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No. 107,331. Patented Sep. 13. 1870.

Fig. 1.

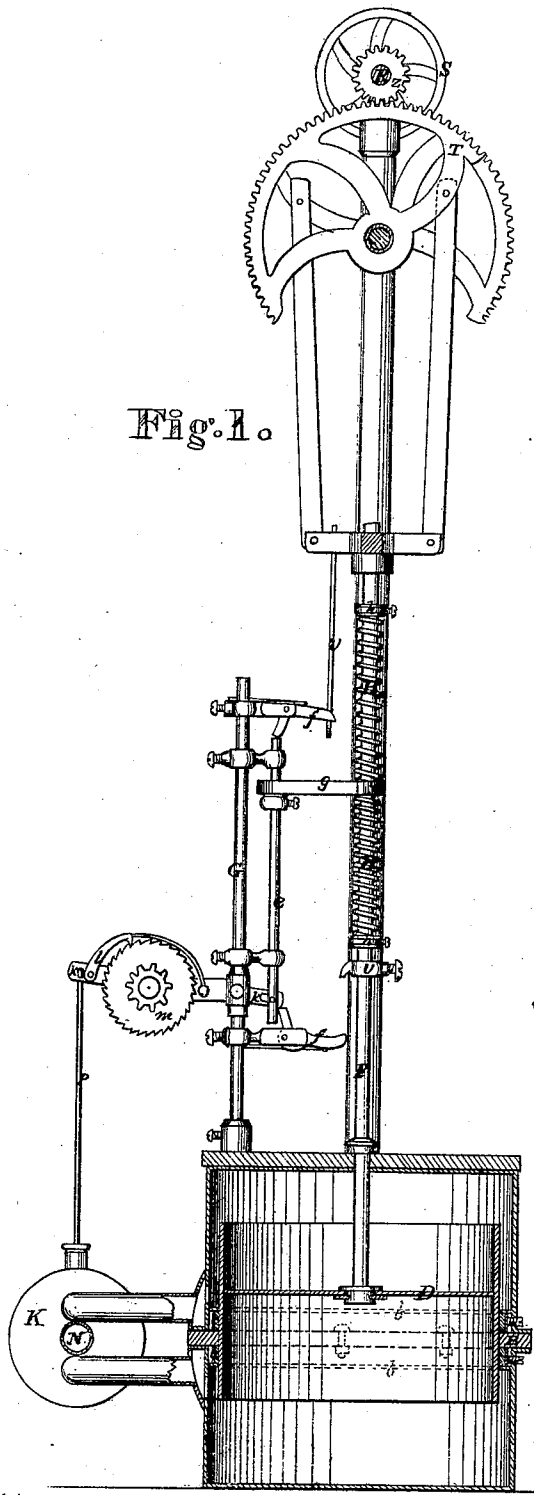
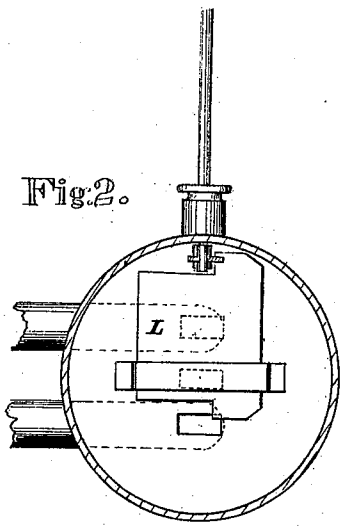


Fig. 2.



Witnesses.

Villette Anderson.

Chas Kenyon

Inventors

J. A. Bradshaw

W. H. Brown

D. Whitfield

Chipman Bowers & Co

Attys

2 Sheets. Sheet 2

Bradshaw. Brown & Whitted,

Governor.

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Fig. 3.

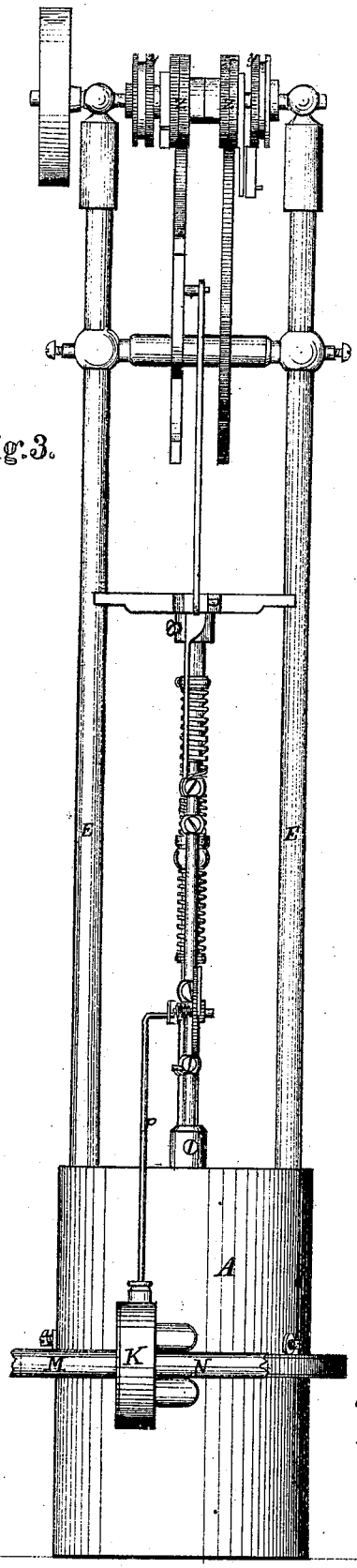
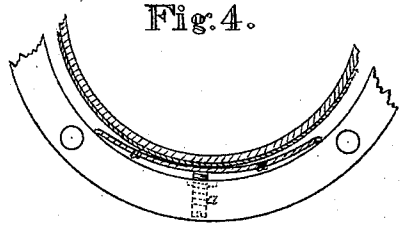


Fig. 4.



Witnesses.
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J. A. Bradshaw
Fr. H. Brown
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United States Patent Office.

JOHN A. BRADSHAW, WILLIAM H. BROWN, AND DARIUS WHITHED, OF LOWELL, MASSACHUSETTS.

Letters Patent No. 107,331, *dated September* 13, 1870.

IMPROVEMENT IN POWER-METERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, JOHN A. BRADSHAW, WILLIAM H. BROWN, and DARIUS WHITHED, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and valuable Improvement in Power-Meters; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a central vertical section of our invention;

Figure 2 is a section of the valve-chamber;

Figure 3 is a side view of the meter; and

Figure 4 is a sectional view, showing the manner of tightening the packing.

Our invention relates to a combined steam-engine and fluid power-meter, and consists in the construction and novel arrangement of the parts thereof, whereby motion is communicated to a shaft through the medium of reciprocating segmental gearing, such as we have shown and described in our Letters Patent No. 92,786, dated July 20, 1869.

In the drawing—

The letter A designates the piston-cylinder, made usually in two sections, secured by means of circular flanches to a metallic ring, B, arranged to fit neatly the hollow piston D, which plays within it.

Above and below the ring B narrow circular flanches *b b* are formed on the inner side of the wall of the chamber A, designed to hold the packing-rings *c c*.

Set-screws *a a* pass through the wall of the cylinder, and serve to press up the springs *d d* against the packing, thus tightening the same.

As these set-screws are operated from the outside, they form a ready and convenient means for adjusting the packing while the machine is in motion.

E E represent standards, which support the shaft, to which motion is to be communicated, and serve, at the same time, as guides for the piston-rod F.

G designates a standard, which serves to support the sliding rod *e* and the spring stops *f f*.

Secured to the sliding rod *e* is a horizontal arm, *g*, the end of which is perforated to embrace the piston-rod, in such a manner that the latter may slide freely within the opening.

Collars *h h* are keyed firmly upon the piston-rod, and between the arm *g* and each collar *h* is a coiled spring, H, encircling the piston-rod, and designed to operate the sliding rod *e* through the medium of the horizontal arm *g*.

Pivoted to the sliding rod *e* is a lever, *k*, provided with a spring pawl, *l*, designed to operate the registering ratchet-wheel *m* and the valve-rod *p*.

K represents the valve-chamber;

L, the valve;

M, the inlet-pipe; and

N, the outlet.

v v designate catches, attached to the piston-rod, and designed to release the spring-stops *f f* at the proper time to change the direction of the water or steam from one side of the hollow piston-head to the other.

R represents the shaft, to which rotary motion is transmitted;

S, the fly-wheel thereof; and

T, the reciprocating toothed segments, engaging with the fast and loose wheels *z z*, provided with pawls, which operate in connection with the ratchet-wheels *y y*, keyed to the shaft, in the manner set forth in our patent of July 20, 1869.

The machine above described forms an excellent fluid-meter, and, when a head can be obtained, power may be transmitted through the medium of the piston-rod and its connections.

When steam is employed, the action is complete and satisfactory, and the power attained is believed to be greater than when the ordinary crank attachment, with its concomitant dead-points, is employed.

In this application we do not desire to claim the toothed segments or the attendant gearing, whereby the shaft is rotated, this mechanism being fully secured by Letters Patent No. 92,786, dated July 20, 1869; neither do we desire to claim an ordinary steam-cylinder as applied thereto; but

What we claim as our invention, and desire to secure by Letters Patent, is—

As an improvement upon our invention for which Letters Patent No. 92,786 were granted, the power-meter or steam-engine herein described, having piston-cylinder A, with central ring B, packing-springs *d*, adjustable by means of set-screws *a*, valve-chamber K, ratchet-register *m*, slide-rod *e*, with horizontal arm *g*, spring stops *f f*, coil springs H H, and adjustable catches *v v*, all constructed and arranged to operate in connection with the reciprocating segments T T, in the manner and for the purposes shown and described.

In testimony that we claim the above, we have hereunto subscribed our names in the presence of two witnesses.

JOHN A. BRADSHAW.
WM. H. BROWN.
DARIUS WHITHED.

Witnesses:

CHAS. A. F. SWAN,
FRANK O. BUTTERFIELD.