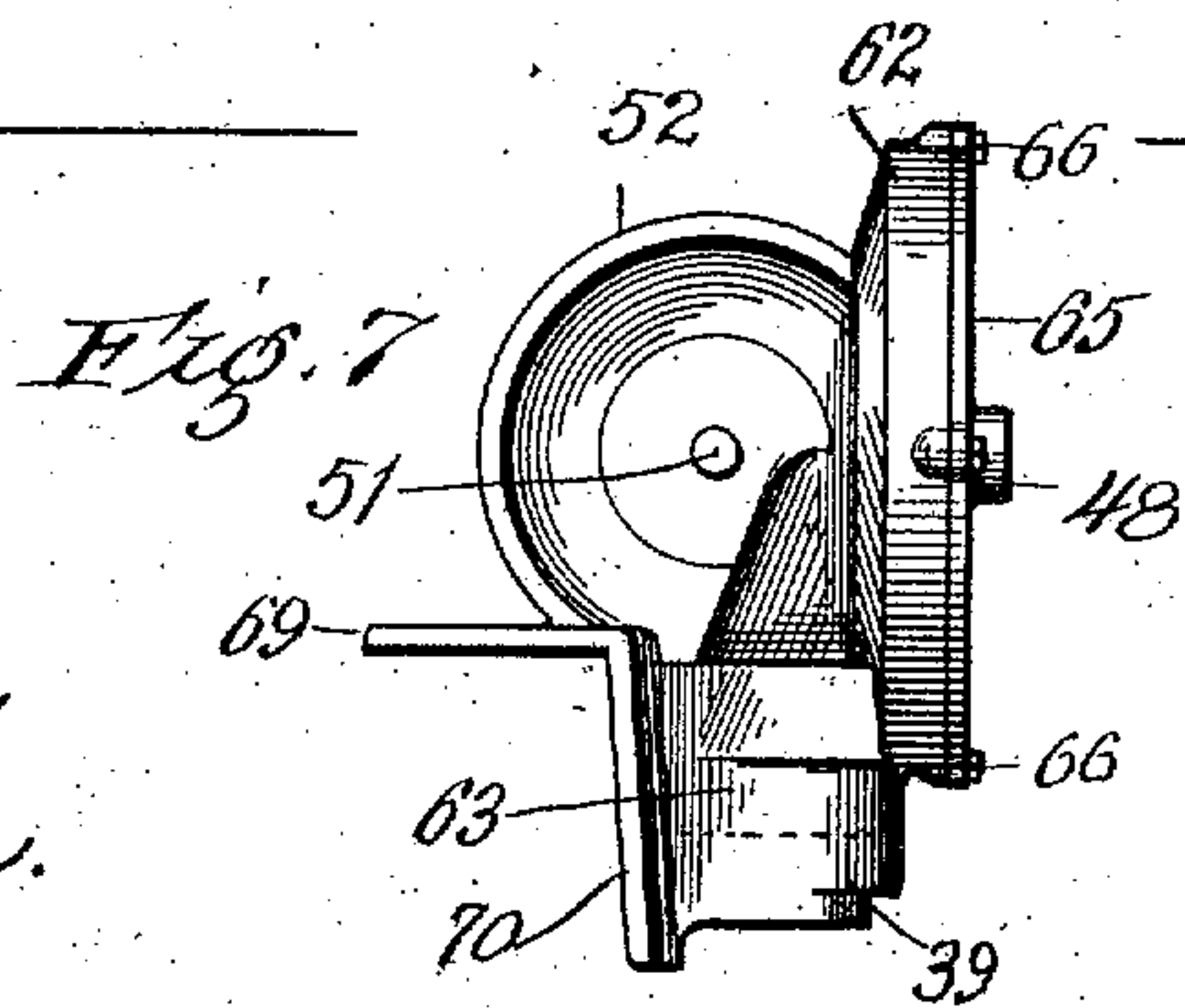
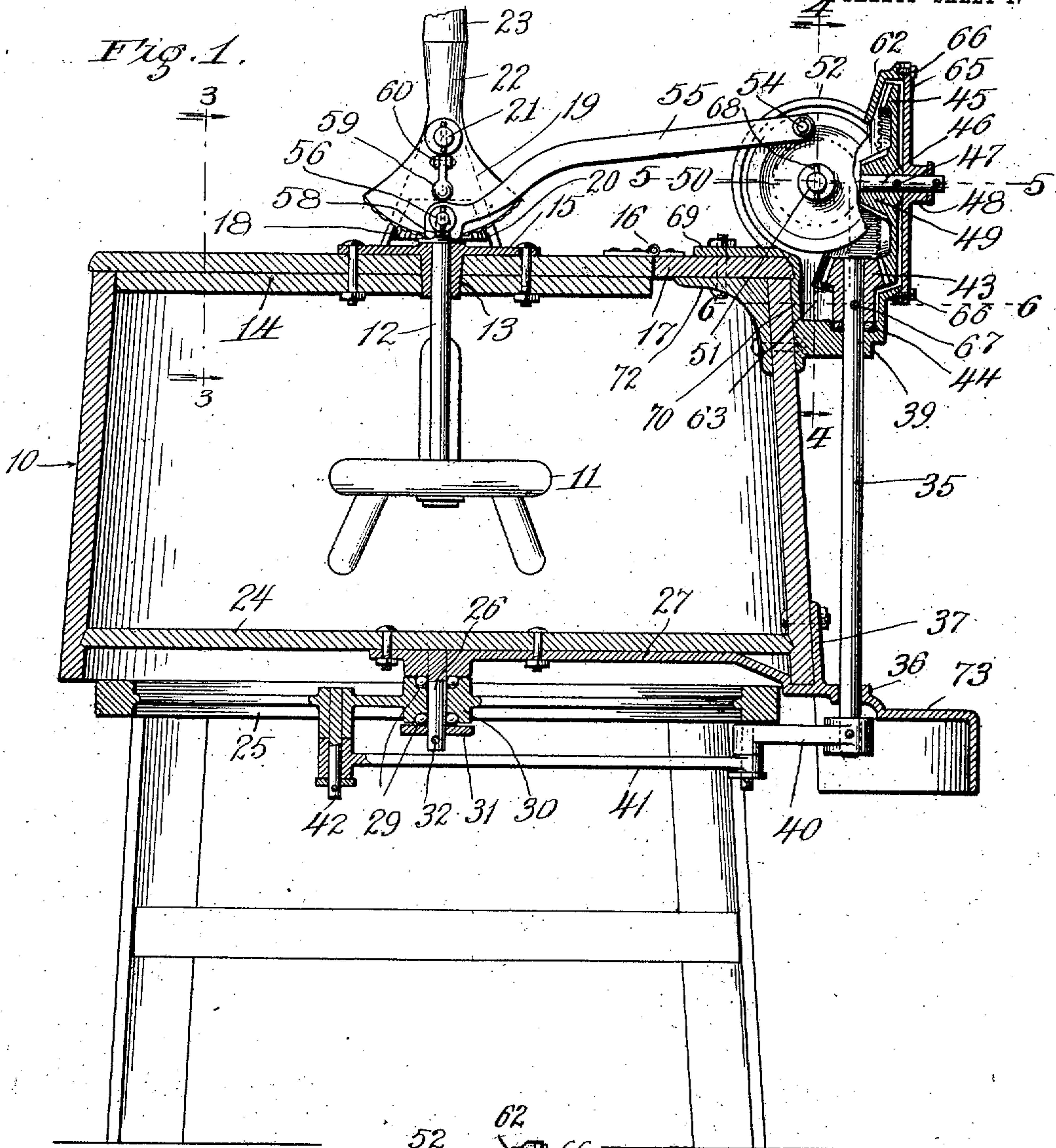


G. N. MEVES.
OPERATING MECHANISM FOR WASHING MACHINES.
APPLICATION FILED AUG. 13, 1909.

961,877.

Patented June 21, 1910.

3 SHEETS—SHEET 1.



Witnesses:
W. Goldberger.
H. B. Petersen

Inventor:
Gustav N. Meves,
by William L. Hall.

his Atty.

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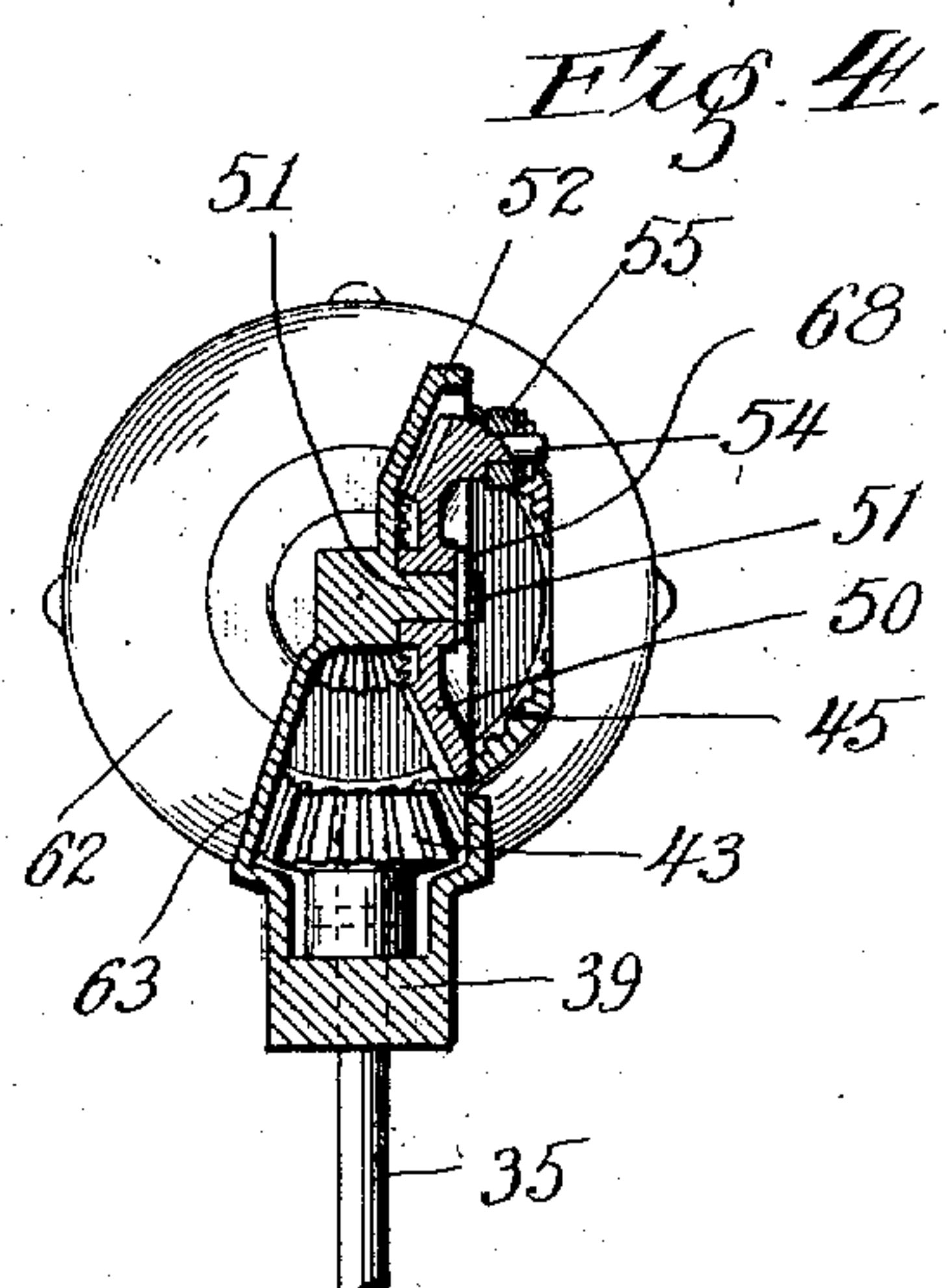
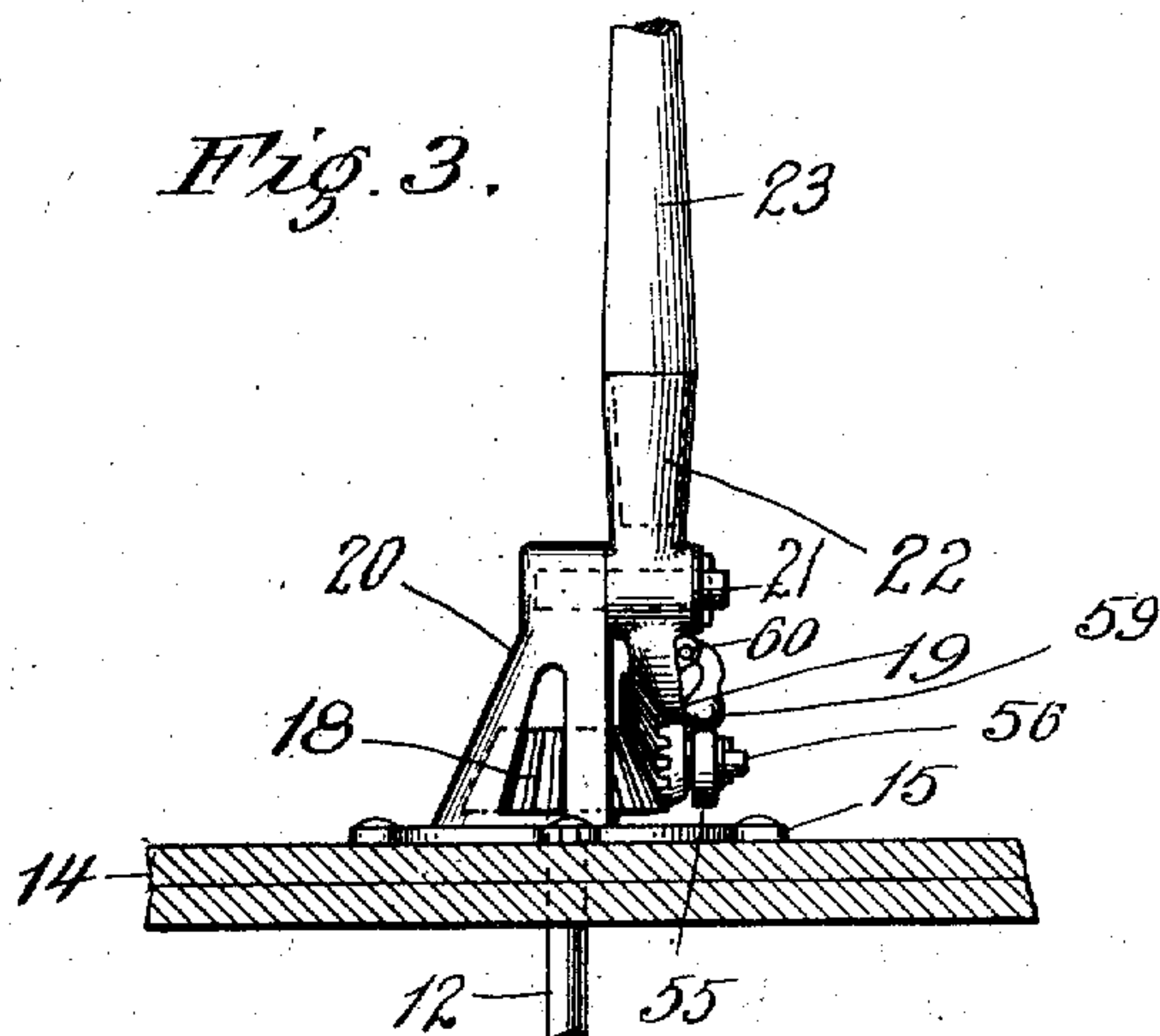
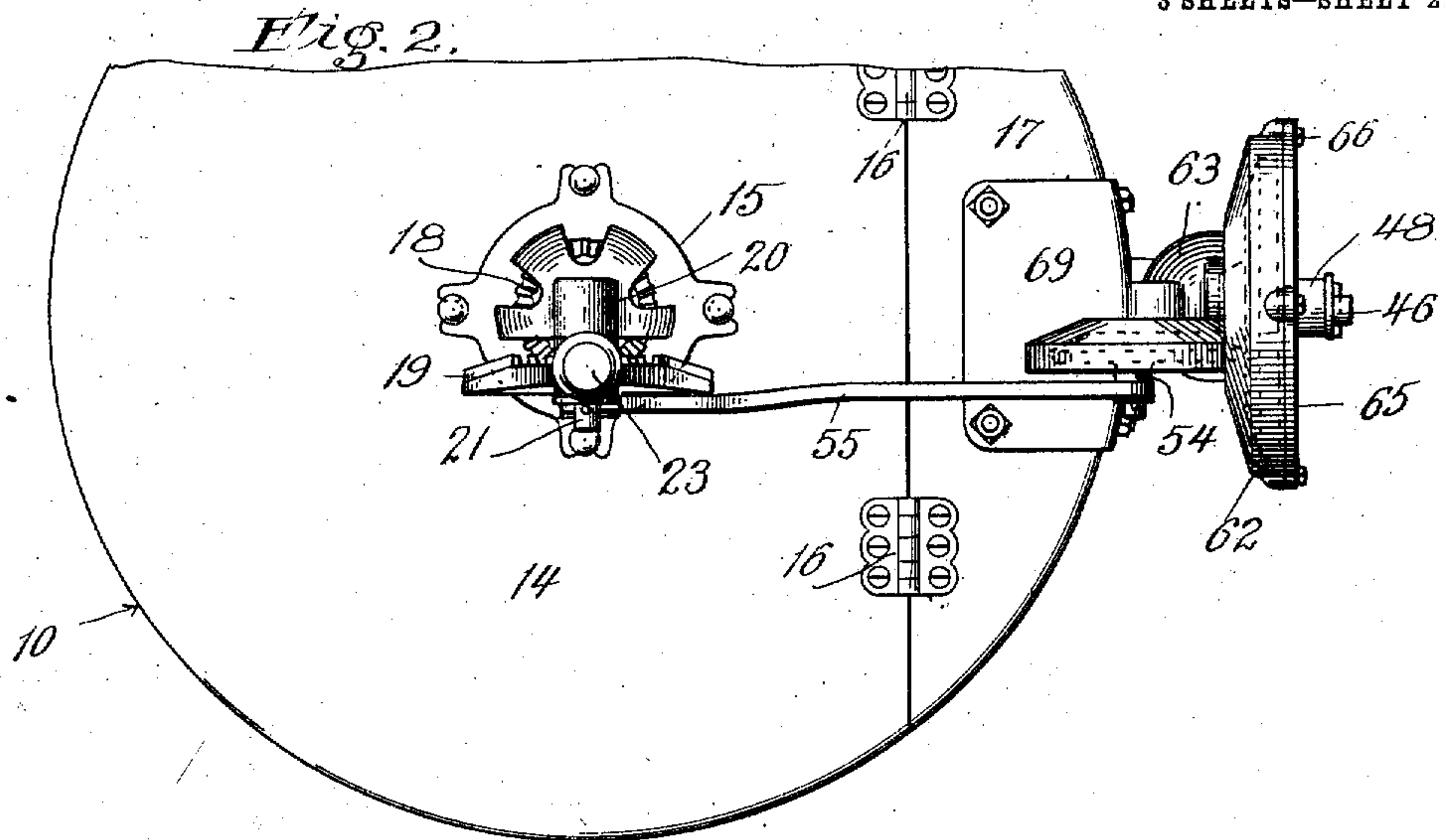
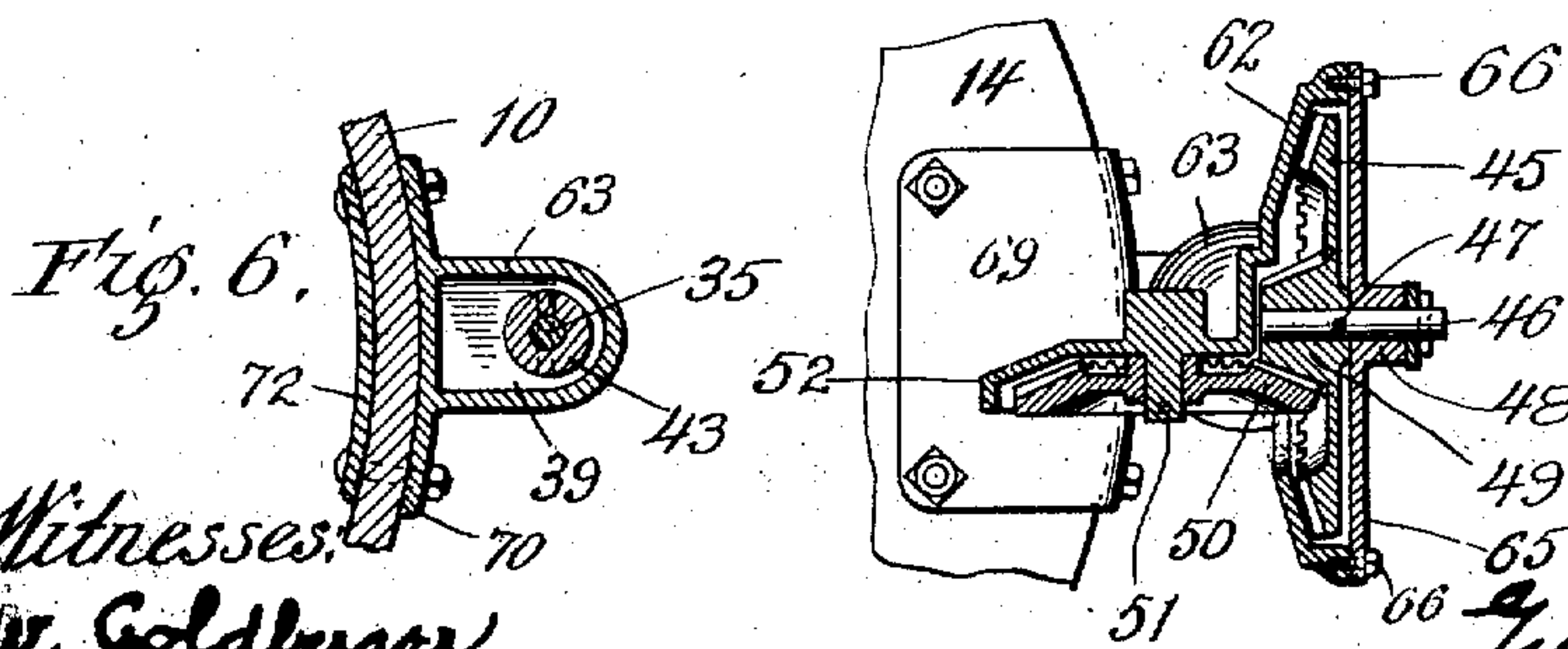


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 8.

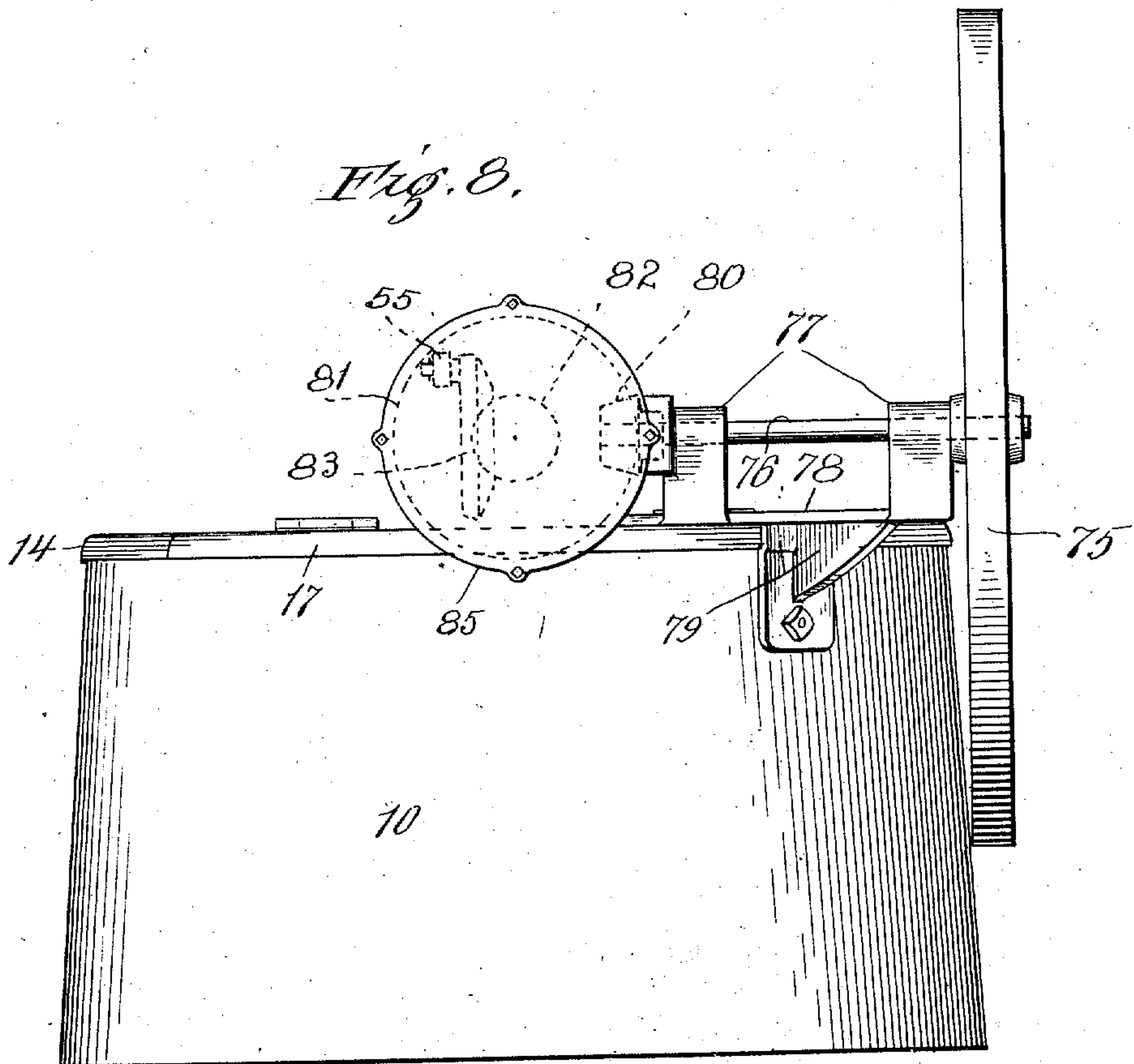
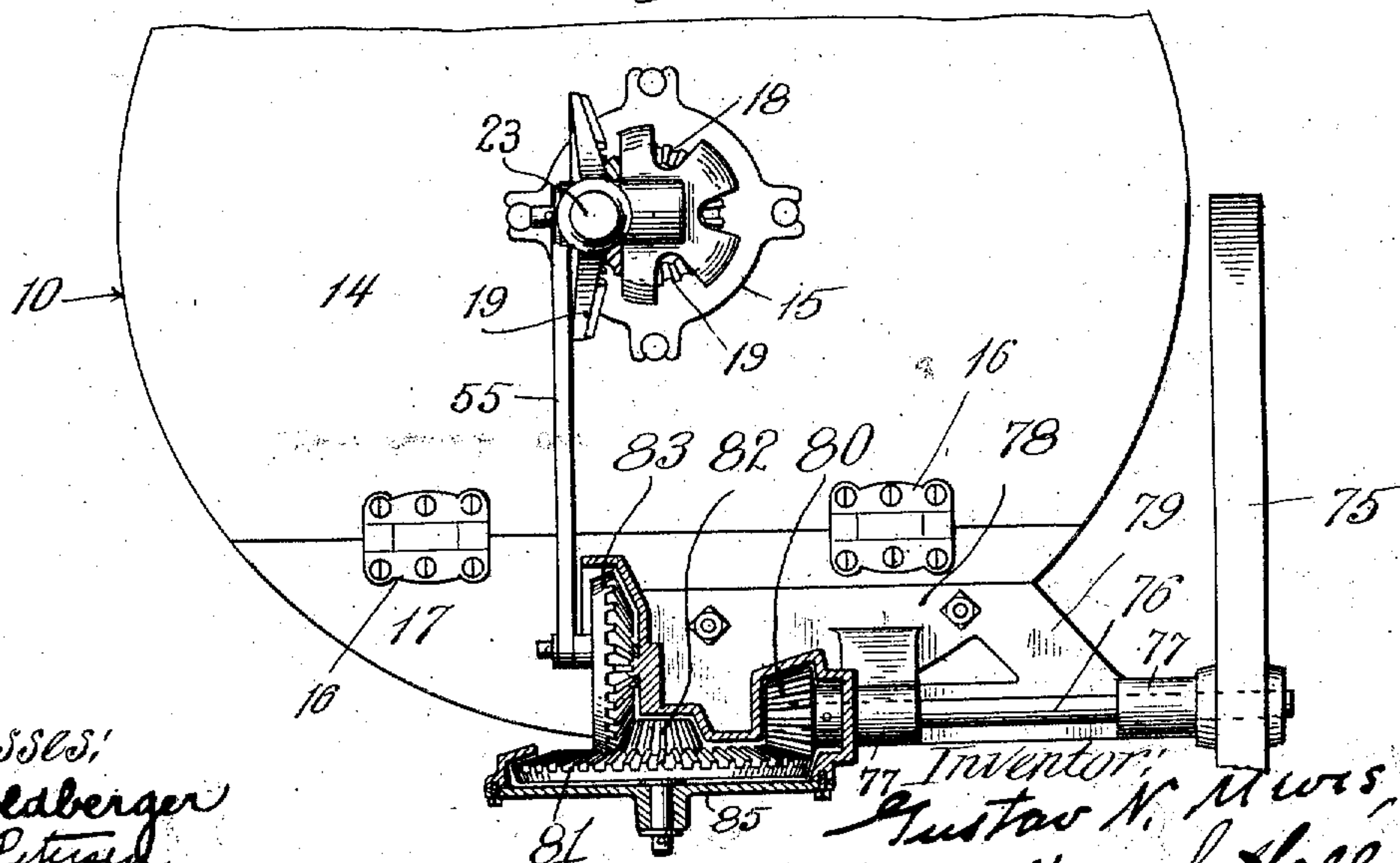


Fig. 9.



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UNITED STATES PATENT OFFICE.

GUSTAV N. MEVES, OF DAVENPORT, IOWA.

OPERATING MECHANISM FOR WASHING-MACHINES.

961,877.

Specification of Letters Patent. Patented June 21, 1910.

Application filed August 13, 1909. Serial No. 512,630.

To all whom it may concern:

Be it known that I, GUSTAV N. MEVES, a citizen of the United States, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Operating Mechanism for Washing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to improvements in operating mechanism for washing machines of that type in which the stirrer head or dolly is given a rotary reciprocatory motion within the tub to turn the clothes first in one direction and then in the other through the wash water in the tub.

The invention relates more specifically to improvements in machines of that type wherein a balance wheel or other power storing device is operatively connected with the actuating device for the stirrer head shaft in such manner as to reduce the power required to operate the machine, after the operating mechanism has been set in motion and to render the reversal of the operating means by which rotary reciprocatory motion is imparted to the stirrer head shaft smooth and free from shocks due to such reversal.

I have herein shown my improvement as applied to a machine having a rocking member through which rotary reciprocatory motion is imparted to the stirrer head shaft, the rocking member being operatively connected with a gear on the outer or upper end of said shaft and provided with a lever by which it is rocked. This type of machine is known as the lever type. My improvements however may be applied to machines having other forms of actuated devices.

In the drawings, Figure 1 is a central vertical sectional view of a washing machine equipped with an operating mechanism embodying my invention. Fig. 2 is a partial plan view thereof. Fig. 3 is a vertical section on line 3—3 of Fig. 1. Fig. 4 is a vertical section on line 4—4 of Fig. 1. Fig. 5 is a horizontal section on line 5—5 of Fig. 1. Fig. 6 is a detail horizontal section on line 6—6 of Fig. 1. Fig. 7 is a side elevation of the gear casing or housing which incloses a portion of the intermediary gears between the balance wheel and the hand actuated de-

vice of the machine. Fig. 8 is a partial side elevation of a washing machine, showing a modified arrangement of the operating mechanism. Fig. 9 is a partial plan view of the parts shown in Fig. 8.

As shown in Figs. 1 to 7 of said drawings, the tub 10, the stirrer head 11 and the stirrer head shaft 12 are of the usual construction for this type of machine. Said stirrer head shaft extends upwardly through and has bearing in a sleeve 13 that extends through an opening in the swinging lid or cover 14 of the machine and is made integral with a plate 15 fixed to the upper side of the swinging lid or cover. The swinging portion 14 of the top wall is hinged at 16 to the fixed or non-rising portion 17 thereof. The stirrer head shaft is provided at its upper end above the lid with a beveled pinion 18 which meshes with the gear sector of a rocking member 19 that is pivoted to an upright standard or bracket 20 that rises from or is made integral with the plate 15. Said standard is provided with a horizontal pivot pin 21 which extends through a bearing aperture in the rocking member 19 by which the rocking member is pivoted to said standard. Said gear sector or rocking member is provided with a socket piece 22 in which fits a hand lever 23 by which the rocking member is swung or rocked about its axis to impart rotary reciprocatory motion to the stirrer head shaft.

Located beneath the bottom 24 of the tub is a horizontal balance wheel 25 which is rotatively mounted on a pin or stud 26 made integral with and depending from a frame plate 27 that is fixed to the lower face of the bottom of the tub. Ball bearings 29 are interposed between the recessed ends of the balance wheel hub 30 and said frame plate and a washer 31, respectively, the latter surrounding the bearing stud 26 below the hub and fixed to the stud by means of a pin 32 extending transversely through the stud beneath the washer. The said washer and stud supports the balance wheel and the antifriction balls reduce the friction between the balance wheel and its bearing support. The said balance wheel is operatively connected with the rocking member 19 in such manner that the balance wheel has imparted thereto a continuous rotary motion in one direction, through the swinging or rocking movement of said segmental rocking member, whereby power is stored in the balance wheel to as-

sist the actuation of said rocking member after the mechanism is in operation and to minimize the shocks brought on the rocking member and pinion 18 at the points of reversal of the parts. The connection between the rocking actuating member and the balance wheel is made as follows. 35 designates a vertical rotary shaft located at one side of the tub. It has rotative bearing at its lower end in a bearing member or bracket 36 that is shown as made integral with the frame plate 27, the latter extending beyond the side of the tub to form said bearing. Said plate is provided with a vertical attaching member 37 that is bolted to the side wall of the tub. At its upper end the shaft is rotatively mounted in a bearing bracket 39 located at one side of and near the top of the tub. The lower end of the shaft is provided with a crank arm 40 which is connected, through the medium of a pitman 41, with an eccentric pin 42 depending from the balance wheel at one side of its hub.

Fixed to the upper end of the shaft 35, above the bearing bracket 39, is a beveled pinion 43. Interposed between the lower end of the hub of said pinion and a raceway in the upper side of the bracket 39 is a set of anti-friction balls 44 by which the weight of the shaft and its pinion are supported. The said pinion meshes with a vertically arranged beveled gear wheel 45 that is fixed to a stud 46, as by means of the pin 47, and said stud is rotatively mounted in a fixed bearing 48. The said beveled gear wheel 45 is provided on its inner side, or the side thereof facing the operating lever, with a concentric, integral, beveled pinion 49 that meshes with a beveled gear wheel 50 which is rotatively mounted on a stud 51 made integral, as herein shown with a casing or housing 52 which partially incloses said gear wheel 50. The said gear wheel 50 is provided at one side with an eccentric pin 54 that is connected by a pitman 55 with a stud 56 carried by the rocking member 19 and located eccentrically with respect to the axis of oscillation of said rocking member; said stud being herein shown as located below said axis or the bearing pin 21.

As herein shown the pitman 55 is detachably connected with said stud 56 so as to permit the pitman to be disconnected from the rocking member when the lid of the tub is to be opened. This detachable connection may be effected by providing the inner end of the pitman with a downwardly opening notch 58 which is fitted downwardly over the stud 56, and the pitman is detachably locked to said stud by means of a gravity locking detent 59 which is hinged to the rocking member at 60, above said stud, to swing toward and away from said rocking member and toward and away from the notched end of the pitman. The lower or

headed end of said locking detent normally rests on the upper edge of the inner notched end of the pitman 55 and in this position holds the pitman pivotally connected with its stud 56. When the detent is swung outwardly the inner end of the pitman is free to be raised away from the stud for disengagement therewith, whereby the pitman may be swung backwardly out of the way of the hinged lid when it is desired to swing the latter upwardly to open the tub.

The bearing bracket 39, the bearing 48 for the stud 46 and the bearing stud 51 may be made integral parts of a single casting formed to constitute a housing for the pinions 43 and 49 and the gear wheels 46 and 50, said housing embracing the portion 52 before referred to, which partially incloses the gear wheel 50, a portion 62 which incloses the gear wheel 45 and a portion 63 which incloses the pinion 43. For convenience of assembling the gears in said housing, I may form the portion 62 thereof with a detachable plate 65 that is fixed to the housing casting by bolts 66. On this removable plate is integrally formed the bearing 48 for the shaft 46 on which the gear wheel 45 is mounted.

When the housing is formed as thus described the plate 65 is removed before the gears are assembled, and in assembling the gears the pinion 43 is first dropped over the upper end of the shaft 35 and fixed thereto, as by means of the pin 67. Thereafter the gear wheel 50 is applied over its bearing stud 51 and fastened thereon by means of the pin 68 which extends transversely through the stud outside of the gear wheel, and finally the plate 65, with the stub shaft 46 mounted therein, and the gear fixed to said shaft is fitted in place, with the pinion 49 meshing with the gear wheel 50 and the gear wheel 45 meshing with the pinion 43. Thereafter the bolts 66 are applied to fasten the plate in place. The housing with the bearings arranged therein as described is attached to the tub by means of integral horizontal and vertical attaching members 69, 70 which are fitted over and bolted to the fixed portion of the top wall and the side wall of the tub, respectively. In order to strengthen the connection of said housing with the tub the attaching bolts extend through an angle brace 72 arranged inside of the tub at the angle between the top and side walls of the tub. The said housing carrying the various bearings for the gearing described may be made an integral casting, if desired, and may be arranged to inclose both sides of the gear 50, leaving therein a slot for the play of the connecting pitman 55.

In the operation of the machine the hand lever 23, or other manually operable part, is grasped by the operator and swung from

side to side, and operates the gear sector or operating member 19 and the pinion 18 on the stirrer head shaft to impart a rotary reciprocatory motion to the stirrer head or dolly. The connection of said rocking member, through the medium of the pitman 55, with the gear 50 operates to rotate said gear continuously in one direction, and this unidirectional movement is imparted to the vertical shaft 35 through the pinion 49, the gear wheel 45 and the pinion 43, and to the balance wheel through the crank 40, the pitman 41 and eccentric pin 42 of the balance wheel. Said balance wheel is thus rotated in one direction and at a high speed as determined by the ratios of the intermediary gearing. The design of the gearing shown imparts a high speed to the balance wheel with a comparatively slow oscillation of the rocking member and by the use of an exceedingly compact arrangement of the gearing. An advantage of the arrangement shown is that the swinging lid carries the weight of none of the gearing or of the balance wheel, thereby enabling the lid to be readily lifted. A guard 73 is arranged at the lower side of the tub to inclose the crank arm 40 of the shaft 35 and to prevent the crank arm from striking a person or objects near the machine. This guard is herein shown as formed integral with the bearing bracket 36 for the lower end of the shaft 35.

In Figs. 8 and 9 I have shown a modified arrangement of the balance wheel 75 and the operative connections between it and the speed increasing gears. In this construction the balance wheel is arranged in a vertical plane at one side of the tub near the top of the latter and is fixed to the outer end of a horizontally rotative shaft 76. Said shaft is rotatively mounted in bearing lugs or brackets 77, 77 made integral with and rising from a frame plate 78 that is bolted to the fixed portion 17 of the top wall of the tub. Said frame plate is provided with a brace 79 that extends downwardly therefrom and is bolted to the side of the tub. To the inner end of said rotative shaft 76 is fixed a beveled pinion 80 that meshes with a beveled gear wheel 81 which, in turn, carries a concentric pinion 82 that meshes with a second beveled gear wheel 83 that may be connected by the pitman 55 with the rocking member or geared sector 19 in the same manner as before described. The train of gears 83, 82 and 81 operate in the same manner as do the gears 50, 49 and 45 to rotate the pinion 80 and the horizontal shaft 76 and balance wheel fixed thereto, said gear train increasing or multiplying the speed of the balance wheel for the purpose before set forth. The said train of gears of the construction shown in Figs. 8 and 9 may be incased and have bearing in a suitable hous-

ing 85 generally similar to the housing shown in Figs. 1 to 7 inclusive.

While I have described with considerable particularity the structural details of the mechanism shown, it is to be understood that many of the details may be considerably varied within the scope of the invention, and the invention is not limited to such details except as hereinafter made the subject of specific claims.

While the operating mechanism herein shown has been described in connection with a washing machine, it will be obvious that it may be equally well applied to other machines having the same general mode of operation, or wherein there is provided a member which is designed to be driven in a rotary reciprocatory manner.

I claim as my invention:

1. Operating mechanism for washing and like machines comprising, in combination with a vertical shaft capable of rotary reciprocatory motion, actuating means for imparting rotary reciprocatory motion to said shaft, a balance wheel arranged below said shaft and speed increasing gear mechanism operatively connected between said actuating means and said balance wheel embracing a vertical rotative shaft operatively connected at its upper and lower ends with said actuating means and balance wheel respectively.

2. Operating mechanism for washing machines comprising, in combination with a shaft capable of rotary reciprocatory motion, actuating means for imparting rotary reciprocatory motion to said shaft, a balance wheel arranged in a plane transverse to the axis of said shaft, and operative connections between said actuating means and the balance wheel embracing a rotative shaft arranged in a plane transverse to that of the balance wheel, speed increasing gear mechanism interposed between one end of said shaft and said actuating means and operative connection between the other end of said shaft and the balance wheel.

3. Operating mechanism for washing machines comprising, in combination with a shaft capable of rotary reciprocatory motion, actuating means for imparting rotary reciprocatory motion to said shaft, a balance wheel arranged in a plane transverse to the axis of said shaft, and operative connections between said actuating means and the balance wheel embracing a rotative shaft arranged in a plane transverse to that of the balance wheel, speed increasing gear mechanism interposed between one end of said shaft and said actuating means, a crank at the other end of the shaft, and a pitman connecting said crank with an eccentric stud on the balance wheel.

4. Operating mechanism for washing machines comprising, in combination with a

shaft capable of rotary reciprocatory motion, actuating means for imparting rotary reciprocatory motion to said shaft, a balance wheel arranged in a plane transverse to the axis of said shaft, and operative connections between said actuating means and the balance wheel embracing a rotative shaft arranged in a plane transverse to that of the balance wheel, speed increasing gear mechanism interposed between one end of said shaft and said actuating means, operative connections between the other end of said shaft and the balance wheel and a housing for said speed increasing gears provided with bearings for the gears.

5. Operating mechanism for washing machines comprising, in combination with a shaft capable of rotary reciprocatory motion, a rocking actuating member for said shaft, a balance wheel, a rotative shaft connected at one end to said balance wheel, a train of speed increasing gears connected between the other end of said latter shaft and said rocking member and a link pivoted to said rocking member and to an eccentric stud on the first gear of said train.

6. Operating mechanism for washing machines comprising, in combination with a shaft capable of rotary reciprocatory motion, an actuating device for said shaft, a balance wheel, a rotative shaft provided at one end with a crank which is operatively connected with the balance wheel, a train of speed increasing gears between the other end of said latter shaft and said actuating means, and a link pivoted to said actuating device and to an eccentric stud on the first gear of said train.

7. Operating mechanism for washing and like machines comprising, in combination with a shaft capable of rotary reciprocatory motion, a swinging lever provided with a gear sector, a gear on said shaft meshing with said sector, a rotative shaft, a balance wheel connected to one end of said rotative shaft, a pinion at the other end of said latter shaft, a train of speed increasing gears, the gear at one side of which meshes with said pinion, a link connecting another gear on the other side of said train with said gear sector and means whereby said link is detachably and pivotally connected to said sector.

8. Operating mechanism for washing and like machines comprising, in combination with a vertical shaft capable of rotary reciprocatory motion, a swinging lever provided with a gear sector, a gear on said shaft meshing with said sector, a horizontal balance wheel, a vertical, rotative shaft provided at its lower end with a crank, a pitman connecting said crank with said balance wheel, a pinion on the upper end of said crank shaft, a train of speed increasing gears, the gear at one side of which

meshes with said pinion, the gear at the other side of said train being provided with an eccentric stud, and a link pivotally connected with said stud and with an eccentric stud on the gear sector.

9. Operating mechanism for washing and like machines comprising, in combination with a vertical shaft capable of rotary reciprocatory motion, a rocking member for imparting rotary reciprocatory motion to said shaft, a horizontal balance wheel and operative connections between said rocking member and balance wheel, embracing a vertical, rotative shaft connected at its lower end with the balance wheel, a speed increasing gear mechanism connecting said rotative shaft to the rocking member, said latter mechanism embracing a pitman and a stud on the rocking member, said pitman being pivotally and detachably connected with said stud.

10. Operating mechanism for washing and like machines comprising, in combination with a vertical shaft capable of rotary reciprocatory motion, a rocking member for imparting rotary reciprocatory motion to said shaft, a balance wheel and operative connection between said rocking member and balance wheel, embracing a rotative shaft connected at one end with the balance wheel, a speed increasing gear mechanism connecting the other end of said shaft to said rocking member, said latter mechanism embracing a pitman and a stud on the rocking member, said pitman being provided with a notched portion which fits over said stud and a locking detent carried by the rocking member for detachably holding the pitman engaged with said stud.

11. Operating mechanism for washing and like machines comprising, in combination with a vertical shaft capable of rotary reciprocatory motion, actuating means for said shaft, a horizontal balance wheel arranged below the shaft, a vertical rotative shaft provided at its lower end with a crank connected with said balance wheel, a fixed bearing for the lower end of said rotative shaft, speed increasing gear mechanism connecting the upper end of said shaft with said actuating means and a guard integral with the bearing for the lower end of the rotative shaft inclosing said crank.

12. Operating mechanism for washing and like machines comprising, in combination with a shaft capable of rotary reciprocatory motion, a rocking member operatively connected with and adapted to impart rotary reciprocatory motion to said shaft, a balance wheel, a rotative shaft connected at one end with said balance wheel, a pinion fixed to the other end of said latter shaft, a gear wheel meshing with said pinion and provided with a concentric pinion, a second gear wheel meshing with the last men-

tioned pinion and a link connecting the last mentioned gear wheel with said rocking member.

13. Operating mechanism for washing
5 and like machines comprising, in combination with a vertical shaft capable of rotary reciprocatory motion, a rocking member geared to said shaft for imparting rotary reciprocatory motion to the shaft, a horizontal balance wheel below said shaft, a vertical rotative shaft provided at its lower end with a crank connected with said balance wheel, a pinion at the upper end of the latter shaft, a gear wheel meshing therewith
10 and provided with a concentric pinion, a second gear wheel meshing with the last mentioned pinion and a link connecting the last mentioned gear wheel with said rocking member.

14. Operating mechanism for washing
20 and like machines comprising, in combination with a shaft capable of rotary reciprocatory motion, a rocking member geared to said shaft for imparting rotary reciprocatory motion to the shaft, a balance wheel, a rotative shaft connected at one end with said balance wheel, a pinion fixed to the other end of said latter shaft, a gear wheel meshing with said pinion and provided with a concentric pinion, a second gear wheel meshing with the last mentioned pinion, a link connecting the last mentioned gear wheel with said rocking member and a housing enclosing, and provided with bearings for, said
30 gear wheels and pinions.

15. Operating mechanism for washing
40 machines comprising, in combination, a vertical shaft capable of rotary reciprocatory motion, actuating means for imparting rotary reciprocatory motion to said shaft, a balance wheel below said shaft and operative

connections between said actuating means and balance wheel embracing an upright rotative shaft, speed increasing gear mechanism connected between one end of said rotative shaft and said actuating means and operative connections between the other end of the shaft and balance wheel. 45

16. Operating mechanism for washing machines comprising, in combination, a vertical shaft capable of rotary reciprocatory motion, actuating means for imparting rotary reciprocatory motion to said shaft, a balance wheel below said shaft, and speed increasing gear mechanism operatively connected between said actuating means and balance wheel, embracing a vertical shaft which is driven continuously in one direction by said actuating means and arranged to impart a continuous high speed motion to the balance wheel. 50 55 60

17. Operating mechanism for washing machines comprising, in combination, a vertical shaft provided at its upper end with a pinion, a rocking member having a segmental gear meshing with said pinion, a balance wheel arranged below said shaft and a speed increasing gear mechanism connected between said rocking member and said balance wheel, embracing a vertical shaft which is driven from the rocking member continuously in one direction and operates to drive the balance wheel at high speed in one direction. 65 70

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 3rd day of August A. D. 1909. 75

GUSTAV N. MEVES.

Witnesses:

Hugo C. Vogt,
W. T. Dowd.