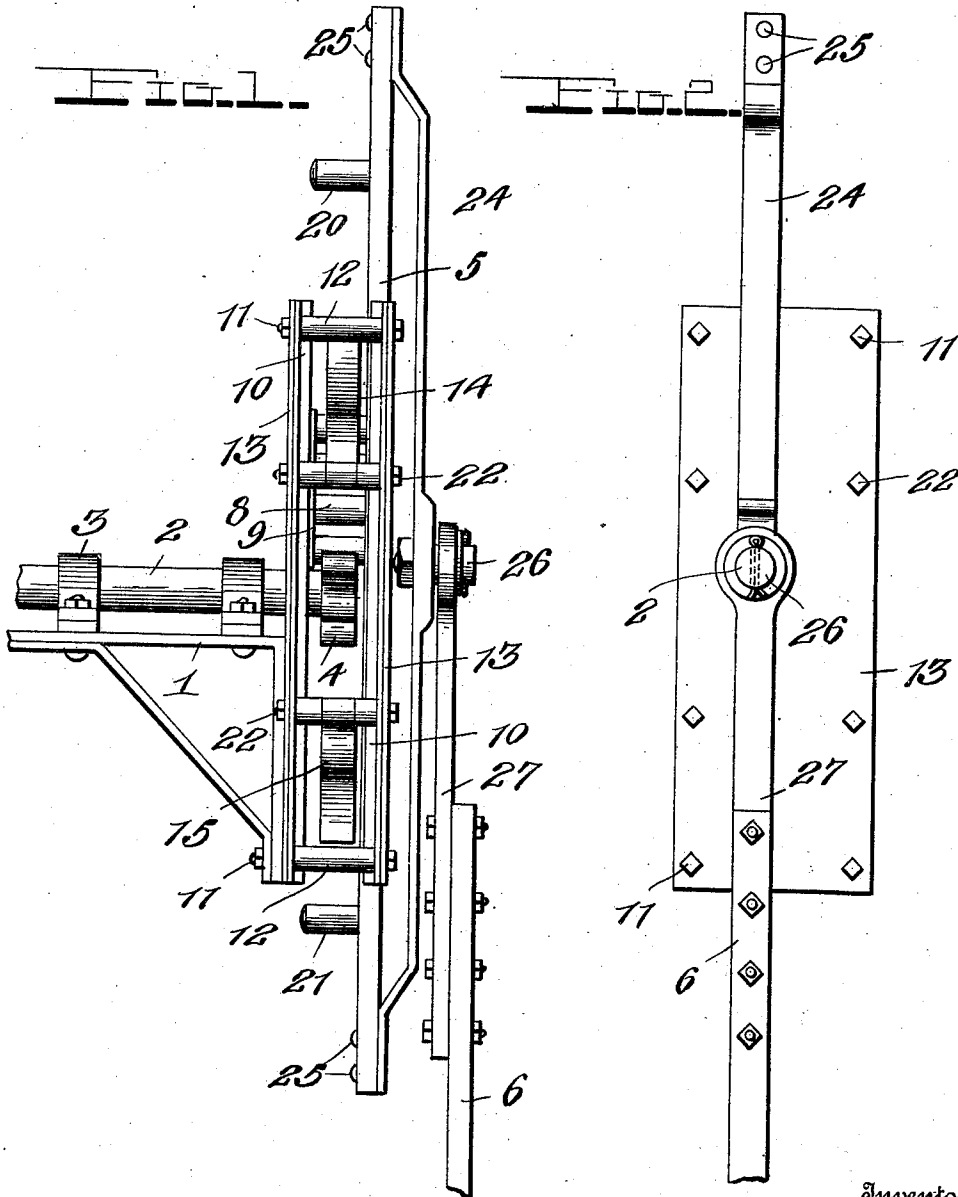


S. M. GARD.
PUMP OPERATING DEVICE.
APPLICATION FILED MAY 12, 1910.

986,561.

Patented Mar. 14, 1911.

2 SHEETS—SHEET 1.



Witnesses

Chas. L. Griesbauer.
E. M. Ricketts

Inventor
S. M. Gard,

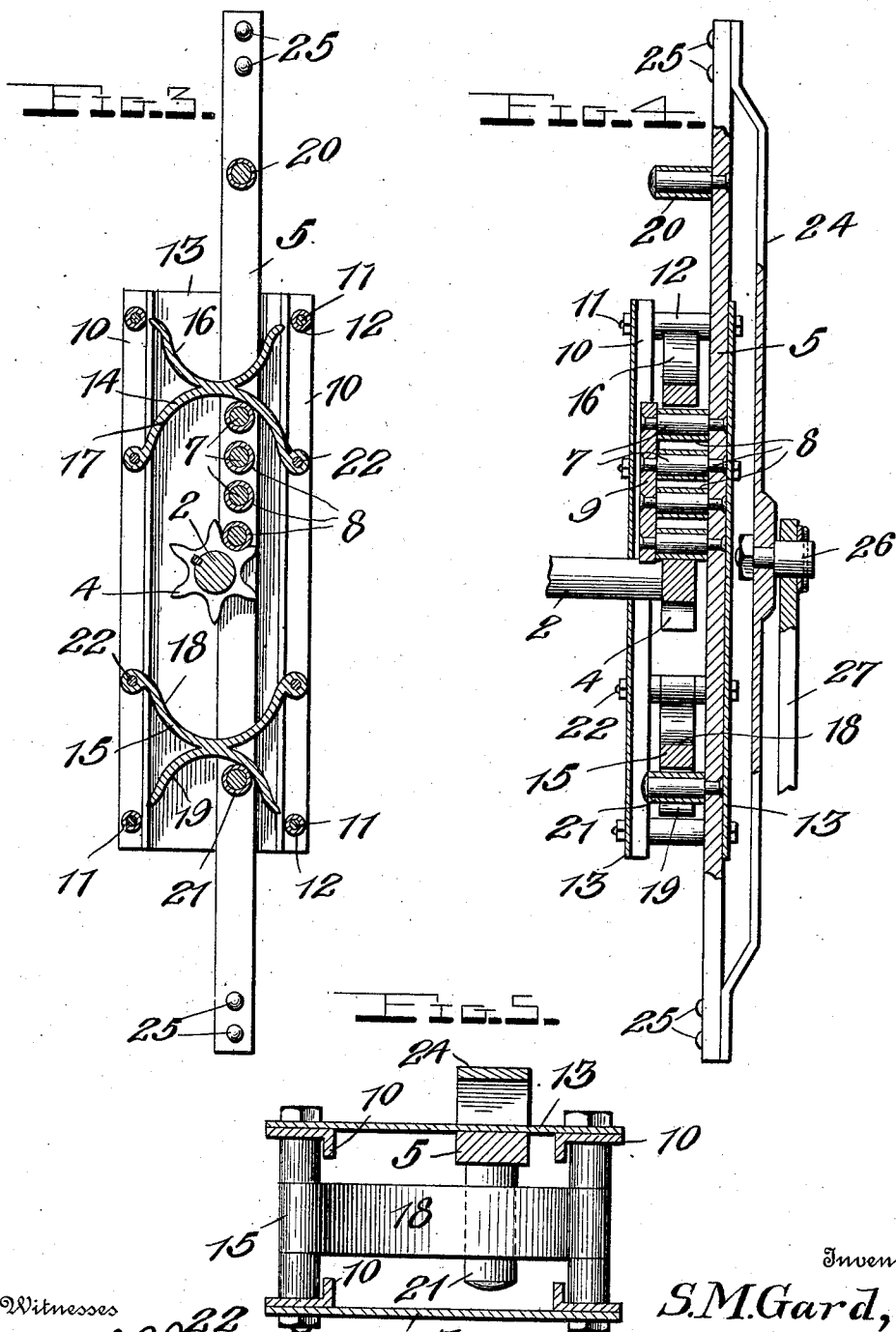
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UNITED STATES PATENT OFFICE.

SAMUEL M. GARD, OF MOUNT PULASKI, ILLINOIS.

PUMP-OPERATING DEVICE.

986,561.

Specification of Letters Patent.

Patented Mar. 14, 1911.

Application filed May 12, 1910. Serial No. 560,923.

To all whom it may concern:

Be it known that I, SAMUEL M. GARD, a citizen of the United States, residing at Mount Pulaski, in the county of Logan and State of Illinois, have invented certain new and useful Improvements in Pump-Operating Devices, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in devices for operating pump rods and which may be used in connection with wind mills, gas engines or other motors.

The object of the invention is to provide a simple and practical operating device or gear in which rotary movement may be converted into reciprocatory movement without friction, noise or jar.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a pump operating device or gear embodying my invention; Fig. 2 is a front elevation; Figs. 3 and 4 are vertical sectional views taken in planes at right angles to each other; and Fig. 5 is a detail horizontal section.

Referring more particularly to the drawings 1 denotes a suitable support which may be a bracket attached to a portion of an engine or which may be a portion of a wind mill structure; and 2 denotes a rotary shaft which may, if desired, be mounted in suitable bearings 3 on the bracket or support 1. On the shaft 2 is keyed or otherwise fixed a toothed wheel 4 which is adapted to reciprocate a rack member 5 connected to a pump rod 6 or any other device which is to be reciprocated. This rack member 5 is preferably in the form of a bar mounted for movement within a casing carried by the support or bracket 1 and carrying a row of rack pins 7 on which are preferably arranged anti-friction rollers 8 for engagement with the toothed wheel or pinion 4. The pins 7 are riveted at one end in the intermediate portion of the bar or member 5 and their opposite ends are similarly secured in a connecting plate or bar 9 which is thus supported and spaced from the bar 5.

The casing within which the bar or member 5 reciprocates is preferably composed of four angle metal corner bars 10 united by

transverse bolts or similar fastenings 11 on which latter are arranged spacing sleeves 12 to hold the bars 10 in spaced relation. Sheet metal side plates 13 extend across and unite the opposite corner bars 10 and are clamped to the latter by the heads and nuts of the bolts 11 whereby an open rectangular frame is provided, as will be understood on reference to Fig. 5.

For the purpose of guiding the reciprocatory member or bar 5 curved guides 14, 15 are arranged in the upper and lower portions of the casing to co-act with guide pins or members on the bar 5. These guides are preferably made double, the upper one 14 having upper and lower curved guide surfaces 16, 17 and the lower one 15 having similar upper and lower curved guide surfaces 18, 19. The surfaces 17, 18 are arranged for engagement by the upper and lower anti-friction rollers 8 on the rack section, while the other guide surfaces 16, 19 are arranged to be engaged by anti-friction rollers 20, 21, respectively, which rollers are carried by pins or rivets secured in the upper and lower portions of the bar 5.

By making the guides double and having them co-act with the endmost rack pins or rollers and the upper and lower guide rollers 20, 21 it will be seen that the bar 5 will be maintained in a perpendicular position as it is reciprocated but at the same time will be caused to travel across the longitudinal axis of the rotary shaft 2 when it reaches the limit of its upward and downward movement. The double guide members 14, 15 are preferably in the form of castings and have pairs of diverging arms certain of which are apertured, as shown at 22, to receive certain of the bolts 11 and the remaining branches or arms may be free as shown or secured in any manner to the inturned flanges of the angle metal corner bars 10 of the casing.

The pump rod or operating connection 6 may be united to the reciprocatory rack member or bar 5 in any desired manner but I preferably attach to said bar 5 a supplemental bar or strap 24 which has offset ends riveted or otherwise secured, as at 25, to the upper and lower ends of the bar 5 whereby the intermediate portion of the bar 24 is spaced from the opposing portion of the bar 5. The bar 24 has its central portion thickened or reinforced and apertured to receive a pivot bolt 26 having an enlarged

cylindrical head to enter an opening in a connecting bar or strap 27 which is bolted or otherwise secured to the pump rod 6.

In operation, it will be seen that when the shaft 2 is rotated by a wind wheel, gas engine, or other motor, the pinion 4 will cause the rack section formed by the row of anti-friction rollers 8, to travel around it and the engagement of said rollers with said pinion and the curved guide surfaces 17, 18, and also the engagement of the guide rollers 20, 21 with the curved guide surfaces 16, 19, will maintain the rack member or bar 5 in a perpendicular position as it is reciprocated vertically and shifted horizontally within the casing. Owing to the peculiar construction and arrangement of parts it will be seen that there will be little or no friction and that noise and shocks or jars will be entirely eliminated.

While I have shown and described in detail the preferred embodiment of my invention, it will be understood that I do not wish to be limited to the precise construction set forth since various changes in the form, proportion and details of construction may be resorted to within the scope of the invention.

What is claimed is:

1. In a machine of the class described, the combination of a shaft having a toothed wheel, at one end thereof, a casing having vertical spaced sides through one of which said shaft extends so that said wheel is disposed between said sides, a reciprocatory member movable in said casing between one side thereof and said wheel, said reciprocatory member having a rack for engagement by said wheel, and being also provided with upper and lower guides spaced from the ends of said rack, guide members in the said casing between the sides thereof, and each having upper and lower curved guide surfaces, the opposing curved guide surfaces of said guide members coacting with the end portions of the rack and the outer guide surfaces coacting with the said guides of said reciprocatory member, a bar on the outer side of said casing which is opposed to said wheel, and having its ends attached to said reciprocatory member, and an

attaching member pivotally connected to said bar, at a point intermediate the ends of the latter.

2. In a machine of the class described, in combination with a shaft mounted for rotation and having a toothed wheel, a casing comprising a pair of spaced sides between which said toothed wheel is disposed, angle metal corner bars extending longitudinally of the sides and disposed on the inner surfaces thereof, bolts connecting said sides, and extending through said corner bars, upper and lower double guide members between said sides and having upper and lower curved guide surfaces, bolts extending through said guide members, said sides and said corner bars, spacing sleeves on said bolts, and between said guide members and said corner bars, spacing sleeves on the first mentioned bolts, and between said corner bars, a reciprocatory member mounted for operation in said casing, and against one side thereof, said reciprocatory member having a rack section for engagement with said toothed wheel and the opposing curved guide surfaces of said guide members, and being further provided at points spaced from the ends of said rack section with guides to coact with the outer curved guide surfaces of said guide members.

3. The combination of a rotary shaft provided with a toothed wheel, a reciprocatory member provided with a rack section to engage and travel around said wheel, a guide casing for said member, upper and lower double guide members, each of the latter having upper and lower curved guide surfaces, the opposing curved guide surfaces on the two guide members being adapted to coact with the end portions of the rack section, and upper and lower guides independent of said rack section and arranged on said reciprocatory member to co-act with the remaining curved guide surfaces on said guide members.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

SAMUEL M. GARD.

Witnesses:

GEO. RUFF,

R. D. AITCHISON.