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J. L. FATE.

RECEPTACLE FOR RETAINING OR EXCLUDING HEAT.

APPLICATION FILED NOV. 23, 1905.

Fig. 2.

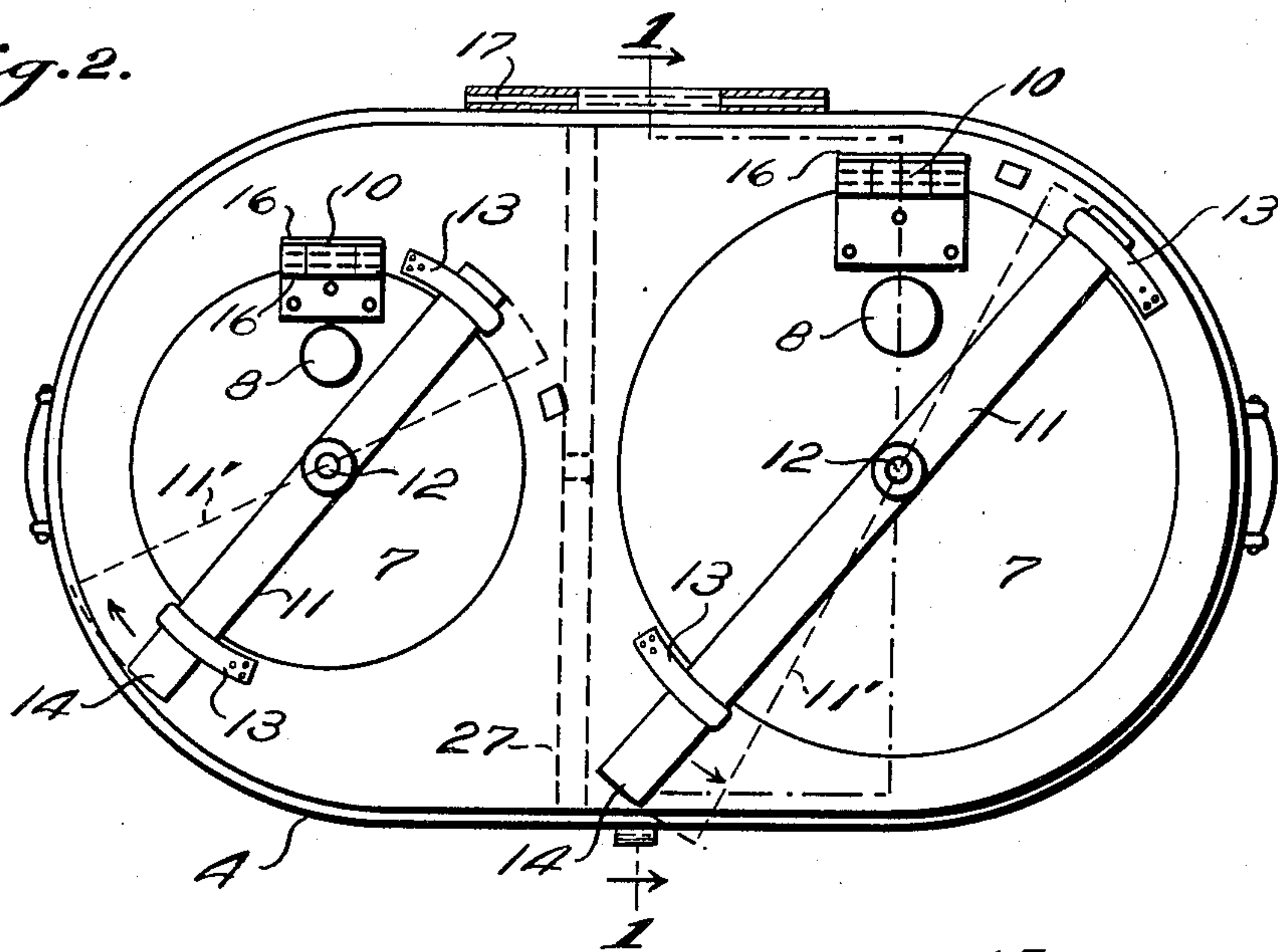


Fig. 1.

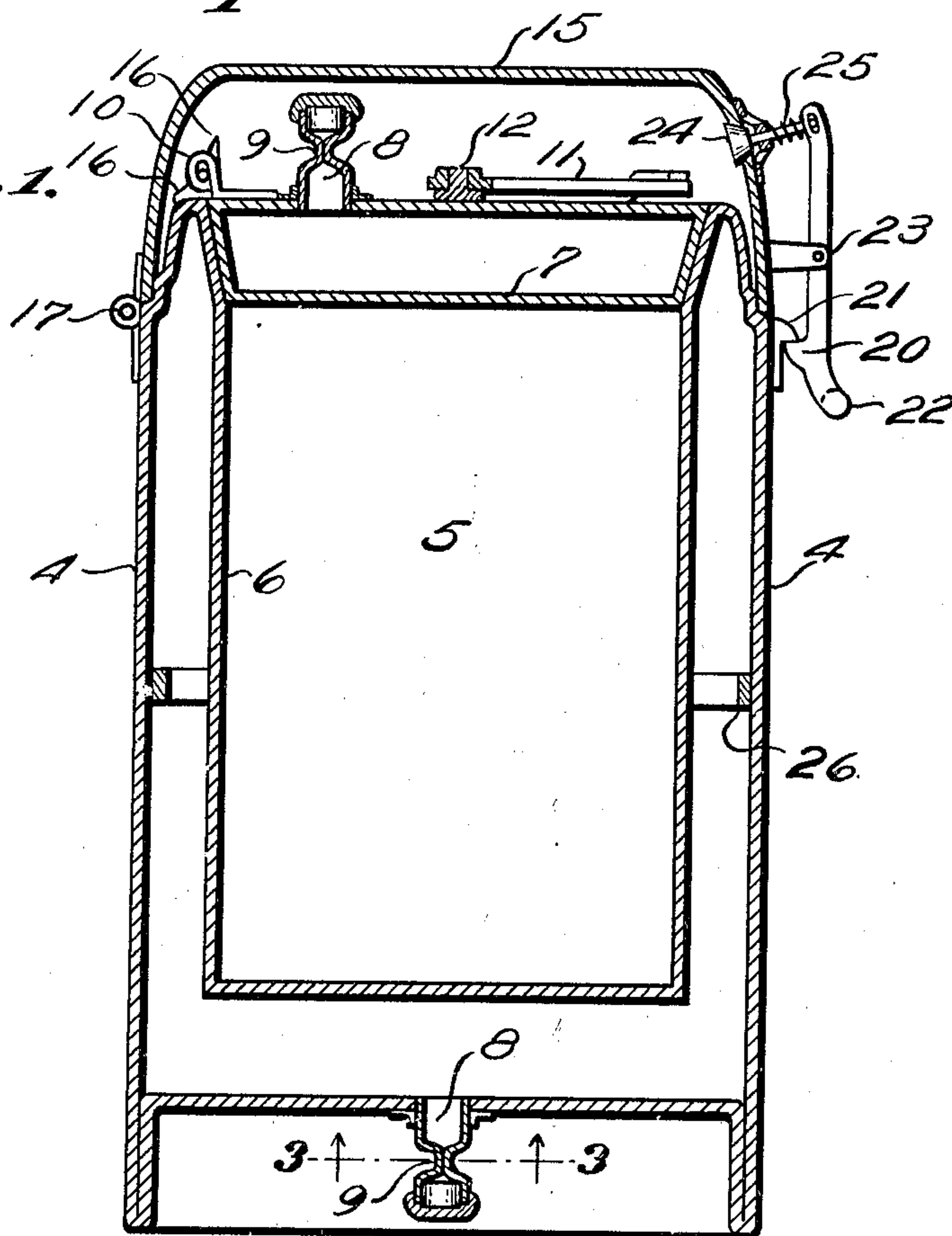


Fig. 3.

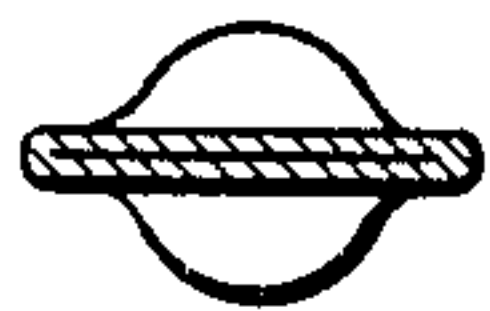
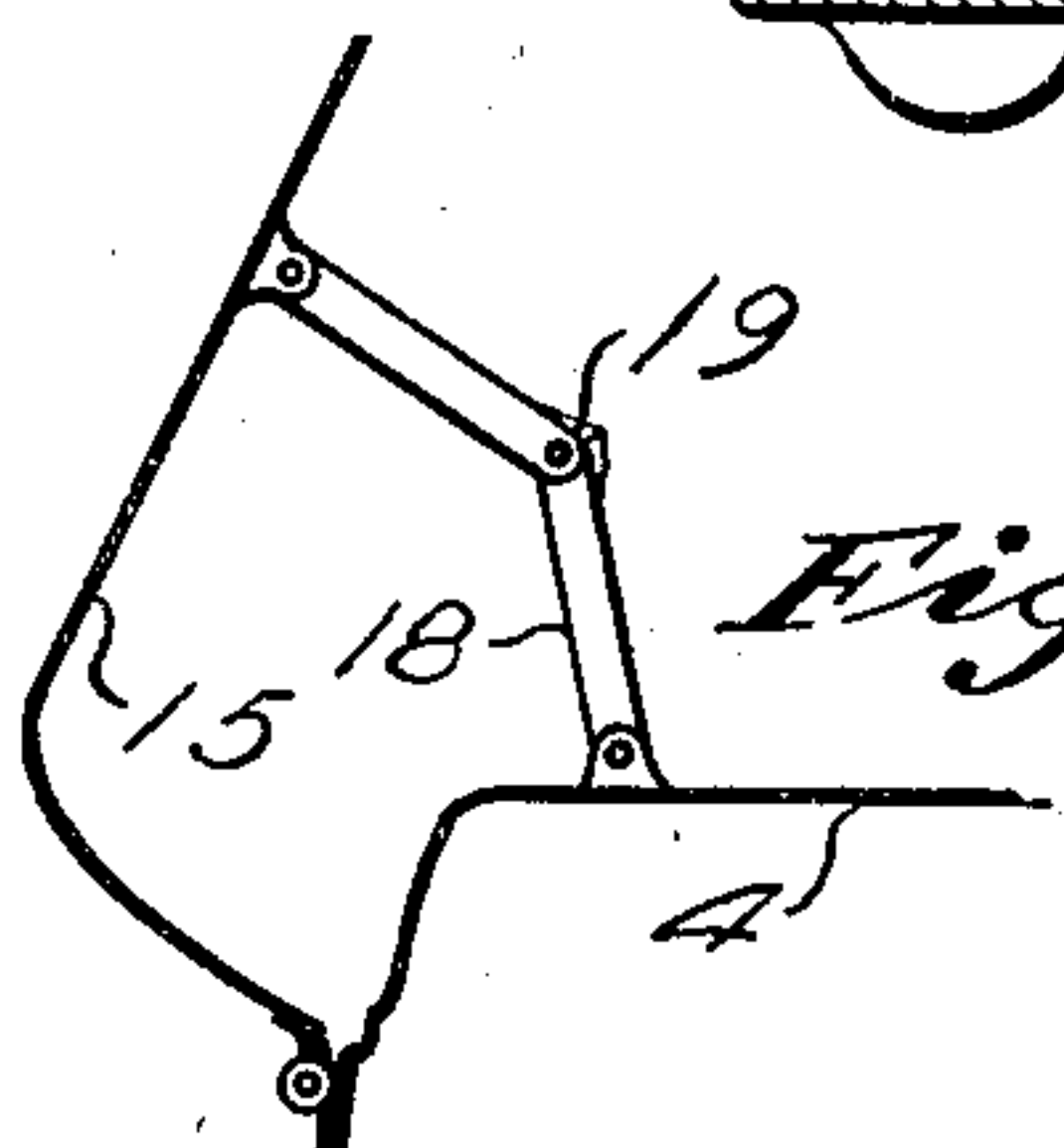


Fig. 4.



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UNITED STATES PATENT OFFICE.

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RECEPTACLE FOR RETAINING OR EXCLUDING HEAT.

No. 844,272.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed November 23, 1905. Serial No. 288,749.

To all whom it may concern:

Be it known that I, JOHN L. FATE, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have
5 invented certain new and useful Improvements in Receptacles for Retaining or Excluding Heat, of which the following is a specification.

This invention relates to receptacles which
10 are intended to retain or exclude heat, so as to maintain the contents at temperatures either higher or lower than the temperature of the surrounding atmosphere.

This invention is particularly applicable to
15 "fireless cook-stoves," in which the process of cooking may be continued for a considerable period of time without requiring the continuous application of heat.

A further application of this invention is to
20 receptacles for the storage of ice-cream and other frozen foods.

The main objects of this invention are to provide an improved, inexpensive, and sanitary construction for receptacles of this class,
25 particularly of the type where heat insulation is accomplished by means of vacuum-spaces to provide an improved construction whereby an outer cover will form a dead-air space and prevent the leakage of heat at the joints
30 between the walls of the receptacle and its lid or door; and to provide means for automatically opening said dead-air space to the outer air at the time of opening or closing the outer cover and automatically cutting off such
35 communication after the cover is closed.

I accomplish these objects by the device shown in the accompanying drawings, in which—

Figure 1 is a transverse section of a fire-
40 less cooking-stove constructed according to this invention. Fig. 2 is a top plan of the same with the cover removed, the line 1 1 indicating the line on which the section of Fig. 1 is taken. Fig. 3 is a section on the line 3 3
45 of Fig. 1, illustrating the method of closing the nipple after exhausting the air from the vacuum-spaces.

The specific construction which is shown in the drawings is one which is used when the
50 device is constructed of sheet metal. In the form shown the outer walls 4 of the receptacle are elliptical in horizontal outline. Two inner compartments 5 are inclosed within the outer walls 4, and the walls 6 of said com-

partments are spaced from the walls 4, so as
55 to provide an outer compartment surrounding the sides and bottom of the compartments 5, and from which the air is exhausted, so as to provide an insulating-vacuum for the purpose of reducing to a minimum the radia-
60 tion of heat from the compartments 5. The walls 6 are connected to the walls 4 only at the upper end of the receptacle. The compartments 5 are open at their upper ends and are provided with tightly-fitting lids 7, which
65 are hollow. The air is also exhausted from the lids 7 to provide an insulating-vacuum at this point.

Each vacuum-space communicates with the exterior by means of a nipple 8, which is
70 adapted to be connected with a suitable pump for obtaining a high state of rarefaction of the air in said spaces. After the air is exhausted from the vacuum-spaces the nipples, which are preferably made of soft metal, are
75 closed by pinching at 9 by means of a suitable instrument. The outer end of the nipple 8 is then disconnected from the pumping apparatus, and is plugged and sealed, so as to prevent the possibility of leakage at 9 after the
80 nipple is released from the grip of the pinching instrument.

The lids 7 are preferably hinged at 10, the hinges being provided with play at their joints or otherwise arranged to permit the
85 lid to be swung approximately into position and then adjust itself upon its seat to form a practically air-tight joint with the walls of the receptacle. The lids are forced tightly upon their seats by means of spring locking-bars
90 11, which are pivoted at 12 in the middle of the lids and adapted to be swung into wedging engagement with lugs 13, located at diametrically opposite sides of the lids. The bars 11 are provided with handles 14 at one
95 end, and these handles are preferably of such length and so disposed as to extend over the edge of the receptacle and prevent the closing of the outer cover 15 when the bars 11 are swung free from the lugs 13, as indicated
100 by the dotted lines 11' in Fig. 2. The full lines show the bars in the position for clamping the lids upon their seats, and the small arrows indicate the direction in which the handles are swung to release the lids to permit
105 them to be opened. The hinges are also provided with stops 16, which limit the opening of the lids 7 and prevent the same

from swinging back where they cannot be conveniently reached.

The outer cover 15 forms a practically air-tight joint with the rim of the outer casing 4 and extends over the top of both of the lids 7, thus forming a space for dead air, which prevents the leakage of air around the edges of the lids, and thus prevents the escape or entrance of heat, as the case may be. The cover 15 is also hinged at 17, and its opening is limited by means of a jointed brace 18. (Shown in Fig. 4.) The toggle-joint in the brace 18 is provided with stops 19, which prevent the arms of the brace from becoming straightened out into alinement with each other. The front of the cover is provided with a catch 20, adapted to engage a hook-shaped lug 21 on the casing and secure the cover in its closed position. The catch 20 preferably forms a part of the handle 22, by means of which the cover 15 is lifted. The handle 22 is a lever pivoted to a lug on the cover at 23. An air-valve 24 is mounted on the cover 15 and is normally urged to a closed position by means of the spring 25. The stem of the valve 24 is connected with the lever 22, so that the spring 25 serves the double purpose of normally holding the valve 25 against its seat and of urging the catch 20 into its engaged position. The walls 4 are braced at a point midway of their height by means of a ring 26. This ring has no direct connection with the walls 6 of the compartment 5. The top is also braced at a point between the receptacles 5 by a stiffening-bar 27.

The operation of the device shown is as follows: The air is exhausted from the vacuum-spaces, and the nipples 8 are collapsed, plugged, and sealed so that the vacuum is permanently maintained. When the device is used as a fireless cook-stove, the food is first partially prepared by placing it upon a stove until it is raised to the proper temperature. The vessels containing the food are then placed into the compartments 5 and the lids 7 are tightly closed by means of the clamping-bars 11. The cover 15 is then closed, and as it falls to its seat the catch 20 snaps over the lug 21. The swinging of the lever 22 to permit the catch 20 to pass over the lug 21 causes the valve 24 to open for an instant and relieve the pressure of air inclosed by the cover, so as to permit said cover to properly engage its seat at the rim of the casing 4. The valve 24 then closes. The dead-air space inclosed by the cover 15 prevents the leakage of air at the joints of the lids 7, and thus prevents the loss of heat through such leakage. The vacuum-spaces effectually insulate the walls of the compartments 5 against the loss of heat, so that the food may be easily maintained at the cooking temperature for many hours.

By the construction shown it is possible to

make the apparatus out of sheet metal and still secure effective insulation against the loss of heat, the only loss of heat being the small amount which is lost through the high vacuum and the additional small amount which is conducted away by the thin metallic connection between the walls 6 and the walls 4 at the top. This loss is insufficient to offset the other advantages which would be had from constructing the device of sheet metal—as, for instance, cheapness, lightness, and cleanliness.

When the handle 22 is raised to release the catch 20 for opening the cover 15, the movement of said handle will also open the valve 24, permitting the inflow of air, and thus preventing the pressure of the outer atmosphere from resisting the opening of the cover 15. The cooling of the air within the cover 15 would of course have the effect of reducing its pressure below that of the outer atmosphere.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A device of the class described, comprising a receptacle open at one end and having hollow air-tight walls from which the air has been exhausted, a lid fitting the opening in said receptacle, said lid being hollow and having the air exhausted therefrom and a cover extending over said lid and fitting the walls of said receptacle beyond the edges of said lid, said cover being spaced away from said lid to form a dead-air space for insulating the joint between said lid and walls.

2. In a device of the class described, the combination of a receptacle having insulated walls, an insulated lid forming a closure for said receptacle, and a cover extending over said lid and fitting the walls of said receptacle beyond the edges of said lid to form a dead-air space for insulating the joint between said lid and walls.

3. In a device of the class described, the combination of a receptacle having insulated walls, an insulated lid forming a closure for said receptacle, a cover extending over said lid and fitting the walls of said receptacle beyond the edges of said lid to form a dead-air space for insulating the joint between said lid and receptacle, and a valve controlling the communication between said dead-air space and the outer air, said valve being adapted to be opened to permit the inflow of air and facilitate the opening of said cover, substantially as described.

4. In a device of the class described, the combination of a receptacle having insulated walls, an insulated lid forming a closure for said receptacle, a cover extending over said lid and fitting the walls of said receptacle beyond the edges of said lid to form a dead-air space for insulating the joint between said lid and receptacle against the leakage of air, a valve controlling the communication be-

tween said dead-air space and the outer air, and a movable handle for lifting said cover, said handle being connected with said valve and adapted to open said valve to permit the inflow of air when said handle is moved for opening said cover.

5 5. In a device of the class described, the combination of a receptacle having insulated walls, an insulated lid forming a closure for said receptacle, a cover extending over said lid and fitting the walls of said receptacle beyond the edges of said lid to form a dead-air space for insulating the joint between

said lid and receptacle, a valve controlling the communication between said dead-air space and the outer air and a spring-actuated catch for securing said cover in its closed position, said catch being connected with said valve and adapted to control the opening and closing thereof.

Signed at Chicago this 21st day of November, 1905.

JOHN L. FATE.

Witnesses:

E. A. RUMMLER,
RUDOW RUMMLER.