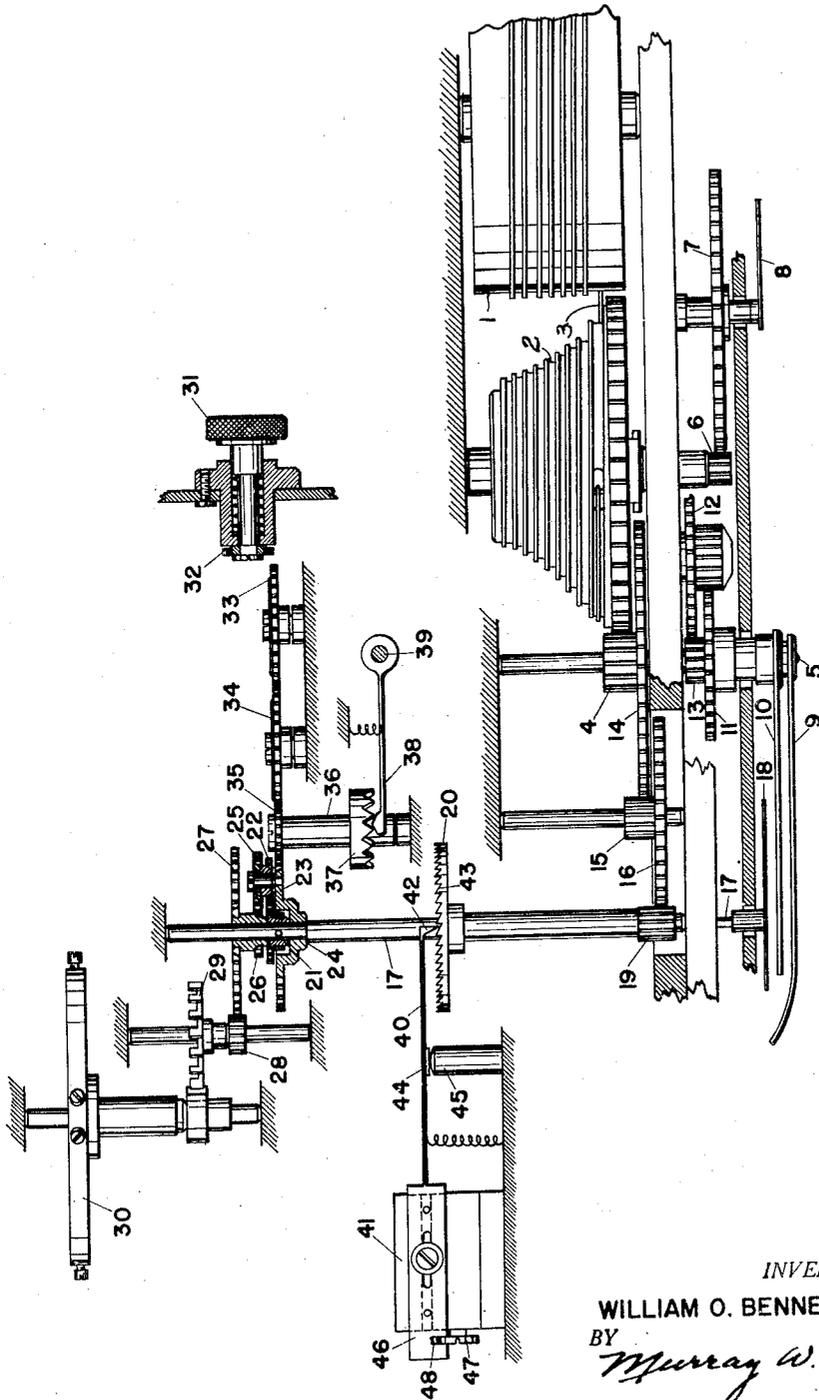


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SECONDS SETTING MECHANISM

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## SECONDS SETTING MECHANISM

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1 Claim. (Cl. 58—80)

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This invention relates to a timepiece and includes improvements consisting in a means for setting the timepiece while running and a break circuit device operated on the second.

The object of the present invention is to provide means for setting a timepiece while running, to within a fraction of a second.

A further object of the present invention is to provide means for setting a marine chronometer, having a fusee and a detent escapement, to a fraction of a second without stopping the balance wheel.

A still further object of the present invention is to provide a setting means for a marine chronometer which will permit setting of the chronometer hands during the running of the chronometer and which will not interfere with the removal of the chronometer movement from the chronometer case.

A still further object of the present invention is to provide means for setting a marine chronometer while running in half second increments making it thus possible to maintain the timepiece to within one-fourth of a second of the exact time.

A still further object of the invention is to provide a break circuit mechanism for a timepiece which can be used to operate a ticker system or other signaling means every second on the second.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein described may be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is shown in the accompanying drawing in which the figure represents a diagrammatic view of the working parts of a marine chronometer showing the parts with regard to their function rather than to their absolute structure and arrangement.

Referring more particularly to the drawing, the chronometer is shown having a mainspring barrel 1 driving a fusee 2 through a fusee chain 3, which drives a pinion 4 on the center shaft 5 and incidentally a pinion 6 connected to a gear 7 to operate a wind indicator 8.

The center shaft 5 carries a minute hand 9 and an hour hand 10 driven through appropriate gears 11, 12 and 13. Also mounted on the center shaft 5 is a center wheel 14 driving a pinion 15

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which is attached directly to and drives a third wheel 16.

The fourth shaft 17 which carries the second hand 18 is connected to the third wheel 16 through the driving pinion 19. Mounted for rotation on the fourth shaft is a seconds break circuit wheel 20 operating a break circuit mechanism which will be described later. Also connected and driven by the fourth shaft is a gear 21 driving planetary gear 22 mounted on carrier gear 23 which is rotatably mounted on shaft 17 and carried against shoulder 24 of shaft 17. Gear 25 attached to gear 22 meshes with gear 26 which is attached to the escape drive wheel or fourth wheel 27.

The escape drive wheel 27 which is driven by the shaft 17 through the planetary gear system and in turn drives the escape pinion 28, escape wheel 29 and balance wheel 30 continuously provides the necessary torque at the pinion 28 to maintain the balance wheel in a constant state of motion.

Setting of the marine chronometer is done through movement of the planetary gear system above described and the second hand 18 is advanced or retarded through movement of this system by pressing the setting knob 31 causing the companion gear 32 to mesh with the idler gear 33. Rotation of this knob will then turn the carrier gear 23 through the action of intermediate gears 33, 34 and 35 moving the axis of gears 22 and 25 around shaft 17, advancing or retarding said shaft 17 with relation to the escape drive wheel 27 while maintaining a constant torque against the pinion 28 and constantly supplying torque to the escape wheel which in turn drives the balance wheel. This turning of shaft 17 with relation to escape drive wheel 27 moves the second hand, the minute hand and the hour hand of the chronometer out of its previous phase relationship with the escape wheel. Connecting the carrier wheel 23 and the idler gear 34 is a gear 35 mounted on a shaft 36 and carrying a star wheel 37.

A spring finger 38 is pivotally mounted at 39 and engages the teeth of the star wheel so that movement of the carrier wheel 23 through the action of setting knob 31 is always in exact increments here calculated to be one-half a second on the reading of the second hand.

It will thus be seen that the chronometer may be set forward or backward without disturbing the torque applied to the escape drive wheel 27 and the escape pinion 28 so that the escape

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pinion is always driven in the same direction, thus maintaining the balance wheel at its normal regular movement.

Referring to the seconds break circuit wheel 20 carried on the shaft 17 and rotating in accordance with the seconds hand of the chronometer, a spring finger 40 adjustably mounted on block 41 has a tooth 42 engaging the teeth 43 of the break circuit wheel 20 mounted on seconds hand shaft 19 to raise and lower the spring finger 40 so that electrical connection between the points 44 and 45 is broken every second. The block 41 is provided with a slide 46 and an adjusting screw 47 engaging a slot 48 in said slide 46, movement of the screw 47 moving the slide 46 and its accompanying spring finger on the block 41 so that a very accurate adjustment of the time of contact break may be made. It is thus possible to provide a break circuit mechanism which will operate on the second from a standard marine chronometer.

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What is claimed is:

A combination of a chronometer having hour, minute and second hands, said second hand advancing in half minute increments and provided with a detent escapement, with means for advancing or retarding, the running mechanism including the second, minute and hour hand in exact half minute increments.

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