

(No Model.)

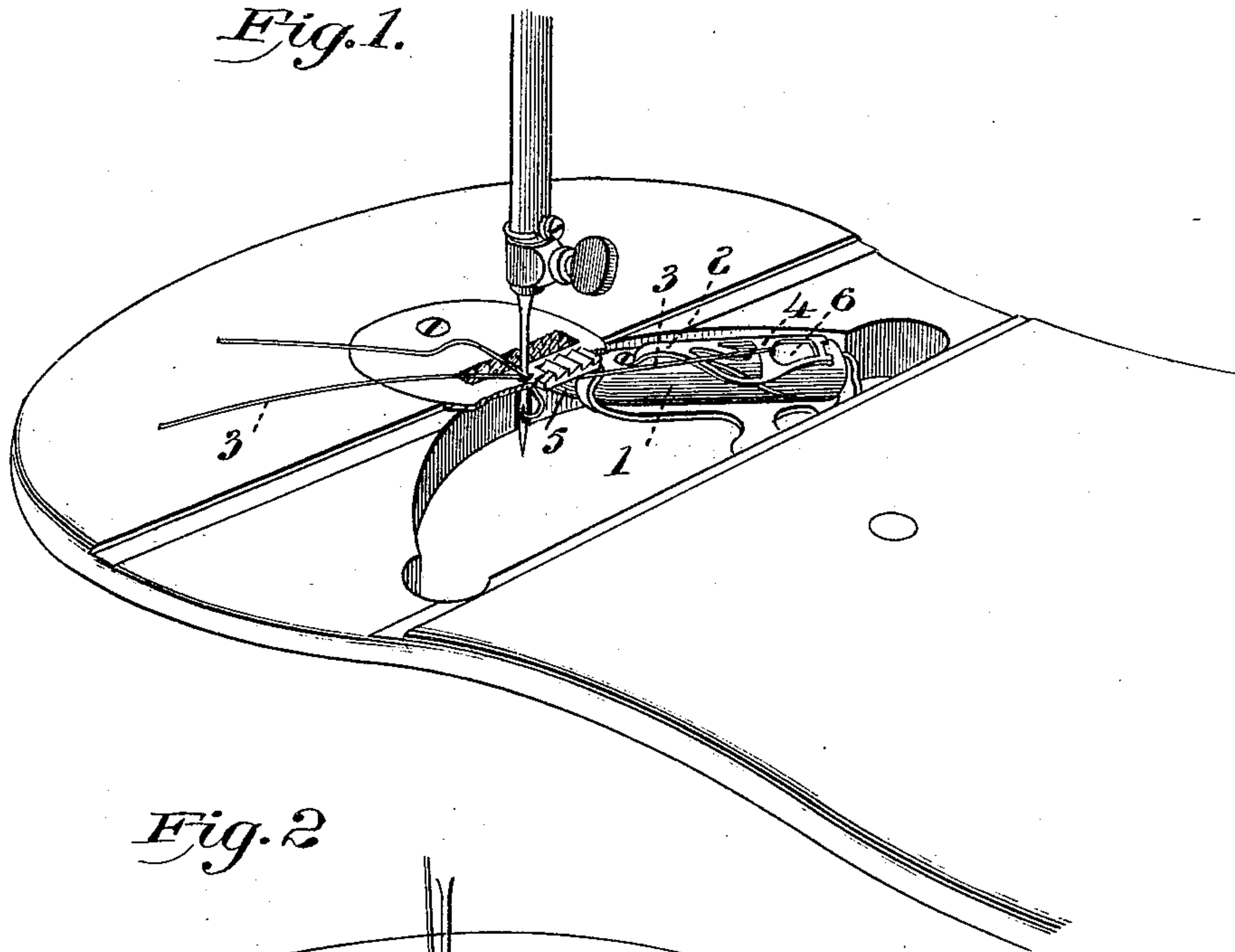
2 Sheets—Sheet 1.

W. E. TRULL.  
SHUTTLE FOR SEWING MACHINES.

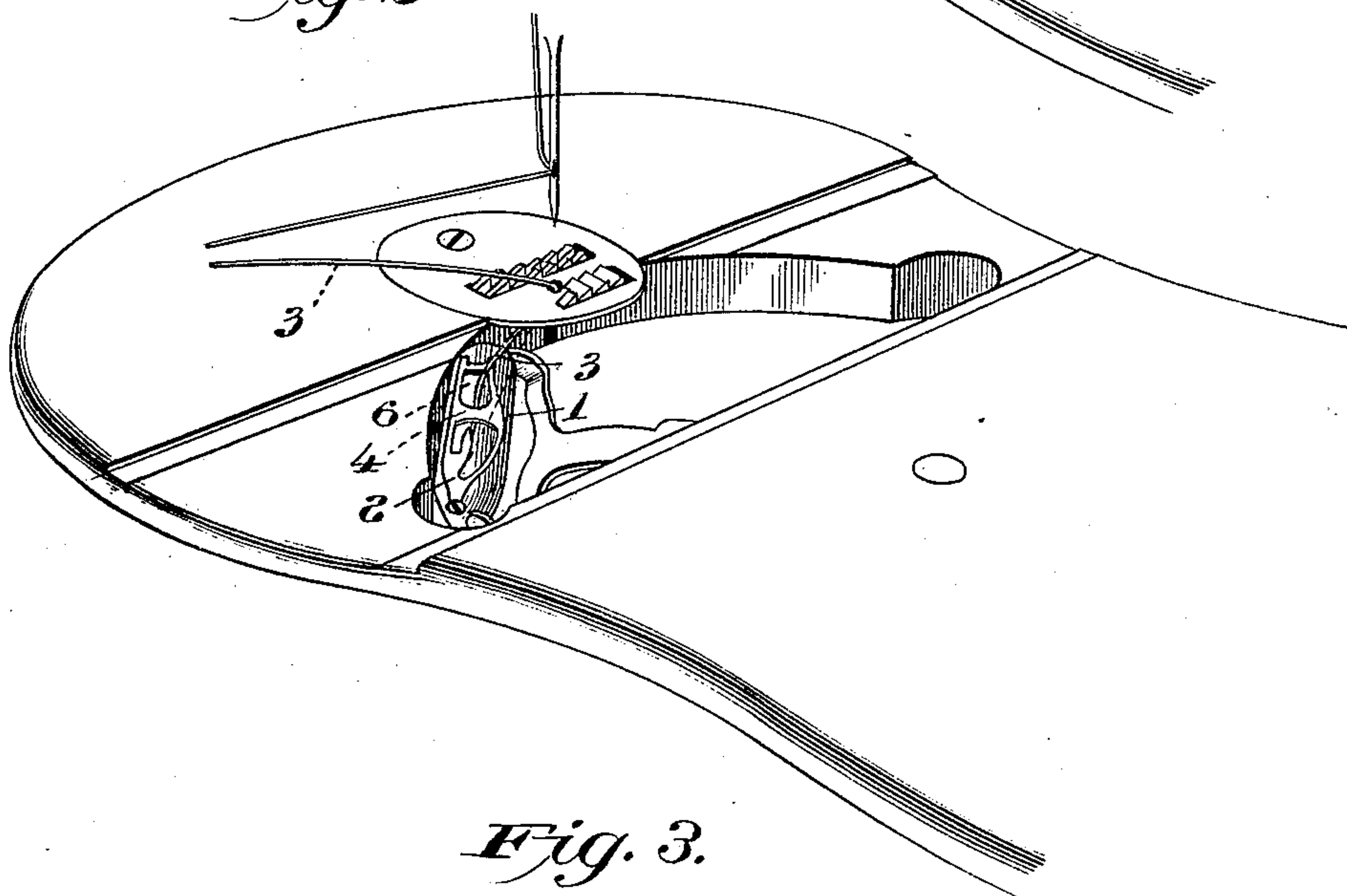
No. 512,526.

Patented Jan. 9, 1894.

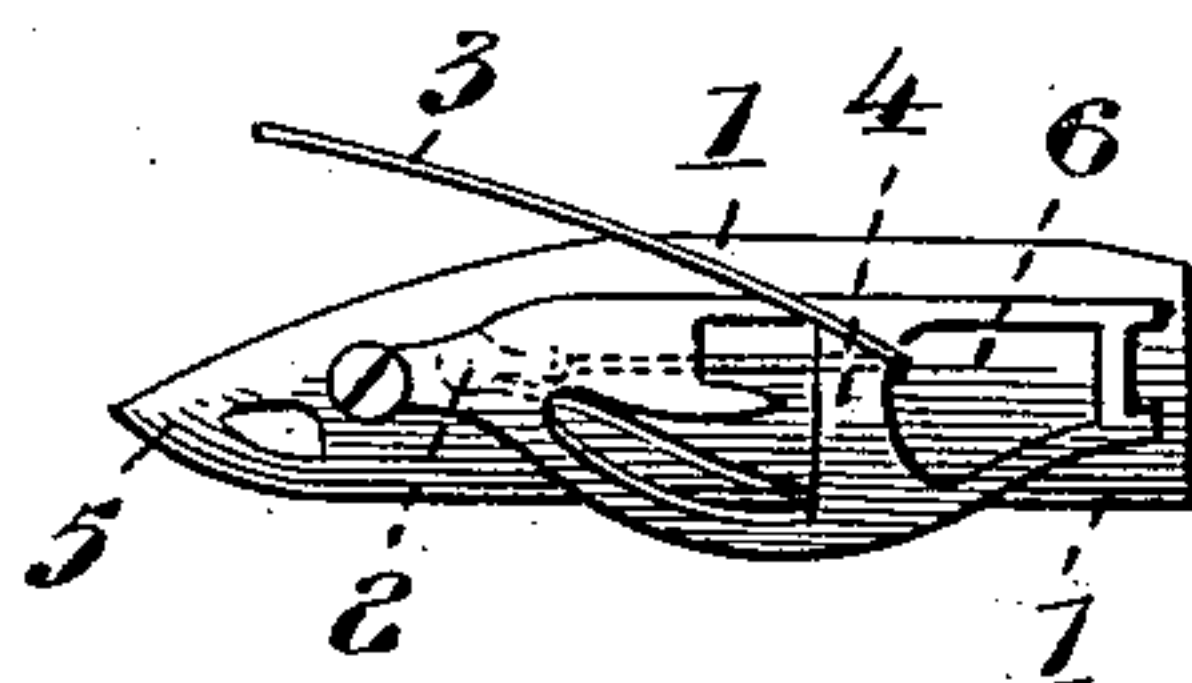
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

*J. F. Kinch.*  
*A. J. Tammes.*

INVENTOR

*William E. Trull*

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*A. W. Smith Jr.*

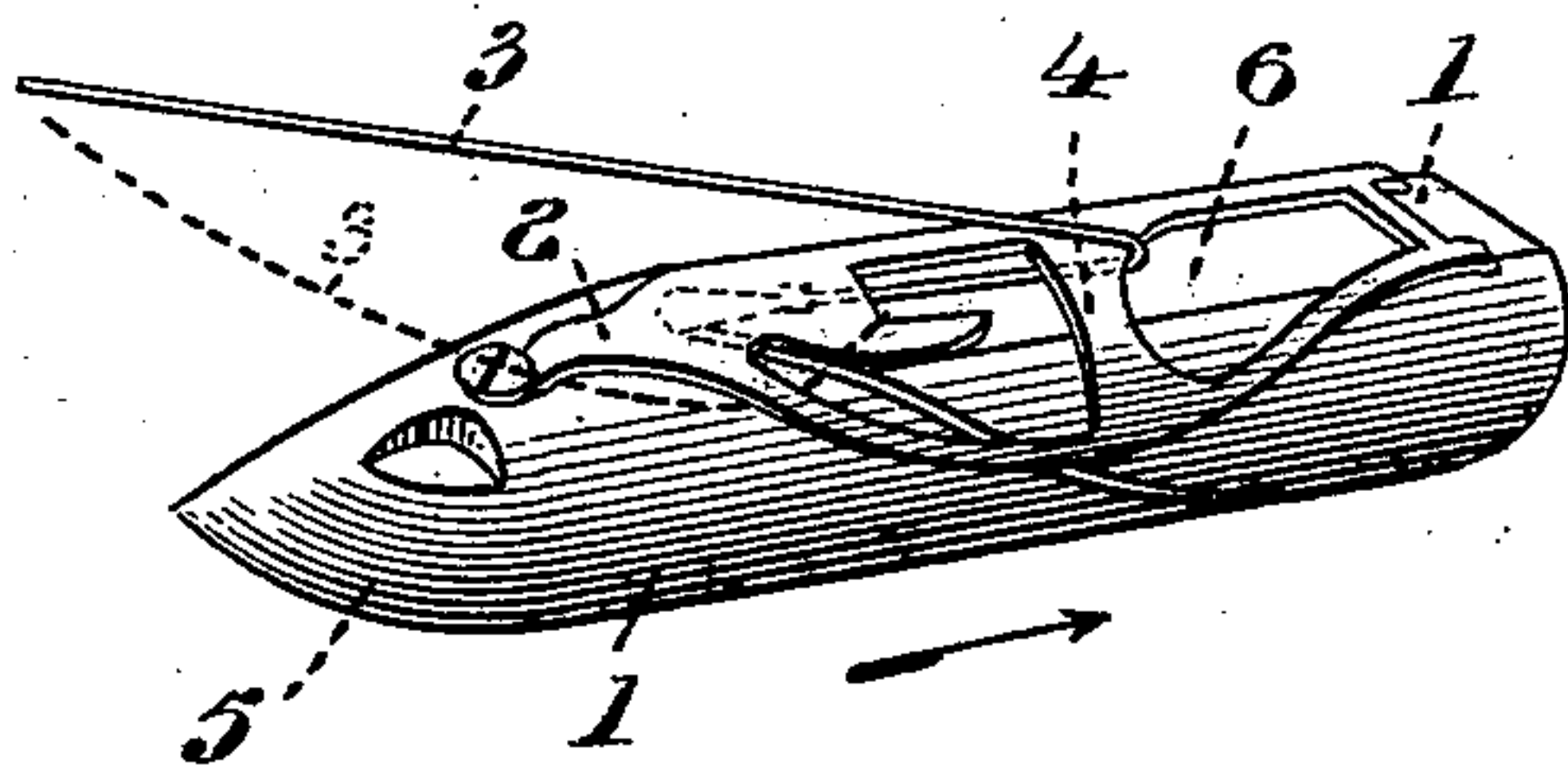
ATTORNEY

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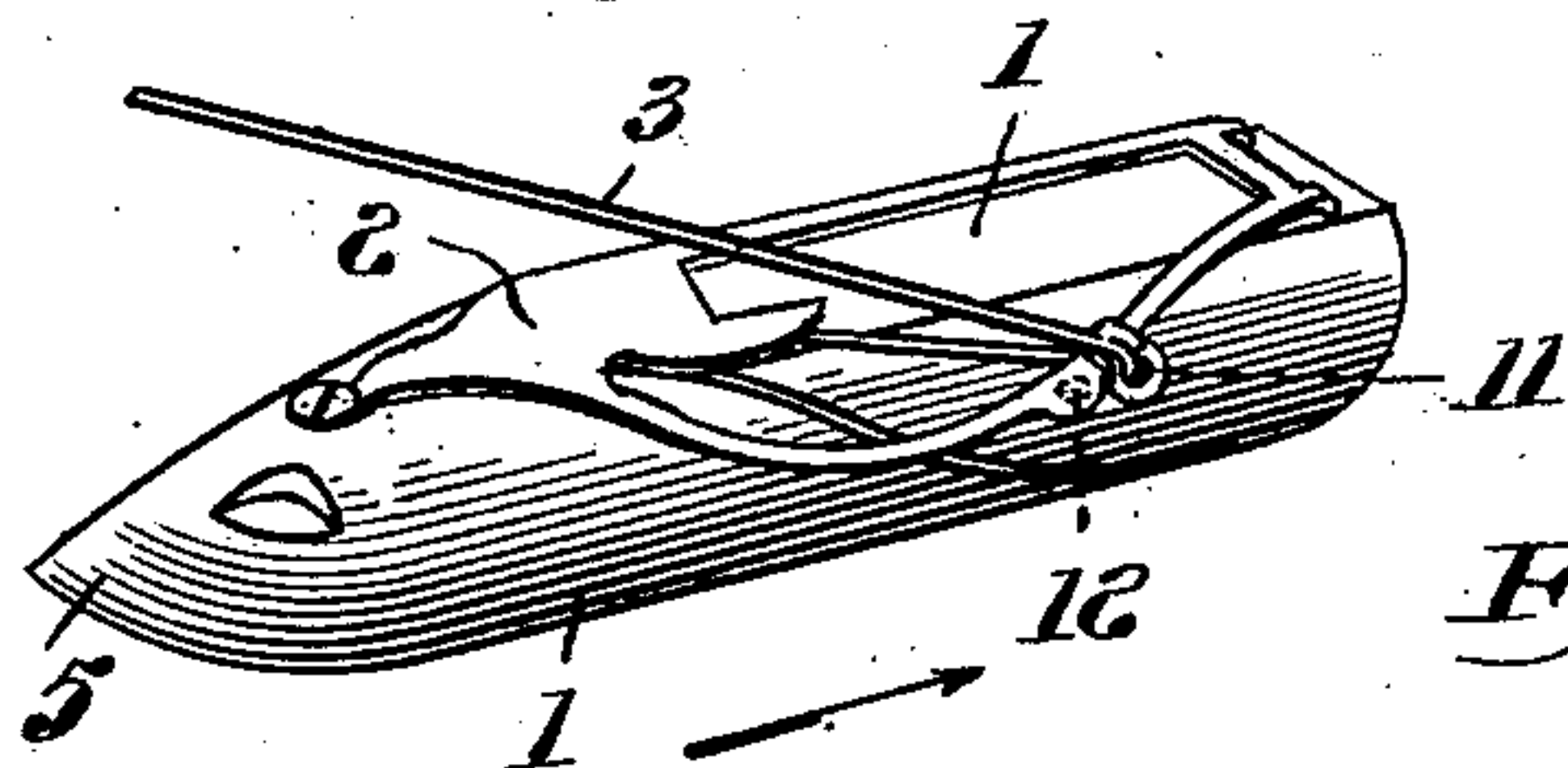
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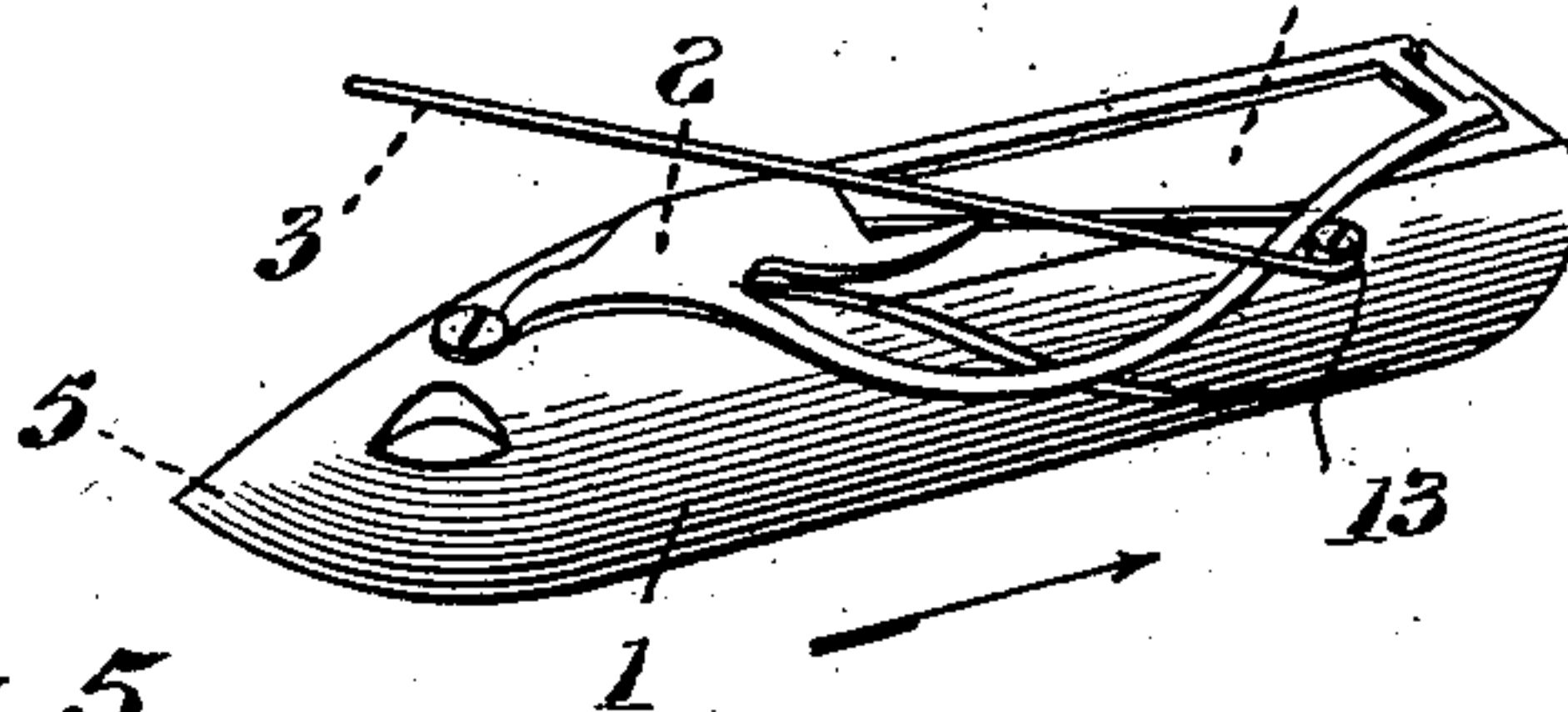
*Fig. 4.*



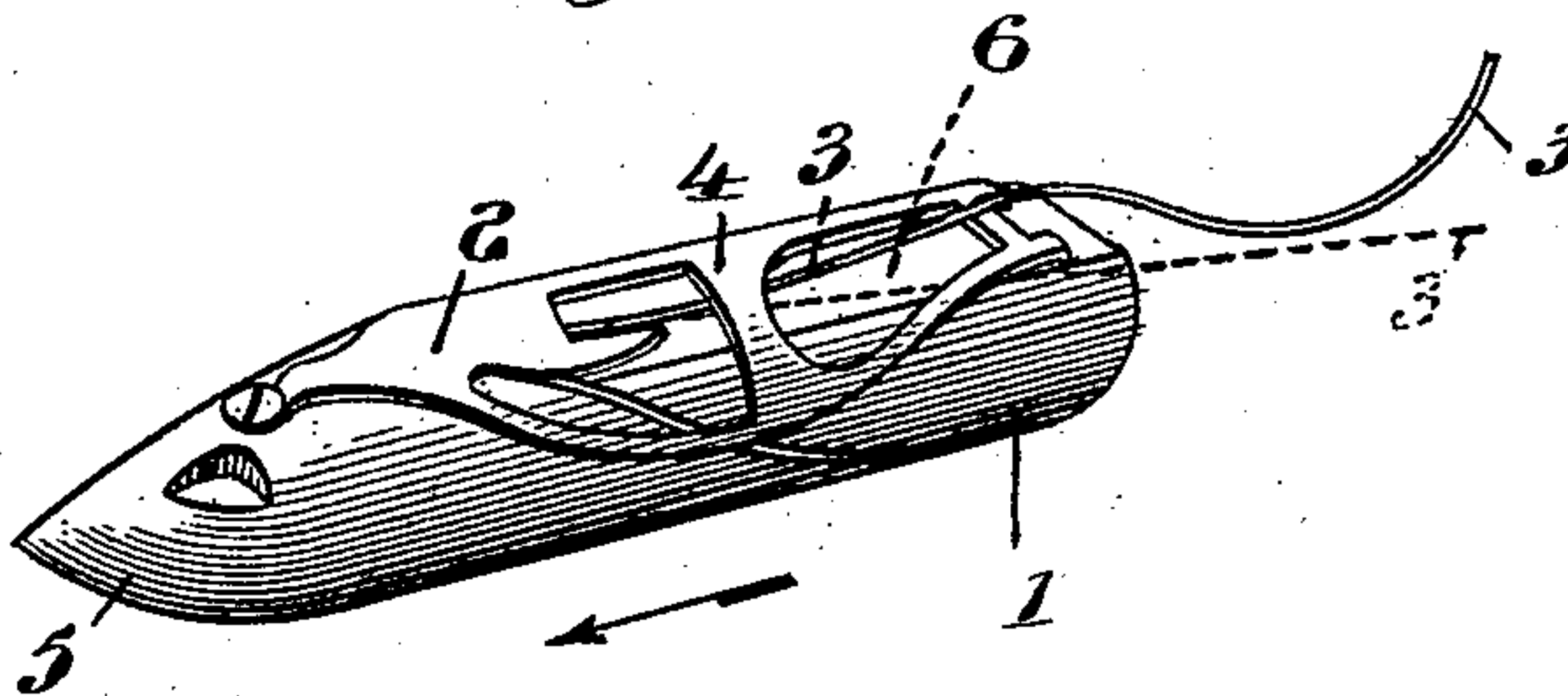
*Fig. 8.*



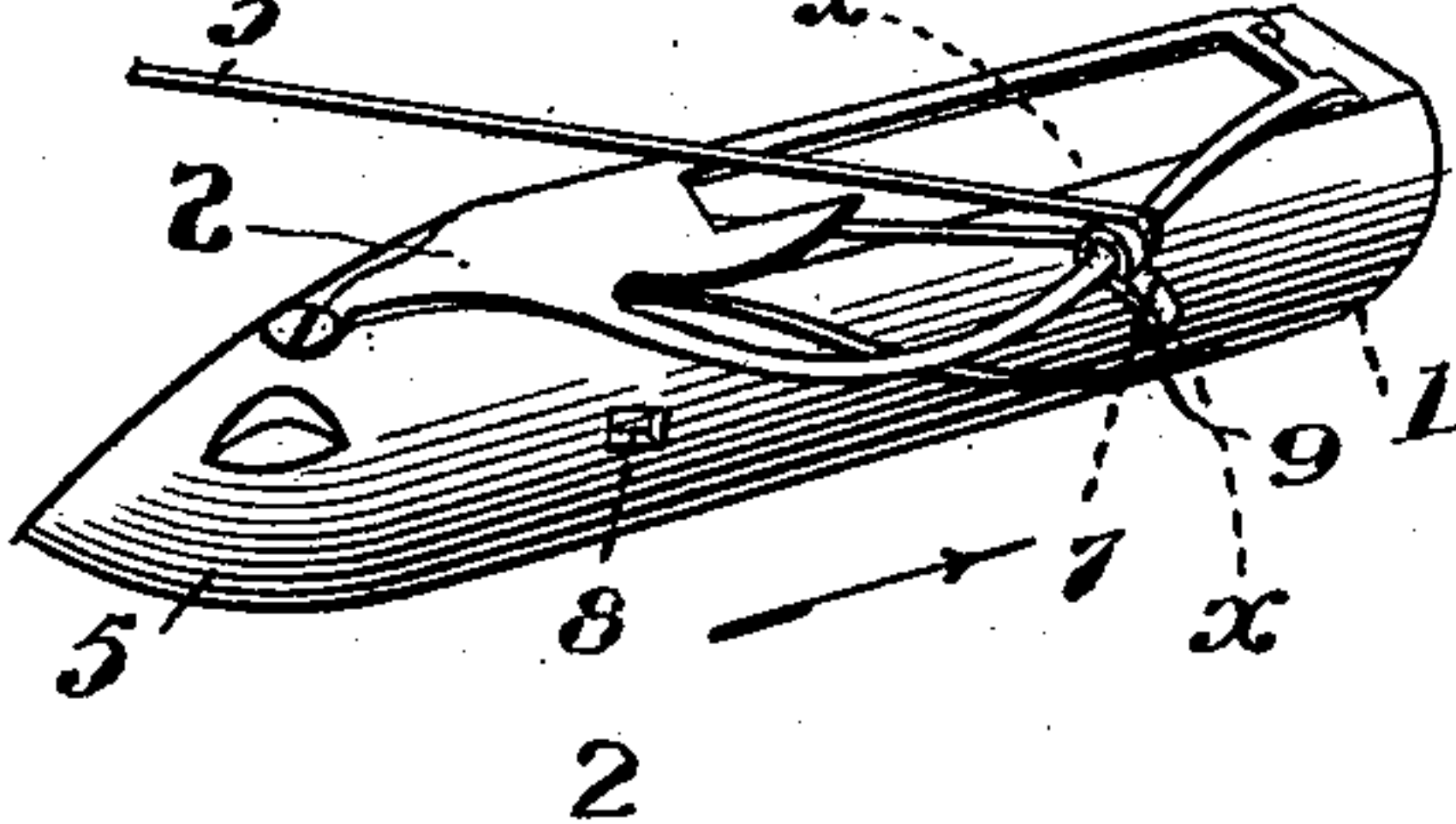
*Fig. 9.*



*Fig. 5.*



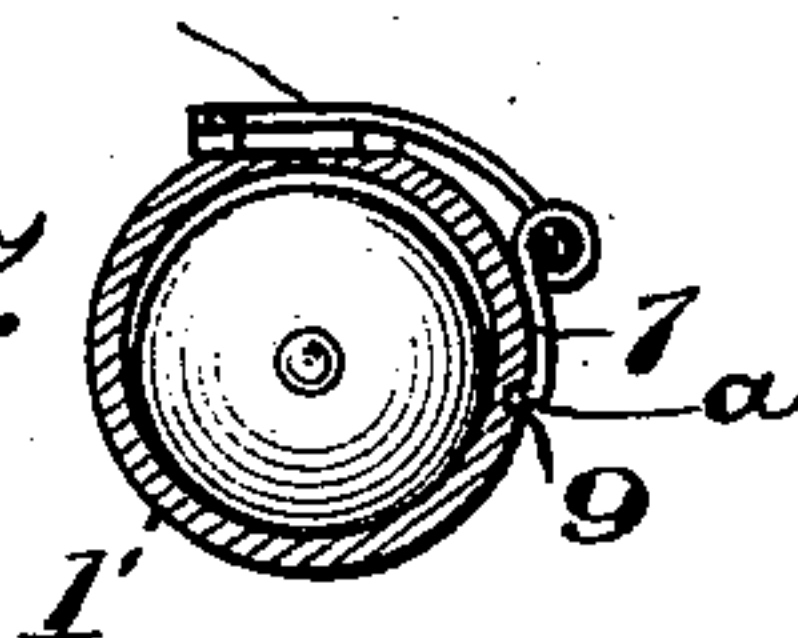
*Fig. 6.*



WITNESSES:

*J. Finch.*  
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*Fig. 7.*



INVENTOR

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# UNITED STATES PATENT OFFICE

WILLIAM E. TRULL, OF NEW YORK, N. Y., ASSIGNOR TO THE SMITH & EGGE  
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## SHUTTLE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 512,526, dated January 9, 1894.

Application filed July 1, 1893. Serial No. 479,382. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. TRULL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to sewing machines but more particularly has reference to button hole sewing attachments therefor.

In using button hole sewing attachments on a sewing machine, it is very desirable to draw up the under thread and to form the stitch lock on the upper face of the goods, in order to afford a purled edge to the button-hole, and in order to do this it has heretofore been necessary to loosen the tension of the bobbin thread. In plain sewing on a sewing machine the tensions on the upper and lower threads are regulated with great nicety, in order that the stitches may present a smooth appearance and at the same time to cause the locking of the threads to be effected on the under side of the goods without permitting the under or bobbin thread to show on the face of the goods. As a rule, the under tension is never disturbed owing to the fact that the ordinary operator in families never has occasion to do this, except in forming a purl as before set forth in stitching button-holes, and for the further reason that such operator is generally unable to properly adjust this tension, and is obliged to call in the services of a skilled person to put this tension in working order.

It is the object of my present invention to so equip the shuttle of a sewing machine, that, without any alternation in the tension, the sewing machine may be used at the will of the operator, for either plain sewing or for sewing button-holes with purled edges.

With these ends in view, my invention consists in a combination shuttle which may be used interchangeably for either plain or button-hole sewing, my invention comprising a simple addition to the ordinary shuttle in the nature of a shoulder against which the

bobbin thread will draw during the last part of the backward movement of the shuttle, in order that during such movement a surplus of thread will be drawn from the bobbin, which surplus is just enough to permit the under thread to be drawn up through the goods and to be locked on the upper face of the latter with the needle thread.

In the accompanying drawings—Figure 1 is a perspective showing a portion of the bed of the sewing machine, and the relative positions of the shuttle and needle during the last part of the backward movement of the shuttle, the latter being equipped with my invention; Fig. 2 a view similar to Fig. 1 but showing the position of the needle and shuttle when the latter is at the end of its forward movement; Fig. 3 a detail plan of a shuttle equipped with my improvement and showing particularly the position of the bobbin thread when drawing against the interposed shoulder; Fig. 4 a detail perspective on an enlarged scale, of the shuttle equipped with my improvement, and showing particularly the arrangement of the thread when drawing against the interposed shoulder at the end of the backward movement of the shuttle, and also showing in dotted lines the position which the thread assumes at this movement of the shuttle during ordinary plain sewing; Fig. 5 a view similar to Fig. 4, with the exception that the positions of the thread in button-hole and plain sewing are shown in connection with the shuttle at the limit of the extreme forward movement of the latter. Fig. 6 is a detail perspective of a shuttle equipped with a modified form of my improvement; Fig. 7 a section at the line  $x-x$  of Fig. 6, and Figs. 8 and 9 are perspectives of shuttles equipped with modified forms of my improvement.

Similar numbers of reference denote like parts in the several figures of the drawings.

1 is the body of an ordinary shuttle and 2 the tension plate thereof.

In plain sewing the bobbin thread 3 draws beneath this plate, and during the forward movement of the shuttle the line of draft of this thread is as is represented by dotted lines in Fig. 5, and during the backward movement of the shuttle, this thread in plain sewing is drawn beneath the plate in loose



condition. In other words, the thread drawn from the bobbin, in plain sewing during the forward movement of the shuttle is just enough for the purposes of concatenation and locking on the under side of the goods, so that no thread is drawn from the bobbin during the backward movement of the shuttle. In button-hole sewing, however, when it is desired to form a purled edge to the button-hole, it becomes necessary to use more of the bobbin thread, and accordingly I provide a shoulder 4, which, in the present instance as shown in Figs. 1, 2, 3, 4 and 5, is in the nature of a bridge connecting the sides of the plate 2 at or about the center thereof. The location of this shoulder is determined by experiment, since the nearer it is to the nose 5 of the shuttle the greater will be the slack in the thread to be taken up before the latter will draw against such shoulder, and it is necessary that only enough surplus thread should be drawn from the bobbin to allow for the change in location of the point where such thread interlocks with the upper or needle thread.

In utilizing the device shown in the first five figures of the drawings the shuttle is threaded in the usual manner for plain sewing and the bobbins thread drawn up through the opening 6 in the plate in the immediate rear of the shoulder 4, so that when the shuttle moves backward, such thread will become taut before the end of such backward movements is reached, the result being that during the latter part of such movement thread will be drawn from the bobbin, as clearly shown at Figs. 1 and 4. During the following forward movement of the shuttle the concatenation will take place in the usual manner, and when the shuttle has reached the limit of its forward movement, and immediately prior to the last end of the upward stroke of the needle bar, the thread from the bobbin will not be taut as is the case in plain sewing, but it will be slack, as shown at Figs. 2 and 5, this slack portion of such thread being drawn up through the goods and interlocked with the needle thread during the final upward stroke of the needle bar. It will thus be seen that, in carrying out my invention, I simply provide a shoulder which operates to tighten the bobbin thread before the end of the backward movement of the shuttle, and since there are various ways of doing this all of which would suggest themselves to a person of ordinary mechanical skill, I have shown a construction at Fig. 6 in which the bridge-like shoulder 4 is done away with, and in place thereof I have shown a small flat spring 7 around the edge plate and capable of sliding along the same, which spring bears resiliently against the body of the shuttle. Notches 8, 9 are formed within the shuttle body at predetermined points, and a small teat depends from the under side of the spring which engages with the notch 8 to hold such spring out of the way when it is desired to do plain

sewing, said teat engaging with the notch 9 to hold the spring in position to perform its function during the stitching of button-holes. It will be clearly understood that this spring, when engaged with the notch 9, will as effectually subserve the purposes of my invention as the shoulder above referred to.

There are other ways in which my invention may be carried out, but they all comprise auxiliary devices carried by the shuttle, the broad feature of which is a shoulder which has no function and does not interfere with the drawing of the thread during plain sewing, but which provides for a different manner of threading the bobbin thread during button-hole sewing and in the latter instance is opposed to the line of draft of the bobbin thread during the backward movement of the shuttle. For instance, a separate threading eye 11 might be secured to the edge of the plate as shown at Fig. 8, through which the bobbin thread would be passed when button-holes were to be stitched, or a perforation 12, to be utilized in like manner, might be made in the edge of the plate as is also shown by dotted lines in Fig. 8. Or a screw 13 might be driven within the shuttle body close to the edge of the plate as shown at Fig. 9 which would also insure the drawing of the thread from the bobbin during the last part of the backward movement of the shuttle.

I am aware that special shuttles have been made with a threading hole at a predetermined point from the nose of the shuttle, so that a surplus of thread may be drawn from the bobbin by giving to the shuttle a throw sufficient to carry said threading hole to a greater distance at the backward movement of the shuttle than at its forward movement. I do not wish to be understood as claiming any such construction of shuttle, wherein the bobbin thread is always delivered in one way and by the same devices, since such construction is incapable of use, as heretofore made, for both plain and button-hole sewing with the stitches locked respectively on the bottom and upon the top of the goods, without altering the under tension.

The distinguishing feature of my invention is the equipment of the shuttle to make it convertible for either plain or button hole sewing, so that by threading the shuttle in a slightly different manner in each instance I am enabled to perform plain sewing with the lock on the bottom of the goods, or button hole sewing with the lock on top of the goods, without any alteration in the lower tension.

All the modifications which I have shown and described merely show different ways of providing the shoulder against which the bobbin thread may draw during button-hole sewing, and in all instances this shoulder is perfectly independent of the construction which controls the bobbin thread during plain sewing with the stitch lock beneath the goods. In other words, there are two constructions carried by the shuttle, namely, one



for plain sewing with the lock beneath the goods, and the other for button-hole sewing with the lock on top of the goods, each of which constructions may be used at the will of the operator without changing the tension of the bobbin thread.

I claim—

1. In a sewing machine, a convertible shuttle for plain and button-hole sewing, the same comprising the usual tension plate secured to the shuttle whereby the bobbin thread is guided and delivered during plain sewing, and a shoulder carried by the shuttle at a predetermined point from the nose thereof and independent of said thread delivering devices, substantially as set forth.

2. A convertible shuttle for sewing machines, comprising the usual body portion and tension plate secured thereto, and a shoulder secured to said plate at a predetermined

point from the nose of the shuttle and out of the path of the thread in sewing with the lock on the under side of the goods, the bobbin thread being manipulated and drawn behind said shoulder whereby during the backward movement of the shuttle a surplus of thread will be drawn from the bobbin to effect the locking of the stitch on the upper side of the goods, substantially as set forth.

3. The combination of the shuttle with the tension plate having a shoulder formed integral therewith and bridging the space between its sides at a predetermined point, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM E. TRULL.

Witnesses:

L. S. HEATH,

F. W. SMITH, Jr.