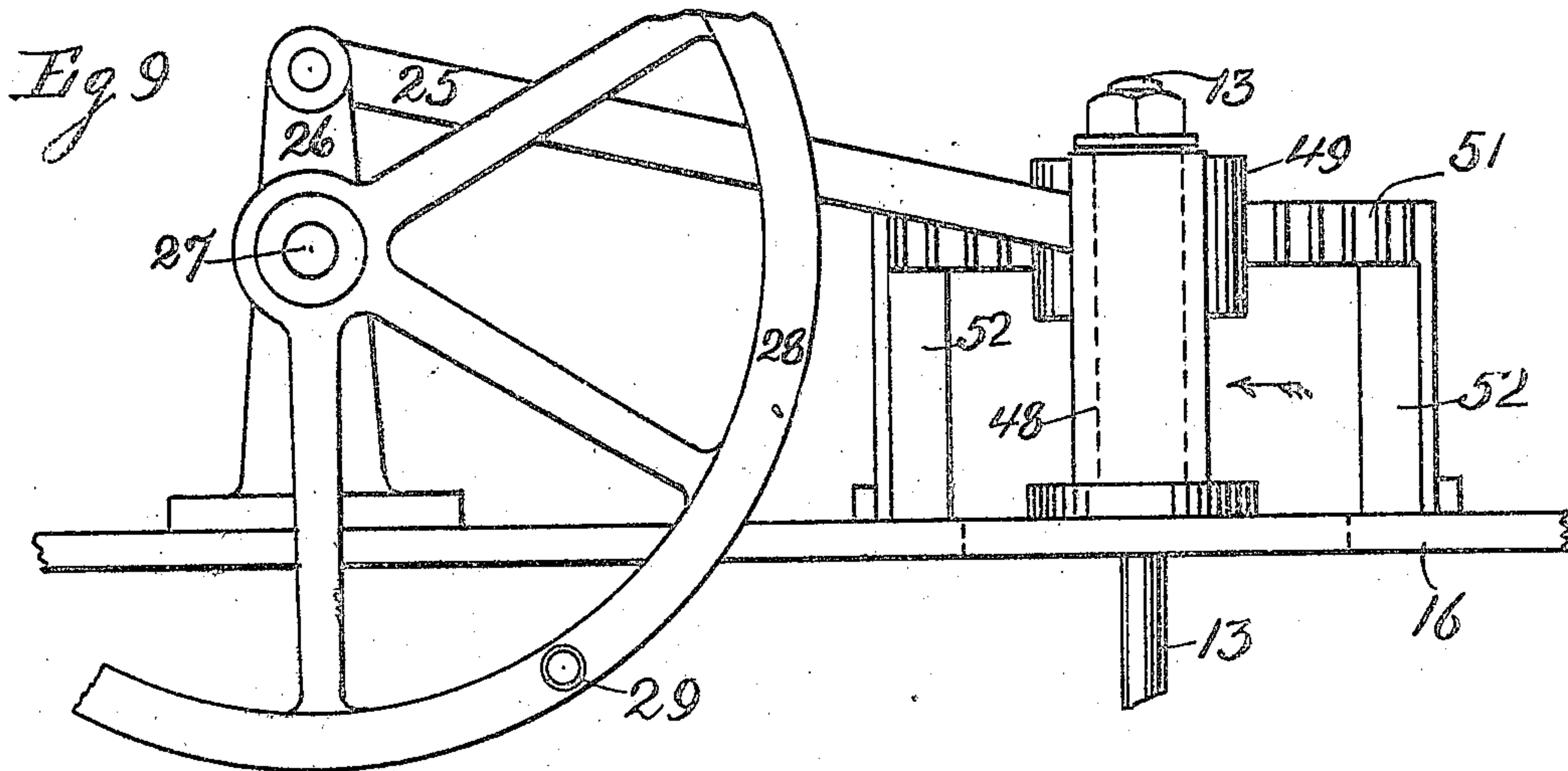


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6 SHEETS—SHEET 5.



UNITED STATES PATENT OFFICE.

GUSTAV A. THODE, OF OMAHA, NEBRASKA.

WASHING-MACHINE.

No. 818,058.

Specification of Letters Patent.

Patented April 17, 1906.

Application filed August 24, 1904. Serial No. 221,993.

To all whom it may concern:

Be it known that I, GUSTAV A. THODE, a citizen of the United States of America, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Washing-Machines, of which the following is a specification.

My present invention relates to a washing-machine so constructed as to cause the agitator to effectually and rapidly wash every portion of clothes placed in the tub.

To this end the object of the invention is to provide a movement made up of a reciprocating traveling motion and an oscillatory rotary motion, both of which may be combined with a rocking motion of the agitator.

Accordingly the general nature of my invention, without defining necessarily the various scopes of the invention, comprises an agitator, the driver, and means connected up between said elements for imparting to the same simultaneously both an oscillatory rotary motion and a reciprocating traveling motion, by which latter term I mean a transit bodily of the agitator as a whole through the tub substantially from one portion thereof through quite a long distance, then back again, and so on, for the purpose of carrying the clothes with a longitudinal motion at the same time that the clothes are whirled around with a rotary motion, and thus the clothes have no chance to escape a very perfect scrubbing, the clothes changing place with one another and rubbing against each other and against the agitator.

More particularly the machine consists of the following elements: a wheel, a handle thereon, a shaft therefor, and a crank attached thereto, a connecting-rod for the crank, a casing attached to the connecting-rod at the end opposite from said crank, bearings in said casing, a shaft supported in said bearings, an agitator and pinion fixed to the last-named shaft, a cover-plate having a slot through which passes said last-named shaft, tracks supported upon and secured to said plate parallel to said slot, wheels on said track and journals in bearings in said casing, said wheels supporting said casing, a rack for said pinion and provided with guides along which said casing may slide, and a rod having one end pivoted to said rack and the other end held stationary.

The invention is illustrated in the accompanying drawings.

In Figure 1 is shown the machine assembled and the tub and its cover represented in vertical section. The sizes and relative sizes are immaterial to the nature of my conception. Fig. 2 is a plan of the same machine that is shown in Fig. 1, but no section is represented. The line of the section in Fig. 1 is at 2 2 in Fig. 2. The scales are about the same in these two figures, and they will serve to give a general idea of the parts when assembled into a complete working device. Fig. 3 is a view of a portion of the machine on a greatly-enlarged scale as compared with that in Figs. 1 and 2. The machine is supposed to be looked at from the right-hand side in Figs. 1 and 2. A portion of the cover-plate of the tub is represented, but the tub itself is entirely omitted. Dotted lines represent hidden parts. Fig. 4 is a plan of what is substantially seen in Fig. 3; but a few of the parts are omitted, as it is intended merely to show what the machine looks like from a different direction, and thus serve about the same purpose as a model. A part is shown in section. Fig. 5 is a section at the line 4 4 in Fig. 4; but some parts are omitted. The shaft of the agitator is supposed to stand vertical in Fig. 5. Fig. 6 is a fragmentary vertical view of a modification, partly in section. Fig. 7 is a plan of about what is seen in Fig. 6 and such other parts as become visible in a plan. Fig. 8 shows the internal construction around the shaft of the agitator in section at the line 6 6 in Fig. 6. Fig. 9 is an elevation of another modification embodying, broadly, the same conception as in the other machines, the view being fragmentary, but the principal movement being represented. Fig. 10 is a plan of Fig. 9. Fig. 11 is a view of a part of Figs. 9 and 10 looked at in the direction of the arrows in those figures.

The mechanical construction consists of an agitator 12; a shaft 13 affixed thereto; a casing 14, having bearings at 11 for supporting the shaft 13 vertically and supported upon tracks 15, which are fastened to a cover-plate 16, having a slot 17, said casing being supported on the tracks by wheels or rollers 18, having stub-shafts 19 fixed to the casing 14, said tracks being secured to the cover 16 by screws 20, and the shaft 13 passing through said slot, and the said bearings being ball-bearings, and the shaft 13 having a nut 21, which carries one portion of the upper ball-bearing; a pinion 22, fixed upon the shaft 13 and located within said casing 14

and engaging with a rack 23, said casing 14 being adapted to slide along the rack 23 by having the guiding-surface on the casing 14 at 24; a connecting-rod 25, extending from said casing and pivoted to a crank 26, mounted upon a shaft 27, provided with a fly-wheel 28, having a handle 29; bearings 30 for the shaft 27; an arm 31, which is fixed to one of the bearings 30, and a rod 32, pivoted at one end to said arm by a pin 33 and at the other end pivoted to said rack 23 by the bolt 34. The tracks 15 are cup-shaped around the wheels 18 and bear against the casing 14, which has at its lower end a portion of the bearing for the balls fastened by screws 35 to said casing, and the casing nearly surrounds the pinion 22 and entirely surrounds the shaft 13 to protect the interior from dust as much as possible.

The function of the rod 32 is to hold the rack 23 stationary with respect to the pinion 22, so that when the crank 26 turns around the agitator 12 will rotate first in one direction and then in the other. However, the rod 32 permits the rack 33 to remain parallel to the connecting-rod 25 for the purpose of the proper action of the teeth of the gearing.

The function of the wheels 18 is to permit the agitator 12 to travel back and forth, together with its shaft 13, bodily from one portion of the tub to another through a distance of several inches. As these wheels 18 are also the fulcrum of the shaft 13, the latter will have a rocking motion. The three motions—the traveling, the rocking, and the rotary—will combine into resulting motions of a similar nature. The operation of the machine is as follows: The fly-wheel 28 is turned by means of the handle 29, constituting a manual driver, whereby the crank 26 is continuously rotated and the pinion as a whole is repeatedly reciprocated through the action of the connecting-rod 25. This reciprocation, together with the relative action of the rack 23, causes the rotation of the pinion 22, and the pull and push of the rod 25 propel the wheels 18 along the tracks 15. The agitator 12 and its shaft 13 have therefore a reciprocating traveling motion, an oscillating motion, and a rocking motion on an axis transverse to said shaft.

The whole mechanism is mounted upon the cover 16 of the tub 37, the bearings 30 being uprights from the cover, the tracks 15 being fixed to the cover parallel to the slot 17, and all the rest of the device being supported by the bearings 30 and the tracks 15. The tub may have legs 38.

My invention may be modified without departing from the spirit thereof—for example, as shown in the remaining figures of the drawings.

Referring particularly to Figs. 6, 7, and 8, the machine consists of the combination of the wheel 28, having the handle 29; the shaft

27 for the wheel 28; the crank 26 on the shaft 27; bearings 30 for the shaft 27; a fork 39 on the end of the connecting-rod 25 and pivoted to a sleeve 40, which surrounds and is loose upon the agitator-shaft 13, by means of pivot-pins 41, extending from the sleeve; two pinions 42, fixed upon the shaft 13; racks 43, gearing with the respective pinions and carried by a frame 44, which is fixed upon the top of the cover 16; guides 45, carried by the racks 43 at the rear thereof for holding and guiding the pinions 42 along the racks 43, the portions in the guides consisting of arms 46, extending from the sleeves 40. When the connecting-rod reciprocates, the sleeve 40 is caused to travel back and forth horizontally without rotating, but the pinions 42 and agitator 12 rotate alternately in opposite directions. At the same time there is a bodily transit of the agitator back and forth equal to the stroke of the crank 26. In the remaining modification the connecting-rod 25 is pivoted to a swinging arm 47, which in turn is pivoted to a post 48, mounted on the cover 16 and carrying at its free end a casing 49, containing a rotary pinion 50, gearing with a curved rack 51, which is fixed to posts 52, standing on the cover 16. This construction is valuable on account of its simplicity and few parts involved. When the arm 25 reciprocates, the arm 47 swings back and forth, causing a long travel of the agitator on the shaft 13 first in one direction and then in the other simultaneously and oscillating rotary motions of the shaft 13 with its agitator.

I am aware of these types of machines in which the rack is movable and engages a fixed rotatable spindle; but the same is objectionable on account of the too simple quality of the motions of the agitator, which should be endowed with more complex movements and yet with almost equally simple means for operating the agitator. There should be as much relative movement between the clothes and the water as can be obtained in order that the water may be effectively forced against and through the clothes. In my invention the additional motions given to the agitator cause the clothes to continually be brought in contact with fresh portions of the suds in the tub and also cause fresh surfaces of the clothes to be successively exposed to the action of the suds, and thus the cleansing operation is greatly facilitated.

In the modification of the invention shown in Figs. 6, 7, and 8 the racks 43 serve an additional purpose of retaining the shaft 13 in an upright position in a direction longitudinal thereto. In the last modification shown a similar function is performed by the swinging arm 47.

I claim as my invention—

1. A washing-machine consisting of the

combination of an agitator, a tub containing said agitator, a shaft upon which said agitator is mounted, a driver, and means connected up between said driver and said agitator and shaft for imparting to the latter two elements a reciprocating traveling motion, an oscillatory rotary motion, and a rocking motion on an axis transverse to said shaft.

2. A washing-machine consisting of the combination of an agitator, a driver, means connected up between the above-named two elements for imparting to said agitator simultaneously, an oscillatory motion and a reciprocating traveling motion, and a tub containing said agitator.

3. A washing-machine consisting of the combination of an agitator, a tub containing said agitator, a driver, and means connected up between said driver and said agitator for imparting to said agitator simultaneously an oscillatory motion and a reciprocating traveling motion, said means consisting of a shaft supporting the agitator, pinion-and-rack gearing between the driver and said shaft for giving the rotary motions, and a track and wheels thereon for supporting said agitator, and a crank and pitman for giving the traveling motions to said agitator.

4. A washing-machine consisting of the combination of an agitator, a tub containing said agitator, a driver, and means connected up between said driver and said agitator for imparting to said agitator simultaneously an oscillatory motion and a reciprocating traveling motion, said means consisting of a shaft supporting the agitator, pinion-and-rack gearing between the driver and said shaft for giving the rotary motions, said pinion being mounted upon said shaft, and traveling therewith, a casing carrying said pinion and forming bearings for said shaft, a crank on said driver and a connecting-rod between said crank and said casing.

5. A washing-machine consisting of the combination of an agitator, a tub containing said agitator, a driver, and means connected up between said driver and said agitator for imparting to said agitator simultaneously a rocking motion and a reciprocating traveling motion, said means consisting of a shaft supporting the agitator, pinion-and-rack gearing between the driver and said shaft for giving the rotary motions, said pinions being mounted upon said shaft, and traveling therewith, a casing carrying said pinion and forming bearings for said shaft, a crank and a connecting-rod for said driver, a track, wheels thereon, said wheels being journaled in bearings in said casing, and said rack being stationary with respect to said pinion, and said wheels forming a support for the weight of said agitator, shaft, casing, pinion, rack, and one portion of said connecting-rod.

6. In a washing-machine the combination of an agitator, a tub containing said agitator,

a driver, and means connected between said driver and said agitator for imparting to said agitator, a traveling motion bodily backward and forward, said means consisting of a shaft carrying said agitator, a crank, and a connecting-rod between said crank and said casing.

7. In a washing-machine the combination of an agitator, a tub containing said agitator, a driver, and means connected between said driver and said agitator for imparting to said agitator, a traveling motion bodily backward and forward, said means consisting of a shaft carrying said agitator, a crank and a connecting-rod between said crank and said shaft, a casing for the shaft, and said rod being connected to said casing.

8. In a washing-machine the combination of a tub, an agitator therein, wheels for supporting the same, tracks for said wheels, a shaft for the agitator, a casing supporting said shaft, bearings in said casing supporting said wheels, and a rod extending from said casing for moving the same along said tracks.

9. A washing-machine consisting of the combination of a wheel, a handle thereon, a shaft therefor and a crank attached thereto, a connecting-rod for the crank, a casing attached to the connecting-rod at the end opposite from said crank, bearings in said casing, a shaft supported in said bearings, an agitator and pinion fixed to the last-named shaft, a cover-plate having a slot through which passes said last-named shaft, tracks supported upon and secured to said plate parallel to said slot, wheels on said track and journals in bearings in said casing, said wheels supporting said casing, a rack for said pinion and provided with guides along which said casing may slide, a rod having one end pivoted to said rack, and the other end held stationary and a tub containing said agitator.

10. A washing-machine consisting of the combination of a tub, an agitator therein, a shaft upon which the same is mounted, a driver, and means connected up between said driver and said agitator and shaft for imparting to the latter two elements a reciprocating traveling motion, an oscillatory rotary motion, and a rocking motion on an axis transverse to said shaft, a casing surrounding said shaft, and antifriction-bearings supporting said shaft vertically in said casing.

11. In a washing-machine the combination of a tub, a cover therefor, a slot in said cover, an agitator with its shaft bodily movable to and fro along said slot, a driver connected up with said shaft, tracks respectively on opposite sides of said slot and parallel thereto, and wheels running on said tracks and supporting said shaft.

12. In a washing-machine the combination of a tub, a cover therefor, having a slot therein, tracks along said slot, a casing between said tracks and carrying-wheels for running

on said tracks, a shaft with its agitator journaled in bearings in said casing, and means for propelling said wheels along said track.

13. In a washing-machine the combination
5 of a tub, a vertical shaft, an agitator within said tub and affixed to said shaft so as to rotate therewith, and means for simultaneously rocking said shaft on its axis and reciprocating the same in a horizontal direction.

10 14. A washing-machine consisting of the combination of an agitator, a tub containing said agitator, a driver, and means connected up between said driver and said agitator for imparting to said agitator simultaneously a

rocking motion and a reciprocating traveling
15 motion, said means consisting of a shaft supporting the agitator, pinion-and-rack gearing for giving the rotary motions, and a crank and pitman for giving the traveling motions
20 to said agitator.

In testimony whereof I have hereunto signed my name this 20th day of August, 1904.

GUSTAV A. THODE. [L. s.]

Witnesses:

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J. W. WAGERS.