April 21, 1931. J. T. GROTENHUIS 1,801,957

BROODER STOVE

Filed Oct. 22, 1928

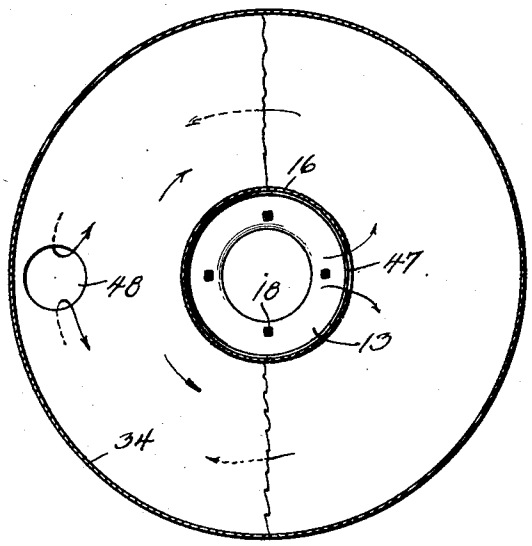


Fig. 2

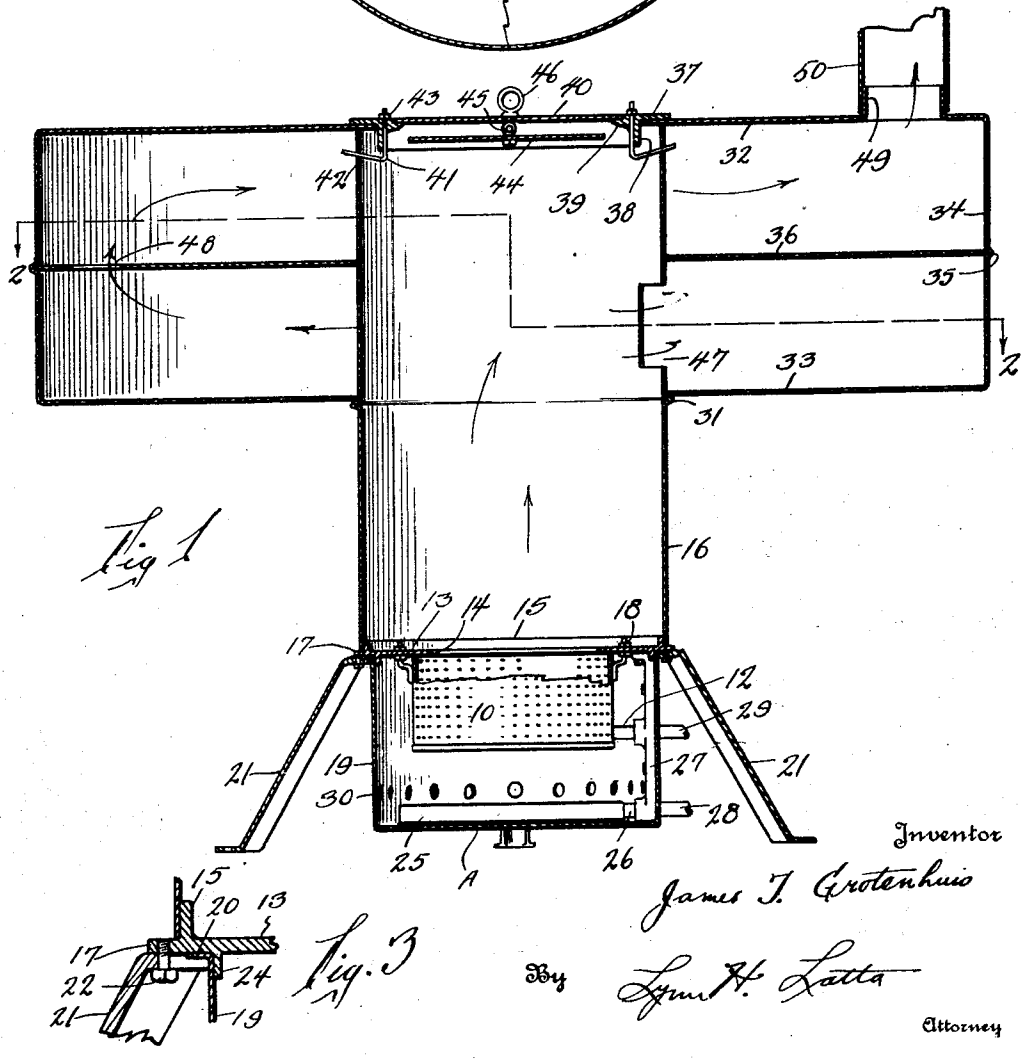


Fig 1

Fig. 3

Inventor

James J. Grotenhuis

By Lynn H. Latta

Attorney

Patented Apr. 21, 1931 1,801,957

UNITED STATES PATENT OFFICE

JAMES T. GROTENHUIS, OF ORANGE CITY, IOWA

BROODER STOVE

Application filed October 22, 1928. Serial No. 314,099.

My invention relates to brooder stoves of the oil or gas burning variety and has specifically to do with that type of stove employing a heat radiating drum of flat cylindrical construction.

It will be understood that the object in all brooder stoves, whether of the hover type or of the type just mentioned, is to throw the heat downwardly and in the type of stove with which my invention is concerned, this is accomplished by the heat radiating drum provided with an upper and lower heat circulating chamber, the heat being trapped in the lower chamber before passing to the upper chamber in such a manner as to provide a very hot radiating surface at the bottom of the drum.

An object of my invention is to improve upon this type of brooder stove, making the construction more simple, providing a stove which may be readily disassembled so as to remove the radiating drum from the stove body, one in which the joints between the drum and the stove body will not oper under the warping effect of heat and wherein said joints do not require welding, soldering or any similar means for providing a gas-tight union.

A further object is to improve upon the heat radiating drum construction of prior stoves of this character, such changes being made as to make it possible to utilize a drum which is much shallower in depth than the drums of the prior art.

Another object is to provide a stove of this character having a better draft than stoves of prior constructions.

A further object of my invention is to provide a stove of this character including in combination the oil burner of my patent, granted July 12, 1927, No. 1,635,836, certain novel features of construction being provided whereby the burner is supported at the lower extremity of the stove body by a plurality of legs, serving to support the burner, the burner casing and the stove body in their proper relationship.

A further object is to provide a stove having a heat retaining lid of simple and novel construction.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical, central, sectional view through the stove.

Fig. 2 is a horizontal, sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged, detail, sectional view illustrating the connection between the legs and the burner.

I have illustrated the oil burner of the above cited patent partly in section in Fig. 1, the perforated burner bowl being indicated by the reference character 10, and the oil feed nipple at 12.

In place of the top plate or burner ring, illustrated in my patent, I substitute a burner ring 13, having the burner opening 14, which is the same in construction as that of the patent but provided with an annular upstanding flange 15, adapted to be received within the lower extremity of the stove body 16.

The ring 13 extends laterally beyond the flange 15 to form a horizontal flange 17, upon which the lower edge of the burner body 16 rests.

The burner bowl 10 is supported by hangers 18, which are identical in construction with the hangers of my prior patent and the relation of the bolt 10 to the ring 13 is identically the same as in the prior patent.

Instead of the burner casing of my prior patent, I provide a burner casing 19, having at its upper edge an outwardly extending annular flange 20. Legs 21 are secured by means of bolts 22 to the ring 13 and the flange 20 of the burner casing is clamped between the legs and the ring. Lugs 24 maintain the wall of the burner casing 19 in firm engagement with the ends of the legs, whereby the legs are held against rotation.

The catch trough 25 is supported below the burner basin 10 by means of a nipple 26 connecting the trough with a casting 27, secured to the ring 13. The nipple 12 also is con-

nected with the casting 27 and pipes 28 and 29 communicate with the nipples 26 and 12 through the medium of the casting 27.

The burner casing 19 is provided with openings 30 for the intake of air, and openings for the pipes 28 and 29. The casing 19 has a closed bottom A.

The stove body 16 is provided intermediate its ends with a peripheral outwardly extending bead 31. The body 16 is formed of sheet metal, tubular in form and preferably cylindrical. It is adapted to closely fit the flange 15.

At its upper end, the body 16 is open and the heat radiating drum rests directly upon the upper edge of the latter. This drum comprises an upper wall 32, resting upon the body, a lower wall 33, which is provided with a central opening to receive the body and fitting the body closely, the peripheral wall 34, which is provided with an outwardly extending channel or bead 35 and a partition 36, which is supported snugly in the channel 35, also fitting the body 16 closely. The wall 33 rests on the bead 31.

The upper wall 32 is provided with a central opening, slightly smaller in diameter than the body 16, which opening forms an opening for the body at its upper extremity. In this opening rests a clamp ring, having the horizontal flange 37, resting upon the upper wall 32, the vertical flange 38 resting within the central opening of the upper wall 32 and snugly fitting said opening and an inner shoulder 39, which is provided to receive the upper plate 40 of the lid.

The clamp ring is held down by a number of hooks 41 having portions extending through the clamp ring and lateral portions hooked through openings 42 in the wall of the body 16. Nuts 43 are threaded upon the hooks 41 and engage the upper surface of the clamp ring to draw the hooks upwardly, thereby tightening the flange 37 downwardly against the wall 32 and clamping the wall securely against the upper edge of the body 16.

The lid comprises the upper plate 40, the lower plate 44, a spacing element 45, and the handle 46. The lower plate 44 is of a diameter small enough to be received through the opening of the clamp ring within the flange 39 and the upper plate 40 rests upon the flange. The space between the upper and lower plates serves to insulate the upper plate from the direct heat of the ascending gases, the lower plate 44 receiving such direct heat. The retention of heat is therefore very materially increased.

The body 16 is provided with an opening 47, communicating with the lower chamber of the radiating drum and the partition 36 is provided with an opening 48, which is diametrically opposed to the opening 47 and provides communication between the upper and lower chambers. The upper wall 32 is provided with a discharge neck 49, positioned 180° from the opening 48, to which may be connected a chimney 50 to allow escape of the gases to the atmosphere.

The heated gases from the burner follow the courses indicated by the arrows in both figures. It may be noted, referring to Fig. 2, that the gases will separate and divide at the openings 47 and 48, respectively, and travel in two different directions. Thus the resistance to the travel of gases through the drum is cut in half, as compared with these types in which a baffle plate closes the drum on one side of the intake opening and I find that the drum may be made substantially half as deep as the drum in the type of burner just mentioned, thus economizing on space, material, etc. At the same time, the heat radiating efficiency of the lower chamber does not seem to be reduced by allowing the gases to travel in both directions.

By positioning the opening 48 diametrically opposite to the opening 47, the gases are caused to travel entirely around each chamber, although in two separated streams. Thus the effect of producing a current of heated gases over the entire area of each drum is identical with the additional advantage of a greater draft, less resistance to the gas travel and a smaller drum.

The bead 31 serves to support the lower wall 33 of the drum, should there be any tendency for the lower wall to buckle downwardly. It will be understood, however, that the weight of the drum is primarily supported by the upper edge of the body 16 and that the function of the bead 31 is primarily to form a shell for the opening in the lower wall 33, to prevent the escape of gases.

The drum may be readily removed from the body by removing the hooks 41, whereupon the drum may be simply lifted off the body. This may be desirable for the purpose of cleaning or repair.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a brooder stove, a tubular stove body, a drum enclosing the upper portion of the body and supported thereon, including a lower wall provided with an opening receiving and fitting the body, and an upper wall resting upon the upper edge of the body and provided with a central opening forming an opening for the body at its upper extremity; a clamp ring encircling said opening, resting upon the upper wall, and extending over the upper edge of the body; means con-

necting the clamp ring with the body, adapted to be actuated to draw the body and ring toward each other to secure the upper wall of the drum in close contact with the upper edge of the body; the body having a heat discharge opening communicating with the interior of the drum; and a chimney communicating with the drum.

2. In a broader stove, a tubular stove body provided with a peripheral, outwardly extending bead intermediate its ends; a drum enclosing the upper portion of the body and supported thereon, including a lower wall provided with an opening receiving and fitting the body, said lower wall resting in contact with the bead, and an upper wall resting upon the upper edges of the body and provided with a central opening forming an opening for the body at its upper extremity; a means for clamping the upper wall against the upper edge of the body; the body having a heat discharge opening communicating with the interior of the drum; and a chimney communicating with the drum.

3. In a brooder stove, a tubular stove body provided with a peripheral, outwardly extending bead intermediate its ends; a drum enclosing the upper portion of the body and supported thereon, including a lower wall provided with an opening receiving and fitting the body, said lower wall resting in contact with the bead, and an upper wall resting upon the upper edge of the body and provided with a central opening forming an opening for the body at its upper extremity; a clamp ring encircling said opening, resting upon the upper wall, and extending over the upper edge of the body, hooks extended through the clamp ring and loosely hooked through openings in the body, and nuts threaded on said hooks and engaging the ring to draw the body and ring toward each other to secure the upper wall of the drum in close contact with the upper edge of the body; the body having a heat discharge opening communicating with the interior of the drum; and a chimney communicating with the drum.

4. In a brooder stove, a tubular stove body provided with a peripheral, outwardly extending bead intermediate its ends; a drum enclosing the upper portion of the body and supported thereon, including a lower wall provided with an opening receiving and fitting the body, said lower wall resting in contact with the bead, and an upper wall resting upon the upper edges of the body and provided with a central opening forming an opening for the body at its upper extremity; a means for clamping the upper wall against the upper edge of the body including hooks loosely hooked through openings in the body, and means to draw said hooks toward the upper wall; the body having a heat discharge opening communicating with the interior of the drum; and a chimney communicating with the drum.

5. In a brooder stove, a tubular stove body, a drum enclosing the upper portion of the body and supported thereon, including a lower wall provided with an opening receiving and fitting the body, and an upper wall resting upon the upper edges of the body and provided with a central opening forming an opening for the body at its upper extremity; a means for clamping the upper wall against the upper edge of the body; the body having a heat discharge opening communicating with the interior of the drum; and a chimney communicating with the drum.

6. In a brooder stove, a tubular stove body, a drum enclosing the upper portion of the body and supported thereon, including a lower wall provided with an opening receiving and fitting the body, and an upper wall resting upon the upper edge of the body and provided with a central opening forming an opening for the body at its upper extremity; a clamp ring encircling said opening, resting upon the upper wall, and extending over the upper edge of the body, hooks extended through the clamp ring and loosely hooked through openings in the body, and nuts threaded on said hooks and engaging the ring to draw the body and ring toward each other to secure the upper wall of the drum in close contact with the upper edge of the body; the body having a heat discharge opening communicating with the interior of the drum; and a chimney communicating with the drum.

7. In a brooder stove, a tubular stove body, a drum enclosing the upper portion of the body and supported thereon, including a lower wall provided with an opening receiving and fitting the body, and an upper wall resting upon the upper edges of the body and provided with a central opening forming an opening for the body at its upper extremity; a means for clamping the upper wall against the upper edge of the body including hooks loosely hooked through openings in the body, and means to draw said hooks toward the upper wall; the body having a heat discharge opening communicating with the interior of the drum; and a chimney communicating with the drum.

8. In a brooder stove, a tubular stove body of sheet metal, a sheet metal drum enclosing the upper portion of the body and comprising an exposed, flat, upper wall, an exposed, flat, lower wall receiving and terminating closely adjacent the stove body, the latter forming the inner wall of the drum, a partition dividing said drum horizontally into an upper and lower chamber, the body having an opening communicating with the lower chamber, the partition having an opening diametrically opposed to the opening in the body and the upper wall having a chimney opening diametrically opposed to the par-

tition opening, said openings constituting the only avenues of travel of gases between the body and lower chamber, lower chamber and upper chamber and upper chamber and outer atmosphere, respectively, and the chambers being unobstructed entirely around the body, each thereby providing two independent paths of travel for gases.

Signed this 19 day of October, in the county of Woodbury, and State of Iowa.

JAMES T. GROTENHUIS.