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2,717,488

NOISELESS ANCHOR-ESCAPEMENT, PARTICULARLY FOR CLOCK-WORKS

Filed Jan. 5, 1953

3 Sheets-Sheet 1

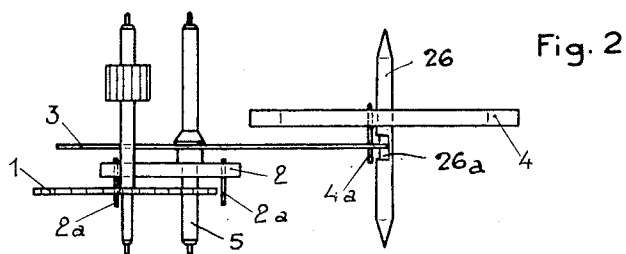
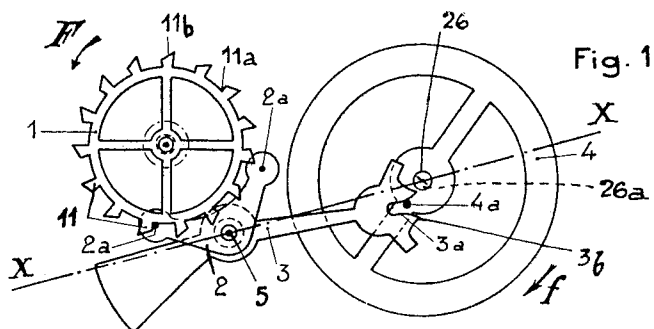


Fig. 3

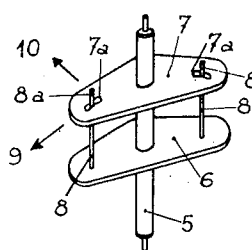


Fig. 4

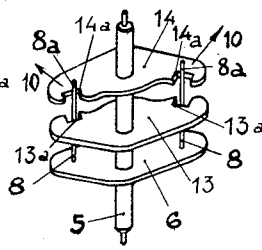


Fig. 5

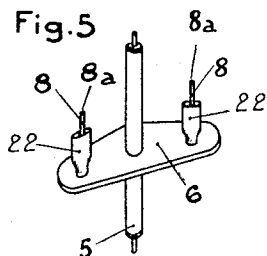
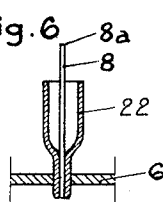


Fig. 6



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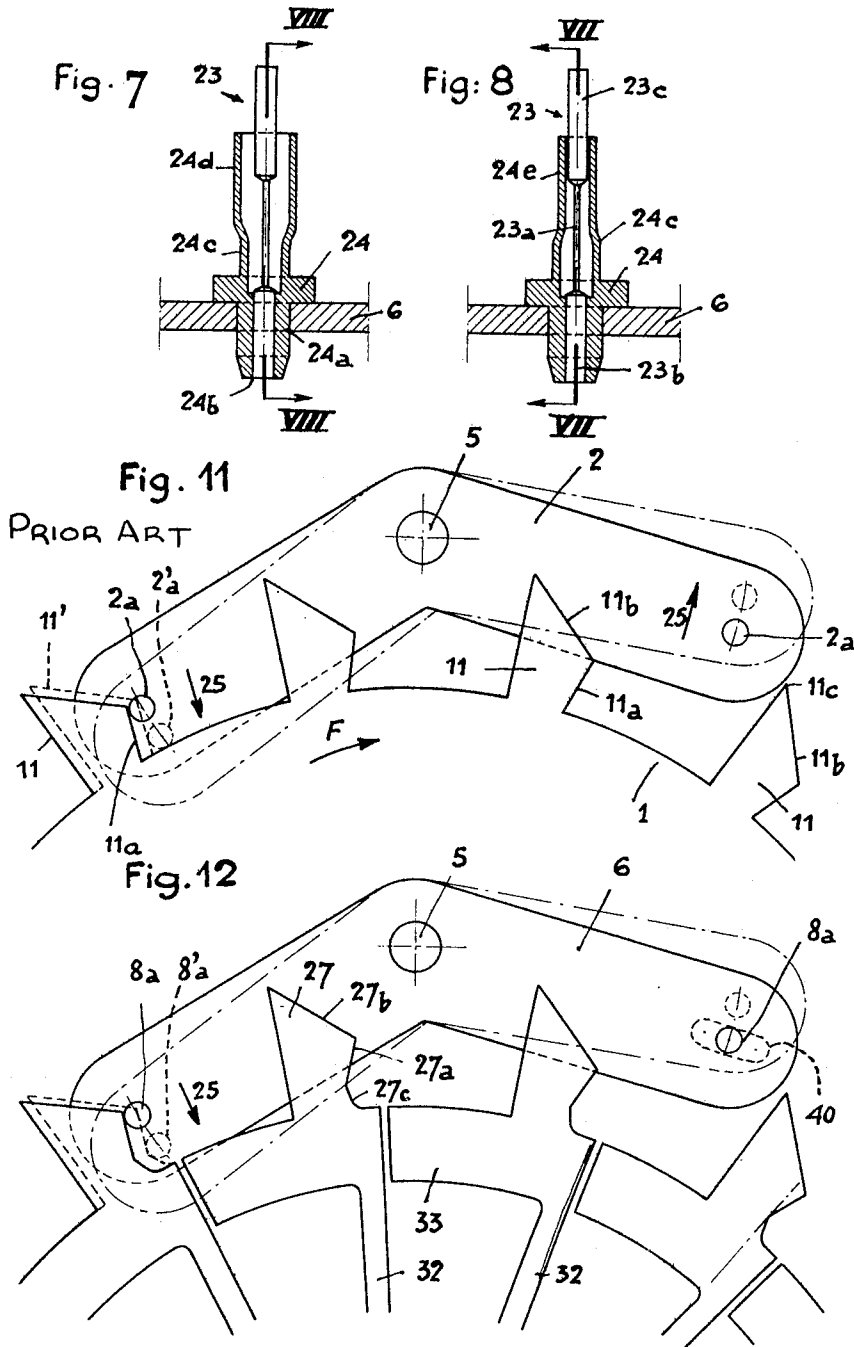
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NOISELESS ANCHOR-ESCAPEMENT, PARTICULARLY FOR CLOCK-WORKS

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3 Sheets-Sheet 2



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Fig. 9

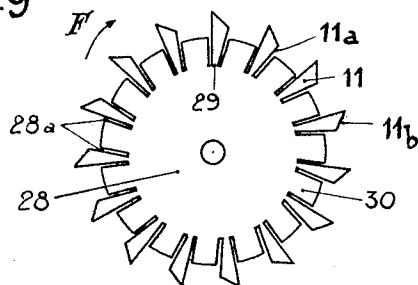


Fig. 10

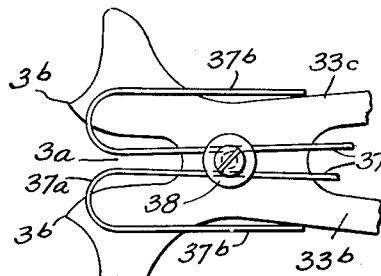
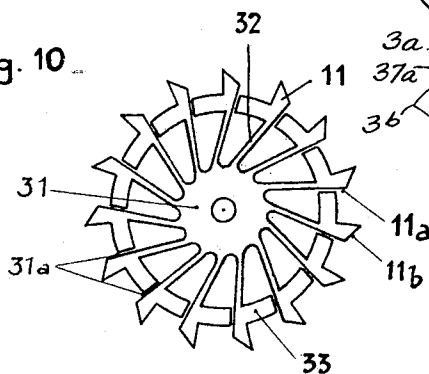


Fig. 13a

Fig. 13

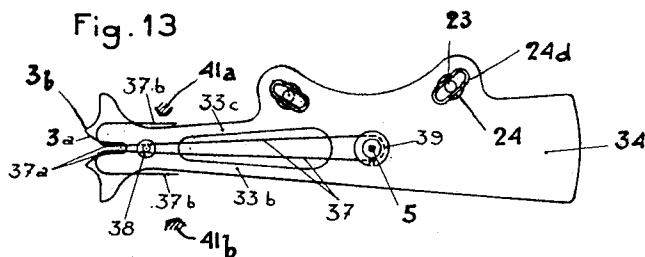
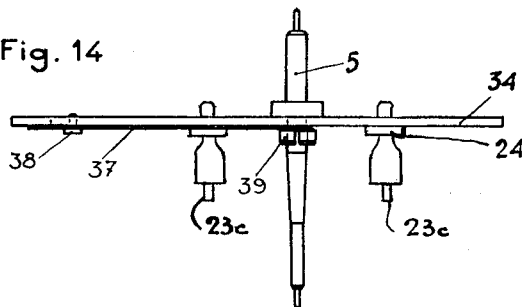


Fig. 14



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NOISELESS ANCHOR-ESCAPEMENT, PARTICULARLY FOR CLOCK-WORKS

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Application January 5, 1953, Serial No. 329,577

Claims priority, application France January 7, 1952

9 Claims. (Cl. 58—121)

The present invention has for its object an improved anchor escapement mechanism for deadening the shocks arising during working, mainly the shocks resulting from the successive encounters of the escapement wheel teeth and the anchor pins, and, moreover, the shocks originating in the mutual action of the fork and the impulse pin of the balance-wheel.

Many suggestions have been made before for deadening these shocks. However, the means suggested are not efficient in working conditions and they require a lowering of 30 to 50% of the oscillation frequency of the balance-wheel for reducing the frequency of the contacts and mainly for decreasing the energy of the mainspring in order that the shocks are weaker. An increase in the oscillation period of the balance-wheel is inconvenient so far as the rating of such movements is very difficult and these movements are much more liable to get choked.

The present invention has for its object means more efficient for deadening the shocks.

Another object of the invention is to construct means of this kind which are easily and cheaply constructed.

Still a further object of the invention is to provide clockworks with efficient means for deadening the shocks such that the oscillation frequency is not reduced.

These and other objects and advantages will become apparent from the following description given with reference to the accompanying drawings in which:

Figs. 1 and 2 are respectively a plan view and an elevational view of a usual escapement mechanism lacking means for deadening the shocks.

Figs. 3, 4 and 5 are perspective views of different anchors provided with flexible pins and having each different guiding means.

Fig. 6 is an elevational view in longitudinal section of a pin carrying tube illustrated on Fig. 5 and having a thin rectilinear pin.

Figs. 7 and 8 are elevational views in longitudinal section of a pin carrying tube being improved with respect to the tube illustrated on Fig. 6. These sections are marked by lines VII—VII and VIII—VIII of Figs. 8 and 7 respectively.

Figs. 9 and 10 are plan views of two different escapement wheels having a divided toothing.

Fig. 11 is a partial plan view in larger scale illustrating a usual escapement wheel cooperating with an anchor.

Fig. 12 is a similar view of an improved escapement wheel cooperating with an anchor having damping pins.

Figs. 13 and 14 are respectively an elevational and a plan view illustrating a fork made of a single piece with its anchor and provided with flexible, guided anchor pins and with a spring for deadening the shocks received by the fork.

Fig. 13a is a fragmentary enlarged view of one end of Fig. 13, showing the fork opening and the spring therein.

At a rough approximation, in an anchor escapement, the members transmitting the main shocks are the escapement wheel and the fork, whereas the members receiving

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these shocks are the pins carried by the anchor and respectively the balance-wheel. It will be seen hereunder that secondary shocks originate from the pins.

According to the invention the anchor-pins have the shape of rods having at least one thinned out part so as to be made flexible and being housed at one of their ends, these rods receiving the shocks in the vicinity of their other end which is guided so as to yield only in a direction tangential to the escapement wheel and not in other directions.

This guiding may be achieved by providing in an element fast with the anchor a slot having the direction of the shock and through which the pin is made to pass. Preferably, the pin is enclosed in a portion of a tube flattened in the tangential direction and having a breadth slightly greater than the thickness of said pin.

Thus, this pin may yield under the shock of the encounter but maintains its stiffness for transmitting the motive impulsions the direction of which is, in the case of the anchor-pins, nearly perpendicular to the direction of the shocks received by these pins.

Preferably, such anchor-pins are associated with escapement wheels having teeth which are separated from each other by substantially radial cuts of this wheel, so that each one of these teeth may yield slightly in the direction tangential to this wheel but acts as a stiff element for strains of different directions.

Thus, at the moment of the encounter of the face of a tooth and an anchor pin, this tooth and this pin yield in opposite directions, tangentially to the wheel, whereby the main shock is deadened. However, a secondary shock from said pin against the bottom of the tooth subsists.

In order to meet this difficulty the face of each escapement wheel tooth which is directed in the rotation direction of said wheel, is provided with a base which, as viewed from the wheel periphery towards the centre of same, is sloped in said rotation direction.

Thus, when the anchor pin encounters this sloped base, the end of the oscillatory motion of this anchor is slackened by the backward motion of the teeth, this last mentioned motion being thus started. The secondary shock of the pin against the bottom of the tooth is thus deadened.

Finally, for damping the noise resulting from the shock of the anchor-fork walls and the impulsion pin of the balance-wheel, this fork may be provided with damping springs at the contact points of the impulsion pin of the balance-wheel, on the one hand, and on the other hand with abutments arranged for limiting the angular displacement of this fork, if need be.

As compared with a usual clock-work, the only provision of anchor pins according to the invention has for a result to reduce considerably the noise arising from these works. If these pins are combined with an improved escapement wheel and anchor-work, then this work is performed practically in fully noiseless working conditions.

On Figs. 1 and 2 is illustrated a usual pin-escapement which comprises a toothed escapement wheel 1 driven by a mainspring not shown, an anchor 2 and a fork 3 fixed on their common axle 5 and oscillating about same, and finally a balance wheel provided with a spiral spring, not illustrated, and cooperating with said fork. The teeth 11 of the escapement wheel (see also Fig. 11) comprise each two active planes, i. e. the plane 11a, so called the "pull-and-dead-plane" which comes into abutment with the pins 2a of the anchor 2, and the plane 11b, so called the "beat-plane" which transmits the motive impulsions to the anchor through the pins.

The wheel 1 being caused to rotate in the direction of the arrow F by the mainspring and the escapement being in the position shown on Fig. 1, the balance wheel rotates then in the direction of the arrow f. During this

last mentioned rotation, the impulsion pin 4a of the balance wheel enters the opening 3a of the fork 3 and starts the rocking motion of said fork and of the anchor, this rocking motion is continued by the thrust received by the left anchor pin 2a from the plane 11b of the tooth in engagement with this pin. As a result of this thrust transmitted to the balance-wheel, the fork takes a position symmetrical to that shown on Fig. 1, with respect to line X—X, and the rotation of wheel 1 is stopped by the right pin 2a.

When the balance wheel rotates in the direction opposite to that shown by the arrow f, the fork returns to the first position; the right pin 2a receives the impulsion and further transmits it to the balance-wheel.

From this well-known, briefly recalled functioning, it results that main shocks arise successively, on the one hand, between each pin 2a and the dead planes 11a, and on the other hand, between the impulse pin 4a and the walls of the opening 3a of the fork. Each one of these shocks causes noise and wear which are to be met by the invention.

Damping of the anchor pins will first be considered. For this purpose, the anchor may be arranged as shown on Fig. 3.

The anchor shown on this figure comprises an axle 5 carrying an anchor plate 6 in which are fixed two flexible, relatively long pins 8. Parallel to the plate 6, another similar plate 7 is fastened to the axle 5. In this plate 7 are provided two elongated apertures 7a having a direction tangential to the escapement wheel which is not shown on this figure but which passes as near as possible to this plate 7, preferably above it, so that the ends 8a of the pins cooperate with this wheel. The pins 8 pass freely through the apertures 7a of the plate 7, so that each one of these pins may yield lengthwise within these apertures. Thus, when the plane 11a of an escapement wheel tooth encounters the left pin 8, for instance, this pin receives the shock in the direction of the arrow 9 and can yield owing to the elongated aperture 7a, whereby the desired damping is achieved.

Later on, the plane 11b of the tooth coming into abutment against the end 8a of this pin has to promote the motive impulsion by thrusting said pin in the direction of the arrow 10; in this direction, the pin is held by the narrow part of the aperture 7a, so that, in this direction, the pin has the necessary stiffness.

It should be noticed that the length of the apertures 7a is just limited by the necessary yield; consequently, these apertures may be relatively short so that the plate 7 protects the pins from accidental deformations.

According to another embodiment shown on Fig. 4, the pins 8 are guided during their yielding displacements by two superimposed recessed plates 13 and 14 which, in the same way as plate 7 of Fig. 3, are fastened to the axle 5 in a parallel direction to the plate 6. The recesses 13a and 14a, are arranged so that, in plan view, they form elongated apertures equivalent to the apertures 7a of Fig. 3. This arrangement has some advantage with respect to the former one because it is easier to cut out recesses in plates than to bore very narrow apertures if the pins have a very small diameter. Moreover, this arrangement contributes to increase the stiffness in the direction in which it is necessary that the pins be stiff. Indeed, when the ends 8a of the pins 8 receive the motive impulsions in the direction of the arrows 10, the middle part of these pins are backed by the edges of the recesses 13a.

Fig. 5 illustrates another embodiment of an anchor provided with a different guiding for long and very flexible pins.

In the anchor plate 6, at the usual locations of the pins, are housed the thinned out ends of two tubes 22 in which are placed the pins 8 which are fixed within said thinned out ends (Fig. 6). In the direction in which the pins may yield, these tubes are flattened at their upper part, so that, between the parallel parts of the tube walls a narrow

space remains inside, this space being slightly larger than the diameter of the pins 8 arranged inside. In the same way as above, the escapement wheel teeth act on the free ends of the pins.

An improved embodiment of the arrangement shown on Figs. 5 and 6 is illustrated on Figs. 7 and 8.

The anchor plate 6 carries a tubular guide 24 housed or riveted within a boring of this plate 6, for holding each one of these pins.

This guide has at its base a cylindrical hole 24b.

Towards its upper part, it is provided with a tubular section 24c having thin walls and partly flattened so that, in cross-section, this portion comprises two parallel faces connected by rounded parts. There are thus an enlarged part 24d (Fig. 7) and a narrowed part 24e (Fig. 8).

Inside this guide is fixed the pin 23 comprising two thick and stiff portions 23b and 23c connected by a thinned out and therefore flexible portion 23a. This pin may thus yield in the direction of the larger dimension 24d of the tubular section when receiving a shock, whereby it is stiffly held when receiving the motive impulsion in the perpendicular direction.

Pin 23 is thus correctly guided by its thick portion 23c, in the direction in which it may yield; moreover, the tubular guide may have at its base a hole 24b having a diameter many times larger than that of the thin portion 23a, so that boring of this hole and stiff housing of the part 23b in this hole are made easy. Finally, the portion 23c cooperating with the escapement tothing may have the diameter of the usual pins.

This embodiment is thus particularly advantageous owing to handy manufacturing and it may be applied to small clock-works. Moreover, the flattened tubes 22 or 24 form oil capacities having an appreciable volume and in which oil is kept through capillarity, which contributes to achieving very smooth functioning and long use.

The above described embodiments of anchor pins yield in the tangential direction, when hit by the plane 11a of the escapement wheels. For obtaining a better damping of the noise, the teeth of the escapement wheel may also yield, at the moment of the shocks, in the tangential direction, as shown on Figs. 9 and 10.

Fig. 9 illustrates an escapement wheel 28 the teeth 11 of which comprise in the manner of the usual escapement wheels the active planes 11a and 11b. Each tooth is partly separated from the mass of the wheel by slots 28a having a substantially radial direction. Between the ends of these slots, material narrow portions 29 connect each tooth to the body of the wheel, these narrow portions allowing the base of the teeth to yield in the tangential direction. When the wheel 28 rotates in the direction of the arrow F, the teeth 11 come successively into abutment with the anchor pins through the planes 11a; thus, each tooth yields owing to the narrow portion 29, so that deadening of the shock is obtained. On the other hand, each tooth remains substantially stiff in the radial direction in which it acts on the anchor pins through planes 11b at the moment of the motive impulsion of the escapement.

It is to be noticed that the slots 28a, may be very narrow; their width is to be fixed by the admissible yielding displacement of each tooth. Consequently, there is between two successive teeth a kind of stiff stud 30 forming an abutment limiting with precision the yield of each tooth; therefore, these latter are protected against all deformations beyond the limit of elasticity of the portion 29. Moreover, each slot keeps by capillarity a certain amount of oil forming a lubrication reserve, so that the encounter of oily surfaces achieves an even more noiseless functioning.

Fig. 10 illustrates another embodiment of an escapement wheel with elastic teeth, having at least qualities equivalent to those of the wheel shown on Fig. 9.

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Each tooth 11 is connected to the hub by means of a flexible arm 32. Each tooth 11 has at its back part an extension formed of a circular sector 33. Between the successive slots is a narrow slot 31a. It may be easily understood that, in the same manner as in the case of the wheel shown on Fig. 9, when a hit occurs on plane 11a, the arm 32 of the corresponding tooth yields tangentially. If the spaces 31a are narrow enough and if the arms 32 are very flexible, the elasticity of each one of the teeth is variable during the yield. Indeed, when a tooth yields, its sector 33 encounters the next tooth and causes this latter to yield too and so forth by degrees. As it were, each tooth is very flexible at the moment of the hit with the pin, and it becomes the more stiff the more its pressure on the pin increases. Thus is achieved an improvement in the damping conditions and in the strength of the whole wheel since yielding elements are for a time jointly responsible.

Any method of manufacture may be used for making such a wheel, as for instance: milling, cutting, moulding, sintering, etc. Also, it may be composed of any suitable metal, alloy or plastics.

However, the main shock arising from the encounter of the face 11a of a tooth and a pin is not the only cause of noise. A supplementary shock occurs when the pin hits the bottom of the tooth, as will be explained with reference to Fig. 11.

Indeed, the impulsion of the oscillatory motion of the anchor is nearly wholly supplied from the wheel 1 to the anchor 2 through the beat-plane 11b of the teeth. For instance, on Fig. 11, the left tooth 11 has just thrust the right pin 2a in the direction of the arrow 25. The impulsion itself has ceased at the moment when the tip 11c of the tooth has left this pin. At this moment, the other pin 2a, on the left hand side, arrives in front of the dead face 11a of the paired left tooth, whereby the rotary motion of the wheel is stopped. However, in order that the pin 4a of the balance-wheel may get out of the opening 3a of the fork 3 (Fig. 1) the anchor 2 has still to achieve, in the same direction, a complementary angular displacement for bringing the left pin 2a into the position of 2'a.

This complementary motion of the anchor, corresponding to the displacement from the position in full line to the position in dot-and-dash line is effected on the one hand owing to the acquired velocity of this anchor and on the other hand owing to a slight secondary impulsion promoted by the face 11a of the left tooth which is sloped, as shown by the figure, so as to "pull" the pin 2a into the position 2'a against the bottom of the teeth. During this motion, the left tooth 11 is displaced into position 11'.

Consequently, instead of being slackened the motion of the anchor 2 is accelerated until the end of its run. Each pin 2a is first hit by the plane 11a (main shock) and then encounters the bottom of the tothing. This last shock is a secondary cause of noise. Moreover, the pin can possibly bounce together with the anchor, thereby causing a supplementary shock from the encounter of the horns 3b of the fork (see Fig. 1) and the axle 26 of the balance wheel 4.

It is well known that this axle 26 is provided with a notch 26a located exactly opposite the pin 4a for leaving free passage to said horns when the fork is moved from the position shown on Fig. 1 to the position symmetrical with respect to line X—X. It follows that, when the anchor pin bounces, the forkhorns cannot be engaged into this notch and hit the axle 26.

In order to meet this difficulty, the escapement wheel is arranged as shown on Fig. 12.

On this figure, which is analogous with Fig. 11, the anchor is formed of the plate 6 oscillating about the axle 5; this plate carries pins 8, in the same manner as described with reference to Figs. 3 to 8, the ends 8a (or 23c if the pins are made as shown on Figs. 7 and 8) co-

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operating with the teeth 27 of the escapement wheel (for clarifying the drawing, these pins are illustrated as being of the usual type; however, the feature illustrated in dot-and-dash line 40 shows, for the right pin, the direction of the guiding for the yield of this pin). The escapement wheel is partially illustrated by some teeth 27 connected to the hub of the wheel by flexible arms 32, for instance in the manner shown on Fig. 10.

In the same manner as for Fig. 11, each tooth comprises a beat-plane 27b and a dead-and-pull-plane 27a. Moreover, each tooth is somewhat extended and the base of each tooth is provided with a plane 27c adjacent to the plane 27a and having a sloping direction opposite to that of plane 27a with respect to the radial direction. Consequently, the end 8a of the pin is first pulled, as previously, by the plane 27a, its motion being accelerated in the direction of arrow 25, then this pin runs further along the plane 27c, whereby the amplitude of oscillation of the anchor is temporarily increased at the end of the run. But, during the end of this motion, the pin acting on the plane 27c of opposite slope causes a slight return displacement of the wheel, whereby slackening the end of this motion, the pin reaching thus the bottom of the tothing with substantially no velocity. Directly afterwards, the plane 27c, pushes the left pin 8a back as far as to the position 8'a in which this pin arrives without hit.

In order to meet the noise caused by the encounter of the fork opening and the impulsion pin 4a of the balance-wheel 4, this fork can be arranged as shown on Figs. 13 and 14.

The fork 3a is cut in a plate 34 which also carries the anchor pins made like the ones illustrated on Figs. 7 and 8, so that their yield is guided in the direction tangential to the escapement wheel not shown.

The impulsion pin 4a of the balance-wheel enters the forked end 3a (see Fig. 1). It is to be recalled first that this pin first hits one of the sides of the fork 3a, whereby the rocking of the fork is started, and then receives from the other side of the fork an impulsion for maintaining the oscillation of the balance wheel. A spring 37, formed of a hair-pin bent wire or lead, is laid flat on the fork with its bent portion around the axle 5; each one of its branch ends has a U curved portion 37a and ends in a rectilinear section 37b.

This spring is secured on the axle 5 by means of a collar 39 fixed on this axle. The branches, which tend to close up, are kept apart by a plug 38 provided with a large head for guiding the displacement of the spring branches in a parallel direction to the plan of the fork, this displacement however being not slackened. The portions 37a of each branch have a curve similar to that of the edges 3a of the fork opening. In dead position, the space between the parts 37a is slightly narrower than the opening 3a of the fork but is large enough for the impulsion pin 4a of the balance-wheel to enter without slackening with a minimum clearance.

When the pin of the balance-wheel enters the fork opening, it comes first into contact with one of the branches 37a of the spring 37 before reaching the solid edge of the inner part of the fork, whereby the shock of the pin entering the fork is deadened. Later on, the impulsion shock from the other side of the fork 3a is deadened in the same manner.

In the embodiment illustrated the rectilinear extensions 37b of the bent spring branches allow in addition to the tothing shown on Fig. 12 to deaden the shock of the anchor pins against the bottom part of the escapement wheel teeth.

Indeed, the anchor pins, in the same manner as the wheel teeth, can only yield in the direction tangential to the motion of the wheel and, on the other hand, they are stiff in the radial direction. Now, it has been shown above that the velocity of the fork is at its maximum towards the end of the oscillating motion of same. Stops 41a and 41b may be arranged opposite the elastic por-

tions 37b for reducing the magnitude of the shock of the pin against the wheel. These elastic parts yield under the shock and deaden the encounter of the fork sides and said stops.

It is to be well understood that the embodiments shown and described do not limit the scope of the invention. In particular, the damping arrangements of the anchor, the escapement wheel and the fork according to the invention may be applied without further modification to the case of alarm-clocks having a pendulum. Consequently in the course of the following claims, it will be referred to as a "balance element" which can be either a pendulum or a balance-wheel with its usual associated spiral spring.

What I claim is:

1. An escapement mechanism for clockwork, comprising a toothed escapement wheel; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two anchor-pins having at least one yielding portion, said anchor-pins being fixed at one of their end parts in said anchor and having their other end part free, said anchor-pins being adapted to alternately engage the teeth of said escapement wheel in the vicinity of their free end part; and means fast with said anchor for guiding the yield of said anchor-pins in a direction substantially tangential to said escapement wheel, said guiding means being in engagement with said anchor-pins in the vicinity of said free end part of same.

2. An escapement mechanism for clockwork, comprising a toothed escapement wheel; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two anchor-pins having at least one yielding portion, said anchor-pins being fixed at one of their end parts in said anchor and having their other end part free, said anchor-pins being adapted to alternately engage the teeth of said escapement wheel in the vicinity of their free end part; and a plate fast with said anchor and having two elongated apertures in a direction substantially tangential to said escapement wheel, said anchor-pins being each engaged in one of said apertures in the vicinity of their free end part and being adapted to have their yield guided in the direction of said apertures.

3. An escapement mechanism for clockwork, comprising a toothed escapement wheel; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two anchor-pins having at least one yielding portion, said anchor-pins being fixed at one of their end parts in said anchor and having their other end part free, said anchor-pins being adapted to alternately engage the teeth of said escapement wheel in the vicinity of their free end part; a plate fast with said anchor and having an edge located on the side opposite to said escapement wheel, said plate having on said edge two elongated recesses in a direction substantially tangential to said escapement wheel, said anchor-pins being each engaged in one of said recesses in the vicinity of their middle part and being adapted to have their yield guided in the direction of said recesses; and a further plate fast with said anchor and having an edge located on the side in front of said escapement wheel, said further plate having on said last mentioned edge two elongated recesses in a direction parallel to the recesses of said former plate, said anchor pins being each engaged in one of the recesses of said further plate in the vicinity of their free end part and being adapted to have their yield guided in said direction.

4. An escapement mechanism for clockwork, comprising a toothed escapement wheel; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two stiff tubular

sections having one of their end parts fixed in said anchor and their other end part flattened, the direction of the longer dimension of said flattened part being substantially tangential to said escapement wheel; and two anchor pins having at least one yielding portion and having each one of their end parts housed in the end part of said tubular sections which is fixed in said anchor, the other end part of said anchor pins being free and projecting out of the flattened part of said tubular sections for alternately engaging the teeth of said escapement wheel, said anchor-pins being adapted to have their yield guided inside said flattened part of said tubular sections along said longer dimension.

5. An escapement mechanism for clockwork, comprising a toothed escapement wheel; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two anchor-pins having a yielding thinned out middle portion and two thicker end portions, one of the end parts of said anchor-pins being fixed in said anchor and the other end part being free, said anchor-pins being adapted to engage the teeth of said escapement wheel in the vicinity of their free end part; and means fast with said anchor for guiding the yield of said anchor-pins in a direction substantially tangential to said escapement wheel, said guiding means being in engagement with said anchor-pins on said thicker portion of their free end part.

6. An escapement mechanism for clockwork, comprising a toothed escapement wheel; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two stiff tubular sections having one of their end parts fixed in said anchor and their other end part flattened, the direction of the longer dimension of said flattened part being substantially tangential to said escapement wheel; and two anchor-pins having a yielding thinned out middle portion and two thicker end portions, one of the end parts of each of said anchor pins being housed in the part of said tubular sections which is fixed in said anchor and the other end part of said anchor-pins being free and projecting out of the flattened part of said tubular sections for alternately engaging the teeth of said escapement wheel, said anchor-pins having the thicker portion of their free end part adapted to be guided inside the flattened part of said tubular sections along said longer dimension, whereby the yield of said anchor-pins is guided in said tangential direction.

7. An escapement mechanism for clockwork, comprising a toothed escapement wheel having slots in a substantially radial direction on each side of the teeth; a rocking-anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two anchor-pins having at least one yielding portion, said anchor-pins being fixed at one of their end parts in said anchor and having their other end part free, said anchor-pins being adapted to alternately engage the teeth of said escapement wheel in the vicinity of their free end part; and means fast with said anchor for guiding the yield of said anchor-pins in a direction substantially tangential to said escapement wheel, said guiding means being in engagement with said anchor-pins in the vicinity of said free end part of same.

8. An escapement mechanism for clockwork, comprising a toothed escapement wheel having slightly converging slots on each side of the teeth, a narrow material portion connecting the base of the teeth to the body of the wheel; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two anchor-pins having at least one yielding portion, said anchor-pins being fixed at one of their end parts in said anchor and having their other end part free,

said anchor-pins being adapted to alternately engage the teeth of said escapement wheel in the vicinity of their free end part; and means fast with said anchor for guiding the yield of said anchor-pins in a direction substantially tangential to said escapement wheel, said guiding means being in engagement with said anchor-pins in the vicinity of said free end part of same.

9. An escapement mechanism for clockwork, comprising a toothed escapement wheel having on each side of the teeth slots extending in a substantially radial direction as far as to the vicinity of the hub of the wheel, said teeth forming the end part of substantially radial yielding arms having between each other a narrow interval; a rocking anchor in driving engagement with said escapement wheel; a fork fast with said anchor; a balance element provided with a balance-pin for engaging said fork; two anchor-pins having at least one yielding portion, said anchor-pins being fixed at one of their end parts in said anchor and having their other end part free, said anchor-pins being adapted to alternately engage the teeth

of said escapement wheel in the vicinity of their free end part; and means fast with said anchor for guiding the yield of said anchor-pins in a direction substantially tangential to said escapement wheel, said guiding means being in engagement with said anchor-pins in the vicinity of said free end part of same.

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