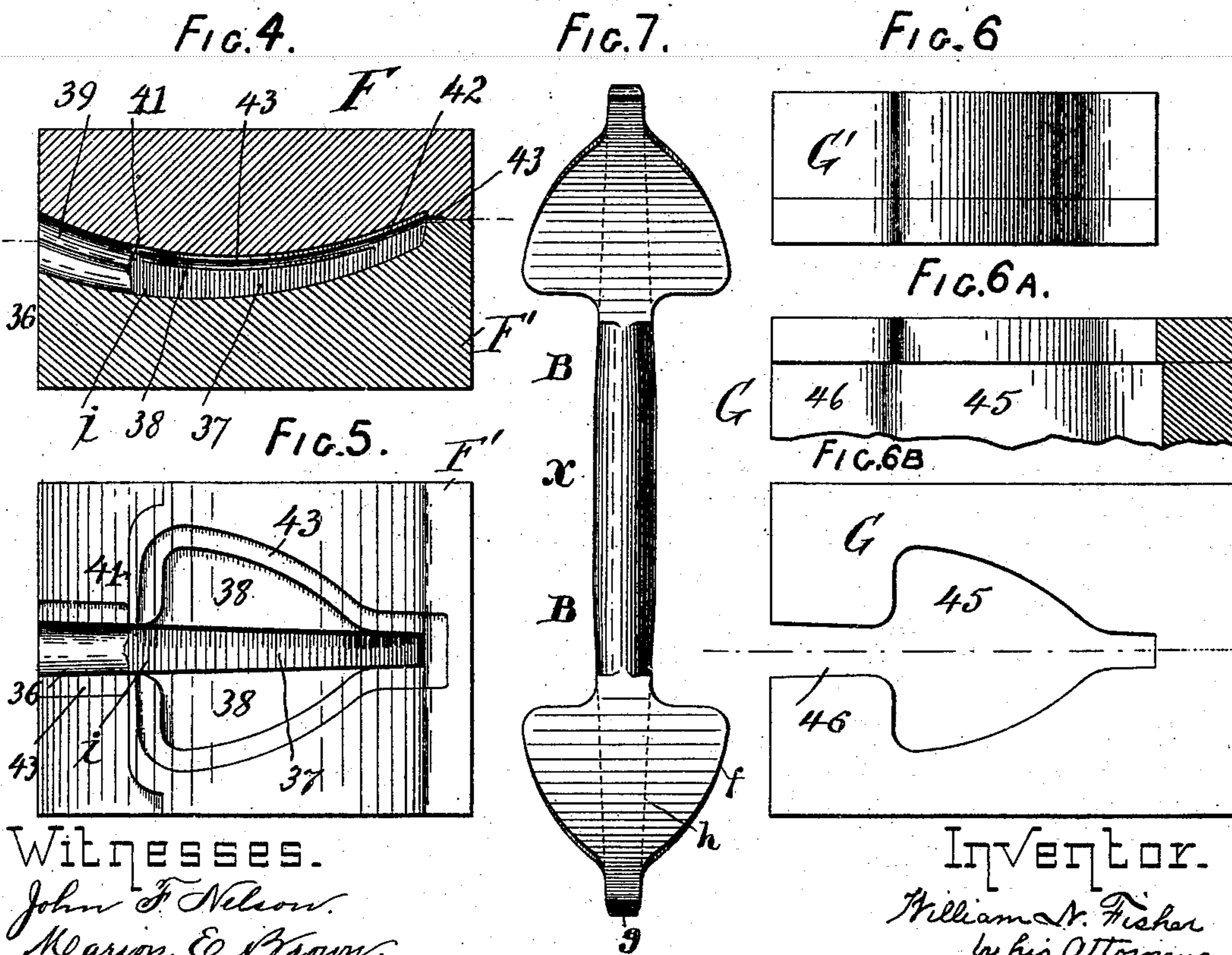
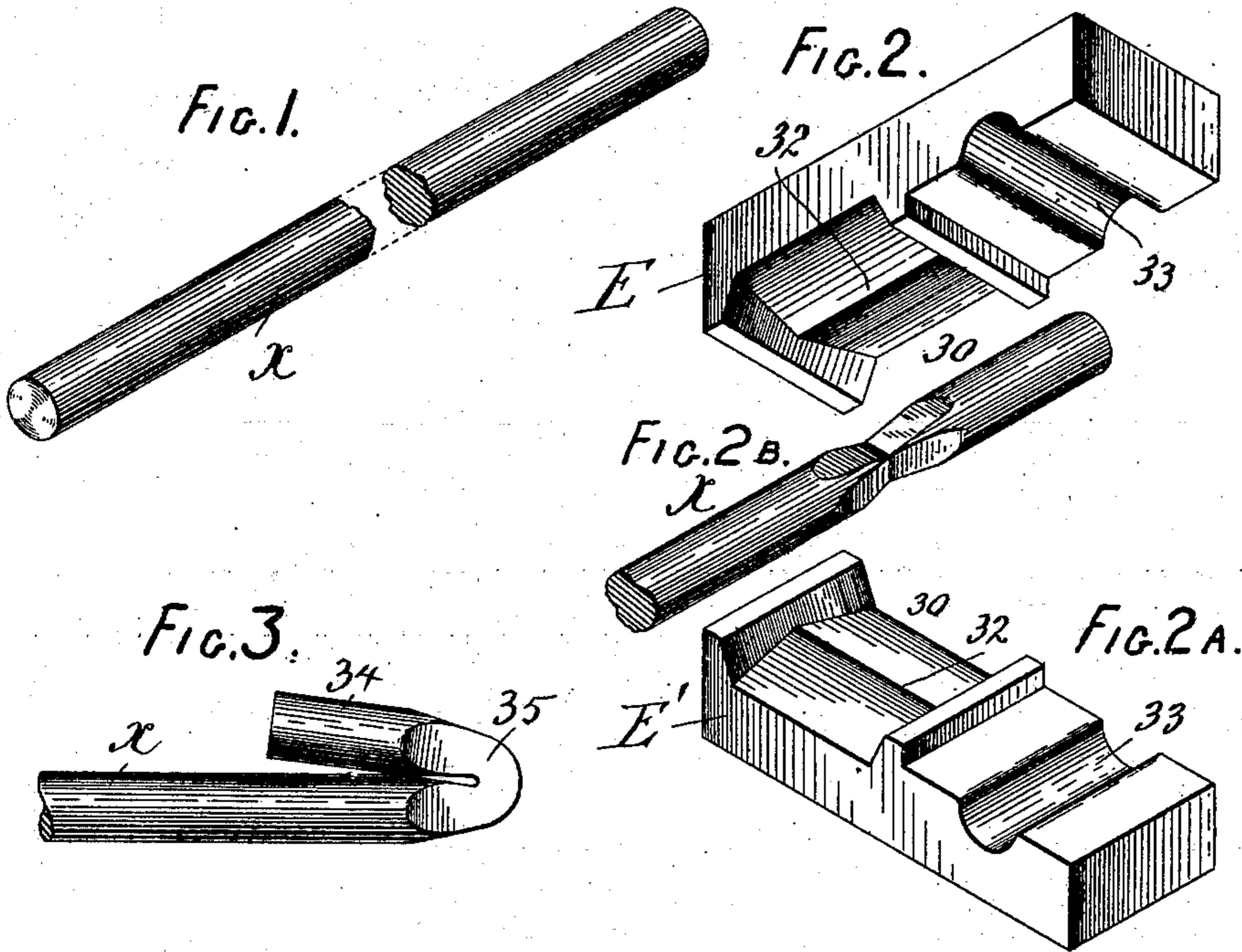


W. N. FISHER.
METHOD OF MAKING ANCHORS.

No. 503,591.

Patented Aug. 22, 1893.



Witnesses.
John F. Nelson.
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Inventor.
William N. Fisher
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FIG. 8.

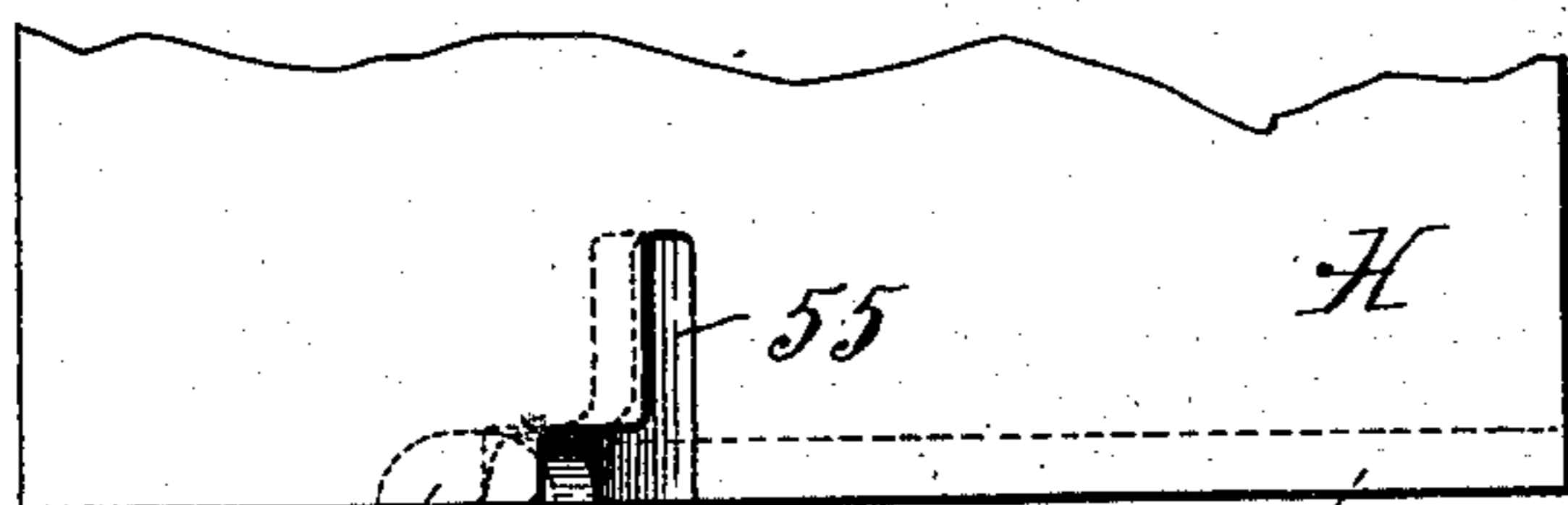


FIG. 8A.

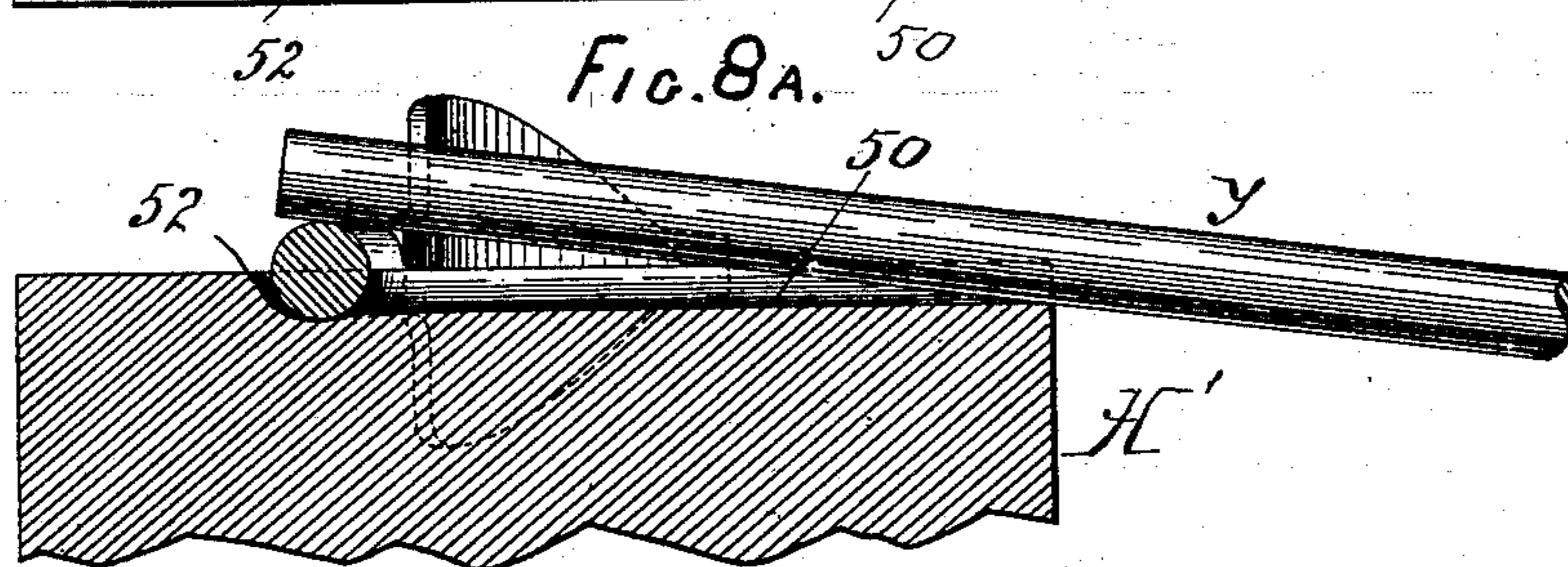


FIG. 9

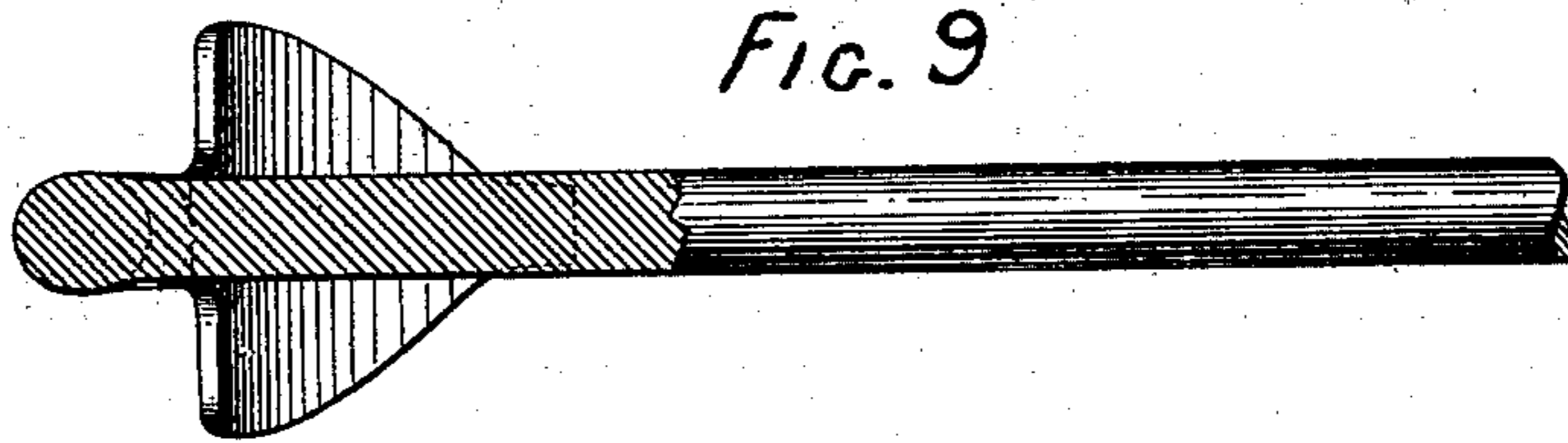
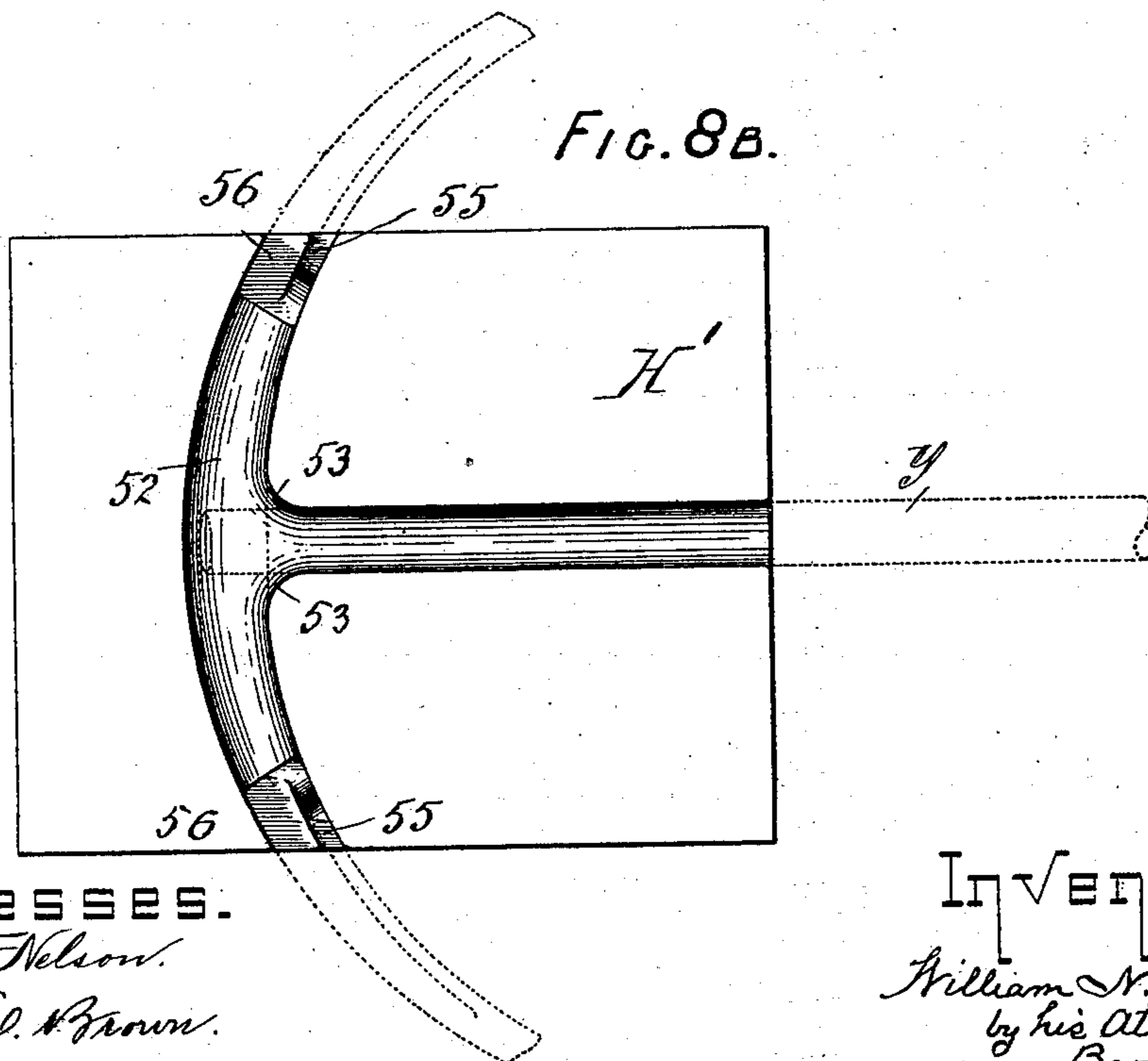


FIG. 8B.



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UNITED STATES PATENT OFFICE.

WILLIAM N. FISHER, OF GLOUCESTER, MASSACHUSETTS.

METHOD OF MAKING ANCHORS.

SPECIFICATION forming part of Letters Patent No. 503,591, dated August 22, 1893.

Application filed February 5, 1892. Serial No. 420,453. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM N. FISHER, a citizen of the United States of America, and a resident of the town of Gloucester, in the county of Essex and State of Massachusetts, have invented a certain new and useful Improved Method of Making Anchors, of which the following is a full, clear, and exact description.

This invention relates to improvements in the method or process of making anchors, more particularly, iron stock anchors and all as hereinafter described and pointed out in the claims.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a perspective view of a section of bar iron from which it is assumed that the anchor arms, having the usual members will be formed. Figs. 2 and 2^A represent in perspective two part forging dies for reducing the end portions of the bar Fig. 1, preparatory to overturning the extremities, and Fig. 2^B the bar of Fig. 1 reduced by the working thereon of the two-part dies, Figs. 2 and 2^A, and Fig. 3 is the bar having its end portion reduced and the extremity overturned. Fig. 4 is a central vertical sectional view longitudinally through a set of dies designed for the forging, from the overturned bar extremity, of the fluke or palm, and its point or bill. Fig. 5 is a plan view of one of the last mentioned die members. Figs. 6 and 6^A represent in side elevation and vertical section the male and female punch-dies for shearing off the web or fin which may remain at the edges of the flukes on coming from the last mentioned set of dies. Fig. 6^B is a plan view of the female die of the last mentioned set of dies. Fig. 7 is a plan view of the anchor-arm and the flukes, &c., formed thereon, all from the bar, Fig. 1, by means of the dies referred to. Figs. 8 and 8^A illustrate a set of dies for effecting the union of the shank with the fluke-arms and for forging or swaging the welded metal for imparting the desired shape at the throat of the anchor, one of the die members being shown in side view and the other in vertical section. Fig. 8^B is a plan view of the

under die of the last mentioned set of dies. Fig. 9 is a view in section longitudinally through the lower portion of the shank or in other words at the junction of the shank with the fluke-arms.

The shank of the anchor is welded to the metal bar *x* Fig. 1, from which is made the fluke-arms B and their blades *h*, flukes or palms *f* and points or bills *g* all by forging from it, in manner and by a die E, E', and a die F, F', to be presently described, and an anchor having fluke-arms B, blades *h*, flukes or palms *f* and points or bills *g*, all of one bar or piece of metal by so forging the same into shape between dies, constitutes the subject of separate application, Serial No. 420,452, for Letters Patent of the United States.

The die E, E' consists of two similar members, upper and lower and each member at one end-portion has working faces along its length and across its width so as to meet at an obtuse angle making an edge 32, and all so as to have a recess 30 of similar shape in each member. This die E, E' is for forming the bar *x*, preparatory to its being forged with the flukes and other parts before referred to and it is used and works in and reduces said bar as is now to be explained. Said die members also have the transverse depressions, 33. The end of the iron or steel bar, *x*, which of course is understood as in a suitable condition to be forged, is placed between the die recesses, 30, 30, having its thickness reduced by the die as indicated in Fig. 2^B on two or more diameters, by turning the bar as the dies are separated. This renders easy the overturning of the extremity, 34, as indicated in Fig. 3, leaving then, within the extreme end of the bar, approximately a double cross sectional bulk with the comparatively attenuated portion, 35, and all as is suitable and requisite for the production of the blade and palm or fluke and point. The end-portions of the dies having the depressions, 33, may be employed to facilitate in the overturning of the extreme portion, 34, of the bar, acting first to clamp or confine the part, 34, while the main portion of the bar is turned angularly thereto, and then to force the turned ex-

tremity closely against the main bar portion. The bar having each of its end-portions overturned,—as indicated in Fig. 3,—is then subjected to the action of the forging dies, F, F',—which are indicated in Figs. 4 and 5, for the formation of the required members at the extremities of the anchor-arms. The meeting faces of the two dies are curved corresponding to the general curvilinear course of the blade, and fluke or palm and the lower die-member has within its concave face a depression, *i*, extending longitudinally from one end of the block nearly to the other the said depression as seen at the left at 36, and as terminating at the end of the block, being substantially semi-circular in cross section, while the inner portion, 37, is of squared cross sectional conformation gradually tapering in depth and slightly in width to correspond to the form of the blade and in part to the point of the anchor arm. The lower die block, F', also has within its upper curved face the shallow depressions, 38, of semi-heart shape the inner areas of which merge into the depression, 37. The upper die-member, F, has the depression in its under curved face, which as indicated at 39, at the left of Fig. 4, is of a semi-circular cross section, the same terminating at the end of the block, extended inwardly therefrom over and for a distance corresponding to that of the length of the depression, 36. This depression widens at each side as at 40, having the heart conformation to overlie and comprise as to width the distance corresponding to the opposite borders of the depressions, 38, and terminating in the contracted portion, 42. It will be noticed that the curved meeting or matching faces of the die blocks, F and F', are each of a step form the lower die having the rise at 41, where the depression, *i*, changes in its cross sectional contour from rounded to angular, the lower face of the upper block being of matching form, and therefore of the forging die depressions in the set of dies for the fluke, the greatest is in the lower block. The die-depressions of both die-blocks are surrounded by the slight depressions, 43, for the escape of a surplusage of stock, so that of course the meeting faces of the dies may come together and leave the fluke, blade and point perfectly formed, with however the surrounding fin. The anchor arm extremity thus formed is subjected to the action of the shear dies indicated in Figs. 6, 6^A and 6^B for the removal of the fin. Of said dies G, is the female and fixed member, G', being the reciprocating member. The lower die, G, has the aperture, 45, vertically through it the plan of which is indicated in Fig. 6^B and corresponds to the plan of the anchor-arm extremity, there being the recess, 46, for the free accommodation of the portion of the arm next to the fluke. The male member, G', closely corresponds to the recesses, 45 and 46. The bar, *x*, on which the flukes, blades, and points have been forged as homo-

geneous members, (the flukes and blades having the curvature longitudinally) is then curved between the flukes into the usual form for the arms. The bar *y*, making the shank of the anchor and formed as hereinafter explained with the holes, for the stock and ring of the anchor is swaged, forged or welded to the arc-formed and fluke-provided arm before explained by forging dies, indicated in Figs. 8, 8^A and 8^B. The set of dies, H and H', are practically alike each having the longitudinal die depression, 50, extended from one end of the block, and the transverse curved die depression, 52, the said depressions being widened at their junction as at 53, corresponding to the throat of the anchor, the depression, 52, opposite the throat also having the increased width corresponding to the crown of the anchor. The width of these die blocks is shown as somewhat less than the distance between the points of the arms but sufficient however to have near the sides thereof the suitably separated depressions, 55, 56, for the reception of the portions of the flukes or palms and of the blade. The curved arm-forming-bar having its extremities forged as hereinbefore described is laid in the depression of the lower die-block, being retained and steadied against movement transversely of its length by the engagement of portions of the flukes in the depressions, 55. The extremity of the bar, *y*, from which the shank is formed is placed across and upon the middle of the arm-forming bar, the said bar ranging in the line of the depression, 50, Fig. 8^A. The upper die-block descending and acting conjointly with the supporting die-block effects at once the welding of the shank forming bar to the arm-forming-bar, the bringing of the shank into the plane of the arms and the forging of the stock to impart the increased thickness or fullness at the crown and throat.

An anchor produced by the method herein described constitutes the subject matter of a separate application, Serial No. 420,452, for Letters Patent of the United States.

Of course in the description of the foregoing processes, it is understood that the metal is to be of suitable nature and in suitable condition to be susceptible of the various forgings and welding, set forth and all of course as manifest to persons skilled in the art to which this invention pertains.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The improved method of making an anchor which consists in providing a bar of metal suitable for forging, overturning the end portions thereof and displacing the metal laterally to form as homogeneous members the palms or flukes and forging the metal to otherwise form the blades and points, curving the bar and welding the shank thereto.

2. The improved method of making an an-

chor from a bar of metal suitable for forging
which consists in reducing the thickness of
the bar a short distance within its ends by
forging, then overturning the end portions,
5 and by forging, displacing the metal later-
ally to form the flukes as homogeneous mem-
bers of the arms substantially as described.

In testimony whereof I have hereunto set
my hand in the presence of two subscribing
witnesses.

WILLIAM N. FISHER.

Witnesses:

ALBERT W. BROWN,
MARION E. BROWN.