

May 9, 1933.

C. C. SHIPP

1,907,450

RADIATOR VENTILATING UNIT

Filed Nov. 30, 1931

5 Sheets-Sheet 1

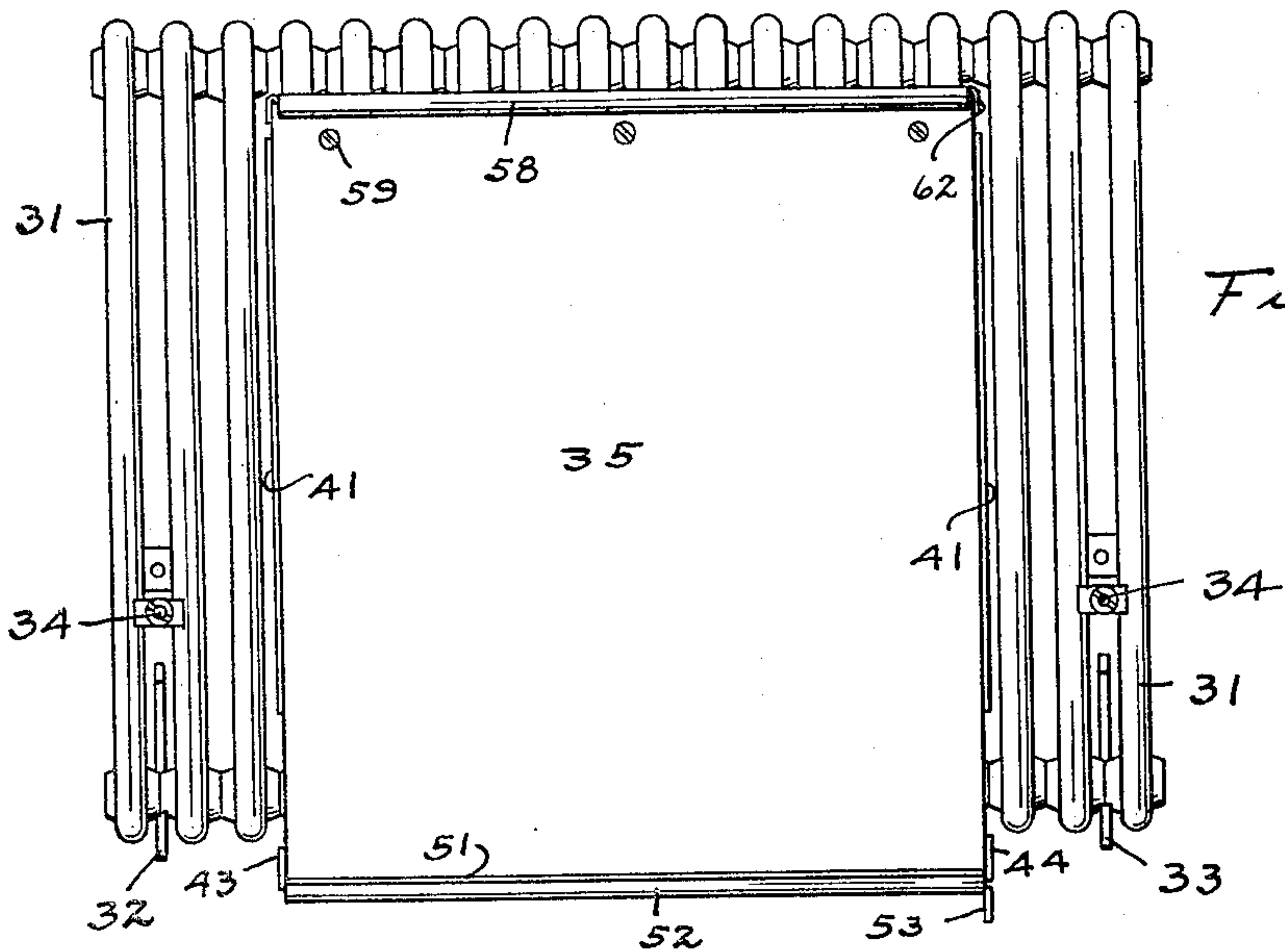


Fig. 1.

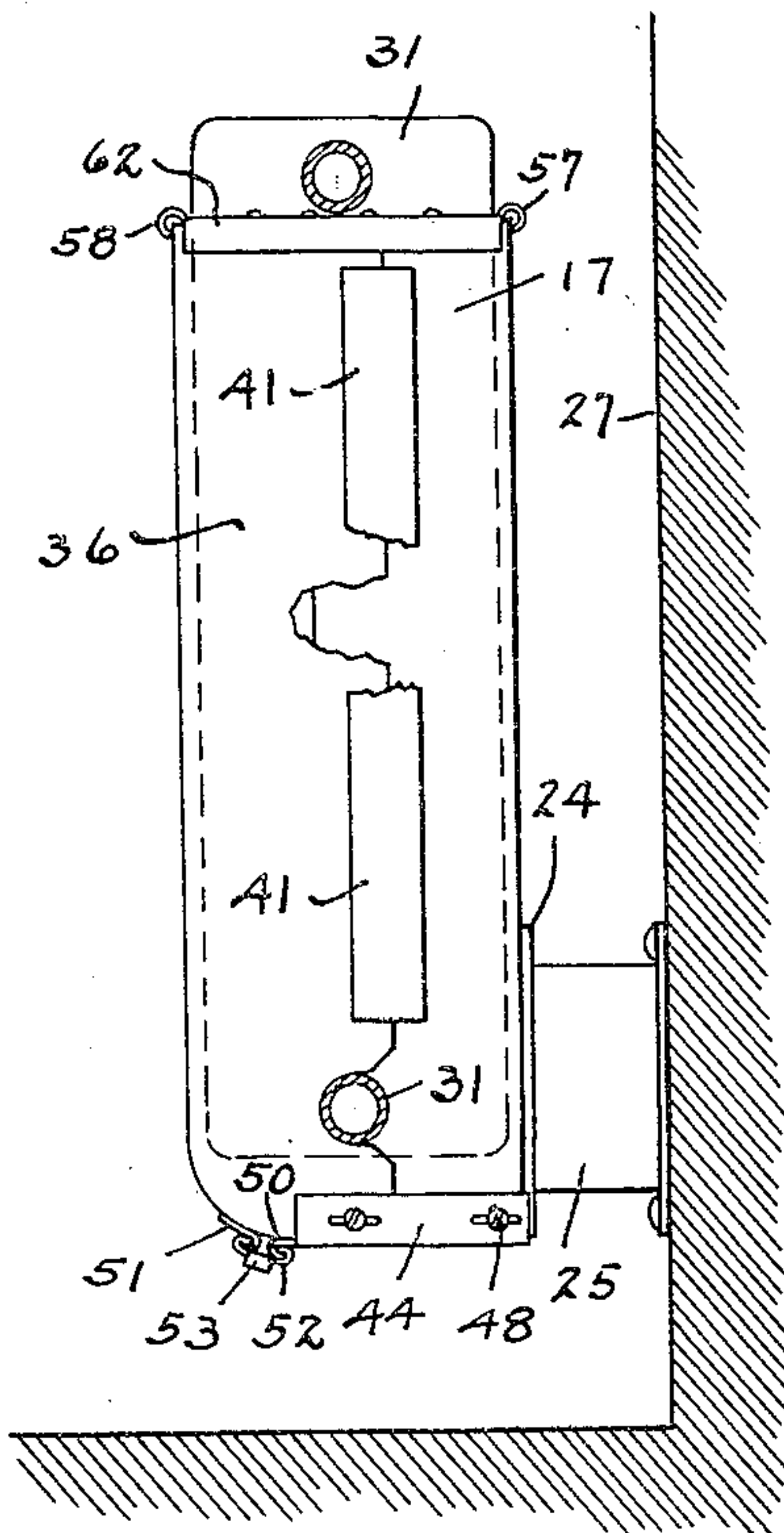


Fig. 2.

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5 Sheets-Sheet 2

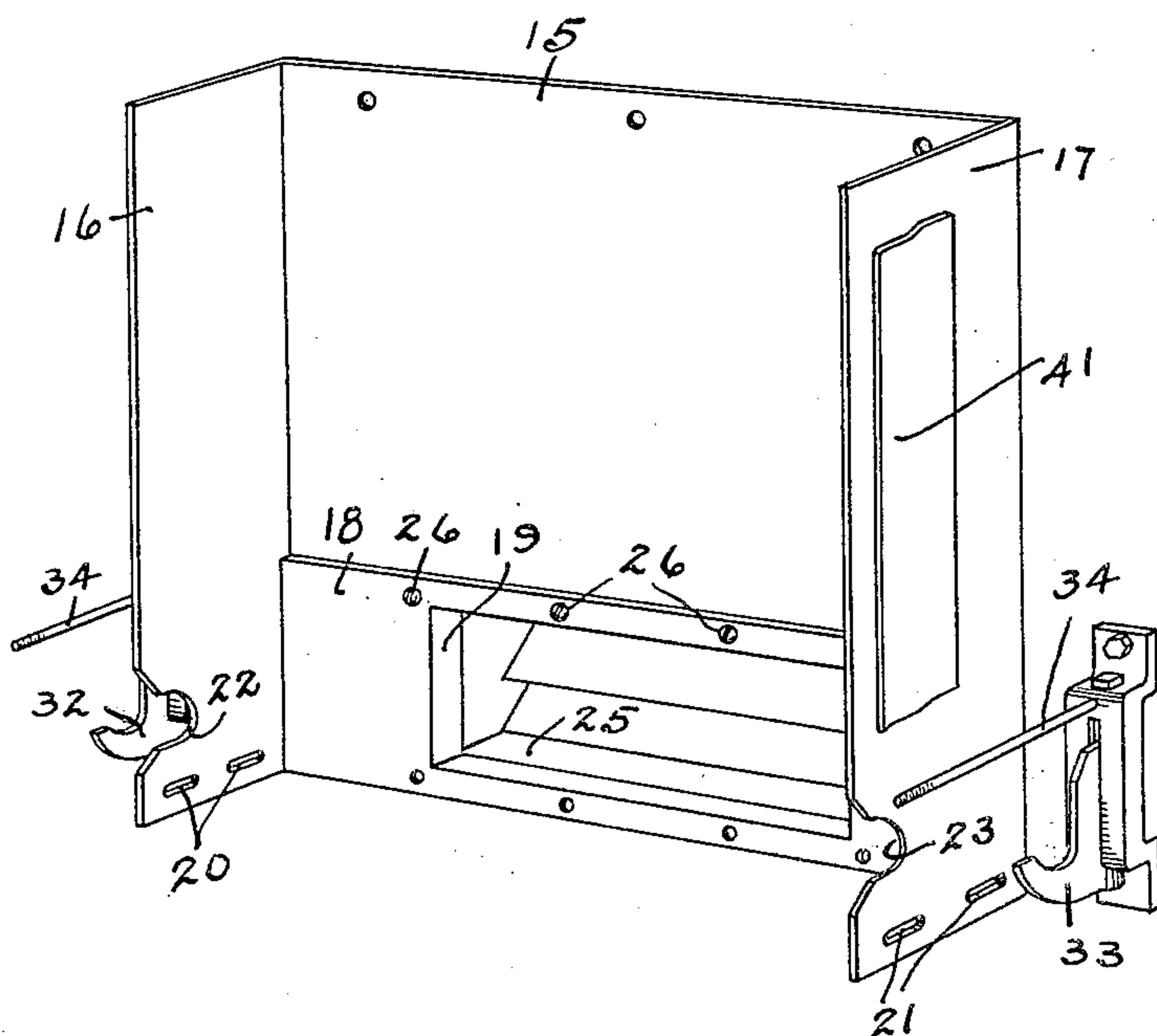


Fig. 3.

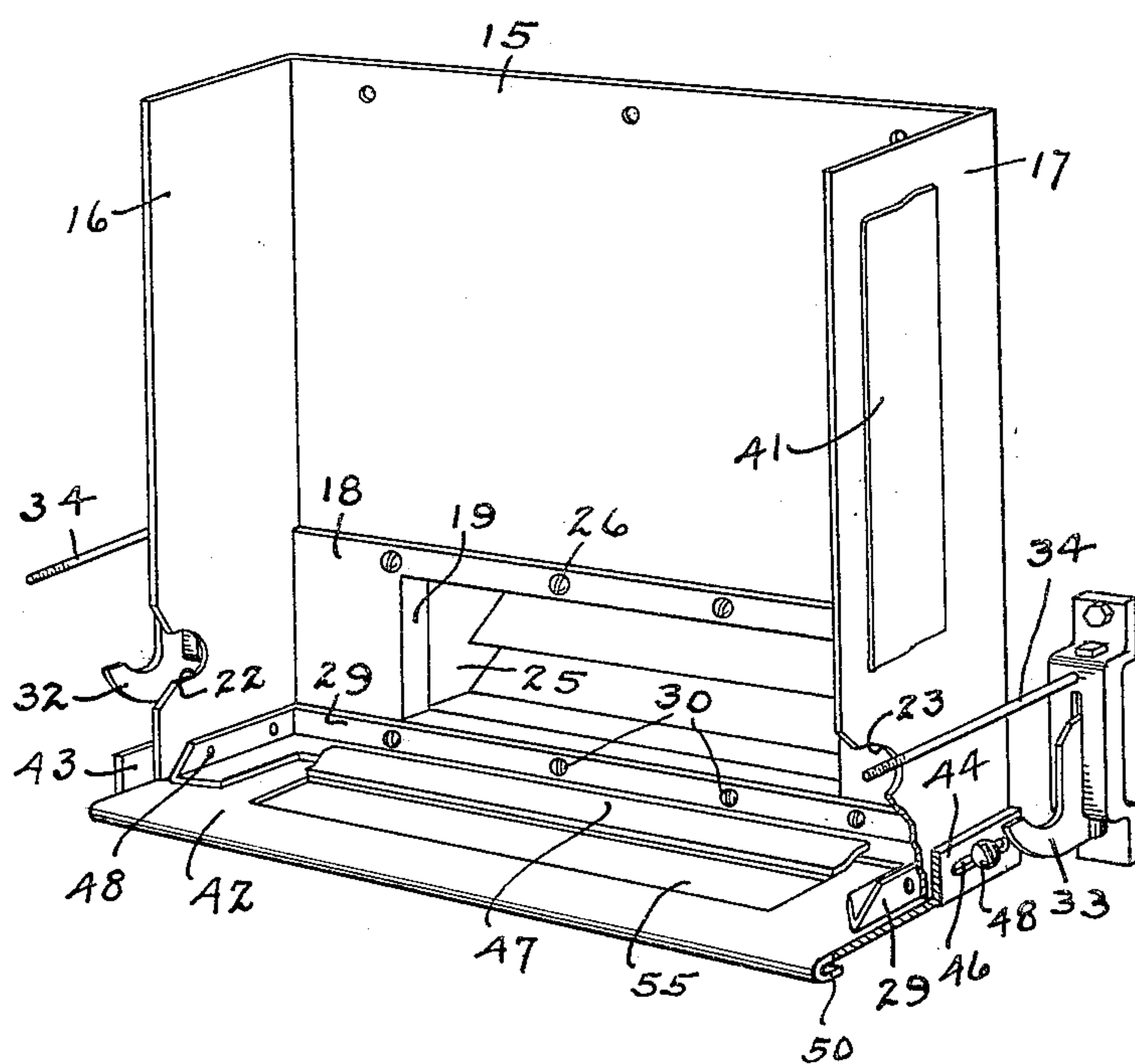


Fig. 4.

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5 Sheets-Sheet 3

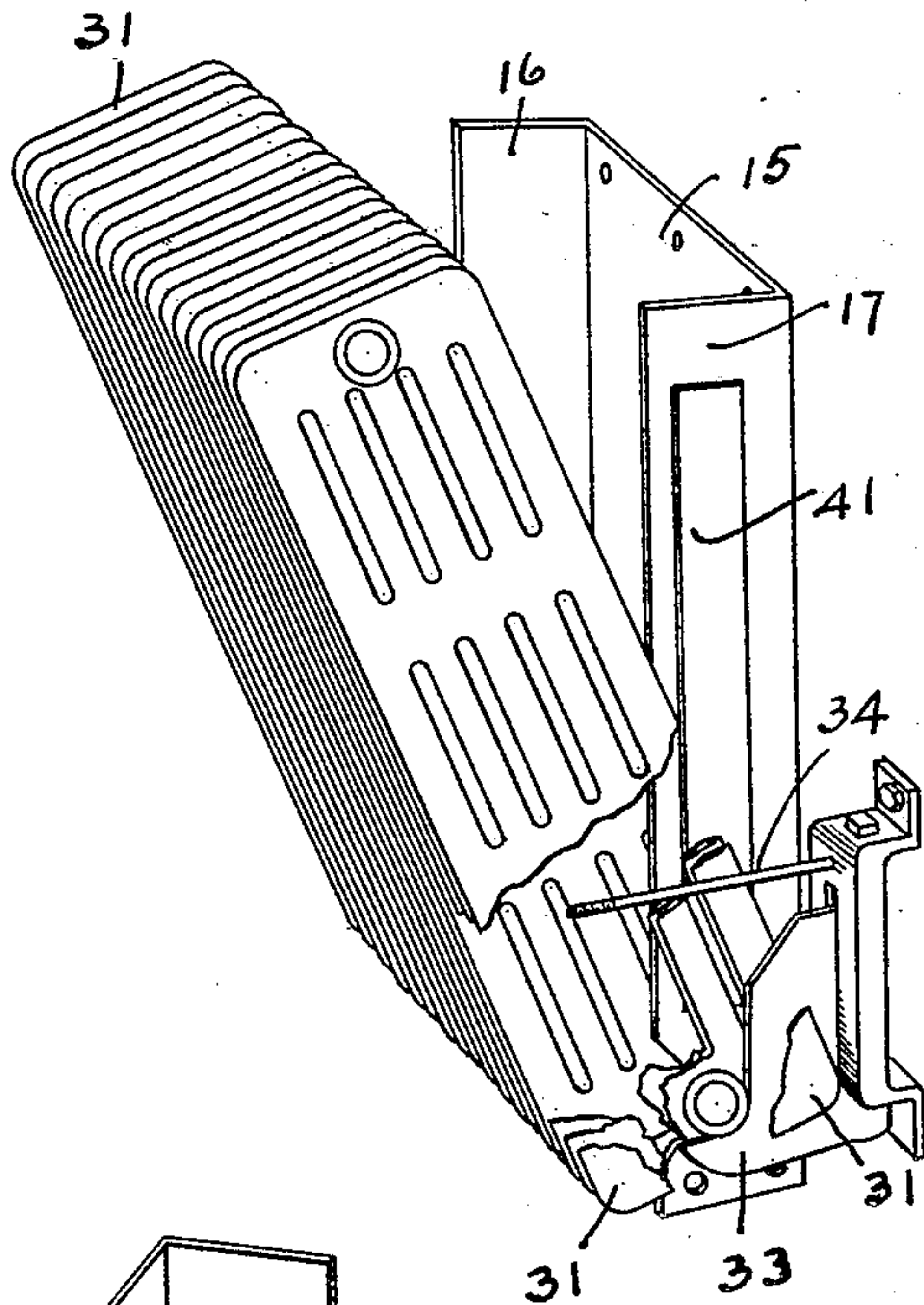


Fig. 5.

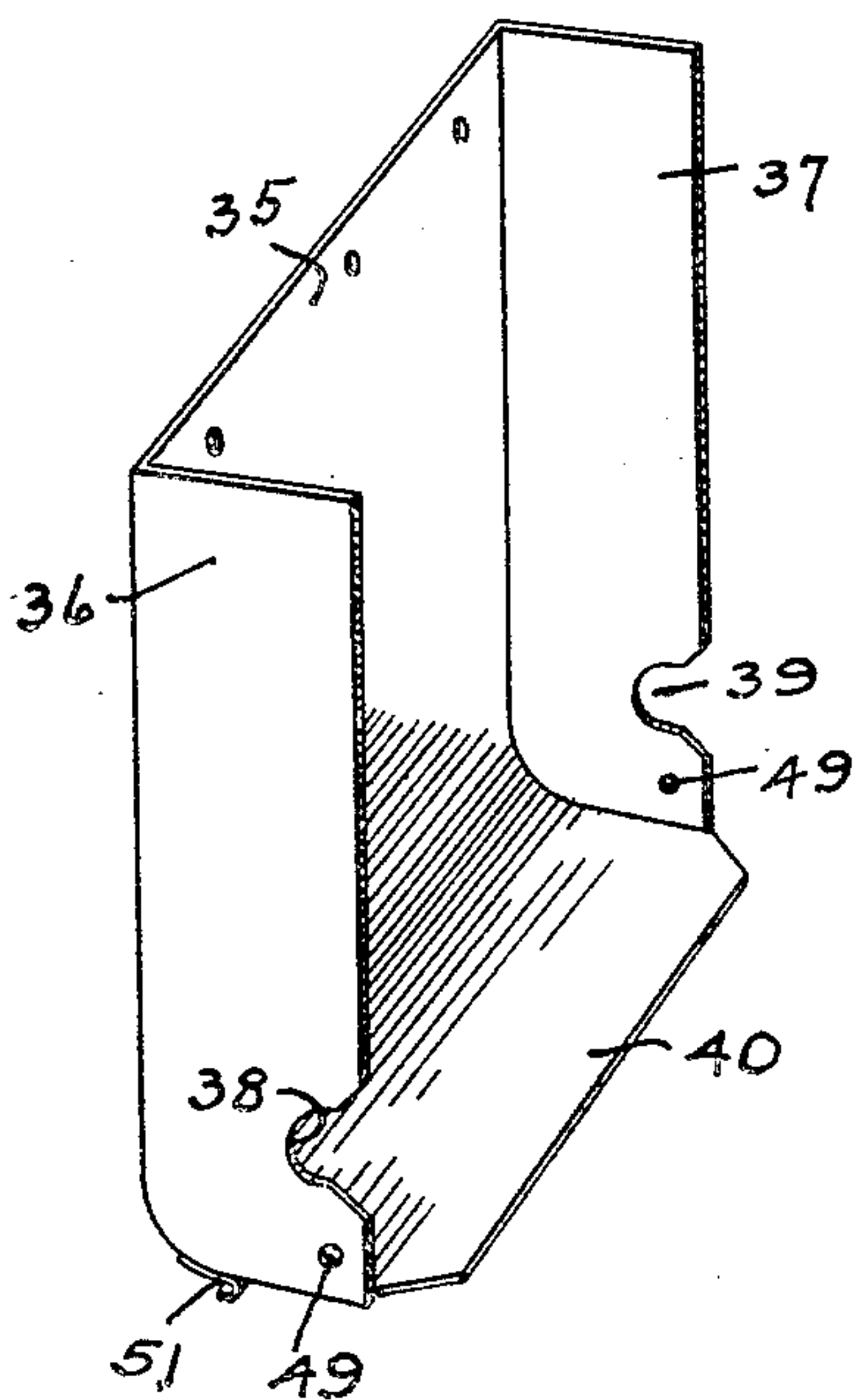


Fig. 6.

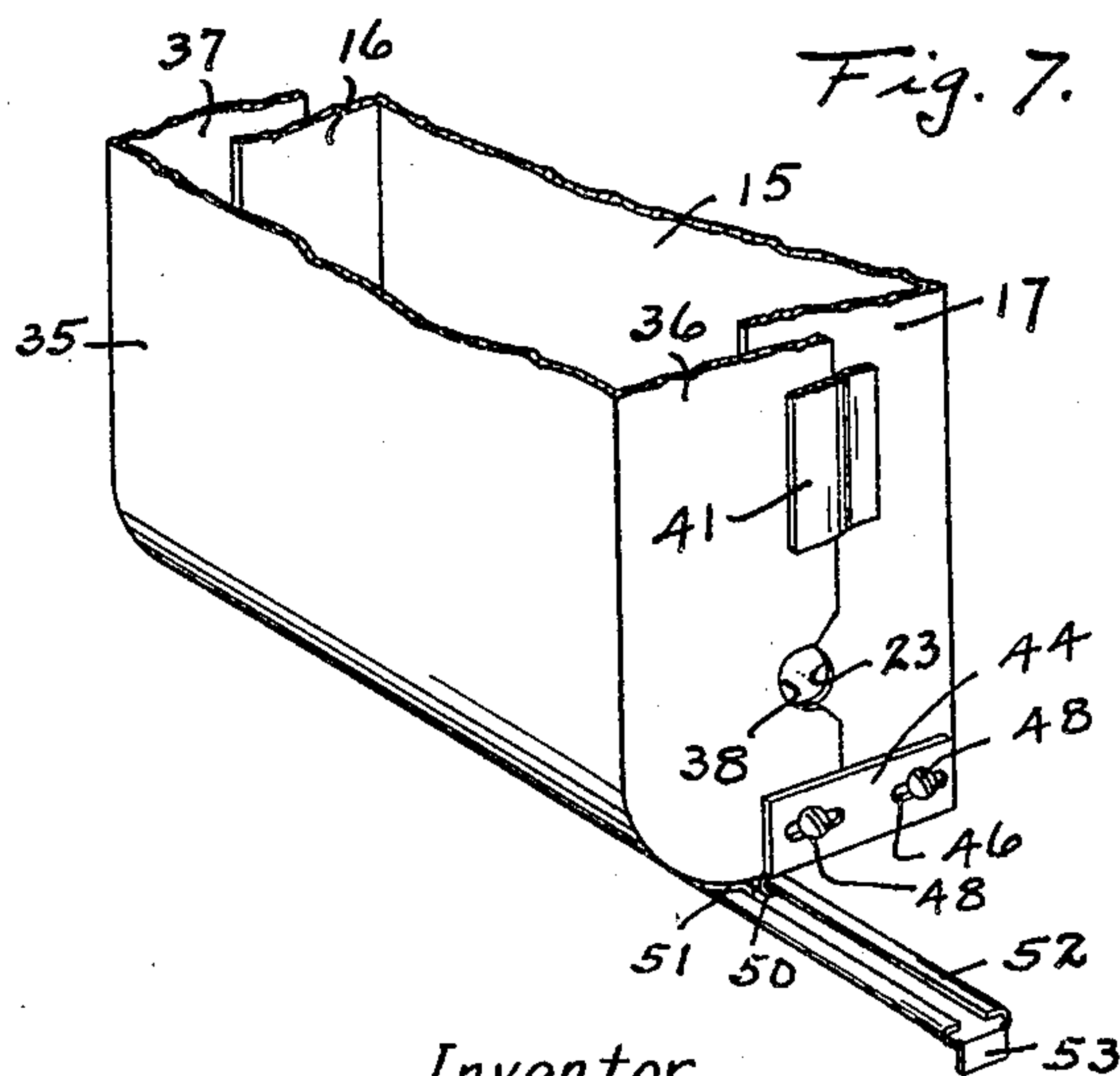


Fig. 7.

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5 Sheets-Sheet 4

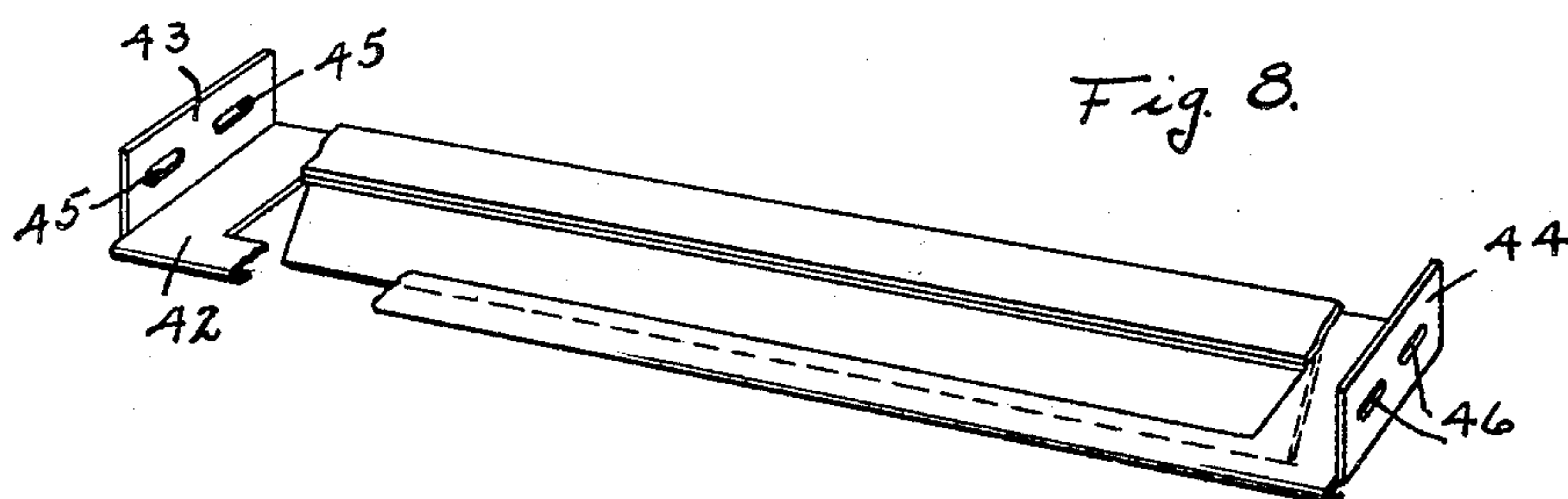


Fig. 8.

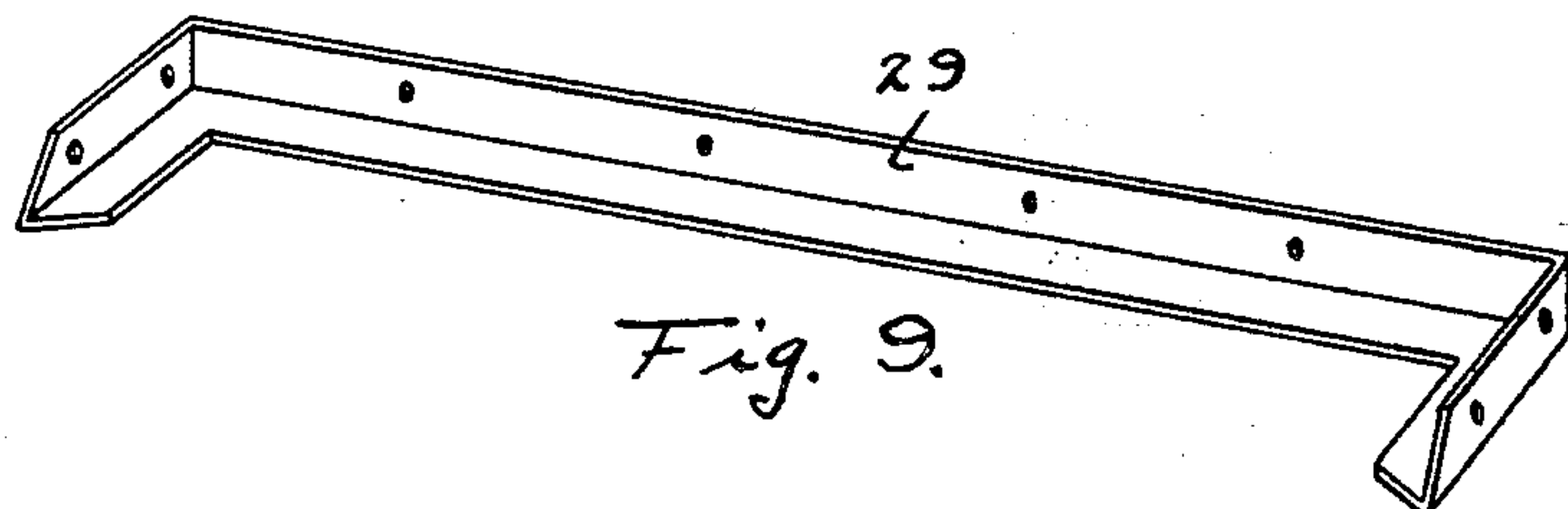


Fig. 9.

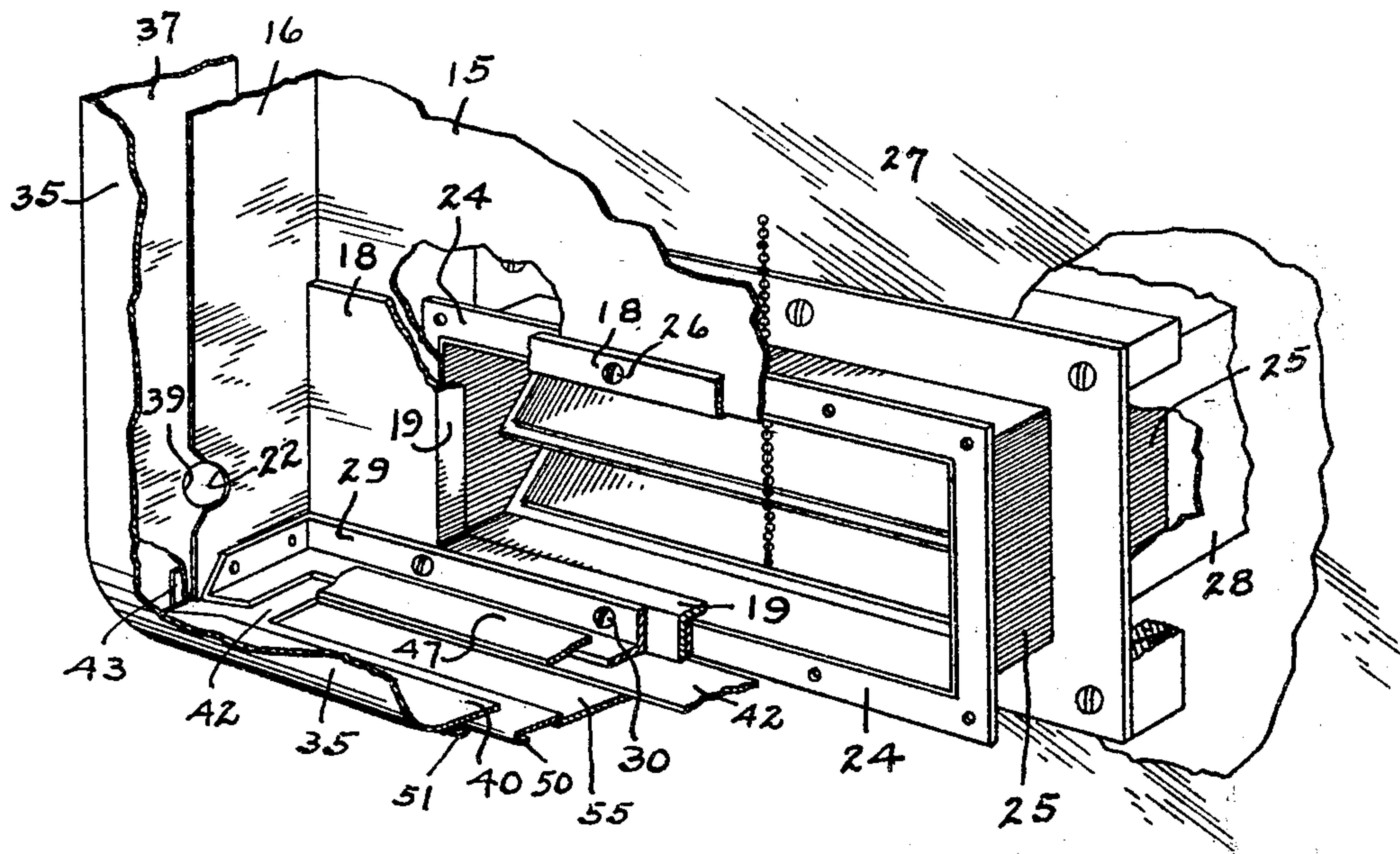


Fig. 10.

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5 Sheets-Sheet 5

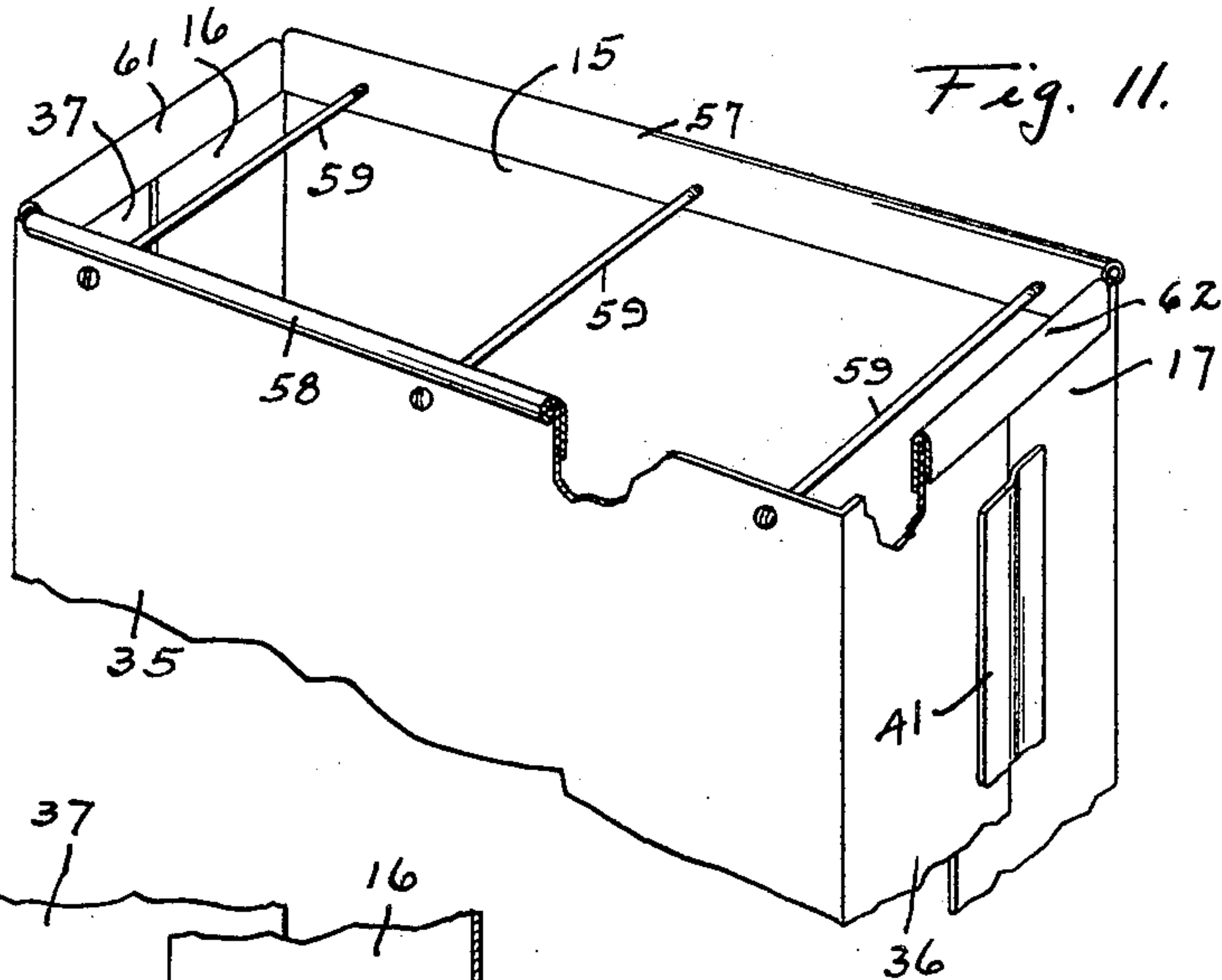


Fig. 11.

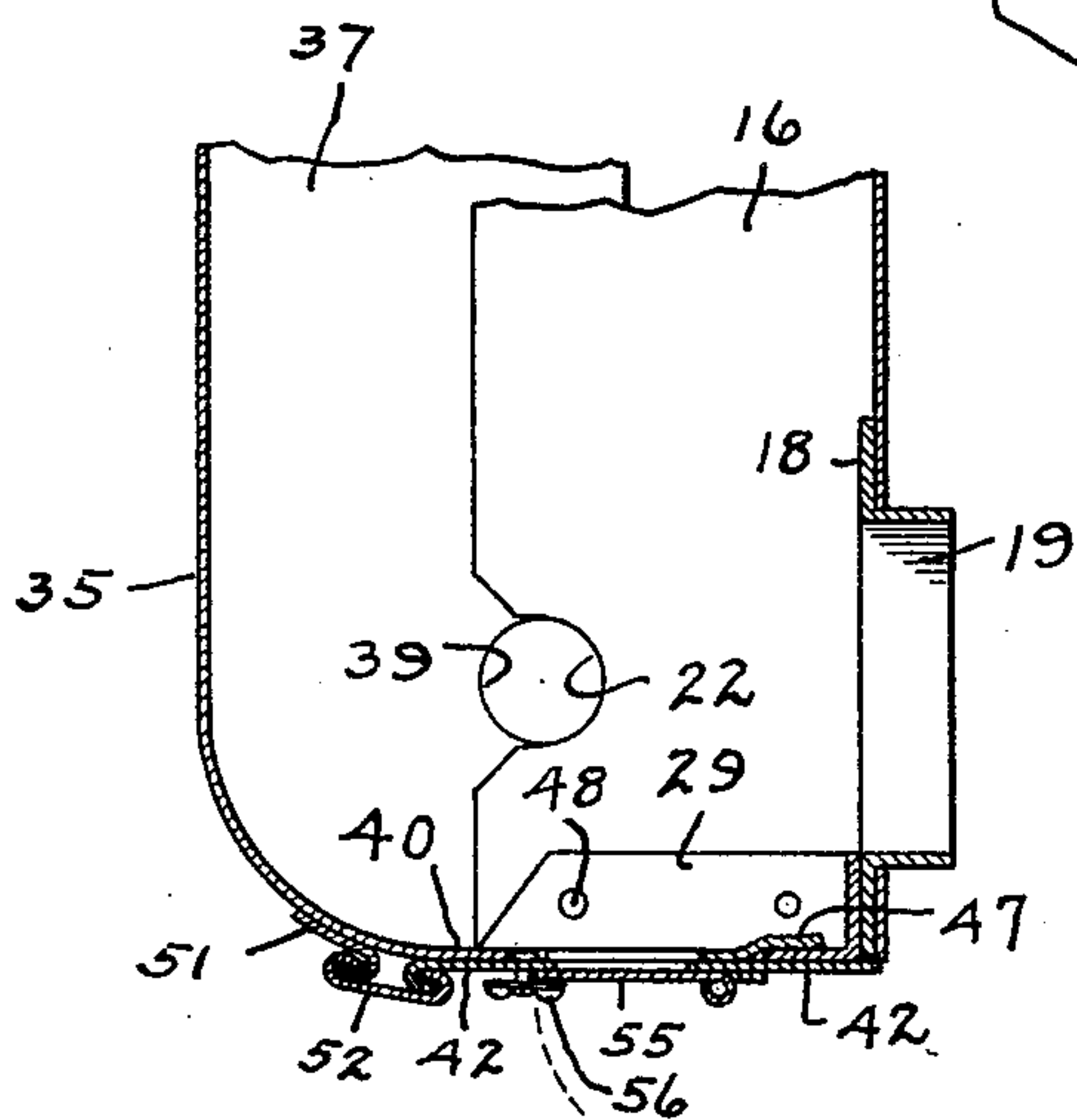


Fig. 12.

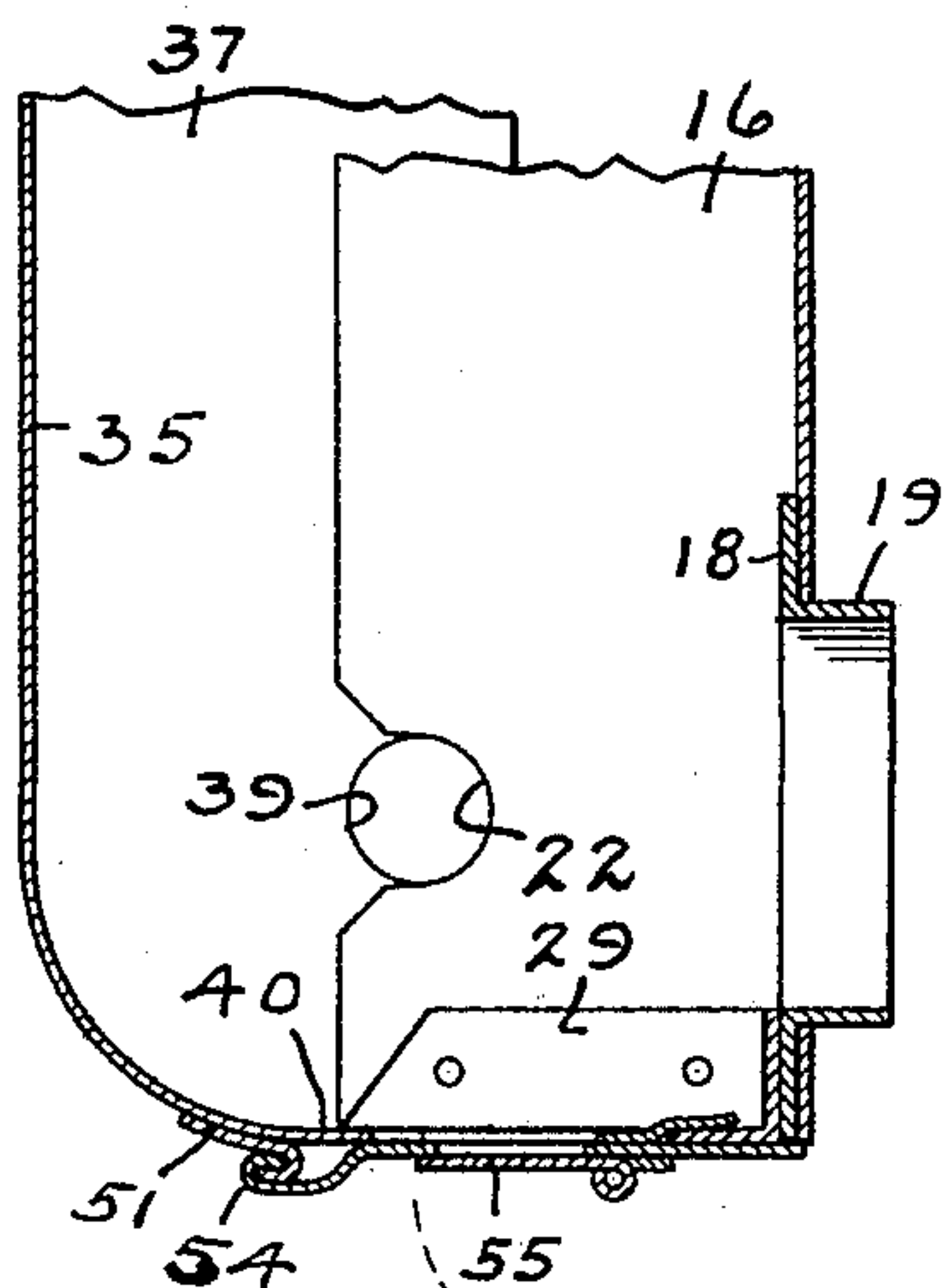


Fig. 13.

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## UNITED STATES PATENT OFFICE

CLARENCE C. SHIPP, OF INDIANAPOLIS, INDIANA

RADIATOR VENTILATING UNIT

Application filed November 30, 1931. Serial No. 577,901.

This invention relates to the art of heating and ventilating devices and particularly to means for conducting and causing air to circulate about and across heated radiating surfaces. The particular adaptation of the invention to be described herein is that wherein a steam or hot water heated sectional radiator is hung on a side wall and an opening is provided through the wall back of the radiator through which fresh air from the outside may be brought and conducted up through the radiator.

While the invention has a wide spread use, it is frequently employed in school rooms where it is subjected to being bumped into as well as becoming the receptacle for much foreign matter including dust that may settle in there and also apple cores, chewing gum and the like.

I am aware of the fact that other radiator housings or inclosures have been devised and used, but many difficulties have been encountered in that those devices have been expensive to make and ship from the point of manufacture to the point of installation, have presented quite a problem in the assembly on the job, and have not remained air-tight. It is essential that a housing about a radiator employed to conduct cold air from the outside remain tight about its joints so as to prevent the leakage of cold air from the housing which would permit the cold air to pour out and travel over the floor instead of passing up through the radiator to become heated. It is also essential that the housing be so formed that the radiator may be placed in position without damaging the housing, particularly in view of the fact that it is now common to employ radiators of a great many sections and of such weight that the radiators can not be bodily lifted and dropped down within housing members.

My invention eliminates the usual heretofore box-base. An advantage of my invention is that the rear portion of the housing may be securely attached to a member projecting from the wall and the radiator then hung on the wall in front of this rear section following which the front section of the housing may be brought up and telescoped with

the rear section and then the bottom of the housing slipped into place and secured.

An important object of the invention is to form the front and rear sections of the housing without a box-base to support them and at the same time to have an underside that may be removed and replaced at will without having to disturb the front and rear sections.

A further important object is to provide a bottom closure for the two-section telescoping housing which bottom will be removable and also be adapted to draw the various lower ends of the sides and walls of the housing sections one against the other and against the bottom to insure tight joints entirely therearound.

A still further object of the invention is to form a radiator housing which will be extremely easy to be assembled on the job with the minimum number of operations, have the minimum number of joints between parts and at the same time that will remain in a fixed, air-tight condition after being assembled.

These and many other objects will become apparent from the following description of the invention to those skilled in the art.

Reference is made to the accompanying drawings, in which

Fig. 1 is a front elevation of my invention applied to a radiator.

Fig. 2 a fragmentary side elevation of the structure embodying the invention.

Fig. 3, a front view in perspective of the rear section of the housing in place ready to receive a radiator thereacross.

Fig. 4, a front perspective view of the rear portion of the housing indicating the method of attaching and supporting the bottom plate.

Fig. 5, an end view in perspective of a radiator being hung across the rear housing portion.

Fig. 6, a rear view in perspective of the front portion of the housing.

Fig. 7, a detail in front perspective of the lower portion of the assembled housing.

Fig. 8, a view in front perspective of the bottom plate.



Fig. 9, a front view in perspective of the rear housing portion anchoring iron.

Fig. 10, a detail in fragmentary front perspective indicating the manner of forming the various joints.

Fig. 11, a detail in front perspective of the upper portion of the housing.

Fig. 12, a detail in vertical transverse section through the lower portion of the housing, and

Fig. 13, a similar detail in vertical transverse section showing a modified form of joint between the bottom plate and the front portion of the housing.

Like characters of reference indicate like parts throughout the several views in the drawings.

I form a rear housing portion to have a back wall 15 and the end walls 16 and 17 bent around to extend forwardly therefrom. A suitable intake hole is cut through the rear wall 15 at the desired elevation to correspond with the relative location of the radiator and of the air intake hole through the wall. The hole is here shown as being across the extreme lower part of the wall 15 and to reinforce the wall 15 about this hole I weld a plate 18 to extend entirely across the lower end of the wall 15, and from which plate 18 I turn the flange 19 rearwardly through the hole cut through the wall 15 to have the flange project rearwardly from the back side of the wall 15 a slight distance. The ends 16 and 17 are each provided with slotted holes 20 and 21 respectively, two in each end, toward the lower ends thereof. Also each of the ends 16 and 17 have semi-circular cut-outs 22 and 23 cut back from the forward edges thereof.

Referring to Figs. 3 and 10, the rear wall portion so described is mounted against the flange 24 of the damper box 25 to have the flange 19 extend to within the box 25, and through holes across the upper side of the plate 18 screws 26 are passed through the back 15 and into the flange 24 to secure the back portion thereto. The damper box 25 is mounted to have the flange 24 spaced from the wall 27 the proper distance and to have its rear end extending into the wall box 28 which is employed to conduct air through the wall 27.

After the rear housing portion has been mounted and secured to the damper box flange 24 as just described, the anchor bar 29, Fig. 9 is then placed against the lower forward side of the plate 18 and screws 30 are passed through the bar, the plate 18, the wall 15 and into the flange 24 so as to secure the lower end of the rear housing portion firmly thereagainst. This anchor bar 29 is here shown as being formed of angle iron to have a length equal to that of the plate 18 and to have ends bent forwardly to lie along in contact with the inner sides of the hous-

ing ends 16 and 17. The bar 29 may of course be made an integral part of the rear housing portion but for shipping purposes it is preferable to make it a separate member to be attached as just described in order that the rear housing portions may be nested in shipping. The bar 29 is formed to have the lower leg thereof extend forwardly. Following the mounting of the parts on the flange 24, the radiator 31 is then brought up and placed in position, Fig. 5, by resting the nipples between sections at the lower ends thereof in the radiator support brackets 32 and 33. The rear housing portion is made to have a length of wall 15 such that the ends 16 and 17 are extended forwardly to between sections of the radiator 31 whereby the brackets 32 and 33 may be mounted on the wall 27 beyond the ends 16 and 17 to receive the ends of the radiator which extend beyond the housing. Referring to Fig. 1, three sections of the radiator 31 are here shown as being outside of the housing at each end thereof whereby the brackets 32 and 33 may support the radiator from between the outer-most sections.

The ends 16 and 17 have the upper and lower corners cut away about the openings 22 and 23 whereby the lower end of the radiator 31 may be pushed back to have the section connecting nipples enter freely into these openings 22 and 23 as the radiator is rested by outer nipples on the brackets 32 and 33 following which the radiator 31 may be rocked upwardly to the vertical position and there secured in the usual manner by the retaining rods 34. The brackets 32 and 33 are of course mounted on the wall 27 and adjusted to be lined up with the holes 22 and 23 so that the radiator 31 may be hung without disturbing or having to move the ends 16 and 17 in any way. The location of the cut-outs 22 and 23 is such that when the radiator 31 is hung on the brackets 32 and 33, the edges of these cut-outs will fit snugly around the rear half of the radiator section nipples entered therein.

A front housing portion, Fig. 6 is formed to have a front wall 35 from which are rearwardly turned the ends 36 and 37. The wall 35 is carried downwardly around and under rearwardly between the lower ends of the end portions 36 and 37 and united thereto to form air-tight joints. The ends 36 and 37 have cut-outs 38 and 39 corresponding to the cut-outs 23 and 22 respectively opening from the rear sides thereof. The lower end of the wall 35 is carried rearwardly somewhat beyond the rear sides of the ends 36 and 37 to form a flap 40 which normally extends downwardly a very slight amount and which may be yieldingly pressed upwardly. This front housing portion is brought up to the front side of the radiator 31 and the ends 36 and 37 are passed between sections of the radiator



to lap over on the outer sides of the rear housing portion ends 16 and 17 respectively. This front housing portion is then pushed rearwardly to bring the cut-outs 38 and 39 snugly up around the forward sides of the radiator section nipples to bring the rear sides of the overlapping ends 36 and 37 to under the vertical lips 41 which are secured to the rear housing portion ends 16 and 17. These lips 41 extend substantially the entire vertical height of the ends above the nipple cut-outs therein. The lips 41 are here shown as being the outer free forward ends of strips of metal welded by their rear ends to the rear housing ends.

A bottom plate 42, Fig. 8 is provided to have up-turned ends 43 and 44, each of the up-turned ends having horizontally slotted holes 45 and 46 respectively therethrough, two of such holes being shown in each end. This plate 42 is brought up under the front and rear housing portions assembled as above described to have the up-turned ends 43 and 44 compressively engaged on the outer sides of the front housing ends 36 and 37 and is pushed rearwardly and upwardly to have the lip 47 slip up and over the forwardly extending leg of the bar 29 so as to compressively draw the entire length of the rear edge of the plate 42 upwardly against the under side of the bar 29 as well as against the lower edges of the wall 15 and the flange 24, the plate 42 being of sufficient width to extend to under the flange 24. When the lip 47 has been engaged with the bar 29, the forward edge of the plate 42 may be lifted into compressive contact with the flap 40 and then the screws 48 may be inserted through the holes 45 and 46, the holes 21 and 22 and the preformed holes 49 in the ends 36 and 37 to have the screws screwthreadedly engage in the forwardly extending ends of the bar 29. The front and rear housing portions as well as the plate 42 are preferably made of sheet metal and accordingly the lap of the ends 36 and 37 over the outside of the ends 17 and 16 will not prevent the rear screws 48 being drawn up snugly to force the up-turned ends 43 and 44 against the uncovered parts of the housing ends 16 and 17.

In order to maintain an air-tight joint between the flap 40 and the plate 42, I provide an interlocking means, here shown in two forms. In one form, the forward edge of the plate 42 is bent downwardly and around rearwardly to form a hook 50 and a bar 51 is welded across the lower portion of the wall 35 in such a position that when the plate 42 is secured by the screws 48, the hook 50 across the plate 42 will be just to the rear of this bar 51. This bar 51 has its rear edge bent around forwardly to form a hook in a reverse position to that of the hook 50. A channel bar 52 is formed to have in-turned edges to permit the bar to be entered from the ends there-

of and slipped horizontally along the opposing hooks, Fig. 7, whereby both of the hooks 50 and 51 are secured within the channel so as to prevent movement forwardly and rearwardly one away from the other. The end of the channel bar 52 is provided with a downturned tab 53 as a means by which the bar may be removed in order that the base plate 42 can be taken up.

The other form of interlocking means, Fig. 13, utilizes the same bar 51 on the lower part of the wall 35 of the forward section of the housing but the plate 42 has its forward longitudinal edge bent around in the reverse manner so as to have a hook 54 on its upper side to engage directly with the hook on the bar 51 as the plate is pushed rearwardly thereunder. Reference to Fig. 13 indicates how the hook 54 is formed by first bending the edge of the plate downwardly thence carrying it forwardly and then around and rearwardly so that the flap 40 may contact with the plate as before to insure a tight joint therealong. The flap 40 is sprung upwardly slightly as the hook 54 engages with the hook on the bar 51.

The plate 42 is here shown as having its central portion cut out with a door 55 hinged to the under side of the plate at the rear edge of the opening therethrough as a means of closing the opening. The door 55 is here shown, Fig. 12, as being held in the closed position by means of a button 56. This door 55 is provided so that in those installations where it is desired to permit air from within the room to circulate through and about the radiator 31, this door may be hooked to work in opposition to the dampers in the box 25. Otherwise the door is held shut by the button 56 and may be used as a clean-out door by turning the button 56 to allow the door to drop downwardly to let the dirt thereon fall out.

It is a simple matter to remove the base plate 42 without disturbing the front and rear sections of the housing by merely taking out the screws 48 and pulling the plate forwardly and downwardly as in the form shown in Fig. 13. In the other form as shown in Fig. 12, the channel bar 52 is first pulled off and then the plate 42 is pulled forwardly and dropped after taking out the screws 48.

It is to be seen from the foregoing description that the rear portion of the housing is rigidly attached to the damper box flange 24 so that when the radiator 31 is being positioned on its supporting brackets, there is no danger of knocking the housing portion out of place or having to reach behind the radiator after it is set to replace the housing as has heretofore been the case. Moreover all of the lower ends of the members forming the housing are covered over by the one base plate 42 which is very easily put on and taken off after the radiator is hung.



The upper end of the housing is finished by placing the reenforcing strips 57 and 58 over the top edges of the walls 15 and 35 respectively and bolts 59 are passed through the wall 35, the strip 58, the strip 57, and back wall 15 to tie the two portions together, the bolts 59 passing between sections of the radiator 31. The inverted channel bars 61 and 62 are slipped down over the top edges of the overlapping ends 16, 37 and 17, 36, Fig. 11. The end walls 36 and 37 are frictionally obtained under the lips 41 whereby the wall portion of the housing will remain in position even though the bolts 59 and the plate 42 are removed.

It is thus to be seen that the structure embodying my invention employs a minimum number of parts formed as described to be fitted together readily without difficulty and while I have here shown and described the form as now best known to me, it is obvious that structural changes may be made without departing from the spirit of the invention and I therefore do not desire to be limited to that precise form beyond the limitations that may be imposed by the following claims.

I claim:

1. A radiator ventilating unit having a rear radiator housing portion comprising a back wall and two ends extending forwardly therefrom, the back wall having an air intake opening therethrough, a front housing portion comprising a front wall and two rearwardly turned end walls, the end walls of the front portion being formed to telescope with the end walls of the rear portion whereby the corresponding end walls of the respective portions overlap one another, each of said end walls having a radiator nipple cut-out, and a bottom plate adapted to be brought up under the lower ends of both of said housing portions, said plate having end members to engage about the lower ends of said end walls, and having interlocking means between it and the wall of said front housing portion.

2. A radiator ventilating unit having a rear radiator housing portion comprising a back wall and two ends extending forwardly therefrom, the back wall having an air intake opening therethrough, a front housing portion comprising a front wall and two rearwardly turned end walls, the end walls of the front portion being formed to telescope with the end walls of the rear portion whereby the corresponding end walls of the respective portions overlap one another, each of said end walls having a radiator nipple cut-out, and a bottom plate adapted to be brought up under the lower ends of both of said housing portions, said plate having end members to engage about the lower ends of said end walls, and having interlocking means between it and the wall of said front

housing portion, and a flap inwardly extending from the bottom of said front wall yieldingly pressing against said plate.

3. A radiator ventilating unit having a rear radiator housing portion comprising a back wall and two ends extending forwardly therefrom, the back wall having an air intake opening therethrough, a front housing portion comprising a front wall and two rearwardly turned end walls, the end walls of the front portion being formed to telescope with the end walls of the rear portion whereby the corresponding end walls of the respective portions overlap one another, each of said end walls having a radiator nipple cut-out, and a bottom plate adapted to be brought up under the lower ends of both of said housing portions, said plate having end members to engage about the lower ends of said end walls, and having interlocking means between it and the wall of said front housing portion, a leg extending forwardly from the lower edge of the wall of the rear housing portion, and a lip on said plate adapted to pass over the leg to hold said plate against the underside thereacross.

4. A radiator ventilating unit having a rear radiator housing portion comprising a back wall and two ends extending forwardly therefrom, the back wall having an air intake opening therethrough, a front housing portion comprising a front wall and two rearwardly turned end walls, the end walls of the front portion being formed to telescope with the end walls of the rear portion whereby the corresponding end walls of the respective portions overlap one another, each of said end walls having a radiator nipple cut-out, and a bottom plate adapted to be brought up under the lower ends of both of said housing portions, said plate having end members to engage about the lower ends of said end walls, and having interlocking means between it and the wall of said front housing portion, and a flap inwardly extending from the bottom of said front wall yieldingly pressing against said plate, a leg extending forwardly from the lower edge of the wall of the rear housing portion, and a lip on said plate adapted to pass over the leg to hold said plate against the underside thereacross.

5. A radiator ventilating unit comprising a rear housing portion consisting of a vertical back wall and a vertical end wall extending forwardly from each lateral end of the back wall, the back wall having an air intake opening therethrough; a front housing portion consisting of a vertical front wall and a vertical end wall extending rearwardly from each lateral end of the front wall, the respective end walls being engaged one by the other, said end walls having radiator nipple cut-outs; and a bottom closure across the lower end of the enclosed space defined by said rear and front housing portions, said bot-



tom closure consisting of a plate removably engaged across the bottom of said rear wall to form a tight joint therewith, means on the plate to engage with the said end walls, and hook means across the front edge of the plate

removably engaging with hook means connected with the lower end of said front wall.

6. In a radiator ventilating unit, in combination with a damper box mounted to have a discharge end extend somewhat from a wall, a rear vertical housing wall secured to the said end of the damper box to be supported thereby and to have an opening through the housing wall coincide with the outlet opening of the box, a vertical end wall extending forwardly from each lateral end of said housing wall having a bottom longitudinal hook, a front vertical housing wall, a vertical end wall extending rearwardly from each lateral end of the front wall, the front wall being supported by the rear wall by having the corresponding end walls frictionally telescoping one with the other, a bottom plate engaged along the lower end of said rear wall, and hook means at the front of the plate engaging the bottom hook of the front housing wall for holding it in contact with the lower end of the front wall.

7. In a radiator ventilating unit, in combination with a damper box mounted to have a discharge end extend somewhat from a wall, a rear vertical housing wall secured to the said end of the damper box to be supported thereby and to have an opening through the housing wall coincide with the outlet opening of the box, a vertical end wall extending forwardly from each lateral end of said housing wall, a front vertical housing wall, a vertical end wall extending rearwardly from each lateral end of the front wall, the front wall being supported by the rear wall by having the corresponding end walls frictionally telescoping one with the other, a bottom plate engaged along the lower end of said rear wall, and means at the front of the plate for holding it in contact with the lower end of the front wall, and means securing the plate to the end walls of the back wall whereby the front wall is fixed in position.

8. In a radiator ventilating unit, a damper box having a discharge opening, a rear ventilating housing wall having an intake opening corresponding to said discharge opening, flange means for locating and mounting said wall on said box to have said openings coincide, means retaining said wall on said box, a front wall having a bottom hooked member, and a separate bottom plate between the two walls having a hooked front edge to engage the hook on the front wall and having means for adjustably securing it to the rear wall, both the front wall and the plate being supported by said rear wall.

9. In a radiator ventilating unit, a horizontally disposed damper box having an air

discharge end, a flange about the discharge end in a vertical plane, a rear radiator housing wall having an opening therethrough corresponding to the opening in the discharge end of said box, a plate contacting the inner side of the rear housing wall having a flange passing through the opening in the housing wall and into the damper box, and screw means passing through the plate and wall around their openings and engaging said flange of the damper box whereby said wall is tightly drawn against the damper box flange and vertically supported thereby.

10. In a radiator ventilating unit, a horizontally disposed damper box having an air discharge end, a flange about the discharge end in a vertical plane, a rear radiator housing wall having an opening therethrough corresponding to the opening in the discharge end of said box, and screw means passing through the wall around its opening and engaging said flange whereby said wall is tightly drawn against the flange and vertically supported thereby, a front wall, end walls between the front and rear walls, a flap turned rearwardly from the front wall to be yieldingly bendable, and a bottom plate having its rear edge supported by the rear wall and pressed against said flap.

11. In a radiator ventilating unit, a horizontally disposed damper box having an air discharge end, a flange about the discharge end in a vertical plane, a rear radiator housing wall having an opening therethrough corresponding to the opening in the discharge end of said box, and screw means passing through the wall around its opening and engaging said flange whereby said wall is tightly drawn against the flange and vertically supported thereby, a front wall, end walls between the front and rear walls, a flap turned rearwardly from the front wall to be yieldingly bendable, and a bottom plate having its rear edge supported by the rear wall and pressed against said flap, ends on said plate fitting about the said end walls, and means securing said plate ends to the end walls whereby said front wall yieldingly rests on the plate.

12. In a radiator ventilating unit, a damper box having a discharge opening, a rear ventilating housing wall having an intake opening corresponding to said discharge opening, flange means for locating and mounting said wall on said box to have said openings coincide, means retaining said wall on said box, a front wall, and a separate bottom plate between the two walls, both the front wall and the plate being supported by said rear wall, said plate having an opening therethrough, and a door hinged to the plate adapted to close the plate opening and to swing downwardly therefrom to the open position.

13. The combination of a rear radiator housing wall, a front housing wall, end walls



telescopically engaging between the rear and front walls, a bottom plate having its rear edge supported by the rear wall, a down and rearwardly turned hooked edge along the front of the plate, a down and forwardly turned hooked edge on the lower part of the front wall, and a bar having hooked members to engage both the hooked edges of the wall and the plate.

14. The combination of a rear radiator housing wall, a front housing wall, end walls telescopically engaging between the rear and front walls, a bottom plate having its rear edge supported by the rear wall, a down and rearwardly turned hooked edge along the front of the plate, a down and forwardly turned hooked edge on the lower part of the front wall, and a bar having hooked members to engage both the hooked edges of the wall and the plate, a flap rearwardly turned from the lower part of the front wall yieldingly bendable, said plate being pressed against said flap upon engagement of said bar with said hooked edges.

15. The combination of a rear radiator housing wall, a front radiator housing wall, end walls telescopically engaging between the rear and front walls, a bottom plate supported from the rear wall by its rear edge, an upwardly and rearwardly turned hooked edge along the front side of the plate, and a downwardly and forwardly turned hooked edge along the under side of the front wall, said plate hooked edge being removably hooked over and engaged with said front wall hooked edge.

16. The combination of a rear radiator housing wall, a front radiator housing wall, end walls telescopically engaging between the rear and front walls, a bottom plate supported from the rear wall by its rear edge, an upwardly and rearwardly turned hooked edge along the front side of the plate, and a downwardly and forwardly turned hooked edge along the under side of the front wall, said plate hooked edge being removably hooked over and engaged with said front wall hooked edge, and a flap rearwardly turned from the lower part of the front wall yieldingly pressing downwardly on said plate.

17. For a radiator ventilating unit having front, rear, and end walls, a bottom closure plate, means on the plate to detachably engage the rear wall, a yielding flap on the front wall, and front wall and plate engaging means removably holding the plate compressively against the flap.

18. For a radiator ventilating unit having front, rear, and end walls, a bottom closure plate, means on the plate to detachably engage the rear wall, a yielding flap on the front wall, and front wall and plate engaging means removably holding the plate compressively against the flap, and upturned

ends on the plate adapted to be connected to said end walls.

19. For a radiator ventilating unit having front, rear, and end walls, a bottom closure plate having an opening, a door hinged to the plate and adapted to close the opening and to swing downwardly therefrom to open position, means on the plate to detachably engage the rear wall, a flap on the front wall and front wall and plate engaging means removably holding the plate against the flap.

In testimony whereof I affix my signature.

CLARENCE C. SHIPP.