

M. D. TEMPLE.
Chain Pump.

No. 237,142.

Patented Feb. 1, 1881.

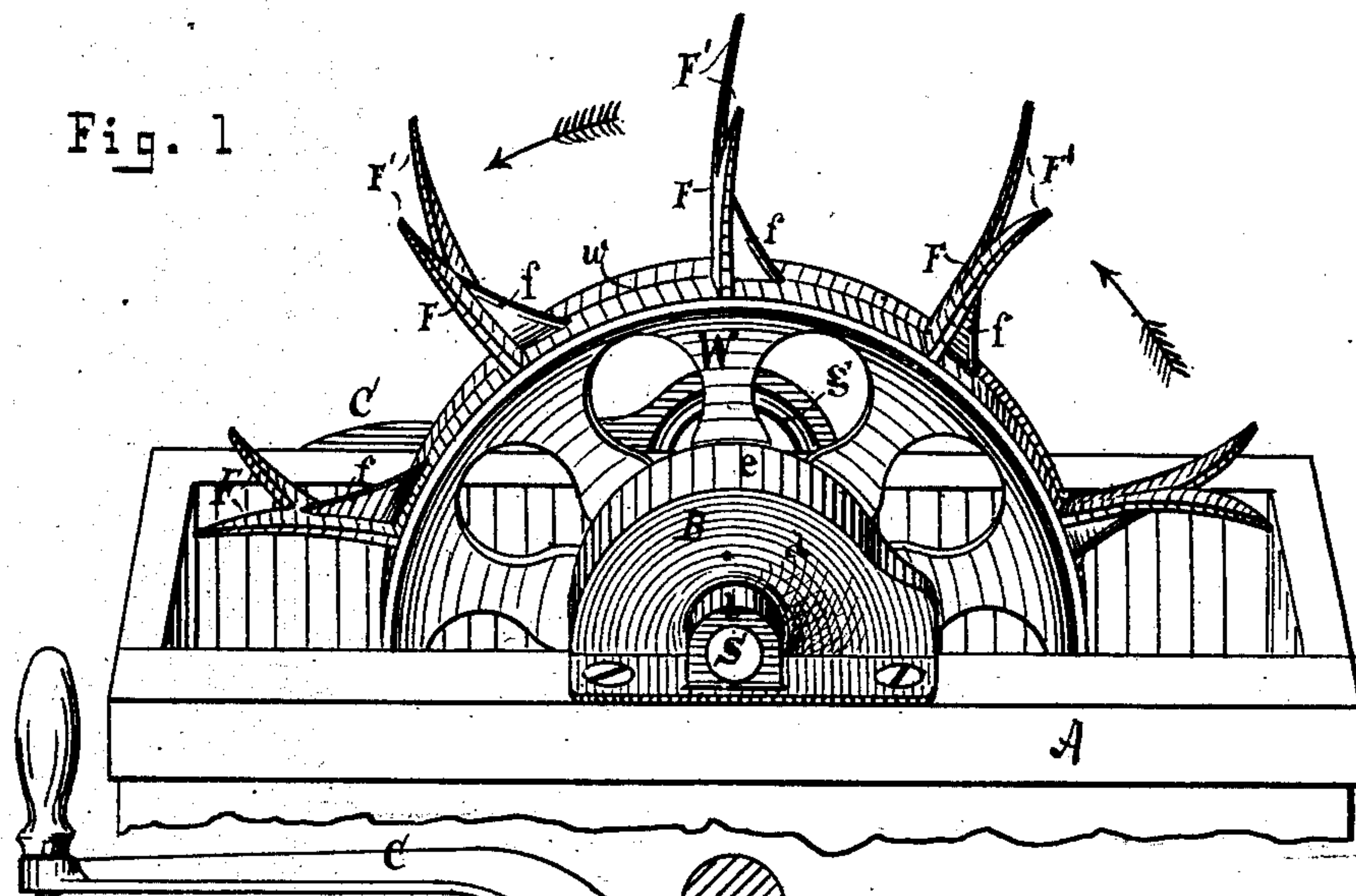


Fig. 2

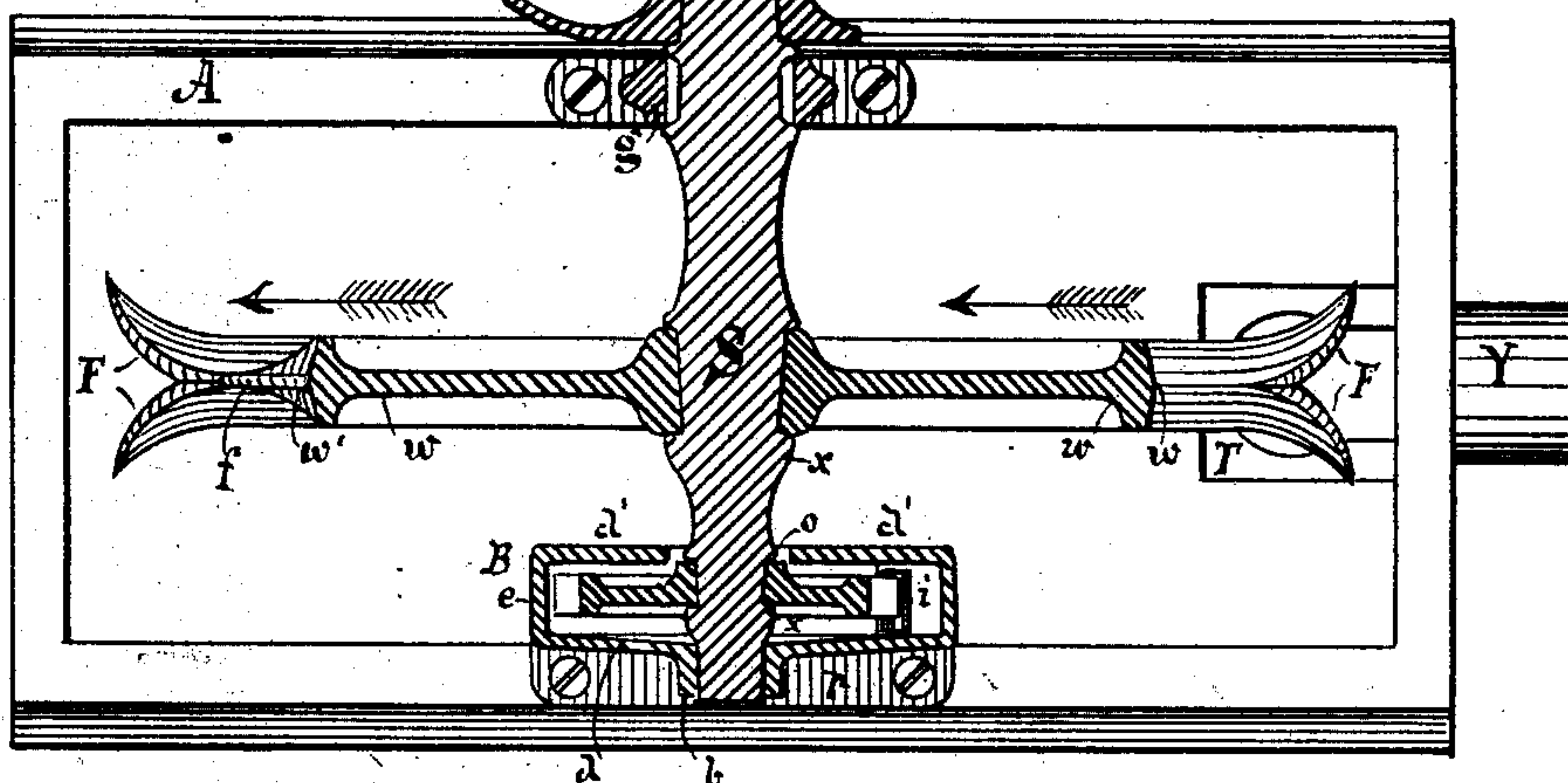


Fig. 3

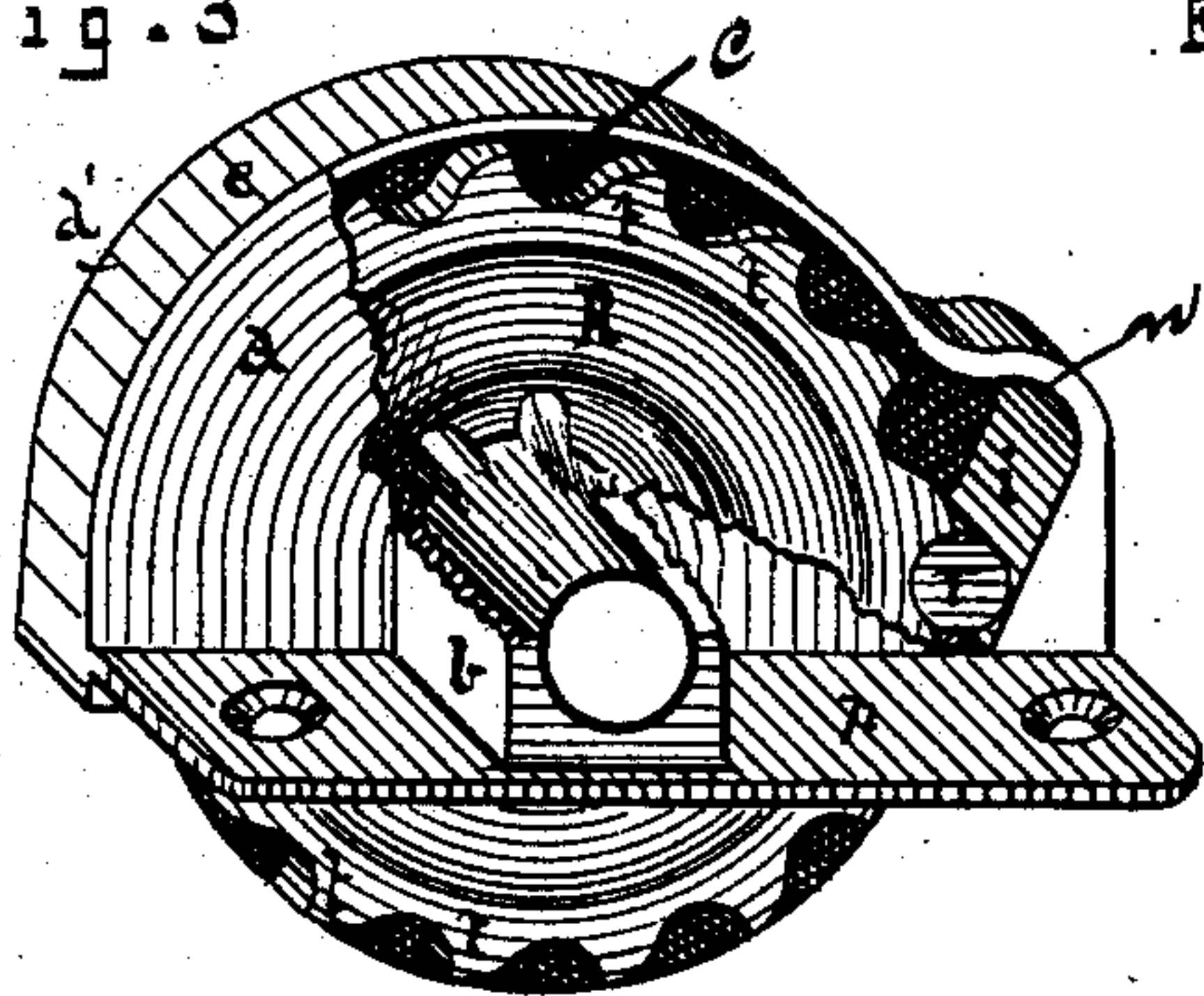


Fig. 4

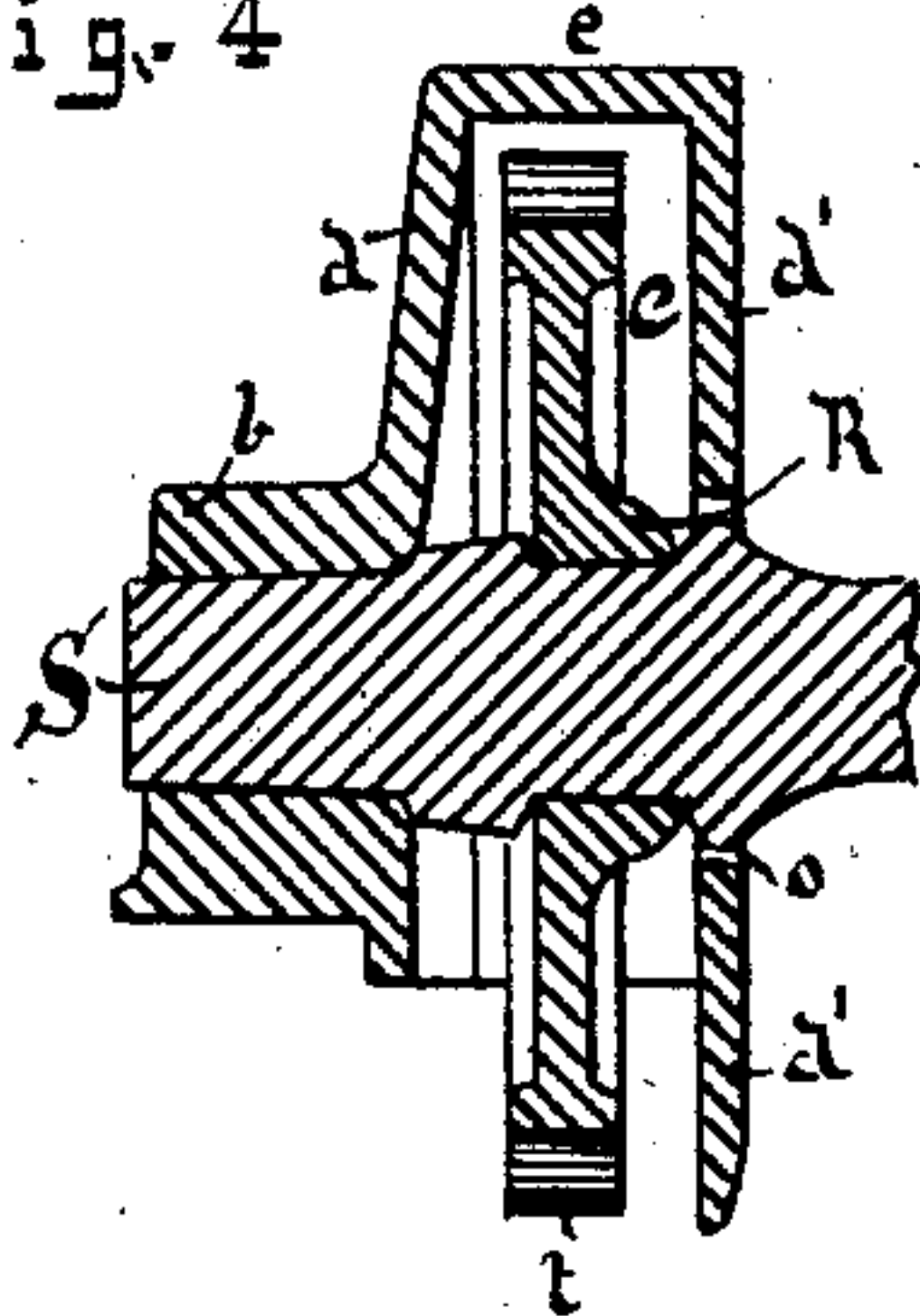


Fig. 5

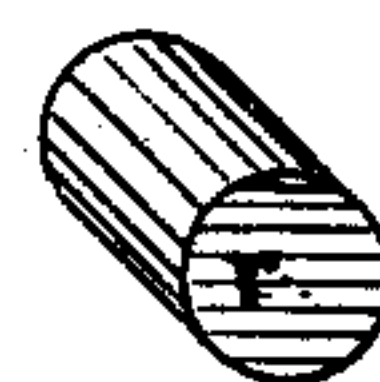
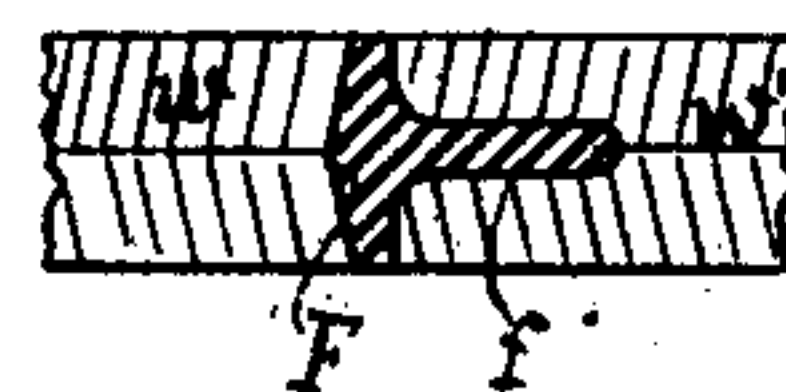


Fig. 6



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CHAIN-PUMP.

SPECIFICATION forming part of Letters Patent No. 237,142, dated February 1, 1881.

Application filed August 22, 1879.

To all whom it may concern :

Be it known that I, MORRIS D. TEMPLE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Fixtures for Endless-Chain Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

10 Figure 1 is a perspective view of my improved fixtures as they appear when attached to the pump-curb and viewed from the side opposite the crank or left side of the curb. Fig. 2 is a plan view of a horizontal section
15 through the center of the wheel-shaft, with the pump-curb in perspective. Fig. 3 is a perspective view of the ratchet-box or cover for the ratchet-wheel with a segment of one of its sides removed, showing a portion of its interior chamber and the ratchet-wheel in position
20 with its check or roller which controls the revolution of the shaft. Fig. 4 is a vertical central section of the ratchet-box, also of its wheel and shaft, taken on the line of the
25 axis of the shaft. Fig. 5 is a perspective view of the check or roller. Fig. 6 represents a cross-section of one of the forks of the chain-wheel, taken near its base.

30 The arrows indicate the direction of motion of the several parts.

Like letters of reference indicate like parts.

My invention relates to that class of machines designed to transmit motion to an endless chain provided with buckets for raising
35 water through a tube. Those in common use are defective chiefly in the ratchet and pawl, which, slow in action, permit a reverse motion of the chain of several inches before arresting it, thereby damaging and sometimes
40 destroying the rubber buckets attached to the chain. This reverse motion, caused by the weight of water in the tube, is very rapid, and by the time the pawl engages with the ratchet the momentum acquired is so great as to cause
45 a violent shock, often breaking either the pawl, forks of the wheel, or chain. In cold weather the ratchet and pawl, being unprotected from the water thrown off by the chain and buckets, become incrustated with ice, causing the pawl
50 to slip on the ratchet and permitting the chain to run back with great velocity, thus ruining

the buckets and injuring any person who may be within reach of the rapidly-revolving crank. At best the ordinary ratchet and pawl are very noisy. In my improved fixtures these
55 serious defects are all entirely overcome.

In the accompanying drawings, S represents the shaft in its right and left bearings *g* and *b*; W, the forked chain-wheel; R, the ratchet-wheel; B, the ratchet-box or housing for the
60 ratchet-wheel, and C the crank. The crank C, chain-wheel W, and ratchet-wheel R are fitted to the shaft by self-locking joints.

The ratchet-box B, cast in one piece, is formed by the plates or sides *d d'* and the
65 curved plate or rim *e e'*. One of the sides, *d'*, is nearly semicircular in form, with lateral extensions to *e'*, where the curved plate or rim *e e'* makes a descending turn. Projecting from the side *d* of the ratchet-box B is a screw-plate,
70 *p*, by which the ratchet-box B is secured to the pump-curb A. Formed upon the screw-plate *p*, and adjoining the side *d* of the ratchet-box B, is the bearing *b* for the left end of the shaft S. The inner side, *d d'*, of the ratchet-box B
75 is perforated at *o*, to allow the end of the shaft S to pass through it to its bearing *b*, and is extended below the shaft sufficiently to shield the ratchet-wheel from the water thrown off by the chain and buckets. The ratchet-box is
80 left open on its lower edge, and through the opening so formed the ratchet-wheel is passed, after which it is fastened upon its shaft, the roller *r* being first passed into the box at the same time with its wheel. The interior cham-
85 ber of the ratchet-box B nearly conforms in shape to its exterior, having the bay or recess *n* formed by the lateral extension of the sides *d d'*, a portion of the curved plate or rim *e e'*, and the inclined plate *i*. The plate *i* is in a
90 plane oblique to the plane of the horizon, and serves as an inclined track for the cylindrical roller *r* to move upon. Within the interior chamber, *c*, of the ratchet-box revolves the ratchet-wheel on the shaft S, to which it is
95 firmly secured. The periphery of the ratchet-wheel is formed into hook-shaped teeth *t*, all similarly formed, having each a concave side to fit over and clutch the cylindrical roller *r*, and a convex side so formed as to easily move
100 the roller up the inclined track out of its way. The roller *r* is made of metal turned and cut

of proper size to roll freely on the inclined plane *i*, inclosed by the walls *d* *d'* and *c'* and ratchet-wheel. It constantly rolls down the inclined plane, and rests against it and the ratchet-wheel.

When the several parts of my improved fixture are set together and placed in position, it is clearly seen that the roller *r* offers no resistance to the revolution of the shaft *S* and its attachments in the proper direction, being successively met and rolled up the inclined track by the convex faces of the teeth *t* of the ratchet-wheel.

It is further observed that the force of gravity constantly draws the roller back down the inclined plane as far as the ratchet-wheel will permit, and that the instant the revolution of the shaft ceases or a reverse motion begins it blocks the ratchet-wheel by rolling under the concave face or edge of one of its teeth, thereby preventing a reverse motion. The roller, being small and light, makes but little noise, and may be made perfectly noiseless by covering it with rubber. The ratchet with its roller is thus protected from water and consequent ice in winter.

The improvement of the chain-wheel is in the form of its forks, each of which consists of a curved plate, *F*, provided with curved prongs *F'* and the brace *f*, as shown, the brace *f* greatly strengthening the plate *F*, and thereby preventing it from breaking off, as is apt to be the case. A cross-section of the parts cut at the base near the rim *W* is shown in Fig. 6.

What I claim is—

1. In chain-pump fixtures, the ratchet-box *B*, having the interior chamber, *c*, recess *n*, inclined track *i*, shaft-bearing *b*, and screw-plate *p*.

2. A ratchet-wheel provided with teeth *t*, the longer surfaces of which are convex and the shorter concave, in combination with a recess, *n*, provided with an inclined track, *i*, and loose roller, all combined and operated as described.

3. A ratchet-wheel provided with a box or housing open on one side, and provided with

a chamber or recess, *n*, having an inclined track, *i*, in combination with a roller, *r*, for the purpose shown and described.

4. The housing *B* of a ratchet-wheel, provided with side *d*, to which is attached a screw-plate, *p*, provided with a shaft-bearing, and side *d'*, provided with opening *o*, recess *n*, having inclined plane *i*, and opening on the under side thereof, as herein described.

5. The housing *B* of a ratchet-wheel, provided with side *d*, having a screw-plate, *p*, and shaft-bearing *b*, side *d'*, extending to or beyond the lower edge of the ratchet-wheel, and provided with the opening *o*, constructed as and for the purpose specified.

6. The combination of the ratchet-box *B*, provided with the upwardly-inclined track *i*, ratchet-wheel *R*, roller *r*, and shaft *s*, substantially as and for the purpose specified.

7. The housing *B* of a ratchet-wheel, provided with chamber *n*, having inclined track *i*, side *d*, provided with screw-plate *p* and shaft-bearing *b*, side *d'*, provided with opening *o*, the side *d'* extending beyond the lower edge of the ratchet-wheel, as shown and described.

8. The housing of a ratchet-wheel provided with sides *d* and *d'*, extending beyond the periphery of the ratchet-wheel and covered by a rim, *c*, provided with a recess, *n*, and inclined track *i*, one of said sides being provided with an opening, *o*, and the other with a plate, *p*, and shaft-bearing *b*, substantially as and for the purpose specified.

9. A chain-pump wheel provided with forks *F* *F'*, braced by braces *f*, placed upon the rear side of the part *F*, substantially as and for the purpose specified.

10. In chain-pump fixtures, the combination, with the chain-pump wheel *W*, provided with forks *F*, substantially as described, of the shaft *S*, ratchet-wheel *R*, ratchet-box *B*, provided with track *i*, and roller *r*, constructed substantially as shown and described.

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Witnesses:

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