

(No Model.)

L. MURRAY.

MANUFACTURE OF CLOCK AND WATCH BALANCES.

No. 359,980.

Patented Mar. 22, 1887.

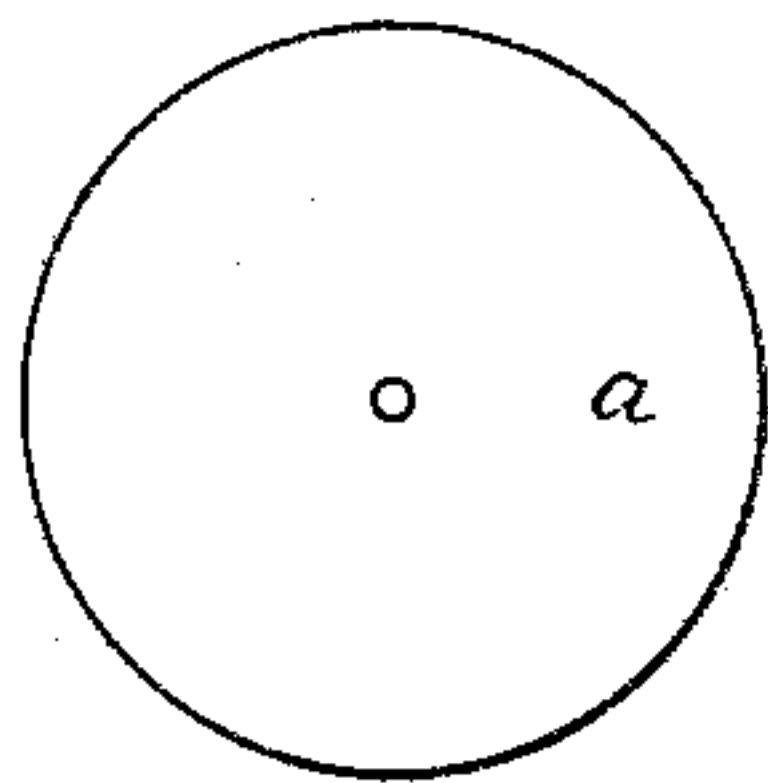


Fig. 1.

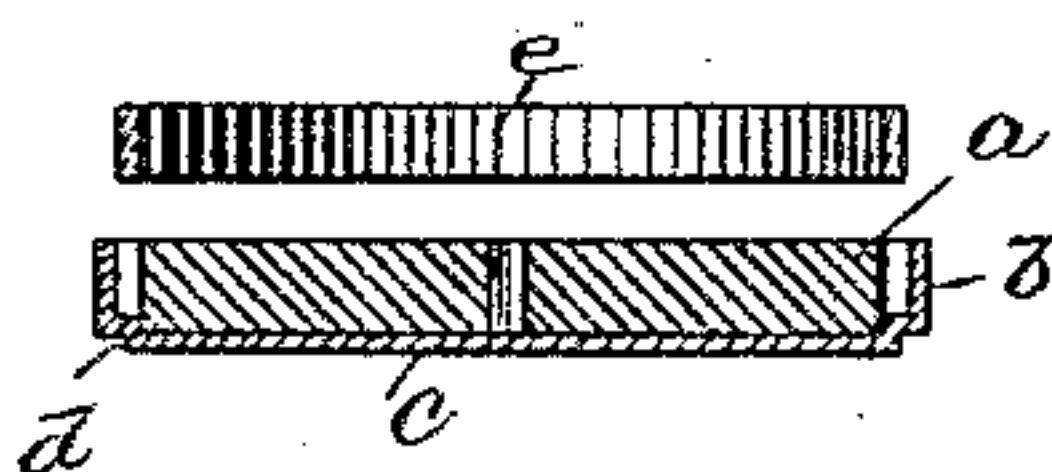


Fig. 2.

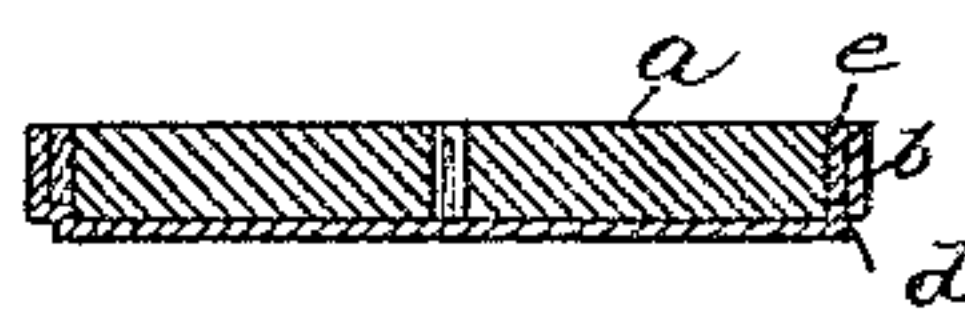


Fig. 3.



Fig. 4.

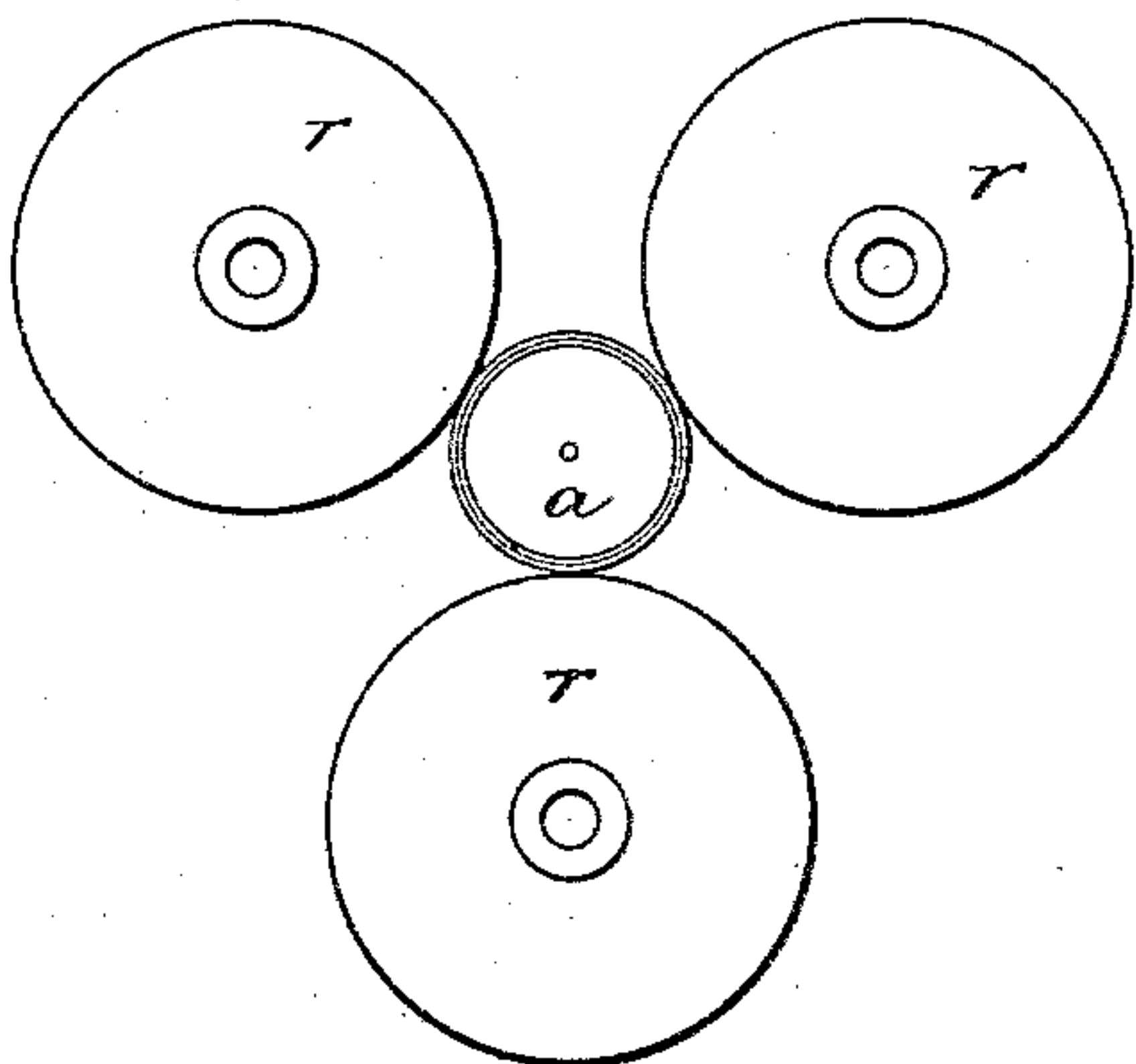


Fig. 5.

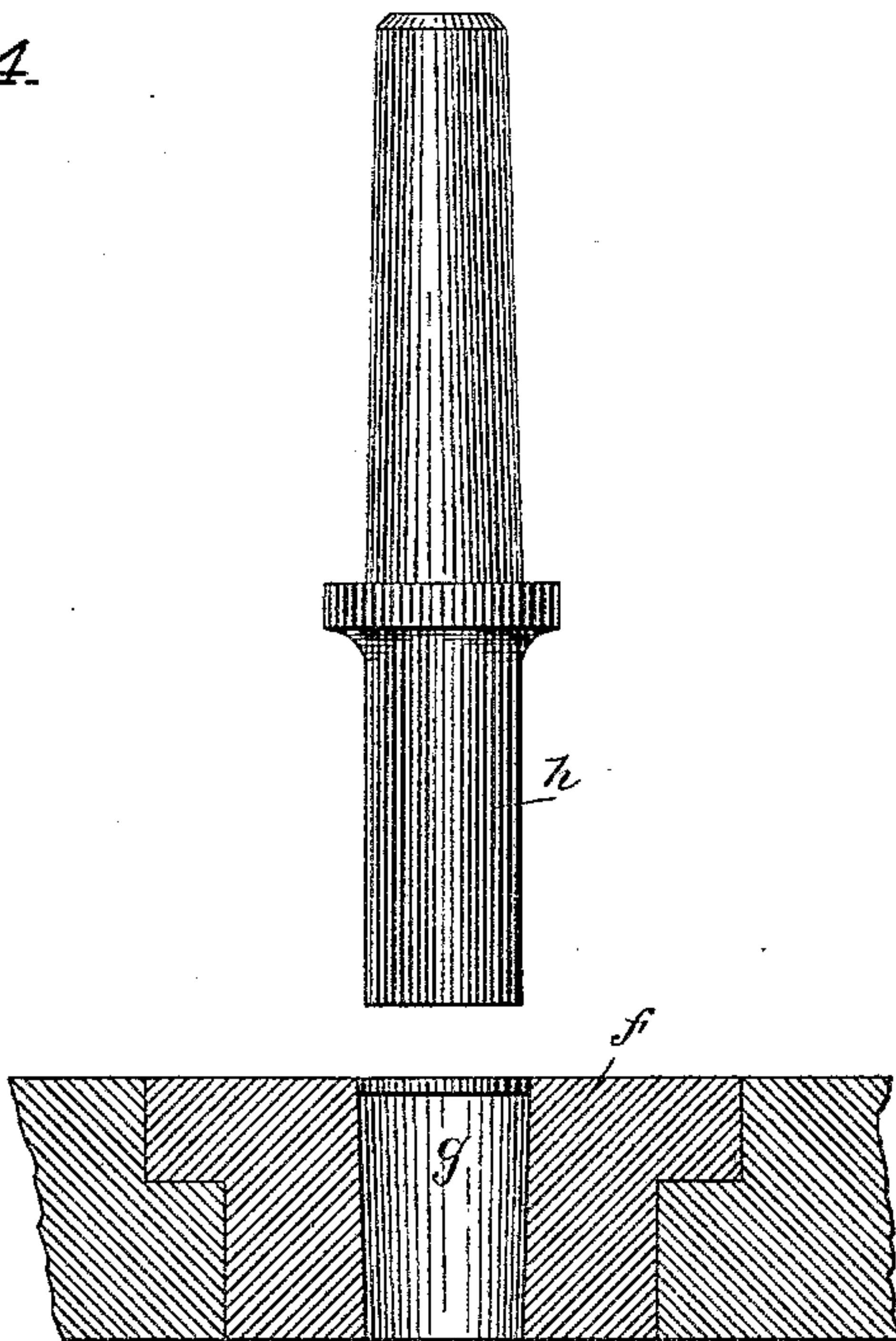


Fig. 6.

WITNESSES.

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LEONIDAS MURRAY, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
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MANUFACTURE OF CLOCK AND WATCH BALANCES.

SPECIFICATION forming part of Letters Patent No. 359,980, dated March 22, 1887.

Application filed January 4, 1887. Serial No. 223,342. (No model.)

To all whom it may concern:

Be it known that I, LEONIDAS MURRAY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and
5 useful Improvements in the Art of and Means for Manufacturing Compensation-Balances for Watches and Clocks, of which the following is a specification.

My invention relates to the art of manufac-
10 turing compensation-balances for watches and clocks.

The method commonly employed in making watch and clock compensation-balances is to first drill the steel blank, then turn it to the
15 required thickness and diameter, then melt or fuse on the periphery of this steel blank a ring or lamina of brass, and, finally, after properly dressing or turning down the balance-blank so formed to roll or hammer the brass rim to
20 obtain the requisite temper. The objection to this mode of procedure is that the step pursued for the purpose of tempering or hardening the brass rim has a tendency, also, to elongate it, and at the same time impair its weld
25 or union with the steel blank or disk.

It is the object of my invention to overcome the objection mentioned, and this I do by the improved method which I will now proceed to describe and claim, reference being had to the
30 accompanying drawings and the letters of reference marked thereon, forming a part of this specification, the same letters indicating the same parts wherever they occur.

In said drawings, Figure 1 represents a plan
35 view of a drilled steel blank. Fig. 2 is a vertical central section of the same and a capsule supporting and surrounding it preparatory to receiving the ring or lamina of brass to be fused thereon. Fig. 3 represents a section similar to
40 that portrayed in Fig. 2, showing the brass ring united to the steel blank, as also the capsule, by fusing. Fig. 4 represents the balance after the capsule has been turned off. Fig. 5 is a diagram showing the old method of hardening or temper-
45 ing the brass ring or periphery of the balance. Fig. 6 represents the means employed in my improved method of tempering or hardening the lamina or ring of brass forming the rim or periphery of the balance.

In forming compensation-balances for
50 watches or clocks it is common, first, to construct a properly-drilled steel blank, *a*, as represented in Fig. 1, which blank is supported on a capsule consisting of a plate, *c*, having an offset, as at *d*, to receive the blank, for the
55 purpose of maintaining the latter in proper position, and a circular rim, *b*, extending at substantially right angles to the plate *c* and at a distance uniform in extent from the periphery of the blank *a* in position on the plate *c* to
60 permit the brass ring *e* to be fused on the blank to be placed therearound within the circle formed by the rim *d*. In this position the parts are placed in a furnace, and the brass
ring *e* fused and united to the blank *a*, which
65 process also unites said ring to the capsule *c d*, the latter device being used as a mere expedient for maintaining the parts in proper position during the operations of fusing, and composed of material which will not fuse at
70 as low temperature as that required to melt the brass ring *e*. The capsule is now turned off, which leaves the balance in the condition represented in Fig. 4.

In order to harden or temper the brass rim
75 or lamina *e* on the blank *a*, it has been usual to place it between a plurality of rollers, *r r*, as represented in Fig. 5. This operation, however, has a tendency to elongate the lamina, as also to impair its union with the steel blank
80 *a*, both of which results prevent the construction of a perfect balance. To overcome this difficulty, I construct a steel die, *f*, forming therein a slightly-tapered hole, *g*, of a diameter sufficient at its larger end to admit the bal-
85 ance after the capsule has been turned off therefrom, and by means of a plunger, *h*, force the balance through said hole from the larger to the smaller end, thus securing a perfectly even compression on the lamina or ring at all
90 points, tempering or hardening the same precisely as desired and without elongating it or in the least degree impairing its union or weld with the steel blank.

It will be seen that my improved method is
95 even simpler than that heretofore practiced, while at the same time it entirely overcomes the objections heretofore met with in the tem-

pering or hardening of rings or laminæ on watch and clock balances.

Having thus described my invention, what I claim is—

- 5 The improvement in the art of tempering or hardening a lamina or ring on a watch or clock balance, which consists in placing the balance having the lamina or ring united thereto in the larger end of a slightly-tapered hole formed
10 in a die, and forcing said balance through to the smaller end, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 29th day of December, A. D. 1886.

LEONIDAS MURRAY.

Witnesses:

ARTHUR W. CROSSLEY,
C. W. H. BROWN.