

No. 755,891.

PATENTED MAR. 29, 1904.

J. E. LEATHERS.
AX.

APPLICATION FILED NOV. 13, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

Fig. 1.

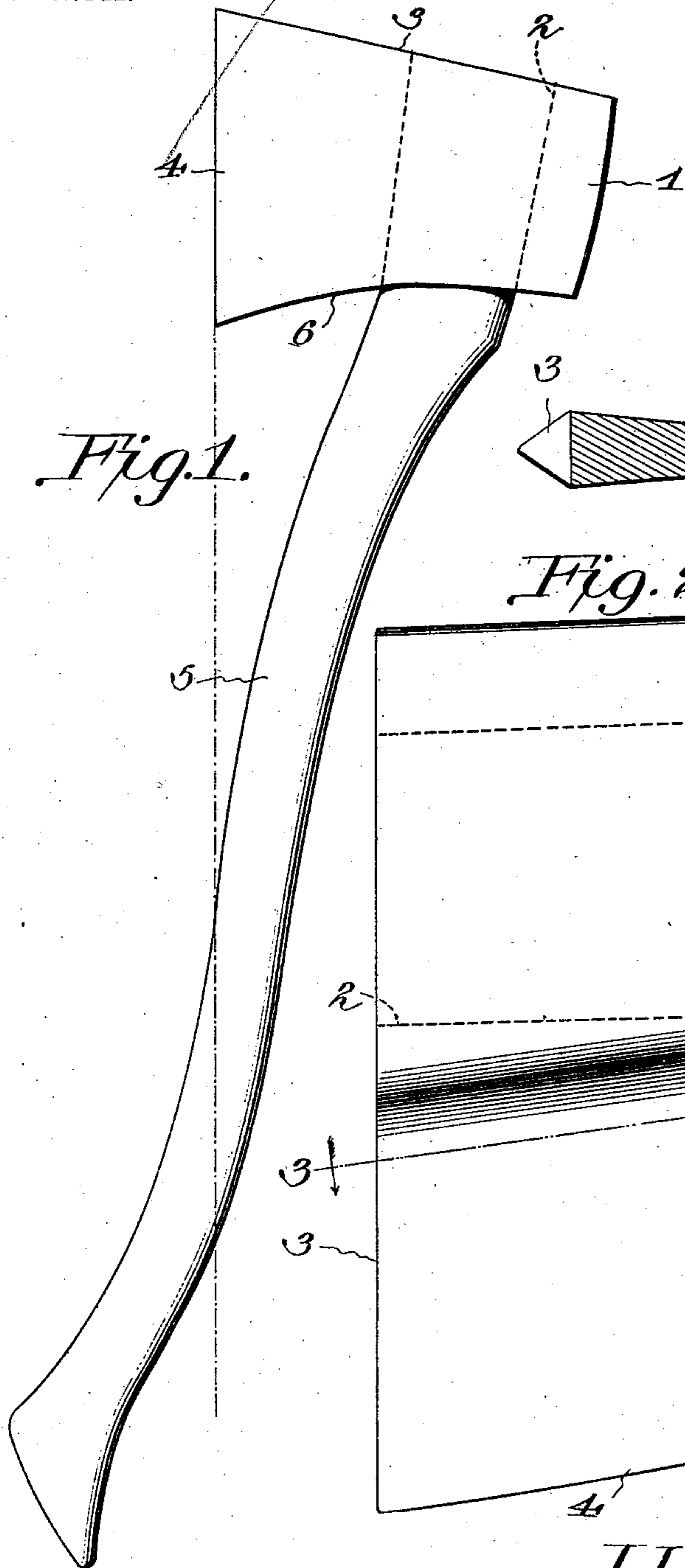


Fig. 2.

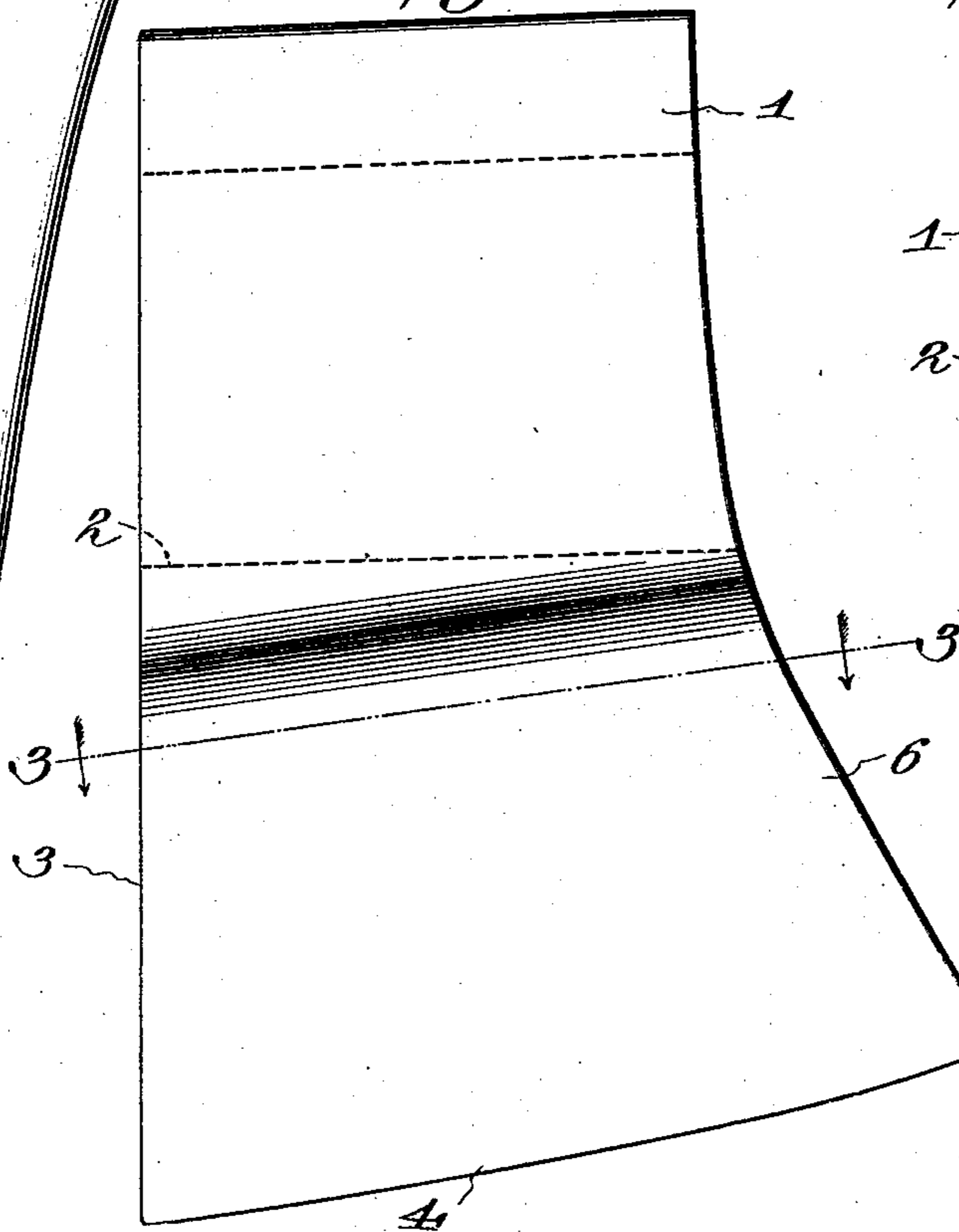


Fig. 3.

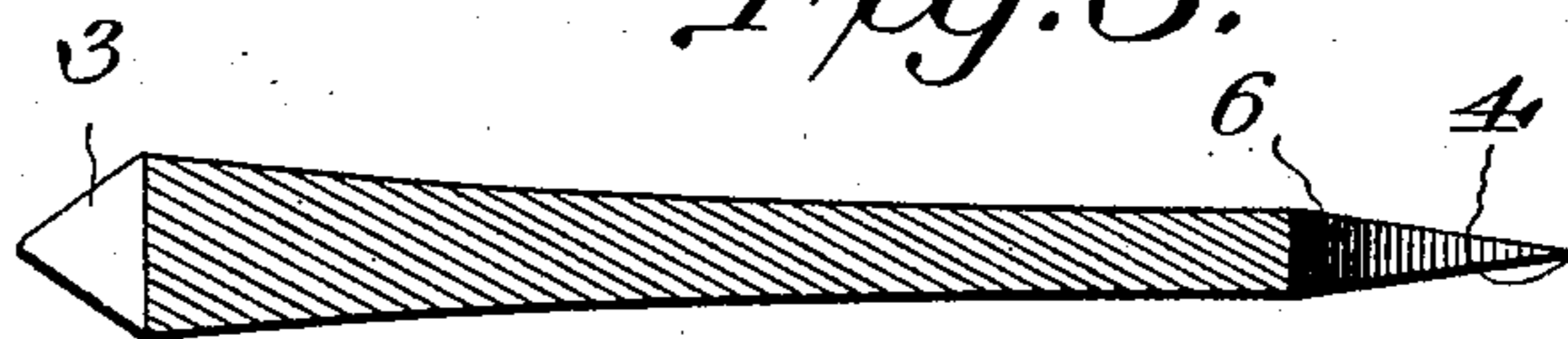
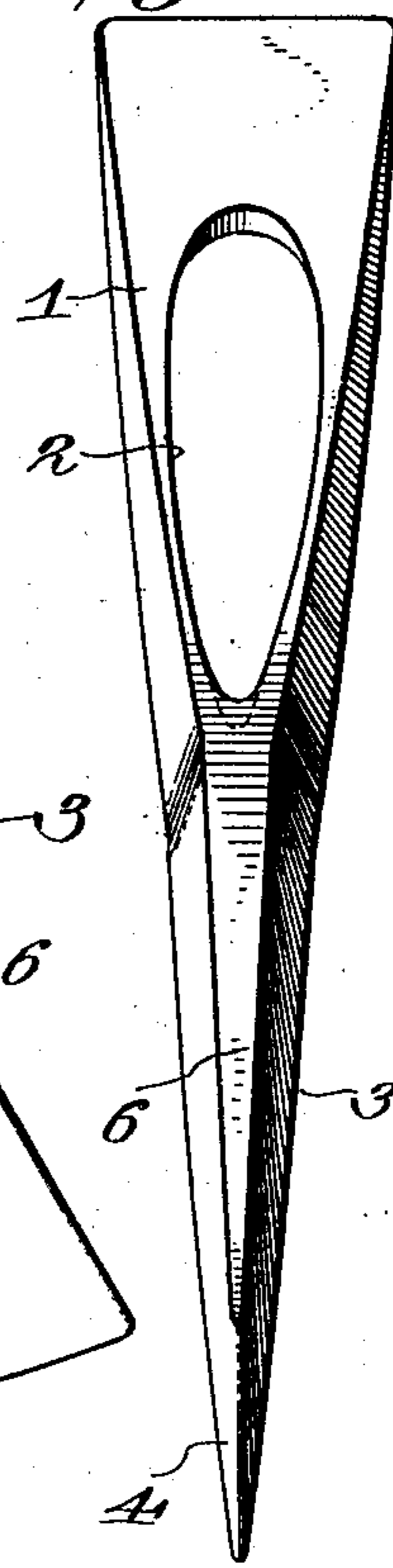


Fig. 4.



Witnesses

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4 SHEETS—SHEET 2.

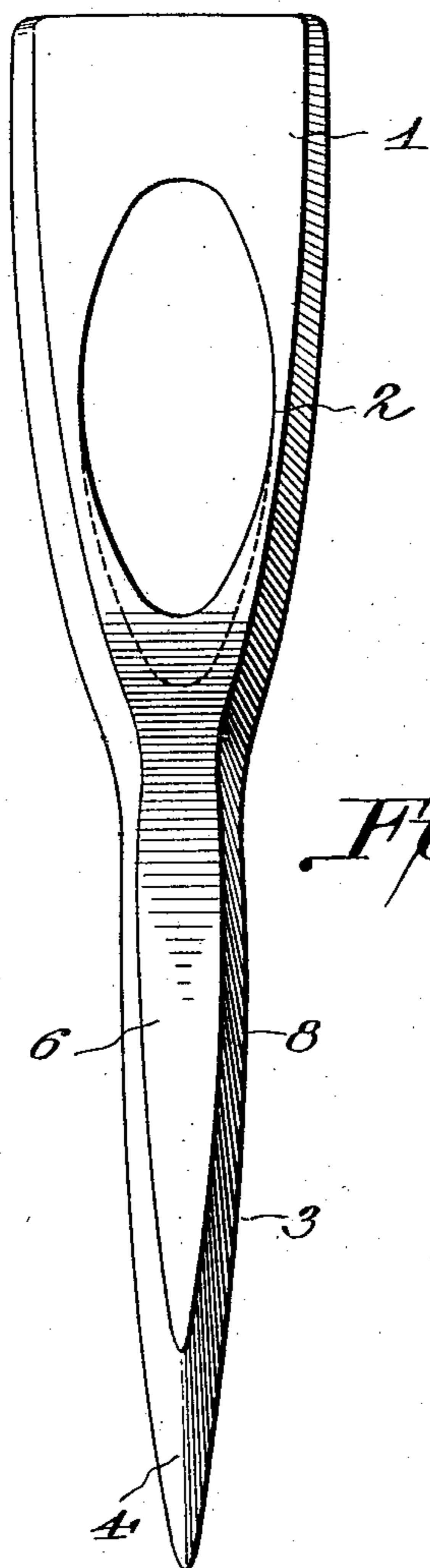


Fig. 5.

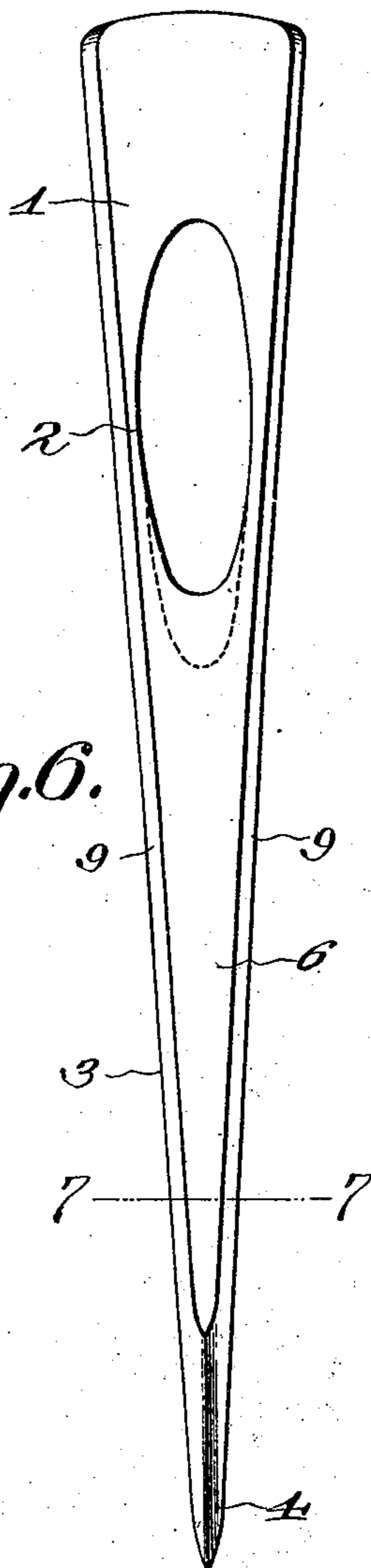


Fig. 6.

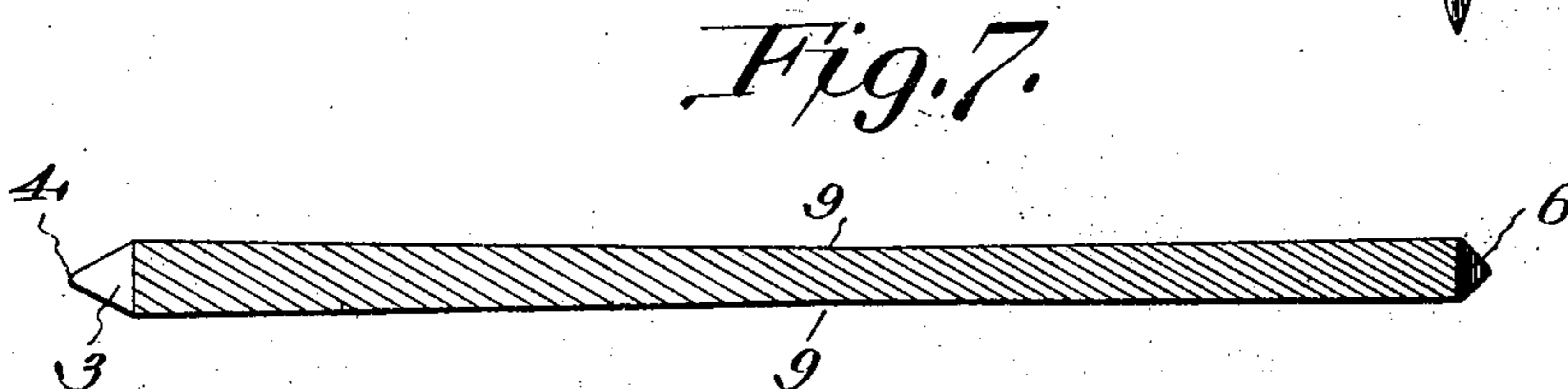


Fig. 7.

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4 SHEETS—SHEET 3.

Fig. 8.

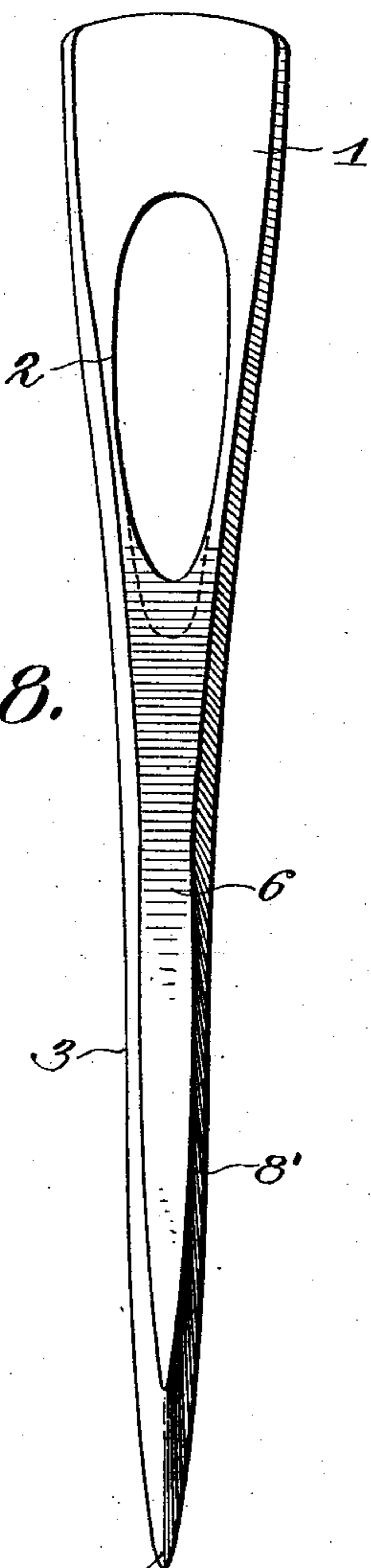
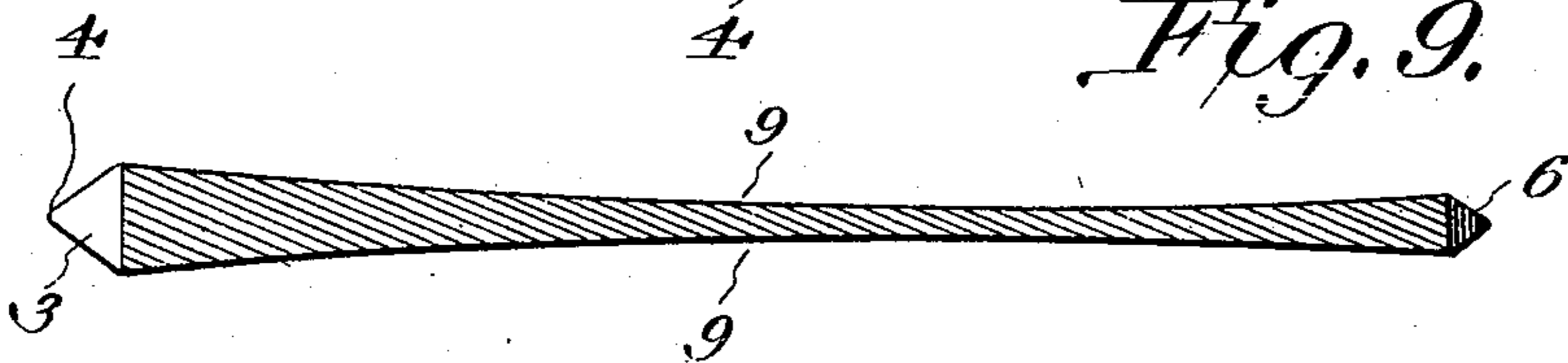


Fig. 9.



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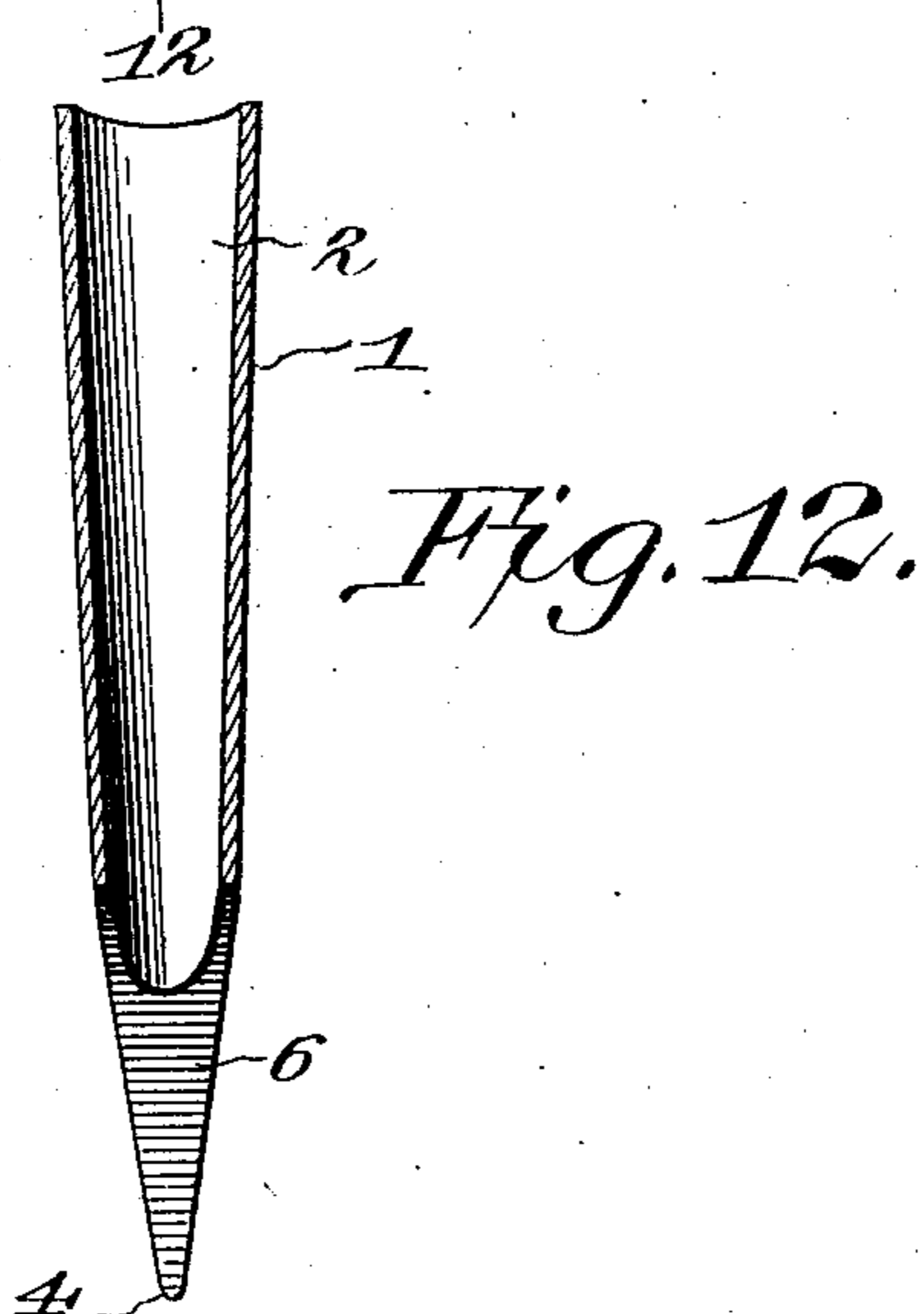
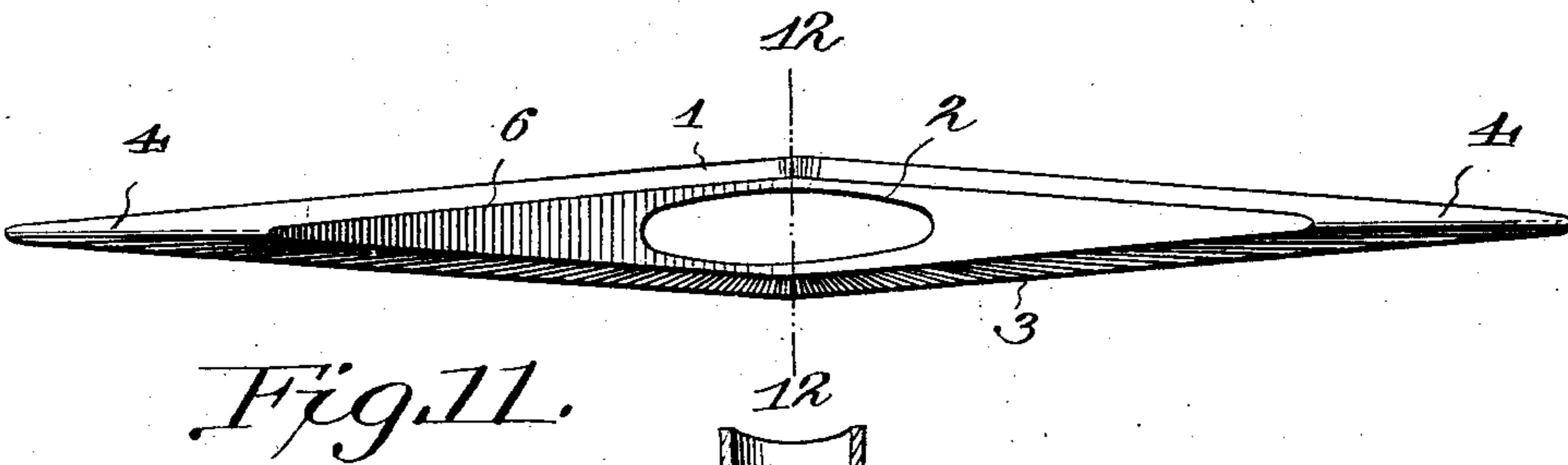
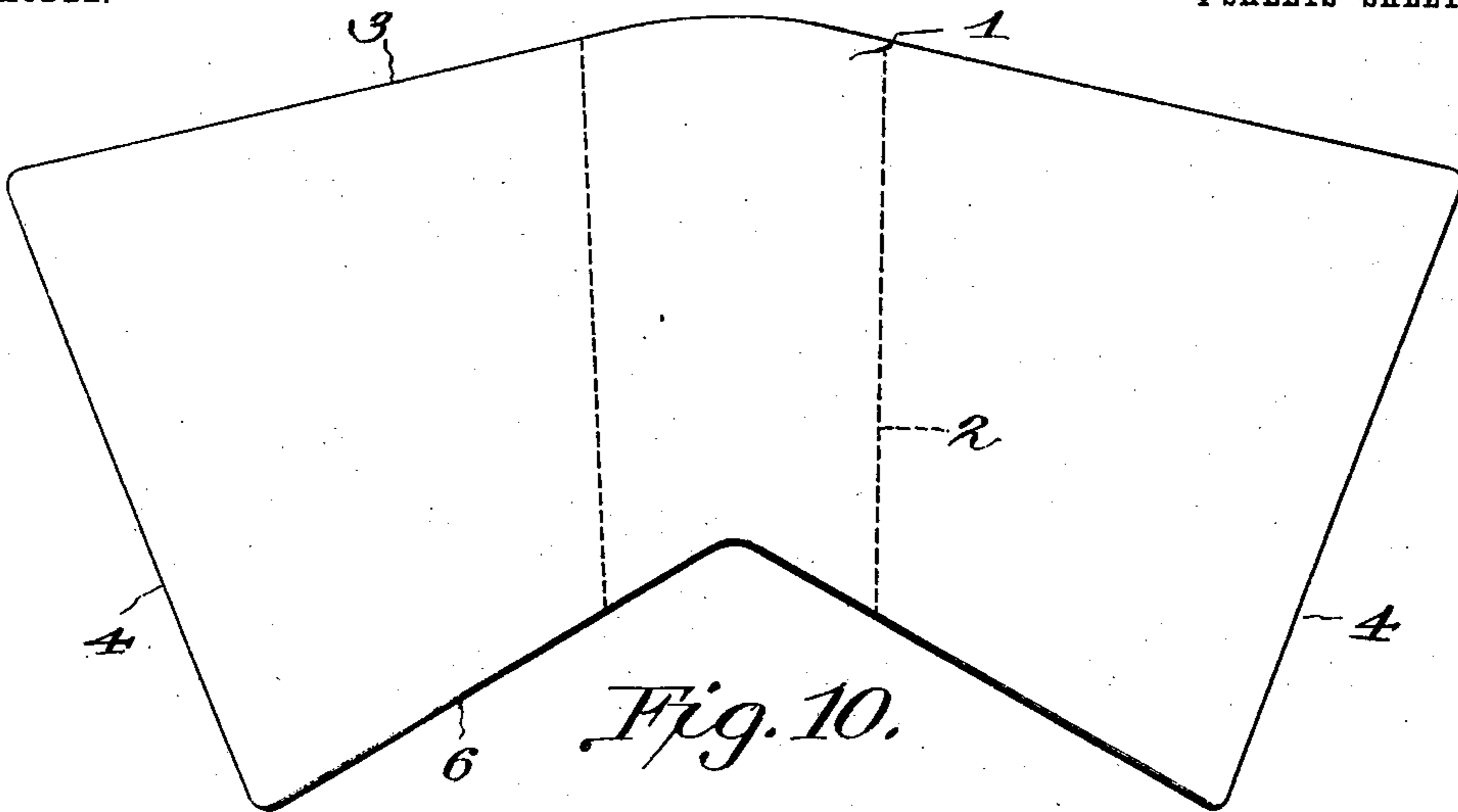
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOHN E. LEATHERS, OF FITZWILLIAM DEPOT, NEW HAMPSHIRE.

AX.

SPECIFICATION forming part of Letters Patent No. 755,891, dated March 29, 1904.

Application filed November 13, 1903. Serial No. 181,087. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. LEATHERS, a citizen of the United States, residing at Fitzwilliam Depot, in the county of Cheshire and State of New Hampshire, have invented a new and useful Ax, of which the following is a specification.

This invention relates to certain improvements in axes, one object of the invention being to provide an ax in which the cutting edge is arranged at such an angle with relation to the axial line of the eye and the helve that in operation the user is able to deliver a draw cut that will be more effective and from which the chips may more readily clear themselves than is the case with axes of ordinary construction, and in this connection a further object of the invention is to provide an ax in which the cutting edge is arranged at such an angle that in the splitting of blocks of wood the blade entered at one blow without fully splitting the block will serve to hold the block in proper position, so that when the block is raised with the ax and again brought down to the ground or chopping-surface the blow may be rendered more effective than where in using axes of ordinary construction an unsplit block is likely to swing outward during upward movement of the ax in readiness for a second blow.

A further object of the invention is to provide an ax-blade in which the blade tapers in thickness from its outer to its inner or handle edge, so as to permit the more ready clearance of chips and at the same time to facilitate the withdrawal of the tool from the wood should it become wedged therein.

A still further object of the invention is to provide an ax-bit in which the blade tapers from the head to the edge, the opposite sides of the blade being slightly concaved in order to permit greater depth of cut, and in this connection a still further object is to provide a blade in which a thickened portion is formed at a point between the edge and the eye, so that the clamping or wedging effect of the wood will be diminished by reducing the surface area of the blade with which the walls of the cleft are in contact.

A still further object of the invention is to

provide an ax-bit in which the opposite sides of the bit are concaved at the cutting edge from the front to the rear edge of the blade, so that the thinnest point of the blade will be at a point intermediate of the width thereof, while said front or lower edges will be comparatively sharp in order that they may break up any chips which may remain in the cut.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is an elevation of an ax constructed in accordance with the invention, illustrating in detail the relative angular positions of the cutting edge and the helve. Fig. 2 is an elevation, on an enlarged scale, of the ax, the helve being omitted. Fig. 3 is a sectional plan view of the same on the line 3 3 of Fig. 2. Fig. 4 is an end elevation illustrating in outline the difference in width between the outer and inner or handle edges of the blade. Fig. 5 is a view similar to Fig. 4, illustrating a modified construction of blade, in which the blade is thickened at a point between the cutting edge and the eye. Fig. 6 is a similar view, illustrating a slightly-modified construction in which the blade is concaved to a slight extent from the head to the bit. Fig. 7 is a sectional plan view of the same on the line 7 7 of Fig. 6, illustrating the concavity of the bit from the front to the rear edges thereof. Fig. 8 is a view similar to Fig. 4, showing a construction embodying the features shown in Figs. 5, 6, and 7. Fig. 9 illustrates a construction somewhat similar to that shown in Figs. 6 and 7 and in which the concavity of the blade is more noticeable. Fig. 10 is an elevation of a double-bitted ax embodying the principal features of the invention. Fig. 11 is an end view of the same. Fig. 12 is a transverse sectional view of the blade on the line 12 12 of Fig. 11.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

Referring first to Figs. 1 and 2 of the drawings, it will be seen that the general outline of the ax is such that the head 1 and the eye 2 are arranged in the same horizontal plane, and the outer edge 3 of the blade is in a line at a right angle to both the head and the eye. The cutting edge and bit at 4 is arranged at an acute angle to the outer edge 3 and at an acute angle to the general line of the handle or a helve 5, so that if the line of the cutting edge were continued in the direction of the handle it would intersect the helve at or near the gripping-point of the latter. The result of this is that when a blow is delivered either in felling, chopping, or splitting a draw cut will be exercised and the extent of penetration will be greater with the same force than where an ax of the ordinary construction is used. When cutting across the plane, as in felling or chopping wood, the outer edge of the blade will penetrate more deeply than the inner, and thus permit of the more ready clearance of the chips. In the splitting of blocks of wood, where it often happens that a single blow is insufficient to accomplish the splitting operation, the angular position of the cutting edge is such that when the blade has entered in the wood unsuccessfully and the block is raised with the ax in readiness for a second blow that the block will follow up in the same arcuate line as the blade and will not have the same tendency to swing outward at its lower end, as is usually found in splitting-axes of the ordinary construction. With an ax constructed in accordance with the present invention the block will be maintained in proper position, and when again brought down against the ground or chopping-surface the blow will be much more effective than is usually the case.

On reference to Figs. 2, 3, and 4 it will be seen that the thickness of the blade gradually decreases from the outer edge to the inner or handle edge thereof, 3 indicating the outer edge, and 6 the inner edge, while from edge to edge the blade is practically straight or slightly concaved, rather than convexed or bulged, thus to some extent throwing the greater weight of the blade at the extreme end of the handle, where in cutting the blow will be rendered more effective, and this, in connection with the angular position of the cutting edge, will result in greater penetration of the blade at the outer than at the inner edge. This is of value in felling or chopping, inasmuch as the chips may be more readily cleared, and at the same time the blade may be more readily withdrawn should it become wedged in the cut. When the blade is held tightly in the cut after the delivery of the blow, slight inward movement of the handle will cause the inner or handled edge to act as a fulcrum and permit the loosen-

ing of the outer or thicker ends of the blade and on subsequent movement in the reverse direction the thinner inner edge may be released and the blade readily withdrawn. Where the blade is of even thickness from its front to its rear edges, it is practically impossible to exercise a leverage force of this kind, inasmuch as the gripping effect of the wood is equally distributed throughout the blade, and the result is a twisting strain which is more or less likely to split or break the helve. With a blade of unequal thickness the fulcrum-point formed may be positive and the blade quickly withdrawn. This is also found advantageous over the ordinary blades where the thickest portion is at the longitudinal center of the blade and from thence gradually tapers down toward both the front and rear edges. In such cases the central portion of the blade is caught and held more firmly than the other points, and this thicker portion will of necessity form the fulcrum-point, so that movement of the handle will exercise little or no effect in loosening the blade.

In Fig. 5 is illustrated a modification of the invention, the construction here shown being more especially adapted for use in connection with splitting-axes, where the force of the blow rather than the thinness of the cutting edge produces the desired effect. It will be noticed that in the blade shown in Fig. 5 there is a thickened portion (indicated at 8) at a point intermediate of the cutting edge and the lower line of the eye, while between this thickened portion and the eye the thickness of the blade is slightly reduced. This intermediate bulge or thickened portion throws the gripping-point of the wood on the blade nearer the cutting edge and to this extent reduces the effective gripping area of the walls of the cleft on the blade. In ordinary constructions, where the blade may be provided with perfectly-straight or slightly-concaved walls from the cutting edge to the head, the lines of the sides of the blade will follow the lines of the cleft, and the walls thereof will exercise a gripping force over the entire area of the blade. Where a thickened portion of the blade is arranged adjacent to the cutting edge, all that part of the blade beyond this thickened portion will be released from contact with the walls of the cleft, and by so reducing the frictional surface the blade may be more readily withdrawn, if necessary.

In Figs. 6 and 7 is shown a form of blade embodying the advantages of the structure illustrated in Figs. 2, 3, and 4 in that it tapers in cross-section from its outer to its inner edge. The blade shown in this figure exhibits a further advantage in that the bit proper is concaved from the front to the rear edges, as will be noted more especially on reference to Fig. 7. The concaved sides 9 make the blade thinnest at an intermediate point and thickest at the outer and inner edges, and at

these latter points there will be formed comparatively sharp edges, which on the entry of a blade into a cut will tend to break up the cut chips which may have remained therein.

5 Aside from this the blade is strengthened while cutting and resharpening without the necessity of removing the same amount of metal as must be removed in the sharpening of an ordinary ax.

10 Fig. 8 illustrates a modification of the invention embodying the features shown in Figs. 5, 6, and 7, and this blade may be employed to advantage in both felling and splitting. It will be noted on reference to this figure that
15 the thickened portion of the blade is arranged nearer to the cutting edge, as illustrated at 8'. This blade is also tapering in thickness from its outer to its inner edges in the same manner as that described with reference to Figs.
20 2, 3, and 4.

In Fig. 9 is shown an ax of substantially the same construction as illustrated in Figs 6 and 7 with the exception that the concavity of the blade is more noticeable, blades of this character being made for use in cutting special
25 qualities of wood.

In Figs. 10 and 11 is illustrated a double-bitted ax, the cutting edges of both bits being arranged at an acute angle to the general
30 plane of the helve, so that this draw cut, previously referred to, may be attained. In this connection also the ax is tapered in thickness from its outer to its inner edges. With a double-bitted ax of the construction shown in

Fig. 10 the arrangement of the cutting edges 35 at an acute angle to the helve and to each other permits the use of the implement with less danger of injury to the person than with a double-bitted blade of the ordinary construction. 40

Having thus described the invention, what is claimed is—

1. In an ax, a blade in which the head is disposed approximately at a right angle to the outer edge of the blade and provided with an eye arranged in a plane substantially parallel 45 with that of the head, the cutting edge of the blade being at an acute angle to the outer edge of the blade and the axial line of the eye, and a helve having one end extending 50 through the eye, the general planes of the helve and of the cutting edge of the blade intersecting in advance of the handle end of said helve.

2. In an ax, a blade portion in which the 55 opposite sides are gradually concaved from edge to edge, the thickness at the outer edge being greater than at the inner or handle edge.

3. In an ax, a bit portion in which the opposite sides are gradually concaved from edge 60 to edge.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN E. LEATHERS.

Witnesses:

AMOS J. BLAKE,
LEROY S. BLAKE.