

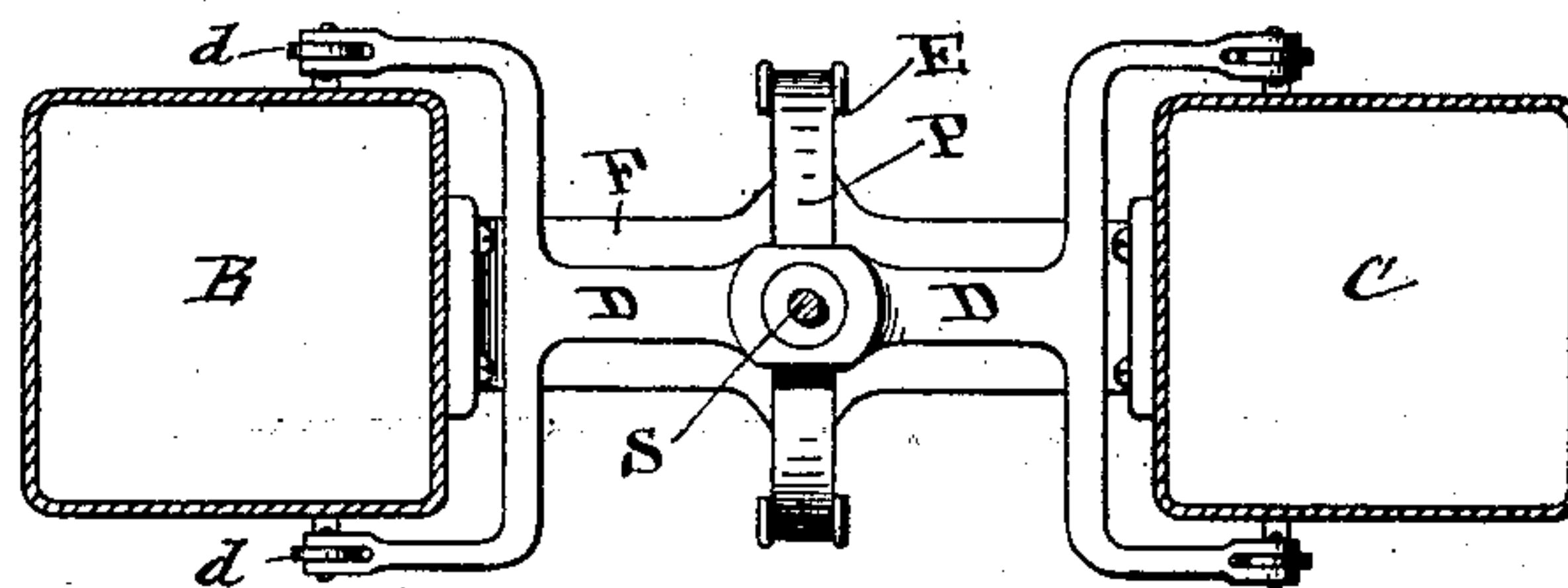
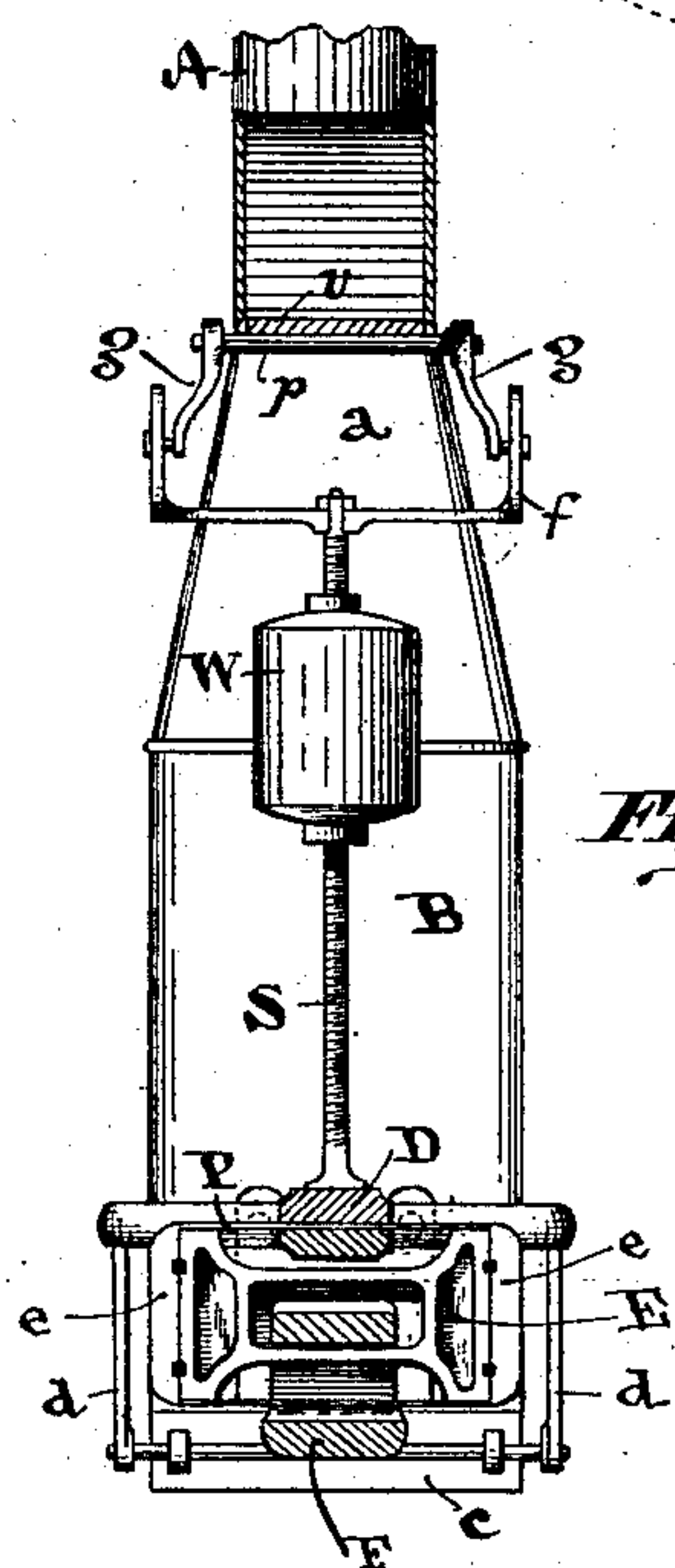
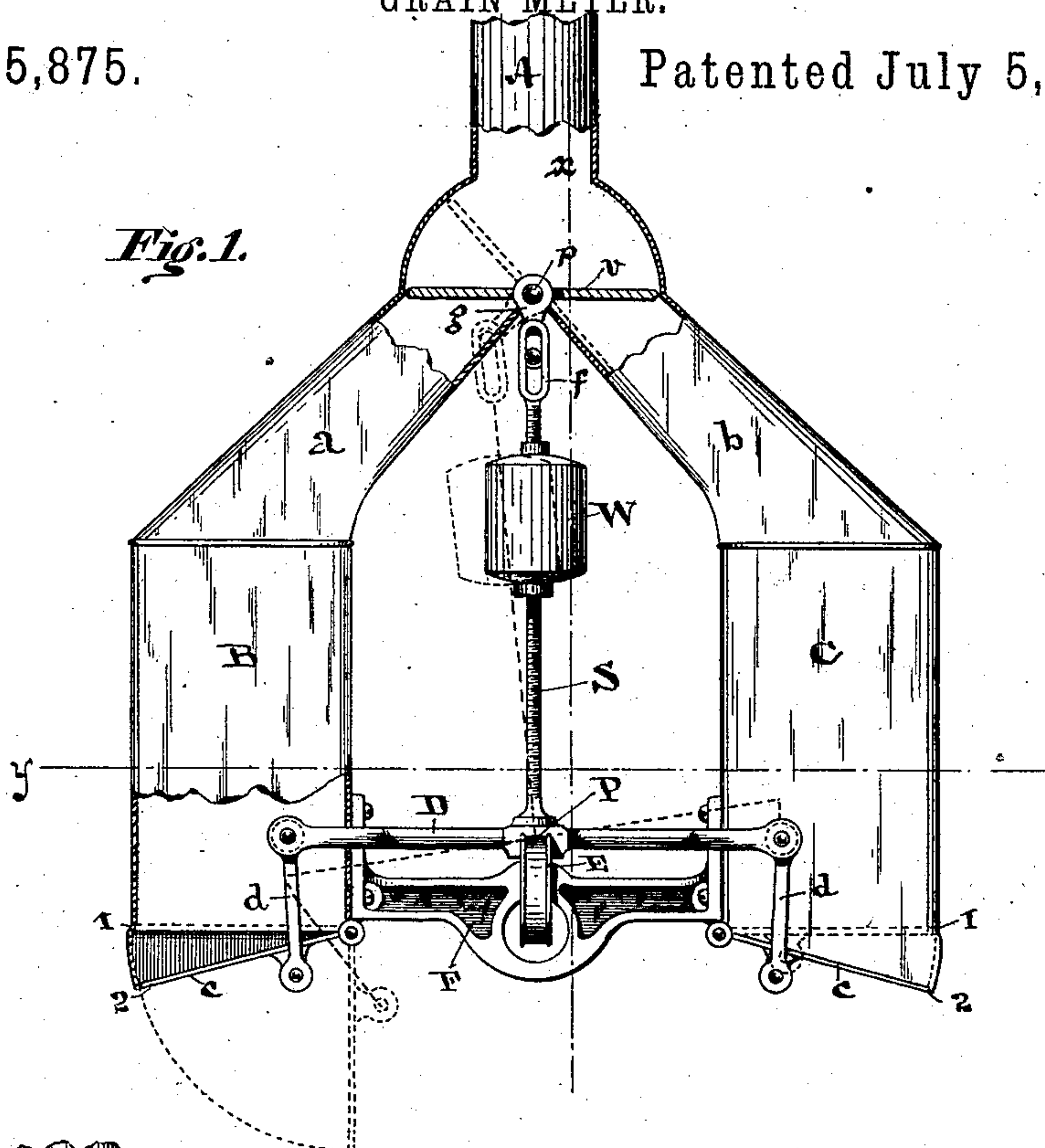
(No Model.)

A. SPRINGER & W. KENT.

## GRAIN METER.

No. 365,875.

Patented July 5, 1887.



*Fig. 3.*

*Attest.*

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C. L. Kerr.

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G. L. Hosen, Atty.



# UNITED STATES PATENT OFFICE.

ALFRED SPRINGER, OF CINCINNATI, OHIO, AND WILLIAM KENT, OF JERSEY CITY, NEW JERSEY.

## GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 365,875, dated July 5, 1887.

Application filed November 24, 1886. Serial No. 219,840. (No model.)

*To all whom it may concern:*

Be it known that we, ALFRED SPRINGER and WILLIAM KENT, citizens of the United States, residing at Cincinnati, Ohio, and Jersey City, New Jersey, respectively, have invented new and useful Improvements in Grain-Meters, of which the following is a specification.

Our invention relates to grain-meters, its object being to provide a simple, inexpensive, durable, and efficient apparatus for the automatic measuring of grain delivered continuously thereto by a series of registrable movements; to which end it consists in an apparatus embodying as a leading constructive principle a grain-conduit bifurcated into two delivery-tubes having movable bottoms upheld by an oscillating weight acting as an overbalance to a beam pivoted preferably upon a torsional pivot, and a valve governing the distribution of grain into the delivery-tubes actuated by the oscillation of the beam.

Mechanism embodying our invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of the apparatus complete; Fig. 2, a vertical cross-section of the same in the plane  $x$  of Fig. 1; and Fig. 3, a plan section in the plane  $y$  of Fig. 1.

Referring to the drawings, A designates a grain-conduit bifurcated into two spouts,  $a$   $b$ , terminating below in the delivery-receptacles B C. These are provided with hinged bottoms  $c$ , upheld upon and by a centrally-pivoted balance-beam, D, controlled by overbalancing-weight W, adjustably mounted upon a standard, S, rising rigidly from the beam centrally above its pivot of oscillation. We prefer to employ a torsional pivot for the beam D, the same consisting of a band or strip, P, of elastic metal, tensioned around a "tension-frame," E, which is attached to or cast as part of a cross-brace, F, by which it is joined to and supported by and between the receptacles B C, as shown. The frame is a plate of metal formed to carry the torsion-pivot P in a rectangular path around it externally, with the upper side of the frame recessed to enable the beam D to be clamped centrally to the pivot at such side and permit free oscillation of the beam. One or both ends  $e$  of the tension-frame may be made

separate, to permit wedging out to tension the pivot. As shown, the beam D is bifurcated at each end, to pass around to each side of the receptacles, and is provided at each bifurcated end with a pivotal link,  $d$ , engaging the hinged bottom  $c$  at the proper distance from its hinge. These pivots may be of cylindrical form, held in the ordinary bearings. The lower ends or mouths of the receptacles B and C are formed at the sides opposite the hinge-line of the bottoms  $c$  to the arc traversed by the outer edge of the said bottoms, and the bottom edges of the receptacles properly inclined, so as to permit the movement of hinged bottoms from the extreme upper position at the horizontal line 1 to the said inclined edge indicated at 2 without opening the receptacle to discharge contents. Thus when the apparatus is in the position indicated in Fig. 1 both hinged bottoms coincide with the plane of the lower edges of the receptacles B C, and the overbalancing-weight W (whose function will be more fully described) is in its neutral vertical position. The tilting of the apparatus beyond this point will open one of the hinged bottoms to the position indicated by dotted lines and close the other to the line 1. The weight W normally holds the beam D, overweighted at one side or the other of its axis of oscillation, until the grain descending into the receptacle whose bottom is elevated accumulates sufficiently in weight to counterbalance the beam and raise the weight W to and past its neutral point, whence its statical moment is transferred to the then already overweighted side and drops the bottom from the filled receptacle. The amount or weight of grain required to thus overbalance the weight W and elevate it from an extreme position to the neutral position forms the unit of measure effected by the apparatus, and the alternating movements thus produced are utilized to actuate registering apparatus, which may be of any of the many devices in common use. We have not shown the registering apparatus herein, as the same forms no part of our invention.

It remains to describe the means for shunting the grain from the conduit A into the receptacles B and C in harmony with the oscillations of the apparatus. Any suitable valve mechanism may be employed. That form



which we deem preferable, and have illustrated in the drawings, consists of a wing-valve, *v*, pivoted in the angle of junction between the conduit *A* and its bifurcations *a b*. The walls of the conduit above the horizontal plane of the valve are curved to the arc of its rotation, as shown, whereby, as will be seen from Fig. 1, its movement in opening to the receptacles is alternate and exclusive. The movement is effected by a slotted arm or yoke, *f*, attached to the standard *S*, engaging cranks *g* at the termini of the valve-pivot *p*.

The unit of measure developed by the apparatus may be varied within limits by elevating or depressing the weight *W* upon its standard *S*, provision being made for the same by threading the weight upon the standard. A wider variation may be effected by substituting other weights.

The principal advantage of apparatus constructed and operating upon the principles herein set forth is, that the pivot of oscillation is relieved of the dead-weight of the structure, and carries, besides its proper load, only the weight of its beam and the hinged bottoms, which is insignificant. Moreover, where, as in the present case, a torsion-strip is employed for the oscillating pivot and the element of friction thus removed, the remaining pivotal connections offer no difficulties, inasmuch as their resisting friction is practically eliminated by the relative increase in the effective weight of grain in the filled bucket over the decreasing statical moment of the opposing weight *W*, whereby the stoppage of the apparatus at a dead-center is impossible with proper adjustments, and its action is always uniform.

We claim as our invention and desire to secure by Letters Patent of the United States—

1. The improved grain-meter embodying a centrally-fulcrumed balance-beam secured between two fixed receptacles, two fixed receptacles joined at the top to the delivery-conduit, a controlling-valve arranged at the junction of the same to close the receiving-conduit at the median position of the valve, bottoms hinged to said receptacles, upheld by the beam-terminals, a rigid standard rising vertically from the beam centrally and actuating the controlling-valve by suitable connections, and an overbalancing-weight held adjustably upon the standard, substantially as set forth.

2. In a grain-meter of the character described, embodying two discharging-receptacles alternately supplied from a common conduit, the combination, with the receptacles and their discharging mechanism, of the conduit flared at its terminus to a semi-cylindrical section, and the pivoted valve operating therein, as described, to control two openings and close the discharge through one before opening the other, substantially as set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

ALFRED SPRINGER.  
WILLIAM KENT.

Witnesses for Alfred Springer:

L. M. HOSEA,  
C. D. KERR.

Witnesses for William Kent:

J. C. JULIUS LANGBEIN,  
EMIL REINL.