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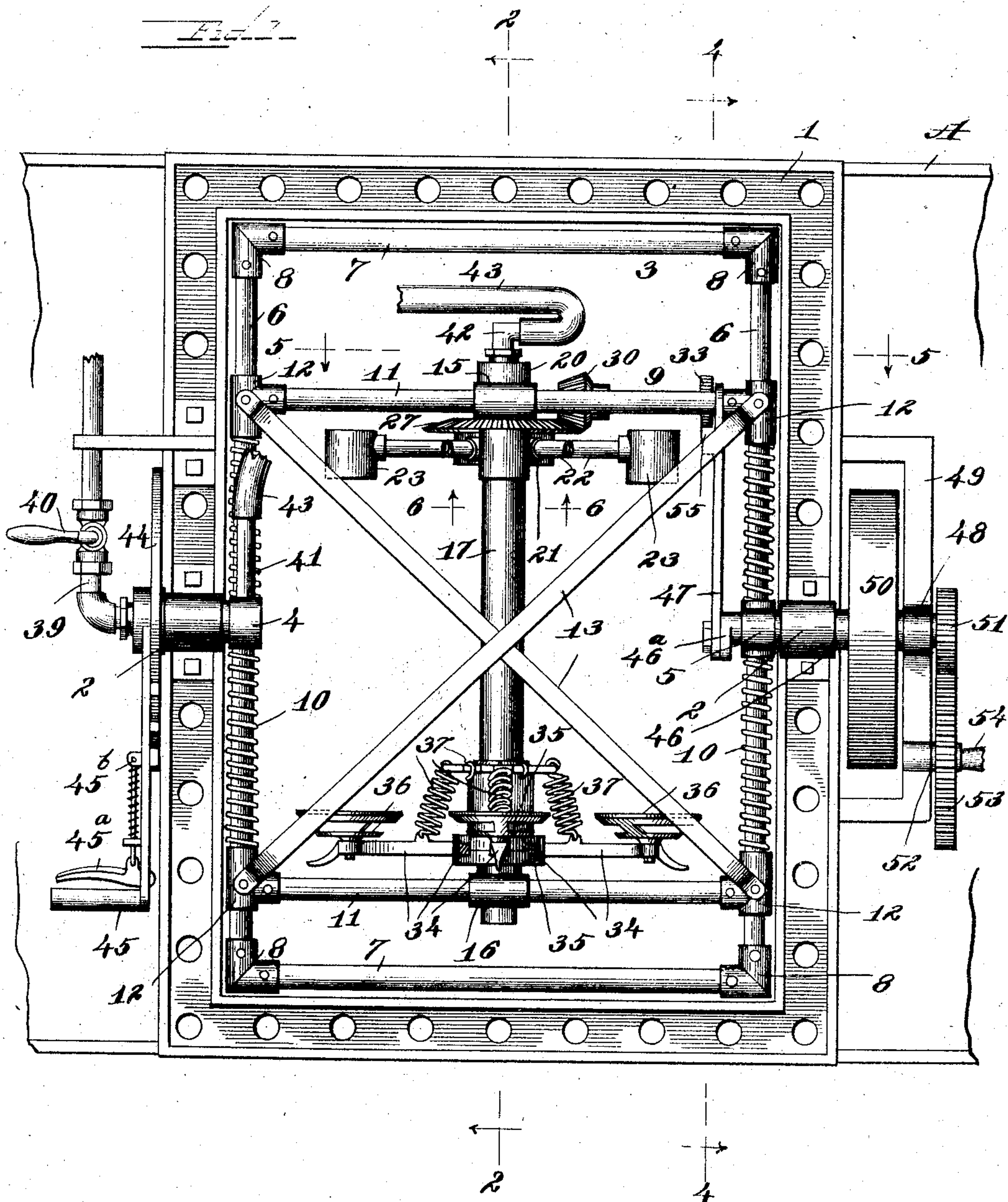
PATENTED AUG. 23, 1904.

E. A. LUFKIN.  
BOTTLE WASHING MACHINE.

APPLICATION FILED NOV. 21, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses—

*E. A. Pauberschmidt*  
*George L. Chindahl*

Inventor—

*E. A. Lufkin*  
*By Luther L. Miller*  
Att'y—

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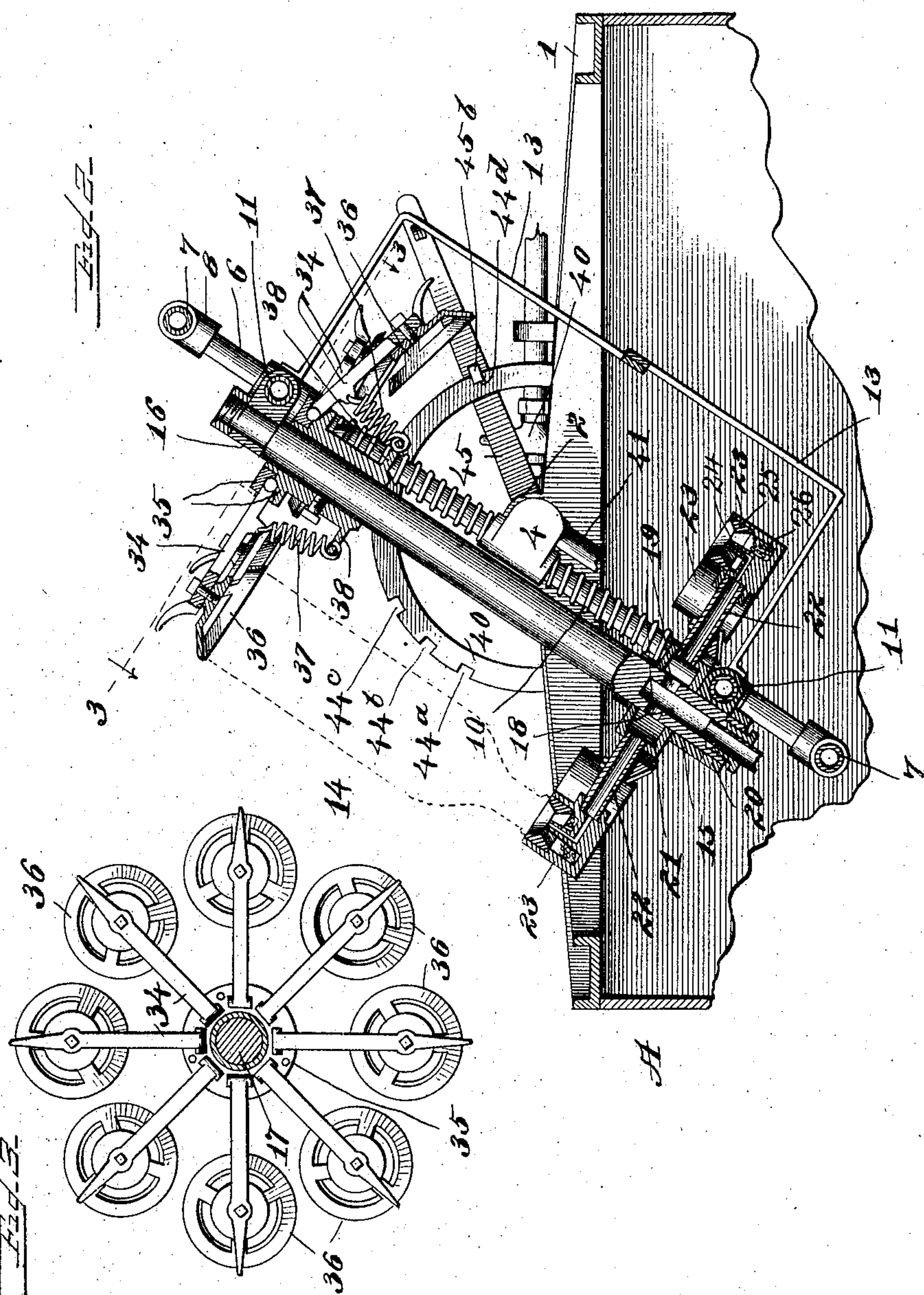
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*G. W. Pauberschmidt*

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ATTY—



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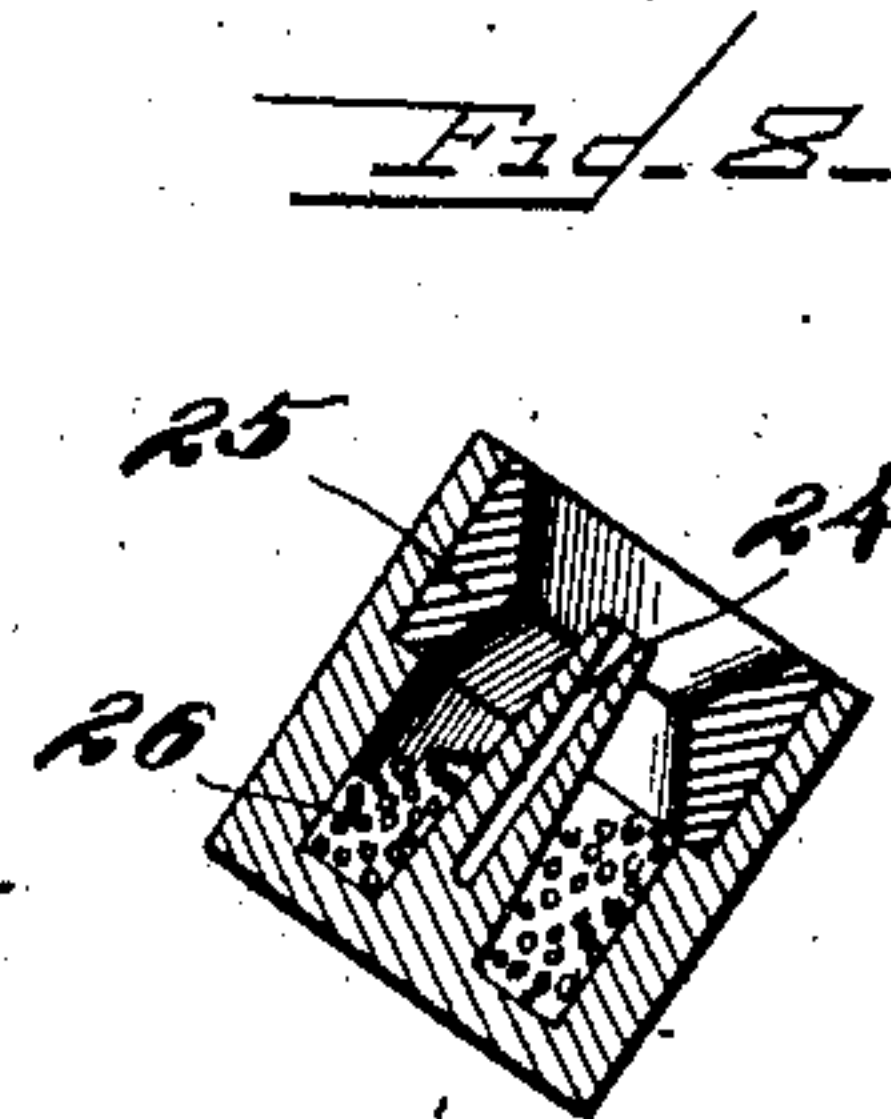
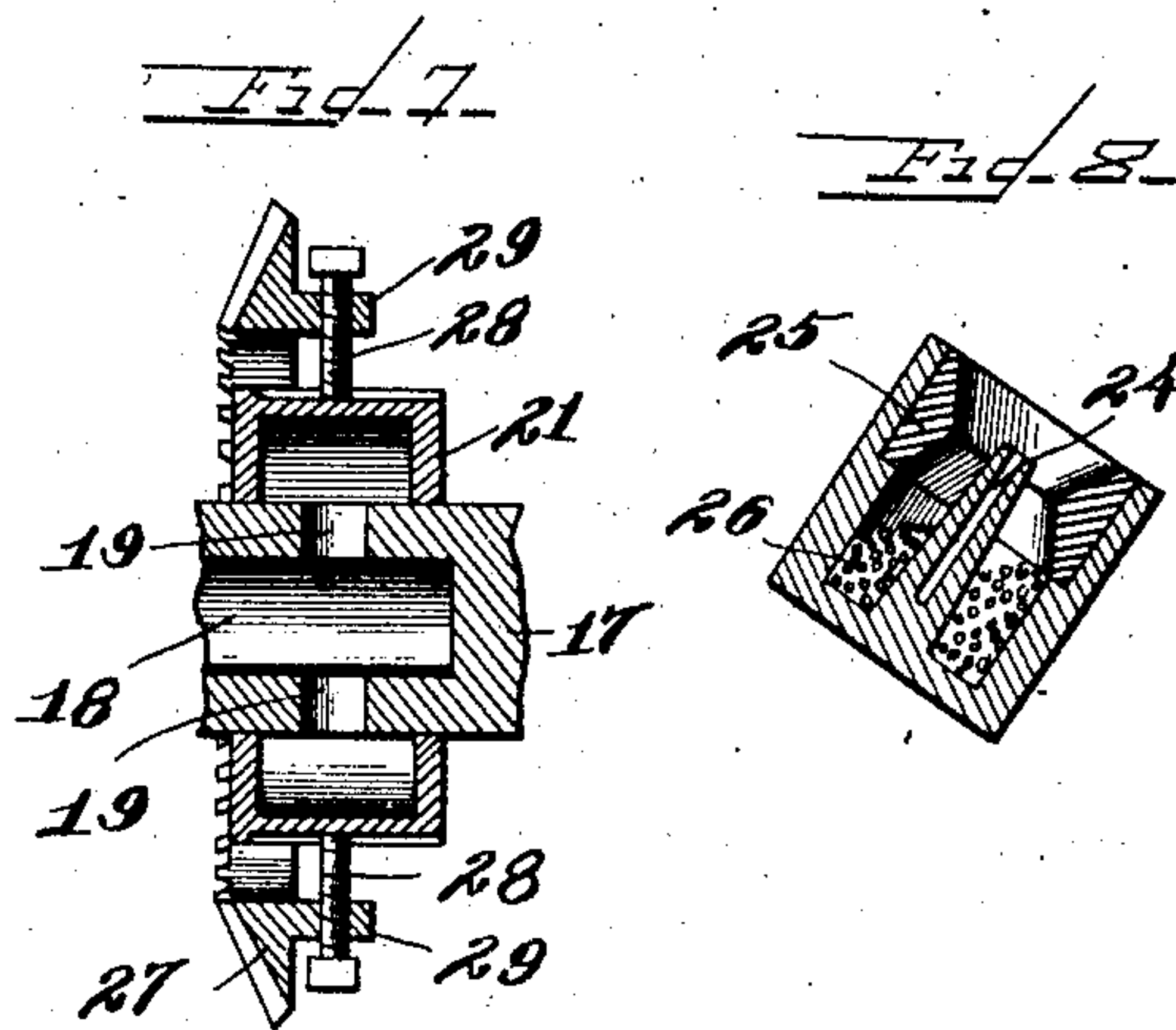
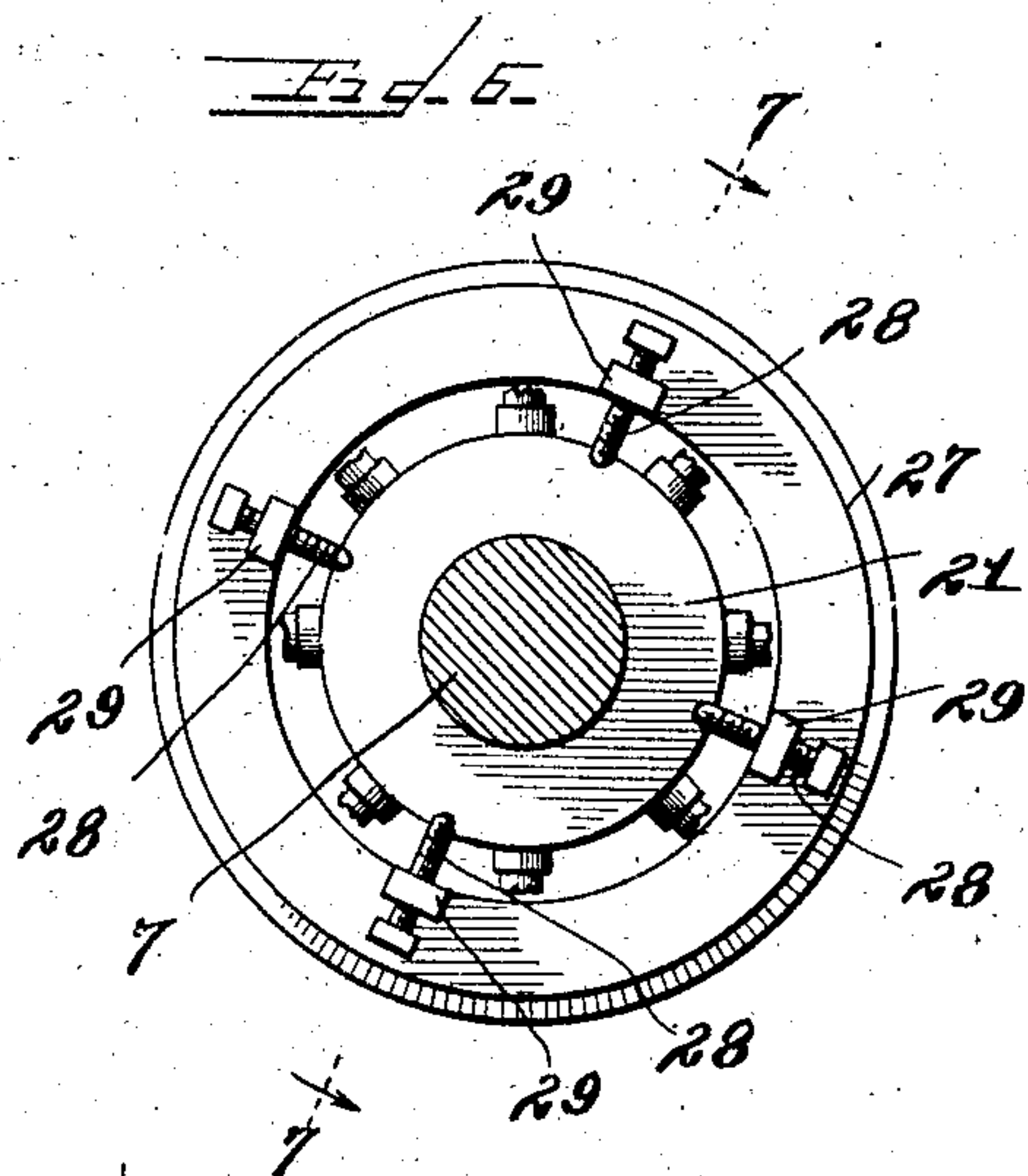
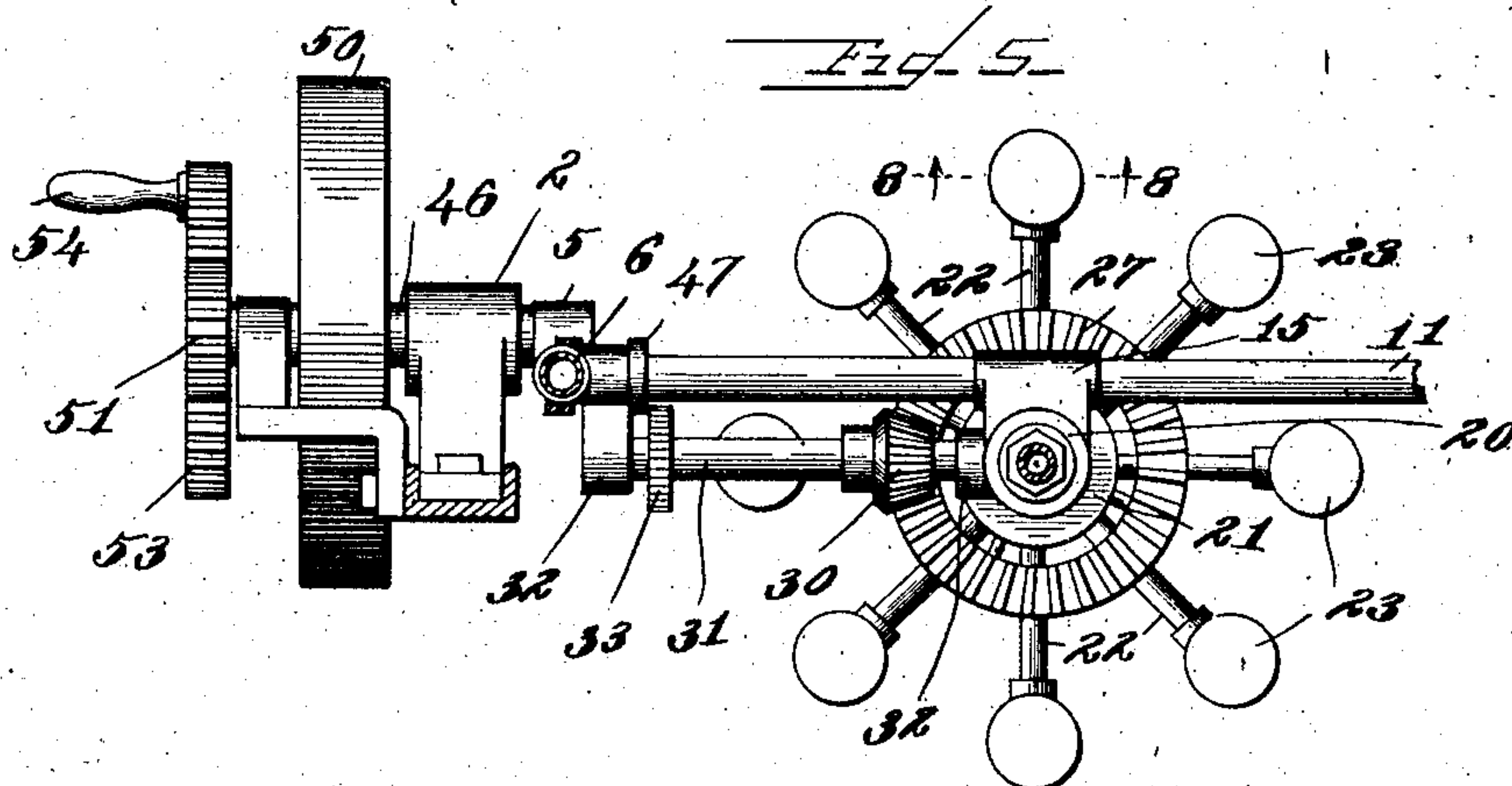
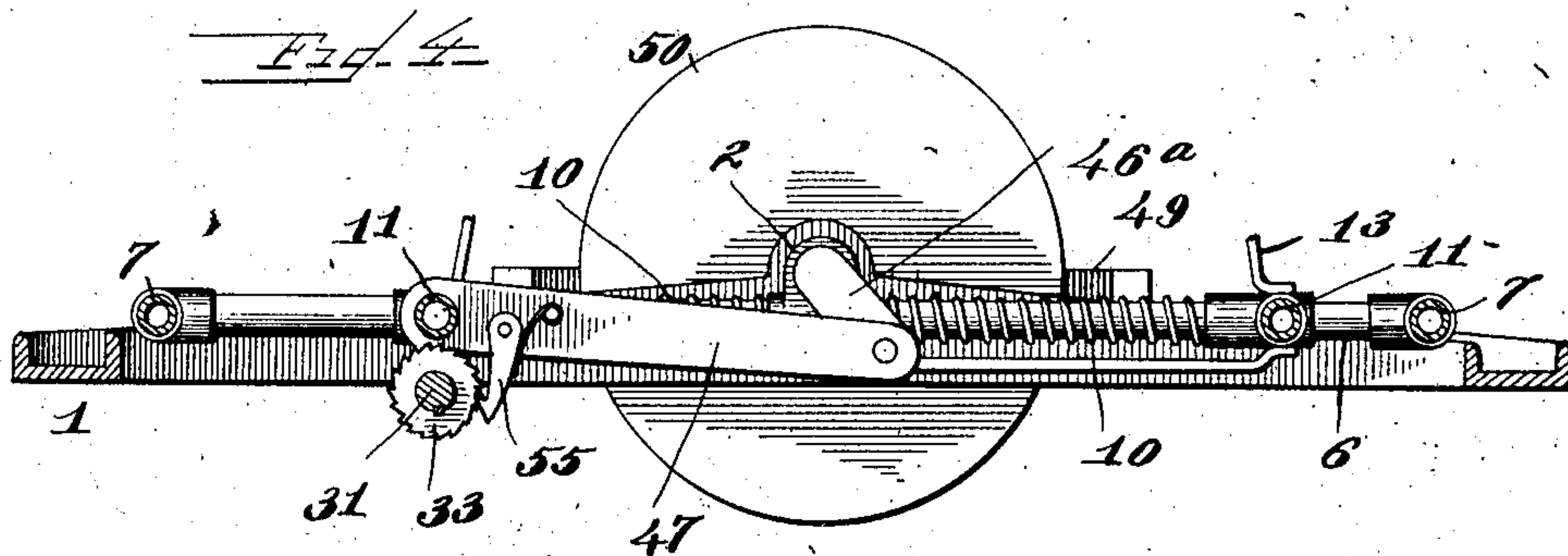
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3 SHEETS—SHEET 3.



Witnesses—

*G. A. Pucherschnitt*  
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Att'y



## UNITED STATES PATENT OFFICE.

EDWARD A. LUFKIN, OF BELOIT, WISCONSIN.

## BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 768,057, dated August 23, 1904.

Application filed November 21, 1903. Serial No. 182,089. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD A. LUFKIN, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Bottle-Washing Machines, of which the following is a specification.

The object of this invention is the production of an improved apparatus for thoroughly cleansing bottles.

In the accompanying drawings, Figure 1 is a top plan view of a bottle-washing mechanism embodying the features of my invention, said mechanism being shown in operative relation to a cleaning-tank. Fig. 2 is a longitudinal vertical central section through said mechanism on dotted line 2 2 of Fig. 1, the parts of the mechanism, however, being shown in a different position. Fig. 3 is a detail view of the means for supporting one end of the bottles being operated upon, taken on dotted line 3 3 of Fig. 2. Fig. 4 is a longitudinal vertical section through the machine, taken on dotted line 4 4 of Fig. 1. Fig. 5 is a sectional view taken on dotted line 5 5 of Fig. 1. Fig. 6 is a section on dotted line 6 6 of Fig. 1. Fig. 7 is a section on dotted line 7 7 of Fig. 6. Fig. 8 is a central section through one of the shot-cups, taken on dotted line 8 8 of Fig. 5.

In the embodiment herein shown of this invention the bottles to be washed are supported in a rotatable holder, which holder is carried by a reciprocable frame, and said frame in turn is supported in a tilting frame. Mechanism is provided for rotating the holder and for reciprocating the frame first mentioned, and other and separate means are shown for tilting the frame last mentioned. By means of a suitable connection water may at any time be introduced into the bottles, and a quantity of small steel balls held by the mechanism may likewise be introduced to more effectually and rapidly remove sediment from the inner walls of the bottles being cleansed.

In the construction of a bottle-washer according to my said invention I provide a supporting-frame 1, preferably rectangular in outline, and on opposite sides of said frame arrange the bearings 2. Within the support-

ing-frame 1 is mounted a second or tilting frame 3, the trunnions 4 and 5 of which tilting frame lie within the bearings 2. The tilting frame 3 is made up of side (guide) rods 6 and end rods 7, rigidly joined together in rectangular outline by the elbow-couplings 8. Both of the trunnions 4 and 5 are tubular, the former for receiving a water connection, the latter a crank-shaft, and both are slightly offset from the plane of the frame 3.

A reciprocating frame 9 is slidably supported on the guide-rods 6 of the tilting frame 3, and its movement on said guide-rods is adapted to be cushioned by the coil-springs 10, surrounding said guide-bars and lying between each of the trunnions 4 and 5 and the opposite ends of the reciprocating frame 9. This reciprocating frame comprises the cross-bars 11, the sleeves 12, surrounding the guide-rods 6, and the diagonal outwardly-bowed braces 13.

Between the cross-bars 11 a rotatable bottle-holder 14 is supported in the bearings 15 and 16, offset from the plane of said cross-bars. This rotatable bottle-holder comprises a supporting-shaft 17, having the axial openings 18 and the radial openings 19 in one of its ends. This end of the supporting-shaft enters a stuffing-box 20 of common construction and adjacent to said stuffing-box carries an annular casing 21, the interior of which casing communicates with the axial opening 18 and the radial openings 19, before mentioned. The casing 21 also carries a series of radial tubular arms 22, the outer end of each of which arms is provided with a shot-cup 23, within the center of which projects a nozzle 24, said nozzle communicating through its tubular arm 22 with the interior of the casing 21. The open end of the shot-cup 23 is partially closed by an annular packing-ring 25, and the space within said cup below said packing-ring is adapted to receive a quantity of small steel balls 26.

A bevel gear-ring 27 surrounds the shaft 17 and is secured with relation thereto by means of set-screws 28, passing through screw-threaded openings in its integral ears 29 and impinging against the casing 21. A bevel-pinion 30 is adapted to mesh with the teeth of



the gear-ring 27 and is fixed upon a shaft 31, rotatably supported within suitable bearings 32 in the reciprocating frame 9. Said shaft also carries a ratchet-wheel 33, fixed to said shaft.

Near its opposite end the shaft 17 is provided with a series of bottle-holding arms 34, pivotally mounted in a ring composed of two flanges 35, each of said arms having a bottle-holding cup 36 at its outer end and being held upward (toward the shot-cups 23) by means of a coil-spring 37, extending between the arms 34 and a fixed support 38.

The trunnion 4, as hereinbefore stated, is tubular and has a stuffing-box connection of common construction with a water-supply pipe 39, having a regulating-valve 40. The inner end of the trunnion 4 is provided with a nipple 41, and this nipple is connected with the stuffing-box 20 by means of a similar nipple 42 and a length of flexible hose 43.

Near the trunnion 4 the supporting-frame is provided with a sector 44, having setting-notches 44<sup>a</sup>, 44<sup>b</sup>, 44<sup>c</sup>, and 44<sup>d</sup>, and said trunnion carries a fixed crank-arm 45, having a pivoted hand-latch 45<sup>a</sup> and a spring-plunger 45<sup>b</sup>, the latter for engaging said setting-notches. By means of this crank-arm the frame 3 may be tilted into any desired position on the trunnions 4 and 5.

Power is communicated to the frame 9 to reciprocate it by means of a crank-shaft 46, rotatably supported within the tubular trunnion 5, a connecting-rod 47 extending between the crank 46<sup>a</sup> and one of the cross-bars 11 of the frame 9. At its outer end the crank-shaft 46 is supported in a bearing 48 in a bracket 49 and within said bracket carries a flat-face balance-wheel 50, fixed to said shaft, upon which wheel a belt may be run, if it is desirable, to operate the mechanism by power. If hand-power is to be employed, the crank-shaft 46 is fitted with a pinion 51 and the bracket 49 with a stud 52 for supporting a spur-gear 53, meshing with said pinion and having a hand-crank 54 projecting from its side.

A step-by-step feed is imparted to the rotatable bottle-holder by means of a spring-actuated pawl 55, pivotally mounted on the connecting-rod 47 near its point of attachment to the cross-bar 11, which pawl upon the upward oscillation of the connecting-rod engages the teeth of the ratchet-wheel 33, fixed on the shaft 31. It will thus be seen that as the frame 9 is reciprocated the bottle-holder 14 will be slowly rotated.

For convenience the mechanism hereinbefore described is supported over an open tank A.

In operation the tilting frame 3 is placed in the position indicated in Fig. 2, and the bottles to be cleansed are put into the bottle-holder 14, the mouths of the bottles being first inserted into the shot-cups 23 and the bases of the bottles then slipped into the cups

36, the latter being pulled backward by the operator to admit the bottle. In thus filling the bottle-holder it may be freely rotated upon its axis in the direction to cause the ratchet-wheel 33 to click under the pawl 55. When the bottle-holder is filled, the tilting frame 3 is turned into such position that the balls 26 will fall from the shot-cups 23 into the bottles, and the inlet-valve 40 is opened to admit a quantity of water into the bottles. The frame 9 is then reciprocated, either by power or hand, as hereinbefore described, and during such reciprocation the bottle-holder 14 is rotated by the pawl 55 and the tilting frame 3 operated by the crank 45 to bring the balls 26 into contact with all portions of the interior of said bottles. When the bottles have been sufficiently washed, the tilting frame is oscillated into its first position, Fig. 2, and the water in the bottles permitted to run out between the mouths of the bottles and the rings 25. In this position also the balls 26 fall into the shot-cups 23. When the bottles are empty, they may be rinsed by opening the valve 40 and permitting water to spray into the bottles through the nozzles 24.

It is apparent that the embodiment herein shown is susceptible of many modifications without departing from the spirit and scope of my invention. Therefore I desire to have it understood that I do not limit myself to the specific construction herein described.

I claim as my invention—

1. In a bottle-washing machine, in combination, a substantially rectangular supporting-frame; a substantially rectangular frame pivotally supported within said supporting-frame; a frame slidably supported by said pivoted frame; and a spring interposed between said slidable frame and said pivoted frame, for cushioning the sliding movement of said slidable frame.

2. In a bottle-washing machine, in combination, a substantially rectangular supporting-frame; a substantially rectangular frame pivotally supported at points about midway of its ends, within said supporting-frame; a crank-arm for oscillating said pivoted frame; a frame slidably supported by said pivoted frame; and a spring interposed between said slidable frame and said pivoted frame, for cushioning the sliding movement of said slidable frame.

3. In a bottle-washing machine, in combination, a supporting-frame; a frame pivotally supported upon said supporting-frame; a crank-arm for oscillating said pivoted frame; means for locking said pivoted frame at various degrees of inclination; a frame slidably supported by said pivoted frame; and a bottle-holder supported by said slidable frame.

4. In a bottle-washing machine, in combination, a supporting-frame; a frame pivotally supported at points about midway of its ends, upon said supporting-frame; means for lock-



ing said pivoted frame at various predetermined degrees of inclination; a frame slidably supported by said pivoted frame; and a bottle-holder supported by said slidable frame.

5 5. In a bottle-washing machine, in combination, a supporting-frame; a frame pivotally supported at points about midway of its ends, upon said supporting-frame; means for locking said pivoted frame at various predetermined degrees of inclination; a bottle-holder  
10 arranged to oscillate with said pivoted frame; means for rotating said bottle-holder; and means for reciprocating said holder.

15 6. In a bottle-washing machine, in combination, a supporting-frame; a frame pivotally supported at points about midway of its ends, upon said supporting-frame; a bottle-holder arranged to oscillate with said pivoted frame; means for rotating said bottle-holder about  
20 an axis parallel with the longitudinal axis of the bottles; and means for reciprocating said holder.

25 7. In a bottle-washing machine, in combination, a supporting-frame; a frame pivotally supported at points about midway of its ends, upon said supporting-frame; a frame slidably supported by said pivoted frame; a bottle-holder supported by said slidable frame; and means for rotating said bottle-holder about  
30 an axis parallel with the longitudinal axis of the bottles.

35 8. In a bottle-washing machine, in combination, a supporting-frame; a frame pivotally supported at points about midway of its ends, upon said supporting-frame; a crank-arm for oscillating said pivoted frame; means for locking said pivoted frame at various predetermined degrees of inclination; a frame slidably supported by said pivoted frame; a bottle-  
40 holder supported by said slidable frame; and means for rotating said bottle-holder about

an axis parallel with the longitudinal axis of the bottles.

9. In a bottle-washing machine, in combination, a supporting-frame; bearings in said 45 frame; a frame pivotally supported upon trunnions lying within said bearings, one of said trunnions being hollow and in communication with a water-supply; a frame slidably supported by said pivoted frame; a bottle-holder 50 rotatably supported by said slidable frame, said holder comprising means for introducing a fluid into the bottle being held; and means of communication between said hollow trunnion and said bottle-holder. 55

10. In a bottle-washing machine, in combination, a bottle-holder comprising a rotatable shaft having an axial opening in one of its ends, rigid tubular arms extending radially from said shaft and communicating with the 60 axial opening therein, shot-cups carried by said arms and adapted to support one end of the bottles; and means for supporting the opposite ends of the bottles; means for reciprocating said bottle-holder; and means for tilt- 65 ing said holder.

11. In a bottle-washing machine, in combination, a frame; a bottle-supporting shaft rotatably mounted in said frame; a second shaft rotatably supported in said frame and having 70 a driving connection with said bottle-supporting shaft, said second-mentioned shaft also having a ratchet-wheel fixed thereon; means for reciprocating said frame, comprising a crank-arm and a rod connecting said frame and said 75 crank-arm; and a pawl pivotally mounted upon said rod and adapted to engage said ratchet-wheel for rotating the same.

EDWARD A. LUFKIN.

Witnesses:

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