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CLAMP-ON RADIATION FIN  
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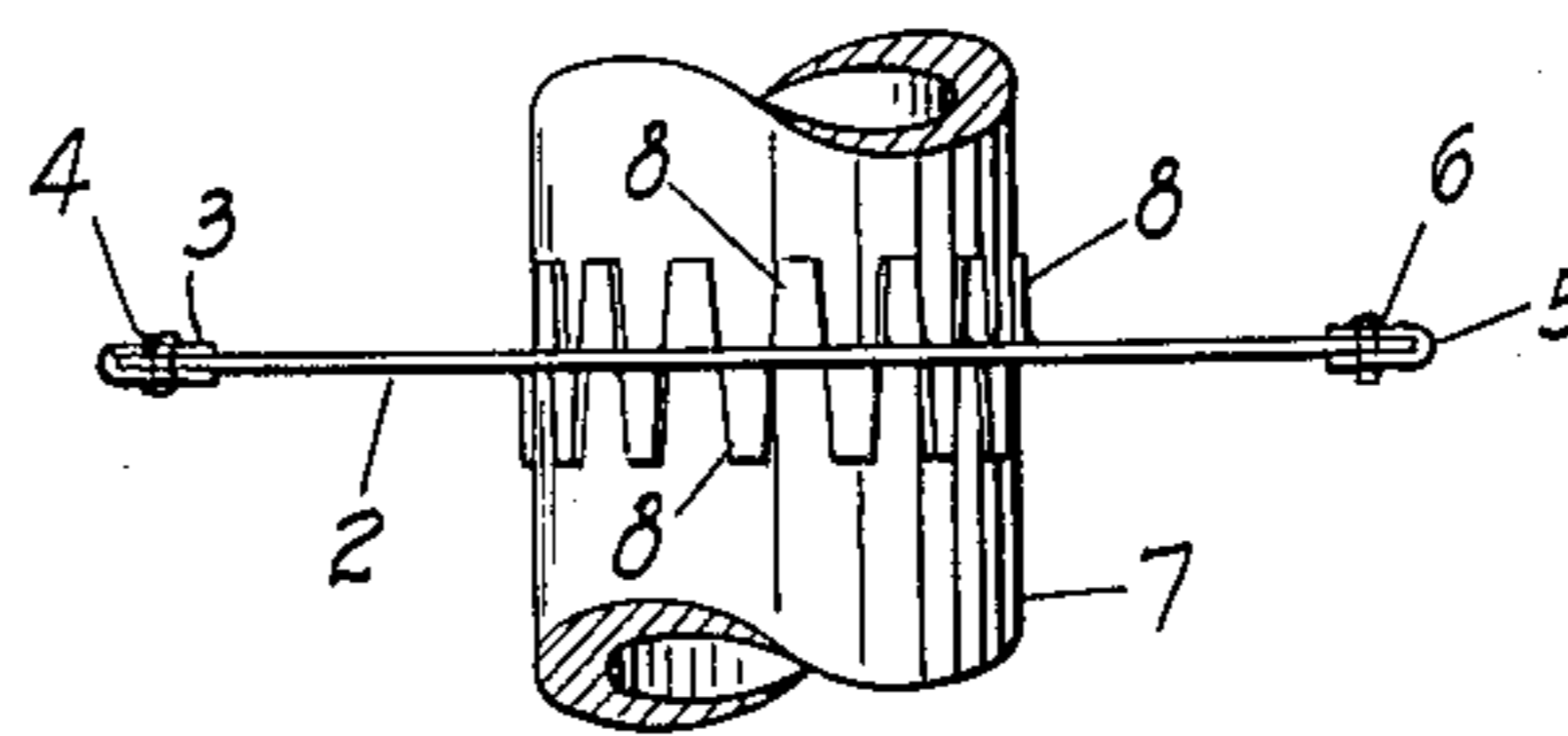
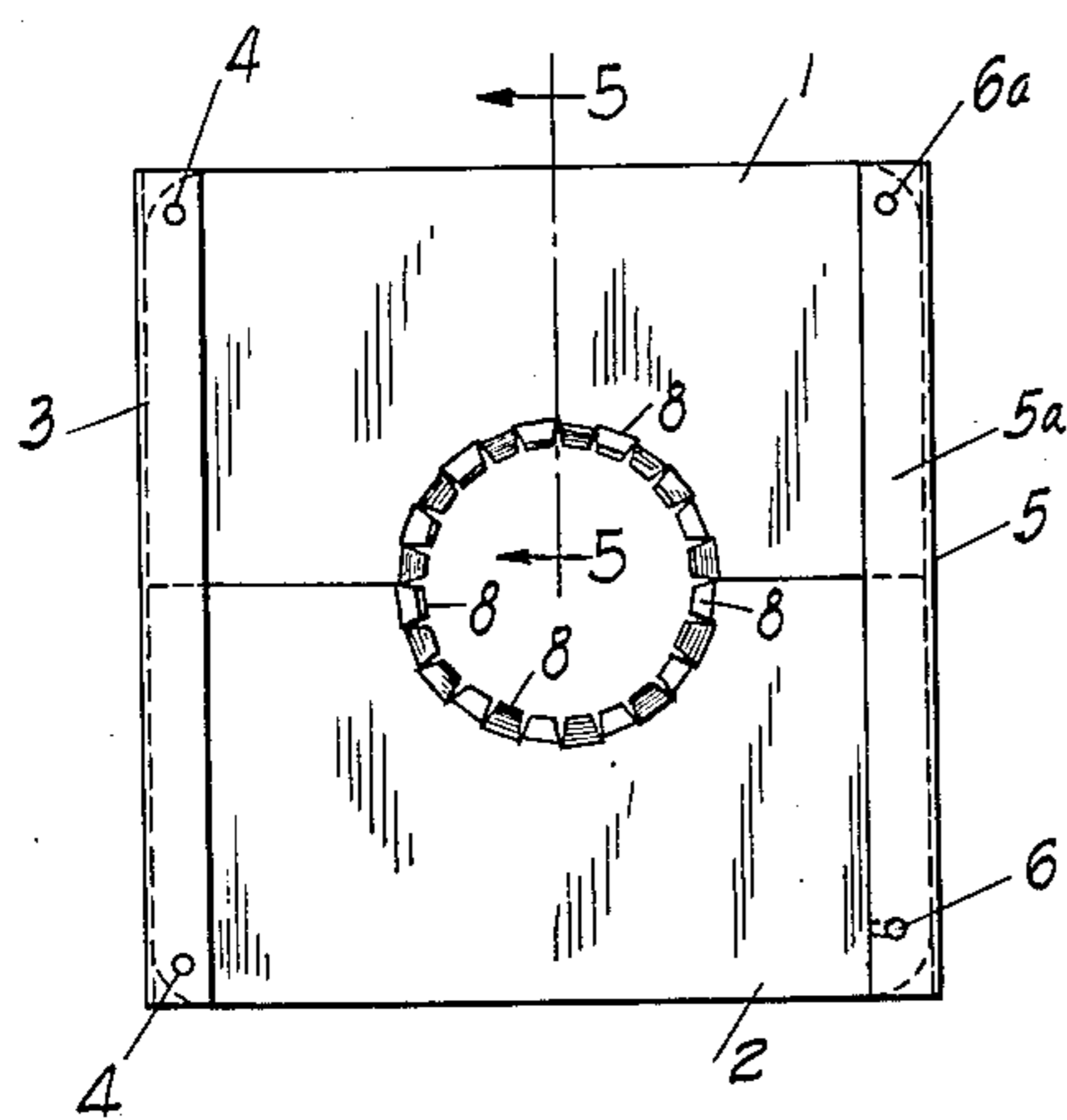
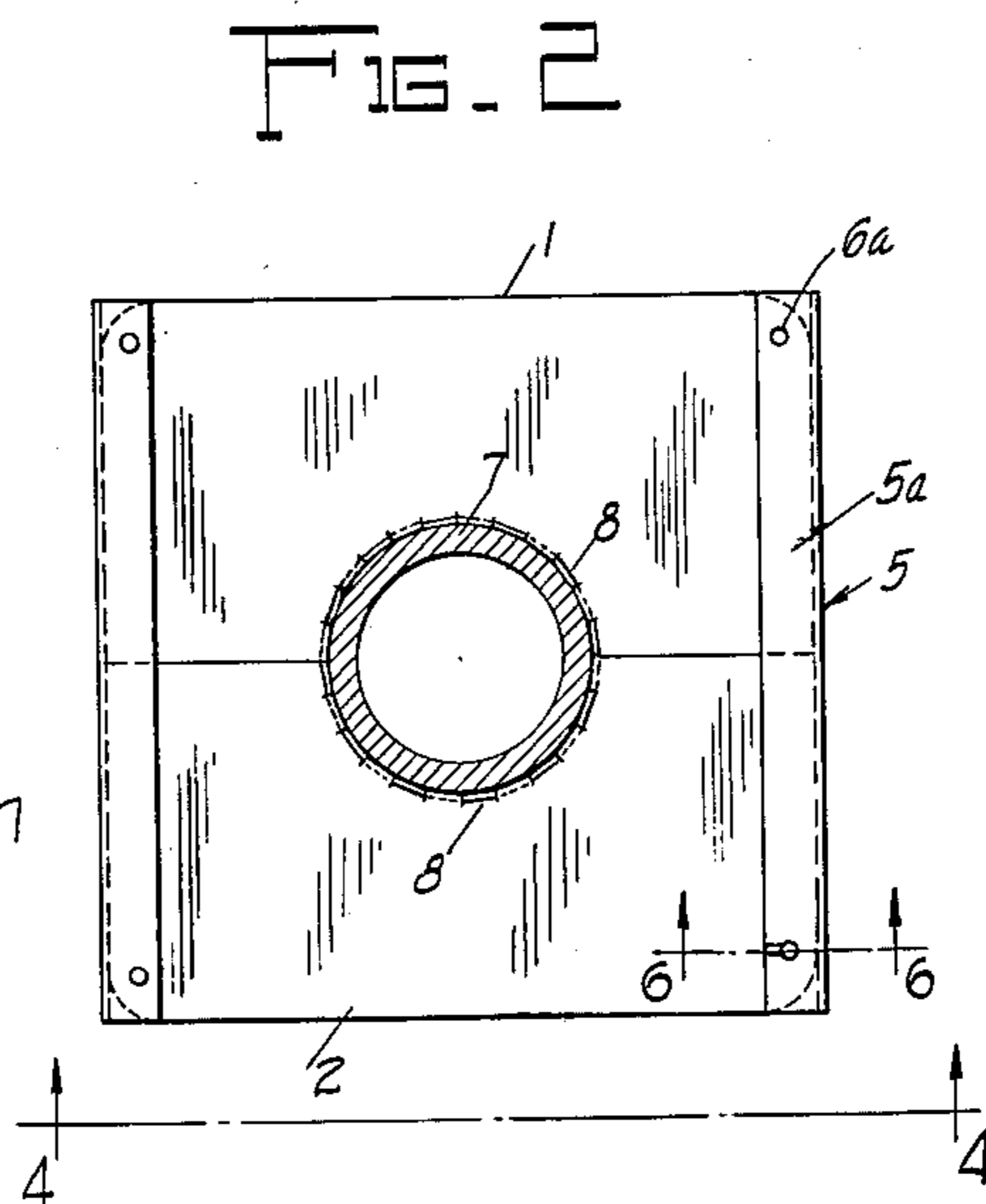
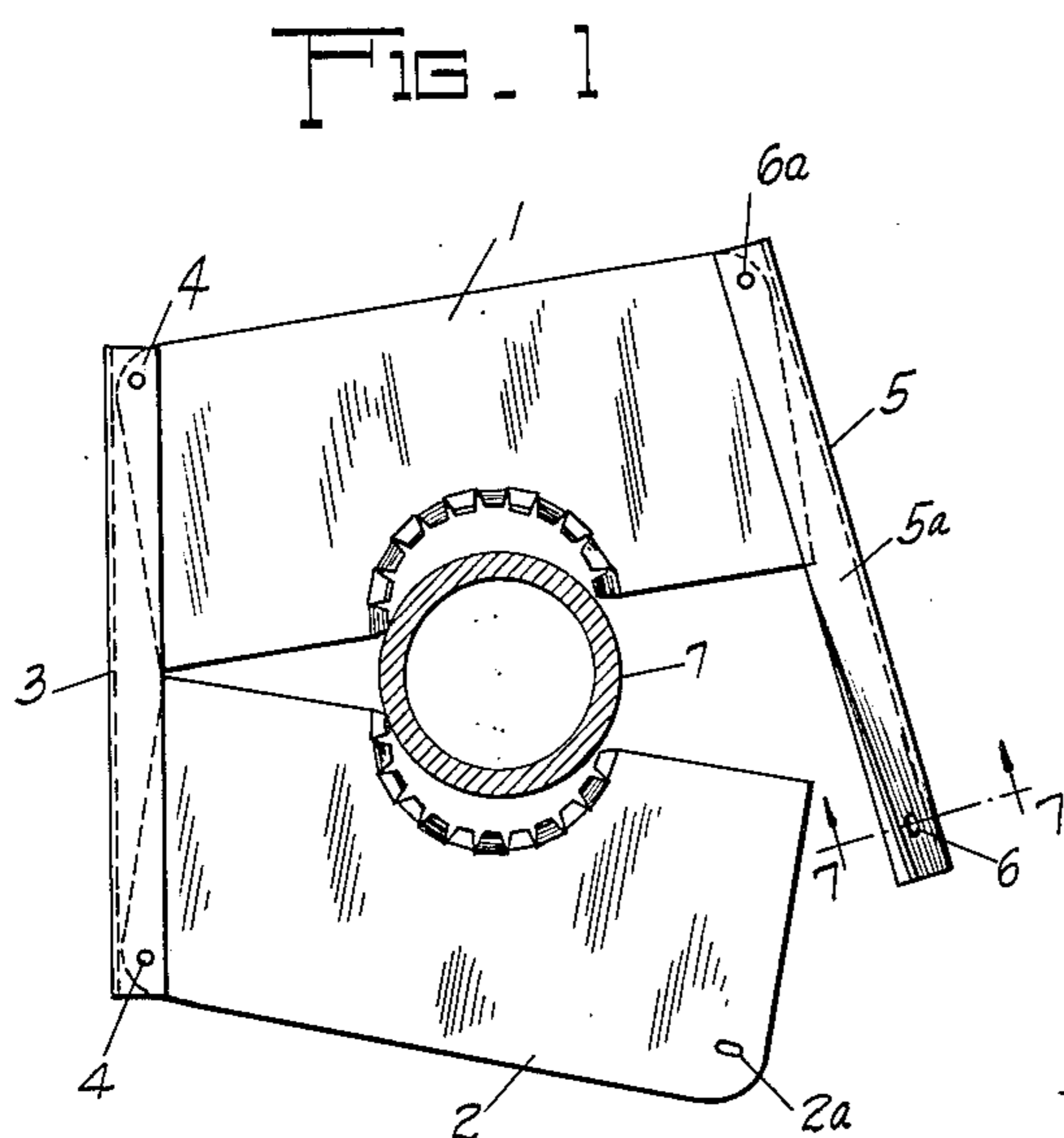


FIG. 4

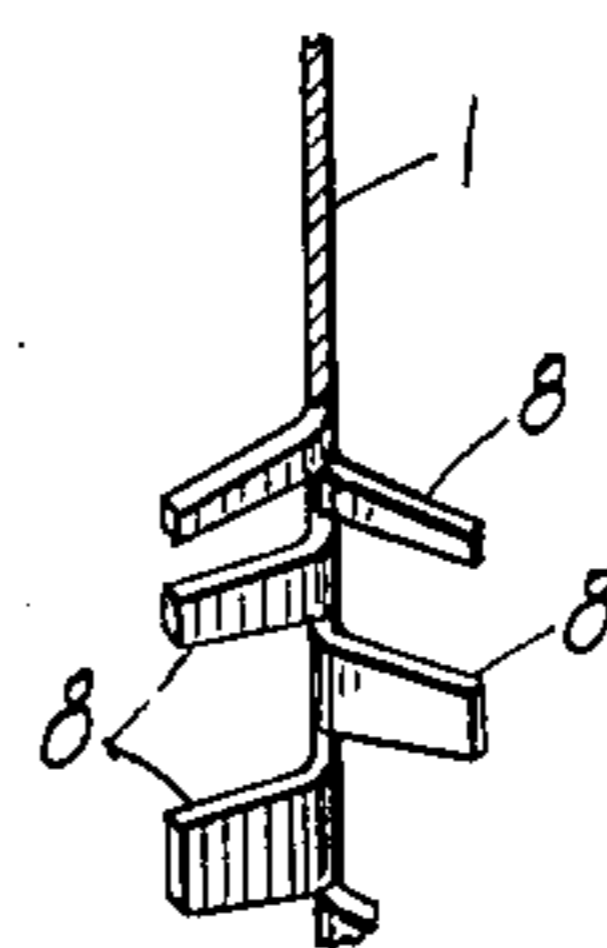


FIG. 5

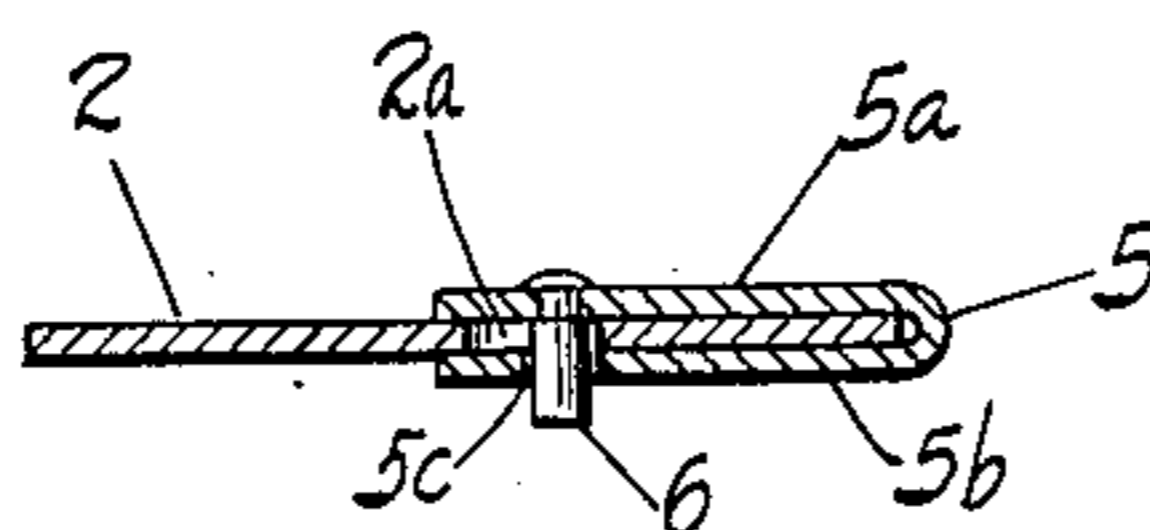


FIG. 6

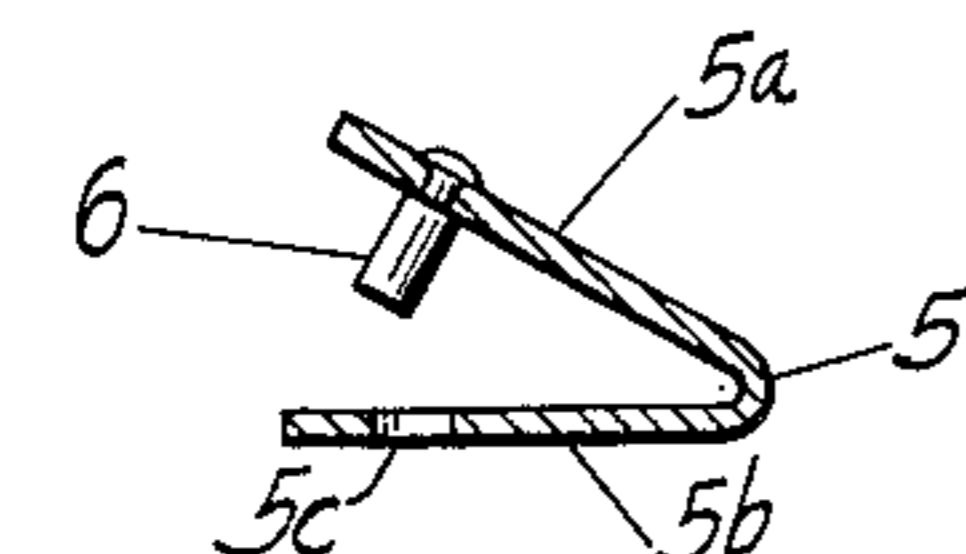


FIG. 7

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## UNITED STATES PATENT OFFICE

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## CLAMP-ON RADIATION FIN

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2 Claims. (Cl. 257—262.16)

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My invention pertains to the art of heating by extended surfaces, and particularly involves improvements in radiation fins for fluid or liquid conducting tubes or conduits for facilitating dissipation or absorption of heat.

It has heretofore been proposed in this art to provide upon heating tubes, separate fins suitably united thereto in heat conduction connection thereto, and of a number, size and spacing determined by the amount of radiation desired or required. My invention embodies a novel type of clamp-on fin or fin unit of the last mentioned class and comprising a sectional form of fin adapted to surround the tube with which it is to be used, the sections being readily separable to enable quick attachment facility, and locking provisions being made to prevent unauthorized displacement of the fin once it is in position on the tube or pipe.

A special feature of novelty of my new fin lies in the provision of certain tube contacting projections integrally struck from the fin at the portions thereof most adjacent to the tube for engaging the latter to provide a relatively large amount of tube engaging area to afford a high rate of heat conduction between the tube and fin under service conditions.

In the accompanying drawings I disclose a preferred form of the invention hereof, but details of the construction shown may be modified in accordance with the claims forming a part of this specification.

In said drawings:

Figure 1 is a view showing a heating tube in cross-section, and illustrating the clamp-on fin or fin unit of my invention arranged in position ready to be finally locked in clamping and in proper engaging relation to the said tube.

Figure 2 is a view similar to Figure 1 but showing the fin as when finally clamped and locked onto the tube surrounding the same with the heat conduction projections flattened in proper conduction relation to the periphery of the tube.

Figure 3 is a view of one of my fins or fin units with the parts thereof in locked relation, preliminary to separation to the positions shown in Figure 1, in which condition the fins may be packed or shipped and are ready for use.

Figure 4 is a view showing one of my fins mounted upon a heating or like tube, the showing being a view taken about on the line 4—4 of Figure 2, looking in the direction of the arrow, the tube being broken away and shown partly in sections.

Figure 5 is a fragmentary detail perspective

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view taken about on the line 5—5 of Figure 3 and bringing out a little more fully the construction of the struck out heat conduction projections which extend laterally from opposite sides of each of the sections of the fin.

Figure 6 is a sectional view taken on the line 6—6 of Figure 2 and bringing out more clearly the pin and opening locking connection between the connecting and locking straps, and one of the fin sections.

Figure 7 is a cross-sectional view taken about on the line 7—7 of Figure 1, bringing out a little more clearly the feature which is illustrated in Figure 6.

Similar reference characters refer to like parts throughout the following description and in the accompanying drawings.

Describing specifically the construction of my fin unit, of the class hereinbefore referred to, it is notable that said unit is comprised of complementary plate sections 1 and 2. These sections are disposed and held in the same general plane by means of, first, a connecting strap 3 which is permanently attached to the sections 1 and 2 by means of pivot pin connections designated 4. The pivot pins 4 are disposed at opposite ends of the connecting strap 3, which strap is of U-form in cross-section, as seen best in Figure 4, with the bridge portion between the sides of the strap 3 outermost so that adjacent edge portions of the sections 1 and 2 may move inwardly and outwardly in relation to the space between the sides of the member 3. The outermost adjacent corner portions of the sections 1 and 2 are the points at which the pivotal connections 4 pass through said members 1 and 2.

Now, in somewhat like form to connecting strap 3 I employ another strap which I call connecting and locking strap 5, also of U-form in cross-section (see Figure 4 and Figures 6 and 7). The connecting and locking strap 5 is pivoted at one end by the pivot pin 6a to the adjacent outer corner portion of the plate section 1.

The pivot pins 4 and the pivot pin 6a provide for permanent pivotal connections between the parts 3, 5 and the plate sections 1 and 2. At the end of the connecting and locking strap 5, opposite that having the pivot pin connection 6a with the plate 1, said member 5 is provided with a lock pin 6 which extends transversely to the U-formation of the member 5 and is attached on the inner surface of the side portion 5a of said member 5. On the opposite side portion 5b of the member 5, and adjacent to the point of mounting of the pin 6 on the side 5a, there is provided an open-

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ing 5c in which the locking pin 6 is adapted to engage and interlock, after said pin passes through a slotted opening 2a in the outer corner portion of the plate 2, adjacent the free end of the connecting and locking strap 5.

In the preliminary condition of the fin unit of my invention, as seen in Figures 1 and 7 primarily, one of the sides of the member 5, notably the side 5a is bent slightly outwardly or divergently from the side 5b at the end portion near the locking pin 6. The adjacent end portion of the plate 2 is adapted to be received between the sides 5a and 5b of the member 5 somewhat similarly to the manner in which the ends of the plates 1 and 2 are adapted to be received between the sides of the connecting strap 3.

Each of the plate sections 1 and 2 of my device is formed with a semi-circular cut-out at its innermost edge portion, the two cut-outs of the members 1 and 2 being complementary and enabling the members 1 and 2 to be engaged around the tube or pipe 7 with the cut-out edge portions in close proximity to said pipe at the outer periphery or surface thereof. The material of the plate members 1 and 2 at the curved cut-out portions thereof, above referred to, is formed with radial slits and the sections of the metal of each of the members 1 and 2 by reason of the provision of said slits are bent alternately in opposite directions after the manner shown in Figures 1, 3 and 5, normally approximately at an obtuse angle to the plane of the plate section with which they are integral. The said bent out portions which I designate 8 in the drawings are adapted to be presented flatwise to the surface of the tube or pipe 7, in applying the fin unit of the invention to said pipe or tube. Moreover, the said projections 8 are of considerable superficial area so that they will, when pushed against the surface of the tube 7, obtain a considerable amount of surface engagement with the tube enabling them to act as heat conduction projections in a self evident manner.

Now, with the foregoing understanding of the construction of my fin unit in mind, the method of assembling the same upon a tube such as that designated 7 in the drawings, is as follows:

The plate sections 1 and 2 of the fin unit are first separated from the condition in which they are illustrated in Figure 3 as the usual condition of shipment and packing, so as to assume approximately the position of Figure 1 though somewhat wider apart. The tube 7 is thus adapted to be received between the plate sections 1 and 2 by sufficiently separating same and thereafter by the employment of any suitable clamping device, such as a screw clamp for instance, engaged with the free outer edge portions of the members 1 and 2, the latter are forced towards each other in their common plane of the positions thereof, thus bringing the cut-out inner edge portions toward the opposite outer wall portions of the tube 7. Continuing the movement of the members 1 and 2 together will first cause engagement of the outer extremities of the conduction projections 8 with the outer periphery of the tube and then when the inner edges of the members 1 and 2 finally substantially meet one another the projections 8 will have been bent from their angular positions of Figures 5, 1 and 3 to the positions illustrated in Figure 2 in which said projections are disposed substantially at a right angle to the plane of the plate members 1 and 2. When the parts of my fin unit are assembled to the extent of bringing the plate mem-

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bers 1 and 2 together in the manner shown in Figure 2 and in Figure 4, the side surfaces of the projections 8 which are adjacent to the periphery of the tube 7 will be in full flat conduction engagement with the surface of the tube. At such time the connecting and locking strap 5 of the fin unit may be shifted from the position in which it is shown in Figure 1 to the position in which it is shown in Figure 2 until the free end portion of the member 5 receives between its side portions 5a and 5b the adjacent end portion of the plate 2. At such time the pin 6 will be disposed in substantially the position of Figure 7 and by using a pair of pliers or any suitable tool, the side portions 5a and 5b may be brought together at the free end of the member 5 so that the pin 6 will pass through the slotted opening 2a in the member 2 and the opening 5c in the side 5b of said member 5. The foregoing represents the condition of the pin unit when it has been finally fully united upon and locked to the tube 7, the interlocking relations of the parts 5a, 2 and 5b, in regard to the action of the locking pin 6 being fully disclosed by the sectional view of Figure 6 of the drawings.

It will be understood, of course, that the number of the pin units 1 that may be applied to a tube 7 of predetermined length will depend upon the amount of extended heat desired to be radiated from the tube 7. In like manner, the above matter will be controlled to a certain extent by the size of the fin units employed, according to well known principles of heat radiation and absorption.

My invention comprises a relatively simple construction of fin unit for the purposes thereof, one which is particularly advantageous in that it may be very quickly applied to a tube or pipe, and should occasion arise, detached therefrom, and one which by proper manipulation in the application thereof to the tube will establish a very desirable heat conduction connection between the body of the fin or fin unit and said tube.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A fin unit for tube radiation purposes, comprising normally connected complementary plate sections of relatively large area disposed in the same plane to form a plate-like fin body and having adjacent cut-out edge portions to fit against opposite portions of a tube to which the unit may be applied, said sections being formed with lateral conduction projections offstanding from the cut-out edge portions and adapted to lie against the side portions of a tube on moving the plate sections together, a connecting strap pivotally connected at its opposite ends to the plate sections at corresponding adjacent ends thereof to normally connect the sections together, and locking means to lock together the opposite corresponding ends of the said sections comprising a connecting strap pivotally attached to one of the sections and having interlocking connection with the other of the sections.

2. A fin unit for tube radiation purposes, comprising normally connected complementary plate sections of relatively large area disposed in the same plane to form a plate-like fin body and having adjacent cut-out edge portions to fit against opposite portions of a tube, said sections being formed with lateral conduction projections offstanding from the cut-out edge portions for close engagement with a tube on moving the plate sections together, and means to hold the sections

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together and maintaining the projections flat against a tube to which the fin unit is applied comprising a connecting strap pivotally connecting the plate sections at corresponding ends thereof, and a strap pivoted to one plate section and having a pin lock connection with the other plate section, said last mentioned strap being disposed at the other corresponding ends of the plate section, each of said above mentioned straps having a body of U-form in cross section to receive therein the adjacent edges of the plate sections.

CASEY DI VINCENZO.

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