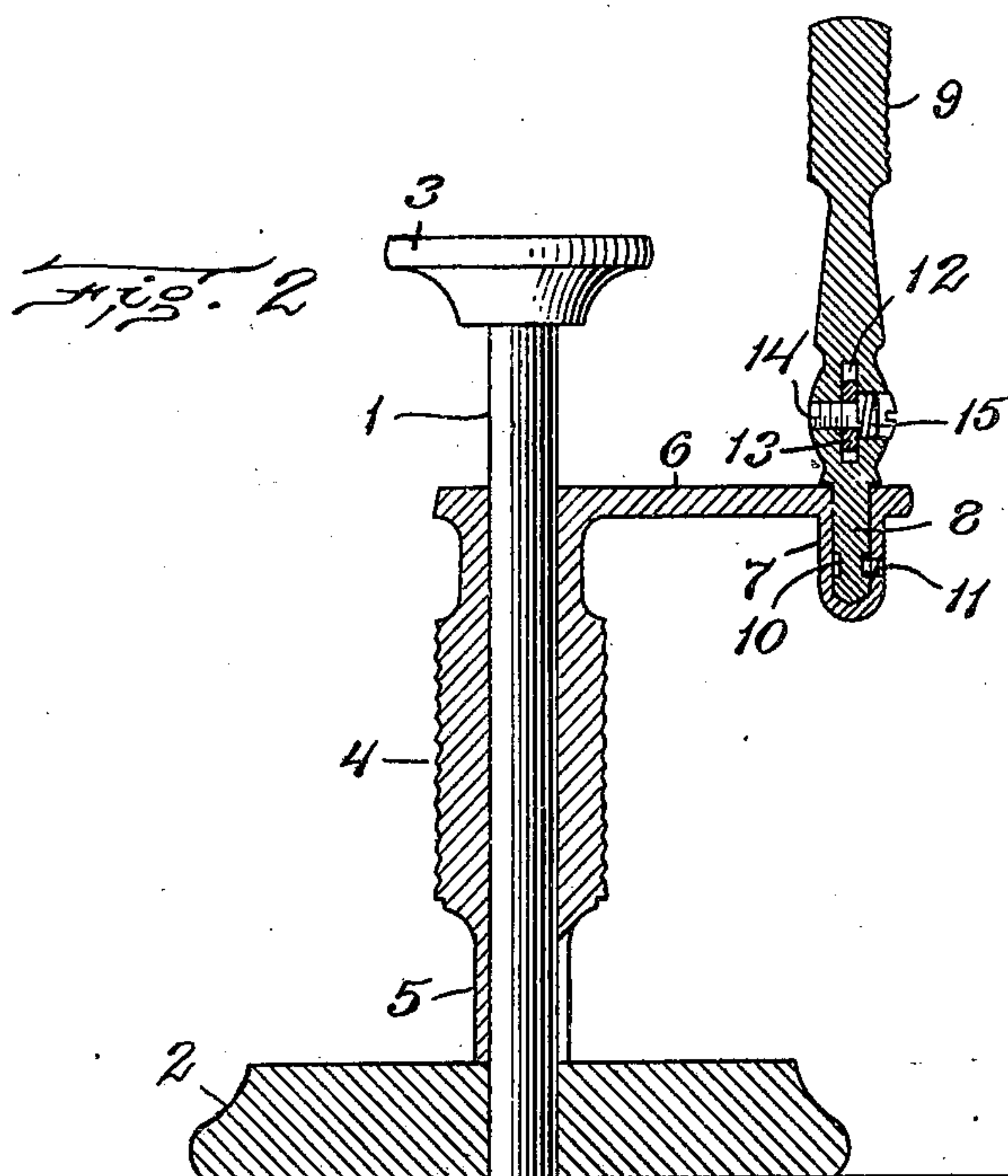
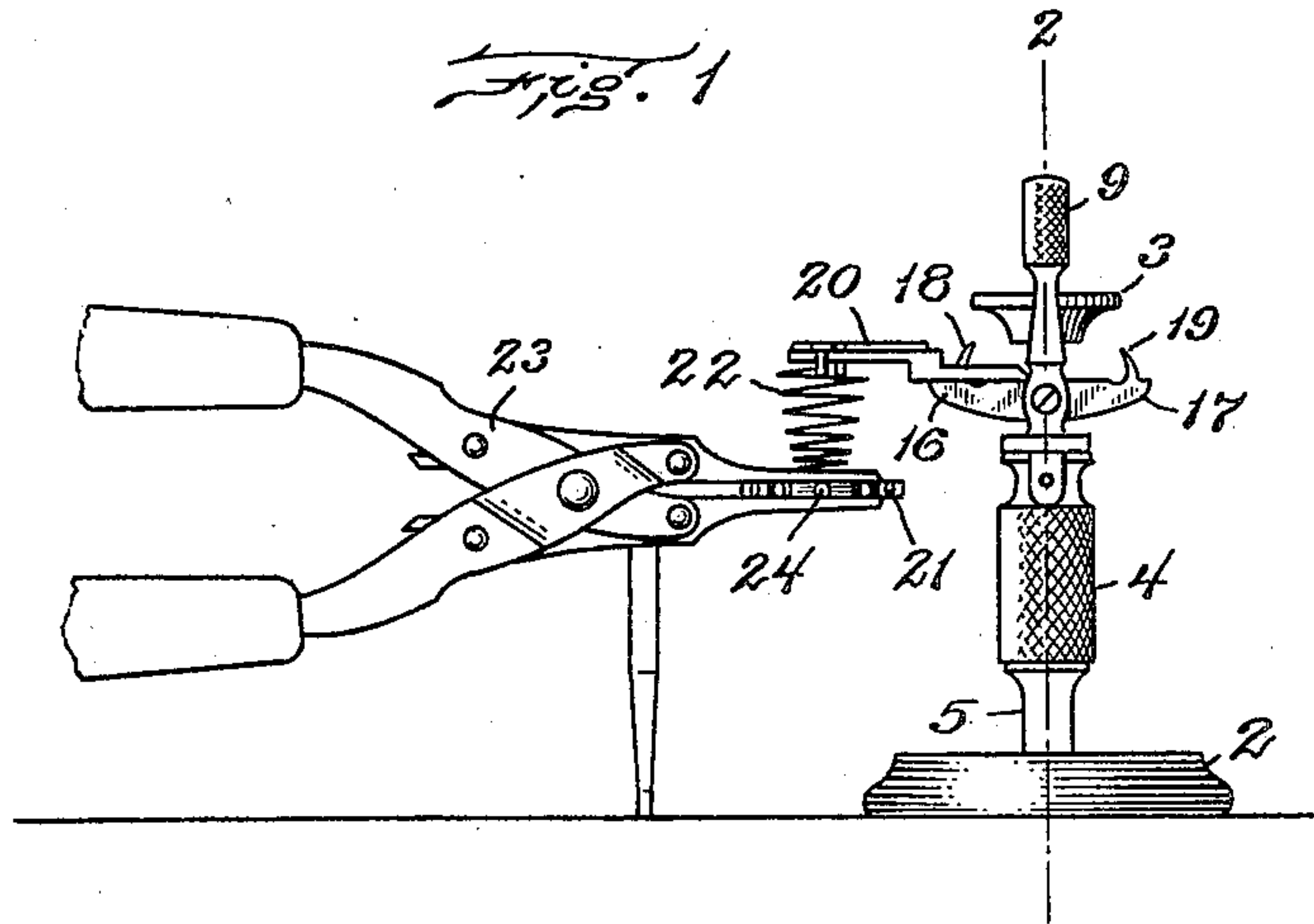


F. R. CUNNINGHAM.
 APPARATUS FOR ADJUSTING BALANCE WHEELS.
 APPLICATION FILED NOV. 6, 1907.

922,095.

Patented May 18, 1909.



Witnesses:
 A. C. Rotigan
 M. W. Flower

Inventor
 F. R. Cunningham
 by *George Brown* *Attorneys*

UNITED STATES PATENT OFFICE.

FRANK R. CUNNINGHAM, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO KENDRICK & DAVIS,
OF LEBANON, NEW HAMPSHIRE, A FIRM.

APPARATUS FOR ADJUSTING BALANCE-WHEELS.

No. 922,095.

Specification of Letters Patent.

Patented May 18, 1909.

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To all whom it may concern:

Be it known that I, FRANK R. CUNNINGHAM, of Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Adjusting Balance-Wheels, of which the following is a specification.

The present invention relates to watch making, and particularly to that special part of the watch-maker's art which consists in timing the balance after it has been mounted in a watch movement.

It has been my object to devise a way for holding the balance so that the timing screws may be removed and replaced without incurring liability of oiling the hair-spring or bending the pivots.

Accordingly, the invention consists in a tool for supporting the balance-cock and balance in this manner.

Of the accompanying drawings,—Figure 1 represents an elevation, showing the tool embodying my invention and the manner of its use. Fig. 2 represents a sectional view of the tool on an enlarged scale.

The same reference characters indicate the same parts in both figures.

In adjusting a watch, it is sometimes necessary to apply timing washers between the rim of the balance and the heads of certain screws, or to remove such washers previously applied in order that the time of oscillation of the balance may be corrected. Ordinarily when the watch-maker finds it necessary to apply or remove such washers, he removes the balance-cock with the balance and hair-spring attached, lays the cock bottom up on a bench, and, holding the balance in his fingers, removes the screw, applies or removes the washer, and replaces the screw. This method of operation is objectionable, because there is danger of oiling the hair-spring from the top pivot of the balance, bending the pivot, and distorting and staining the balance itself. When the cock is inverted with the balance pivot still in the bearing and set down on the bench, there is a shock which in many cases will bend the pivot. After being so set down and while the balance is being handled, its top pivot will usually slip out of the bearing and frequently be brought against the hair-spring, depositing a slight amount of oil on the spring.

This of course is highly detrimental inasmuch as even the slightest quantity of oil will cause the coils of the spring to adhere in case they should be brought into contact, and immediately destroy the accuracy of the watch. The handling of the balance directly by the fingers of the workman is also detrimental, because in many cases the balance rim is soft and easily bent, while often the moisture on the fingers of the workman stains the metal and causes subsequent corrosion. Another practice is to remove and adjust the timing screws without taking the balance from the watch movement. This necessitates removal of the watch movement from the case, and endangers the pivots, for in many cases the screws are hard to start, opposing so great resistance to the screw-driver as to displace the balance-staff and bend the pivots.

I have devised means of handling and supporting the balance so as to avoid all the dangers and risks above indicated. In practicing my method, I remove the balance-cock, carrying with it the attached balance and hair-spring, and hang it in a substantially horizontal elevated plane, that is, in its normal and correct position, with the balance hanging from its lower side, the top pivot of the latter being free of its bearing and of the hair-spring. The pendent balance being thus free from all surrounding objects, is in such a position that it can be gripped by pliers and held stationary while the timing screws are turned.

The tool constituting part of my invention consists of a standard 1 mounted perpendicularly in a base 2, and having a head 3. Surrounding the standard is a sleeve 4 which at the lower end is longitudinally divided into spring jaws 5 which frictionally grip the column. This sleeve is of less length than the column so that it can be adjusted to various heights, and it can also be turned, the spring jaws 5 retaining it in whatever position it is left.

From the top of the sleeve 4 projects laterally an arm 6, in the end of which is a socket 7 to receive the stem 8 of a post or holder 9. This stem has an annular groove 10 into which enters a screw 11 in the socket, preventing removal of the post, while at the same time allowing it to turn. In the post or holder 9 is a slot 12 through which passes

a cross-bar 13 pivotally held by a screw 14 about which is coiled a spring 15 bearing frictionally against the cross-bar so as to hold it at any angle at which it may extend. This cross-bar has two arms 16 and 17, each with a straight upper edge, and an upwardly-extending projection, hook or horn. These hooks are indicated by 18 and 19, respectively.

10 The manner of use of the tool is indicated in Fig. 1. The lower side of the balance-cock 20 is placed on the upper edge of one of the arms, with the hook of the same arm projecting through the screw hole. This supports the cock with its lower side, that is, the one in which is the bearing for the top pivot of the balance, underneath, while the cock extends outward in line with the arm which supports it. This is in a horizontal plane or nearly so, since the cross-bar has little play for swinging. The balance 21 is thus enabled to hang freely at the end of the extended hair-spring 22 beside the standard 1 and above the surface of the bench on which the tool is placed. It can then be grasped by the parallel-jaw pliers 23 and held stationary, while its timing screws 24 are turned. After one screw has been taken out and replaced, the timing screw on the opposite side is rendered accessible by a semi-rotation of the holder 9. A similar result may be obtained by a semi-revolution of the holder about the standard 1, by rotation of the sleeve 4. It will thus be seen that the cock holder has planetary movements, one of rotation about the axis of the post 9, and of revolution about the standard 1.

The spreading of the hair-spring under the weight of the balance causes the pivot of the latter to be withdrawn from the bearing, while the fact that the cock is held so that the balance is directly beneath it, avoids all danger of the balance pivot being displaced sideways far enough to deposit any oil on the hair-spring. The vertical adjustment of the sleeve 4 enables the balances of all kinds of watches to be located at the most convenient point. The hooks 18 and 19 are all different sizes so as to be capable of entering the screw-holes of all sizes of cocks, and enabling the latter to rest on the upper edges of the arms.

I claim:—

1. A tool for the purpose specified, comprising an arm having portions to support and retain a balance cock, a base, and a holder for said arm rotatably connected with said base.

2. A tool for the purpose specified, comprising an arm having portions to support and retain a balance cock, and a rotatably and revolubly supported holder for said arm.

3. A tool for holding a balance cock and balance for adjustment of the latter, having provisions for supporting the cock with the

hair-spring and balance depending therefrom.

4. A tool for holding a balance cock and balance for adjustment of the latter, having provisions for supporting the cock with the hair-spring and balance depending therefrom, said provisions being rotatable to present opposite sides of the balance accessibly to the workman.

5. A tool for holding a balance cock and balance for adjustment of the latter, comprising a base, and means for holding the cock approximately horizontal with the hair-spring and balance hanging therefrom, at a distance above the base.

6. A tool for holding a balance cock and balance for adjustment of the latter, comprising supporting and positioning means adapted to hold a cock approximately horizontal with the hair-spring and balance hanging therefrom in mid-air.

7. A tool for holding a balance cock and balance for adjustment of the latter, comprising an arm having a surface adapted to support the under side of the cock and a hook to enter the screw-hole thereof, to retain the cock in such position that the balance may hang therefrom at the end of the hair-spring.

8. A tool of the character described comprising a lateral arm having a hook or horn, and a revoluble holder therefor.

9. A tool for holding a balance cock and balance for adjustment of the latter, comprising a base, a standard, a sleeve movable thereon and having an arm, a holder revoluble on said arm, and a cock-supporting arm projecting from said holder and having a projection to enter a recess in the cock.

10. A tool of the character and for the purpose described, comprising a standard, a post rotatably and revolubly supported by and beside said standard, and a two-armed cross-bar pivoted to said post and having a cock-holding hook on each arm.

11. An apparatus for supporting balance cocks and wheels for timing adjustment, consisting of a laterally extending support on which said cock may be placed, with the hair spring and balance hanging free of the end thereof, and provisions on said support for holding the cock thereon.

12. An apparatus for supporting balance cocks and wheels for timing adjustment, consisting of a laterally extending support on which said cock may be placed, and means on said support for securing the cock thereon in such a position that the hair spring and balance wheel may hang freely therefrom, clear of the support.

In testimony whereof I have affixed my signature, in presence of two witnesses.

FRANK R. CUNNINGHAM.

Witnesses:

P. W. PEZZETTI,

ARTHUR H. BROWN.