

Dec. 19, 1939.

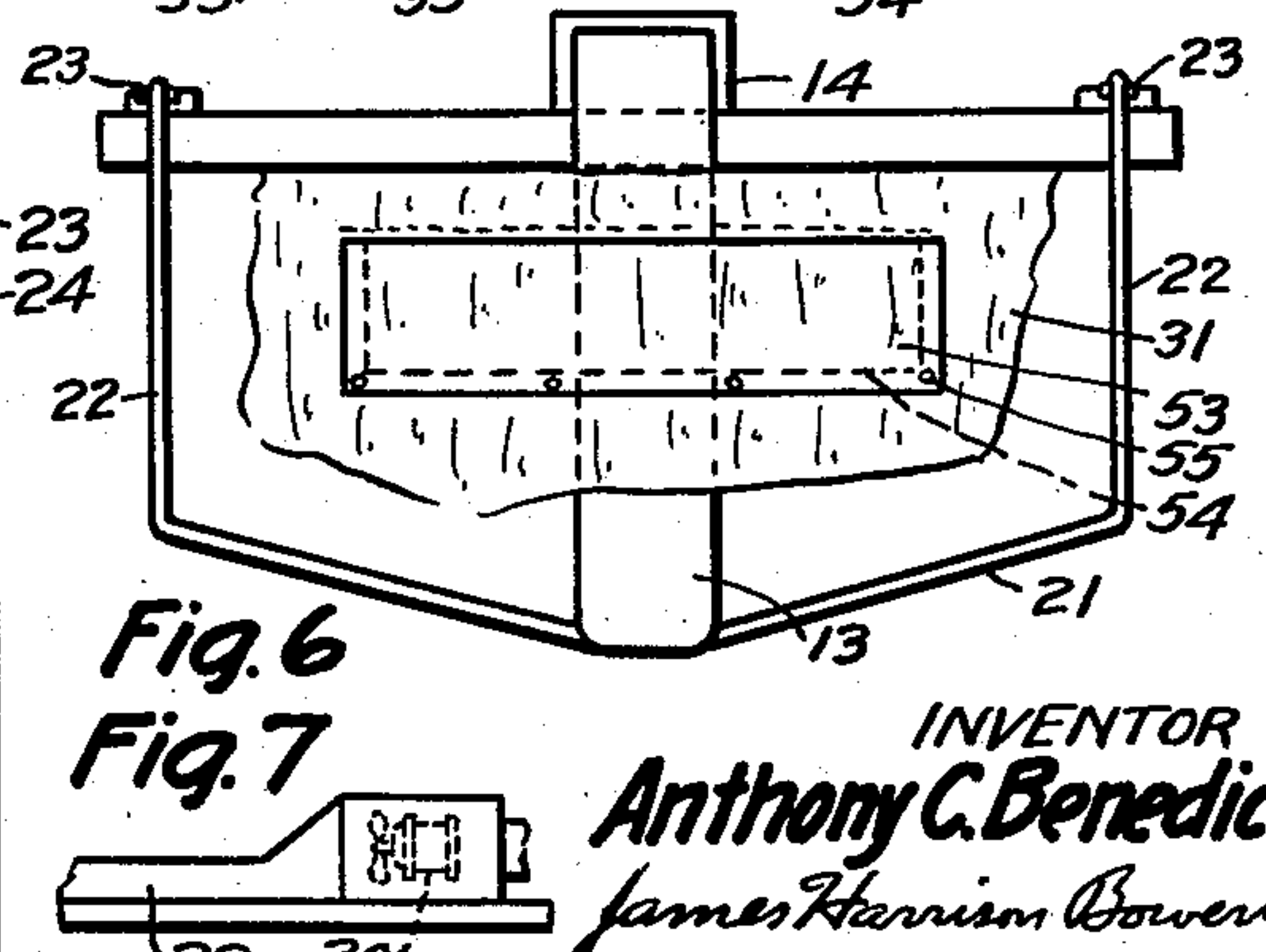
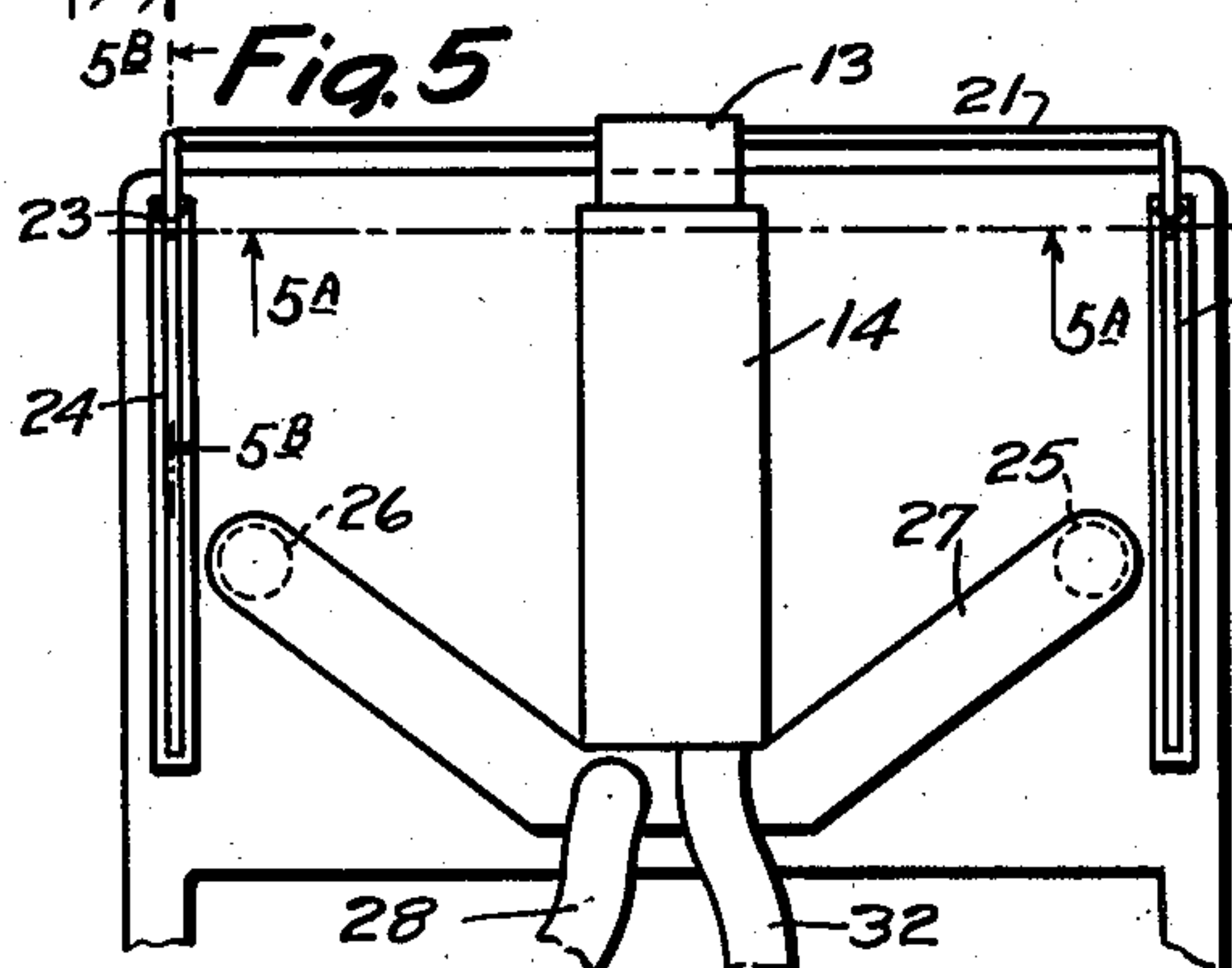
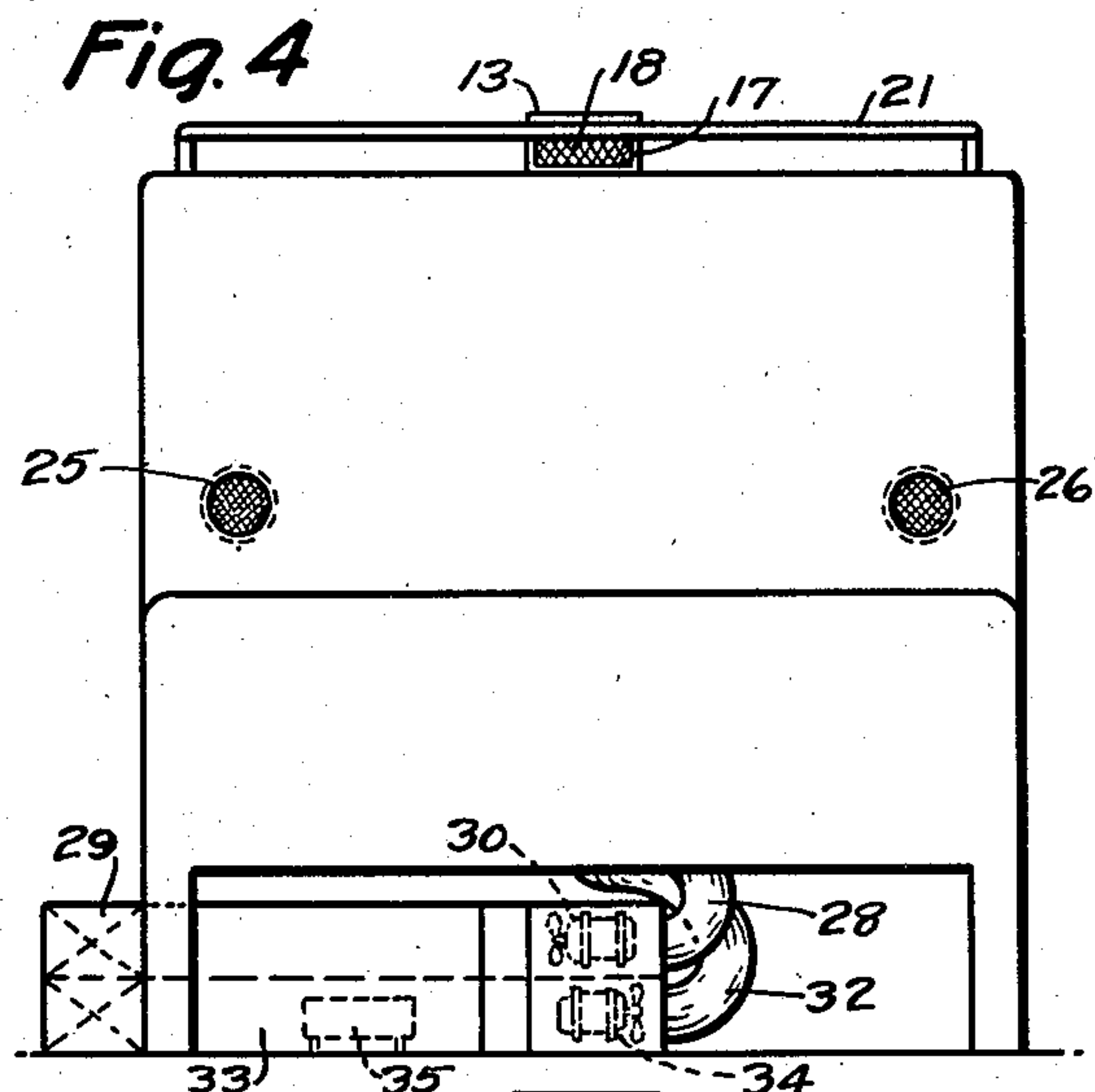
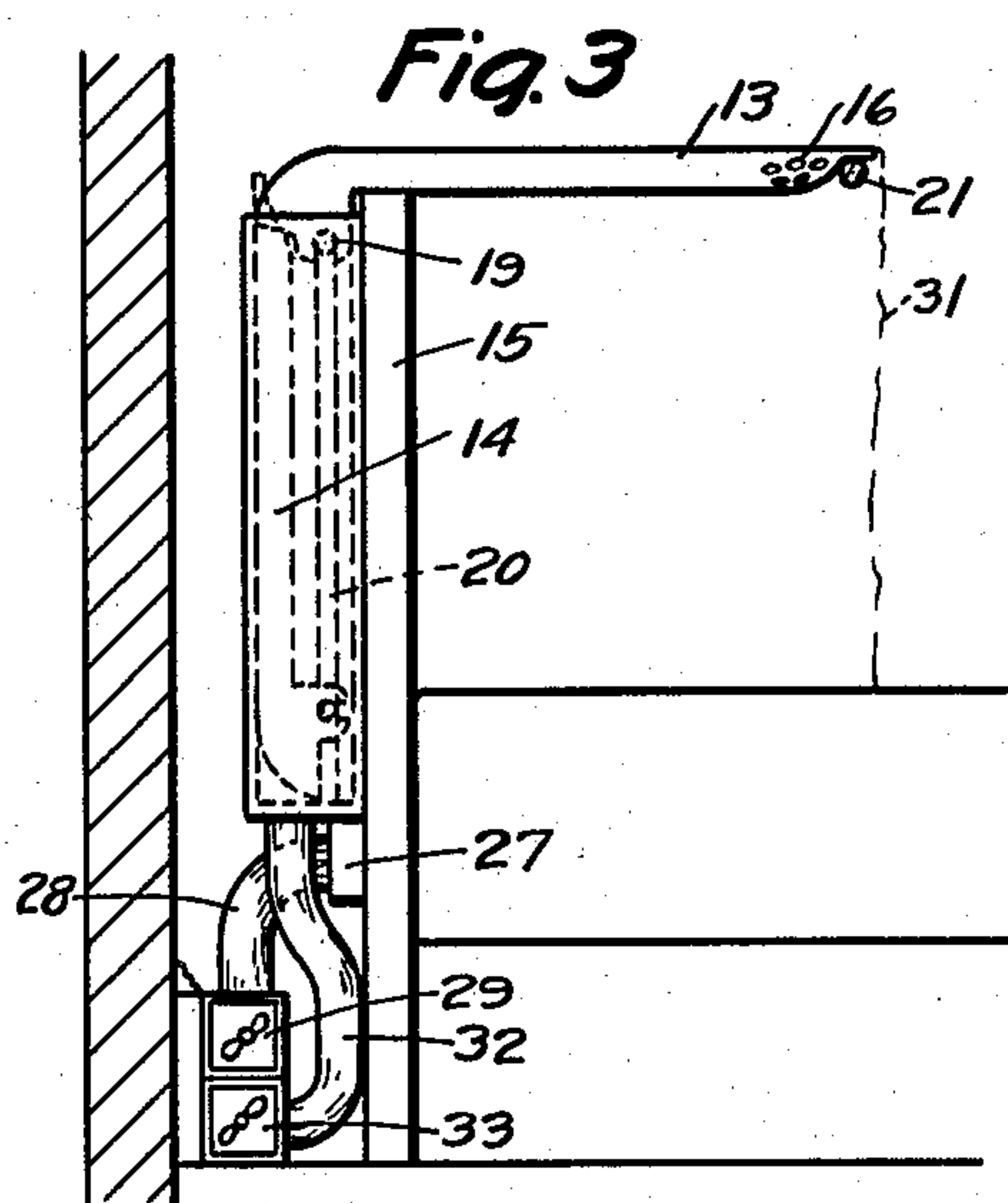
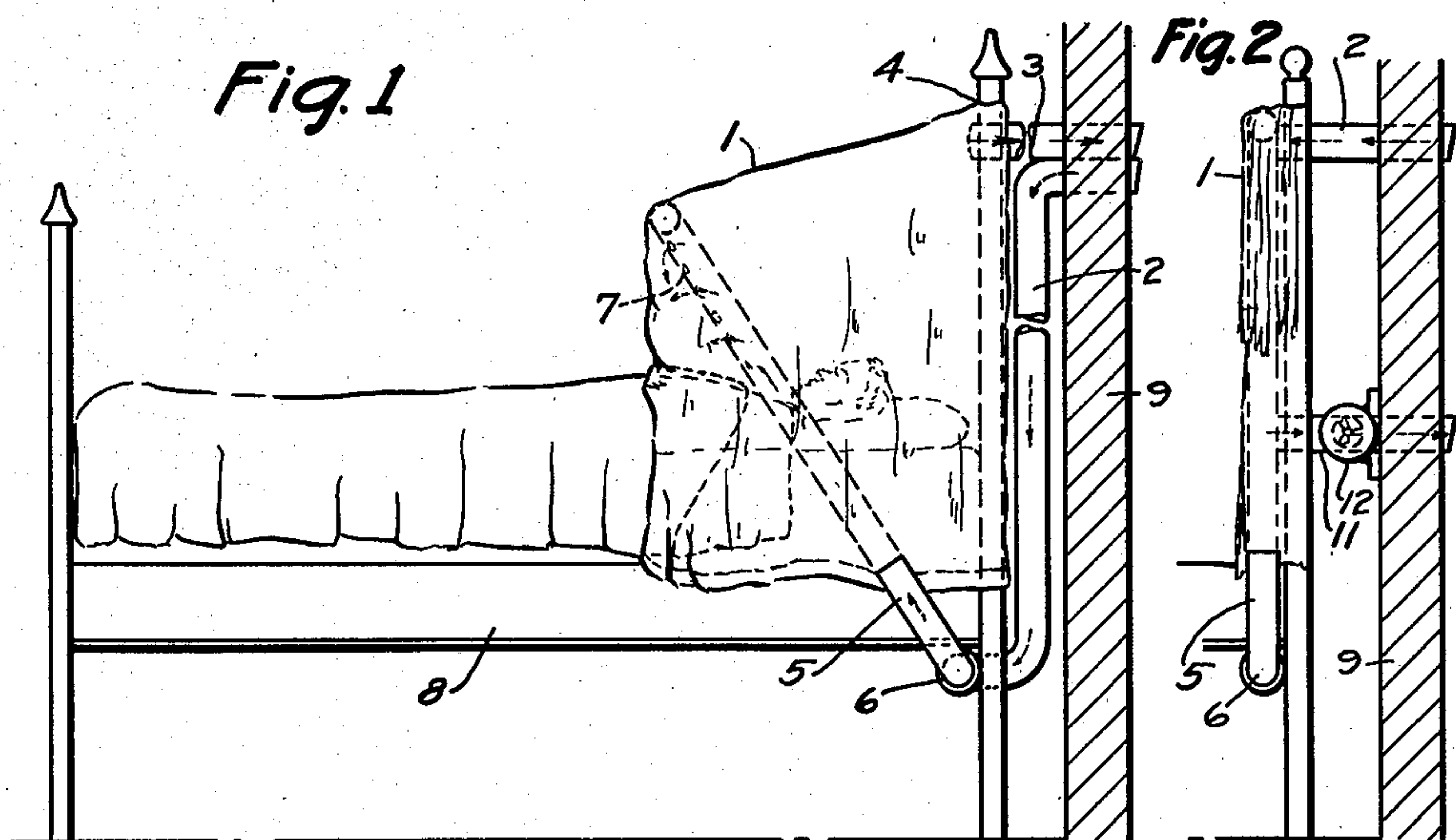
A. C. BENEDICT

2,183,533

VENTILATING MEANS FOR BEDS AND THE LIKE

Filed May 31, 1935

3 Sheets-Sheet 1



INVENTOR

Anthony C. Benedict

James Harrison Bowers
ATTORNEY

Dec. 19, 1939.

A. C. BENEDICT

2,183,533

VENTILATING MEANS FOR BEDS AND THE LIKE

Filed May 31, 1935

3 Sheets-Sheet 2

FIG. 5A

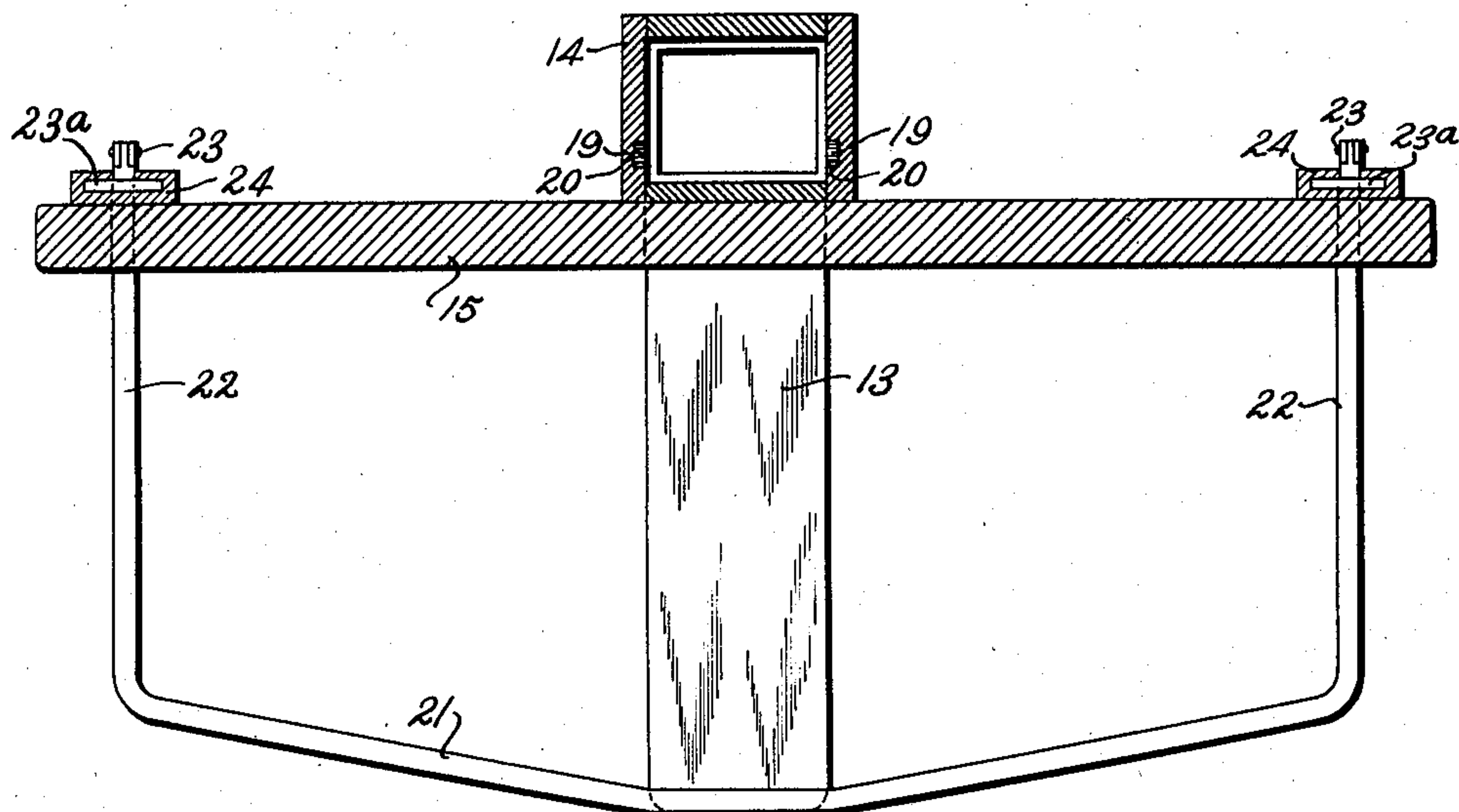


FIG. 5B

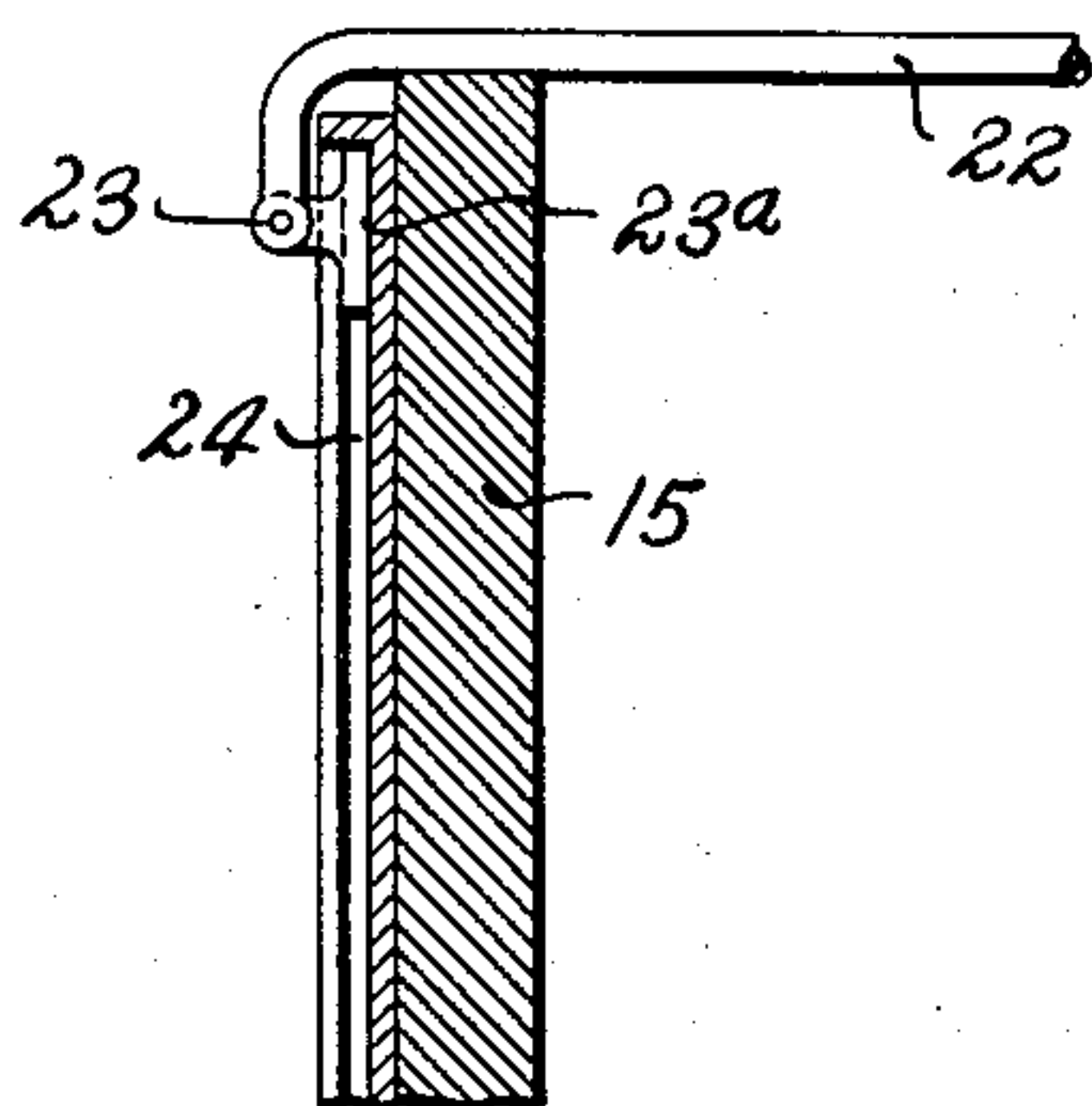
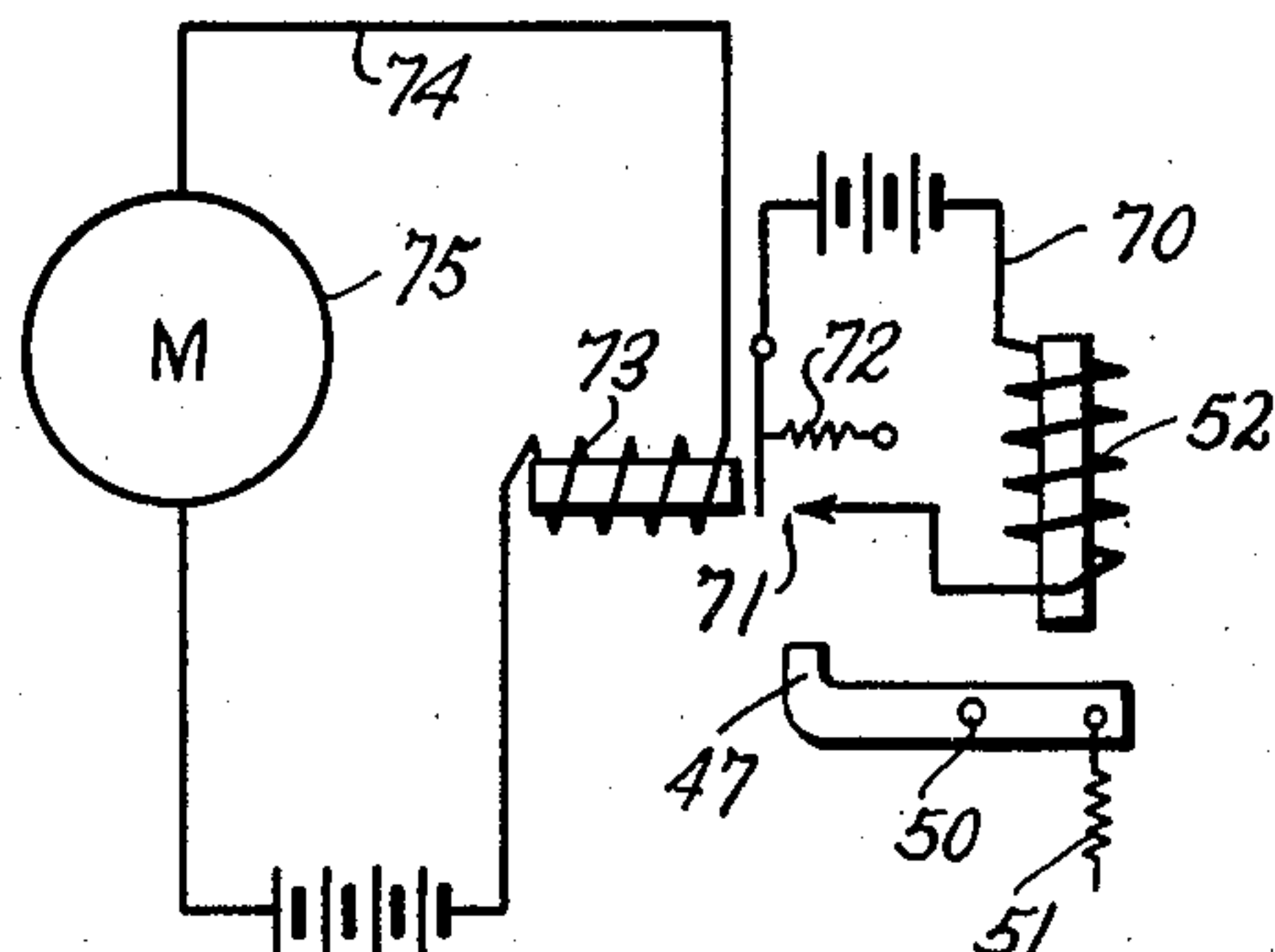


FIG. 11A



INVENTOR

Anthony C. Benedict

Dec. 19, 1939.

A. C. BENEDICT

2,183,533

VENTILATING MEANS FOR BEDS AND THE LIKE

Filed May 31, 1935

3 Sheets-Sheet 3

Fig. 8

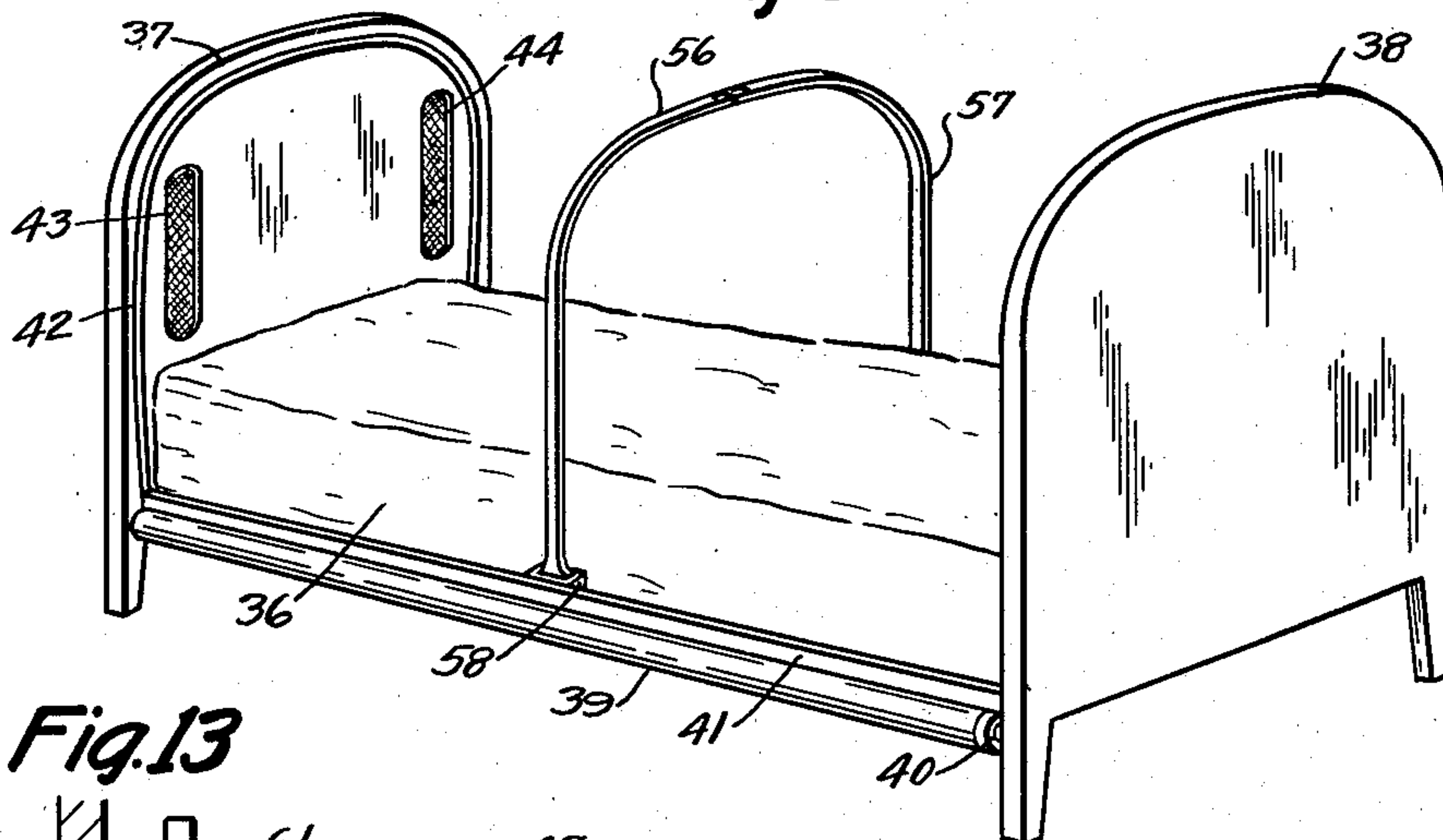


Fig. 13

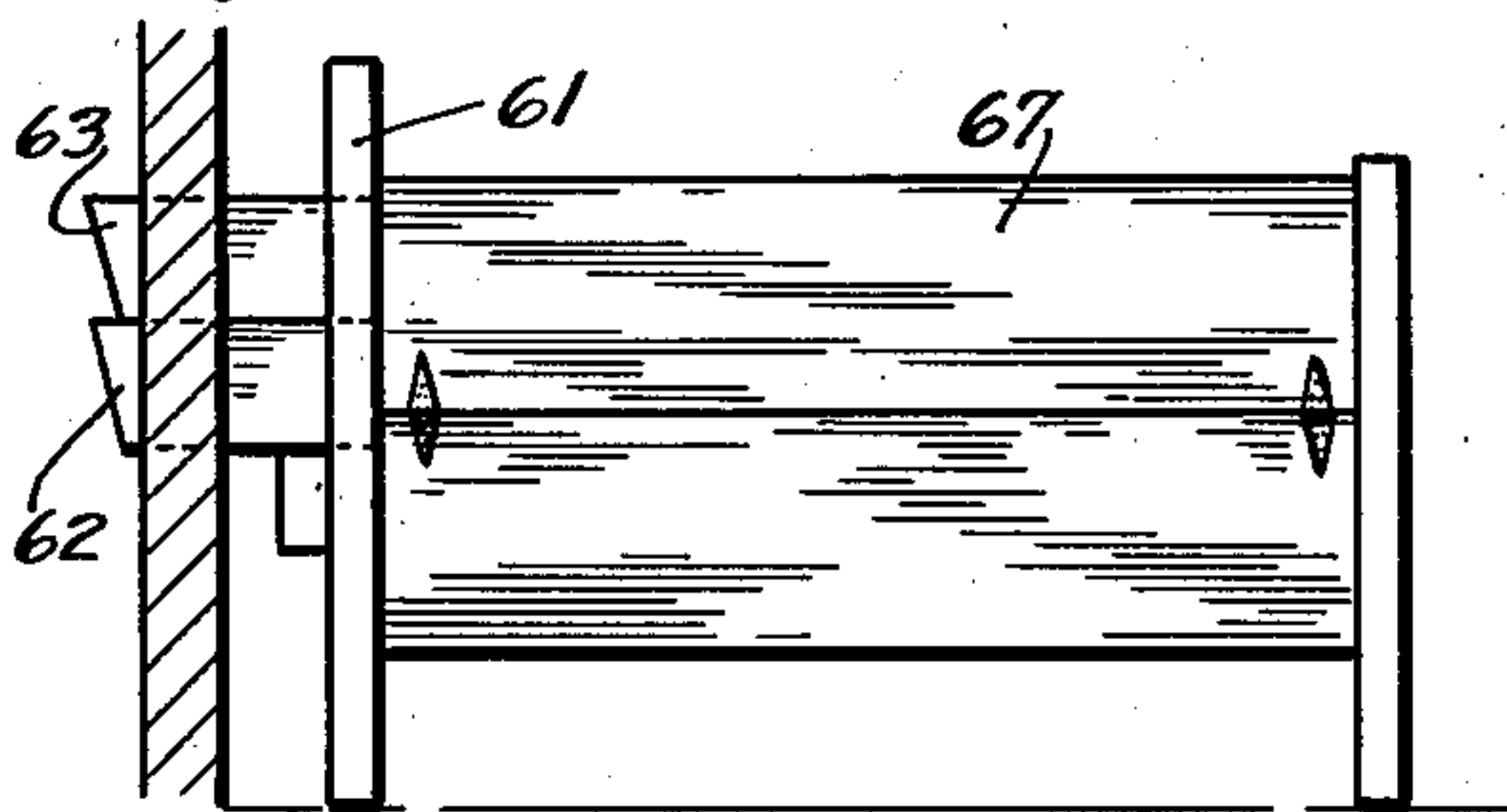


Fig. 14

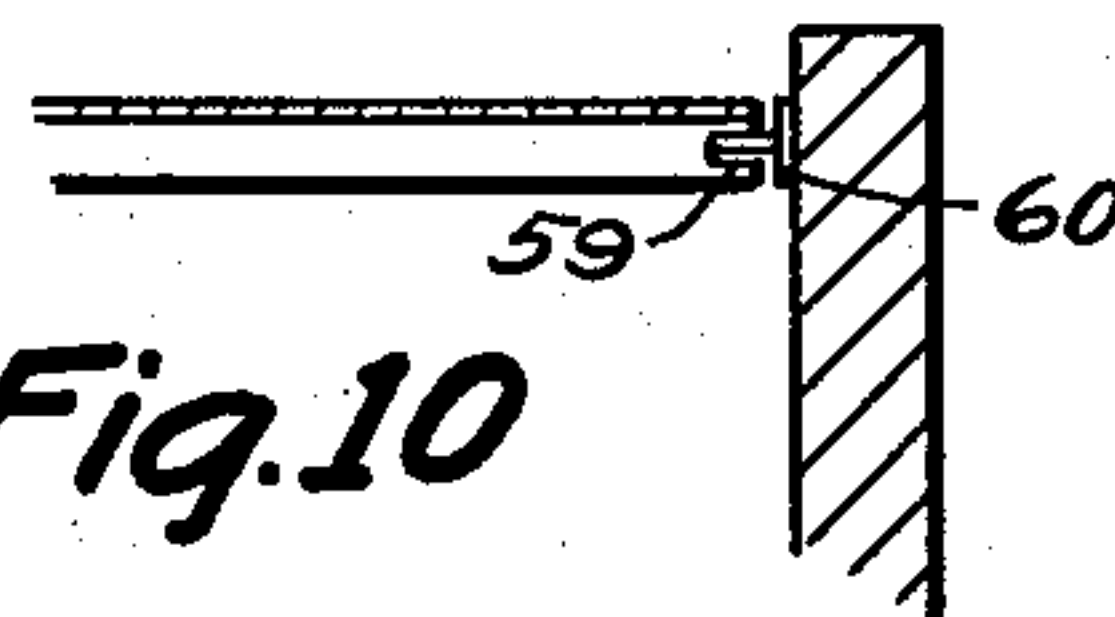
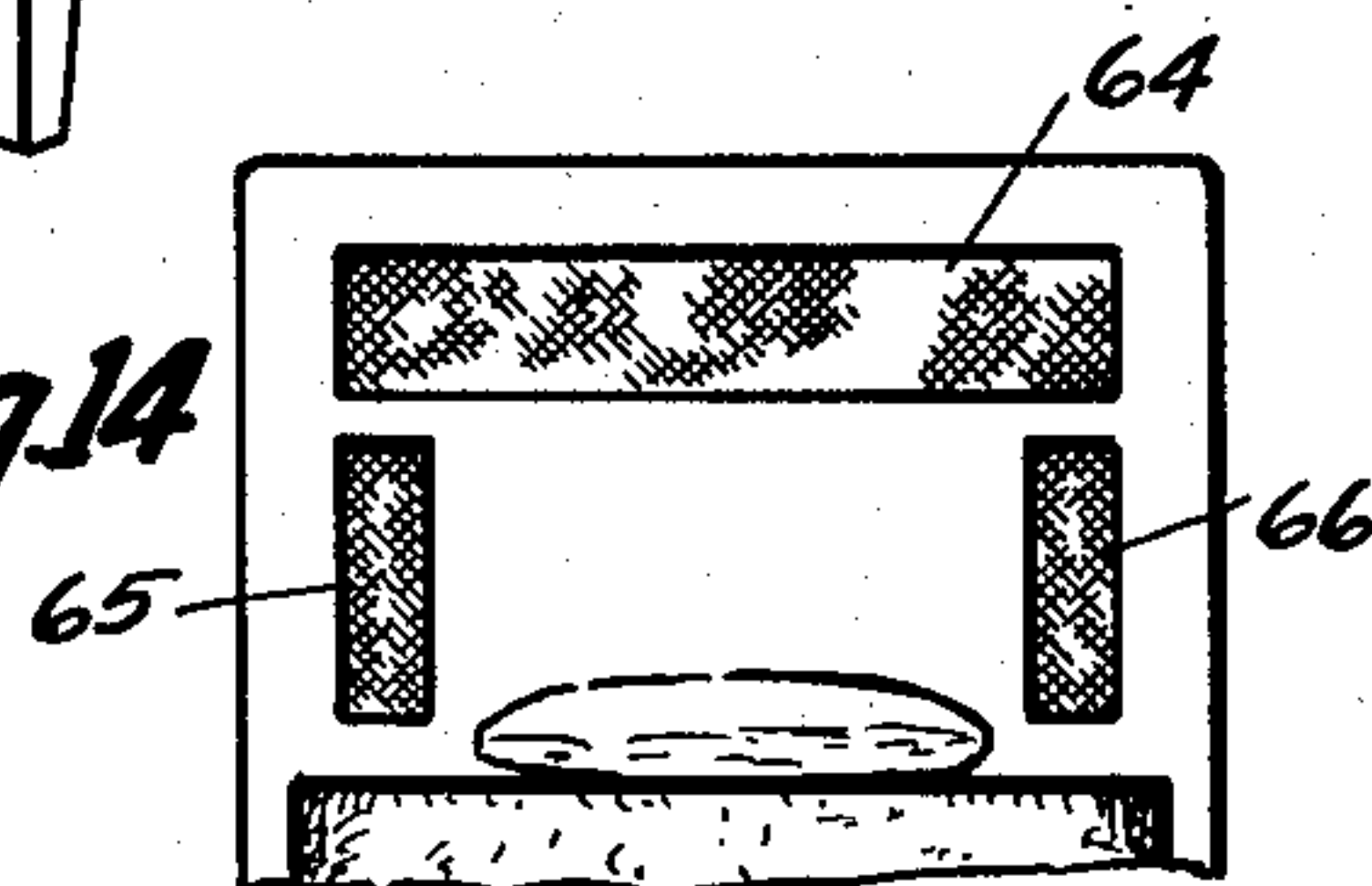


Fig. 10

Fig. 9

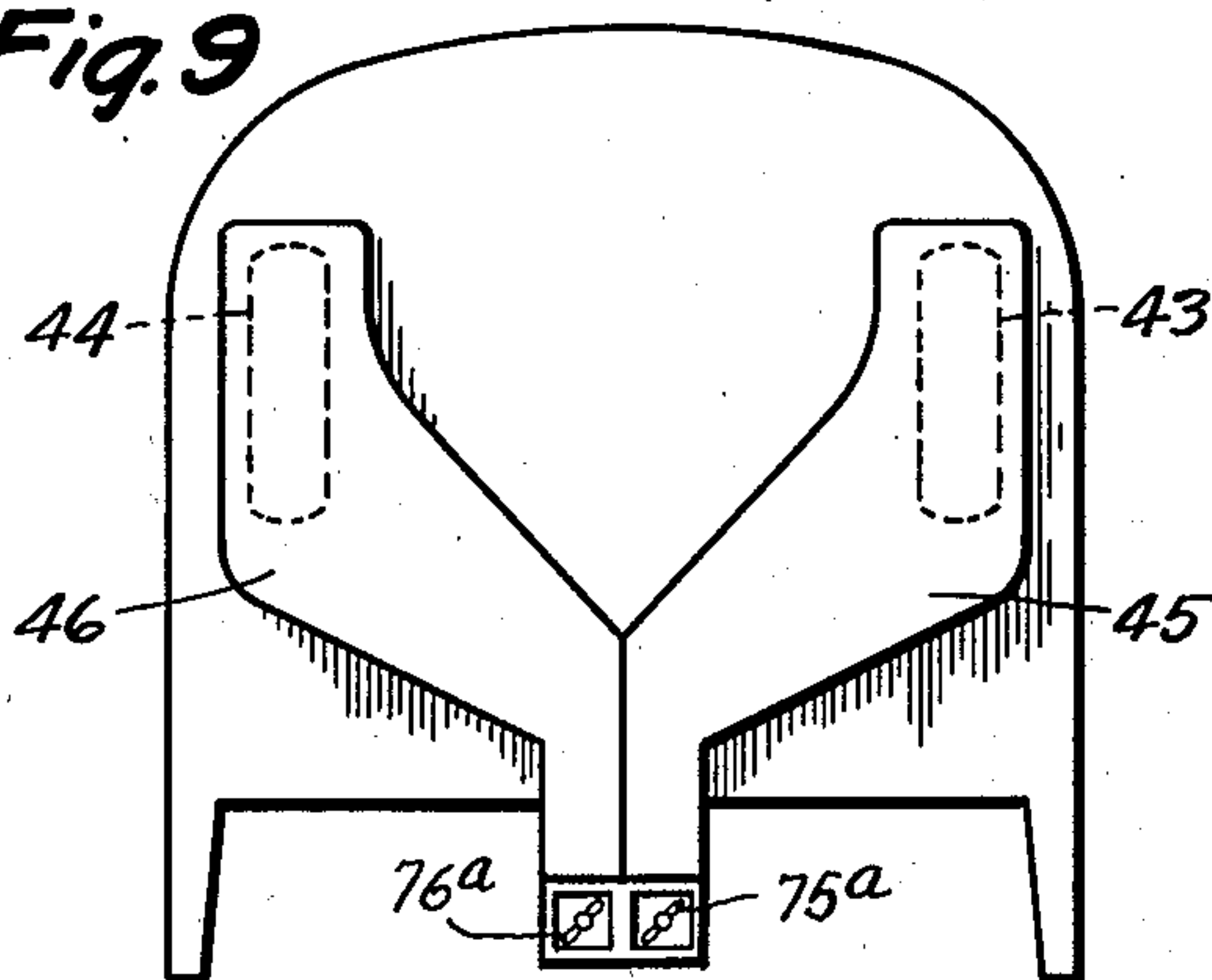


Fig. 11

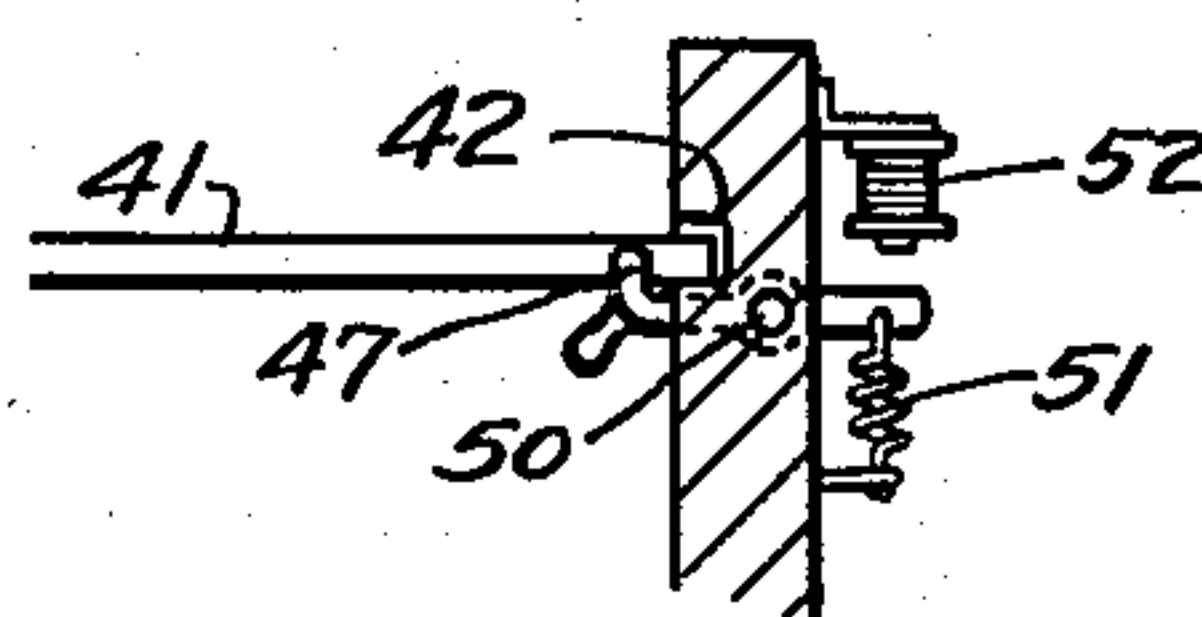


Fig. 12

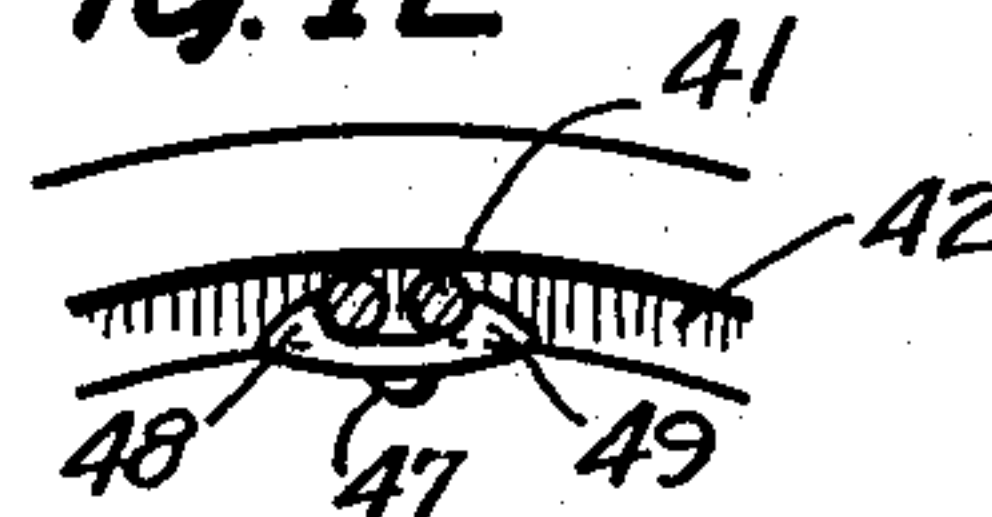
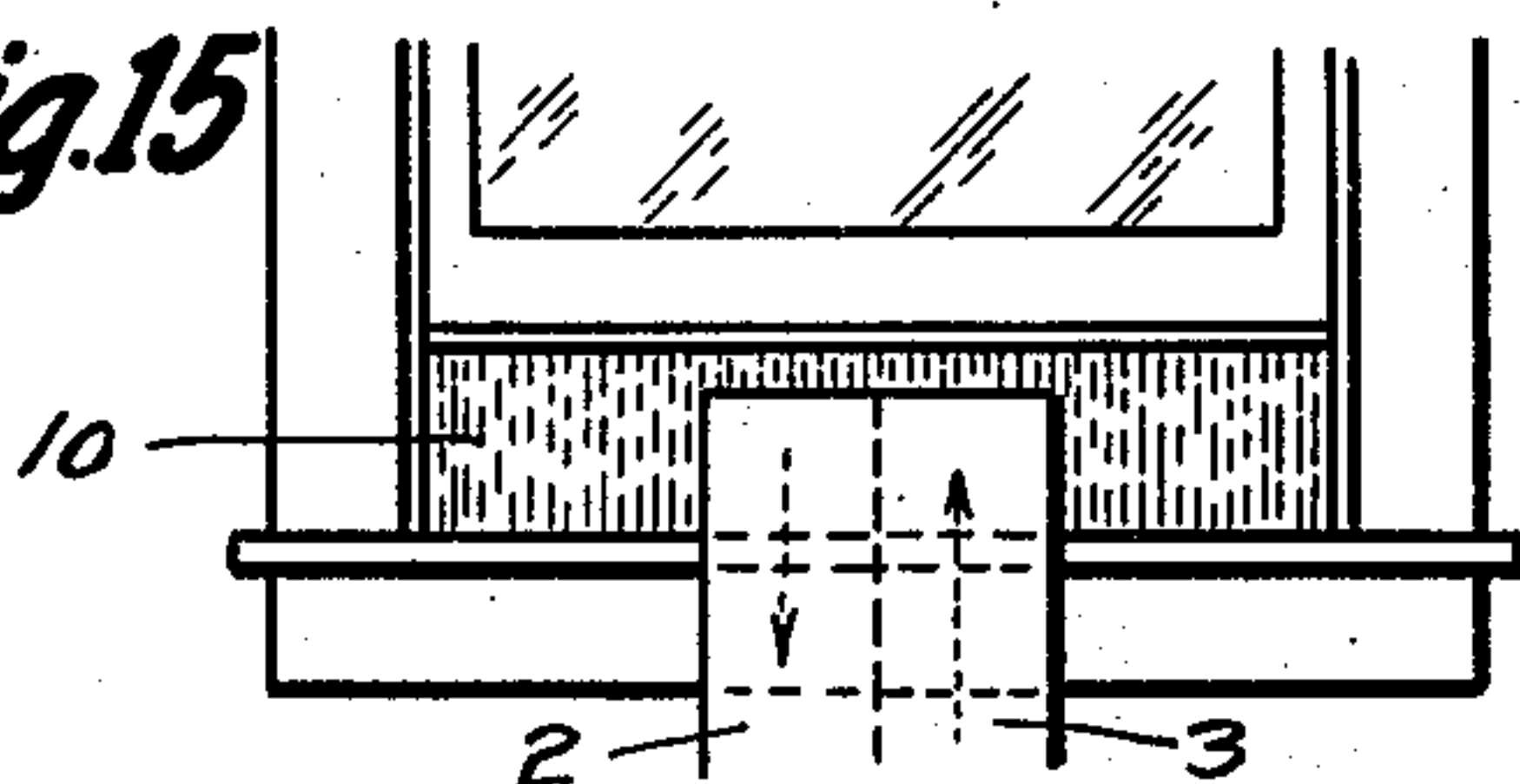


Fig. 15



INVENTOR
Anthony C. Benedict
James Harrison Bowen
ATTORNEY

UNITED STATES PATENT OFFICE

2,183,533

VENTILATING MEANS FOR BEDS AND
THE LIKE

Anthony C. Benedict, Rockville Centre, N. Y.

Application May 31, 1935, Serial No. 24,450

11 Claims. (Cl. 98—89)

The general purpose of this invention is to provide means for supplying fresh or conditioned air to and removing the exhaled air from a person while sleeping without substantially affecting the temperature of the room or enclosure in which the bed or other sleeping device is located.

The invention is an enclosure provided in combination with a bed or the like with means for conducting fresh air from outside of the bedroom, as through a window or wall of a building in which the bed is located, and also means for providing an outlet for air from the enclosure.

In order to supply fresh air particularly through the night it is usually necessary to open the windows and possibly the doors of a room and this air often cools the entire room and its contents so that it is necessary to utilize considerable heat to return the temperature of the room to normal, whereas if fresh air is supplied to a person without cooling the room the temperature will only drop a comparatively small amount and therefore fuel and other economies will be obtained.

The main object of the invention is therefore to provide means for supplying fresh or conditioned air to a person sleeping without changing the air in the entire room in which the person is located.

Another object is to provide means for supplying fresh air, which may be attached to a bed.

Another object is to provide means for supplying fresh air to a person on a bed, which means may be folded or collapsed so that it is comparatively out of the way and/or sight when not in use.

Another object is to direct the air entering an enclosure over a sleeper away from sleeper's head in order to prevent drafts on the head.

Another object is to control the natural circulation of fresh air to and from a person on a bed so as not to substantially affect the air at large in the room in which the bed is located.

A further object is to provide means for supplying fresh or conditioned air and removing the used air to and from a person in a bed in combination with which a safety device is provided for readily admitting air from the room at large when circulating means for the fresh or conditioned air fails.

And a still further object is to provide means for supplying fresh air to a person sleeping by apparatus which is of a simple and economical construction.

With these ends in view the invention embodies an enclosure adapted to be positioned over part or the whole of a bed or the like or in combination therewith with means for changing the air therein by natural draft or by forced draft.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:

Figure 1 is a view showing a simple form of enclosure, hood, cover or canopy positioned on the head of a bed with inlet and outlet connections.

Figure 2 is a similar view of the head of the bed showing an alternate arrangement in which the air exhaust is directly connected to an enclosure and the cover is shown in the folded position.

Figure 3 is a view showing another alternate arrangement in which the supporting means disappears behind the head of the bed when not in use and also in which fans are provided in the outlet and inlet air ducts.

Figure 4 is a front view showing the bed shown in Figure 3.

Figure 5 is a view showing the rear of the head of the bed shown in Figure 3.

Figure 5^A is a sectional view on line 5^A—5^A of Figure 5 looking in the direction of the arrows.

Figure 5^B is a sectional view on line 5^B—5^B of Figure 5 looking in the direction of the arrows.

Figure 6 is a plan view showing the framework for supporting a curtain or hood of the device shown in Figure 3, with part of a covering curtain shown thereon.

Figure 7 is a detail showing a plan view of a part of the ducts shown in Figure 4.

Figure 8 is a view showing a bed of an alternate design in which the entire top of the bed is enclosed when the enclosure means is in place, providing a larger space for the circulation of air for the occupant of the bed. Continuous curtains are provided at the sides with their edges mounted in grooves in the head and foot of the bed and in which the curtains may be drawn upward and secured at the top to completely enclose the bed.

Figure 9 is a view showing the rear of the head as shown in Figure 8.

Figure 10 is a detail showing a track of an alternate design, for the edge of the curtain shown in Figure 8.

Figure 11 is a detail showing a latch device for automatically releasing the ends of the curtains of the design shown in Figure 8, when the fresh air supply fails.

Figure 11^A is a diagrammatic view showing the electric circuit to operate the latch.

Figure 12 is a detail showing a releasable latch for holding the ends of the curtain rods shown in Figure 8.

Figure 13 shows a bed with natural draft connections.

Figure 14 shows the head of the bed shown in Figure 13.

Figure 15 shows an air duct connection to a window.

In the drawings the device is shown as it may be made wherein numeral 1 indicates a hood or cover or enclosure, numeral 2 an air inlet connection or duct and numeral 3 an outlet connection or duct.

In the design shown in Figure 1 the hood 1 is attached to the head of the bed at the point 4 and is held outward by an inverted U shaped frame formed by side members 5 on either side of the bed and a horizontal member at their upper ends, and these members are formed of pipes or tubes with the lower ends of the side members 5 connected to the inlet pipe 2 through a cross member 6 and they are provided with air escape perforations 7 in their upper ends. It will be noted that with the hood 1 extending from the head of the bed outward as shown in Figure 1 and supported in this position by the U shaped frame it will hang over the head of a person in the bed 8 and rests upon the bedclothes over the sleeper and the sides of the hood may be arranged so that a complete enclosure is formed by tucking under the mattress or otherwise so as to make it sufficiently air tight, it fitting snug to the bed at all other points. The end of the hood which rests upon the bed clothes may fold inwardly toward the sleeper's head as shown in dotted lines, or outwardly a sufficient distance to form a suitably tight air seal. The duct 3 communicates with the interior of the enclosure and may extend directly outward through a wall 9, through which the duct 2 also extends, to out of doors or other fresh air supply. However, it will be understood that the ducts 2 and 3 may pass through a window, with a special panel or frame 10, as shown in Figure 15, or may be connected to supply and discharge air ducts of an air conditioning system in a building, or to any means for supplying fresh air and removing the foul air. The hood 1 may therefore be mounted upon a bed as it is being manufactured or readily attached to any bed by connecting the ducts 2 and 3 to the head thereof and extending these ducts through a window or wall or connecting them to any means for providing a supply of fresh air and removing the air. When not in use the device may be folded against the head of the bed as shown in Figure 2 so that the hood will hang downward in the form of a curtain or disposed in any convenient manner. The lower ends of the arms 5 are pivotably attached to the cross member 6 which may readily be attached to the lower part of the head of a bed so that it will extend across under the sideboards or stringers and with the duct 2 connected to the cross member and communicating with the members 5 a continuous supply of fresh air may be provided in the hood. The perforations 7 are arranged so that the air enters in direction and place so as to not produce a draft on the sleeper, and may be at any part of the inverted U inside the enclosure. As shown, the air is discharged through openings 7 in a direction downwardly and toward the foot of the bed, so as not to blow

directly toward the head of the sleeper but rather toward the adjacent part of the enclosure 1.

In the design shown in Figure 2 an inlet connection 2 is shown, and an outlet connection 11 is provided from the hood to outside through the outer wall or a window and through the head of the bed in the same manner as the connection 2. The connection 11 may be provided with a fan 12 which will exhaust stale air from the hood causing fresh air to enter through 2, the hood being sufficiently air-tight elsewhere. It will also be understood that a fan may be used in connection with the duct 2 shown in Figure 1 and also that fans may be used in both connections as shown in Figures 3 and 4. It will also be understood that the frame including the side members 5 and the cross bar 6 may be made of any material and may be attached to the head of the bed at any point or points. It will also be understood that a frame similar to the frame of an awning may be used if desired.

In the design shown in Figures 3 to 7 the supporting means for the hood or curtain 31, which will be described more particularly hereinafter is made so that it will collapse or disappear so that it is practically out of sight when not in use and it will also be understood that this is only a typical arrangement as any mounting means may be provided. In this design the device is provided with a hollow arm 13 the inner end of which is slidably mounted in a casing 14 which may be positioned on the back of the head 15 of the bed and the arm may be provided with perforations 16 and an opening 17 in the outer end through which air may be supplied through the casing 14. These openings may also be provided with screens, louvres, or other means, as indicated by the numeral 18 for diffusing the air. The arm is mounted upon pins 19 which are secured to and project from either side of this arm and which are slidable in grooves 20 formed interiorly in the side walls of the casing 14, as shown in Fig. 5^A and when in the position shown in Figure 3 the inner end thereof will substantially close the upper end of the casing 14 and when not in use the outer part 13 may be raised and the inner end dropped downward into the casing as indicated by the dotted lines. The outer end of the member 13 is provided with a cross bar 21 shown in section, in Figure 3, which may be bent in the form shown in Figure 6 and this is formed with side members 22 hinged at 23 to end members or blocks 23^a, which are slidably held in tracks or ways 24 at the back of the head. As will be observed from Figs. 5^A and 5^B, as the arm 13 slides downwardly in the casing 14 the members 23^a will also slide downward in the tracks 24.

The head of the bed is also provided with outlet openings 25 and 26 and these are connected to a duct 27, the lower portion of which is connected by a flexible tube 28 to a horizontal duct 29 which may be connected to the outside and which may be provided with a fan 30 which will provide a forced draft to draw stale air through the openings 25 and 26 from a hood that may be formed by a curtain 31 as indicated in dotted lines over the members 13 and 22 and the end of the curtain may be attached to the head of the bed or made to fit over the head so as to form an enclosure which is sufficiently air-tight. The casing 14 is also connected by a flexible tube 32 to a horizontal duct 33 having a fan 34 therein and this fan will draw air from the outside and inject it into the hood through the casing 14 and the arm 13 thereby providing fresh air at the upper

part of the hood. The duct 33 may extend through a wall or a window similar to the duct 2 shown in Figure 1 or may be connected to an air conditioning riser or may extend to any point where fresh air may be obtained. The ducts 29 and 33 may be provided as shown in Figure 7 in which they are formed with an enlarged portion surrounding the fans and then these are narrowed down so that they may run against a baseboard or the like, as shown. However, it will be understood that they may be of any shape or design, and run in any suitable manner.

It will also be observed that the fresh air vents 16 and 17 are arranged so as to direct the stream of fresh air away from the head of a sleeping person and the air will be diffused through the hood so as to avoid a draft upon the person's head. It will be noted that the openings 16 and 17 are arranged upon the sides of the arm 13 and in the end portion of this arm so that the air is discharged laterally and toward the foot of the bed, or, in other words, generally toward the curtain 31 instead of toward the head of the sleeper.

The air inlet duct may also pass over a radiator, or may be provided with a heater 35, as shown in Figure 4, or any means may be connected therewith for heating, cooling, washing or otherwise conditioning the air.

The cover formed by the enclosure or hood 31 may also be provided with a flap 53 as shown in Figure 6 which may rest freely on the upper surface of the hood and provide a cover for an opening 54 in the hood so that the opening will be normally closed. However when desired this flap may be opened so that some circulation of air between the room and the bed enclosure would take place in the event forced circulation should fail. However, when fans are used in both the inlet and the exhaust ducts and the flap 53 is open, a circulation through the ducts and the enclosure without seriously affecting the air of the room is obtained when the in and out volumes of air through the ducts are substantially the same. This cover 53 may be provided with snaps 55 if desired or any fastening means may be provided, or the cover 53 may be omitted so that the opening will be permanent.

In the design shown in Figures 8 to 12 the bed is made of a special design in which the head and foot may be the same size and shape and grooves are provided in which the edges of a curtain or curtains or other covering, mounted in combination with the bed, may travel as the covering is moved into position to form an enclosure with the bed.

The bed is indicated by the numeral 36 and this is formed with a head 37 and a foot 38 and the coverings 39 may be mounted upon rollers 40 in casings at the sides of the bed and stays 41 at the edges of the curtain may be gripped so that the stays and coverings may be drawn through grooves 42 in the inner surfaces of the head and foot and any means may be provided for holding the edges of the stays or coverings together at the center of the top or at any point. These coverings may be in somewhat the form of rolling window shades and mounted upon spring rollers so that as soon as they are released they will be drawn downward into their respective positions and the curtains may be provided with any number of horizontal stays to prevent sagging between supports when rolled out, and the stays may be made in hems or attached to the material of the curtain, or formed in any manner. In this design one end of the bed is provided with an in-

let opening 43 and an outlet opening 44 and these openings may be connected respectively by ducts 45 and 46 to any suitable means for supplying fresh air and removing the stale air from the bed enclosure, such as the fans 75^a and 76^a.

One or both of the ends of the bed may be provided with a latch 47 as shown in Figures 11 and 12 which is formed with gripping members 48 and 49 and positioned in the lower part of the groove 42 so that as the stays 41 are brought to the center of the bed the ends of the stays will snap over the members 48 and 49 which will be gripped and held thereby. This latch may have a knob extending downward therefrom by which it may be released by hand and the knob and latch may be of any type or design. In the design shown the latch 47 is pivotally mounted on a pin 50 and the outer end of the latch is resiliently held downward by a spring 51 and in this design a solenoid 52 is provided above the outer end of the latch and this may be connected to an electric relay by any suitable means so that should the motor of the fan supplying fresh air stop for any reason the relay would energize the solenoid 52 and this would attract the outer end of the lever and draw the inner end backward so that the curtains will be released thereby preventing stagnation of air in the hood. In Fig. 11A there is shown an electric circuit diagram to effect this result. The solenoid 52 is controlled by a circuit 70 having a switch 71 urged to closed position by a spring 72, but held in open position against the action of this spring by a solenoid 73 controlled by the motor circuit 74 leading to the motor 75 which drives fans 75^a and 76^a, controlling the delivery of air to and withdrawal of air from the enclosure. It will be noted that when current fails for any reason in the motor circuit 74, causing the motor 75 to stop, the solenoid 73 will be de-energized and permit the spring 72 to close the switch 71, thus energizing the solenoid 52 and withdrawing the latch 47.

The bed shown in Figure 8 may also be provided with a central support for the covering means consisting of members 56 and 57 slidably mounted in sockets 58 that may be provided at the sides of the bed and these members may readily be removed when not in use, however if it is desired to support the central part of the cover or curtain the ends of these members may readily be inserted in the sockets so that they may be installed in the position shown. It will be understood that any number of such members may be used or any other means may be provided for supporting the central part of the curtain or hood if required.

The edges of the curtain may also be provided with grooves 59 as shown in Figure 10 and these may fit over a rail 60 which may be mounted upon the inner surfaces of the head and foot of a bed instead of providing grooves extending into the surface of the head of the bed; and it will be understood that any other means may be used for holding the edges of the curtains to the bed or slidably connecting them so that the curtains may readily be raised and lowered with their edges guided by means on the head and foot.

Figures 13 and 14 show a bed with an enclosure that may be a curtain, or any foldable material, or the covering may be made with panels, or sheets, or slabs of material joined together and adapted to be folded or collapsed to open the bed, and moved into such a position that they will completely enclose the bed. This bed, which is indicated by the numeral 61 is also shown with

relatively large inlet and outlet ducts 62 and 63 which may pass through the wall to provide natural draft or circulation through the enclosure. The outlet duct 63 communicates with an opening 64 in the head of the bed, and the inlet duct 62 communicates with two openings 65 and 66 which distribute the incoming air to the sides to prevent draft on the sleeper's head. These ducts may, however be arranged in any manner and any means may be provided for assisting the natural draft into or out of the enclosure, which in the design shown is formed with foldable panels 67 secured to the sides of the bed and hinged so as to form an enclosure over the entire bed between the head and the foot. This will provide a suitable opening for the entrance and exit of a person to the bed when the panels are opened by means of their hinges.

It should be understood the enclosing cover may be constructed in any suitable manner and of any suitable material so as to perform the function of forming a sufficiently tight enclosure when in place and to be readily removed from over the bed to permit ready access in and out of the bed. The enclosing means may be built into the bed or attached to a bed already built.

Any supplementary means for making the enclosure in any of the forms more tight against the passage of air may be utilized, it being only necessary that the circulation of air through the enclosure and the ducts is not unduly interfered with by leakage to or from the room. A tighter enclosure is, in general, required when the air is forced in but one of the ducts because of the tendency to blow through the cover or between it and the bed rather than through the other duct. A fan in each of the ducts makes tightness of the cover less important.

It should also be understood that the construction of the bed enclosure and/or the ventilating means may depart substantially from that shown without avoiding the claims so long as it is within the principle of the invention.

It will also be understood that although the air connections are referred to as ducts any means may be employed to conduct air to and from the enclosure, and these connections may also be flexible and of any length, so that the bed may be moved.

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

1. In combination with a bed, means for supplying fresh air to a person therein independently of the air at large about the bed, comprising an enclosure about the head of the bed, inlet and outlet means communicating with the interior of said enclosure to carry the air to and from the same, means to induce a current of air through said inlet and outlet means, and means effective only upon the cessation of said inducing means to provide interchange of air between the space within said enclosure and the space at large about the bed.

2. In combination with a bed, means for supplying fresh air to a person therein independently of the air at large about the bed, comprising an enclosure about the head of the bed, inlet and outlet means communicating with the interior of said enclosure to carry the air to and from the same, means to induce a current of air through said inlet and outlet means, means providing communication between the space within said enclosure and the air at large about the bed, said last-named means being inoperative

when said air inducing means is in operation and becoming operative upon the cessation of said inducing means.

3. In combination with a bed, means for supplying fresh air to a person therein independently of the air at large about the bed, comprising an enclosure about the head of the bed, inlet and outlet means communicating with the interior of said enclosure to carry the air to and from the same, means to induce a current of air through said inlet and outlet means, means providing communication between the space within said enclosure and the air at large about the bed for furnishing a breathing supply of air to the enclosure, said last-named means being inoperative when said air inducing means is in operation and becoming operative upon the cessation of said inducing means, and said inducing means comprising an air propelling device to force air to and from the enclosure at substantially the same volume rate.

4. In combination with a bed, means for supplying fresh air to a person therein independently of the air at large about the bed, comprising an enclosure about the head of the bed, inlet and outlet means communicating with the interior of said enclosure to carry the air to and from the same, means to induce a current of air through said inlet and outlet means, said enclosure being provided with an openable portion, and controlling means for said portion arranged to open the same upon the cessation of said inducing means.

5. An apparatus in combination with a bed or the like, adapted to form an enclosure around the head of a person on the bed, means for supplying fresh air to said enclosure and for removing air from said enclosure, a motor driven fan in the air-supplying and removing means, and means for automatically opening the enclosure as the motor of said fan stops.

6. Apparatus in combination with a bed or the like adapted to form an enclosure around the head of a person on the bed, means for supplying fresh air to said enclosure and removing air from said enclosure, mounting means for said enclosing means upon the bed, said mounting means adapted to be folded to a relatively out of the way position, and in which air is delivered through said mounting means.

7. Apparatus in combination with a bed or the like comprising mounting means attached to the head of the bed, an enclosure supported by said mounting means and enclosing a space about the head of the bed, means attached to the head of the bed for delivering air to and removing it from said enclosure, said means communicating with an air supply exterior to the room, and said mounting means being movably attached to the head of the bed and foldable to a position behind said head when not in use.

8. Apparatus in combination with a bed or the like comprising mounting means attached to the head of the bed, an enclosure supported by said mounting means and enclosing a space about the head of the bed, means attached to the head of the bed for delivering air to and removing it from said enclosure, said means communicating with an air supply exterior to the room, and said mounting means and said delivering means being movably attached to the head of the bed and foldable to a collapsed position against said head when not in use.

9. Apparatus in combination with a bed or the like comprising mounting means attached to the

head of the bed, an enclosure supported by said mounting means and enclosing a space about the head of the bed, means adjacent the head of the bed for delivering air to and removing it from
5 said enclosure, said means communicating with an air supply exterior to the room, said mounting means and said delivering means being movably attached to the head of the bed and foldable to a collapsed position against said head
10 when not in use, and said delivering means also serving to support the enclosure.

10. In combination with a bed, means for supplying fresh air to a person therein independently of the air at large about the bed, comprising
15 an enclosure about the head of the bed, inlet and outlet means communicating with the interior of said enclosure to carry the air to and from the same, means to induce a current of air through said inlet and outlet means to supply air
20 within the enclosure, and said inlet and outlet means being disposed at a point remote from the

head of a person in the bed to prevent a harmful draft on such person, and said means being arranged to force air to and from the enclosure at substantially the same volume rate, and means
5 providing communication between the space within said enclosure and the air at large about the bed upon cessation of said inducing means.

11. Apparatus in combination with a bed or the like comprising means forming an enclosure
10 about the head of a person on the bed, means for delivering to and removing from said enclosure a breathing supply of air independently of the air at large about the bed, said enclosure being attached to the bed and collapsible without detaching to a position completely without the space
15 between the head and foot of the bed, whereby the space over the mattress portion of the bed is entirely free of said enclosure when the latter is collapsed.

ANTHONY C. BENEDICT. 20