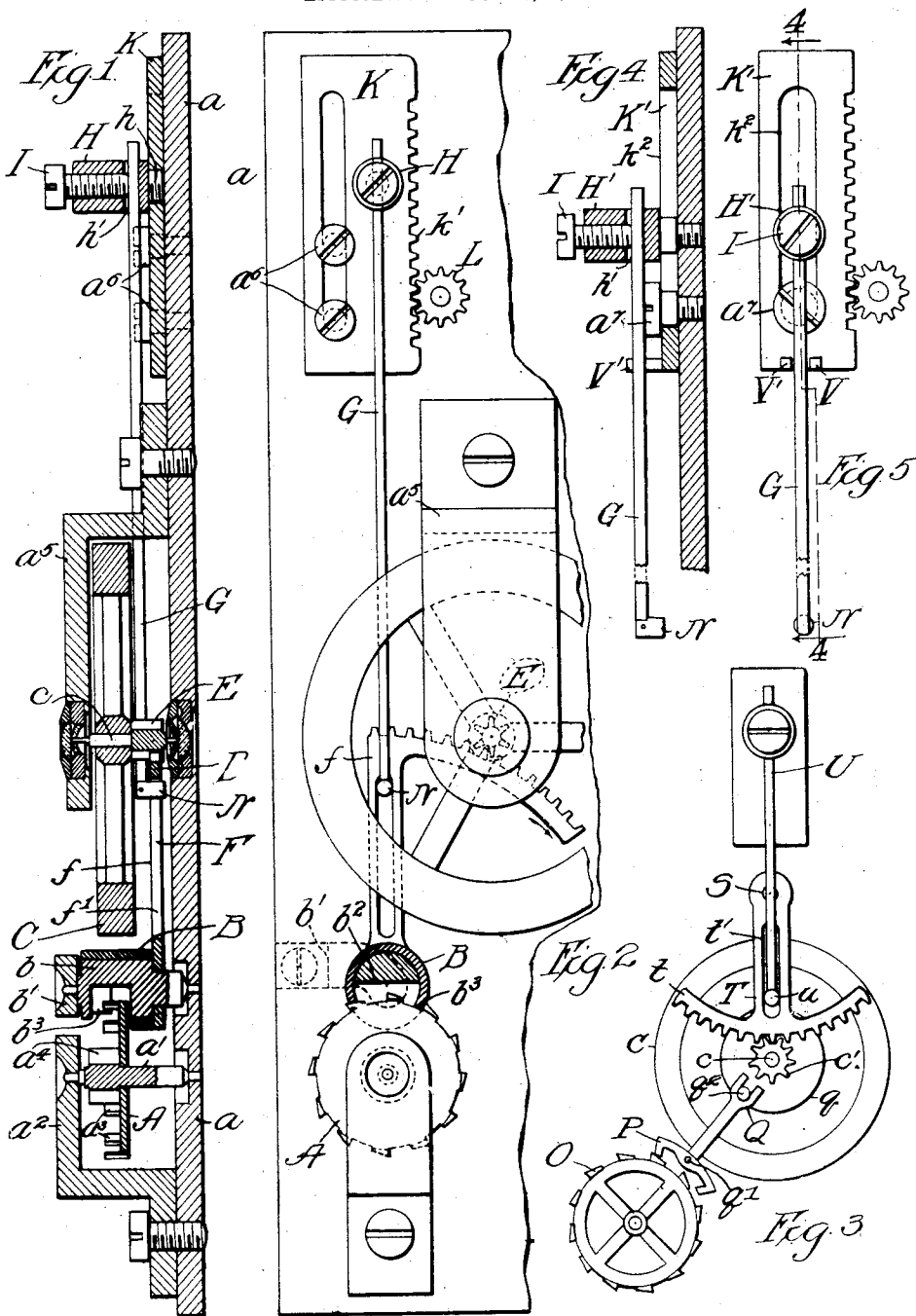


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PATENTED SEPT. 24, 1907.

H. COULLERY.
ESCAPEMENT MECHANISM FOR TIMEPIECES.

APPLICATION FILED OCT. 15, 1906.



Witnesses:

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HENRI COULLERY, OF LA CHAUX-DE-FONDS, OF SWITZERLAND.

ESCAPEMENT MECHANISM FOR TIMEPIECES.

No. 867,015.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRI COULLERY, engineer, a citizen of the Republic of Switzerland, residing at La Chaux-de-Fonds, Canton of Neuchâtel, Switzerland, have invented new and useful Improvements in Escapement Mechanism for Timepieces, of which the following is a specification.

This invention relates to improvements in means for limiting or controlling the movement of balance wheels in time pieces and consists broadly in associating a spring with the escapement lever in such a manner to limit the stroke or movement thereof and the invention further consists in providing adjusting means for the spring whereby the limitation of movement of the escapement lever may be varied.

The invention will be more fully described in connection with the accompanying drawings and will be more fully pointed out and ascertained in and by the appended claims.

In the drawing: Figure 1 is a longitudinal sectional view of a device embodying the main features of my invention. Fig. 2 is a plan view thereof. Fig. 3 is a plan view of a modified form of the invention. Fig. 4 is a sectional view of a further modification of the invention taken on line 4—4 of Fig. 5. Fig. 5 is a plan view of the form shown in Fig. 4.

Like characters of reference designate similar parts throughout the different figures of the drawing.

As shown in Figs. 1 and 2 *a* designates the back or arbor plate of a time piece. *A* designates the escapement wheel which may be driven in the usual manner by other parts of time piece not herein shown. Said escapement wheel *A* is mounted upon an arbor *a'* journaled in the back plate *a* and a bridge *a²* and is provided with the usual pallet teeth *a³* and pinion *a⁴* adapted to mesh with the time train (not shown). *b* designates an arbor which is journaled in the back plate *a* and a bridge *b'* and is provided with a recess *b²* adapted to receive a portion of the escapement wheel *A*. An escapement lever *F* is provided with a sleeve hub *B* journaled on the arbor *b* and provided with marginal portions *b³* adapted to cooperate with the pallet teeth *a³* as shown. Said lever *F* comprises an arm *f* preferably slotted at *f'* and provided with a toothed sector *D*. The balance wheel *C* is shown as mounted upon an arbor *c* journaled at its opposite ends in the back plate *a* and a bridge *a⁵*. Said arbor *c* carries a pinion *E* with which the sector *D* meshes. Means in the form of a spring *G* is provided having on one end a stud *M* adapted to project into the slot *f'* and being mounted at its other end in an adjusting device. As shown said adjusting device comprises a plate *K* movably mounted upon back plate *a*. Said movable mounting may comprise as shown a slot *k* and screws *a⁶* projecting through said slot and anchored in the back plate *a*. The plate *K* is preferably provided

with displacing means which as shown consists of a rack *k'* formed on one of its margins and a pinion *L* meshing with said rack and adapted to be actuated in any desirable manner. The outer end of the spring *G* is preferably anchored in the plate *K* by means of a spring stud *H* having a reduced threaded shank *h* adapted to be secured to the plate *K* and a passage *h'* for the reception of the spring *G*. A screw *I* extending longitudinally of the stud *H* and having threaded engagement therewith serves to anchor said spring *G* in place.

In the operation of the balance wheel it will be obvious that as the sector *D* moves in the direction of the arrow its swinging movement will be effected against the resistance of the spring *G* which latter will serve to limit movement of the sector *D* in accordance with the adjustment of said spring *G*. In the adjustment shown in Fig. 2 the escapement lever *F* has the greatest possible leverage in the construction shown owing to the fact that the stud *N* is located near the outer end of the slot *f'* therefore the sector *D* will have its greatest stroke in this adjustment. If it is desired to decrease the length of stroke of sector *D* the pinion *L* will be rotated to displace the plate *K* and force the stud *N* in the direction of the arbor *b* thereby limiting leverage of the lever *F* and decreasing the stroke of the sector *D* in proportion to the inward movement of the stud *N*. In order to lock the plate *K* in its position of adjustment the screws *a⁶* may be turned down on the plate *K* or any other suitable anchorage means may be provided.

In the form shown in Figs. 4 and 5 one of the screws *a⁶* is dispensed with and the plate *K'* is provided with a slot *k²* and is guided upon the plate *a* by means of a screw *a⁷* and the spring stud *H'* which latter in other respects resembles the spring stud *H* shown in Figs. 1 and 2. In order to limit or restrict the resiliency of spring *G* in the modified form studs *V* and *V'* are provided on the plate *K'* and project upwardly therefrom on both sides of the spring *G*. Said studs *V* and *V'* also serve to lessen the liability of the spring stud *H'* working loose. This construction is especially adapted for use in time pieces where the balance action is unusually strong.

In Fig. 3 is shown a further modification wherein the escapement wheel indicated by *O* cooperates with pallets *P* on a pallet arm *Q*. Said pallet arm *Q* is mounted at *q'* and engages a pin *q²* on a disk *q* which may form a part of and is designed to oscillate with the balance wheel *C*. The shaft *c* of the balance wheel carries a pinion *c'* adapted to mesh with a sector *t* of an escapement lever *T* which latter is mounted upon a stud *S* secured to any convenient stationary part. The member *T* is provided with a slot *t'* adapted to receive a stud *u* of a spring *U* similar in character to spring *G*. The mounting for the outer end of the spring *U* to effect

requisite of adjustment may if desired be in the form shown in either Figs. 2 or 5.

I claim:—

1. A device of the class described comprising in combination, an escapement wheel, a balance wheel, an escapement lever operatively associated with said escapement and balance wheels, yielding acting means slidably connected with said lever for limiting movement thereof, and an adjusting device for said means.
2. A device of the class described comprising in combination, an escapement wheel, a balance wheel, means operatively associating said escapement and balance wheels, and yieldingly acting device slidably connected with said means.
3. A device of the class described comprising in combination, an escapement wheel, an escapement lever operatively associated therewith provided with a toothed sector and a slot, a balance wheel provided with a pinion adapted to mesh with said sector, a rod spring provided with a stud adapted to engage said slot, a displacing device comprising a plate provided with a spring stud for anchoring said spring, said plate having a slot, screws projecting through said slot to guide said plate, said plate having rack teeth, and a pinion meshing with said teeth.
4. A device of the class described comprising in combination, an escapement wheel, an escapement lever operatively associated therewith and provided with a toothed sector and slot, a balance wheel provided with a pinion adapted to mesh with said sector, a spring rod provided with a stud adapted to engage said slot, a displacing device comprising a plate provided with a spring stud for anchoring said spring, said plate having a slot, screws projecting through said slot to guide said plate, and means for displacing said plate.
5. A device of the class described comprising in combination, an escapement wheel, an escapement lever operatively associated therewith and provided with a toothed sector and a slot, a balance wheel provided with a pinion

adapted to mesh with said sector, a spring rod provided with a stud adapted to engage said slot, a displacing device comprising a plate provided with a spring stud for anchoring said spring, means for guiding said plate, and means for displacing the same.

6. A device of the class described comprising in combination, an escapement wheel, an escapement lever operatively associated therewith and provided with a toothed sector and a slot, a balance wheel provided with a pinion adapted to mesh with said sector, a spring rod provided with a stud slidably engaging said slot, a displacing device to which said spring rod is anchored, and means for displacing said device.

7. A device of the class described comprising in combination, an escapement wheel, an escapement lever operatively associated therewith and provided with a toothed sector, a balance wheel provided with a pinion adapted to mesh with said sector, a spring rod slidably connected with said lever, a displacing device to which said spring rod is anchored, and means for displacing said device.

8. A device of the class described comprising in combination, an escapement wheel, an escapement lever operatively associated therewith and provided with a toothed sector, a balance wheel provided with a pinion adapted to mesh with said sector, a spring rod slidably connected with said member, and means for varying the tension of said rod.

9. A device of the class described comprising in combination, an escapement wheel, an escapement lever operatively associated therewith and provided with a toothed sector, a balance wheel provided with a pinion adapted to mesh with said sector, and yieldingly acting means slidably connected with said lever.

In testimony whereof I affix my signature in presence of two witnesses.

HENRI COULLERY.

Witnesses:

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