

No. 619,857.

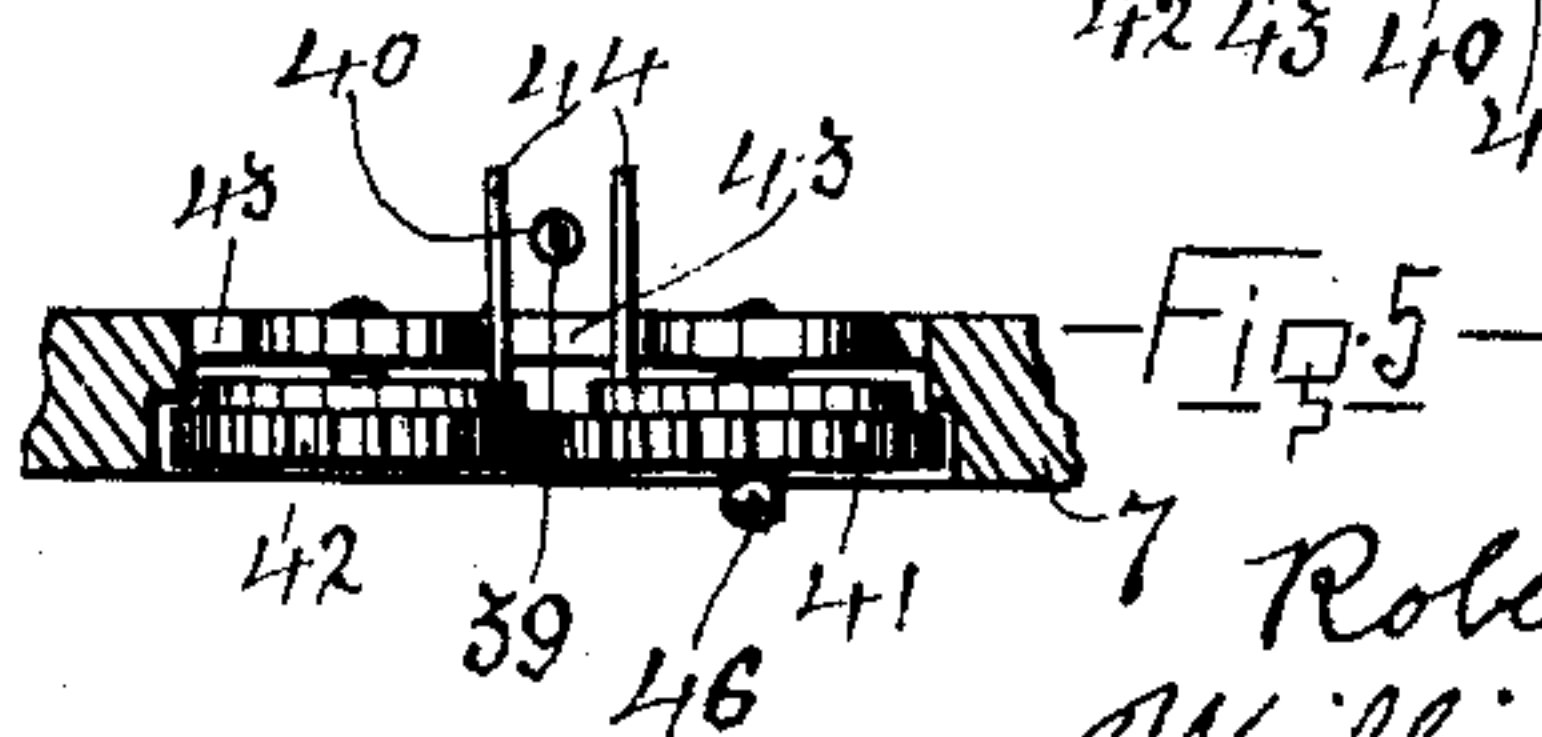
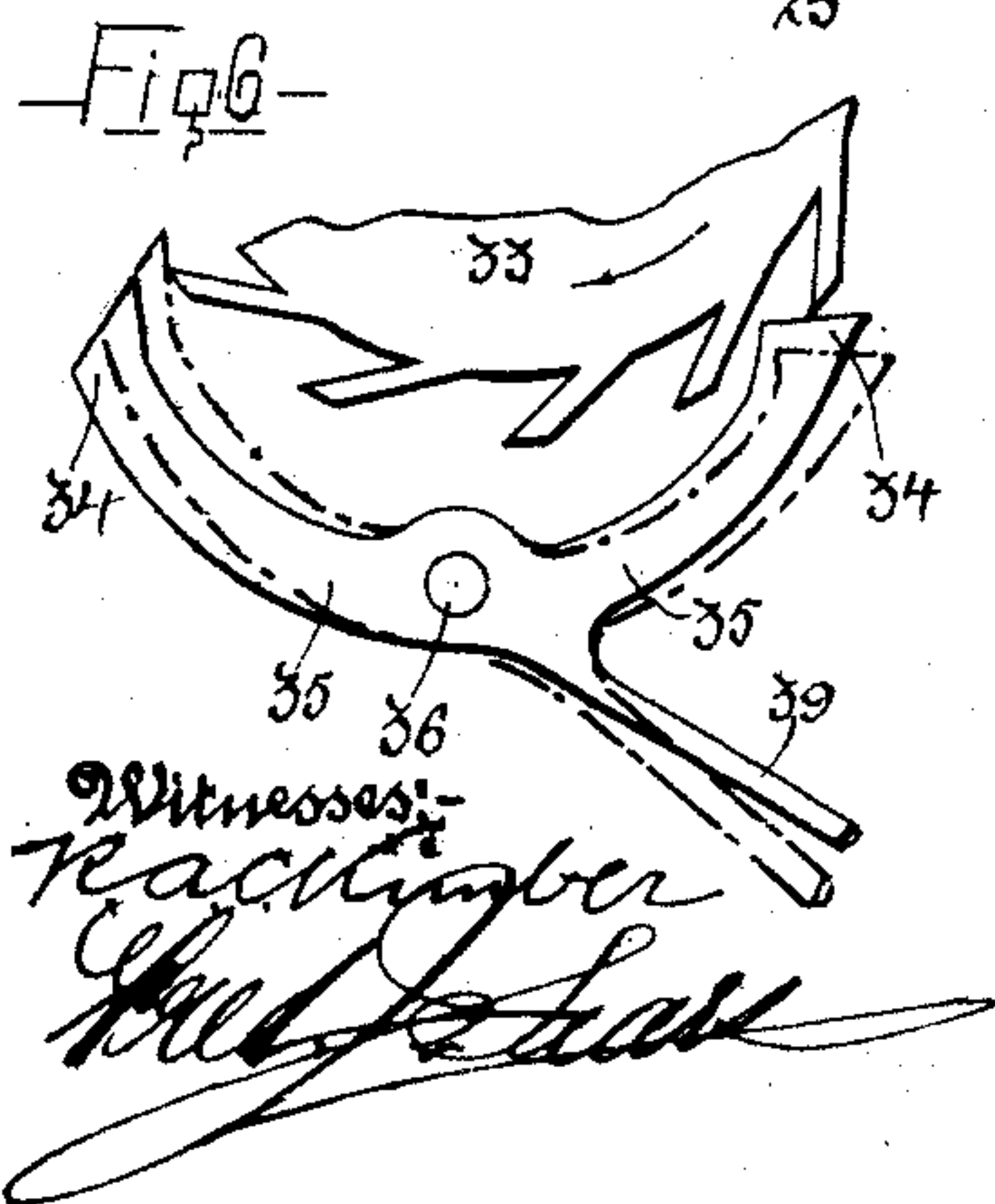
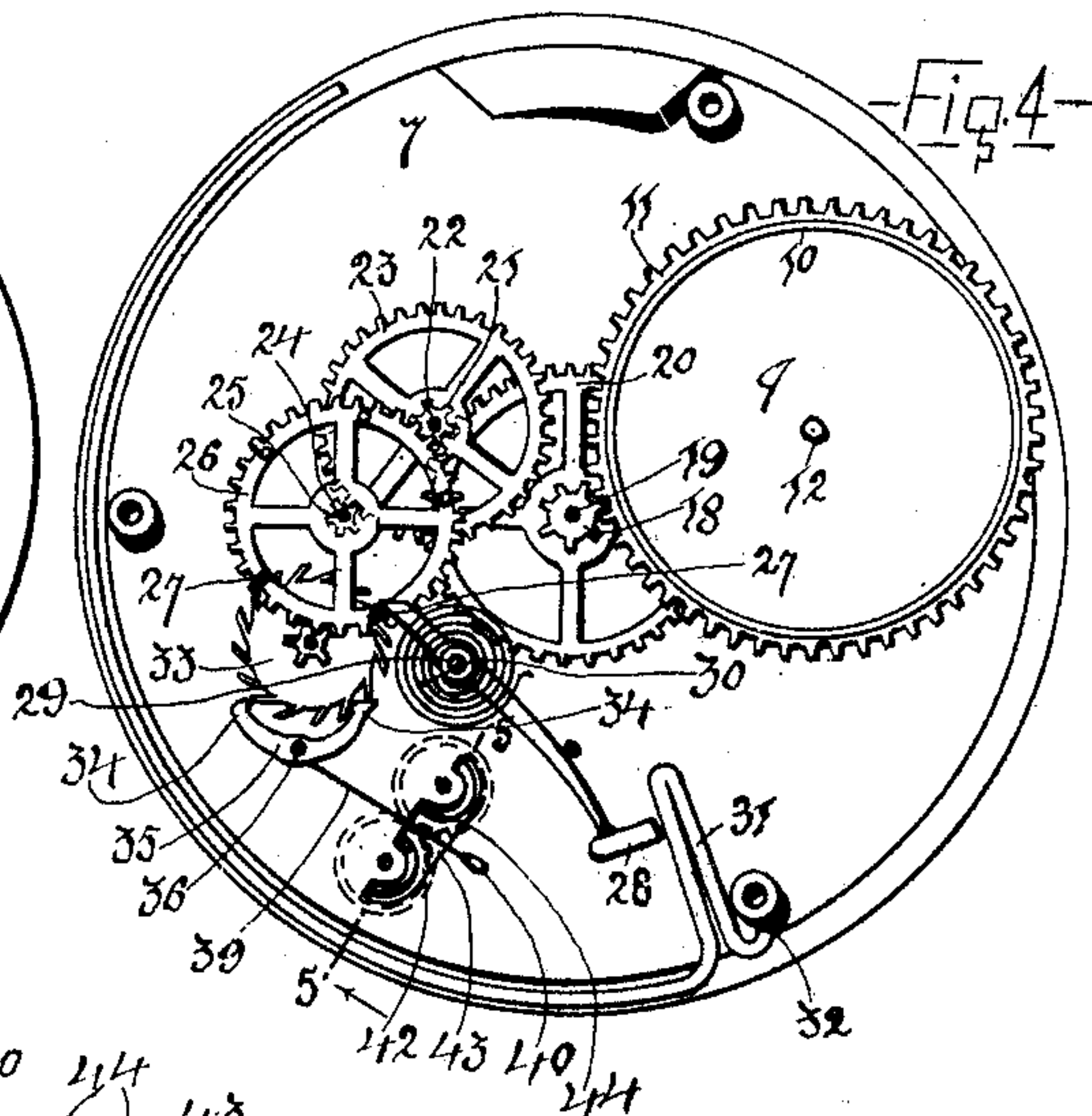
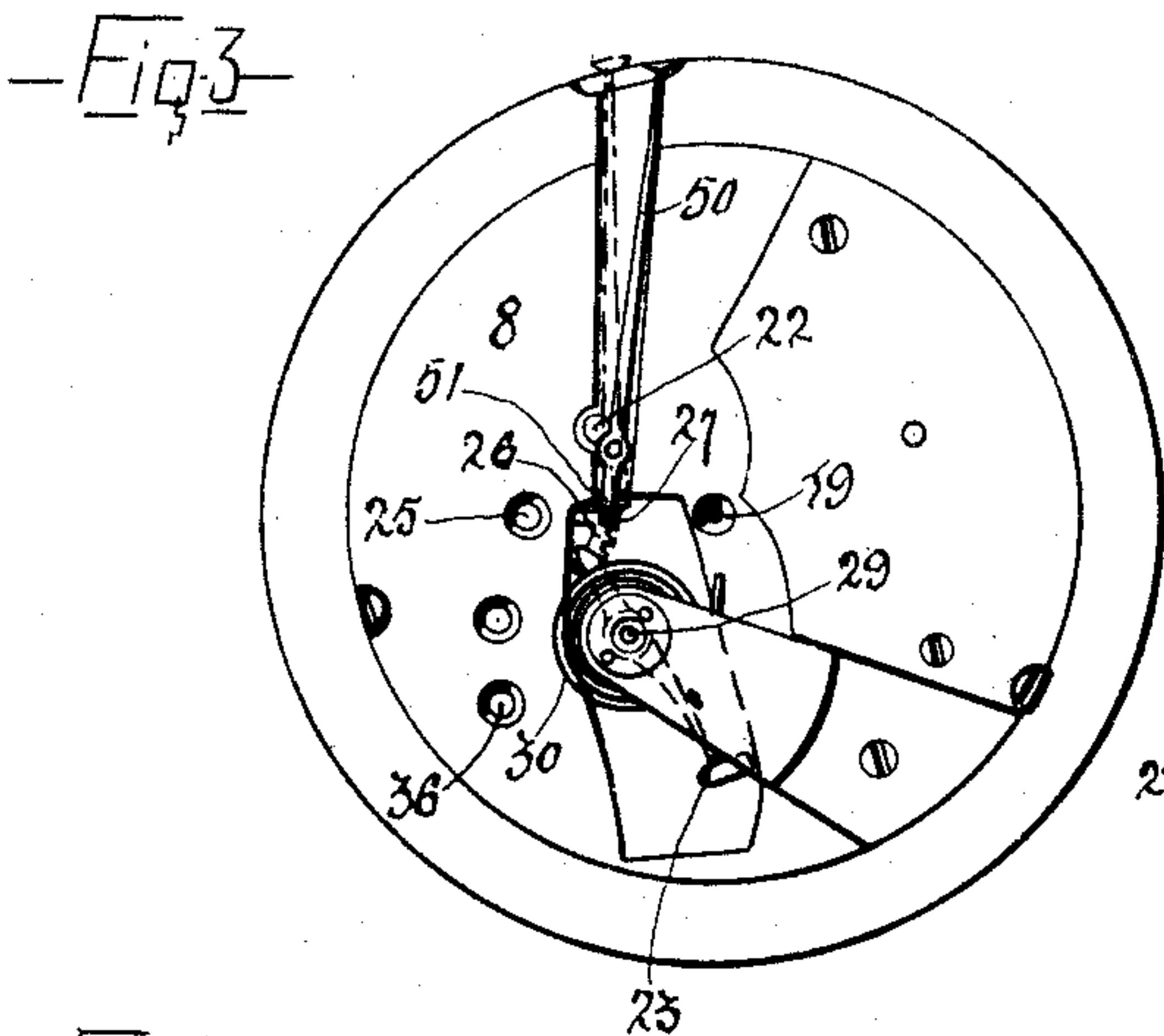
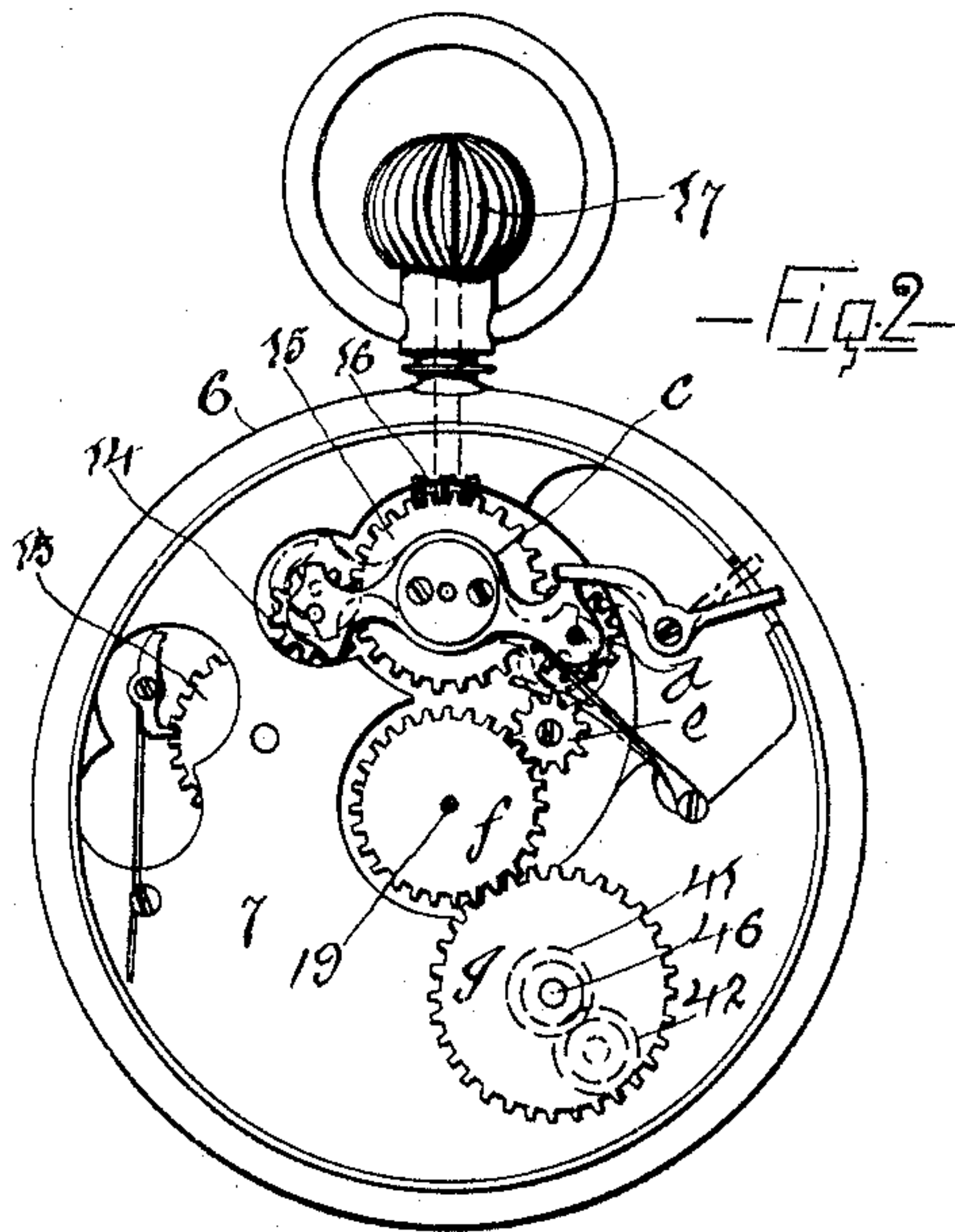
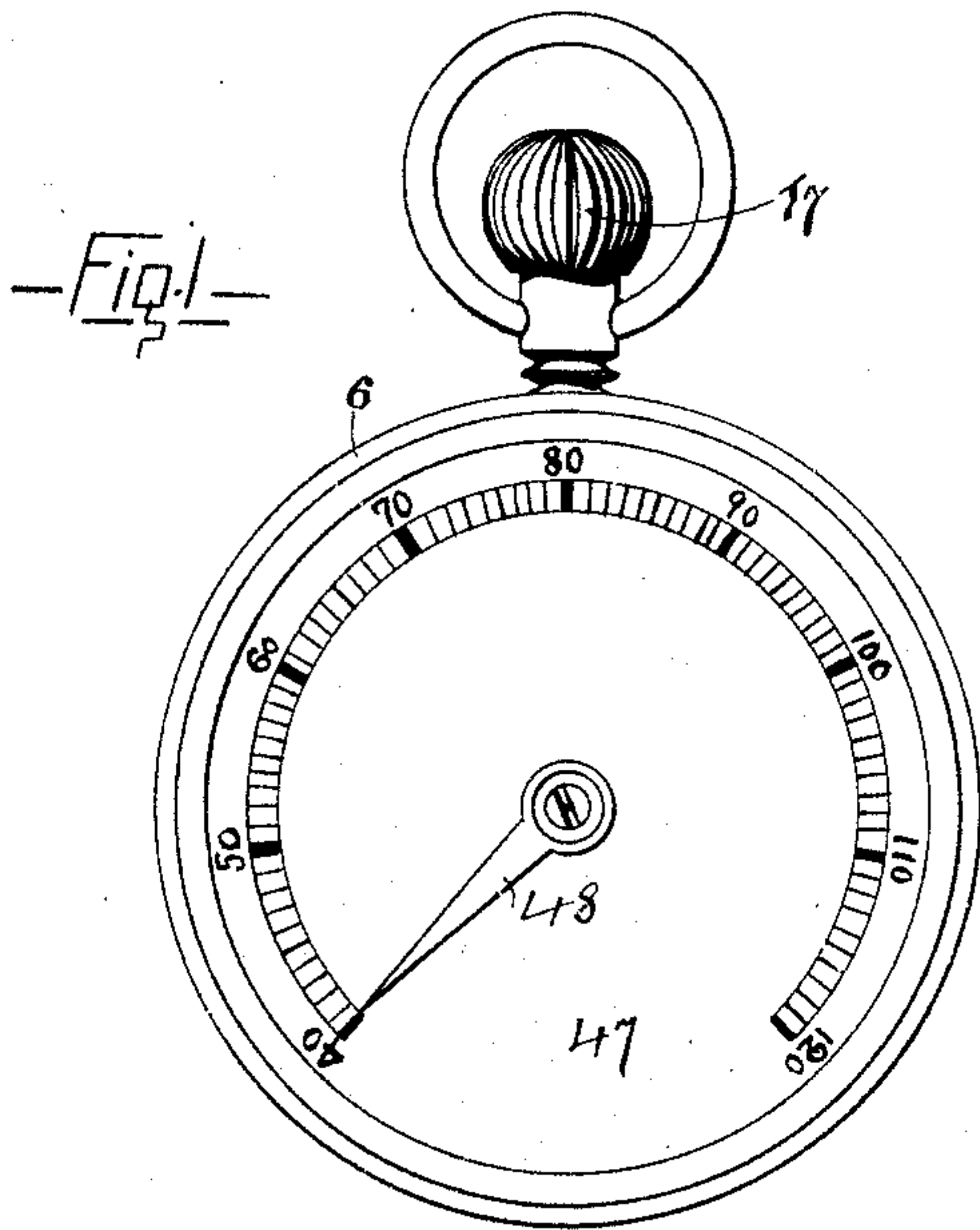
Patented Feb. 21, 1899.

R. A. BECKET & W. A. WOOD.

METRONOME.

(Application filed Feb. 28, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ROBERT A. BECKET AND WILLIAM A. WOOD, OF MONTREAL, CANADA.

METRONOME.

SPECIFICATION forming part of Letters Patent No. 619,857, dated February 21, 1899.

Application filed February 28, 1898. Serial No. 672,114. (No model.)

To all whom it may concern:

Be it known that we, ROBERT ANDERSON BECKET, merchant, and WILLIAM ARCHIBALD WOOD, watchmaker, of the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Metronomes; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention has for its object to produce a metronome that can be readily carried about in the pocket and that will comprise means to indicate, preferably by announcement, the beat or division of time and means whereby said division can be varied according to requirement.

To these ends the invention may be said briefly to consist in mounting in an ordinary watchcase an indicator adapted to indicate any predetermined beat or division of time that may be required to guide a conductor or performer in rendering a piece of music, whether vocal or instrumental, this indicator being controlled by suitable controlling mechanism, through which the number of beats in or divisions of a given length of time can be varied to suit different styles of music. This indicator preferably consists, more specifically speaking, of a gong or other annunciator adapted to give a measured note or distinct sound and be actuated by a train of gears, including novel scape mechanism comprising a novel scape-wheel and a novel form of "pallets," the reciprocal movement of which is limited by a device adapted to vary the extent of such reciprocal movement.

For full comprehension, however, of our invention reference must be had to the accompanying drawings, forming a part of this specification, in which like symbols indicate the same parts, and wherein—

Figure 1 is a plan view of the dial of a pocket-metronome constructed according to our invention; Fig. 2, a face view of our improved metronome with the dial removed; Fig. 3, a rear view thereof with the case opened to illustrate the back plate and the parts carried thereby; Fig. 4, a similar view, but enlarged and with the back plate partly broken away and case removed to expose in plan view the main coacting parts of our invention. Fig. 5

is a transverse vertical sectional view taken on line 5 5, Fig. 4, and looking in the direction indicated. Fig. 6 is a detail.

The case 6 may be of any suitable construction ordinarily employed in the manufacture of watchcases.

7 and 8 are the front and back frame-plates, respectively, which carry all the parts of our metronome.

Upon the rear side of the front plate 7 is located the mainspring 9, inclosed in a barrel 10, having gear-teeth 11 formed upon the periphery thereof, the whole being mounted upon an arbor 12, taking through said front plate and having mounted thereon the click-wheel 13 of the winding-train, which train consists of an idler 14, large gear-wheel 15, and a pinion 16, carried by the stem or pendant 17, the gears 14 and 15 being carried in a swinging bracket *c*, which also carries a second idler *d*, adapted when the bracket is swung to the dotted position shown to intermesh with a train consisting of a pinion *e*, gears *f* and *g*, the gears *f* and *g* being mounted upon a central arbor 19, and an arbor 46, to be hereinafter mentioned.

Referring again to the rear side of the front plate, the gear-teeth 11 intermesh with a pinion 18, mounted rigidly upon an arbor 19, which also carries rigidly thereon a large gear-wheel 20, adapted to intermesh with a pinion 21, mounted rigidly upon an arbor 22, carrying a large gear-wheel 23 rigidly thereon. This latter gear-wheel intermeshes with a pinion 24, carried rigidly upon an arbor 25, upon which is also rigidly mounted a gear-wheel 26, having a series of lateral projections 27, which wheel 26 may be termed the "beating" or "time-dividing" wheel, as it actuates the device that indicates the required division of time. This indicating device preferably consists of a hammer 28, fulcrumed upon an arbor 29, mounted rigidly in the frame and having its free end maintained in a position to yieldingly bear upon the said projections 27 by means of a spring 30, connected at one end thereto and coiled about the arbor 29, to which the other end is connected. This hammer, when tripped by said projections 27, is adapted to strike a gong 31, formed, preferably, of a bow-spring connected at one end

to the frame, as at 32, at a point adjacent to and within striking distance of the hammer and taken around said frame inside the case.

In order to control the movement of the train just described, we provide novel scape mechanism, comprising a scape-wheel 33, having all of its teeth set tangentially, and pallets adapted to retard but not lock the scape-wheel. This pallet consists of a pair of pawls 34, connected by an arm 35, fulcrumed, as at 36, to the frame, said pawls being adapted to alternately engage the tangential teeth of the scape-wheel, the engaging faces thereof being cut at an angle, as shown in Fig. 4, when in an engaging position to the said teeth. This novel form of scape mechanism obviates the use of a balance-wheel, thereby allowing the pallets to have perfect freedom of action.

Our construction as thus far described provides a complete metronome, but one that will only give a regular and invariable beat or division of time. In order to enable the intervals between these beats to be lengthened or shortened to vary the division of time at will, according as the style of music may demand, we provide the arm 35 with a resilient tailpiece 39, weighted at its outer end, as at 40. A pair of pinions 41 42 is carried upon the forward face of the front plate 7, which is slotted, as at 43, to allow a pair of pins 44, carried by the rear side of said gear-wheels, to project therethrough, these pinions and their pins being arranged in such a position relatively to the tailpiece 39 of the pallets as to be located one on each side thereof, thus limiting its oscillatory movement.

The central arbor 19 projects through the dial 47 and carries a pointer 48 rigidly upon the front end thereof, while the dial is marked numerically to indicate the number of beats that may be required, from forty to one hundred and twenty, and by adjusting the pointer to the number indicating the beat or division of time required the pinions 41 and 42 will be rotated and the limiting-pins 44 adjusted to or from one another according as it may be desired that the beat be quickened or slackened, an arrester being provided to arrest the metronome movement when desired, said arrester consisting, preferably, of a lever 50, fulcrumed to the back plate adjacent to the beating or time-dividing wheel 26 and having one end 51 offset and adapted to be adjusted into the path of the projections 27 of said wheel 26, thus stopping said wheel and the movement.

Although we have illustrated our invention as comprising an annunciator in the form of a hammer and gong, yet we do not restrict ourselves to that particular construction, as other forms of annunciators may be used, or a device adapted to indicate without announcing substituted therefor, or many other changes made in the precise construction and

arrangement of the various parts without departing from the spirit of our invention.

What we claim is as follows:

1. In a pocket-metronome, a pendant, a vibrating indicator, an indicator adapted to indicate the frequency of the vibrations of said vibrating indicator, a train of gears including a scape-wheel 33 for operating said vibrating indicator, a pair of pinions 41 and 42 intermeshing with one another and independent of said train of gears, a pair of pins 44, 44, carried one by each of said pinions and near the periphery thereof, pallets 35 in operative engagement with said scape-wheel, a resilient tailpiece 39 and formed integrally with said pallets and extending between said pins, and a train of gears 15, 16, *d*, *e*, *f* and *g* extending between the pendant and said pinions, the gear *d* being mounted in a swinging bracket *c*, to make or break an operative connection between said pendant and pinions and vibration-indicator, a spring adapted to act upon said swinging bracket and keep the gear *d* normally out of contact with the remainder of the train and a bell-crank lever fulcrumed to the frame-plate of the movement and adapted to swing said bracket and cause said gear *d* to engage said train, substantially as and for the purpose set forth.

2. In a pocket-metronome, a pendant, a vibrating indicator, an indicator adapted to indicate the frequency of the vibrations of said vibrating indicator, a train of gears including a scape-wheel 33 for operating said vibrating indicator, a pair of pinions 41 and 42 intermeshing with one another and independent of said train of gears, a pair of pins 44, 44, carried one by each of said pinions and near the periphery thereof, pallets 35 in operative engagement with said scape-wheel, a resilient tailpiece 39 weighted at its free end as at 40 and formed integrally with said pallets and extending between said pins, and a train of gears 15, 16, *d*, *e*, *f* and *g*, extending between the pendant and said pinions, the gear *d* being mounted in a swinging bracket *c*, to make or break an operative connection between said pendant and pinions and vibration-indicator, a spring adapted to act upon said swinging bracket and keep the gear *d* normally out of contact with the remainder of the train and a bell-crank lever fulcrumed to the frame-plate of the movement and adapted to swing said bracket and cause said gear *d* to engage said train, substantially as and for the purpose set forth.

In testimony whereof we have affixed our signatures in presence of two witnesses.

ROBERT A. BECKET.
WILLIAM A. WOOD.

Witnesses:

WILL P. McFEAT,
FRED. J. SEARS.