

No. 898,172.

PATENTED SEPT. 8, 1908.

W. B. BENNETT.
ANNEALING BOX.
APPLICATION FILED APR. 17, 1908.

2 SHEETS—SHEET 1.

FIG. 1

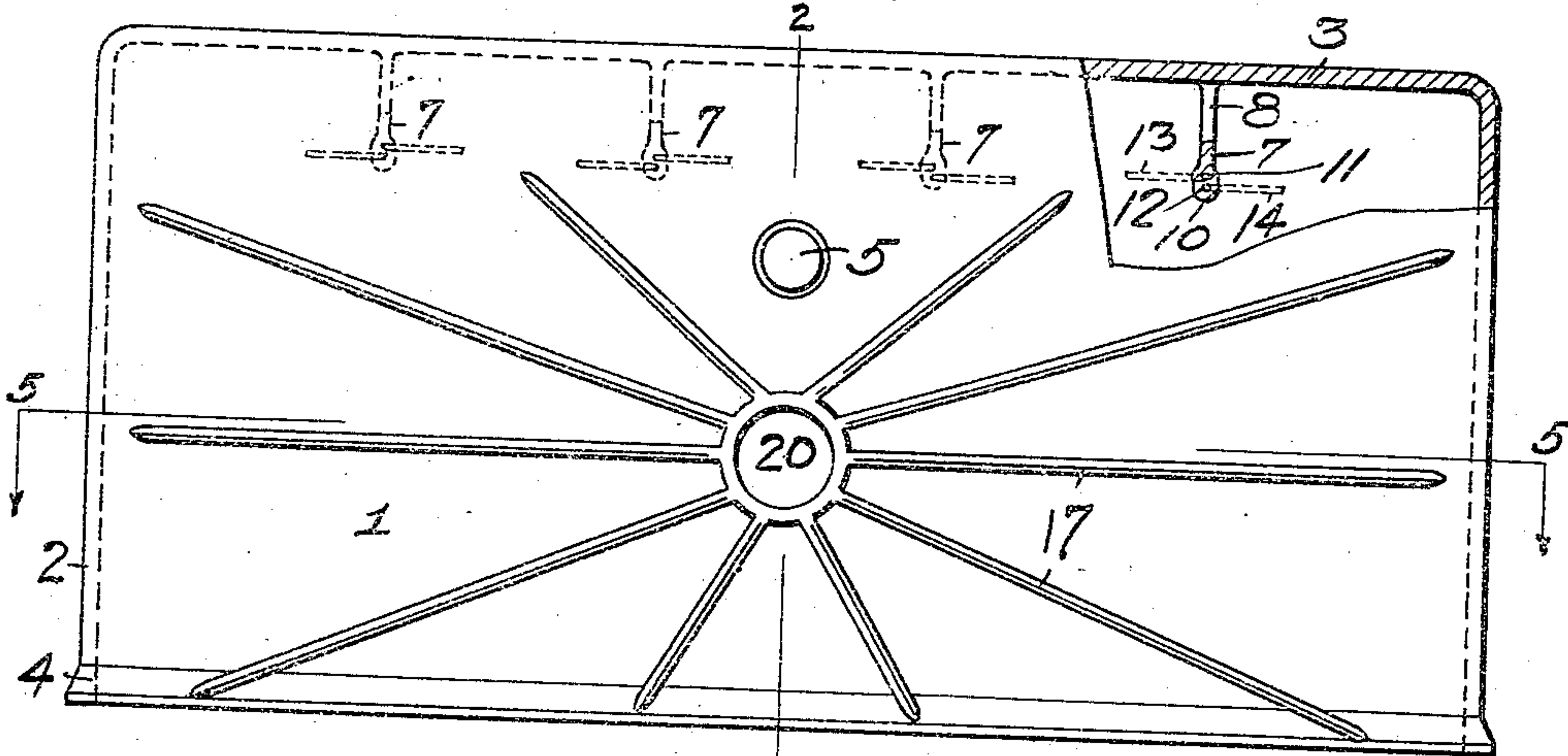


FIG. 5

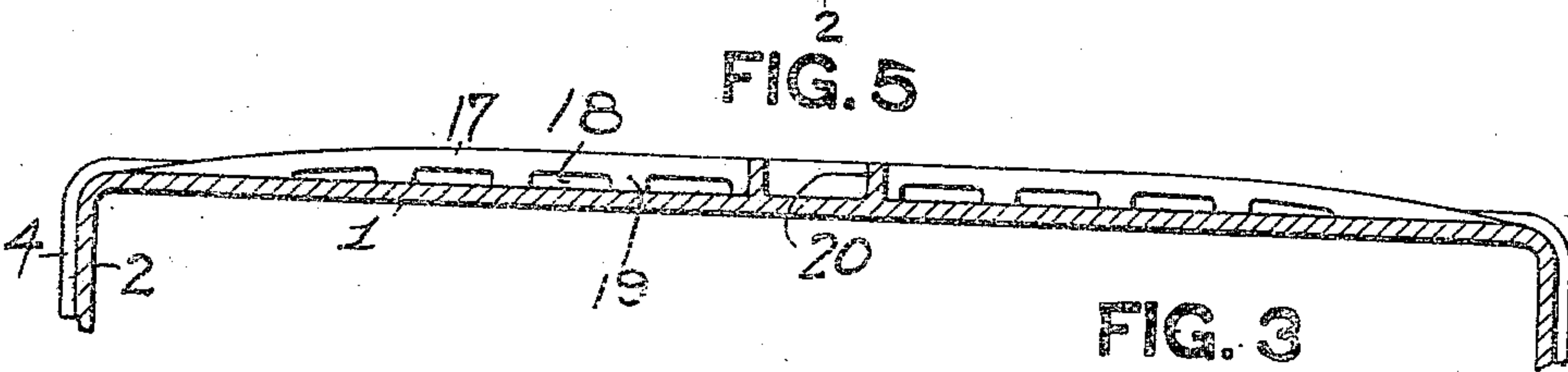


FIG. 3

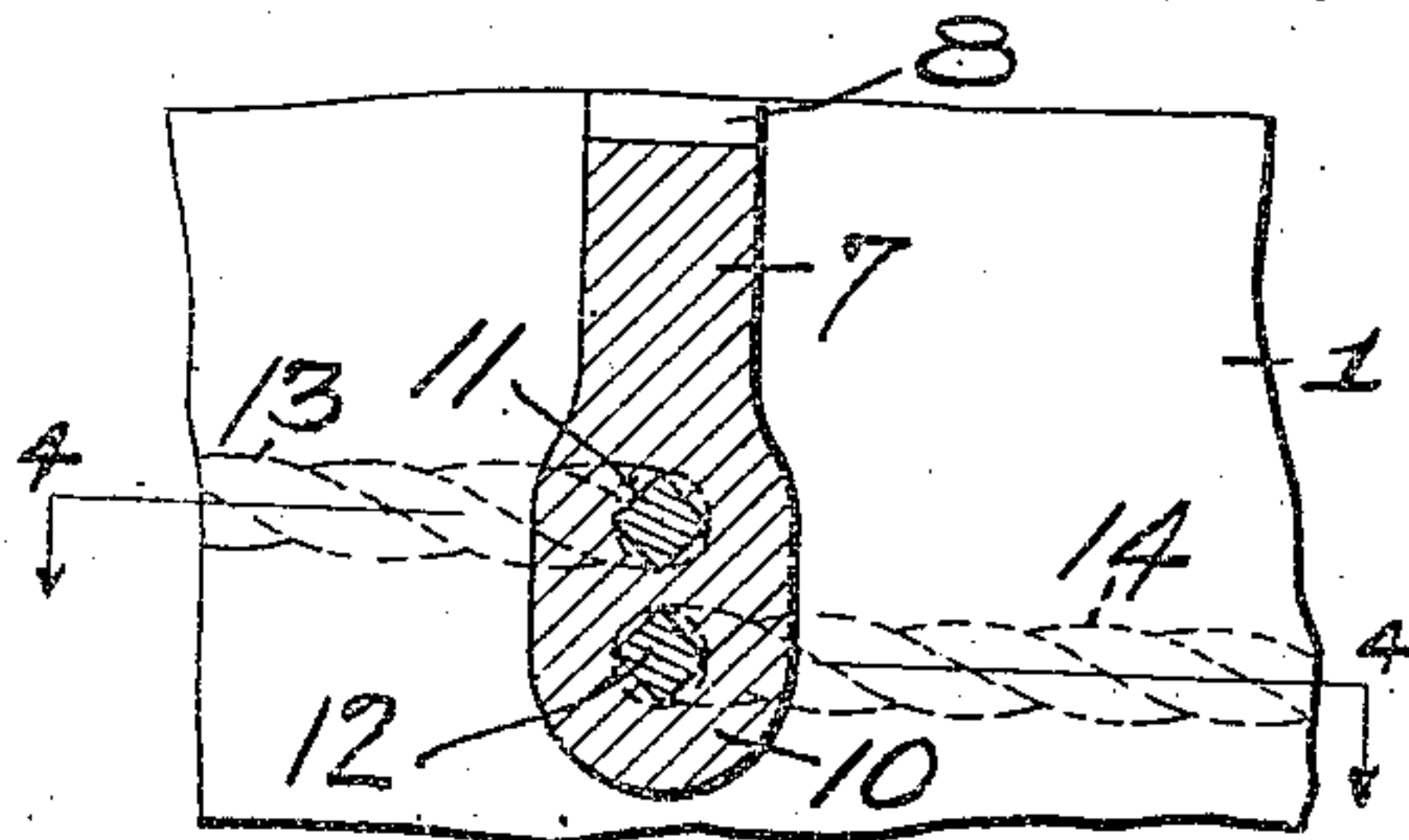


FIG. 2

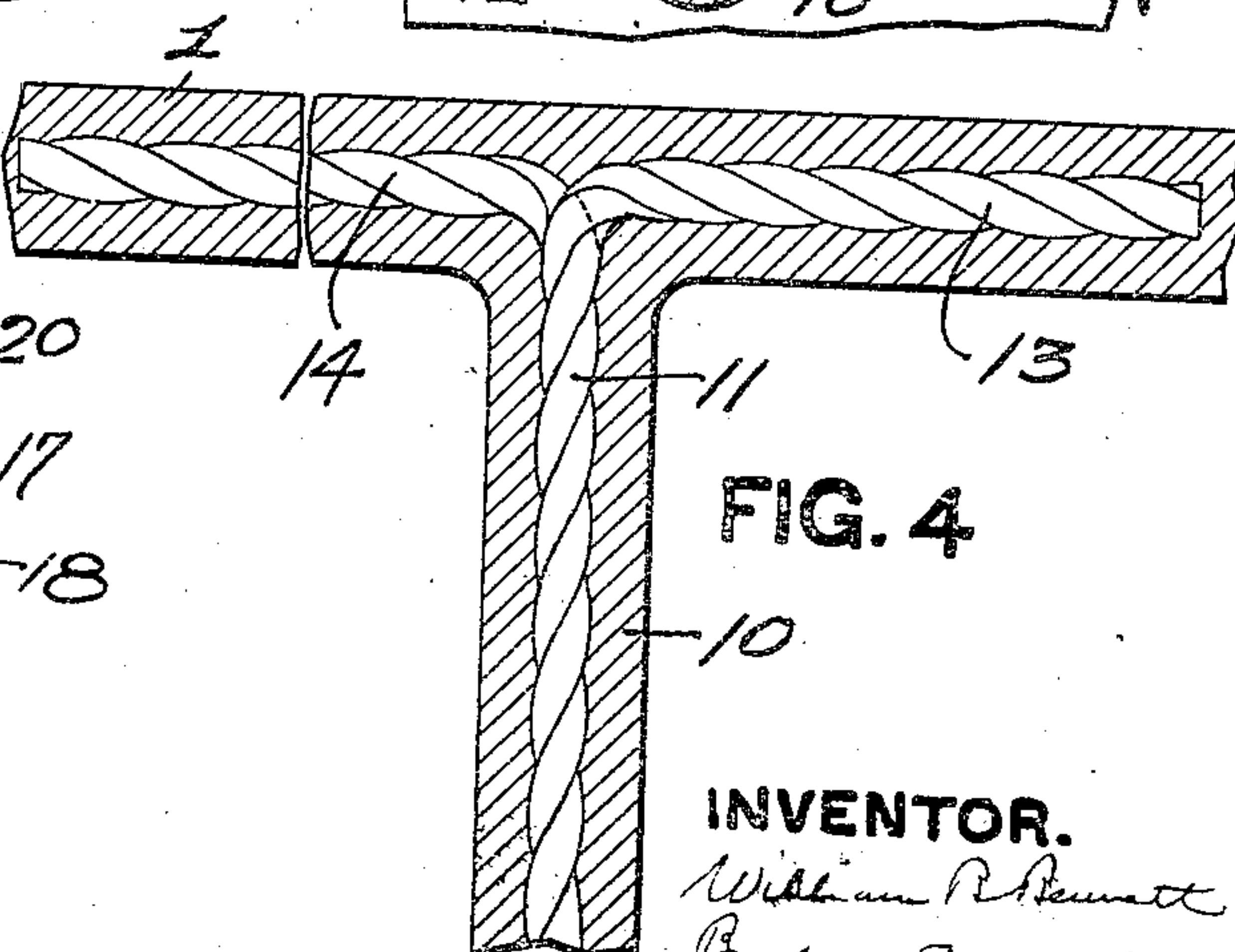
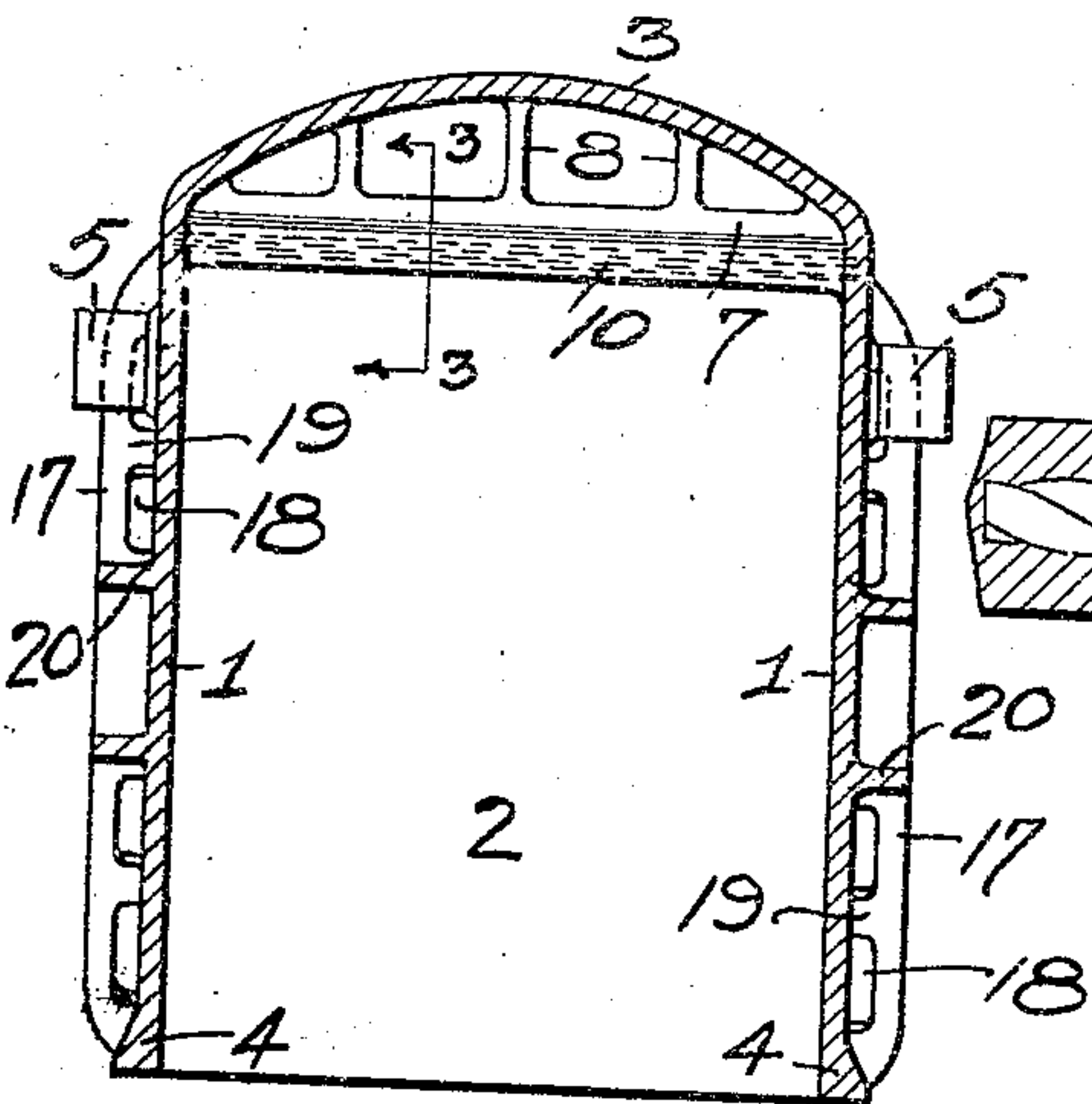


FIG. 4

WITNESSES.

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2 SHEETS—SHEET 2.

FIG. 6

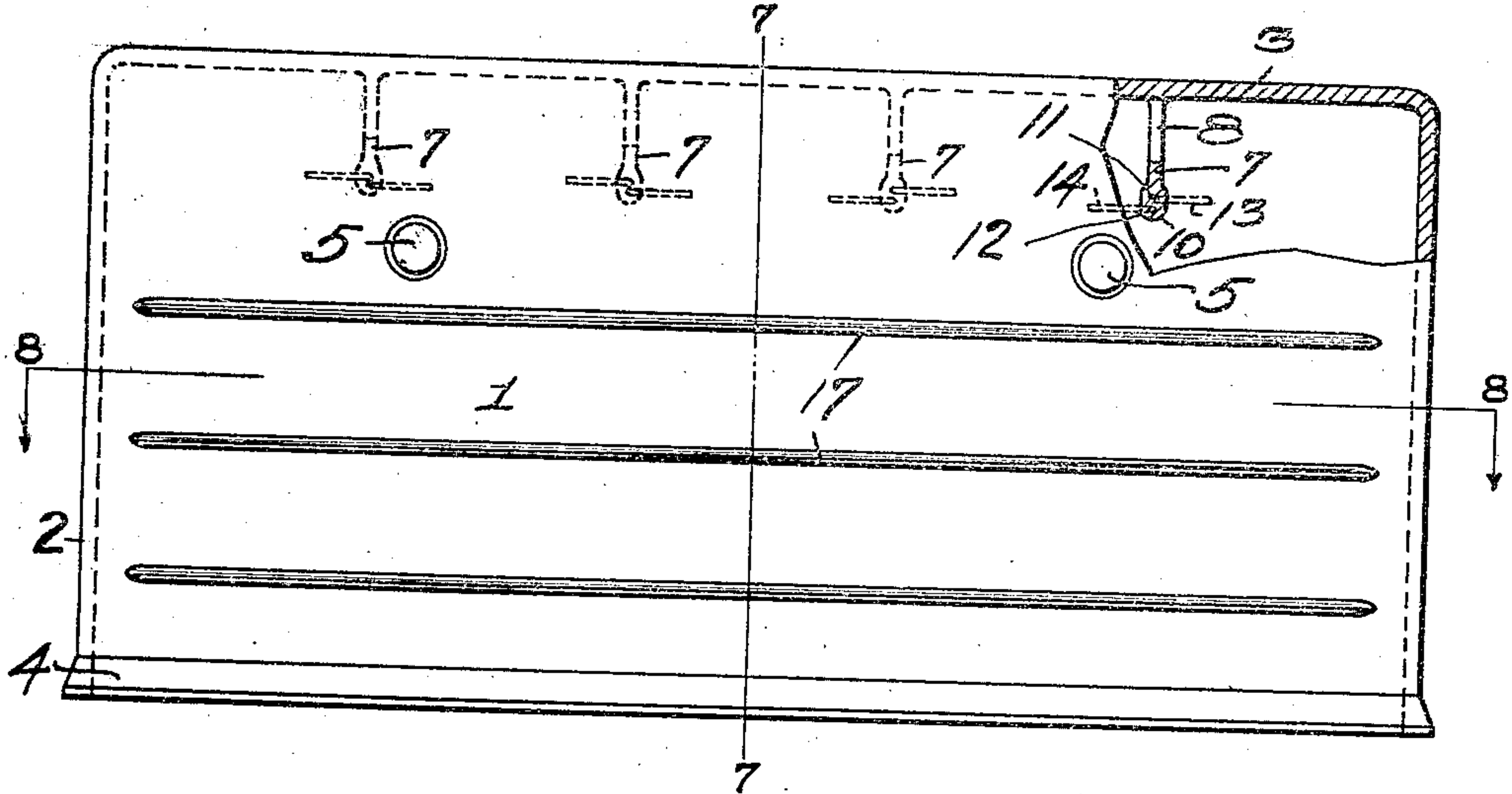


FIG. 8

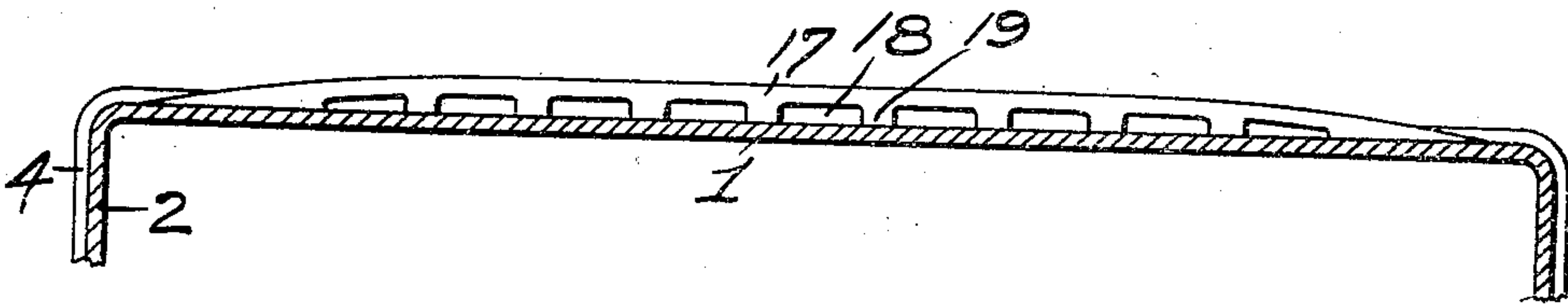
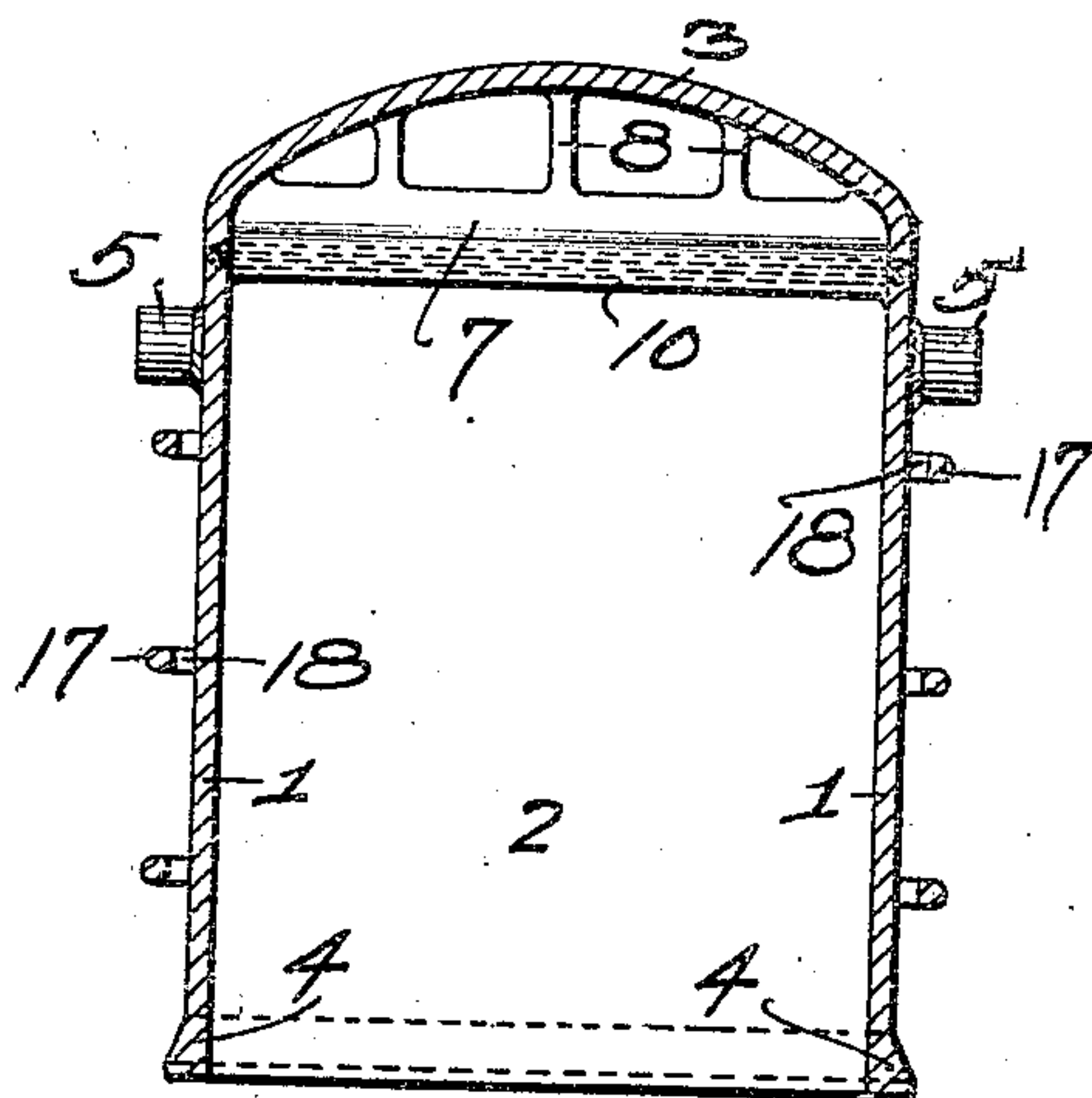


FIG. 7



WITNESSES.

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UNITED STATES PATENT OFFICE.

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OF PENNSYLVANIA.

ANNEALING-BOX.

No. 898,172.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed April 17, 1908. Serial No. 427,613.

To all whom it may concern:

Be it known that I, WILLIAM B. BENNETT, a resident of Ross township, in the county of Allegheny and State of Pennsylvania, have
5 invented a new and useful Improvement in Annealing-Boxes; and I do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to annealing boxes
10 and especially to such boxes formed of cast steel or other cast metal.

The object of the invention is to reinforce and stiffen such boxes to prevent collapse, and especially the walls thereof, so as to in-
15 crease the life thereof.

A further object of the invention is to improve the reinforcing means for the roofs of such boxes.

In my application filed March 6, 1908, Serial No. 419,592, I have shown and de-
20 scribed an integral cast steel annealing box having truss members for supporting the roof to prevent collapse, said truss members being provided with bulbous chords and reinforcing
25 bars embedded therein.

One feature of the invention claimed in this application is to provide another form of reinforcing bar for the roof trusses.

In the use of annealing boxes the long con-
30 tinued softening heats to which the same are subjected not only has a tendency to cause the roof to sag, thereby thrusting the side walls outwardly and causing the box to col-
35 lapse, as described in my application afore- said, and which evil effect is overcome by the roof trusses, but there is also a tendency for the side walls to either bulge outwardly or collapse inwardly. Heretofore annealing
40 boxes have occasionally been provided with vertical strengthening ribs on the side walls, but these have only imperfectly secured the desired result of preventing the side walls from bulging or collapsing.

The principal object of this invention is to
45 prevent such bulging or collapsing of the side walls, this being effected by providing the side walls, preferably exteriorly, with deep ribs or webs which at intervals are cor-
50 nected out so as to substantially form chords with struts connecting the same to the walls, and in the preferred form having said ribs or webs dis-
posed radially so as to lie diagonally on the side walls.

In the accompanying drawings Figure 1 is
55 a side view partly in central vertical longitu-

dinal section of an annealing box embodying the invention; Fig. 2 is a transverse section on the line 2—2, Fig. 1; Fig. 3 is a cross section on an enlarged scale through the tie member or chord of the truss taken on the
60 line 3—3, Fig. 2; Fig. 4 is a detail horizontal section on the line 4—4, Fig. 3; Fig. 5 is a horizontal section through one side wall taken on the line 5—5, Fig. 1; Fig. 6 is a side
65 view partly in section of a box showing a modification; Fig. 7 is a transverse view thereof on the line 7—7, Fig. 6; and Fig. 8 is a horizontal section through one side wall taken on the line 8—8, Fig. 6.

The annealing box shown in the drawings
70 is provided with the usual side walls 1, end walls 2, and arched or curved roof 3, these parts being formed as a single integral casting, and the side and end walls being pro-
75 vided at their bottom edges with the thickened edge portions 4, all as is usual in this type of box. The usual trunnions 5 are provided for lifting the box.

Connecting the side walls near their tops, and substantially at the point where the
80 arched roof springs from said side walls, is a transverse tie member or members 7, the drawings showing four such members in the box illustrated, but the number will vary ac-
85 cording to the length of the box. These tie members are cast integral with the box and are connected to the roof by one or more struts or supports 8, but if desired a web may take the place of the struts. For the sake of
90 lightness, however, the struts are preferred and they form in effect an open web.

The tie members 7 are in effect tension chords of trusses whose top chords are the
95 roof 3 and whose struts are the parts 8. The chords 7 act as tension members to prevent the side walls of the box from bulging out-
wardly, due to the outward thrust of the sag-
100 ging roof. This largely prevents distortion of the box. The same effect would be produced if parts of the roof above the position
of these chords were depressed to form a cross trough with a straight lower edge, which straight portion would form the chord.

The chord 7 on its lower edge is provided
105 with a bulb or thickened portion 10 to give additional strength to this part and prevent the formation of checks and cracks in the cooling of the metal after casting. The
110 bulbs 10 are formed in casting the box by merely giving the pattern the desired shape.

They provide sufficient metal at the lower edge of the chord so that in cooling after casting shrinkage checks or cracks are not likely to occur, the bulk of the metal being sufficient to hold the heat sufficiently long to prevent this.

The box so far described is substantially the same as that shown and described in my application aforesaid. In said application aforesaid, I also showed and described a transverse reinforcing member located in the bulbous portion 10 of the chord 7 and having its ends anchored in the side walls of the box. In the present box I provide for the same purpose two reinforcing bars or members 11 and 12, both embedded in the chord of the truss, one above the other and having their ends bent at right angles and embedded in the side walls of the box. The ends of the two bars are turned in opposite directions, the end of the upper bar being indicated at 13 and that of the lower bar at 14. The two opposite ends of each bar are preferably turned in opposite directions so that each bar is in effect of Z shape. This provides sufficient anchorage by means of reinforcement bars which are very simple and cheap to make, by merely cutting the bar to the desired length and then bending the two end portions at right angles.

The particular bars shown are twisted bars of square cross section so as to be strongly anchored in the metal and prevent slipping therein. These bars are placed in the mold prior to pouring, being supported in any suitable way, and have the metal cast around the same. These reinforcing bars are of wrought metal and of a different character from the metal constituting the chord of the truss, as fully described in my prior application, and have the function of not only providing a strong tension member, but also act to stop any checks or cracks that may develop in the chord in the cooling of the box or in use. Another feature of the box consists in stiffening the side walls. This is done by providing ribs or webs 17 which are comparatively wide and which are cored out at intervals so as to form the open spaces 18 with posts or connecting parts 19 connecting the rib to the side walls. The consequence is that the rib proper forms in effect a chord, while the parts 19 are struts connecting the same to the side wall. It gives an extremely wide flange, so to speak, with a minimum amount of weight. These trussed ribs, as I prefer to call them, may be variously arranged on the walls of the box, either inside or outside, but preferably outside so as not to decrease the piling space in the box.

Figs. 6 to 8 show a simple arrangement wherein the ribs extend horizontally. The preferred arrangement, however, is one in which the ribs, or some of them, have a diagonal disposition, such as shown for instance in

Fig. 1, where the various ribs radiate outwardly from a central ring or annulus 20, located practically centrally of the side walls. If there is a tendency of the side walls to bulging outwardly the ribs act in tension to prevent the same. The tendency of the walls to collapse inwardly puts the chord portions of the ribs in compression, and in the radial arrangement shown in Fig. 1 they exert stress on the ring or annulus 20. The latter being a small ring is very rigid, so that the arrangement shown effectively prevents the walls from either bulging or collapsing.

The box described is exceedingly strong both as to its roof and side walls. It effectively prevents the collapsing of these parts under the long softening heats to which these boxes are subjected and greatly increases the life of such boxes. In fact, a box so constructed can be used without material distortion practically until the metal is burned through.

What I claim is:

1. An annealing box having side and end walls and roof, a chord connecting the side walls near their tops, the side walls being provided with open trusses, all said parts being a single integral casting.
2. An annealing box having side and end walls and roof, the side walls being provided with wide ribs cored out at intervals from the side of the box, all of said parts being a single integral casting.
3. An annealing box having side and end walls and roof, a chord connecting the sides at the roof, and the side walls being provided with wide ribs cored out at intervals, all said parts being a single integral casting.
4. An annealing box having side and end walls and roof, the side walls having thereon diagonally disposed ribs or webs cored out at intervals, all said parts being a single integral casting.
5. An annealing box having side and end walls and roof, the side walls being provided with radially arranged ribs or webs cored out at intervals, all said parts being a single integral casting.
6. An annealing box having side and end walls and roof, the side walls being each provided with an annulus or ring shaped rib and with ribs extending radially thereof, all said parts being a single integral casting.
7. An annealing box having side and end walls and roof, the roof portion being provided with a chord connecting the sides at the roof, and the side walls being provided with ribs or webs cored out at intervals, all said parts being a single integral casting.
8. An annealing box having side and end walls and roof, a transverse tie member connecting the sides at the roof, all said parts being a single integral casting, and a pair of wrought metal reinforcing bars embedded in said tie members and extending into the sides

and having their ends provided with anchoring means embedded in said walls.

9. An annealing box having side and end walls and a roof, a transverse chord extending between the sides at the roof and having a thickened or bulbous lower edge, all said parts being a single integral casting, and wrought metal reinforcing bars embedded in said tie members and extending into the sides and having their ends bent at right angles to provide anchoring means embedded in said sides.

10. An annealing box having side and end walls and roof, a transverse tie member con-

necting the sides at the roof, all said parts being a single integral casting, and a pair of wrought metal reinforcing bars embedded in said tie member and extending into the walls and having their ends bent at right angles, one in one direction and the other in the opposite direction to provide anchoring means embedded in said walls.

In testimony whereof, I the said WILLIAM B. BENNETT have hereunto set my hand.

WILLIAM B. BENNETT.

Witnesses:

F. W. WINTER,

ROBERT C. TOTTEN.