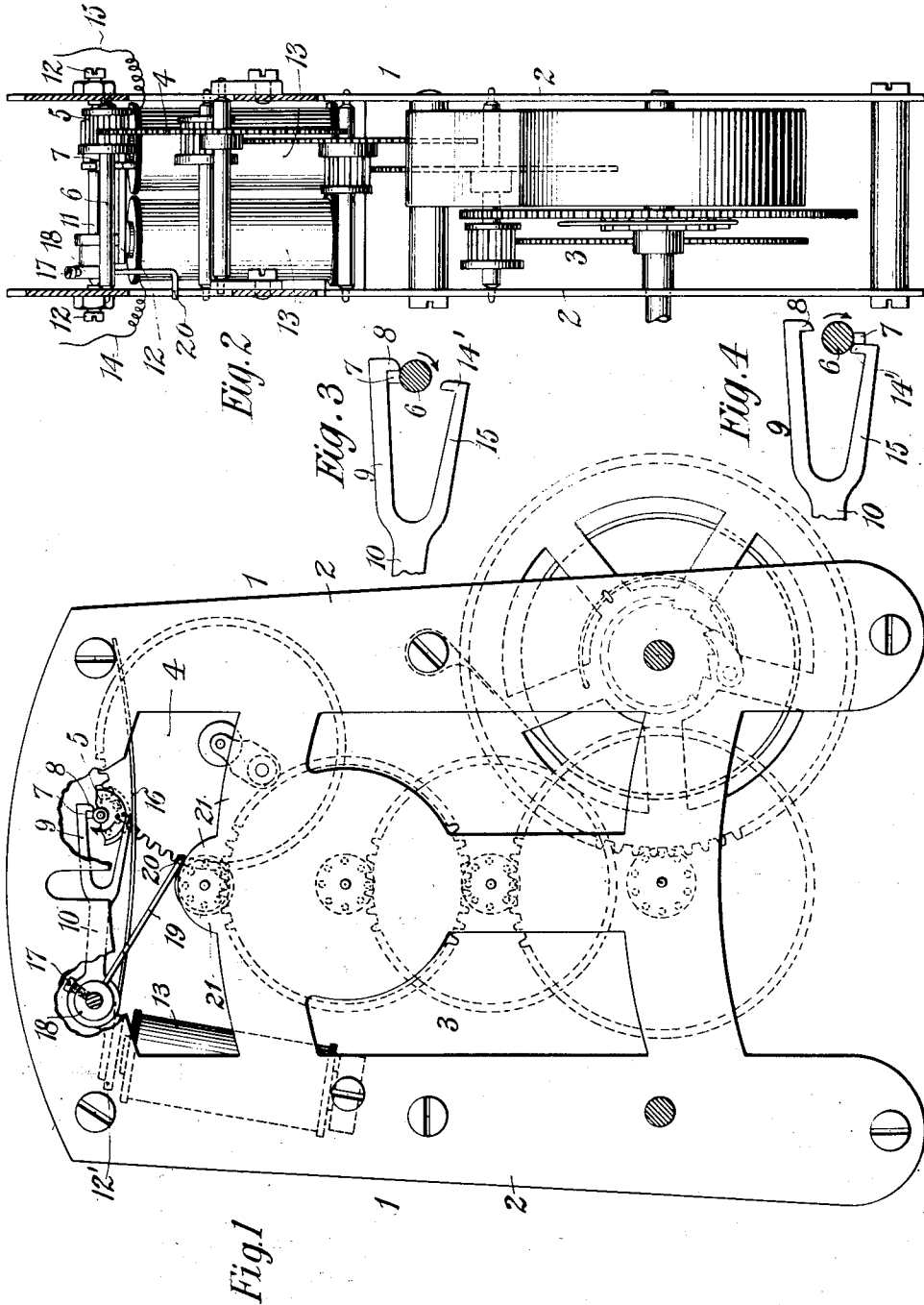


P. E. BURNS.  
 SYNCHRONIZING ATTACHMENT FOR CLOCKS.  
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954,714.

Patented Apr. 12, 1910.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## SYNCHRONIZING ATTACHMENT FOR CLOCKS.

954,714.

Specification of Letters Patent. Patented Apr. 12, 1910.

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*To all whom it may concern:*

Be it known that I, PETER E. BURNS, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Synchronizing Attachments for Clocks.

This invention relates to clocks, and more particularly to synchronizing attachments for those clocks controlled electrically from a master clock. Such controlled or subsidiary clocks, with which my invention is used, may be either those chronometers used simply to record the correct time at a distance from the master clock, or I may use it in connection with a controlled or subsidiary clock which, in addition to recording the correct time, controls printing or analogous mechanism to print or otherwise mark the correct time, or any desired symbols, upon some medium, such for instance, as a tape or check. Such clocks are well known as time recorders and are in universal use to record the time of employees or for other similar uses.

In the accompanying drawings showing illustrative embodiments of this invention, and in which the same reference numeral refers to similar parts in the several figures, Figure 1 is a side elevation of a portion of a clock mechanism, a part of the frame being broken away to better illustrate my invention. Fig. 2 is an end elevation, a part being shown in section. Fig. 3 is a detail showing the escapement in one position, and Fig. 4 is a detail similar to Fig. 3, showing a different position of the escapement.

In the illustrative embodiment of this invention shown in the drawings, 1 is a frame having sides 2, 2 between which is mounted a clock movement of any approved form, the entire movement, for the sake of brevity, being designated 3. The last wheel 4 of the clock movement 3 has teeth which engage with a lantern wheel 5 carried by an escapement arbor 6, which as clearly shown is mounted between the sides 2, 2 of the frame 1. Upon this escapement arbor 6 I also firmly secure, in any suitable manner, a tooth or lug 7 which always revolves with the arbor 6 and is normally in engagement with the pallet 8 of the arm 9 of the bifurcated lever 10. This lever is rigidly attached to a rocking arbor 11 adjustably secured by screws 12, 12 to the sides 2, 2 of the frame 1,

see Figs. 1 and 2. Upon the other end of the lever 10, I mount one or more armatures 12', one such armature being shown in the drawing, which is adapted to be actuated by the electro-magnets 13, two such magnets being shown in the drawings mounted between the sides 2, 2 of the frame, said magnets being adapted to be energized by the current passing through the wires 14 and 15. As well understood in this art, the current passing through these wires 14 and 15 is controlled by the master clock, which controls the escapement of all the subsidiary clocks in the circuit, by energizing the respective electro-magnets, such as 13, of each clock. Prior to my invention, this control by the master clock of the escapement of each clock in the circuit was usually through a synchronizer having an anchor and escape wheel, and usually other necessary elements, such as a vibrating spring and an adjustable pallet equalizer which is adjusted on an arm to regulate the speed of the escape wheel, its function being similar to the adjustable weight on the pendulum of a clock. In my improved synchronizer I omit entirely such anchor and escape wheel with the other necessary adjuncts.

When the master clock permits a current to flow through the wires 14 and 15, in any well known manner, the electro-magnets 13, 13 are energized drawing down the armature 12' carried by the lever 10 and instantly lifting the pallet 8, carried by the arm 9, from engagement with tooth or lug 7, permitting the escapement arbor 6 to turn half a revolution, or from the position shown in Figs. 1 and 3 to that shown in Fig. 4. Complete revolution of the escapement arbor 6 is prevented by the tooth or lug 7 coming into engagement with pallet 14 carried by the lower arm 15 of the bifurcated lever 10. The distance between these two arms 9 and 15 is such that when the pallet 8, which is normally in engagement with the tooth or lug 7, is released by the magnet being energized, the corresponding pallet 14 is instantly brought into position to prevent the further rotation of the escapement arbor 6 until the magnet 13 is deenergized permitting the lever 10 to withdraw the armature 12 into the position shown in Fig. 1, which at the same time permits the pallet 14 dropping out of the path of the lug or tooth 7 (Fig. 4) so that it, and the escapement arbor

6 may complete its revolution and be engaged by the other pallet 8 (Fig. 3). As shown, the movement is so adjusted that the arbor 6 will make a complete revolution every minute, though it is to be understood that my invention is not to be limited to such an adjustment. The lever 10 is pivoted so that its longer arm will readily overbalance the arm carrying the armature 12'; if desired however, a spring 16 may be used though it is to be understood that my synchronizer is not limited to use of such a spring.

On the arbor 11 I adjustably secure by any suitable means, such as a screw 17, a sleeve 18 carrying a stop-arm 19 which may have an out-turned end 20 to engage with a cross piece 21 of the frame 1, said cross piece constituting a stop for the stop-arm. By adjusting the sleeve 18 upon the arbor 11, the armature 12 can be so adjusted, with relation to the magnet 13, that even in its inoperative position (Fig. 1) it will not be more than approximately  $1/32$  of an inch from the magnet 13, the end 20 of the stop-arm 19 engaging with the cross piece 21 to prevent further separation of the electromagnet 13 and armature 12. This adjustment insures an instantaneous and positive action of my synchronizer upon the escapement, which in a time recording clock is of great and marked utility for the manipulation of the recording mechanism of such clocks by employees or others will necessarily often be when the escapement has just been released.

In certain forms of synchronizers in use before my invention, it would take several seconds for the synchronizer to operate the escapement. In such clocks, if the time recording mechanism was operated during these several seconds, the escapement was liable to be again released, making that particular clock record faster time than the

master clock, the variance depending upon the number of times the escapement or release mechanism was accidentally operated by the person or persons operating the time recording mechanism. All these objections are overcome by my new and improved synchronizer, which is positive and instantaneous in action. Furthermore, a clock equipped with my synchronizer will accurately register time regardless of whether or not it is level, which is not true of many of the old forms of synchronizers, which in the rough handling that they are often subjected to will be thrown out of plumb.

Having thus described the invention in connection with an illustrative embodiment thereof, to the details of which it is not, of course, to be limited, what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

What I claim is:

1. In a synchronizing attachment for clocks, the combination of an escapement arbor having a lug or tooth, a bifurcated lever having pallets arranged to engage said tooth alternately, a shaft on which said lever is mounted, an electromagnet arranged to actuate said lever, an adjustable stop arm in rigid connection with the lever, and a stop in the path of said arm, as set forth.

2. In a synchronizing attachment for clocks, the combination of an escapement arbor having a lug or tooth, a bifurcated lever having pallets arranged to engage said tooth alternately, a rock shaft on which said lever is rigidly mounted, an electromagnet arranged to actuate the lever, a stop arm adjustably mounted on the rock shaft, and a stop in the path of said arm, as set forth.

PETER E. BURNS.

Witnesses:

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