

No. 685,294.

Patented Oct. 29, 1901.

N. E. PALMER & R. C. DOWNS.

SHINGLE DIE.

(Application filed Dec. 3, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

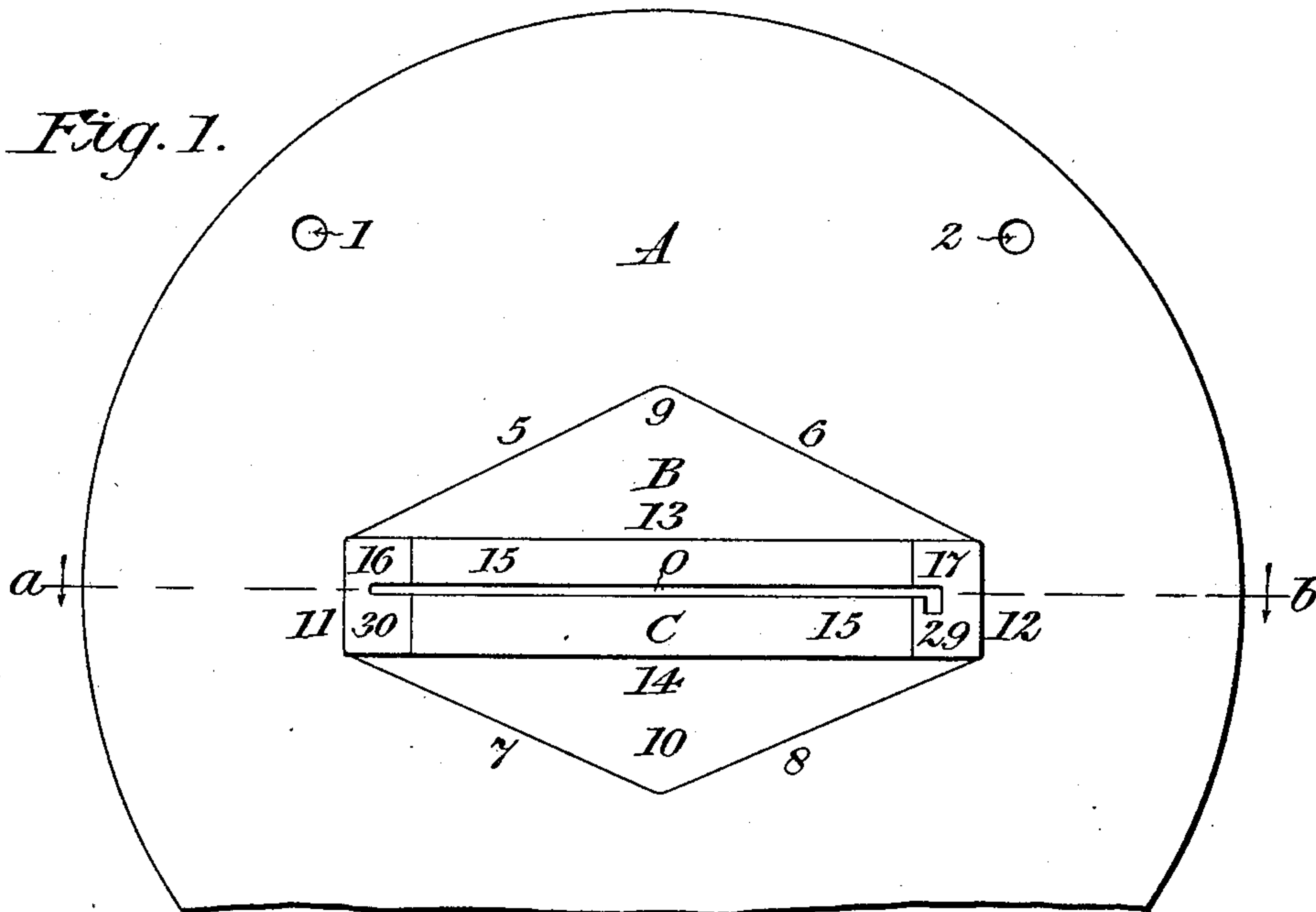
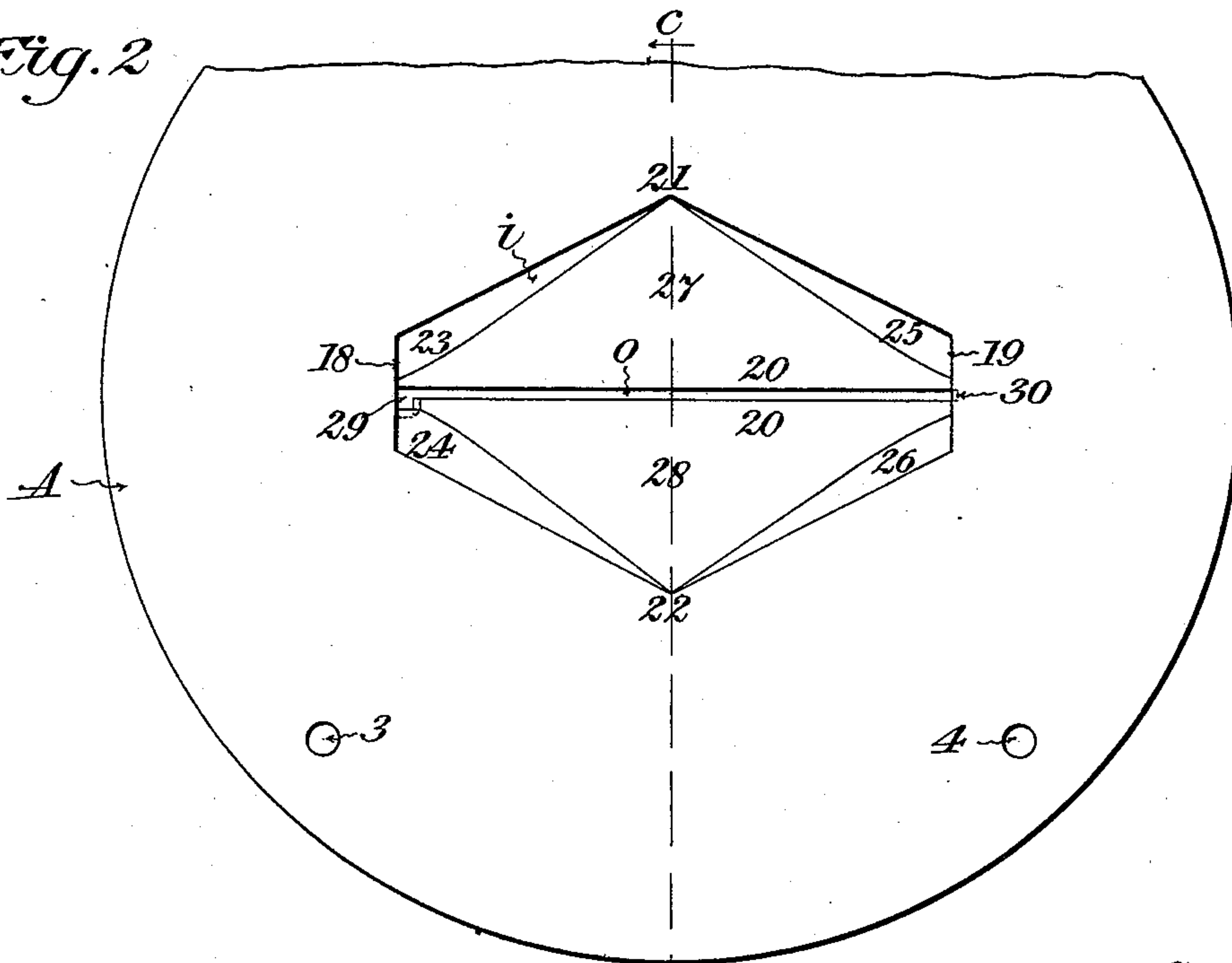


Fig. 2.



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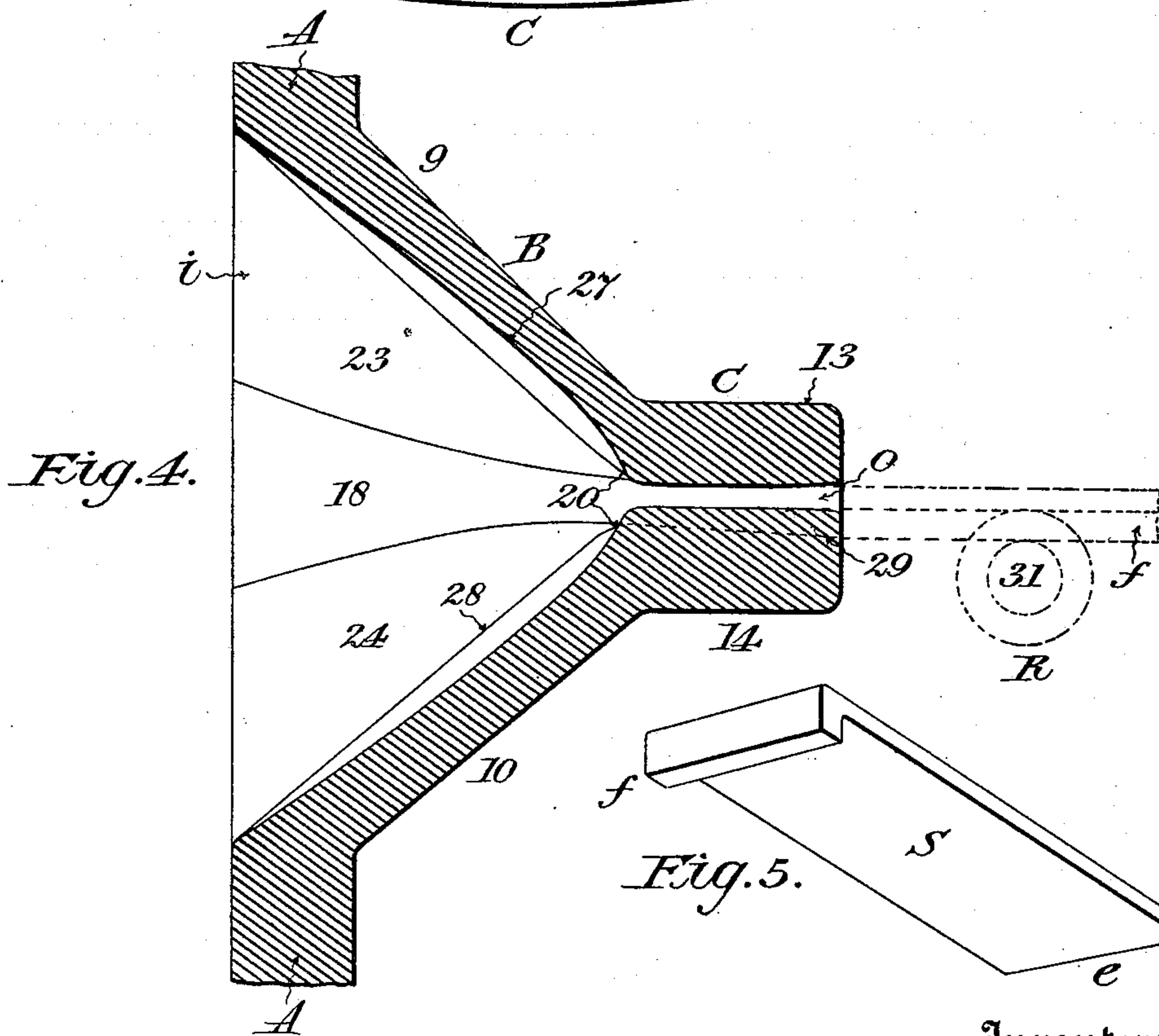
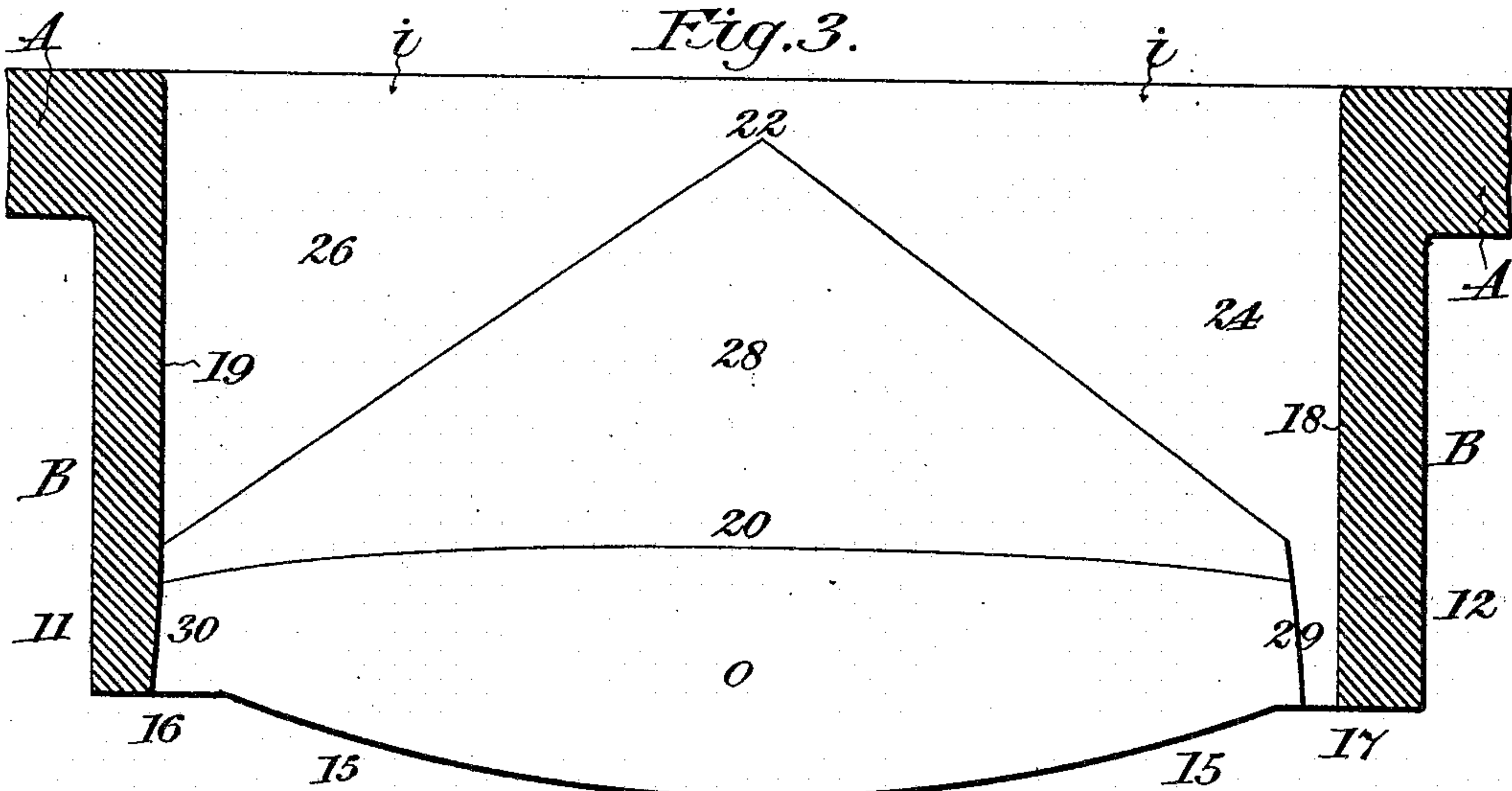
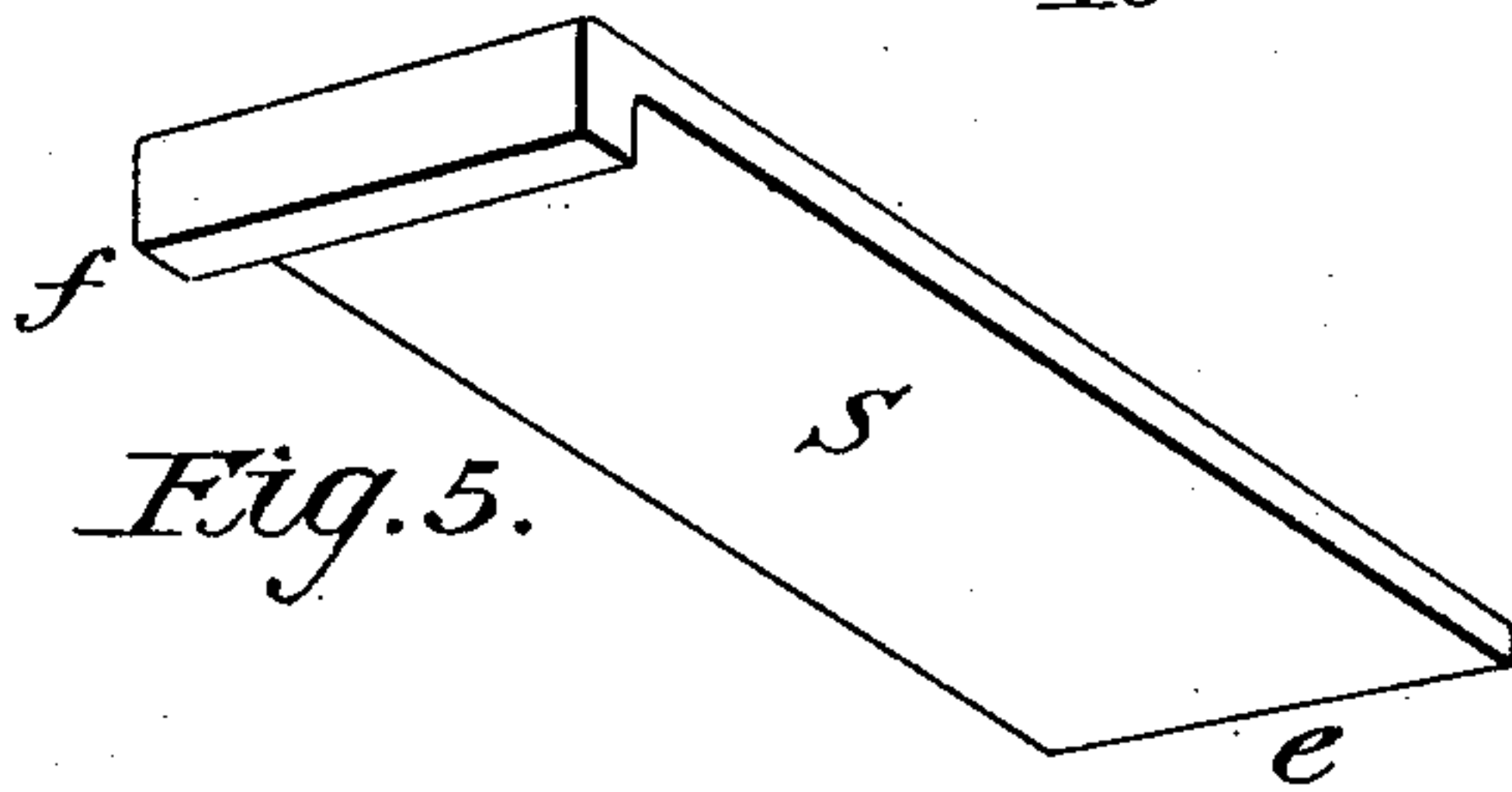


Fig. 5.



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UNITED STATES PATENT OFFICE.

NOAH ELDRIDGE PALMER AND RICHARD CHARLES DOWNS, OF LAKE, INDIANA; SAID DOWNS ASSIGNOR TO DANIEL BEELER, OF LAKE, INDIANA.

SHINGLE-DIE.

SPECIFICATION forming part of Letters Patent No. 685,294, dated October 29, 1901.

Application filed December 3, 1900. Serial No. 38,491. (No model.)

To all whom it may concern:

Be it known that we, NOAH ELDRIDGE PALMER, a citizen of the United States of America, and RICHARD CHARLES DOWNS, a subject of the Queen of Great Britain, both residents of Lake, in the county of Spencer, Indiana, have jointly invented a new and useful Improvement in Shingle-Dies, of which the following is a specification.

10 This invention relates to the production from suitable clay or its equivalent of that variety of roofing-tiles known as "shingles" and to the dies attached to auger-feed "tile-machines" by which such shingles are produced.

15 The object of the invention is the production of such shingles with flanges extending across their upper ends, the flanged shingles being adapted to be applied to the customary sheathing of roofs without nails and to be produced at a single operation by feeding the clay or other suitable plastic material continuously through the die and cutting it transversely into suitable widths.

20 This invention consists in an improved die adapted to produce such shingles as above and in certain novel features thereof, as hereinafter particularly specified and claimed.

25 Two sheets of drawings accompany this specification as part thereof.

30 Figures 1 and 2 of the drawings are respectively front and back views of said improved shingle-die detached. Fig. 3 represents a horizontal section on the line *ab*, Fig. 1. Fig. 35 4 represents a vertical section on the line *cd*, Fig. 2; and Fig. 5 is a perspective view of the product.

Like letters and numbers refer to like parts in all the figures.

40 The die is a one-part casting of suitable metal. It comprises a "plate" A, provided with bolt-holes 1 2 3 4, Figs. 1 and 2, corresponding with those in the flange of the delivery end of the tile-machine (not shown) to which it is fitted. Projecting forward centrally from said plate is the body B of the die, which is preferably and conveniently oblong in end view, as in Fig. 1, with its longest diameter horizontal and with lateral bevels 5 6 50 7 8 and longitudinal bevels 9 and 10, by which, respectively, it is tapered in depth from mid-

width laterally and from back to front. Its lateral edges 11 and 12 are preferably substantially parallel with each other.

At the front of the body B is what we term 55 the "flange" C of the dies, the lateral edges of which are preferably prolongations of said parallel lateral edges 11 and 12, its top and bottom 13 and 14 horizontal, and its middle front convex, as indicated at 15 in Fig. 1 and 60 shown in Fig. 3, with flat portions 16 and 17 on the respective sides of the convexity. Apart from said shape of the front of the flange C the external shape of the die is immaterial, so long as it is not inconsistent with 65 the required internal construction, (illustrated by Figs. 2, 3, and 4,) which will next be described.

The opening *i*, Fig. 2, through the plate A may be described as diamond-shaped with 70 truncated acute angles at the sides of the die. At these points substantially parallel side walls 18 and 19 extend entirely through the die. Between said side walls the cavity within the body B extends forward to what may 75 be termed the "back" of the flange A, (indicated by a curved line at 20 in Fig. 3 and by the same number in Figs. 2 and 4.) The upper and lower walls of the body-cavity are divided by straight lines diverging from mid- 80 width points 21 and 22 within the inlet-opening *i* of the die or thereabout into pairs of substantially triangular surfaces 23 and 24, 25 and 26, and 27 and 28, which are alike or nearly alike, in the upper and lower walls of the cavity. Said surfaces 23 24 and 25 26 extend at 85 a suitable angle and with slight convexity to the converging edges of the respective side walls 18 and 19. (See Fig. 4.) The central surfaces 27 and 28 extend forward with increasing concavity toward the center up to 90 said back 20 of the flange C. Through this flange-back 20 the matrical outlet-opening *o* of the die extends, with substantially flat and horizontal top and bottom surfaces, except at 95 one end, where an abrupt groove 29 in the direction of the feed, matching the flange *f* of the product, Fig. 5, provides for forming said flange on the shingle as a die-finished part of the same. In the improved die, as 100 shown in the drawings, said groove is formed in the bottom of the outlet-opening *o*. The

bottom of the groove is formed as a continuation of said surface 24, which insures an ample feed of the clay into the groove, and its inner side is inclined somewhat, rendering the groove tapering in width, as shown in Figs. 2 and 3, to solidify the flange *f* in its passage through the outlet-opening. The bottom of the groove, on the other hand, is inclined outwardly somewhat, as indicated in dotted lines in Figs. 2 and 4, to ease the flange *f* as it issues from the die, so as to keep it from splitting or cracking. The opposite end 30 of the outlet-opening forms the thin end *e* of the shingle and is or may be flared somewhat, as shown in Figs. 2 and 3, to ease the edge that forms said end *e* as it issues from the die.

The reëntrant angles or valleys along the divergent lines leading from the points 21 and 22 act as leaders to insure an ample feed of the plastic material to the respective sides of the die, and the curve of the flange-back 20 is adjusted at its respective ends, as shown in Fig. 3, so that the two edges shall feed uniformly, the concavities in the surfaces 27 and 28 immediately behind the flange-back, as shown in Fig. 4, and the increased width of the walls of the outlet-opening *o* from back to front toward the center, due to the front convexity 15 and the convexity of said flange-back 20, serving to hold back the plastic material at the middle of the die to the required extent, so that the feed from edge to edge shall be uniform.

As the plastic product issues from the die it is supported by rollers R, (at the top of the cut-off table,) as represented by dotted lines in Fig. 4, the flange *f* traveling beyond the end of the roller in contact with or above its shaft 31, so as to be out of contact with the roller. The continuous sheet is cut transversely into shingles S, Fig. 5, in customary manner, and this locates the flange *f* at one end of the shingle, as required. The shingles may be dried and burned or otherwise finished for the market and for use in any known or improved manner.

In use it is only necessary, as a rule, to hook the flanges *f* over the upper edge of the sheathing-boards of the roof in order to securely attach the improved shingles; but they may in addition be provided with the customary nail-holes or otherwise adapted to be fastened down where they will be exposed to high winds.

Both the external and the internal shape of the die may be considerably varied without materially changing its operation, as above described. The die may be used in inverted position, so that the flange *f* will be on top on the cut-off table, and other like modifications will suggest themselves to those skilled in the art.

Having thus described said improvement,

we claim as our invention and desire to patent under this specification—

1. A shingle-die having an outlet-opening provided with a groove, in the direction of the feed, adapted to form a continuous flange on the plastic product, which flange will extend across one end of each shingle cut from such plastic product, and constructed with otherwise substantially flat top and bottom surfaces within said outlet-opening.

2. A shingle-die having a horizontal outlet-opening provided with a groove at one side of the die, in the direction of the feed, adapted to form a continuous flange on the plastic product, which flange will extend across one end of each shingle cut from such plastic product, and constructed with otherwise substantially flat top and bottom surfaces within said outlet-opening.

3. A shingle-die having a horizontal outlet-opening provided with a flange-forming groove at one side of the die, and constructed with otherwise substantially flat top and bottom surfaces, said groove tapering in width to solidify the flange as it issues from the die.

4. A shingle-die having a horizontal outlet-opening provided with a flange-forming groove at one side of the die, and constructed with otherwise substantially flat top and bottom surfaces, said groove flaring in depth from top to bottom, and said opening flaring at the other side of the die, to ease those edges of the plastic product which form the flange and the thin edge of the shingle.

5. A shingle-die having an inlet-opening, a cavity constructed with leaders extending from mid-width toward the sides of the die, and a horizontal outlet-opening having at one side of the die a flange-forming groove.

6. A shingle-die comprising an attaching-plate, a body and a flange, provided respectively with an inlet-opening, a cavity constructed with leaders extending from mid-width toward the sides of the die, and a horizontal outlet-opening having at one side of the die a flange-forming groove and having top and bottom surfaces increased in width from back to front at mid-width by convexities at the front and back of said flange.

7. A shingle-die comprising an attaching-plate, a body and a flange, provided respectively with an inlet-opening, a cavity constructed with concave top and bottom surfaces, and a horizontal outlet-opening having at one side of the die a flange-forming groove, and having otherwise substantially flat top and bottom surfaces, substantially as hereinbefore specified.

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