

(No Model.)

G. B. FARRELL.  
WATCHMAKER'S CALIPERS.

No. 528,535.

Patented Nov. 6, 1894.

Fig. 1.

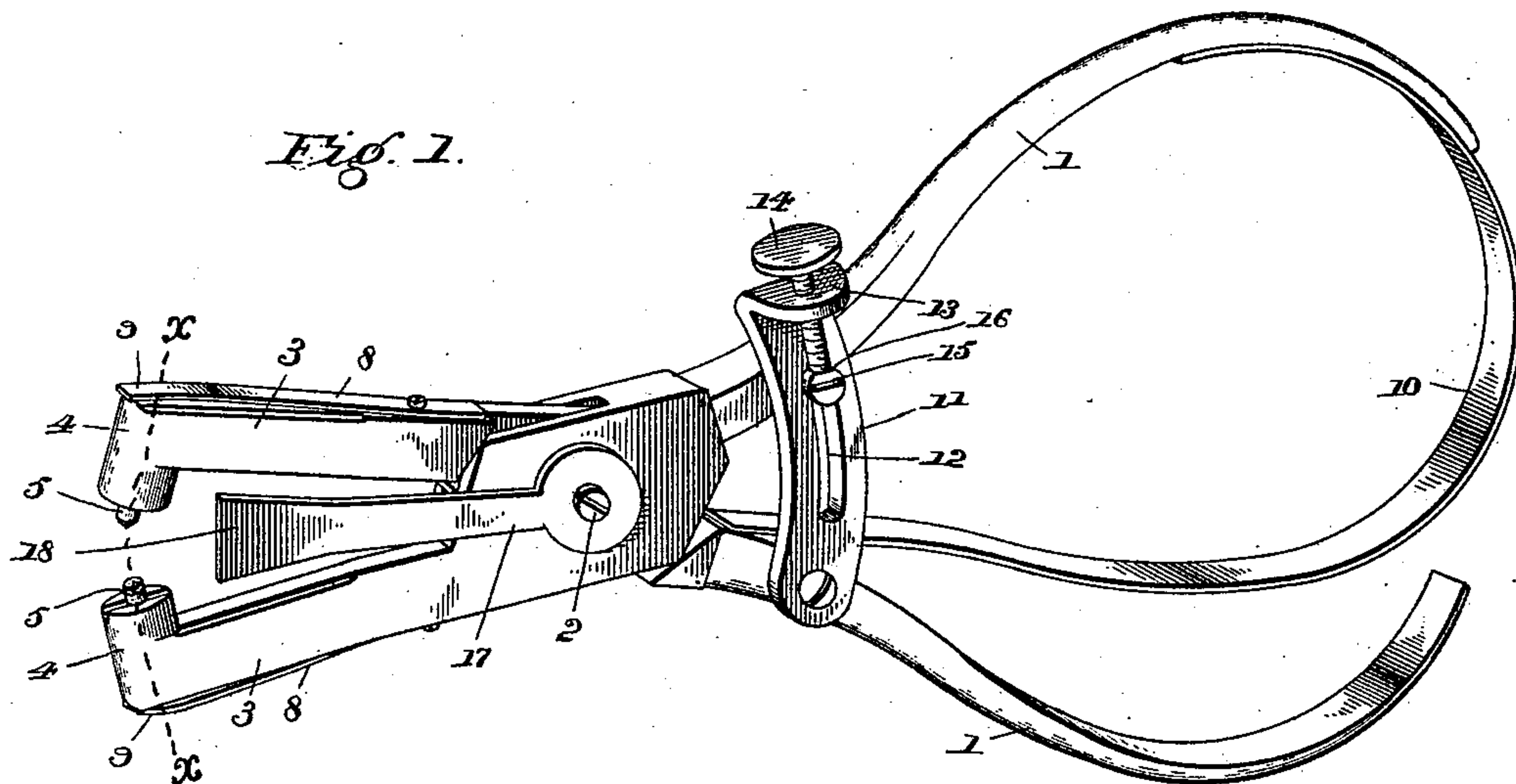


Fig. 2.

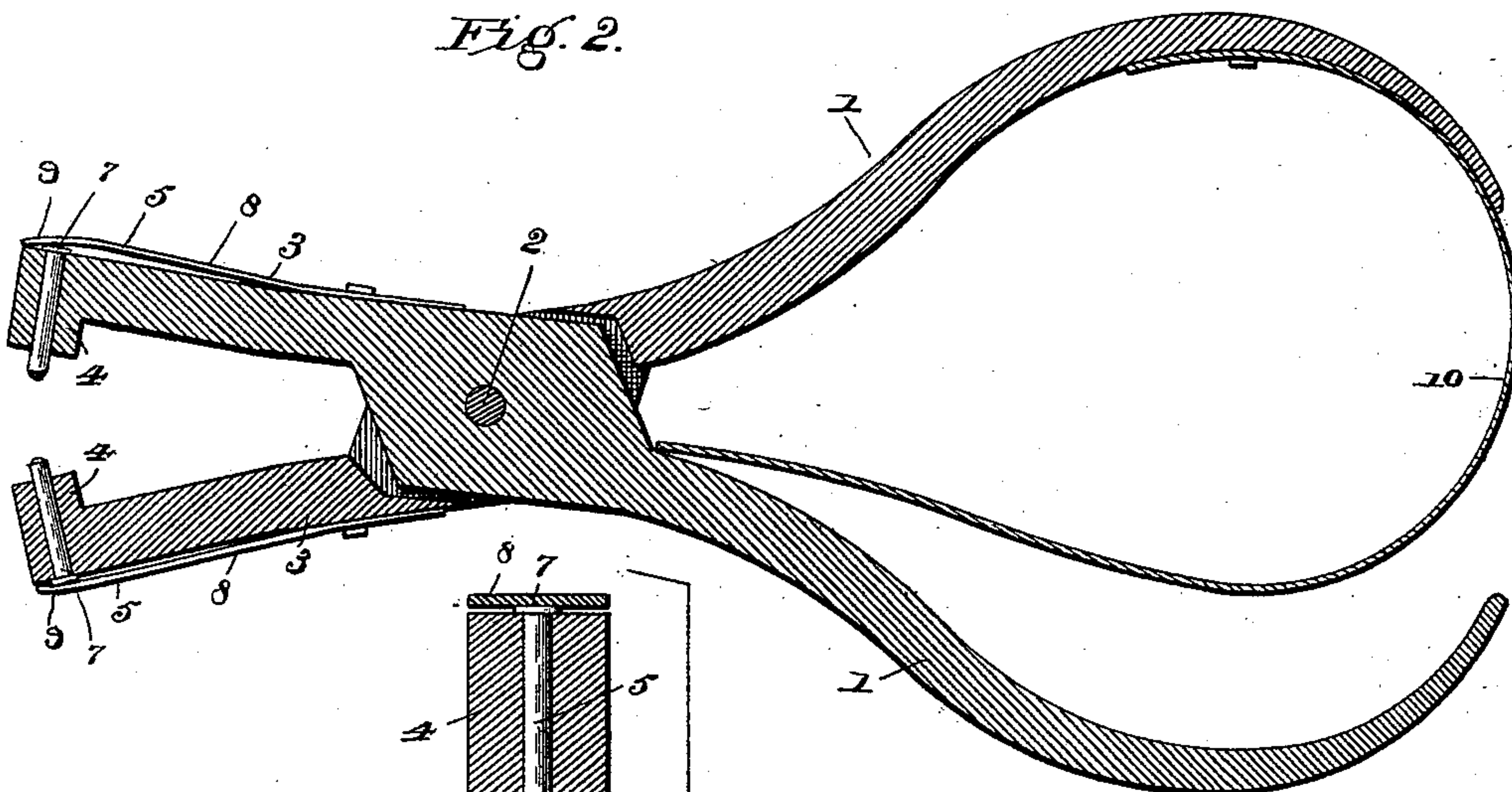
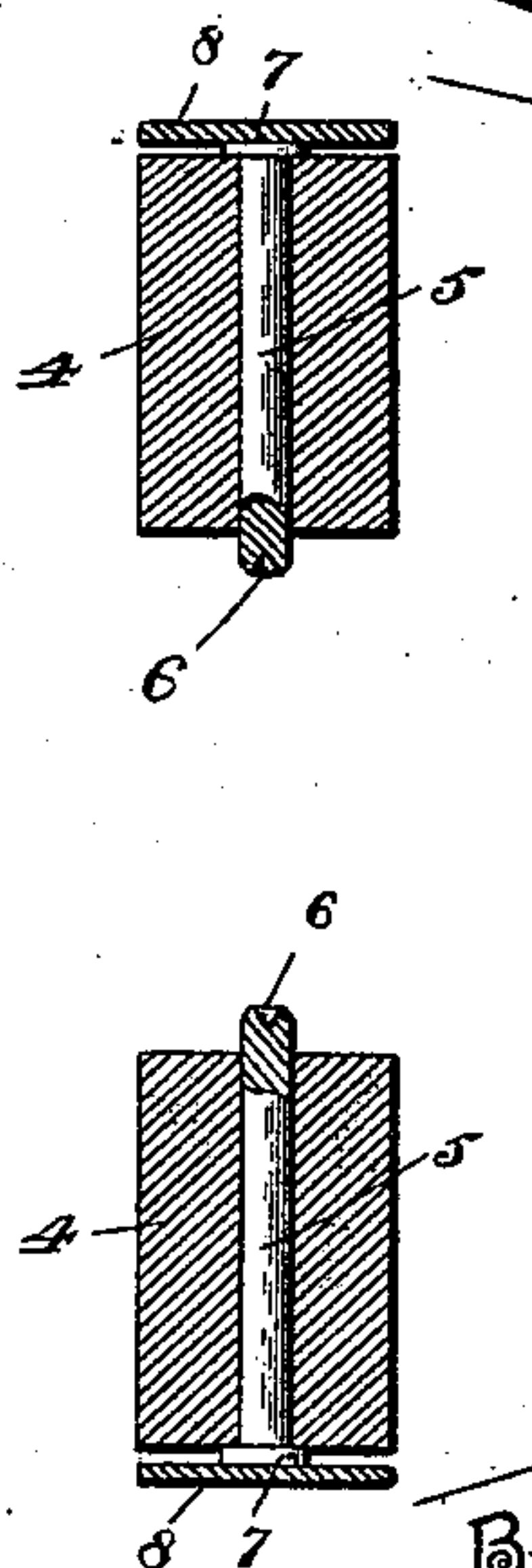


Fig. 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE B. FARRELL, OF EAST LAS VEGAS, TERRITORY OF NEW MEXICO.

## WATCHMAKER'S CALIPERS.

SPECIFICATION forming part of Letters Patent No. 528,535, dated November 6, 1894.

Application filed April 15, 1893. Serial No. 470,507. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. FARRELL, a citizen of the United States, residing at East Las Vegas, in the county of San Miguel and Territory of New Mexico, have invented a new and useful Combined Calipers and Pliers, of which the following is a specification.

This invention relates to an improved tool for watch-makers' use, comprising a combined calipers and balance-wheel truing pliers, and has for its object to provide a convenient and practical combination of implements of this character for holding a balance-wheel loosely or with slight friction on its pivot while truing or training the wheel, the said tools being also adapted to be quickly changed so as to grasp the arm of the wheel firmly in order to bend the arms and true the wheel entire, the construction being materially simplified and the cost of manufacture reduced.

With these and other objects in view the invention consists of the construction and arrangement of the parts thereof, as will be hereinafter more fully described and claimed.

In the drawings: Figure 1 is a perspective view of the improved implement. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a transverse vertical section on the line  $x-x$ , Fig. 1, on an enlarged scale.

Similar numerals of reference indicate corresponding parts in the several figures of the drawings.

Referring to the drawings, the numeral 1 designates the handles, which have a pivotal connection, as at 2, in a well-known manner, and beyond the said pivotal connection and continuous of the said handles are jaws 3, having their front ends spread apart divergently to a slight degree and provided with inwardly projecting posts 4, within which are removably mounted, in a loose manner, punches 5. The punches 5 extend through and through the post 4, and the inner opposing ends thereof are constructed with cavities 6, while their outer ends have flanged heads 7 to prevent the said punches from being forced entirely through the said posts. The said punches are held yieldingly within the posts by spring-arms 8, pivotally connected to the rear part of the jaws and having their outer ends slightly bent or arched, as at 9, to take over and bear against the

flanged heads of the said punches. Between the handles 1 is mounted a bowed spring 10, that has one of its ends secured to one of said handles and the opposite end loosely engages a point between the said handles at or about the pivotal or fulcrum point of the same.

The implement is provided with an adjusting gage which consists of a segmental plate 11, that has its lower end secured to one of the handles and its upper part slotted, as at 12, with its upper end turned outwardly at a right angle to provide a flange to form a bearing or seat 13, having a screw-opening therein that adjustably receives a set-screw 14. Upon the handle 1, opposite to that to which the lower end of the gage-plate is secured, is rigidly fastened a headed stud 15, that extends through the slot in the said plate and has the flange of the head thereof bear against the outside of the plate adjacent to the slot of the same. The upper part of the head of the said stud is cut away to form a straight shoulder or bearing-surface 16, that contacts with the lower end of the screw 14, and by means of this construction the implement may be gaged in such manner as to hold the wheel therein and permit it to turn easy, but at the same time prevent it from dropping out and also the adjustable feature of said gage provides for engagement with any length of staff.

On the side of the implement in advance of the gage heretofore set forth is a truing gage consisting of an elongated arm having its rear end pivotally secured adjacent to the pivotal or fulcrum point of the jaws, and its forward end extended adjacent to the posts on the outer ends of the jaws. The said arm 17 has its front end broadened or extended in width, as at 18, to project over a greater extent of space when the jaws are open and holding a wheel in order to insure a thorough engagement with the wheel by the said broadened end of the arm in order to hold the said wheel in true position during the operation of truing and also serve as a test for the said wheel.

The implement can be easily adjusted to fit any length of staff, and the wheel can be set in place with very little trouble and without removing the roller table or hair-spring,



if so desired. If the wheel is not true it is best in all cases to remove the roller table or hair-spring in order to get a tight or better grip on the center of the arm with the pliers, which  
5 enables the arm to be sprung to its proper place, and it can be tried as often as necessary without changing tools. The work of truing a balance-wheel can all be accomplished by means of the device herein set  
10 forth without any change of the wheel. By the employment of the construction set forth it will be seen that the pivots always sit in cones and are at a perfect center. The springs are light, and the pressure being equally divided and bearing directly on the ends there  
15 is no possible chance of bending the pivots.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or  
20 sacrificing any of the advantages of this invention.

Having described the invention, what is claimed as new is—

The combination with a tool having pivoted jaws and provided with handles, a segmental plate secured at one end to one of the handles and having intermediate of its ends a longitudinal slot, and provided at its other end with an outwardly extending flange or seat 13 arranged at right angles to the body  
25 of the plate and provided with a threaded opening, a headed stud projecting outward from the other handle and arranged in the slot of the plate, and a set screw mounted in the threaded opening of the flange or seat  
30 13 and arranged to engage the head of said stud, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in  
35 the presence of two witnesses.

GEORGE B. FARRELL.

Witnesses:

J. H. OVERHULS,  
J. F. WILLIAMS.