

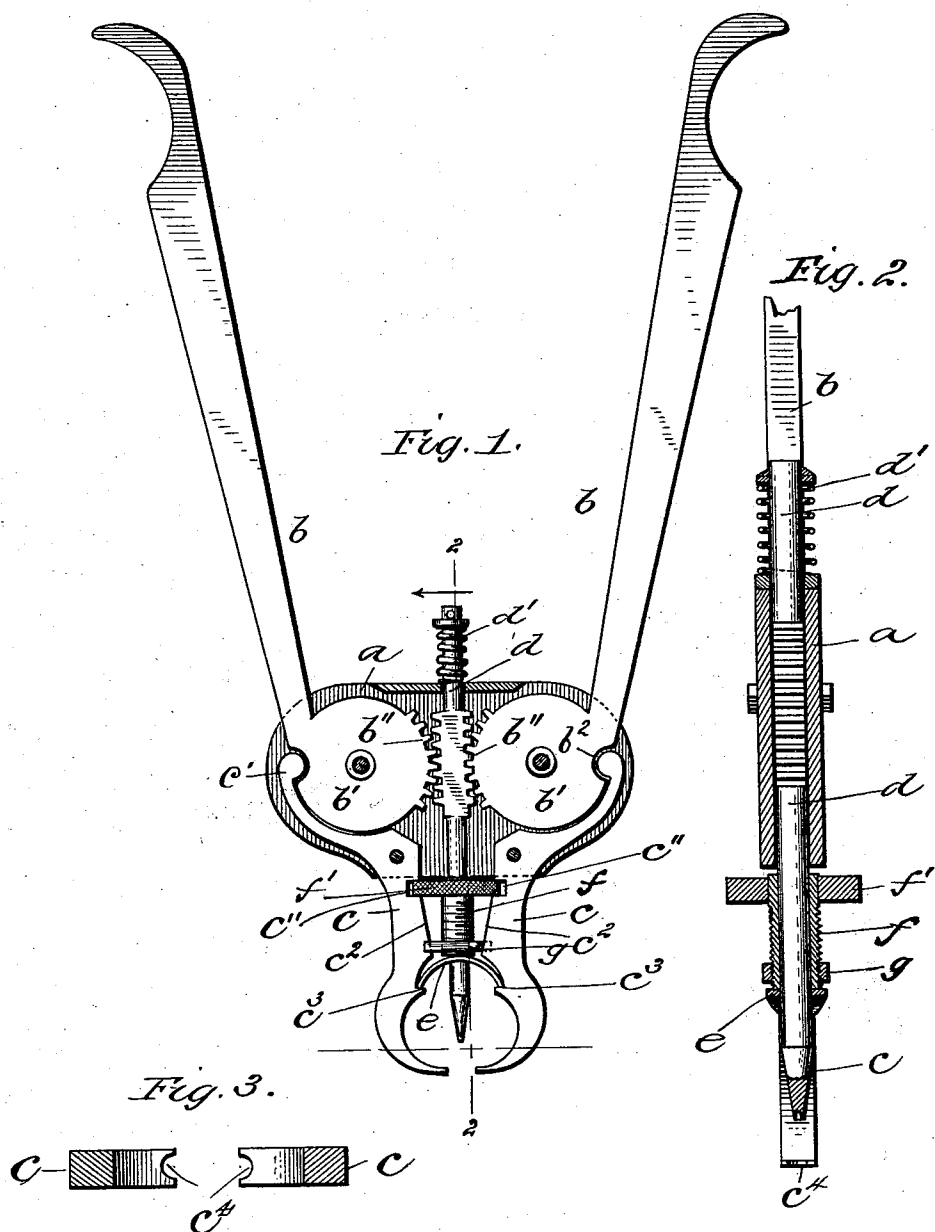
(No Model.)

C. G. INGALLS.

TOOL FOR REMOVING THE HANDS OF TIMEPIECES.

No. 507,817.

Patented Oct. 31, 1893.



Witnesses
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UNITED STATES PATENT OFFICE.

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TOOL FOR REMOVING THE HANDS OF TIMEPIECES.

SPECIFICATION forming part of Letters Patent No. 507,817, dated October 31, 1893.

Application filed April 24, 1893. Serial No. 471,637. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. INGALLS, a citizen of the United States, residing at Colville, in the county of Stevens and State of Washington, have invented certain new and useful Improvements in Watchmakers' Tools, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a side elevation with one side of the casing removed. Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1; and Fig. 3 is a sectional view on line 3—3 of Fig. 1.

This invention is designed to provide a simple tool for removing the hands from watch-movements, and for other purposes, as more fully hereinafter appears.

In the drawings, *a* designates a small flat casing between whose sides the operating levers *b* and the jaws *c* are pivoted. The levers *b* have their inner or lower pivoted ends formed into cams *b'*, the inner or adjacent edges of the cams being provided with a series of teeth *b''*, which engage teeth on a vertically-movable pusher-bar *d* working in the casing between the levers and jaws. The pusher-bar is normally held up by a coil-spring *d'* interposed between the upper edge of the casing and a head or washer on the upper end of the bar; this spring also keeps the levers normally spread apart through the medium of the engaging teeth. The jaws *c* are pivoted below the ends of the levers and their upper arms are respectively curved around close to the outer edges of the cams *b'* and have formed at their upper ends the curved enlargements *c'* which bear on the edges of the respective cams, and normally fit into the recesses *b²* formed in the cams *b'*; the lower parts of the jaws immediately below the lower edge of the casing *a* are provided on their inner edges with the recesses *c''*, and immediately below these recesses they are formed, also on their inner edges, with the downwardly and inwardly inclined faces *c²*, and below these inclined faces the shoulders *c³* are formed, the lower ends of the jaws being curved inwardly and sharpened, their adjacent edges being preferably recessed at *c⁴* to fit and pass under the rims of the hands. The lower ends of the jaws *c* are kept normally apart and the upper ends of the jaws

are caused to bear on the cams *b'* by means of a $\cap$ -shaped spring *e* inserted between the jaws, the ends of this spring bearing against shoulders *c³* on the jaws.

On the pusher-rod below the casing *a* is loosely mounted an externally threaded sleeve *f* which carries at its upper end the milled nut *f'*, said nut projecting into the recesses *c''* of the jaws and thereby supporting the sleeve on the rod. On the lower end of the sleeve *f* is threaded a cross-bar *g* which is recessed at its ends to receive the inner edges of the jaws *c*, said recessed ends of this bar working on the inclined faces of the jaws *c* as shown. This bar *g* may be moved along the faces *c²* of the jaws by means of the threaded sleeve *f*, which is turned by means of the nut *f'*, and said movement of the bar *g* adjusts the lower ends of the jaws to suit the different sizes of hands. The lower end of the pusher rod is tapered to a point so as to press on the end of the center-pinion and pass between the notched ends of the jaws during the act of removing the hands.

The operation of the device is as follows:—In removing the hands from a watch-movement it is simply necessary to hold the tool in one hand and press the levers inwardly, taking care that the jaws are in position to engage under the flanges of the hands. As the levers are forced together the jaws pass in under the flanges of the hand and the pusher-rod pressed down on the end of the center-pinion, whereby the jaws are lifted and the hands removed from the movement. The pusher-rod is forced down by the teeth on the inner ends of the levers and those on the rod and the jaws are simultaneously operated by the cams bearing against the upper ends of the enlargements *c'* of the jaws as is evident. Thus it will be seen, that the hands are removed easily with but a single movement of the levers. The bar *g* and its operating devices enable the jaws to be adjusted to suit different sized hands, and to set them accurately with respect to the point of the pusher-bar. The tool may be also used to remove the roller from the staff of the balance-wheel, for which purpose a small hole is formed in the end of the pusher for the reception of the staff; it may also be used to remove the hair-spring collet, but in this latter case the shape of the

jaws would have to be changed a little to drop in on the arms of the balance wheel.

The advantages of a tool of this character will be apparent to a watch-maker and some of the most important are as follows:—It will remove the hands without twisting or wrenching the center pinion or cutting or bruising the pipe of the dial-wheel; it will remove the roller from any sized staff and is always open ready for work; it is impossible for the jaws to spring out of line and thereby bend the staff; the adjusting devices for the jaws are extremely simple and effective enabling them to be adjusted simultaneously, whereby they are maintained truly centered; and that in working it one hand only of the operator is necessary, thereby giving him the use of the other hand to steady and adjust the work he is engaged upon. There are other minor advantages that will be apparent to those skilled in the use of tools of this character.

Having thus fully described my invention, what I claim is—

1. The combination of a casing, levers pivoted therein, a pusher-rod working between the levers and adapted to be reciprocated thereby, spring-actuated jaws pivoted in the casing, on either side of the pusher and adapted to be closed by the levers simultaneously with the depression of the pusher-rod, substantially as described.

2. The combination of a casing, a pair of levers pivoted therein and provided with cams, a spring-actuated pusher engaging the inner ends of the levers and serving to spread the same, spring-actuated jaws pivoted in the casing and having their upper arms operated by the cams, substantially as described.

3. The combination of a casing, a pair of

levers pivoted therein at their inner ends, said inner ends being provided with teeth and cams, a spring-actuated pusher-rod provided with teeth engaging teeth on the levers, spring-actuated jaws pivoted in the casing and having their upper arms bearing on said cams, and means for adjusting the lower ends of said jaws to or from each other, substantially as described.

4. The combination of a casing, a pair of levers pivoted therein, a pusher-rod working between the levers and adapted to be reciprocated thereby, spring actuated jaws pivoted in the casing on either side of the pusher and adapted to be closed by the levers simultaneously with the depression of the pusher-rod, and means for simultaneously adjusting the lower ends of the jaws to or from each other, substantially as described.

5. The combination of a pair of pivoted levers carrying cams, a pair of pivoted jaws having their upper ends bearing on said cams, a device bearing on oppositely-inclined parts of the jaws and adapted to spread the same, and means for adjusting this device, substantially as described.

6. The combination of a casing, levers pivoted thereon and provided with cams at their lower ends, jaws pivoted in the casing and having their upper ends bearing against the cams, a plate bearing against the adjacent inclined edges of the jaws, and a screw for adjusting said plate, substantially as described.

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

CHARLES G. INGALLS.

Witnesses:

JACOB STETZAL,
JOHN H. MOYLE.