



No. 789,709.

PATENTED MAY 16, 1905.

C. P. BILSON.  
PUMP OPERATING MECHANISM.

APPLICATION FILED MAY 7, 1904.

3 SHEETS—SHEET 2.

Fig. 1.

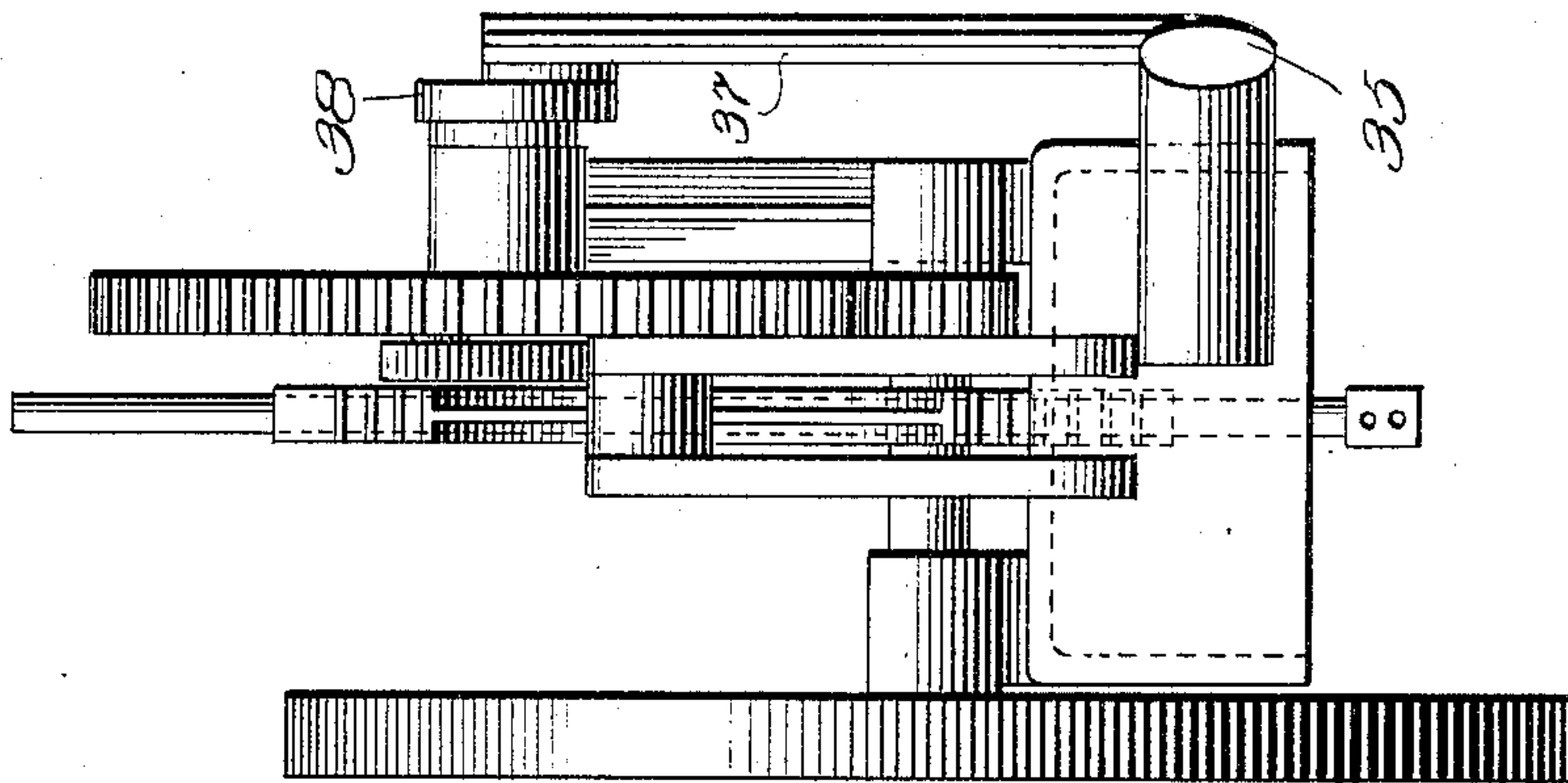
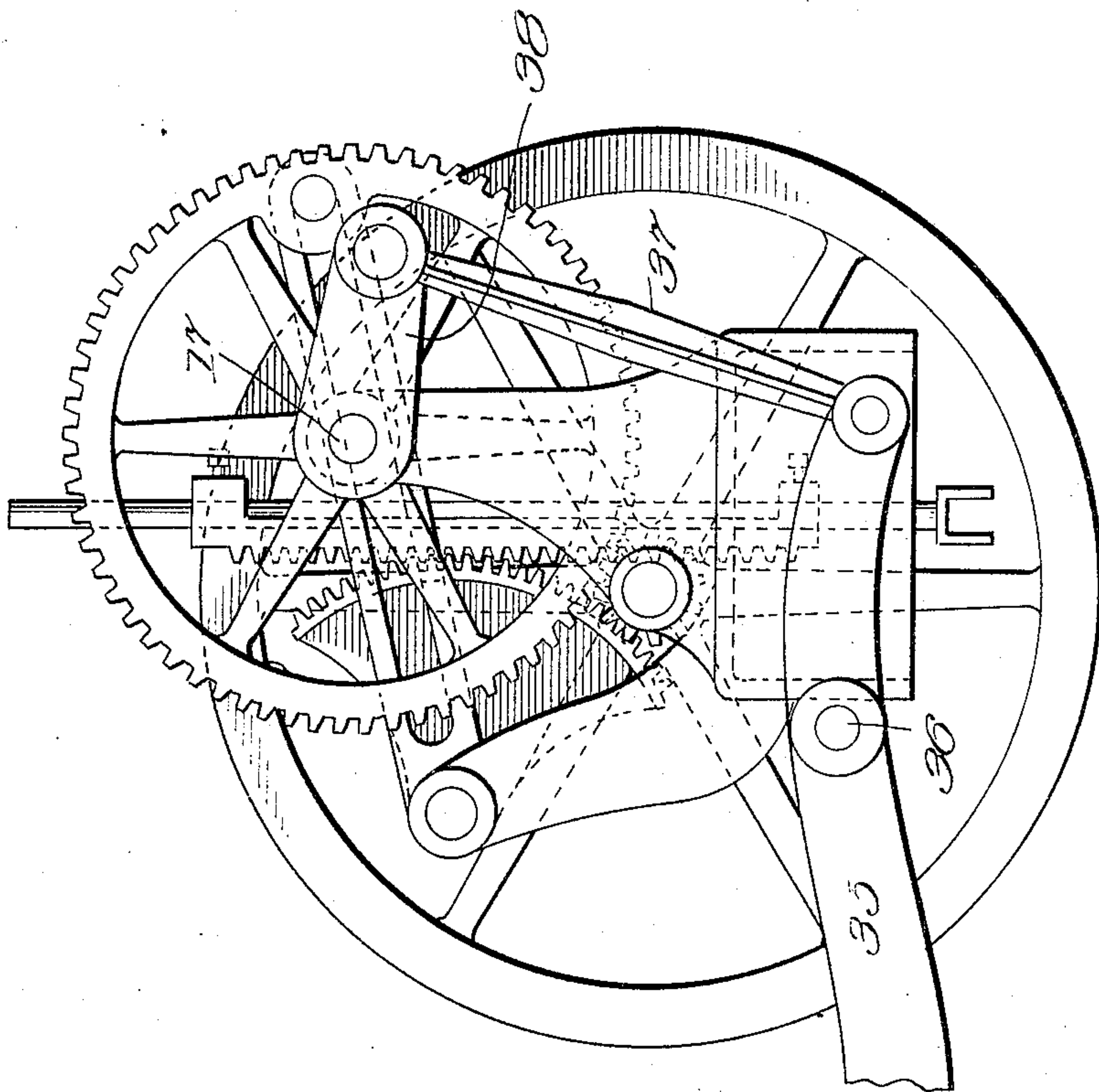


Fig. 3.



Witnesses:  
H. S. Carter  
M. A. Kiddie

Inventor:  
Christian P. Bilson  
by Wm. F. Bell  
att'y



No. 789,709.

PATENTED MAY 16, 1905.

C. P. BILSON.  
PUMP OPERATING MECHANISM.  
APPLICATION FILED MAY 7, 1904.

3 SHEETS—SHEET 3.

Fig. 6.

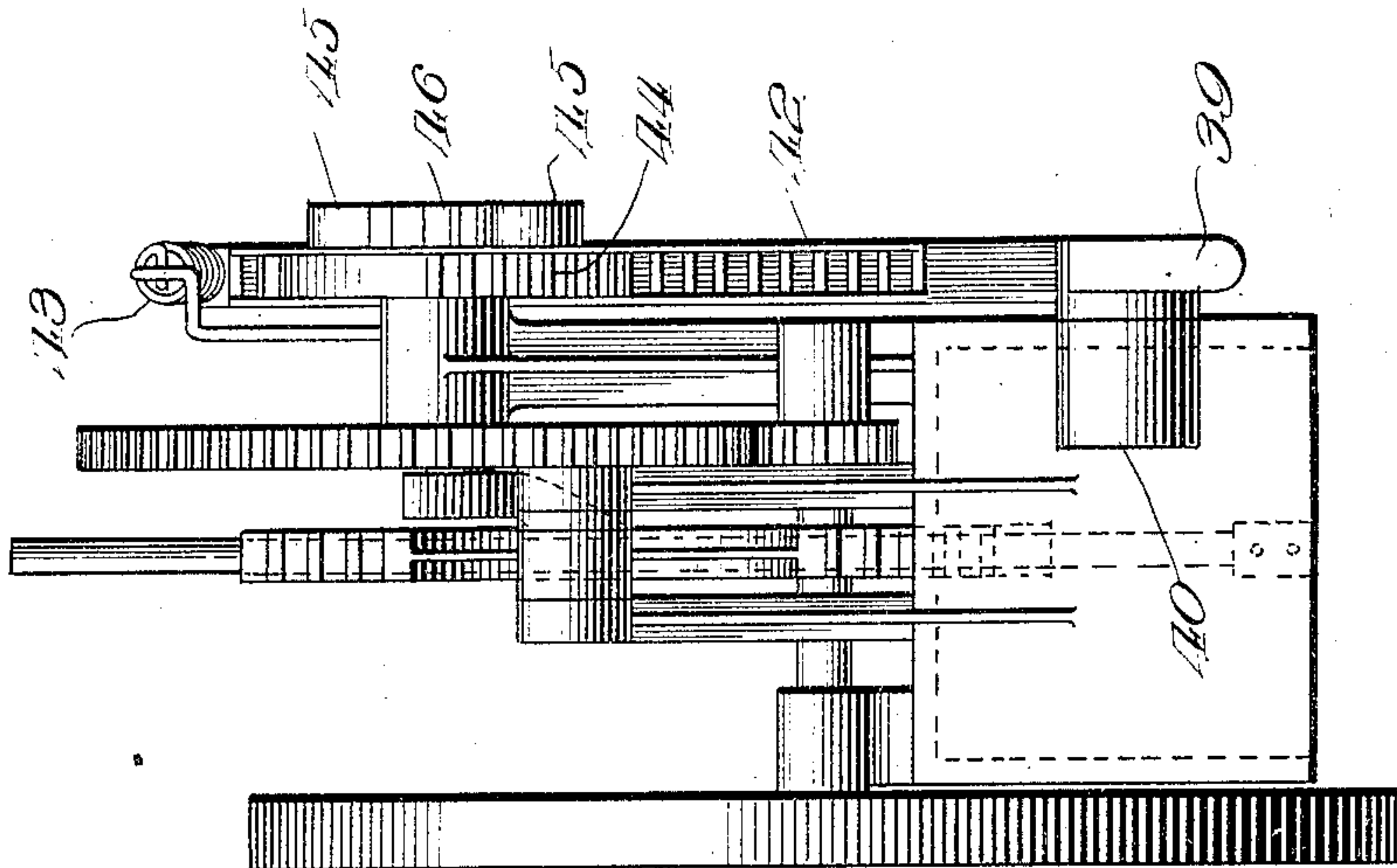
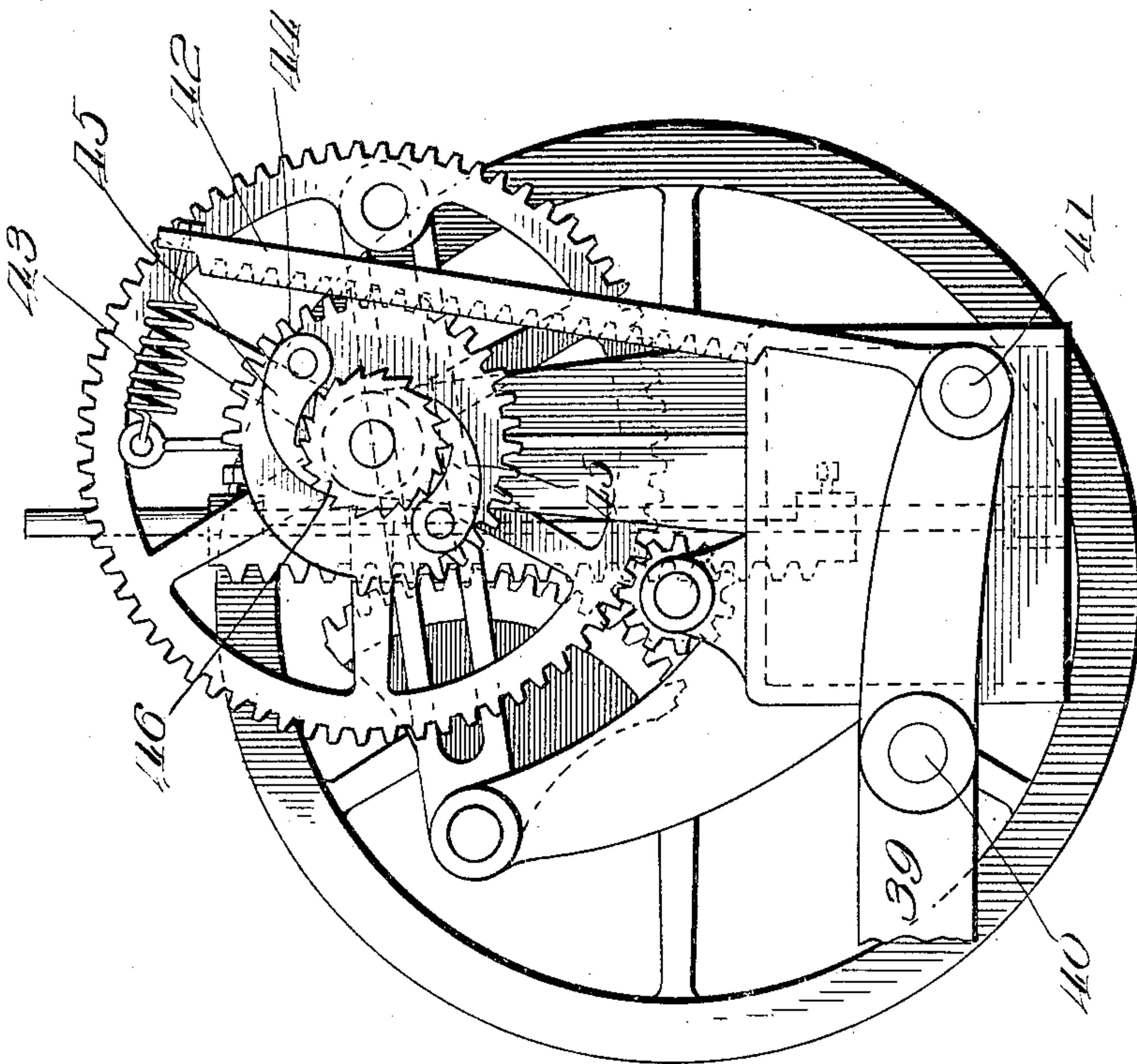


Fig. 5.



Witnesses:  
H. S. Gaiter  
M. A. Kiddie

Inventor:  
Christian P. Bilson  
by Wm. J. Bell  
att'y



# UNITED STATES PATENT OFFICE.

CHRISTIAN P. BILSON, OF CHICAGO, ILLINOIS.

## PUMP-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 789,709, dated May 16, 1905.

Application filed May 7, 1904. Serial No. 206,823.

*To all whom it may concern:*

Be it known that I, CHRISTIAN P. BILSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pump-Operating Mechanism, of which the following is a specification.

The object of this invention is to enable pumps to be operated with a minimum amount of power and to provide a mechanism of simple and inexpensive construction which can be easily and conveniently applied to a wood or metal pump of any kind and operated by hand or power.

In the accompanying drawings, Figure 1 is a side elevation of one form of mechanism embodying the invention. Fig. 2 is an end elevation thereof. Figs. 3 and 4 are similar views illustrating another embodiment of the invention. Figs. 5 and 6 are similar views illustrating still another embodiment of the invention.

Referring first to Figs. 1 and 2 of the drawings, 10 designates generally the frame of the mechanism, which comprises a socket 11 and certain standards and bearings which will be described specifically hereinafter. The socket may be formed in any suitable shape, and it is adapted to be secured by any suitable means on the upper end of the barrel or body 12 of the pump. A drive-gear 13 is mounted on a stub-axle 14, journaled in the bearing 15 on the frame, and this gear meshes with a gear 16 on the crank-shaft 17, which is journaled in a suitable bearing on the standard 18. The power-shaft also carries a crank which may be made in the form of a disk or gear-wheel 19, carrying at its periphery a wrist-pin 20, which works in the slotted arm 21 on the toothed segment 22. This segment is pivoted at 23 on the standard 24, and the slotted arm projects therefrom in alinement with its pivot. The segment is arranged to mesh with a rack 25, which is adjustably secured on the rod 26. This rod forms a part of the mechanism, but also constitutes a continuation of the piston-rod 26' of the pump, and it is provided with a socket 27 or other suitable means whereby it can be easily and readily connected to the end of the piston-rods in pumps now in use.

In new pumps the piston may, if desired, be extended above the barrel or body to comprise the rod 26. A fly-wheel 28 is mounted on a shaft 29, journaled in bearings 30 and carrying a pinion 31, which meshes with the gear 19. The mechanism may be operated manually by means of a crank 32, fastened to the gear 13 or the shaft 14, or the mechanism can be driven at high speed by power communicating through a belt arranged on the fly-wheel and driven by a motor or engine of any suitable character.

In practice the mechanism is secured on the end of a pump, and the rod 26 is connected to the piston-rod 26'. When the mechanism is operated by the crank 32, the drive-gear 13 turns the gear 16, the crank-shaft 17, and the wheel 19, and the pin 20 is carried by the wheel 19 back and forth in the slotted arm 21, which causes the segment to swing on its pivot and raise and lower the piston-rod through its meshing engagement with the rack 25. It will be observed that on the upstroke of the pump-rod the crank-pin operates in the slotted arm remote from its fulcrum, and on the downstroke of the pump-rod the crank-pin operates in the slotted arm near the fulcrum of the arm. This construction enables the operation of the mechanism with comparatively little power and provides for the discharge of a steady stream of water in considerable volume. When the mechanism is operated by power applied to the fly-wheel, the shaft 29 turns the pinion 31, which operates the gear 19 in the manner heretofore described. The crank 32 and gear 13 may be removed when the mechanism is driven from the fly-wheel, if desired.

In Figs. 3 and 4 I have shown different means for operating the crank-shaft, said means comprising a lever 35, pivotally mounted at 36 on the frame and connected by a link 37 to a crank 38 on the crank-shaft. This lever is adapted to be operated like an ordinary pump-handle to turn the crank-shaft in a manner which will be readily understood.

In Figs. 5 and 6 I have shown still another means for operating the crank-shaft, which comprises a lever 39, pivoted at 40 on the frame and pivotally connected at its outer end 41 to



a rack 42, which is held by a spring 43 in engagement with a toothed wheel 44, loosely mounted on the crank-shaft 17. This toothed wheel carries two spring-pressed pawls 45, which operate a ratchet-wheel 46, fastened securely on the crank-shaft. It will be readily understood that on the downstroke of the lever 39 the rack will be moved upward and turn the toothed wheel 44, and the pawls on said wheel will turn the ratchet-wheel and the crank-shaft. On the return or upward stroke of the pump-handle the rack will be carried down, and the pawls will be carried by the toothed wheel over the teeth of the sprocket-wheel.

The mechanism is adapted to be applied to wood or metal pumps now in use, as well as new pumps, and this can be easily and readily accomplished. The mechanism is simple in character and is not liable to get out of order, and by its use a large quantity of water can be pumped in a short time with comparatively little power. The arrangement of the slotted arm on the segment 22 is of special importance, as I am thereby enabled to provide the greatest degree of leverage at the time of greatest resistance on the upstroke and the shortest leverage at the time of least resistance on the return stroke in the operation of the mechanism.

Without limiting myself to the exact construction and arrangement of parts herein shown and described, what I claim, and desire to secure by Letters Patent, is—

1. In a pump-operating mechanism, the combination of a socket-frame adapted to be mounted on the barrel or body of a pump, a rack mounted lengthwise on the piston-rod of the pump, a toothed segment pivoted on the frame and meshing with the rack, a slotted arm operatively connected to said segment, and a crank comprising a pin arranged to operate

in said slotted arm to swing the segment on its pivot, whereby the greatest leverage is provided on the upstroke of the pump-rod at the time of greatest resistance and the shortest leverage is provided at the time of least resistance to give the pump-rod a quick return stroke.

2. In a pump-operating mechanism, the combination of a socket-frame adapted to be mounted on the barrel or body of a pump, a rack mounted lengthwise on the piston-rod of the pump, a standard on the frame extending upward alongside the piston-rod, a toothed segment pivoted on the standard to swing in a vertical plane and meshing with the rack, a slotted arm carried by said segment and projecting forward from the side of its toothed edge across the plane of movement of said piston-rod and in alignment with the pivot of the segment, and a crank comprising a pin arranged to operate in said slotted arm to swing the segment on its pivot.

3. In a pump-operating mechanism, the combination of a socket-frame adapted to be mounted on the barrel or body of a pump, a rack mounted lengthwise on the piston-rod of the pump, a standard on the frame extending upward alongside the piston-rod, a toothed segment pivoted on the standard to swing in a vertical plane and meshing with the rack, a slotted arm carried by said segment and projecting forward from the side of its toothed edge across the plane of movement of said piston-rod and in alignment with the pivot of the segment, a crank-shaft on the frame, a wheel mounted on said shaft, a crank-pin carried by said wheel and operating in the slot in said arm, a gear on said crank-shaft, a drive-gear, and a crank for operating said drive-gear.

CHRISTIAN P. BILSON.

Witnesses:

J. F. HOPKINS,  
CHAS. H. BILSON.