

(No Model.)

2 Sheets—Sheet 1.

L. G. CLAUDE.
MANUFACTURE OF HORSESHOES.

No. 324,360.

Patented Aug. 18, 1885.

Fig. 1.

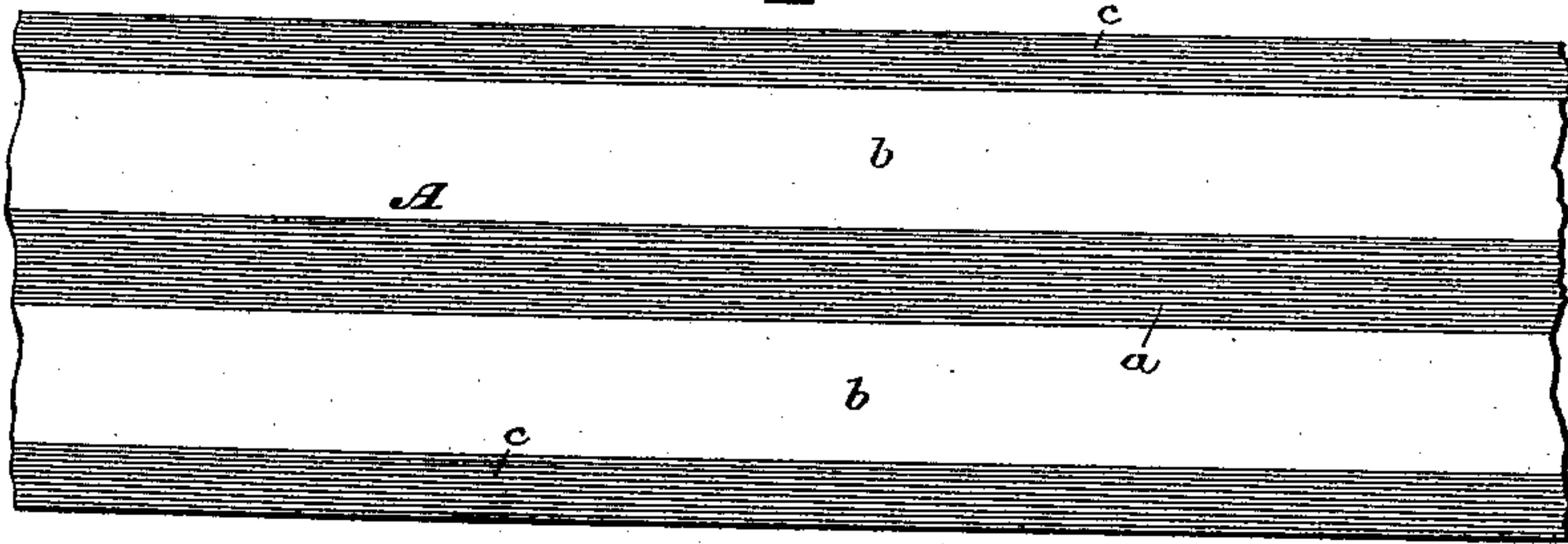


Fig. 2.

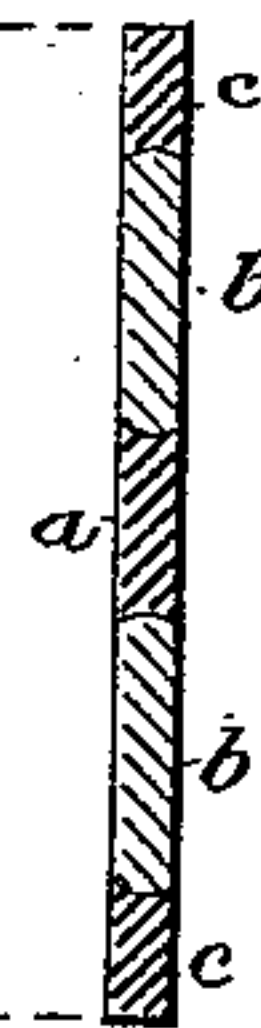


Fig. 3.

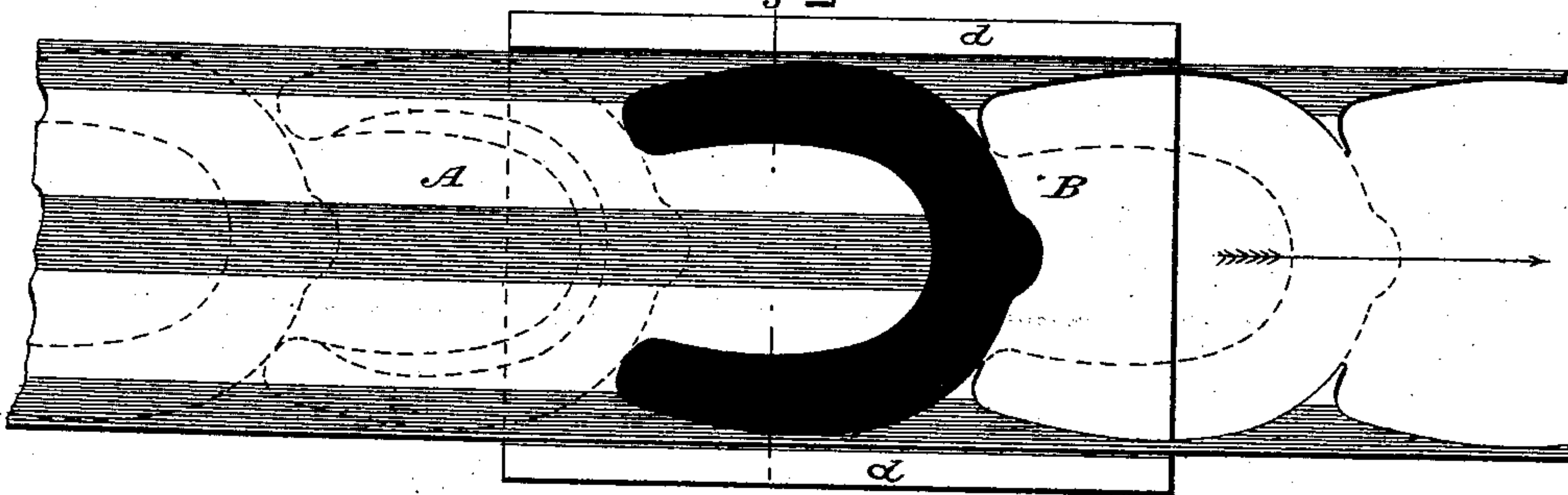


Fig. 4.

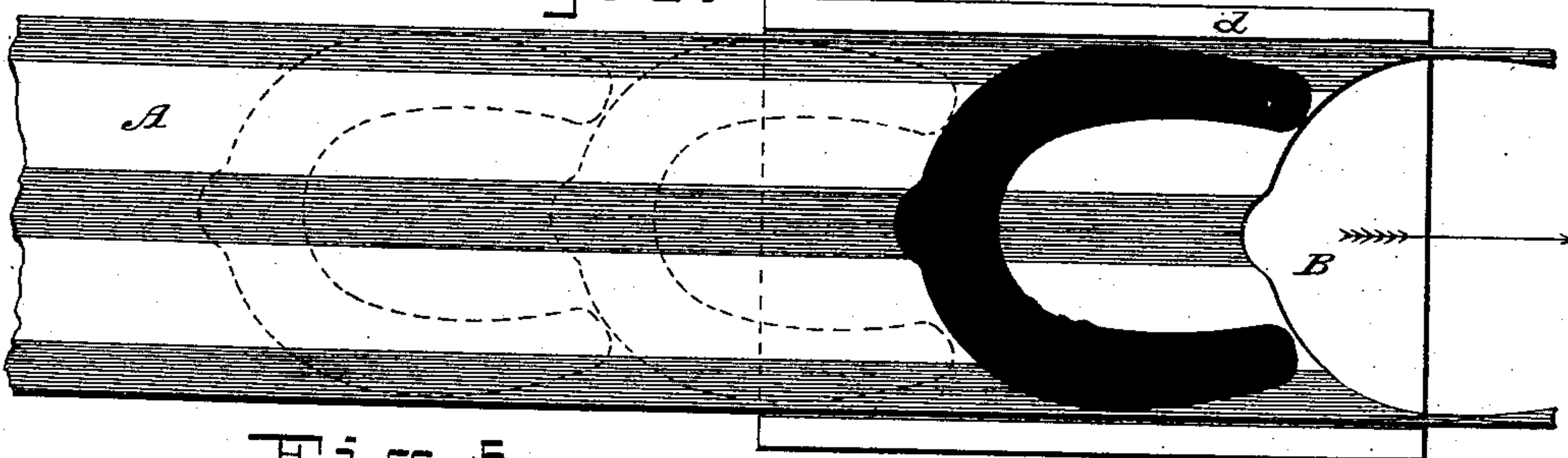


Fig. 5.

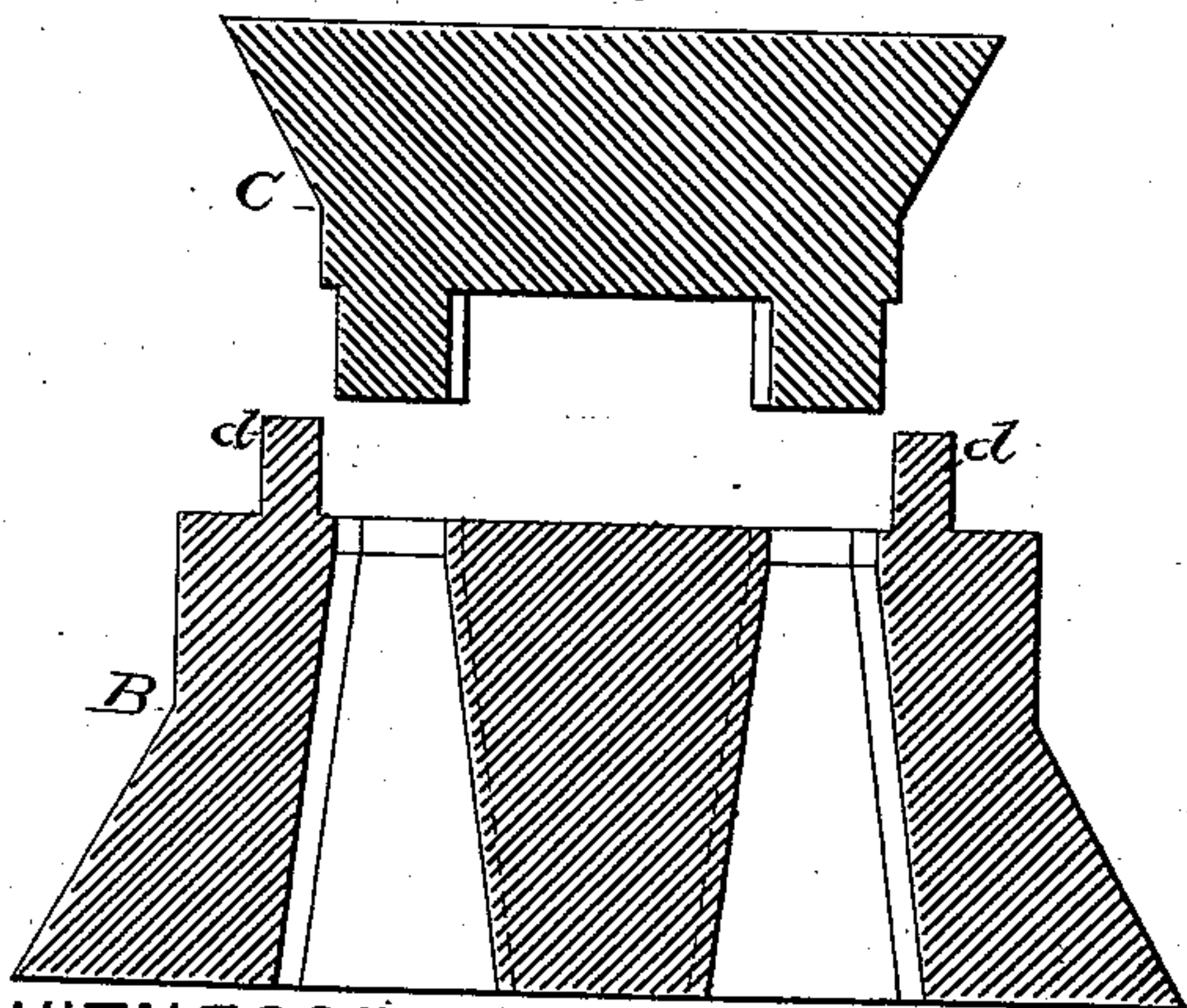


Fig. 15.

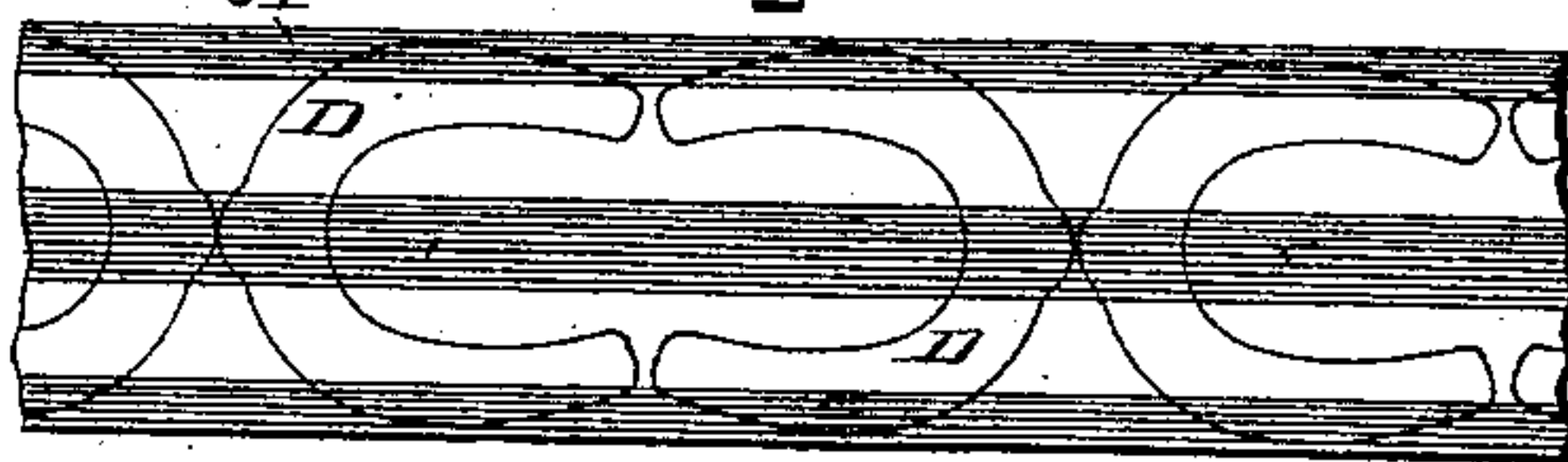
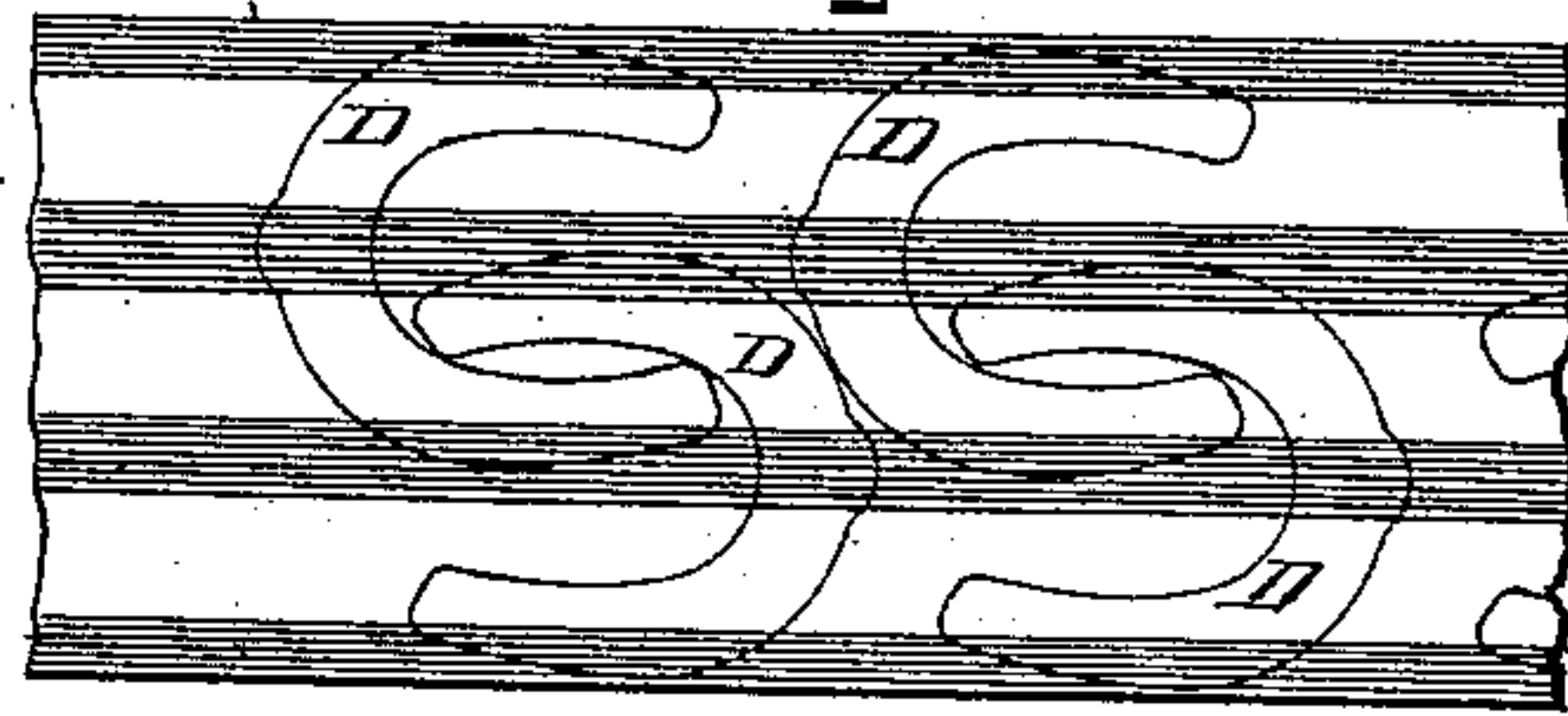


Fig. 16.



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Geo. H. Fraser.

INVENTOR:

Louis G. Claude
By his Attorneys,

Burly Fraser & Co.

(No Model.)

2 Sheets—Sheet 2

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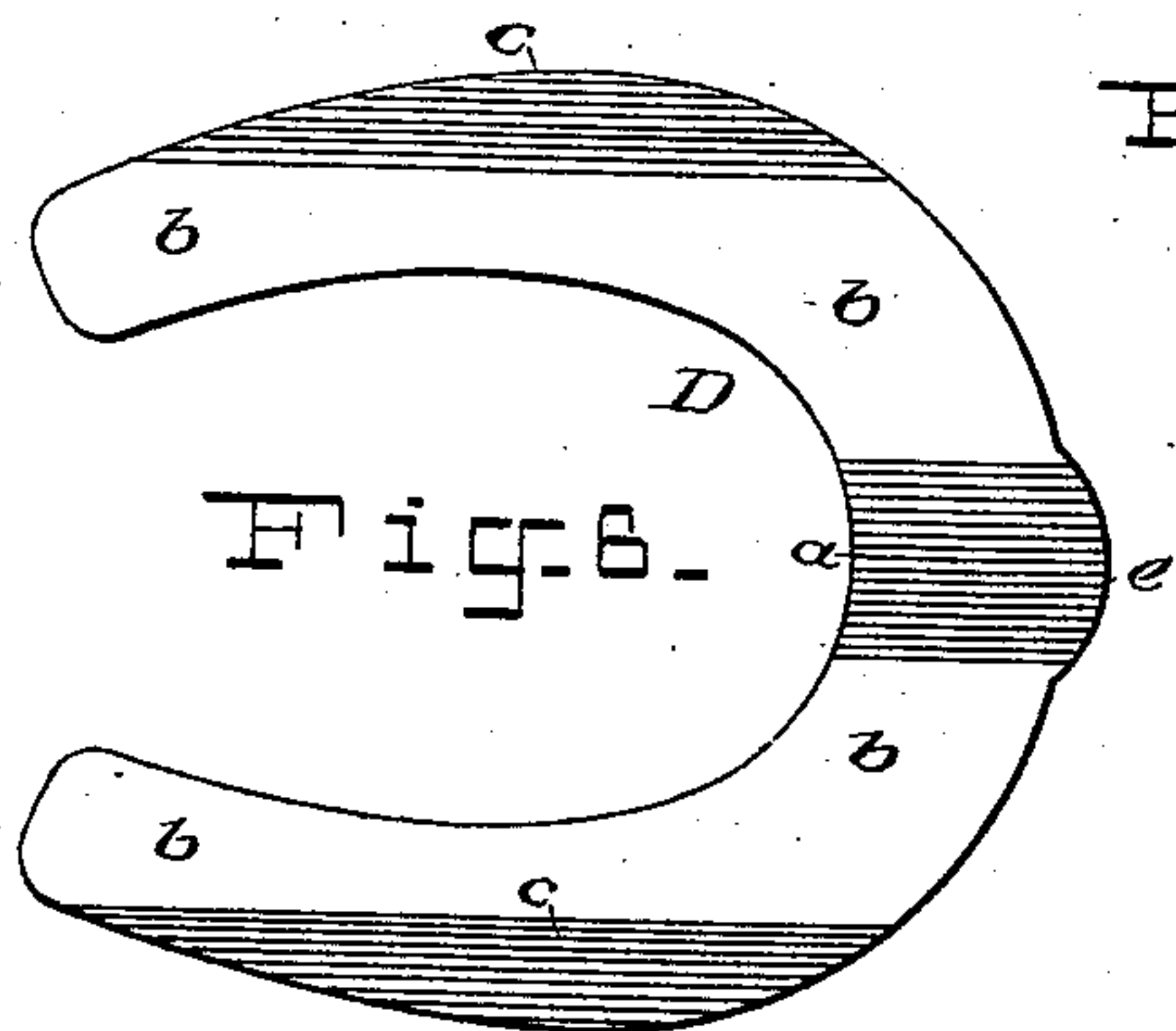


Fig. 6.

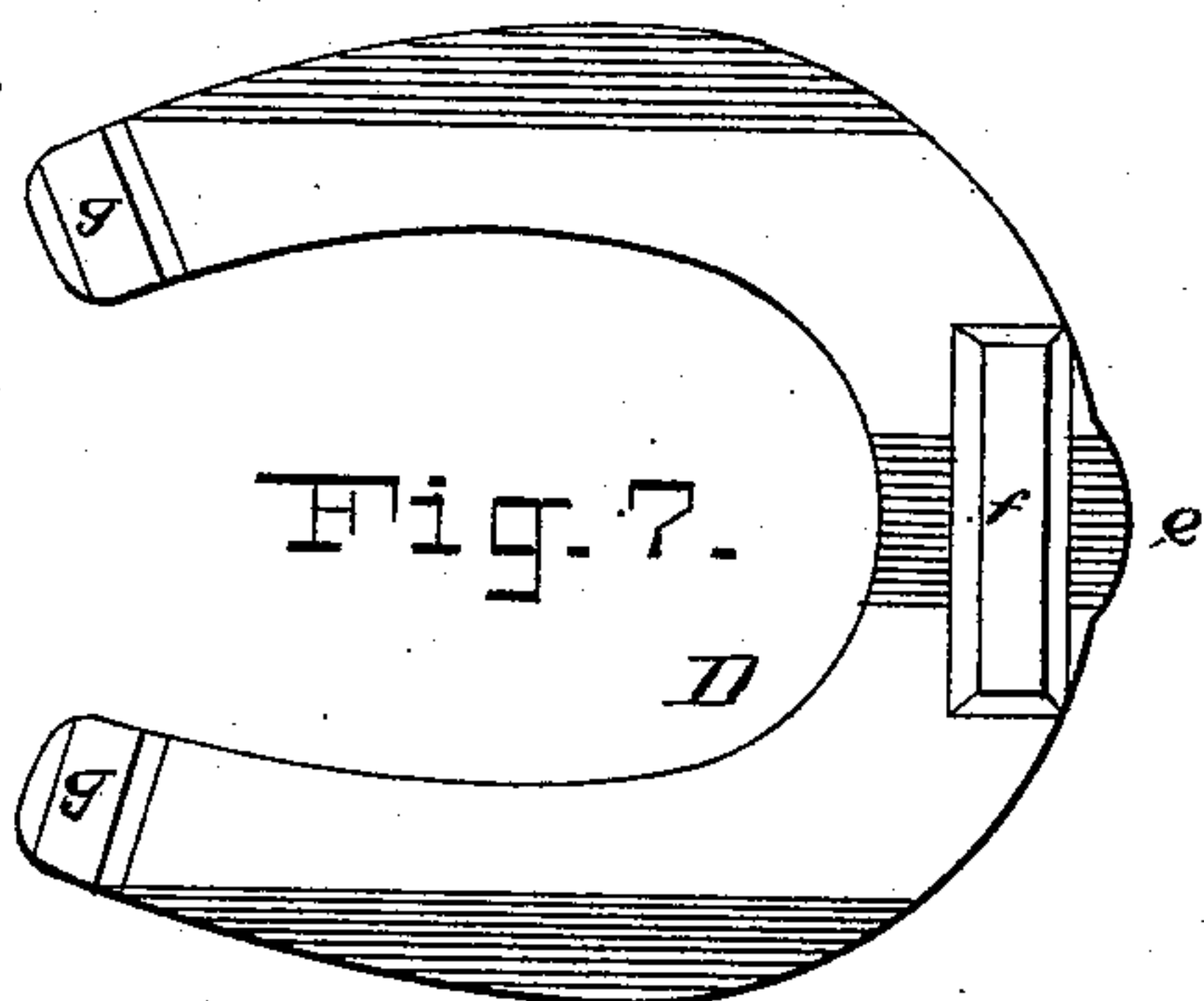


Fig. 7.

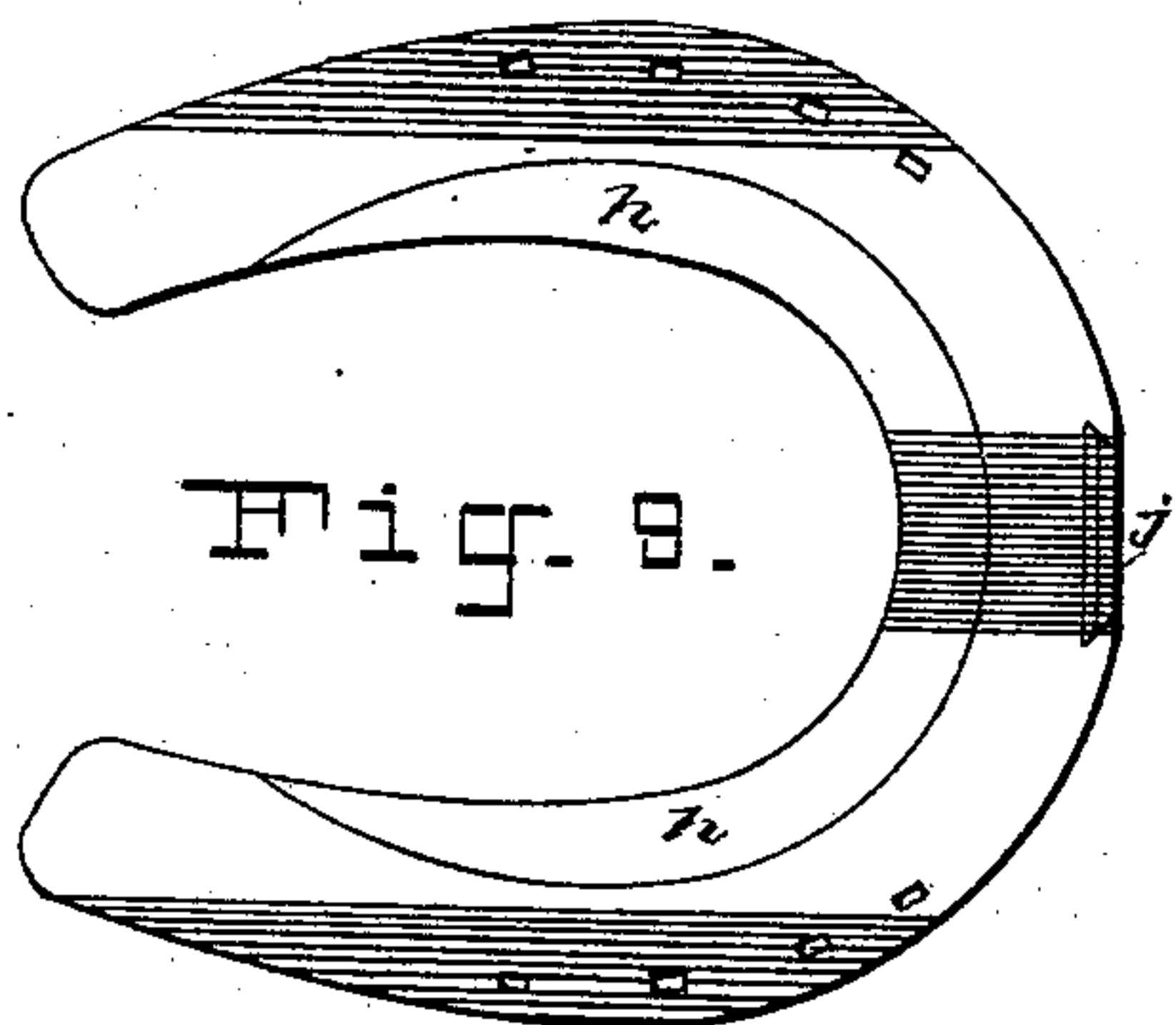


Fig. 8.

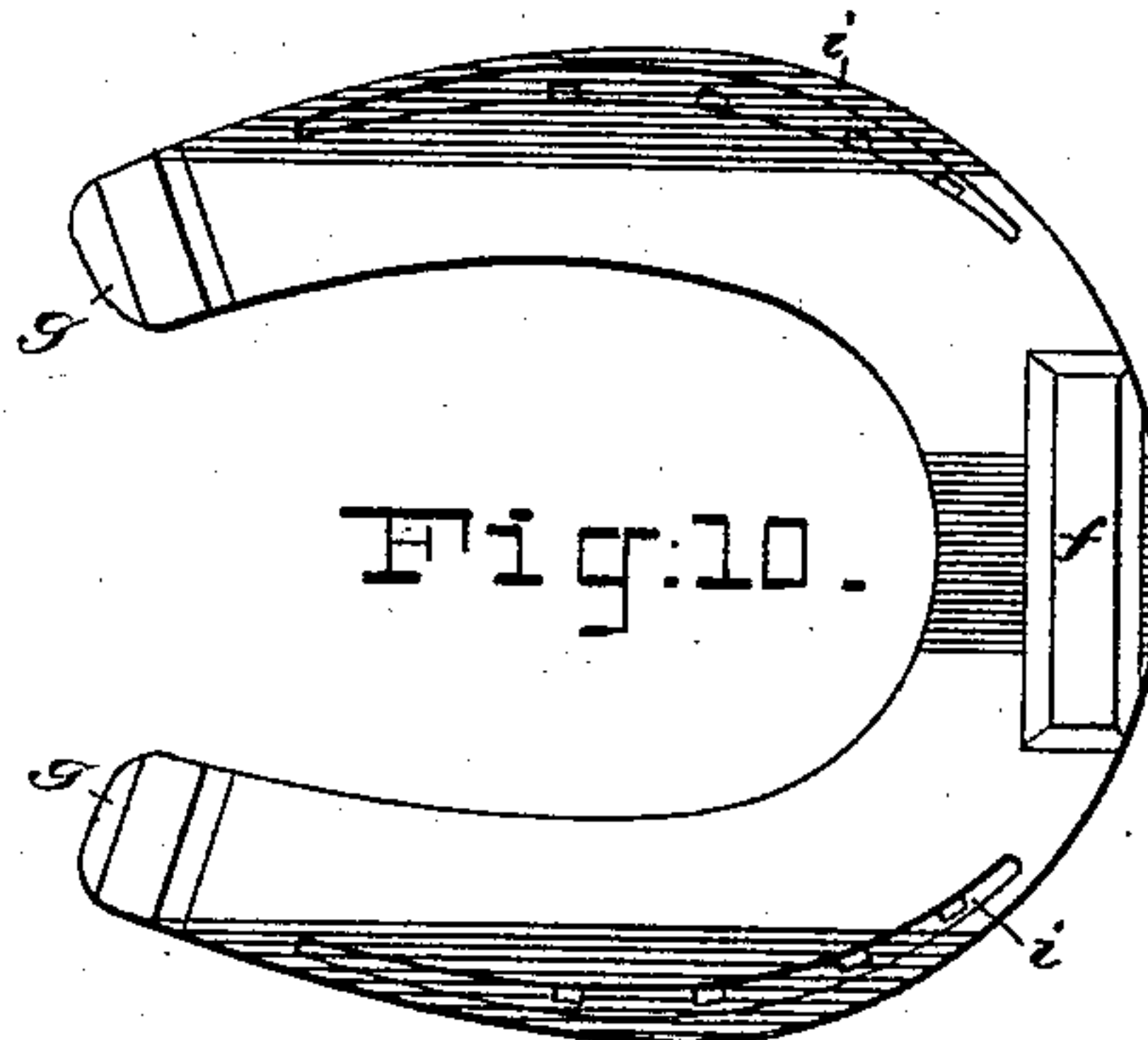


Fig. 10.

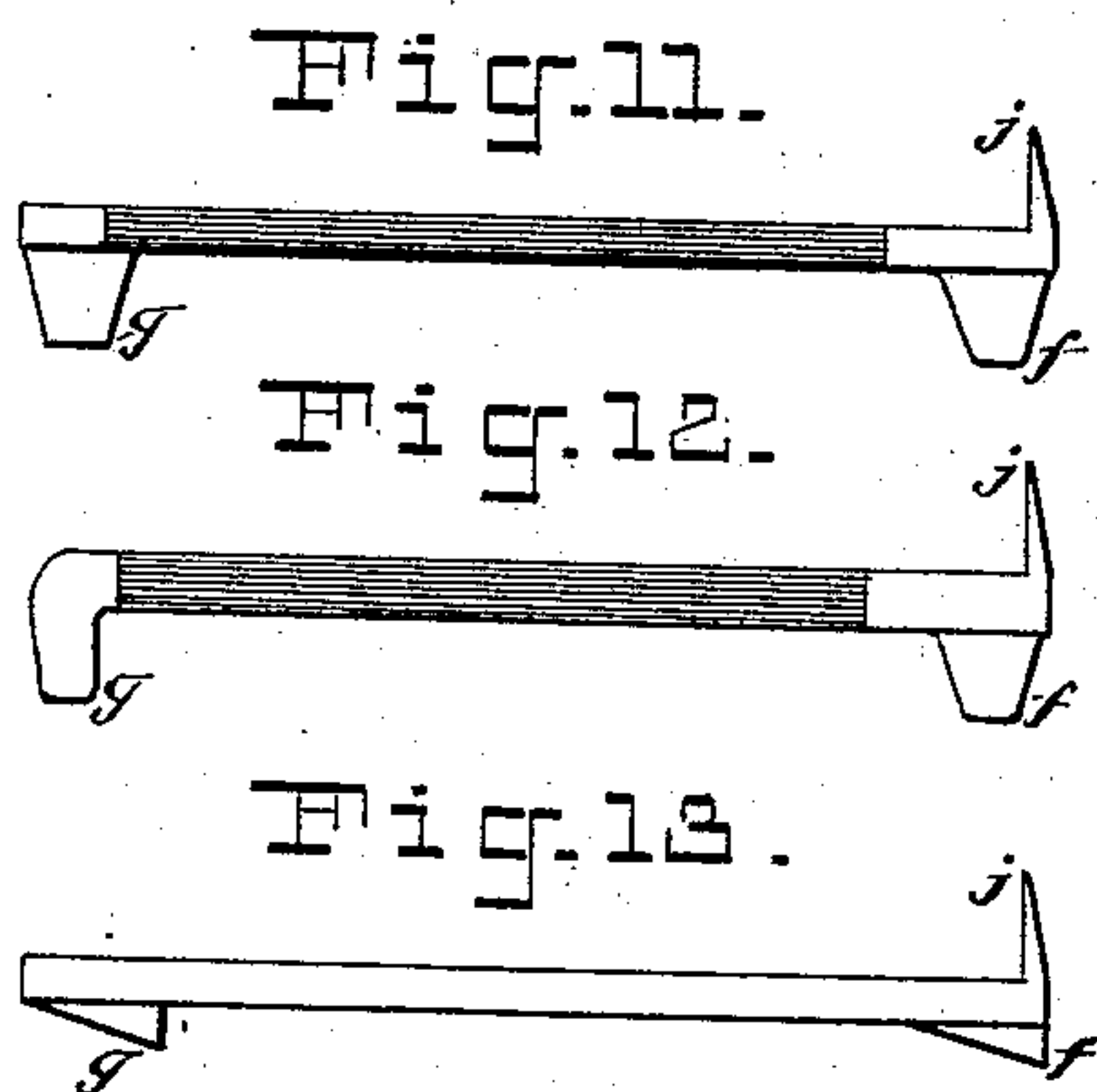


Fig. 11.

Fig. 12.

Fig. 13.

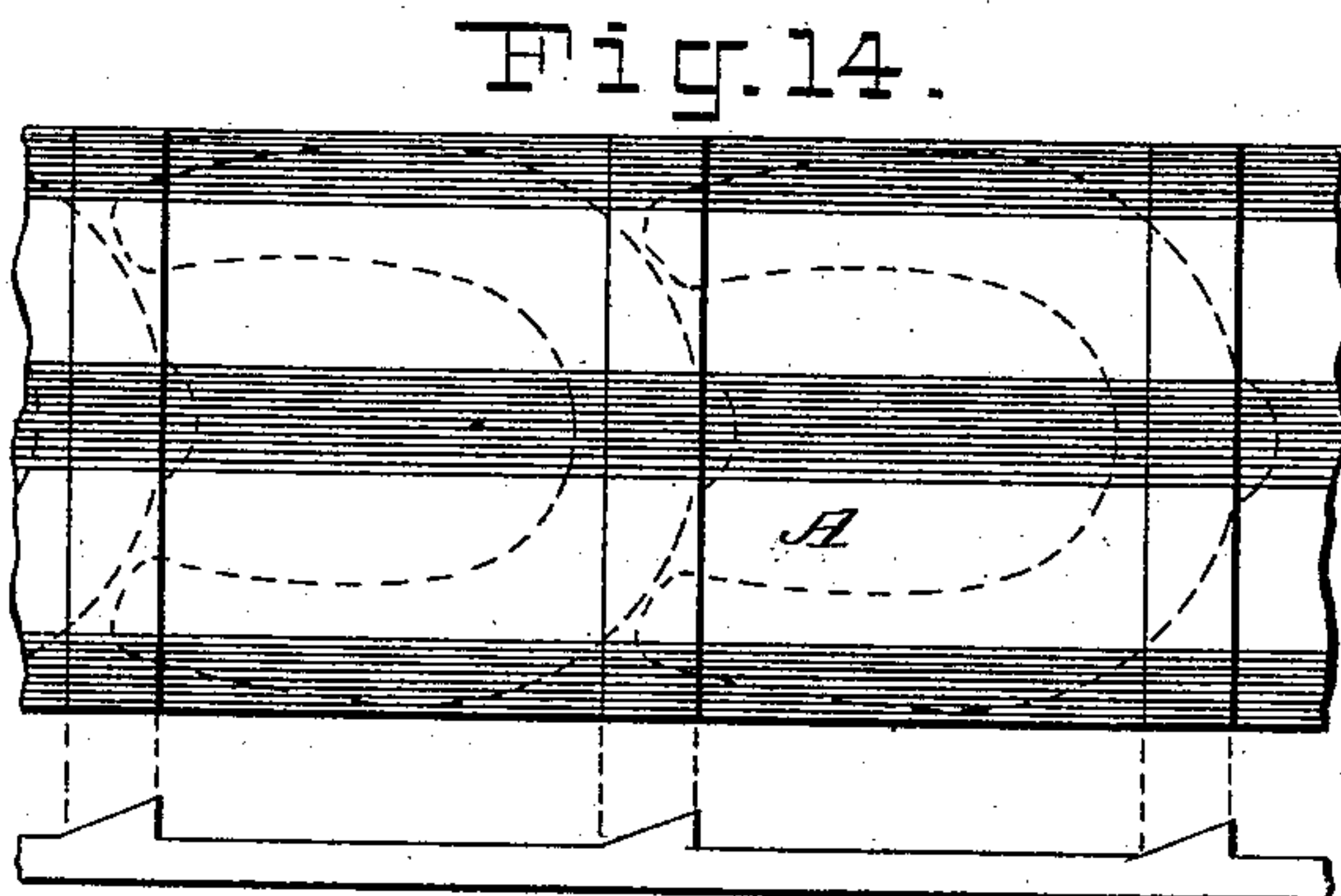


Fig. 14.

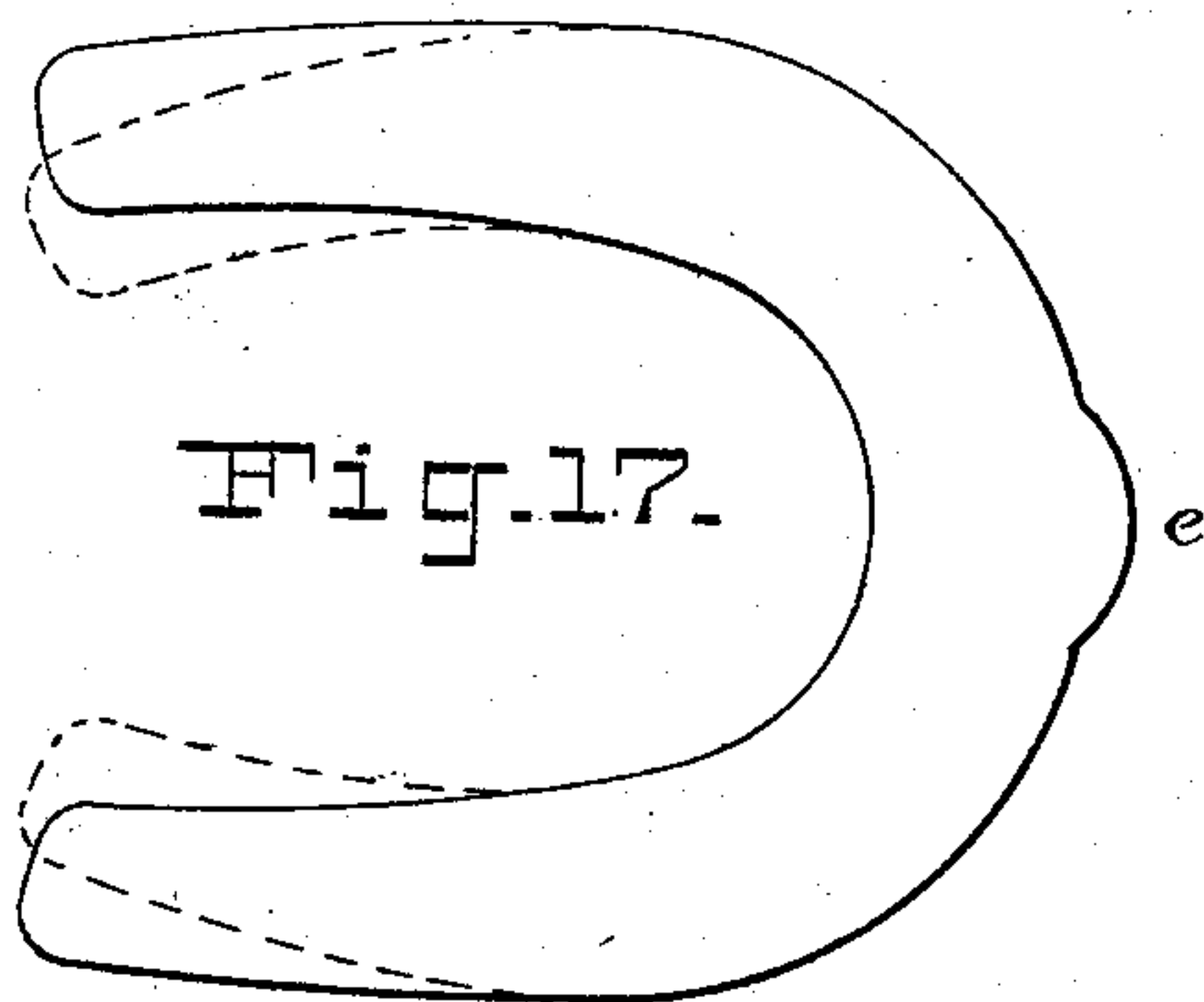


Fig. 17.

WITNESSES:

E. B. Bolton
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INVENTOR:

Louis G. Claude
By his Attorneys,

Burley Fraser Hornum

UNITED STATES PATENT OFFICE.

LOUIS G. CLAUDE, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE RUSSELL HORSESHOE COMPANY, OF SAME PLACE.

MANUFACTURE OF HORSESHOES.

SPECIFICATION forming part of Letters Patent No. 324,360, dated August 18, 1885.

Application filed December 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, LOUIS G. CLAUDE, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in the Manufacture of Horseshoes of Combined Iron and Steel, of which the following is a specification.

This invention relates principally to the manufacture of horseshoes from plates or bars of combined steel and iron, but is applicable also, in part, to the manufacture of horseshoes from plates of all iron or all steel.

Prior to this invention two general methods of manufacturing horseshoes by machinery have been used. The first method, which is the one most commonly practiced, consists in rolling a bar of iron or steel, or both combined, cutting the same into lengths, and bending the lengths into horseshoe shape. The calks are usually formed in the rolling of the bar, and the creases are formed before the bar is bent.

The second method consists in rolling a bar with longitudinal ribs to form the heel and toe calks and punching out from this rolled bar, in a transverse direction, bent blanks, which are afterward shaped and finished to constitute the completed shoe. These bent blanks have solid calks formed on them by being punched from the said longitudinal ribs. The completed shoe has the grain of the metal extending transversely of it, resulting from the blank being struck transversely from the rolled bar. This transverse grain is a disadvantage, because of its weakening the sides of the shoe between the calks, where it is naturally weakest, owing to the thinness of the metal and the presence of the creases and nail-holes.

My present invention aims to provide for the manufacture, without bending, of shoes which shall have the grain of the metal extending longitudinally of them.

The principal distinguishing feature of my invention consists in stamping out curved shoes from a bar or plate in successive longitudinal series, the toe of one shoe being cut out adjacent to the heels of the next.

I will proceed to describe in detail the preferred mode of practicing my invention in manufacturing shoes of combined steel and

iron, referring for that purpose to the accompanying drawings.

Figure 1 is a plan of a portion of the rolled plate of iron and steel from which the shoes are struck out, the dark stripes of ruled lines thereon being designed to indicate the iron and the white stripes the steel portions of the plate. Fig. 2 is a transverse section of the plate. Fig. 3 is a plan of the plate and female die, illustrating the operation of stamping out the shoes. Fig. 4 is a similar view illustrating a modified method of stamping out the shoes. Fig. 5 is a vertical transverse section of the stamping-dies, cut on the line 5 5 in Fig. 3. Fig. 6 is a plan of the roughly-formed shoe or shoe-blank after being thus stamped out. Fig. 7 is an inverted plan of the same with the calks applied to it. Fig. 8 is a transverse section of a calk. Fig. 9 is a plan of the finished shoe. Fig. 10 is an inverted plan thereof, and Fig. 11 is a side elevation thereof.

The remaining views illustrate modifications. Figs. 12 and 13 are side elevations of two different forms of shoe. Figs. 14, 15, and 16 are views corresponding to Fig. 3, and showing modified methods of stamping out the shoe-blanks. Fig. 17 is a view of the shoe-blank corresponding to Fig. 6.

The flat bar or plate A (shown in Figs. 1 and 2) is made up of alternate stripes or portions of iron or steel. The center stripe, *a*, is of iron; each side of this are stripes *b b* of steel, and outside of these are marginal or flank stripes *c c* of iron. This plate may be produced in any way known to workers in iron and steel, as by rolling from an ingot or pile of combined iron and steel. It is preferably made according to the method disclosed in my application for patent on "improvements in bars of combined iron and steel and their manufacture" executed by me this day, application No. 150,778, filed December 19, 1884.

In Figs. 3, 4, and 5, B is the lower or female die, and in Fig. 5, C is the upper or male die or punch for stamping out the shoe-blanks. These dies are made to cut out a blank having the outline of the finished shoe or an outline closely approximating thereto. The die B is made with a raised margin or flange, *d*, on each side to serve as a guide to the bar or plate A, thus constituting a sort of trough,

through which the plate is passed as the punching proceeds.

Fig. 3 shows clearly the preferred method of punching out the shoe-blanks. The dies are turned with the heels toward the operator, who feeds along the plate and controls the operation of the press. After each blank is punched out the operator moves the plate forward just far enough to cover the die with whole metal from which to punch the succeeding blank. The relation of the successive blanks to each other as they are to be punched out of the bar is denoted by the dotted lines.

Fig. 4 shows a different way of feeding the bar during the punching, it being passed in the opposite direction through the dies. The dies are turned with the toe of the shoe toward the operator, the blanks being struck out heel foremost, instead of toe foremost. The former method is preferable, however.

Fig. 6 is a plan of one of the shoe-blanks thus punched out, lettered D. It has by preference the same outline as the finished shoe, so that no bending is necessary to complete it. It consists, mainly, of steel, the steel portions *b b* extending from toe to heel down each leg of the shoe, along the inner side thereof, with iron flanks *c c* along the outer side of each leg of the shoe, and an iron center, *a*, between the steel portions. The steel portions *b b* impart strength and rigidity to the shoe where strength is most needed. The iron flanks afford a comparatively soft medium in which to form the creases, and through which to punch the nail-holes, and the iron center affords a ductile portion from which to form the toe-clip. The blank is formed with a slight projection, *e*, at the toe, punched from within the limits of the iron center *a*, which furnishes sufficient metal for forming the toe-clip.

Fig. 7 shows the blank in the next stage of the manufacture. The plain blank shown in Fig. 7 has a toe-calk, *f*, and heel-calks *g g*, welded upon its under side. These are cut from a rolled bar of the cross-section shown in Fig. 8, preferably of steel, or having an edge or core of steel. The shoe may then be finished in any known or practicable way, it being necessary to form the concave upon its upper side, at *h* in Fig. 9, to form the creases for the nail-heads *i i*, Fig. 10, and to turn up the toe-clip *j*, Figs. 9 and 11. All these operations may be performed simultaneously by the machine disclosed in my application, executed simultaneously herewith, for a patent on "improvements in horseshoe-machines," application No. 151,134, filed December 26, 1884. The final operation is the punching of the nail-holes, which is effected in any suitable punching-press.

Figs. 9, 10, and 11 show the finished shoe. This shoe is characterized by having a parallel grain running from toe to heel, or longitudinally of the shoe, in contradistinction to a grain running in a curve around the shoe from one heel around to the other. The only

portion of the shoe where the grain runs transversely to the outlines of the shoe is at the toe, and at this point the shoe is strengthened by the toe-calk *f*, which extends transversely of the grain.

The heel-calks instead of being welded on may be formed by turning down the heels, as shown in Fig. 12.

The shoe may be made entirely without calks, if preferred, but in this case it is preferable to thicken the toe at its lower front edge, as shown in Fig. 13, where a similar beveled thickening is shown at the heel. This construction of shoe is best made from a plate having transverse ribs, as shown in Fig. 14—a method of manufacture, however, which I do not claim in my present application, it being made the subject of another application for patent executed by me this day for "improvements in the manufacture of horseshoes with solid calks," application No. 150,889, filed December 20, 1884.

It will be observed from an inspection of Figs. 3 and 4 that the toe of each shoe-blank enters between the heels of the next, thus economizing waste to the utmost. This is not, however, absolutely essential to my invention, since every alternate blank might be reversed, as shown in Fig. 15, thus bringing the blanks heel to heel and toe to toe; or, a double row of blanks might be cut from the same plate, as shown in Fig. 16.

I have said that the shoe-blank D is punched from the plate with the same outline as the finished shoe, or approximately the same. It is not essential to my invention that the blank should have, by any means, the exact outline of the finished shoe, since it may be punched out with its legs or heels spread considerably wider apart than they should be in the shoe, and be squeezed inward to the proper shape during the subsequent steps in the manufacture. Fig. 17 shows a blank which is punched out with its legs nearly straight and its heels considerably wider apart than in the shoe. Before the shoe is finished it will be brought to the shape shown in dotted lines. This is best accomplished in the creasing-machine, before referred to, where the shoe is gripped laterally by jaws, and these jaws in coming together will serve to force in the heels of the shoe. It is always preferable for the shoe-blank to be made a little wider than the shoe, in order that the gripping-jaws may, by compressing the shoe laterally, gain a firm hold and force all the shoes to a uniform outline, ready for the creasing-dies.

I am aware of the method of manufacturing horseshoes disclosed in English Patent No. 3,337, dated July 5, 1883, and I make no claim to anything contained in that patent.

My invention possesses several important advantages over the method of manufacturing horseshoes by bending them from a straight bar, namely: The manipulations are simpler and cheaper, and are effected with less complicated machinery, and the metal is not subjected

to strain. In the case of a shoe bent from a bar of combined iron and steel, difficulty has been experienced from the liability of the iron and steel portions to separate, by reason of the strain imposed upon them in bending, a trouble which is entirely obviated by my invention.

I make no claim in this application to the finished shoe produced by my present invention, that being claimed in another application executed by me this day for improvements in horseshoes, application No. 151,042, filed December 23, 1884.

I claim as my invention—

1. The improvement in the manufacture of horseshoes, which consists in punching from a plate of rolled metal a succession of curved blanks, their outline coinciding with or approximating that of the finished shoe, and the plate being presented to the punching-dies with the grain of the metal extending longitudinally of the shoe-blank, whereby the blanks have a parallel grain extending from toe to heel, substantially as set forth.

2. The improvement in the manufacture of horseshoes, which consists in punching from a rolled plate having a longitudinal central stripe of iron flanked by stripes of steel a succession of curved blanks of a shape approximating that of a finished shoe, with the said stripe of iron crossing the toe portion of each blank, substantially as set forth, whereby the subsequent formation of the toe-clip is facilitated.

3. The improvement in the manufacture of horseshoes, which consists in punching from a rolled plate having a longitudinal stripe of iron flanked by steel a succession of curved blanks of a shape approximating that of a finished shoe, the toe portion of each of which is

formed with a projection, *e*, the said blanks being cut with said stripes of iron crossing their toe portions medially, substantially as set forth.

4. The improvement in the manufacture of horseshoes, which consists in punching from a rolled plate having a central longitudinal stripe of iron two parallel stripes of steel on opposite sides thereof, and opposite stripes of iron flanking the steel, a succession of shoe-blanks of a shape approximating that of a finished shoe, with the said central stripes of iron crossing the middle of the toe portion, the steel stripes extending longitudinally through the legs, and the iron flanks forming the outer sides of the legs, substantially as set forth.

5. The improvement in the manufacture of horseshoes, which consists in punching from a rolled plate a successive series of curved shoe-blanks of an outline approximating that of the finished shoe, the plate being presented to the punching-dies with its grain extending longitudinally of the shoe-blank, and the successive blanks being struck out toe to heel, substantially as set forth.

6. The improvement in the manufacture of horseshoes, which consists in first punching out a curved shoe-blank from a rolled plate, with the grain extending longitudinally of the blank, and subsequently welding a toe-calk to said blank transversely of the grain of the blank, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LOUIS G. CLAUDE.

Witnesses:

ARTHUR C. FRASER,
HENRY CONNETT.