

(No Model.)

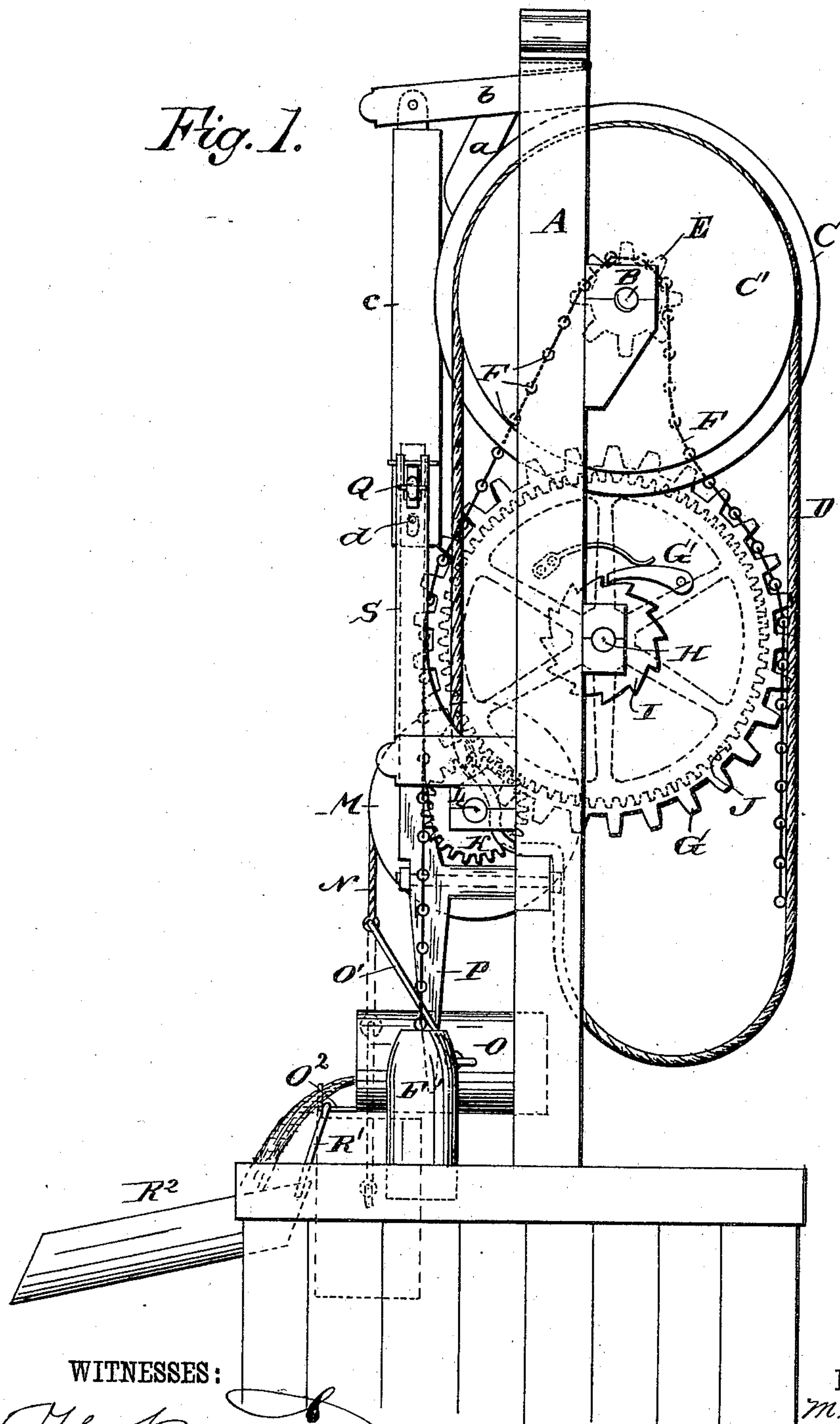
2 Sheets—Sheet 1.

M. VANDERCOOK, W. P. SMITH & H. M. BAKER.

WEIGHT POWER MACHINE.

No. 309,422.

Patented Dec. 16, 1884.



WITNESSES:

Hotzinger
C. Sedgwick

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ATTORNEYS.

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Fig. 2.

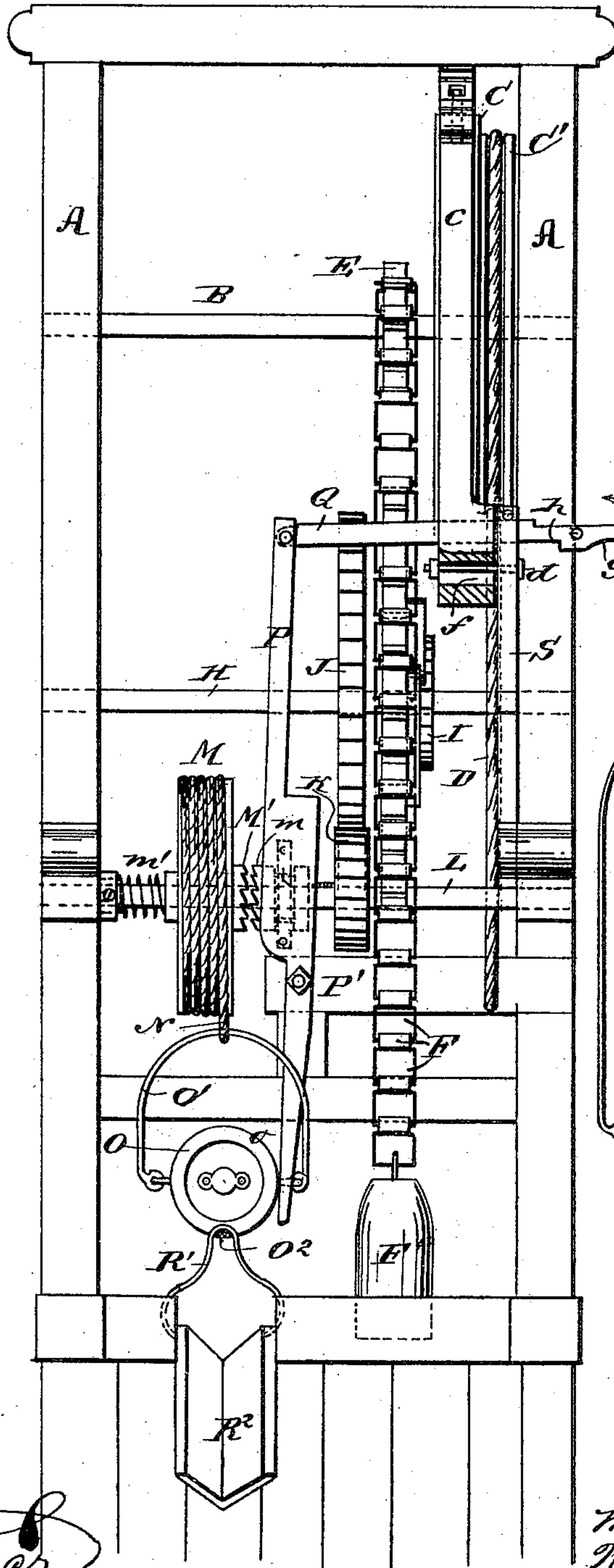
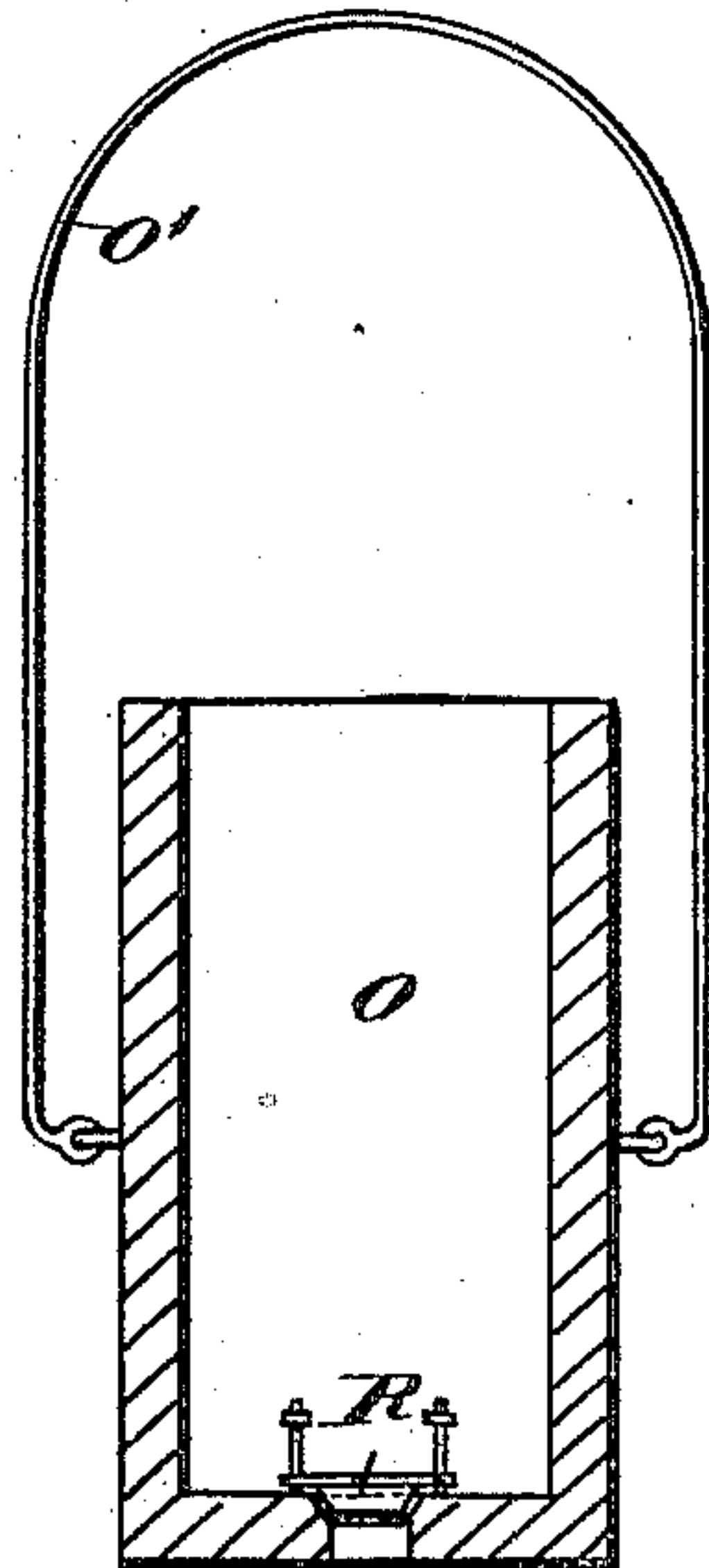


Fig. 3.



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UNITED STATES PATENT OFFICE.

MARK VANDERCOOK, WARD P. SMITH, AND HENRY M. BAKER, OF
MANTON, MICHIGAN.

WEIGHT-POWER MACHINE.

SPECIFICATION forming part of Letters Patent No. 309,422, dated December 16, 1884.

Application filed September 26, 1884. (No model.)

To all whom it may concern:

Be it known that we, MARK VANDERCOOK, WARD P. SMITH, and HENRY M. BAKER, residents of Manton, in the county of Wexford and State of Michigan, have invented a new and Improved Weight-Power Machine, of which the following is a full, clear, and exact description.

The object of our invention is to provide a new and improved machine for utilizing weights as a power for lifting water or for other purposes.

The invention consists in the combination, with the sprocket-wheel mounted loosely on a shaft, and provided with a pawl adapted to engage with a ratchet-wheel mounted rigidly on the shaft, of a chain passed over the sprocket-wheel and having a weight suspended from its lower end, which chain also passes over a smaller sprocket-wheel mounted on the same shaft with a pulley over which an endless rope is passed, to be used for elevating the said chain and weight. A brake is provided which is operated automatically, when necessary, by some of the levers of the machine.

The invention also consists in parts and details and combinations of the same, as will be fully described and set forth hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of our improved weight-power machine, showing it in use for lifting water by means of a bucket. Fig. 2 is a front view of the same, parts being broken out and others shown in section. Fig. 3 is a longitudinal sectional view of the bucket.

Two uprights, A, are united by a cross-piece at the top, and are suitably braced and stiffened, and in brackets on the said uprights a shaft, B, is journaled, on which is mounted a pulley or wheel, C, on one side of which a grooved pulley, C', is formed, over which an endless rope, D, passes.

On the shaft B a sprocket-wheel, E, is rigidly mounted, and over the same a chain, F, passes, on one end of which a heavy weight, F', is secured. The chain also passes over part of a sprocket-wheel or toothed wheel, G, the teeth of the said wheel G engaging with

the links of the chain. The said wheel G is loosely mounted on the shaft H, and is provided with a pivoted pawl, G', adapted to engage with a ratchet-wheel, I, rigidly mounted on the shaft H adjacent to the wheel G. A suitable spring secured on the wheel G presses the pawl against the teeth of the ratchet-wheel I. A cog-wheel, J, rigidly mounted on the shaft H, engages with a pinion, K, rigidly mounted on a shaft, L, on which a drum, M, having a spiral groove in its rim, is loosely mounted, a rope, N, being secured to and wound on the drum, from the lower free end of which rope a bucket, O, is suspended which is provided with a bail, O'. The drum M is provided with a ratchet-hub or clutch-hub, M', adapted to engage with the clutch-sleeve m, which turns with the shaft L, but is adapted to slide on the same, and is connected with a lever, P, pivoted on a cross-beam at P', and having its upper end pivoted to a transversely-sliding bar, Q. A spring, m', surrounds the shaft L, and is connected with the drum M at one end, the other end being rigidly held to the frame. The lower end of the lever P is so located that the bucket O will act on it. The bucket is provided in its bottom with an opening closed by a valve, R, adapted to open upward, and on its top edge the bucket is provided with a hook, O'', adapted to catch on a wire bail, R, at the upper end of the spout R'. A brake-shoe, a, is pivoted to a lever, b, pivoted to the cross-piece uniting the standards A, to which lever b a bar, c, is pivoted, which is provided at its lower end with a slot through which the bar Q passes. The bar Q also passes through the forked end of a standard or bar, S, provided with a pin, d, passing through a slot, f, in the bottom of the bar c. The bottom edge of the bar Q is beveled or rounded at g, and a shoulder, h, is formed a short distance from the end on the bottom edge.

The operation is as follows: The weight is raised by turning the shaft B from the pulley-wheel C C' by means of the endless rope D, whereby the sprocket-wheel E lifts the chain F and the weight F', suspended from the same. The bucket is at the bottom of the well or cistern, and the clutch-collars M' and m are disengaged, and the brake-shoe a is

lowered and rests on the rim of the pulley C, thus preventing the said pulley from revolving, and thereby locking the weight in place and stopping the entire machine. When the machine is to be operated, the bar Q is pushed in the direction of the arrow a' until that part of the bar between the shoulder h and the end rests upon the forked bar S, whereby the bar c is raised and raises the brake-shoe a from the rim of the wheel C, thus permitting the weight to descend and to revolve the shaft L. By moving the bar Q in the direction of the arrow a' the clutch-collar m is engaged with the clutch-collar M', whereby the drum M is revolved, and the rope N wound on the same, and the bucket raised. When the bucket arrives at the top, the hook O² catches on the bail R', whereby the bucket is swung into a horizontal position, so as to permit the water to flow out into the spout R². As the bucket swings up its bail acts on the lower end of the lever P and moves the lower end of the said lever in the direction of the arrow a' , thereby moving the bar Q in the inverse direction of the arrow a' , and pushing the shouldered part of the said bar off the forked upper end of the bar S, thus permitting the bar c and the brake-shoe to drop. The brake-shoe locks the several parts above mentioned in place, and prevents the farther descent of the weight F'. When the apparatus is again to be operated, all that is necessary is to push the bar Q in the direction of the arrow a' . The bucket O descends immediately after it has been emptied, and is filled automatically through the opening in the bottom. The spring m' is coiled by the unwinding of the rope from the drum M, and equalizes and regulates the unwinding of the rope.

According to the size of the weight F' and the arrangement of the gearing more or less work can be performed by the weight-power machine. For instance, the weight may be so adjusted that by raising the weight once, five, six, ten, or twelve buckets of water can be raised by the descent of the weight before requiring the weight to be again raised.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a weight-power machine, the combination, with a shaft, of a sprocket-wheel mounted loosely on the same, devices for locking the sprocket-wheel on the shaft when it revolves in one direction, a chain passing over the sprocket-wheel, a weight on the chain, a sprocket-wheel mounted on a shaft, over which sprocket-wheel the chain also passes, a pulley mounted on the said shaft, and an endless rope passing over the pulley, substantially as herein shown and described.

2. In a weight-power machine, the combination, with a shaft, of a sprocket-wheel mounted loosely on the same, devices for lock-

ing the sprocket-wheel on the shaft when it revolves in one direction, a chain passing over the sprocket-wheel, a weight on the chain, a sprocket-wheel mounted on the shaft, over which sprocket-wheel the chain also passes, a pulley mounted on the same shaft with the sprocket-wheel, on the side of which pulley a grooved pulley is formed, over which an endless rope passes, and of a brake-shoe resting on the rim of the pulley on which the grooved pulley is secured, substantially as herein shown and described.

3. In a weight-power machine, the combination, with the shaft H, of the ratchet-wheel I on the same, the sprocket-wheel G, mounted loosely on the shaft, and provided with a pawl, G', the chain F, passed over the sprocket-wheel, the weight F' on the said chain, the cog-wheel J on the shaft H, the pinion K on the shaft L, the drum M, mounted loosely on the shaft L, and provided with a clutch-collar, and of a clutch-collar mounted to slide on the shaft L, and held in the pivoted lever P, substantially as herein shown and described.

4. In a weight-power machine, the combination, with the shaft H, of the ratchet-wheel I, the sprocket-wheel G, the pawl G', the chain F, the weight F', the cog-wheel J, the pinion K, the drum M, provided with a clutch sleeve or collar, the clutch-sleeve m , held in the pivoted lever P, and of a brake connected with the said lever P, substantially as herein shown and described.

5. In a weight-power machine, the combination, with the shaft H, of the ratchet-wheel I, the pawl G', the sprocket-wheel G, the chain F, the weight F', the shaft B, the sprocket-wheel E, the pulleys C C', the endless rope D, the lever b , carrying a brake-shoe, the bar c , the cross-bar Q, pivoted to the pivoted lever P, the cog-wheel J, the pinion K, the drum M, having a clutch-sleeve, and the clutch-sleeve m , held in the pivoted lever P, substantially as herein shown and described.

6. In a weight-power machine, the combination, with the shaft H, of the ratchet-wheel I, the pawl G', the sprocket-wheel G, the chain F, the weight F', the sprocket-wheel E, the shaft B, the pulleys C C', the endless rope D, the lever b , carrying a brake-shoe resting on the pulley C', the bar c , the cross-bar Q, having a shoulder, h , the lever P, the cog-wheel J, the pinion K, the drum M, having a clutch-sleeve, the clutch-sleeve m , held in the pivoted lever P, and of the standard S, in the upper forked end of which the cross-bar Q is held to slide, substantially as herein shown and described.

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Witnesses:

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H. F. CAMPBELL,
H. B. HICKS.