

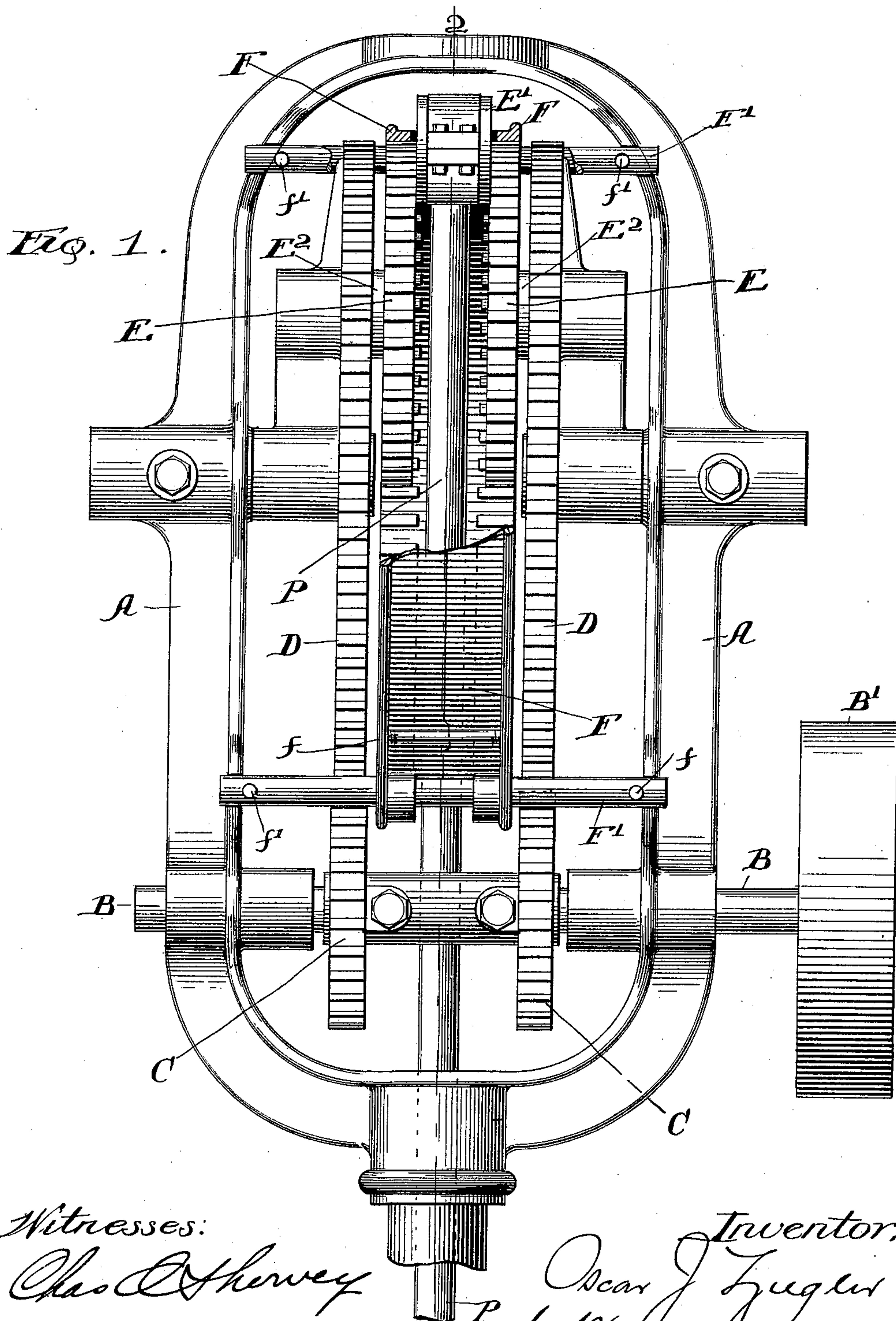
(No Model.)

3 Sheets—Sheet 1.

O. J. ZIEGLER.  
MECHANICAL MOVEMENT.

No. 587,380.

Patented Aug. 3, 1897.



Witnesses:  
Chas O Shewey  
A J H Epheser

Inventor:  
Oscar J. Zugler  
by Wm. G. Ginn & Pitman  
Attys

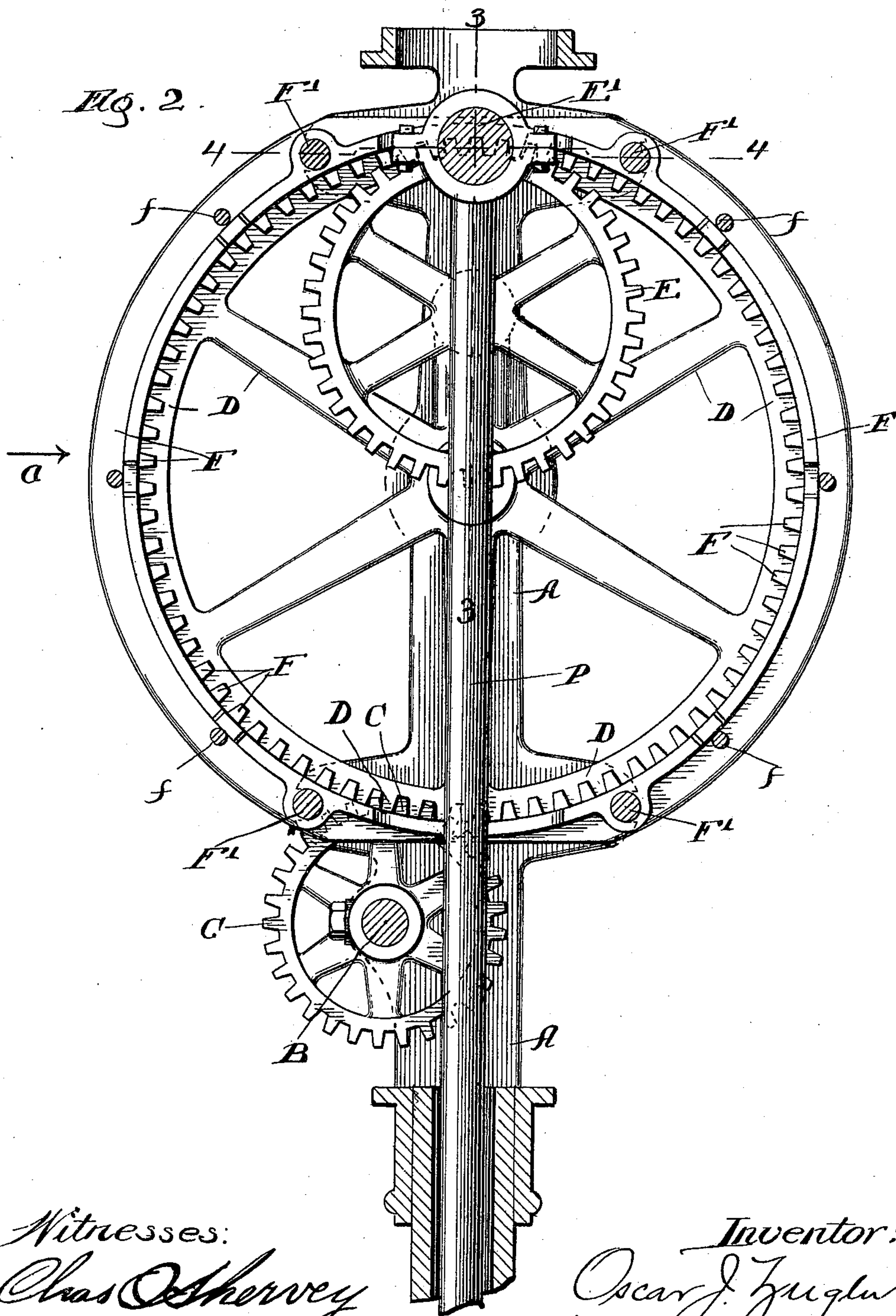
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3 Sheets—Sheet 2.

O. J. ZIEGLER.  
MECHANICAL MOVEMENT.

No. 587,380.

Patented Aug. 3, 1897.



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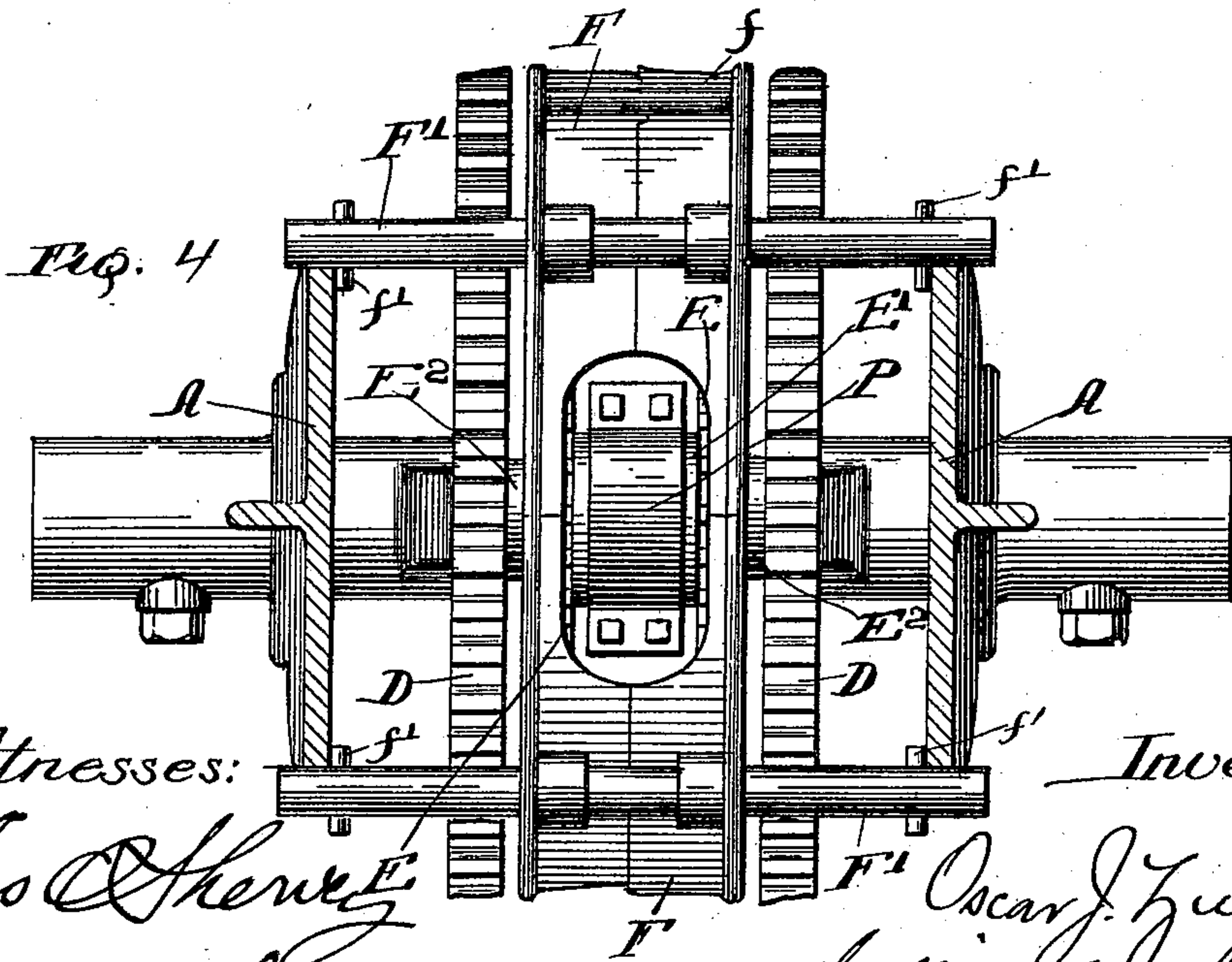
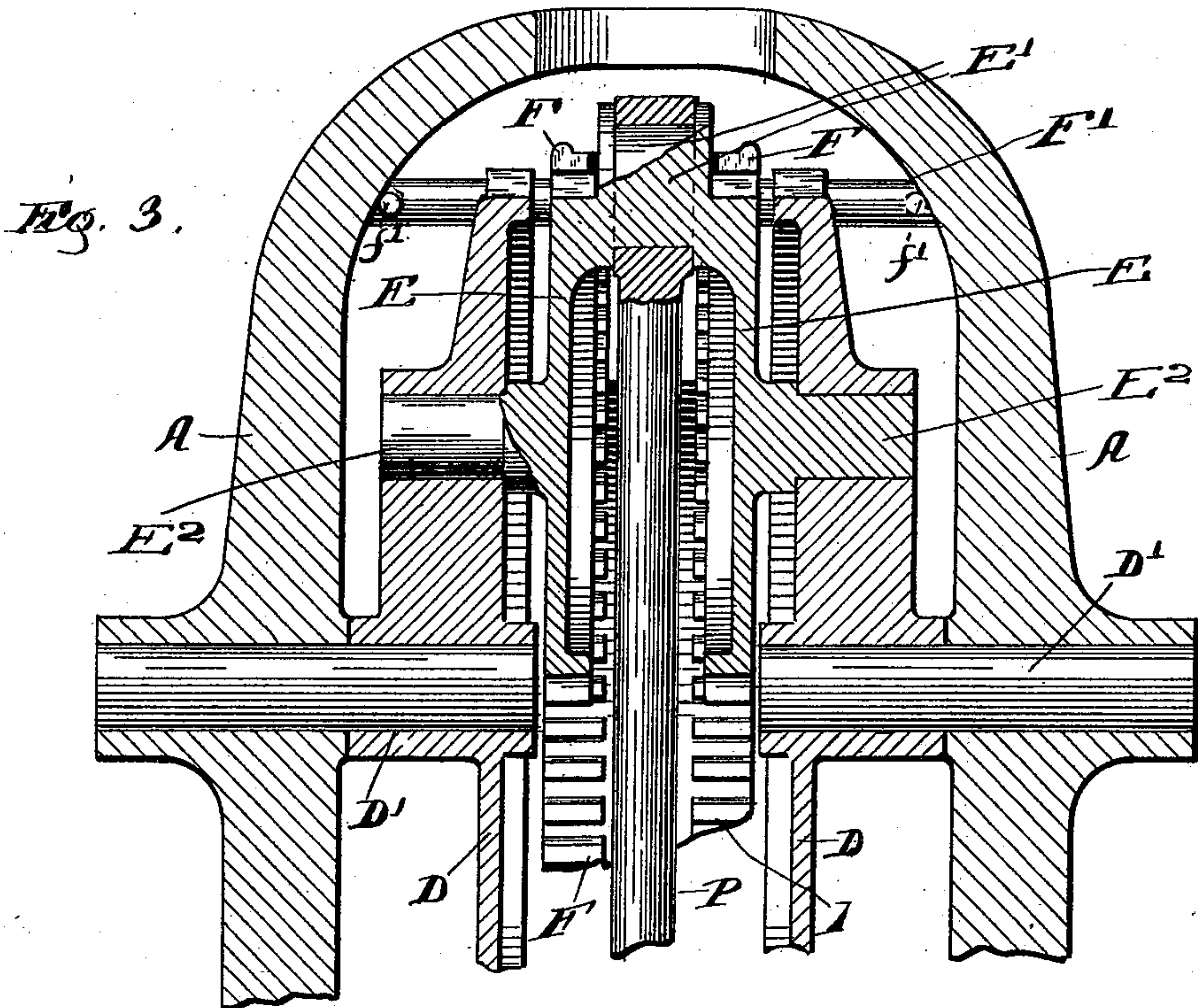
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3 Sheets—Sheet 3.

O. J. ZIEGLER.  
MECHANICAL MOVEMENT.

No. 587,380.

Patented Aug. 3, 1897.



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# UNITED STATES PATENT OFFICE.

OSCAR J. ZIEGLER, OF FREEPORT, ILLINOIS.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 587,380, dated August 3, 1897.

Application filed September 27, 1895. Serial No. 563,860. (No model.)

*To all whom it may concern:*

Be it known that I, OSCAR J. ZIEGLER, a citizen of the United States of America, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

My invention relates to improvements in mechanical movements, and particularly in devices for converting rotary into reciprocal motion—as, for instance, in applying the rotation of a shaft to the reciprocation of a pitman.

The invention is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my improvements, the view being in the direction indicated by the arrow *a* in Fig. 2. Fig. 2 is a central vertical section of the device shown in Fig. 1, the plane of section being through the line 2 2, Fig. 1. Fig. 3 is a transverse vertical section through the upper part of Fig. 2, the plane of section being through the line 3 3 in said figure. Fig. 4 is a view partly in top plan and partly in horizontal section, the plane of section being through the line 4 4, Fig. 2.

In the views, A is a frame adapted to support the parts of the mechanism embodying my invention, this frame being of any suitable form adapting it for the particular use in which the mechanism may be employed. I have used the device in practice in a pumping-windmill, and the frame shown in the drawings is adapted for that use and is so constructed as to rotate about its vertical axis. This, however, is not essential to my present invention, and the frame may be varied in form as may be required or desired. At a suitable point in the frame A is journaled a transverse shaft B, provided with a pulley B' or with other means for rotating the shaft, and on the shaft, within the frame, are rigidly mounted two pinions C C in suitable relation to each other. The pinions C C engage, respectively, two correspondingly-placed spur-gears D D, mounted on studs D' D' set in the frame, and the gears D D carry pinions E E, connected by an integrally-

formed transverse crank-pin E', the pinions E E being preferably pivoted to the gear-wheels D D by means of gudgeons E<sup>2</sup> E<sup>2</sup>, formed on the pinions and journaled in suitable bearings in the gear-wheels. The two pinions E E are in engagement with a stationary internal gear or annular rack F of double their diameter fastened to the frame A in any suitable manner, and a pitman P, hung upon the transverse crank-pin E', between the two pinions E E, passes through a suitable opening in the annular gear F and is operated by the movement of said crank-pin, the shaft B being set at one side of the vertical axis of the device and out of the path of the pitman.

The internal gear F may be constructed and attached to the frame in any suitable manner, but is preferably made in four similar pieces, the entire gear being thus divided on a transverse plane and also on a plane parallel to its faces. Transverse bolts *f f* connect the parts, and the whole ring is preferably held in place by means of transverse rods F' F', passing through the ring and lying in notches in the frame, the rods themselves being tied together by bolts *f'* parallel to the plane of the gear.

In operation the rotation of the shaft B is communicated through the pinions C C to the gears D D, and the rotation of the gears D D carries the pinions E E in an annular path, thereby rolling them about the inner face of the annular gear or rack F. The rack being of double the diameter of the pinions E E the crank-pin E' moves in a straight line back and forth across the center of the rack, and the pitman is so placed as to coincide with this line of movement of the crank-pin. The pitman is therefore reciprocated in a straight line and has no lateral movement whatever, and the entire device operates positively and with but little friction.

I am aware that a pitman movement made up of a rotating wheel or plate, a pinion mounted on the plate and provided with a crank-pin, and a stationary annular rack in engagement with the pinion has long been known and used, and I do not claim that as my invention. I have found, however, in practice that a device made in accordance



with the old construction just described is objectionable for the reason that all the bearings are on one side and all the working parts overhang, so that the strain on the bearings and pivots is unequal, and the wear is thereby greatly increased. Such a device is therefore unsuited for any heavy work, and I have found that in windmill construction, for instance, a device made as suggested is short-lived and entirely unsatisfactory.

The object of this invention is to utilize the old gearing above described and render it practical by providing it with symmetrical bearings, so as to equalize the strain on the parts and bring the weight midway between the working bearings instead of at one side of a single bearing. It is evident that such duplication of the parts and bearings is impossible except by the addition of some means of communicating power from the driving-shaft to the two symmetrical pinion-carrying wheels, and this has been accomplished by providing the driving-shaft with pinions C C, engaging the pinion-carrying wheels.

It will be seen that in the construction which I have adopted the pitman hangs in the center and all the parts are symmetrical with reference to it, so that its weight is distributed to all the bearings, and the construction and connection of all the elements of the device are such as to hold them in their proper relation and give to the symmetrically-placed bearings substantially the effect and operation of long shafts journaled in suitably-separated boxes.

The shaft B may be connected with the gears D D by means of chain belts, if desired, instead of by spur-gearing, but one of these connections is the evident equivalent of the other.

Having now described and explained my

invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a suitable frame and a driving-shaft, B, mounted therein and provided with pinions, C, C, of the gear-wheels D, D, engaging said pinions, C, C, pinions E, E, mounted upon and between said gear-wheels, and provided with an interposed crank-pin, E', a stationary internal gear, F, mounted in the frame and engaging the pinions, E, E, and a pitman, P, hung on the crank-pin, E', and operated by the movement thereof, the internal gear being formed with a suitable opening for the passage of the pitman.

2. The combination with the frame, the shaft, B, and the rotating wheels, D, D, receiving movement from said shaft, of the pinions, E, E, mounted upon and between said wheels and connected by the integral crank-pin, E', the stationary internal gear, F, mounted in the frame and engaging the pinions, E, E, and the pitman, P, hung on the crank-pin, E', and operated by the movement thereof, the internal gear being formed with an opening for the passage of the pitman.

3. The combination with the frame, the shaft, B, the rotating wheels, D, D, operated by the shaft, the pinions, E, E, mounted on the wheels, D, D, and provided with an interposed crank-pin, E', and the pitman, P, hung on the crank-pin E', of the stationary internal gear, F, engaging the pinions, E, E, and the rods, F', F', passing transversely through said internal gear and seated in the frame, whereby the internal gear is held in suitable relation to the frame.

OSCAR J. ZIEGLER.

Witnesses:

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