

(No Model.)

J. T. SMITH.  
RAILWAY RAIL.

No. 478,766.

Patented July 12, 1892.

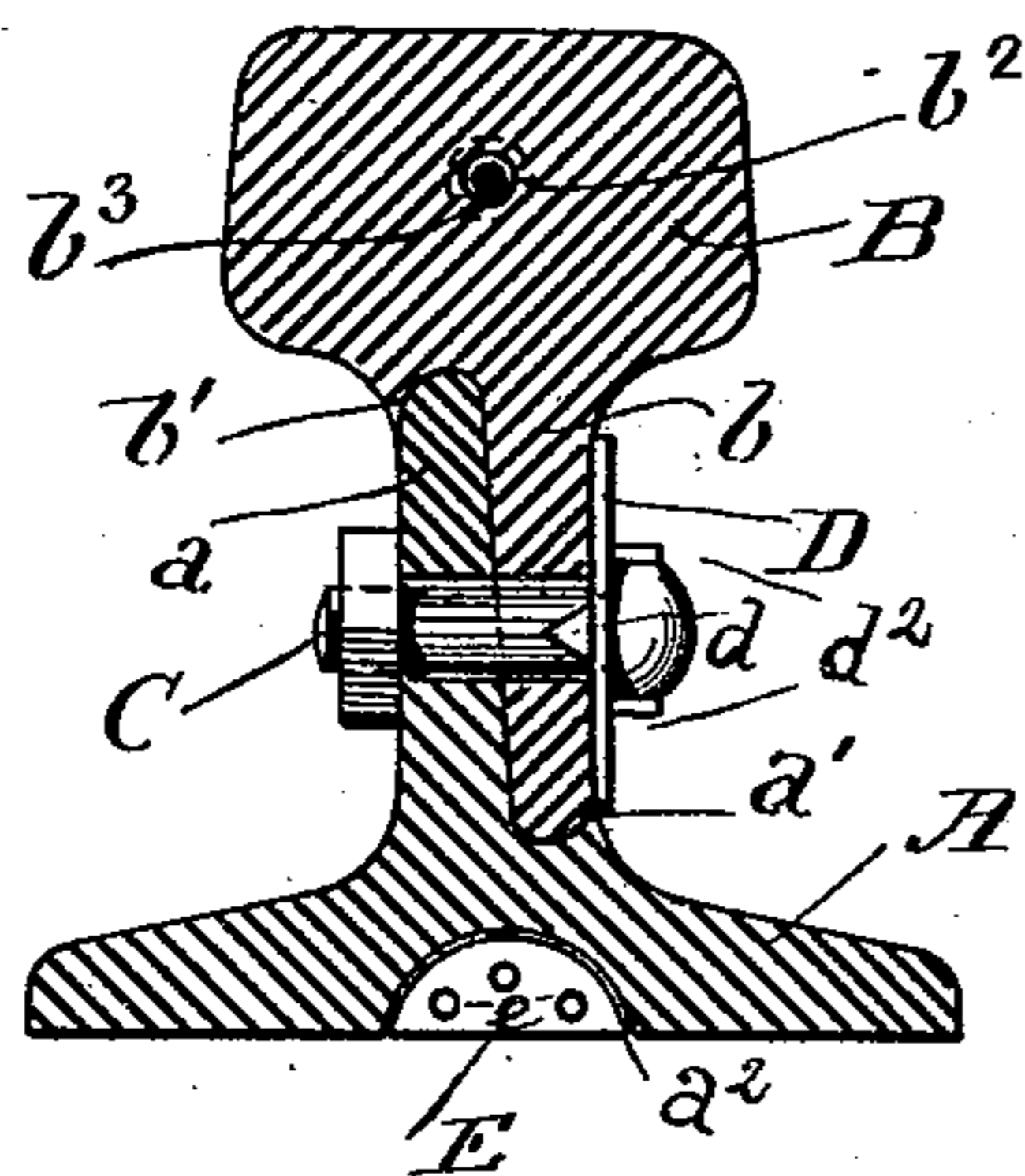


Fig. 1.

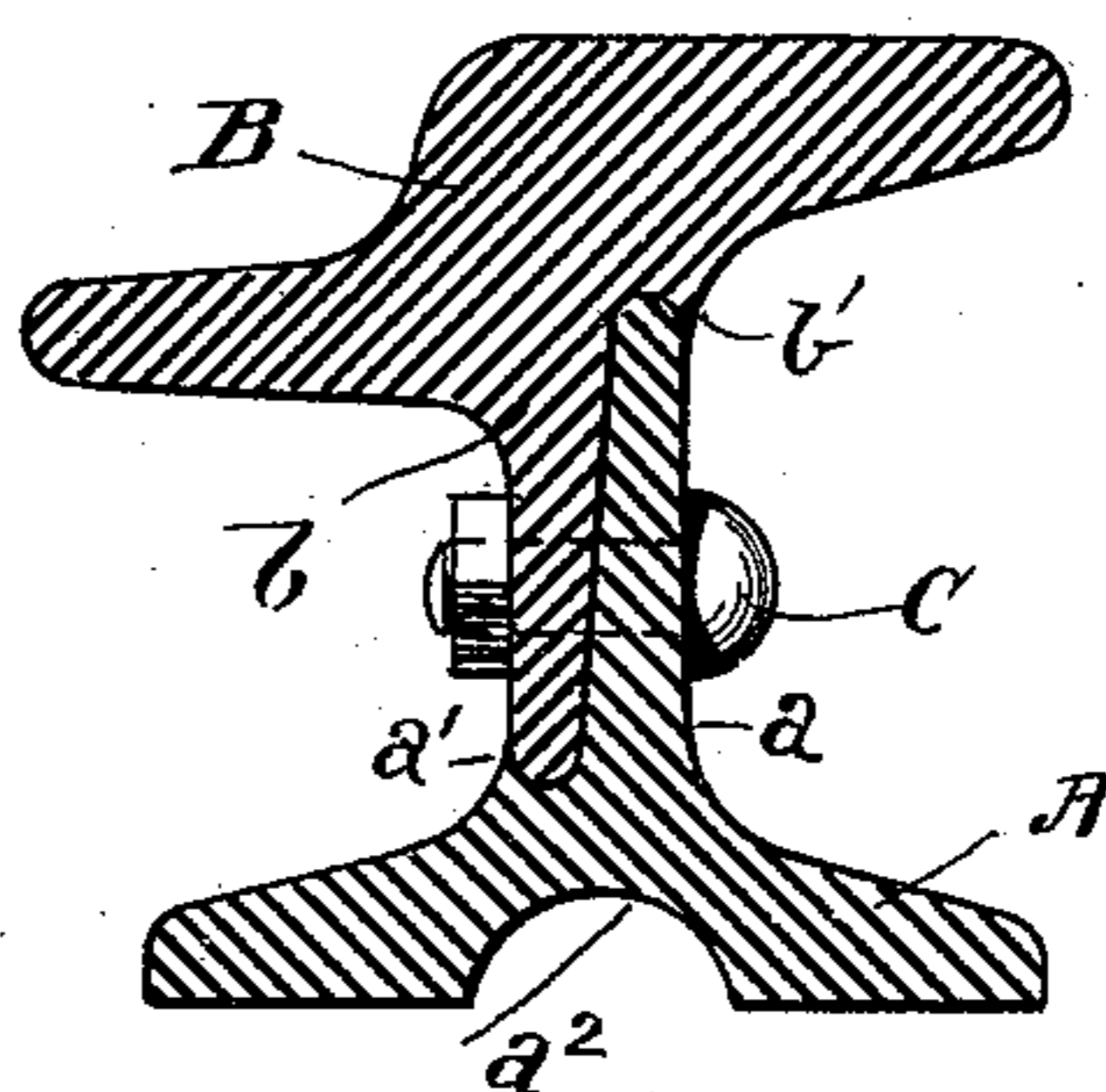


Fig. 2.

Fig. 6.

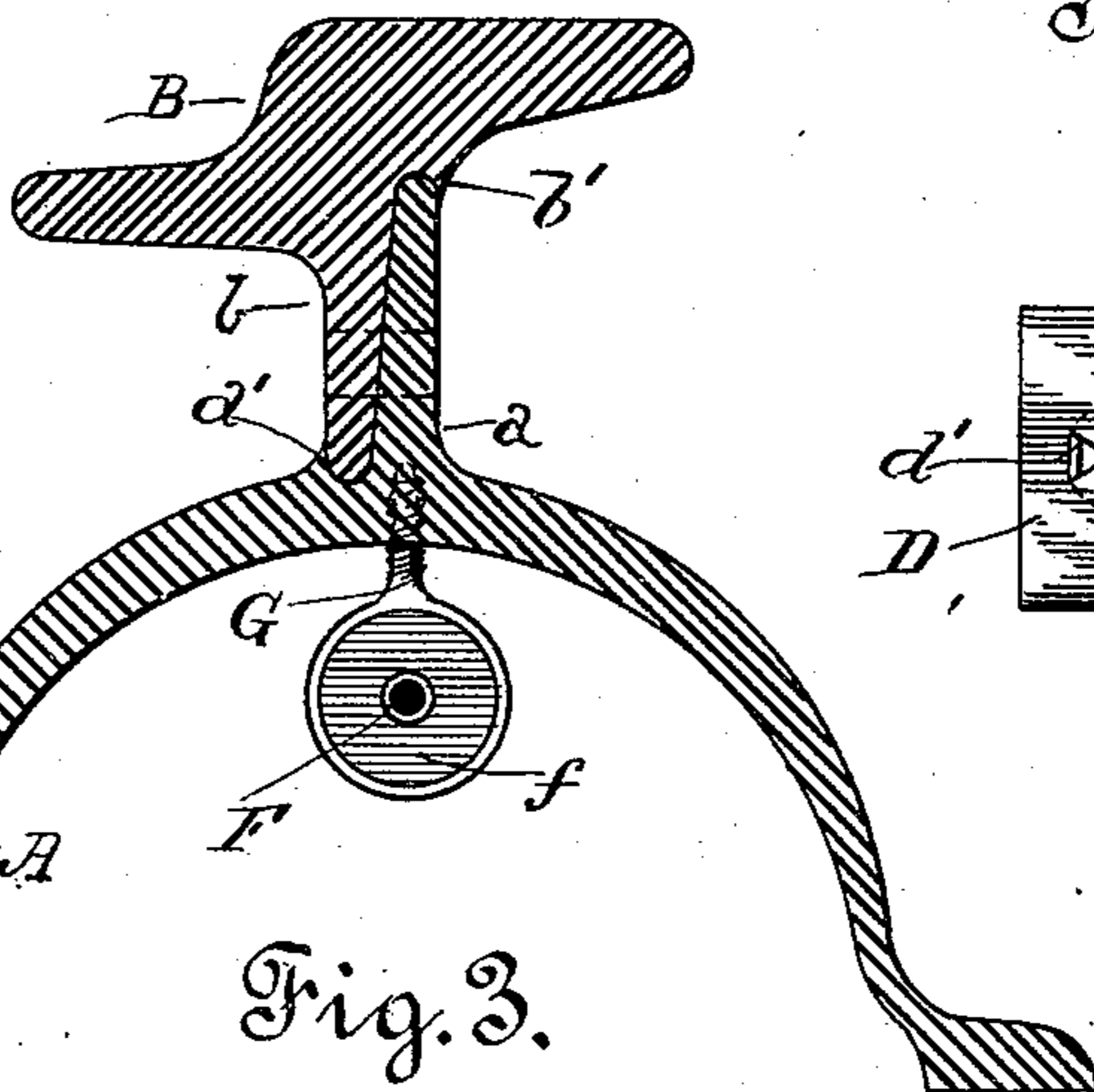
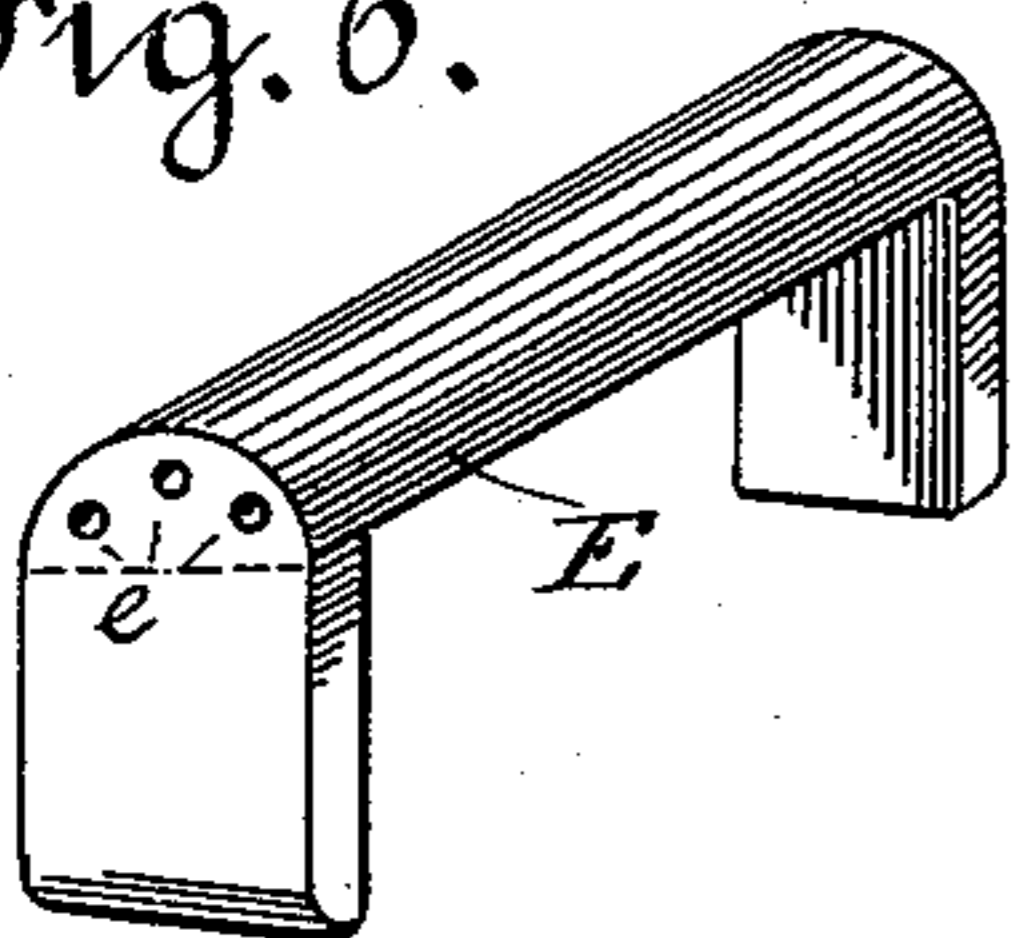


Fig. 3.

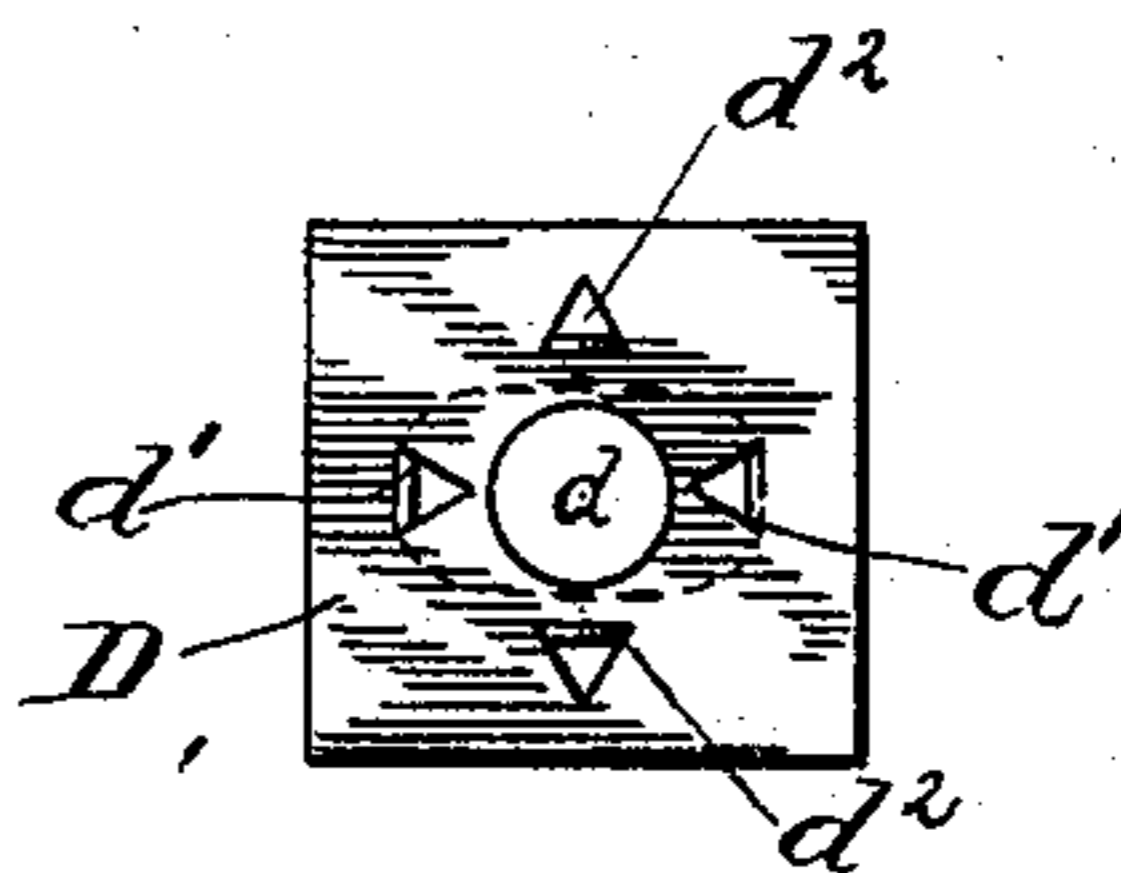


Fig. 7.

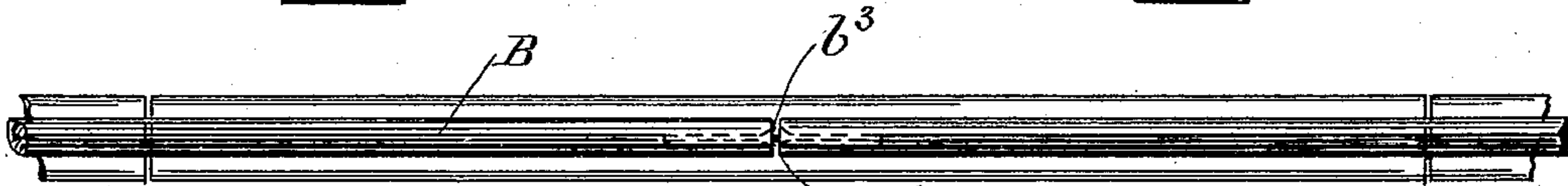


Fig. 4.

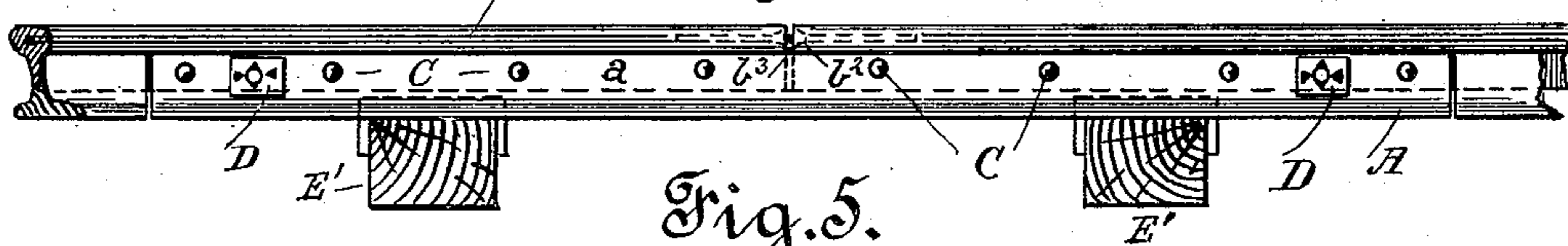


Fig. 5.

Witnesses.

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# UNITED STATES PATENT OFFICE.

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## RAILWAY-RAIL.

SPECIFICATION forming part of Letters Patent No. 478,766, dated July 12, 1892.

Application filed October 14, 1891. Serial No. 408,717. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. SMITH, a citizen of the United States, and a resident of the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Railway-Rails, of which the following is a specification.

My invention consists in the peculiar construction of a lock-scarfed rail designed for use on steam-railways and tramways or street-railroads of all kinds.

The object of my improvements is to afford a practical, safe, light, and inexpensive continuous rail, doing away entirely with the jarring and jolting noticeable on all roads equipped with the ordinary rails, and which is due to the ends of the rails butting square up to each other, with but narrow plates resting on ties beneath the rail ends, whereas in my improved rail the top and bottom pieces composing the same are arranged to break joints and present a smooth, even, and firm tread for the car-wheels as a train goes over.

A further object is to utilize this same rail as a means to carry one or more electric wires and even adapt the body of the rail itself to convey an electric current when desired.

Referring to the accompanying drawings, which form part of this specification, Figure 1 is a vertical cross-section of a T-rail embodying my improvements. Fig. 2 is a similar view of a rail of slightly-different pattern used for street-railways. Fig. 3 is a like section of an electric-railroad rail. Fig. 4 is a top view of my improved rail. Fig. 5 is a side elevation of the same. Fig. 6 is a detailed view in perspective of a combined rail-support and tie-clamp, and Fig. 7 is a face view of a safety plate or washer used in connection with the bolts uniting the scarfed pieces which compose the rail.

Similar letters refer to similar parts in all the views.

A B represent, respectively, the two halves or pieces forming my improved rail. These are united lengthwise by a scarf-joint, presenting when bolted together the appearance of a diagonally-split rail. A comprises the base, which is provided with an upward rounded flange  $a$  and a rounded groove  $a'$  on the inner side thereof. B forms the head, which also is provided with a similar but

downwardly-running flange  $b$  and a similar groove  $b'$  on the outer side of the same. The two flanges  $a$  and  $b$  are brought together, with their ends sunk in the opposite grooves  $a' b'$  to form the rail-web, and are firmly secured to each other by means of bolts C, thereby uniting the upper and lower sections, so that they are interlocked and constitute what may be properly termed a "lock-scarfed" rail. Each point of the scarf is sufficiently sunk at top and bottom to hold the rail in proper shape and keep the joint unloosened by the passage of the trains. The upper sections of the rails are placed on the inside of the track for a similar reason.

D represents safety plates or washers used under the heads and nuts of the bolts C to prevent them from turning, and therefore avoid accidents. These plates may be made of any thin plate metal, such as Russian iron, zinc, or untempered steel. They are cut square and large enough to reach from the base to the head of the rail, on which their top and bottom edges rest. A suitable hole  $d$  is provided in their center for the passage of the bolts, and close to this are punched out four V-shaped or triangular points  $d' d^2$ , two of which stand reverse to the others. The two pointing toward the central hole are bent down into the oblong hole usually provided in the rail-web in such a way as to keep the washer from turning. The two pointing toward the outside of the plate are used to likewise prevent the bolt from moving, they being bent up against the head of the bolt or the edge of the nut. Where round-headed bolts are used there can be a corner chipped off, making a flattened side, upon which the V's are brought to bear. As many of the bolts and washers may be used as are found desirable, say three to four at each joint; but they should be found at regular intervals, in order that the rail-sections be interchangeable.

To reduce the weight of the rail and render it light as the ordinary rail as nearly as possible, I make the base A hollow on the under side at  $a^2$ , thus forming a deep channel, which compensates for the extra thickness of the flanges composing the web. In this channel are placed false pieces or bars E of segmental form, the top of which fits the hollow part of

the rail and the bottom lies flush with the under side of the base. These rest on the ties E' and not only act as supports for the rail, but being bent over at right angles to straddle the ties at both ends they prevent the latter from moving either way. The pieces E are also made hollow in the center and may be used to guide and support telegraph or telephone wires, which may be inserted through holes *e* in their ends.

The rail itself may be utilized to convey an electric current for transmitting messages or power. In this case only short lengths of wire *b*<sup>3</sup> are used to connect the upper sections of the rails where the joints occur, which is done by drilling corresponding holes *b*<sup>2</sup> in each section large enough to insert wires of suitable proportion, the holes being drilled to a depth of from three-quarters of an inch to one inch in each head. The entrance to the holes *b*<sup>2</sup> should be made larger than the rest and finished smooth to allow the rail-sections to move by each other without cutting or chafing the inserted wire.

My improved lock-scarfed rail may be joined easily with the ordinary rail or with frogs and switches. The ends of the upper and lower sections are then brought flush in the same vertical plane and make a butt-joint. Connection with the ordinary rail is made by splicing with the usual fish-plates and bolts passing through these and through both rails.

The rail illustrated in Fig. 3 differs somewhat from the other rails shown in the drawings and has been devised especially for electric railroads. It is lock-scarfed precisely in the same manner as the others, but its base is made higher and semi-cylindrical in form in order to raise it from the ties and afford plenty of room for the electric wire F and its glass insulators *f*. The wire and insulators

are held up by eye-screws G, provided at suitable intervals along the rail.

I use no fish-plates nor any like devices to effect joints, except where connection is had with the ordinary rail, as above stated. This and the deep channel formed in the under side of the base will offset the little extra weight added to the other parts of my scarfed rail and materially reduce its cost of manufacture. A further saving may be reckoned in the wear and tear of the rail. The ordinary rail, as is well known, has to be wholly replaced every ten or fifteen years, according to usage, whereas only the upper portion of my rail, which alone is subjected to constant wear, need be removed. The lower section, having to undergo but little friction, may be used for a much longer time, hence a saving of about one-half in the expense of renovating the track.

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

1. The combination of a rail hollowed at the base, ties thereunder, and segmental bars in said base to clamp said ties, substantially as set forth.

2. The combination of a rail hollowed at the base, and segmental bars adapted to support and guide electric wires therein, substantially as set forth.

3. The combination, in a rail, of a scarfed upper section, a correspondingly-scarfed lower section having a semi-cylindrical base, an electric wire, and means to support said wire within said base, substantially as set forth.

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Witnesses:

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