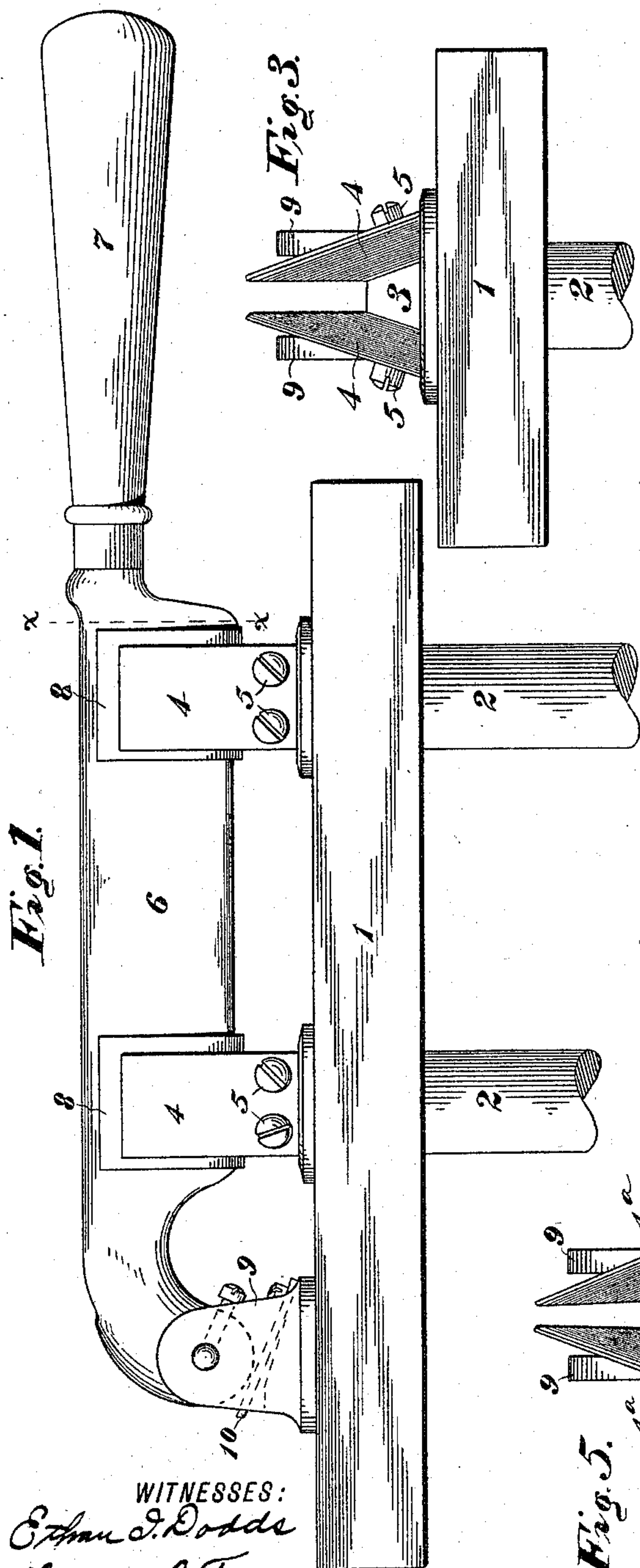


(No Model.)

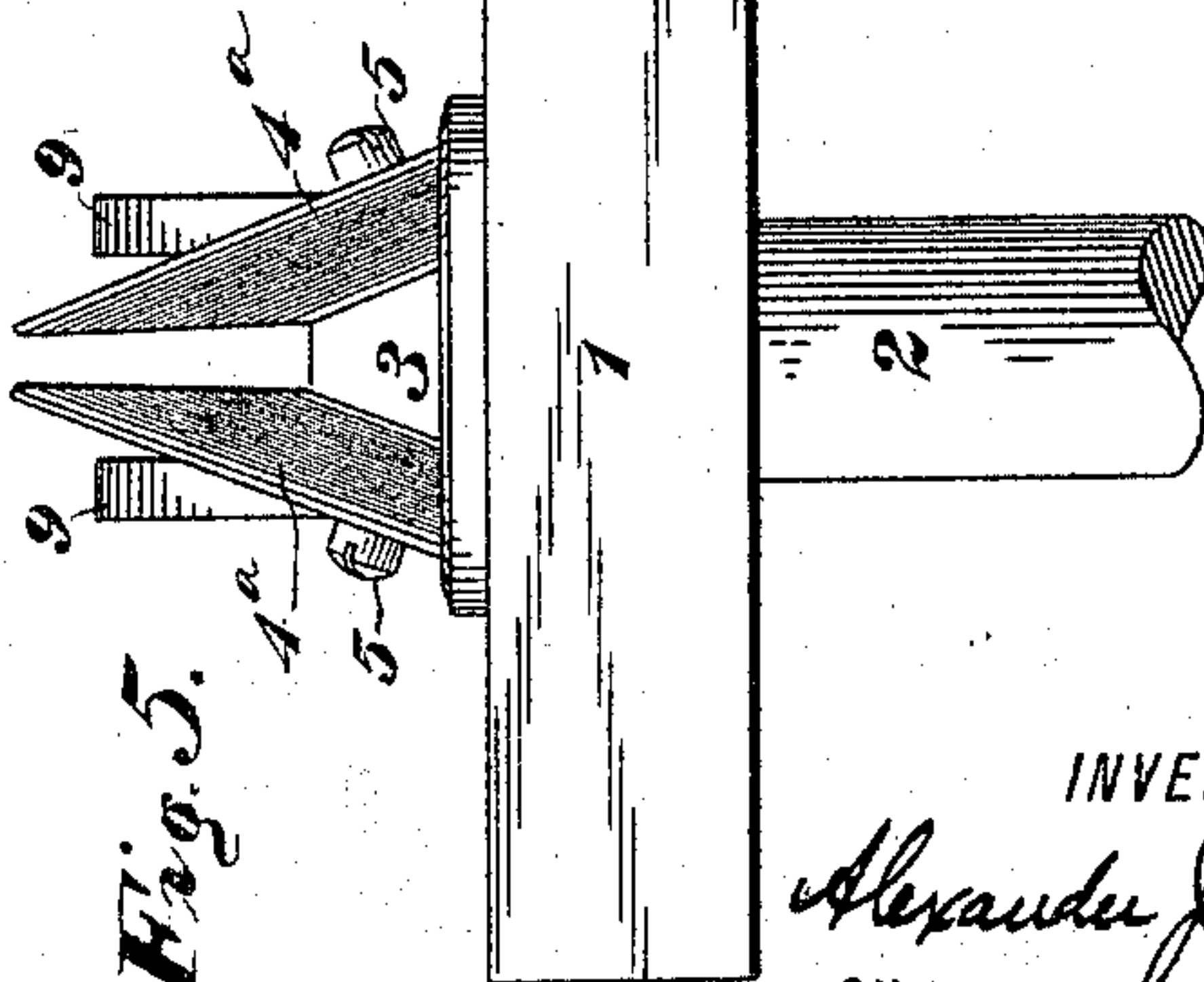
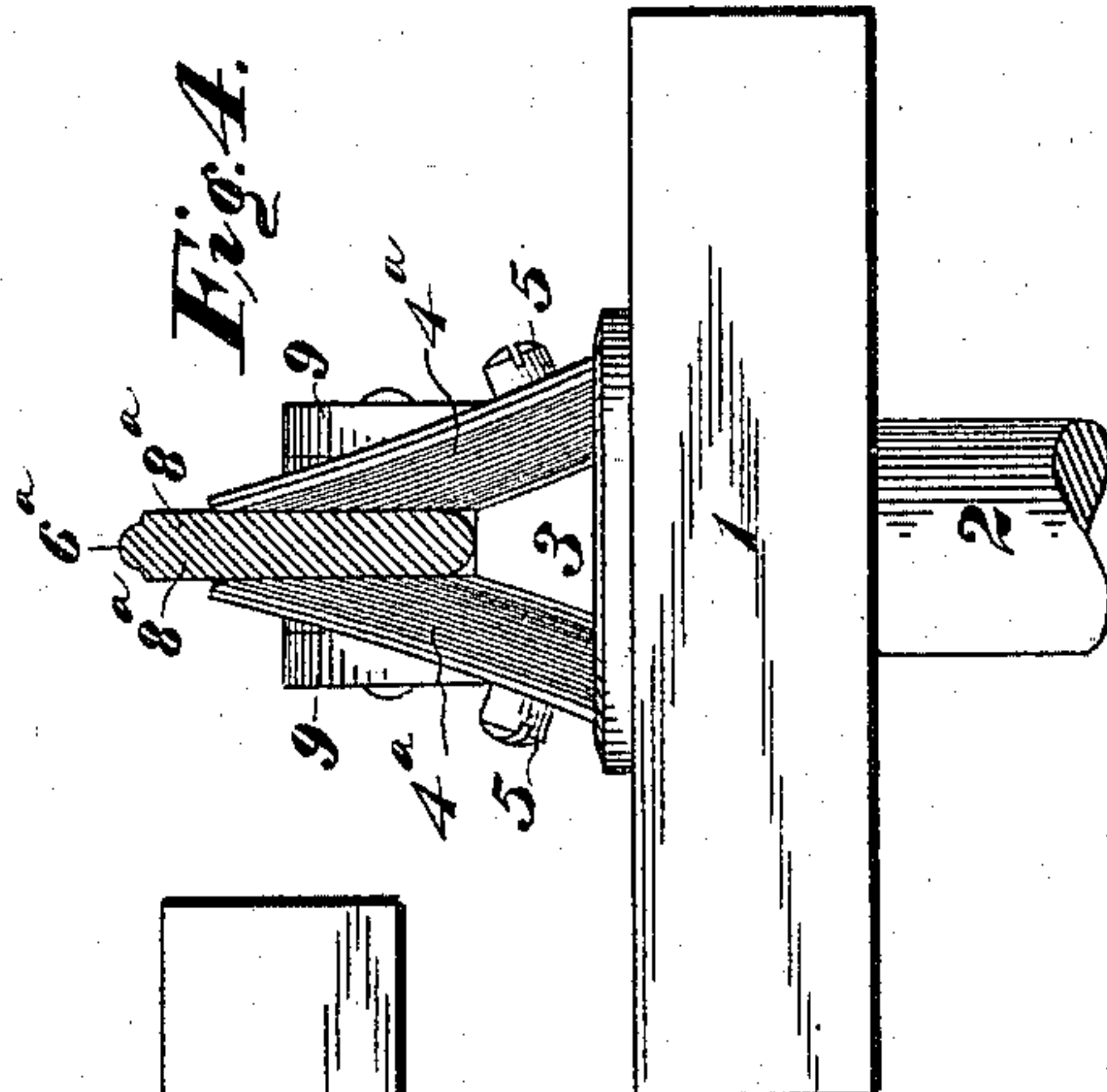
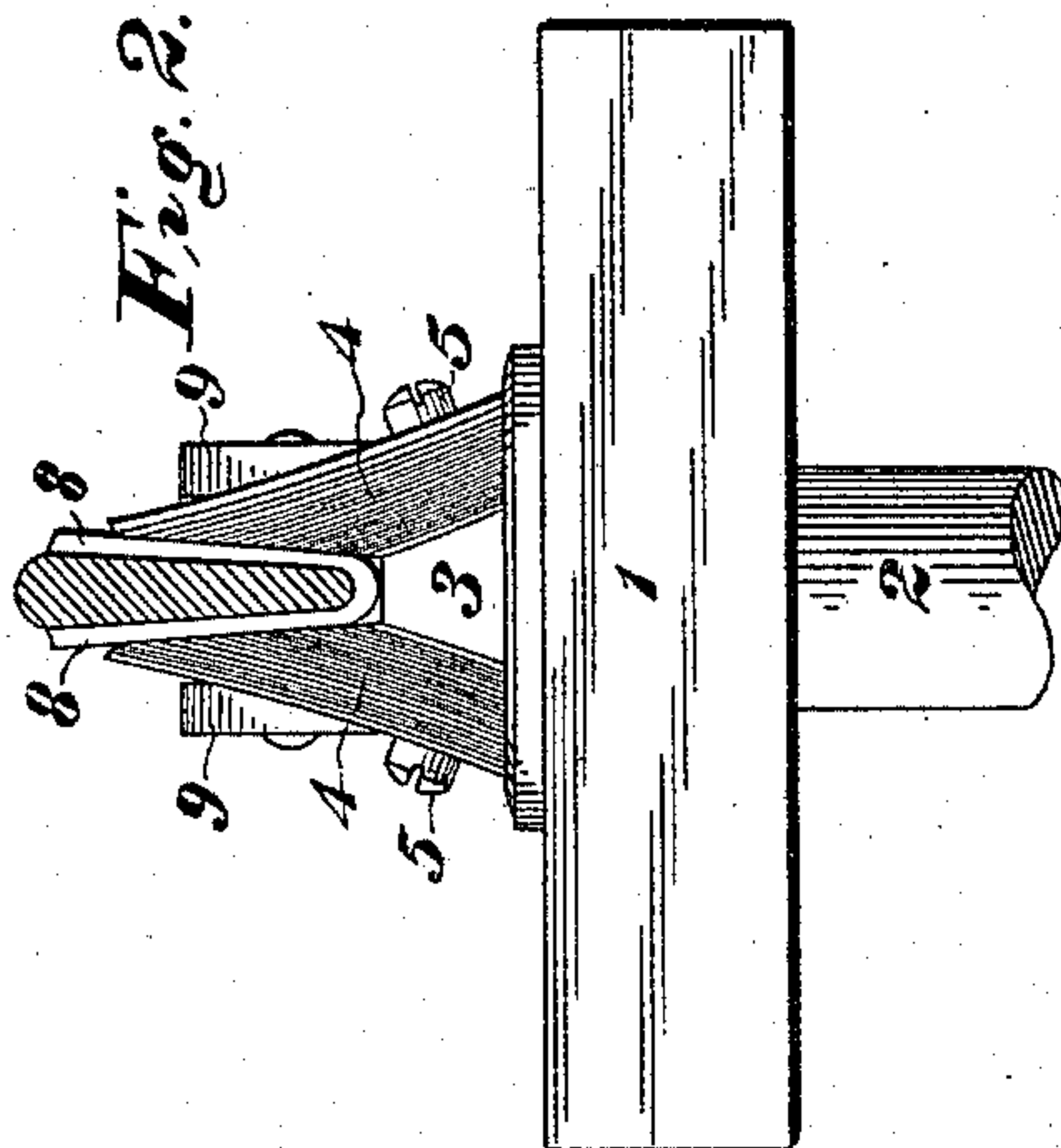
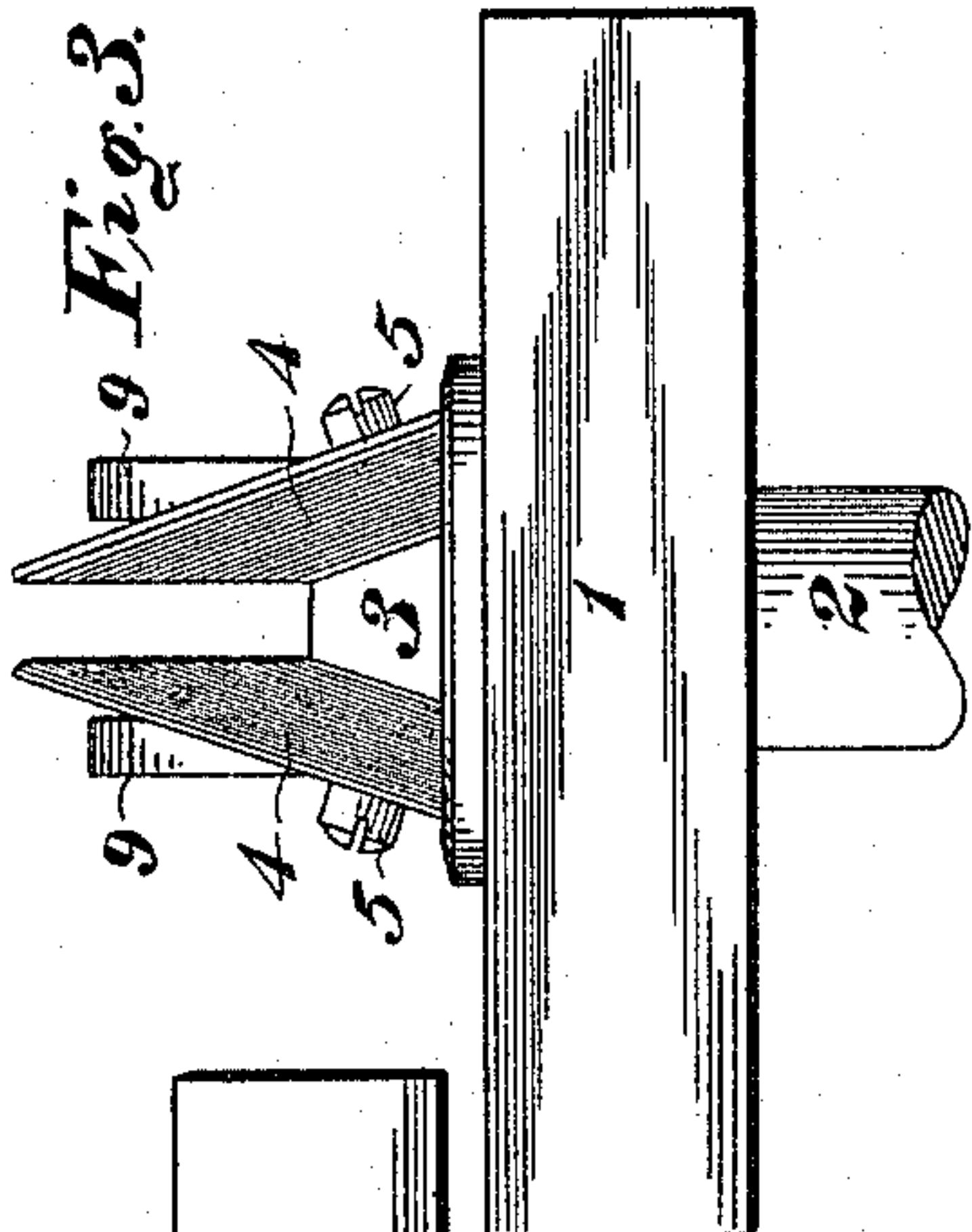
A. J. WURTS.
SWITCH FOR ELECTRIC CIRCUITS.

No. 582,111.

Patented May 4, 1897.



WITNESSES:
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UNITED STATES PATENT OFFICE.

ALEXANDER JAY WURTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
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SAME PLACE.

SWITCH FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 582,111, dated May 4, 1897.

Application filed November 14, 1896. Serial No. 612,113. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER JAY WURTS, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Switches for Electric Circuits, (Case No. 720,) of which the following is a specification.

My invention relates to that class of switches for electric circuits in which the circuit is opened and closed by the movement of a blade or blades between stationary jaws which are mounted upon or connected to the terminals of such circuit. In devices of this character which are intended to be opened or closed by hand it is desirable that there should be sufficient friction between the blades and jaws to retain the switch in closed position until such time as it is desired to open it. It is also important that a good electrical contact should be made between the two parts of the switch over as great a surface as possible, in order that the switch may not introduce a resistance into the circuit and thereby cause undue heating.

Heretofore it has been the usual practice in the construction of jaw-switches to form each side of the jaw of a spring-plate which is preferably slit so as to form a plurality of fingers extending nearly or quite throughout the length of the contact portion of the blade. It is found in practice, however, that even with this arrangement it is difficult to obtain a uniform contact throughout the entire surface of the blade, and in switches of large size the accurate adjustment of the parts necessary for securing a uniform contact between their engaging surfaces involves a very considerable expenditure of time and labor.

The object of my present invention is to provide a switch of this general character in which the jaws may be constructed without any special care as to their adjustment and which shall make a uniform and perfect contact with the blade when the latter is inserted between them.

In the accompanying drawings, Figure 1 is a side elevation of a switch constructed in accordance with my invention. Fig. 2 is a sectional view of the switch, taken on line $x x$ of Fig. 1. Fig. 3 is an end elevation of the switch, the blade being omitted. Figs. 4 and

5 are views corresponding, respectively, to Figs. 2 and 3 and illustrate a modification.

Reference being now had to Figs. 1, 2, and 3 of the drawings, 1 is the insulating base-plate of the switch, which may be a panel of a switchboard, and 2 are the back terminal studs, which extend through the base-plate, and each of which is rigidly connected to or forms an integral part of a metal block 3, which constitutes a part of one of the stationary contacts of the switch.

4 are bundles of thin copper plates, the inner ends of which are preferably either soldered together or united by means of an amalgam paste. The inner ends of these plates also abut against the outer face of the laterally-extending portion of the block 3 and are clamped together and to the sides of the wedge-shaped outer portion of the block 3 by any suitable means, screws 5 being shown for this purpose in the drawings. These bundles of plates may also be joined to the block 3 by means of solder or amalgam. The outer free ends of the plates of each bundle lie in a plane which is substantially perpendicular to the base-plate and constitute a contact face or surface with which the corresponding side of the movable blade engages. The angle which these contact-faces make with the planes of the individual plates or laminae is not of vital importance provided it is less than ninety degrees, but an angle of not more than thirty degrees is desirable in practice. The angle of about twenty degrees shown in the drawings has been found to give very satisfactory results. The width of the space between the contact-faces of the jaw will obviously be determined by the thickness of the blade designed to enter such space.

While I have shown the two members of each jaw as opposite each other, it will be apparent to any one skilled in the art that they may be otherwise arranged, provided their inner faces are so placed as to be engaged by the corresponding faces of the movable blade.

The movable member of the switch comprises a blade 6 and a handle 7, the latter being of any convenient form and constructed of insulating material. The blade 6 is provided with contact portions 8, of wedge shape, which are thicker than its other portions. This extra thickness of the contact portions

is not essential, but is employed in order to avoid machining the entire blade and at the same time provide a device which is pleasing and attractive in appearance. The blade 6 is pivoted at one end in a block 9 and the latter is provided with a spring-plate 10, which serves as a yielding stop for the blade when the latter is thrown backward away from the stationary contacts. The minimum thickness of the contact portions 8 of the blade is either equal to or a little greater than the space between the contact-faces of the jaws, in order that the ends of the plates may be engaged successively, beginning with the outermost ones and lifted slightly, one at a time, from their normal positions in the operation of closing the switch.

It is obvious that two blades connected by a bridge may be employed in lieu of the single blade shown, if desired, such a construction being an alternative arrangement well known in the art.

It will be understood from the foregoing description that when the portions 8 of the blade 6 are inserted in the jaws the free end of each plate of each bundle will engage with the corresponding side of the blade and be pressed slightly outward, thus making intimate contact between the blade and each plate independently of any irregularity in the contact-surfaces.

It will be seen that each contact portion of each plate moves in the arc of a circle when deflected from its normal position and that a close contact between the same and the engaging positions of the movable blade will therefore be effected whether the latter are plane or slightly concave surfaces, provided they are inclined outwardly, as indicated in the drawings.

In the modification shown in Figs. 4 and 5 the parts are of the same construction as those shown in the other figures and are designated by the same reference-numerals, with the exception of the laminated jaws and the switch-blade. In this modification the contact-faces of the jaw members 4^a are separated by a wedge-shaped space, the outer portion of which is narrower than the inner portion. The faces of contact portions 8^a of the blade 6^a are parallel, and the thickness of these portions is either equal to or a little greater than the width of the widest portion of the space between the contact-faces of the laminated jaws. It will be understood that the operation of this modification and the results attained are substantially the same as those already described, since in both forms the ends of the laminæ are deflected by reason of the fact that they lie in the path of movement of the corresponding contact-face of the blade and that the engaging surfaces are inclined slightly toward each other.

I do not intend to limit my invention to contact-jaws composed of plates having the same width as the jaws, since the individual conductors may be materially different from

those shown, both in form and dimensions, provided they are thin enough to be flexible. I desire it to be also understood that both the blade and the space between the jaw members may be made of wedge shape, and that the engaging surfaces of the two members of the switch may be respectively concave and convex, without departing from the spirit and scope of my invention.

I claim as my invention—

1. The combination with a supporting-base, and a movable blade, of a pair of stationary terminals each of which is provided with a jaw consisting of two inclined bundles of conductors the free ends of which terminate in planes which are inclined with reference to the cooperating contact-faces of the blade and the maximum distance between which does not exceed the minimum thickness of the contact portions of the blade, whereby said ends are engaged and deflected successively by the blade in closing the switch.

2. The combination with a supporting-base, and a movable blade having a wedge-shaped contact portion, of a stationary jaw-terminal comprising two bundles of conductors which are inclined toward each other and the free ends of which are located in parallel planes the distance between which is equal to or slightly less than the minimum thickness of the contact portion of the switch-blade, whereby said ends are engaged and lifted successively by the blade in closing the switch.

3. A switch for electric circuits comprising a jaw and a blade cooperating therewith, said jaw comprising two bundles of conductors inclined with reference to each other and to the plane of movement of said blade the free ends of which constitute contact-surfaces which are slightly inclined with reference to the cooperating surfaces of the blade and are separated by a space the maximum width of which does not exceed the minimum thickness of the contact portion of the blade whereby the free ends of said conductors are in position to be engaged and lifted successively by the blade as the switch is closed.

4. A switch for electric circuits comprising a blade and a cooperating jaw consisting of a pair of bundles of laminæ projecting outwardly from their support toward each other and terminating in planes which are inclined with reference to the cooperating surface of the blade and which are separated by a space the maximum width of which is equal to or slightly less than the minimum thickness of the switch-blade, whereby the free ends of the laminæ will be successively engaged and slightly moved, one at a time, from their normal positions by the blade.

In testimony whereof I have hereunto subscribed my name this 12th day of November, A. D. 1896.

ALEXANDER JAY WURTS.

Witnesses:

WESLEY G. CARR,
HUBERT C. TENER.