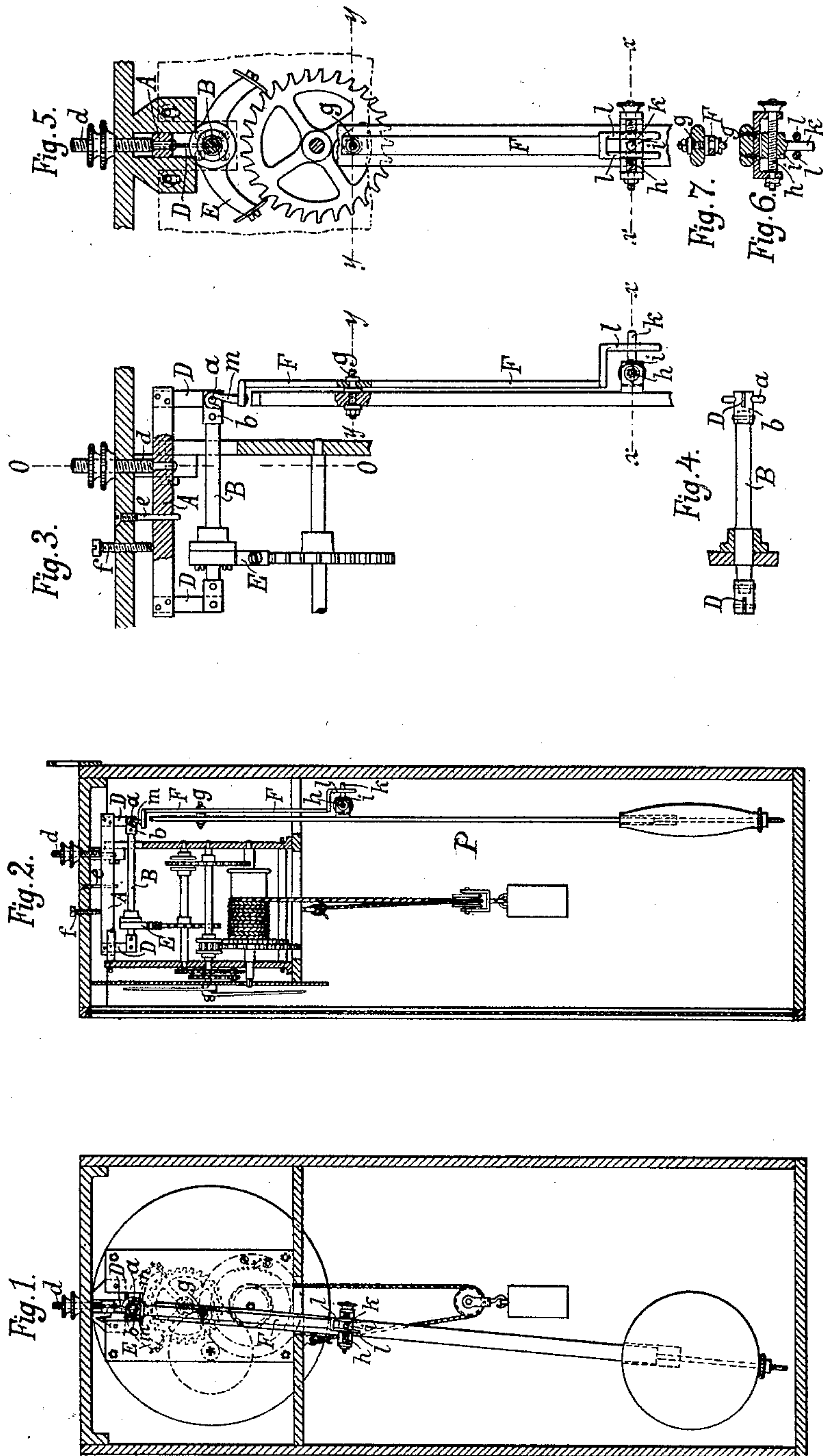


(No Model.)

J. WERNER.
CLOCK PENDULUM.

No. 404,997.

Patented June 11, 1889.



Witnesses:
Fred Hays
O. Sundgren

Inventor:
Joseph Werner
by his attorneys
Brown & Grubbs

UNITED STATES PATENT OFFICE.

JOSEPH WERNER, OF DRESDEN, SAXONY, GERMANY, ASSIGNOR TO ARTHUR
DZONDI, OF SAME PLACE.

CLOCK-PENDULUM.

SPECIFICATION forming part of Letters Patent No. 404,997, dated June 11, 1889.

Application filed October 10, 1888. Serial No. 287,778. (No model.) Patented in Germany February 15, 1888, No. 44,446.

To all whom it may concern:

Be it known that I, JOSEPH WERNER, of the city of Dresden, in the Kingdom of Saxony, German Empire, have invented certain
5 new and useful Improvements in the Means for Suspension of Pendulums of Clocks, (for which I have obtained a patent in Germany, dated February 15, 1888, No. 44,446,) of which the following is a specification, reference be-
10 ing had to the accompanying drawings.

It is an essential point in clocks to construct the mechanical parts of the clock-work in such a manner that they not only work with the least possible friction, but also
15 so that bearings causing friction shall be avoided as much as possible, in order that variations in the resistance of such frictional parts will be reduced as far as possible and the clock may work regularly. The defects
20 mentioned will mostly occur in the means of suspending the pendulum. Such defects may be in some degree counterbalanced by increasing the weight; but the irregularities which result from the above-mentioned de-
25 fects in the bearings cannot be obviated thereby. Now, in order to obtain a suspension of the pendulum, causing the least possible friction, but at the same time allowing an exact adjustment of the hooking and of
30 the stroke or swing of the pendulum, I construct and combine the suspension devices, as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 represents a back view of a clock
35 having my invention applied to it. Fig. 2 represents a central vertical section of the same. Fig. 3 is a view corresponding with Fig. 2, but on a larger scale, representing only the parts included in my improvement.
40 Fig. 4 is a top view of the anchor-spindle. Fig. 5 is a view at right angles to Fig. 3, partly in section in the line *o o*, of the escape-wheel and anchor, representing, also in section, the means of supporting the anchor-
45 spindle. Fig. 6 represents a horizontal section in the line *x x* of Figs. 3 and 5. Fig. 7 represents a horizontal section in the line *y y* of Figs. 3 and 5.

Similar letters of reference designate corresponding parts in the several figures. 50

In the upper part of the clock-work I arrange a carrier A, (represented as a horizontal bar,) for carrying the two swing-springs or flexible suspension parts D, which are connected together by the anchor-spindle B. 55
On the one end of said anchor-spindle B there is a head *b*, provided with the carrying-pin *a*, on which the pendulum is suspended or hooked.

The carrier A is represented as adjustable 60 in height by means of a screw *d* in the top of the clock-case, so as to be able to exactly regulate the engagement of the anchor E into the balance-wheel or escapement-wheel. Furthermore, a guiding-pin *e* and a set- 65 screw *f* are applied between the carrier and the top of the case, so that no sidewise shifting or displacement of the carrier A may take place. The hook of the pendulum-rod P is not affixed to the latter, but to the ad- 70 justing mechanism, which is of peculiar construction, its principal part consisting of the double-armed lever F, which may be turned or moved on the fulcrum or pin *g*, provided on the rod P of the pendulum. This pin *g* 75 constitutes a pivotal suspension of the pendulum from the lever F. The adjustment of said lever F is effected by means of the horizontal screw *h*, capable of turning in bearings affixed to the pendulum-stem, said screw 80 carrying a nut *i*, on which is a pin *k*, which enters between two pins or a fork *l* on the lower end of the lever F. By turning the screw *h* the nut *i* is shifted, and by means of the pins or fork *l* the lever F and the 85 pendulum are laterally adjusted the one to the other, and the pendulum-rod is adjusted relatively to the center of suspension at *a m* to one side or the other, as may be required. 90

What I claim as my invention is—

The combination, with the vertically-adjustable carrier A, the anchor-spindle B, and the suspension-springs D, suspending the said spindle from said carrier, of the adjust- 95 ing-lever F, suspended at its upper end from

the anchor-spindle, the pendulum pivotally
suspended from said lever between the ends
of the latter, and also connected with the lat-
ter at the lower end thereof, and the adjust-
5 ing-screw *h*, applied at the last-mentioned
connection for the lateral adjustment of the
pendulum, substantially as herein described.

In testimony that I claim the foregoing as
my invention I have signed my name in pres-
ence of two subscribing witnesses.

JOSEPH WERNER.

Witnesses:

PAUL KREBS,

WILHELM PRUDEN.