

No. 846,481.

VAN BUREN LAMB.
BRAKE.

PATENTED MAR. 12, 1907.

APPLICATION FILED OCT. 6, 1905.

3 SHEETS—SHEET 1.

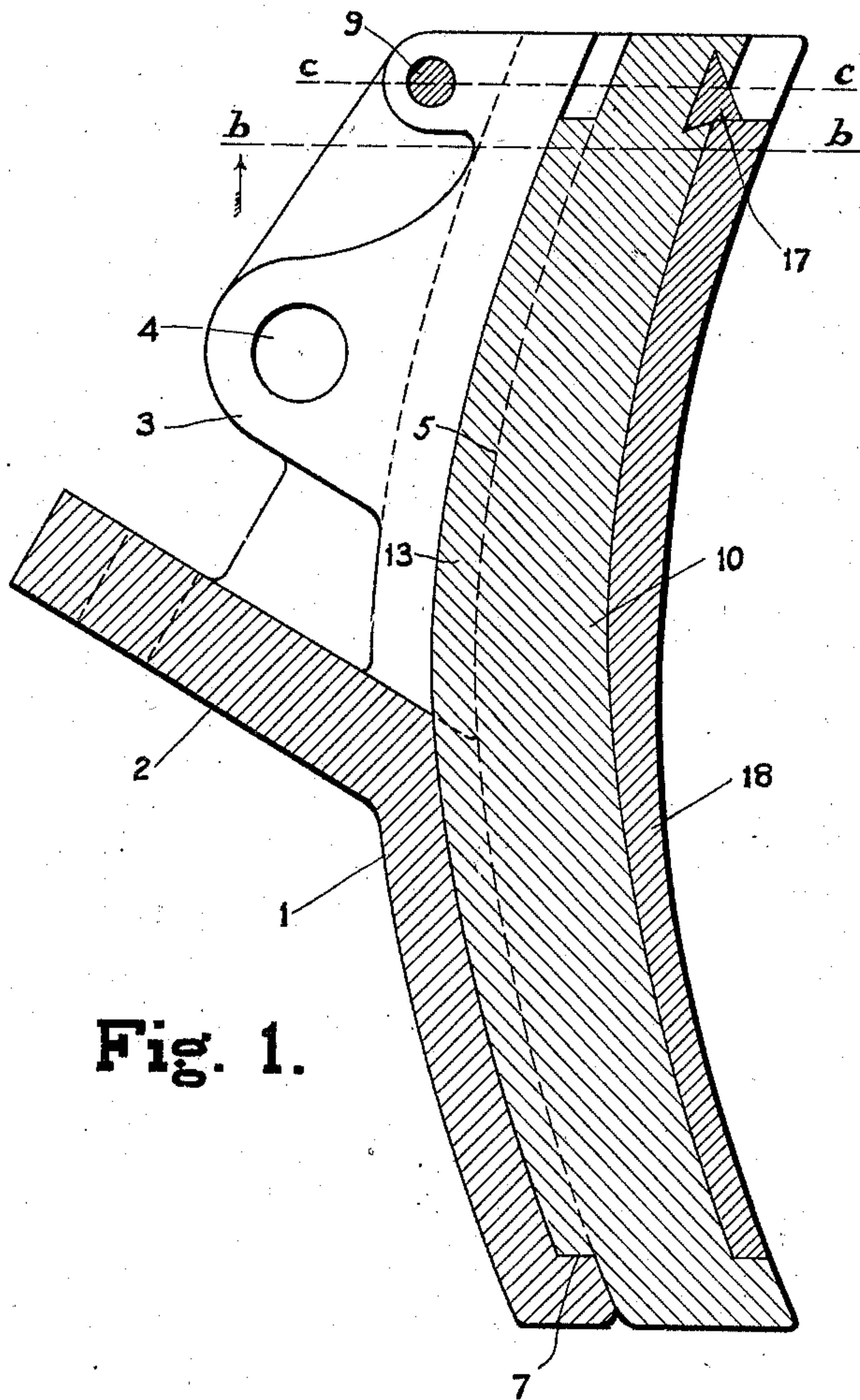


Fig. 1.

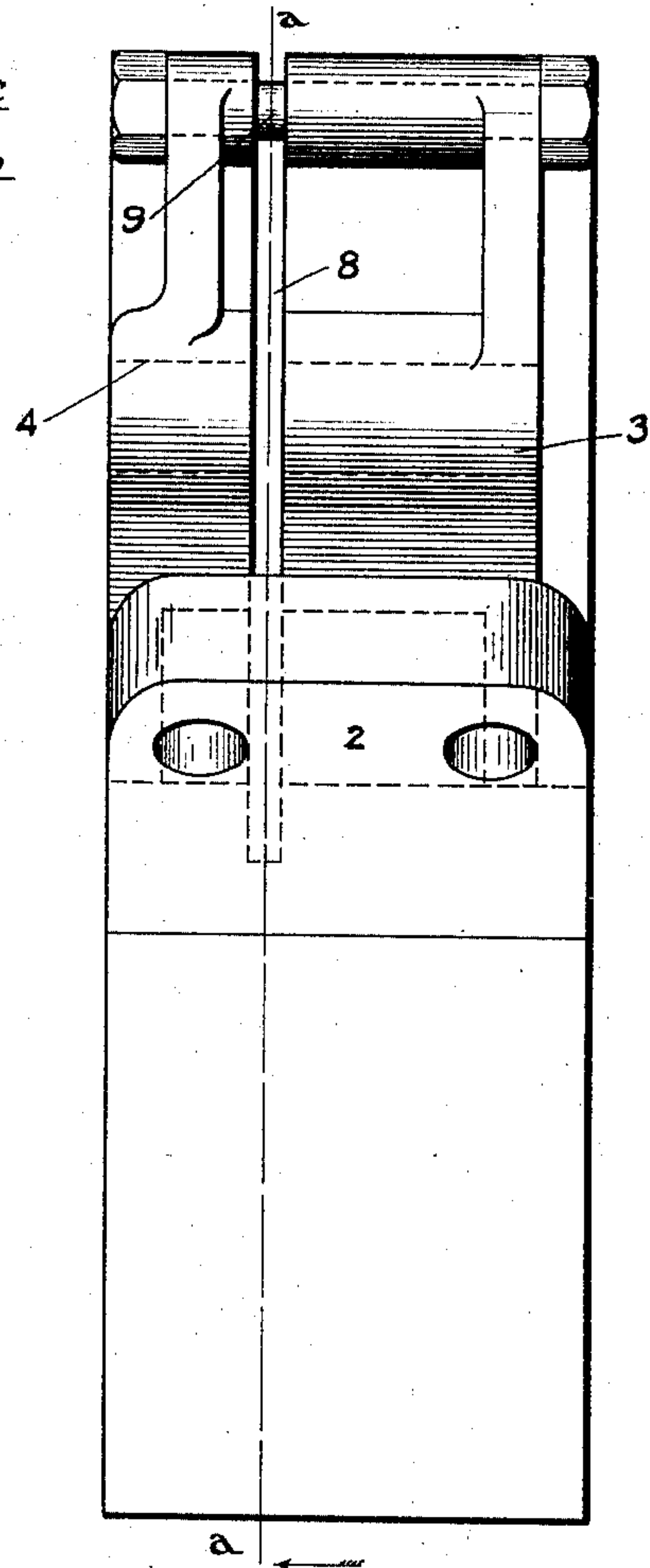


Fig. 2.

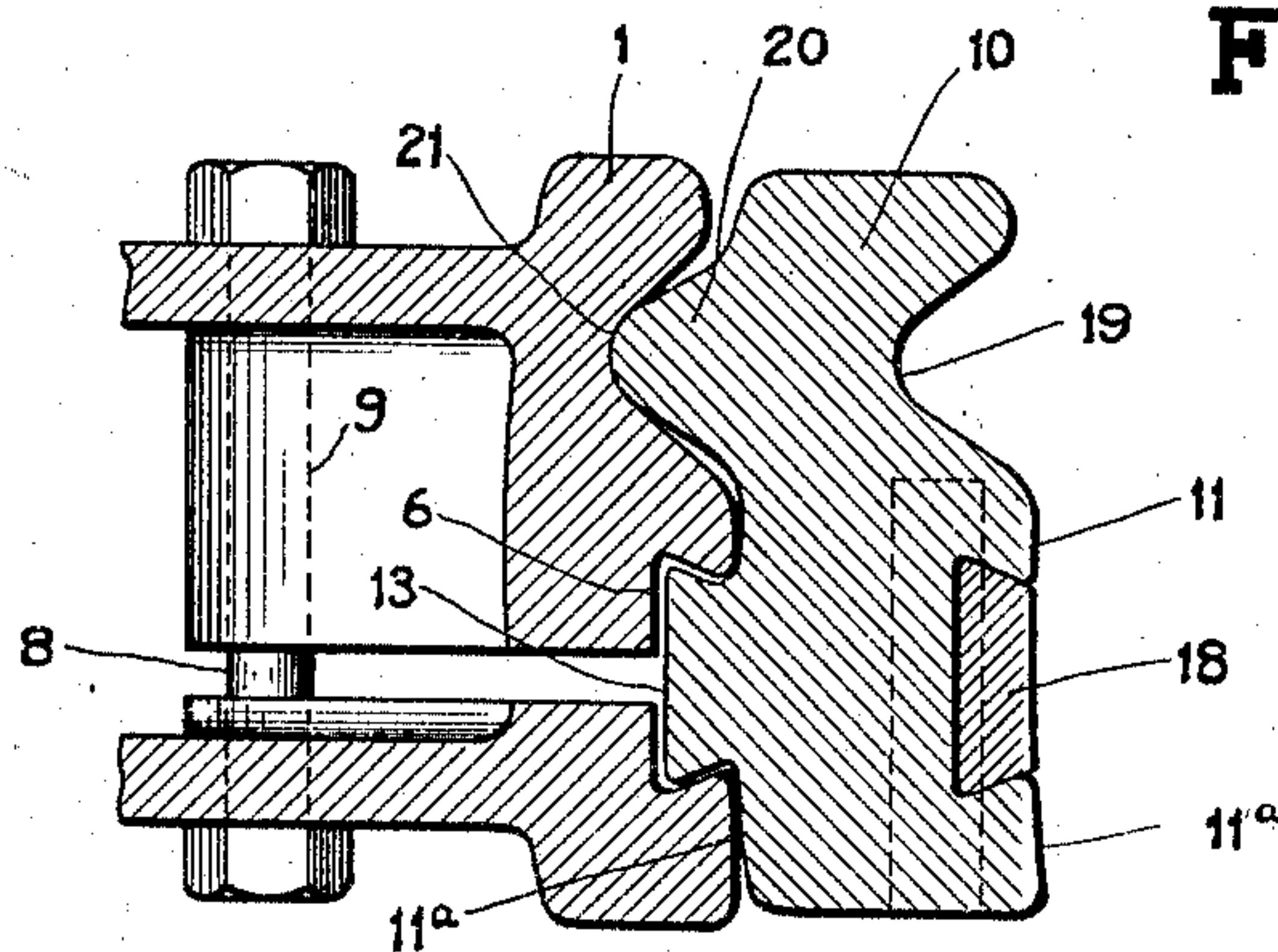


Fig. 3.

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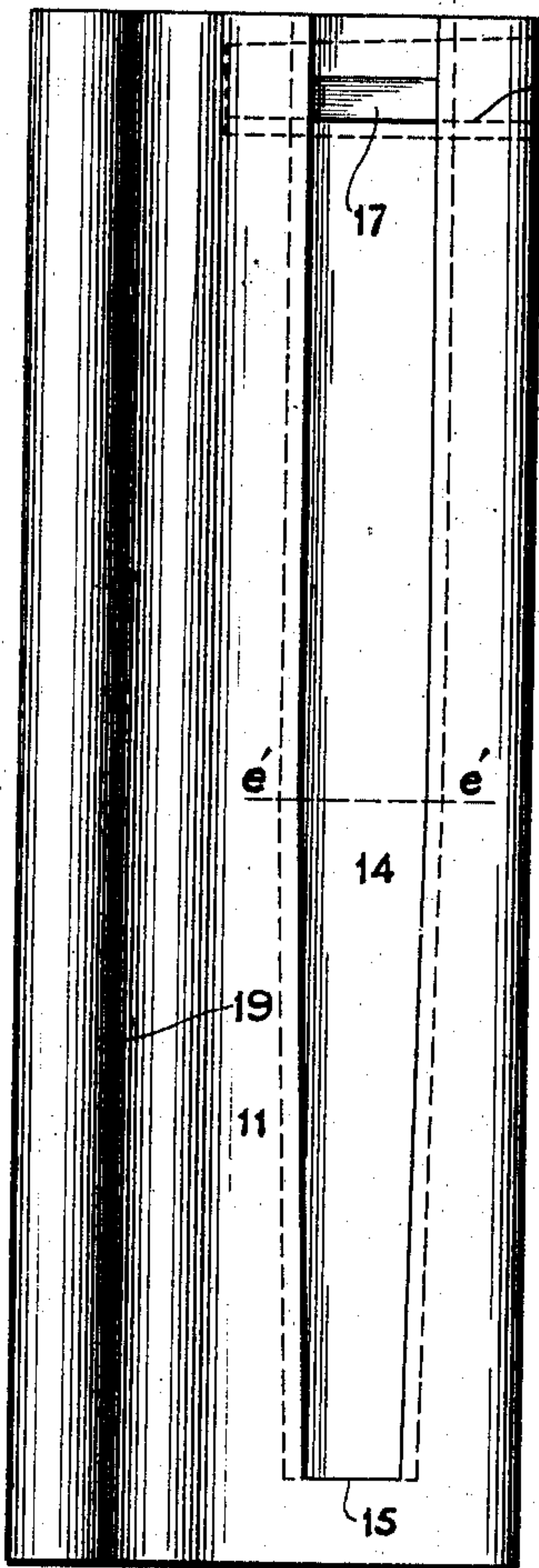


Fig. 8.

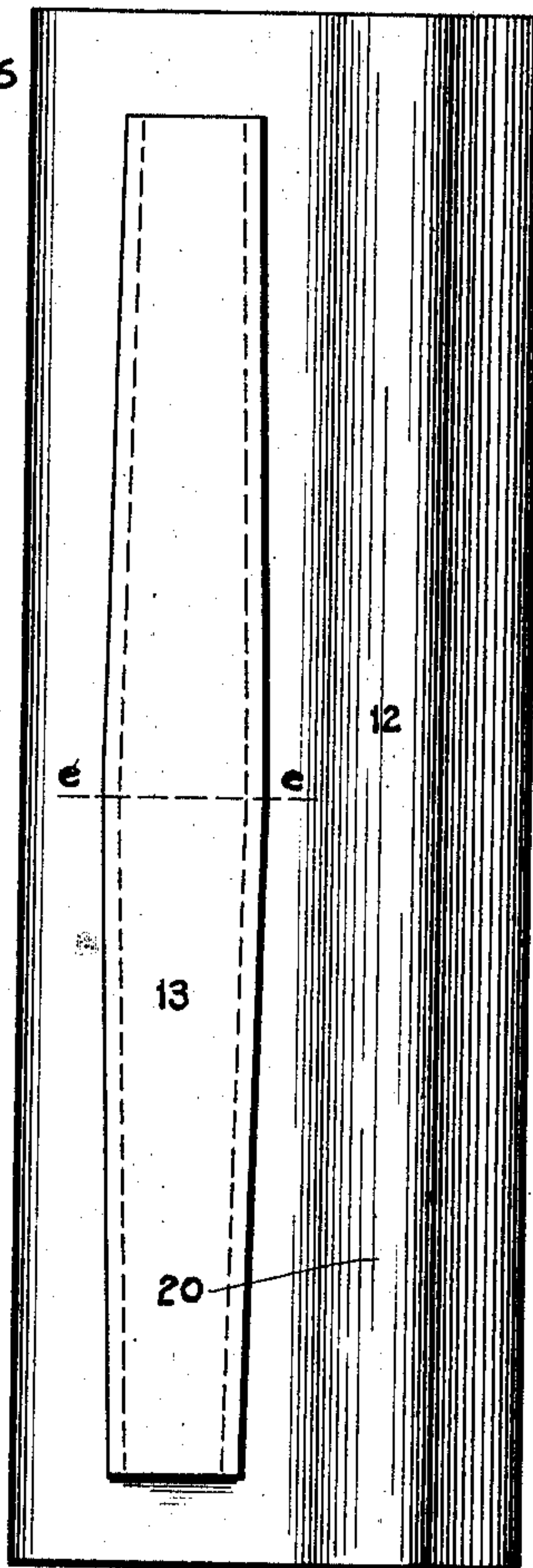


Fig. 7.

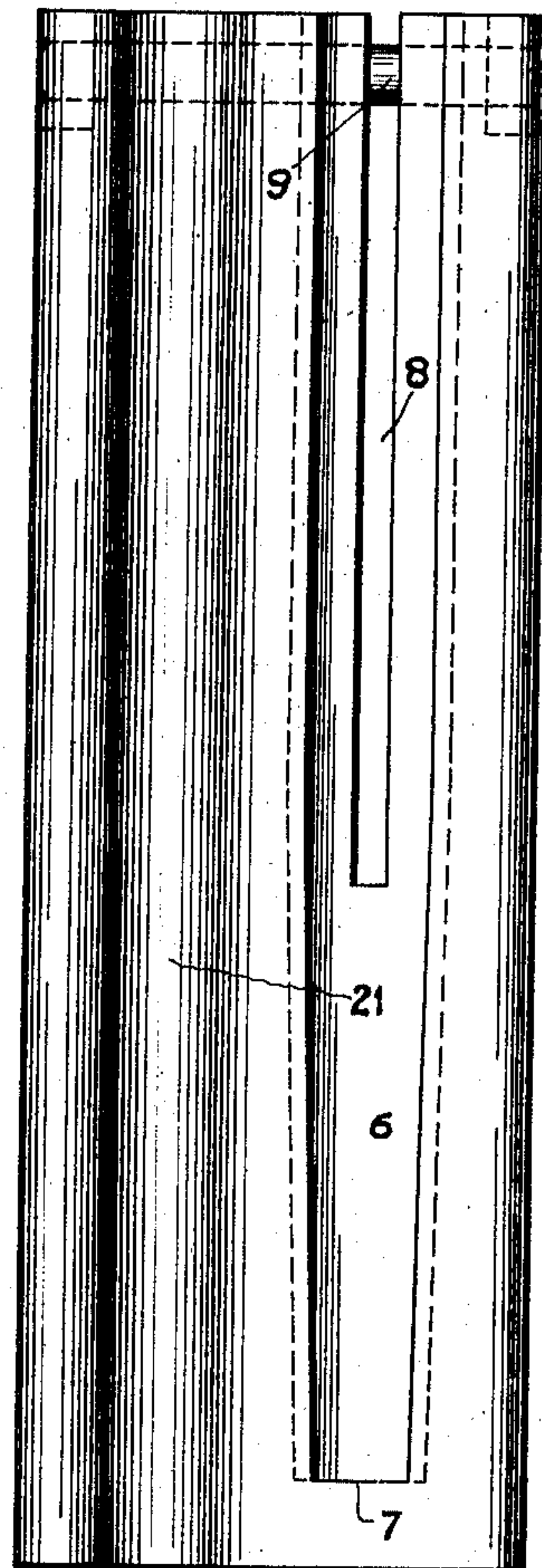


Fig. 6.

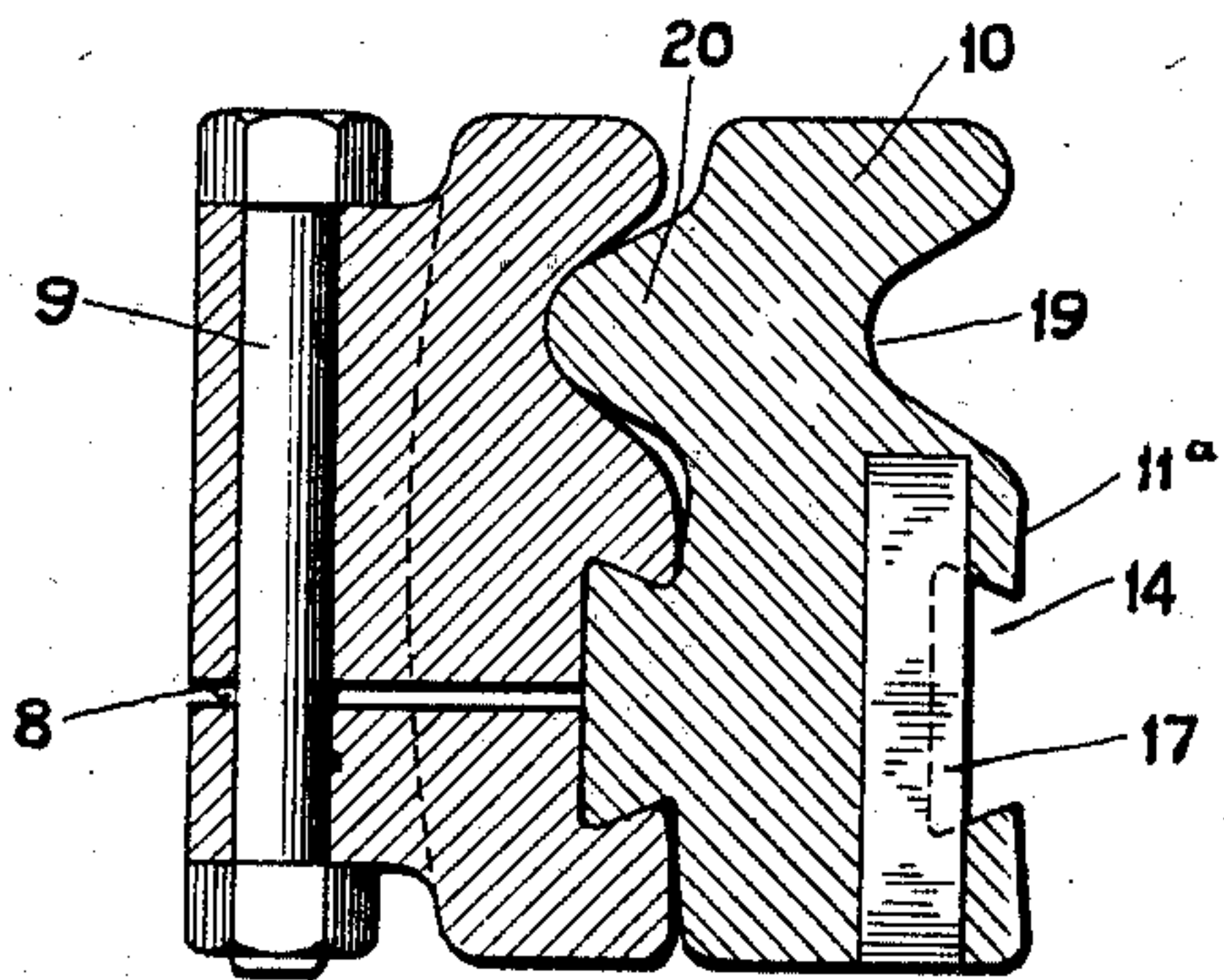


Fig. 4

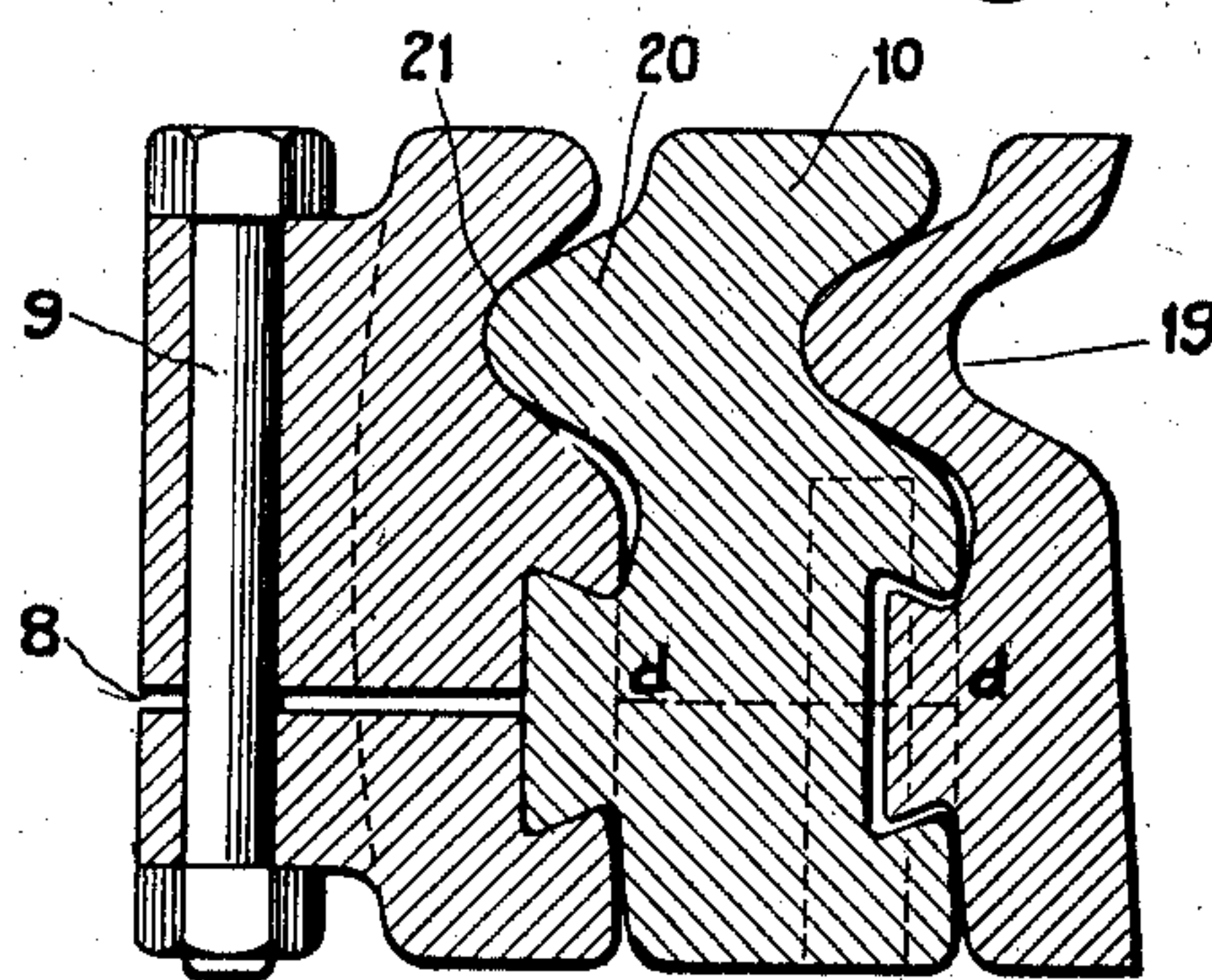


Fig. 5.

Witnesses.
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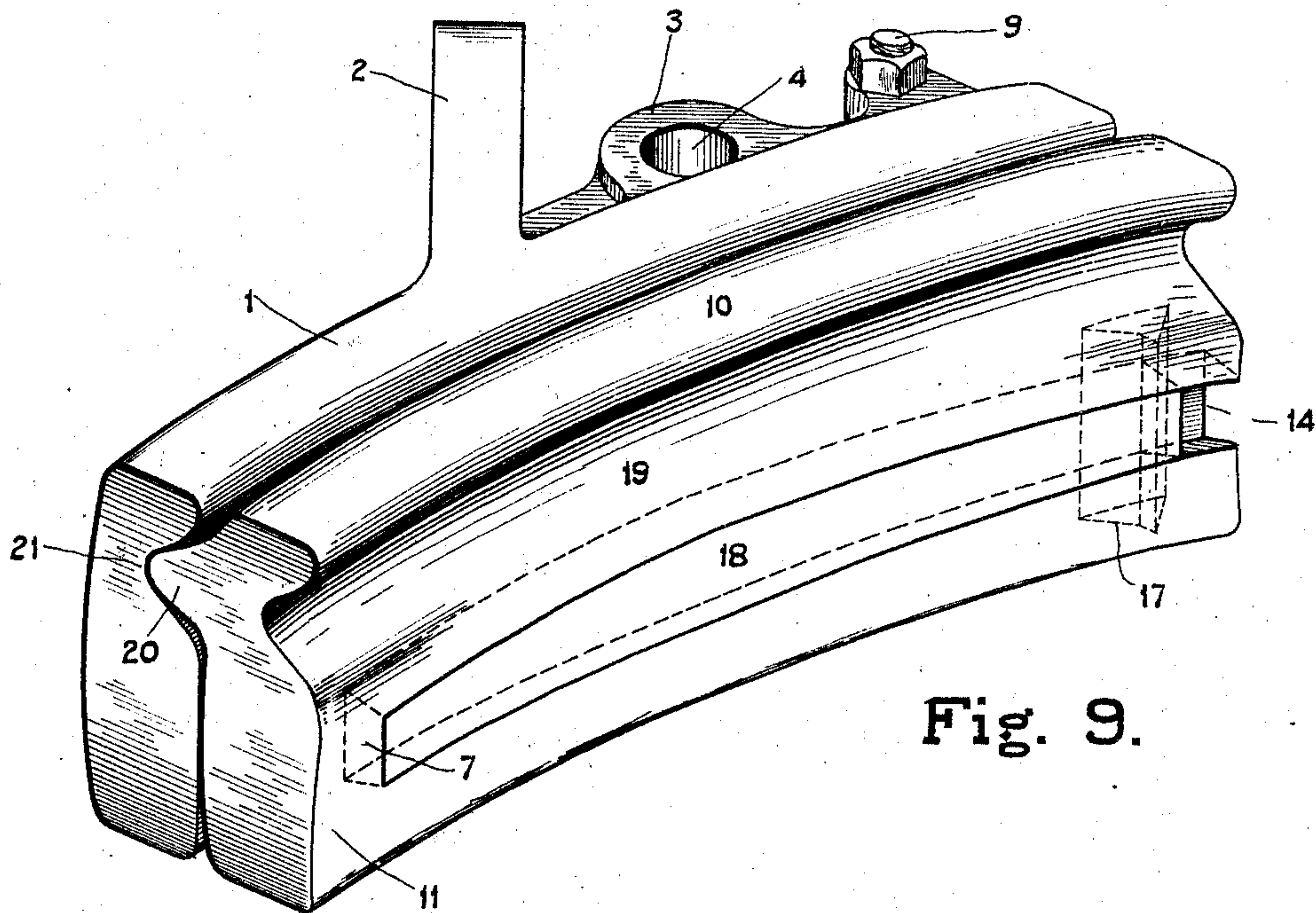


Fig. 9.

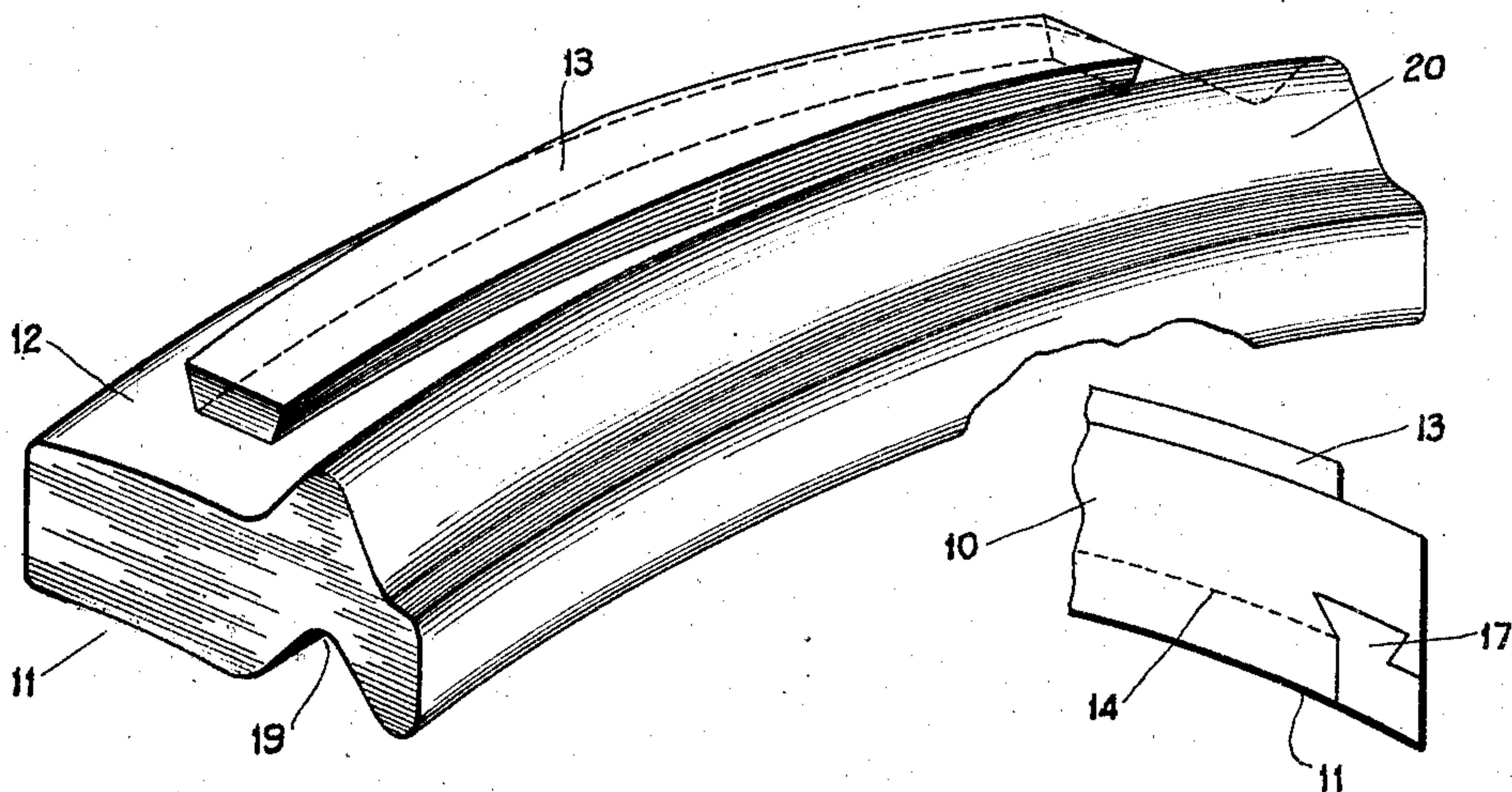


Fig. 10.

Fig. 11.

Witnesses
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UNITED STATES PATENT OFFICE.

VAN BUREN LAMB, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO KEYSTONE BRAKE-SHOE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

BRAKE.

No. 846,481.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed October 6, 1905. Serial No. 281,596.

To all whom it may concern:

Be it known that I, VAN BUREN LAMB, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Brakes, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to brakes, and more especially to friction-brakes designed to be used in railway-service.

It has for one of its objects the provision of means for fastening a brake-shoe securely to a brake-head.

Another object is to provide a brake-shoe such that when the same becomes partially worn it may be readily detached from the brake-head and attached to the wearing-face of a new shoe in such manner that the material of the former may be completely used up.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of the various possible embodiments of my invention, Figure 1 is a vertical sectional view of a brake head and shoe on line *a a* of Fig. 2. Fig. 2 is a rear elevation of the brake-head. Fig. 3 is a horizontal section on line *b b* of Fig. 1, showing a shoe seated loosely in the brake-head. Fig. 4 is a similar view on line *c c*, Fig. 1. Fig. 5 is a similar view showing a worn shoe in position upon the face of a new shoe. Fig. 6 is a view in elevation of the face of the brake-head. Fig. 7 is a similar view of the rear face of a brake-shoe. Fig. 8 is a similar view of the front face thereof. Fig. 9 is a view in perspective of a brake-head and an attached shoe. Fig. 10 is a similar view of a brake-shoe. Fig. 11 is a view in section showing a slightly-different embodiment of retaining-wedge.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Preliminary to a description of the specific features of my invention and as conducive to a clearer understanding of the more important objects thereof, it may here be noted that a great source of loss in the use of brake-shoes as heretofore constructed resides in the necessity of scrapping the worn portions of old shoes when the wearing-surfaces thereof have approached through wear into proximity to the brake-heads. Moreover, one of the chief sources of loss, aside from wasted material, has been caused by the time consumed in the operation of detaching worn shoes from the brake-heads and replacing them with new ones. In eliminating the losses above specified and in providing for the saving of both time and material I have found it desirable therefore to construct a braking member such that when worn it may readily be detached from the brake-head and attached to a new braking member, the latter being interposed between the brake-head and the worn braking member, thus allowing the utilization of all the material thereof for braking purposes. I have, moreover, found it desirable to provide means for connecting the braking members securely together, so that they will be maintained firmly in a fixed relation in all stages of wear, the connecting means being so constructed that the braking members may be connected with each other or with the brake-head without disturbing the adjustment of the brake-beam. The above defects are remedied, and, among others, the advantages above specified are secured in constructions of the nature of that hereinafter described.

Referring now to the drawings, 1 denotes a brake-head, which is preferably an integral casting provided with a lug 2, as shown, for attaching the head to the brake-beam, and a lug 3 having an opening 4 to receive the supporting-link. It may at this point be noted, however, that the construction of the rear face of brake-head, or the number of attaching members or lugs, or their relative arrangement thereon form no part of my present invention, being merely shown herein incidentally. The head, in so far as its attaching features are concerned, may be of any desired construction, such construction depending, of course, upon the particular style of brake-beam upon which it is to be mounted. The face 5 of brake-head 1 is constructed

upon an arc of a circle equal to that described by the radius describing the circumference of the tread of the wheels upon which the braking members operate, the radius of the arc of face 5 being also equal to the radius describing the front and rear faces of the coacting braking member. Face 5 is adapted to receive the rear face of a braking member, as shown in Figs. 3, 4, and 5. Located in face 5 of brake-head 1 is a longitudinally-extending mortise 6 of substantially dovetailed shape and having its greatest width and depth at its middle portion, (indicated by the line $d d$ of Fig. 5.) The walls of mortise 6 converge in every direction downwardly from its middle portion to its lower closed end 7, or, in other words, the lower half thereof is wedge-shaped both in width and thickness from its middle portion to its closed end. Brake-head 1 is also provided with a recess 8, formed by cutting away a portion of the material so that one end thereof is bifurcated, recess 8 extending longitudinally through the bottom wall of mortise 6 to a position adjacent the middle portion thereof. The walls of mortise 6, as shown in Fig. 6, are cut substantially parallel from the middle portion thereof to its upper open end, and extending through a transversely-arranged aperture in the rear portion of brake-head 1 is a clamping-bolt 9, having a nut threaded thereon, said clamping-bolt being adapted to draw the bifurcated portions of brake-head 1 together, so that the walls of the upper portion of mortise 6 will taper in all directions from the middle portion to its upper open end, the shape thereof being similar in all respects to the lower wedge-shaped portion.

Braking member 10, herein designated "shoe," comprised, preferably, by an integral casting designed to cooperate with brake-head 1, has front and rear faces 11 and 12, respectively, upon arcs described by radii equal to the radius of the arc describing brake-head 1. Extending longitudinally of shoe 10 is a rigid tenon 13, dovetailed in end section, as shown, and tapering in every direction toward either end from its middle portion, (denoted herein by line $e e$.) Tenon 13 is of such size as to be received and fit in mortise 6 of brake-head 1, the lower portion thereof fitting the same closely. Shoe 10 is, in the wearing-face thereof, provided with a mortise 14, preferably dovetailed, as shown, which tapers downwardly from the middle portion (herein indicated by line $e' e'$) to a closed end 15, the upper portion being comprised by substantially parallel walls. The lower portion of mortise 14 is of such shape and dimensions as to fit exactly the corresponding portion of a tenon of a shoe constructed similarly to shoe 10. In an opening 16 substantially dovetail in shape extending transversely of shoe 10, near the

upper end thereof and intersecting mortise 14, is a similarly-shaped key 17, adapted to engage and maintain in position in mortise 14 a wedge-shaped filler-piece 18, as shown in Fig. 1, or the tenon of an attached shoe. As shown in this illustrative embodiment, shoe 10 is provided with a longitudinal groove 19 in its wearing-surface to receive the flange of the wheel and has a similarly-arranged projection or rib 20 upon the rear surface thereof which is adapted to be received when the shoe is in position upon the brake-head in a depression 21 therein. At this point it may be noted that shoe 10 increases gradually in thickness from its lateral side inwardly to a point opposite the middle portion of the base of tenon 13, (indicated by line $d d$), which is in a plane cutting the shoe longitudinally from top to bottom. In other words, any given line drawn through shoe 10 parallel to the plane indicated by line $d d$ in either direction toward the lateral sides of the shoe will be of less length than line $d d$ and of less length than any line drawn parallel and intermediate that line and in the plane indicated by line $d d$. By reason of this construction shoe 10 will be worn away completely, the wearing occurring first at its lateral edges and later gradually wearing inwardly in opposite directions toward tenon 13, thus providing against portions of the shoe being cut away through wear from the body portion of the shoe.

The front faces of the head and of the shoe are preferably recessed, so as to form the concave surfaces 11^a, which fit the convex rear surfaces of the parts mounted thereon.

As shown in the embodiment illustrated in Fig. 11, key 17 is carried upward, so as to be flush with the wearing-surface of shoe 10, and is so shaped as to fit the end of mortise 14.

Having thus described my invention, its method of use, which should be largely obvious, is substantially as follows: In attaching a brake-shoe to the brake-head it is only necessary to slide tenon 13 in mortise 6 and clamp the bifurcated members of the brake-head thereabout by means of clamping-bolt 9, which draws the walls of the upper portion of mortise 6 into engagement with the tapered upper portion of tenon 13, the resiliency of the metal of which the brake-head is constructed allowing for the relative movement of the bifurcated members thereof during the clamping operation. The shoe is thus held firmly against movement by the wedge-shaped walls of the mortise coacting with the oppositely-disposed wedge-shaped surfaces of the tenon. When a new shoe is interlocked in the brake-head, the mortise in the wearing-face of the shoe is filled with the wedge-shaped filler-piece 18, which comes flush with the wearing-surface, as shown in Figs. 2 and 3, being held securely in place by means of key 17, driven in the transversely-

extending mortise. Filler-piece 18 and key 17 wear away with the face of the shoe, and as both are wider at their bottom than at their top portion they are maintained in position until completely worn away. When the shoe becomes worn to any degree, it may be removed from the head by simply unscrewing the nut upon clamping-bolt 9, and after a new shoe has been clamped therein the worn shoe may be fastened to the face of such shoe by simply sliding the tenon in the mortise of the new shoe, after which a key 17 is driven to its seat to retain the same in position. In Fig. 5 for purposes of illustration I have shown a partly-worn shoe attached to the wearing-face of a new shoe, which is in turn clamped to the head. Inasmuch as the shoe has its maximum wearing thickness opposite the base of the longitudinally-arranged tenon and as the surfaces of the interfitting parts diverge from the wearing-surfaces rearwardly, connecting means will at all times be provided for all portions of the wearing-surface of the shoe. When the material of a worn shoe which has been mounted upon a new one is completely worn away, the longitudinally-extending tenon of the old shoe will be retained in position in the recess of the new shoe. In this way the old shoe may be completely worn away, as its tenon will provide a filler-piece for the wearing-surface of the interposed shoe and will be worn away therewith. It may here be noted that the term "shoe" or "shoe member" is used throughout the following claims in a broad sense as comprehending not merely an integral part, but rather a unit which may be of either integral or built-up construction. It will accordingly be seen that I have provided a construction characterized by increased simplicity and efficiency and one well adapted to achieve the objects of my invention. The wedge-shaped interfitting members insure against the loosening of the parts, as a slight movement of the shoe in either direction, whether mounted in a brake-head or in another shoe, will only serve to wedge the members more securely together. As the interfitting parts are fitted into each other with a sliding movement, worn shoes may be detached and new ones substituted without disturbing the adjustment of the brake-beam, thus effecting a saving of a large amount of labor and the expense incident thereto. The material of the brake-shoe is entirely worn away, nothing being left to be scrapped or wasted, which results in the maximum utilization of material. It will also be seen, as has been hereinbefore indicated, that parts of the shoe at no stage of the wear thereof are free to become detached from the member upon which they are mounted, and thus drop upon the track. It may also be noted at this point that by reason of the interfitting construction of the sev-

eral parts whereby substantially the entire shoe is positively secured to the member upon which it is mounted all chance of the same becoming detached by reason of the breakage of any of the parts, such as might occur in constructions in which merely interlocking lugs are employed, is done away with.

The brake-head may, if desired, be made in two independent longitudinal sections designed to be clamped together by suitable means instead of being bifurcated, as herein shown.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention could be made without departing from the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative, and not in a limiting sense. I desire it also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

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

1. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side walls, and a shoe comprising a pair of substantially interchangeable shoe members, each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a recess adapted to receive a similar tenon.

2. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut walls, and a shoe comprising a pair of substantially interchangeable shoe members, each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a recess adapted to receive a similar tenon.

3. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side walls converging toward one end of the member, and a shoe comprising a pair of substantially interchangeable shoe members, each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a recess adapted to receive a similar tenon.

4. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side walls converging toward both ends of the member, and a shoe comprising a pair of substantially interchangeable shoe members,

each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a recess adapted to receive a similar tenon.

- 5 5. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess of decreasing depth toward one end thereof and having undercut side walls, and a shoe comprising a pair of
10 substantially interchangeable shoe members, each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a recess adapted to receive a similar tenon.
- 15 6. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess of decreasing depth toward one end thereof and having undercut side walls converging toward one end of the
20 member, and a shoe comprising a pair of substantially interchangeable shoe members, each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a
25 recess adapted to receive a similar tenon.
- 30 7. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side walls converging toward one end thereof, and a shoe comprising a pair of substantially
interchangeable shoe members, each of which is provided with a rear surface of general convex form in a transverse direction and
35 with a tenon upon said rear surface adapted to fit within said recess, said shoe members being provided upon their forward surfaces with recesses adapted to receive similar tenons.
- 40 8. In a device of the class described, in combination, a braking member provided with a dovetail tenon the walls of which converge toward one end of the member, a supporting member provided with a correspond-
45 ingly-shaped mortise, and means adapted to clamp said tenon within said mortise.
- 50 9. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side walls converging toward one end of the member, and a shoe comprising a pair of substan-
tially interchangeable shoe members, each of which is provided with a rear surface of a
55 general convex form in a transverse direction and with a tenon upon said rear surface adapted to fit within said recess, said shoe members being provided upon their forward surfaces with recesses adapted to receive similar tenons.
- 60 10. In a device of the class described, in combination, a brake-shoe having a rearwardly-projecting member, a brake-head provided with a recess adapted to receive said member and fit a portion thereof, and means
65 adapted to clamp another portion of said brake-head about said member.

11. In a device of the class described, in combination, a brake-shoe having a rearwardly-projecting member provided with undercut side walls, a brake-head provided with a recess adapted to receive said member
70 and fit a portion thereof, and means adapted to clamp another portion of said head into engagement with said member.

12. In a device of the class described, in combination, a brake-head having a recess
75 therein, said brake-head being bifurcated through a portion of its extent, a brake-shoe having a member designed to be seated in said recess, and means for clamping the bifurcated portion of said brake-head about said
80 member.

13. In a device of the class described, in combination, a brake-head having a recess therein, said brake-head being bifurcated, a
85 brake-shoe having a member designed to be seated in said recess, and means for clamping the bifurcated portion of said brake-head about said member.

14. In a device of the class described, in combination, a brake-shoe having a projec-
90 tion the greatest width of which is at a point intermediate its ends, and a brake-head provided with a recess in which a portion of said projection is adapted to fit closely, a portion of the walls of said recess being adapted to
95 be brought into engagement with the remaining portion of said projection.

15. In a device of the class described, in combination, a brake-shoe having a projec-
100 tion the greatest width and thickness of which is at a point intermediate its ends, a brake-head provided with a recess in which a portion of said projection is adapted to fit closely, and means for forcing a portion of the walls of said recess into engagement with
105 the remaining portion of said projection.

16. In a device of the class described, in combination, a brake-shoe provided with a projecting member having its greatest width
110 at a point intermediate its ends, and a brake-head having a recess in which a portion of said member is adapted to fit closely, a portion of the walls of said recess being adapted to be moved into engagement with the remaining portion of said member.
115

17. In a device of the class described, in combination, a brake-shoe provided with a projecting member having its greatest width
120 at a point intermediate its ends, a brake-head having a recess in which a portion of said member is adapted to fit closely, and means for clamping a portion of the walls of said recess into engagement with the remaining portion of said member.

18. In a device of the class described, in
125 combination, a brake-head provided with a recess open at one end and closed at the other, a brake-shoe provided with a projecting member adapted to be seated in said recess with one end thereof engaging the closed end
130

of said recess, and means for contracting a portion of the walls of said recess into engagement with a portion of said member.

19. In a device of the class described, in combination, a brake-head having a shoe-receiving face, a recess in said receiving-face of greater width at the bottom than at the top thereof, said recess being open at one end and closed at the other and being tapered from a point intermediate its ends to the closed end thereof, a brake-shoe having a projecting member shaped similarly to the tapered portion of said recess adapted to be seated therein and engage the closed end thereof, and means for clamping a portion of the walls of said recess into engagement with a portion of said member.

20. In a device of the class described, in combination, a bifurcated brake-head provided with a longitudinally-extending recess in its receiving-face and having overhanging walls so that the said recess is of greater width at the bottom than at the top thereof, said recess being tapered from a point intermediate its length in all directions to a closed end, and a brake-shoe provided with a longitudinally-extending lug one end of which is adapted to fit closely in the tapered end of said recess, the opposite end being adapted to be clamped between the walls of said recess by means extending through the bifurcated portion of said brake-head.

21. In a device of the class described, in combination, a brake-shoe provided with a longitudinally-extending tenon having outwardly-directed, lateral surfaces, said tenon being tapered toward either end thereof from a point intermediate said ends, and a brake-head provided with a mortise one end of which is shaped to correspond with one end of said tenon, the walls of the opposite end being adapted to be clamped into engagement with the opposite end of said tenon.

22. In a device of the class described, in combination, a brake-shoe provided with a longitudinally-extending tenon having outwardly-directed, lateral surfaces, said tenon being tapered toward either end thereof from a point intermediate its ends, a brake-head provided with a mortise one end of which is shaped to correspond with the tapered portion of said tenon, and means for clamping the walls of the opposite end of said recess into engagement with the opposite end of said tenon so that they fit closely along the entire contacting surface thereof.

23. In a device of the class described, in combination, a brake-shoe provided with a longitudinally-extending tenon having outwardly-directed, lateral surfaces, said tenon being tapered in width and thickness from a point intermediate its ends toward either end thereof, a brake-head provided with a mortise one end of which is shaped to correspond with an end of said tenon, and means for

clamping the walls of the opposite end of said mortise into engagement with the opposite end of said tenon.

24. In a device of the class described, in combination, a brake-shoe provided with a longitudinally-extending tenon having outwardly-directed, lateral surfaces, said tenon being tapered in width and thickness from a point intermediate its ends toward either end thereof, a bifurcated brake-head provided with a mortise, the bifurcation therein extending within said mortise, one end of said mortise being shaped to correspond with said tenon and having a closed end to form an abutment for the end thereof, and a clamping member extending through the bifurcated portion of said brake-head adapted to clamp the walls of said mortise into engagement with said tenon.

25. A brake-shoe having a wearing-face and a back face formed substantially in parallel relation so that the wearing-face of one shoe will fit the back face of another shoe, and provided upon its back face with a longitudinally-extending, undercut tenon upon its wearing-face with a recess adapted to receive a similar tenon of another shoe.

26. A brake-shoe having front and rear faces formed substantially upon arcs of equal radii provided upon its rear face with a tenon having undercut side walls and upon its forward face with a recess adapted to receive and fit about a similar tenon.

27. A brake-shoe provided with wearing and attaching faces formed upon arcs of equal radii, and provided with a tenon upon its attaching-face having outwardly-directed walls and a mortise having receding walls upon its wearing-face, said mortise being adapted to receive the tenon of another shoe.

28. A brake-shoe having back and wearing faces formed upon arcs of equal radii so that the wearing-face of one shoe may fit about the back face of another shoe, and provided with a longitudinally-extending tenon upon its back face and a recess upon its wearing-face, a portion of which is shaped similarly to a portion of said tenon, said recess being adapted to receive the tenon of another shoe, and means adapted to close one end of said recess.

29. A brake-shoe having wearing and back faces formed upon arcs of equal radii so that the wearing-face of one shoe may fit about the back face of another shoe, and provided with a longitudinally-extending tenon upon its back face, and a recess having a closed end upon its wearing-face, the portion of said recess adjacent the closed end being shaped similarly to a portion of said tenon so that the same may receive the tenon of another shoe, and means adapted to close the opposite end of said recess.

30. A brake-shoe formed with wearing and

back faces upon arcs of equal radii so that the wearing-face of one shoe will fit the back face of another shoe, and provided with a tapering projection upon its back face and a tapering recess in its wearing-face, said recess being closed at one end and open at the other, and means extending transversely through the open end of said recess.

31. A brake-shoe formed with wearing and back faces upon arcs of equal radii so that the back face of one shoe will fit the wearing-face of another shoe, and provided with a recess in its wearing-face having a closed end, the open end of said recess being intercepted by a transversely-extending recess, and means extending through said last-mentioned recess to close said first-mentioned recess.

32. In apparatus of the class described, in combination, a shoe-supporting member having formed in its forward surface a recess provided with undercut side walls, and a brake-shoe having upon its rear surface a tenon adapted to fit said recess and upon its forward surface with a recess adapted to receive and fit a like tenon upon another shoe.

33. In apparatus of the class described, in combination, a shoe-supporting member having formed in its forward surface a recess provided with undercut side walls converging toward one end thereof, and a brake-shoe having upon its rear surface a tenon adapted to fit said recess and upon its forward surface with a recess adapted to receive and fit a like tenon upon another shoe.

34. A brake-shoe having in its wearing-face a recess in which the attaching part of another shoe is adapted to be received and being provided with a member seated in a transverse recess adapted to engage the attaching part upon another shoe and maintain said shoes in an interfitted condition.

35. A brake-shoe having in its wearing-face a recess in which the attaching part of another shoe is adapted to be received, said brake-shoe being provided with a member dovetailed in a transversely-extending recess therein adapted to engage a part upon another shoe when the same is seated in said first-mentioned recess.

36. A brake-shoe having in its wearing-face a recess adapted to receive a filler-piece.

37. A brake-shoe having in its wearing-face a recess adapted to receive a filler-piece and being provided with a recess extending transversely of said first-mentioned recess adapted to receive a retaining-key.

38. In combination, a brake-shoe having in its wearing-face a recess, a wedge-shaped filler-piece adapted to be received in said recess, and means adapted to maintain said filler-piece in place therein.

39. In combination, a brake-shoe having in its wearing-face a recess, a filler-piece adapted to be seated in said recess, and means adapted positively to engage said

filler-piece to maintain the same in position in said recess.

40. In combination, a brake-shoe having a substantially wedge-shaped recess adapted to receive a correspondingly-shaped filler-piece, and means located in a recess extending transversely of said first-mentioned recess adapted to maintain said filler-piece in position in said first-mentioned recess.

41. In combination, a brake-head, a brake-shoe provided with means whereby the same may be attached to said brake-head, and a filler-piece located in a recess in said brake-shoe.

42. In combination, a brake-head, a brake-shoe provided with a wedge-shaped tenon upon its rear face adapted to be seated in a recess in the face of said brake-head, a filler-piece located in a recess in the face of said brake-shoe, and means for retaining said filler-piece in position therein.

43. In combination, a brake-head, a brake-shoe provided with a tenon upon its attaching-face adapted to be seated in a recess in said brake-head, said brake-shoe being provided with a recess in its wearing-face, a filler-piece seated in the recess in said brake-shoe, and means adapted positively to retain said filler-piece in position therein.

44. In combination, a brake-head, a brake-shoe provided with a tenon upon its attaching-face and having outwardly-projecting walls, said tenon being adapted to be seated in a recess in said brake-shoe, said recess being provided with receding walls, said brake-shoe being provided with a recess having receding walls upon its wearing-face, a filler-piece seated in the recess in said brake-shoe, and means for retaining said filler-piece in position therein.

45. In combination, a brake-head, a brake-shoe having back and wearing faces formed upon arcs of equal radii so that the wearing-face of one shoe may fit about the back face of another, said brake-shoe being provided with a longitudinally-extending tenon upon its back face, and a longitudinally-extending recess upon its wearing-face, the tenon upon said back face being adapted to be received in the recess in said brake-head, the recess in the wearing-face of said shoe being adapted to receive the tenon of another shoe, and means adapted to close one end of said recess.

46. In combination, a brake-head, a brake-shoe formed with back and wearing faces upon arcs of equal radii so that the wearing-face of one shoe may fit the back face of another, said shoe being provided with tapering projection upon its back face adapted to be received in a similarly-shaped recess in said brake-head and being further provided with a tapering recess in its wearing-face, said last-mentioned recess being closed at one end and open at the other, a filler-piece seated in said recess, and means extending trans-

versely through the opening in said recess adapted to retain the filler-piece in position therein.

47. A brake-shoe formed with back and wearing faces upon arcs of equal radii and provided with an attaching member, said brake-shoe being greatest in thickness opposite said attaching member.

48. A brake-shoe formed with back and wearing faces upon arcs of equal radii having an attaching member, said brake-shoe increasing gradually in thickness from its lateral sides to a point opposite said attaching member.

49. A brake-shoe formed with back and wearing faces of equal radii having a longitudinally-extending attaching member, said brake-shoe being so constructed as to gradually diminish in thickness in either direction laterally from a plane extending longitudinally thereof cutting the middle portion of said attaching member.

50. In apparatus of the cases described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided with means upon its front and rear surfaces for forming a dovetailed connection with similar shoe members in front or at the rear of the same and each of which is provided with a rear surface of a general convex form in a transverse direction.

51. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided with means upon its front and rear surfaces adapted to form a dovetailed connection with similar shoe members in front or at the rear of the same, and each of which is of a decreasing thickness toward the sides of the shoe.

52. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided with means upon its front and rear surfaces adapted to form a dovetailed connection with similar shoe members in front or at the rear of the same, and each of which is of a decreasing thickness toward the sides of the shoe, the lateral walls of said dovetailed connections being converged toward one end of the shoe.

53. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided with means upon its front and rear surfaces adapted to form a dovetailed connection with similar shoe members in front or at the rear of the same, and each of which is of a decreasing thickness toward the sides of the shoe, the lateral walls of said dovetailed connections being converged toward both ends of the shoe.

54. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which

is provided with means upon its front and rear surfaces adapted to form a dovetailed connection with similar shoe members in front or at the rear of the same, the lateral walls of said dovetailed connections converging toward one end of the corresponding shoe.

55. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided with means upon its front and rear surfaces adapted to form a dovetailed connection with similar shoe members in front or at the rear of the same, the lateral walls of said dovetailed connections converging toward both ends of the corresponding shoe.

56. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided upon one surface with a dovetail tenon of decreasing thickness toward one end of the shoe and upon its opposite surface with a recess adapted to receive and fit a similar tenon.

57. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided upon one surface with a dovetail tenon of decreasing thickness toward one end of the shoe and upon its opposite surface with a recess adapted to receive and fit a similar tenon, the walls of said tenons being converged toward one end of the shoe.

58. In apparatus of the class described, in combination, a plurality of substantially interchangeable shoe members, each of which is provided upon one surface with a dovetail tenon of decreasing thickness toward both ends of the shoe and upon its opposite surface with a recess adapted to receive and fit a similar tenon, the walls of said tenons being converged toward both ends of the shoe.

59. In apparatus of the class described, in combination, a shoe-supporting member provided upon its forward surface with a recess of decreasing depth toward the ends thereof, and a shoe member provided upon its rear surface with a tenon adapted to fit said recess.

60. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side walls converging toward each end thereof, and a shoe member provided with a tenon adapted to fit said recess.

61. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side walls converging toward each end thereof and of decreasing depth toward the ends of the shoe, and a shoe member provided with a tenon adapted to fit said recess.

62. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut side

walls, and a shoe comprising a pair of substantially interchangeable shoe members, each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a recess adapted to receive a similar tenon, the ends of said shoe members projecting beyond the corresponding tenons.

63. In apparatus of the class described, in combination, a shoe-supporting member provided with a recess having undercut walls, and a shoe comprising a pair of substantially interchangeable shoe members, each of which is provided upon its rear surface with a tenon adapted to fit within said recess and upon its forward surface with a recess adapted to receive a similar tenon, the ends of said shoe members projecting beyond the corresponding tenons.

64. A supporting member for a brake-shoe having in its wearing-face a recess in which

the attaching part of said shoe is adapted to be received, and being provided with a member seated in a transverse recess therein adapted to engage the attaching part upon said shoe and maintain the same in an inter-fitted condition.

65. A supporting member for a brake-shoe having in its wearing-face a recess in which the attaching part of said shoe is adapted to be received, said member being provided with means dovetailed in a transversely-extending recess therein adapted to engage a part of said shoe when the same is seated in said first-mentioned recess.

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

VAN BUREN LAMB.

Witnesses:

J. H. FREEMAN,
ROBERT S. BLAIR