

944,773.

Patented Dec. 28, 1909.
2 SHEETS—SHEET 1.

FIG. 1.

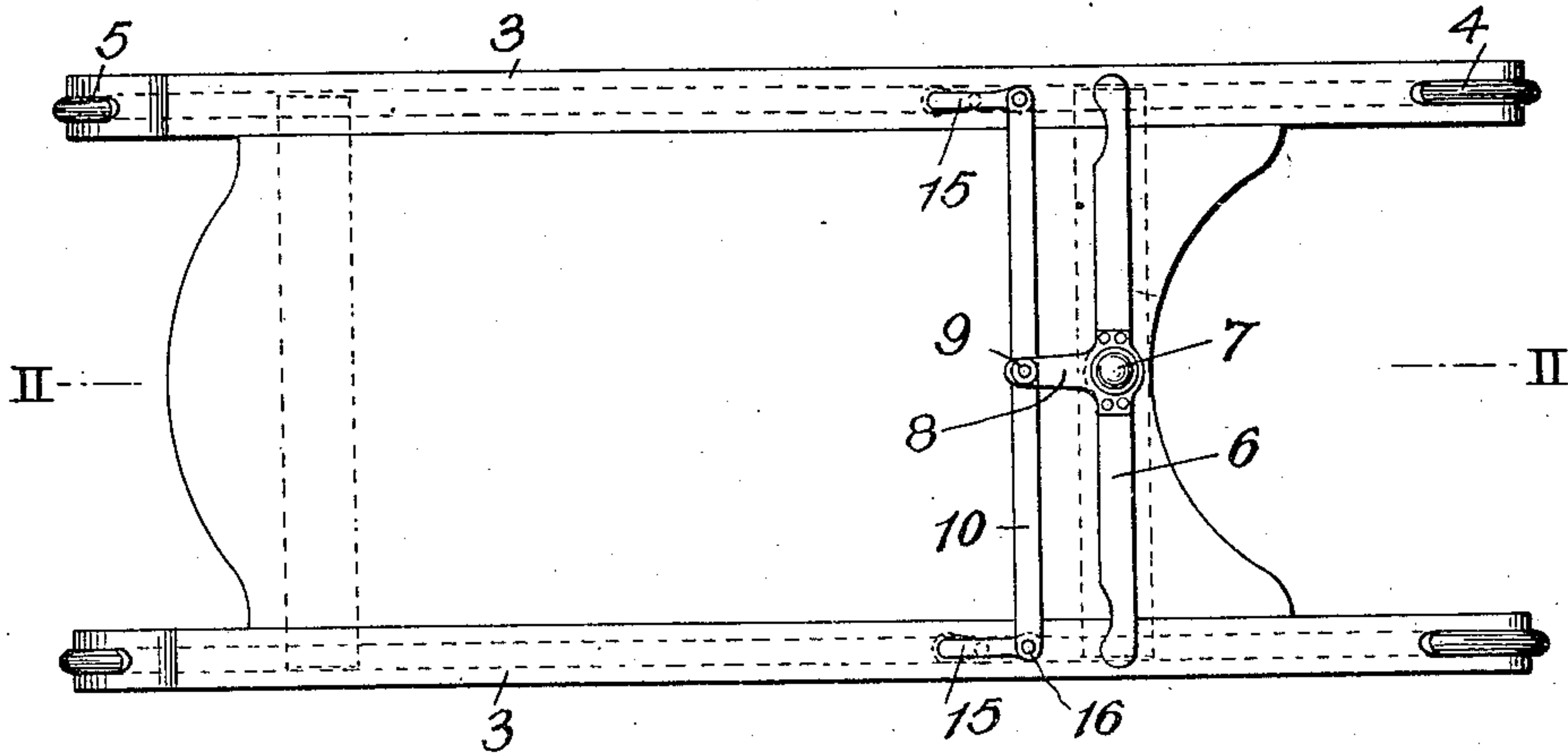


FIG. 2.

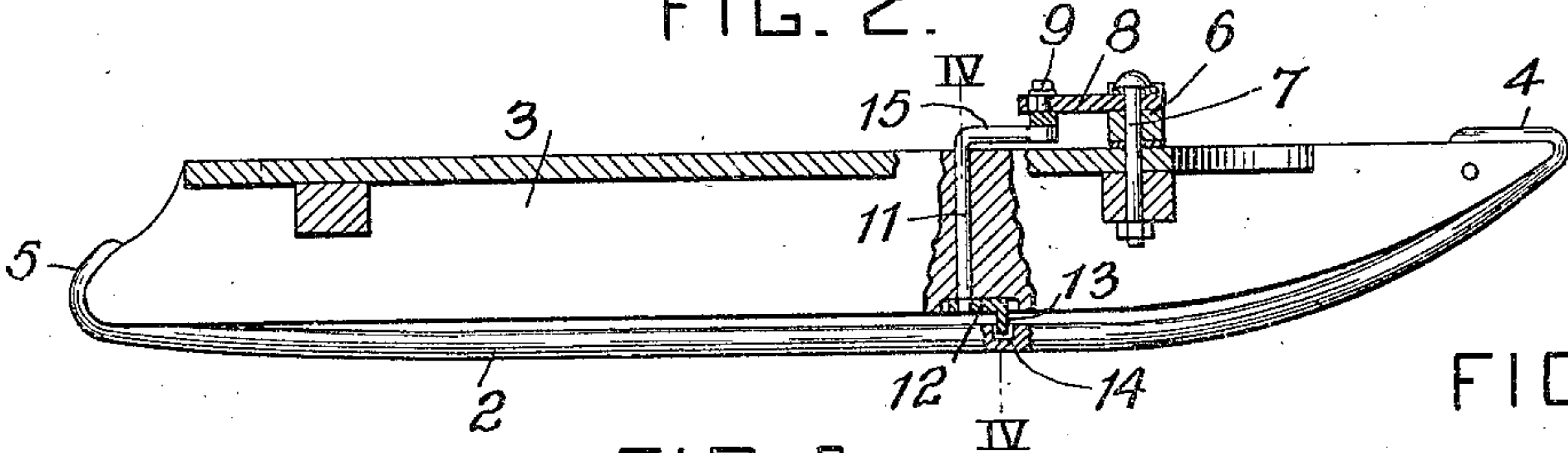


FIG. 3.

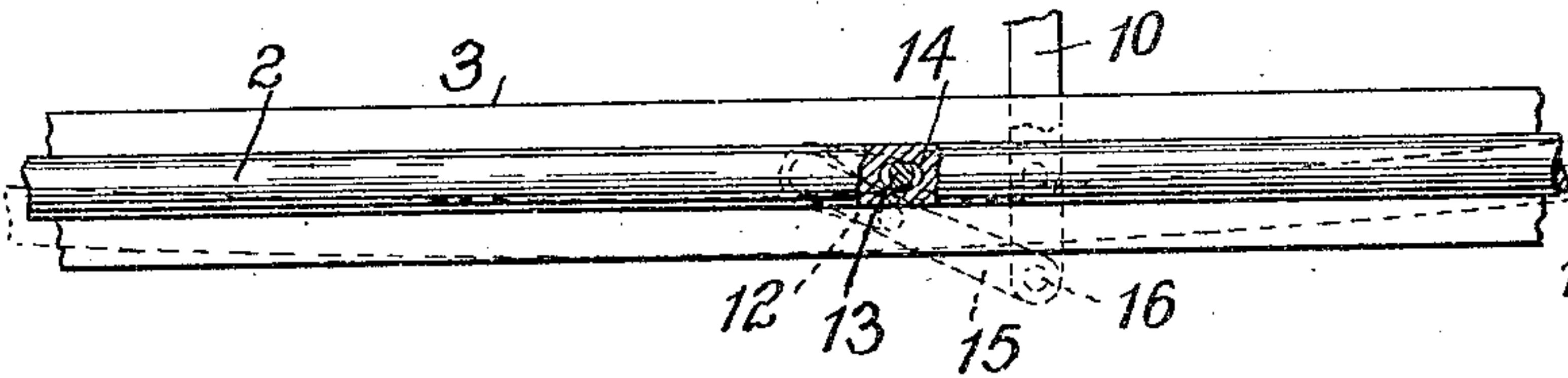


FIG. 4.

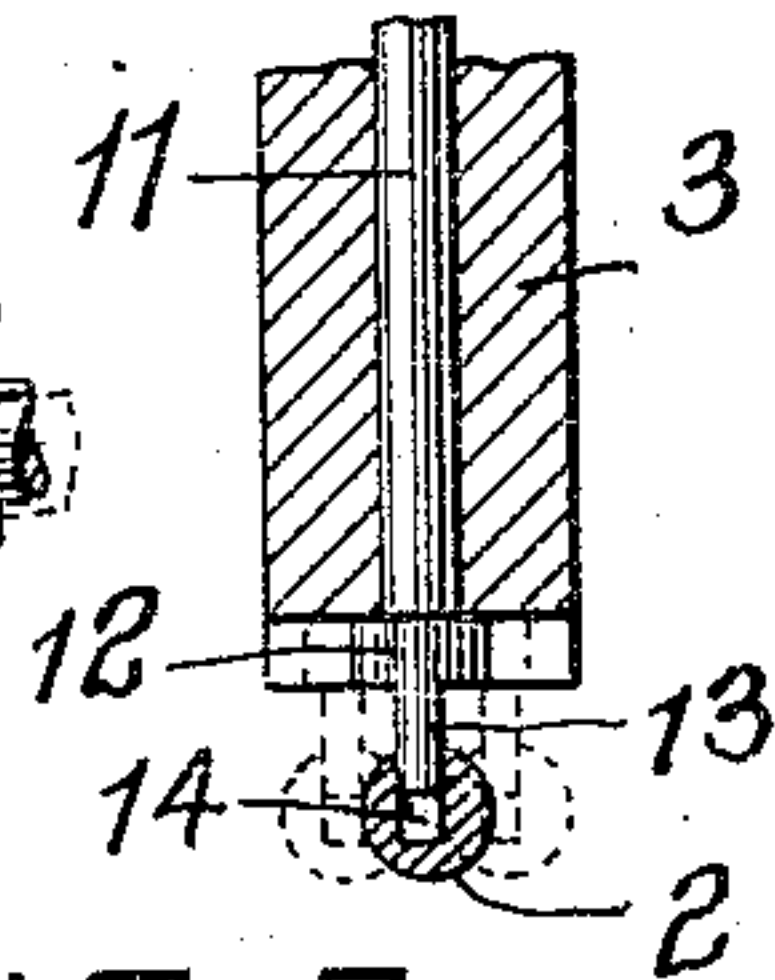


FIG. 5.

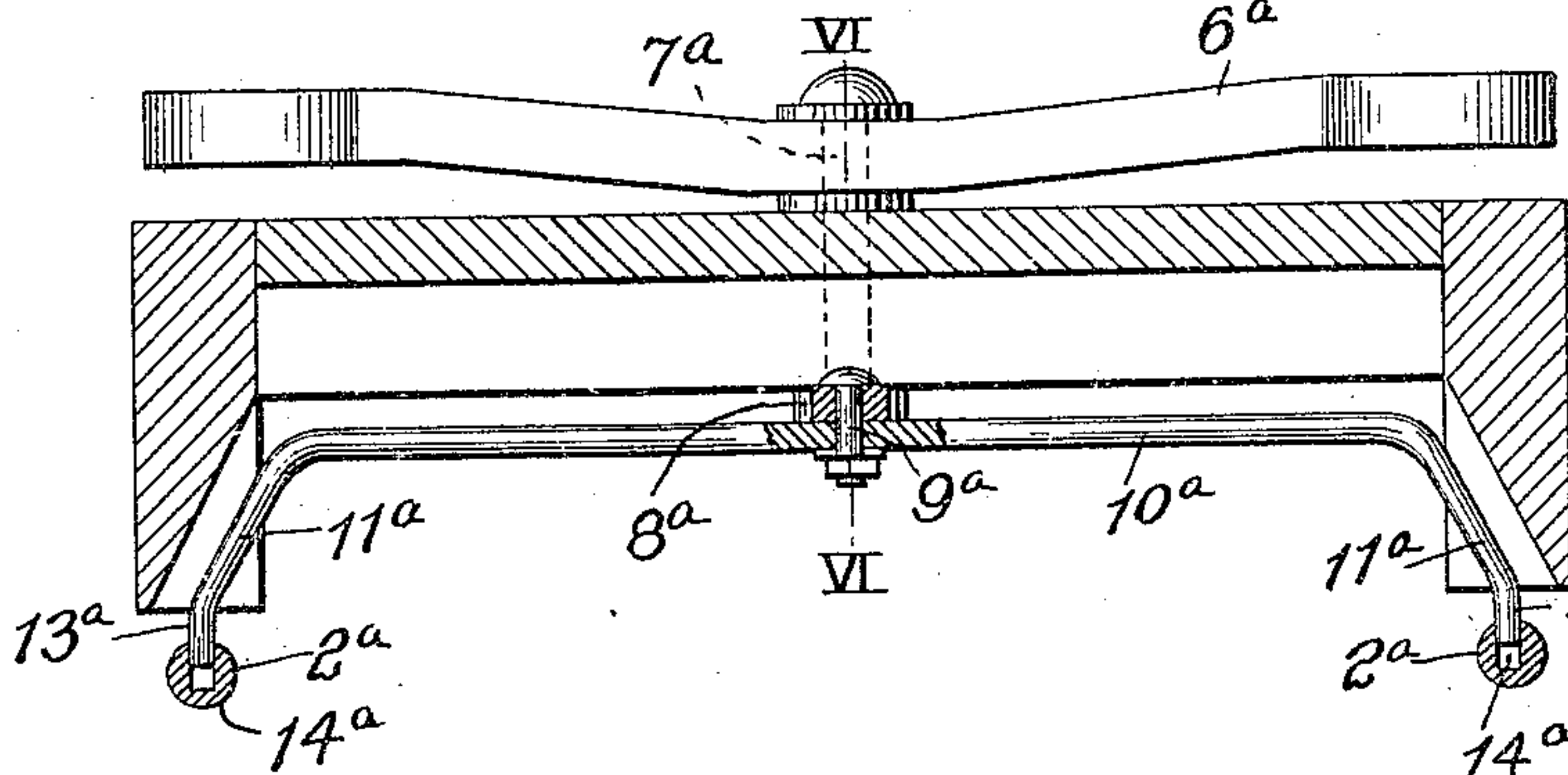
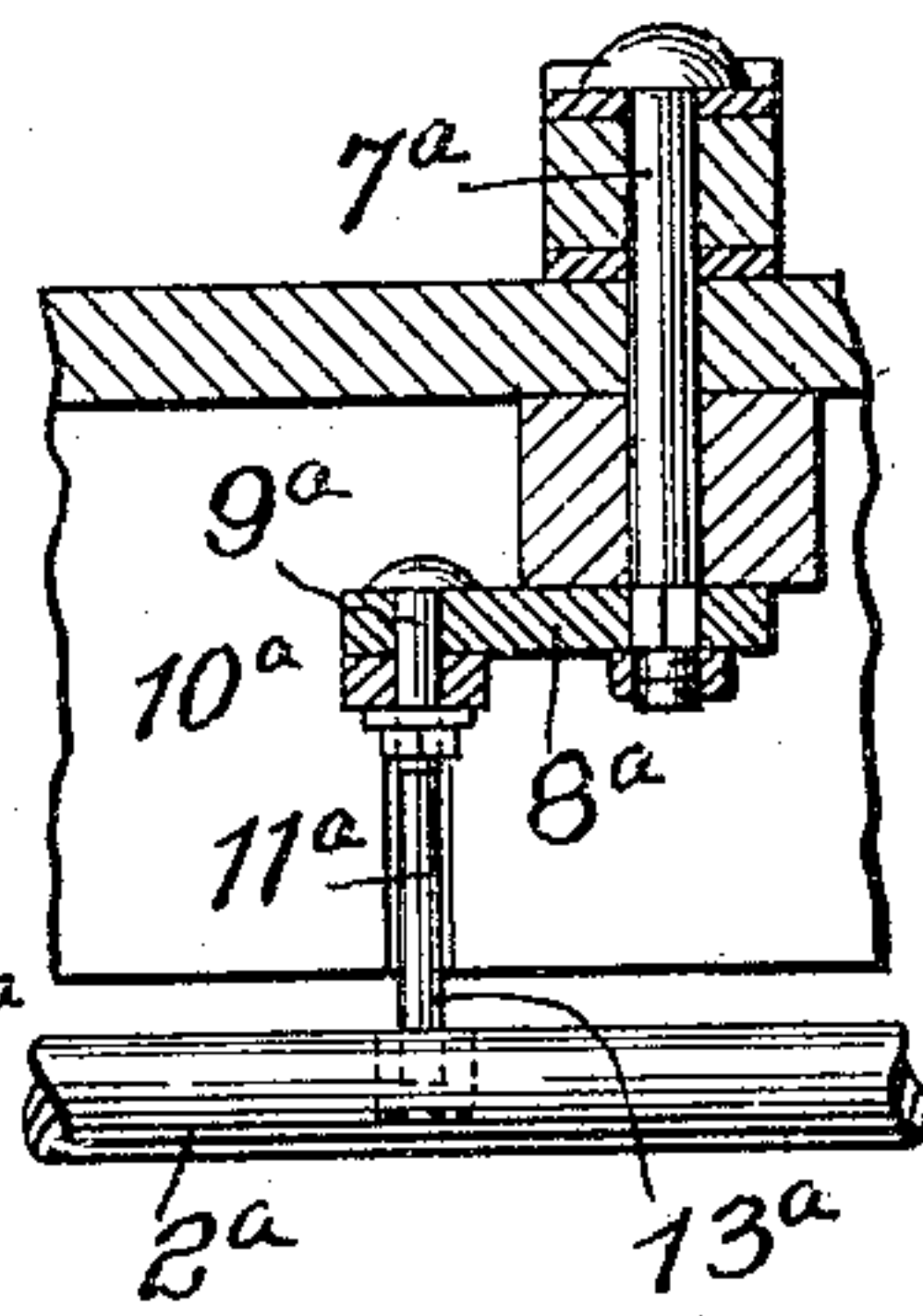


FIG. 6.



WITNESSES:

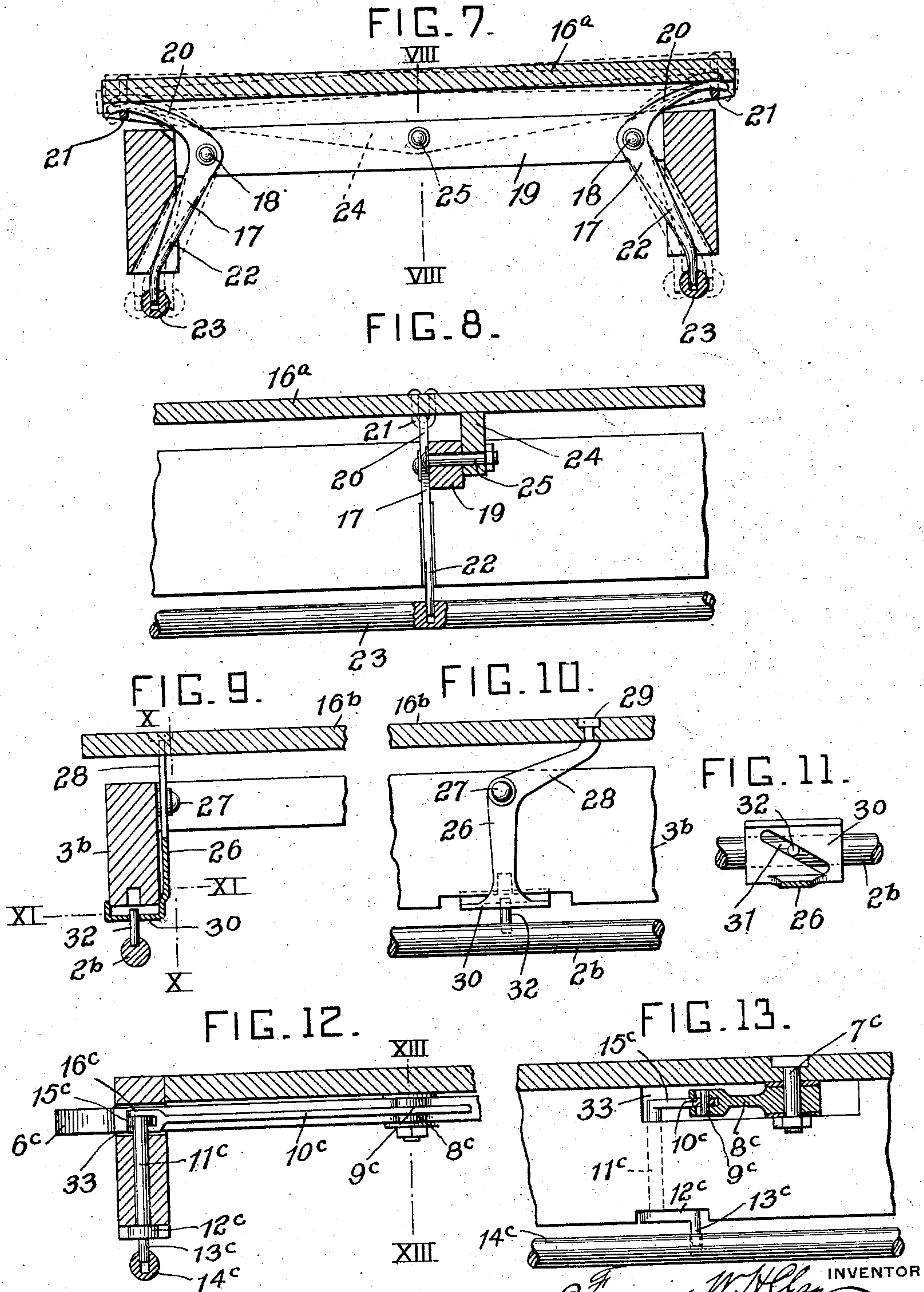
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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANCIS W. H. CLAY, OF PITTSBURG, PENNSYLVANIA.

STEERABLE SLED.

944,773.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed February 14, 1908. Serial No. 415,855.

To all whom it may concern:

Be it known that I, FRANCIS W. H. CLAY, a citizen of the United States, residing at Pittsburg, in the State of Pennsylvania, have invented certain new and useful Improvements in Steerable Sleds, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to steering means for coasting sleds, ice-boats, and similar devices, its primary object being to accomplish the steering or change of direction by flexing the shoe or runner between fixed ends.

Steerable sleds have heretofore been made having runners adapted to be bodily bent or deflected at the front end; but in these the part bent out of alinement is frequently not in contact with the ground and the action is irregular and uncertain; whereas in my invention the body portion of the "shoe" or metal wearing strip attached by its ends to a rigid runner is flexed at the middle part, between the ends, where the weight is supported, thus causing the deflection to immediately act at the most sensitive position and with certainty, and obtaining a change of direction with the least possible amount of movement.

In the accompanying drawings I have shown several forms of the invention as applied to common coasting sleds with wooden runners.

Figure 1 is a plan view of a sled provided with foot-controlled lever mechanism for deflecting the runner shoes, and Fig. 2 is a longitudinal section. Fig. 3 is an enlarged partial under plan, showing the connections between the operating elements and the shoe. Fig. 4 is an enlarged vertical section on the line IV, IV, of Fig. 2. Fig. 5 is a transverse sectional view of a sled showing a modified construction of deflecting mechanism, and Fig. 6 is a cross section on the line VI, VI, thereof. Fig. 7 is a vertical cross section, showing a modified construction adapted to utilize the weight of the rider thrown to one side or the other to steer the sled, and Fig. 8 is a longitudinal section on the line VII, VII, thereof. Fig. 9 is a cross section through one side of a sled illustrating a further modified construction, and Fig. 10 is a sectional view indicated by the line X, X, of Fig. 9. Fig. 11 is a detail plan view, indicated by the sectional line XI, XI, of Fig. 9 showing the engagement of the lever with a pin on the shoe. Fig. 12

is a partial cross sectional view of a sled showing a construction similar to that of Figs. 1 and 2, but with the treadle bar located beneath the top, and Fig. 13 is a cross section on the line XIII, XIII, of Fig. 12.

The invention is designed to use any convenient means for imparting lateral flexure to the shoes of the sled, either utilizing hand or foot-controlled levers, or mechanism so connected with a rocking top of the sled as to be actuated by shifting the weight of the rider, or any other suitable means, and though the drawings show wooden sleds provided for illustration with some of such various means, the invention is in no way limited to any particular construction for bending the shoe or runner near its middle. In the drawings the shoes 2 of the runners are rigidly connected with them at the front and back ends, 4 and 5 respectively, leaving the intervening portions of the shoes free and usually bowed downwardly below the middle portion of the runners. For steering this middle portion is deflected to one side or the other.

In Figs. 1 to 4 I have shown the sled as provided with a foot-controlled lever 6 pivotally mounted at 7 and having a middle lever arm 8 connected by a pivotal bolt 9 with a laterally shifting rod 10. This is connected by levers 15 to the shafts 11, mounted at each side in or upon the runners 3, provided at their lower ends with cranks 12 having terminal pins 13 fitting into sockets or recesses 14 extending partially or entirely through the shoes 2. By this construction, when the lever 6 is deflected in one direction or the other, movement will be imparted through arms 8 and 10 to each crank pin 11 which in turn will shift the shoes together, throwing both in the same direction and bowing their middle portions outwardly to one side, thereby causing the sled to veer toward the other side.

In Figs. 5 and 6 the treadle lever 6^a is pivotally mounted on the sled by means of a vertical stem 7^a to which it is keyed or secured in any suitable manner, the stem passing through a suitable bearing cross-brace portion and having at its lower end a crank or lever arm 8^a, which in turn is pivotally connected as at 9^a with a transverse bar 10^a. Said bar in such construction is provided with downwardly extending integral arms 11^a having tips 13^a which fit into receiving sockets 14^a of the shoes or otherwise engage

them, so that the shoes are directly bowed outwardly at their middle portions between the fixed ends by operating the foot treadle in the direction corresponding to the desired direction of deflection.

When it is desired to utilize the pressure or weight of the body, the sled top 16^a may be directly connected with lever mechanism as by the construction shown in Figs. 7 and 8, utilizing bell-crank levers 17 pivoted at 18 upon a cross bar 19, said levers having an upper arm 20 bearing up underneath the sled top at each side and connected therewith if desired by any suitable means as a staple 21. The other arm 22 of the lever extends downwardly directly into a receiving socket 23, in the shoe or is connected with it in any other suitable manner. The top 16^a is mounted on the sides or frame of the sled in any desired way to provide rocking movement of its side edges.

In the drawings I have shown the top as provided with a cross cleat 24 pivotally mounted midway of the sides by bolt 25 in cross bar 19. By this construction, upon bearing downwardly at one side or the other of the sled, the shoes will be deflected or bowed in opposite direction, thereby causing the sled to veer toward that side upon which pressure is exerted. This makes the steering practically automatic, as the rider unconsciously leans over in the direction he wishes to go.

The same results may be secured by the construction shown in Figs. 9, 10 and 11, wherein levers 26 are pivotally mounted within the sides 3^b at their upper portions upon pivotal bearings 27, said levers having upper arms 28 provided with terminals bearing up underneath or secured to the top 16^b in any suitable manner as indicated at 29. The other arm of lever 26 extends downwardly below such pivotal bearing and is provided with a horizontal flat portion 30, extending between the lower edges of the side 3^b and the shoe 2^b, and having an inclined slot 31 engaging a pin or abutment 32 of the shoe. By this construction downward movement of the arm 28 of lever 26 at one side or the other will impart a corresponding movement of shoe 30 laterally of the runner and side. By this form, the shoe is held securely whenever placed, causing lateral movement of the shoe by engagement with pin 32 in the manner of a wedge or cam, producing the desired deflection and resulting veer of the sled.

It will be observed that in the construction just described and in that of Figs. 7 and 8, the downward pressure at one side of the top of the sled and a corresponding upward movement to the other side, as when the top is mounted for lateral rocking, will impart motion to the lever mechanism at each side of the sled respectively, producing the desired

flexure of the levers in the same direction either to the right or left, depending on the side of the top which is depressed.

In Figs. 12 and 13 I have shown a construction generally similar to the arrangement illustrated in Figs. 1 to 4 inclusive, employing the lateral shifting bar 10^c, the rotatable shafts 11^c having cranks 12^c with terminal pins 13^c fitting into sockets or recesses 14^c, the shafts having at their upper ends lever arms 15^c pivotally connected at 16^c, with the shifting arm 10^c. Said arm is actuated toward one side or the other by the foot-controlled lever or treadle 6^c pivotally mounted at 7^c underneath the top of the sled and provided with the middle lever arm 8^c pivotally connected at 9^c with the laterally arranged shifting arm 10^c, in the same manner generally as has been already described. The mounting of the treadle in the present case however, is entirely underneath the top of the sled and projecting outwardly at each side through suitable openings 33 in the sides of the sled and beyond it sufficiently far to provide treadle bearings. The advantage of such construction is that the actuating lever mechanism is entirely below the top surface of the sled and in no way interferes with its use.

Various other means may be employed for producing the lateral deflection of the shoes at their middle, and the points of engagement of the deflecting mechanism with the runners may be varied to suit the construction the principal object being to apply the pressure to the runners at some point between their fixed ends, to produce the lateral bowing. It will be observed that by deflecting these portions of the runners which are in contact with the track way, the resulting effect in deflecting the sled will be more immediately produced, than when the upwardly and forwardly extending front terminals of the runners are deflected, such portions being ordinarily entirely above the track and away from contact therewith. For these reasons a comparatively slight flexure of the shoes at their middle portions will produce immediate and material change in direction of the sled with a comparatively slight effort.

The invention may be changed or varied by the skilled mechanic in different details, it may be applied to ice-boats and sleds of all constructions and does not require any particular design of the sled or of its operating mechanism, and all such changes or variations are to be considered as within the scope of the following claims.

Having thus described my invention and illustrated its use what I claim as new and desire to secure by Letters Patent is the following:

1. A sled having rigid runners and laterally flexible bearing shoes and means adapt-

ed for actuation by shifting the weight of the rider, operating to flex said shoes and steer the sled.

2. A coasting sled provided with rigid
5 runners and shoes attached at front and back to the runner and having intervening laterally flexible bearing portions, and means for applying lateral pressure to said bearing portions.

10 3. A sled having rigid runners and a frame and a rocking seat, and mechanism to change the course of the sled by the rocking of said seat, substantially as described.

15 4. The combination with a rigid sled having bearing shoes attached to the sides of the sled at each end, of means adapted to receive movement from shifting the weight of the body of a rider and connections to thereby cause lateral flexing of the middle
20 portions of the shoes, substantially as set forth.

5. A sled having rigid runners and flexible runner shoes, a top with vertically movable parts, and lever mechanism connecting the top and shoes by which the shoes are
25 laterally flexed by moving the top.

6. A sled having a cross-bar pivoted to swing and connections from said bar to the runner shoes to directly deflect them near the middle portions. 30

7. A steerable sled, comprising a rigid frame and runners, a rocking seat, laterally flexible shoes and levers pivoted on the frame and attached to the seat and shoes whereby rocking the seat will bend the
35 shoes, substantially as described.

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

FRANCIS W. H. CLAY.

Witnesses:

C. M. CLARKE,

CHAS. S. LEPLEY.