

(No Model.)

2 Sheets—Sheet 1.

P. SIMONS.
RACK RAIL FOR RACK RAILWAYS.

No. 444,641.

Patented Jan. 13, 1891.

Fig. 1.

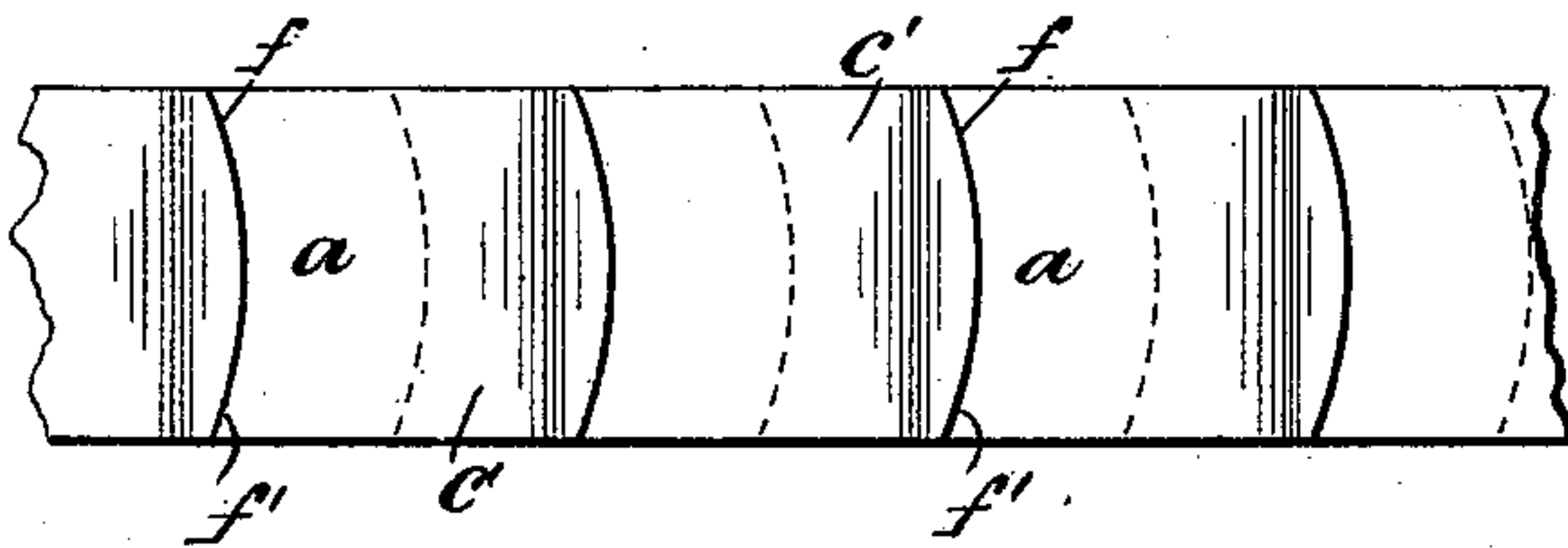


Fig. 2.

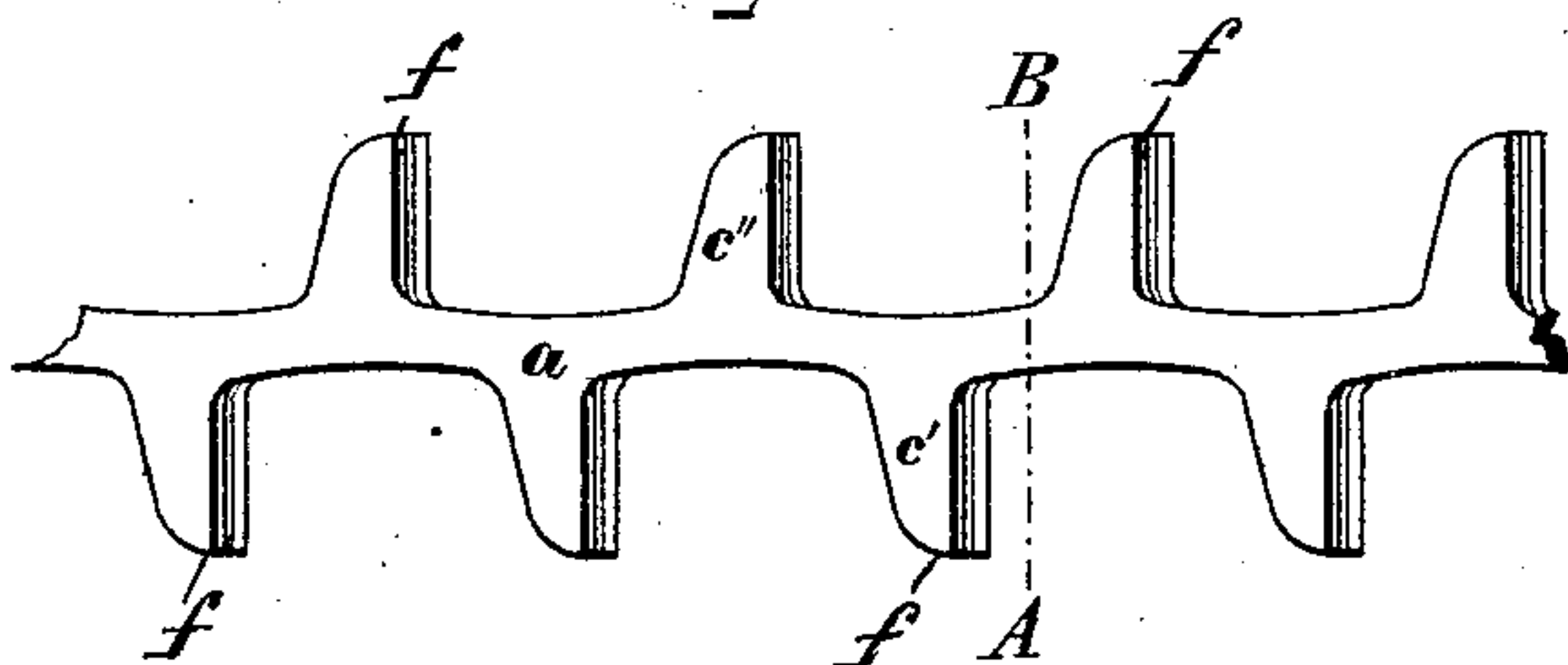


Fig. 3.

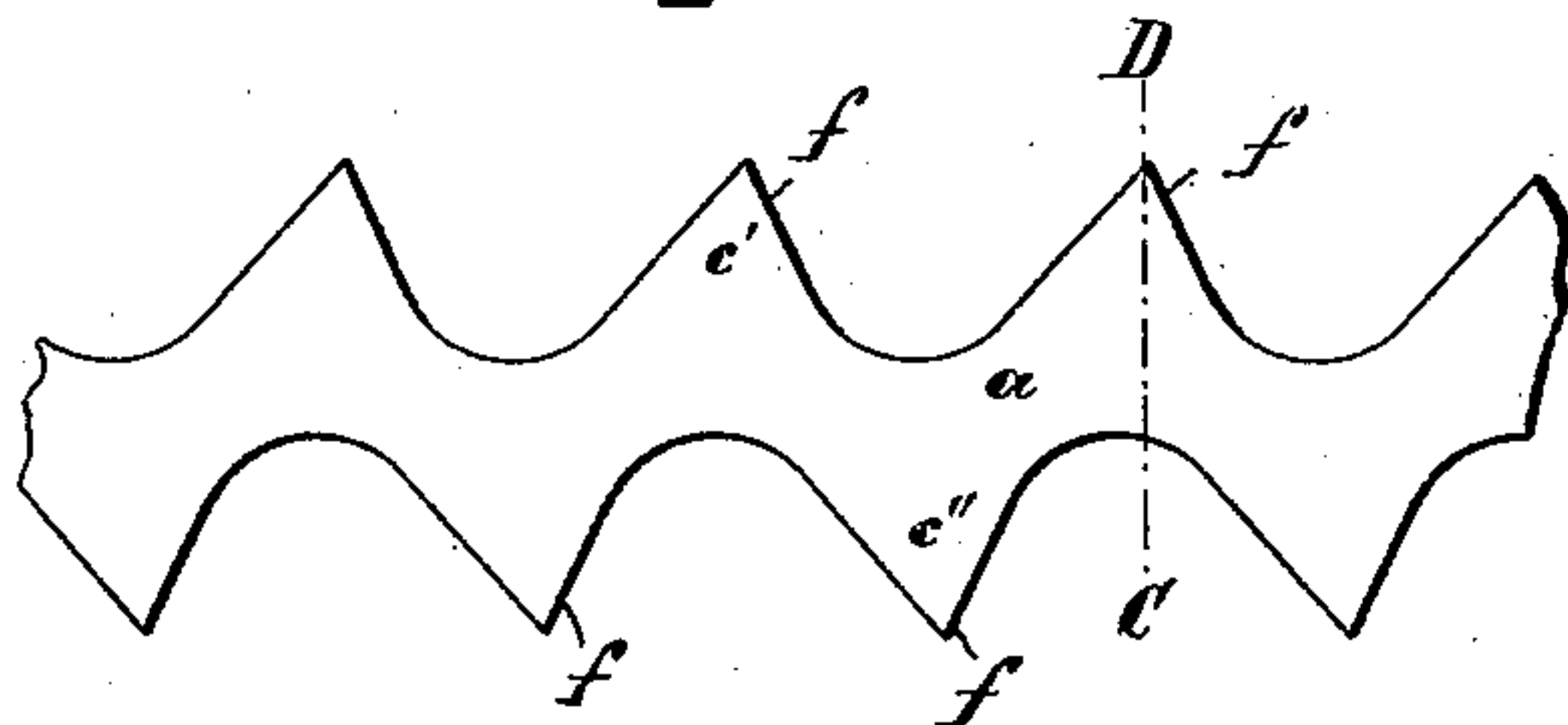


Fig. 4.

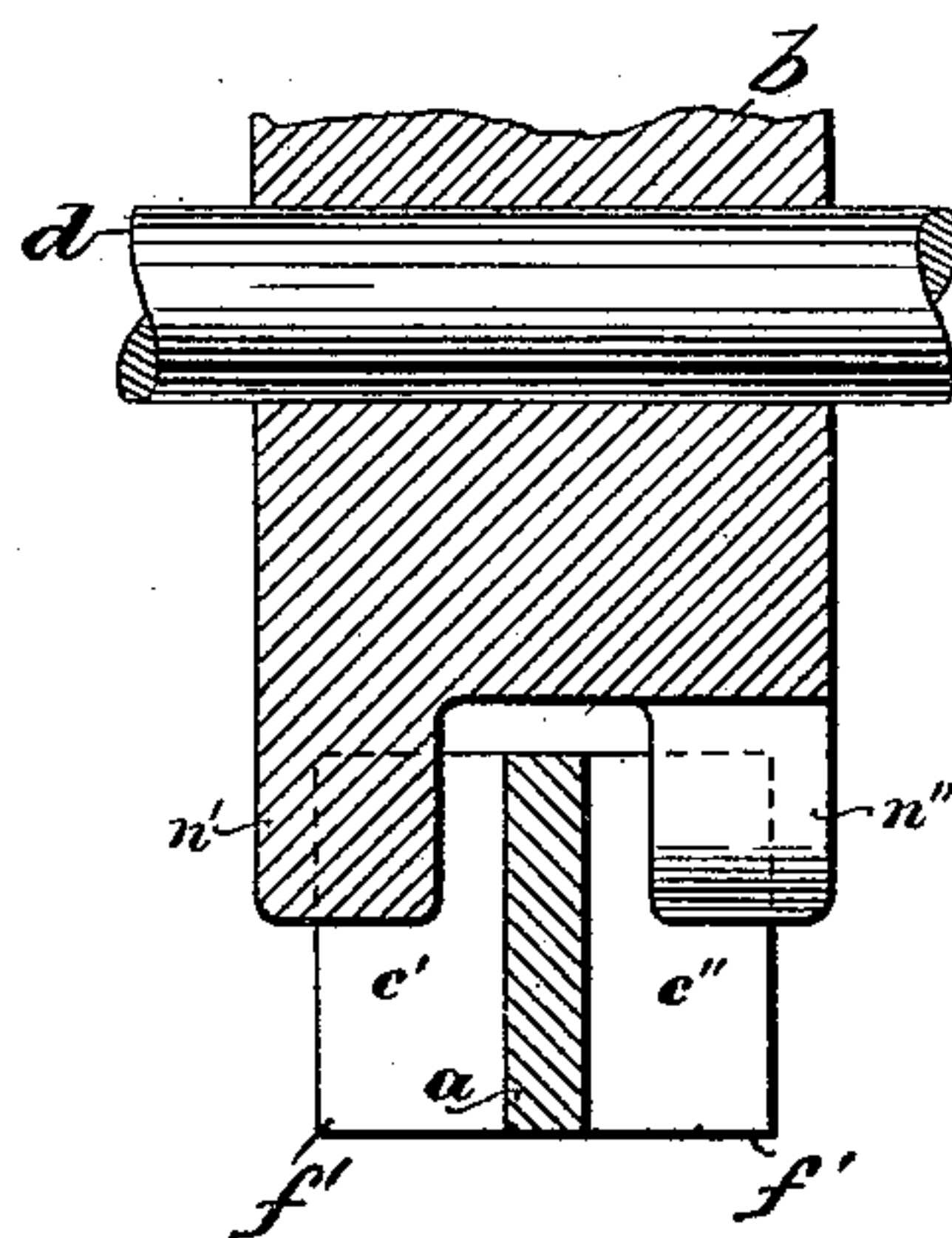
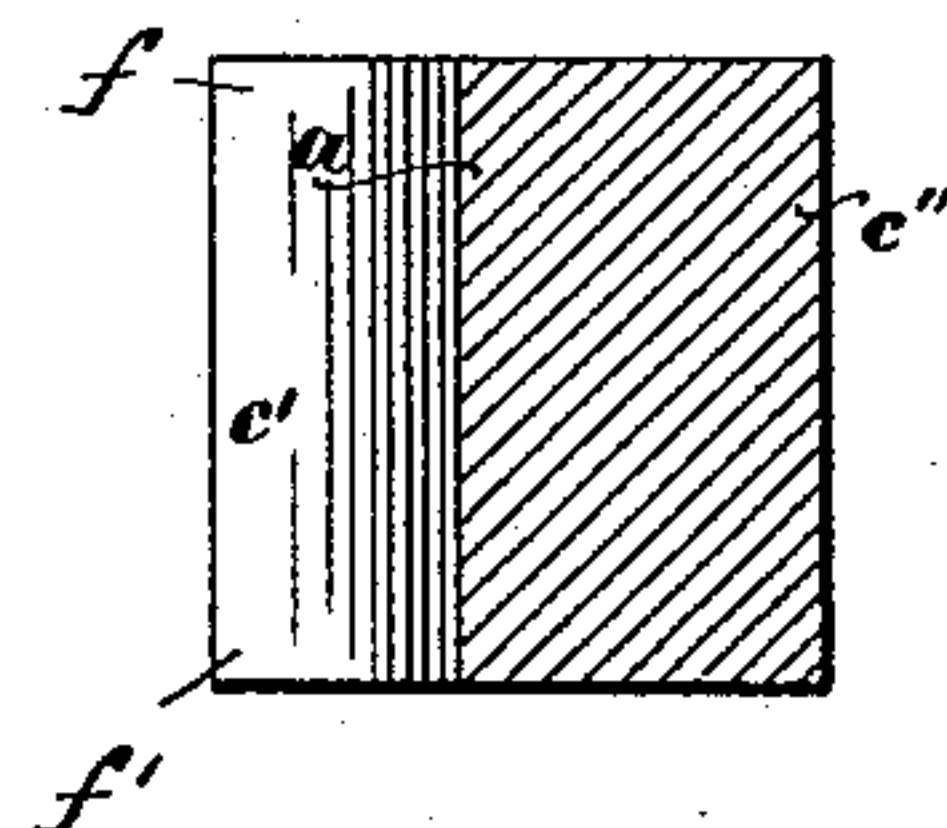


Fig. 5.



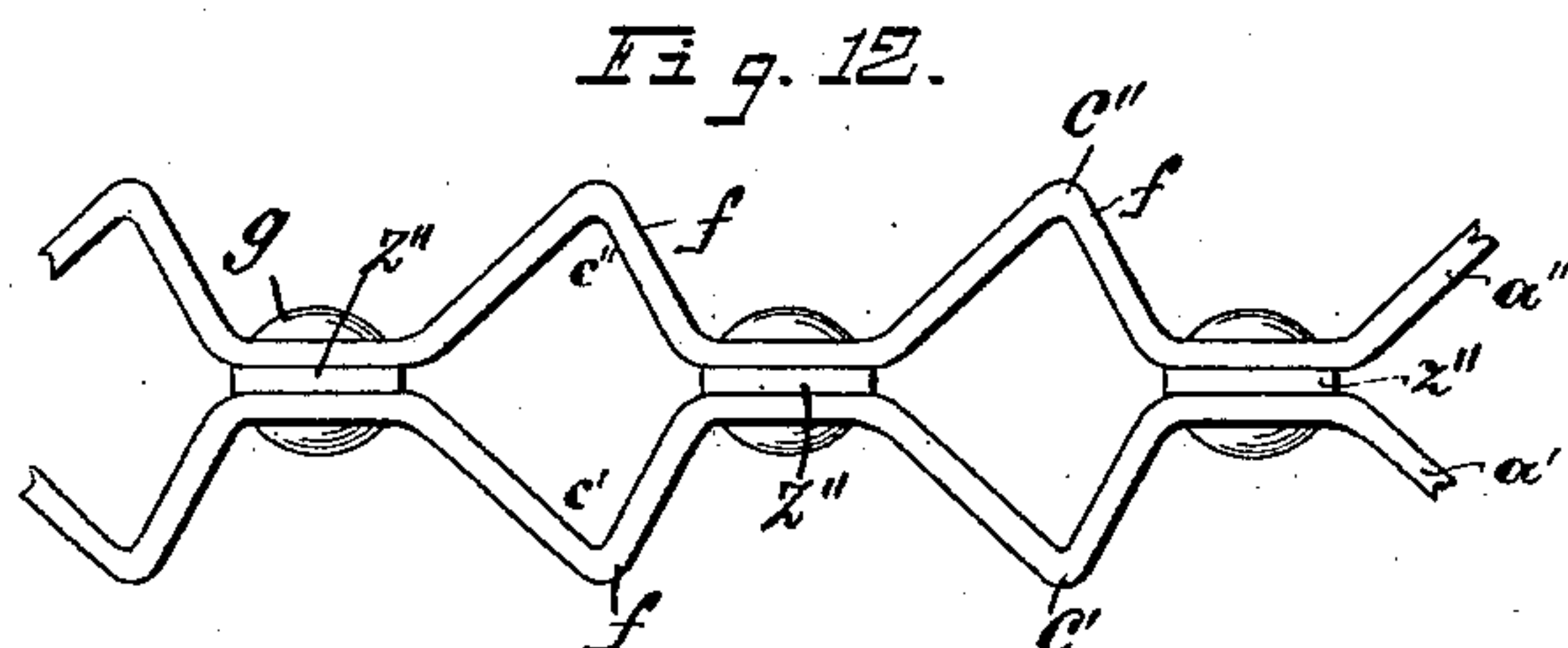
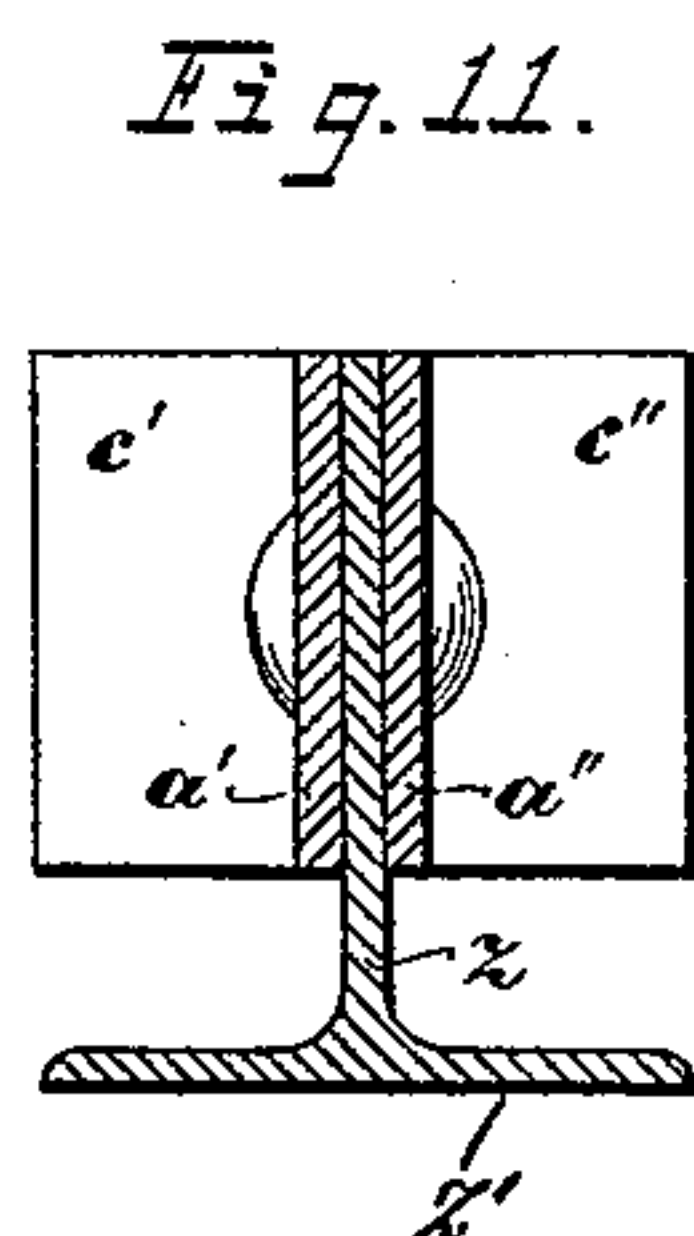
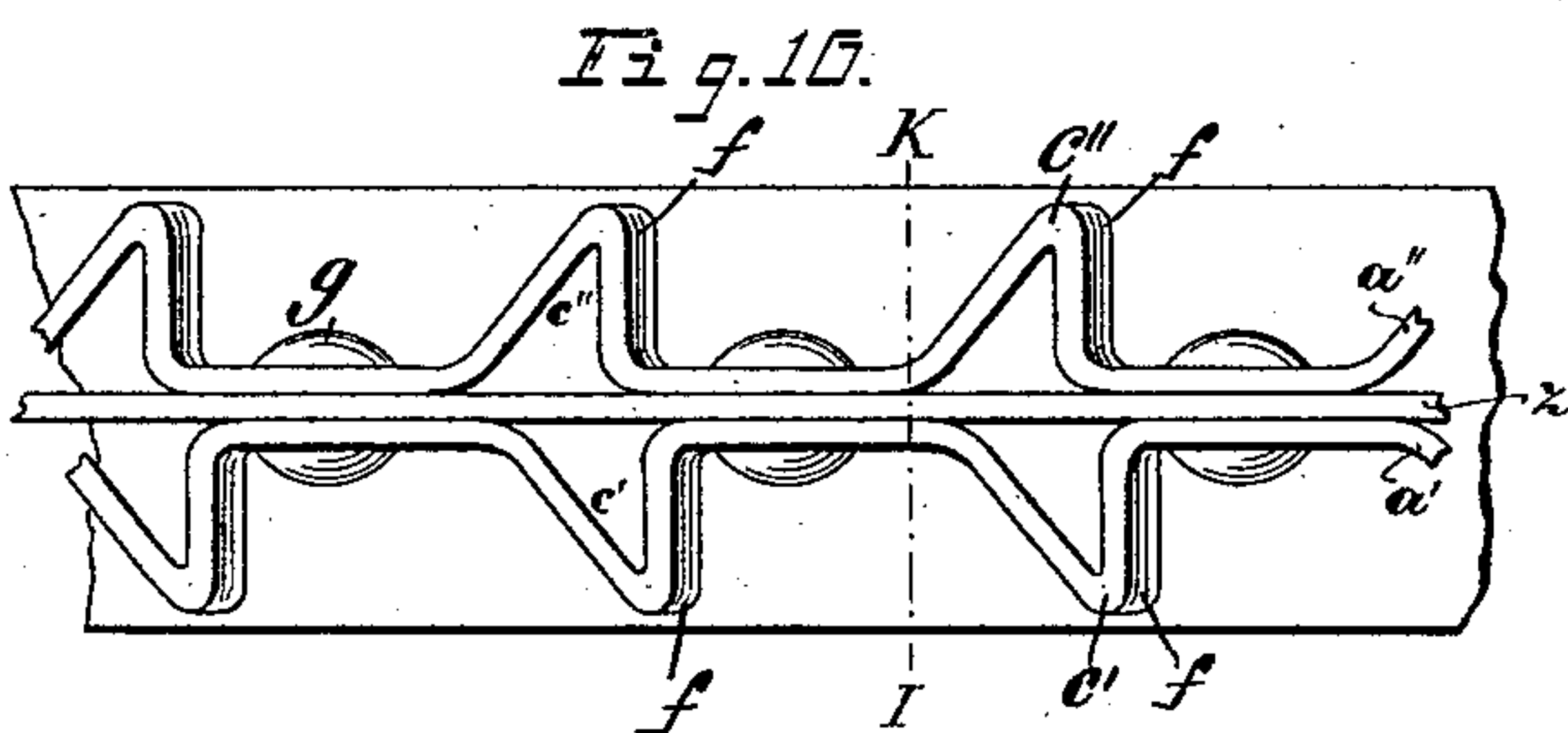
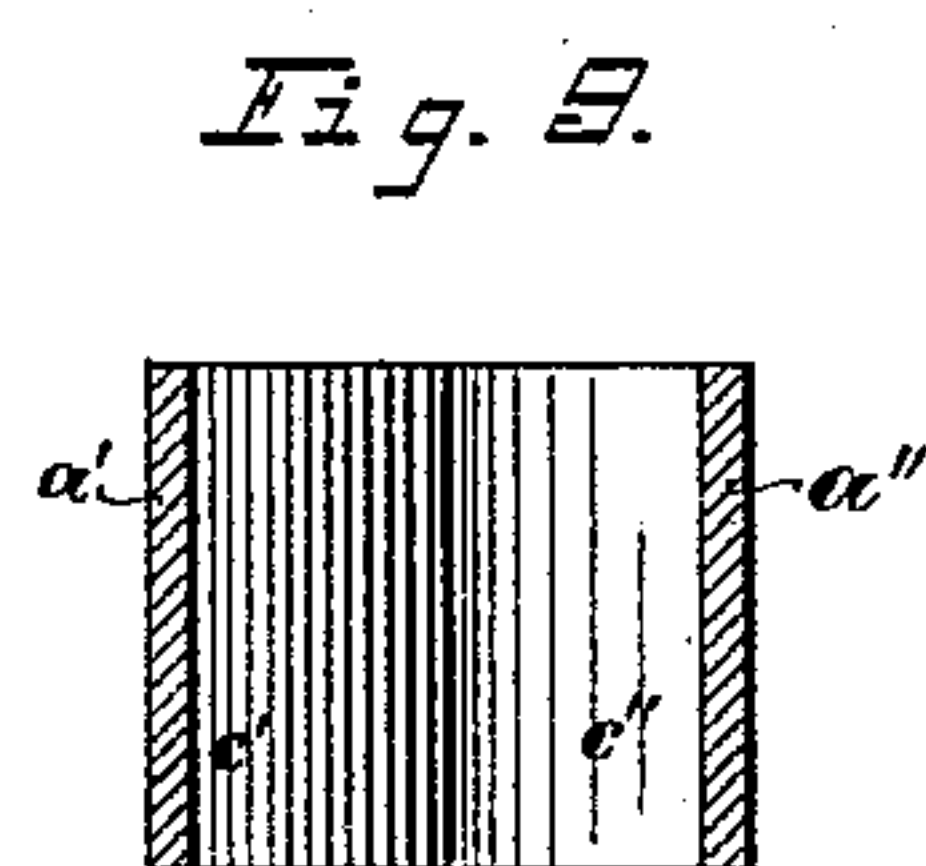
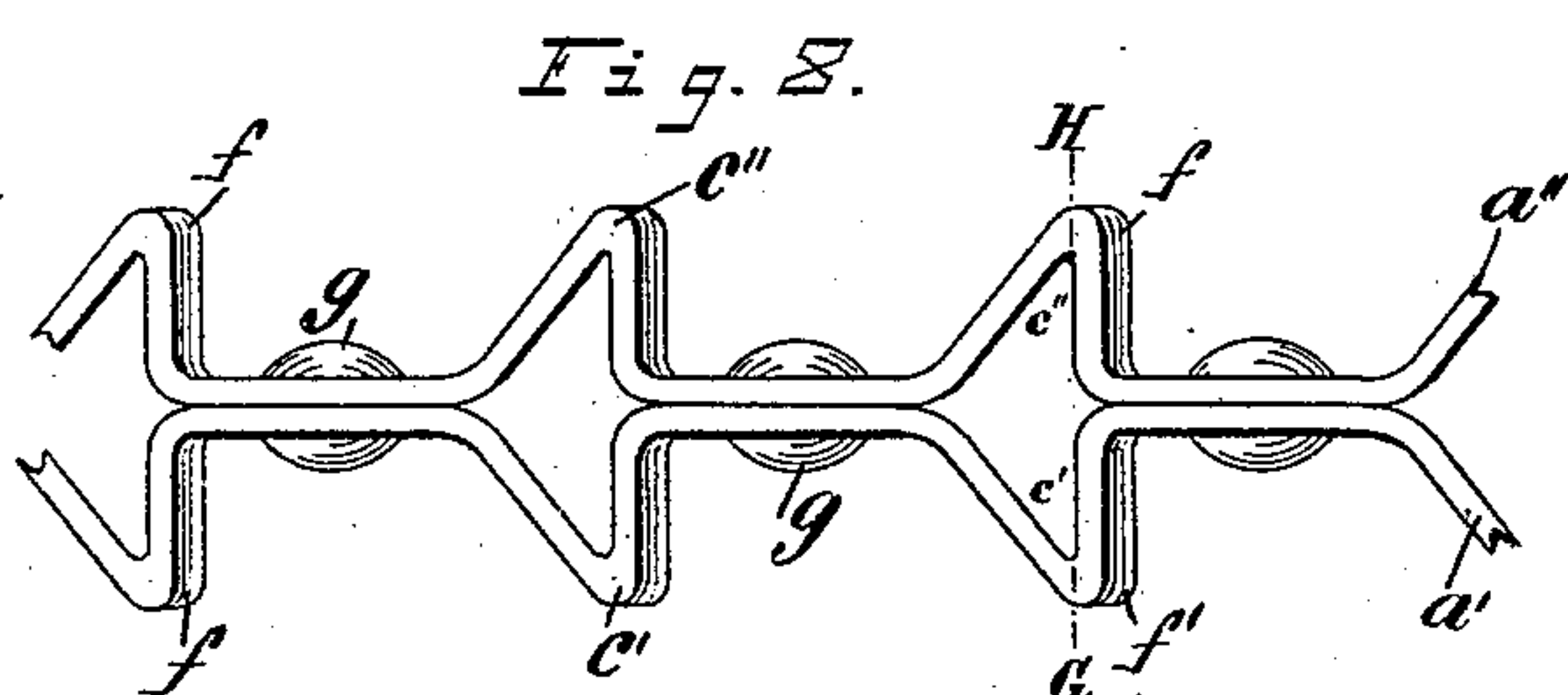
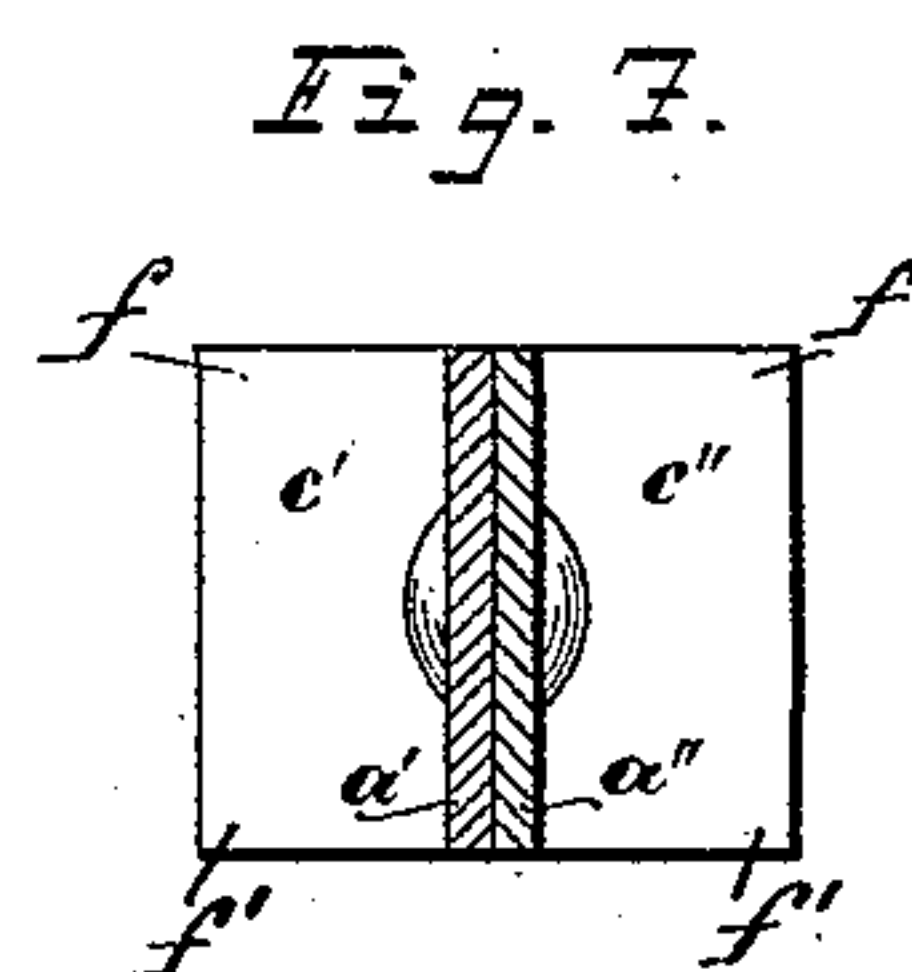
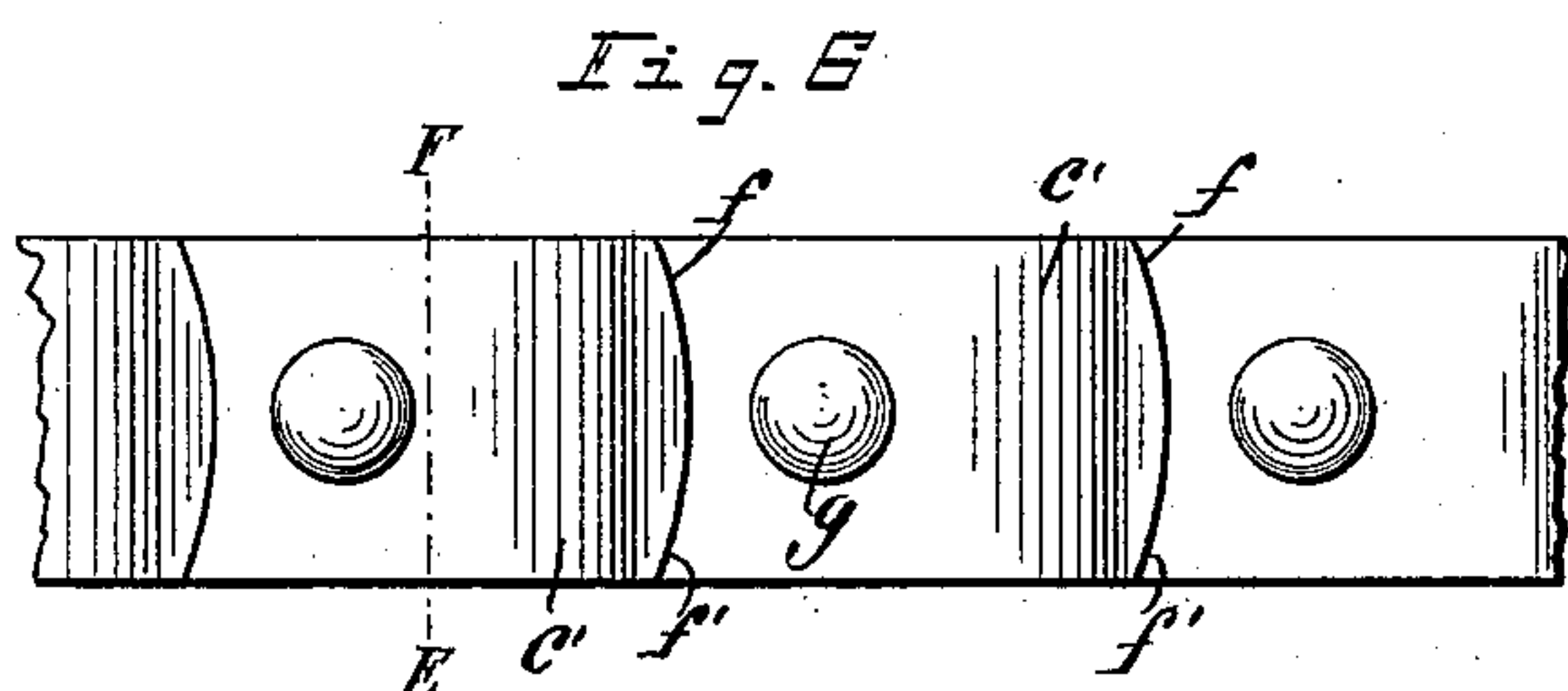
Witnesses,
A. H. Norris,
Robert Everett,

Inventor,
Paul Simons.
By James L. Norris,
Atty.

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UNITED STATES PATENT OFFICE.

PAUL SIMONS, OF DARMSTADT, GERMANY.

RACK-RAIL FOR RACK-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 444,641, dated January 13, 1891.

Application filed June 17, 1890. Serial No. 355,798. (No model.)

To all whom it may concern:

Be it known that I, PAUL SIMONS, of the city of Darmstadt, in the Grand Duchy of Hesse and German Empire, have invented a certain new and useful Improvement in Rack-Rails for Rack-Railways, of which the following is a specification, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to improvements in rack-rails for rack-railways; and its object is to provide means for constructing such racks very light, durable, and at low cost, and in such a manner as to allow them to be reversed and used on the other side when the one side has become worn.

The object of this invention is to provide a novel rack-rail for rack-railways of such construction that after the upper portions of the rack-teeth are unduly worn the rack-rail can be turned upside down for the purpose of reversing it and the opposite ends of such teeth be brought into position for co-operation with the toothed wheel of the car.

The invention consists, essentially, in a rack-rail consisting of a web having at its opposite sides laterally-projecting teeth arranged vertically, and each having counterpart upper and lower acting end portions to engage the teeth of a wheel on a car, the construction being such that by turning the rack-rail upside down to reverse it after one set of the acting ends of the teeth are worn the opposite set of acting ends are brought into position for correct co-operation with the toothed wheel, which rotates in a vertical plane on a horizontal axis, as usual.

In the accompanying drawings, Figure 1 is a broken side elevation of a portion of a rack-rail constructed in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a sectional view taken on the line A B, Fig. 2, and showing a portion of a toothed wheel. Fig. 4 is a top plan view showing a modified construction. Fig. 5 is a sectional view taken on the line C D, Fig. 4. Fig. 6 is a side elevation of another modification. Fig. 7 is a sectional view taken on the line E F, Fig. 6. Fig. 8 is a top plan view of the modification shown in Fig. 6. Fig. 9 is a sectional view taken on the line G H, Fig. 8. Fig. 10 is a top plan view of another

modification. Fig. 11 is a sectional view taken on the line I K, Fig. 10; and Fig. 12 is a top plan view of another modified construction.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the accompanying drawings, where the letter *a* indicates the rail web or body, which is provided at opposite sides with laterally-projecting teeth *c' c''*, which, as shown in Fig. 1, 2, and 4, alternate with each other. The laterally-projecting teeth are coextensive with the height of the web or body and extend in vertical planes to co-operate with a toothed wheel *b*, Fig. 3, adapted to rotate in a vertical plane on a horizontal axis *d*.

In Figs. 1, 2, and 3 the web or body *a* and the laterally-projecting teeth *c' c''* are formed integral with each other, and the inner or acting faces of the teeth are convex, and each tooth is provided with an upper and lower acting end portion *f f'*, which are coequal and the counterpart of each other.

In Figs. 4 and 5 the teeth are approximately V-shaped and the acting end portions *f f'* are arranged in the same perpendicular plane.

In Figs. 6, 7, 8, and 9 the rack-rail comprises two sections *a' a''*, united by rivets *g* at points intermediate the laterally-projecting teeth *c' c''*. The sections are each composed of a metallic plate bent laterally at intervals to form the projecting teeth, and the inner or acting faces of such teeth are convex, substantially the same as described with reference to Figs. 1, 2, and 3.

In Figs. 10 and 11 the vertical plate *z*, formed with a base-plate *z'*, is interposed between metal sections *a' a''*, constructed as described with reference to Figs. 8 and 9, the latter being rigidly united together by rivets *g*.

In Fig. 12 the construction is the same as described with reference to Figs. 8 and 9, with the exception that independent spacing blocks or plates *z''* are interposed between the sections *a' a''*, having the teeth *c' c''*, while the acting faces of such teeth extend in perpendicular planes instead of being convex, as in Figs. 8 and 9.

In Figs. 6 to 9, inclusive, each pair of teeth

are arranged in coincidence or alignment and directly opposite each other, and in Fig. 10 the two teeth of each pair are slightly out of alignment, while in Fig. 12 the teeth of each pair are located opposite each other.

The improved rack-rail is particularly designed for operation in conjunction with a toothed wheel revolving in a vertical plane on a horizontal axis; but obviously it would be possible to arrange the parts in such relation that the wheel would revolve in a horizontal plane.

The laterally-projecting teeth are of such height as to leave a portion of their inner surfaces unexposed to the action of the engaging teeth, while the upper and lower acting end portions $f f'$ of the teeth are symmetrical and the counterpart of each other, by which construction, when the upper end portions of the teeth are worn, the rack-rail can be turned upside down to reverse it, and thereby bring the opposite ends of such teeth in correct position for co-operation with the teeth $n' n''$ of the wheel b .

What I claim is—

1. A rack-rail for rack-railways, consisting of a web having at its opposite sides laterally-projecting teeth arranged in vertical planes and each having counterpart upper and lower acting end portions $f f'$, substantially as described.

2. A reversible rack-rail for rack-railways, consisting of a web or body a , having at opposite sides the laterally-projecting teeth $c' c''$, provided with counterpart upper and lower acting end portions $f f'$ to engage the teeth of a wheel, the construction being substantially as described, that by turning the rack-rail upside down to reverse it after one set of the acting ends of the teeth are worn the opposite set of acting ends of the teeth are brought into position for correct co-operation with a toothed wheel, substantially as described.

PAUL SIMONS.

Witnesses:

LOUIS BENZ,
PAULO SELDEN.