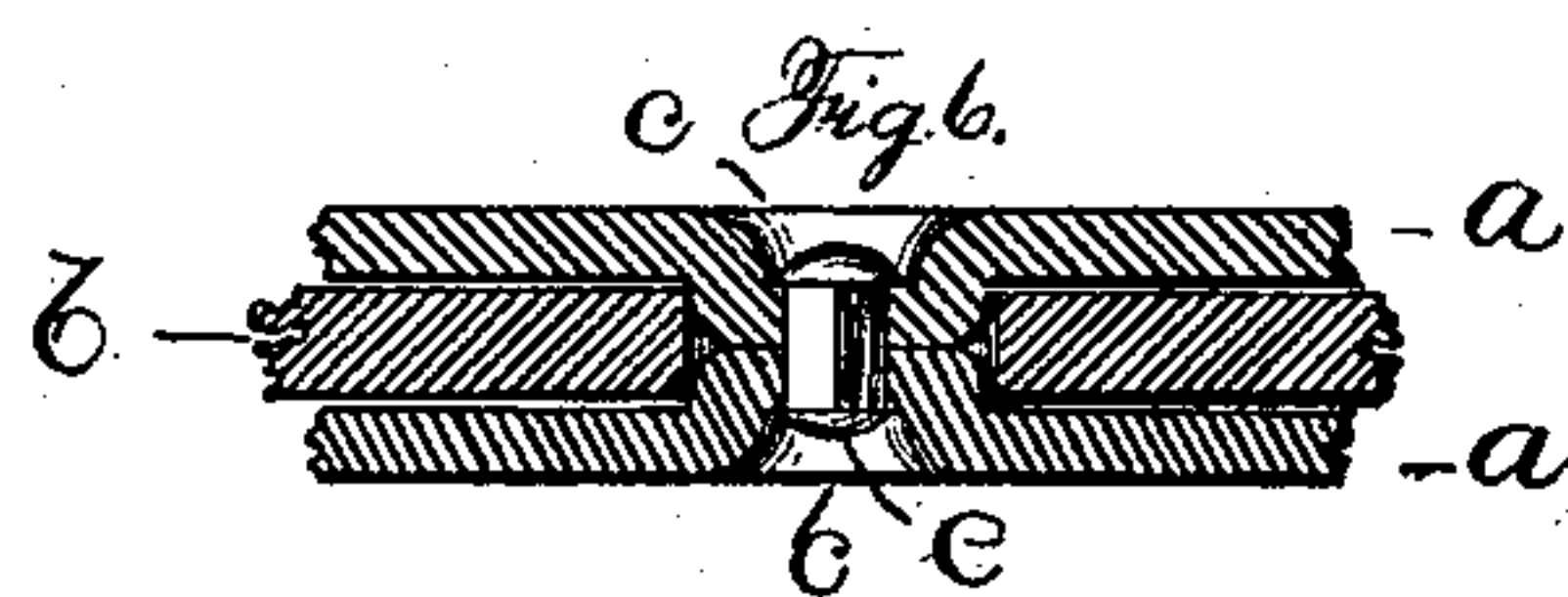
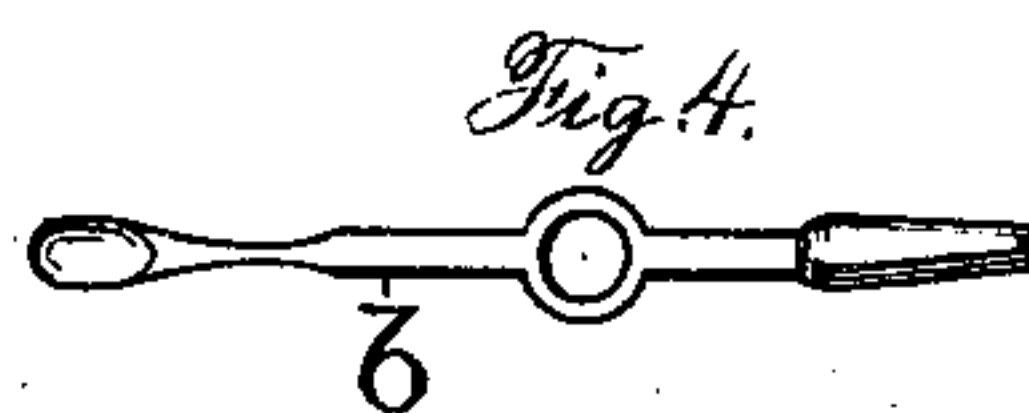
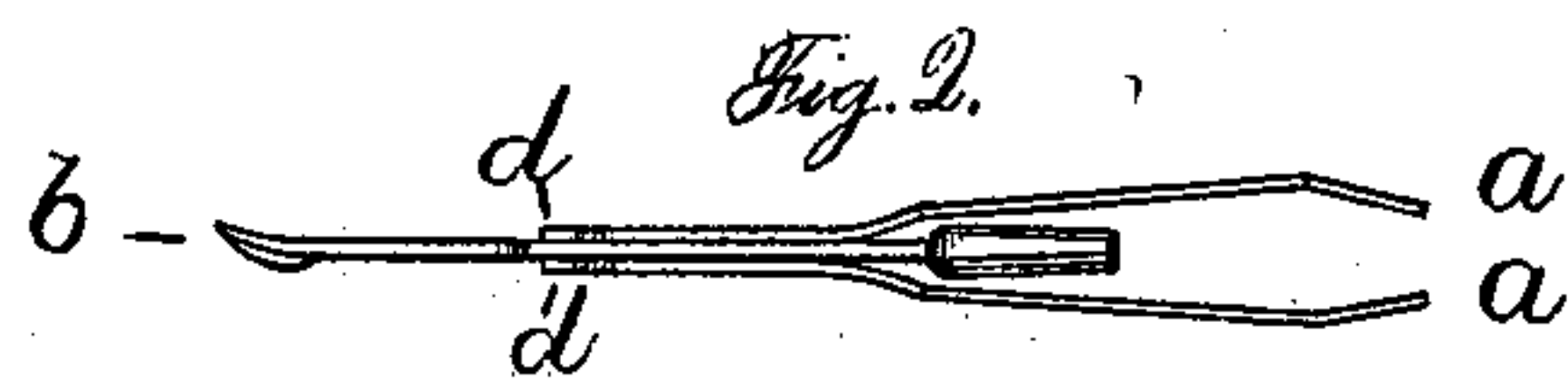
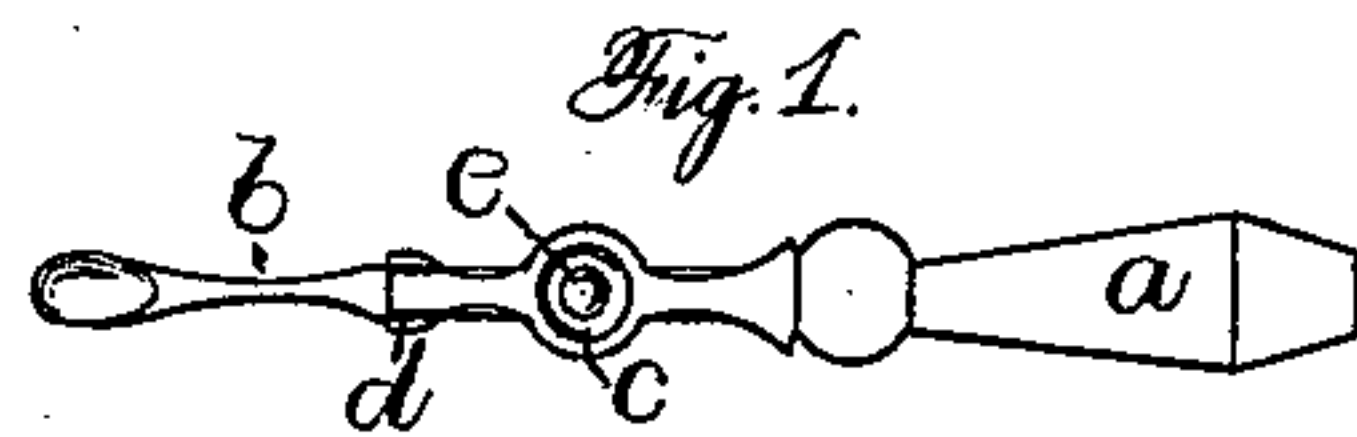


F. L. ELLIS.  
Spring-Tweezers.

No. 227,680.

Patented May 18, 1880.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

FREDERICK L. ELLIS, OF MILLDALE, CONNECTICUT.

## SPRING-TWEEZERS.

SPECIFICATION forming part of Letters Patent No. 227,680, dated May 18, 1880.

Application filed December 18, 1879.

*To all whom it may concern:*

Be it known that I, FREDERICK L. ELLIS, of Milldale, in the town of Southington, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Spring-Tweezers, with other tools attached, of which the following is a specification.

Prior to my invention spring-tweezers have been formed of two leaves of steel, which were connected together by a post which was round at the middle portion and had square tenons on each end, which were riveted into the body of the spring-leaves, and upon this post there has been placed a swivel-shaft having some useful tool upon each end. Substantially the same construction of the tweezers from spring-leaves has been followed when a swivel-shaft was hung between the ends of the leaves which projected upon one side of the connecting-stud.

One prior patent which shows this latter construction says that the post may be wholly omitted and a portion of each of the spring-leaves swaged inward, so that when the inwardly-swaged parts are riveted together the parts upon each side of the connection will be open and form spring-jaws at each end; but there is no suggestion in said patent that said swaged portions should or would be in cup-shaped form, so as to form a rounded projection on one side and a circular depression upon the other side of the spring-leaves. All of the foregoing prior devices are hereby disclaimed.

I form my tweezers from two spring-leaves; but, in lieu of the connecting-stud before described, I swage two cup-shaped depressions in each of said leaves, which makes a corresponding projection upon the opposite side of each depression. I then place these two leaves together, with the projections at the bottom of the cup-shaped recess resting against each other, and I secure them together by a rivet of angular form in cross-section, which passes through the bottoms of said cups. If a swivel-shaft is employed, it may take its bearings upon the confronting projections of said leaves.

In the accompanying drawings, Figure 1 is a front elevation of spring-tweezers which embody my invention, the same being shown in connection with a swivel-shaft which has a

watch-key at one end and an ear-spoon at the other. Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation of one of the spring-leaves of said tweezers. Fig. 4 is a front elevation of the swivel-shaft carrying the watch-key and ear-spoon. Fig. 5 is a longitudinal section, showing the cup-shaped recess in one of the spring-leaves on a greatly-enlarged scale. Fig. 6 is a longitudinal section of a portion of my tweezers, also upon an enlarged scale.

*a a* designate the spring-leaves which form the tweezer-blades. *b* designates the swivel-shaft, carrying a watch-key and ear-spoon or other convenient pocket implements to be hung between the spring-leaves or blades of the tweezers.

I connect these tweezer-blades together in such manner as to hold them always coincident with each other, as follows: I first strike up a cup-shaped depression, *c*, upon the outside of each tweezer-blade, thereby making a similar-shaped projection upon the opposite side of said blade. I next punch out a square hole in the middle of said cup-shaped depression, and place the two blades together in the position shown in Fig. 6, and then pass a square rivet, *e*, through the holes formed in the bottoms of the depressions *c*, and head the ends thereof to hold the two leaves or blades together, the square rivet *e* and corresponding-shaped hole always keeping the two blades directly opposite each other, although they have but one connection. If desired, however, this hole and rivet might be of any other angular form, or any form excepting round, so as to accomplish the same result.

I make the blades or leaves *a a* a little longer than is necessary for the simple purpose of tweezers, thereby forming spring-arms *d* at the end opposite the tweezer-blades. I also form a swivel-shaft, *b*, with a hollow bearing, which is large enough to take upon the projections in the blades which are opposite the depressions *c c*, and when said shaft is to be mounted upon the one connection of the two blades it is placed in the position represented in Fig. 6 before the said blades are riveted together. The spring-arms *d d* will bear upon the swivel-shaft *b*, so as to hold it gently in place with either end of said shaft outward, as may be



desired, which feature, however, is not of my invention.

By making the cup-shaped depressions in the blades *a a* and using the projections opposite said depressions as a bearing for the swivel-shaft I am enabled to use a connecting pin or rivet which is angular throughout its length, instead of having to take a round piece and square the two ends thereof, as in the former connection of said parts. I am also enabled to let the leaves or blades come directly together at the point surrounding the rivet in such manner as to form a much broader, and thereby a firmer, bearing, so as to hold the blades more rigidly together. The depressions also form pockets for receiving the heads of the rivet below the surface of the blades.

Although I design to employ a swivel-shaft carrying some convenient implement at each end, yet it is evident that this manner of securing the two blades together is the same whether the swivel-shaft be present or not, or whether it be pivoted by a separate pin, so as to swivel between the spring-arms *d d*.

I claim as my invention—

1. In spring-tweezers, the blades or leaves *a a*, having cup-shaped depressions *c c*, with corresponding-shaped projections upon the opposite sides thereof, the blades being placed together with the projections resting upon each other, and secured by an angular rivet, *e*, the heads of which are within the depressions *c c*, substantially as described, and for the purpose specified.

2. The combination of the blades *a a*, having the depression *c* upon one side and corresponding projection upon the other side, secured together by an angular rivet, with the projections resting against each other, as described, in combination with the swivel-shaft *b*, having its bearings on said projections, substantially as described, and for the purpose specified.

FREDERICK L. ELLIS.

Witnesses:

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