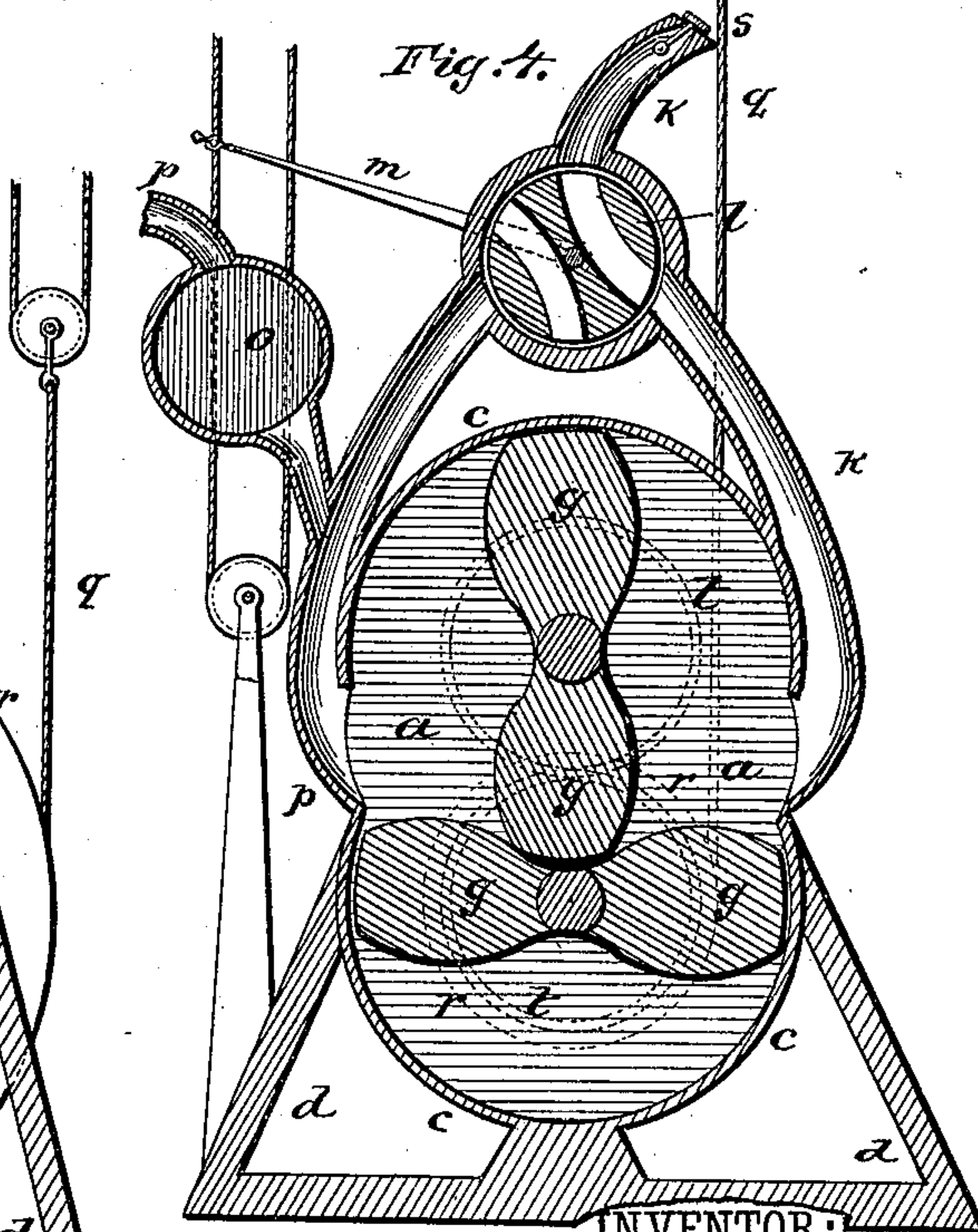
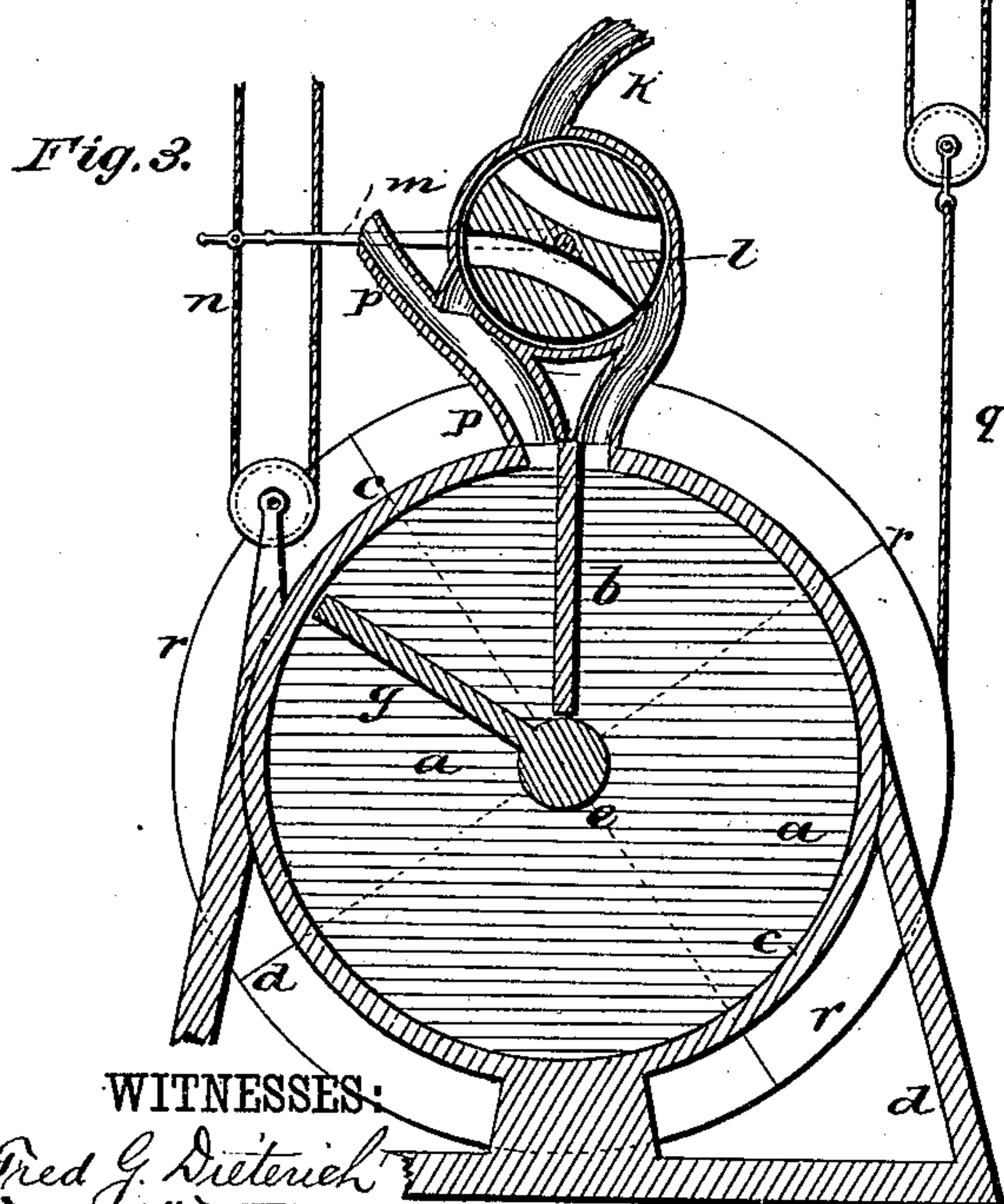
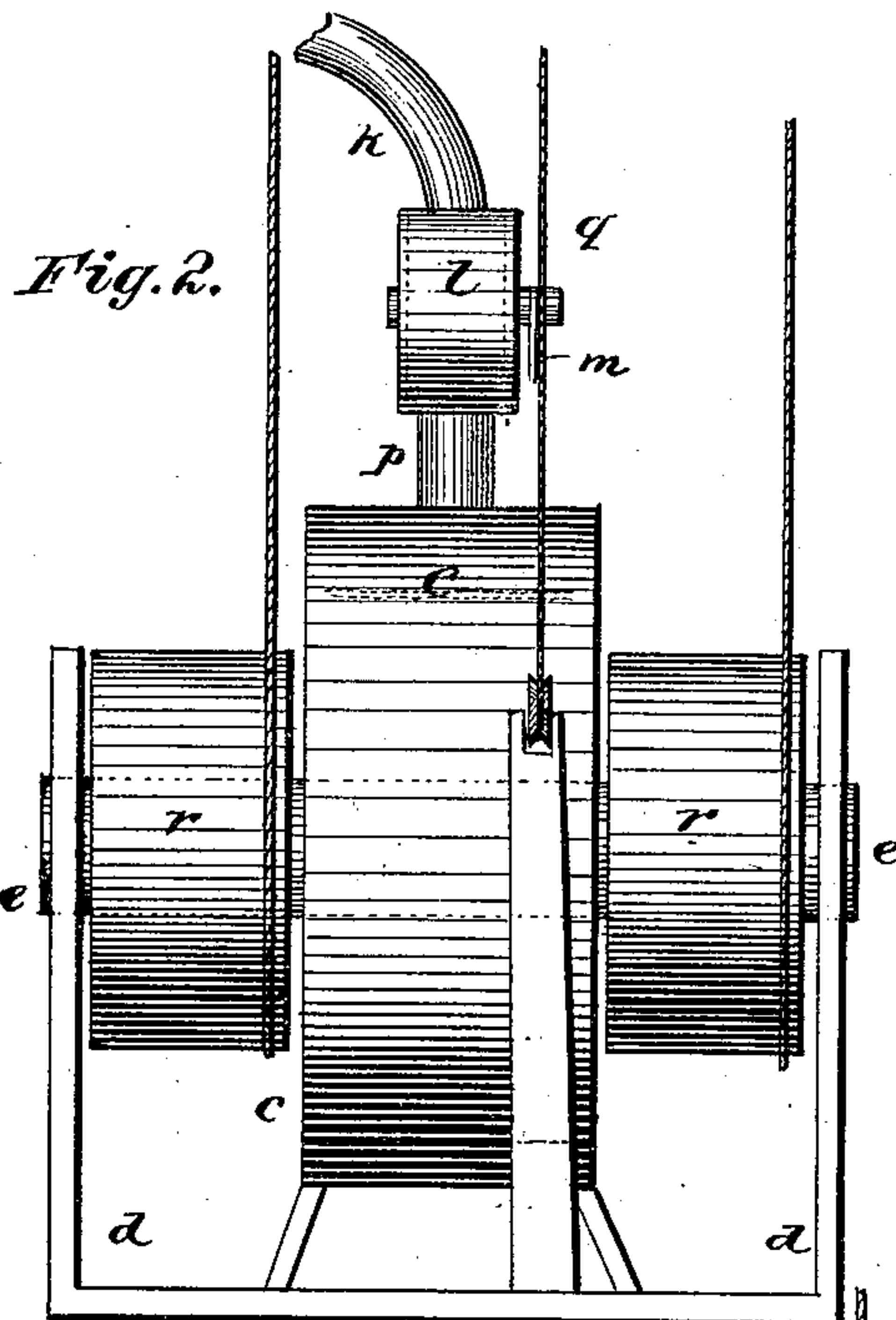
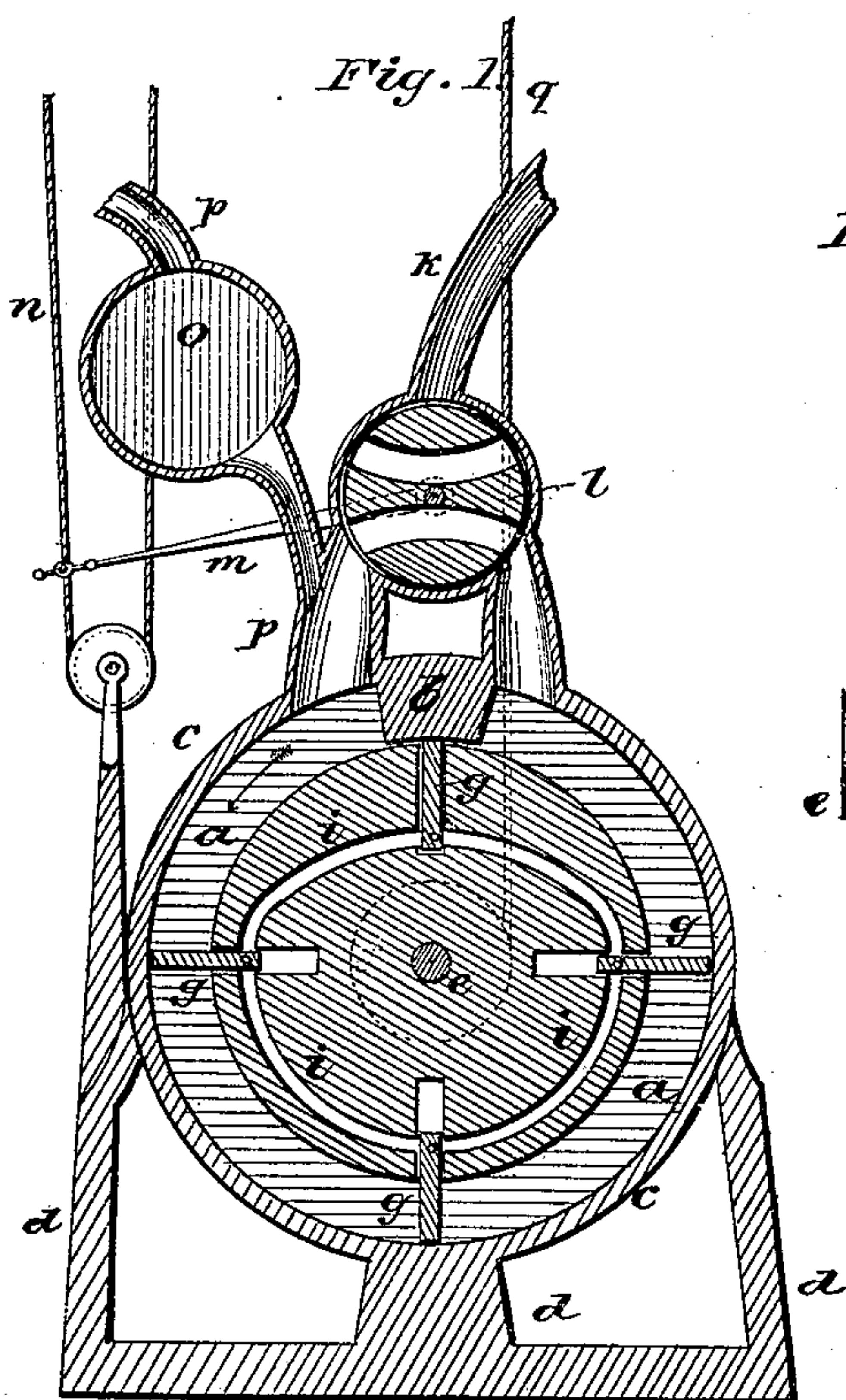


(No Model.)

C. T. WIDSTRAND.
HYDRAULIC ELEVATOR.

No. 253,799.

Patented Feb. 14, 1882.



WITNESSES:
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UNITED STATES PATENT OFFICE.

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HYDRAULIC ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 253,799, dated February 14, 1882.

Application filed April 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. WIDSTRAND, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Hydraulic Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention consists in the adaptation of a rotary engine, pressure-wheel, or rotary pump for operating elevators by means of water-pressure, the principal object being to secure a more compact and less cumbrous form of apparatus than that now commonly employed.

In the accompanying drawings, Figure 1 is a sectional elevation of a rotary engine with indrawing pistons adapted for operating an elevator; Fig. 2, a front exterior view of the same, and Figs. 3 and 4 are similar adaptations of other forms of rotary engines.

In Fig. 1, *a* is the hollow annular cylinder; *b*, the abutment; *c*, its outer rim; *d*, the frame and supports solidly fixed to the floor; *e*, the shaft; *g*, the pistons; *i*, an eccentric groove on the inner sides of the cylinder *a* for regulating their movement. *k* is the inlet-pipe, through which water under pressure is introduced upon one side of the pistons; *l*, the valve connected with said pipe to regulate the flow of the water, and operated by means of its arm *m*, which is attached to the pulling-rope *n*. *o* is a small reservoir connected with the escape-pipe *p*, *q* being the hoisting-rope, working on the shaft *e*, or a drum, *r*, rigidly fixed thereon, and passing over a pulley (not shown) at the top of the hoist.

Fig. 1 shows the position of the valve *l* when the cab is descending. In this case, if the cylinder is not already full of water, the deficiency is to be supplied by admitting a portion of that contained in the reservoir *o* into the cylinder by means of the waste-pipe *p*. The cylinder then being full, and the port of the valve *l* being in a position to form a means of communication between the opposite sides of the cylinder, the weight of the cab will be suf-

ficient to cause a backward circulation of the water from the cylinder through the port in the valve and back into the cylinder again; and by regulating the size of the port by the proper adjustment of the valve *l* by means of the rope *n*, the speed of the descent of the cab can be controlled as desired, or the cab brought to a stand at any point of elevation by closing the port of the valve, as shown in Fig. 3, since the water can no longer circulate when the port is closed, and consequently the pistons will be held at any desired position without the additional use of brakes, for the purpose of preventing the water from backing up into the supply-pipe in case of attempting to raise the cab with too light pressure or too heavy a load.

The reservoir *o* is not needed in practice, and is only provided to make up for any possible loss of water from any cause whatever.

In Fig. 3, which shows a rotary pump capable of making but one revolution, the valve *l* is shown in the position it occupies when the cab is at rest, the orifice for the escape of the water being completely closed.

In Fig. 4, which shows a rotary pump or engine having two rotating intermeshing pistons, the valve is shown in the position it occupies when the cab is ascending.

For operating the elevator the water may be obtained either from public water-works, where such exist, or by means of a pumping-engine, the throttle-valve being connected with the pulling-cord, so that the engine shall run only when the cab is ascending.

Having thus described the nature of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with an elevator, of a suitable hydraulic rotary engine, pressure-wheel, or pump having an inlet-pipe leading to one side of the pistons and an outlet-pipe leading from the opposite side thereof, a reservoir communicating with the outlet-pipe, and an induction-valve located between said pipes, and which is adapted to connect them with each other, substantially as shown and described, whereby the cylinder may be kept full of water, and the descent of the cab regulated

by the free or retarded circulation of the water through the port of the said induction-valve, as set forth.

2. The combination, with an elevator, of a
5 hydraulic rotary engine, pressure-wheel, or pump having valve *l*, provided with arm *m* and rope *n*, inlet-pipe *k*, having check-valve

s, escape-pipe *p*, and reservoir *o*, and hoisting-rope *q*, substantially as shown and described.

CHARLES THEODORE WIDSTRAND.

Witnesses:

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