

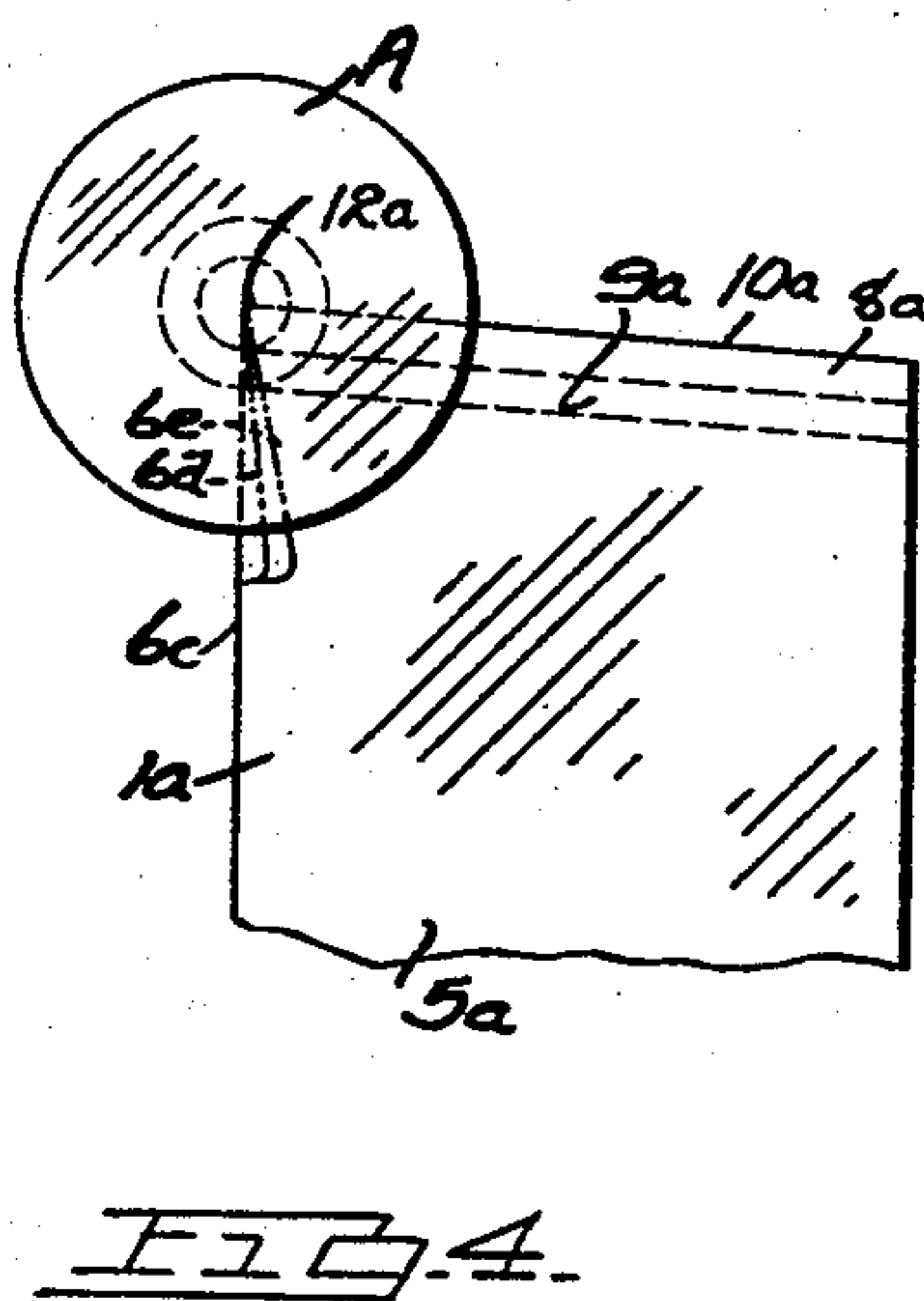
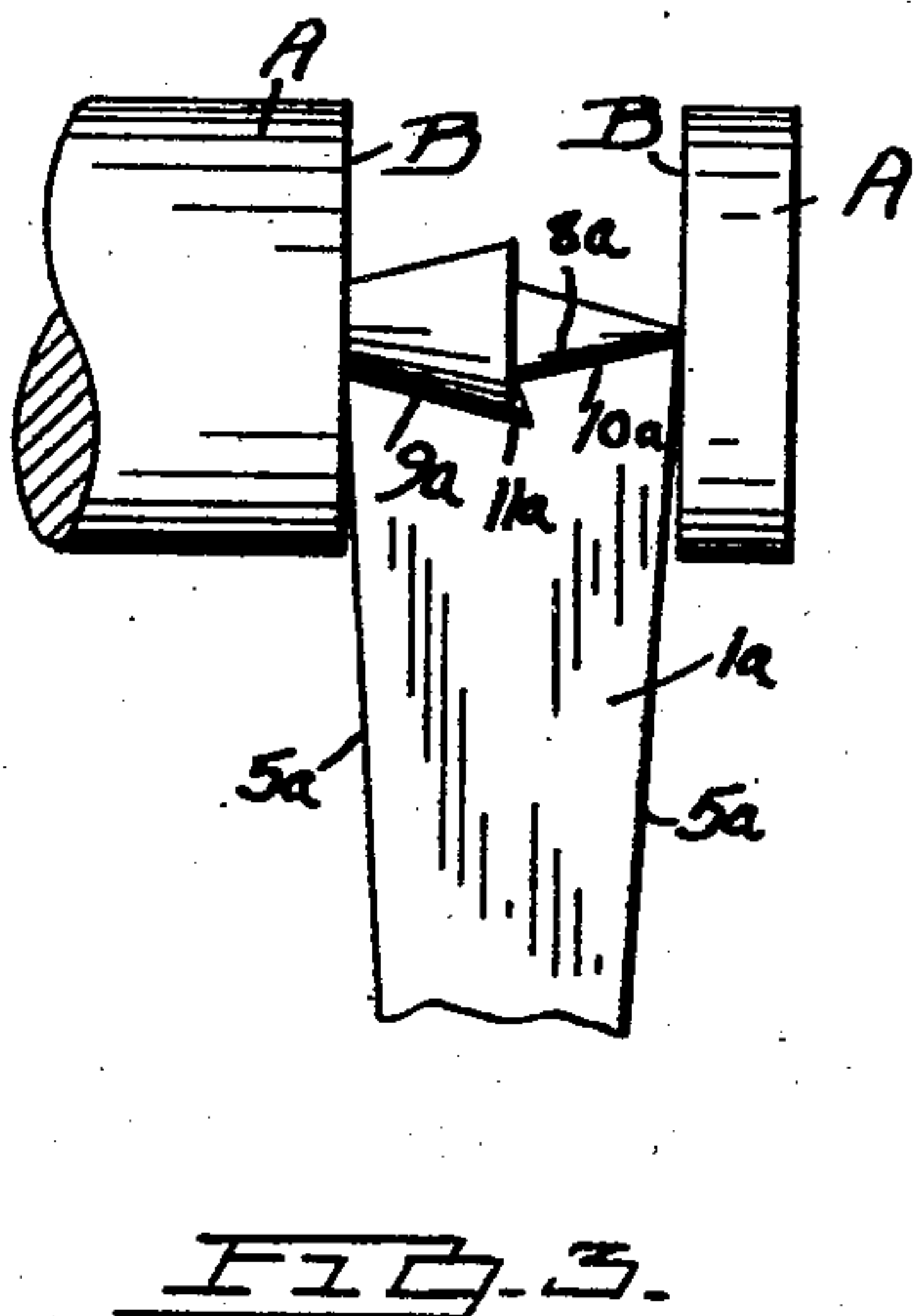
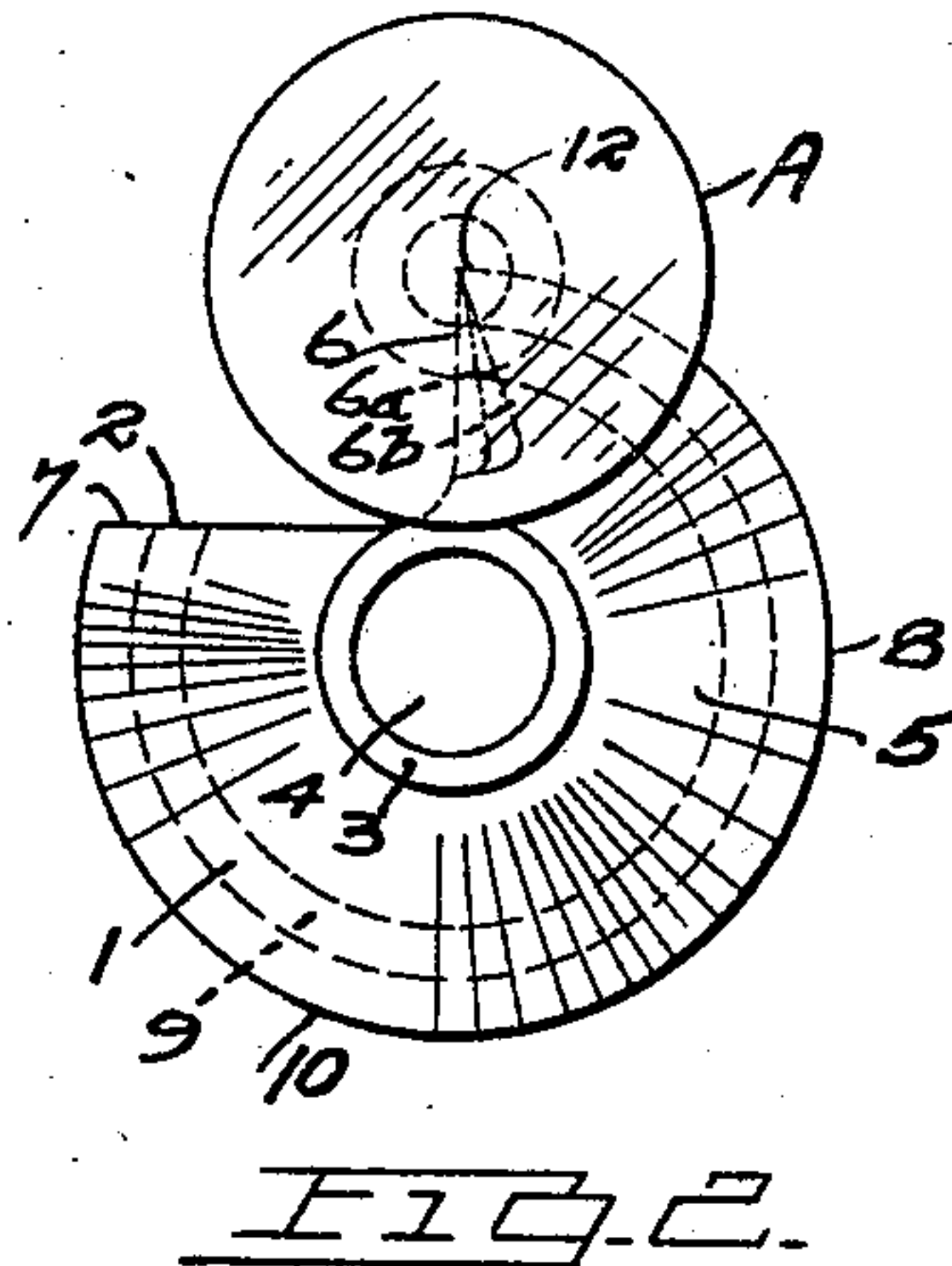
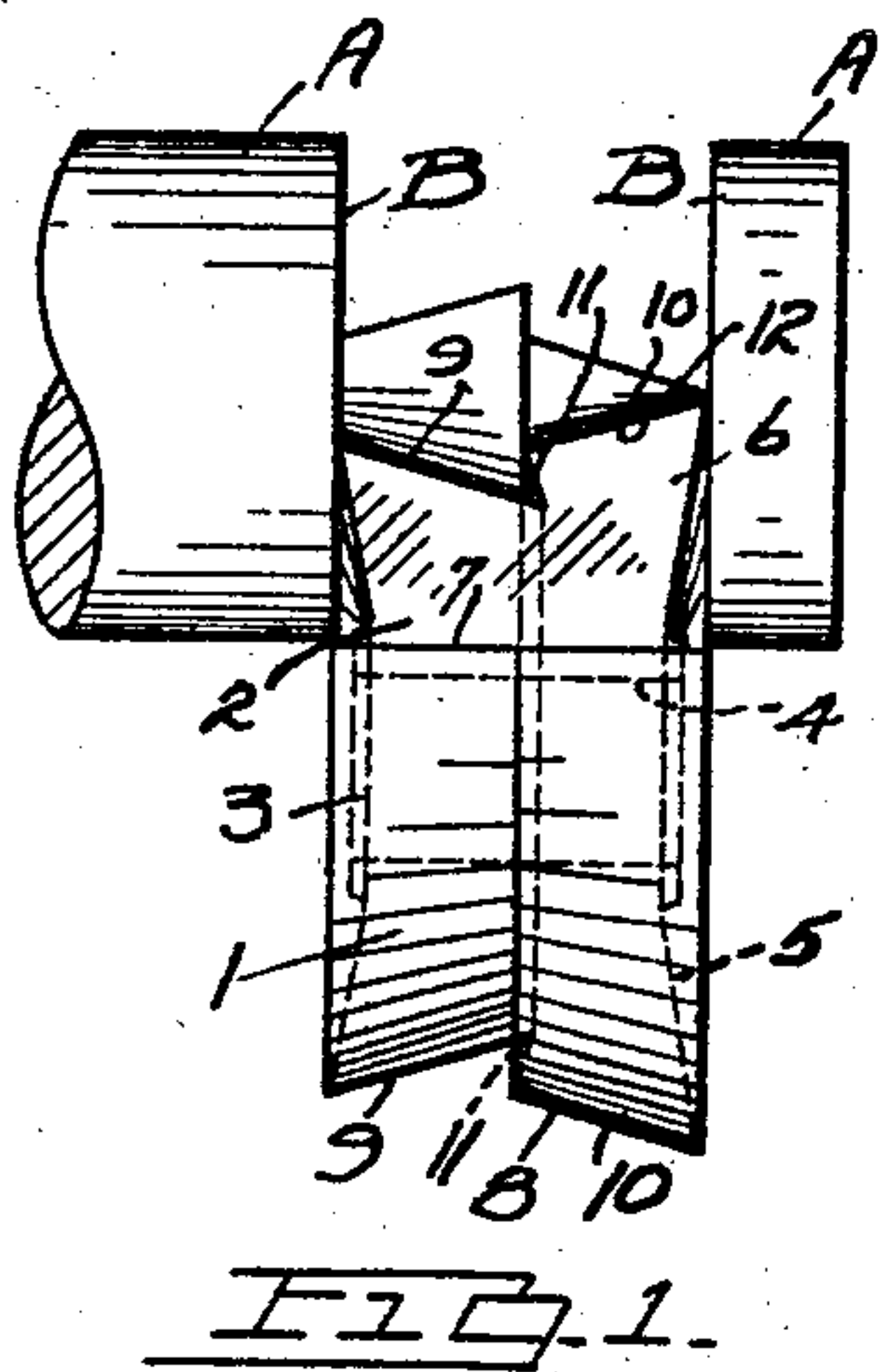
July 15, 1947.

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2,424,041

CUT-OFF BLADE

Filed Nov. 8, 1945



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## UNITED STATES PATENT OFFICE

2,424,041

## CUTOFF BLADE

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Application November 8, 1945, Serial No. 627,417

3 Claims. (Cl. 29—95)

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This invention relates to improvements in blades. At the present time it is a common practice to grind the cutting edge of a blade at an inclination to the longitudinal sides so that one side of the blade penetrates farther into the work than the other. In this manner the central burr or projection so often left on parted workpieces is eliminated. It is also good practice to make a cutting blade as narrow as possible both to increase the cutting speed and to reduce the amount of stock lost in cutting. However a narrow blade having a transversely inclined cutting edge is very liable to become deflected by the pressure of the feed so that one of the opposed faces of the parted stock is somewhat convex and the other correspondingly concave instead of both extending at right angles to the work axis. Thus while such a blade eliminates the central burr or projection another serious drawback is liable to result. And while a blade having its cutting edge transversely of V-formation, that is with its outer edges projecting farther into the work than its central portion where the two sides of the V join, would obviate any tendency to produce distorted opposed faces on the workpieces it would be very inefficient because the chips or cuttings would jam or pack at the center or base of the V and very intense heating would result.

It is an object of this invention to provide a cutting-off blade wherein the cutting edge consists of two sections inwardly inclined transversely of the blade from its opposite edge, each section extending part-way across the blade and one section being positioned forwardly of the other. The inner edge of the forward section is also undercut. Thus the inclination of the two sections eliminates the tendency for the burrs or projections to be formed centrally of the parted faces of the workpiece, and also prevents deflection or distortion of the blade during the cutting operation; and the arrangement whereby one inclined section of the cutting edge is in advance of the other, and the undercutting of the inner extremity of the forward section permits free chip expansion so that packing or jamming of chips centrally of the width of the tool and consequent excessive heating is avoided.

Having thus stated some of the objects and advantages of the invention I will now proceed to describe it with the aid of the accompanying drawing, in which:

Figure 1 shows an end view of a substantially circular blade made according to the invention, and

Figure 2 is a side view thereof.

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Figure 3 is an end view of a flat blade made according to the invention, and

Figure 4 is a side view thereof.

It will be understood that in the drawing the size of the blade is exaggerated for the sake of clarity, both as to width and the advance of one portion of the cutting surface relative to the other.

In Figures 1 and 2 the blade 1 which is substantially circular has a notch 2 formed in its periphery. The blade may be provided with parallel bosses 3 on opposite sides through which a central aperture 4 is formed for mounting the blade upon a holder (not shown). The sides 5 of the blade extending from the periphery of the bosses 3 are preferably inwardly inclined to provide side clearance. Formed around the blade periphery from one side 6 of the notch 2 to the other notch side 7 is a preformed cutting surface 8 consisting of two inclined faces 9 and 10 extending radially inwardly toward the center of the blade from opposite sides thereof. The inclined face 10 is farther from the blade axis than the inclined face 9, and the inclination of both faces though in opposite directions is substantially the same. By this inward inclination of the faces 9 and 10 positive rake is provided and any possibility for the formation of burrs or projections on the opposed faces B of the workpiece A as the latter is severed is also eliminated. The inner margin of the inclined face 10 is undercut at 11 so that the base of the undercut forms substantially a continuation of the inclined face 9 at its inner extremity. However as the inner end of the face 10 extends over the undercut 11 no actual cutting is done by the base of the latter and consequently room is provided for lateral chip expansion of cuttings taken by the face 9. Obviously there is also plenty of room for lateral expansion of chips cut by the inclined face 10. A cutting edge 12 is formed across the intersection of the notch side 6 with the cutting surface 8, and to sharpen the blade the notch side 6 may be ground as indicated at 6a and 6b. It will also be noted that the arrangement and relative inclination of the two faces 9 and 10 prevent deflection or distortion of the blade while cutting so that the cut faces B of the workpiece A are at right angles to the axis of the latter.

In Figures 3 and 4 the same blade is shown in straight form. The blade 1a has a preformed cutting surface 8a which again consists of two faces 9a and 10a which are inwardly inclined at substantially the same angle from opposite sides of the blade though the inclined face 10a is some-



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what in advance of the inclined face 9a so that separate cuts are taken by the two faces. The inner margin of the inclined face 10a is undercut at 11a and the base of the latter forms a continuation of the inner extremity of the inclined face 9a to provide lateral chip expansion for chips cut by the said face 9a. Obviously lateral chip expansion is permitted beyond the inner extremity of the inclined face 10a for chips cut thereby. The opposite sides 5a of the blade between which the cutting surface 3a extends are widest apart at their junction with the latter and are inclined toward one another from the cutting surface. The blade side 6c at its junction with the cutting surface 3a forms a cutting edge 12a across the latter. Thus again the outward inclination of the faces 9a and 10a toward their outer extremities provides positive rake and prevents the leaving of burrs or projections on the opposed faces B of the workpiece A as the latter is severed. The arrangement of the inclined faces also prevents deflection or distortion of the blade sides by which malformation of the opposed faces B might result. The blade may be ground as indicated at 6d and 6e when sharpening is required.

While in the foregoing the preferred embodiments of the invention have been described and shown it is understood that further alterations and modifications may be made thereto provided the said alterations and modifications fall within the scope of the appended claims.

What I claim is:

1. A cutting-off blade including a body having a preformed cutting surface along one edge, said cutting surface including two portions inwardly inclined from opposite sides of the body, one portion being in advance of the other portion, the

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inner extremity of the advanced portion being undercut and the base of the undercut forming substantially a continuation of the inner extremity of said other portion, and a cutting edge formed across the junction of another edge face of the blade with one extremity of the cutting surface.

2. A cutting-off blade including a substantially circular body having a notch formed in its periphery, a preformed cutting surface extending around the unnotched portion of the body periphery, said cutting surface including two portions inwardly inclined from opposite sides of the body, one portion being radially in advance of the other portion, the inner extremity of the advanced portion being undercut and the base of the undercut forming substantially a continuation of the inner extremity of said other portion, and a cutting edge formed at the junction of one side of the notch with one extremity of the cutting surface.

3. A cutting-off blade including a flat body having a preformed cutting surface along one edge, said cutting surface including two portions inwardly inclined from opposite sides of the body, one portion being in advance of the other portion, the inner extremity of the advanced portion being undercut and the base of the undercut forming substantially a continuation of the inner extremity of said other portion, the opposite sides of the blade extending from the cutting surface being inclined toward one another from the latter, and a cutting edge formed across the cutting surface at its junction with one end of the body.

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