

(No Model.)

J. GANSS.

PENDULUM REGULATOR.

No. 322,097.

Patented July 14, 1885.

Fig.1.

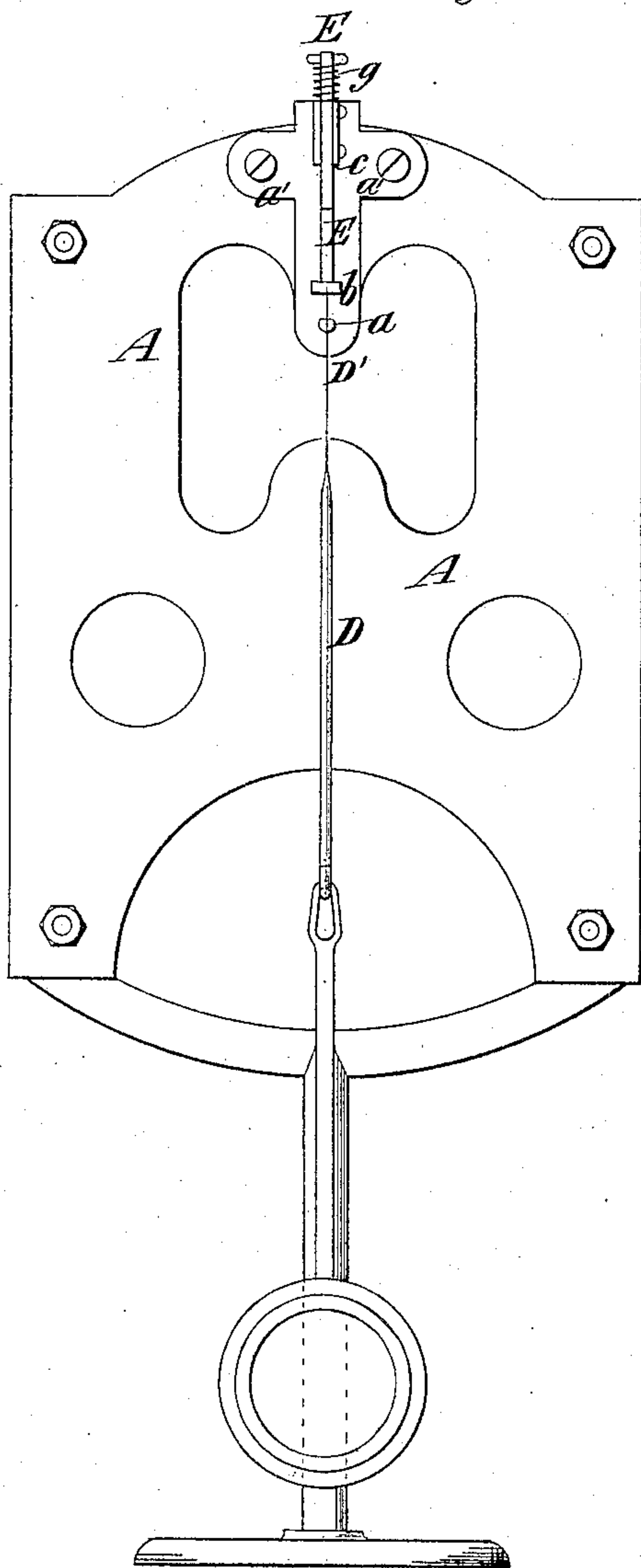


Fig. 2.

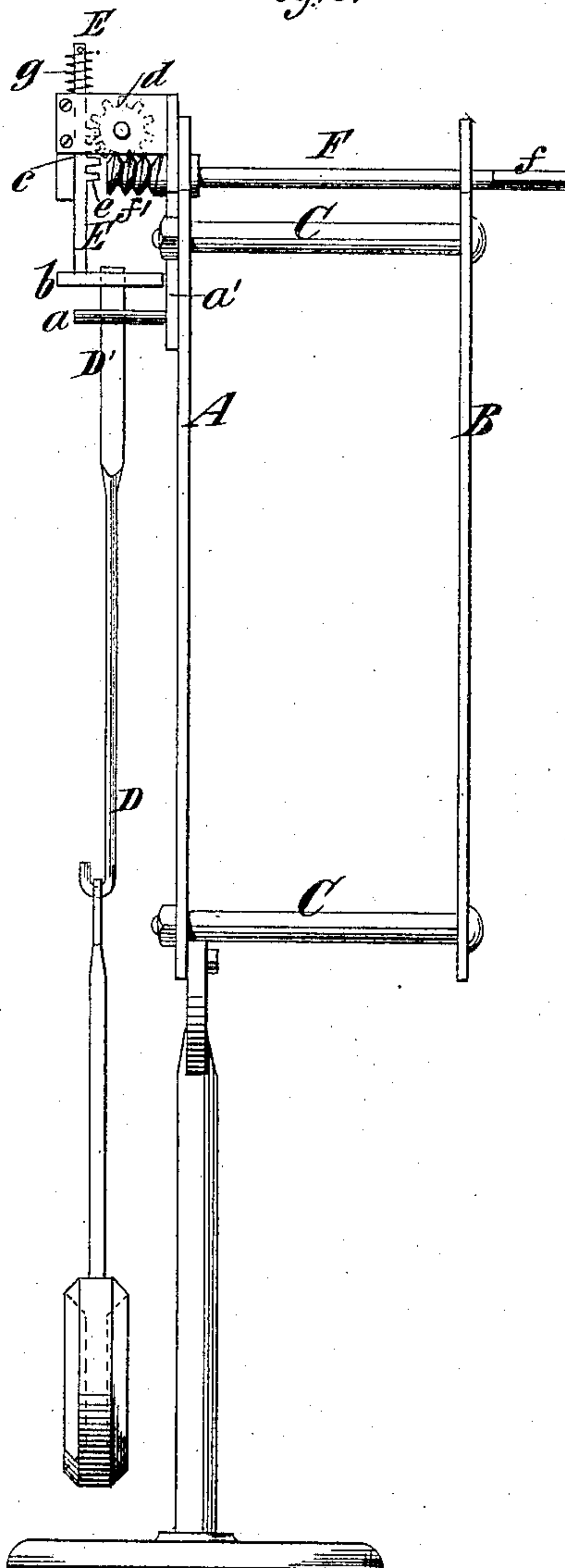


Fig.3.

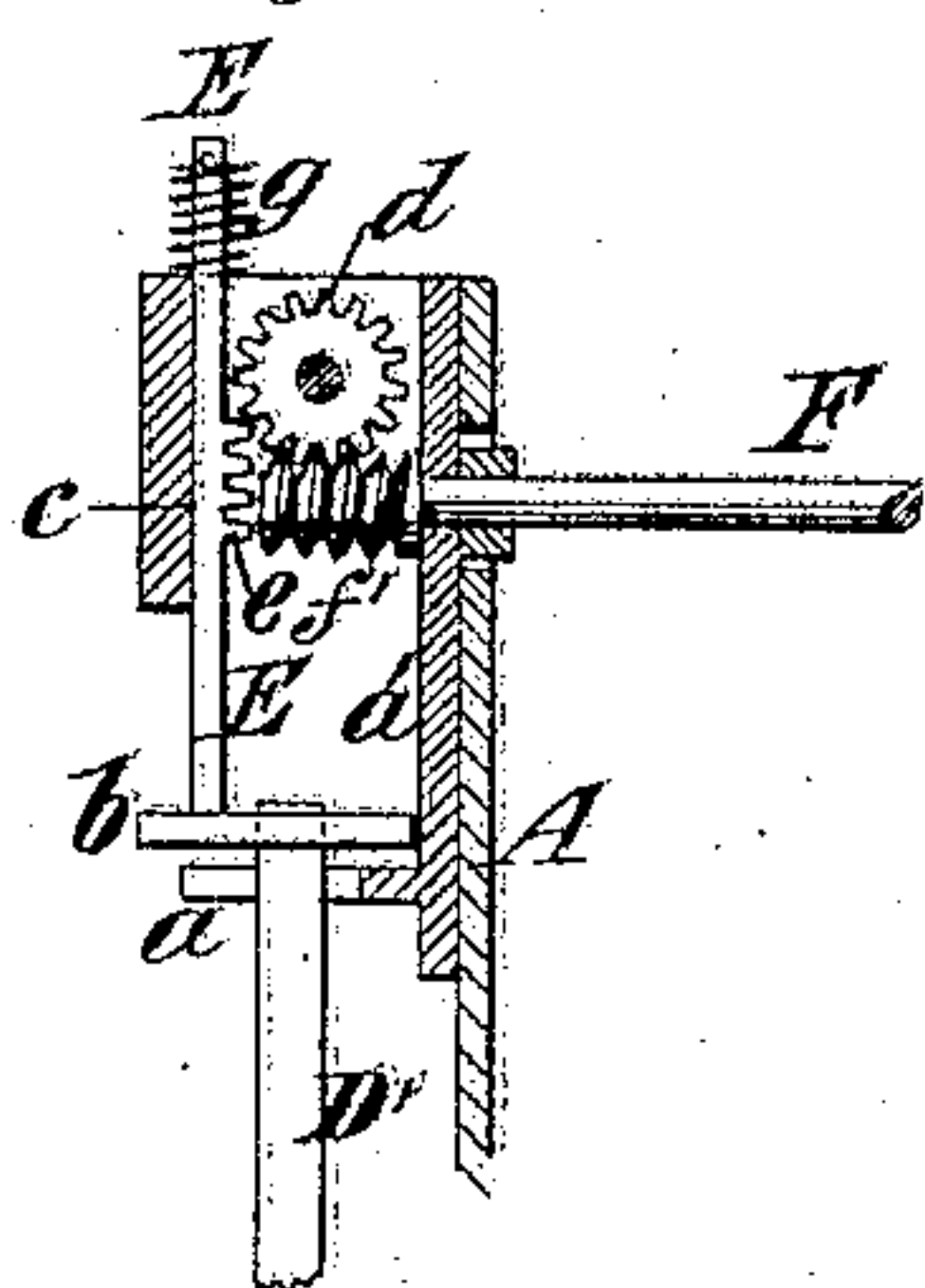
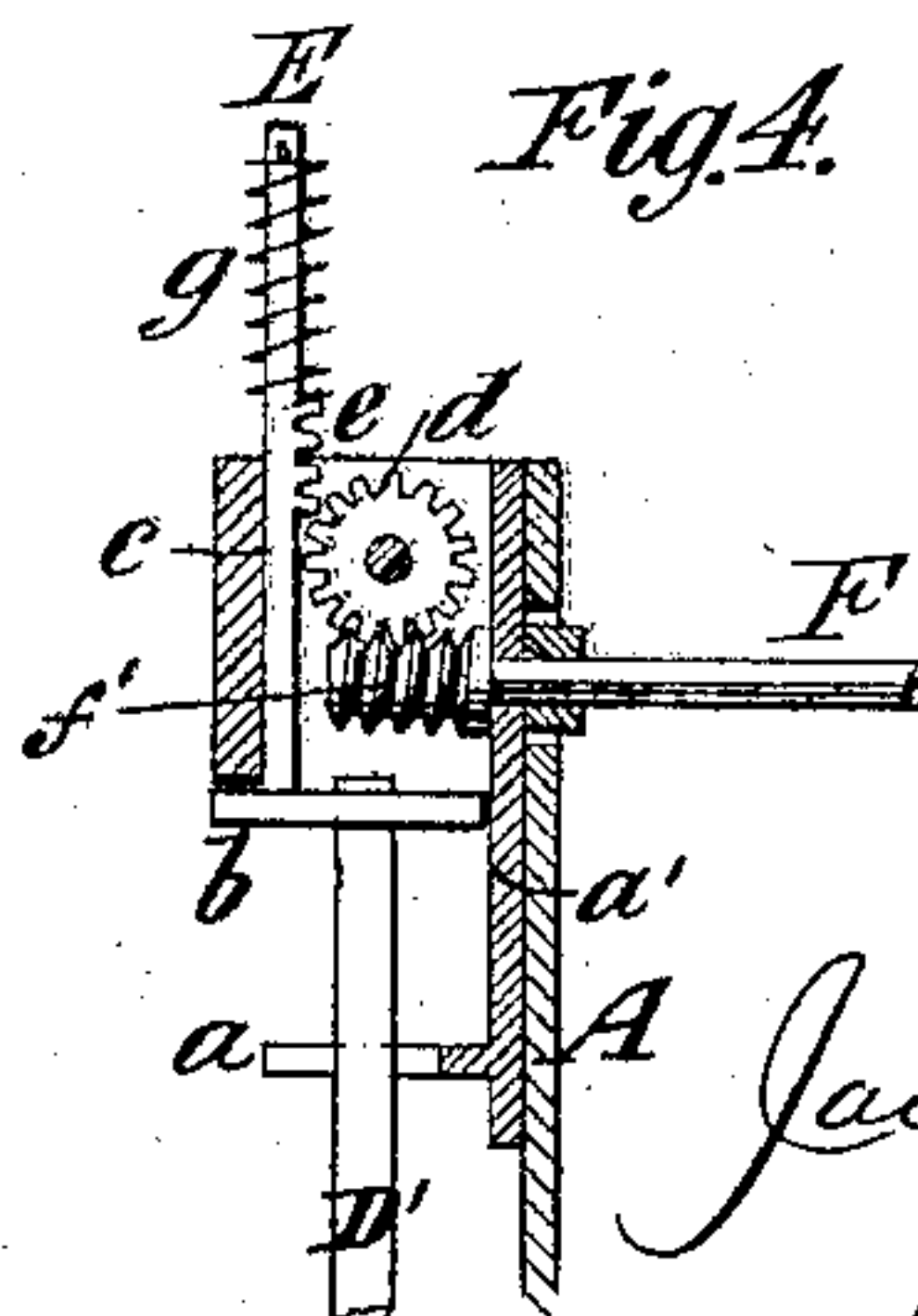


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

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PENDULUM-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 322,097, dated July 14, 1885.

Application filed April 23, 1885. (No model.)

To all whom it may concern:

Be it known that I, JACOB GANSS, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and
5 useful Improvement in Pendulum-Regulators for Clocks, of which the following is a specification.

My invention relates to pendulum-regulators which comprise an arbor or shaft extending forward to the front of the clock-movement, and to which a key may be applied for turning it and so regulate the pendulum, which is at the back of the movement.

The object of my invention is to provide a
15 simple and reliable combination of mechanism through which the turning of the regulating arbor or spindle will act upon the pendulum-rod to both raise and lower it positively, and which is of such nature that after turning the
20 arbor or spindle sufficiently to effect the desired range of regulation its further turning will not operate to move the pendulum-rod up or down, and hence will obviate any liability of straining or breaking these parts by
25 excessive turning of the regulating arbor or spindle.

In carrying out my invention the pendulum-rod is connected at its upper end with a vertically-moving rack-bar with which engages a
30 pinion or wheel, and this pinion or wheel is operated by a worm or screw fixed upon the inner end of the regulating arbor or spindle, whereby the turning of the arbor or spindle produces rotation of the pinion or wheel, and
35 through the teeth upon the rack-bar raises or lowers the pendulum-rod positively, so as to decrease or increase the length of rod below the center of oscillation. The rack upon the
40 rod, which is attached to the upper end of the pendulum-rod, is very short, and at the upper and lower extremities of its movement the rack passes out of gear with its actuating wheel or pinion, and hence the further turning of the latter cannot act to raise or lower the
45 pendulum. When the rack-bar is moved upward to the end of its range of movement, the weight of the pendulum and rod causes the lower tooth of the rack to rest upon the actuating pinion or wheel, so that on a reverse
50 movement of the latter it will readily come into gear with the rack; and I apply a spring

to the rack-bar which acts to raise it, and which, when the rack is adjusted to the lower end of its range of movement, is in a state of tension and keeps the upper tooth of the rack
55 resting against the actuating pinion or wheel, so that on a reverse movement of the latter it will readily come into gear with the rack.

In the accompanying drawings, Figure 1 represents a rear elevation of such parts of a
60 clock as are necessary to illustrate my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a sectional detail view showing the rack-bar and pendulum adjusted to their lowermost position, and Fig. 4 is a similar detail view
65 showing the rack-bar and pendulum rod adjusted to their topmost position.

Similar letters of reference designate corresponding parts in all the figures.

A B designate, respectively, the back and
70 front plates of the frame of the movement, and C designates the posts connecting them. I have not shown either the time-train or the striking-train of the movement, as my invention in nowise relates to them.

D designates the pendulum-rod, having at its upper end the flattened flexible portion D', which passes through the slotted post *a*, projecting from the plate *a'*, attached to the plate A of the movement. The upper end of the
80 flexible portion D' of the pendulum is hung in a head or top piece, *b*, to which is rigidly secured a rack-bar, E, extending upward therefrom, and working in the slideways *c*, which is secured to the plate *a'*. In the bridge
85 which forms the slideway *c* is journaled a small pinion or wheel, *d*, the teeth of which gear into a rack, *e*, formed on the bar E; and hence it will be seen that by turning or rotating the wheel or pinion *d* the rack-bar E and
90 its attached pendulum will be raised or lowered so as to decrease or increase the length of the pendulum-rod below the slotted post *a*, which forms the axis of oscillation.

F designates the regulator arbor or spindle,
95 which extends to the front of the movement and is there squared, as shown at *f*, to receive a key for turning it. At the inner end of the arbor or spindle F is a worm or screw, *f'*, which engages with the wheel or pinion *d*.
100 The worm or screw *f'* serves both to turn the pinion or wheel *d* and through it to regulate

the length of the pendulum-rod; and it also serves to hold the pendulum-rod against accidental lengthening or shortening by its engagement with the wheel or pinion *d*.

5 As best shown in Figs. 3 and 4, the rack *e* upon the bar *E* is short or has only few teeth, and the slideways *c* and slotted post *a*, which form the upper and lower abutments or stops, limiting the range of movement of the pendulum-rod, permit the rack-bar to be raised and lowered to such an extent that the teeth of the rack *e* will pass out of engagement with the wheel or pinion *d*; hence it will be seen that when the arbor or spindle *F* has been turned to lower the rack-bar and pendulum-rod to the position shown in Fig. 3, or to raise them to the position shown in Fig. 4, the teeth of the rack *e* pass out of gear with the pinion *d*, and hence the further turning of the arbor or spindle *F* will not act to raise or lower the pendulum at all, and will not produce any straining or breakage of parts. If the rack-bar and pendulum-rod be adjusted upward to the position shown in Fig. 4 their weight will cause the lowermost tooth of the rack *e* to rest upon the wheel or pinion *d*, and hence the teeth of the wheel or pinion will readily come into gear with the rack when the wheel or pinion is turned in a direction to lower the rack-bar and pendulum-rod. I have shown a spiral spring, *g*, applied to the upper end of the rack-bar *E* above the slideway *c*, and when the rack-bar and pendulum have been lowered to the position shown in Fig. 3 this spring will be under tension, and will keep the upper tooth of the rack pressed against the wheel or pinion *d*, so that on the latter being turned to raise the rack-bar its teeth will readily come into gear with the teeth of the rack *e*. It will, therefore, be seen that by my invention I provide a simple mechanism which acts positively to both raise and lower the pendulum-rod, and which is so constructed as to avoid any straining or breakage of parts by excessive turning of the regulator arbor or spindle *F*. It is not necessary

that the worm or screw *f'* should engage with the wheel or pinion *d*, as it might engage with another wheel or pinion fixed on the same shaft; but the arrangement here shown is preferable because of its simplicity.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a pendulum-rod and a regulator arbor or spindle, of a rack-bar from which the pendulum-rod is suspended, a wheel or pinion engaging with the teeth of the rack-bar, and a worm or screw on the regulator arbor or spindle for turning said wheel or pinion, substantially as herein described.

2. The combination, with a pendulum-rod and a regulator arbor or spindle, of a rack-bar from which the pendulum-rod is suspended, a wheel or pinion engaging with the teeth of the rack, a worm or screw on the regulator-arbor for turning said wheel or pinion, a slotted post forming the axis of oscillation for the pendulum-rod, and a slideway for the rack-bar, the length of the rack being so proportioned that it will give a range of movement to the rack-bar less than the distance allowed between the slotted post and slideway, substantially as herein described.

3. The combination, with a pendulum-rod and regulator arbor or spindle, of a rack-bar from which the pendulum-rod is suspended, a wheel or pinion engaging with the teeth of the rack, a worm or screw on the regulator-arbor for turning said wheel or pinion, the rack being so proportioned that it may be raised and lowered out of engagement with said wheel or pinion, and a spring for sustaining the weight of the rack-bar and pendulum when the rack is lowered out of engagement with the teeth of the wheel or pinion, substantially as herein described.

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Witnesses:

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