

Jan. 27, 1953

A. E. ALMGREN ET AL

2,626,581

CRIMPING HEAD WITH LATERALLY MOVABLE JAWS

Filed Nov. 8, 1948

4 Sheets-Sheet 1

FIG 1

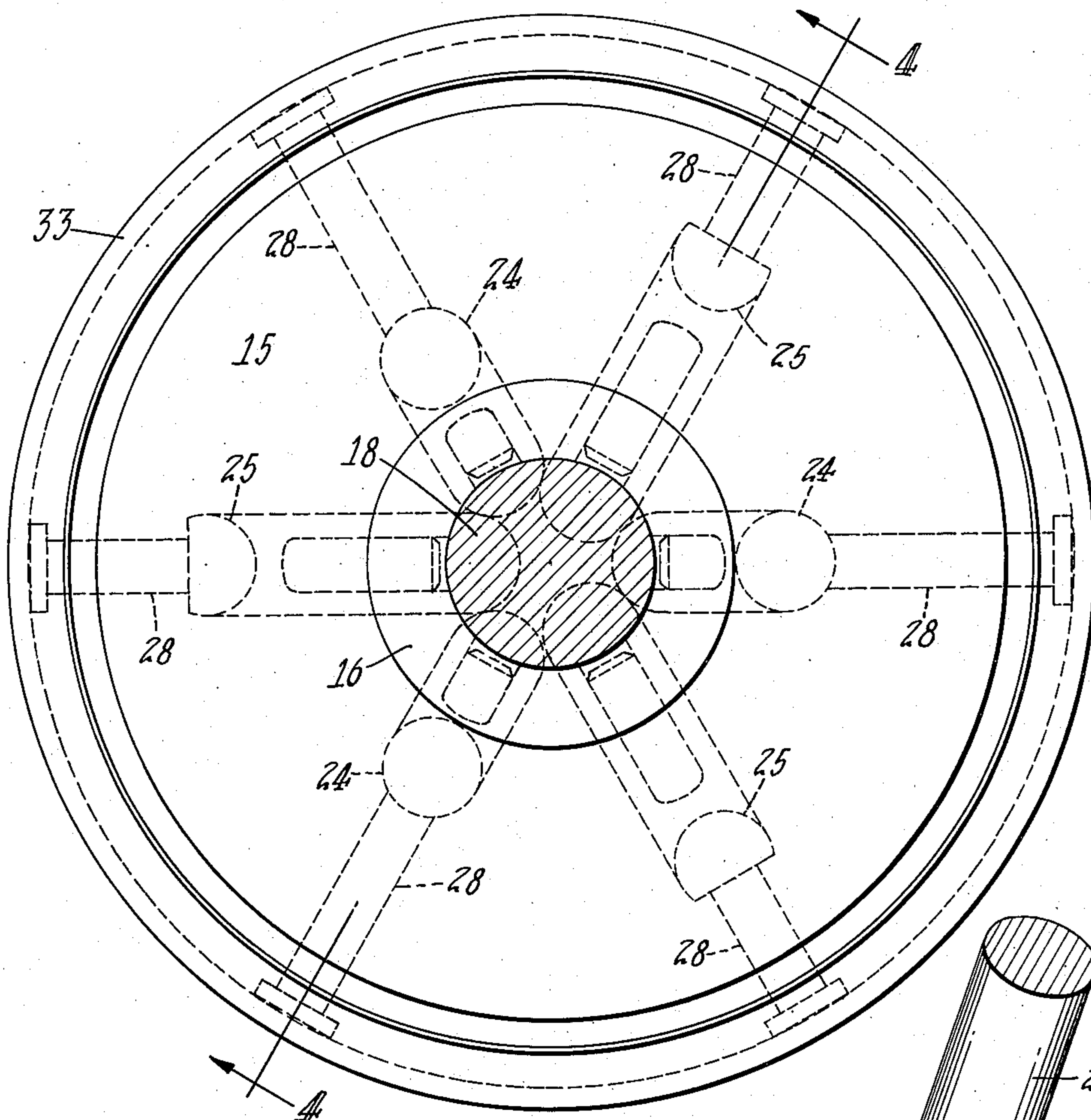


FIG 2

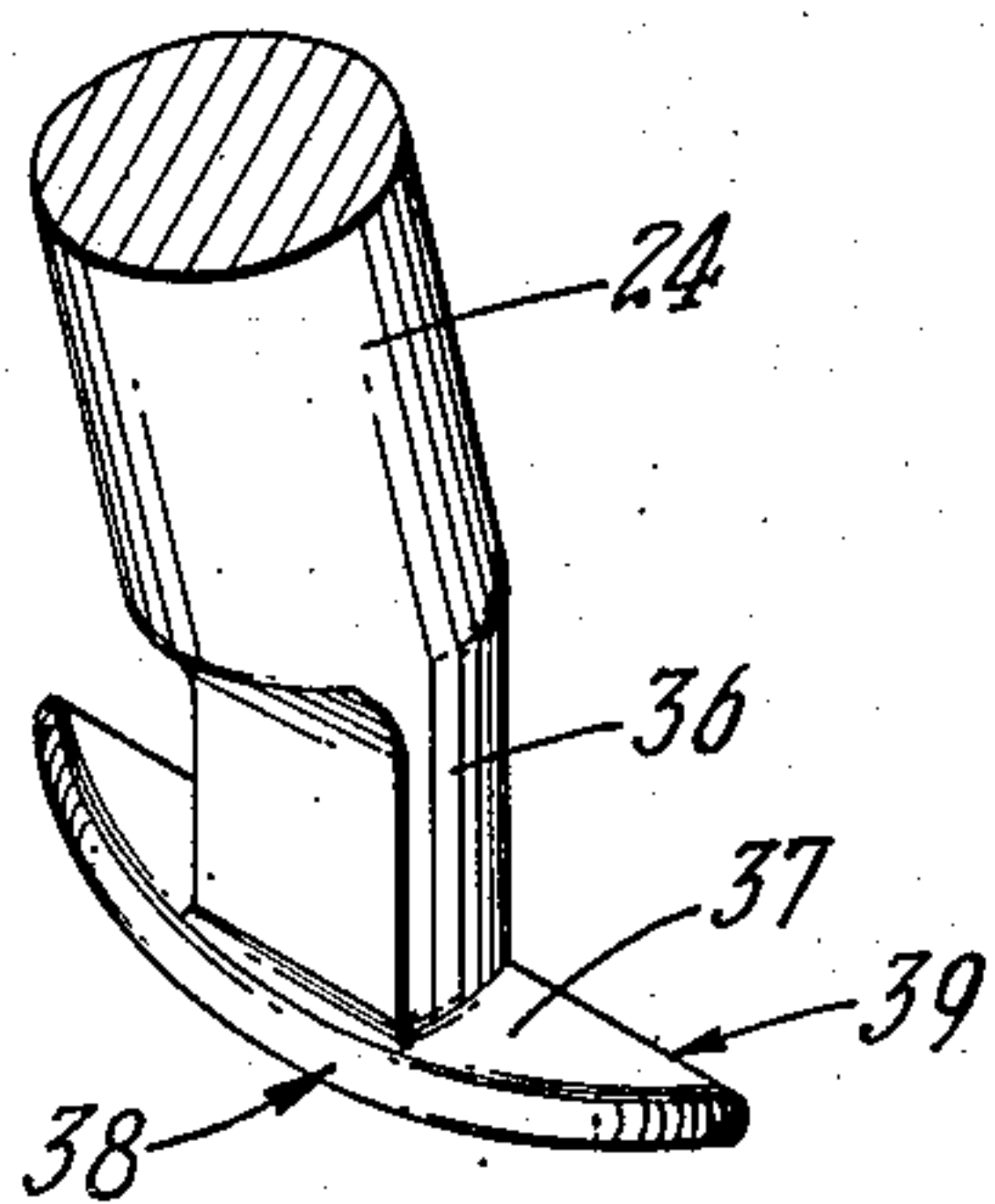
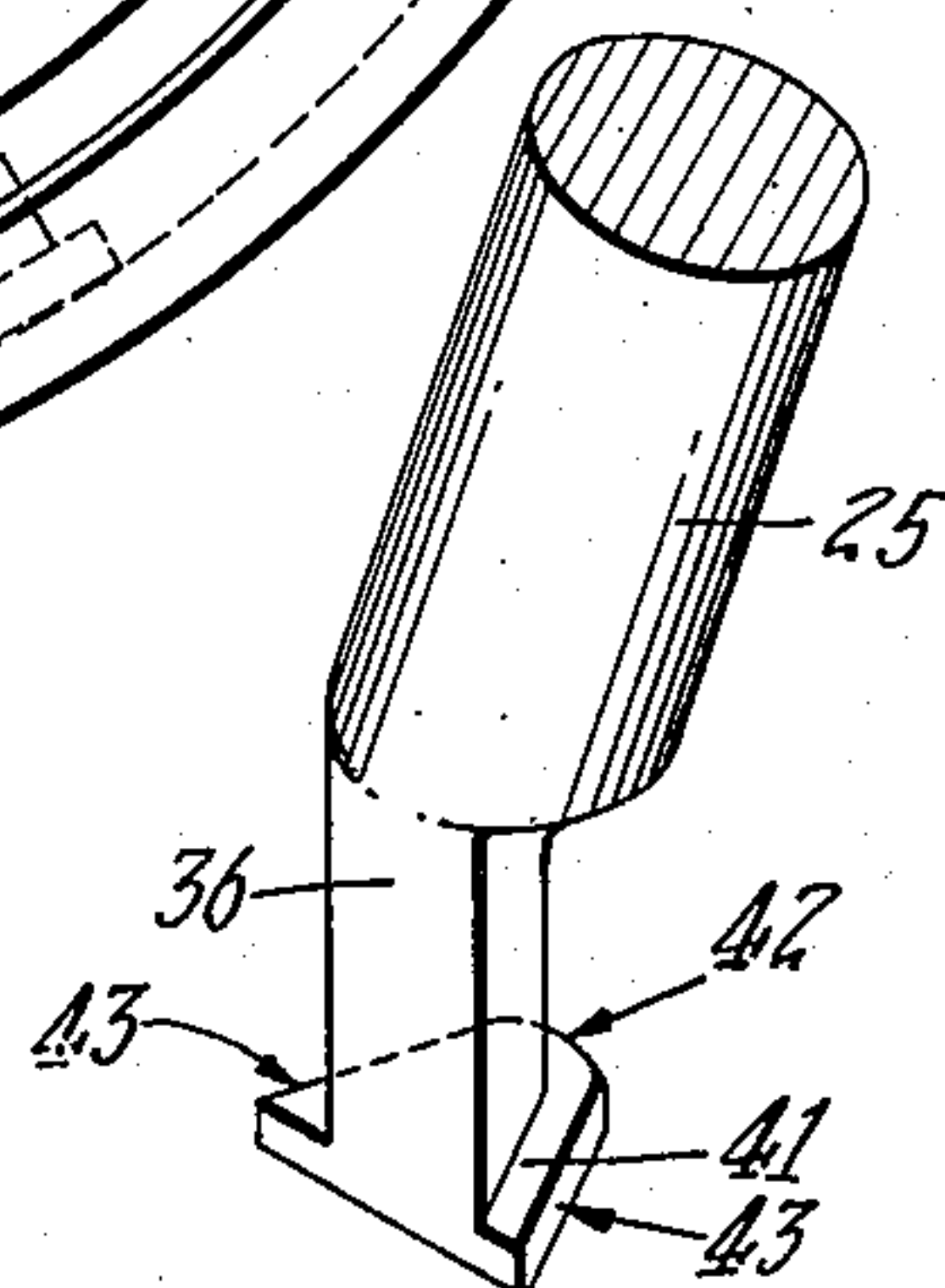


FIG 3



INVENTOR.

August E. Almgren
John D. Jakob
BY Juan D. Thornburgh
Charles H. Eme
ATTORNEYS

Jan. 27, 1953

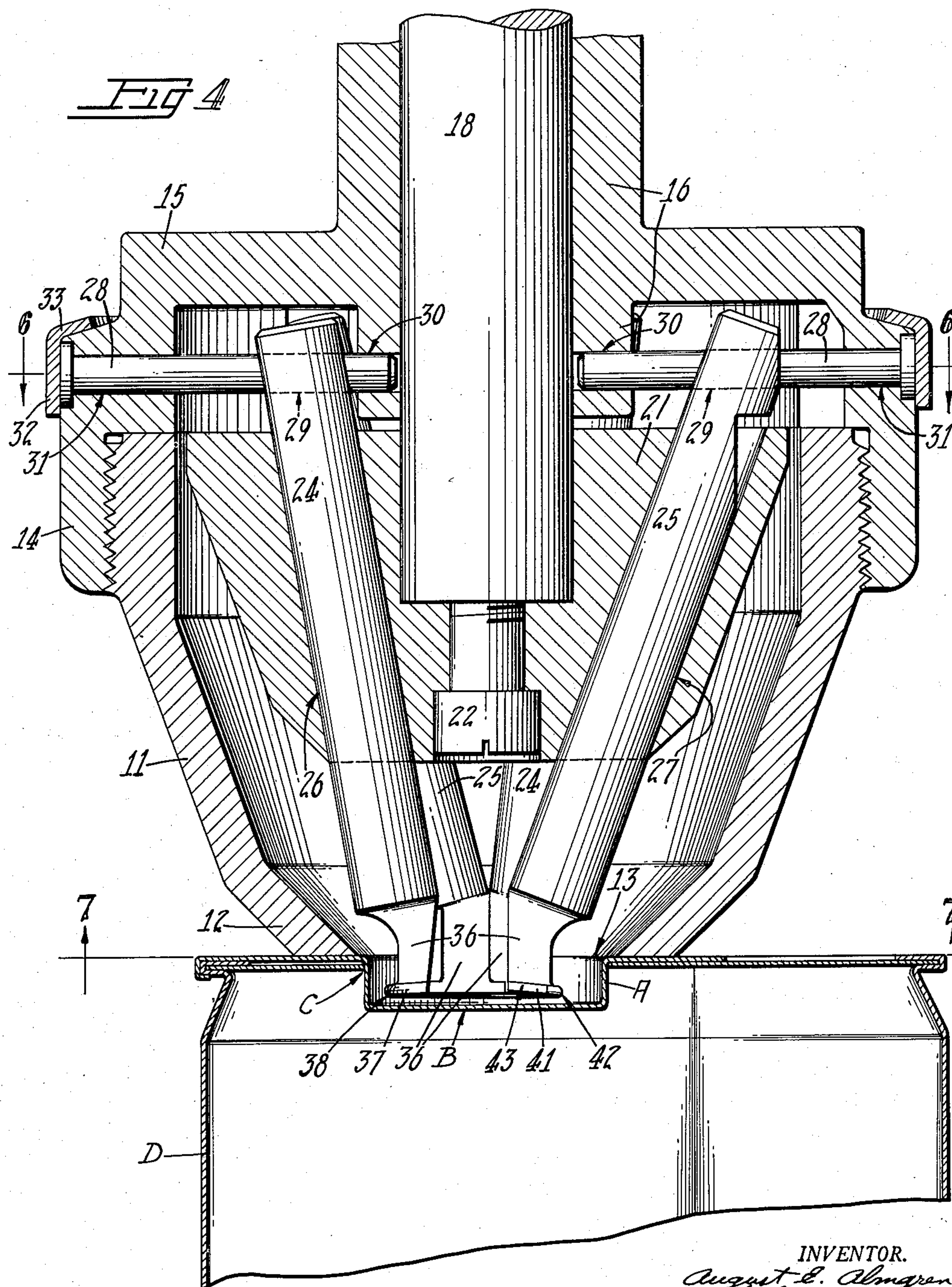
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4 Sheets-Sheet 2



INVENTOR.
August E. Almgren
John P. Jakob
BY Ivan D. Thornburgh
Charles H. Lane
ATTORNEYS

Jan. 27, 1953

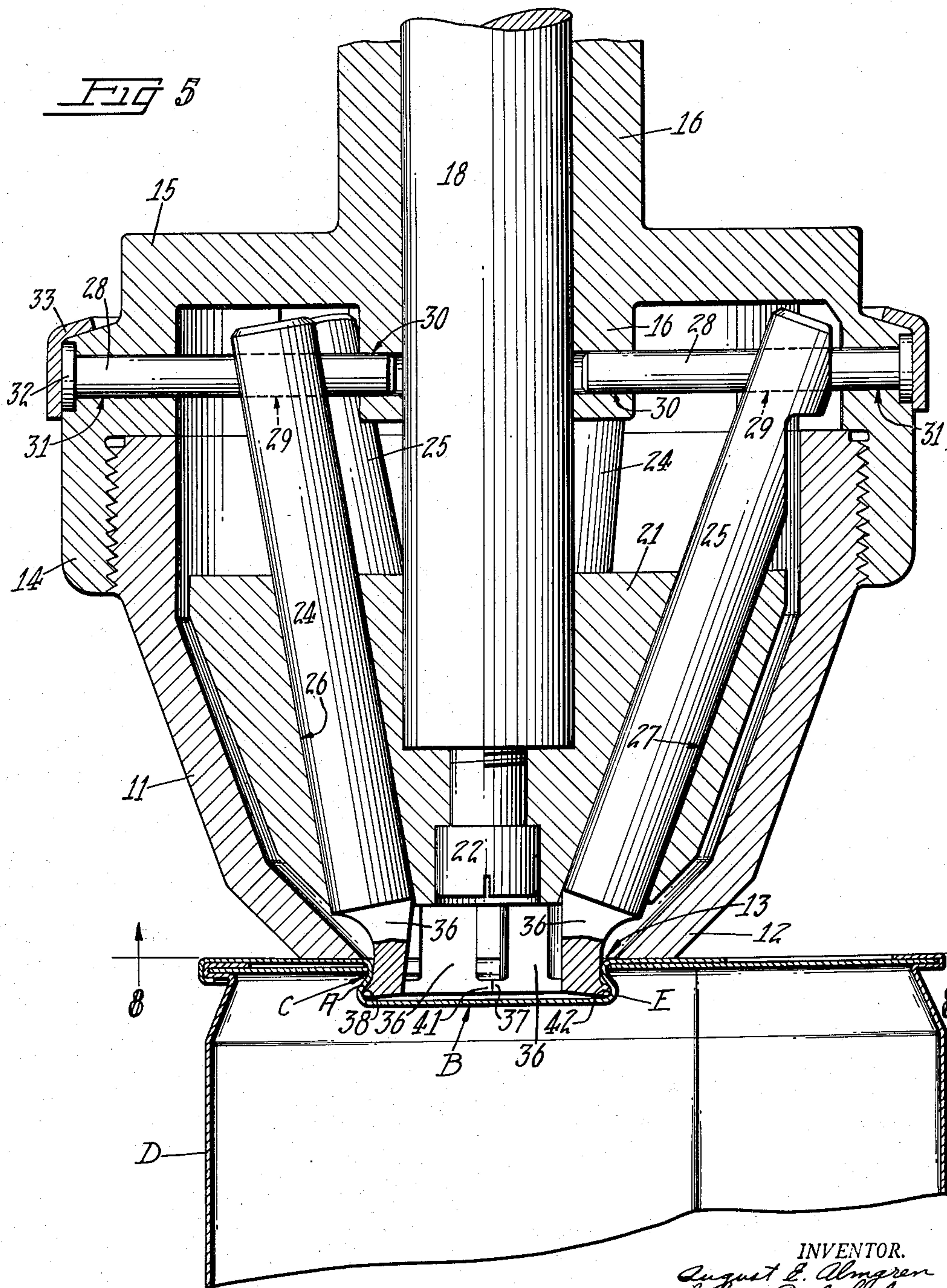
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4 Sheets-Sheet 3



INVENTOR.
August E. Almgren
 BY *John P. Jakob*
Ivan D. Thornburgh
Charles H. Cline
 ATTORNEYS

Jan. 27, 1953

A. E. ALMGREN ET AL

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Fig 6

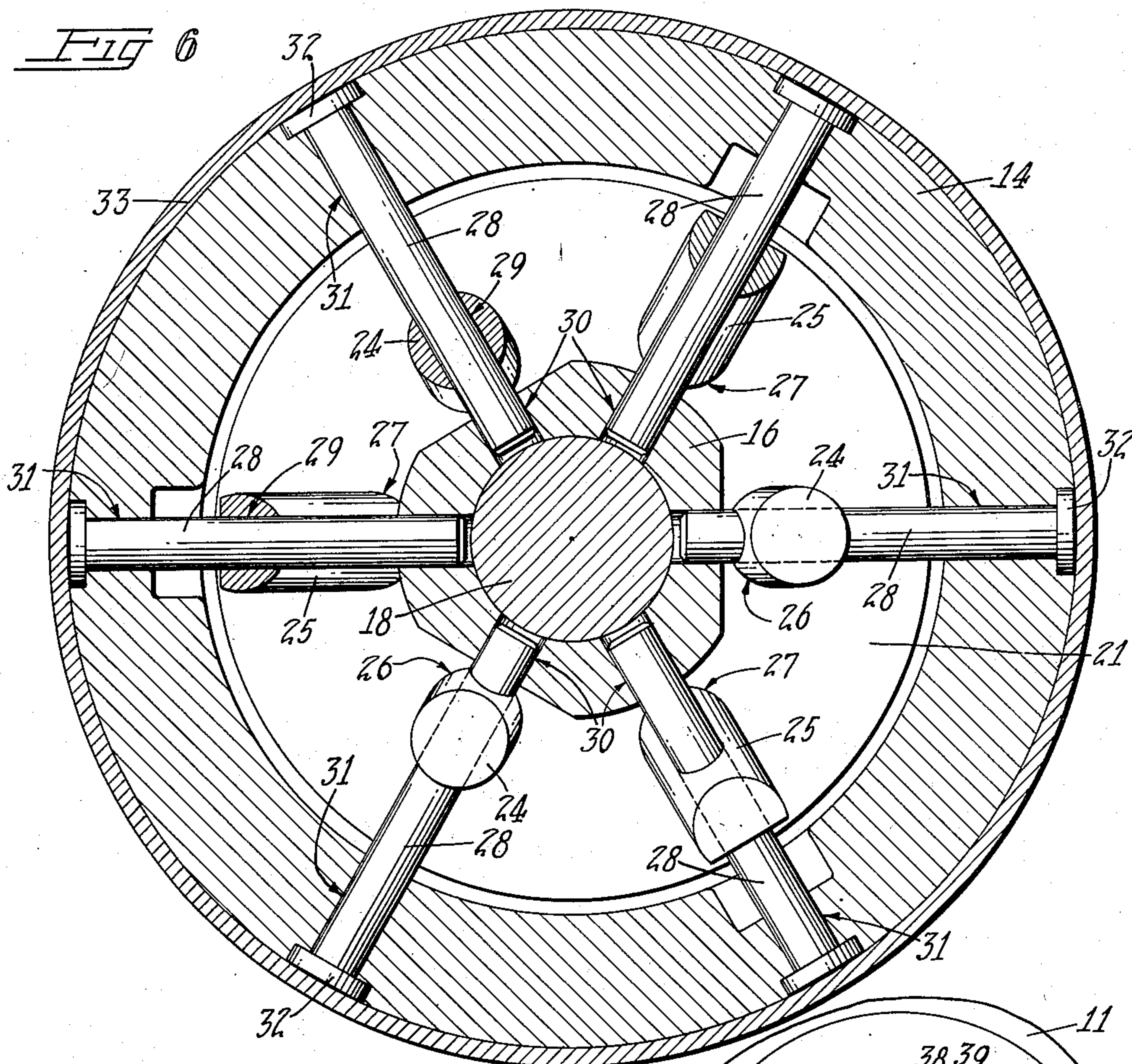


Fig 8

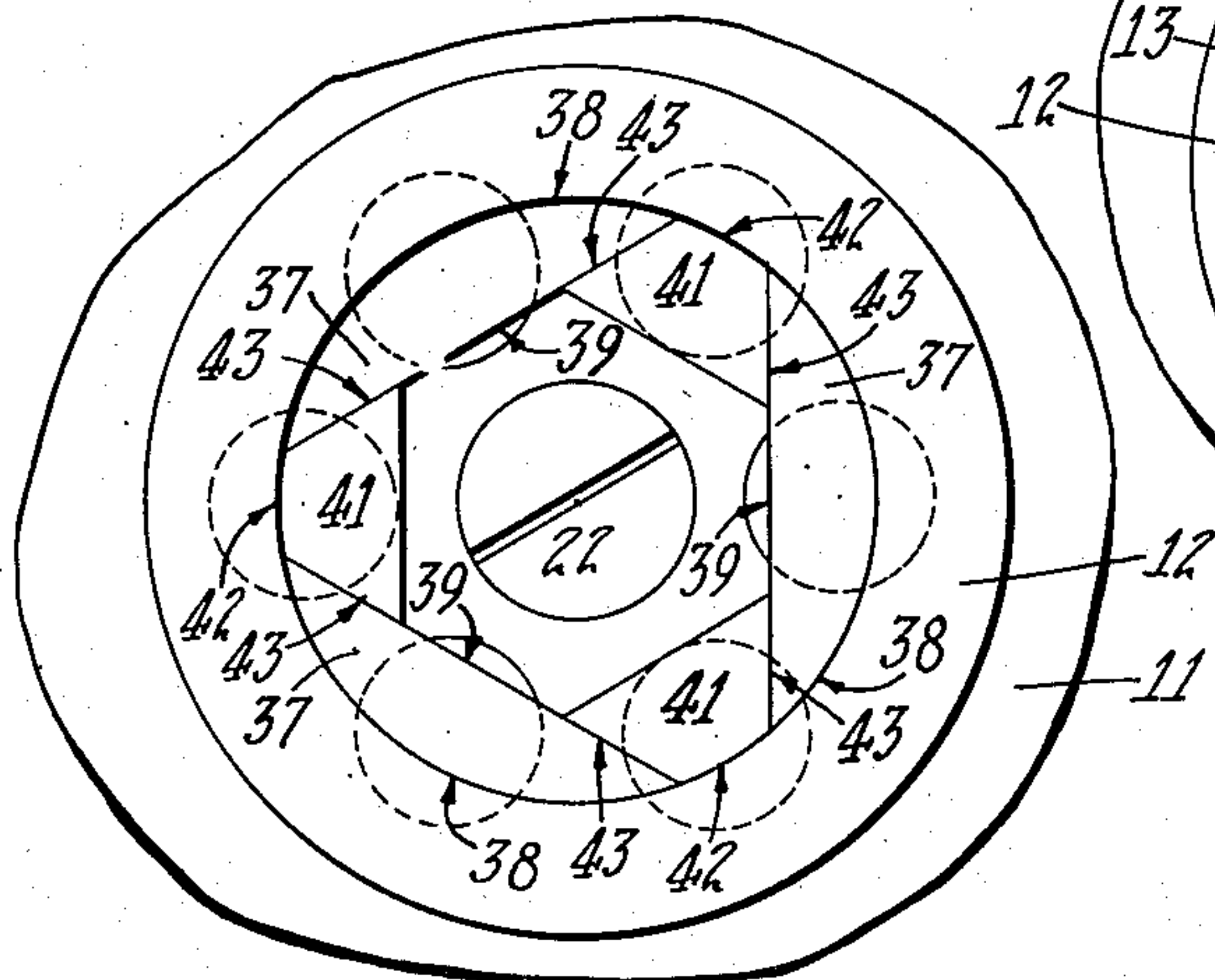
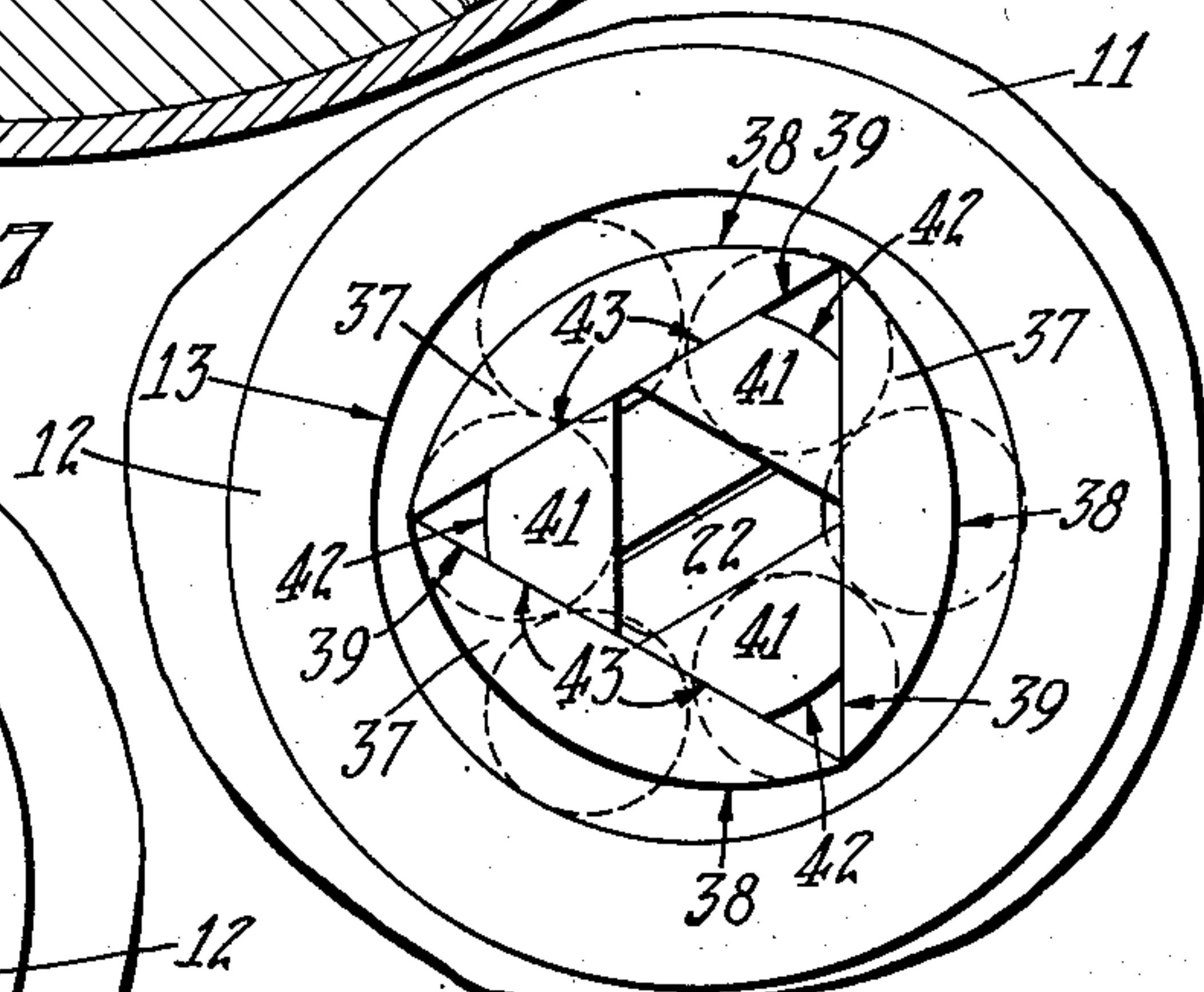


Fig 7



INVENTOR.
August E. Almgren
BY John P. Jakob
Ivan D. Thornburgh
Charles H. Lane
ATTORNEYS

UNITED STATES PATENT OFFICE

2,626,581

CRIMPING HEAD WITH Laterally
MOVABLE JAWS

August E. Almgren, Hillside, and John P. Jakob,
Roselle, N. J., assignors to American Can Com-
pany, New York, N. Y., a corporation of New
Jersey

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3 Claims. (Cl. 113—18)

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The present invention relates to crimping heads for uniting parts of containers and other articles and has particular reference to an improved jaw type crimping head having novel devices for actuating the crimping jaws.

An object of the invention is the provision of an improved crimping head which is simple in construction and which is particularly adaptable to small work such as crimping or expanding or contracting one part relative to another part to effect the uniting of the parts.

Another object is the provision of an improved crimping head wherein the operation of the crimping jaws into and out of operative position is controlled by a single reciprocable member without the aid of devices such as springs and the like ordinarily used for operating the jaws in one direction.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of a crimping head embodying the instant invention, part of the head being shown in section;

Figs. 2 and 3 are enlarged perspective details of crimping jaws used in the head shown in Fig. 1, with parts broken away;

Figs. 4 and 5 are sectional views taken substantially along the line 4—4 in Fig. 1, the views showing parts of the head in different positions, and showing the upper portion of a container in section and in position for closing by the head;

Fig. 6 is a sectional view taken substantially along the line 6—6 in Fig. 4, with parts shown in full; and

Figs. 7 and 8 are bottom plan views taken substantially along the lines 7—7, 8—8 in the respective Figs. 4 and 5, with parts broken away.

As a preferred and exemplary embodiment of the instant invention the drawings illustrate a crimping head for outwardly crimping by expansion, the side walls A (Fig. 4) of a fibre friction plug B for closing and sealing a dispensing opening C of a fibre milk container D of the type disclosed in United States Patent 2,085,979 issued July 6, 1937 to John M. Hothersall on Container, although the invention is equally well adapted to crimping by contraction and to other similar crimping operations and to metallic articles as well as nonmetallic articles.

The crimping head preferably is of substantially cylindrical formation and includes a hollow tapered shell 11 (Figs. 4 and 5) having an open

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upper end and having an integral foot section or element 12 surrounding a restricted opening 13 at its lower end for engaging the article to be operated upon for locating and supporting the article during the crimping operation. This shell 11 at its upper end is threadedly secured to a depending, surrounding flange 14 of a cup shaped cylindrical body member 15 having a centrally located hub 16 surrounding the axis of the head.

The hub 16 of the body member 15 is formed partly inside and partly outside of the member. This hub serves as a bearing for a reciprocable rod 18 which extends down into the interior of the shell 11. The rod may be reciprocated in its bearing in any suitable manner.

The inner or lower end of the rod 18, as viewed in Fig. 4, carries an inverted frusto-conical shaped bearing block or jaw actuating element 21 which is held in place by a large headed screw 22 threadedly engaged in the lower end of the rod. This block carries a plurality of cylindrical jaw shanks 24, 25 which are slidably disposed in upright bores or bearings 26, 27 formed in the block around its axis and at an angle thereto. The bearings 27 are disposed at a greater angle relative to the axis of the block, than the bearings 26, as will be readily observed in the drawings, for a purpose to be hereinafter explained.

The drawings show three shanks 24 and three shanks 25 alternately located and they slope downwardly and inwardly toward the opening 13 in the shell 11. At their upper ends, all of the shanks are individually supported on horizontally and radially disposed stationary sliders or slide pins 28 which extend through transverse bearing holes 29 formed in the upper ends of the shanks.

The inner ends of the pins 28 are supported in spaced and radial bores 30 in the bearing 16 of the head body 15. The outer ends of the pins are supported in similarly spaced and radial bores 31 formed in the flange 14 of the head body 15. The outer ends of the pins are formed with enlarged locating heads 32 which are recessed into the body flange 14 and which are engaged by a ring 33 which surrounds the body flange for retaining the pins 28 in place.

At their lower ends each jaw shank 24, 25 is formed with a depending extension 36 which projects through the opening 13 in the shell 11 and which terminates in a crimping jaw. For an inside expanding operation such as that shown in the drawings as an example of a crimping action, the jaws are proportioned and arranged in such a manner as to form a compact group or nest which may be contracted for insertion into the

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article to be crimped and which may be expanded to produce a full continuous outer crimping surface for effecting the crimping operation. For this purpose each of the extensions 36 of the three shanks 24 are formed with segmental shaped jaws 37 (Figs. 2, 4, 7 and 8) having a relatively long outer curved crimping edge 38 and an inner straight guiding edge 39.

In a similar manner each of the extensions 36 of the alternate three shanks 25 (Figs. 3, 7 and 8) are formed with trapezoidiform jaws 41 having a relatively short outer curved crimping edge 42 and a pair of diverging or tapered straight guiding edges 43. In the contracted position of the jaws 37, 41 as best shown in Figs. 4 and 7, the trapezoidiform jaws 41 are disposed inside of the nest of jaws, with their guiding edges 43 engaging against the inner or guiding edges 39 of the segmental jaws 37. When the jaws are expanded into their crimping position as best shown in Fig. 8 they move outwardly in such a manner that the guiding edges 43 of the trapezoidiform jaws 41 slide along the guiding edges 39 of the segmental jaws 37 until the outer curved edges 38, 42 of these jaws align with each other and thus produce the full, continuous outer crimping surface hereinbefore mentioned.

During this expanding action, the trapezoidiform jaws 41 move outwardly a greater distance than the segmental jaws 37. It is for this reason that the bearings 27 in the actuating block 21 for the jaw shanks 25 are disposed at a greater angle to the axis of the head, than the bores 26 for the shanks 24, as hereinbefore mentioned.

In the operation of the crimping head described above, the crimping jaws 37, 41 are normally disposed in their contracted position as best shown in Figs. 4 and 7 for insertion into the friction plug B of the container D when the container or other article is positioned in locating engagement with the foot element 12 of the shell 11 through relative movement between the head and the container. By relative movement between the head and the container is meant that the head could be moved down onto the container, or the container could be forced against the head. Also the body member 15 could be held stationary and the rod 18 made movable, as described, or the rod 18 held stationary and the body member 15 made movable. In either case there is a reciprocating movement between the body member 15 and the rod 18 with its attached bearing block 21. Any or all of these relative movements are inherently possible in the construction disclosed. With the contracted jaws located within the friction plug B of the container, the rod 18 is pushed downwardly as viewed in Fig. 4 when the body member is stationary and this moves down the actuating or bearing block 21 into the position shown in Fig. 5. As the block 21 moves down into this position it slides along the jaw shanks 24, 25 and since the upper ends of these shanks are supported on the slide pins 28, the shanks are forced outwardly.

During this outward movement of the shanks 24, 25 the upper ends of the shanks slide outwardly along the slide pins 28 and the jaws 37, 41 at the lower ends of the shanks move outwardly into their expanded positions as shown in Fig. 8. The jaws, in thus moving into their expanded position engage and expand the side wall section A of the friction plug B of the container D and thus crimp these side walls under the top wall of the container, producing an expanded bead E (Fig. 5) which secures the plug in place in the

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opening C of the container. This completes the crimping operation.

Upon completion of the crimping operation, the rod 18 and its attached bearing block 21 are raised to their upper or normal position as shown in Fig. 4 and this shifts the jaw shanks 24, 25 inwardly and thus returns the jaws 37, 41 to their normally contracted positions. With the jaws thus contracted the crimped container may be readily removed from the head. This completes a cycle of operation of the head.

It will thus be observed that the action of the jaw shanks 24, 25 and their jaws 37, 41 is controlled in both inward and outward directions by a simple lowering and raising of the bearing block 21. In this respect the block 21 serves as a cam or double wedge for alternately acting against opposite sides of the jaw shanks 24, 25.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. In a crimping head for reforming bendable portions of articles, the combination of a body member having a plurality of radially disposed support elements therein, a bearing block having an axis and a plurality of slide bearings in said block arranged around said axis and disposed at an acute angle thereto, and a plurality of jaw shanks slideably disposed within said slide bearings, each of said shanks having at one end a crimping jaw and having its opposite end movably mounted on a said radial support for lateral movement only relative to said body member, said body member and said bearing block being movable toward and away from each other, said shanks through said movement being reciprocable in said slide bearings and said jaws being movable by said block laterally relative to the axis of said slide block into and out of article crimping position.

2. In a crimping head for reforming bendable portions of articles, the combination of a body member, a bearing block having an axis and a plurality of slide bearings in said block arranged around said axis and disposed at an acute angle thereto, and a plurality of jaw shanks slideably disposed within said slide bearings, a crimping jaw at one end of each shank, and slide means in said body member and engaging the opposite ends of said shanks and confining movement of the engaged ends of said shanks to a lateral direction only relative to said body member, said body member and said bearing block being movable toward and away from each other, said shanks through said movement being reciprocable in said slide bearings and said jaws being movable by said block laterally relative to the axis of said slide block into and out of article crimping position.

3. In a crimping head for reforming bendable portions of articles, the combination of a body member, a bearing block mounted for movement relative to said body member along a longitudinal axis, said block having a plurality of slide bearings, some of said slide bearings being disposed at a specific acute angle to said longitudinal axis and other bearings being disposed at a less acute angle, a jaw shank slideably disposed within each slide bearing and having a lateral

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opening at one end, the jaw shanks located in the bearings at said specific acute angle having segmental shaped crimping jaws with inner straight guiding edges formed on the ends opposite to said lateral openings and the jaw shanks in the bearings disposed at said less acute angle having trapezoidiform crimping jaws formed on the ends opposite their openings with outer tapered guiding edges adapted to slide inside of the guiding edges of said segmental crimping jaws to contract the over all dimensions of said jaws and when in an expanded position to provide a continuous crimping edge, and slide pins secured in said body member and projecting at right angles to said longitudinal axis, each slide pin extending through the lateral opening of one of said shanks and each shank having lateral sliding movement on its associated pin, whereby movement of said bearing block along its longitudinal axis moves said trapezoidiform crimping jaws a greater distance laterally than said

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segmental crimping jaws for expanding and contracting said jaws.

AUGUST E. ALMGREN.
JOHN P. JAKOB.

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