

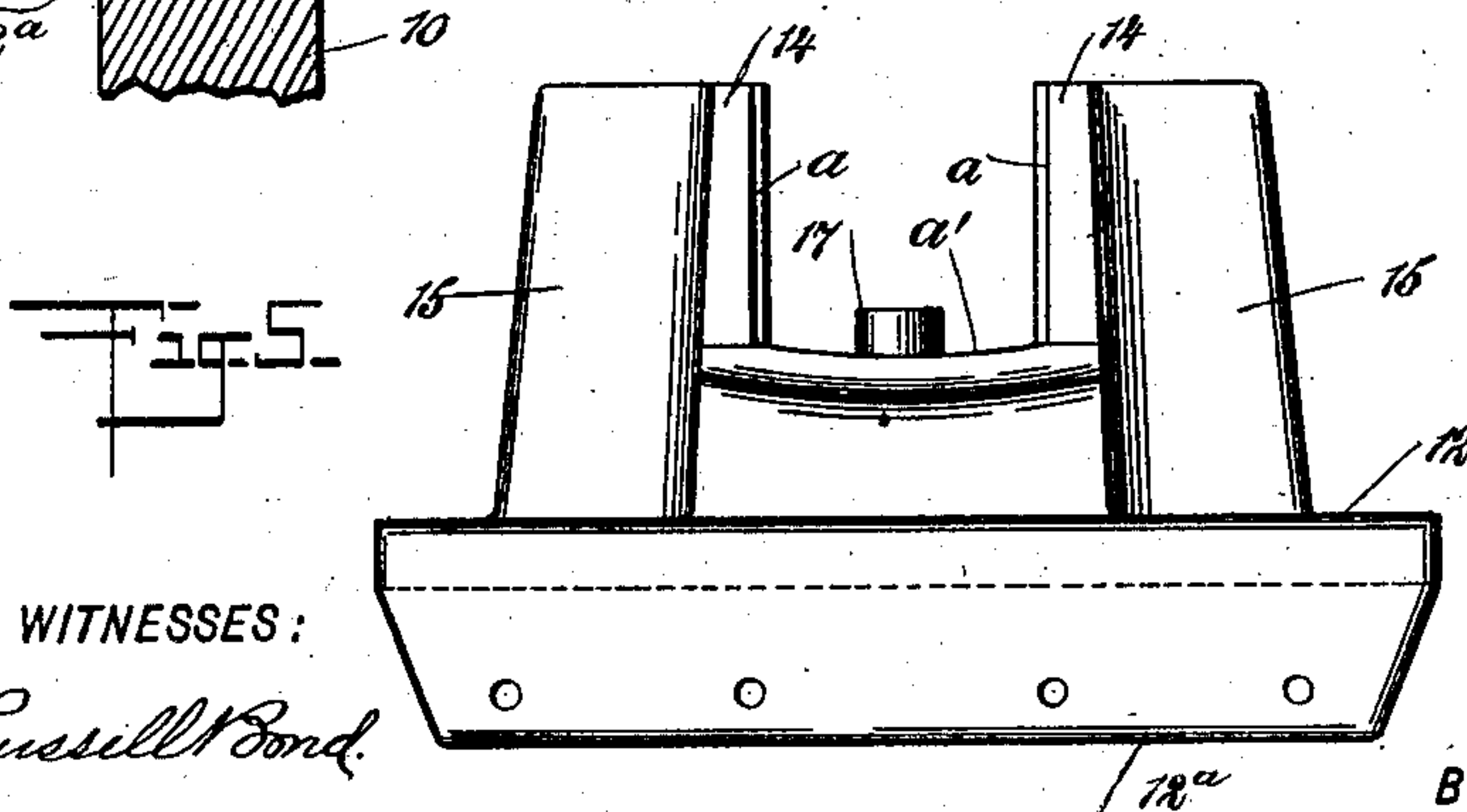
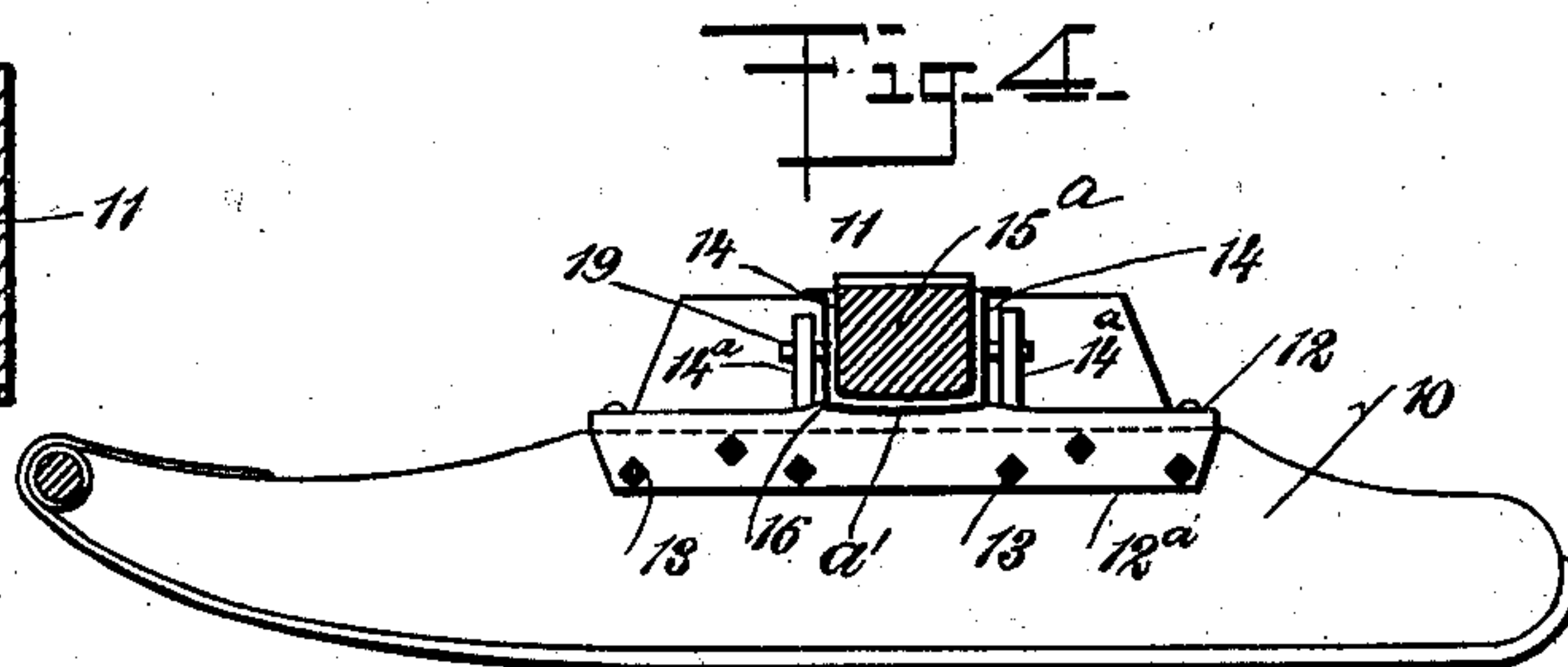
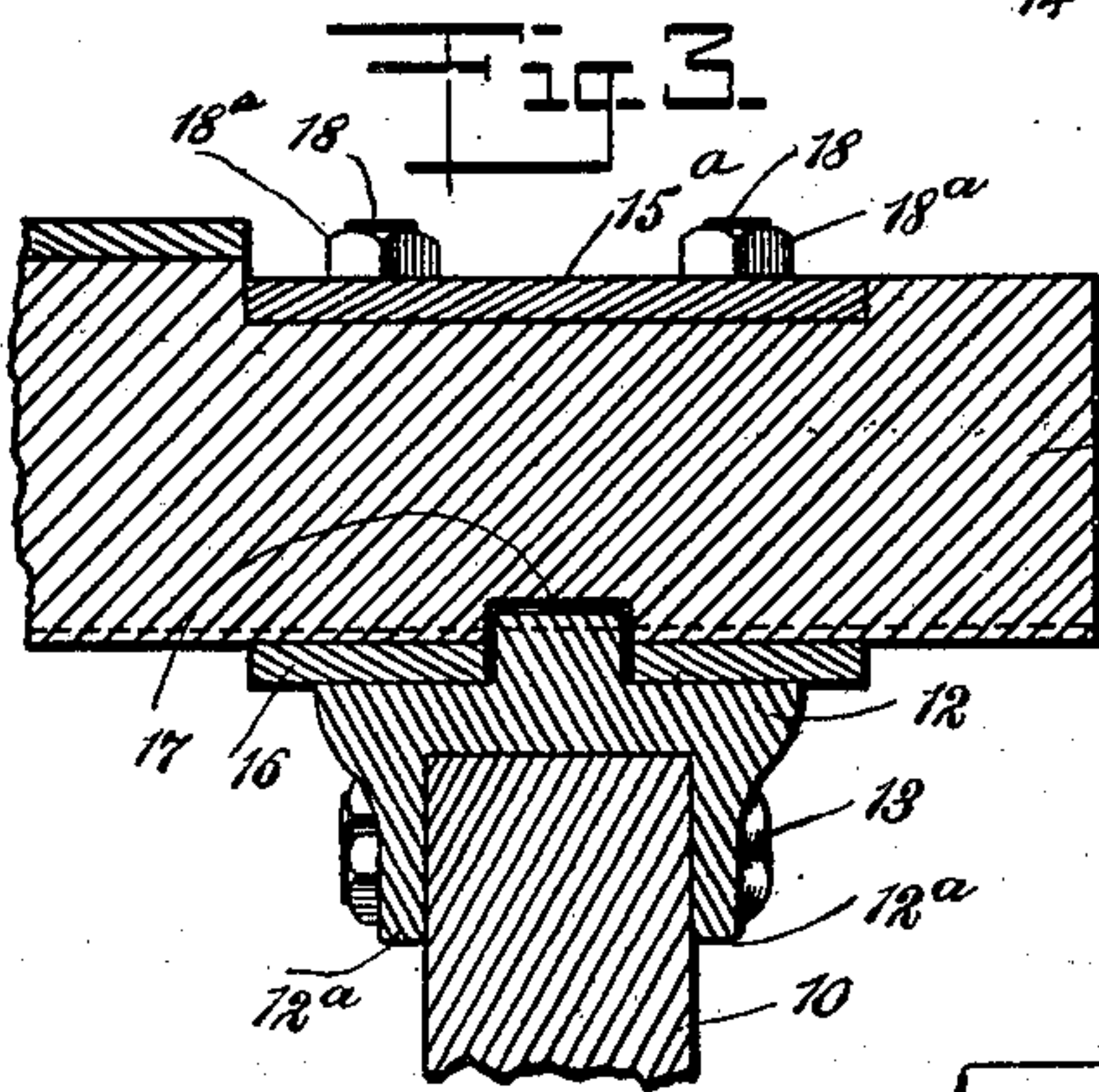
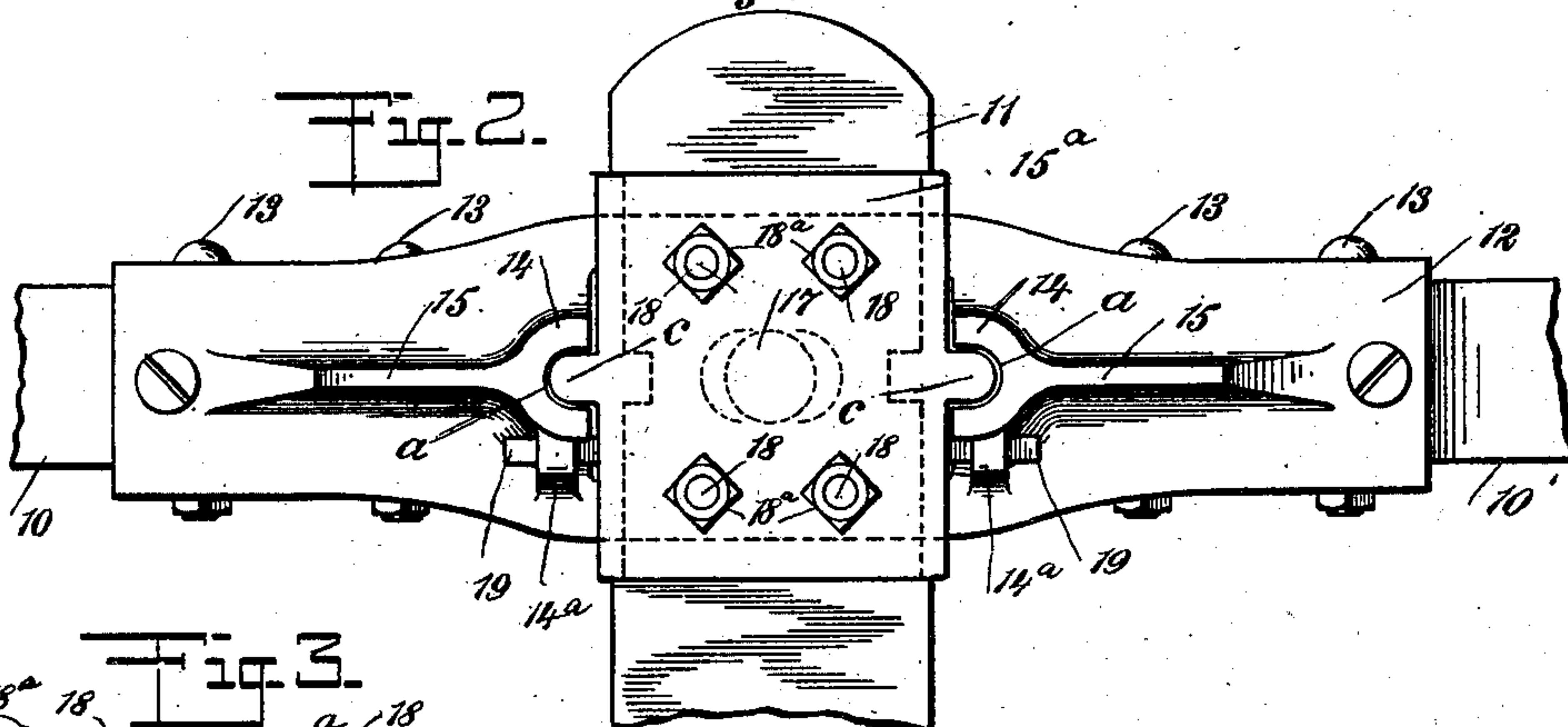
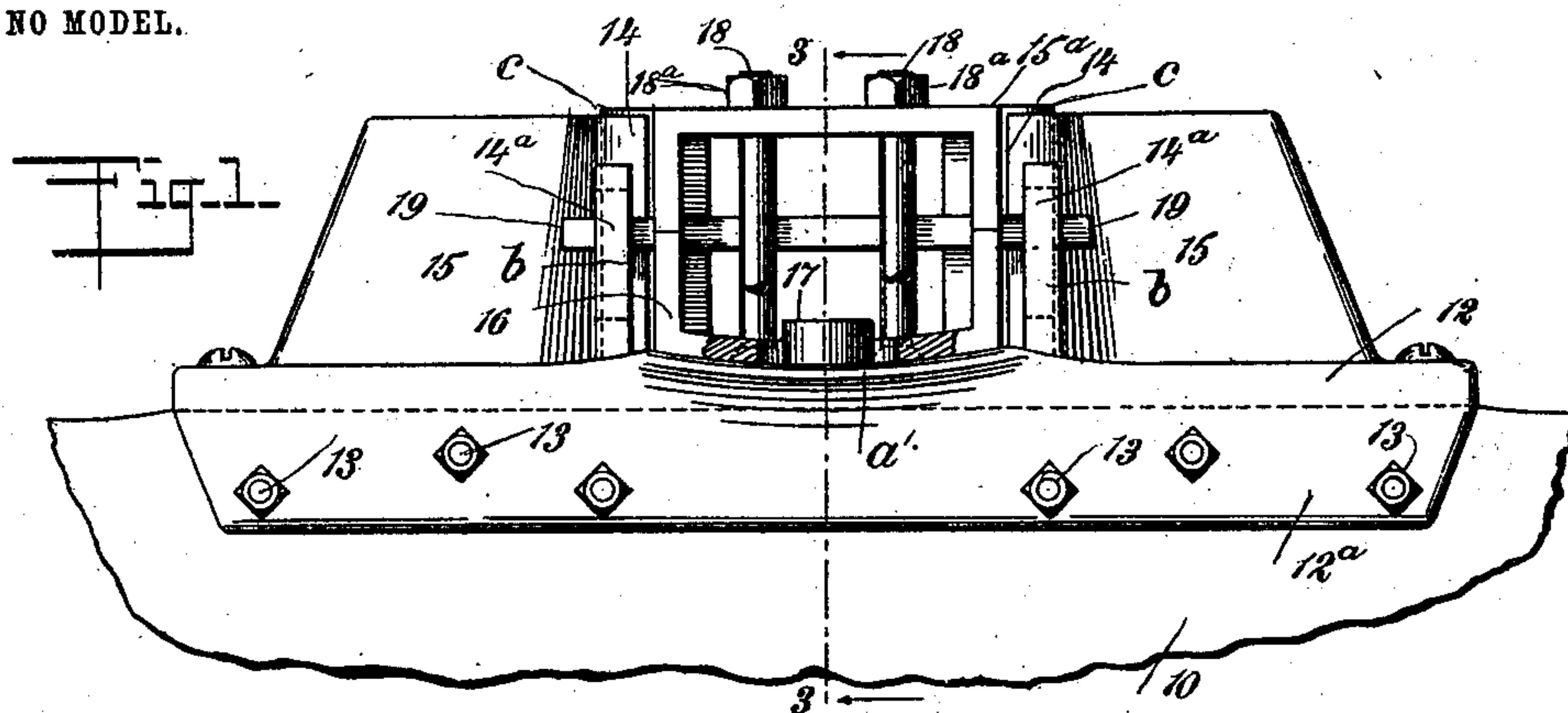
No. 725,502.

PATENTED APR. 14, 1903.

F. O. STARK.
SLED KNEE.

APPLICATION FILED OCT. 15, 1901.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK OSCAR STARK, OF DEER RIVER, MINNESOTA.

SLED-KNEE.

SPECIFICATION forming part of Letters Patent No. 725,502, dated April 14, 1903.

Application filed October 15, 1901. Serial No. 78,715. (No model.)

To all whom it may concern:

Be it known that I, FRANK OSCAR STARK, a citizen of the United States, and a resident of Deer River, in the county of Itasca and State of Minnesota, have invented a new and Improved Sled-Knee, of which the following is a full, clear, and exact description.

The object of this invention is to provide a knee of novel construction which in duplicate affords a reliable connection for the cross-beam of a bob-sled or other sled or sleigh with the sled-runners, so as to permit a slight rocking movement and vertical play of the beam, to facilitate the starting of a loaded sled, and, furthermore, to permit the necessary play between two bob-sleds and the body of the vehicle in running over undulations of the road-bed.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an inner side view of the improved knee applied upon a sled-runner, the runner portion shown being intermediate of the ends thereof and the transverse beam being omitted. Fig. 2 is a plan view of the improvement on a sled-runner in part and engaged with an end of the cross-beam of a sled. Fig. 3 is a transverse sectional view substantially on the line 3-3 in Fig. 1. Fig. 4 is a reduced inner side view of a bob-sled runner and the improved knee secured on the top edge of the runner and engaged with the cross-beam, the latter being shown in transverse section; and Fig. 5 is an enlarged side view of the body-iron of the improved knee.

In the drawings, 10 indicates one of the bob-sled runners, which in pairs joined together by a transverse beam 11 form the half portion of the running-gear of a long sled used for transportation of heavy loads during winter months when snow prevails.

It has been found in practice that it is quite advantageous to confer a suitable degree of yielding movement to the knee connections

that intervene the runners of a bob-sled and the beam which connects them together, as it enables the draft-animals to overcome the inertia of a heavy load on starting with greater ease than can be effected when the runners are rigidly affixed upon the sled-beam.

Another benefit afforded by a slightly-yielding but reliable connection between the runners and cross-beam of the bob-sled is that impediments to progressive movement, due to abrupt undulations in the road-bed or other roughness thereon, are more readily overcome when the improvements are applied to a sled or sleigh the construction of which will now be specifically described. As each knee of a sled is the same in construction, the description of one will answer for a pair.

The body-iron of the knee consists of an elongated base-piece 12, longitudinally channeled on the lower side, thus providing two similar depending side flanges 12^a, so spaced apart as to receive the top edge of the runner 10 at a proper point intermediately of its ends, and the body-iron is secured on the runner by transverse bolts 13, which pass through the flanges 12^a and the runner, as indicated in the drawings.

Two upright jaws 14 are formed on the base-piece 12 and are stiffened in connection therewith by the integral webs 15, said jaws, which are suitably separated, having their inner surfaces oppositely grooved, as shown at *a* in Fig. 2. At the inner sides of the two upright jaws 14 a wing 14^a is projected outwardly from each jaw and a vertical slot is formed in each wing, as indicated by dotted lines at *b* in Fig. 1. The grooves *a* may with advantage have concave bottom walls and, as shown at *a'* in Figs. 1, 4, and 5, the top surface of the base-piece 12 is slightly concaved between the jaws 14.

A box of substantially rectangular form is provided to occupy the space between the upright jaws 14, and the said box comprises two half-sections 15^a 16, that have engagement in horizontal planes with the cross bar or beam 11. The sectional box at each side thereof where it loosely engages the inner faces of the upright jaws 14 is provided with ribs *c*, that are projected oppositely therefrom, said ribs

loosely engaging within the grooves *a* of the jaws 14. The lower section 16 of the two-part box is convexed on its lower surface to conform with the seat *a'* therefor between the jaws 14.

A detent-pin 17 projects up from the seat *a'* at its center and has loose engagement within a corresponding socket *a''*, formed in the bottom wall of the lower box-section 16, as shown clearly in Fig. 3.

The end walls of the two-part box 15^a 16 extend a short distance beyond the side edges of the base-piece 12, and in said box an end of the transverse beam 11 is neatly fitted, said portion of the beam being held in place by the stud-bolts 18, which are erected upon the bottom wall of the lower box-section 16, pass through vertical perforations in the beam, and then project through aligned perforations in the top wall of the upper box-section 15^a far enough to receive nuts 18^a, that bind the box-sections upon the beam.

A keeper device which reinforces the engagement of the ribs *c* within the grooves *a* is provided and preferably consists of a bar 19, which passes tightly through the beam 11 and loosely engages the upright wings 14^a, passing through the vertical slots *b* therein.

It will be evident that the loose engagement of the detent-pin 17 with the socket in the bottom of the box-section 16 will permit a rocking movement of the box in the jaws 14, as well as an upward movement of the box and beam 11, the raising of the beam being controlled by the keeper-bar 19 in an obvious manner.

It will be seen that the bar 19 may be dispensed with, if preferred, and projections be formed or secured oppositely on the box-sections 15^a or 16 to loosely engage with the slotted wings 14^a.

Assuming that both runners of a bob-sled have the improved knees secured thereon and the transverse beam 11 mounted and held in the box-sections 15^a 16, as explained, it will be obvious that the beam may yield rearwardly a limited degree and also rock slightly, and as the like beams of two bob-sleds are secured upon the bottom timbers of an elongated sled-body (not shown) at a proper distance apart it will be seen that each bob-sled while held from lateral play on the body of the sled will be permitted to slightly rock from a normal horizontal plane and also yield sufficiently in a rearward direction to permit load strain to be overcome without sudden jar on the animals pulling the sled.

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

1. A knee for a sled or the like, comprising an elongated base-piece securable on a runner, spaced upright jaws on said base-piece, each having a vertical groove in its inner face, the top surface of the base-piece being concaved between the jaws forming a seat, a two-part box fitted loosely between said jaws so as to permit of the rocking movement of the box, the lower box-section being convexed on its under surface to correspond with the concave seat on the base-piece between the jaws, the box being provided at opposite sides with ribs projected oppositely therefrom and loosely engaging the grooves of the jaws, a detent-pin projecting upwardly from the center of the concave seat on the base-piece and engaging an elongated opening in the bottom wall of the lower box-section, the sides of the elongated slot fitting closely on the detent-pin to prevent side play and strain on the jaws, but permitting the runner to move backward and forward, and means for preventing vertical displacement of the box.

2. The combination with a runner, and a cross-beam, of a knee comprising a base-piece having flanges securable on the runner, two spaced upright jaws on the base-piece having vertical grooves on their inner faces with concave bottom walls, wings projected outwardly from the inner sides of the jaws and each having a vertical slot formed therein, a two-part box engaging between the grooved jaws and having vertical ribs loosely fitting the grooves in the jaws, the box being adapted to rock slightly between the jaws, an integral detent-pin on the base-piece and projecting upwardly therefrom between the jaws, the detent-pin engaging an elongated perforation in the bottom wall of the lower box-section, the said pin fitting closely the sides of the elongated perforation to prevent side play of the runner and strain on the jaws but permitting free backward and forward movement, projections from the box loosely engaging the slots in the wings, and vertical bolts erected on the bottom wall of the lower box-section and passing through vertical perforations in the beam and in the top wall of the upper box-section, the bolts being provided with nuts at the upper ends to secure the box-sections to each other and to the beam.

FRANK OSCAR STARK.

Witnesses:

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E. A. KREMER.