

(No Model.)

3 Sheets—Sheet 1.

W. SILVER.
ANIMAL SHEARS.

No. 542,380.

Patented July 9, 1895.

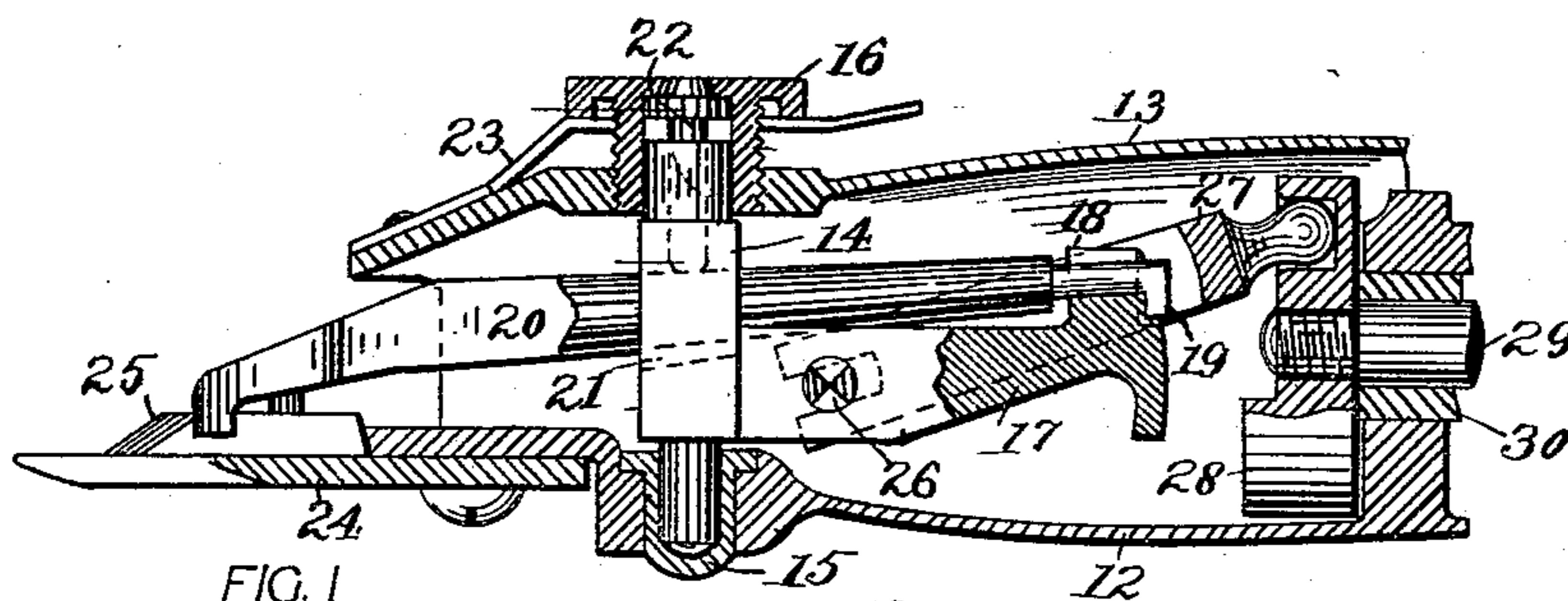


FIG. 1

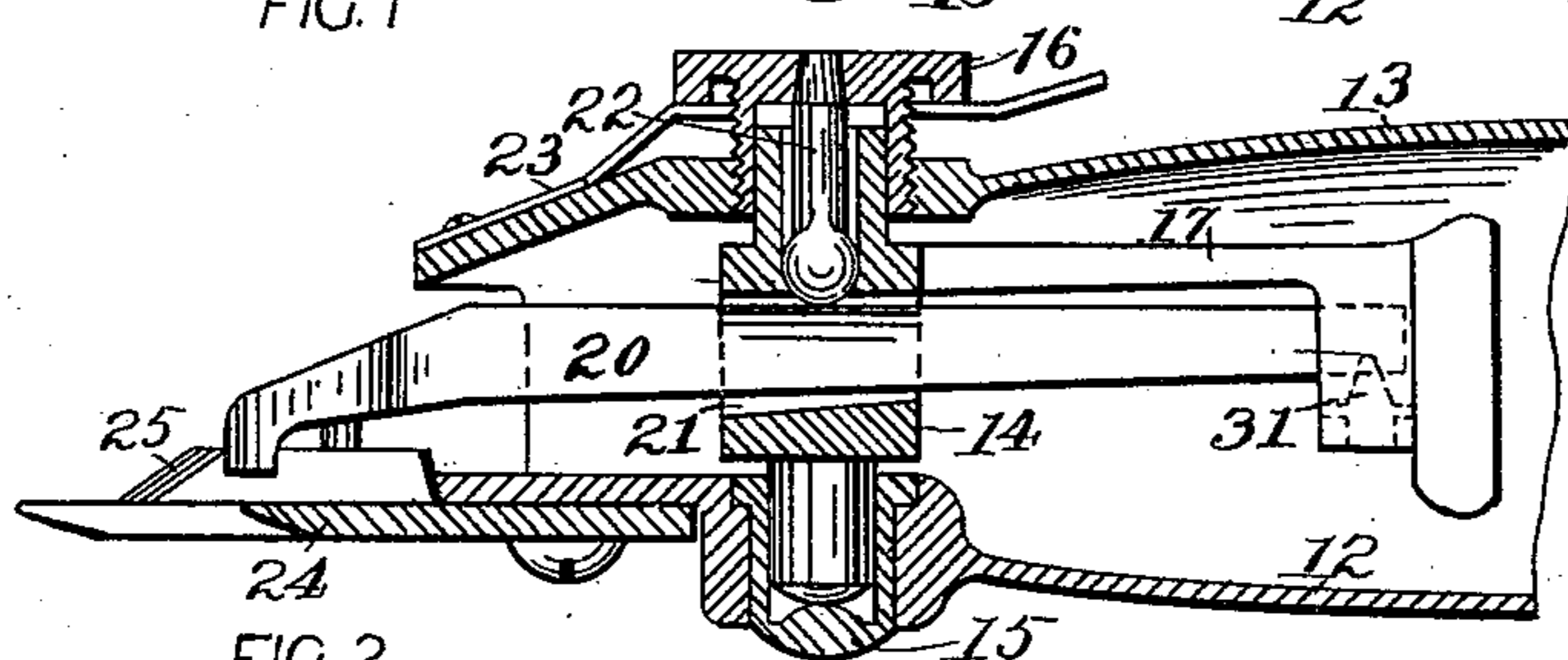


FIG. 2

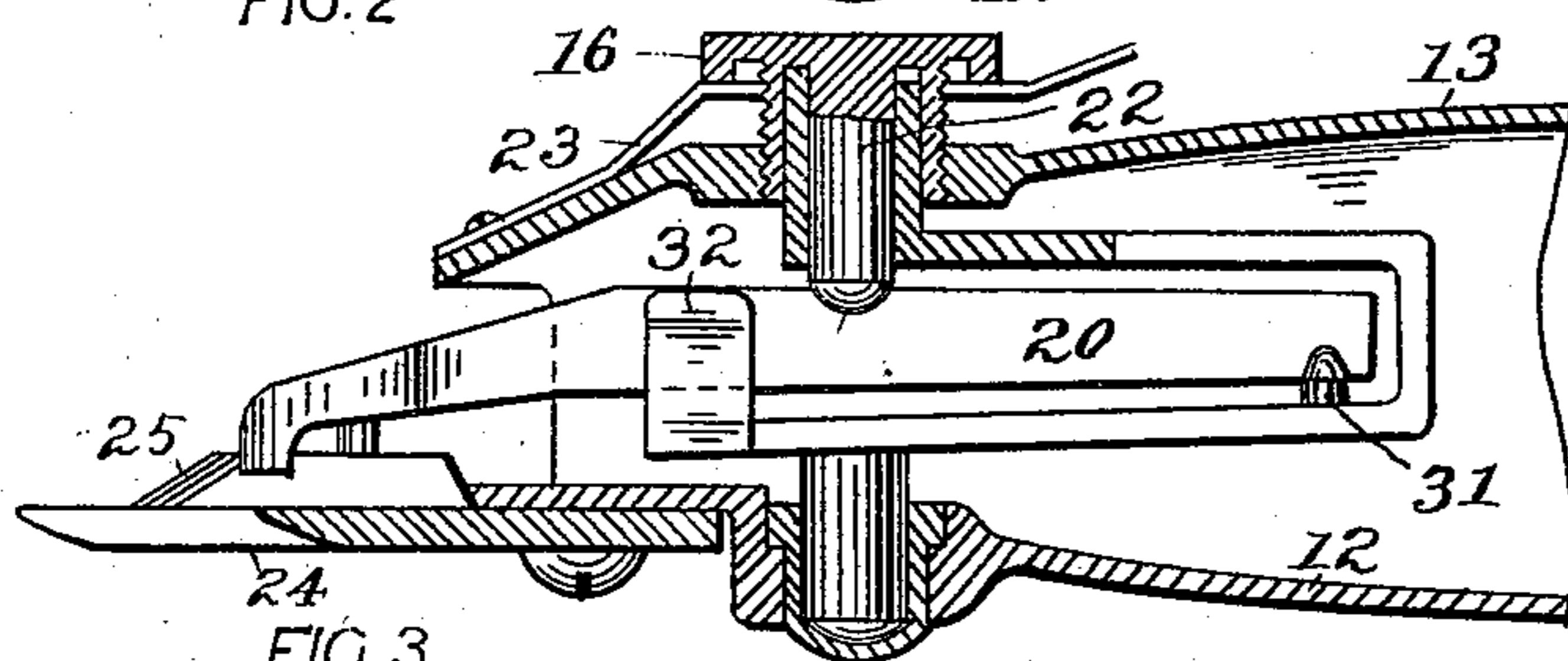


FIG. 3

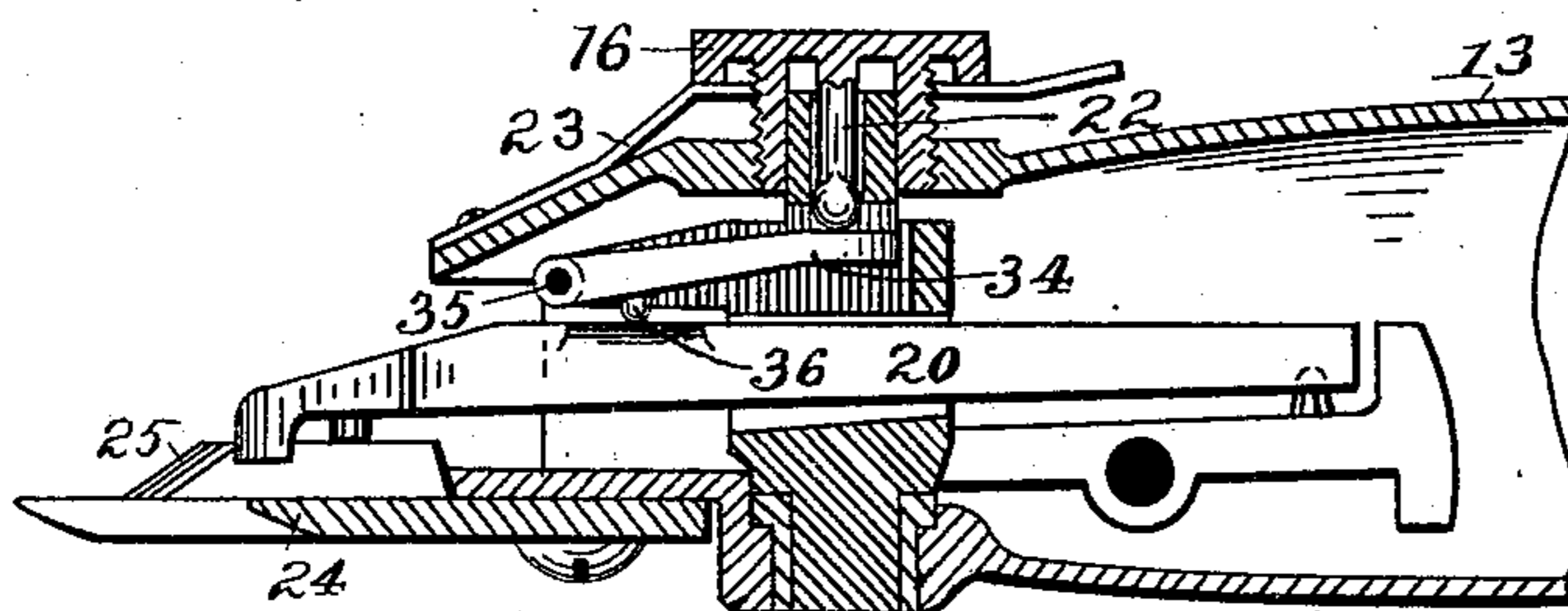


FIG. 4

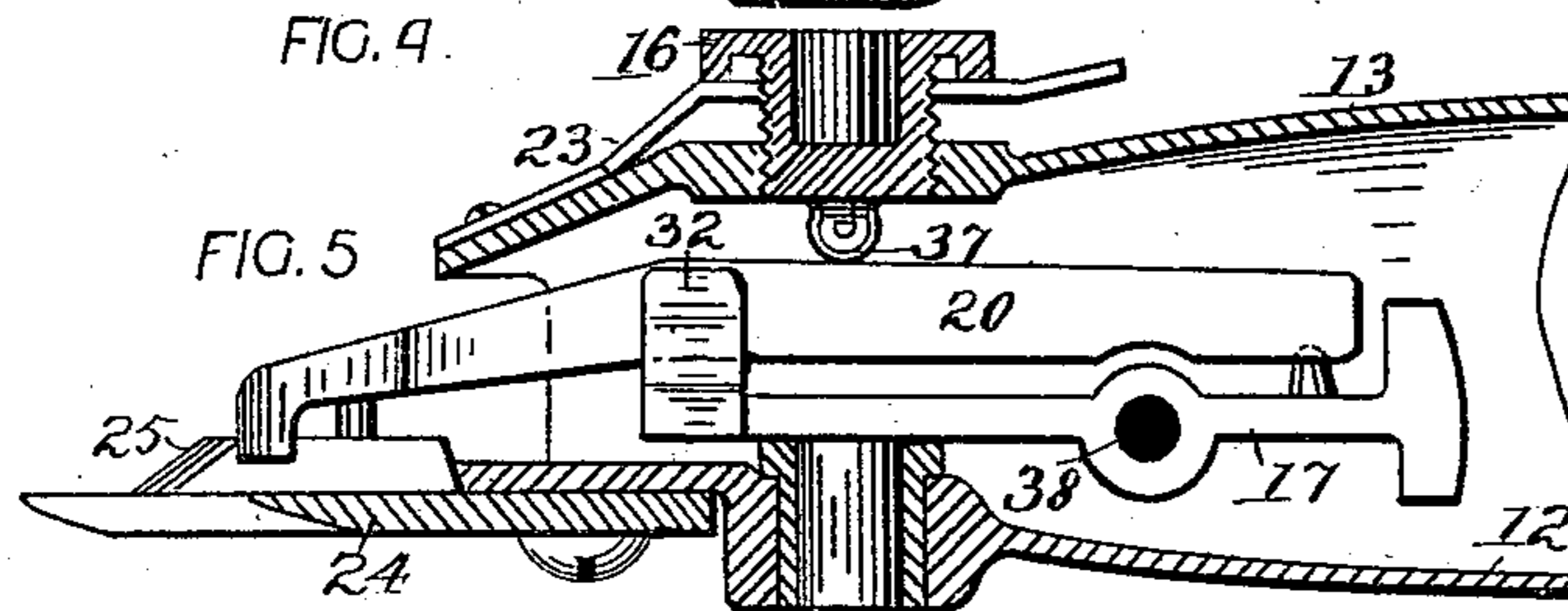


FIG. 5

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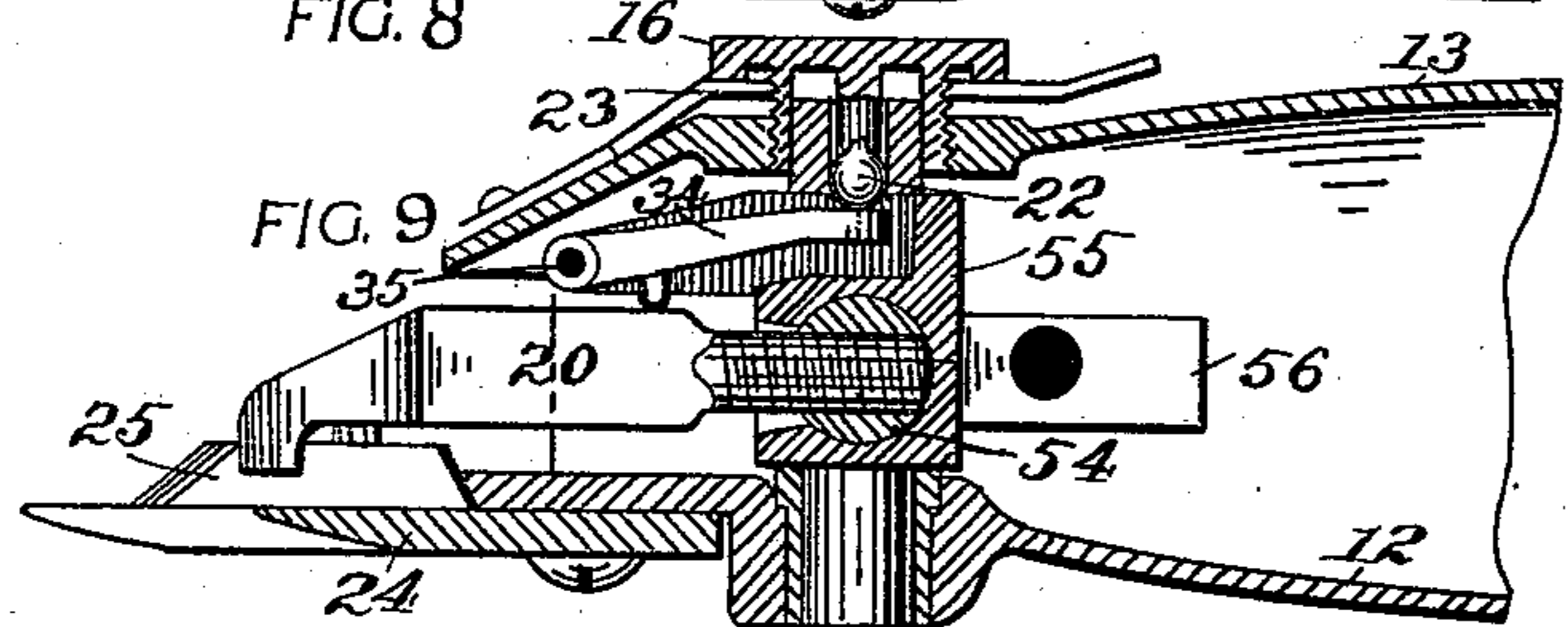
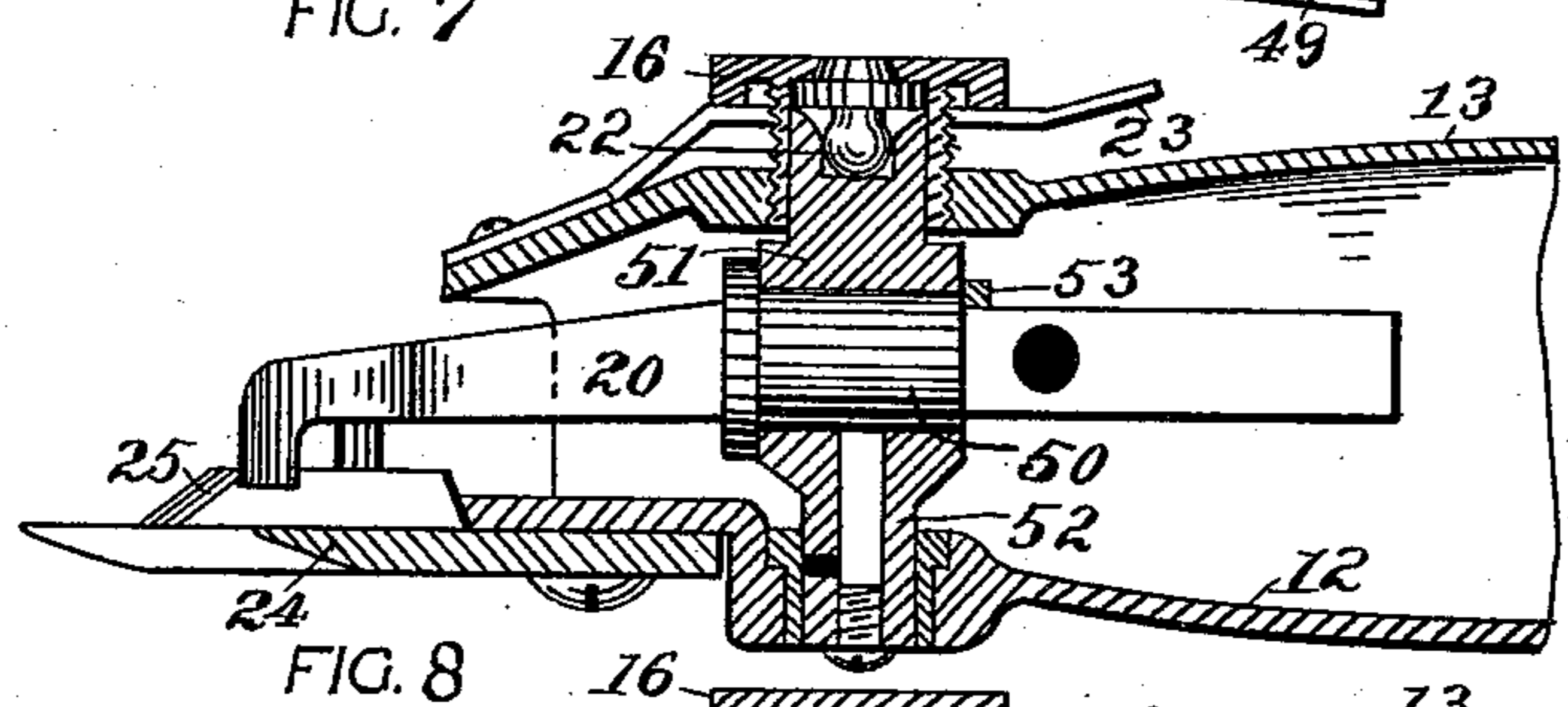
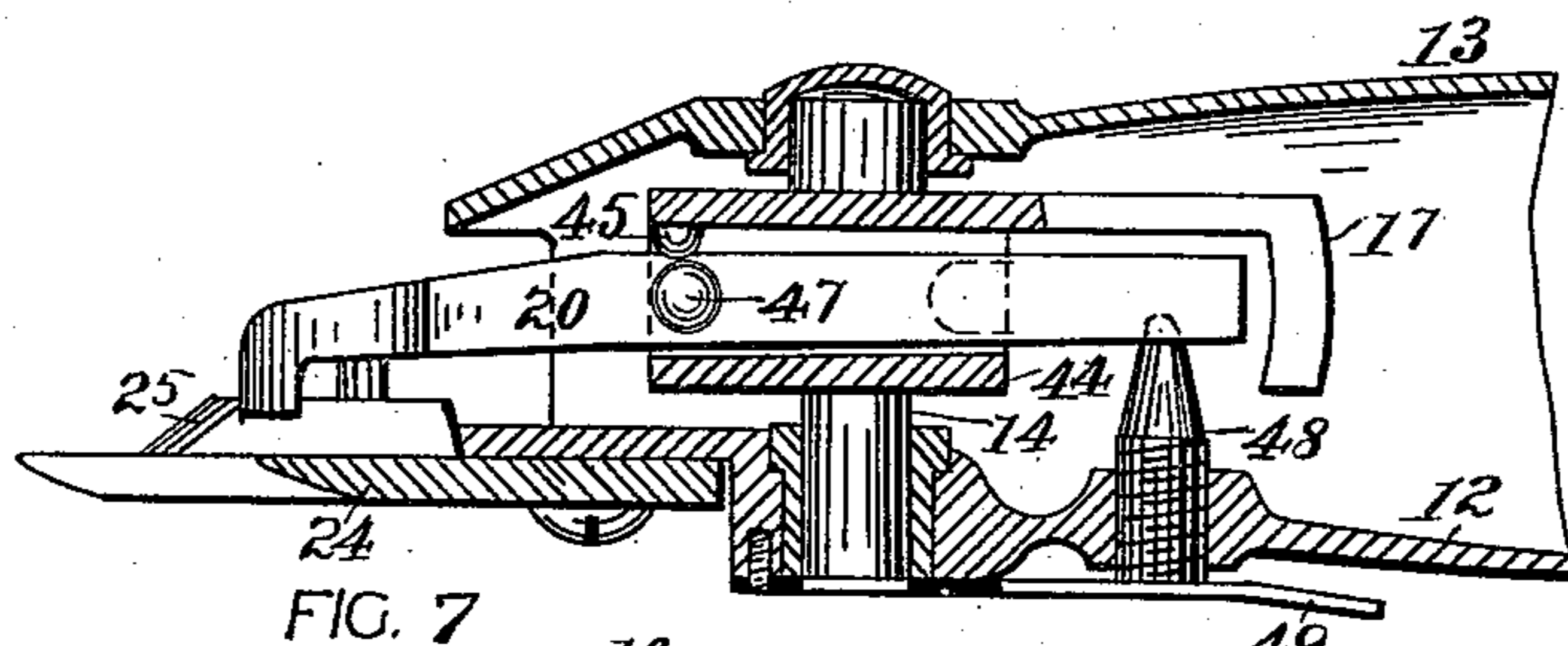
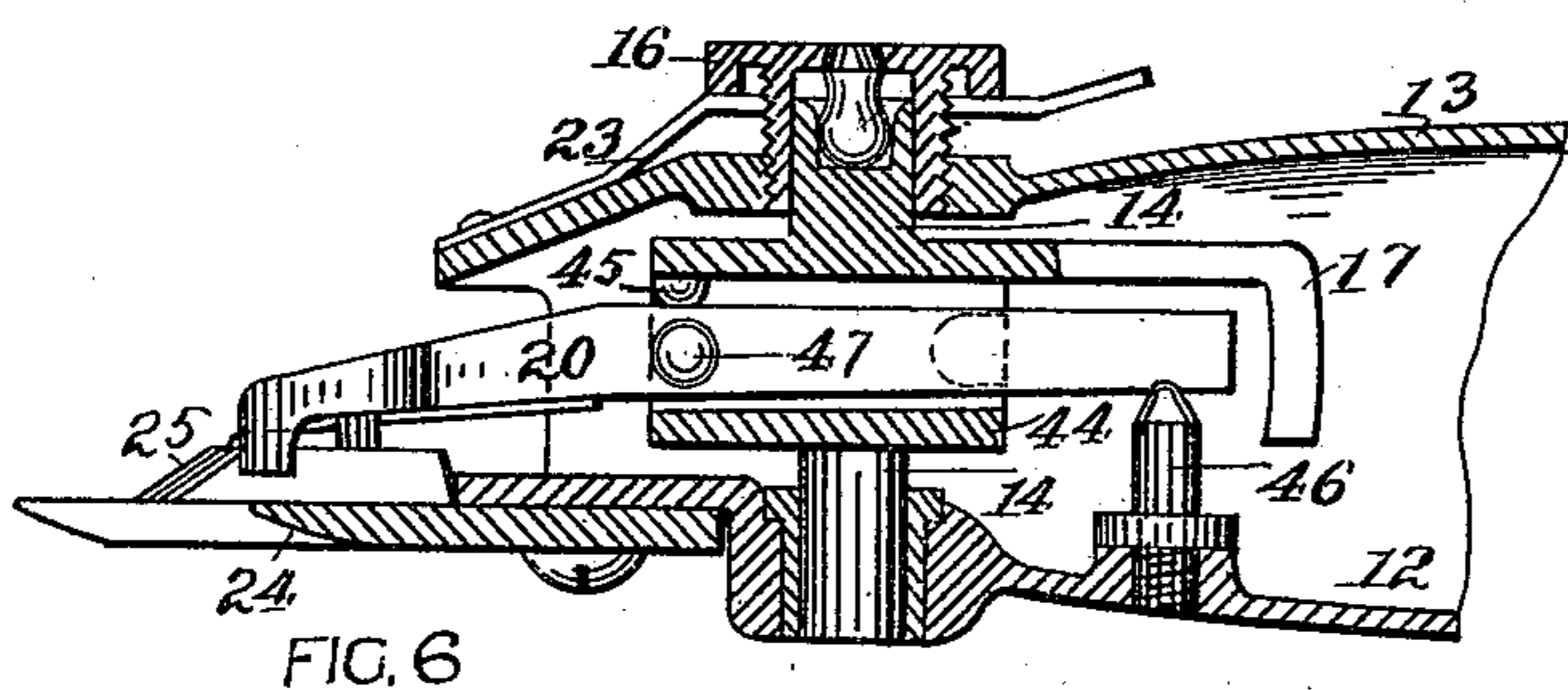
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3 Sheets—Sheet 2.

W. SILVER.
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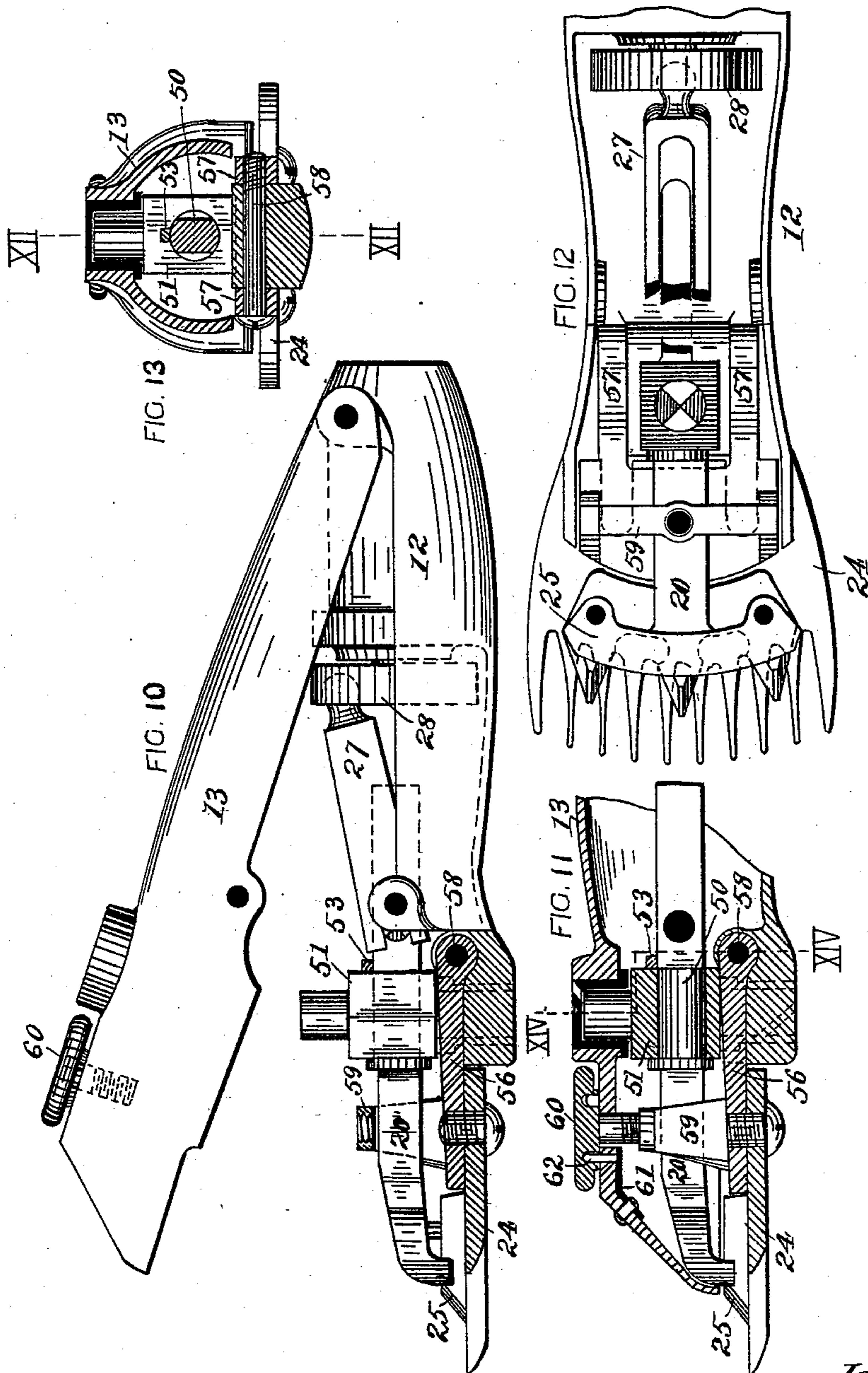
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3 Sheets—Sheet 3.

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ANIMAL SHEARS.

No. 542,380.

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UNITED STATES PATENT OFFICE.

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THREE-FOURTHS TO NATHAN COHEN, OF SAME PLACE, AND BENJAMIN FRANCIS MARKS, OF SYDNEY, NEW SOUTH WALES.

ANIMAL-SHEARS.

SPECIFICATION forming part of Letters Patent No. 542,380, dated July 9, 1895.

Application filed January 4, 1893. Serial No. 457,209. (No model.) Patented in England December 30, 1892, No. 24,092.

To all whom it may concern:

Be it known that I, WILLIAM SILVER, a subject of the Queen of Great Britain, residing at Tamworth, in the Colony of New South Wales, have invented new and useful Improvements in Animal-Shears, (for which I have obtained Letters Patent in Great Britain, dated December 30, 1892, No. 24,092,) of which the following is a specification.

This invention relates to machine-shears, but more particularly to machines for shearing and clipping wool or for cutting hair.

The primary object of the invention is to provide a simple and effective machine capable of various adjustments, and which may properly adjust the tension and distribute it equally on both sides of the cutter.

A further object is to so construct the parts that the lever or arm carrying the cutter-fork, ordinarily called the "tension-lever," may be drawn out of the machine without taking it to pieces, in order to clear it of the grease, dirt, and clippings which might and often do collect within the machine.

With these and other objects in view the invention consists in the construction and combination of the parts, as will be hereinafter more fully described, and then defined in the claims at the end of the description.

Referring to the accompanying drawings, forming a part of this specification, Figure 1 is a longitudinal vertical sectional elevation of one form of the machine. Figs. 2 to 9 are longitudinal vertical sectional elevations of slightly-modified forms of the machine. Fig. 10 is a longitudinal sectional elevation of another modification, illustrating the cap-plate in a raised position. Fig. 11 is a longitudinal sectional elevation on the line XII XII of Fig. 13 of the form shown in Fig. 10, showing the cap-plate in a closed position. Fig. 12 is a plan elevation of the forward portion of Fig. 10 with the cap-plate removed, and Fig. 13 is a transverse sectional elevation on the line XIV XIV of Fig. 11.

Referring to Fig. 1, 12 is the casing of the machine, which is provided with a covering-cap 13 pivotally secured thereto, as best shown in Fig. 10. Vertically arranged between the cap-plate and the casing 12 is a spindle 14,

having a reduced upper and lower portion adapted to fit into a foot-step bearing 15 and a hollow tension-screw 16, located in the casing 12 and the cap-plate, respectively. This spindle has an outwardly-extending arm 17 rigidly secured thereto or formed integrally therewith, the outer end 18 of said arm being U-shaped to form a bearing for the key-piece 19 of the tension-lever 20 to permit of the ready removal of the tension-lever from the arm when so desired. The tension-lever passes through a vertical slot or socket 21 of the spindle 14, in which it is adapted to be adjusted vertically by means of a depending pin or stem 22, which passes through an aperture in the spindle. This stem or pin is provided with a conical end which abuts against the upper surface of the tension-lever, and is provided at its other end with a cap which fits into the hollow tension-screw 16, by which screw the said pin is vertically movable. The screw 16 is retained in an adjusted position by the tension locking-spring 23, which is secured at its forward end to the cap-plate and has its other end arranged to abut against the under side of the enlarged portion of said screw. At 24 is the comb secured to the underside of the casing, and has arranged above the same the cutter 25, which is connected to the forward end of the tension-lever 20.

For operating the cutter I provide a pin or stud 26 on the arm 17, which is engaged on the opposite side of the arm 17 by the slotted ends of a bifurcated vibrating bar 27, one end of which is spherically formed and engages a recess in a crank 28, secured on the end of a drive-shaft 29, which is arranged in a suitable bearing 30 of the casing and adapted to be rotated in any proper manner. It will be seen that by screwing the tension-screw toward the lever 20 the forward end of the tension-lever 20 will be forced downward by the stem 22, thereby retaining the cutter 25 against the comb 24. By rotating the shaft 29 the bar 27 will be vibrated, thereby partially rotating or rocking the spindle 14 on its pivot, which, in turn, imparts a reciprocating movement to the cutter by the lever 20, which is held in the spindle by the tension of the stem 22.

To remove the lever 20, the comb 24 and the cutter 25 are removed and the tension-screw 16 run back and the lever inverted, whereby the key-piece 19 will be brought opposite the mouth of the U-shaped end 18 of the arm 17, when the lever may be withdrawn, or it may be reset by reversing this operation.

It is obvious that the form of apparatus thus described may be changed in some instances, if so desired. In Fig. 2 the construction shown is similar to that of Fig. 1, with the exception that the stem 22 is provided with a spherical lower end which abuts against the tension-lever, the inner end of said lever being supported on a point 31, arranged in a depending portion of the arm 17. The arm 17 is located above the tension-lever instead of below the same, as in Fig. 1, and in this case may be operated in any approved manner, or the depending portion of the arm may have two cheeks, between which an overhung eccentric pin may work to effect the vibration of the levers.

The construction shown in Fig. 3 is practically a combination of those of the two preceding figures. The arm 17 is arranged to extend both above and below the tension-lever and is provided at its forward end with two uprights or cheeks 32, which form a socket and grasp the lever 20 on its opposite sides. Here the stem 22 is made integral with the tension-screw instead of being secured thereto.

Fig. 4 is illustrative of a construction which is in principle practically identical with that shown in Fig. 1, except as regards the tension mechanism. An intermediate lever 34 is here used, which is fulcrumed at 35 to a bracket extending from the spindle 14 and is provided with a projecting teat or point 36, which abuts against a rounded portion of the tension-lever. By turning the screw 16 the stem 22 in pressing on the end of the lever 34 will cause a downward pressure or tension on the lever 20.

Fig. 5 illustrates a construction similar to that shown in Fig. 3. In this case, however, the upper portion of the spindle is dispensed with and the screw 16 is made solid and formed to a point 37, which bears on the lever 20. For operating this construction, as in Fig. 4, the bifurcated bar is arranged to span the arm 17, and is connected thereto at the point 38, so as to move the spindle on its pivot and thereby reciprocate the cutter.

The constructions shown in Figs. 6 and 7 are practically identical. In Fig. 6 the central spindle or pivot has its bearing in the hollow tension-screw 16 and in the casing 12, the central portion of the spindle being somewhat enlarged to form a box-like casing 44, through which the tension-lever 20 passes, and from it extends rearwardly an arm 17, to which vibrating movement is communicated. The rear end of the lever 20 is fulcrumed on a permanent point 46, and the spherical point bears on the upper surface of the lever between this point and the forked end, which

is connected to the cutter and applies tension to said lever. The lever is also provided with spherical portions 47, arranged on opposite sides thereof, so that it will always be in true contact with the sides of the box-like casing of the spindle and yet be always capable of adjusting itself transversely. A ball working between races may be substituted for the spherical point 45 with the object of reducing the friction. In Fig. 7 the point of tension is transposed, the point of the screw 48 serving both to give tension to the lever 20 and to serve as a pivotal point therefor. This screw may be provided with a thumb-cap or formed to receive or engage with or be engaged by a key or spanner, and may also be provided with a nipping-spring, as 49, for locking the screw when the same is adjusted. The operation of these two forms are practically the same and will be understood from the foregoing description.

In Fig. 8 the lever 20 serves as both tension and power lever. Its central portion 50 is turned cylindrical to fit an aperture in the central portion 51 of the spindle or pivot 52. The rear end of the lever is flattened at the sides so as to fit the vibrating bar 27, which is shown in Figs. 10 and 12, and is prevented from being drawn forward by the key 53, which is secured to said lever. In setting up the machine the lever is held sidewise, and is then inserted, rear end first, into the aperture or socket in the part 51 of the spindle, there being at one side of this aperture a slot (not shown) through which the key passes, so that when it is pushed home a quarter-turn will take the key away from the slot against the solid part of the spindle, whereby the parts are firmly locked together, but in such a way that the lever can turn freely in the spindle to effect transverse adjustment on the cutter. In this construction, as in Fig. 6, the end of the stem 22 bears against a recess in the spindle instead of directly against the lever.

Fig. 9 is practically a combination of the construction shown in Figs. 4 and 8, except that the end of the tension-lever is provided with a ball 54, which fits into a socket arranged in the central portion of the spindle 55, which allows both vertical and transverse movement of the forked or tension lever 20. Vibrating motion in this case is imparted to the arm 56 of the spindle 55.

Referring to Figs. 10 to 13, it will be seen that the construction of the central spindle and the lever is practically identical with that shown in Fig. 8, with the exception that both bearings are permanent. Tension is obtained by acting on the comb 24, whose carrier 56, to which the comb is secured, is formed into two legs 57, which are pivoted by a pin 58 to the case 12, by which the comb has a vertical movement. To the sides and forward portion of the carrier a yoke 59 is secured, in the central portion of which is a threaded aperture in which fits the threaded

end of a thumb-screw 60, adapted to abut against the upper surface of the lever 20, and has its bearing on the cap-plate 13. The thumb-screw is retained in an adjusted position by a spring 61 and a detent 62, secured thereto, which engages the cap of the screw. This construction gives a machine that is completely closed.

It will be understood that there may be substituted for the spindle and lever any other known form of mechanism, without its attached tension parts, as can be fitted into the machine.

By the term "socket," as herein employed, is meant that portion of the spindle in which the tension-lever is mounted and by which the said spindle and lever are made to move in unison, whether the socket be in the form of a recess, a slot, an aperture, or a "socket," strictly so called, so long as the same be adapted to have the tension-lever removably fitted or mounted therein.

In lieu of making the whole tension-lever withdrawable, the same principle of construction can be applied to machines in which the fork or claw is pivoted to the shank of that lever by constructing the pivots in such a way that the fork or claw can be lifted out at will. A number of simple mechanical contrivances can be devised for this purpose by any mechanic. Thus a spring-catch may be provided, or the pivot may be formed as a bayonet-joint, which will allow the requisite degree of transverse play. When the point-and-cup construction is used, as shown in Figs. 2, 3, 4, 5, 6, and 7, the lever 20 may be square, instead of round, in section; but where it is grasped at the sides it should be swelled and turned spherical, so as to be capable of free adjustment. According to the present invention the tension-lever and its fork are made of a solid casting or forging, and not, as has been described already and as heretofore used, in two pieces, entailing the use of attachments and connections.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with a spindle having a socket, a tension lever removably mounted in said socket, and tension mechanism locking said lever in place, whereby when the tension

mechanism is released the tension lever can be readily withdrawn longitudinally, substantially as described.

2. In a shearing machine, the combination with the spindle and means for partially rotating the same, of a tension lever passing through an aperture in said spindle and arranged to be held therein by a partial rotation of the same, tension mechanism for locking the tension lever to the spindle so as to cause said lever to move in unison with said spindle; said tension mechanism being adapted to permit the tension lever to be readily removed when the tension is relieved without the removal of internal parts of the machine, substantially as described.

3. In a shearing machine, the combination with a spindle having a slotted central aperture and means for partially rotating the same, of a tension lever provided with a key adapted to be passed through and be locked in the aperture of said spindle, tension mechanism for locking the tension lever in the spindle so as to cause said lever to be moved in unison with said spindle, said tension mechanism being adapted to permit the tension lever to be readily removed when the tension is relieved by a partial rotation of said tension lever, substantially as described.

4. In a shearing machine, the combination with a spindle and means for partially rotating the same, of a tension lever, tension mechanism for locking the lever to the spindle so as to cause said lever and spindle to move in unison, and a cutter carried by the tension lever, together with a comb pivotally arranged below the cutter, substantially as described.

5. In a shearing machine, the combination with a lever carrying a cutter and means for reciprocating said cutter, of a comb pivotally arranged below the cutter, substantially as described.

6. In a shearing machine, the combination with a lever vibrating in a fixed plane and operating the cutter, of a swinging or canting comb and tension mechanism, substantially as described.

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