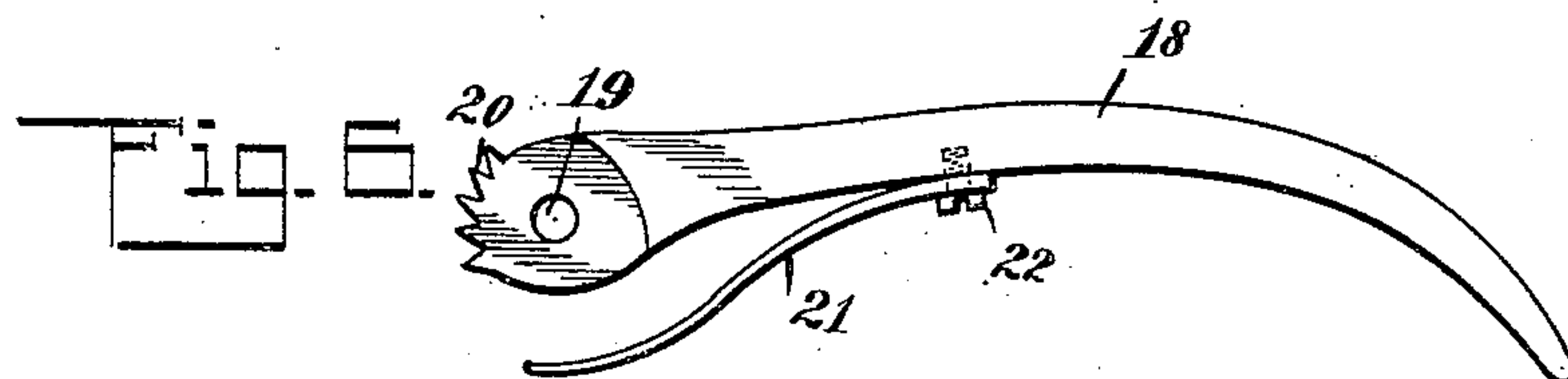
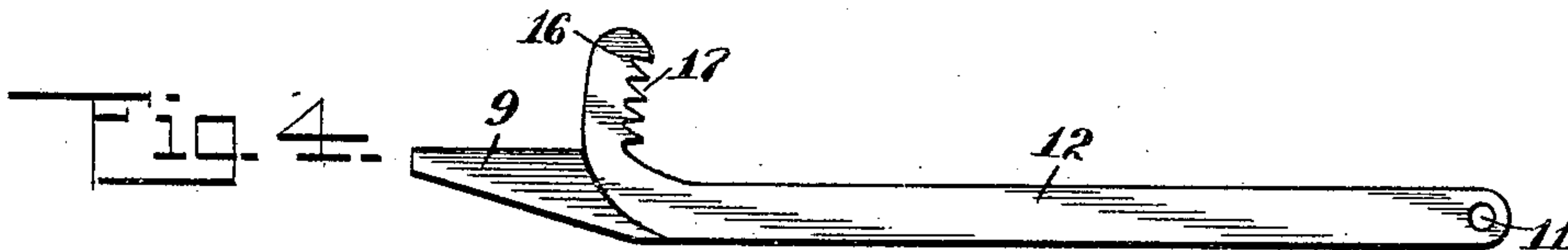
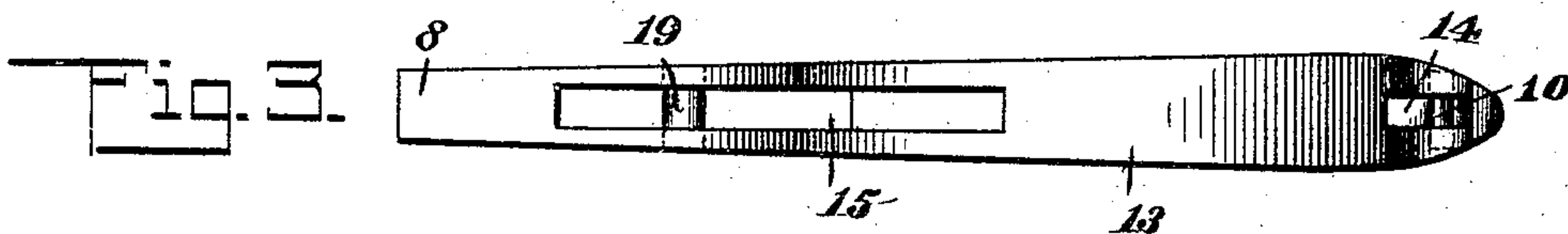
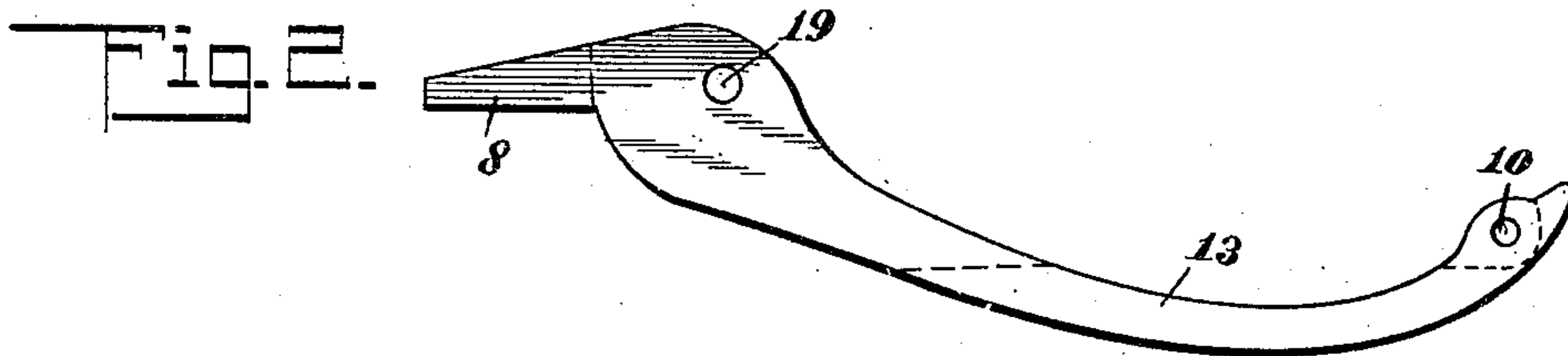
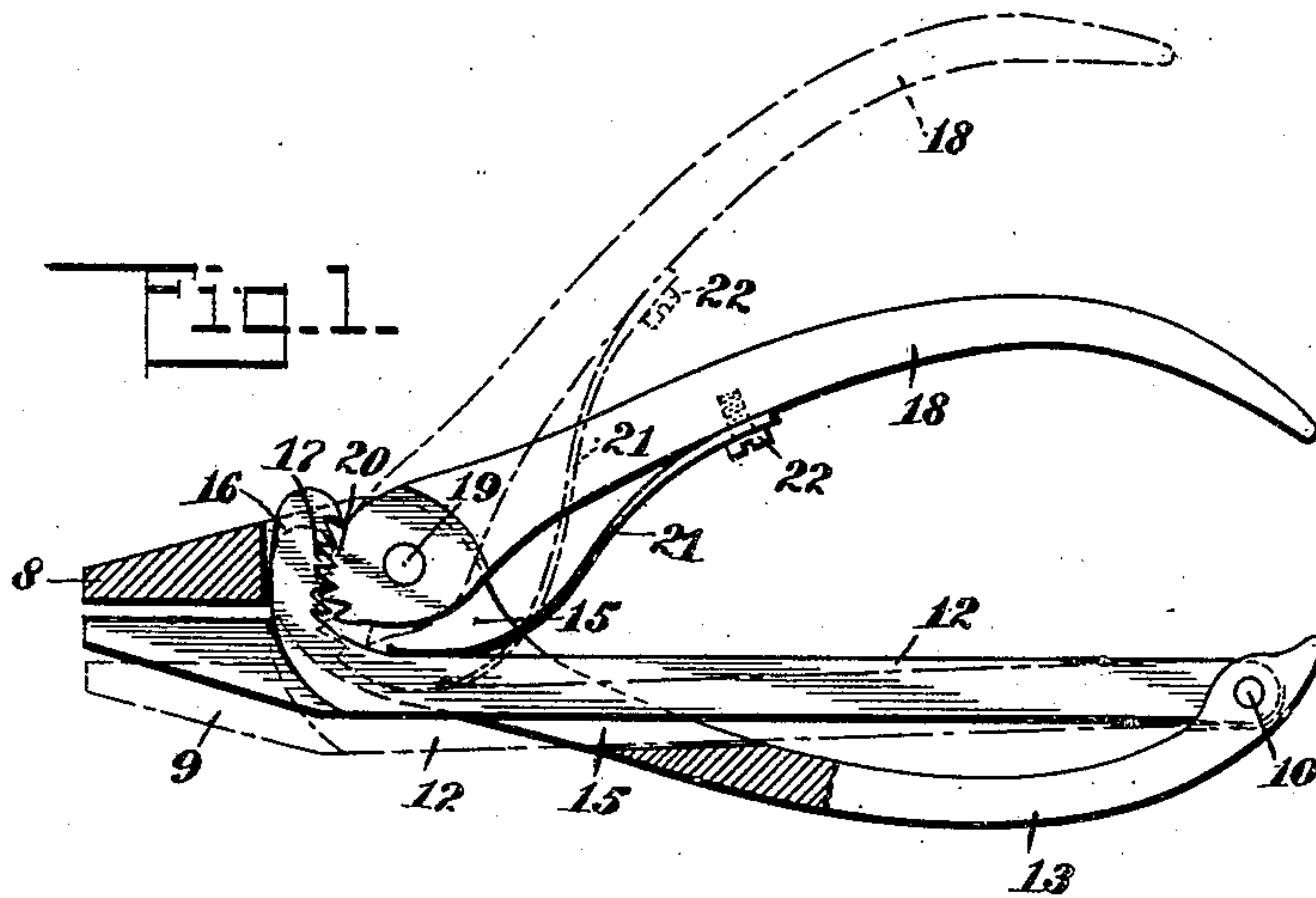


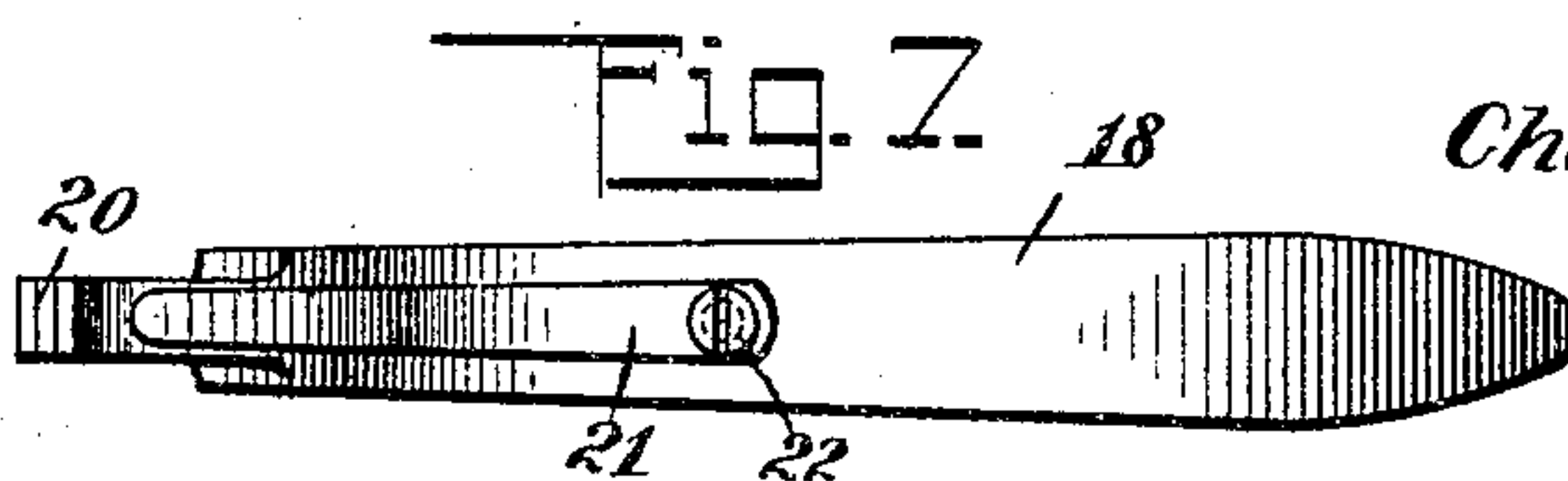
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PLIERS.
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PLIERS.

945,702.

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To all whom it may concern:

Be it known that I, CHARLES R. COUSINO, a citizen of the United States, and a resident of Crescent City, in the county of Del Norte and State of California, have invented a new and useful Improvement in Pliers, of which the following is a full, clear, and exact description.

The objects which the present invention has principally in view are: to provide a construction for pliers wherein the clamping jaws are pivotally mounted to operate in substantially parallel lines in closing; to provide a simple and efficient form of construction; and to provide a construction wherein the parts are readily separable for repair or substitution.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings wherein like characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation, partly in section, to show the assembled operative parts; Fig. 2 is a detail view in side elevation of one of the members of the improved pliers; Fig. 3 is a top view of the construction shown in Fig. 2; Fig. 4 is a side view of one of the members carrying a clamping jaw of the pliers; Fig. 5 is a top view of the construction shown in Fig. 4; Fig. 6 is a side view of the lever member of the improved pliers; and Fig. 7 is a view from beneath, of the construction shown in Fig. 6.

It will be noted that the members of the construction carrying the clamping jaws 8 and 9, are hingedly connected by a pivot 10, a perforation 11 being provided in the member 12 carrying the jaw 9. The member 13 which carries the jaw 8, is provided with a slot 14 in the extreme end of a handle portion, into which the end of the member 12 is protruded, and through the sides of which the pivot 10 is driven, as is seen most clearly in Fig. 3 of the drawings. The member 13 is further provided with a slot 15, which is so formed as to provide space in which the member 12 may move to and from the jaw 8.

The sides of the slot 15 form the guiding members for the movement of the member 12, the said member 12 and slot 15 in certain classes of the implement being machined to fit snugly.

The member 12 carries at the forward end an extension 16, upon the rearward face of

which are provided rack teeth 17. It is by means of this extension 16 and through the engagement of the teeth 17 with a similarly-toothed member pivotally mounted in the member 13, that the member 12 is moved to approach and retract the jaw 9 to and from the jaw 8.

It will be understood that with the construction so far described the operation is as follows: When the member 12 is not supported, it falls to the position shown in dotted lines in Fig. 1 of the drawings, and in this position of the two members 12 and 13, the jaws 8 and 9 are separated as shown by the full and dotted lines in Fig. 1. When the article to be grasped is interposed between the jaws, the member 12 is then raised to bear against the said article. In this position there is no force applied to grip the article, and it is in this position that the member 18 is brought into engagement with the extension 16 of the member 12. The member 18 is mounted upon a pivot 19 which is extended through the side walls of the member 13, forming the slot 15. The member 18 is shown in the form of a gripper handle, corresponding in shape to the form of the member 13. At the forward end it is provided with a segmental toothed construction 20, the teeth of which are formed concentric with the pivot 19. The teeth are sufficient in number to engage the extension 16 when the member 12 is in its full open position, as shown by dotted lines in Fig. 1, to raise the member 12 until the jaws 8 and 9 are in full gripping contact. When, however, the member 18 is raised to its normal position, the member 12 is in its lowest position, and there is no engagement between the teeth 20 and the teeth 17, of the member 18 and extension 16, respectively. It is by reason of this construction that the jaw 9 may be moved so as to produce any sized opening or separation between the said jaw 9 and the jaw 8, while the member 18 is in a full open position. By means of this, various sized hands can be accommodated to give the full power of each hand in the gripping action. It will be understood that whenever the jaw 9 is brought in contact with material already held in contact with the jaw 8, the teeth 20 of the member 18 may be brought into engagement with the teeth 17 of the extension 16. At the same time it will be understood that if for con-

venience of operation, the opening for the operation of the pliers is set at a less than full opening, the member 18 may be moved into contactual relation with the extension 5 16 to operate from the point of opening between the said jaws.

The gripping handle of the pliers is formed by the member 13 and the member 18, which are thrown to an open position, or 10 a position wherein the jaws 8 and 9 are separated, by means of a leaf spring 21, which is fixedly secured as by a screw 22 to the member 18, and in sliding contact upon the top of the member 12. The member 18 being 15 pivotally mounted upon the member 13, and the spring being fixedly attached thereto and bearing against the member 18, and the members 12 and 13 forming the jaws 8 and 9, it will be seen that the action of the spring 20 21 is to separate the members 12 and 13 as well as the members 18 and 13.

With pliers constructed as above described and as shown in the accompanying drawings, the operation is as follows: The member 18 25 being raised out of engagement with the extension 16, and the spring 21 holding the members 12 and 13 in position to separate the jaws 8 and 9, the operator advances the pliers to grasp any article as, for instance, 30 a wire. With his forefinger and thumb he brings the jaws 8 and 9 together upon the interposed article, pressing upon the interposed article. The member 18 is then thrown down into the position wherein the teeth 20 35 engage the teeth 17 of the extension 16. In this position any pressure that is applied to the member 18 is by it exerted through the extension 16 upon the member 12 and the jaw 9, to cause the same to grip yet more 40 tightly the interposed article.

It will be understood that the leverage of the member 18 is proportioned to the length of the handle, and the distance of the teeth 20 from the pivot 19. By reducing the 45 radius of the rounded end carrying the teeth 20, the force applied upon the member 18 may be multiplied extensively. Also the possibilities of the application of the force applied through the member 18, are 50 proportioned to the travel of the handle of the member 18 to the travel of the teeth 20, the extension 16 and the jaw 9. As in ordinary operation, the jaw 9 is in actual contact with the interposed metal, any travel on

the part of the said jaw is such as is allowed 55 by the yielding of the interposed metal.

From the above it will be seen that the possibilities of the gripping force exerted by pliers constructed in accordance with the present invention are very great. 60

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

1. Pliers, comprising two members provided with clamping jaws and hingedly connected at their ends removed from said jaws, a gear-toothed extension mounted upon one of said members in guided relation with the other, and a lever-like member having a rounded end provided with gear teeth 70 adapted to engage the teeth of said extension to move the said jaws toward each other.

2. Pliers, comprising two members provided with clamping jaws and hingedly 75 connected at their ends removed from said jaws, one of said members being provided with a slot and the other with an extension adapted to move in said slot, said extension being provided with teeth, and a lever-like 80 member pivotally mounted in said slot and having a rounded end provided with teeth in segmental arrangement, adapted to be moved into and out of engagement with the said teeth on said extension. 85

3. Pliers, comprising two members provided with clamping jaws and hingedly connected at their ends removed from said jaws, one of said members being provided with a slot and the other with an extension 90 adapted to move in said slot, said extension being provided with teeth, a lever-like member pivotally mounted in said slot and having a rounded end provided with teeth in segmental arrangement, adapted to be 95 moved into and out of engagement with the said teeth on said extension, and a spring adapted to separate the said jaws and move the said lever-like member out of engagement with the teeth of said extension. 100

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES ROLLIN COUSINO.

Witnesses:

CHAS. FRANTZ,
E. D. HOAG.