

No. 815,296.

PATENTED MAR. 13, 1906.

F. W. KELLERMAN.
SAD IRON.

APPLICATION FILED SEPT. 9, 1904.

3 SHEETS—SHEET 2.

Fig. 2.

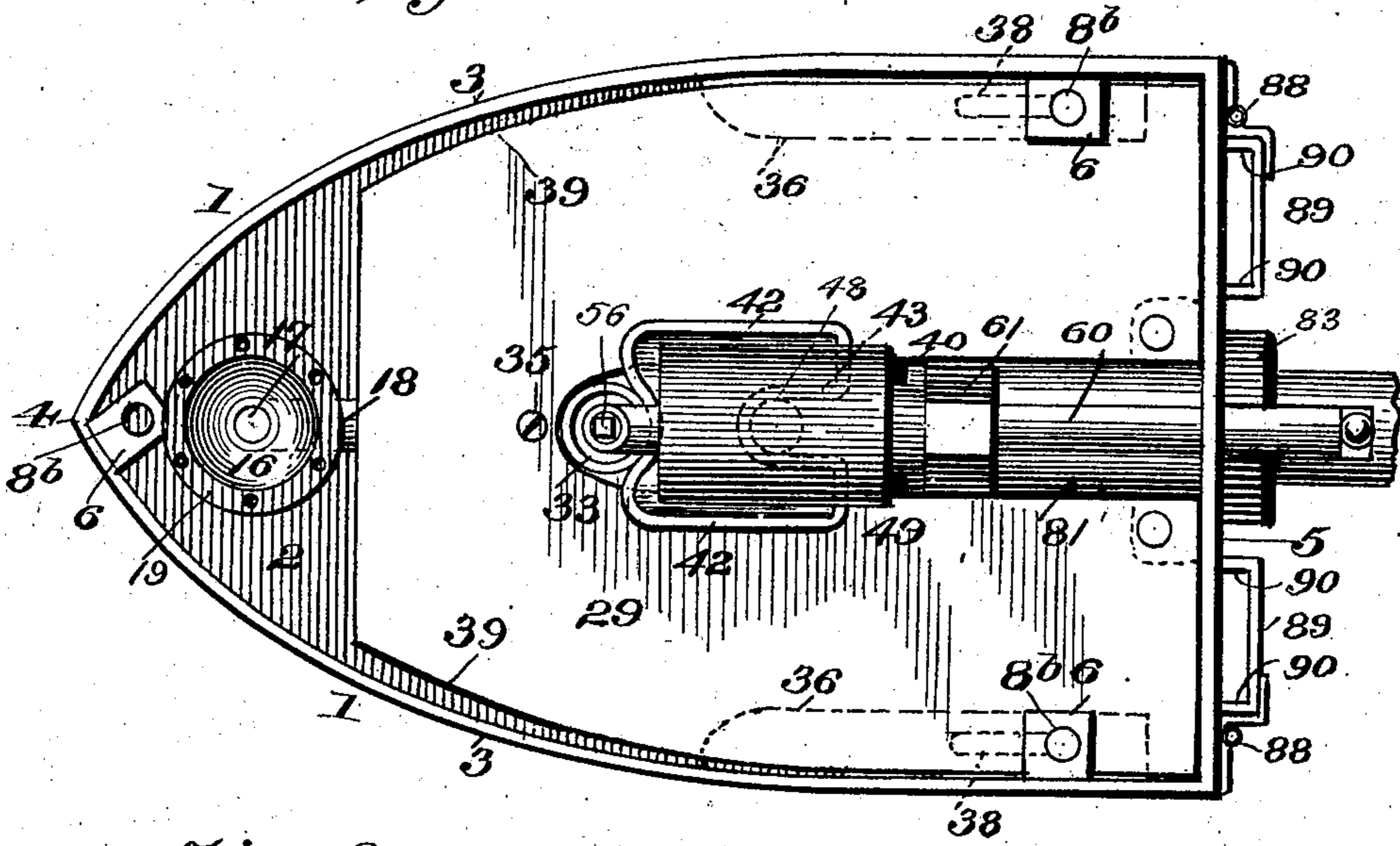


Fig. 3.

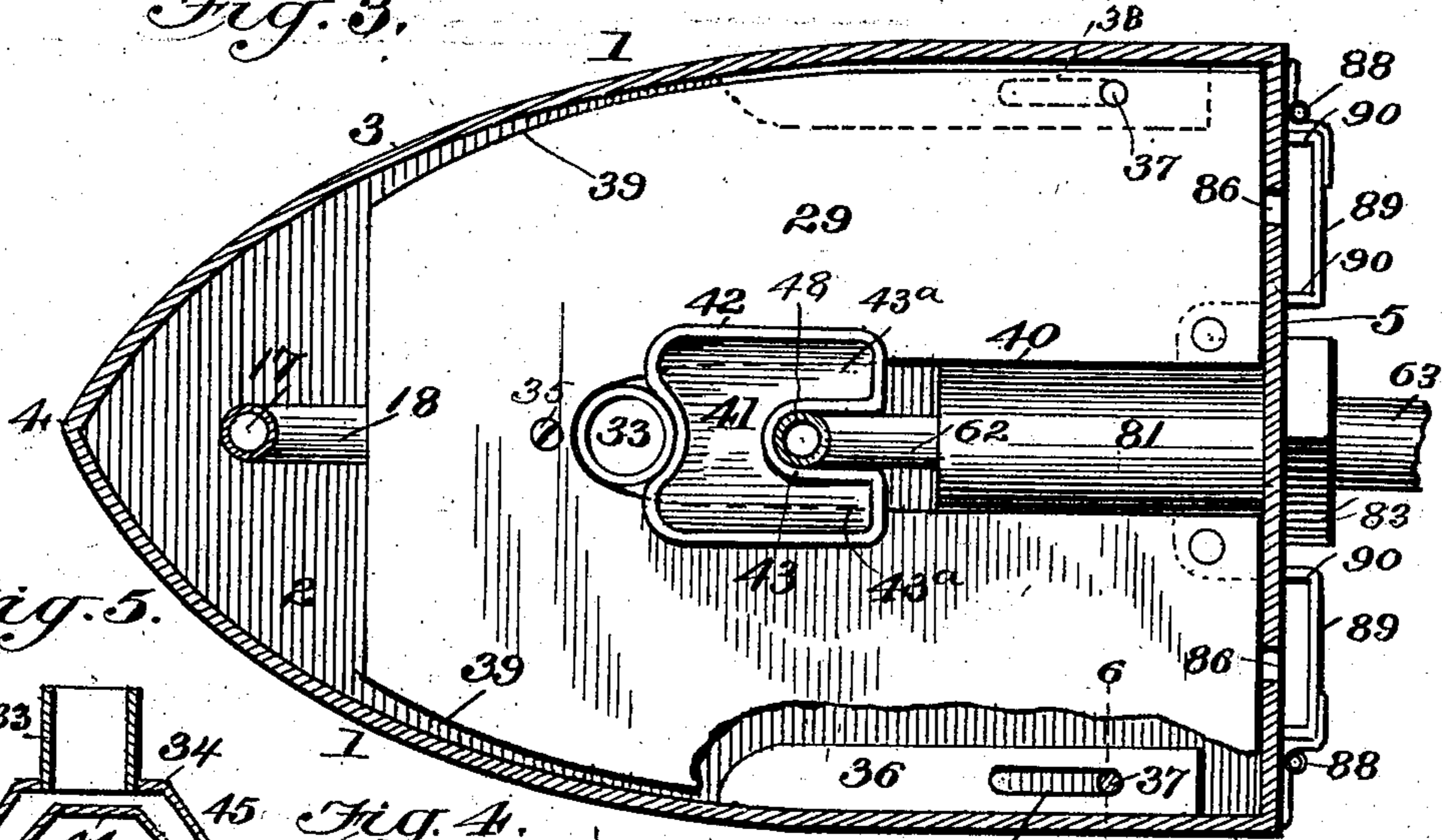


Fig. 5.

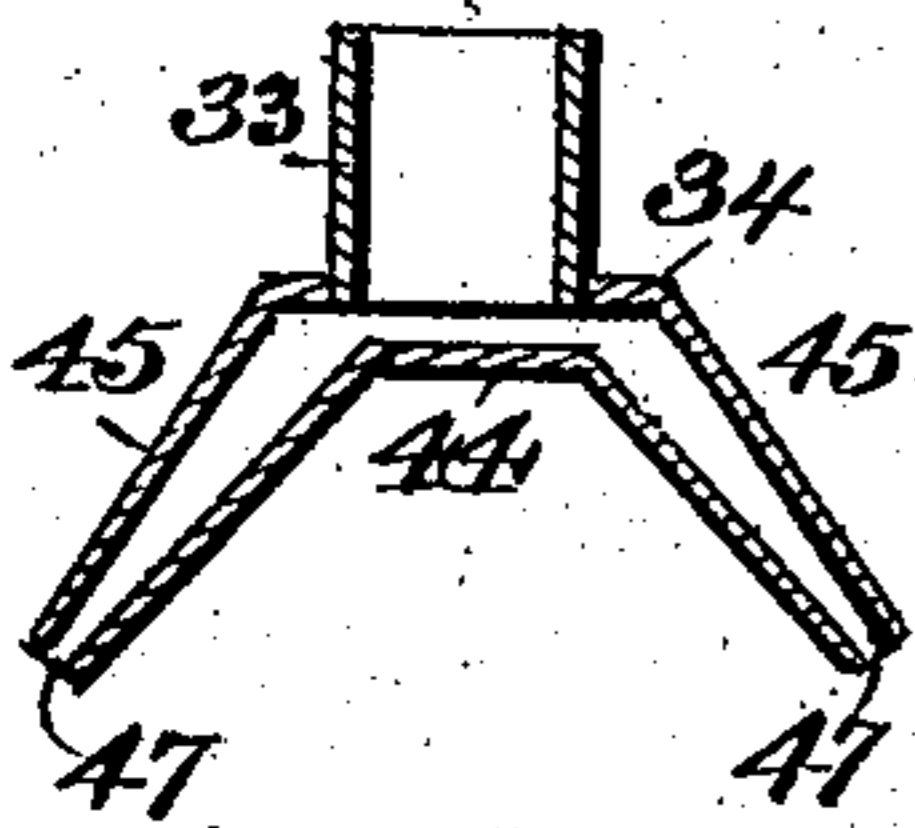


Fig. 4.

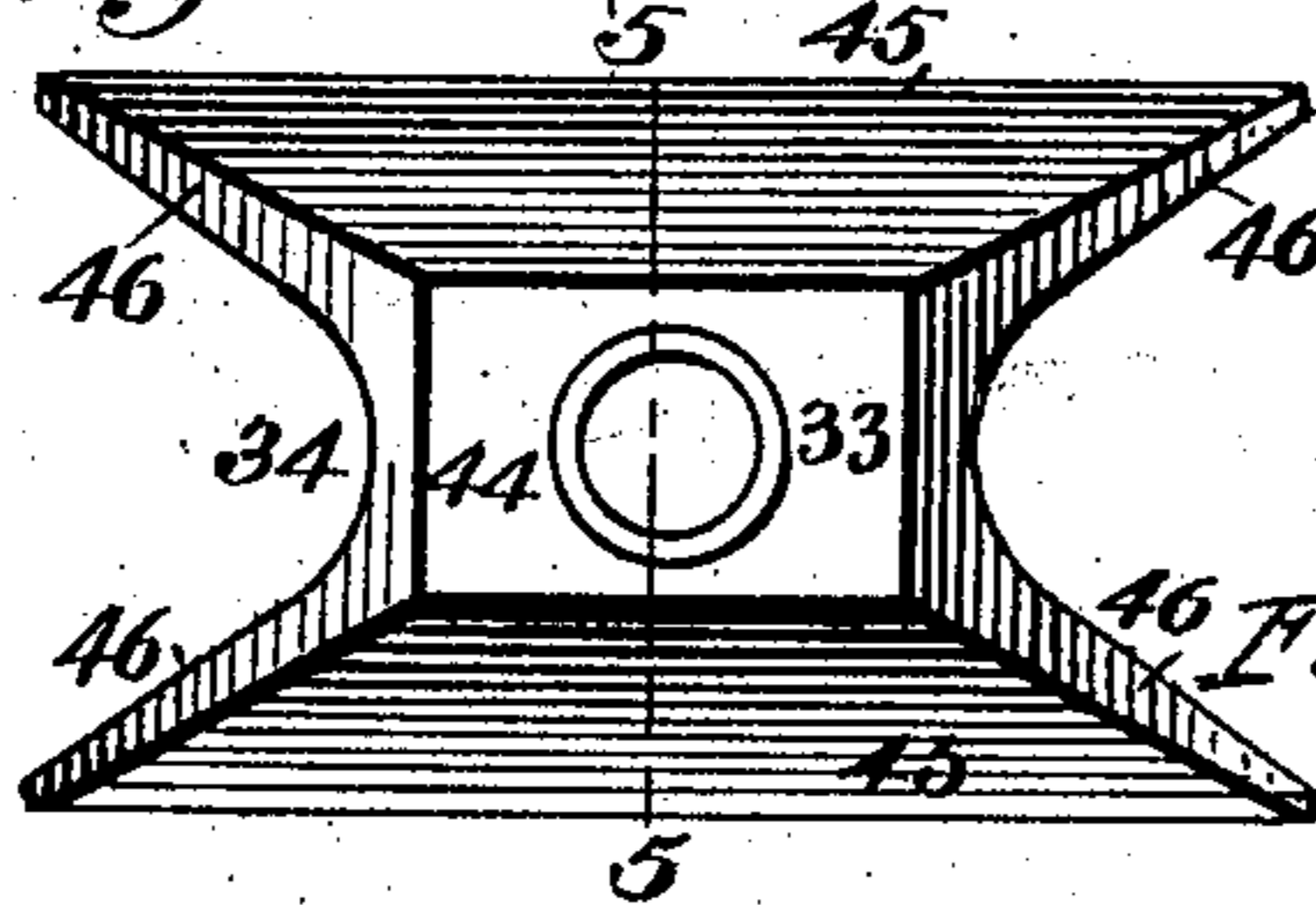
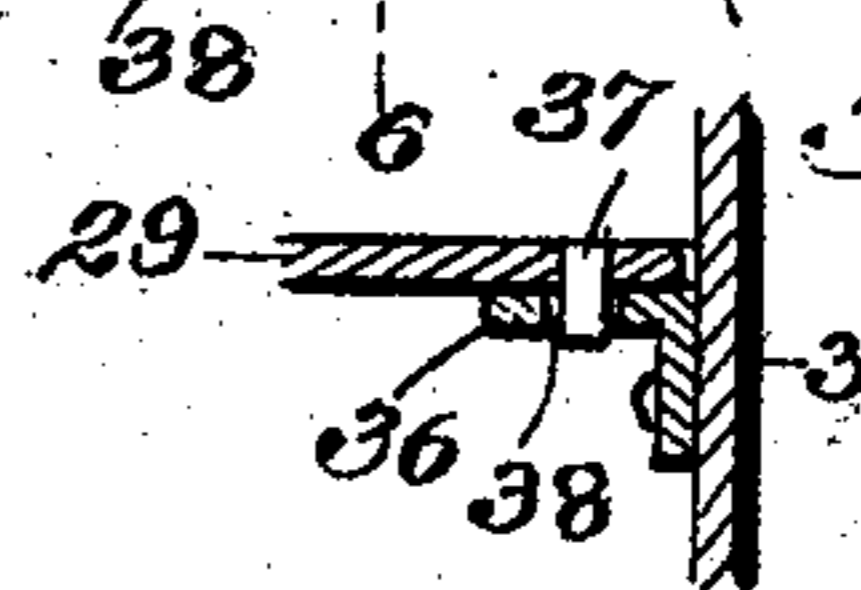


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

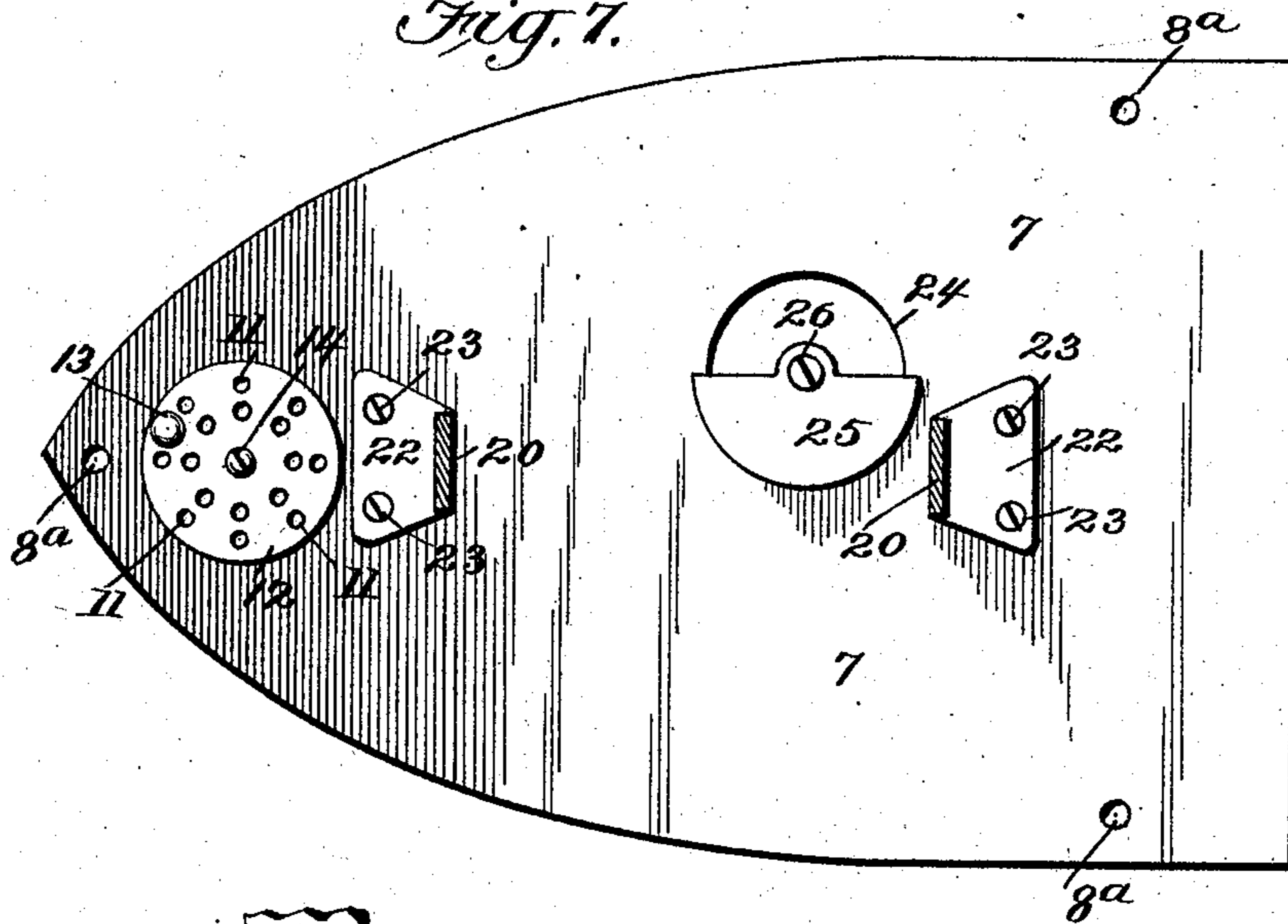


Fig. 8.

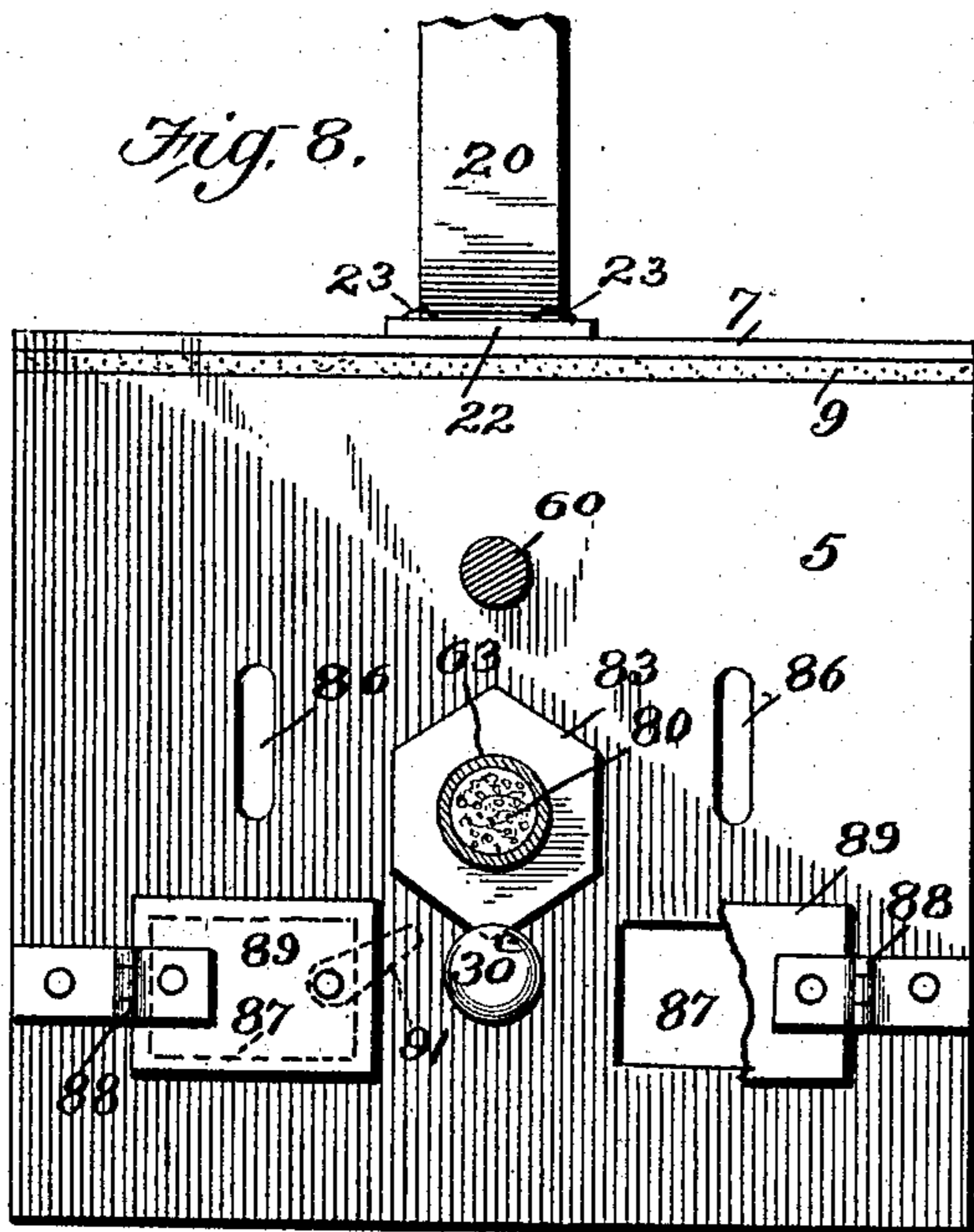
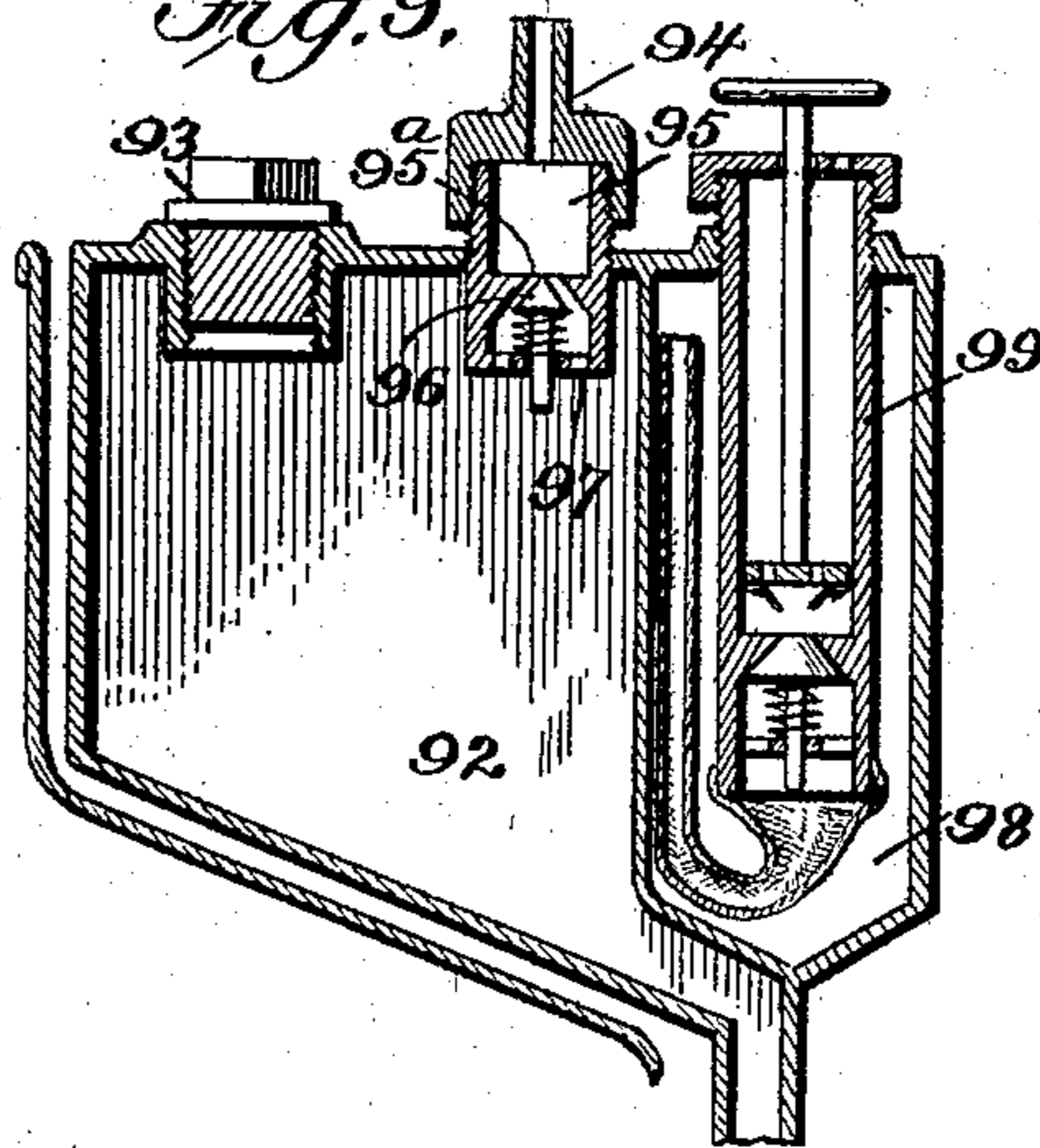


Fig. 9.



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FREDERICK W. KELLERMAN, OF WEYMOUTH, MASSACHUSETTS.

SAD-IRON.

No. 815,296.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed September 9, 1904. Serial No. 223,870.

To all whom it may concern:

Be it known that I, FREDERICK W. KELLERMAN, a citizen of the United States, residing at Weymouth, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Sad-Irons, of which the following is a specification.

This invention relates to sad-irons; and it consists, substantially, in the construction and combinations of parts hereinafter particularly described, and pointed out in the claims.

The invention has reference more especially to self-heating sad-irons in which the vapor of gasolene, naphtha, or other vaporizable fluid is employed as the heating agent; and one of the principal objects of the invention is to overcome disadvantages and objections common to many devices of this class at present in use and also to provide a sad-iron which is comparatively simple in its embodiment as well as inexpensive to manufacture.

A further object is to provide a self-heating sad-iron which may be easily manipulated and controlled and which is effective and reliable in operation, besides possessing the capacity for long and repeated service.

A still further object is to provide a sad-iron the coöperative elements of which may be easily taken apart and again put together and which may be readily repaired and replaced by others when worn or broken.

The above and additional objects are attained by means substantially such as are illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view of a sad-iron embodying my improvements. Fig. 2 is a top plan view of the sad-iron proper with the top plate or cover removed, parts of the complete embodiment of the invention being broken off at the right. Fig. 3 is a horizontal sectional view of the sad-iron proper on the line 3 3 of Fig. 1, being partly broken out to indicate construction and parts of the complete embodiment of the invention being also broken off at the right. Fig. 4 is a top plan view of the burner detached. Fig. 5 is a transverse sectional view of the burner on the line 5 5 of Fig. 4. Fig. 6 is a sectional view in detail on the line 6 6 of Fig. 3. Fig. 7 is a plan view of the top plate or cover of the sad-iron, the handle being removed therefrom and its supports shown in section. Fig. 8 is a rear end view of the sad-iron with parts in section and broken out,

the fluid-supply tank not being shown. Fig. 9 is a sectional view in detail, showing a slight modification in the construction of the supply-tank for the vaporizable fluid employed to heat the sad-iron. Fig. 10 is a detail view in perspective of the bracket secured to the rearward slotted portion of the slidable horizontal partition. Fig. 11 is a transverse sectional view in detail on the line 11 11 of Fig. 1.

Preliminarily to a more detailed description it may be stated that in the form of my improvements herein shown I employ a sad-iron having a body of special construction and within which is supported a specially-constructed movable horizontal partition dividing the interior of the body into an upper and forward chamber and a lower combustion-chamber, in which latter is mounted a vapor-burner, also of special construction. Supported in the upper chamber is a vapor-generator of special construction, in communication with which is a conductor for the vaporizable fluid leading from the supply-tank for such fluid, suitable valves being employed to regulate the passing of the fluid to the conductor, as well as the passing of the generated vapor to the burner. Other specially-constructed elements are also employed, as will hereinafter be more fully explained, and while I have herein represented my improvements in a certain preferred embodiment it will be understood, of course, that I am not limited thereto in precise detail, since immaterial changes may be resorted to coming within the scope of my invention.

Reference being had to the drawings by the designating characters marked thereon, 1 represents the body of the sad-iron in entirety, the same being hollow and comprising the bottom 2 and the side walls 3 3, converging at their forward ends and united to form the nose 4, said side walls being united at their rearward ends by a rear wall 5. Each of the side walls 3 3 is provided with a series of holes or perforations 5^a at the forward upper part thereof, (see Fig. 1,) and secured to the inner sides of said walls by rivets 5^b are a number of properly-disposed brackets 6, on which the top plate or cover 7 of the said iron is supported, said top plate being fastened in place by means of screws 8 inserted through openings 8^a therefor in said top plate and through registering openings 8^b in the brackets. In order to prevent as much as possible the heating of the top plate, I preferably dispose beneath the same a sheet

9 of non-conducting material, such as asbestos, the said fastening-screws 8 for the top plate also serving to fasten said sheet in place, the latter having openings therein corresponding to openings 8^a and 8^b, through which the screws 8 extend. The top plate presents the same outline in plan view as is presented by a plan view of the body, and it is formed near the forward or tapered end thereof with a series of holes or openings 10, with which may be made to register corresponding holes or openings 11, formed in a rotatable valve-plate 12, having an operating-crank or knob 13 and mounted to work on a pin 14 extending through a central opening therein and secured in the top plate by means of a nut 15 on the under side thereof. The holes or openings 10 are in communication with the conical upper extremity 16 of a vertical flue or pipe 17, the lower extremity of which terminates in a rearwardly-extending branch 18, resting on the upper surface of the bottom 2. The edge of the said conical extremity of the flue is flanged at 19 and is riveted to the under side of the top plate at 20, this being a convenient way of fastening the flue in rigid position, although other means may be employed therefor, if desired, it being understood, of course, that the asbestos sheet 9 is cut out beneath the openings 10, so as to offer no obstruction to said openings.

Mounted upon the top plate are supports 20 for a handle 21 of wood or other non-conductor of heat, the bases 22 of said supports being secured in place by means of screws 23, (see Figs. 1 and 7,) and formed approximately centrally of the top plate is an opening 24, which is closed by a valve-plate 25, rotating on a screw 26, the asbestos sheet 9 being correspondingly cut out, so as to permit of access to the interior of the body 1 of the sad-iron through said opening 24.

The hollow body 1 is divided interiorly into a main chamber, comprising a space 26 above the combustion-chamber and a space 27 in front of the same and a lower combustion-chamber 28, by means of a forwardly and rearwardly slidable horizontal partition 29, provided at its forward end with a depending apron 30, the lower edge of which reaches practically to the upper surface of the bottom 2 and is notched at 31 to permit of the entrance to the combustion-chamber of the flue branch 18. (See Fig. 1.) Said partition is of special construction, and upwardly through which projects a tube 33, leading from and communicating with a burner 34, secured to the under side of the partition 29 by means of a screw 35 or in any other preferred way. This partition 29 is supported upon ledges 36, projecting from the opposite inner surfaces of the side walls 3, and is provided with pins 37, working in slots 38 in said ledges, the length of said slots

being such as to limit the forward movement of the partition to prevent the same from striking against or coming into contact with the flue 17, and when the partition is at the limit of its rearward movement the rearward edge thereof abuts the inner surface of the rear wall 5 of the sad-iron. Owing to the converging character of the forward portions of the side walls of the sad-iron, the side edges of the slidable partition 29 are trimmed off at 39, so as to enable the partition to be moved forwardly the required extent whenever desired, the said partition being formed for a suitable distance from its rearward edge with a central longitudinal slot 40 and provided at the forward and closed extremity of said slot with an oil or starting pan 41, having side flanges 42 and 43 extending all around the same, (see Figs. 1, 2, and 3,) said pan comprising rearwardly-extending branches 43^a, as shown.

At the rearward portion thereof the partition 29 has secured to its under side by means of rivets 29^a substantially a Y-shaped bracket 29^b, the diverging members 29^c of which extend to either side of the slot 40 in said partition, and the pendent vertical member 29^d of which is below and substantially intermediate the sides of said slot. Said vertical member is formed with an opening 30^a, in which is screwed the threaded portion of a pin 30^b, extending through an opening therefor in the rear wall 5 of the said iron, and the pin is provided with a knob or handle 30^c at its outer end to be taken hold of to slide the partition 29 either forwardly or backwardly upon its supports.

The burner 34 is constructed of a hollow body 44, having hollow downwardly-diverging side members 45 communicating therewith, the ends of said members being downwardly and outwardly inclined at 46 and the lower longitudinal edges thereof each being formed with a series of jet-orifices 47, at which the fluid vapor is burned in the combustion-chamber 28. Extending upwardly through said slot 40 at its inner extremity and also between the branches 43^a of the starting-pan is a vertical tube 48, upon the upper end of which is mounted a vapor-generator 49, which is practically a cylinder, having heads 50 and 51, formed, respectively, with central openings 52 and 53, the said opening 52 having fitted therein the hollow stem 54 of a nozzle or head 55, having the discharge end thereof directed downwardly. In machining out the bore of said nozzle said bore is formed all the way through the same, being closed at the upper extremity thereof by means of a screw-plug 56, as shown. Fitted in the opening 53 of the head 51 of the generator and abutting at its forward end against the inner surface portion of head 50, surrounding the opening 52 in said head, is an internally-threaded tube 57, leading to stem 54 of the injector and pro-

vided with an opening 58, communicating with the interior of the generator, (see Fig. 1,) said tube projecting beyond the head 51 of the generator at its rearward end and provided with a screw-valve 59, having an operating-stem 60 projecting through an opening therefor in the rear wall 5 and provided with a handle 60^a. Said stem works in a stuffing-box 61, screwed upon the externally-threaded rearward end of said tube 57, and by turning the stem in the proper direction the valve will be moved rearwardly, so that when its forward conical end reaches the opening 58 in tube 57 communication will be established between the interior of the generator and the forward portion of said tube.

Connecting with the lower end of tube 48 is the forward end of a horizontal tube 62, which is preferably enlarged in diameter for a part of its length, as shown at 63, said enlarged portion extending beyond the rear wall 5 and having the outer end thereof externally screw-threaded and fitted into a tubular member 64 of a valve-casing 65, having a chamber 66, from which leads an internally-threaded depending neck 67, through which works the threaded stem 68 of a conical valve 69, which may be operated to open or close the port 70 in the top of said valve-chamber, the said stem working through a stuffing-box 71, applied to the said neck 67. The valve-casing 65 is provided with an internally-threaded upward extension 72, in which is fitted the lower externally-threaded extremity of a spout 73, leading from and communicating with the supply-tank 74 for the vaporizable fluid, said tank having an inclined bottom 75 to assist the downward flow of such fluid to spout 73 and provided in its top with a filling-opening closed by a screw-cap 76. A brace 77 extends from the inner side of the tank to the adjacent support 20 for the handle 21, and the inner and under sides of the tank are provided with a guard 78 to protect said tank as much as possible from heat proceeding from the sad-iron. To relieve the vacuum in the chamber caused by the flow of fluid therefrom, I may form a vent 79 in the top of the tank, through which air may enter the tank above the liquid, and it will be noted that the interior of the enlarged portion 63 of said tube 62 is filled with cotton or similar material 80 for straining the fluid as it passes to the generator 49 from the tank. Surrounding a considerable portion of the tube 62 and the enlarged portion 63 thereof is a sleeve 81 of increased diameter over said enlarged portion 63, the said sleeve projecting through an opening therefor in the rear wall 5 and having its outer end externally threaded at 82 and receiving a nut 83 to hold the sleeve in place. A set-screw 84 is inserted through an opening therefor in the sleeve and bears upon the tube 62. The said sleeve extends within the slot 40 in the partition 29, part of the

sleeve lying above said partition and part below, as shown in Fig. 1. This is a convenient assemblage, since the slot 40 is thereby almost completely filled up in the rearward position of partition 29, thus preventing to a great extent the passing of products of combustion from the combustion-chamber to the upper chamber. The spaces between the inner surface of the sleeve and the outer surface of the tubular members 62 and 63 are filled with asbestos or other non-conducting material 85 to prevent as much as possible the heating of the said tube portions 62 and 63, and thereby lessening the liability of heat being conducted to the valve-casing and the tank.

The rear wall 5 of the sad-iron is provided with preferably vertically elongated openings 86, leading to the upper chamber 26, and with other openings 87, leading to the combustion-chamber 28, while hinged to said rear wall at 88 are doors 89, which may be swung against the wall before said openings 87. The doors are provided with vertical edge flanges 90, Figs. 2 and 3, to cause them to set outwardly from the rear wall when closed, and thus they do not interfere with the entrance of air to the combustion-chamber via the openings 87, serving as they do, practically, as guards to deflect laterally the flames of the burner issuing through said openings. Said doors are preferably provided with catches 91 (dotted lines, Fig. 8) to hold them in position against the rear wall, as shown.

Instead of providing an air-vent in the top of the fluid-supply tank 74, as in Fig. 1, I may subject the fluid to air-pressure in the tank, and for which purpose I resort to the construction shown in Fig. 9. Thus in said figure the tank 92 is provided with the usual filling-opening, closed by a screw-plug 93, and is provided in addition with a nipple 94, leading to a hollow casing 95, in the bottom of which is an air-port 95^a, normally closed from beneath by a conical spring-controlled valve 96, the stem of which works in a spider 97. The end of the flexible tube-outtake of any ordinary small hand-pump may be applied to the nipple to force air into the tank above the liquid, and in order that such a pump may always be at hand when needed I construct the tank with a separate compartment 98, in which I place a hand-pump 99 of ordinary form, which may be removed at any time for the purpose mentioned.

In operation the slidable partition 29 is moved forwardly to carry the starting-pan 41 to position beneath the injector 55, and then the valve 69 is manipulated so as to cause some of the vaporizable fluid in the tank to flow through the tube members 63, 62, and 48, thence to the interior of the vapor-generator 49, whereupon the screw-valve 59 is properly manipulated to cause a quantity of the fluid in the generator to drip into the

starting-pan through said nozzle. On the filling of the starting-pan the said screw-valve 59 is reversely manipulated to close the opening 58, thereby shutting off further supply of fluid to said pan, and then after a suitable quantity of the fluid has been allowed to accumulate in the generator the valve 69 is closed and the fluid in the starting-pan ignited by a lighted torch inserted through the opening 24 in the top plate 7. The flame from the pan heats the generator, and by the time the oil in said pan is consumed the fluid in said generator has been converted into vapor. The screw-valve 59 is now again manipulated to open up communication between the interior of the generator and the forward portion of tube 57, and thus the vapor in the generator passes to the nozzle and is delivered downwardly to the burner through the tube 33, it being understood that in the meantime the slidable partition 29 has been moved rearwardly to carry said tube 33 directly beneath said nozzle. After this a regulated supply of fuel is fed to the generator by the means shown and described, the interior parts having now become sufficiently hot to maintain the production of vapor in the generator. As the sad-iron is moved forwardly in use currents of air will enter the chamber 26 27 through openings 5^a of the side walls, an outlet therefor being had through the elongated openings 86 in the rear wall 5, and then as the sad-iron is moved backwardly the operation will be the reverse. Air currents will enter the chamber 26 27 through the openings 86 and will seek an outlet through said openings 5^a, and as such air-currents enter the chamber through one set of openings they tend to force through the other set any waste products of combustion which may have accumulated in or found their way to said chamber. Quantities of the air will be induced to enter the burner by the force of the vapor passing thereinto from the nozzle leading from the generator, and this mixture produces a clear flame at the burner of great heat intensity. Air is also admitted to the combustion-chamber through the openings 87, both to support combustion and create draft sufficient to cause the waste products of combustion to pass upwardly through the flue 17 and out through the series of openings 10 in the top plate.

It will be understood that while provision has been made for carrying off the products of combustion from both the chamber 26 27 and the combustion-chamber 28 there is a very small percentage of the vapor which remains unconsumed, so that such products are reduced to the minimum of quantity or volume, with the result that no unpleasant odors are apt to issue from the sad-iron when in use.

It will be also noted that my improved burner 44 is so constructed as to direct the

flames thereof downwardly against the bottom 2 of the sad-iron, and which renders the iron much more effective for its intended purposes. In addition to the forward part of chamber 26 27 accommodating the flue 17 it also provides space to permit the partition 29 to be moved forwardly in the manner described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A sad-iron comprising a closed forwardly-tapered hollow body having air-openings in the forward portions of its sides, and similar openings in the rear wall thereof, means dividing the body into a main chamber and a lower combustion-chamber, a vapor-generator in the main chamber, means independent of the iron for supplying the generator with a vaporizable fluid, a burner and a starting-pan, having movable relation with said generator, and means by which vapor is delivered to the burner from the generator.

2. A sad-iron, comprising a hollow body, a forwardly and rearwardly slidable horizontal partition dividing the body into a main chamber and a combustion-chamber, a vapor-generator in the main chamber, means for supplying the generator with a vaporizable fluid, a burner in the combustion-chamber, a starting-pan on said partition, means by which vapor is delivered to the burner from the generator, and an exit-flue for the products of combustion from the combustion-chamber, located in said main chamber.

3. A sad-iron, comprising a hollow body, means for dividing the interior of the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the main chamber, a burner in the combustion-chamber, means for supplying a vaporizable fluid to the generator, a nozzle for delivering vapor from the generator to the burner, said body having a top plate formed with a series of openings therein above the forward part of the main chamber, and means for carrying off the products of combustion comprising a vertical flue located in the forward part of the main chamber, having communication with said openings at its upper extremity, and with the combustion-chamber at its lower extremity.

4. A sad-iron, comprising a hollow body, means for dividing the interior of the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the upper part of the main chamber, a burner in the combustion-chamber, a nozzle for delivering vapor from the generator to the burner, said body having a top plate formed with a series of openings therein above the forward chamber, means for carrying off the products of combustion comprising a vertical flue located in the forward chamber, having

communication with said openings at its upper extremity, and with the combustion-chamber at its lower extremity, the top plate being also provided with a rotary valve-plate having openings therein adapted to register with the openings in the said top plate.

5. A sad-iron, constructed of a body comprising a bottom, side walls, having converging portions united at the forward ends thereof, a rear wall uniting the rearward ends of the side walls, and a top plate, means for dividing the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the upper part of the main chamber, a burner in the combustion-chamber, means for supplying a vaporizable fluid to the generator, means by which vapor is delivered to the burner from the generator, and a flue located in the forward part of the main chamber, having communication with the combustion-chamber, the rear walls and said converging portions of the side walls each having a series of openings therein leading to the main chamber.

6. A sad-iron, comprising a hollow body, a forwardly and rearwardly slidable horizontal partition having a pendent flange at its forward edge, and dividing the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the upper part of the main chamber, means for supplying the generator with a vaporizable fluid, a starting-pan on the partition, a burner supported on the under side of the partition, means by which vapor is delivered to the burner from the generator, and an exit-flue for the products of combustion leading from the combustion-chamber, and located in the forward part of the main chamber.

7. A sad-iron comprising a hollow body having opposite ledges, a forwardly and rearwardly slidable horizontal partition moving on said ledges and dividing the body into an upper and forward main chamber, and a combustion-chamber, a vapor-generator in the upper chamber, means for supplying the generator with a vaporizable fluid, a starting-pan on the partition, a burner in the combustion-chamber, means whereby to deliver vapor from the generator to the burner, and an exhaust-pipe for the products of combustion from the combustion-chamber located in said forward part of the main chamber.

8. A sad-iron, comprising a hollow body, a forwardly and rearwardly slidable partition having a pendent flange at its forward edge, and dividing the body into a main upper and forward chamber and a combustion-chamber, said partition having a longitudinal slot therein, a vapor-generator in the upper part of the main chamber, means for supplying the generator with a vaporizable fluid, a starting-pan on the partition, a burner on the under side of the partition, having a communicating tube extending upwardly there-

through, a nozzle to deliver vapor to said tube from the generator, and a flue in the forward part of the main chamber leading from the combustion-chamber.

9. A sad-iron, comprising a hollow body, a forwardly and rearwardly slidable horizontal partition having a pendent flange at its forward edge, and dividing the body into an upper and forward main chamber and a combustion-chamber, said partition having a longitudinal slot therein, a starting-pan on the upper side of the partition at the inner extremity of the slot, a vapor-generator in the upper part of the main chamber, means for supplying the generator with a vaporizable fluid, a burner supported on the under side of the partition and having a communicating tube extending upwardly there-through, a nozzle for delivering vapor to said tube from the generator, and a flue in the forward part of the main chamber leading from the combustion-chamber.

10. A sad-iron, comprising a hollow body, a forwardly and rearwardly slidable horizontal partition having a pendent flange at its forward edge and dividing the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the upper part of the main chamber, a tank for a vaporizable fluid, means for supplying such fluid to the generator from the tank, a burner, a starting-pan on the partition, means by which vapor is delivered to the burner from the generator, means for regulating the fluid-supply to the generator, means for regulating the vapor delivery to the burner, and an exit-flue for the products of combustion, leading from the combustion-chamber and located in the forward part of the main chamber.

11. A sad-iron comprising a hollow body having a top plate, a forwardly and rearwardly slidable horizontal partition having a pendent flange at its end dividing the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the upper chamber, means for supplying the generator with a vaporizable fluid, a burner in the combustion-chamber, a starting-pan on the partition, means whereby to deliver vapor from the generator to the burner, and a flue located in the forward part of the main chamber having a branch in communication with the combustion-chamber, said flue being secured at its upper end to the under side of the top plate and the latter having a valve-controlled opening communicating with the flue.

12. A sad-iron, comprising a hollow body having a top plate, a forwardly and rearwardly slidable horizontal partition having a pendent flange at its forward edge and dividing the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the upper part of the main chamber, means for supplying the generator with a vaporizable fluid, a starting-pan on the par-

6
 titution, a burner in the combustion-chamber, and means by which vapor is delivered to the burner from the generator, said top plate having a valve-closed opening for the introduction of a torch to ignite the fluid contained in the starting-pan.

13. A sad-iron, comprising a hollow body having forwardly-converging side walls and a rear wall, a forwardly and rearwardly slidable horizontal partition having a pendent flange at its forward edge and dividing the interior of the body into an upper and forward main chamber and a combustion-chamber, a vapor-generator in the upper part of the main chamber, means for supplying the generator with a vaporizable fluid, a burner in the combustion-chamber, a starting-pan

on the partition, means by which vapor is delivered to the burner from the generator and an exit-flue for the products of combustion from the combustion-chamber, located in the forward chamber, the said side walls having openings in the upper parts of the converging portions thereof, and the rear wall having openings leading to the combustion-chamber, said wall being provided with hinged doors closed thereagainst before the openings last named, and provided with flanges to cause them to set outwardly from the wall.

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Witnesses:

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