

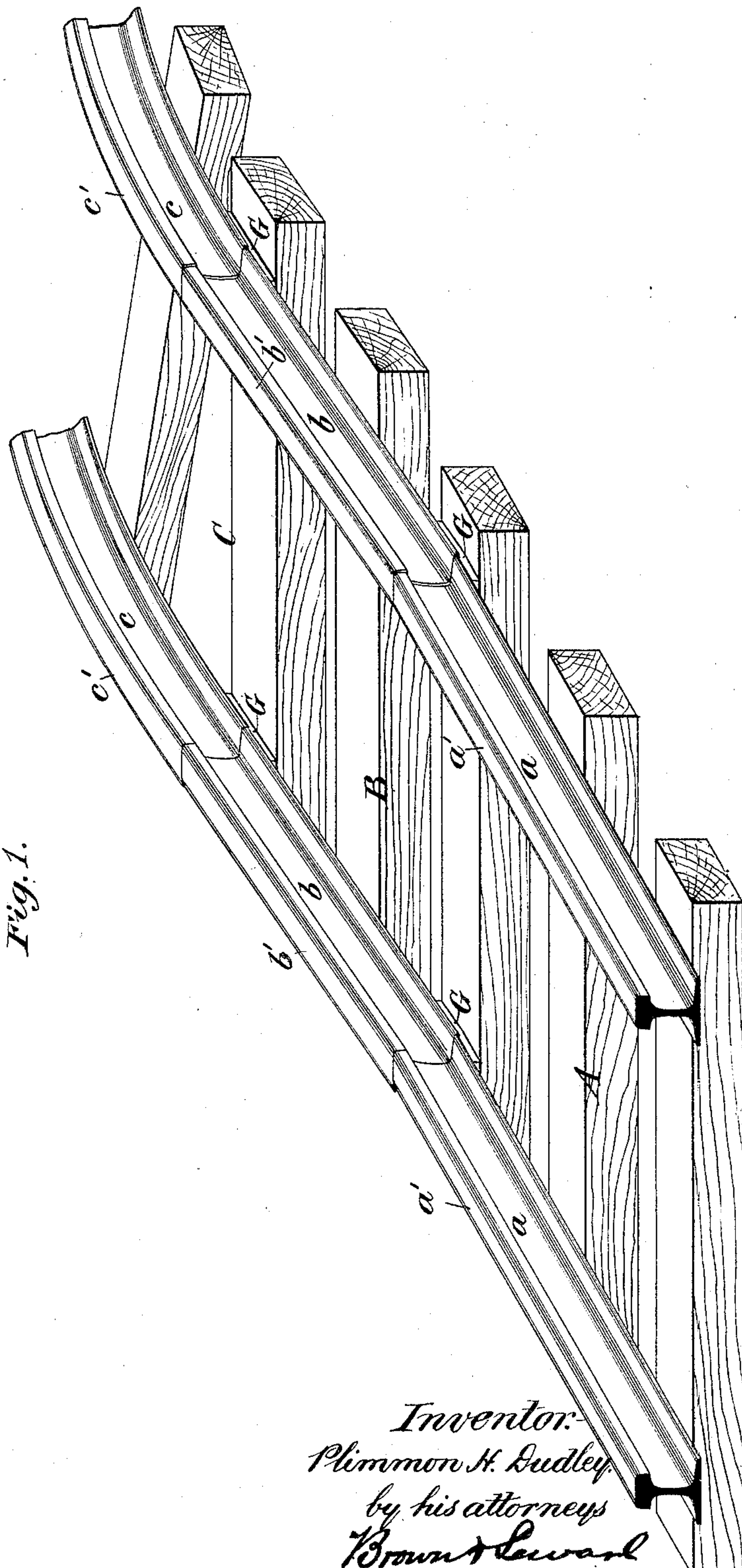
(No Model.)

4 Sheets—Sheet 1.

P. H. DUDLEY.
RAILWAY TRACK.

No. 432,159.

Patented July 15, 1890.



Witnesses:-
D. H. Hayward
O. Lundgren

Inventor:-
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by his attorneys
Brown & Leavelle

(No Model.)

4 Sheets—Sheet 2.

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Fig. 2.

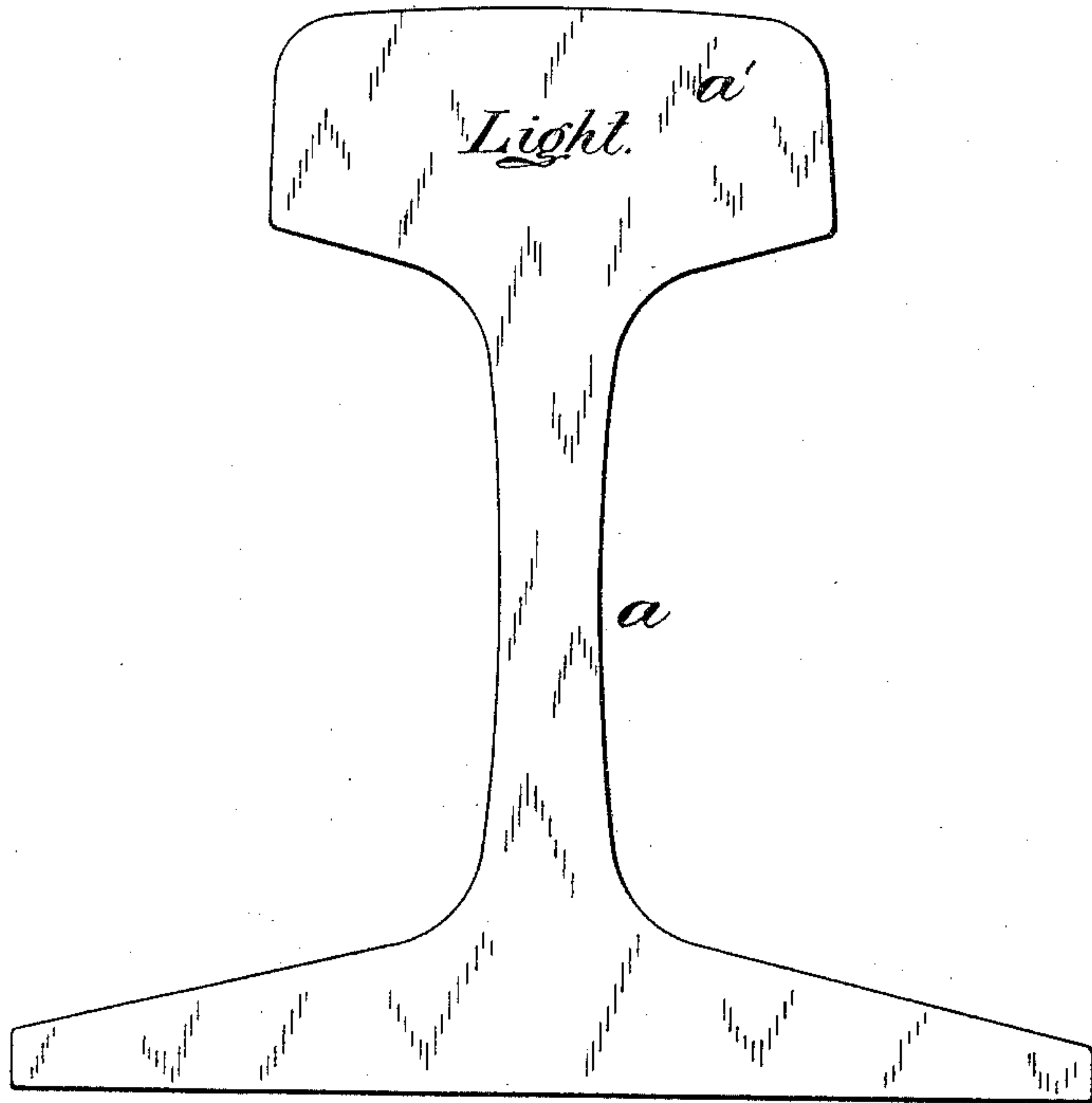
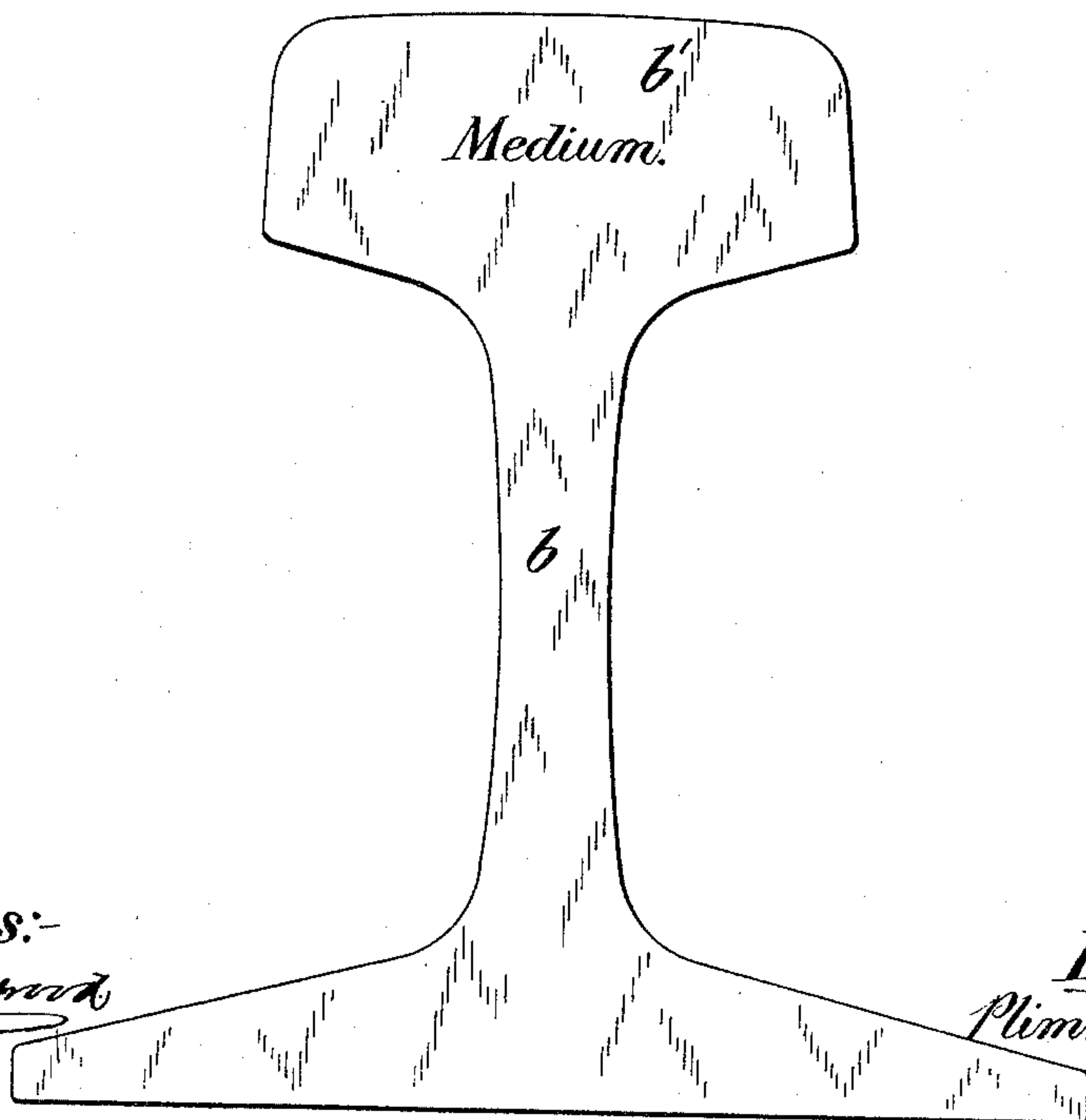


Fig. 3.



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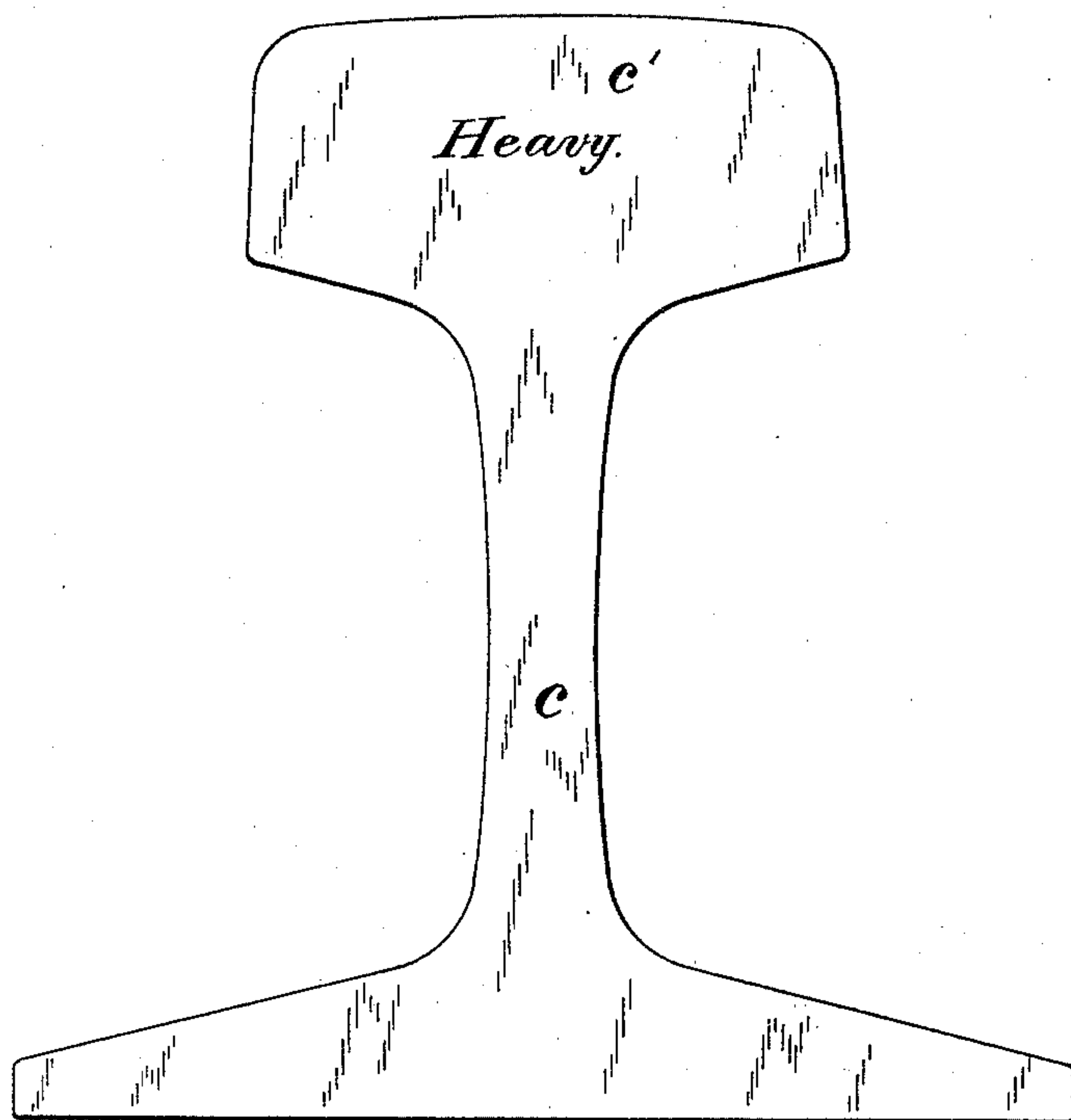
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Fig. 4.



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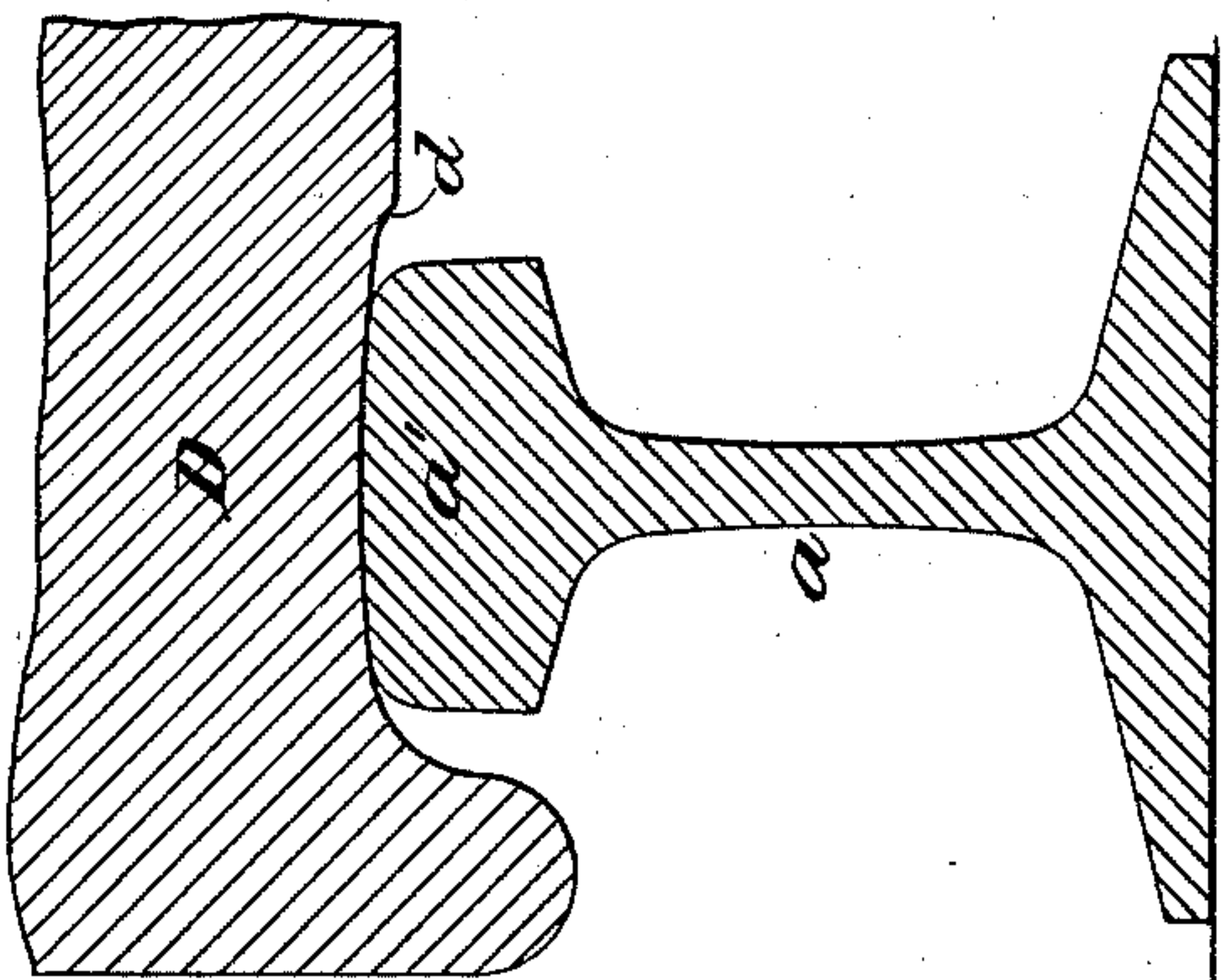


Fig. 5.

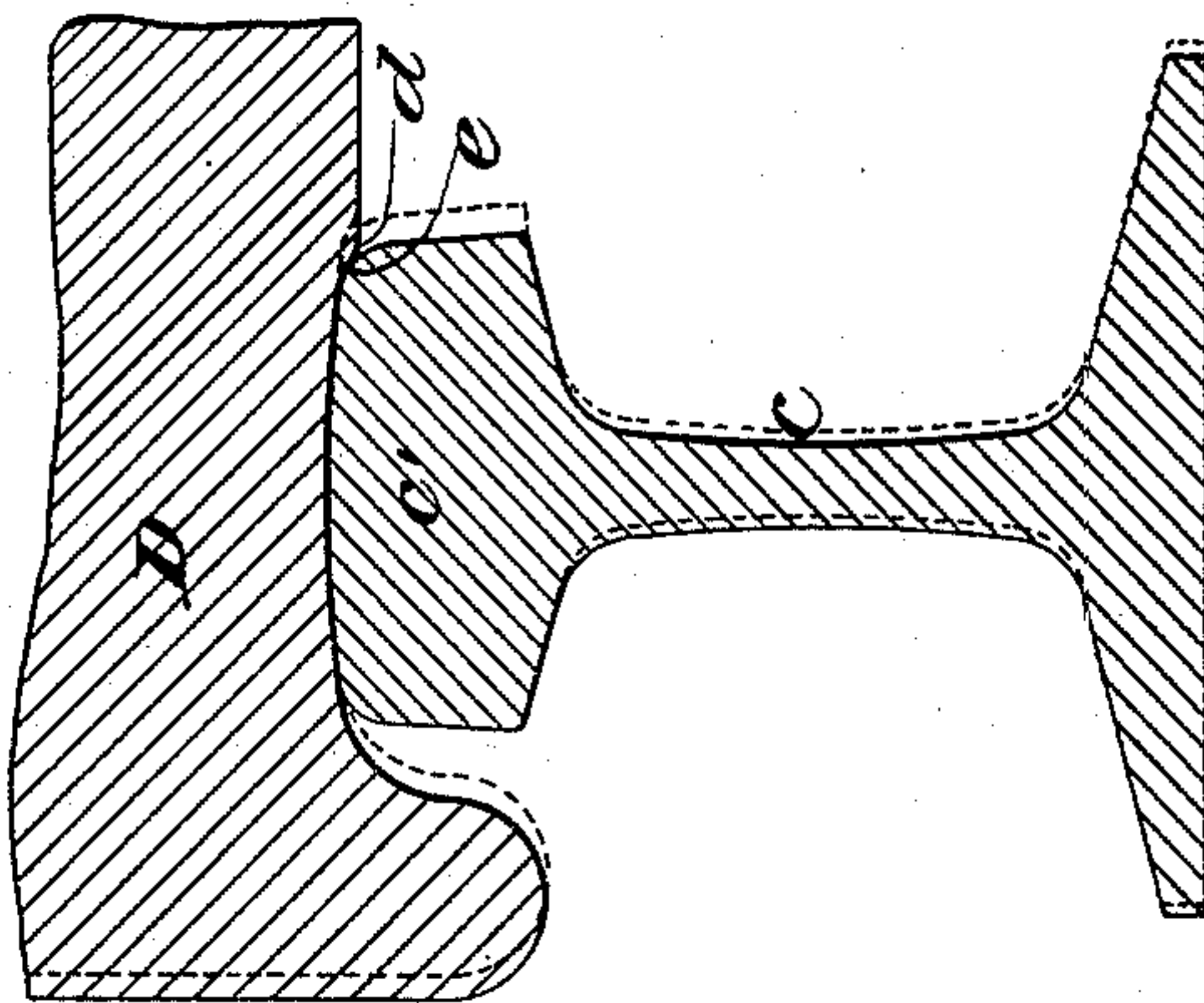
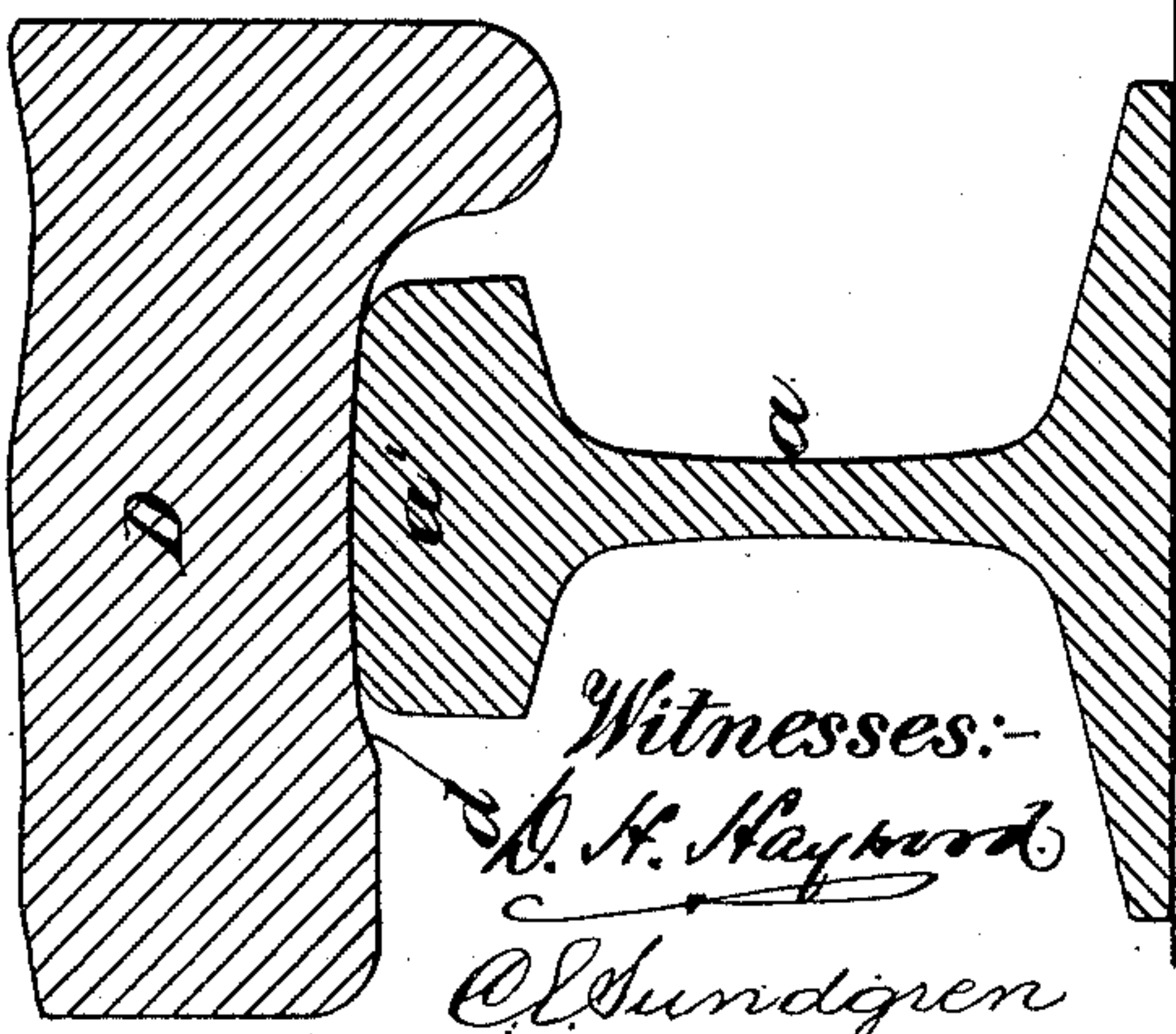
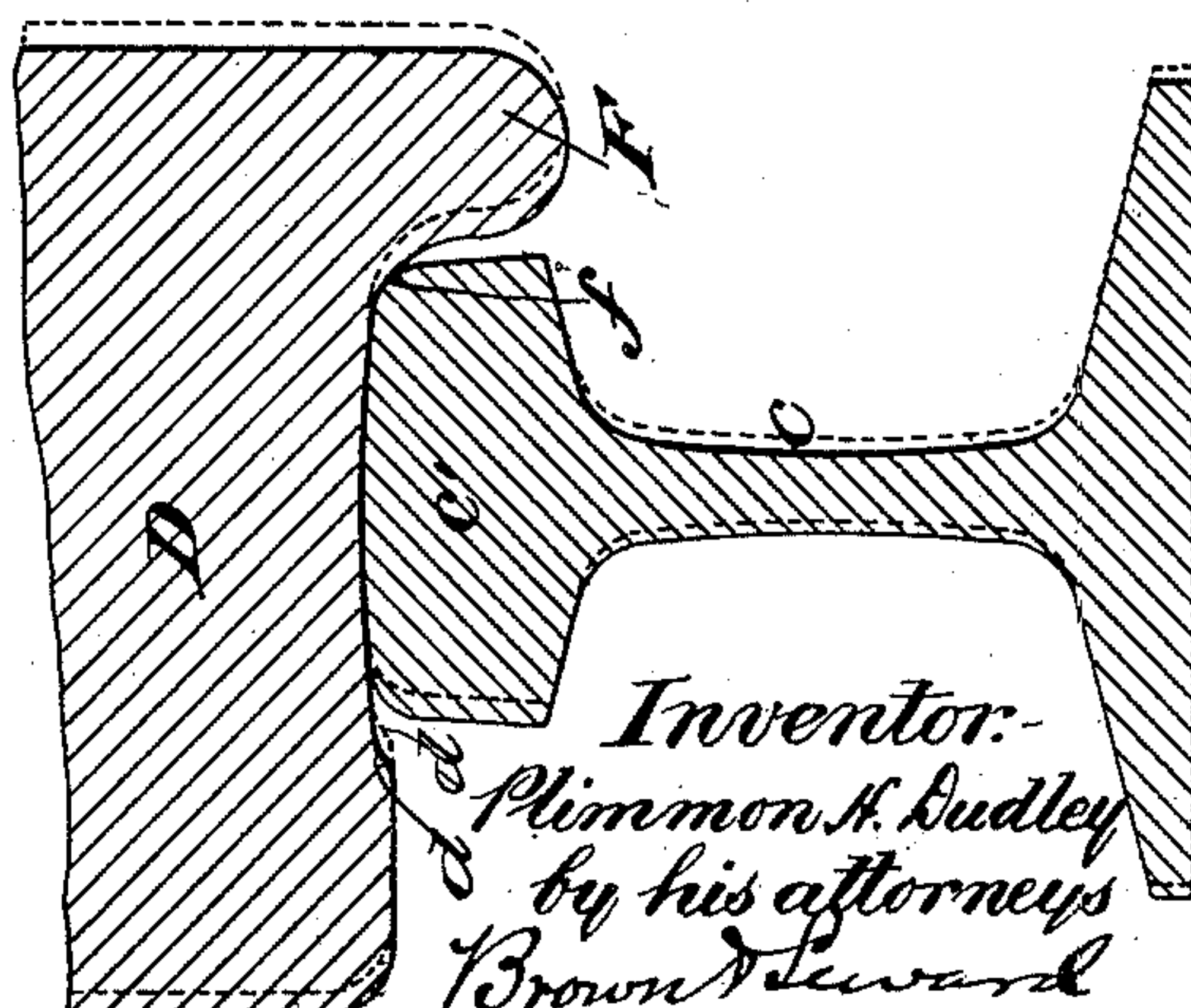


Fig. 6.



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UNITED STATES PATENT OFFICE.

PLIMMON H. DUDLEY, OF NEW YORK, N. Y.

RAILWAY-TRACK.

SPECIFICATION forming part of Letters Patent No. 432,159, dated July 15, 1890.

Application filed March 11, 1890. Serial No. 343,483. (No model.)

To all whom it may concern:

Be it known that I, PLIMMON H. DUDLEY, of New York, in the county and State of New York, have invented a certain new and useful
5 Improvement in Railway-Tracks, of which the following is a specification.

A careful and correct inspection of railway-tracks which have been in use for some time discloses the following state of facts:
10 The least wear of rails is on the level tangents. On the gradient tangents it is from two to three times as great as on the level for the same tonnage, while along the curves it is still greater, especially where the curves
15 are on gradients. In the latter case very severe cutting of the inside head of the outer rail takes place in addition to the increased surface wear of the rails due to the slipping which takes place on all curves. Where tracks
20 are laid with a uniform section of rail this unequal wear requires the renewal of such rails as are the most worn, and when these are replaced by new rails the portion of the track not new seems to ride very poorly as compared with
25 the part renewed. This result has induced most of the roads to renew their rails in long stretches, removing not only those rails which are most worn, but, together with them, those which are only partially worn, thereby losing
30 the benefit of the use of the partially-worn rails for the remainder of their natural life.

The object of my invention is to provide a track in which the life of the rails shall be substantially uniform throughout the level,
35 gradient, and curved portions; and to this end I provide a rail of sufficient stiffness, width, and depth of head to carry the traffic on the level tangents for a number of years with a certain amount of wear, and this, for
40 convenience, I term the "light section" of a series. For the gradient tangents I provide a rail of greater wearing capacity, either by increasing the depth of the head or the width of the head, or both, and at the same time in-
45 creasing the dimensions of the web and base, if necessary, in order to maintain the same proportionate stiffness of the section. This rail I prefer to term the "medium section" of the series. For the curves where the wear
50 is still greater I provide a rail of greater wearing capacity by still further increasing the depth of width of the head or both, as be-

fore. In order to maintain a proportionate stiffness I prefer to increase the dimensions of the web and base. This latter provision is
55 also of importance, in order to equalize the cooling strains in the manufacture of the rails. This latter I call the "heavy section" of the series. I further provide in connection with the series of rails, as hereinbefore
60 referred to, certain supports and fastenings, as will hereinafter be more particularly described.

In the accompanying drawings, Figure 1 represents a portion of track comprising a
65 level, gradient, and curved section, with the respective rails in position thereon as in practical use. Figs. 2, 3, and 4 represent in end elevation different rails of the series. Fig. 5
70 represents the cross-section of track of a level-track section, and Fig. 6 represents a cross-section of track of a curved section.

In laying the track I preserve the same inside gage throughout all sections of the series; but because of the increase in the width
75 of the heads of the rails the actual extent of contact of the tread of the wheel with the rail will be increased for the medium section and still further increased for the heavy section. This will clearly appear by reference to Fig.
80 1 of the drawings, in which the level section of track is denoted by A, the gradient section by B, and the curved section by C, the rails of the level section or the light rail-sections being represented by *a*, the medium by *b*, and
85 the heavy rail-sections by *c*. The narrow head of the level section is denoted by *a'*, the wider head of the gradient section is denoted by *b'*, and the still wider head of the curved section is denoted by *c'*. Because of the fact
90 that the percentage of tangent sections is in excess of the percentage of curved sections on a line of road it follows that the treads of the wheels are worn to a narrower bearing
95 (see, for example, D, Fig. 5) than the bearing would be on a curve laid with rails having the wider heads *c'*. In passing along curves the axles of the wheels do not stand parallel with the radii of the curve; but if in any po-
100 sition the line of the axle were prolonged it would extend in advance of the center of the curve, and this position would throw the flange of the outer wheel into such a position relative to the rail that it would tend to con-

tact with the inner edge of the head of the outer rail in front of the line drawn through the center of the wheel perpendicular to the head of the rail. When, however, the head of the rail is widened, as at c' , the outside edge d of the worn tread of the wheel on the inside of the curve will contact with the outer edge e of the head of the rail on the inside of the curve, and will tend to hold the flange f of the wheel on the outside of the curve away from the inner edge of the head of the rail on the outside of the curve, and thereby prevent the serious cutting away of said rail. This holding of the flange of the outer wheel away from contact with the rail is of great advantage, not only in preventing abrasion of the rail, but also in reducing the retarding friction. Such widening of the head on the curves therefore renders it feasible to reduce the width of the head of the outer rail as compared with the width of the head of the inner rail, (see, for example, dotted lines, Fig. 6,) and still secure substantial uniformity of the lives of the rails.

While I prefer to utilize the special advantage due to a widening of the head of the rail in connection with a deepening of the same, as hereinabove set forth, the increase in the depths of the head might alone be made sufficient to render the lives of the different sections substantially uniform; or the widening alone might be employed. I also find it advisable in general to increase the dimensions of the web and base of the rail, their thickness and height, to keep up the most approved proportions of the same to the increased dimensions of the head.

The meeting ends of the rails of varying heights and thicknesses may be connected by fish-plates of any well-known and approved form adapted for the purpose.

Having determined the increase of wear of a uniform rail-section along its gradient tangents over that along its level tangents, and the increase of wear along its curves and gradient curves over that along its level tangents or gradient tangents, the particular amount of increase in the depth or width, or both, of the head of the rail to withstand the increased wear may be satisfactorily determined, and the light, medium, and heavy rail-sections disposed in such order as to render the lives of the rails substantially uniform throughout the line of road. At prominent stations, yards, intersecting points, and terminals where many trains are stopped and

started, increasing the wear on the rails, I also employ the medium or heavy section to provide for the increased wear, as the case might require.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a railway-track, a series of rail-sections having heads of different dimensions in cross-section and arranged with relation to the level, gradient, and curved sections of the road, substantially as set forth.

2. A railway-track in which the rails constituting curved portions of the track have the bearing-faces of their heads wider than the bearing-faces of the heads of those rails which constitute the tangent portions of the track, substantially as set forth.

3. A railway-track in which the rails constituting the curved portions of the track have their heads deeper than the heads of those rails which constitute the tangent portions of the track, substantially as set forth.

4. A railway-track in which the rails constituting the curved portions of the track have their heads both wider and deeper than the heads of those rails which constitute the tangent portions of the track, substantially as set forth.

5. A railway-track in which the rails constituting the gradients have their heads wider than the heads of those rails which constitute the level portions of the track, substantially as set forth.

6. A railway-track in which the rails constituting the gradients have their heads deeper than the heads of those rails which constitute the level portions of the track, substantially as set forth.

7. A railway-track in which the rails constituting the gradients have their heads wider and deeper than the heads of those rails which constitute the level portions of the track, substantially as set forth.

8. A railway-track in which the rails constituting the curved portions are deeper than those rails which constitute the tangent portions of the track, substantially as set forth.

9. A railway-track in which the rails constituting the gradients are deeper than the rails which constitute the level portions of the track, substantially as set forth.

PLIMMON H. DUDLEY.

Witnesses:

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GEORGE BARRY.