No. 654,726. Patented July 31, 1900.

F. I. GETTY.

PENDULUM.

(Application filed July 13, 1899.)

(No Model.)

Fig. 1.

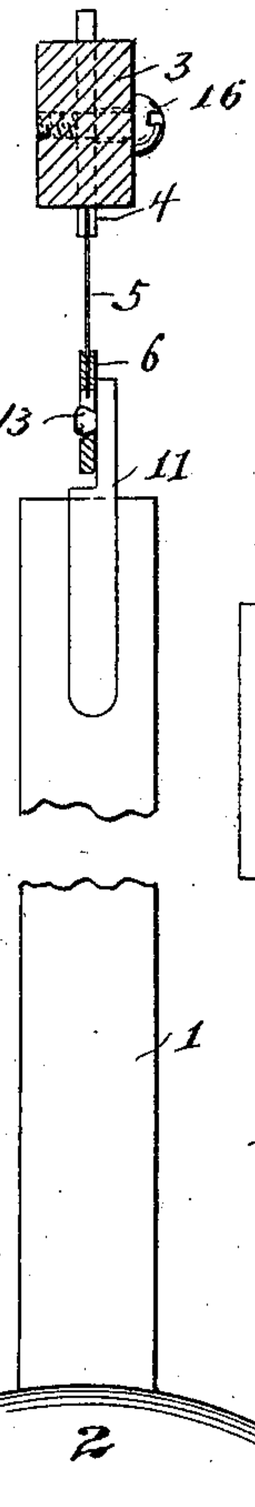


Fig. 2.

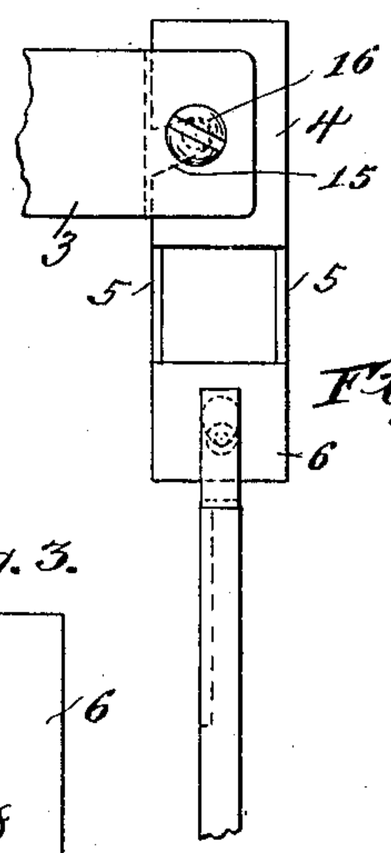


Fig. 3.

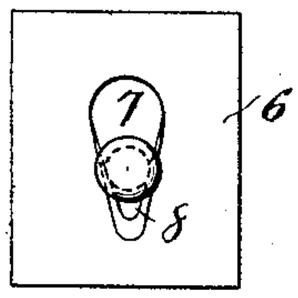
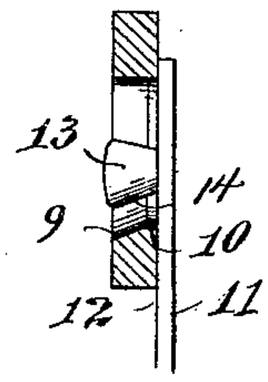


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRED I. GETTY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE AUTOMATIC ELECTRIC CLOCK COMPANY, OF KANSAS CITY, MISSOURI.

PENDULUM.

SPECIFICATION forming part of Letters Patent No. 654,726, dated July 31, 1900.

Application filed July 13, 1899. Serial No. 723,704. (No model.)

To all whom it may concern:

Be it known that I, FRED I. GETTY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pendulums, of which the following is a specification.

This invention relates to pendulums, and has for its object the provision of a simple and effective connection between the upper end of the pendulum-rod and the suspension-plate by means of which it is carried, said provision being such that all lost motion is taken up by the same and accuracy of regulation is thereby assured. Heretofore it has been customary in effecting this connection to provide the upper end of the pendulum-rod with a vertical slot to embrace the suspension-plate and with a transverse slot to receive a transverse pin on said plate. Such a construction, while it permits the ready removal and replacement of the pendulum and also permits it to vary its angular relation transversely of its path of motion in order to accommodate changes in the position of the clock or other instrument from the vertical, is open to the objection that unless the fit between the vertical walls of the slot and the similar walls of the suspension-plate is absolutely accurate more or less lost motion will exist between the two, and the accuracy of the pendulum will thus be more or less seriously affected. Moreover, this lost motion tends to increase or even to come into existence through wear between the parts.

It is the particular object of my present invention to provide a simple and efficient construction which will overcome this objection and by means of which the pendulum will be not only readily detachable and replaceable, but there will also be an automatic taking up of all lost motion, whether due to imperfections in the fitting of the parts or to wear.

To these ends my invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a front elevation, partly in vertical section, of a pendulum embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged view of the connection between the pendulum-rod and suspension-plate seen from the side opposite to that shown in Fig. 2; and Fig. 4 is a central vertical sectional view through said connection, the stem of the pendulum-rod and its pin being shown in elevation.

In the said drawings, 1 indicates the pendulum-rod, and 2 the bob or weight thereof, these parts being of any approved construction.

3 indicates a fixed arm projecting from the frame of the clock or other instrument in connection with which the pendulum is to be employed. This arm has secured to it in any suitable manner a plate 4, from which extend downward two flexible or spring pieces 5, which carry the suspension-plate 6. This suspension-plate is provided with a slot or opening 7, the upper portion of which is of a diameter sufficiently large to receive the connecting-pin hereinbefore described. The lower portion of the slot or opening 7 is of decreasing diameter downward, as shown, so as to give to it an approximately V shape, as indicated at 8. The wall of this V-shaped portion is beveled or inclined on that side thereof opposite to that on which the pin is inserted, as indicated at 9; but this bevel or incline does not extend clear through to the opposite side of the plate, the margin of the aperture being cut away at right angles on said opposite side, as indicated at 10, to form a clearance or relief.

The pendulum-rod 1 has at its upper end a stem or extension 11, one side of which is finished off in a flat or plane surface 12 to fit against the corresponding or abutting face of the suspension-plate 6. This stem or projection 11 is provided with a pin 13, which is beveled off from its outer extremity toward the stem, as indicated at 14, said bevel corresponding with the bevel 9 of the opening in the suspension-plate.

It will be seen that in order to connect the pendulum with its suspension-plate it is only necessary to insert the pin 13 through the enlarged upper portion of the aperture in the suspension-plate and to then allow the pendulum to be lowered by its own weight, whereupon the beveled under surface 14 of the pin 13 will come into contact with the beveled

portions 9 of the aperture in the suspension-plate, and by this contact and the inclination of the beveled surfaces the plane surface of the stem of the pendulum will be firmly drawn against the corresponding abutting face of the suspension-plate and there held by the weight of the pendulum. It will also be seen that the construction is such that the connection will automatically adjust itself to any variations in fit and to any wear which may occur, so that by merely inserting the pin through the aperture and releasing the pendulum the weight of this latter will draw the face of its stem firmly and evenly against the face of the suspension-plate and will also hold it firmly in contact therewith and will prevent any lost motion between the parts, thus insuring accuracy on the part of the pendulum. It will be observed that the pendulum may be detached by simply lifting it until the pin lies in the enlarged upper portion of the opening in the suspension-plate, whereupon a lateral movement of the upper end of the pendulum-rod will disengage the pin and detach the pendulum. It will also be observed that the connection is such that the pendulum is free to change its angular relation to the suspension-plate transversely to the path of motion, turning upon the pin 13 as a pivot for this purpose, so as to cause the pendulum to automatically adjust itself to any deviation from the true vertical position on the part of the clock or other instrument in connection with which it may be employed. The provision of a clearance by terminating the bevel of the aperture short of the bearing-face of the suspension-plate insures a proper contact between the said suspension-plate and the stem of the pendulum simultaneously with a proper seating of the pin between the converging walls of the opening in the plate.

I do not wish to be understood as limiting myself to the precise details of construction hereinbefore set forth, since, although the particular construction shown in the drawings and just described is that which I deem the best embodiment of my invention, such construction may be departed from without departing from the principle of my invention. For instance, although I have described both the pin and the wall of the aperture as being beveled, yet it is obvious that the beveling of one of these parts may be dispensed with, and although I have shown the pendulum as provided with a pin and the suspension-plate with a slot it will be at once apparent that the suspension-plate might carry the pin, while the slotted member would in this case be carried by the pendulum. Such a mere reversal of the construction shown will be readily understood without detailed description.

As hereinbefore stated, the plate 4 may be connected to the fixed arm 3 in any suitable manner. I prefer, however, to effect this connection by providing the plate 4 with an inclined slot 15, while the arm 3 is split at its end to receive the plate, the split portions being connected by a screw 16, which passes loosely through one of said portions and is threaded into the other. By this means the plate 4 may be readily inserted in the split of the fixed arm and its slot engaged with the screw, whereupon said screw may be tightened up so as to clamp the plate between the two portions of the arm.

I claim—

1. In a pendulum, a rod and a suspension-plate having plane meeting surfaces, one of said parts being provided with an opening and the other with a pin to engage the same, and one of said engaging devices being beveled, whereby the plane meeting surfaces of the rod and plate are held in firm bearing contact, substantially as described.

2. In a pendulum, a rod and a suspension-plate having plane meeting surfaces, said plate being provided with an opening having a beveled margin, and said rod being provided with a pin to engage the same, whereby the plane meeting surfaces of the rod and plate are held in firm bearing contact, substantially as described.

3. In a pendulum, the combination, with a suspension-plate having an opening therein the lower margin whereof is beveled or inclined, of a rod provided with a pin correspondingly beveled on its under side, said plate and rod having plane meeting surfaces which are held in firm bearing contact by the bevel or inclination of their engaging parts and the weight of the pendulum, substantially as described.

4. In a pendulum, the combination, with a suspension-plate having a plane contact-surface and an opening therein of comparatively-large diameter at its upper portion, its lower portion being V-shaped or of downwardly-decreasing diameter and marginally beveled, of a rod having a plane contact-surface to bear against that of the plate and provided with a tapered pin adapted to be inserted through the enlarged upper part of the opening in the plate and to fit the beveled margins of the V-shaped lower portion of said opening, substantially as described.

5. In a pendulum, the combination, with a suspension-plate having a plane contact-surface and an opening of comparatively-large diameter at its upper end and of downwardly-decreasing diameter or V-shaped below, the margin of said V-shaped portion being beveled and said bevel terminating short of the opposite wall of the plate to form a clearance, of a rod having a plane contact-surface to bear against that of the plate and provided with a tapered pin adapted to be inserted in the enlarged upper portion of the opening in the plate and to fit the beveled margin of the V-shaped lower portion, substantially as described.

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