

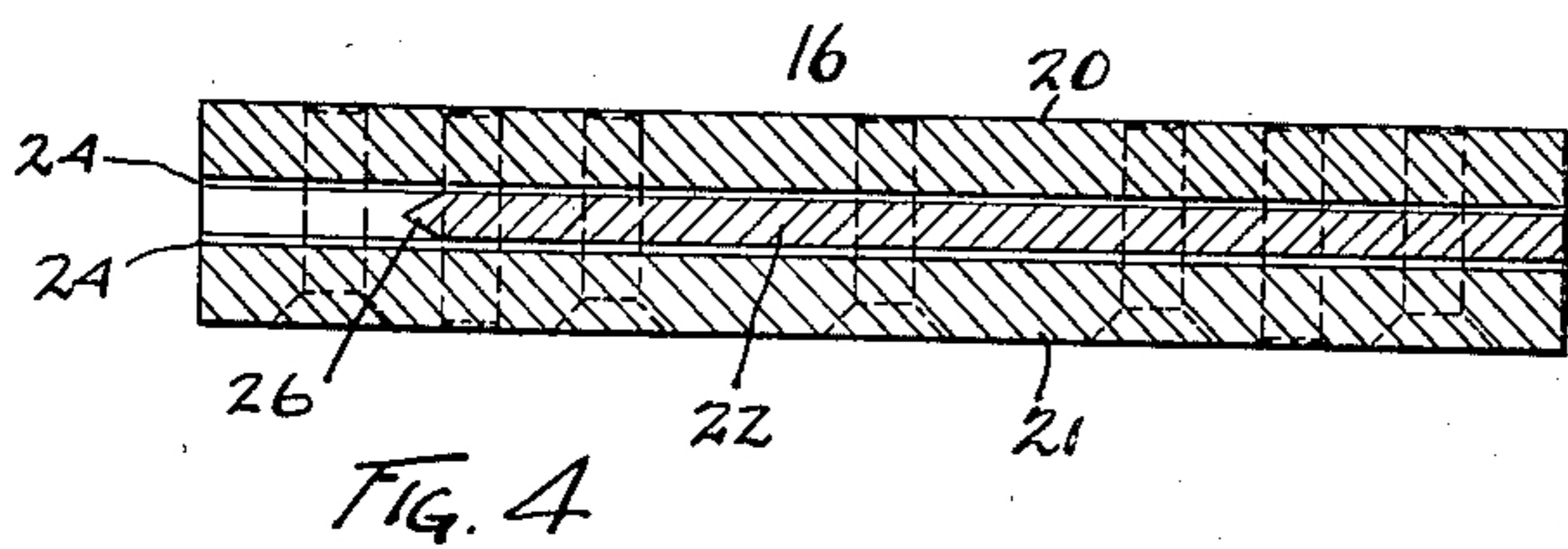
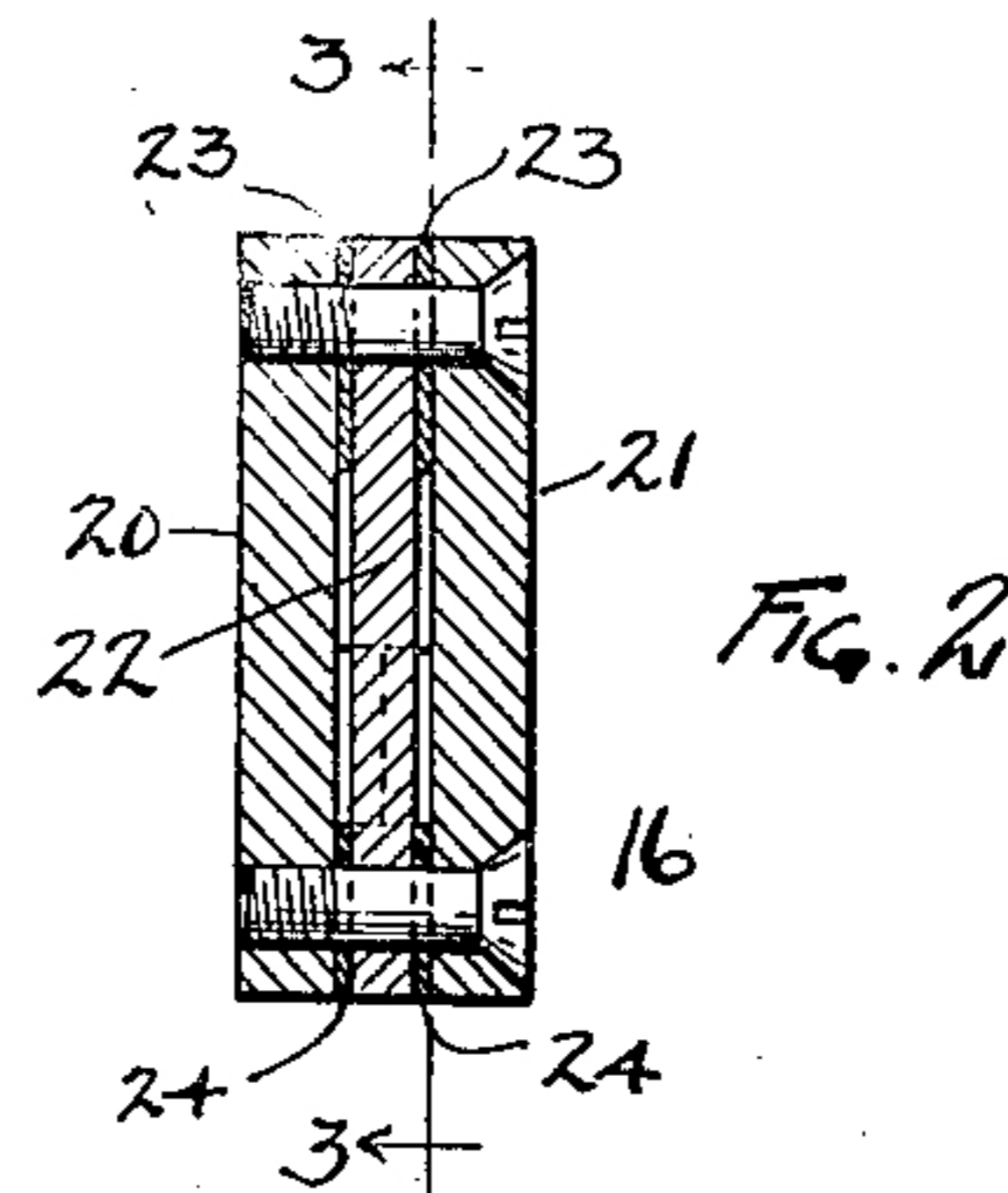
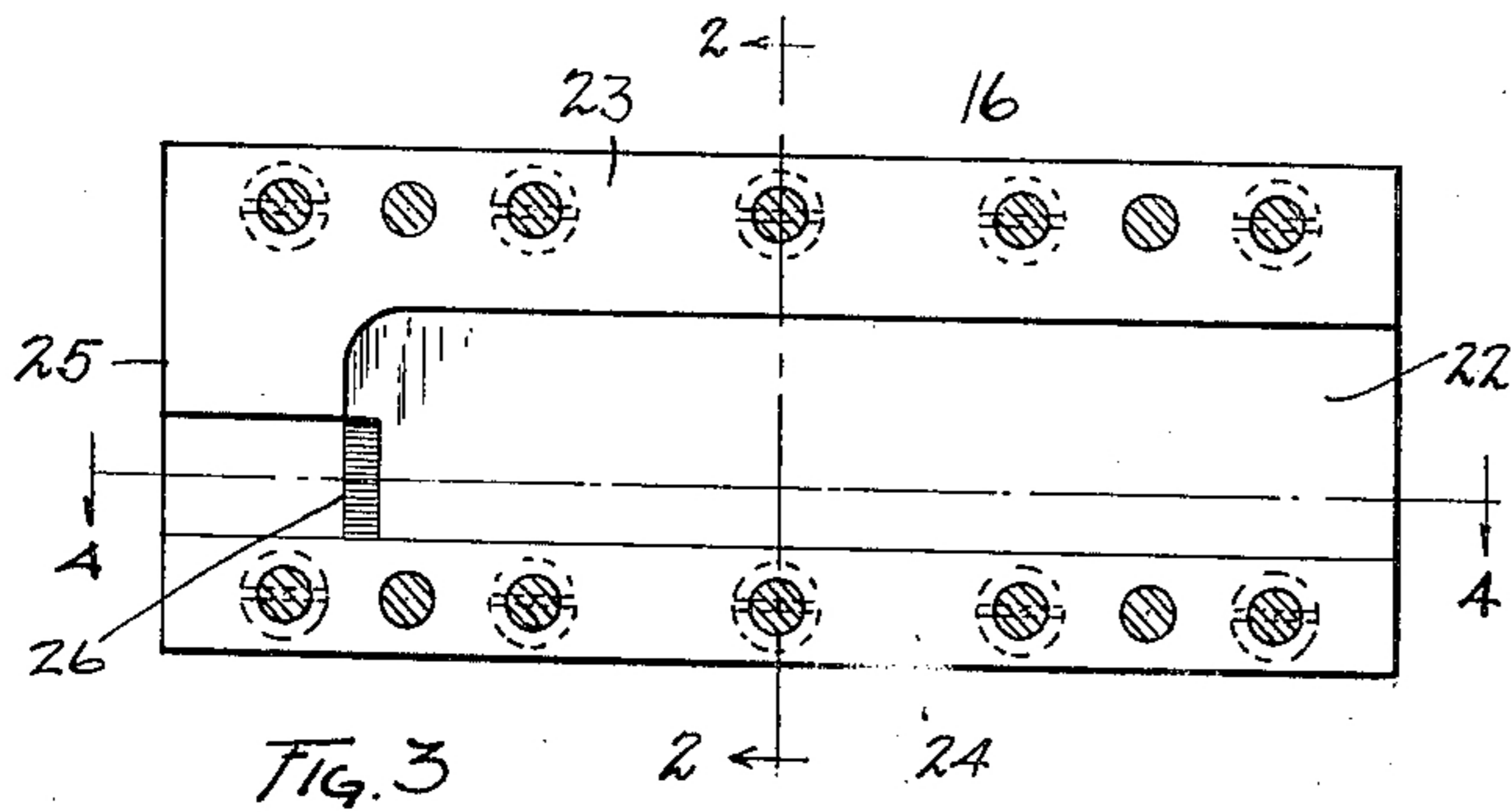
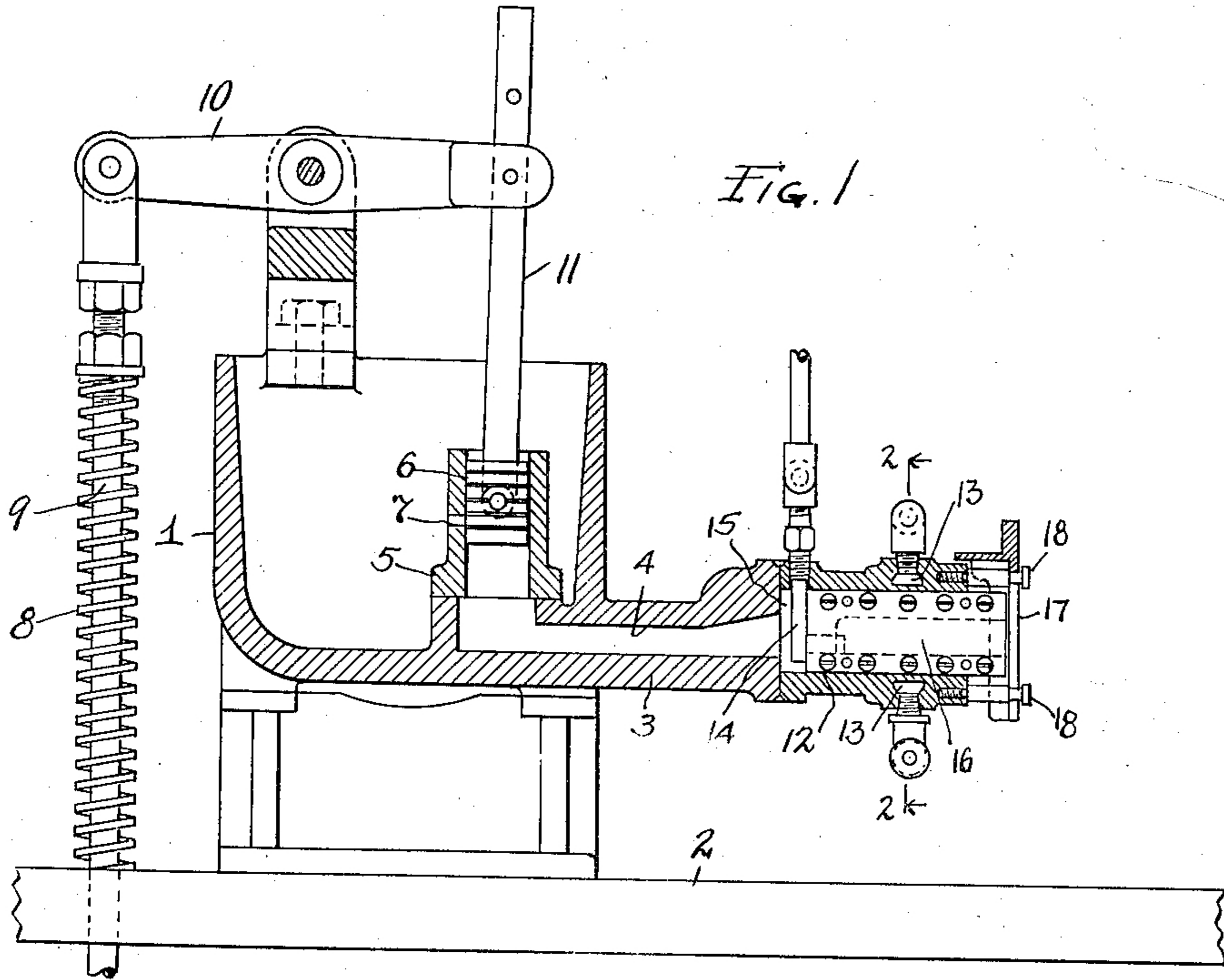
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A. H. HEDLY

STRIP FORMING MECHANISM

Filed Feb. 3, 1922



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UNITED STATES PATENT OFFICE.

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STRIP-FORMING MECHANISM.

Application filed February 3, 1922. Serial No. 533,831.

To all whom it may concern:

Be it known that I, ARTHUR H. HEDLY, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Strip-Forming Mechanism, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present improvements relate, more particularly, to the production of metal strips in the form known in the printing art as rules, leads and the like, such strips being formed directly from a body of molten metal by extrusion through a die. In place of extrusion merely being relied on, a pull may, in addition, be applied to the finished strip as it emerges from the die, or such extrusion and pulling action may be combined.

The object of the present invention is to adapt a strip-forming mechanism of the general type referred to for the production of a plurality of strips simultaneously by drawing or extruding metal directly from a molten body through a corresponding number of appropriately formed die openings.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawing and the following description setting forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—

Fig. 1 is a central longitudinal section through a casting pot with my present improved form of die shown as attached thereto, typical extruding and drawing appliances being illustrated in connection therewith; Fig. 2 is a transverse section on a somewhat larger scale of such die by itself, the plane of the section being indicated by the line 2—2, Fig. 1 (see also line 2—2 Fig. 3); Fig. 3 is a vertical longitudinal section of a die by itself taken on the plane indicated by the line 3—3, Fig. 2; and Fig. 4 is a horizontal longitu-

dinal section of such die taken on the plane indicated by the line 4—4, Fig. 3.

I am aware that it has heretofore been attempted in the so-called Elrod slug casting machine to simultaneously extrude or draw a plurality of strips through a forming die by simply interposing a thin partition plate in such die so as to form two parallel channels therein, such channels being supplied from a common feed passage. I have found, however, that in practice such a thin plate is not satisfactory, not only because it is subject to flexure, but also because the conduction of heat away from the opposed faces of the strips being formed is an essential feature in the operation of a device of this sort. I have furthermore found that it is quite essential that the supply of the molten metal to the plural channels thus formed in the mold must be nicely controlled in order to insure the production of a strip on each side of such partition that will be clear of imperfections, and to avoid danger of breakage where a pulling strain is imposed on the strips in order to draw same through the die.

As indicated above, the main features of the mechanism illustrated in Fig. 1 are to be regarded as of typical construction, so far as the present invention is concerned. Thus the casting pot 1 is supported on a suitable bed 2 and is adapted to be heated by gas burners and the like (not shown), whereby the metal in said pot may be maintained in a proper molten condition. Leading horizontally from one side of the pot is a spout or nozzle 3 formed with a channel or passage 4 that communicates with the lower end of the pump cylinder 5. In the latter is reciprocally mounted a piston 6 that when elevated sufficiently permits molten metal to flow into said cylinder and thus into passage 4 through an opening 7. This piston is normally urged downwardly by means of a compression spring 8 surrounding a rod 9 that is in turn connected through a lever 10 and rod 11 with said piston. Suitable actuating mechanism, (not shown) periodically pulls down the rod 9 so as to raise piston 6 and then allow the latter to descend under the impulsion of spring 8.

Attached to the outer end of spout or nozzle 3 is a housing 12 that is provided with water circulating passages 13, as need

not be described in detail, also with an oil supply duct 14 that extends downwardly to a point near the bottom of the rear end of the opening 15 in said housing that forms a continuation of channel 4 in the spout. The die 16 of present interest is of rectangular cross-section and closely fits this opening 15, which is of corresponding cross-section, being held in place therein by simply allowing a small quantity of molten metal to enter such opening and then solidify or freeze in the space left over between the die and the walls of the opening. A guard plate 17, removably attached to pins 18 projecting from the front end of the housing is employed to prevent the accidental dislodgment of the die, should such metal not be sufficiently frozen at any stage in the operation of the mechanism.

The die 16, as shown in detail in Figs. 2, 3 and 4, comprises two similar side plates 20 and 21 and a partition plate 22, all having flat faces, the inwardly directed faces of the side plates being spaced a proper distance from said partition plate to form strips of the desired length by means of liners 23, 23 and 24, 24 that extend longitudinally throughout the entire extent of the die, the parts just described being firmly secured together by means of suitable dowels and screws, as shown. It will be observed that the partition plate is of substantial thickness, approximating, in fact, the thickness of the side plates,—they should be at least something more than half as thick as the latter, the relative dimensions being ascertainable from the drawings by noting the fact that the die there illustrated is designed for the forming of a strip of two-point thickness. It will be understood that the liners 23 and 24 are separated vertically the proper distance to produce a strip of the desired height or width in contradistinction to thickness, and it will further be noted that the rear end 25 of each of said liners 23, (see Fig. 3) projects downwardly to form a partial closure for the rear end of the corresponding passage in the mold.

The partition plate 22 is recessed or cut away at its rear end so as to leave the port opening in the die of full width up to the point where such depending ends 25 of plates 23 extend, and the inner wall 26 of such recess is beveled on its opposite sides so as to form an angle of approximately 60 degrees, (see Fig. 4).

The operation of the die, as just described, should be readily apparent from the foregoing description. The molten metal enters the port opening from the passage 4 in spout 3 at the proper temperature and under suitable pressure, produced in the construction of pot illustrated by the action of pump plunger 6. The beveled edge 26 of partition plate 22 causes the metal to fill both cham-

bers in the die equally, such metal rising so as to entirely fill said chambers, and continuing in molten condition to a point approximately adjacent the cooling passages 13 in the housing 12. From such point on, the metal is in the form of a solidified strip capable of withstanding pulling action if it be desired to apply a pulling or drawing device to the strips at a point beyond the exit end of the die. Where the pressure on the molten metal in passage 4 is applied by an intermittently operating piston, such pulling device is preferably intermittent in its action, but inasmuch as this portion of the mechanism forms no part of the present invention it has not been deemed necessary to illustrate same. While only a twin die, i. e., one having two passages is illustrated and described, it will be understood that a die may be constructed with more than two passages, and so capable of simultaneously forming three or more strips, in accordance with the principle of the present invention.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In mechanism of the character described, a forming die having a plurality of parallel channels whereby a corresponding number of strips may be simultaneously formed, such channels being partially closed off at the port end of the die and the partition therebetween being recessed to leave the port opening of full width.

2. In mechanism of the character described, a forming die having a plurality of parallel channels whereby a corresponding number of strips may be simultaneously formed, such channels being partially closed off at the port end of the die and the partition therebetween being recessed to leave the port opening of full width, and having the inner wall of such recess beveled on its opposite sides.

3. In mechanism of the character described, a forming die having a plurality of parallel channels whereby a corresponding number of strips may be simultaneously formed, such channels being partially closed off at the port end of the die and the partition therebetween being recessed to leave the port opening of full width, and having the inner wall of such recess beveled on its opposite sides, so as to form an angle of approximately 60°.

4. In mechanism of the character described, a forming die having a plurality of parallel channels whereby a corresponding number of strips may be simultaneously

formed, said die comprising two side-plates, a partition plate, and a pair of liners between said side-plates and each side of said partition plates, whereby such channels are provided, 5 the rear ends of the upper liners depending so as to partially close off the port ends of such channels and the corresponding end of said partition plate being recessed below such depending liner portions so as to leave the 10 port opening of full width.

5. In mechanism of the character described, a forming die having a plurality of parallel channels whereby a corresponding number of strips may be simultaneously 15 formed, said die comprising two side-plates,

a partition plate, and a pair of liners between said side-plates and each side of said partition plates, whereby such channels are provided, the rear ends of the upper liners depending so as to partially close off the port 20 ends of such channels and the corresponding end of said partition plate being recessed below such depending liner portions so as to leave the port opening of full width, the 25 inner wall of the recess in said partition plate being beveled on its opposite sides.

Signed by me this 31st day of January, 1922.

ARTHUR H. HEDLY.