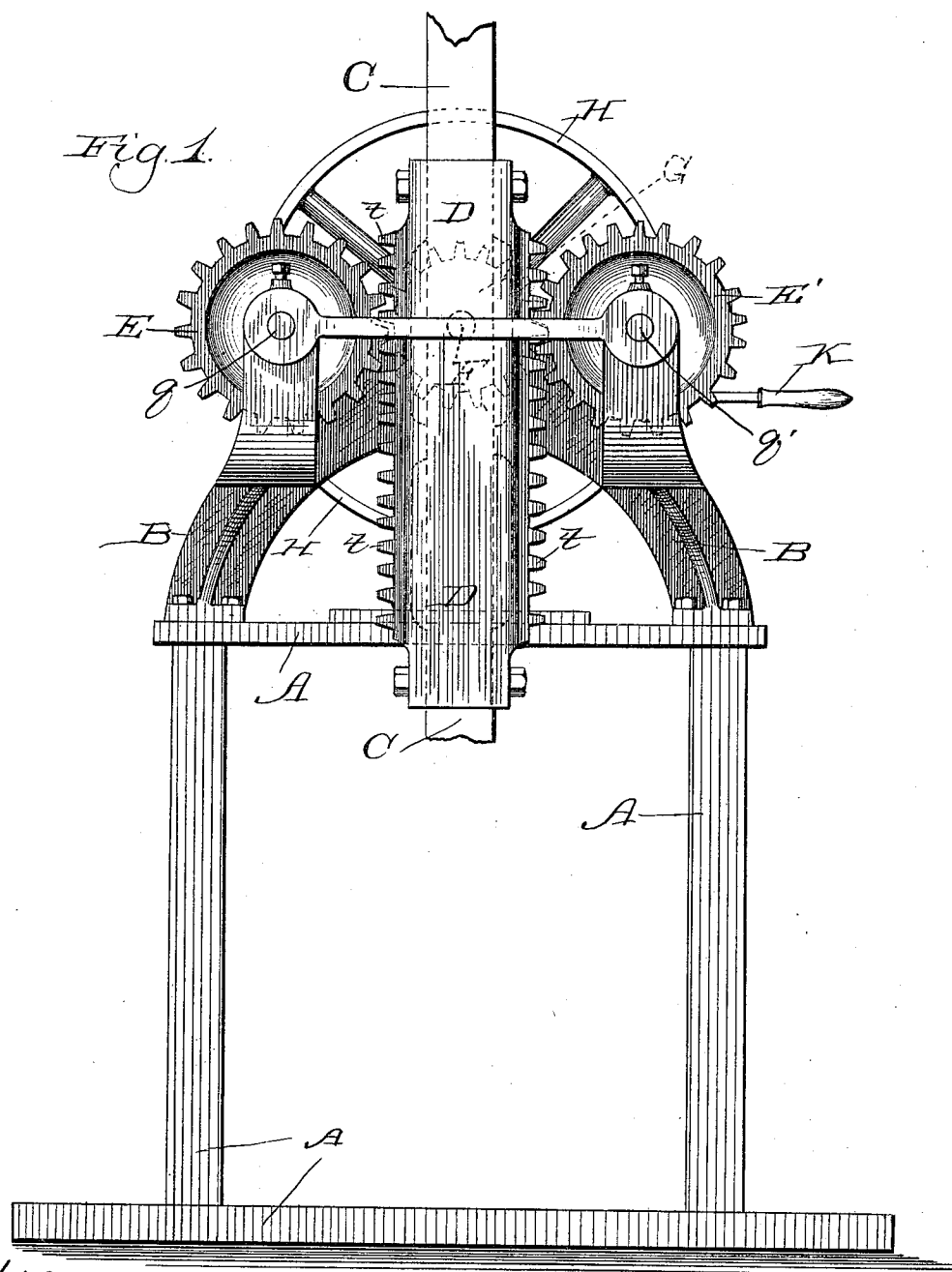


W. G. DAWSON.

DEVICE FOR CONVERTING RECIPROCATING INTO ROTARY MOTION.

No. 320,338.

Patented June 16, 1885.



Witnesses.

Chas & Gaylord  
Mason Bros.

Inventor.

William G. Dawson,  
By Dyrenforth & Dyrenforth,

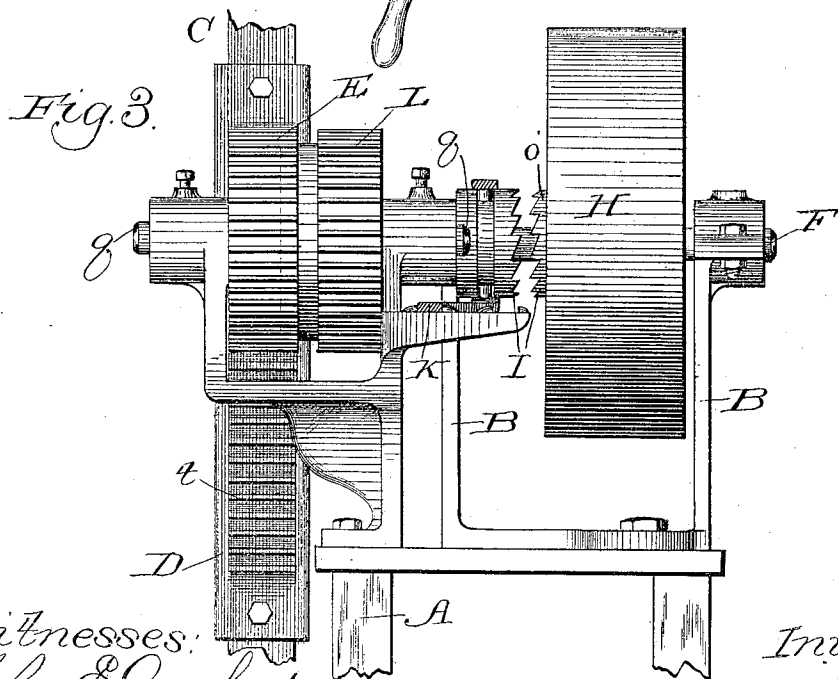
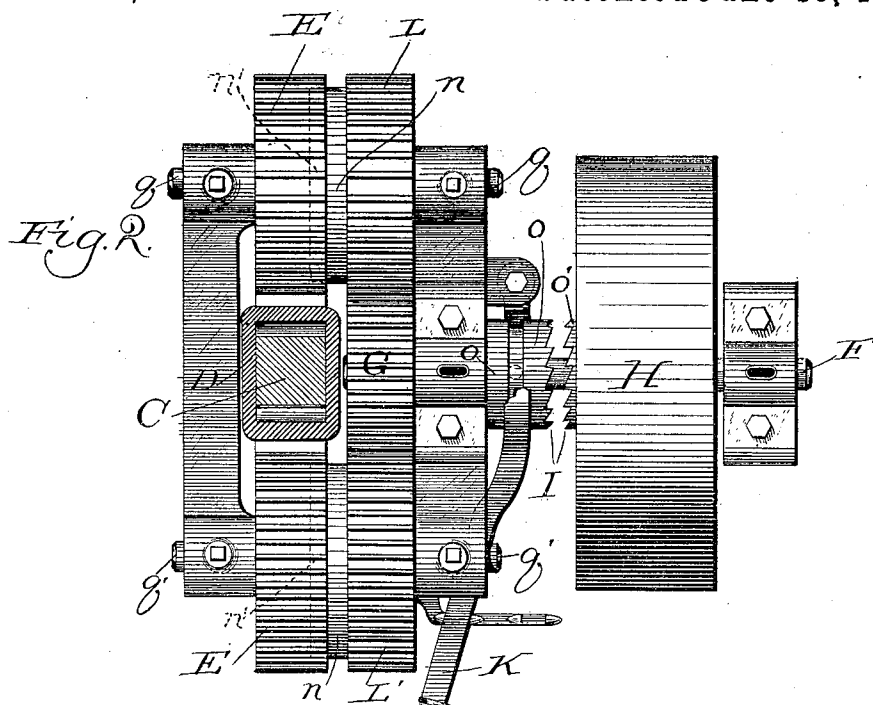
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(No Model.)

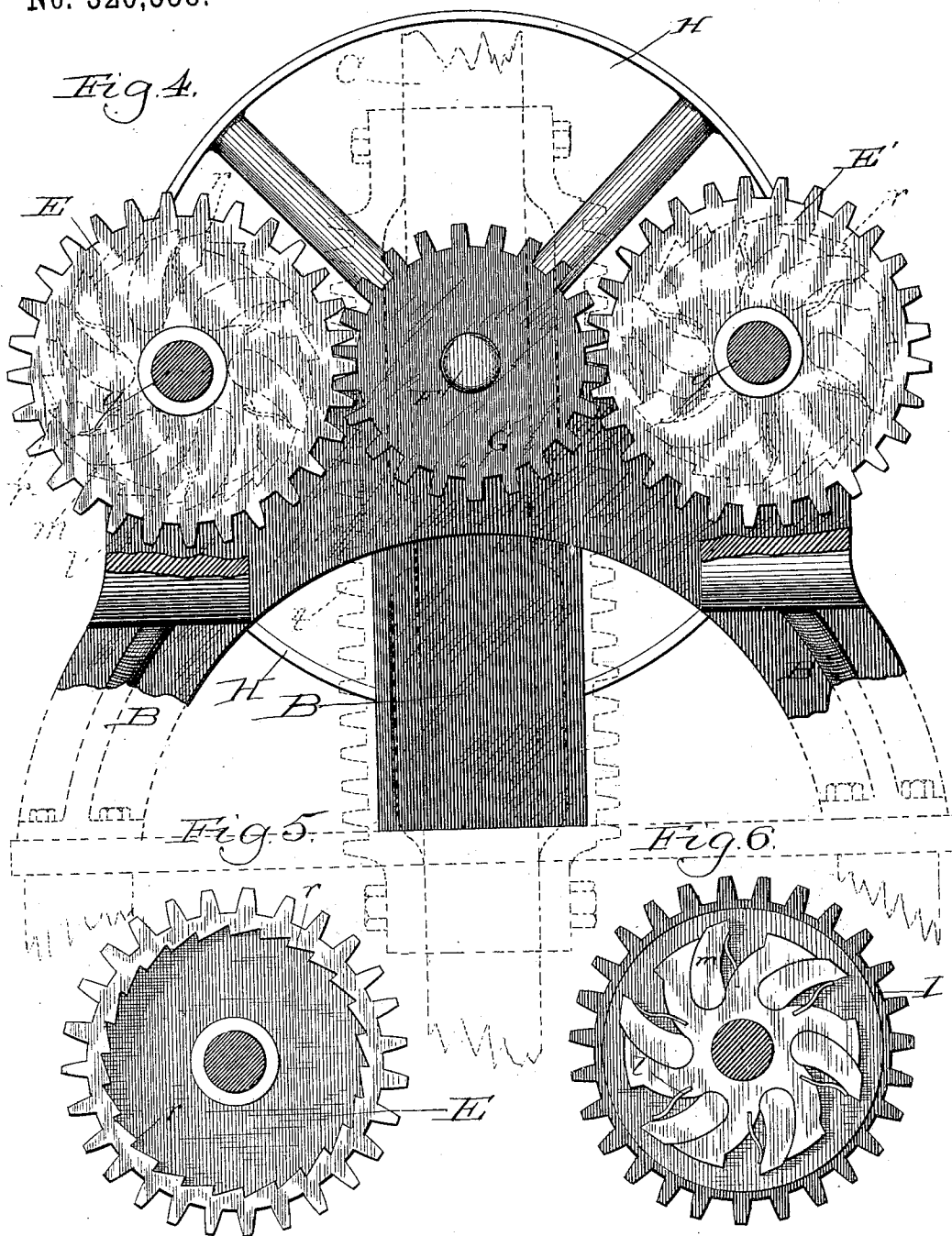
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# UNITED STATES PATENT OFFICE.

WILLIAM G. DAWSON, OF CHICAGO, ILLINOIS.

DEVICE FOR CONVERTING RECIPROCATING INTO ROTARY MOTION.

SPECIFICATION forming part of Letters Patent No. 320,338, dated June 16, 1885.

Application filed November 17, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. DAWSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and Improved Machine for Converting Reciprocating Motion into Rotary Motion; and I hereby declare the following to be a full, clear, and exact description of the same.

It is my object to provide a machine the principle of which may be used to convert either vertical or horizontal reciprocating motion into rotary motion for the purpose of transmitting power; and my invention consists in the particular mechanism which I employ for the purpose, and in the construction and combination of the parts of the same.

Referring to the drawings, Figure 1 is a front elevation of my device supported upon a suitable stand; Fig. 2, a plan view of the same; Fig. 3, a side elevation; Fig. 4, an enlarged front elevation showing details in dotted lines, and representing the forward cog-wheels in engagement with the rack; and Figs. 5 and 6, plan views of details.

A is a stand, of suitable construction to support the machine, the frame B of which is bolted to it, as shown in Figs. 1 and 4.

C is a vertical pitman, provided toward its lower extremity with a rack, D, bolted to the pitman, and having teeth *t* projecting from each side.

Cog-wheels E and E' are loosely supported on stationary axles *q* and *q'*, supported within suitable bearings provided in the frame B of the machine at opposite sides of the pitman C, to engage with the rack D, and are recessed out on their rear surfaces and provided with internal ratchets, *r*; the teeth of each of which project in the same direction.

F is a horizontal shaft supported to revolve within bearings in the frame B of the machine, and provided with an adjustable sleeve, *o*, carrying a pinion, G, toward one extremity, and having its opposite extremity provided with teeth, (see Figs. 2 and 3,) to form with similar teeth provided upon the sleeve *o'* on the same shaft, and carrying a belt-wheel, H, a clutch, I, which is operated, in the usual way, by a lever, K.

L and L' are cog-wheels, loosely supported, to engage with the pinion G, upon the axles *q*

and *q'*, and having each on its forward surface a projecting disk, *n*, forming collars to abut against the wheels E and E', and having another disk, *n'*, narrower than the disk *n*, to enter the recessed portions of the wheels E and E', the disk *n'* being provided with dogs or pawls *m*, sunk into it to a level flush with the surface of the disk *n*, to provide confines for the dogs, and set to engage, for the purpose hereinafter described, with the ratchets *r* in the wheels E and E'. Springs *l* are preferably provided to sustain the free ends of the dogs.

The operation of the machine is as follows: The purpose is to cause the shaft F (the teeth *o* and *o'* of the clutch I being caused by means of the lever K to engage with each other) to rotate continuously in the same direction. As the reciprocating pitman C is moved in one direction—say, for the sake of illustration, vertically downward—the rack D, having a length corresponding with the length of stroke of the pitman, to cause its teeth to be in continual contact with the cogs of the wheels E and E', will rotate the latter both in an inward direction above their axes, and with them the wheel L', owing to the engagement of the dogs *m* upon the latter with the teeth of the ratchet within the wheel E', and will revolve the pinion G and shaft F in a direction toward the wheel L', the pinion in turn causing the wheel L to rotate in the opposite direction, which is permitted by the sliding of the dogs *m* thereon over the teeth of the ratchet *r* within the wheel E. The upward stroke of the pitman will, through the medium of the rack D, cause the wheels E and E' to turn in an outward direction above their axes, thereby causing the wheel L to continue the direction of its rotation, owing to the engagement of the dogs *m* upon it with the teeth of the ratchet within the wheel E, thus continuing the revolution in the same direction of the pinion G and shaft F, the continuous rotation in the same direction of the wheel L' by the pinion G being permitted by the sliding of the dogs *m* thereon over the teeth of the ratchet *r* within the wheel E'. It will thus be seen that the effect of the downward movement of the pitman is to revolve the wheels E' and L' in the same direction, while the wheels E and L are rotated in opposite direc-

tions, the wheels E and E' moving inward above their axes, while the upward movement of the pitman reverses the movements of the various wheels, causing the wheels E and E' to move from each other above their axes and the wheels E and L to move together, the result being that the pinion G and shaft F are continuously rotated in one direction. Power is transmitted by suitable connection with the belt-wheel H.

Though my device, perhaps with slight mechanical alterations for particular adaptations, may be used for all the ordinary purposes for which such devices are designed, it will be found particularly useful as a machine for grinding grain, &c., in connection with windmills commonly used for pumping water, in which the machine may be connected directly with the reciprocating pitman of the mill, or indirectly, and preferably, by providing a separate pitman for the machine and connecting it with that of the mill by means of a walking-beam.

The collars *n* on the wheels L and L', though not absolutely indispensable, are useful in maintaining the wheels in position.

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

1. A machine for converting reciprocating motion into rotary motion, comprising, in combination, a reciprocating pitman, C, provided with a rack, D, cog-wheels E E', supported within suitable bearings to engage with the said rack, a pinion, G, upon a rotary shaft, F, supported within suitable bearings, cog-wheels L and L', supported within suitable bearings to engage with the said pinion, and means connecting the said cog-wheels E and E' with the said cog-wheels L and L', whereby reciprocation of the said pitman shall rotate the said shaft continuously in the same direction, substantially as described.

2. A machine for converting reciprocating motion into rotary motion, comprising, in combination, a reciprocating pitman, C, provided with a rack, D, cog-wheels E E', supported within suitable bearings to engage with the said rack and recessed on one side and provided with ratchets *r*, having their teeth projecting in the same direction, a pinion, G, upon a rotary shaft, F, supported within suitable bearings, cog-wheels L L', supported within suitable bearings to engage with the pinion G, and having each a disk, *n'*, on one face to enter the recess formed in each of the wheels E and E', and provided with dogs *m*, to engage with the ratchets within the said recesses, the whole being constructed and arranged to operate substantially as described.

3. A machine for converting reciprocating motion into rotary motion, comprising, in combination, a reciprocating pitman, C, provided with a rack, D, cog-wheels E E', supported within suitable bearings to engage with the said rack and recessed on one side and provided with ratchets *r*, having their teeth projecting in the same direction, a pinion, G, upon a rotary shaft, F, supported within suitable bearings, cog-wheels L L', supported within suitable bearings to engage with the pinion G, and having each on one face a collar, *n*, and a disk, *n'*, to enter the recess formed in each of the wheels E and E', and provided with dogs *m*, to engage with the said ratchets within the said recesses, clutch mechanism I upon the said shaft F, and means for operating the said clutch mechanism, the whole being constructed and arranged to operate substantially as described.

WILLIAM G. DAWSON.

In presence of—

MASON BROSS,  
EDWARD THORPE.