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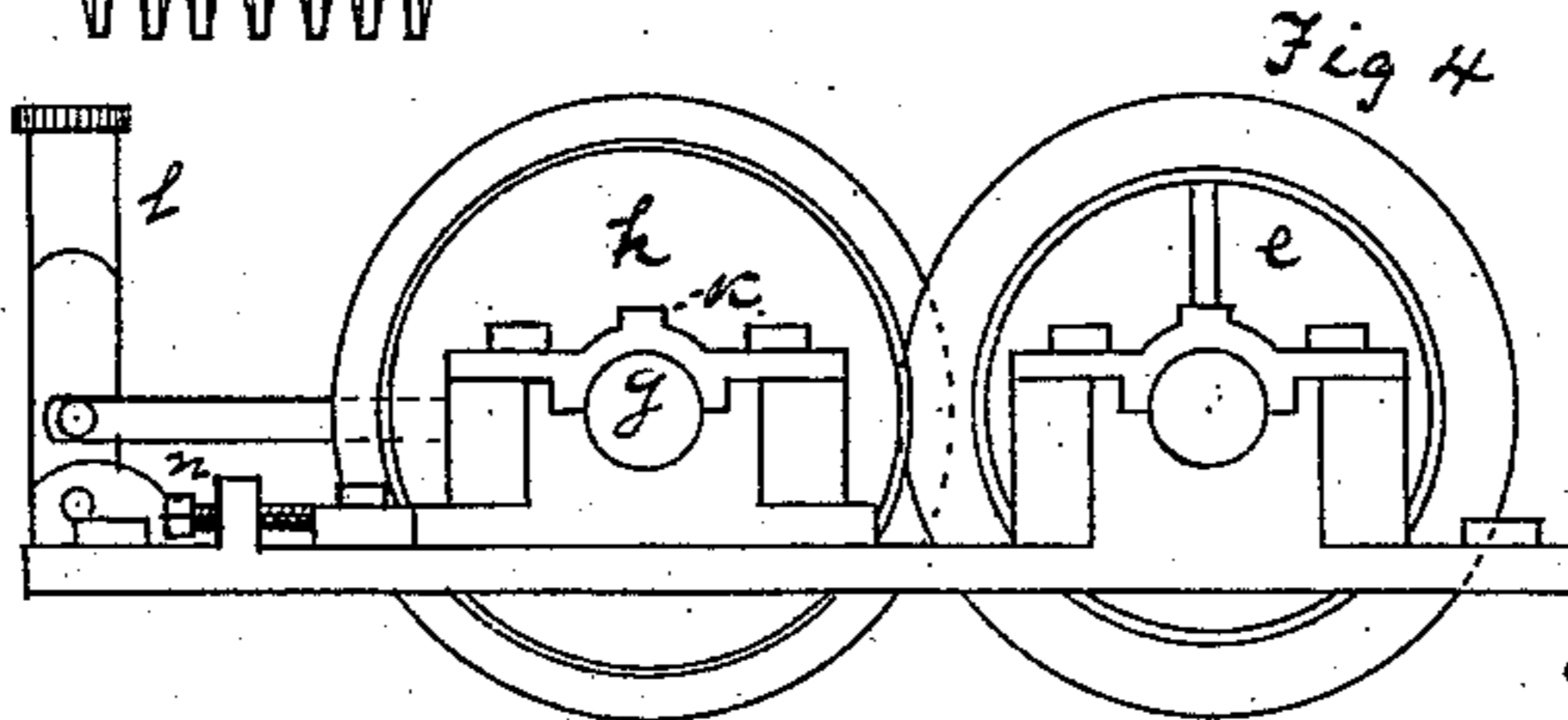
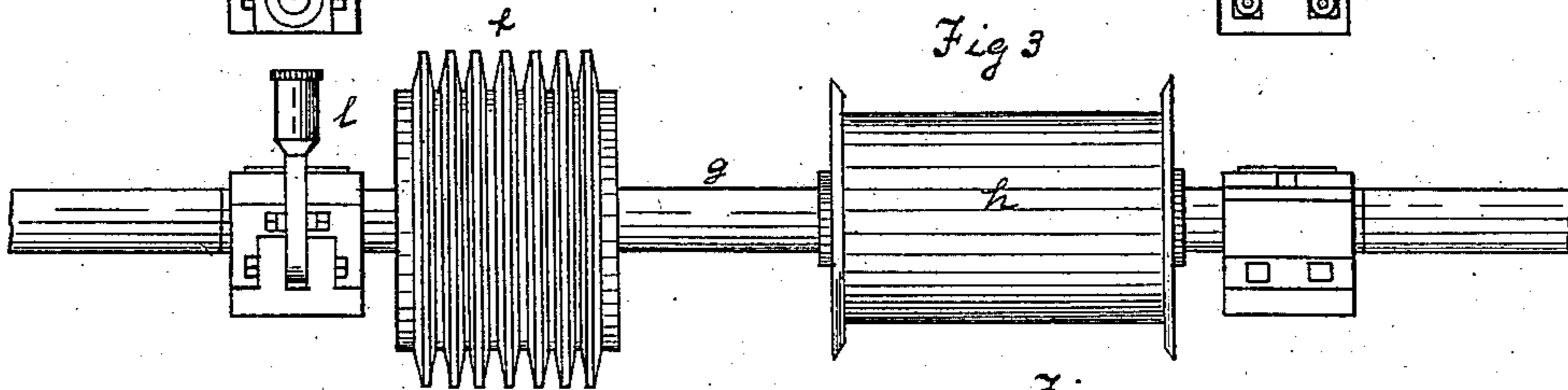
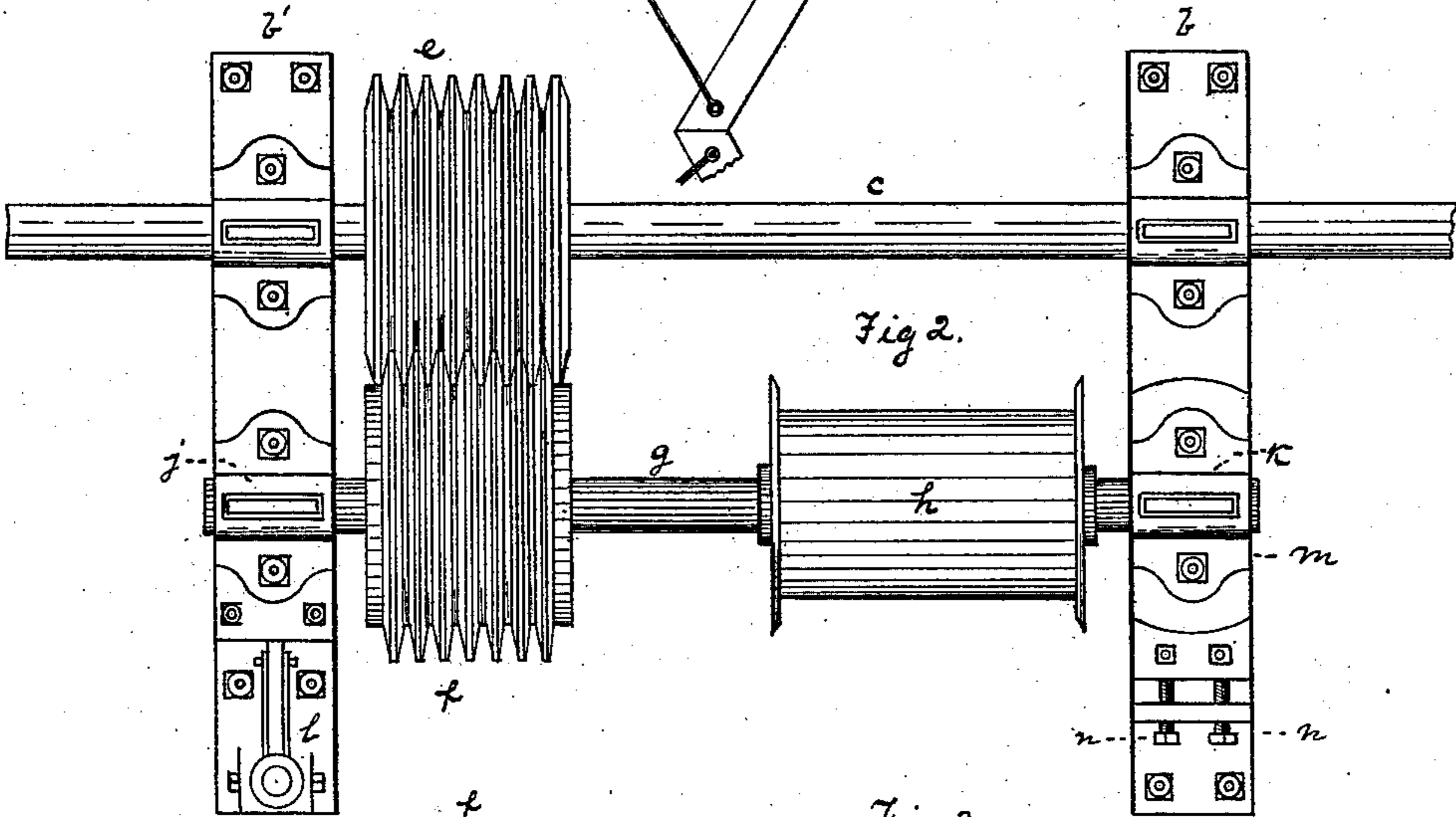
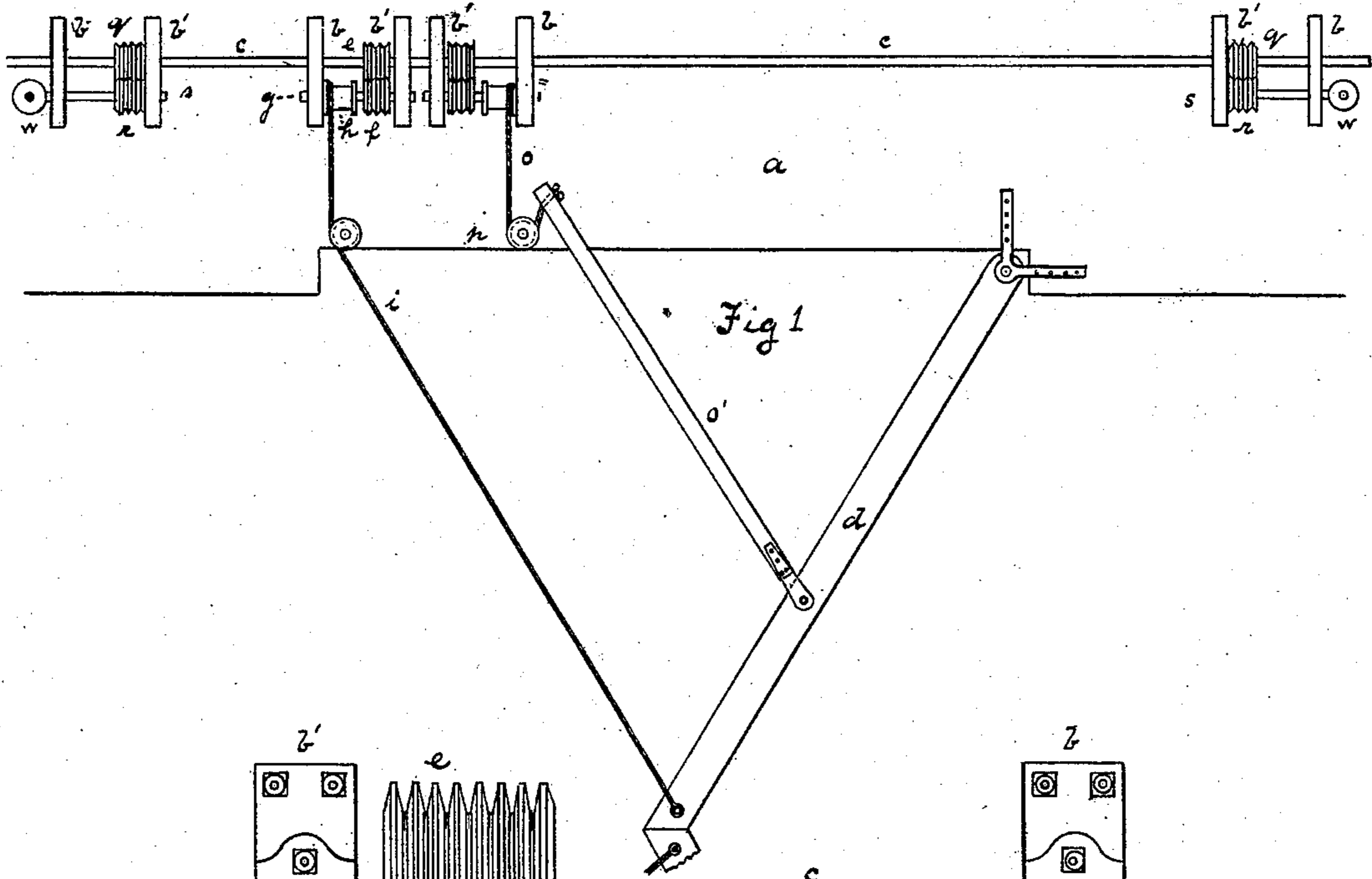
2 Sheets—Sheet 1.

T. H. POLLOCK.

APPARATUS FOR OPENING AND CLOSING LOCK GATES.

No. 287,575.

Patented Oct. 30, 1883.



Witnesses
J. K. Smith
R. C. Wrenshall

THETOR
Thomas H. Pollock
by his attorneys
Bakerwell & Kerr

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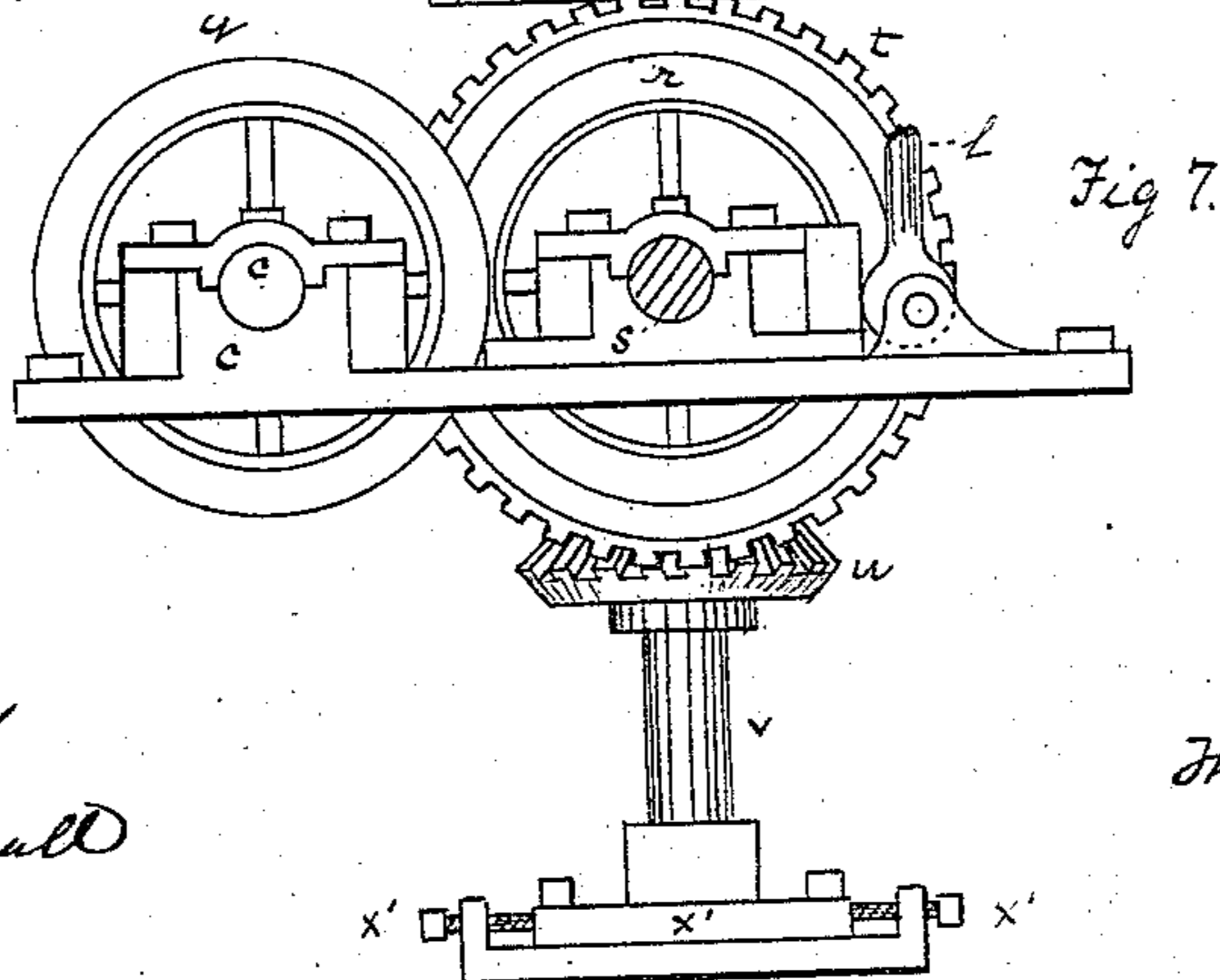
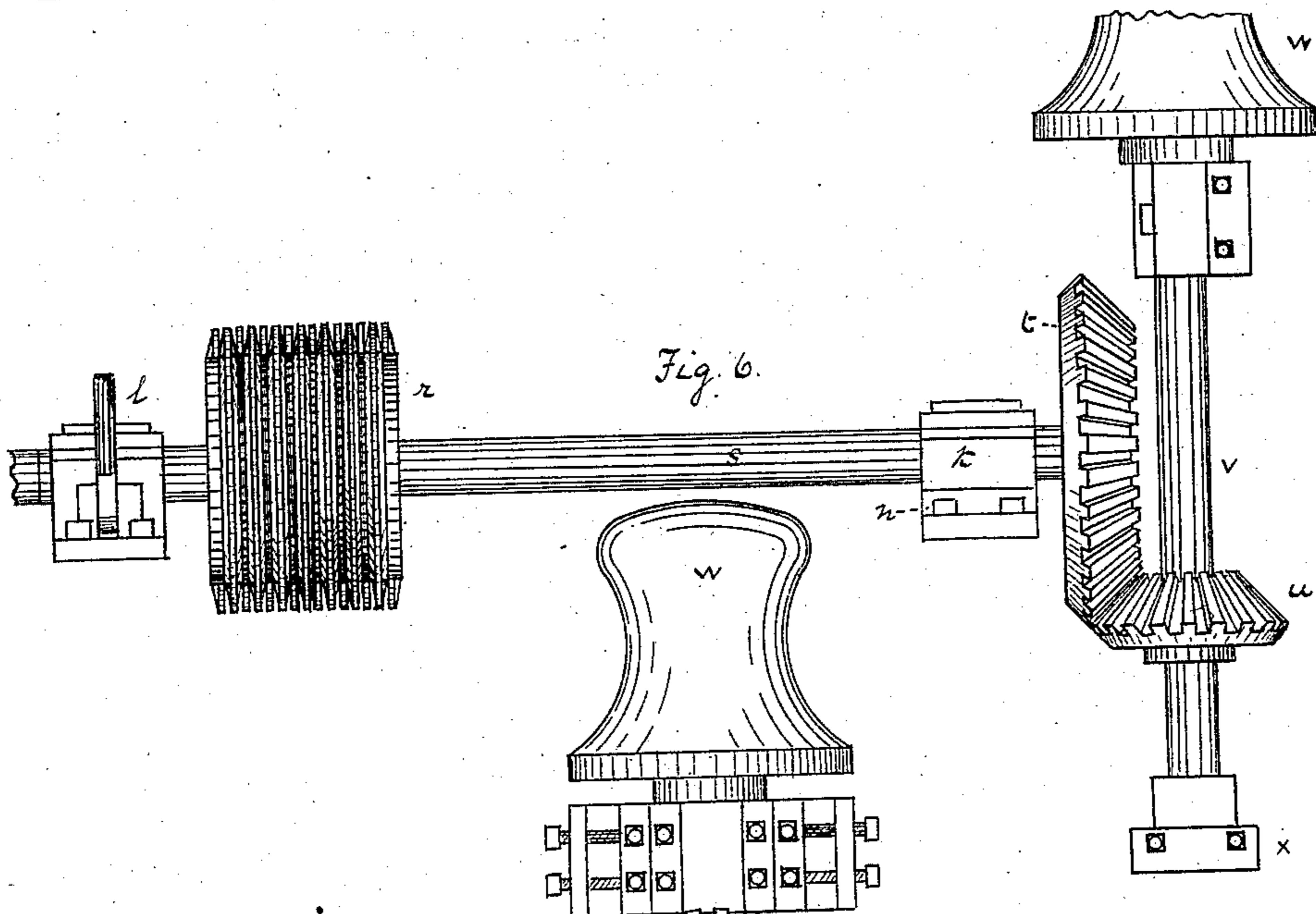
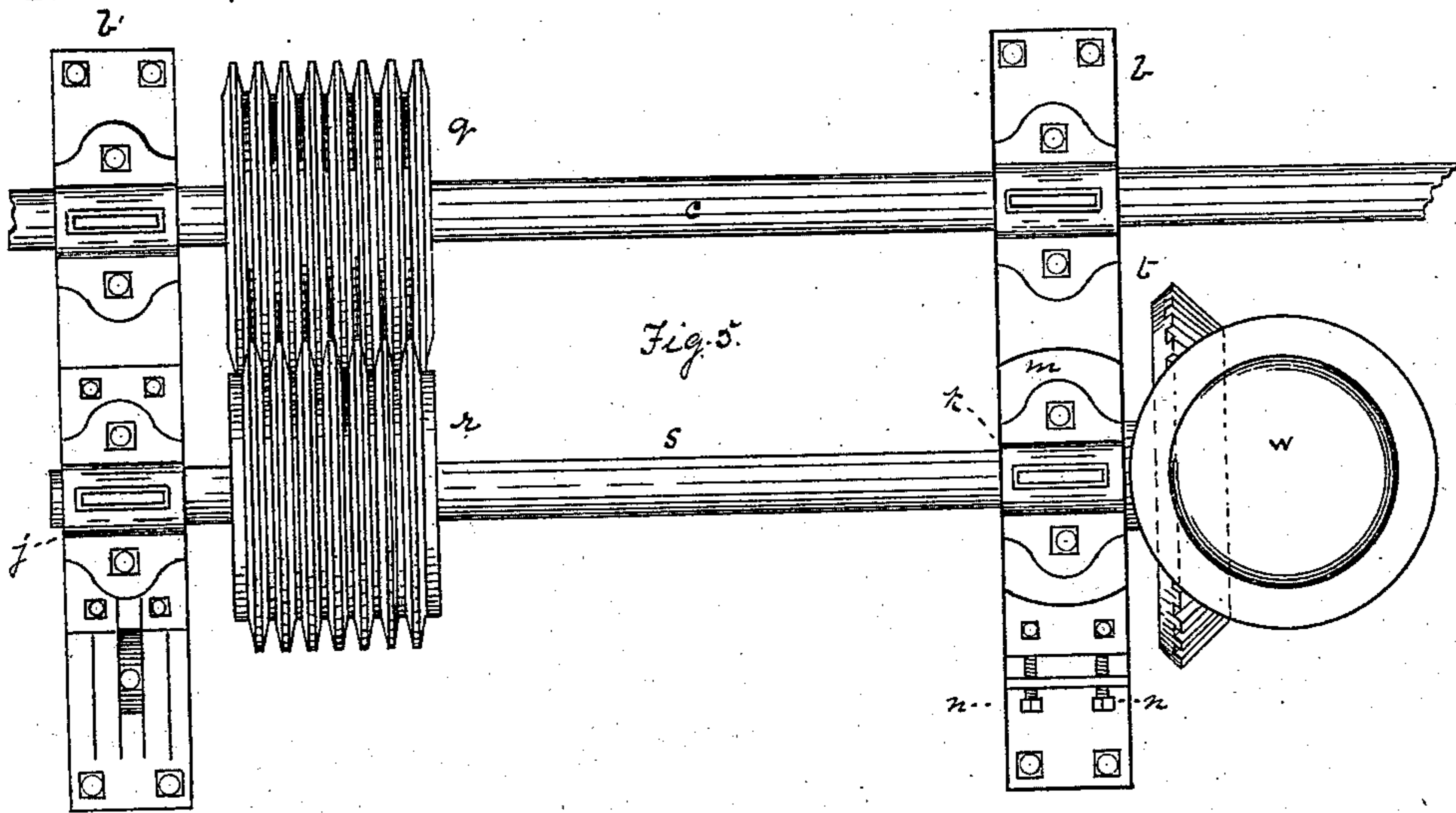
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Inventor.

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UNITED STATES PATENT OFFICE.

THOMAS H. POLLOCK, OF MONONGAHELA CITY, PENNSYLVANIA.

APPARATUS FOR OPENING AND CLOSING LOCK-GATES.

SPECIFICATION forming part of Letters Patent No. 287,575, dated October 10, 1883.

Application filed May 19, 1883 (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. POLLOCK, of Monongahela City, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Opening and Closing Lock-Gates; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the construction and arrangement of a system of gearing, and its combination with a lock and its swinging gate, whereby the gate may be opened or closed, and boats and barges conducted through the lock by continuously-applied power without danger of injury to the lock or passing barge from obstructions; and to this end it consists, generally, of the combination, with the swinging lock-gate, of a pull-rope and push-spar connected to the power-shaft by shifting friction-gearing; and in the combination, with the main power-shaft by means of interposed shifting friction-gearing, of a capstan or capstans, all as will hereinafter more fully appear.

I will now describe my invention, so that others skilled in the art may manufacture and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of my improved apparatus as applied to a lock-gate: Fig. 2 is a plan view of the friction-wheels, drum, and shafting. Fig. 3 is a side elevation of the same. Fig. 4 is an end elevation of the same. Fig. 5 is a plan view of the friction-wheels, capstan, and shafting. Fig. 6 is a side elevation of the same, and Fig. 7 is an end elevation of the same.

Like letters of reference indicate like parts wherever they occur.

The devices employed by me and forming my invention are a main or driving shaft mounted in suitable pillow-block and extending along the wall of the lock; friction-rollers keyed to the main shaft, which gear into and operate other friction-rollers which operate a drum by means of which and a line extending from the gate to the drum the gate is opened; also, a drum by means of which and a line and spar the gate is closed, and also capstans at each end of the lock-wall, by

means of which boats and barges may be drawn through the lock.

In the drawings, *a* represents the lock-wall, upon which, at suitable distances apart, are pillow-blocks *b b'*, which support the horizontal revolving shaft *c*, which is connected with and operated by a steam-engine, water-power, or other suitable means. Keyed to this main shaft *c*, at a point forward of the lock-gate *d*, is a friction-roller, *e*, which gears into and operates another friction-roller, *f*, keyed to shaft *g*, which extends between the pillow-blocks *b b'*, parallel with the shaft *a*. These friction-rollers are preferably formed of cast-iron cylinders, upon which are turned alternate V-shaped ridges and grooves, the ridges of one cylinder fitting into the grooves of the other.

Keyed to the shaft *g*, between the two pillow-blocks *b b'*, is a drum, *h*, which revolves with the shaft. From this drum a line, *i*, extends to the end of the gate *d*. The short shaft *g* is journaled in two boxes, *j k*, attached movably to the bed-plates on the pillow-blocks, the box *j* being movable to and fro in the direction of the length of the bed-plate and being operated by a lever, *l*, while the box *k* turns on a swivel, *m*, which is adjusted laterally by means of the set-screws *n*, the purpose of this being to enable the friction-roller *f* to be thrown into gear with the roller *e* and relieved therefrom.

Mounted on pillow-blocks, near to the pillow-blocks described, is a similar arrangement of friction-rolls, lever, and drum, from which drum a line, *o*, passes over a block, *p*, secured to the lock-wall, and is attached to the end of a spar, *o'*, the other end of which is hinged to the lock-gate. This spar extends beyond the block *p*, so that when the line is wound on the drum the free end of the spar is drawn toward the block and the gate is pushed shut.

At each end of the lock-wall, keyed to the main shaft *a*, is a friction-roller, *q*, which meshes into a friction-roller, *r*, keyed to a shaft, *s*, which is journaled in movable boxes provided with a lever and set-screws similar to those already described. At the end of the shaft *s*, outside of the pillow-block, is a crown or miter wheel, *t*, which gears into another miter-wheel, *u*, keyed to the vertical shaft *v*. Keyed to the

upper portion of the shaft *v* is a capstan, *w*. The lower end of this vertical shaft *v* rests in an adjustable step, *x*, provided with set-screws *x'*, the purpose of which is to adjust the shaft *v* to the crown-wheel *t* as the horizontal shaft *s* and friction-roller *r* are adjusted to the friction-roller *q* on the main shaft *a*.

The operation of these devices is as follows: Power being applied to the main shaft *c*, in order to open the gates of the lock, the friction-roller *f* is brought in contact with the friction-roller *e* on the main shaft *c* by means of the lever *l*, and motion is thereby imparted to the shaft *g* and drum *h*. The line passing from the drum to the gate is thereby wound upon the drum and the gate is drawn open. When the gate has been opened, the friction-roller *f* is thrown out of gear and the shaft *g* and drum *h* cease to revolve. The boat or barge may then be drawn into the lock by a line extending from the boat to the capstan *w*, motion being imparted thereto in a like manner by throwing the friction-roller *r* in the shaft *s* into gear with the friction-roller *q* on the main shaft *c*. In order to close the gate, the friction-roller is thrown into gear with its corresponding friction-roller on the main shaft, and the line *o*, being wound on the drum, draws the free end of the spar *o'* toward the block *p*, thereby closing the gate.

The apparatus described is situated on both walls of the lock, so as to furnish an opening and closing device to each of the four gates.

Should an obstruction be met by the gates in opening or closing, or by a boat or barge entering or leaving the lock in the manner described, the friction-rollers will slip one within the other, and injury to the gate, boat, or apparatus is thereby prevented.

The different friction-rollers and corresponding shafts and drums or capstans may be situ-

ated at such points along the main shaft as are found to be most convenient.

I do not desire to claim, broadly, as my invention the opening or closing of lock-gates by means of lines, spars, and capstans; nor do I claim the grooved friction-rollers as a new device; but,

Having thus described my invention, what I desire to claim and secure by Letters Patent is—

1. The combination, with a lock and its swinging gate, of a pull-rope and a push-spar connected to the gate, a power-shaft, and interposed shifting friction-gearing for actuating the pull-rope and push-spar from the power-shaft, substantially as and for the purposes specified.

2. In a system for actuating lock-gates and barges within the lock, the combination, with the lock and its swinging gate, of a main power-shaft, a capstan, a pull-rope and push-spar connected with the lock-gate, and shifting friction-gearing interposed between the capstan, the pull-rope, the push-spar, and the main power-shaft, substantially as and for the purposes specified.

3. The combination, with the swinging lock-gate, of the pull-rope provided with a drum and shifting friction-gearing, the push-spar provided with a line, fulcrum-pulley, drum, and shifting friction-gearing, and the main power-shaft arranged on the lock to apply power to pull-rope and push-spar, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand this 17th day of May, A. D. 1883.

THOMAS H. POLLOCK.

Witnesses:

W. B. CORWIN,
JNO. K. SMITH.