

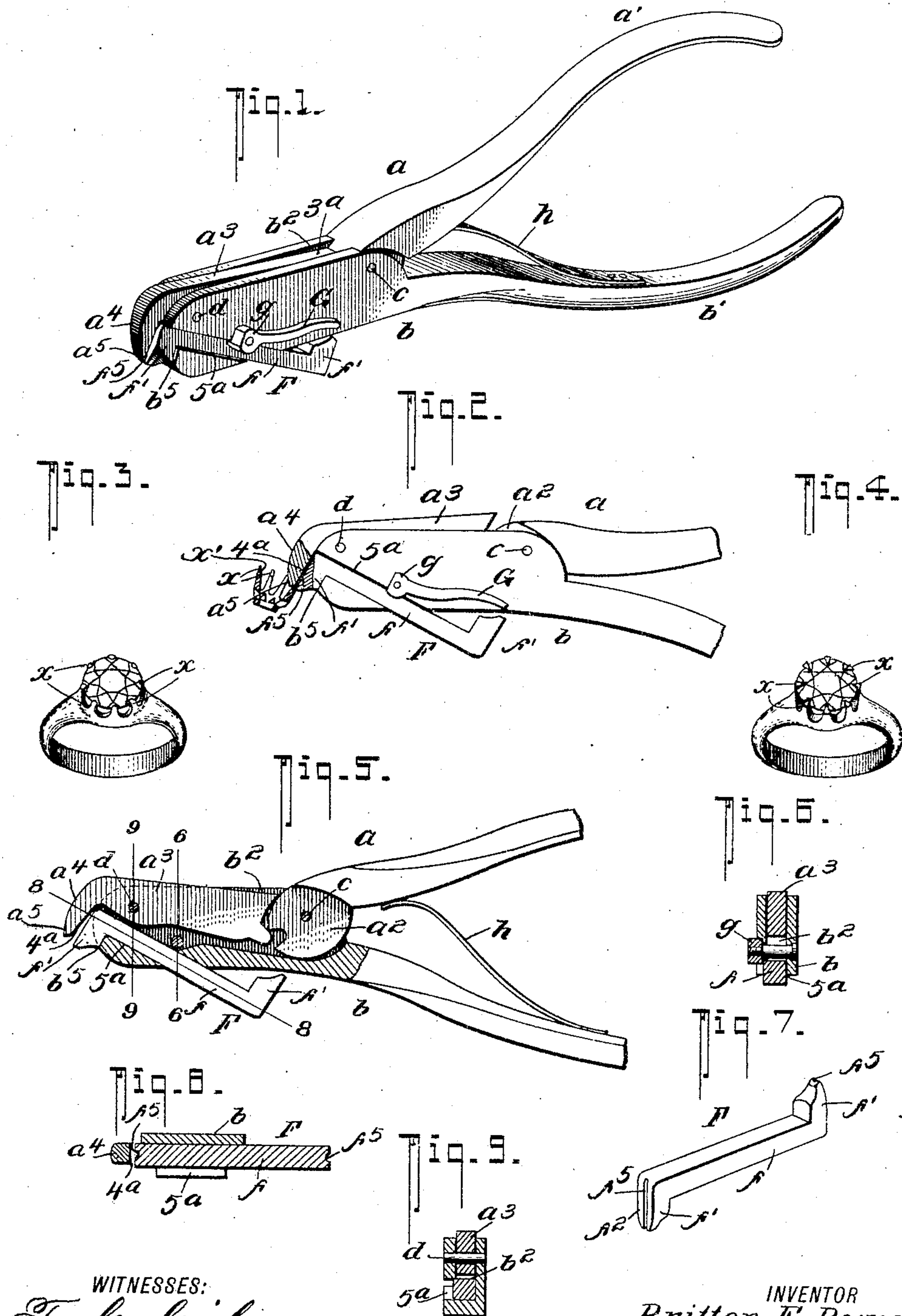
No. 786,189.

PATENTED MAR. 28, 1905.

B. E. BYRD.

WATCHMAKER'S AND JEWELER'S PLIERS.

APPLICATION FILED JUNE 22, 1904.



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## WATCHMAKER'S AND JEWELER'S PLIERS.

SPECIFICATION forming part of Letters Patent No. 786,189, dated March 28, 1905.

Application filed June 22, 1904. Serial No. 213,626.

*To all whom it may concern:*

Be it known that I, BRITTON E. BYRD, residing at Durham, in the county of Durham and State of North Carolina, have invented a new and Improved Watchmaker's and Jeweler's Pliers, of which the following is a specification.

My invention, which is in the nature of an improved tool or implement for jewelers' use, more especially seeks to provide a new and improved construction of pliers which, while generally useful as a watchmakers' and jewelers' pliers, is more particularly designed for forming the notches or shoulders on the prongs or fingers of the cages or holding-frames used in setting diamonds or other precious stones.

My invention in its generic nature comprehends a pair of pivoted plier-legs, one of which has a fixed gripping member or jaw, the other of which has a removable and adjustable anvil or gripping-jaw that opposes the aforesaid gripping member, the several jaws having such coöperative connection whereby in operation the finger or extension members of the cage or jewel-holding frame can be quickly and accurately shaped with the required shoulder or offset to form the seat for the stone or other precious jewel member held in the said cage or frame and to form the ends of the said fingers or prongs in such a manner that they can be easily bent up over the edges of the diamond or other jewel in a manner to firmly and positively secure the said stone or jewel in the cage.

In its more subordinate features my invention embodies an improved construction of jewelers' pliers, the distinguishing characteristics of which will be hereinafter fully described and claimed, and also illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of my improved jewelers' tool. Fig. 2 is a side elevation thereof, parts being in section and showing the manner in which my improvement is used for making an offset or seat in the jewel-setting. Fig. 3 illustrates a worn cage or frame of the ordinary jewel-setting. Fig. 4 shows the said worn cage or frame after it

has been fixed by my improved tool and after the setting has been secured therein. Fig. 5 is a longitudinal section of the pivoted jaws. Fig. 6 is a cross-section thereof on the line 6 6 of Fig. 5. Fig. 7 is a detail view of the detachable, reversible, and adjustable anvil or lower gripping-jaw. Fig. 8 is a detail cross-section of the upper or face jaw and the opposing anvil or lower jaw, taken on the line 8 8 of Fig. 5. Fig. 9 is a detail cross-section on the line 9 9 of Fig. 2.

In the practical construction of my improved jeweler's tool or pliers the same comprises the two legs  $a$  and  $b$ , which are suitably curved in opposite directions, as indicated by  $a'$   $b'$ , and similar to that of the curvature of the ordinary form of pliers. One of the legs or jaws, herein termed the "lower" jaw  $b$ , at its forward end is bifurcated, whereby to form a longitudinally-extended socket  $b^2$ , and in this socket is pivoted the cam-head  $a^2$  of the upper jaw or leg  $a$ , and in which also operates the gripping member  $a^3$  which forms a coöperative part of the upper jaw of my improved tool. The cam-head  $a^2$  is fulcrumed on the cross-pin  $c$ , located in the rear end of the bifurcated portion of the lower jaw  $b$ , while the gripping member is fulcrumed on the cross-pin  $d$ , located in the front end of the said bifurcated portion or socket  $b^2$  of the lower jaw  $b$ , as best shown in Fig. 5.

The gripper member (designated  $a^3$ ) comprises a longitudinally and rearwardly extending arm  $3^a$ , that is shaped to ride freely in the vertical plane within the socket  $b^2$ , and this rear end is cut on an angle or bevel to coact with the cam-head  $a^2$  of the member  $a$ . The gripper member  $a^3$  also includes a claw  $a^4$ , whose gripping-face  $4^a$  is disposed tangentially to the pivot or fulcrum pin  $d$ , preferably at an angle of forty-five degrees to a line drawn to the longitudinal plane of the pivots  $c$  and  $d$ , and the said claw  $a^4$  is disposed in advance of the front end of the grip portion of the member  $b$  and to coact with the opposing gripping member, which is in the nature of an anvil.

The extreme end of the claw  $a^4$  is bent up



at an angle obtuse to the gripping-faces of the said claw, whereby to form a swaging edge or shoulder  $a^5$ , the purpose of which will presently appear. The anvil or lower gripping member (designated F) consists of a flat shank  $f$ , which is adapted to seat in the rectangular socket  $5^a$ , formed in the outer face of the socketed end of the lower leg or jaw  $b$ , and which is disposed at an angle tangent to the pivot-pin  $d$  and extends downwardly and rearwardly from the front edge of the jaw  $b$  down through the bottom edge of the socketed end of the jaw or member  $b$ , as shown. In the practical application of my invention a number of the detachable anvil members F are provided, which form the gripping or claw portions adapted to suit the work for which it may be desired to use my improved implement.

In the drawings the gripping or anvil faces have U-shaped grooves  $f^5$ , that extend longitudinally of the faces and are smooth, whereby to snugly fit over the back edge of the fingers or prongs of the jewel-holding cage or frame and to permit of shaping the inner faces of the said fingers or prongs without materially changing the outer or back side of the said cage fingers or prongs. The gripping-surface of the upper claw is preferably rough, so as to effect a firm bite on the material to be formed to receive the stone or other setting.

By now referring to Fig. 1 it will be noticed that when the parts are in normal position the opposing gripping-faces of the upper and lower claws are not in parallel alinement, but that the said faces have a V-shaped relation. This correlation of the parts just referred to permits the upper claw when the two legs or jaws  $a$  and  $b$  are closed to creep forward with respect to the lower or anvil claw, whereby to permit the shouldered end of the upper claw swaging or crowding against the metal to upset the same and produce a shoulder or offset  $a'$  of the prong-tips  $a$ , (see Fig. 2,) while the outer end of the prong tip or finger of the cage is being drawn out and flattened into a desired shape to permit of freely bending the said flattened end to clip over the jewel to secure the same upon the seat or shoulder in the cage or frame formed in the manner just described.

For fitting the claws of the cage or frame, such as used for diamond-settings, my implement has been found especially useful, since the fingers of the cage can be almost in an instant properly shaped to receive the jewel. Furthermore, for repair-work—that is, where the cage or frame fingers have been worn or broken off, and in consequence one or more fingers are shorter than the others—the shorter fingers can be readily drawn out or flattened by the use of my implement in the manner shown in Fig. 2 to mash or squeeze the said finger tips or prongs between the jaw  $a^4$  and the anvil

$f'$  until the said prong is of the same length as the remaining ones.

The part F has an anvil or gripping-claw  $f'$  at each end, the gripping-faces  $f^2$  of which are disposed at right angles to the shank  $f$ , and the said faces  $f^2$  are suitably shaped to receive the prongs or teeth of the cage or frame of the jewel-setting.

The member F, which can be readily used reversibly, is secured in the socket  $5^a$  by any suitable means, preferably by the locking-lever G, pivoted on the front face of the socketed end of the part  $b$  and having a cam-head  $g$  arranged when the parts are adjusted as shown in Fig. 2 to project over the shank  $f$  and hold the same from moving laterally out of the socket  $5^a$ , and to hold the anvil or member F from moving endwise out of the said socket  $5^a$  it has portions at the opposite ends of the shank F that are so extended as to engage the abutment  $b^5$  on the lower jaw  $b$ . The two jaws or legs  $a$  and  $b$  are normally spread by a spring  $h$ , as shown.

For setting a diamond or other precious stone it is only necessary to slip the jaws over the finger the desired distance, and then by giving pressure to the handle the shoulder is formed on the inside of the fingers by the short angular shoulder on the upper jaw, while the anvil or lower jaw forms a suitable means, together with the upper jaw, for pressing out the extremity of the fingers or prong end sufficient to extend it, as well as shape it, so it can be readily bent or clipped over the edge of the stone in the usual manner.

While I have shown and described my improved implement as especially useful for setting diamonds and other precious stones and for repairing worn settings to bring the cage or frame members into a proper shape to make a new and firm setting, my invention is not limited to such use, since the same may be used for other purposes—such, for example, for bending catch-cases that have become so worn as to require tightening to make them hold their seat.

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

1. In an implement of the character described, the combination with the plier-legs  $a$  and  $b$  the leg  $b$  having a forward extension, the leg  $a$  being pivotally connected to the leg  $b$  and having a cam-head at its pivoted point, and an anvil or lower jaw detachably and adjustably mounted on the forward extension of the leg  $b$  and projected beyond the front end of the said extension; of an upper jaw pivotally mounted in the extension of the leg  $b$ , the said upper jaw having a gripping-face for opposing the gripping-face of the anvil and having a rearwardly-extending member that coöperatively engages the cam-head of the leg  $a$ , and a means for holding the detachable



and adjustable lower jaw in position, as set forth.

2. A jeweler's pliers which comprises the legs *a* and *b*, the lower one *b* having a forward extension provided with a longitudinal socket, the upper leg having a cam-head that fits in and is pivotally mounted in the rear end of the aforesaid socket, an anvil having a gripping-surface at each end detachably and reversibly mounted on one side of the extension of the lower leg and projected beyond the front end thereof, and an upper jaw pivotally mounted in the socket of the lower leg *b* and having a gripping portion for opposing the gripping-face of the lower gripping-jaw or anvil.

3. An implement of the character described comprising a pair of plier-legs *a* and *b*, a lower jaw on the leg *b* having a flat gripping-face disposed at an angle to the front end of the leg *b* and in close proximity thereto, an upper jaw that extends in the longitudinal plane of the legs *a* and *b* and is pivotally mounted on the front end of the lower leg *b*, and toggle connections that join the rear end of the lower jaw and the upper leg and arranged whereby when the upper leg *a* is closed in the said upper jaw is moved to its gripping position, said upper jaw also having a flat gripping-face disposed at an outwardly-extending angle and projected over the angle-face of the lower jaw, as specified.

4. In combination with the plier-legs *a* and *b*, the leg *b* having a forward extension provided with a longitudinal socket in the upper end, the leg *a* being pivotally mounted in the rear end of the said socket and having a cam-head at its fulcrum-point, a supplemental jaw pivotally mounted on the front end of the said extension and in the socket thereof and having movement in the longitudinal plane of the said socket, the said jaw having a gripping member that projects down at an angle of about forty-five degrees the outer extremity of said gripping member being inclined up-

wardly at an angle to the gripping-face to form a swaging-shoulder, the extension of the leg *b* having an inclined socket that extends downwardly from the front edge to the bottom edge thereof; a supplemental double-ended jaw or anvil adapted to be reversibly and detachably mounted in the said socket, the ends of the said anvil having gripping-faces at an angle to the body thereof, said gripping-faces being grooved longitudinally, and a means for locking the said anvil in the socket from lateral endwise movement, as set forth.

5. An implement of the character described, the combination with the legs *a* and *b*, a fixedly-held gripping-jaw on the lower leg having its face at an angle to the front end of the said leg, an upper jaw pivotally mounted on the lower leg *b* and having a gripping member projected at an angle and opposing the gripping-surface of the lower jaw, said gripping member having its front edge inclined upwardly at an angle to its gripping-surface to form a shoulder, and a means for imparting a gripping motion to the upper jaw as the two legs are closed.

6. In an implement of the character described, the combination with the plier-legs *a* and *b*, the leg *b* having a forwardly-extending member, an upper gripping-jaw pivotally mounted on said extended member to rock in the longitudinal plane thereof, and connections that join the said supplemental jaw with the upper leg *a*, and a lower jaw which consists of a double-ended anvil having a gripping-face at each end at right angles to the body thereof, and a means for adjustably and reversibly mounting said lower jaw on the front end of the leg *b* to alternately bring the gripping end of the said jaw to oppose the gripping-face of the upper jaw, as set forth.

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Witnesses:

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