

No. 622,966.

Patented Apr. 11, 1899.

A. MORRISON.
ROLLING FLANGED PLATES.

(Application filed Nov. 1, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

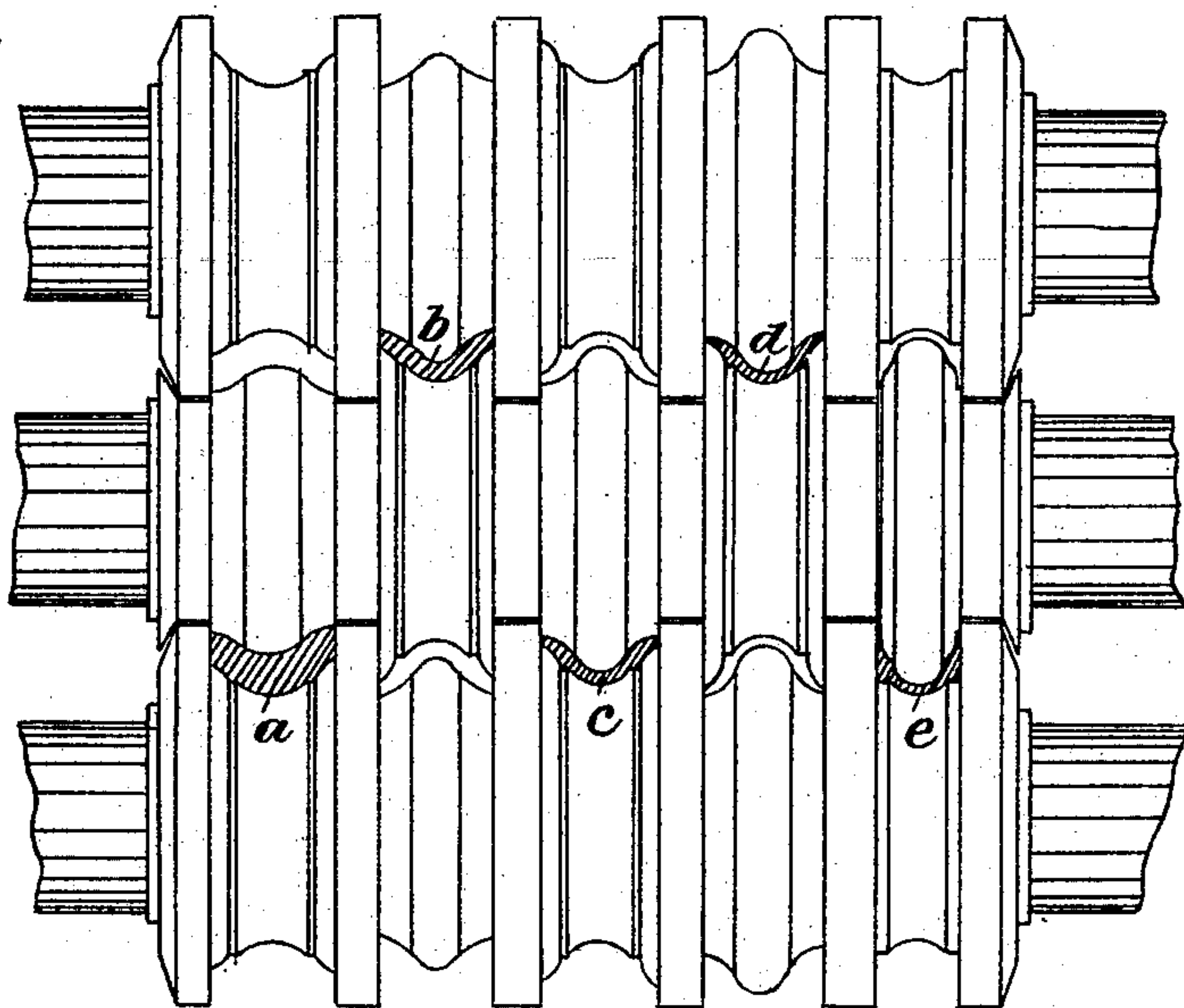
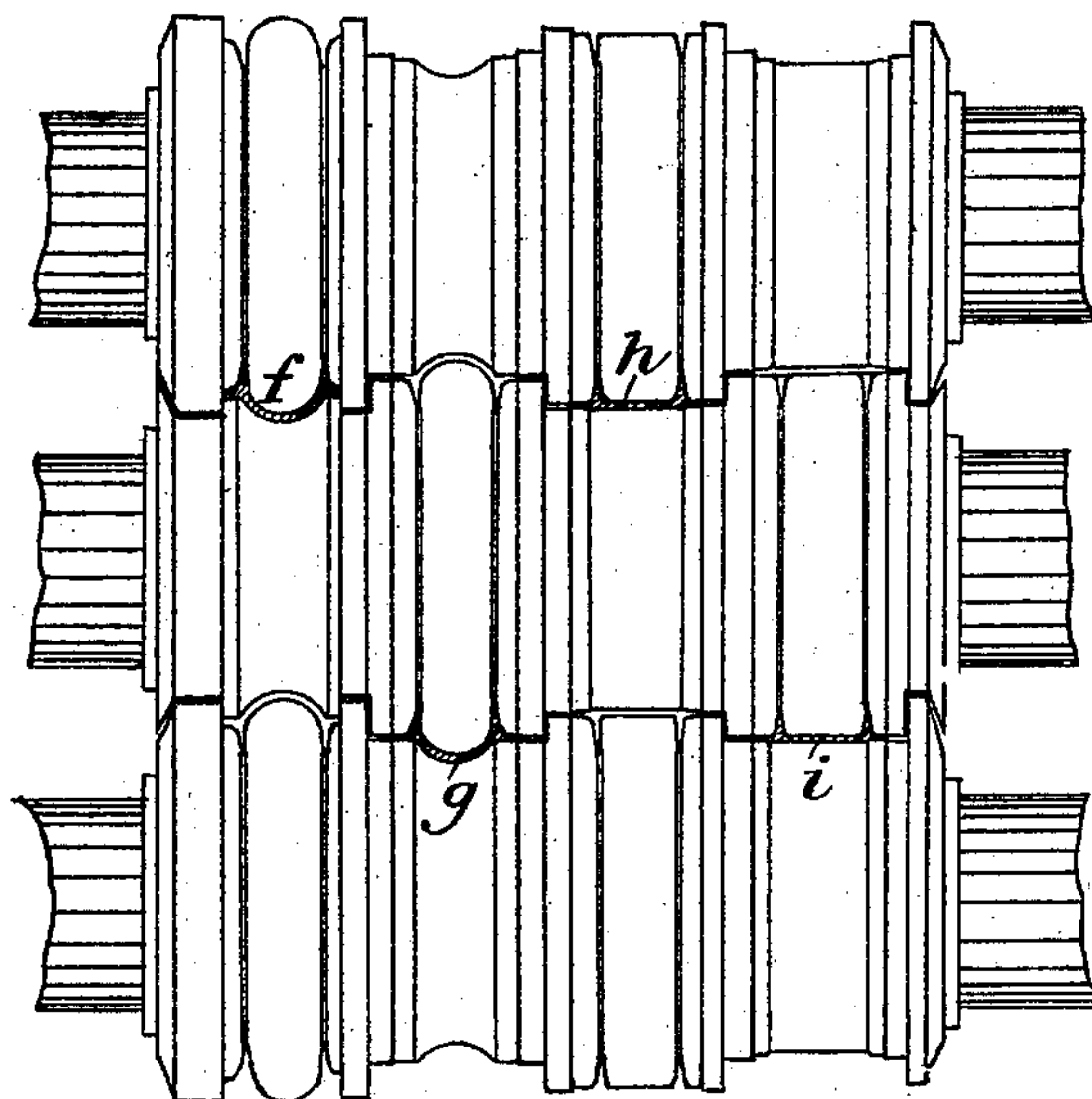


Fig. 2.



WITNESSES

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2 Sheets—Sheet 2.

Fig. 3.

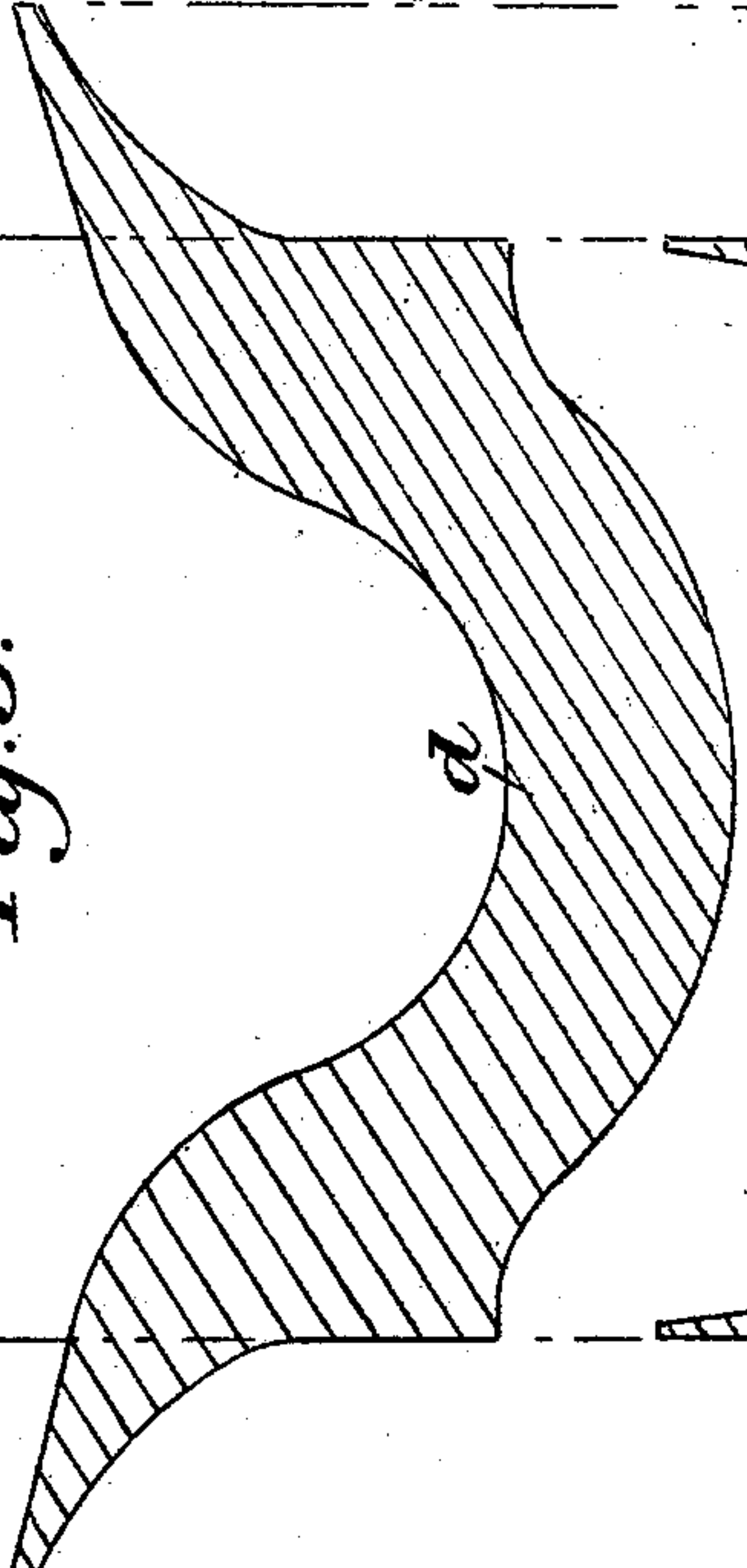


Fig. 4.

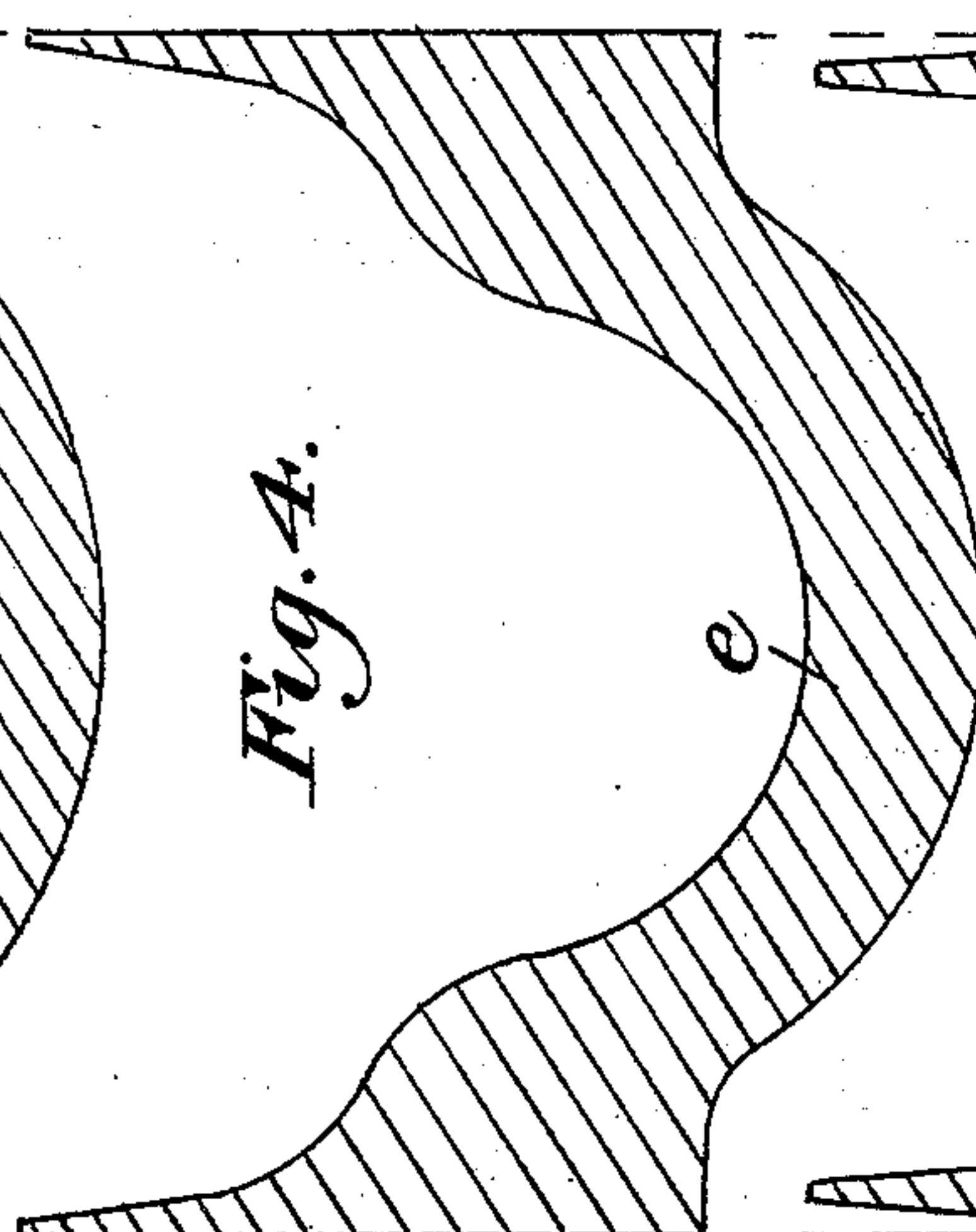


Fig. 5.

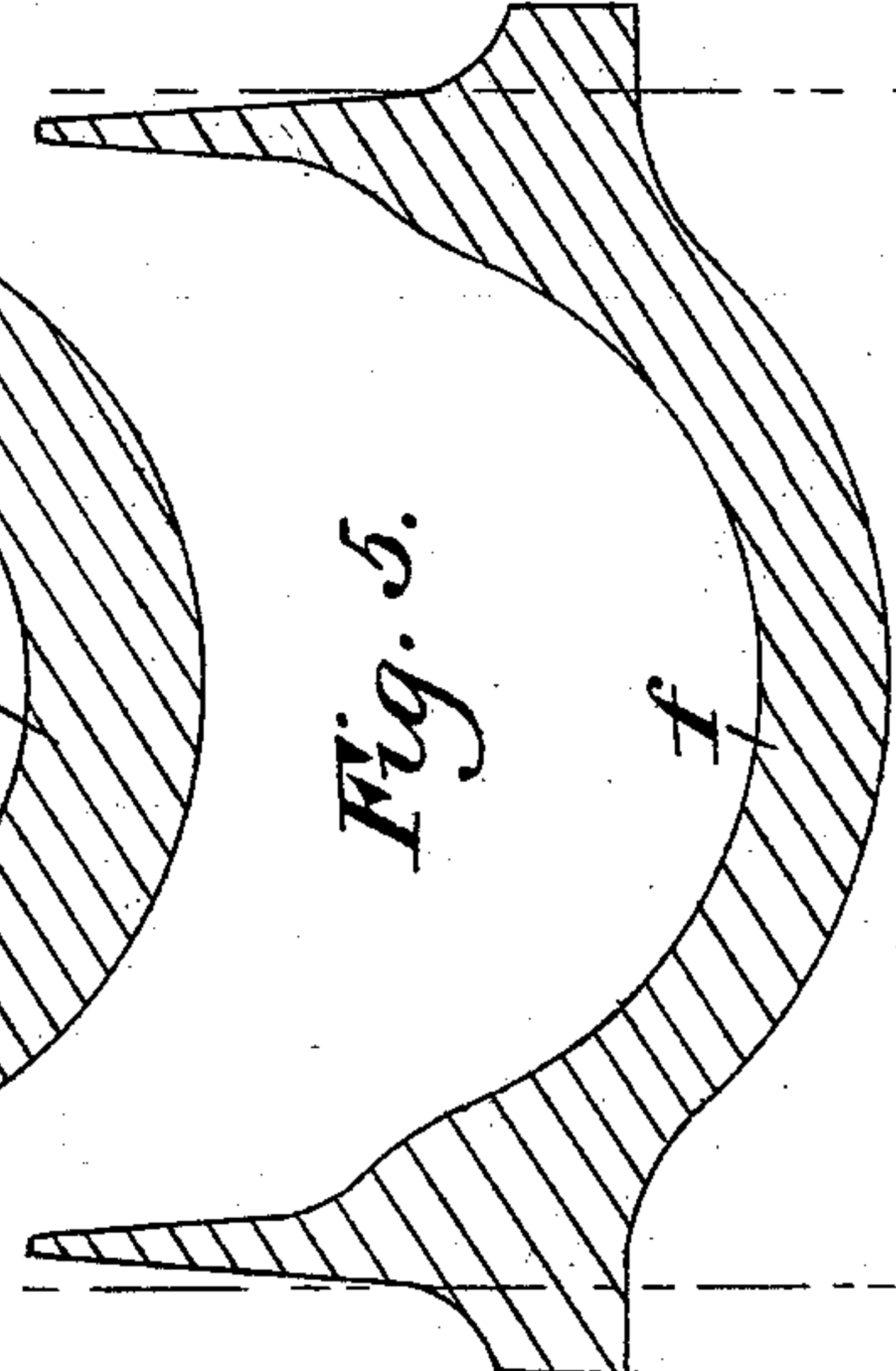


Fig. 6.

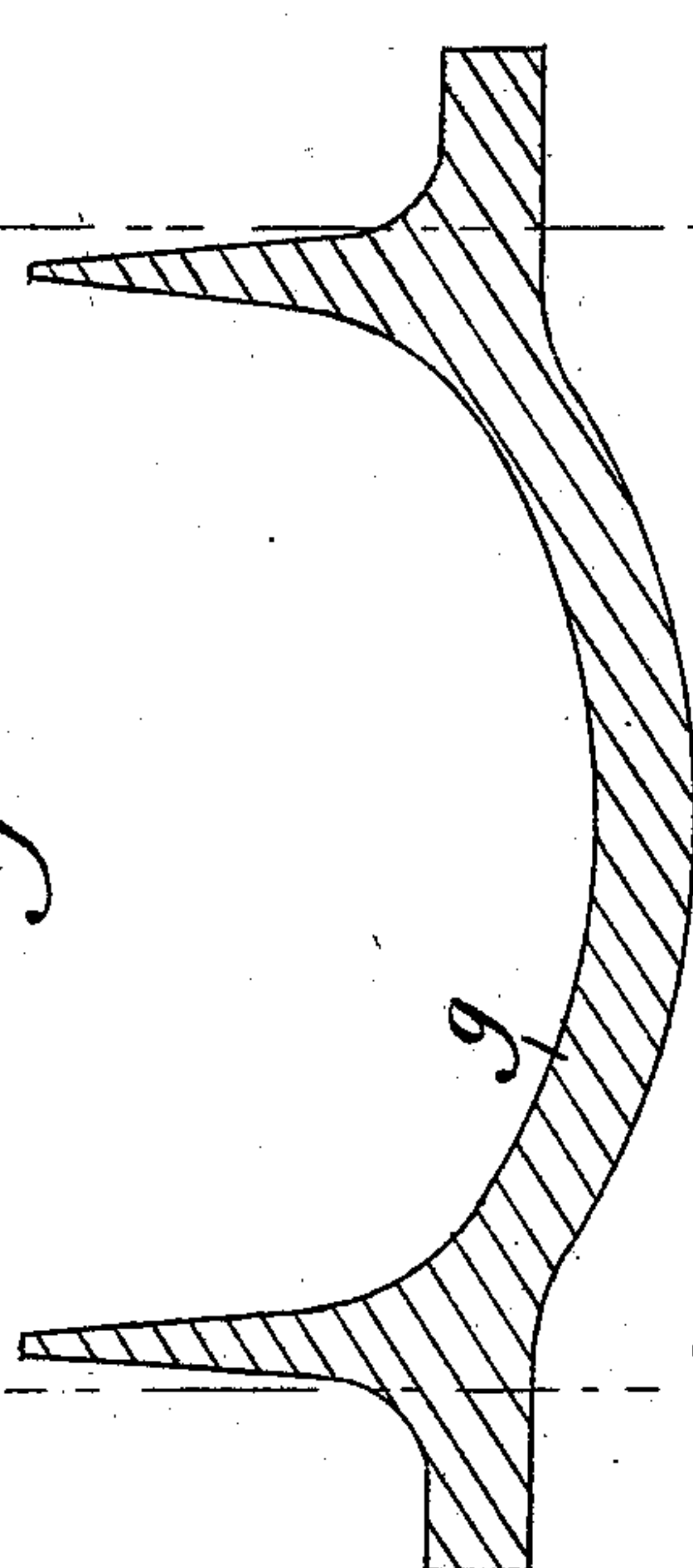


Fig. 7.

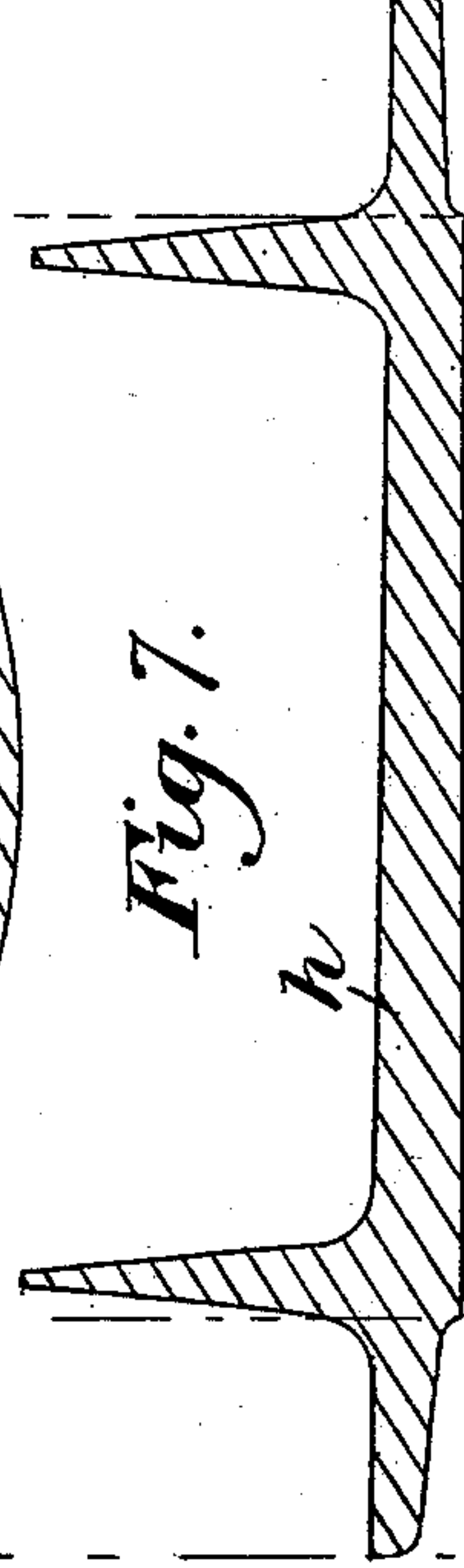
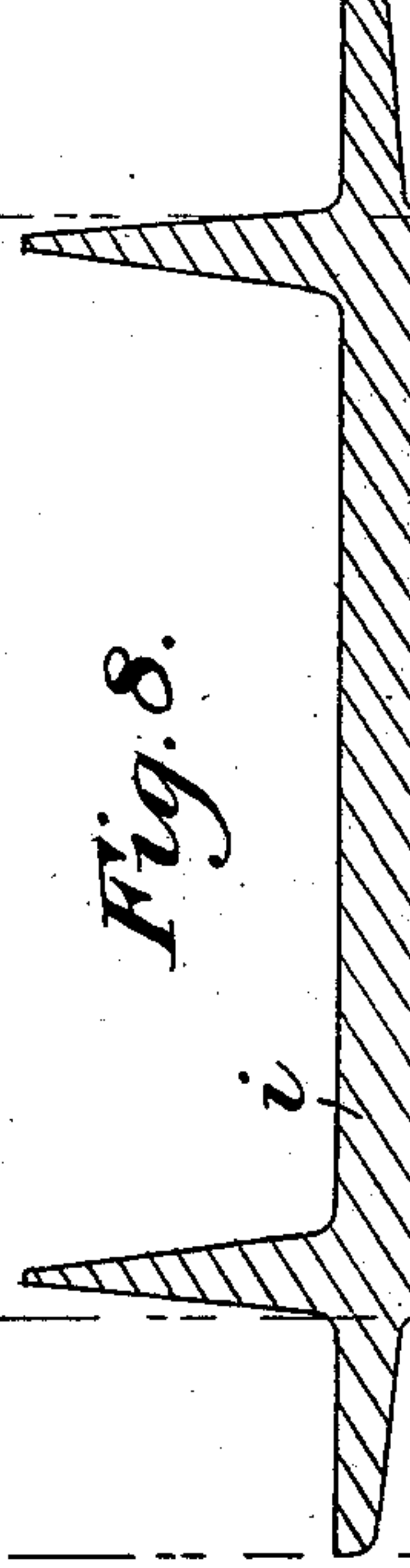


Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

ANDREW MORRISON, OF PITTSBURG, PENNSYLVANIA.

ROLLING FLANGED PLATES.

SPECIFICATION forming part of Letters Patent No. 622,966, dated April 11, 1899.

Application filed November 1, 1898. Serial No. 695,146. (No model.)

To all whom it may concern:

Be it known that I, ANDREW MORRISON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolling Flanged Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are front elevations showing roughing and finishing rolls, respectively, provided with passes formed in accordance with my invention; and Figs. 3 to 8, inclusive, are enlarged views showing in succession the intermediate and final passes.

My invention relates to the rolling of plates or bars which are provided with a flange or flanges extending longitudinally of the plate or bar and set in from its side edges; and it is designed to provide an improved system of passes for rolling such material and a new process of shaping the plates.

In the drawings, *a*, *b*, and *c* represent the first three passes. These passes give an irregular cross-section, preferably a trough shape, so that the cross-sectional length of the bar or plate is greater than a straight line connecting its opposite edges. The plate is formed and thinned down in the second pass with thick projecting flanges at each side extending at an angle to the body, and these projecting flanges are further thinned down in their outer portions and bent to a greater angle with the body in pass *d*. (Shown in Fig. 3.) In the next pass *e* the projecting flanges are brought into substantially right-angled position, thus considerably reducing the width of the plate and forming flanges with a large amount of metal at the inside of their bases, the body of the plate being bowed or curved or of any other irregular form to give it a cross-sectional length greater than the shortest distance between its side edges. In the following pass *f* the metal upon the inside of the flanges is forced downwardly and outwardly, so as to form projections upon the side edges and beyond the flanges, the plate being preferably flattened somewhat at the same time. In pass *g* these operations are repeated and carried out to a greater extent, thus reducing the thickness of the flanges at

their base and lengthening the projecting side portions, the body being still further flattened. In the eighth pass *h* the body of the plate is flattened into a horizontal plane, the metal flowing laterally and lengthening the overhanging projecting side portions beyond the flanges. In the final pass *i* the body of the plate is thinned slightly, the projecting portions being preferably made thinner than the body, and the plate or bar is formed into its final shape suitable for cutting up into tie-plates. It will be noticed that after the flanges are formed and brought to the desired angle with the plate-body the position of these flanges is not substantially changed, their points being moved in slightly in pass *f*. The flanges are therefore not moved outwardly during the forming of the projecting or overhanging side portions; but these portions are formed by the flattening of the plate and by forcing outwardly the heavy surplus metal at the inside of the flanges. The flanges may, if desirable, be moved inwardly during the widening of the plate, and these flanges may be originally formed inside the side edges of the plate, if desired.

The advantages of my invention will be apparent to those skilled in the art, since a simple, cheap, and effective method of rolling flanged plates is provided and the inset flanges and projecting side portions made of almost any desired length.

By the words "of greater cross-sectional length than a straight line connecting its opposite edges" I mean that the distance from edge to edge of the plate measured along its cross-sectional contour is greater than a straight line drawn between these points.

I have shown my invention as applied to the rolling of tie-plates; but it may be employed upon other flanged shapes, and many variations may be made in the form and arrangement of the passes without departing from my invention, since

I claim—

1. In the manufacture of flanged plates, rolls having passes arranged to form a bar of irregular cross-section with a side flange, said bar being of greater cross-sectional length than a straight line connecting its opposite edges, and passes arranged to flatten the bar

and increase its width while preventing the moving out of the flange; substantially as described.

2. In the manufacture of flanged plates, rolls having passes arranged to form a flanged blank, with surplus metal inside the flange, and passes for forcing this surplus metal outwardly into a side extension while preventing the moving out of the flange; substantially as described.

3. In the manufacture of flanged plates, rolls having passes arranged to form a flanged bar of bent or bowed cross-sectional form, and passes arranged to flatten the bar and increase its width, while preventing the moving out of the flanges; substantially as described.

4. In the manufacture of flanged plates, rolls having passes arranged to form a bar having side flanges, the body of the bar being bent or bowed in the opposite direction to that of the flanges, and passes arranged to flatten the bar and increase its width, while preventing the moving out of the flanges; substantially as described.

5. In the manufacture of flanged plates, rolls having passes arranged to form a bar of irregular-shaped cross-section with lateral flanged side portions, passes arranged to bend

up the flanges and decrease the width of the plate, and passes arranged to flatten the plate and increase its width, while preventing the moving out of the flanges; substantially as described.

6. The method of rolling flanged plates, consisting in forming a flanged bar of greater cross-sectional length than a straight line connecting the outer edges, and then flattening the bar and increasing its width, while preventing the moving out of the flanges; substantially as described.

7. The method of forming flanged plates, consisting in forming a flanged bar of greater cross-sectional length than a straight line connecting the opposite edges and with surplus metal inside the flanges, flattening the bar and forcing the surplus metal outwardly so as to increase the width of the plate, and preventing the moving out of the flanges; substantially as described.

In testimony whereof I have hereunto set my hand.

ANDREW MORRISON.

Witnesses:

M. S. MURPHY,
H. M. CORWIN.