(Model.) 2 Sheets—Sheet 1.

# R. J. CLAY.

## ESCAPEMENT.

No. 286,685. Patented Oct. 16, 1883.

Fig 1.

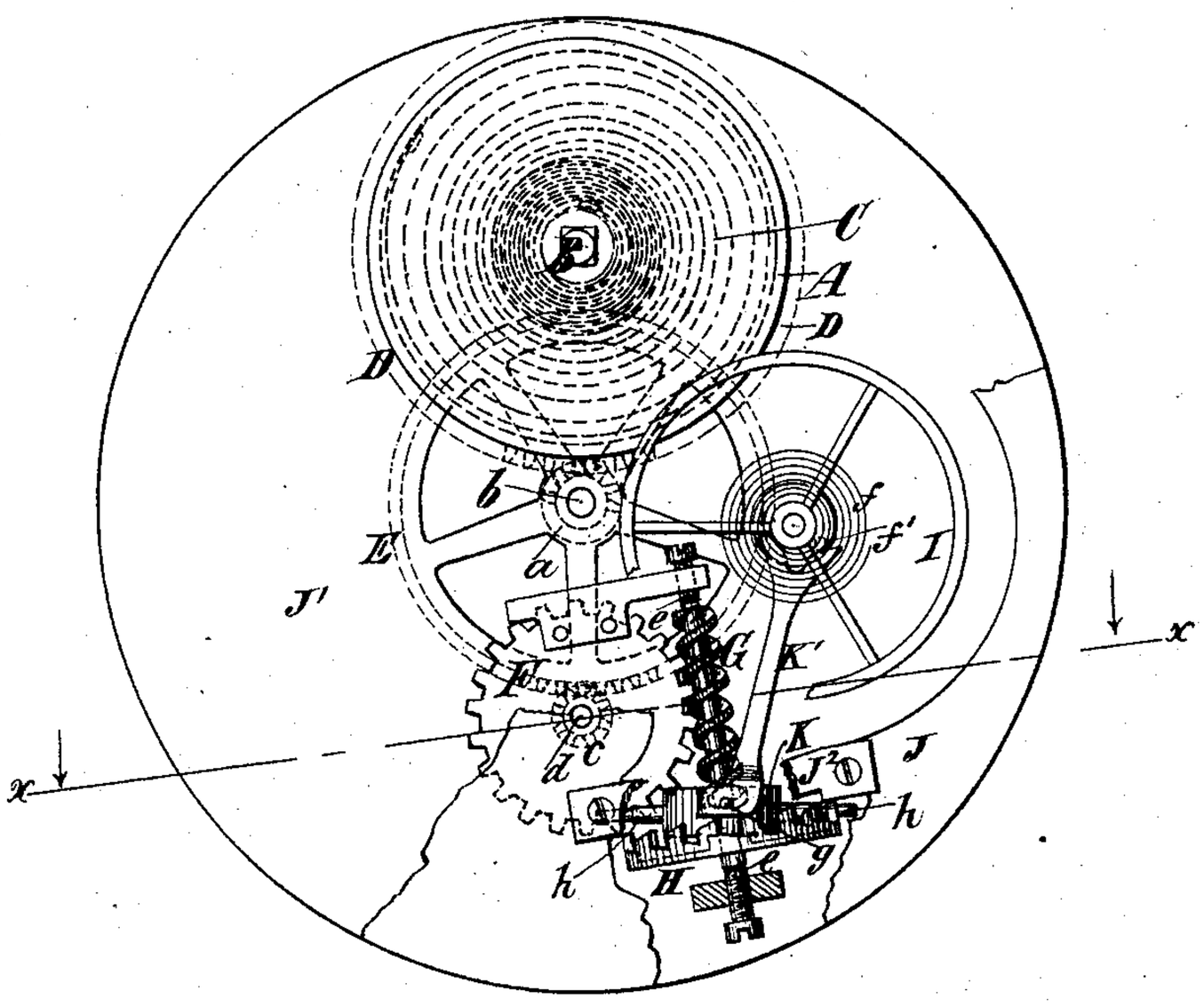



Fig 2.

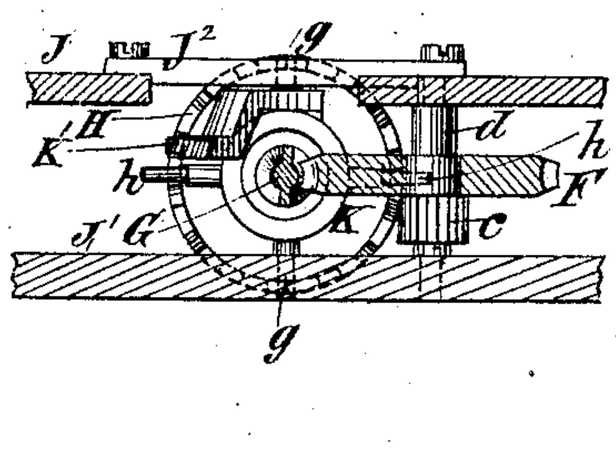
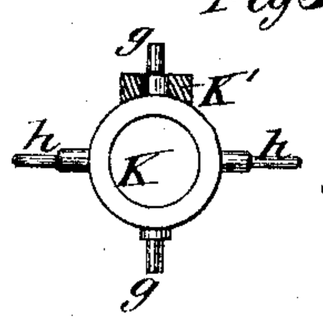



Fig 3.

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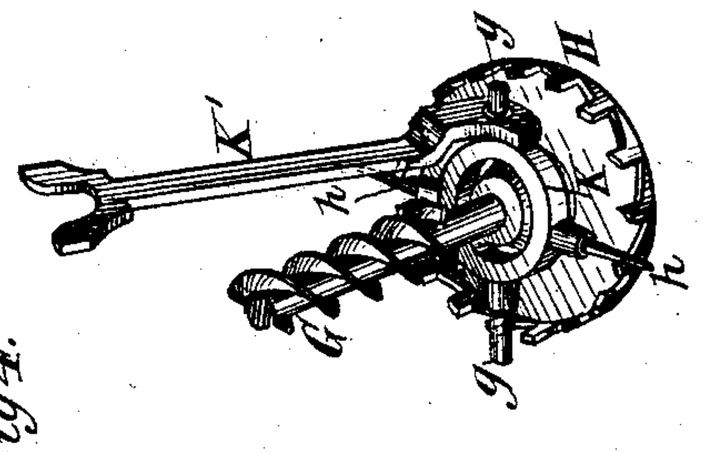
(Model.) 2 Sheets—Sheet 2.

# R. J. CLAY.

## ESCAPEMENT.

No. 286,685. Patented Oct. 16, 1883.

Fig 4.

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# UNITED STATES PATENT OFFICE.

ROBERT J. CLAY, OF JERSEY CITY, NEW JERSEY.

## ESCAPEMENT.

SPECIFICATION forming part of Letters Patent No. 286,685, dated October 16, 1883.

Application filed February 6, 1883. (Model.)

*To all whom it may concern:*

Be it known that I, ROBERT J. CLAY, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Watch-Movements, of which the following is a specification.

The principal object of my invention is to provide a watch-movement which is very simple and has but few parts, and which will nevertheless be capable of practical and effective operation.

The invention consists in the combination, with a train of wheels and a spring for actuating the train, of a worm or screw engaging with and operated by one of the wheels of the train, a contrate escape-wheel on the shaft of the worm or screw, and an escapement-lever of novel construction engaging with said escape-wheel, and adapted to swing or vibrate in a plane coincident or parallel with the axis-wheel and worm or screw, as more fully hereinafter described.

In the accompanying drawings, Figure 1 is a plan, upon an enlarged scale, of a watch-movement embodying my invention. Fig. 2 is a sectional view on the dotted line *x x*, Fig. 1, looking in the direction indicated by the arrow. Fig. 3 is a view of a yoke for the escapement-lever which I may employ; and Fig. 4 is a perspective view, illustrating the relative arrangement of the worm or screw, the contrate-wheel, and the escapement-lever.

Similar letters of reference designate corresponding parts in all the figures.

A designates the barrel, B the barrel-arbor, and C the mainspring, of a watch. Upon the barrel is a wheel, D, gearing into a pinion, *a*, on the arbor *b*, and on the said arbor *b* is a wheel, E, gearing into a pinion, *c*, on the arbor *d*. On the arbor *d* is a spur-wheel, F, the teeth of which engage with a worm or screw, G. This worm or screw, as here shown, has two threads, or is a double or multiple threaded screw.

The teeth of several wheels are not represented, save by dotted lines to indicate the exact diameter of the wheels. The worm or screw G is adapted to turn freely on pivots *e*, and upon the shaft thereof is secured a contrate or crown escape-wheel, H. (Best shown in Fig. 4.)

I designates the usual balance-wheel, and *f f'* designate, respectively, the hair-spring balance-pallet. The several arbors are journaled, in the usual way, in the plates J J' of the movement. The escapement-lever is composed of a stock-piece or yoke, K, and an arm, K', forked so as to receive the balance-pallet *f'*, and rigidly secured to the stock-piece or yoke K. The stock-piece or yoke K is annular in form, so as to receive the worm or screw loosely through it, as shown in Fig. 4, and it is provided with pivots *g*, which are here shown in vertical alignment. One of the pivots *g* has a bearing in the plate J', and the other has its bearing in a bridge, $J^2$, attached to the plate J. On opposite sides of the yoke or stock-piece K, in horizontal alignment, are pallets *h*, upon which the teeth of the contrate-wheel H act, and thereby the arm K' is vibrated in a plane parallel with the axis of the worm or screw.

In Fig. 4 the bearings in which the pivots *g* are journaled are not shown; but from Fig. 4 it will be clearly understood that by the teeth of the contrate-wheel H acting on the pallets *h* the lever K K' is oscillated on its pivots *g*.

The stock-piece K may be greatly varied in form, and it need not necessarily embrace or surround the screw or worm; but in every case I use a contrate-wheel and a lever provided with an arm which is vibrated in a plane which is coincident with or parallel with the axis of the worm or screw.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the train of wheels of a watch, of a worm or screw engaging with and operated by one of the train-wheels, a contrate escape-wheel on the shaft of said worm or screw, and an escapement-lever engaging with said escape-wheel and adapted to vibrate in a plane coincident or parallel with the axis of the contrate-wheel, substantially as described.

2. The combination, with the train of a watch, of a screw engaging with and operated by one of the train-wheels, a contrate escape-wheel on the shaft of said worm or screw, and an escapement-lever composed of a yoke surrounding the worm or screw and an arm which

is adapted to be vibrated in a plane parallel with the axis of the contrate-wheel, substantially as described.

3. The combination, with the contrate escape-wheel H and its screw-threaded shaft, of the lever K K′, made with a yoke which surrounds said shaft, and on which are both the pivots and pallets of the escapement-lever, substantially as herein described.

ROBERT J. CLAY.

Witnesses:
T. J. KEANE,
ED. L. MORAN.