

(No Model.)

2 Sheets—Sheet 1.

S. C. MENDENHALL.  
ROLLER SKATE.

No. 329,927.

Patented Nov. 10, 1885.

FIG. I.

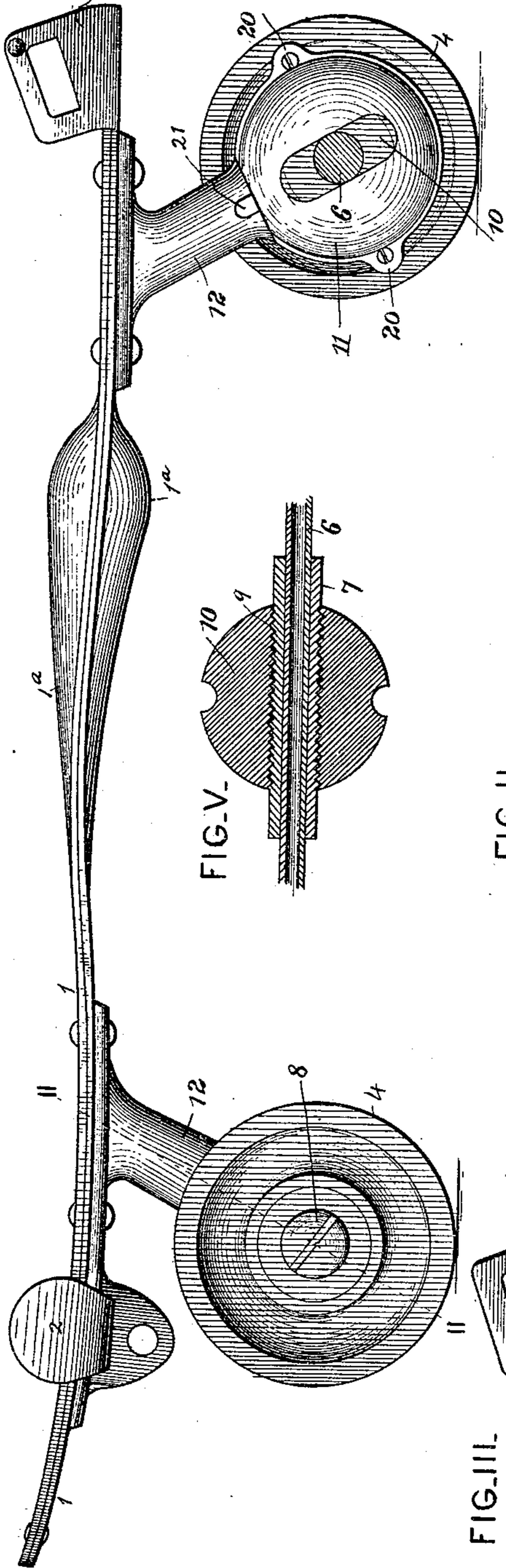


FIG. V.

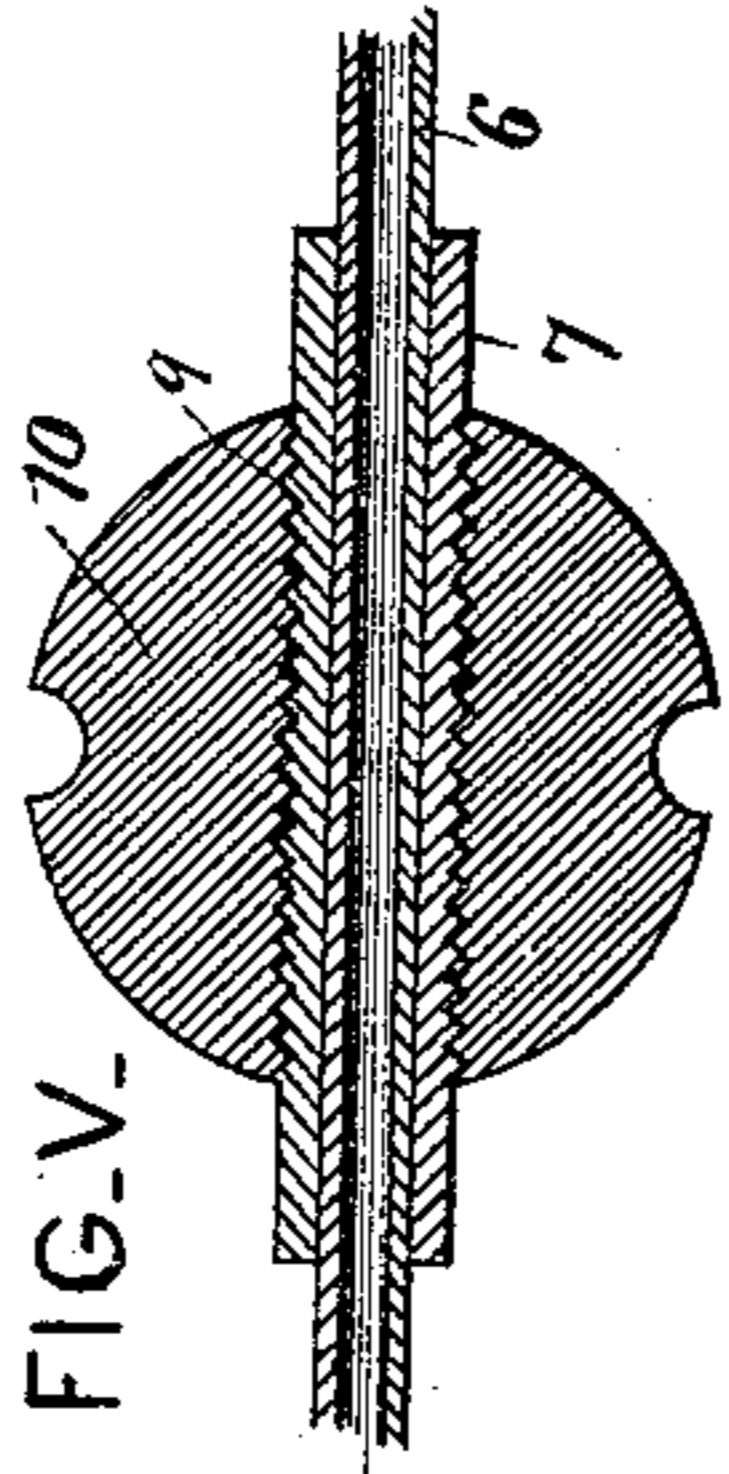


FIG. II.

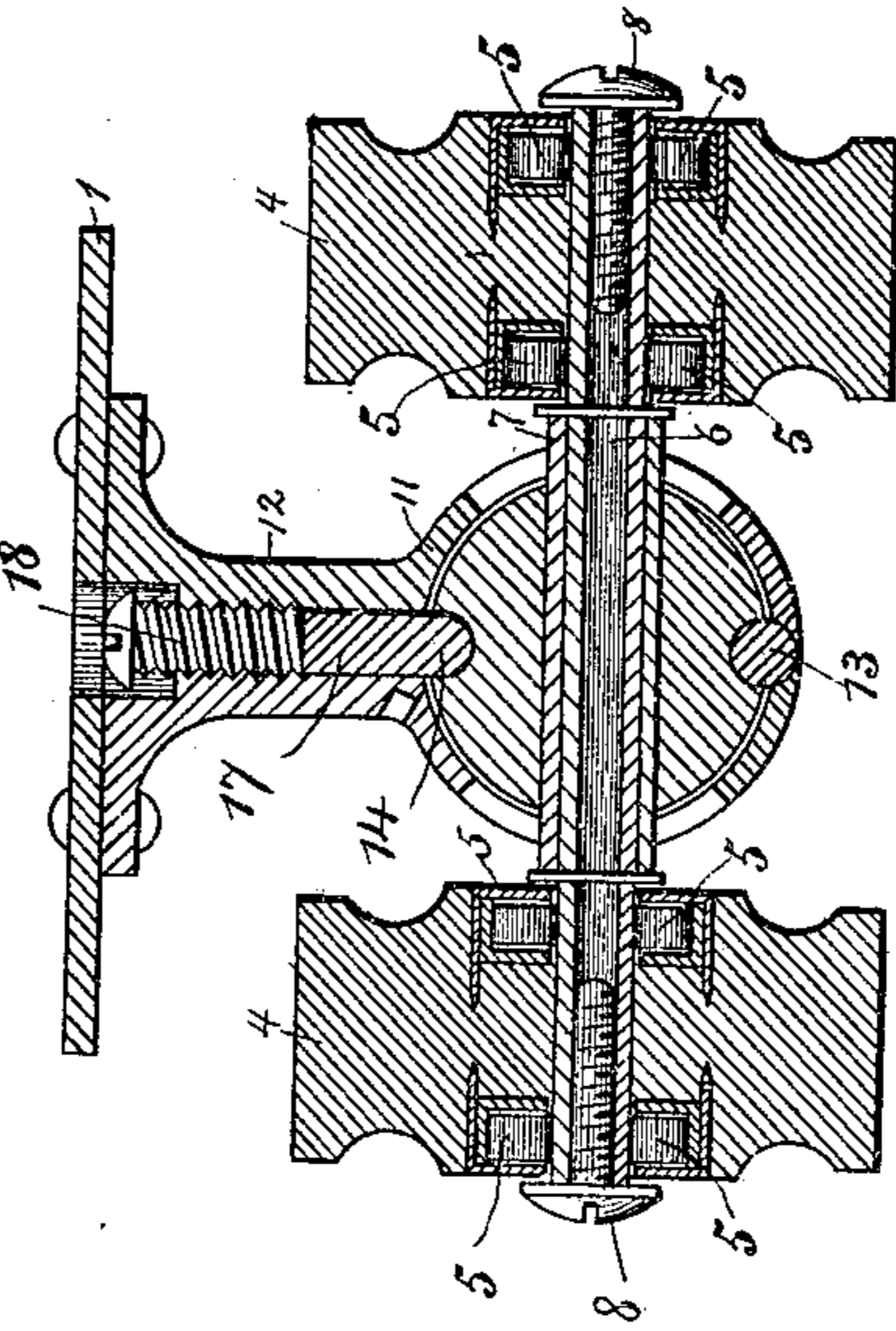


FIG. III.

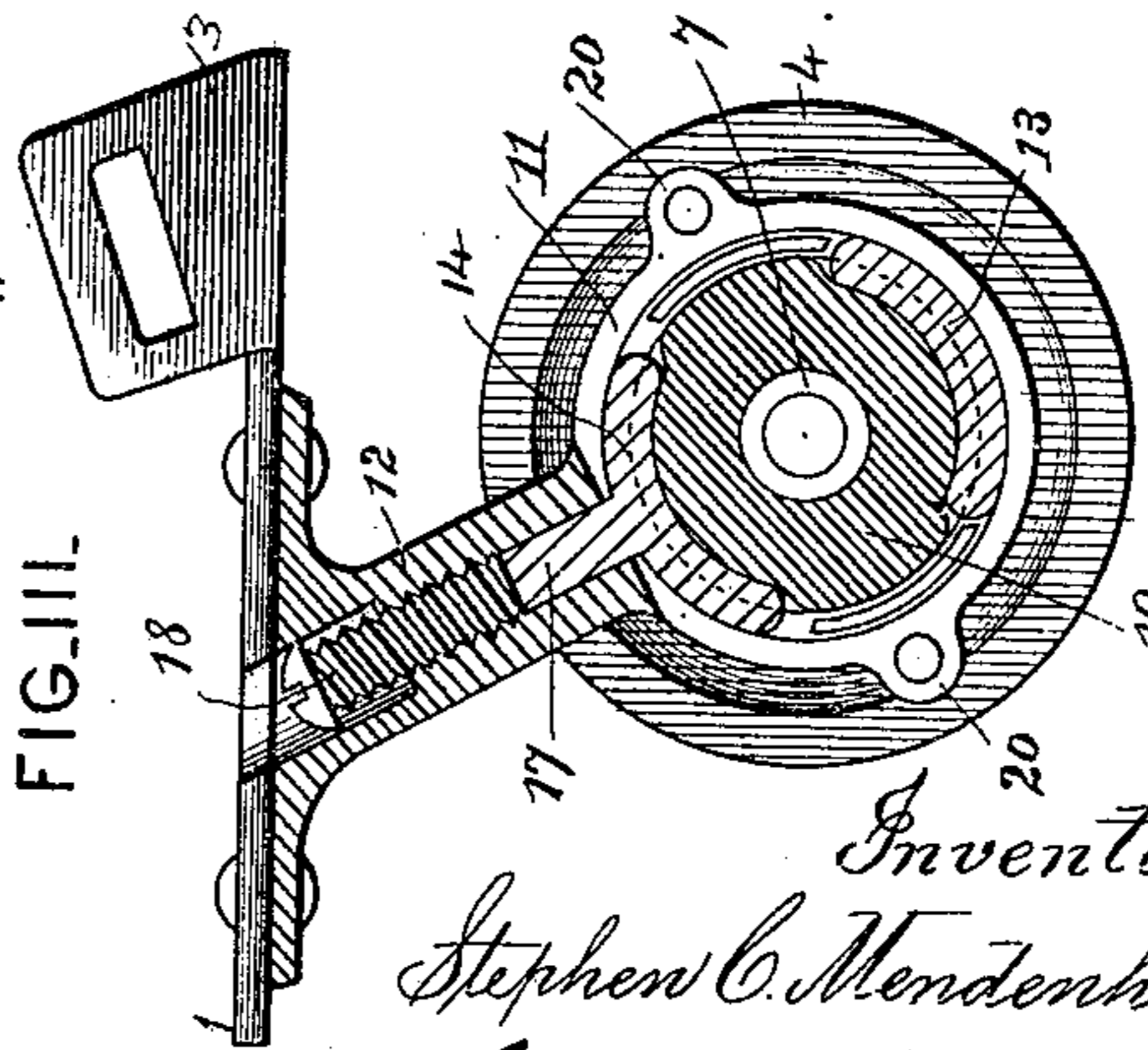
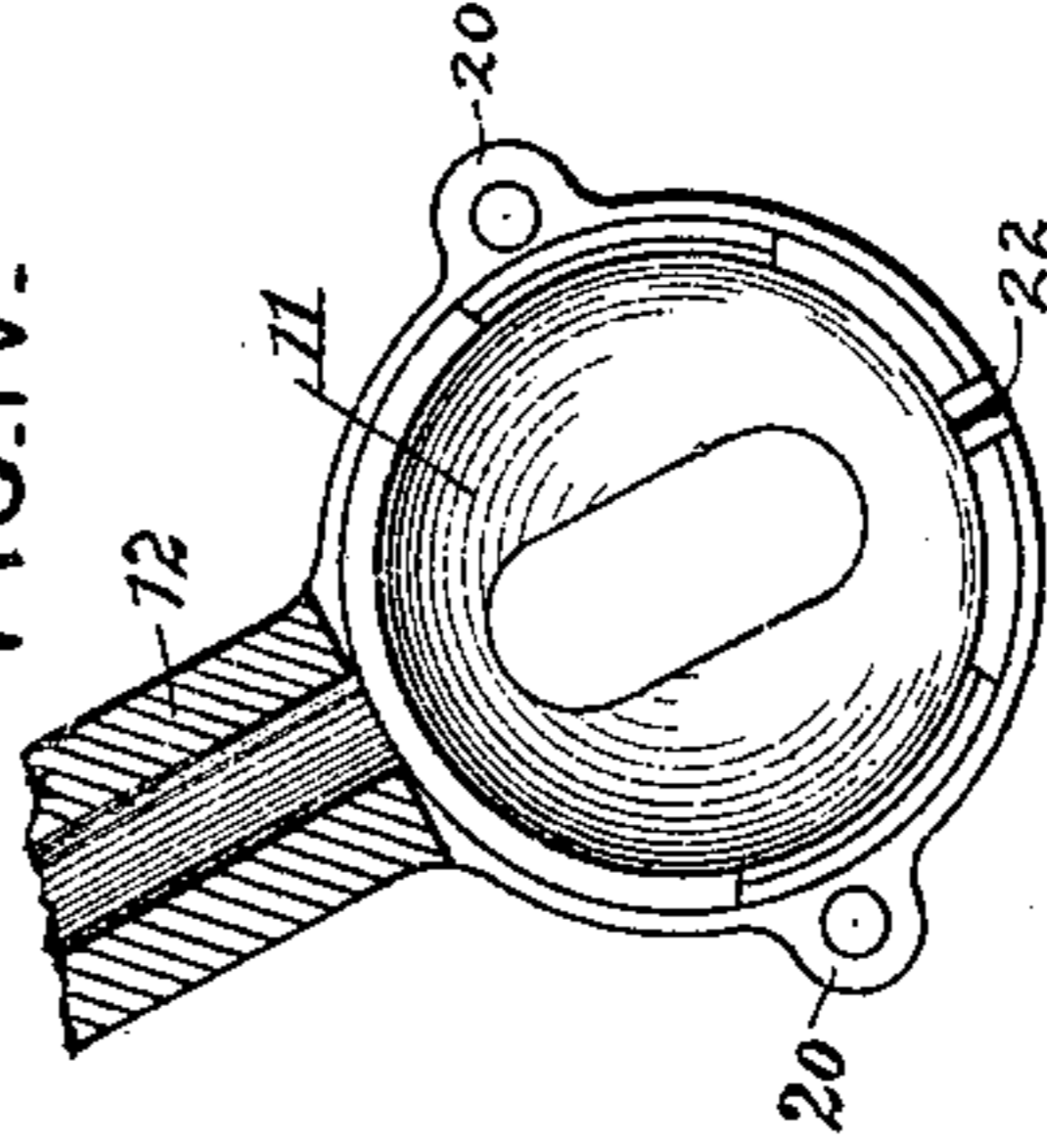


FIG. IV.



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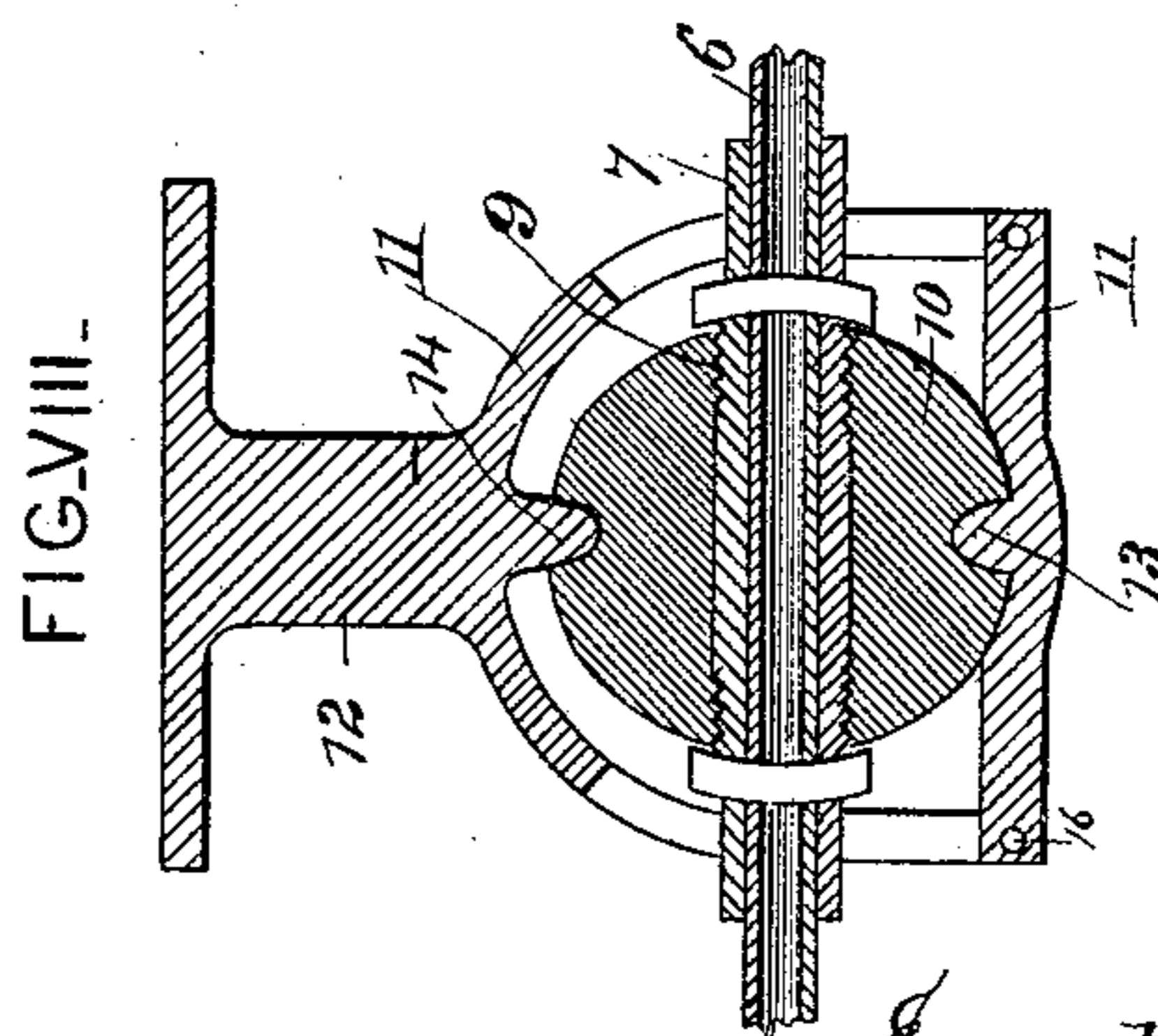
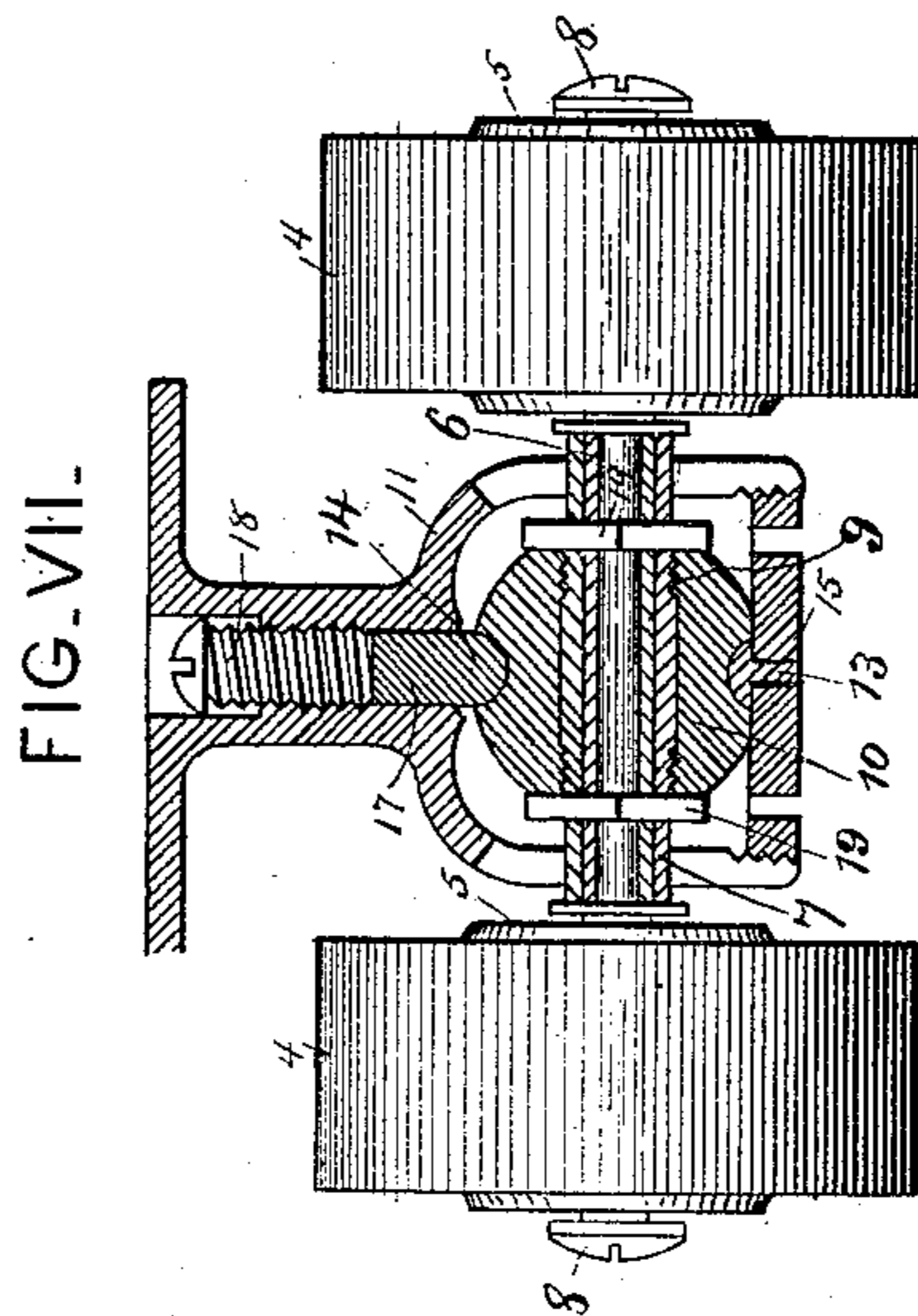
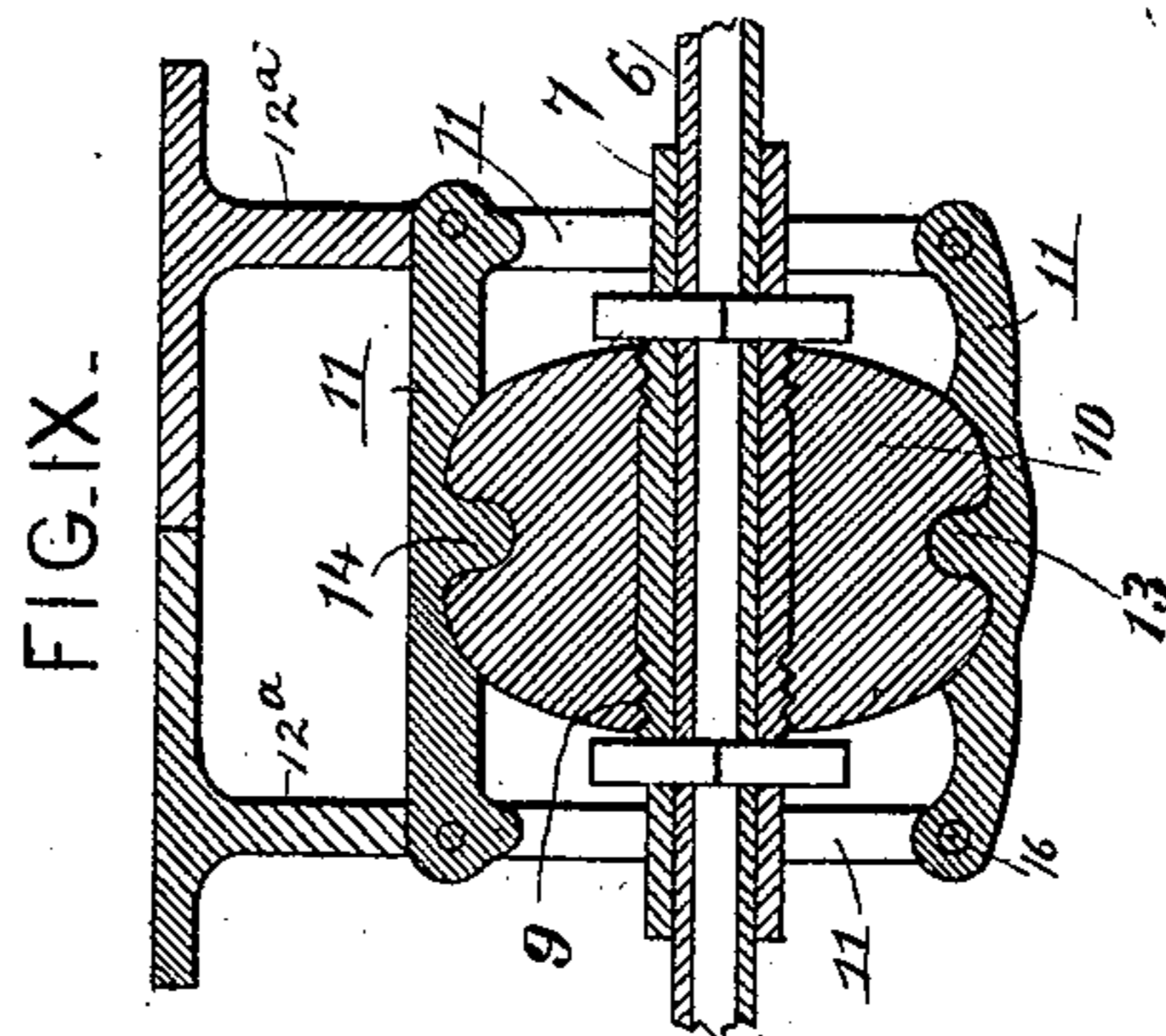
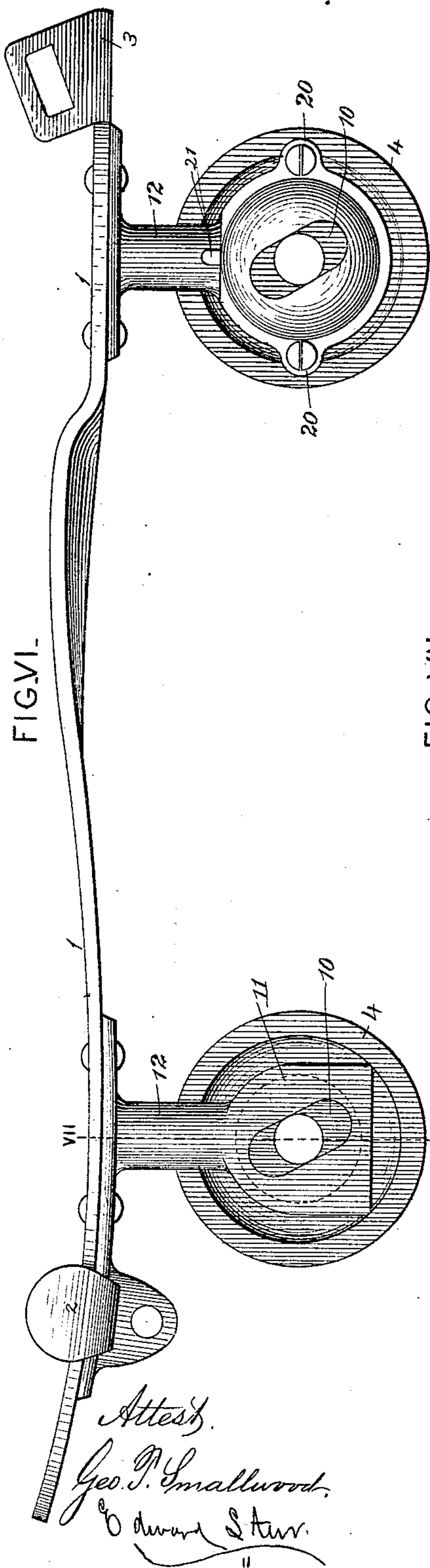
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2 Sheets—Sheet 2.

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Attest.  
Geo. P. Smallwood,  
Clerk of Court.

Inventor:  
Stephen C. Mendenhall.  
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# UNITED STATES PATENT OFFICE.

STEPHEN C. MENDENHALL, OF RICHMOND, INDIANA.

## ROLLER-SKATE.

SPECIFICATION forming part of Letters Patent No. 329,927, dated November 10, 1885.

Application filed March 13, 1885. Serial No. 158,704. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN C. MENDENHALL, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, (present business address Cincinnati, Ohio,) have invented a new and useful Improvement in Roller-Skates, of which the following is a specification.

My invention relates, primarily, to improvements in the manner of supporting the foot-plate of a skate from the axles of the floor-wheels through the medium of a cushioning-spring, which thus not only serves to take up shocks on the skate and prevent injury to the wearer thereby, but serves the purpose of the ordinary spring or cushion of a roller-skate in maintaining the axle at right angles to the foot-plate so long as weight on such foot-plate is evenly distributed.

In my improvement the cushion is made integral, is substantially spherical, and is placed or fixed directly upon a metallic sleeve surrounding the floor-wheel axle, which latter, for purpose of lightness and strength, is made integral of wrought tubing, its ends being closed by screws, which retain the floor-wheels in position by means of interposed loose washers. The ball-cushion is supported in a globular or other shaped housing having its sides slotted to permit relative oscillation of itself and the axle, and supporting interiorly fins or segmental rings for entering the cushion equatorially and serving as abutments therefor. The cushion by its peculiar shape acts with great and equal efficiency, whatever the direction in which it is compressed.

Means for adjusting the abutments above and below and for compressing the cushion from the sides by means of screws or nuts are provided, so that the tension of the rubber may be regulated by the skater at will.

To enable the ready application or removal of the cushion from its housing, one side or the bottom of said housing is made removable, being fastened by screwing to the rigid portion of the housing when the rubber is in position. The housing may be rigidly connected with the foot-plate of the skate in any desired manner. Preferably, however, I cast or form it with a neck or standard on its upper side, which standard has at top a flange capable of riveting to the under side of the foot-plate.

The foot-plate is preferably made of two thin plates riveted together and bulged oppositely in the shank for strengthening it. At their rear both plates are turned upwardly, riveted together, and slotted to receive heel-straps.

In the accompanying drawings, Figure I is a side elevation of my improved skate, one floor-wheel being removed. Fig. II is a transverse sectional view of the same on the line II II, Fig. I. Fig. III is a vertical sectional view of one end of the skate in a plane at right angles to the axle. Fig. IV is a view in elevation of the inside of one-half of the housing. Fig. V is an axial section of the axle with cushion, showing the preferred method of applying the latter. Fig. VI is a side elevation of a slightly-modified form of the skate, two floor-wheels being removed. Fig. VII is a vertical sectional view on the line VII VII, Fig. VI, showing the preferred form of housing and of adjusting devices. Figs. VIII and IX are similar views, but omitting the floor-wheels, and showing further modes of forming the housing.

1 may represent a wooden or metallic foot-plate of a skate, having toe-clamps 2 and up-turned lugs 3 to assist in the attachment of the skate to the wearer's foot.

In Fig. I is shown the preferred form of the foot-plate. It consists of two thin metallic plates riveted together at front, and both turned up to form the lugs 3 at rear. These lugs are also riveted together and slotted to receive the heel-straps. The shank of the two-part foot-plate is bulged oppositely in forming the blanks to provide rounded ridges 1<sup>a</sup> above and below the plate, which ridges materially aid in strengthening the plate and allow it to be made of light wrought metal.

4 are the floor-wheels of the skate, each wheel preferably provided with two sets of anti-friction bushings, 5, and journaled upon hollow steel axles 6, each made of a single piece of tubing. A sleeve, 7, is driven or fixed upon the central portion of said hollow axle in such manner that its ends will serve as abutments for the inner faces of the floor-wheels or for washers interposed between them and said wheels. The ends of the hollow axle are screw-threaded interiorly to receive screws 8, whose heads may be flattened out to retain the rollers upon the axle, preferably

through the medium of an interposed washer, and the outer surfaces of which may be polished or ornamented in any desired manner. The use of an axle hollow throughout, with screws at its ends, as here shown, lightens the construction of the skate, while preserving its strength, and prevents the tearing of dresses and unsightly appearance due to a construction in which the rollers are held upon the axle by the ordinary split key. Fixed upon the sleeve 7 centrally, preferably by means of screw-thread 9, as shown in Fig. V, is a ball-shaped cushion, 10, of one piece of rubber, which is retained within a globular or other formed housing, 11, connected rigidly with the foot-plate 1 by means of a single central neck or standard, 12, or, as in the modification shown in Fig. IX, by two parallel standards, 12<sup>a</sup>. In both cases the standards are flanged at top, and fixed to the foot-plate by rivets or screws passing through said flanges.

Arranged equatorially upon the rubber cushion 10 are grooves within which rest segmental abutments 13 14. (Shown most clearly in Fig. III.) The lower abutment, 13, may be formed of a separate piece of wire, and slipped into position within a groove on the interior of the housing, as shown in Figs. II and III; or it may be formed integrally with the bottom plate of said housing, as shown in Figs. VIII and IX.

Fig. VII represents the preferred form in which the abutment is formed or supported pivotally upon the bottom plate, 15, of the housing 11. Said housing is provided with a screw-thread with which corresponding threads upon the plate 15 engage, so that said plate may be screwed up or down to adjust the tension of the cushion 10, or to apply it to or remove it from its housing.

In Figs. VIII and IX the plate 15 is shown removable in a different manner, it being hinged at one side to the housing and retained at its other side by removable key or pin 16. The upper abutment, 14, is also preferably adjustable, as shown in Figs. II, III, and VII. It is provided with a cylindrical neck, 17, which enters and is retained in place within a correspondingly-formed way in standard 12, by means of the upward pressure of the cushion 10. For a portion of its length the said way is screw-threaded to receive a set-screw, 18. It will be seen that the tension of the rubber cushion 10 is readily adjustable from above by means of the set-screw 18. The tension of the spring may also be regulated from the sides by turning up flat or curved nuts 19, working on the screw-threads of sleeve 7. It will thus be seen that the tension of the ball can be regulated on all sides, so as to be perfectly under the control of the wearer of the skate. The necessary horizontal oscillation of the axle is obtained by a vertical oscillation of the foot-plate and housing by arranging the slotted bearings of the axle in said housing on an inclination, as shown in Figs. I, IV, and VI. It will be observed that this

inclination can be obtained equally well in a case in which the standard 12 is fixed to the foot-plate in vertical position, as shown in Fig. VI, as when fixed in an inclined position, as shown in Fig. I.

In Figs. II, VIII, and IX, I have shown the preferred method of applying a cushion and axle within the housing—namely, by dropping them through the open slots of the sides of said housing, and then fixing the bottom plate, 15, in position. In case, however, the housing is made of globular form, as shown in Figs. I, II, III, and IV, it is preferably constructed in halves, one-half being shown in Fig. IV, which halves, when the cushion and axle are in position, are fixed together by screws or rivets passing through lugs 20, cast or stamped on the edges of the housing. The two parts of the housing are further held from relative movement by projections or lugs 21, formed on one part and entering corresponding depressions, 22, on the face of the other part.

I am aware that it has before been proposed to employ a rubber cushion for both sides of a roller-skate axle, and that the upper retaining-plate of such cushion has been adjustable by set-screw; but it has not to my knowledge been before proposed to make the rubber cushion in the form of a ball having abutments which, when depressed by set-screw, sink into the body of the cushion equatorially only instead of compressing the said cushion throughout its length.

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

1. In combination with a roller-skate axle and housing wherein said axle is supported and guided, a solid globular cushion surrounding said axle and abutments supported in the housing and pressing equatorially on said cushion at each side of the axle.

2. In combination with an integral ball-shaped cushion surrounding the axle of a roller-skate, a housing within which said cushion is contained and equatorial abutments on said cushion, substantially as set forth.

3. In combination with a floor-wheel axle, a screw-threaded sleeve thereon and a rubber cushion secured by said screw-threads on said sleeve, substantially as set forth.

4. In combination with a ball-shaped cushion of rubber surrounding the floor-wheel axle and abutment arranged equatorially over said cushion, the housing, and a set-screw within the same for adjusting said abutment, substantially as set forth.

5. In combination with a floor-wheel axle, a cushion surrounding the same and nuts also surrounding said axle and adjustable for varying the tension of the cushion from the sides, substantially as set forth.

6. An axle for roller-skates, hollow throughout, formed in one piece, screw-threaded interiorly at its ends, in combination with a threaded sleeve on said axle, floor-wheels, and

screws at each end of the axle for retaining the floor wheels or rollers thereon.

7. A foot-plate having an upwardly and downwardly bulged shank in two parts, 1<sup>a</sup> 1<sup>a</sup>,  
5 secured together.

8. A foot-plate made of two plates riveted together at front, both turned up at rear in the form of lugs, slots in said lugs for the at-

tachment of the foot-straps, and rivets through the lugs for fastening the parts of the foot-plate together at rear, substantially as set forth.

STEPHEN C. MENDENHALL.

Witnesses:

HARRY E. KNIGHT,  
OCTAVIUS KNIGHT.