(No Model.)

H. CAMP.

CLOCK MOVEMENT.

No. 262,738. Patented Aug. 15, 1882.

fig. 1

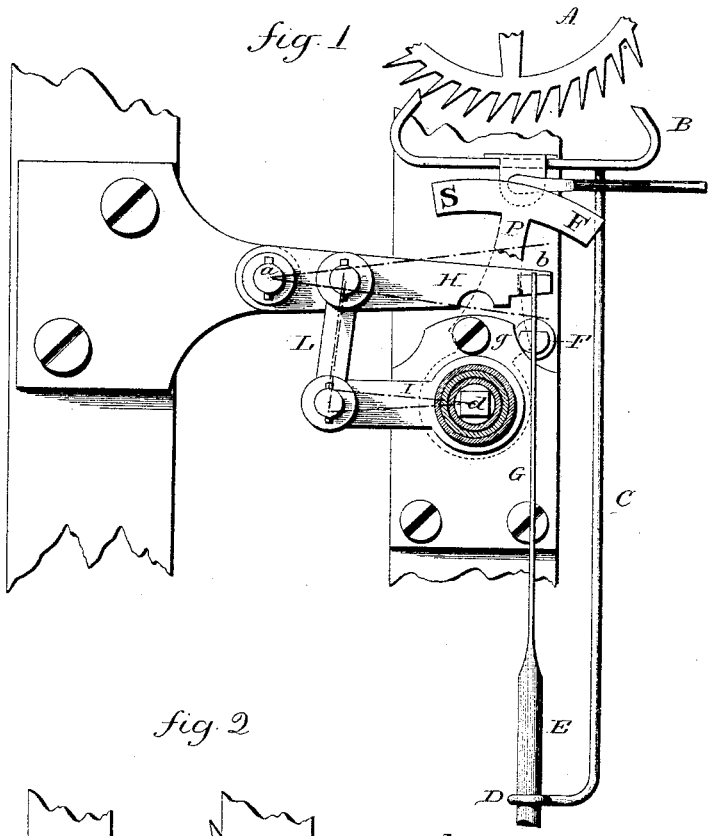


fig. 2

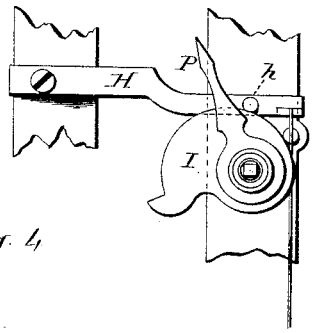


fig. 3

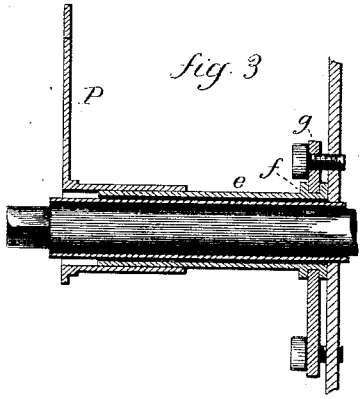
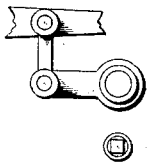


fig. 4



Witnesses.

J. K. Shumway

Jos. C. Earle

Hiram Camp
Inventor
By attys,
Wm. G. Earle

UNITED STATES PATENT OFFICE.

HIRAM CAMP, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE NEW HAVEN CLOCK COMPANY, OF SAME PLACE.

CLOCK-MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 262,738, dated August 15, 1882.

Application filed May 1, 1882. (No model.)

To all whom it may concern:

Be it known that I, HIRAM CAMP, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Clock-Movements; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of that portion of a clock-movement necessary to illustrate my invention; Figs. 2 and 4, modifications; Fig. 3, longitudinal section through the center shaft.

This invention relates to an improvement in that class of clock-movements in which a pendulum is employed. In the usual construction of this class of clocks the clock is regulated by adjusting the pendulum-ball on the rod, as by a nut on the rod below it, or some equivalent device. In others the rod has been suspended to a device above the movement, so that the rod and pendulum together were raised, as in what are known as "French clocks." In the latter the shaft of the adjusting device extends through to the front at the top of the dial. Nothing indicates how the adjustment is to be made, and very few persons understand it. In most of the pendulum-ball adjustments there is nothing to indicate the extent to which the ball is moved, so that in either case, unless a person is well acquainted with the mechanism of the clock, this regulator is a difficult matter.

The object of my invention is to apply an adjusting or regulating device which shall be at the center of the clock-movement, and so that an indicator may be arranged at the center front by which the regulating mechanism may be operated and readily understood by any one however unskilled they may be in clock mechanism, and which will correspond, so far as the movement to make the adjustment is concerned, to the regulator of watches and "marine clocks;" and my invention consists in a lever hung to the frame, one arm above the center of vibration of the pendulum, the pendulum-rod extending through said center of vibration and attached to the said arm of the lever, combined with mechanism at or near the center shaft, in connection with said lever, and whereby the pendulum-rod may be raised or lowered to reduce or increase its length from said center of vibration, as more fully hereinafter described.

In carrying out my invention the mechanism illustrated in Figs. 1 and 3 is the best known to me, and in which A represents the crown-wheel, and B the verge, arranged in connection with the train of gearing in the usual manner, too well known to require further description. From the verge the usual rod, C, extends downward, and is provided with a loop, D, through which the pendulum-rod E is introduced.

F is the stud to which the upper end of the pendulum is usually suspended, and into which the thin end or spring G is placed, but so as to be moved freely up and down therein.

H is a lever hung at one side, as at *a*, its other end extending over the stud F and constructed to receive the upper end, *b*, of the pendulum-rod, the stud F, however, forming the center of vibration of the pendulum in the usual manner.

I is a lever arranged concentrically around the center shaft—that is, over the pointer-sleeve—but so as to leave the shaft and sleeve free for rotation. This is best done by constructing the lever with a long hub, *e*, having a grooved collar, *f*, near its inner end, as seen in Fig. 3, the shaft arranged through a plate, *g*, so that the groove of the collar takes a bearing in the plate and the plate screwed to the collar, as seen in Figs. 1 and 3, and so that while concentric with the shaft it has a bearing independent of it. The lever I stands parallel with the lever H and projects toward the hinging-point *a* of that lever H, the lever I being joined to the lever H by a connection, L, as seen in Fig. 1. If the lever I be turned downward, it correspondingly turns the lever H downward and drops the pendulum-rod to that extent; on the contrary, if it be raised it raises the rod, and as indicated in broken lines, Fig. 1.

At the outer end—that is, outside the dial—or at a point conveniently reached, an arm, P,

is connected to the hub of the lever I; as seen in Fig. 3, and by which the lever I may be conveniently turned, this arm P serving as a pointer to indicate the extent of movement. The arm or pointer P may be provided with projections to the right and left, as seen in Fig. 1, to indicate which way to turn the pointer to shorten or lengthen the pendulum-rod—that is, to cause the clock to run faster or slower.

By this construction the regulator is brought into a convenient position for adjustment. So far as the use of the regulator is concerned it appears to be the same as that on marine clocks and watches, which is more generally understood than that of raising or lowering the ball or the pendulum-rod, and the extent of movement to make the adjustment is more conveniently seen.

Another advantage of this peculiar regulating mechanism consists in the fact that it is self-adjusting to different temperatures or atmospheres. The connection L is made near the pivot of the lever H, so that it moves through but a small arc compared with the end of the lever where the pendulum is attached. Hence the length of this connection may be proportioned to the pendulum-rod, so that the expansion of the said connection L will counteract the expansion of the longer pendulum-rod. Thus the regulator becomes self-adjusting so far as variable temperature is concerned.

Instead of the lever I and its connection L, a cam may be substituted for the lever I, as seen in Fig. 2, the cam operating upon the lever H or upon a stud, *h*, projecting therefrom, to raise and lower the lever the same as does the rod I.

While I prefer to arrange the mechanism which operates the lever H concentric with the center shaft, as it makes a better appearance, the lever or cam may be arranged directly above the center shaft, as seen in Fig. 4, or it may be below the center shaft, the connection between the lever H and the operative mechanism being such as to escape interference with the center shaft. Again, instead of arranging the lever H above, it may be placed below; or, instead of hanging the lever H to the frame by one end and suspending the pendulum at the other end with the operative mechanism between, the lever H may be hung to the frame between its two ends, the pendulum suspended from one end and the operative mechanism from the other. While, therefore, I prefer the lever arrangement first described, I do not wish to confine my invention to that particular arrangement of levers, the essential feature of my invention being the arrangement of a lever hung to the frame, one arm over the center or point from which the pendulum vibrates, with the pendulum-rod extending through said center of vibration and connected to the arm of said lever, combined with mechanism for turning said lever to raise or lower the pendulum. Arm P

I claim—

1. In a pendulum clock-movement, a lever hung to the frame, one arm extending over the stud which forms the center of vibration of the pendulum, the pendulum-rod extended through the said stud and hung to the arm of said lever above, with mechanism, substantially such as described, around and concentric with the center shaft to operate said lever to raise and lower the pendulum, substantially as described.

2. In a pendulum clock-movement, a lever hung to the frame, one arm extending over the stud which forms the center of vibration of the pendulum, the pendulum-rod extended through said stud and hung to the arm of the said lever above, a second lever hung to the frame and substantially parallel with the pendulum-lever, a connection from said second lever to the first at a point nearer its fulcrum than the point where the pendulum-rod is hung, substantially as described.

3. The combination of the lever I, arranged in a bearing on the frame concentric with and surrounding the center shaft, the lever H, hung to the frame, its one end extending over the stud F, which forms the center of vibration of the pendulum, the pendulum-rod hung to said end of the lever H, and a connection, L, between the said two levers, substantially as described.

HIRAM CAMP.

Witnesses:
W. M. WELLMAN,
F. E. MORGAN.