C. W. FOGG.

Watch.

No. 41,461. Patented Feb. 2, 1864.

Fig. 2

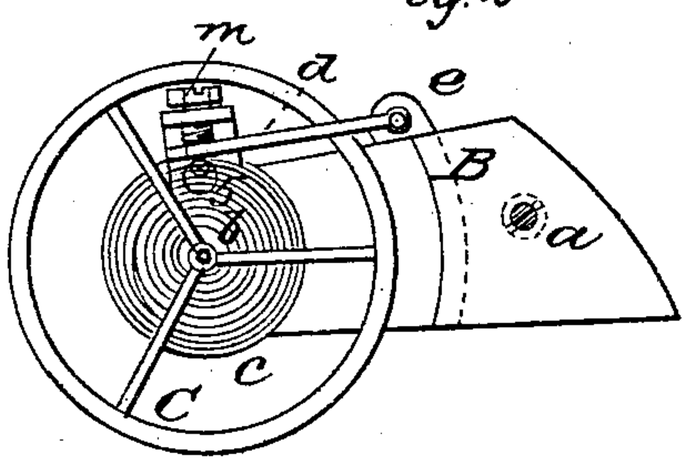


Fig. 4

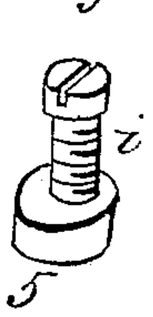
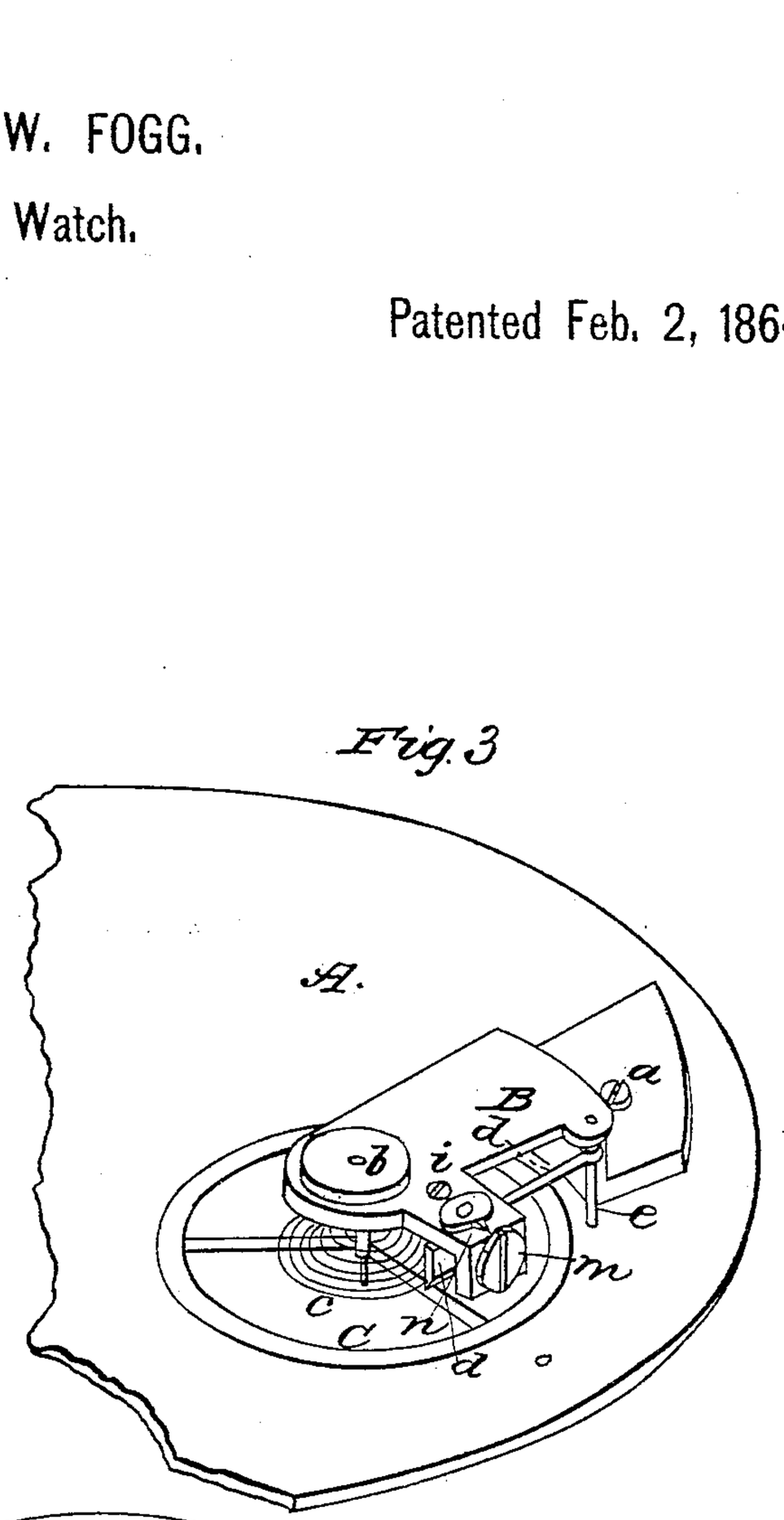
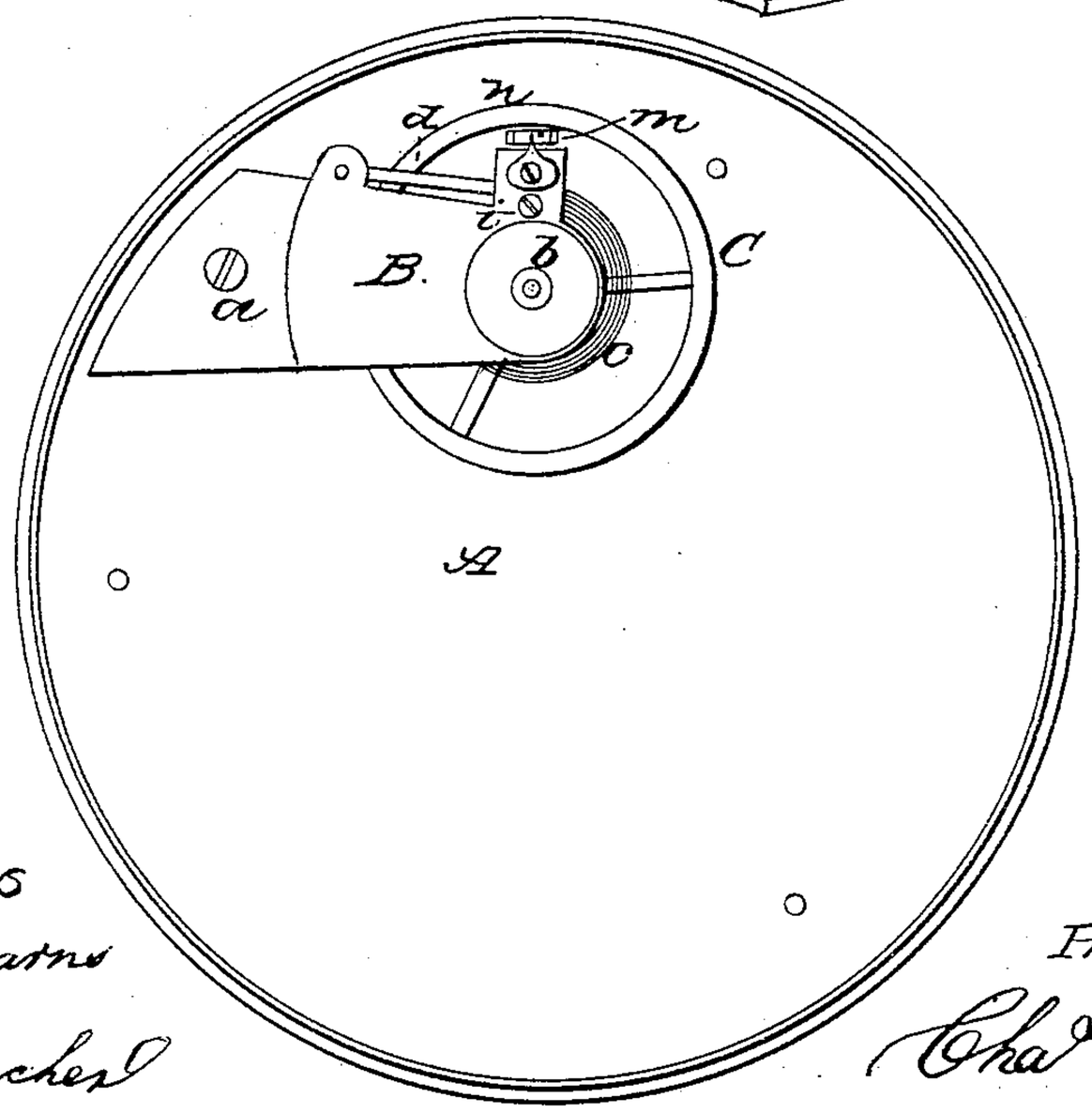


Fig. 3





Witnesses

N. W. Stearns

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UNITED STATES PATENT OFFICE.

CHARLES W. FOGG, OF WALTHAM, MASSACHUSETTS, ASSIGNOR TO AMERICAN WATCH COMPANY, OF SAME PLACE.

IMPROVEMENT IN WATCHES.

Specification forming part of Letters Patent No. **41,461**, dated February 2, 1864.

To all whom it may concern:

Be it known that I, CHARLES W. FOGG, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Watches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan enlarged of the lower or pillar plate and that portion of a watch to which my improvements are applied, the train and other portions being omitted; Fig. 2, an underneath view of the cock and balance-wheel, showing my improved regulator; Fig. 3, a perspective view; Fig. 4, a view of the eccentric screw *i* detached.

In chronometers and watches of a high order a difficulty has been experienced, on account of the effective length of the balance-spring being varied by the regulator, as after the balance-wheel is once nicely adjusted with a certain length of spring, the changing of the length of the spring by the regulator is liable to disturb the isochronism. In order to avoid this changing of the length of the spring, in some watches the ordinary regulator has been omitted, and the regulation effected by changing the "mean-time" screws in the balance-wheel, but by so doing the compensation and equipoise of the balance were liable to be disturbed.

To avoid these objections is the object of my present invention, which consists in permanently attaching one end of the balance-spring to a vibrating lever, the vibrations of which are regulated by a screw or other device, whereby the ordinary regulator is dispensed with, and the length of the spring is not changed in regulating.

To enable other skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the pillar-plate, to which is attached by a screw, *a*, the cock B, between which and the pillar-plate is supported in the ordinary manner the shaft *b* of the balance-wheel C.

c is the balance or hair spring, one end of which is secured to the shaft *b*, and the other end permanently fastened to one end of a vibrating lever, *d*, the other end of which is attached to a shaft, *e*, supported between the cock and the pillar-plate. The spring *c*, as it contracts and expands, vibrates the lever *d*, and these vibrations are controlled for the purpose of regulating the watch in the following manner:

i is a screw which passes up through the cock B, and has on its lower end an eccentric head, 5, Figs. 2 and 4, which serves as a stop to regulate the vibration of the lever *d* in that direction. When the proper position of this eccentric screw is once ascertained, its position need never be changed.

A portion of the cock is bent down at *h*, as seen in Fig. 3, and through this portion passes the regulating-screw *m*, which also serves as a stop and controls the amount of vibration of the lever *d* in that direction, the lever *d*, as it is vibrated by the spring *c*, alternately striking against the eccentric head 5 of the screw *i*, and the end of the regulating-screw *m*.

n is a pointer, which may be used in connection with an index on the edge of the screw *m*, so as to indicate the exact distance the screw *m* is turned.

It will thus be seen that as the regulating-screw *m* is turned in one direction the space between it and the eccentric screw *i* will be contracted, and consequently the amount of vibration of the lever *d* and spring *c* attached to it will be decreased, causing the watch to go faster, and on turning the screw *m* in the opposite direction, so as to allow a greater amount of vibration to the lever *d* and spring *c*, the opposite result will be attained.

I have thus obtained an exceedingly delicate and reliable means of regulating a watch with a degree of certainty heretofore unattained, and without altering or disturbing the equipoise or compensation of the balance-wheel or the isochronism of the spring, and which is also simple and not liable to get out of order.

It is obvious that there are various methods of arranging the vibrating lever *d* and controlling its vibrators. For instance, instead of the screw *m*, the lever *d* may be made to vibrate between two eccentrics, to one of which a lever is attached, by moving which the space between the two eccentrics may be varied as desired, and the vibrations controlled as before, or the lever, instead of being piv-

oted at *e*, as shown, may be pivoted in any position required to suit the maker. The method first above described, however, is that which I prefer, as it is more compact, and the operation of "taking down" the watch is simplified.

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

Attaching one end of the balance-spring *c* to a vibrating lever, the vibrations of which are controlled by an adjustable stop or stops, substantially as described, for the purpose specified.

CHAS. W. FOGG.

Witnesses:
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