C. Ramsay.

Watch Balance.

No. 65,116. Patented May. 28. 1867.

Fig. 1.

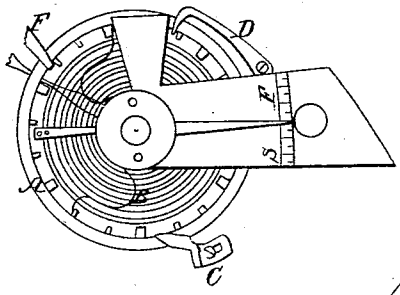


Fig. 2.

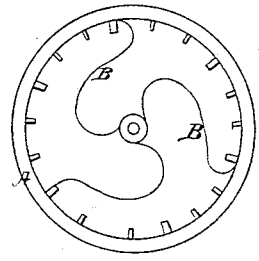


Fig. 3.

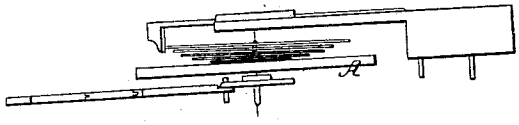


Fig. 4.

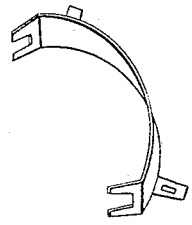
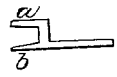


Fig. 5.



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United States Patent Office.

GEORGE RAMSAY, OF CLYDE, OHIO.

Letters Patent No. 65,116, *dated May* 28, 1867.

IMPROVEMENT IN BALANCE-WHEELS OF WATCHES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE RAMSAY, of Clyde, in the county of Sandusky, and State of Ohio, have invented certain new and useful Improvements in Watches; and I do hereby declare that the following is a full and complete description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an enlarged view of the balance-wheel.

Figure 2, a detached view of the same.

Figure 3 is a side view of fig. 1.

Figures 4 and 5 are detached sections to which reference will be had.

Like letters refer to like parts in the several views.

A, fig. 2, is a balance-wheel. B, the arms of which are light steel springs, making by this means an elastic spring-arm balance-wheel. C and D are guards, of which fig. 5 is an enlarged view. F is also a guard, and fig. 4 a segment guard to be referred to hereafter. The balance-wheel is held responsible for the time the watch may keep. Knowing this, the manufacturer, in order to lessen the friction, makes the pivots of the balance-staff smaller than the others; also, cap jewels are placed for the ends of the pivots to rest upon, thus keeping the shoulders of the staff from touching. Now the balance being the heaviest wheel in the watch, with the exception of the first wheel, and resting, too, upon the smallest pivots, the watch when dropped or in any way receives a sudden blow, the pivots in consequence are invariably broken or driven through the jewels, and not unfrequently both are broken; whereas the other wheels, being much lighter and resting on stronger pivots, sustain no injury unless struck by the broken balance. When once the balance pivots are broken they are seldom or never replaced as good and true as before. Hence the value of the watch for time and beauty of movement is forever injured, for the pivot, if not exactly centred, the wheel is thrown out of balance, which is very difficult to remedy in the common balance-wheel. In order to avoid these accidents to the watch, the guards referred to have been introduced, and which are arranged in relation to the watch as shown in fig. 1. These guards are placed close to the sides of the wheel so that the periphery of which may vibrate between the fingers *a b*, fig. 5, and close to the back of the guard. It will be seen by this arrangement of guards surrounding the wheel, that should the watch receive a sudden and violent blow the wheel is caught by the guards, which, and by the aid of the elastic arms of the wheel, breaks the force of the blow; hence it does not come upon the pivots, therefore they receive no injury, and the pivots thus protected cannot strike the jewels with force enough to break them, which would not be the case were the wheel not thus guarded. The segment guards, fig. 4, may be used instead of the single guards described, if so desired. The ruby pin, which is often broken in the common balance in consequence of its striking the lever, is saved by the spring-arms of the balance referred to. The arms being light and elastic, they act with less force upon the pin, by yielding readily to any resistance offered by it. It is also much lighter, and thereby releases the wheel of a dead weight at the centre, and the arms by their peculiar shape act against each other, preventing by this means any trembling in the vibration. By the use of a wheel thus constructed and guarded the pivots can be made smaller, thereby reducing the friction, and still be perfectly safe, and can be turned in any direction without taking it out of the callipers. The ruby pin being attached to a collet on the balance-staff, standing in the forks of the lever when the watch is not running, but when the escape-wheel acts upon the pallet the lever is pressed against one side of the ruby pin, causing the balance to rotate, and as the balance is brought back by the hair-spring, it detaches the lever, and the other pallet is acted upon, pressing on the other side of the ruby pin, thereby throwing the balance in an opposite direction, and thus the motion of the wheel is kept up. Now, when the watch is dropped, or moved violently without striking anything, the balance sometimes makes an entire revolution, in which case the ruby pin strikes outside the fork of the lever, and is in consequence broken, which would not be the result in the use of the wheel above described, for the lightness of the balance and the elasticity of the arms would break or restrain the force of the rotation of the wheel. These guards and balance-wheels can be applied to all watches in which the ruby pin is used.

The elastic arms are equally applicable to balance-wheels the periphery of which is constructed in sections and with a combination of different metals; also the arms may be of any desired shape and number, and of any

suitable metals or material, brass and steel in combination in one arm, or used alternately, steel and brass thus making the weeel a compensating balance which is not affected by the extremes of heat and cold, as are the solid wheels in ordinary use.

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

1. A watch-balance wheel constructed with spring arms, as and for the purpose set forth.

2. The balance-wheel with spring arms, in combination with the guards, substantially as and for the purpose set forth.

GEO. RAMSAY.

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