No. 667,176. Patented Feb. 5, 1901.

M. BAIER.

ESCAPEMENT.

(Application filed Mar. 14, 1899. Renewed June 15, 1900.)

(No Model.)

Fig. 2.

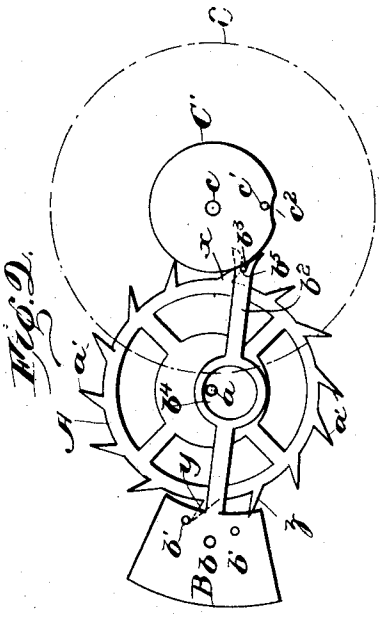


Fig. 4.

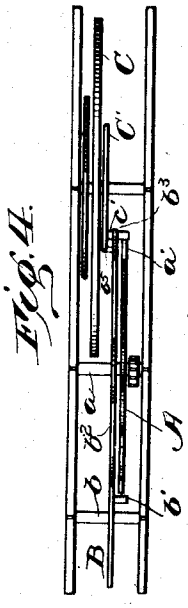


Fig. 5.

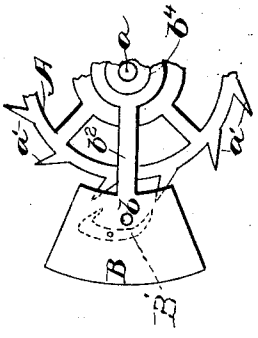


Fig. 1.

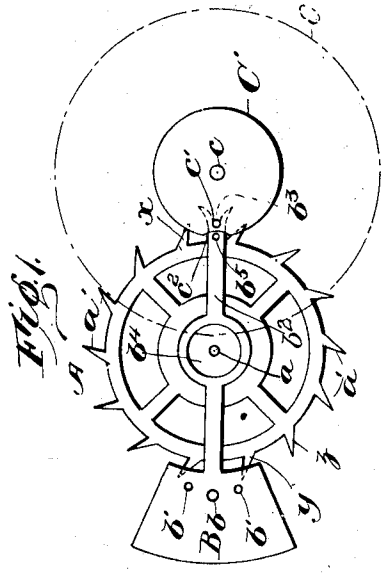
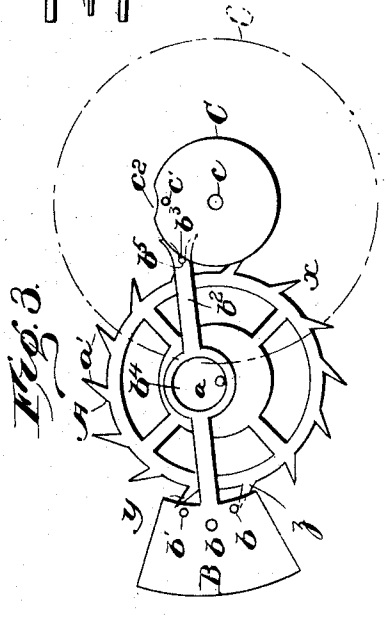


Fig. 3.



Witnesses:
J. M. Fowler Jr.
Thomas Durant

Inventor
Max Baier,
by Jaffes & Rose,
his Attorneys

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UNITED STATES PATENT OFFICE.

MAX BAIER, OF ELIZABETH, NEW JERSEY.

ESCAPEMENT.

SPECIFICATION forming part of Letters Patent No. 667,176, dated February 5, 1901.

Application filed March 14, 1899. Renewed June 15, 1900. Serial No. 20,474. (No model.)

To all whom it may concern:

Be it known that I, MAX BAIER, a citizen of the United States, residing at Elizabeth, in the county of Union, State of New Jersey, have invented certain new and useful Improvements in Escapements, of which the following is a description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to improvements in escapements, and more particularly to escapements for watches, my objects being to provide an escapement which will be accurate in its operation and at the same time can be made at a small expense and to provide a cheap escapement by the use of which the train will start of its own motion when the mainspring is properly wound.

To these ends and also to improve generally upon devices of the nature indicated my invention consists in the various matters hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a top plan view of my present escapement, the parts being shown in the position assumed when at rest, the balance-wheel being indicated by dotted lines. Fig. 2 is a view similar to Fig. 1, except that the parts are shown in the position assumed when checking the scape-wheel for the first time after the watch has started. Fig. 3 is a view similar to the above, except that the parts are in the position assumed at which the scape-wheel receives its second check. Fig. 4 is a side elevation of the present escapement, and Fig. 5 is fragmentary top plan view of a modification.

Referring now more particularly to the drawings, A represents a scape-wheel mounted upon its staff a, and upon said wheel are the usual teeth a'. To one side of the scape-wheel is pivoted a lever B upon the staff b, said lever having thereon downwardly-projecting pins or locking-pallets b', one of these pallets being located on each side of the staff b. Upon the side of the scape-wheel opposite that upon which the lever is pivoted is the usual vibratory balance-wheel C upon its staff c, the staff having thereon the usual table-roller C', which roller has the customary jewel-pin c'. For a purpose to be more fully hereinafter indicated the table-roller is provided with a notch or cut-away portion c^2 at the point of the pin c'. As herein shown, the staffs of the balance-wheel, scape-wheel, and lever B lie in a straight line, and the table-roller lies in a plane above that of the scape-wheel, the pin c' of the table-roller projecting, when the parts are in the position of rest, in the path of movement of the teeth of the scape-wheel and between two of said teeth, said pin extending downwardly into the plane of the scape-wheel, as shown in Fig. 4.

The lever B has an arm b^2, which extends across the scape-wheel, said arm having in its free end a fork b^3 and being provided intermediate its ends with an enlarged opening b^4. Extending upwardly from the free end of the arm and slightly in the rear of the fork is a pin b^5, adapted to rest upon the periphery of the table-roller when the arm is rocked to one side, and thus prevent accidental return movement of said arm, the notch c^2 upon the table-roller permitting the rocking of the arm at the proper moment. This arrangement of forked arm, notched table-roller, and pin upon the arm for preventing accidental movement is well-known, and therefore no further description of the same is deemed necessary.

Referring now to Fig. 1, it will be seen that when the parts are in the position of rest (the watch having run down and the hair-spring having thrown the balance-wheel and table-roller into the position indicated) the arm lies across the scape-wheel, with the scape-wheel staff in substantially the center of the enlarged opening, the fork being engaged by the pin c' upon the table-roller and said pin lying between two scape-wheel teeth and in the path of movement of one of them. It is to be noted that in the position here described the pallets b' upon the lever B lie out of the path of movement of the teeth upon the scape-wheel, said teeth being thus out of contact with the pallets or any part of the lever and the scape-wheel being thereby free to rotate when power is exerted upon the same. Upon winding the watch as soon as there is stored in the mainspring a sufficient amount of force to rotate the train the scape-wheel commences to rotate and the tooth x at the side of the pin c' of the table-roller strikes such pin, thus imparting movement to the table-roller and balance-wheel and at the same time,

through the arm b^2, rocking the lever B to bring one of the locking-pallets b' into the path of movement of the tooth y upon the scape-wheel, so that the parts assume the position shown in Fig. 2. The scape-wheel is in this way checked or locked until the hair-spring has in its unwinding movement thrown the arm b^2 to the side opposite to that to which it has moved in its first movement, and in this operation the tooth y has been released and the tooth z (following the tooth y) has come in contact with the second pallet b'. The distance between the teeth of the scape-wheel is greater than between the pallets b', so that in the various positions the relation between the said teeth and the pallets is as shown, the pallets thus checking the wheel at proper intervals, but not striking the teeth to give them impulse.

It is believed that with this explanation the operation of the parts will be fully understood, it being borne in mind that the table-roller, and consequently the balance-wheel, is given impulse by the scape-wheel teeth and that the pallets b' serve to alternately check the teeth in their rotation. The staff of the scape-wheel extending through the enlarged opening b^4 of the arm the said arm has full lateral movement; but excess movement is prevented by reason of the portions of the arm at the sides of the opening coming in contact with the scape-wheel staff. In order to provide for light and easy movement of the lever B and its arm b^2, the lever is made of such size and weight that it is balanced at its pivotal point—that is, at its staff b.

It is manifest that many forms of pallets may be substituted for the pins b' upon the lever B, and in Fig. 5 I have shown one of such substitutions, this being here shown as the anchor B', secured upon the under side of the lever B.

The present structure occupies but very small space when assembled and can be made at very little expense. Nevertheless the action of the parts upon one another is direct and positive, and the watch is free to start of its own motion when the mainspring is wound, thus avoiding the necessity of rocking the watch in the hand, which has heretofore existed in connection with cheap escapements.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in an escapement of a scape-wheel, a pivoted lever having locking-pallets thereon, means for oscillating the lever whereby the said pallets are alternately engaged by the teeth of the scape-wheel, and connection between the scape-wheel and the said oscillating means whereby the initial oscillation of said means and of the lever is imparted by the initial movement of the scape-wheel, the parts being so arranged that when in the position of rest the pallets lie out of the path of movement of the teeth of the scape-wheel and said teeth are free from contact; substantially as described.

2. The combination in an escapement of a scape-wheel having teeth, a pivoted lever having locking-pallets thereon, a balance-roller, and a pin upon said balance-roller and adapted to engage the said lever and oscillate the same to cause the pallets to alternately engage the teeth of the scape-wheel and thus momentarily lock said wheel, said balance-roller having a part adapted to be struck by the scape-wheel teeth, the parts being so arranged that when in the position of rest the pallets lie out of the path of movement of the teeth of the scape-wheel and said teeth are free from contact, while the pin upon the balance-roller engages the lever and the part upon the balance-roller adapted to be struck lies between two scape-wheel teeth, whereby when power is applied to the scape-wheel, it is free to move and in its initial movement imparts movement to the balance-roller and through said balance-roller to the lever; substantially as described.

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

MAX BAIER.

Witnesses:
ALBERT STAKE,
JULIUS D. DEJORGE.