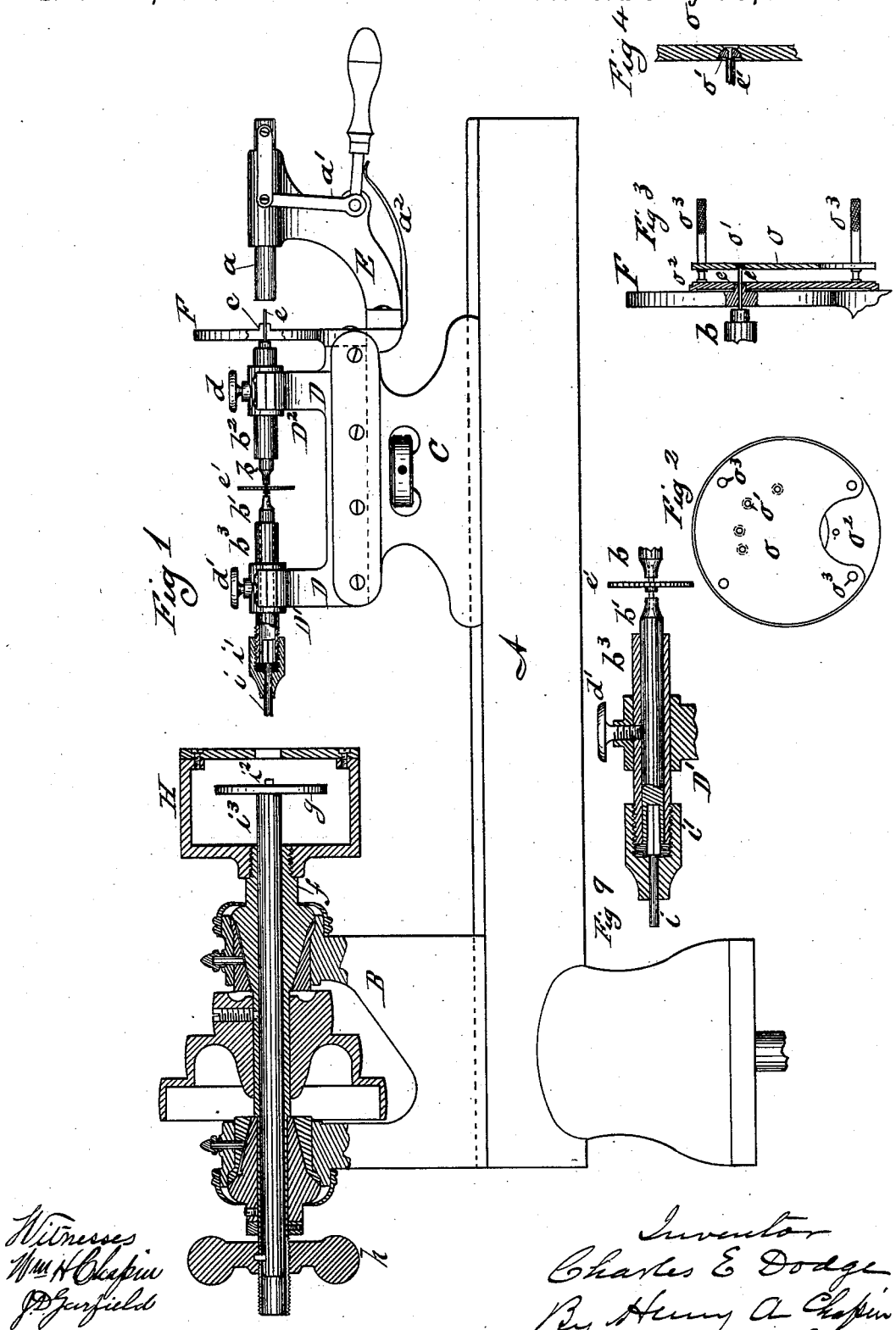
(No Model.) 2 Sheets—Sheet 1.

C. E. DODGE.

MACHINE AND DEVICE FOR END SHAKING WATCH TRAINS.

No. 244,438. Patented July 19, 1881.



Witnesses
Wm H Chapin
J. D. Garfield

Inventor
Charles E Dodge
By Henry A Chapin
Atty

(No Model.) 2 Sheets—Sheet 2.

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Fig 6

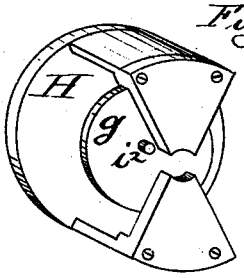


Fig 5

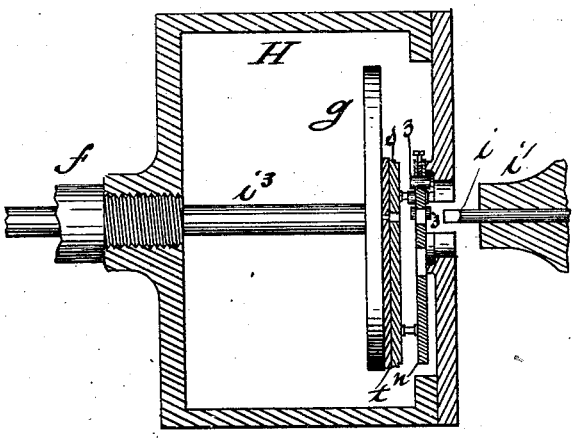


Fig 7

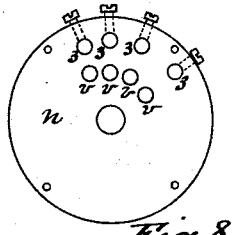
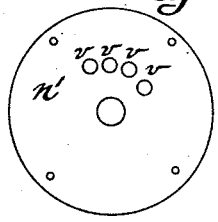


Fig 8



Witnesses
Wm H Chaplin
J D Garfield

Inventor
Charles E Dodge
By Henry A Chaplin
Atty

UNITED STATES PATENT OFFICE.

CHARLES E. DODGE, OF SPRINGFIELD, MASSACHUSETTS.

MACHINE AND DEVICE FOR END-SHAKING WATCH-TRAINS.

SPECIFICATION forming part of Letters Patent No. 244,438, dated July 19, 1881.

Application filed October 25, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. DODGE, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines and Devices for End-Shaking Watch-Trains, of which the following is a specification.

This invention relates to devices for countersinking the bottom plate of watches around the pivot-holes therein; and the object thereof is to provide improved devices whereby the base of the countersink in the bottom plate will be just the distance from the jewel in the top plate over it which the length of the pivot from shoulder to shoulder which is to run therein demands, thus preventing any undue endwise motion in the pivot, or any cramping of the same between the top and bottom plates, said devices providing facilities for causing the set of the jewel and each pivot for which a countersink is cut to gage the depth thereof, according to the length of said pivot.

I attain the above-named objects by the devices and construction illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of a bottom-plate-countersinking lathe embodying my improvements. Fig. 2 is a plan view of the top plate of a watch, secured temporarily upon a standard-plate, pierced with holes directly back of the jeweled holes in the top plate. Fig. 3 is an enlarged view of a portion of the lathe, Fig. 1, and the plates, Fig. 2, partly in section. Fig. 4 is an enlarged view of a jeweled portion of a top plate, in section, and the end portion of one of the centers of said lathe. Fig. 5 is an enlarged view, partly in section, of a part of said lathe, showing the bottom plate of a watch secured therein in position to be operated upon by the countersink-tool there shown. Fig. 6 is a perspective view of the lathe part shown in Fig. 5. Fig. 7 is a plan view of a drill-templet with adjustable bearing-studs. Fig. 8 is a plan view of a drill-templet constructed without said bearing-studs; and Fig. 9 is a view, partly in section, of the tool-holding piston and tool-stop of the lathe.

Like letters refer to like parts in all the figures.

In the drawings, A is the lathe-bed. B is the head-stock. C is the tail-stock base, secured adjustably to bed A. D is the tail-stock, adapted to slide longitudinally on base C, and provided with two spindle bearing-posts, D' D^2. E is an arm extending rearwardly from the tail-stock D secured thereto, provided with a suitable bearing for a piston, *a*, and having an elbow-lever, a', pivoted thereto and connected to said piston, as shown. a^2 is a spring operating to throw the handle of lever a' upward. F is a vertical plate secured to the tail-stock D, and provided with a central pierced projection, *c*. *b* is a piston movable longitudinally in a sleeve, b^2, in post D^2, provided with a slim center, *e*, in its rear end, having its opposite end adapted to receive the end of a watch-pinion pivot, as shown, and to be secured in any desirable position in its bearing in said sleeve by a set-screw, *d*. e' is a watch-pinion. b' is a piston movable longitudinally in a sleeve, b^3, in post D', adapted, like piston *b*, to receive in one end the end of a watch-pinion pivot to be secured when need be in its bearings in said sleeve b^3 by a set-screw, d', and having one end pierced to receive the end of a countersink-tool, *i*; and sleeve b^3 is screwed to provide for screwing the tool-stop i' thereon over tool *i*, as shown. *f* is a hollow spindle fitted in proper bearings in the head-stock B, provided with a cone driving-pulley, as shown, and having a clamp-case, H, screwed to its inner end, said clamp-case being constructed with its sides and front partly open, as shown in Fig. 6. *g* is a clamp-disk, provided with a central stud, i^2, and secured within case H to the end of a piston, i^3, adapted to be moved longitudinally in spindle *f* by the screw-wheel *h*. *n* is the drill-templet, provided with adjustable bearing-studs, 3 3 3 3, and pierced with holes opposite each of said studs, as shown, to allow the tool *i* to pass through it, and with holes to receive the ends of the posts on the bottom plate when the templet is placed thereon, as in Fig. 5. n' is a drill-templet constructed without the bearing-studs 3. *s* is the bottom plate of a watch, and *t* a supporting-plate to the same when placed in the clamp-case H, and said supporting-plate is pierced with holes to correspond in position with those in the templets *n* n' marked *v*, and of suitable size to receive the stud i^2 on clamp-

disk *g*. *o* is the top plate of a watch, and *o'* the jewel therein. o^2 is a standard-plate, to which plate *o* is secured temporarily by the screw-pins o^3, and, like plate *t* back of plate *s* in Fig. 5, is pierced with four holes to allow the stud *c* on plate F to enter them as stud i^2 enters plate *t*.

The operation of my improvements in end-shaking watch-trains, whereby just the depth of the countersink is cut on the bottom plate which the length of the pivot and the set of the jewel requires, is as follows: The top plate *o* having been jeweled, I secure it to the standard-plate o^2, as aforesaid, by screws o^3, and, retiring piston *a* from the face of plate F by pressing down on the handle to lever *a'*, place said standard-plate flat against plate F, stud *c* on the latter entering one of the holes therein, the center *e* on piston *b* passing through said stud. Lever *a'* is now released, and spring a^2, operating thereon, causes piston *a* to press against the top plate at a point opposite one of the jewels therein, and to hold both of said plates against plate F. The set-screw *d* is now released, piston *b* is pushed toward piston *a*, and the end of the center *e* made to bear against the face of the jewel on the inner side of plate *o*, and piston *b* is secured in that position by set-screw *d*.

The relative positions of the parts just described, after placing the top plate in the lathe, is illustrated in Fig. 3.

Before describing the manner of putting the bottom plate into the clamp-case H to be countersunk, and the use of the templet *n* therewith, I will explain the functions of the adjustable studs 3 in said templet, which are as follows: When a difference in degree of end shake between the pallet and escape-pivots and the third and fourth wheels of a watch is desirable, as is sometimes claimed, the ends of certain of the adjustable studs 3 in the templet *n* can be set nearer to the face of said templet, so as to accomplish that object, when used in conjunction with the lathe parts and cutting-tool, as will be hereinafter fully described; but when all the countersinking should vary only as governed by the projection of the tool *i* beyond the end of the stop *i'*, and any variation in the length of the pivots placed between pistons *b b'* and the set of the jewel, then the templet *n'* serves all purposes; or templet *n* may be used by setting the outer ends of all the studs 3 to a uniform distance from the face of the templet. I now place the bottom plate, *s*, of the watch upon the supporting-plate *t*, and place the templet *n* upon its posts, as in Fig. 5, and placing said parts in the clamp-case H, with stud i^2 in the proper hole of plate *t* to cause the hole in plate *s* corresponding to the jeweled hole in the aforesaid top plate, *o*, to be opposite the end of stud i^2. The screw-wheel *h* is turned to force the disk *g* toward the inner side of the front of the clamp-case, and so clamp said parts firmly in said case. This disposition of said parts brings the pivot-hole in the bottom plate *s* which is to be operated upon opposite the center of the case H and the end of the cutting-tool *i*. The ends of the pistons *b b'* are now set end to end without the pivot between them, and the parts carried on tail-stock D are all moved toward the templet, carrying tool *i* through a hole in it, and the stop *i'* is now screwed to such a position over said tool as will allow the end of the latter to project just enough beyond the inner face of said templet to countersink for the degree of end shake desired. The stop is now secured in said position by a set-screw or other suitable device so that it will not be turned by contact with the revolving templet as they meet when the cutting-tool has reached the requisite depth in the bottom plate. The said parts on the tail-stock are now moved back from the templet, the pivoted pinion *e'* is placed between the ends of pistons *b b'*, as in Fig. 1, and the said pistons are secured immovable in their sleeves by the set-screws *d d'*, the spindles *f* and case H are set in motion, and all of the aforesaid parts on the tail-stock are again moved toward case H, carrying the cutting-tool *i* through the templet against the bottom plate, and allowing it to cut a countersink therein whose depth is governed by the space between the end of the stop and the stud 3, which it approaches when the tool first strikes the bottom plate, stop *i'* coming to a bearing against the said stud when the countersinking-tool shall have reached a proper depth. The templet and its connected parts are now successively moved in case H to bring the several pivot-holes in the bottom plate in succession before tool *i*. The top plate *o* is likewise adjusted between its proper centers, as aforesaid, and that pivot which is to run in the second hole is placed between pistons *b b'*, when the cutting operation is repeated, as before.

By employing the jeweled top plate to cause the piston *b* to be set in its sleeve according to the depth that each jewel is set in said plate, the position of said jewel and the length of the pivot placed between the ends of pistons *b b'* co-operate together to govern the degree of projection of the tool *i* beyond the end of stop *i'*, and consequently the depth of the countersink-cavity.

When the cutter has been once adjusted relative to the end of the stop, as just described, it need not be readjusted again until its wear shall make it necessary.

What I claim as my invention is—

1. In a lathe for end-shaking watch-trains, the combination, on the sliding tail-socket D, of the piston *a*, supported in a proper bearing, of mechanism for moving and for holding said piston against the top plate of a watch, of the vertical plate F, having stud *c* thereon, and of the piston *b*, carrying the center *e* and movable horizontally in its support, substantially as and for the purpose set forth.

2. In combination, the piston *b* and tool-piston *b'*, adapted to receive and hold between

their adjacent ends the pivoted watch-pinion e', the stop i', and cutting-tool i, substantially as and for the purpose set forth.

3. In combination with spindle f, the clamp-case H, the clamp-disk g, provided with stud i^2 and secured to piston i^3, and appliances for moving said piston longitudinally in spindle f, substantially as and for the purpose set forth.

4. In combination, the clamp-case H, and appliances for holding and revolving the bottom plate of a watch therein, the templet n, cutter i, and appliances for setting the end of said cutter at varying distances beyond the end of stop i', according to the varying length of the watch-pivots, and for moving it against said bottom plate, substantially as and for the purpose set forth.

5. The templet n, pierced with holes v to correspond with the position of the pivot-holes in the bottom plate of a watch, and provided with the studs 3, adjustable transversely in said templet, substantially as and for the purpose set forth.

6. In combination, the clamp-case H and appliances for holding and revolving the bottom plate of a watch therein, appliances for holding the set jewel of the top plate, o, of a watch against the end of the piston b, templet n, cutter i, and appliances for setting the end of said cutter at varying distances beyond the end of stop i', according to the varying length of the watch-pinion pivots and the set of said jewel in said top plate, and for moving said cutter against said bottom plate, substantially as and for the purpose set forth.

CHARLES E. DODGE.

Witnesses:
HENRY A. CHAPIN,
J. D. GARFIELD.