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MECHANISM OF LINEAR CLOCKS

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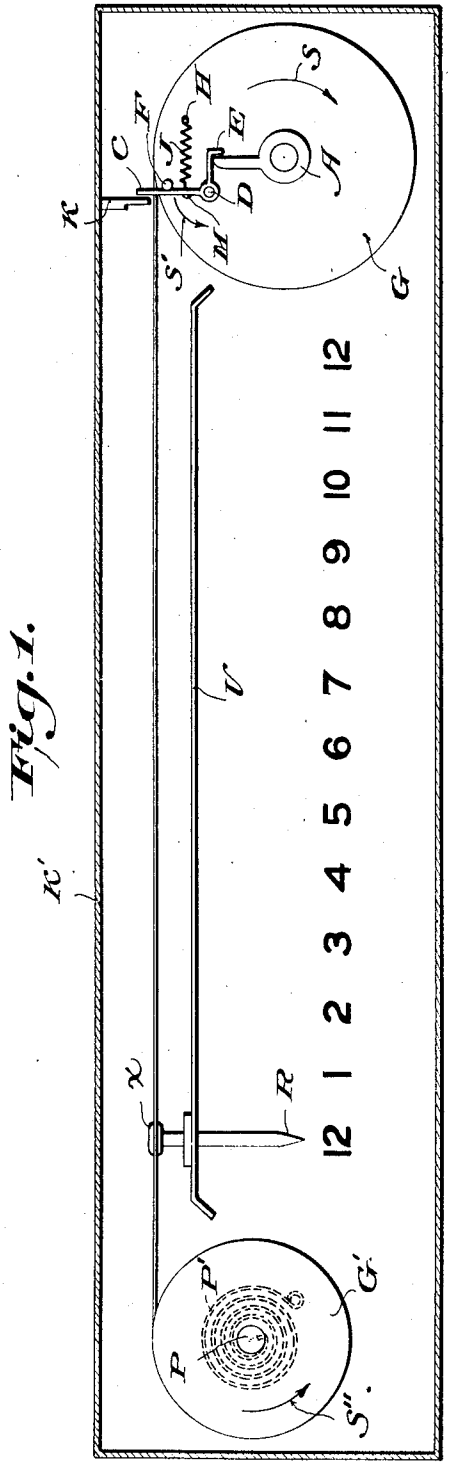

Fig. 1.

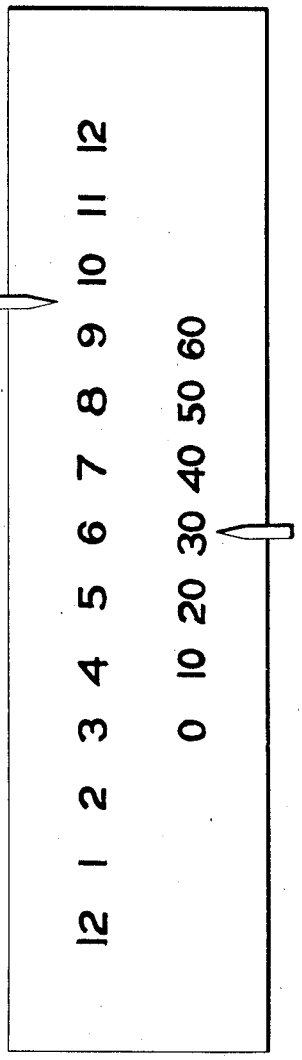

Fig. 2.

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MECHANISM OF LINEAR CLOCKS

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1 Claim. (Cl. 58—2)

This invention relates to a clockwork which is applicable to clocks as used at present and provides a new type of clock that differs entirely from those known hitherto, in which latter the hour, minute and second hands describe a circle in twelve hours, one hour, and a minute respectively, whereas here the hands travel, with uniform or variable movement, along a line that may be straight, curved, broken or of mixed nature, keeping or not throughout their course a direction parallel to their initial direction. At the end of the above-mentioned periods of time the hands return automatically to their starting point to travel again over the same stretch.

The mechanism may be applied to the clockwork of any clock having one, two or three axles corresponding to the hour, minute or second hands. As the solution is the same for each of these hands, the following description is limited to the case of one hand, for example, the hour hand and is illustrated in Fig. 1 of the accompanying sheet of drawings, in which the mechanism forming the subject of the invention is represented schematically.

Fig. 2 represents a modified type of dial.

Fitted loosely on the axle of the hour hand of an ordinary clock, or on the prolongation of such axle, is a pulley G of circular or other section and the diameter of which depends upon the total distance to be covered by the new hand. Fixed in the plane of this pulley and parallel to its axis of rotation is axle D serving as fulcrum for the bell crank lever CDE, from whose end E a tooth of slight height projects towards the center of rotation of pulley G. A counter spring J, fixed at one end H to the pulley and at the other end M to the lever CDE, holds this lever against stop F, which is also fixed to the pulley.

A claw A fixed to the hour-axle of the clock, by engaging with the tooth at E, carries the pulley with it in its circular movement in direction of the arrow S. A stop K, fixed to the casing K' of the clock, is fitted so that, when lever CDE, in rotating with the pulley under the thrust of claw A, reaches that stop (on its left side), the latter causes the lever to swivel on its fulcrum D in the direction of arrow S'.

Another pulley, G', fitted loosely on an independent axle P, tends, under the action of a spring P' or counter-weight, to turn in the direction of arrow S''. A cord, or the like, fastened at one end to pulley G' and at the other end to pulley G, tends to make the latter turn in a direction contrary to that of the arrow S.

The hour pointer or hand R is fitted so as to slide on guide V, which may be straight, curved or straight and curved, and is secured at X to the above-mentioned cord or the like. Upon a complete turn of pulley G this hour hand R will travel over a stretch within which, at intervals that are equidistant or not (according as pulley G is, or is not, circular), the twelve hours must be marked off on the dial, but so that the first figure on the left be twelve, and then one, two, etc. up to twelve again on the extreme right.

The working of the parts, hereinbefore described, of the mechanism forming the subject of the invention is as follows:

Supposing that at the outset (as shown in Fig. 1) lever CDE is on the right hand of stop K, but touching the latter, and claw A is resting against the left side of the tooth of lever CDE; in addition, that hand R is secured to the cord so as to point exactly to figure 12 on the left.

If the clock is now set in motion, the hand R, being drawn by the cord under the traction of pulley G, will mark the successive hours, as in the case of an ordinary clock, until it reaches a point close to the figure 12 on the right, when lever CDE will come to rest against the left side of stop K. Then, as the pulley G continues to turn in the direction of arrow S, lever CDE will swivel on its fulcrum D in the direction of arrow S' and the tooth at E will rise with relation to the end of claw A. When the hand points precisely to 12 o'clock, this tooth, having reached the end of the claw, disengages from it, and pulley G, being loosely mounted on its axle and now free from the traction exerted by the claw, is drawn rapidly back in the opposite direction, as is also hand R, by pulley G', which now turns in the direction of arrow S''. Under the effect of this new traction the hand and all other parts are at once restored to their initial position, i. e. the position they held twelve hours before, when the clock was set in motion.

If similar mechanisms are applied to the axles of the ordinary minute and second hands, the new hands will travel a distance marked on the dial from 0 to 60 in an hour, or a minute, and will return rapidly from point 60 to point 0, to restart their linear movement.

As the distance covered by each hand depends upon the diameter of the corresponding pulley G, dials may be made of any desired type, such as that shown in Fig. 2, in which the space corresponding to the hours is longer than that corre-

sponding to the minutes, or their dimensions may be varied at will.

The dial might also be arranged vertically instead of longitudinally, in which case the hands would move vertically. This type of dial would be suitable for ordinary wall clocks and clocks on towers.

As already stated, the rate of movement of the hands may be uniform or not, according to the shape of the pulleys; and, according to the form given to guide V, their path may, or may not, be a straight line.

What I claim is:

In a linear clock, a casing, a clock-work driven shaft, a primary pulley loosely mounted thereon, means for coupling said primary pulley to the shaft for compelling movement thereof in a clock-wise direction, said means comprising a radially disposed claw on the shaft, a bell-crank lever having one of its arms projecting beyond the periphery of the primary pulley and having an angularly disposed lug on its other arm normally disposed in the path of forward movement of the end of said claw, said lever being pivoted at the juncture of said arms to one side of the primary pulley eccentrically to said shaft, a spring for urging the lever in a direction to cause the said lug normally to yieldingly engage the claw, a secondary pulley spring tensioned for movement in a counter clock-wise direction, a flexible member connecting said primary and secondary pulleys and adapted for linear movement relative thereto, a linear dial having linear indications, a linear guide adjacent the dial, a pointer slidably mounted on the guide and attached to said flexible connection for linear movement over the dial, and a stop on the casing adjacent the primary pulley and disposed in the path of the arm of said bell-crank which projects beyond the periphery of the primary pulley, whereby upon each complete cycle of the primary pulley in a clock-wise direction, the bell-crank will engage the stop to release the primary pulley to the influence of the flexible connection and the spring tensioned secondary pulley thereby to return the pointer to initial position on the dial and whereby the bell-crank on passing the stop will be restored to normal position and engage the claw.

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