

(No Model.)

N. L. FORSTER.

APPARATUS FOR UTILIZING THE EBB AND FLOW OF THE TIDE.

No. 285,251.

Patented Sept. 18, 1883.

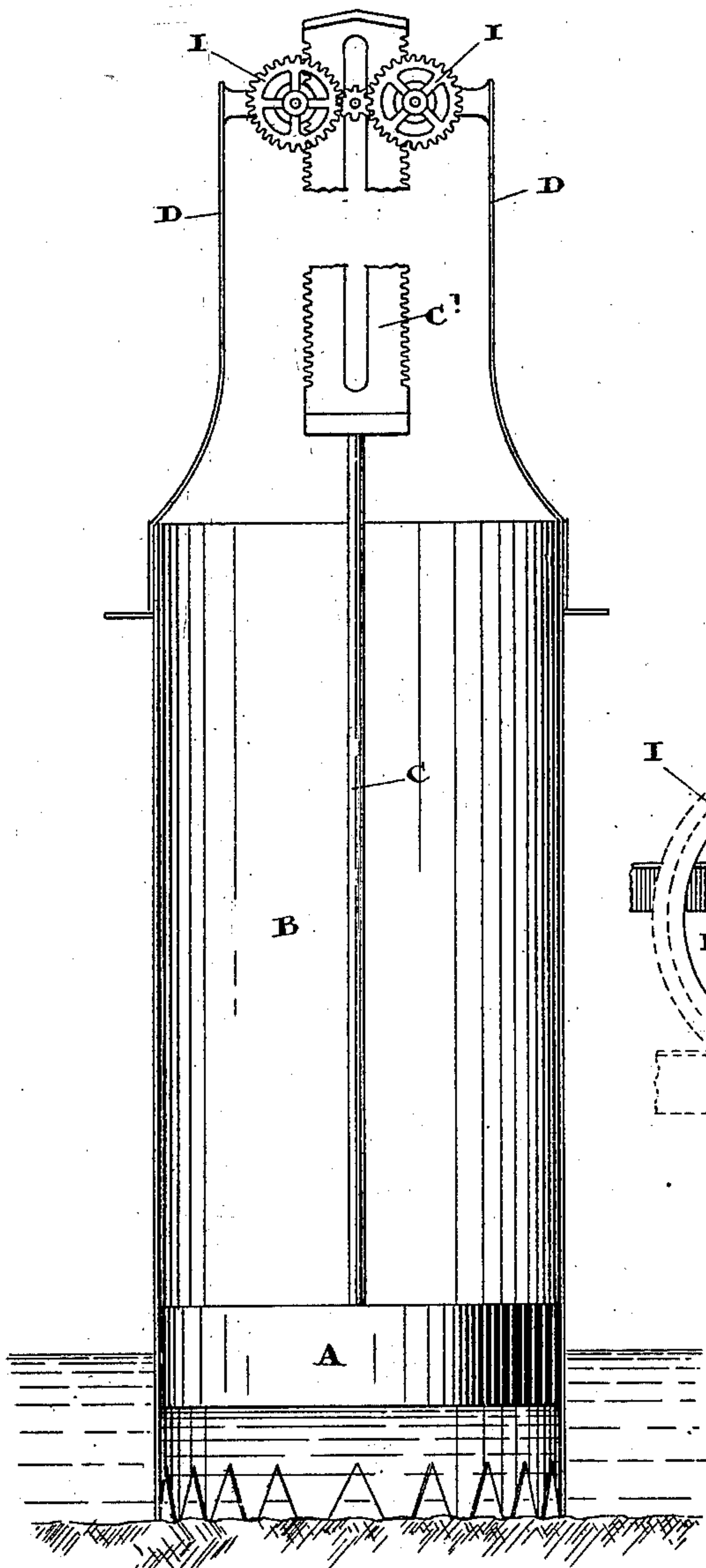


Fig. 1.

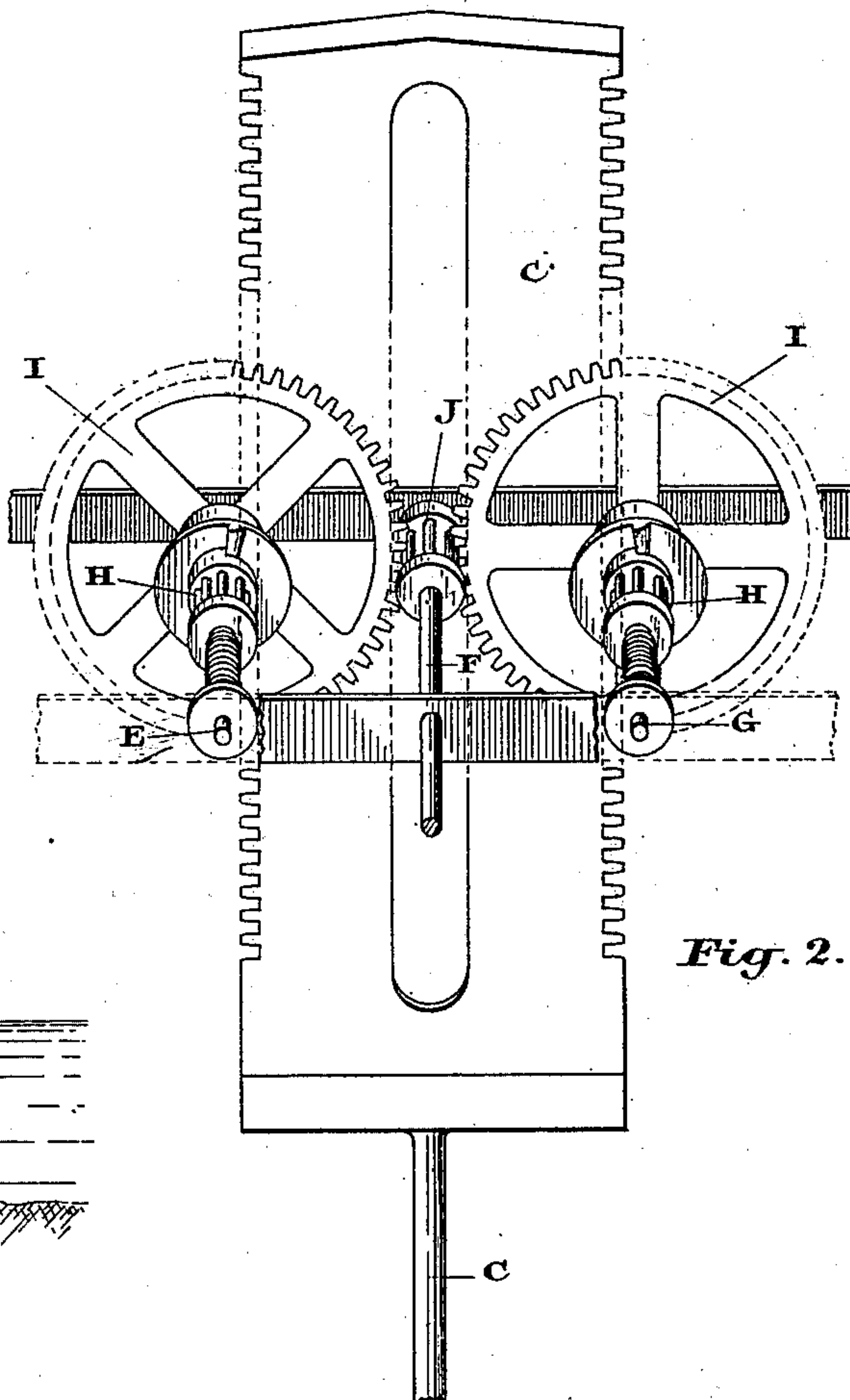


Fig. 2.

Witnesses.

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APPARATUS FOR UTILIZING THE EBB AND FLOW OF THE TIDE.

SPECIFICATION forming part of Letters Patent No. 285,251, dated September 18, 1883.

Application filed April 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, NEWTON LUTHER FORSTER, a subject of the Queen of Great Britain, residing at the township of Trafalgar, in the county of Halton, in the Province of Ontario, Dominion of Canada, have invented a certain new and useful Apparatus for Utilizing the Ebb and Flow of the Tide, of which the following is a specification.

The object of the invention is to devise simple mechanism for that class of motors in which the ebb and flow of the tide are utilized for generating a power which may be stored and given out as required for the purpose of driving other machinery; and it consists in the peculiar construction, arrangement, and operation of parts, as more fully hereinafter described and claimed.

Figure 1 is an elevation showing the cylinder in section. Fig. 2 is an enlarged detail of the gearing.

In order to utilize to the fullest extent the power created by the ebb and flow of the tide, I place my apparatus at a point where, at low tide, the float A will rest on the water, while the mechanism connected with the float is placed at such a point that at high tide the mechanism will be above the water-line.

B is a cylinder, into which the float A is inserted, being a loose fit therein, so that it may move freely without any appreciable friction. The cylinder B is open at its bottom, so that the water surrounding it may flow freely into the cylinder. The cylinder B should of course be made high enough to extend above high-water mark, and it is designed to form a support for carrying the mechanism invented by me to convert into a rotary movement the reciprocating action of the float A.

C is a piston-rod, attached to the float A and extending up through the mechanism referred to. The upper end of the rod C is formed substantially as shown, and has a rack, C', formed on each side of it, and extending a length greater than or equivalent to the distance which the rod C will be moved by the action of the float.

D is a frame, supported from the top of the cylinder B. In this frame are journaled the three spindles, E, F, and G, E and G being one on each side of the piston-rod C, while F

passes through the longitudinal slot formed in the said piston-rod.

H are two spur-pinions, journaled, respectively, on the spindles E and G. These pinions revolve loosely on their spindles, and are provided with a clutch-face, designed to engage with a corresponding clutch-face formed on the spur-wheels I, which are keyed or otherwise fastened upon the spindles E and G, the clutch on the face of the pinion journaled on the spindle E being such that it will engage with the spur-wheel on its spindle when moved in one direction, while the pinion on G has a clutch arranged to engage with the clutch on the wheel keyed to its spindle when turned in the reverse direction. Owing to this connection the upward movement of the rack C' causes one of the spur-wheels I to revolve, while the downward movement of the rack correspondingly acts upon the other spur-wheels. As these spur-wheels both gear into the spur-pinion J, both keyed to the center spindle, F, on opposite sides thereof, the said spindles will, as a consequence, be caused to move only in one direction, no matter whether the spindle be moved upwardly or downwardly. The end of the spindle F will be connected to the motor power which it is desired to actuate. For instance, it may be attached to the winding-spindle of powerful clock mechanism; or it may be directed for the purpose of winding up a weight, which would direct the power exerted in raising it to machinery used for other purposes. Owing to the connection between the piston-rod C and spindle F, the movement of the rod C either upwardly or downwardly will be directed toward turning the spindle F in one direction. Consequently the power required to raise the float will be stored in the mechanism attached to the spindle F, while the downward movement of the spindle F will continue the rotary movement of the spindle F. Consequently the power created in the rising and falling of the tide will be stored in the mechanism connected to the spindle F, and may be redirected from that mechanism for the purpose of driving machinery.

What I claim as my invention is—

1. In a device for utilizing the tides as a motor, and in combination with a weighted

piston-rod having external ratchets to operate one of two gear-wheels in whichever direction the piston reciprocates, a single pinion meshing with both such gears and operating in a slot in the piston-rod, and clutches for automatically connecting or breaking the engagement between the piston and gears, according to the direction said piston is moving, as set forth.

10 2. The combination of the cylinder B, having open bottom, the piston A, and piston-rod

C, having plate C', with external ratchets and central longitudinal slot, the gear-wheels I and pinions H, connected by clutches, which engage when the pinions are rotated in one direction, and the single pinion J, working in the slot in the plate C' and engaging both gears I, as and for the purposes set forth. 15

NEWTON LUTHER FORSTER.

Witnesses:

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