Barrel Cap Applying and Endshake Adjusting Machine

Filed Jan. 8, 1952

Fig. 4

Fig. 5

Fig. 6

Inventor

Egbert Van Haften
John Reber, Jr.

By

Attorney
This invention relates to a tool for applying the cap to a watch mainspring barrel and for adjusting the endshake of the barrel in the barrel arbor.

It is the object of the present invention to provide a tool for applying the cap to the mainspring barrel under a uniform pressure throughout the cap area.

A further object of the invention is to provide means for adjusting the endshake of the barrel arbor between the barrel arbor and the bottom of the barrel and the cap.

It is a still further object of the invention to provide a tool in which a barrel having the spring arbor and cap in relative position can be placed and without changing the position of the barrel, the cap can be applied and the endshake adjusted before removing the completed barrel and spring.

The invention is shown in the accompanying drawings in which:

Figure 1 is a perspective view showing the rear part in cross section.

Figure 2 is a side elevation showing the parts in cross section.

Figure 3 is a perspective view taken from the side opposite to that shown in Figure 1.

Figure 4 is an enlarged cross sectional view showing the barrel in mounted position.

Figure 5 is a view similar to Figure 4 with the parts in the clamping position.

Figure 6 is a view of the actual size of one of the larger of the barrels.

The invention comprises a base 5 which may be mounted on a table, bench or clamped in a vise and supports a framework 6 which is longitudinally bored at 7 and transversely cut at 8 to provide an opening in line with the bore for the reception of the barrel. Referring particularly to Figure 2, a movable piston 9 is mounted in the bore 7, said piston being bored and threaded at 10 to receive a screw threaded rod 11 which is operated by the knurled wheel 12. The bore 10 in the piston 9 is enlarged at the outer end, as shown at 13, and a plug 14 is fitted into the enlarged bore 13 leaving the outer rim 9 extending beyond the plug 14. Located centrally of the plug is a spring loaded pin 15 which is formed with an outward conical depression 16 for the reception of the cap end of the arbor. The other section of the bore 7 has mounted therein a slideable piston 17 formed with a central longitudinal bore having an enlarged outer portion 18 in which a spring loaded rod 19 is mounted. The piston rod extends back through the longitudinal bore to be engaged by a finger 20 on the vertical pivot post 21. The piston 17 is formed with a rearwardly extending projection 22 which is engaged by the pivoted cam lever 23 to force the piston 17 toward the opening 8.

A locking device for holding the piston 17 in forward position is a rod 25 having a hand grip cap 23 and formed with a reduced portion 31. The rod 25 is normally held in an outward position but when the piston is in the forward position so that the notch 30 in the piston conforms to the curve of the rod, the enlarged portion is pushed forward and the piston held in the forward position.

The rod 18 extends through the piston 17 and is engaged at its outer end by the finger 20 carried on the post 21. The post 21 is mounted for rotation in the frame and is swung through a partial arc by the L-shaped lever 24 which is formed with a slot 25 at the end farthest from the post 21. The slot 25 receives a screw 26 which is mounted on a transversely sliding rod 27 extending on either side of the framework. Movement of the rod 27 slides the rod 18 in and out of the piston 17.

In the operation of the barrel cap applying tool (referring to Figures 4 and 5 particularly), a barrel 34 having the spring 35, the arbor 36 and the cap 37 in position is set up between the conical depression 38 of the rod 19 and the conical depression 39 of the rod 15. The piston 17 is moved forward through the cam 23 and the projection 22 so that the barrel is moved (as shown in Figure 5) to bring the cap into engagement with the lip 39 of the piston 9 and firmly seated in the groove 40 of the barrel. The pressure which is applied to the handle 32 and through the cam to the piston 17 determines the amount of endshake in the barrel arbor. This endshake is critical and must be right. The operator tests this endshake entirely by feel and should the arbor be too loosely fitted, the process is repeated pressing the cap 30 so that it is slightly dished to take up any unnecessary play. Should there be too much endshake, the piston 17 is moved so that the groove 30 is aligned with the piston 23 and the larger portion of the piston 29 is moved forward to lock the piston 17 in position. Movement of the lever 24 rotates the vertical rod 21 and moves the finger 20 to push the rod 19 forward and press the barrel arbor outwardly against the cap 37 which in turn tends to bow the cap from the metal and increase the play between the bearing points of the arbor to produce greater endshake.

With this tool the operator is enabled to apply the cap to the barrel and, without removing the barrel from the tool, determine and adjust the
endshake of the barrel arbor. Previously this has been two separate operations requiring the mounting in two different fixtures or tools at an expenditure of the time of transfer and the re-mounting of the barrel arbor in the tool.

What is claimed is:

A barrel cap applying and endshake adjusting tool for use on a mainspring barrel, a barrel cap, an arbor and a mainspring, comprising a base formed with a pair of longitudinally aligned spaced cylinders, pistons mounted in said cylinders for restricted longitudinal movement, one of said pistons having a flat end for engagement with the mainspring barrel and the other piston being formed with an annular rim for engagement with said cap adjacent the circumference of said cap, whereby pressure exerted by one piston against the end of the mainspring barrel is opposed by pressure exerted against the cap on a circular line adjacent the circumference of said cap to firmly seat said cap within said barrel, said pistons being formed with central longitudinal bores, rods slidably mounted within said bores, means for moving said pistons toward each other to seat the barrel cap on the barrel which is mounted between said pistons, means for locking one of said pistons, and means for moving one of said rods to engage the arbor of the barrel to move said arbor against said cap to regulate the relative play between said arbor and said barrel and cap.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>164,913</td>
<td>Granger</td>
<td>May 4, 1875</td>
</tr>
<tr>
<td>699,547</td>
<td>Merritt</td>
<td>May 6, 1902</td>
</tr>
<tr>
<td>982,635</td>
<td>Rogers et al.</td>
<td>Jan. 24, 1911</td>
</tr>
</tbody>
</table>