

(No Model.)

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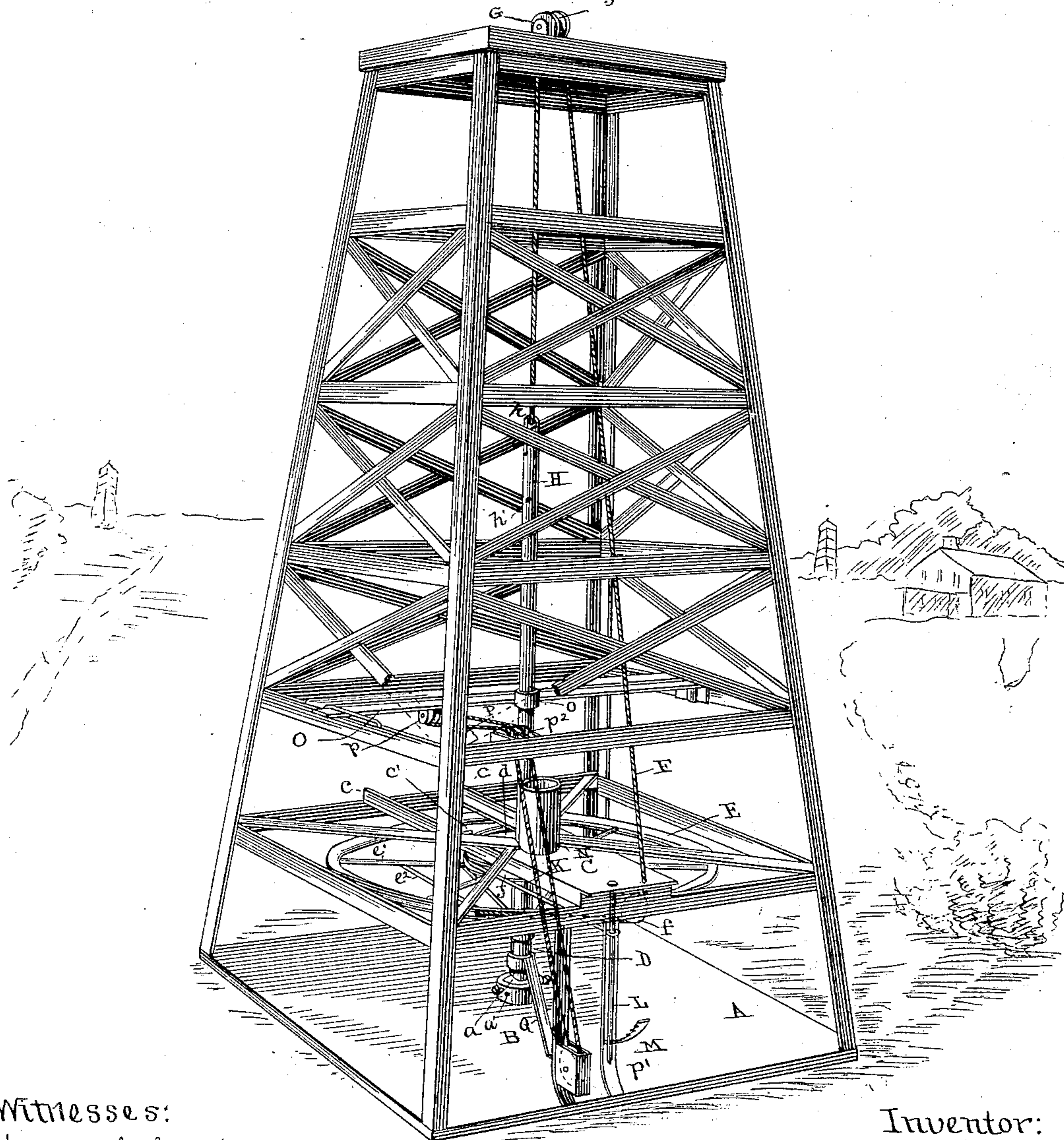
A. W. SWIFT.

ELEVATING APPARATUS FOR WELLS.

No. 375,717.

Patented Dec. 27, 1887.

Fig. 1.



Witnesses:

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Inventor:

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(No Model.)

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Fig. 2.

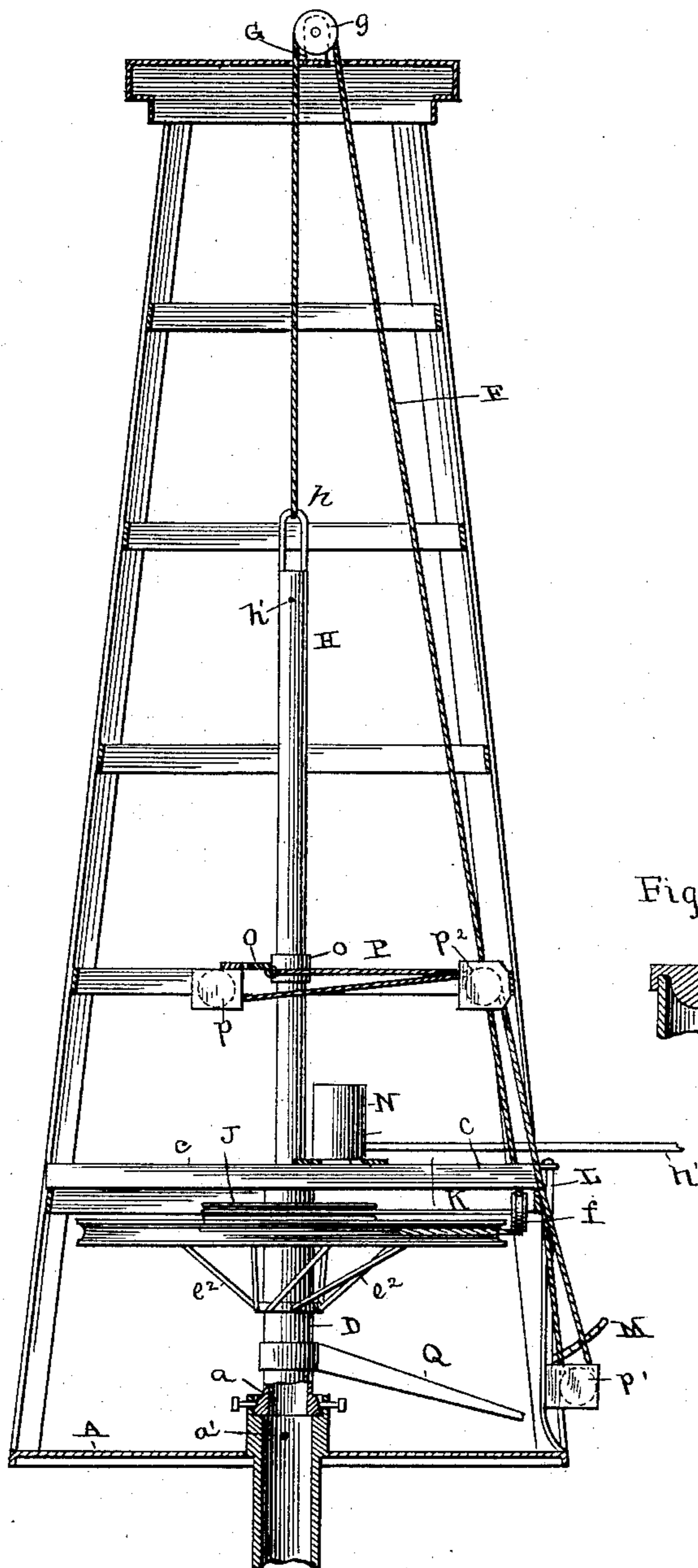
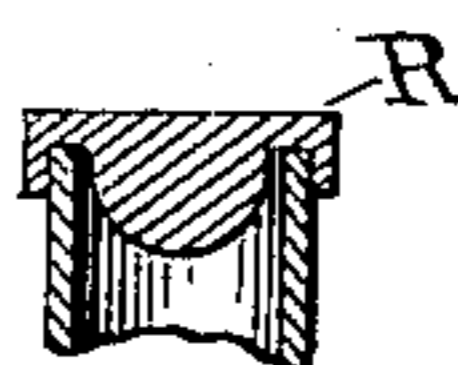


Fig. 6.



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Fig. 3.

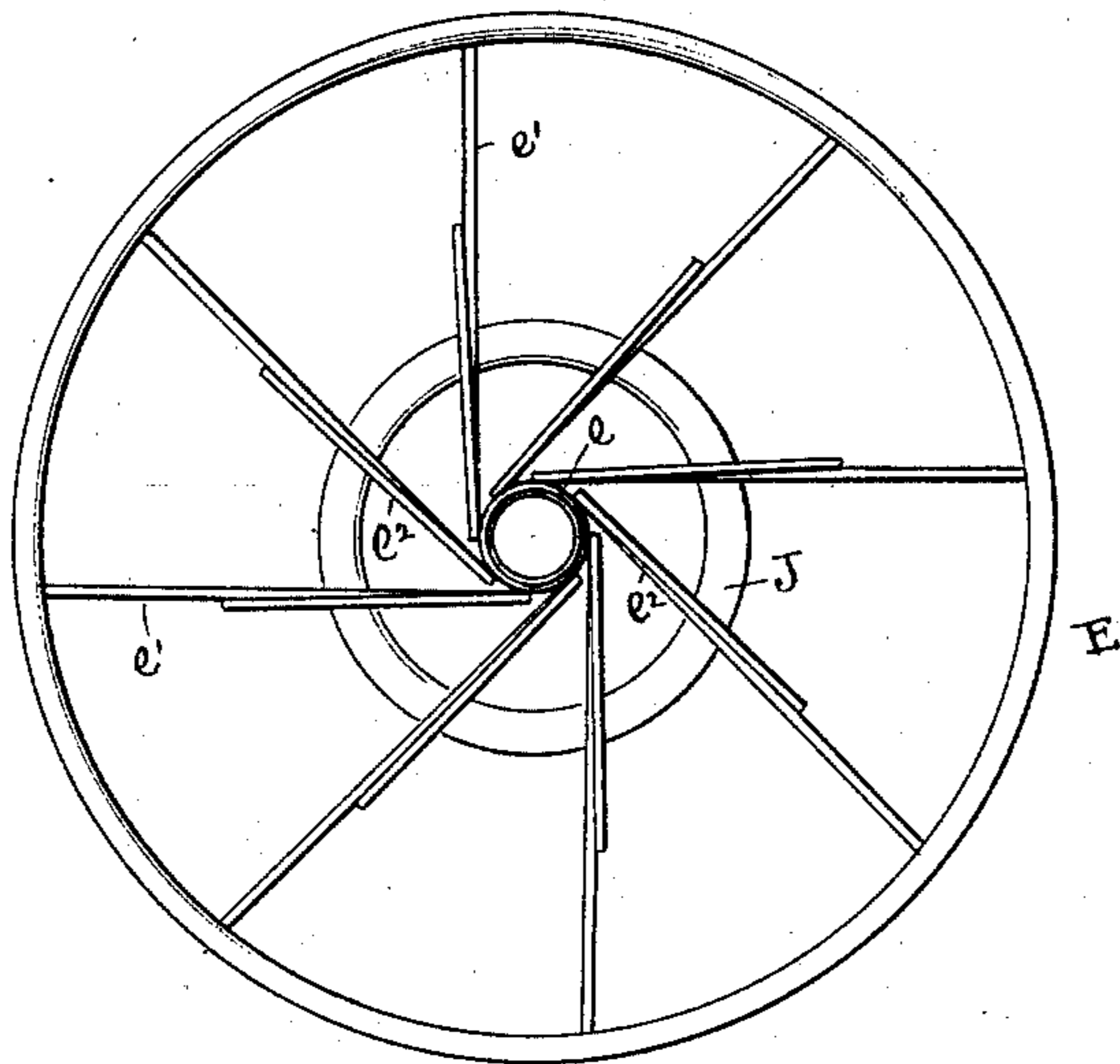


Fig. 4.

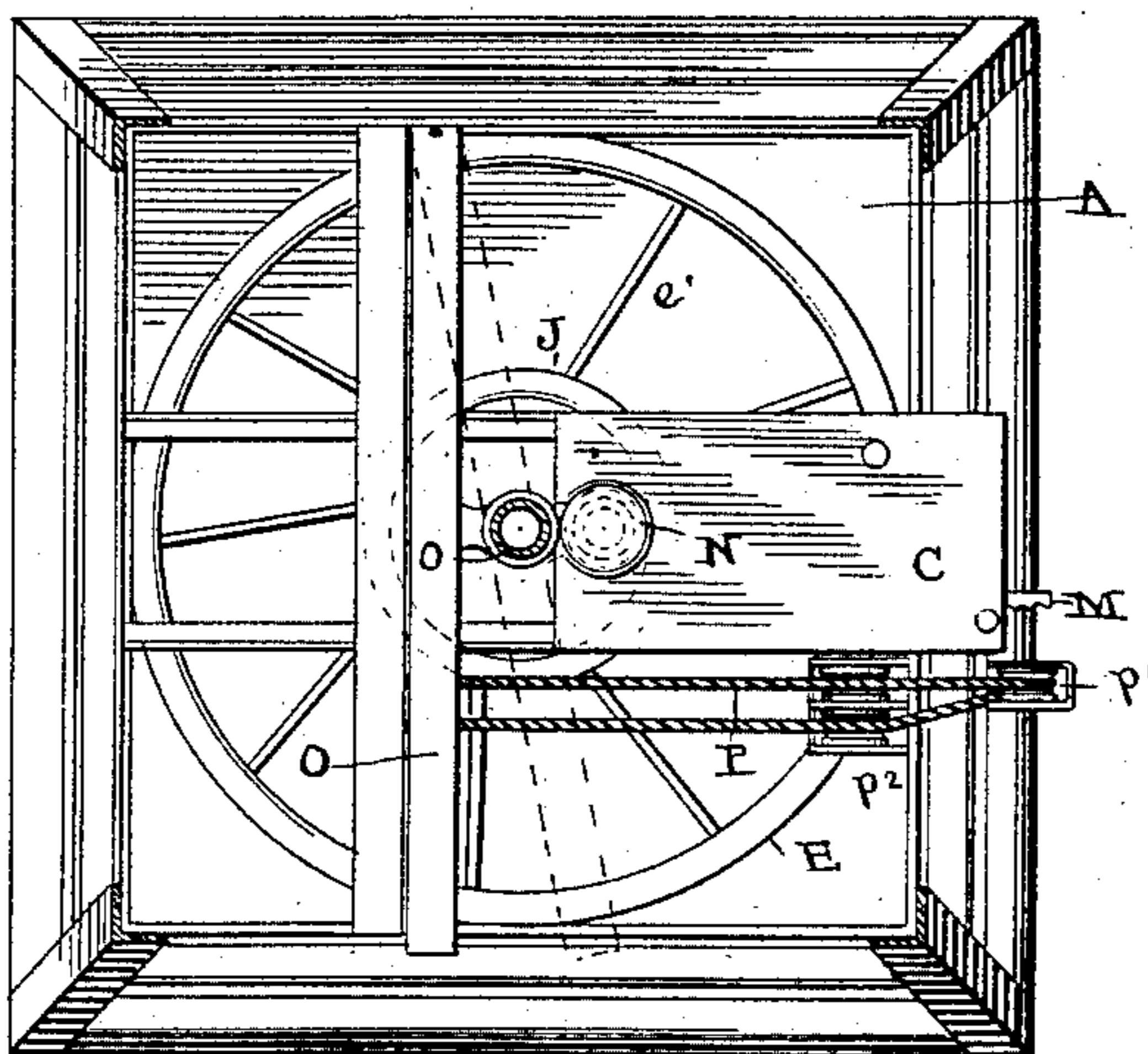
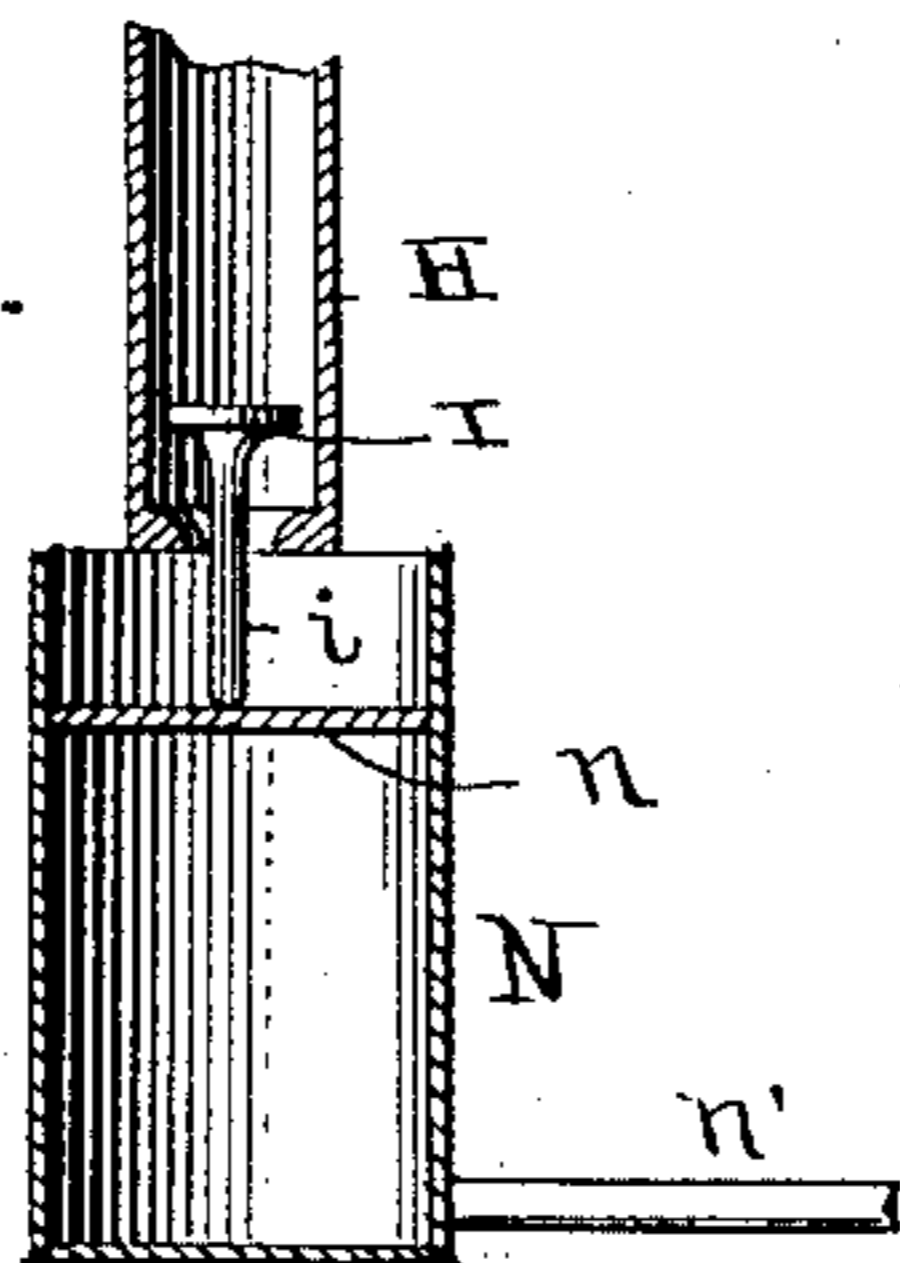


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALFRED W. SWIFT, OF KINZUA, PENNSYLVANIA.

ELEVATING APPARATUS FOR WELLS.

SPECIFICATION forming part of Letters Patent No. 375,717, dated December 27, 1887.

Application filed April 28, 1887. Serial No. 236,474. (No model.)

To all whom it may concern:

Be it known that I, ALFRED W. SWIFT, of Kinzua, in the county of Warren and State of Pennsylvania, have invented certain Improvements in Elevating Apparatus for Wells; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to improvements in the apparatus used for elevating fluids above the mouth of an Artesian well and for transferring them to a suitable receptacle, from which in turn they are conveyed away for use or storage.

The invention applies more particularly to oil-wells; and the apparatus embodying it may be said, generally speaking, to consist of a derrick or tower built above the mouth of the well and supporting a bailer, which, when lowered within the well-casing, collects the oil and is then raised by means of horse-power and shifted to a position over a suitable receptacle, into which it automatically discharges the oil. In connection with the bailer are special hoisting devices and a brake mechanism applied to the revolving shaft of the hoist, by means of which the bailer may be supported at any point, and by the release of which may drop by gravity into the well-casing to be refilled.

The invention consists, partly, in a construction by which all the operative parts of the apparatus, including the horse-power, are supported within and by the derrick-structure, the floor of which forms a tramping-ground for the horse.

It consists, also, in making the casing-head a bearing for the hoisting-shaft, the latter supporting the horse-power mechanism; further, in the construction and arrangement of the brake mechanism; further, in the bailer and the manner of discharging it; and, finally, in various details of construction, all fully hereinafter described.

The invention is fully illustrated in the accompanying drawings, in which Figure 1 is a perspective view of the whole apparatus. Fig. 2 is a central vertical section of the hoisting-shaft and well-casing, showing the construction of the hoisting-wheel. Fig. 3 is a separate view of the hoisting-wheel. Fig. 4 is a cross-section of the derrick-structure, showing in plan the mechanism for shifting the

bailer. Fig. 5 is a vertical section of the bailer and oil-receptacle, showing the discharge-valve. Fig. 6 shows the cap for the hoisting-shaft.

The derrick or tower is a strongly-built frame-work of timber or iron, of frusto-pyramidal form, having at its base a floor, A, centrally perforated for the upper end of the well-casing B. Upon two of the transverse beams of the derrick is supported a platform, C, by means of the angle-iron bars *c c*. A perforated plate, *d*, rests upon the horizontal flanges of the bars *c*, being retained in place by stops *c' c'*, or by other suitable means. This plate forms the upper bearing for the tubular hoisting-shaft D, the lower end of which has a bearing on a seat, *a*, formed with or secured to the top of the well-casing, of which the hoisting-shaft thus forms the continuation.

E represents a large hoisting-wheel, the hub or spider *e* of which is fixed upon the shaft D, and which has a grooved periphery to receive the hoisting rope or cable. The rim of the wheel is connected to the spider by a series of tangent spokes, *e'*, which give greater stiffness to the wheel than radial spokes, as they counteract the tendency of the rim to move independently of the hub, and thus prevent any lost motion. The wheel is further braced and stiffened by auxiliary spokes *e''*, placed tangent to the shaft D below the spider and firmly connected to the spokes *e'* about midway between the rim and hub.

The hoisting rope or cable F is supported in the groove of the wheel E, passes over a guide-pulley, *f*, journaled in the frame, and extends up within the derrick to a block, G, on top of the latter, in which is journaled the hoisting-sheave *g*. The rope or cable then passes down through the center of the derrick and is attached to the bail *h* of the bailer H, which is thus supported directly in line with the open end of the hoisting-shaft.

The bailer is a long metal tube provided at its lower end with an opening in which slides the stem *i* of an automatic valve, I. The bailer is of sufficient weight to descend automatically into the well-casing when the hoisting-rope is slack. The pressure of the liquid as the bailer enters it will raise the valve sufficiently to allow the bailer to fill; but the withdrawal of the bailer from the liquid allows the valve to close

by gravity. An air-vent, *h'*, is provided near the upper end of the bailer.

J is a brake-wheel, which may be either secured to the shaft D or (as shown) to the spokes of the hoisting-wheel. A band-brake, K, is fitted to the periphery of wheel J, one end of which is secured to one of the derrick-beams, while the other passes through said beam and is connected to an operating-lever, L. A rack-bar, M, enables the operator to lock the brake under greater or less tension or to release it altogether.

N represents a barrel or similar receptacle, which is supported upon the platform C a little to one side of the line of movement of the bailer. This barrel constitutes the means for discharging the oil from the bailer, and for that purpose it is provided with a plate, *n*, for tripping the valve of the bailer when the latter is lowered into it in the manner now to be described.

The device for shifting the bailer to a position for discharging the oil is a lever, O, pivoted on the derrick-frame and having a ring, *o*, or other suitable device connecting it to the bailer. The lever is attached to an endless wire or rope, P, running over single sheaves *p p'*, journaled at suitable points on the derrick-frame, and over a double guide-pulley, *p²*, placed at a point between pulleys *p* and *p'*. By pulling on these ropes the lever will be shifted so as to bring the bailer either in line with the well or with the barrel N.

Q represents the horse-power lever, secured to the hoisting-shaft above the floor, the latter thus forming the circular path for the horse. The upper end of the hollow hoisting-shaft is closed, when the apparatus is not in operation, by a flanged cap, R, which thus prevents the escape of gas at that point, which is, however, provided for by openings *a'* in the well-casing, which allow the gas to escape into proper pipes for distribution. The barrel N is also connected with storage-tanks or any desired place of consumption by a pipe, *n'*.

In the operation of the apparatus the brake is released and the bailer is allowed to descend into the well, where it is automatically filled. The horse is then hitched to the lever Q and the bailer raised till its lower end is above the barrel, when it is shifted. The horse is now backed enough to slacken the rope and permit the end of the bailer to enter the barrel, where the valve is automatically opened, and the oil thereby discharged. The horse is then started far enough to raise the bailer from the barrel, when it is shifted to its normal position over the well, the horse is unhitched, and the bailer allowed to descend again.

The brake may of course be applied during the operation of shifting the bailer and to control the speed of the latter during its descent into the well.

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

1. The combination, with the casing of an

Artesian well, of a tubular hoisting-shaft having a bearing in the said casing and forming a continuation thereof, and a bailer connected with and operated by said tubular shaft and adapted to pass through the same, substantially as described.

2. The combination, with the casing of an Artesian well, of a derrick or tower above the well, a hoisting-shaft having bearings in said casing and derrick, a bailer connected with and operated by said shaft, and a horse-power lever within the derrick-structure and connected to the hoisting-shaft, substantially as described and shown.

3. The combination, with the casing of an Artesian well, of a hoisting-shaft bearing in and forming a continuation of said casing, a hoisting-wheel on the said shaft, and a rope or cable connected with the wheel and supporting a bailer, substantially as described and shown.

4. The combination, with the casing of an Artesian well, of a tubular hoisting shaft forming a continuation of said casing, a suspended bailer adapted to be elevated by said hoisting-shaft and to descend by gravity into the well, a rope or cable connecting the bailer with the hoisting-shaft, and a brake mechanism for controlling or stopping the movement of the bailer, substantially as described and shown.

5. The combination of the well-casing, the derrick or tower, the tubular hoisting-shaft forming a continuation of the casing, the suspended bailer, a rope or cable connecting the bailer with the hoisting-shaft, a receptacle supported by the derrick out of line with the hoisting-shaft, and a device, substantially as described, for shifting the bailer when elevated to a position above the said receptacle, substantially as described.

6. The combination, with the derrick or tower frame, of a bailer suspended by a rope or cable and adapted to move vertically, the lever O, fulcrumed horizontally within the frame and carrying a guide for the bailer, the endless rope, as at P, connected with and adapted to shift said lever and carry the bailer into position for discharging, and guides or sheaves provided upon the lever and frame and carrying said rope, substantially as set forth.

7. The combination of a derrick or tower having a base or floor, a well-casing projecting through said floor, a hoisting-shaft, a bailer connected with and operated by said shaft-bearing in the derrick and casing, and a horse-power lever connected to the hoisting-shaft and extending out over the floor of the derrick, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED W. SWIFT.

Witnesses:

G. L. LAWRENCE,
S. H. BRIGGS.