No. 656,712. Patented Aug. 28, 1900.

W. S. BIDLE.

METHOD OF MAKING FORKED EYEBARS.

(Application filed Apr. 25, 1900.)

(No Model.)

4 Sheets—Sheet 1.

FIG. I.

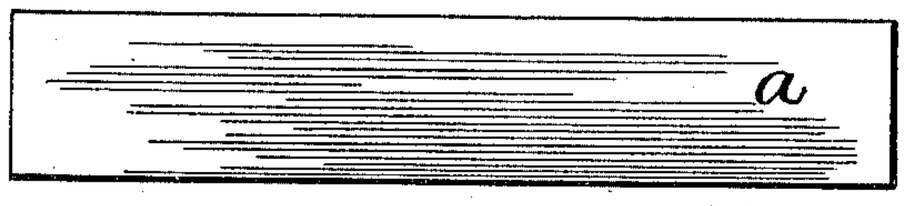


FIG. II.

FIG. III.

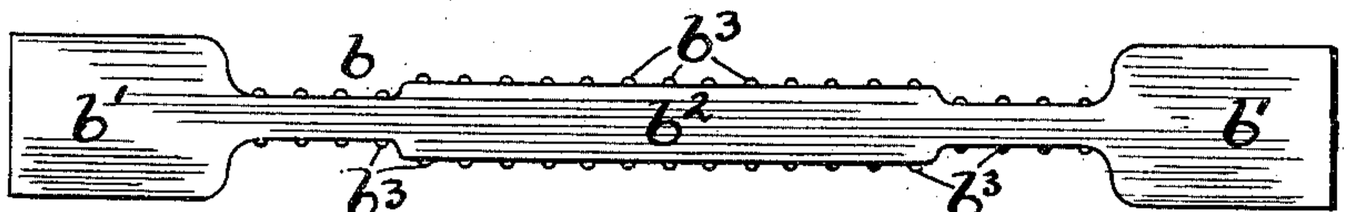


FIG. IV.

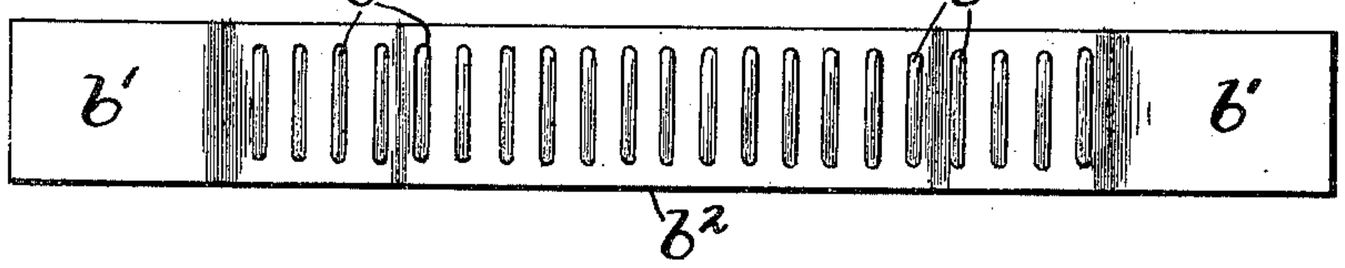


FIG. V.

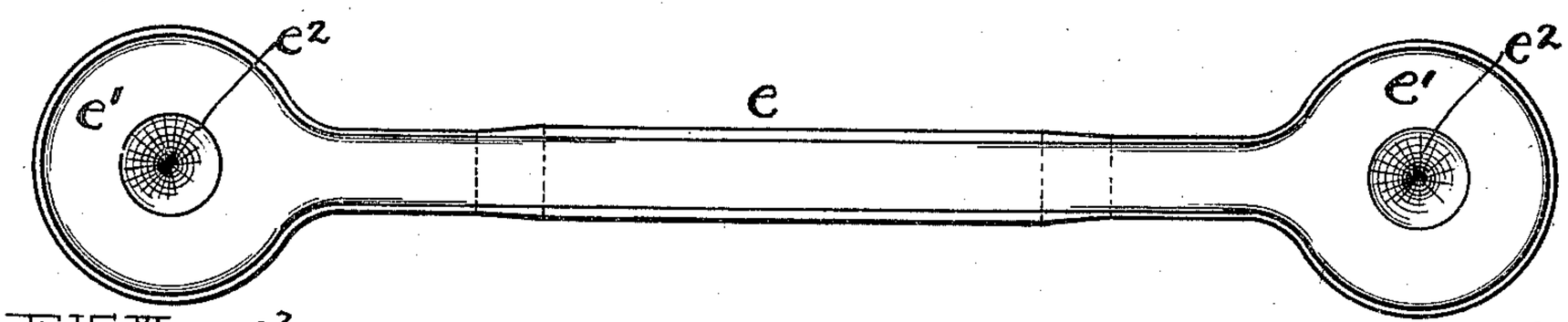


FIG. VI.

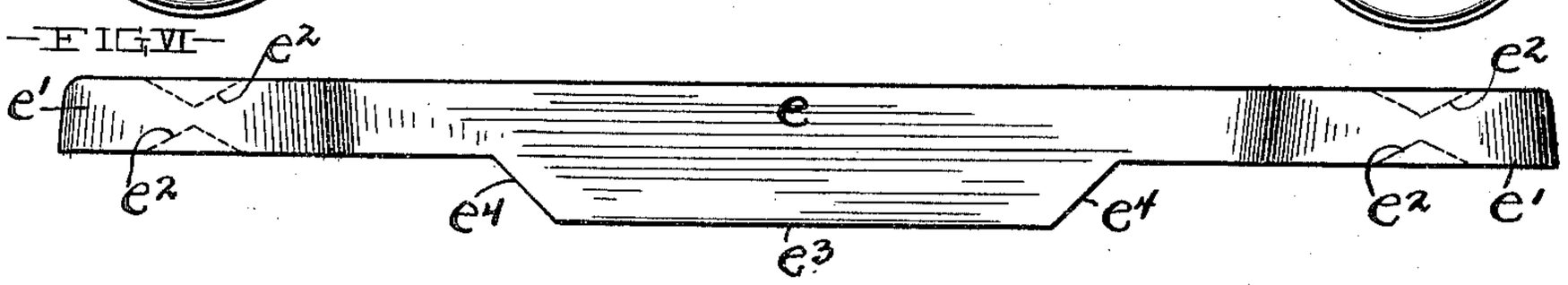


FIG. VII.

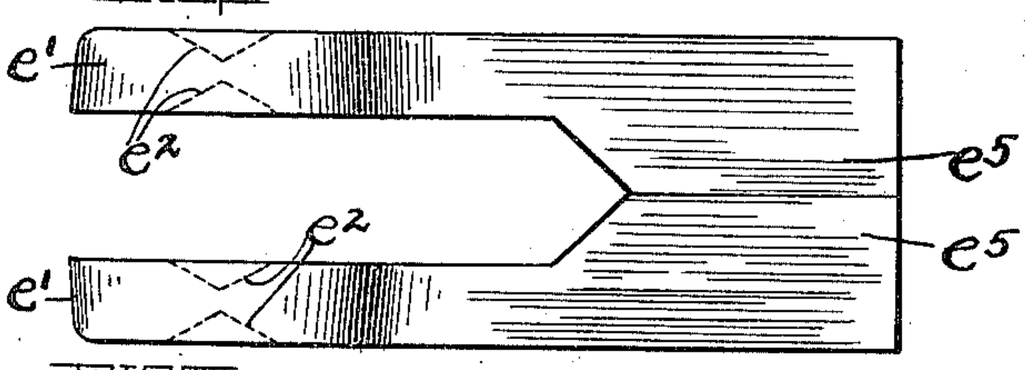


FIG. VIII.

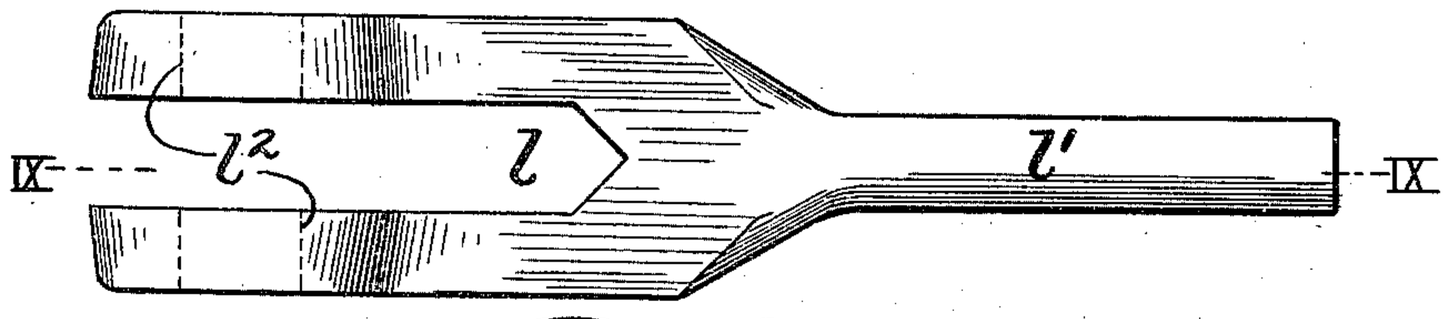
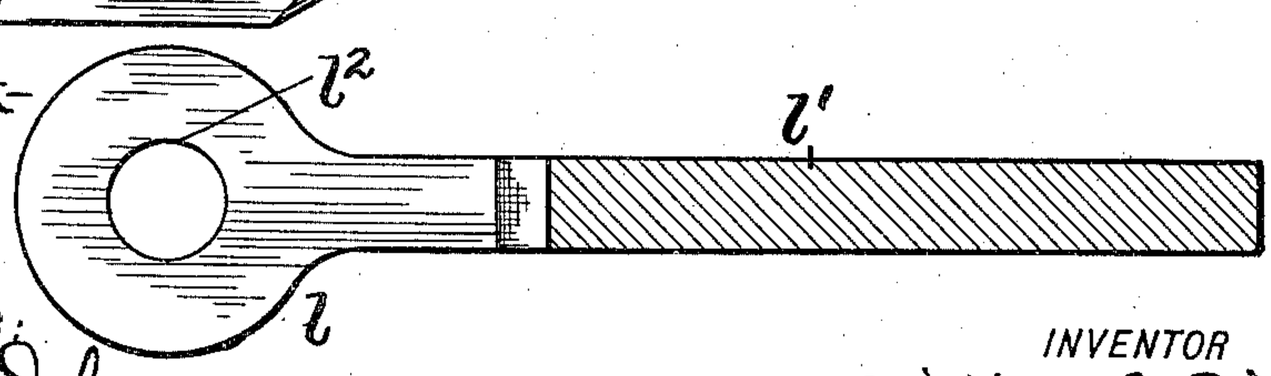


FIG. IX.



WITNESSES:
Daniel E. Daly.
A. H. Parratt

INVENTOR
William S. Bidle
BY
Lynch & Dorsey
his ATTORNEYS

No. 656,712. Patented Aug. 28, 1900.

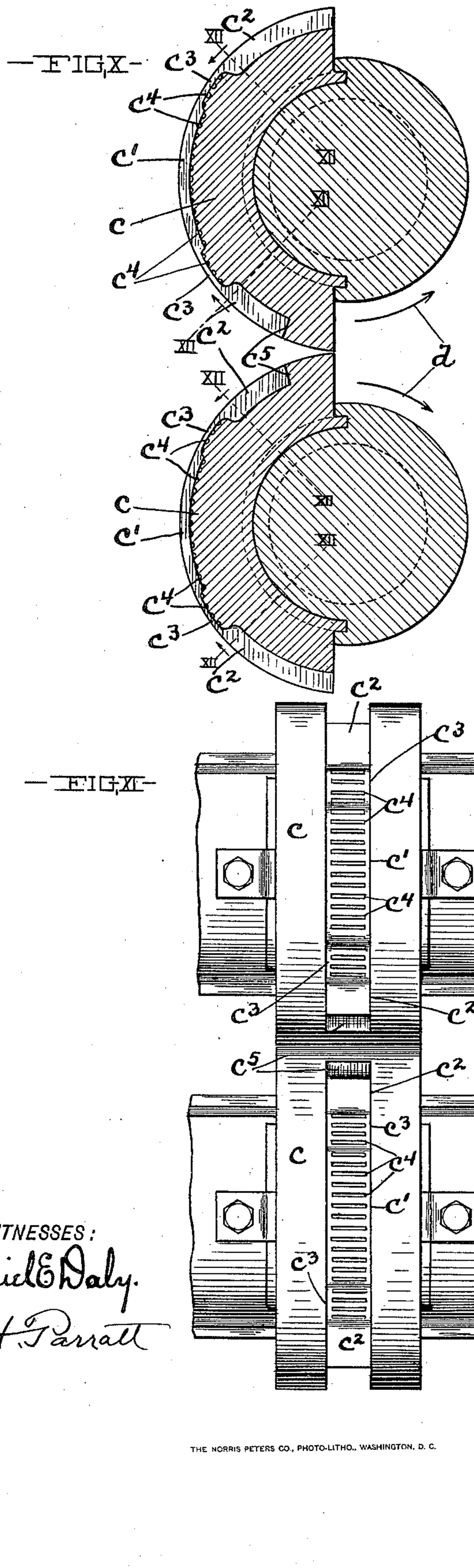
W. S. BIDLE.

METHOD OF MAKING FORKED EYEBARS.

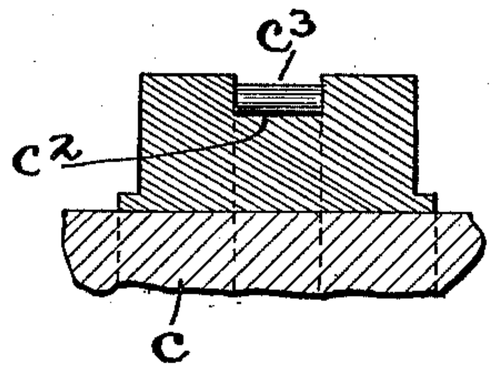
(Application filed Apr. 25, 1900.)

(No Model.) 4 Sheets—Sheet 2.

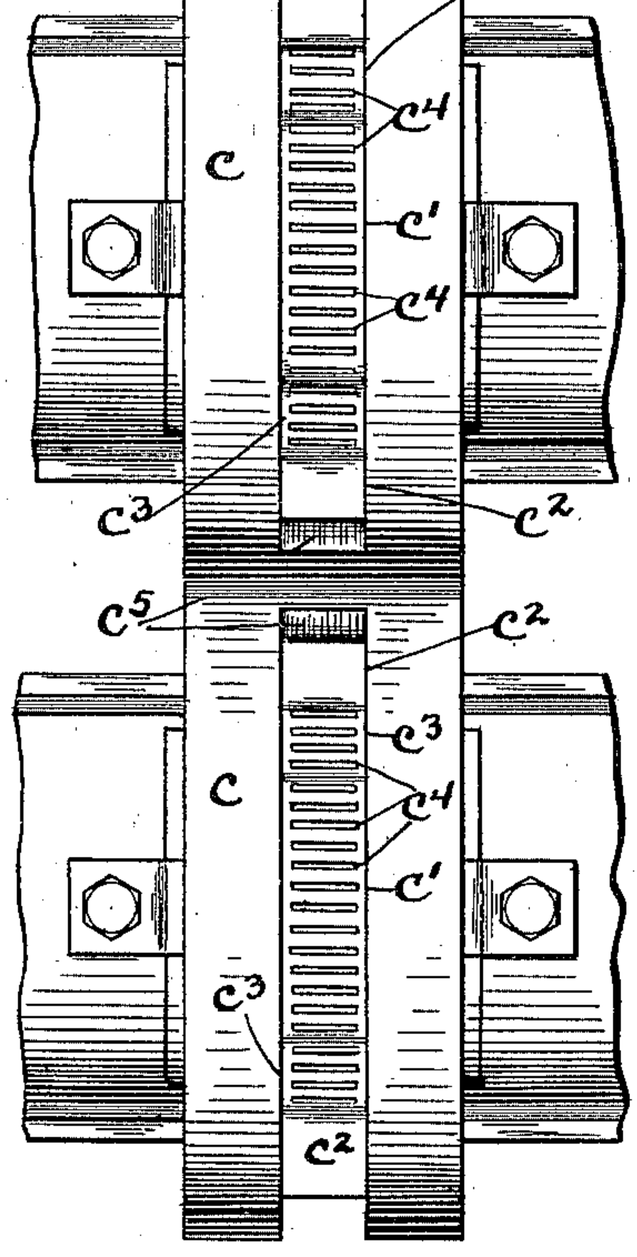
—FIG. X—



—FIG. XII—



—FIG. XI—



WITNESSES:
Daniel E. Daly.
A. H. Parrall

INVENTOR
William S. Bidle
BY Lynch & Dorer
his ATTORNEYS

No. 656,712. Patented Aug. 28, 1900.

W. S. BIDLE.

METHOD OF MAKING FORKED EYEBARS.

(Application filed Apr. 25, 1900.)

(No Model.) 4 Sheets—Sheet 3.

FIG. XIII.

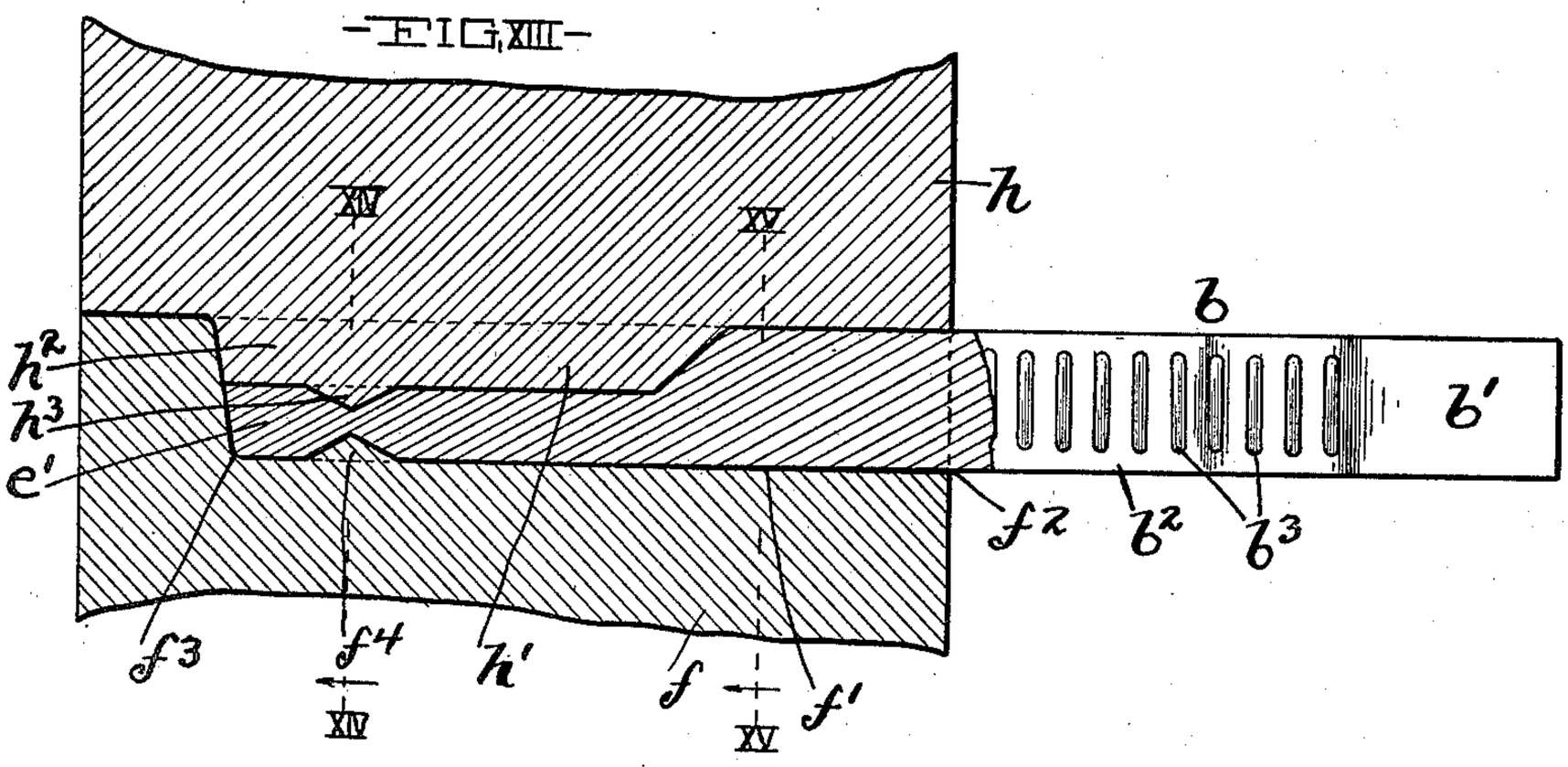


FIG. XIV.

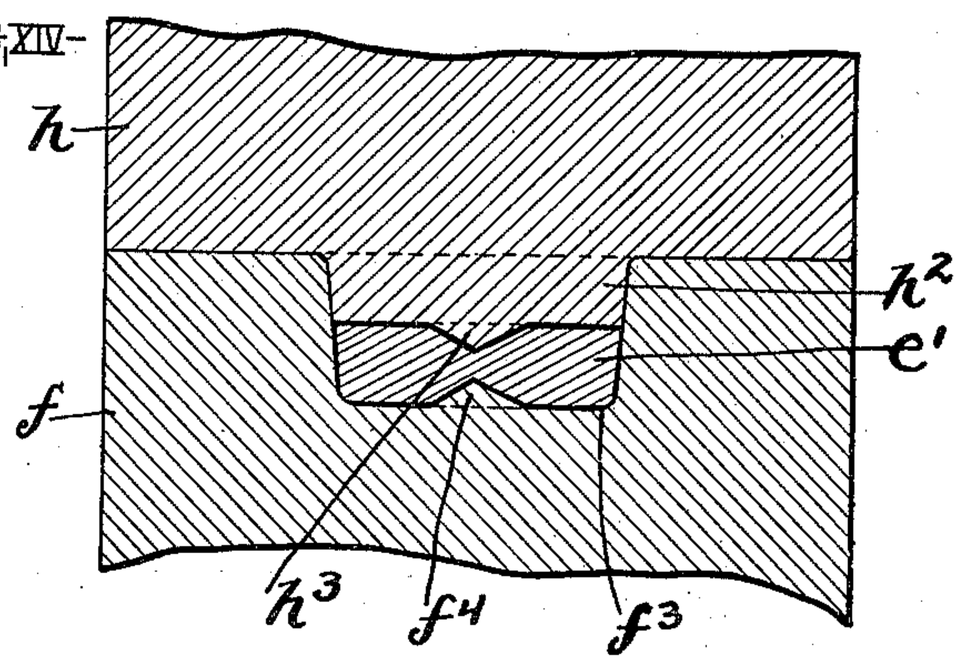
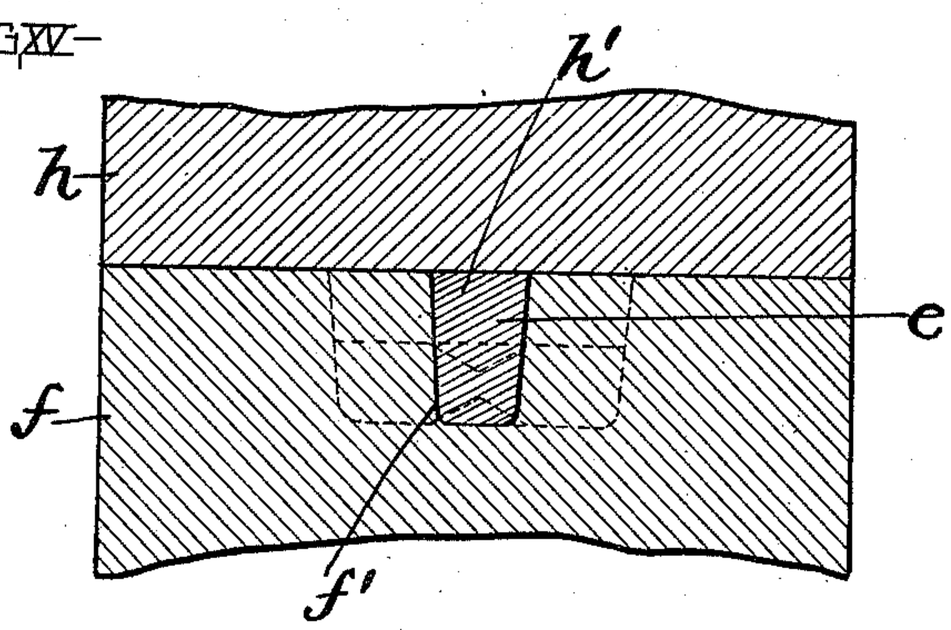


FIG. XV.



WITNESSES:
Daniel E. Daly.
A. H. Parrall

INVENTOR
William S. Bidle
BY
Lyon & Doren
his ATTORNEYS

No. 656,712 Patented Aug. 28, 1900.

W. S. BIDLE.

METHOD OF MAKING FORKED EYEBARS.

(Application filed Apr. 25, 1900.)

(No Model.) 4 Sheets—Sheet 4.

FIG. XVI.

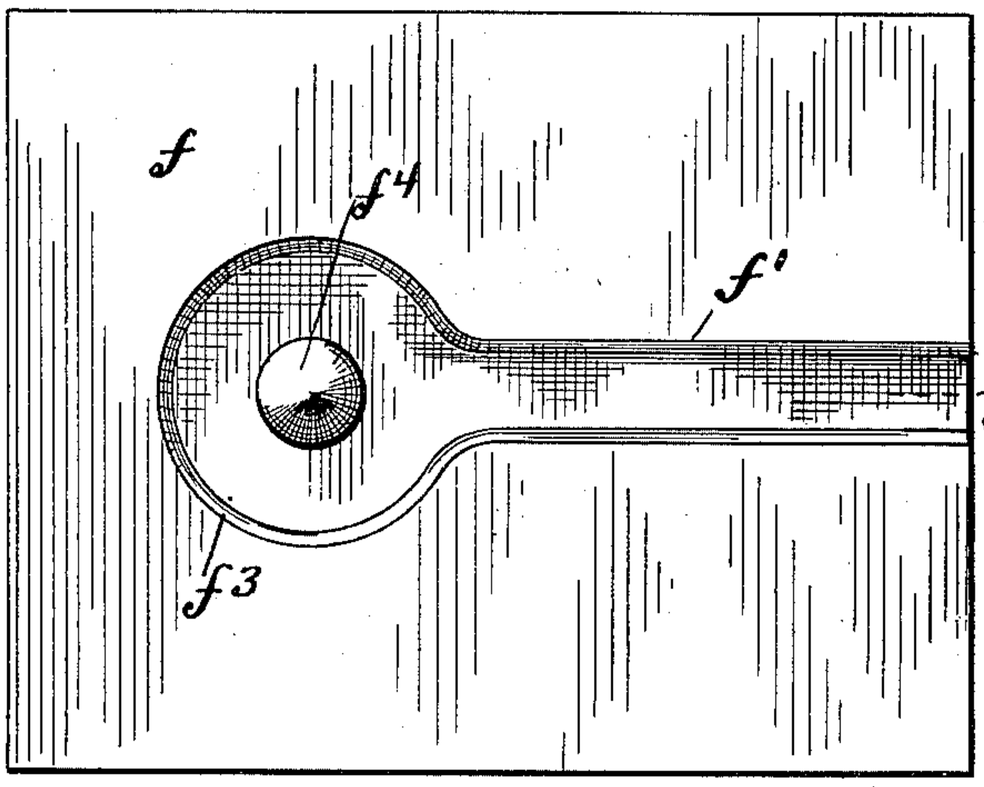


FIG. XVII.

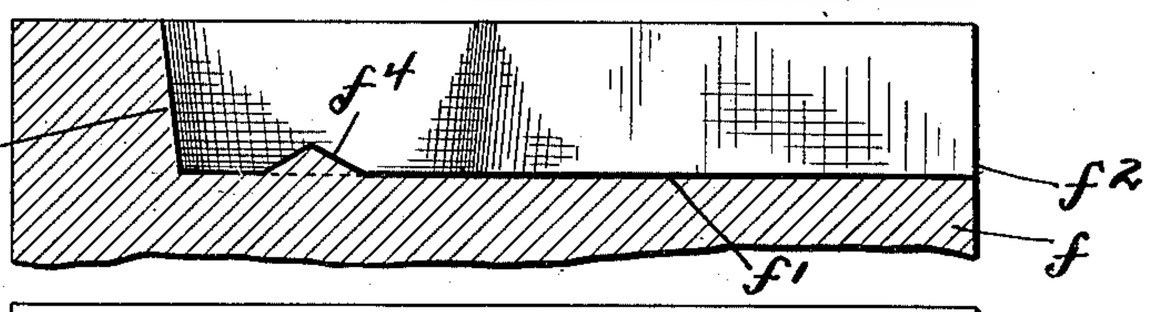


FIG. XVIII.

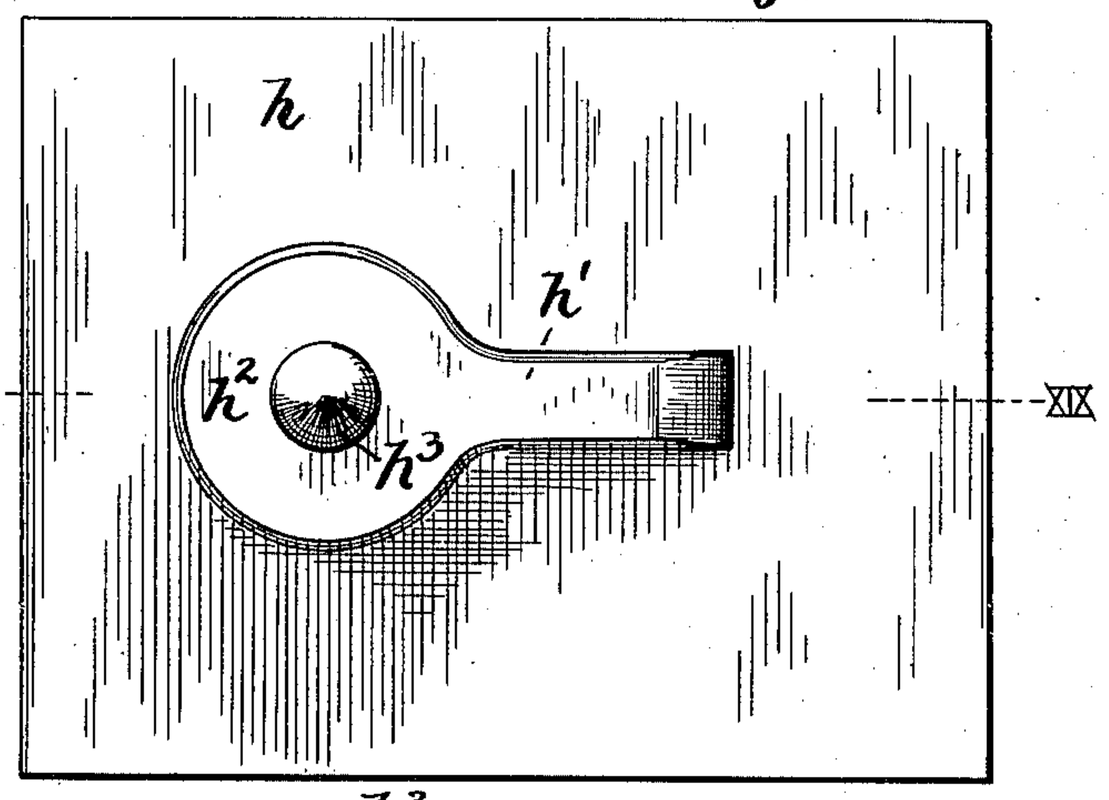
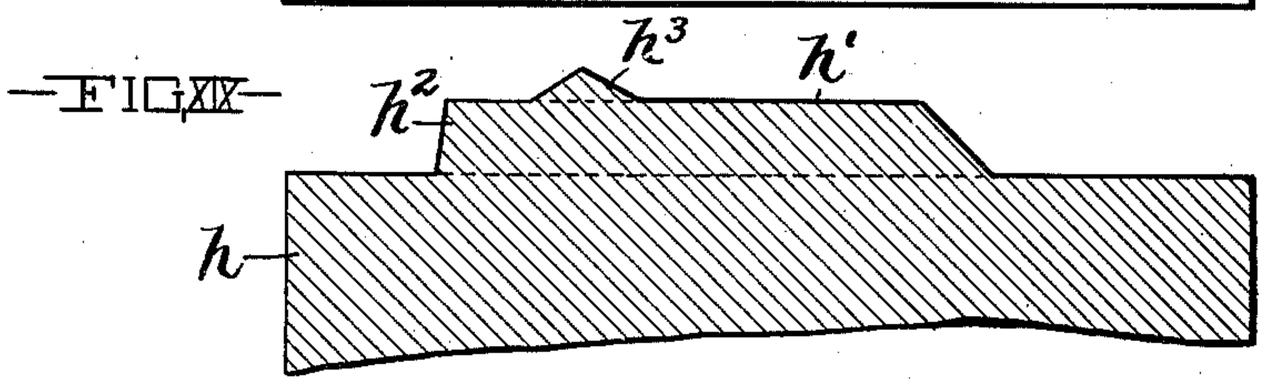


FIG. XIX.



WITNESSES:
David E. Daly.
A. H. Parratt.

INVENTOR
William S. Bidle
BY
Lynch & Dorer
his ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM S. BIDLE, OF CLEVELAND, OHIO.

METHOD OF MAKING FORKED EYEBARS.

SPECIFICATION forming part of Letters Patent No. 656,712, dated August 28, 1900.

Application filed April 25, 1900. Serial No. 14,281. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BIDLE, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Methods of Manufacturing or Forming Forked Eyebars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to an improved method of manufacturing or forming forked eyebars.

The object of this invention is to simplify and facilitate the manufacture of bars of the character indicated and to produce a forked eyebar that is lighter, cheaper in construction, and more durable than the forked eyebars heretofore made.

With this object in view the invention consists in certain steps employed in the manufacture of my improved eyebars hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure I is a side view of a billet employed in the formation of the blank that is required for the manufacture of my improved eyebar, and Fig. II is an end view of the same. Fig. III is a top or bottom view of the blank, and Fig. IV is a side view of the same. Fig. V is a side view of the bar-forming forging made from the blank illustrated in Figs. III and IV, and Fig. VI shows a side edge view of the said bar. Fig. VII shows the manner of assembling the halves or sections into which the bar illustrated in Figs. V and VI is divided, and Fig. VIII shows the said assembled sections welded together and converted into my improved eyebar. Fig. IX is a section on line IX IX, Fig. VIII, looking in either direction. Fig. X is an end elevation, in central section, of a pair of rolls employed in rolling a billet into the shape required to form a blank suitable for use in the production of my improved eyebar. Fig. XI is a side elevation of the said rolls. Fig. XII is a transverse section on any one of lines XII XII, Figs. X and XI. Fig. XIII shows a pair of dies operating upon one end portion of the blank. Fig. XIV is a vertical section on line XIV XIV, Fig. XIII. Fig. XV is a vertical section on lines XV XV, Fig. XIII. Fig. XVI is a top plan of the lower die. Fig. XVII is a vertical section on line XVII XVII, Fig. XVI. Fig. XVIII is a bottom plan of the upper die. Fig. XIX is a section on line XIX XIX, Fig. XVIII.

Figs. I and II show the billet a that is rolled into the shape required to form the blank b employed in the production of my improved eyebar, and Figs. III and IV illustrate the said blank. The billet is a piece of steel or wrought-iron quadrangular in end elevation and of suitable length. The blank b has each end terminating in a head b' and has a web b^2 connecting the two heads. The web b^2 is enlarged in thickness centrally between the heads along about three-fifths of the length of the web. The heads b' contain the material that forms the eyes of the finished eyebar. The thicker and central portion of the web b^2 contains the material that forms the shank of the finished eyebar, and the thinner or end portions of the web form the necks that connect the eyes of the finished eyebar with the shank of the bar. The web b^2 is provided upon each side with ribs b^3, arranged transversely of the web and at suitable intervals longitudinally of the web.

Figs. X, XI, and XII illustrate the parallel rolls c employed in the formation of the blank. The rolls are arranged horizontally one directly above the other and supported from housings or standards (not shown) in any approved manner. Each roll upon its peripheral surface is provided with a channel c', that extends circumferentially of the rolls a suitable distance. The end portions c^2 of the channel of each roll have greater depth than the remaining or central portion of the channel, and the heads of the blank are formed within the said deeper portions of the channels of the rolls. The web of the blank is formed within the central or shallower portion of the channels of the rolls, and the end portions c^3 of the central or shallower portion of the channel of each roll are somewhat raised, as required, to form the thinner portion of the web next to the heads of the blank. The central outwardly-facing wall of the central or shallower portion of each channel c' is provided with grooves c^4, that extend transversely of the said wall and are arranged at suitable intervals longitudinally

of the wall, and the ribs b^3 of the blank are formed within the grooves c^4 of the rolls. The engagement of the ribs b^3 with the grooves c^4 prevent displacement of the work circumferentially of the rolls during the rolling operation. Briefly described, the rolling surfaces of the coöperating rolls have the contour required to form the blank hereinbefore described. The rolls rotate during their operation in the direction indicated by the arrows d in Fig. X, and each roll at the receiving end of its work-receiving channel is provided with a stop-forming shoulder c^5, that forms an abutment for the work preparatory to the rolling operation, and the billet or work is pushed and held against the said abutment c^5 of the two rolls until the rolls have commenced to operate upon the billet.

The blank illustrated in Figs. III and IV having been formed in the manner hereinbefore described is operated upon between the coöperating dies, (illustrated in Figs. XIII to XIX, inclusive,) and the coöperating surfaces of these dies have the form required to render them capable of operating upon each end portion or half of the blank at a time and forge the blank into the bar e. (Illustrated in Figs. V and VI.) The blank is elongated during the forging operation, and the forged article is a bar that terminates at each end in a circular head e', having each side thereof provided centrally with an indentation e^2 and having the indentations in opposite sides thereof in line, and the bar e has its central portion, centrally between the heads e', increased in thickness, as at e^3, and provided with beveled ends e^4, sloping toward each other from the thinner end portions of the bar, and the edges of the bar e are somewhat beveled, as illustrated, chiefly to facilitate the removal or separation of the bar from the dies. The lower die f of the forging-dies has a plain horizontal top surface and is provided centrally of the said surface with a channel f', that in length and general configuration corresponds to one-half of the length of the bar e that is to be formed by and between the dies, and the said channel, as illustrated in Figs. XVI and XVII, is open at one end thereof, as at f^2, at one end of the die and has has its other or inner end enlarged and forming a circular chamber f^3, whose bottom is provided centrally with a conical projection f^4, instrumental in the formation of the indentations e^2 to be formed in one side of the bar e. The upper die h is arranged to engage and drop during the forging operation upon the lower die and is provided centrally with a downwardly-projecting portion h', arranged as required to render it capable of entering about half-way and conforming to the channel f', formed in the lower die—that is, the projecting part h' of the upper die has a circular end portion h^2, arranged to enter and conform to the circular portion f^3 of the channel of the lower die, and the remaining portion of the said projection h' is arranged as required to render it capable during the forging operation of entering the channel of the lower die next to the circular portion of the said channel, but not long enough to extend to the outer end of the channel, so that the thinner portion of the resulting bar or forging e shall be formed between the dies within the circular portion of the channel of the lower die and in the inner end of the straight portion of the said channel, as shown in Fig. XIII, and obviously as the projection of the upper die does not during the operation of the dies extend into the outer end of the channel of the lower die the thicker portion of the resulting forging is formed within the outer end of the straight portion of the said channel. The dies, when they have operated upon one end portion of the blank, are separated to permit the removal of the blank's end half that has been operated upon from the dies, whereupon the work is turned end for end and returned with its other end to be operated upon by and between the dies. Figs. XIII, XIV, and XV show the dies operating upon an end half of the blank b. The bottom of the circular portion of the channel of the lower die is provided centrally with a conical projection f^4, adapted to form the indentations in one side of the bar e during the operation of the dies, and the projecting portion h' of the upper die has its circular end provided centrally with a conical projecting member h^3, capable of forming the indentations in the other side of the bar e during the operation of the dies. The side walls of the channel of the lower die and the edges of the projection of the upper die are beveled or sloping, as required, to render them capable of forming the beveled edges of the resulting bar e. The bar e having been formed is severed centrally and transversely, so as to divide the bars into halves centrally of the central and thicker portion of the bar, whereupon the resulting halves are assembled, so that their heads register with each other, as shown in Fig. VII, with the thicker or offset portion e^5 of each half against and arranged longitudinally of the offset portion e^5 of the other half, so as to form a fork, whereupon the thicker and offset portions e^5 of the assembled halves are welded together upon the application of heat in any approved manner, so as to form the shank l' of the resulting forked bar l, (illustrated in Figs. VIII and IX,) and the indentations e^2 of the parts assembled in Fig. VII are enlarged into perforations l^2 in the finished eyebar.

What I claim is—

1. An improvement in the manufacture of eyebars herein described, consisting in forging a blank into the form of a bar provided with head-forming ends and thicker centrally between the head-forming ends, then severing the bar centrally and transversely of the central and thicker portion of the bar, then assembling the resulting halves or pieces with their offset or thicker portions abutting each

other and with their head-forming ends in registry, and then welding together the said abutting ends of the assembled sections, substantially as and for the purpose set forth.

2. The method herein described of converting a billet into a forked eyebar, consisting in rolling a billet into the form of a blank having its ends terminating in heads connected by a web enlarged in thickness centrally between the heads, then forging and elongating the blank so as to form a bar having head-forming ends and thicker centrally between the heads, then severing the said bar transversely centrally of the thicker portion of the bar, then assembling the resulting sections or pieces with their head-forming ends in registry and with their offset or thicker ends abutting each other, and then welding together and elongating the abutting ends of the assembled sections, substantially as and for the purpose set forth.

3. The formation of a forked eyebar from a billet *a*, by, first, rolling the billet into a blank *b* having each end terminating in a head *b'* and having a web b^2 connecting the heads and enlarged in thickness centrally; secondly, forging the said blank into a bar *e* having its end portions thinner than its central portion and terminating in circular heads *e'* provided with the indentations e^2; thirdly, severing the said bar centrally and transversely; fourthly, assembling the resulting sections with their thicker ends abutting each other and with their indented heads in registry; fifthly, welding the said thicker ends together and thereby forming the shank of the eyebar, and enlarging the indentations of the heads into perforations that register with each other and thereby completing the formation of the eyes of the eyebar, substantially as set forth.

Signed by me at Cleveland, Ohio, this 21st day of April, 1900.

WILLIAM S. BIDLE.

Witnesses:
C. H. DORER,
A. H. PARROTT.