Nov. 2, 1937. J. H. MEINHARDT ET AL 2,098,103

WATCHMAKER'S TOOL

Filed Jan. 2, 1936

FIG. 1.

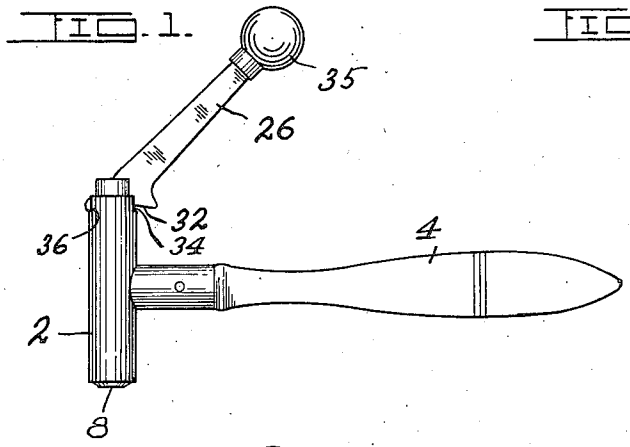


FIG. 2.

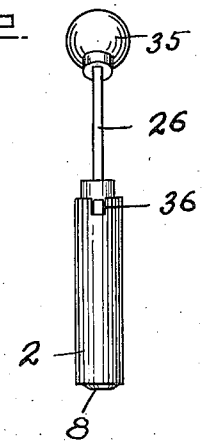


FIG. 3.

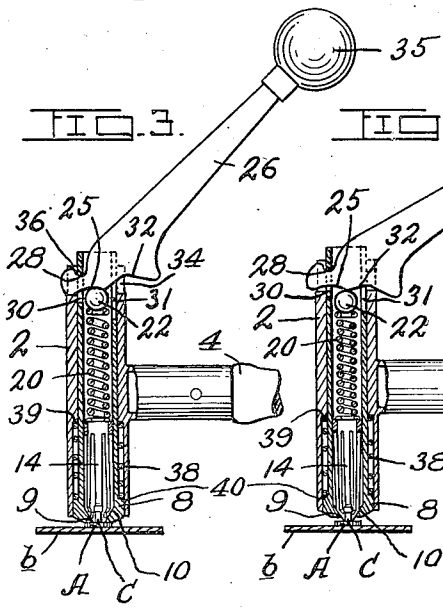


FIG. 4.

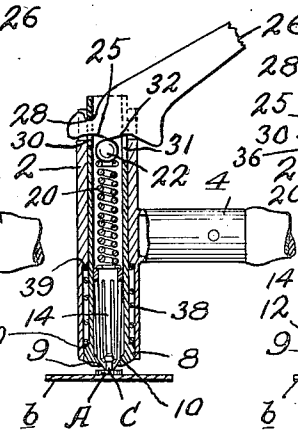


FIG. 5.

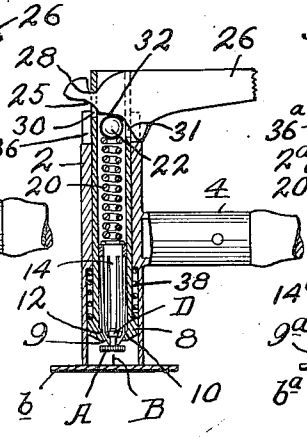


FIG. 10.

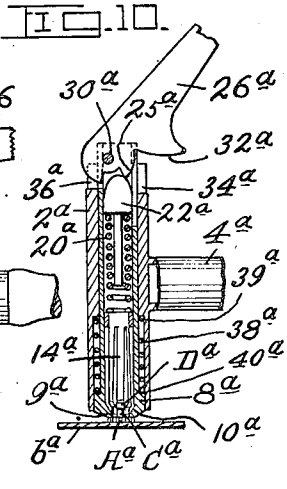


FIG. 6.

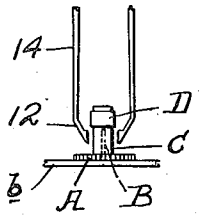


FIG. 7.

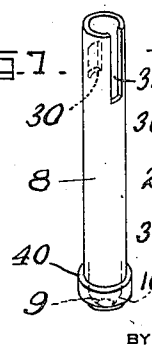


FIG. 8.

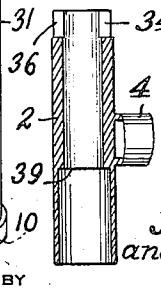
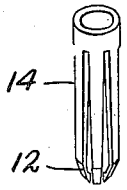


FIG. 9.



INVENTORS:
Joseph H. Meinhardt
and Samuel M. Coffman,

BY

F. G. Fischer,

ATTORNEY.

Patented Nov. 2, 1937 2,098,103

UNITED STATES PATENT OFFICE

2,098,103

WATCHMAKER'S TOOL

Joseph H. Meinhardt and Samuel M. Coffman, Kansas City, Mo.; said Coffman assignor of one-fourth to said Meinhardt

Application January 2, 1936, Serial No. 57,240

11 Claims. (Cl. 29—88.1)

Our invention relates to a watchmaker's tool designed more particularly for removing and replacing cannon pinions, and our object is to provide a device of this character which will enable a watchmaker to readily remove or replace a cannon pinion without damaging the same and which will also hold said cannon pinion after removal so that it cannot become lost while awaiting replacement in the watch.

A further object is to provide a simple and inexpensive device of this character which is well adapted for the purpose intended, 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 for removing a cannon pinion.

Fig. 4 shows the tool gripping the cannon pinion preparatory to removing it from its stub shaft.

Fig. 5 shows the position of the parts after removing the cannon pinion from its stub shaft.

Fig. 6 is an enlarged broken detail view of two jaws of a chuck which operates in a plunger forming part of the invention.

Fig. 7 is an enlarged detail view of the plunger.

Fig. 8 is an enlarged sectional view of a tubular member in which the plunger operates.

Fig. 9 is an enlarged view of the chuck.

Fig. 10 is a broken detail sectional view of a modified form of the device.

Referring in detail to the different parts, 2 designates a tubular member provided intermediate its ends with a handle 4.

8 designates a hollow plunger provided at its lower end with a reduced orifice 9 adapted to pass over the hub C of the cannon pinion A and an enlargement D on the upper portion of said hub. The plunger 8 is reciprocably mounted in the tubular member 2 and provided with means for causing the resilient jaws 12 at the lower end of a tubular chuck 14 to grip the hub C preparatory to removing the cannon pinion A from the stub shaft B. An example of said means is illustrated by the internally beveled surface 10 at the lower part of the plunger 8. The jaws 12 are tapered for engagement with the beveled surface 10 and the underside of the enlargement D on the upper portion of the hub C.

The chuck 14 is reciprocably mounted within the plunger 8 and yieldably held against the beveled surface 10 by means of a 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 operably located in the upper portion of the plunger 8.

The ball 22 is held by the spring 20 against the underside of a lever 26 having a recessed forward portion 25 and a concave cam 32 to cooperate with the ball 22, as will hereinafter appear. The lever 26 is provided with a notched portion 28 operably mounted in a slot 30 in the upper forward portion of the plunger 8 which latter has a slot 31 in its rear portion through which the forward part of the lever 26 extends. The concave cam 32 projects into a notch 34 in the upper rear portion of the tubular member 2, which also has a notch 36 diametrically opposite the notch 34 for reception of the forward end of the lever 26 which limits the downward movement of the plunger 8 by contacting the bottom of said notch 34, as shown by Fig. 3. The lever 26 is provided at its rear end with a knob 35, so that it may be readily operated by the thumb of the hand which grasps the handle 4. The plunger 8 is yieldably held in lowered position, Figs. 2 to 4, inclusive, by a spring 38 which is much weaker than the spring 20 and interposed between an internal shoulder 39, in the tubular member 2, and an external shoulder 40 on the lower portion of the plunger 8.

In practice, when it is desired to remove the cannon pin A from its stub shaft B the device is lowered until the plunger 8 passes over the hub C and rests upon the cannon pinion A, as shown by Fig. 3. The lever 26 is then swung downwardly to the position shown by Fig. 4, causing the cam 32 to depress the ball 22 which in turn compresses the spring 20, causing it to depress the chuck 14 until the tapered jaws 12 are firmly closed by the beveled inner surface 10 of the plunger 8 around the hub C. Continued downward movement of the lever 26 causes the cam 32 to press against the lower end of the notch 34 and force the tubular member 2 down against the action of spring 38 until the lower end of said tubular member 2 passes over the pinion A and rests upon the watch plate b while the forward end of the lever 26 lifts the plunger 8 with the chuck 14 which loosens and lifts the cannon pinion A from its stub shaft B, Fig. 5. The tool still grasping the cannon pinion A is then removed from the watch and the lever 26 is permitted to swing upward slowly to the position shown by Fig. 4, where it is checked by its forward end contacting the bottom of the notch 36 in the tubular member 2. The spring 20 remains under

sufficient pressure to cause the chuck **14** to continue to hold the cannon pinion A until the latter is replaced upon the stub shaft B, whereupon the protruding ends of the jaws **12** are pressed down against the cannon pinion A until they are forced inwardly from the orifice **9** far enough to permit them to expand and release the hub C, so that the tool can be removed without removing the cannon pinion A therewith. While we have stated that the tool holds the cannon pinion A after the same has been lifted from the stub shaft B, it is to be understood that the jaws **12** may be forced to release the cannon pinion by rocking the lever **26** upwardly on the bottom of the notch **36** until the pressure of the spring **29** on the chuck **14** has been relieved sufficiently to let the jaws **12** expand to the position shown by Figs. 3 and 6.

The modified form of device shown by Fig. 10 is somewhat similar in construction and operation to the form above described as is evidenced by corresponding reference numerals with exponents *a*, the exceptions being that a presser element **22***a* is substituted for the ball **22**, the lever **26***a* is fulcrumed upon a pin **30***a* instead of in the slot **30** and has convex cams **25***a* and **32***a*, instead of the recess **25** and the cam **32**.

From the foregoing description it is apparent that we have provided a watchmaker's tool whereby cannon pinions may be removed or replaced in watches without danger of damaging or losing said cannon pinions, and while we have shown and described two embodiments of the invention we 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 our invention, what we claim and desire to secure by Letters Patent, is:

1. A device of the character described comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided with an internally beveled portion, a chuck reciprocably mounted within said plunger and provided with resilient jaws adapted to be closed when forced to slide upon said beveled portion, a spring adapted when compressed sufficiently to exert enough pressure on said chuck to slide the jaws upon the beveled portion, and means for compressing said spring.

2. A device of the character described comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided with an internally beveled portion, a chuck reciprocably mounted within said plunger and provided with resilient jaws adapted to be closed when forced to slide upon said beveled portion, a spring adapted when compressed beyond normal to depress said chuck and thereby slide the jaws upon the beveled portion, a ball resting upon said spring, and manually operated means for forcing said ball to compress the spring beyond normal.

3. A device of the character described comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided with an internally beveled portion, a chuck reciprocably mounted within said plunger and provided with resilient jaws adapted to be closed when forced to slide upon said beveled portion, a spring adapted when compressed beyond normal to depress said chuck and thereby slide the jaws upon the beveled portion, an element resting upon said spring, and a lever adapted to force said element to compress the spring beyond normal and also move the plunger in one direction and the tubular member in the opposite direction.

4. A device of the character described comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided with an internally beveled portion, a chuck reciprocably mounted within said plunger and provided with self-opening jaws adapted to be closed when forced to slide upon said beveled portion, a spring adapted when compressed beyond normal to depress said chuck and thus slide the jaws upon the beveled portion, a ball resting upon said spring, a lever adapted to force said ball to compress the spring beyond normal and also move the tubular member in one direction, and cam means on said lever for moving the plunger in the opposite direction from that in which the tubular member is moved.

5. A device of the character described comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided with an internally beveled portion, a chuck reciprocably mounted within said plunger and provided with resilient jaws adapted to be closed when forced to slide upon said beveled portion, a spring adapted when compresed beyond normal to depress said chuck and thus slide the jaws upon the beveled portion, a ball resting upon said spring, a lever adapted to force said ball to compress the spring beyond normal and thus force the jaws to slide upon the beveled portion, said lever also being adapted to move the plunger in one direction and the tubular member in the opposite direction, and means for restoring the tubular member and the plunger to normal position.

6. A device of the character described comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided at one end with an orifice and means for directing the jaws of a chuck to said orifice, a chuck reciprocably mounted in said plunger and provided with tapered jaws adapted to pass part way through said orifice and be closed by the surrounding wall of the latter, and mechanism for forcing the chuck towards the orifice until the jaws protrude from and are closed by the surrounding wall of the orifice.

7. A device of the character described comprising a tubular member, a hollow plunger reciprocably mounted in said tubular member and provided with means for closing the jaws of a chuck, a chuck reciprocably mounted within said plunger and provided with self-opening jaws adapted to be closed when forced to slide upon said jaw-closing means, coacting means for forcing said chuck in a direction to slide the jaws upon the jaw-closing means, and also move the plunger in one direction and the tubular member in the opposite direction, an external shoulder on the plunger, an internal shoulder on the tubular member, and a coil spring interposed between said shoulders and adapted to restore the plunger and the tubular member to normal position.

8. A device of the character described comprising a tubular member, a plunger reciprocably mounted in said tubular member and provided with a reduced orifice, a chuck operably-mounted in said plunger having jaws adapted to enter said orifice and be forced by the surounding wall thereof toward each other to grip an object, a lever fulcrumed in the plunger, and means interposed between the chuck and said lever and adapted to coact with the latter in forcing the chuck towards the orifice.

9. A device of the character described comprising a tubular member, a handle projecting from said tubular member, a plunger reciprocably mounted in said tubular member and provided with a reduced orifice, a chuck operably-mounted in said plunger having resilient tapered jaws adapted to enter said orifice and be forced by the surrounding wall thereof toward each other to grip an object, a lever fulcrumed in the plunger and projecting over the handle, and means interposed between the chuck and said lever and adapted to coact with the latter in forcing the chuck towards the orifice.

10. A device adapted to release cannon pinions from their stub shafts in watches comprising a chuck having jaws adapted to grip a cannon pinion, a plunger adapted to rest on the pinion and provided with means adapted to force the jaws to grip the pinion, a tubular member adapted to receive the pinion and in which said plunger is reciprocably mounted, and means adapted to force said tubular member down against the watch and lift the plunger and the chuck until the pinion is released from the stub shaft.

11. A device adapted to release cannon pinions from their stub shafts in watches comprising a chuck having jaws adapted to grip a cannon pinion, a plunger adapted to rest on the pinion and provided with means adapted to force the jaws to grip the pinion, a tubular member adapted to receive the pinion and in which said plunger is reciprocably mounted, a lever fulcrumed in the plunger and provided with cam means, means interposed between the chuck and said cam means adapted to coact with the latter in forcing the tubular member against the watch and the plunger with the chuck away from the watch until the pinion is released from the stub shaft, and a handle projecting from the tubular member.

JOSEPH H. MEINHARDT.
SAMUEL M. COFFMAN.