Feb. 3, 1942. J. H. MEINHARDT 2,271,945

WATCHMAKER'S TOOL

Filed April 1, 1940

FIG. 1.

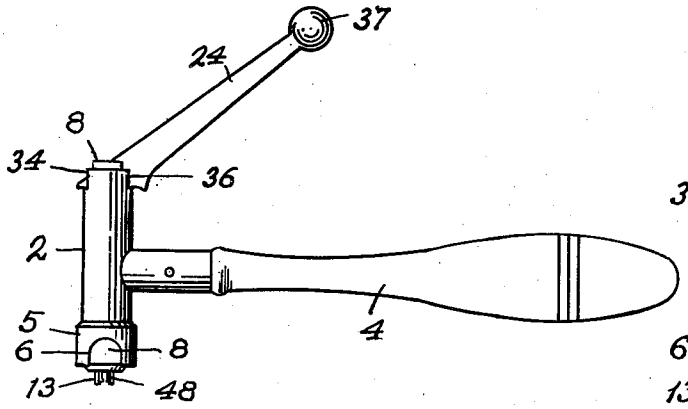


FIG. 2.

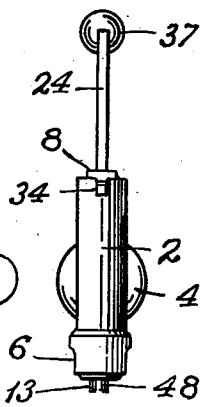


FIG. 3.

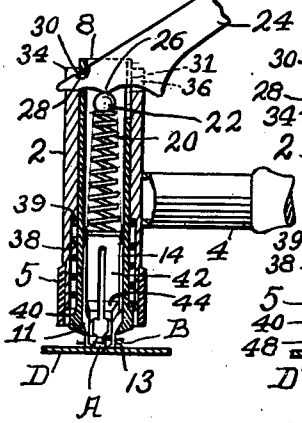


FIG. 4.

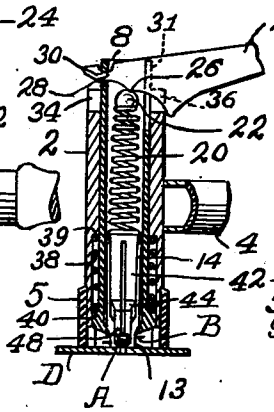


FIG. 5.

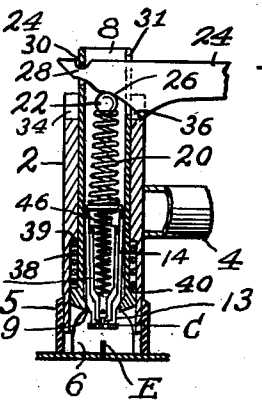


FIG. 6.

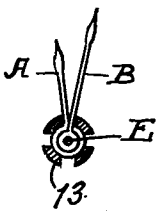


FIG. 7.

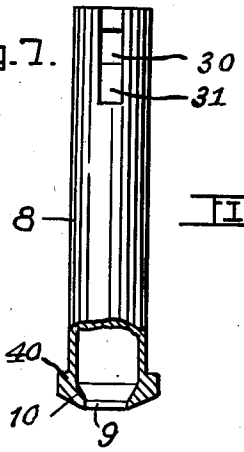


FIG. 8.

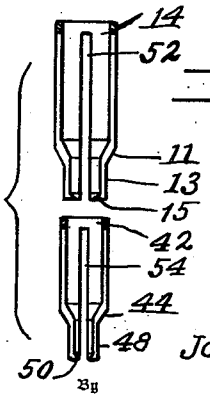
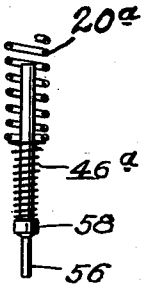


FIG. 9.



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WATCHMAKER'S TOOL

Joseph H. Meinhardt, Kansas City, Mo.

Application April 1, 1940, Serial No. 327,202

9 Claims. (Cl. 29—88.1)

My invention relates to watch makers' tools and the present invention is an improvement over U. S. Patent 2,098,103 granted November 2, 1937, in which I am the owner of an undivided three-fourths interest.

One new feature of the present invention resides in means for removing and replacing the hour and minute hands of a watch, in addition to the means for removing and replacing the cannon pinion.

Another new feature resides in means for preventing the tool from scratching or otherwise damaging the highly polished face of the watch dial during the operation of removing or replacing the hands of the watch.

Other features will hereinafter appear and in order that the invention may be fully understood, reference will now be had to the accompanying drawing in which:

Fig. 1 is a side elevation of the tool.

Fig. 2 is a front elevation of the tool.

Fig. 3 is an enlarged broken vertical section of the tool in initial position preparatory to gripping the hub of the hour hand of a watch.

Fig. 4 shows the tool gripping the hour hand preparatory to simultaneously lifting it and the minute hand from their respective staffs.

Fig. 5 shows the position of the tool after lifting a cannon pinion from its staff.

Fig. 6 is a detail plan view partly in section showing jaws of the tool gripping the hub of the hour hand preparatory to lifting it and the minute hand from their respective staffs.

Fig. 7 is a detail elevation partly in section of a plunger.

Fig. 8 is a detail of two chucks.

Fig. 9 is a detail of a modification.

Referring in detail to the different parts, 2 designates a tubular member in which the major portion of the working parts are assembled. The tubular member 2 is provided intermediate its ends with a fixed handle 4 and at its lower end with a fixed cylindrical base 5 having lower marginal recesses 6, so that the hour and minute hands A and B, respectively, and the cannon pinion C of the watch may be viewed when placing the tool in position thereover. The base 5 is made of softer material than the tubular member to prevent scratching or otherwise maring the polished face of the watch dial D during the operation of removing or replacing the hands A and B. I have found that fiber such as is used for insulating electrical devices provides a satisfactory material for the base.

Reciprocably mounted within the tubular member 2 is a hollow plunger 8 provided at its lower end with a reduced orifice 9 and an interior beveled surface 10, which latter coacts with the tapered upper portion 11 of jaws 13 of a relatively large tubular chuck 14 in forcing the jaws 13 to grip the hub of the hour hand A as shown by Fig. 4, preparatory to removing it and the minute hand B from their respective staffs. The jaws 13 have lips 15 at their lower ends as best shown by Fig. 8, for engagement with the underside of the hour hand hub which is arranged below and of slightly greater diameter than the minute hand which is mounted upon the cannon pinion staff E.

The chuck 14 is mounted within the plunger 8 and yieldably held with its tapered surface 11 against the beveled surface 10 by means of a relatively stiff coil spring 20 arranged within the plunger 8 and bearing at its lower end upon the chuck 14 and at its upper end against a ball 22 located in the upper part of the plunger 8. The ball 22 is pressed by the spring 20 against a hand lever 24 having a cam surface 26 at its under side for acting upon the ball 22.

The lower end of lever 24 has a notched portion 28 extending through the slotted upper portion 30 of plunger 8, which latter has a slot 31 in its rear portion through which the lower part of the lever 24 extends. The lower portion of the lever 24 also extends into diametrically opposed notches 34 and 36 in the upper end of the tubular member 2, which prevent the lever from rotating in a horizontal plane. The bottom of the notch 36 also constitutes a fulcrum for the lower end of the lever to rock upon when operated. A knob 37 is fixed to the upper rear end of the lever 24, so that it may be readily operated by the thumb of the hand which grasps the handle 4, leaving the other hand free to hold the watch when removing or replacing the handle A and B, or the cannon pinion C.

The plunger 8 is normally held in its lowered position by a relatively weak spring 38 which is interposed between an internal shoulder 39 in the tubular member 2 and an external shoulder 40 on the lower portion of the plunger 8, the downward movement of which is normally checked by the lower end of the lever contacting the bottom of the notches 34 and 36, as shown by Fig. 3.

Operably mounted within the large chuck 14 is a relatively small chuck 42 for removing the cannon pinion C from its staff E. The small chuck 42 has a tapered lower portion 44 normally held seated in the tapered portion 11 of the

chuck 14 by an internal coil spring 46 which is interposed between the lower end of the spring 20 and the inner tapered portion 44 of the chuck 42. The small chuck 42 is provided at its lower end with jaws 48 having lips 50 at their lower ends for gripping and lifting the cannon pinion C from its staff E, or for replacing it upon said staff. The chucks 14 and 42 are rendered resilient with slots 52 and 54, extending from their upper portions down through their respective jaws so that each set of jaws may be pressed toward each other, as will hereinafter appear.

The tool may be operated as follows: When it is desired to remove the hands of the watch the device is lowered over the hubs of the hands until the jaws 13 rest upon the dial D and the jaws 48 press upon the hub of the minute hand B, as shown by Fig. 3. The lever 24 is then swung downward to force the tubular member 2 down until base 5 bears upon the dial D as shown by Fig. 4. As the tubular member 2 moves down the lever 24 lifts plunger 8, causing the beveled surface 10 to compress the tapered portion 11 of chuck 14 until the lips 15 are forced beneath the hour hand hub and the jaws 13 firmly grip said hub. Continued downward movement of lever 24 raises the plunger 8 and the chucks 14 and 42 until the hands are removed from their respective staffs. As the plunger 8 moves up compression of the springs 20 and 46 is increased so the tapered portion 11 of chuck 14 is firmly held against the beveled portion 10 of plunger 8 and the chuck 42 is held firmly against the minute hand hub, thus holding the hands together until they are deposited in a receptacle where they are not liable to become lost while the watch is being repaired.

The foregoing operations are repeated to lift the cannon pinion C from the staff E, the only difference being that the lips 50 and jaws 48 of the small chuck 42 are forced by the jaws 13 to firmly grip the pinion C preparatory to removing it from the staff E.

If desired the small chuck 42 may be dispensed with for removing the hands, in which case the chuck 14 is used for removing and replacing the hands A and B and also the pinion C, but as the hub of the minute hand B is smaller than the hub of the hour hand the jaws 13 will not engage the smaller hub so a pin 42*a* is employed instead of the chuck 42 to firmly hold the minute hand hub against the hour hand hub during removal or replacement of the hands.

The pin 42*a* has a reduced lower portion 56 to pass between the jaws 13 of the chuck 14, and a shoulder 58 to limit its downward movement by engaging the internal tapered portion of said chuck. The pin 42*a* extends upwardly through a coil spring 46*a* and into a coil spring 20*a*, the former of which presses downward on the shoulder 58 to yieldably hold it against the tapered portion of the chuck 14.

From the foregoing description it is apparent that I have provided a watch maker's tool embodying the features above-mentioned, and while I have shown a preferred form of the invention and a modified form of a portion of the tool, I reserve all rights to such other forms and modifications thereof as properly fall within the spirit and scope of the invention as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

1. A puller comprising a tubular member, a plunger reciprocably mounted in said tubular member provided at its lower end with an orifice and an internal beveled portion, a relatively large tubular chuck movably arranged in the plunger and provided with jaws adapted to be forced toward each other by engagement with said beveled portion when the plunger is moved upward relative to the chuck and the tubular member, means for moving the plunger upward, and a relatively small chuck provided with jaws extending between the jaws of said tubular chuck and adapted to be forced thereby toward each other.

2. A puller comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided with an orifice at one end and an internal beveled portion, a relatively large chuck provided with jaws having tapered portions, means for moving the plunger relative to the chuck to press the jaws towards each other through coaction of the beveled and tapered portions, and a relatively small chuck having jaws extending between the jaws of the larger chuck and adapted to be pressed thereby toward each other.

3. A puller comprising a tubular member, a hollow plunger reciprocally mounted in said tubular member and provided with an internal beveled portion, a relatively large tubular chuck mounted within said plunger and provided with jaws, spring means pressing the chuck against the beveled portion, means for increasing the pressure of said spring means and moving the plunger relative to the chuck to cause the beveled portion to press the jaws towards each other, a relatively small chuck within the larger chuck having jaws extending between the first-mentioned jaws to be closed thereby, and spring means coacting with the first-mentioned spring means in pressing the smaller chuck toward the jaws of the larger chuck.

4. A puller comprising a tubular member, a plunger reciprocably mounted in said tubular member provided at one end with a reduced orifice and an internal beveled portion tapering toward said orifice, a relatively large tubular chuck movable in the plunger and provided with jaws, lips on the free ends of said jaws, means for moving the plunger and the chuck in opposite directions to each other to cause the beveled portion to press the jaws toward each other, and a relatively small chuck in the larger chuck provided with jaws adapted to be pressed toward each other by the first-mentioned jaws.

5. A puller comprising a tubular member, a plunger reciprocably mounted in said tubular member provided at one end with a reduced orifice and an internal beveled portion tapering toward said orifice, a relatively large tubular chuck in the plunger provided with jaws, spring means for pressing the chuck against the beveled portion, manual means for moving the plunger in a direction to cause the beveled portion to press the jaws towards each other, and a relatively small chuck in the larger chuck provided with jaws adapted to be pressed toward each other by the first-mentioned jaws.

6. A puller comprising a tubular member, a plunger reciprocably mounted in said tubular member provided at one end with a reduced orifice and an internal beveled portion tapering toward said orifice, a relatively large tubular chuck in the plunger provided with jaws adapted to be pressed toward each other by the beveled portion, spring means for pressing the chuck against the beveled portion, manual means for moving the plunger in the tubular member in a

direction to cause the beveled portion to press the jaws towards each other, and a relatively small chuck in the larger chuck provided with jaws having lips at their free ends and adapted to be pressed toward each other by the first-mentioned jaws.

7. In a device adapted to remove the cannon pinion of a timepiece from its staff, a tubular member, a plunger reciprocably mounted in said tubular member and provided with an internal beveled portion, a relatively large tubular chuck movably mounted in said plunger and provided at its lower end with jaws which project through the lower end of the plunger and have tapered portions, a relatively small tubular chuck arranged in the larger chuck provided at its lower end with jaws extending between the first-mentioned jaws, manual means for forcing the tubular member down against the timepiece and for lifting the plunger and the chucks, and spring means interposed between said manual means and the chucks to press upon the latter and thereby allow the plunger to start upward ahead of the chucks, thus causing the beveled portion and the tapered portion to coact in causing the jaws of the larger chuck to force the jaws of the smaller chuck to grip the cannon pinion preparatory to lifting the latter from its staff.

8. In a device adapted to remove the hour and minute hands of a timepiece from their respective staffs, a tubular member, a plunger reciprocably mounted in said tubular member and provided with an internal beveled portion sloping toward an orifice in its lower end, a relatively large tubular chuck movably mounted in said plunger and provided at its lower end with jaws adapted to be forced into engagement with the hour hand by said beveled portion, a relatively small chuck arranged in the larger chuck and provided at its lower end with jaws adapted to press down upon the minute hand, manual means adapted to force the tubular member down against the timepiece and lift the plunger and the chucks, and resilient means interposed between said manual means and the chucks to press down upon the latter and thus allow the plunger to start upward ahead of the chucks, thereby causing the beveled portion to effect engagement of the jaws of the larger chuck with the hour hand preparatory to lifting the same and the minute hand from their respective staffs.

9. In a puller, a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided at its lower end with a reduced orifice, a relatively large tubular chuck movable in said tubular member and provided with jaws adapted to be forced into the orifice and thereby press the jaws towards each other, manually operated means for moving the chuck towards the orifice to force the jaws into the latter, and a relatively small chuck having jaws extending between and adapted to be forced toward each other by the jaws of the larger chuck.

JOSEPH H. MEINHARDT.