April 7, 1953 L. B. STONE 2,633,695

ESCAPEMENT FOR CLOCKS AND WATCHES

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Fig. 1.

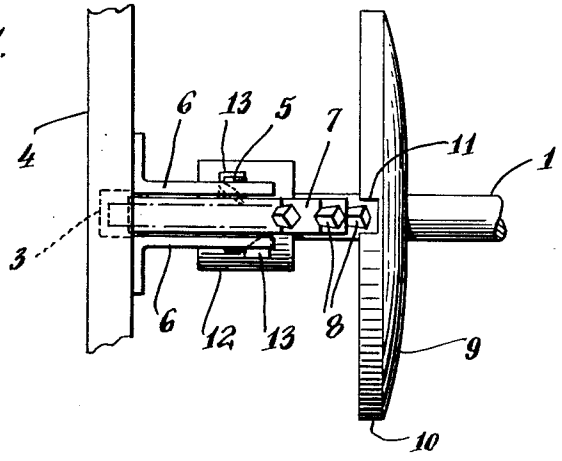
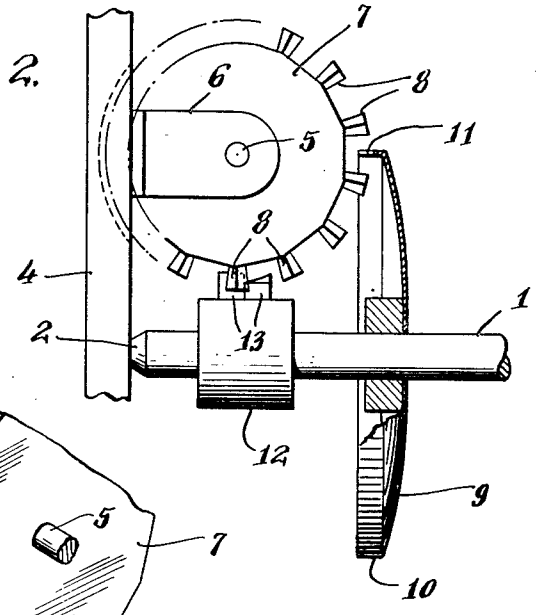


Fig. 2.



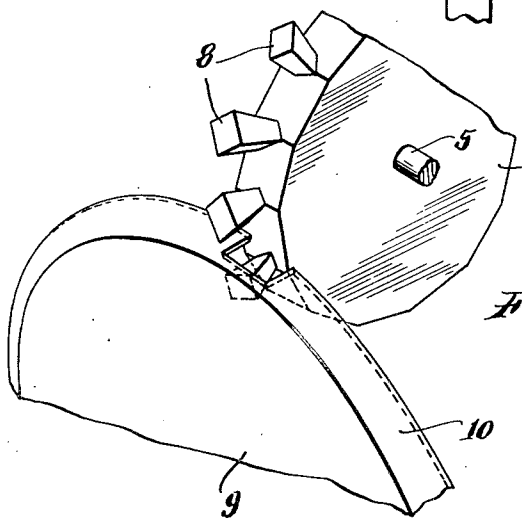


Fig. 3.

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ESCAPEMENT FOR CLOCKS AND WATCHES

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4 Claims. (Cl. 58—28)

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This invention relates to an improved escapement for clocks and watches, it being one object of the invention to provide an escapement wherein rotation of the escape wheel is controlled by a disk mounted upon the balance wheel shaft, the disk having a marginal portion formed with an opening through which the teeth of the escape wheel successively pass and wherein the oscillating disk moves back and forth through space between the said teeth and serves very effectively to prevent undue rotation of the escapement wheel.

Another object of the invention is to provide an escapement mechanism wherein the balance wheel shaft carries levees having cam action engagement with the teeth of the escape wheel and thus cause the escape wheel and the balance wheel shaft to turn in predetermined relation to each other.

Another object of the invention is to provide an escapement mechanism of such construction that it prevents the works of a clock or watch from being subjected to a slip-through which is objectionable, as a slip-through will prevent accurate operation of the clock or watch.

Another object of the invention is to provide an improved escapement mechanism which is of simple construction and not liable to be broken or get out of proper running order.

With these and other objects in view, the invention consists of an improved construction and arrangement of parts, one practical embodiment of which is illustrated in the accompanying drawing, wherein:

Figure 1 is a plan view of the improved escapement mechanism, some of the teeth of the escape wheel being omitted for sake of clearness.

Figure 2 is a side elevation of the escapement, the disk carried by the balance wheel shaft being shown in section; and

Figure 3 is a fragmentary view in perspective of the escape wheel and the balance shaft disk.

This improved escapement constitutes a portion of the works of a clock or watch which includes the usual train or gearing. The train of gearing has not been illustrated in detail as it is of a conventional construction. The balance wheel shaft 1 is rotatably mounted for oscillating movement and has one end portion tapered to provide a terminal portion 2 which is mounted in the bearing 3 of the plate 4. Adjacent this shaft is disposed a shaft 5 which is rotatably mounted through bearing brackets 6 and disposed at right angles to the balance wheel shaft 1 in crossing relation thereto. An escape wheel

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7 is fixed upon the shaft 5 between the bearings 6, and this wheel carries a plurality of teeth 8 which project from the peripheral edge face of the wheel radially thereof and are evenly spaced from each other circumferentially thereof. These teeth have flat side faces and the teeth are so mounted upon the wheel that each tooth has pairs of side faces presented circumferentially of the wheel with the side faces of each pair converging and intersecting, as shown in Figure 3.

In order to control rotation of the escape wheel and the shaft 5 carrying the same, there has been provided an escapement disk 9 which is fixedly mounted upon the balance wheel shaft 1 and disposed close to the escape wheel 7. The disk is of concavo-convexed formation with its concaved surface presented towards the escape wheel and about its peripheral edge, the disk is formed with a marginal flange 10 of such width that it fits between teeth of the escape wheel and will serve very effectively to prevent rotation of the escape wheel and its shaft 5 unless a slot or opening 11 formed through the flange is in position to permit passage of the teeth through it. When the clockwork is running, the balance wheel shaft 1 is oscillated and as the disk is fixed to this shaft, the opening 11 moved back and forth between teeth of the escape wheel and thus is intermittently moved into and out of position for passage of a tooth through it. Therefore, the teeth successively move through the opening in the flange of the disk but can not have such movement if the opening or slot is not directly under a tooth. It will thus be seen that the teeth of the escape wheel may be disposed at rest against the flange of the disk at one side or the other of the opening 11 and slip through the opening causing oscillating movement of the disk. Rotation of the escape wheel and its shaft will thus be very effectively controlled.

A collar 12 is formed about the shaft 5 and this collar carries levees 13 which project laterally from the collar in the direction of the shaft 5. These lugs or levees are spaced from each other circumferentially of the collar so that they are located at opposite sides of the escape wheel and its teeth and in addition are offset longitudinally of the collar. Inner side faces of the levees are at an oblique angle to the length of the shaft 5 with the diagonally extending inner side face of each levee sloping in a direction opposite to that of the other levee. Therefore, during rotation of the balance wheel

shaft, a cam action will take place as the levees move across the diagonally disposed side faces of the teeth 8 and the escape wheel will be pushed by action of the levees and turn in proper timed relation to movements of the balance wheel shaft. The balance wheel shaft moves in conjunction with the hair spring of the clock works. As the balance wheel turns first to the right and then to the left, the teeth of the escape wheel drop or pass one at a time through the slot of the concaved disk and between such dropping movements they rest one at a time against the flange of the disk. Accurate intermittent turning movements are, therefore, imparted to the escape wheel and its shaft and the clock or watch will keep accurate time.

From the foregoing description of the construction of my improved escapement for clocks and watches, the assembly and operation thereof will be readily understood, and it will be seen that I have provided a simple, inexpensive and efficient means for carrying out the various objects of the invention.

While I have particularly described the elements best adapted to perform the functions set forth, it is apparent that various changes in form, proportion and in the minor details of construction may be resorted to, without departing from the spirit or sacrificing any of the principles of the invention.

Having thus described the invention, what is claimed is:

1. In an escapement mechanism for clockworks, a rotatably mounted balance wheel shaft, an escapement wheel having a shaft rotatably mounted and extending transversely of the balance wheel shaft in crossing relation thereto, said escapement wheel having teeth projecting from its peripheral edge face, each tooth being formed with side faces converging and intersecting in the direction of the circumference of the wheel, an escapement disk carried by said balance wheel shaft and having a flange about its periphery extending towards the escapement wheel and formed with a slot movable back and forth across the edge face of the escapement wheel into and out of position for passage of the teeth through the slot during oscillating movement of the disk, a collar about said balance wheel shaft, and levees extending laterally from said collar towards the escapement wheel and spaced from each other circumferentially of the collar and disposed at opposite sides of the escapement wheel and offset from each other longitudinally of the balance wheel shaft and having beveled inner side faces constituting cam surfaces engageable with the converging side faces of said teeth during rocking movement of the balance wheel shaft and rotation of the escapement wheel shaft.

2. In an escapement mechanism for clockworks, a balance wheel shaft, an escapement disk rigidly mounted about said shaft to turn therewith and about its marginal edge having a flange formed with a slot, an escapement wheel having a shaft rotatably mounted in crossing relation to the balance wheel shaft, said wheel having radially extending teeth individually and successively moving through the slot during turning of the escapement wheel and its shaft, and levees projecting laterally from said balance wheel shaft at opposite sides of the escapement wheel, said levees and the teeth of the escapement wheel having cam surfaces cooperating with each other for imparting rocking motion to the balance wheel shaft and thereby moving the slot into and out of position for passage of the teeth through the slot.

3. In an escapement mechanism for clockworks, a balance wheel shaft, an escapement disk rigidly mounted about said shaft to turn therewith and about its marginal edge having a flange formed with a slot, an escapement wheel having a shaft rotatably mounted in crossing relation to the balance wheel shaft, said wheel having radially extending teeth individually and successively moving through the slot during turning of the escapement wheel and its shaft, and levees projecting laterally from said balance wheel shaft at opposite sides of the escapement wheel and engageable with the said teeth for imparting rocking motion to the balance wheel shaft and moving the escapement disk back and forth into and out of position for passage of the teeth through the slot during rotation of the escapement wheel and its shaft.

4. In an escapement mechanism for clockworks, a balance wheel shaft, an escapement disk rigidly mounted about said shaft to turn therewith and about its marginal edge having a flange formed with a slot, an escapement wheel having a shaft rotatably mounted in crossing relation to the balance wheel shaft, said wheel having radially extending teeth individually and successively moving through the slot during turning of the escapement wheel and its shaft, and cam members associated with the balance wheel shaft and disposed in cooperating relation to the slot and being engageable with the teeth for effecting movement of the disk into and out of position for allowing passage of the teeth through the slot during rotation of the escapement wheel and its shaft.

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Executrix of the estate of Lucien Bedell Stone, deceased.

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