

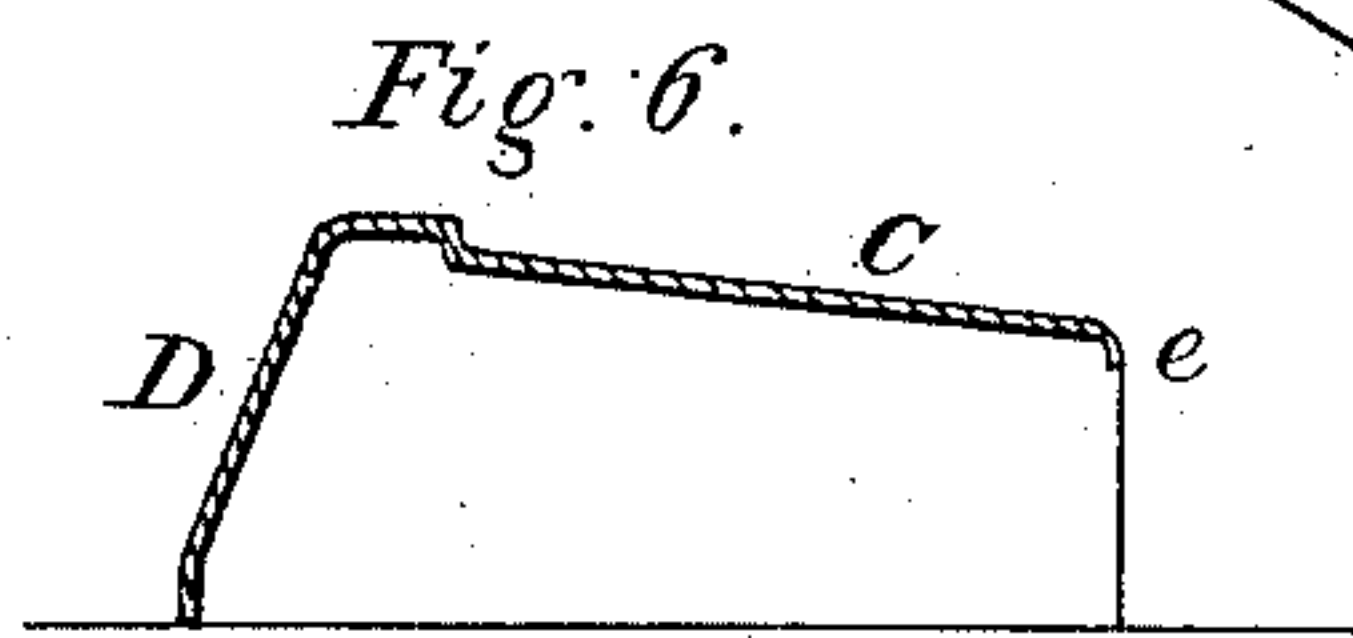
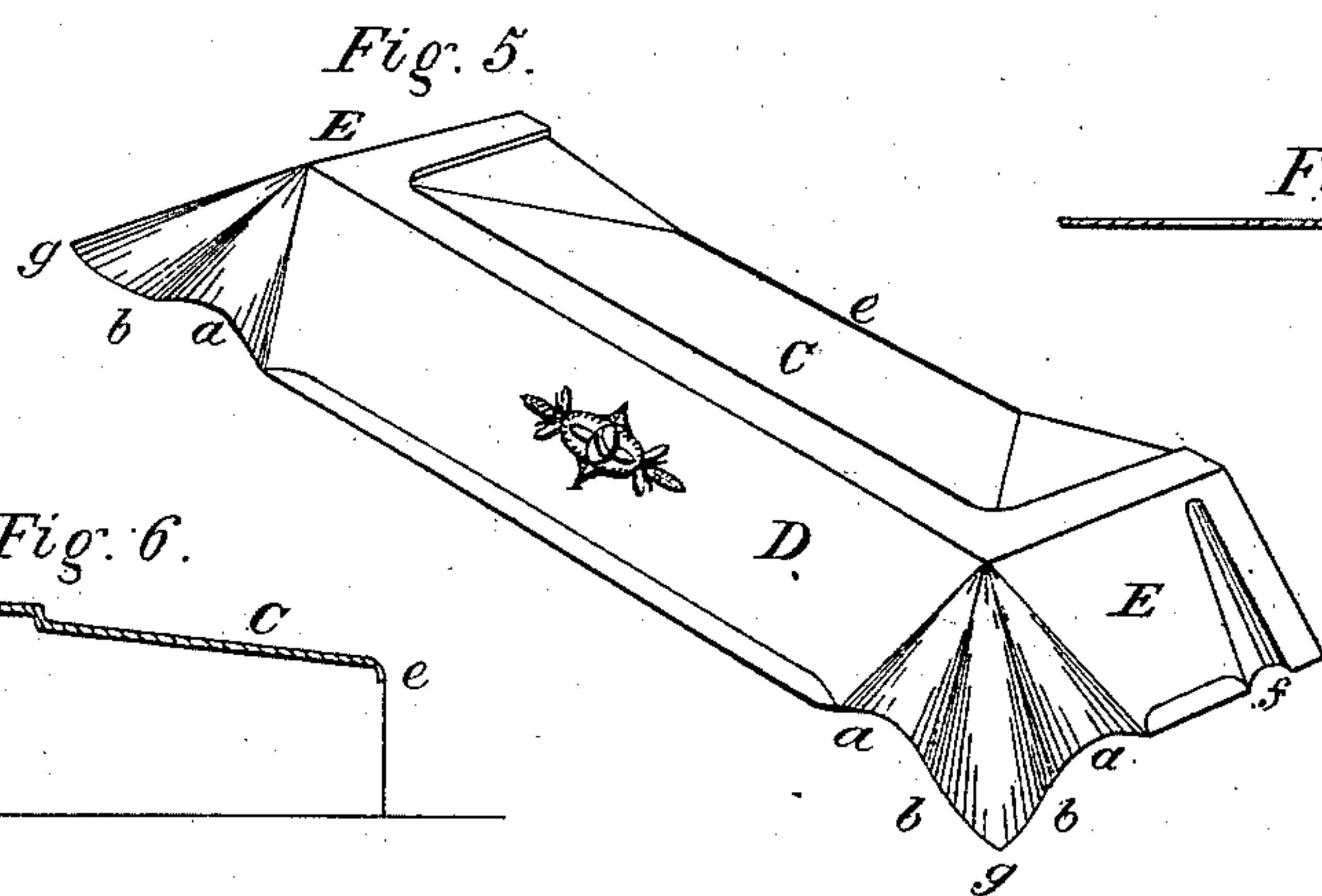
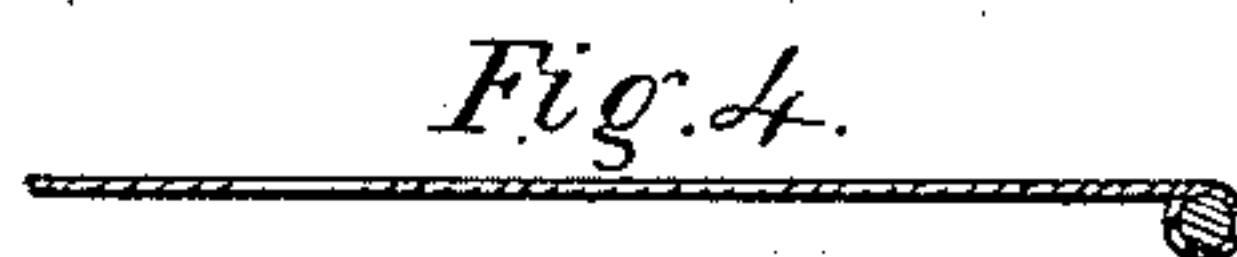
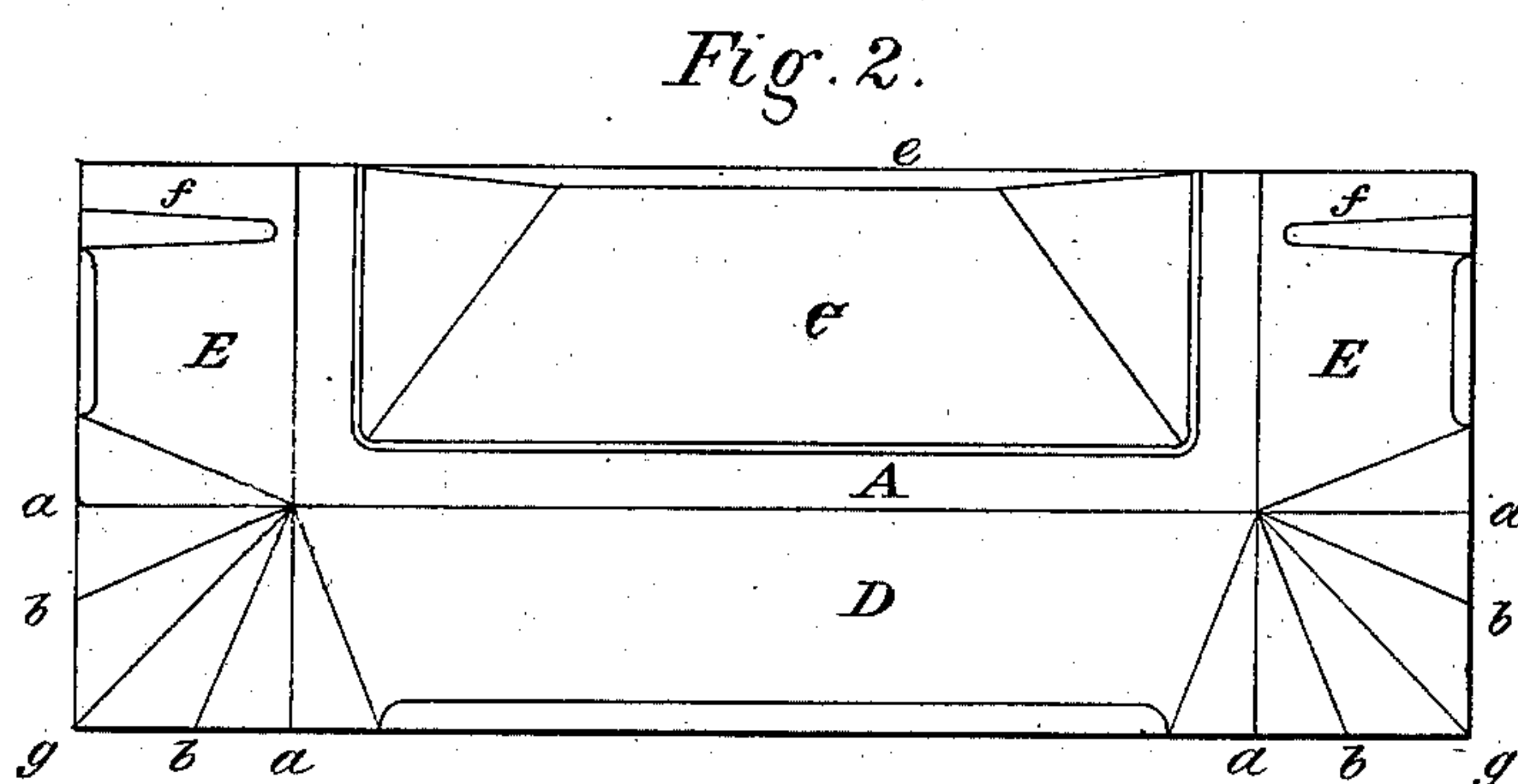
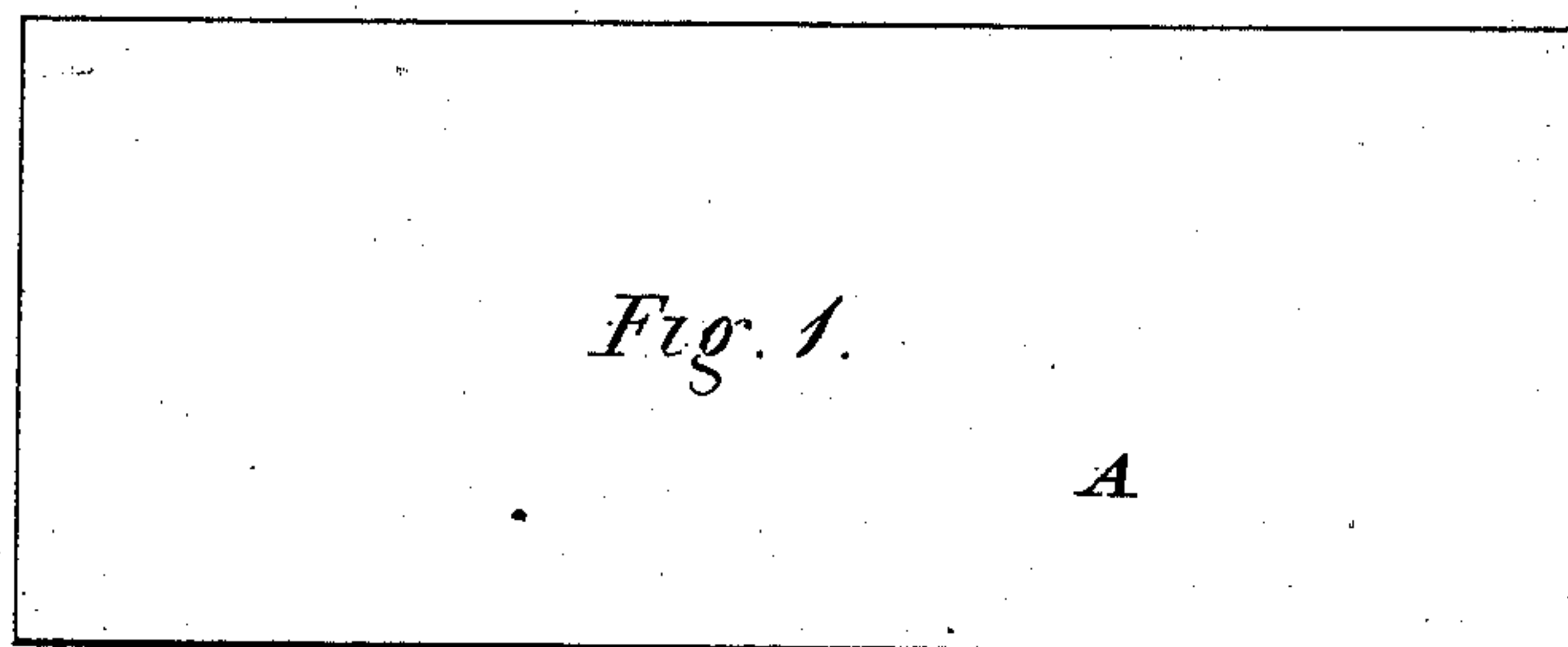
(No Model.)

J. W. ELLS.

FIRE FENDER.

No. 312,620.

Patented Feb. 24, 1885.



Witnesses.

Jonathan Ord.

B. C. Barreille.

Inventor.

Josiah W. Ells.

UNITED STATES PATENT OFFICE.

JOSIAH W. ELLS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO JAMES W. FRIEND, OF SAME PLACE.

FIRE-FENDER.

SPECIFICATION forming part of Letters Patent No. 312,620, dated February 24, 1885.

Application filed December 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH W. ELLS, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Fire-Fender, of which the following is a specification.

The nature of my invention consists of a fire-fender having all its parts comprising its front, together with its ends and pan or apron, formed in one piece and of a single piece of thin sheet metal stamped or pressed into complete and final shape, producing a neat, good, substantial, and cheap fire-fender without joints, seams, or rivets.

My invention will be readily understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 represents a rectangular and plain thin sheet of metal; Fig. 2, a similar sheet of metal of the same size and shape, having delineated thereon a diagram indicating the lines of bend; Fig. 3, a longitudinal section of a part of a sheet of metal, showing its edge turned over and folded upon itself; Fig. 4, a similar section wherein the edge is made to inclose a wire. Fig. 5 represents a perspective view of a fire-fender constructed wholly from an uncut or undivided single sheet of metal and in accordance with my invention; Fig. 6, a transverse vertical section of the middle portion of said fender.

In making fire-fenders I use a rectangular plain thin sheet of metal, A, of proper length, breadth, and thickness, and if the sheet be very thin and require extra stiffness its four edges may be turned over a short distance and folded down tightly upon itself, or such fold may be made to inclose a wire that shall extend entirely around the sheet. This rectangular sheet of metal A, either folded or not so folded around its edges, is to be placed between and subjected to the joint action of such shaped dies operated by suitable machinery as will depress that portion of the sheet intended for the pan or apron *c* a short distance below the general surface and with a slight downward inclination toward its edge *e*, which edge is turned down on a curved line to bring

it below the upper surface of the pan *c*, as indicated in Fig. 6, thus giving said pan a desirable and final shape. At the same time and by the same means that part of the sheet extending outwardly around the apron *c*, and a little distance therefrom, is bent down to form the front D and ends E E of the fender. The intervening metal existing between the ends and front, that would otherwise be a surplusage and greatly interfere with the easy bending of the sheet, is in this case taken advantage of and made of practical utility by corrugating into wrinkles that portion of the sheet, so as to form two elevations, *a a*, and two deep depressions or re-entering curves, *b b*, having between them a projecting point that constitutes the foot *g* of the fender. These several elevations and depressions are wide at the bottom and taper upward to the top, each terminating in its respective upper corner or angle of the fender, as shown more particularly in Fig. 5. Each end E of the fender is also fluted, or given a single corrugation, *f*, from top to bottom, to strengthen and stiffen it at that part.

A short distance above the lower straight edges of the fender the plain sheet existing between the several curves or elevations is bent down vertically, which not only improves the appearance of the fender, but gives increased rigidity thereto; and any ornamental design may be stamped in or along the front of the fender at the same time or after its general form is produced.

This construction of fenders enables me to make a nice complete article from a rectangular piece of sheet metal without extra cutting or particle of waste and with no preparatory shaping.

The form of the fender is such as to admit of its being made by suitable dies either by a process of stamping or pressing, and so that the entire structure may be given its complete and final shape at a single blow or operation, its configuration being such as to obviate undue straining or weakening of the sheet in the formation. The folding or doubling the edges of the sheet upon itself, or so as to inclose a wire preparatory to forming the fender, is of great advantage, especially where thin sheets

are used, as thereby the fold will extend into and all around those parts that could not otherwise be reached by reason of their shape.

This fender, although light, is remarkably strong, and, being formed of a single piece of sheet metal without cuts and destitute of seams, joints, or rivets, presents a clean, smooth surface on which the dirt can find no lodgment.

10 Having thus briefly described my invention, I claim—

1. As a new article of manufacture, a fire-fender having all its constituent parts comprising its front, together with its ends and
15 pan or apron, formed in one piece and of a single piece of thin sheet metal stamped or pressed into complete and final shape, substantially as shown and set forth.

2. A fire-fender having all its constituent
20 parts comprising its front, together with its ends and pan or apron, formed in one piece and of a single piece of thin sheet metal cor-

rugated or wrinkled at its corners, substantially as shown and set forth.

3. A fire-fender having all its constituent
25 parts comprising its front, together with its ends and pan or apron, formed in one piece and of a single sheet of metal, having the edge of the pan or apron turned downwardly a short distance, substantially as and for the
30 purposes set forth.

4. A fire-fender having all its constituent parts comprising its front, together with its ends and pan or apron, formed in one piece
35 and of a single sheet of metal turned over and folded around its edges before and preparatory to being given its complete and final shape, as hereinbefore shown and set forth.

In testimony whereof I have hereunto set my hand this 22d day of December, A. D. 1883.

JOSIAH W. ELLS.

Witnesses:

W. BAKEWELL,

B. C. BAKEWELL.