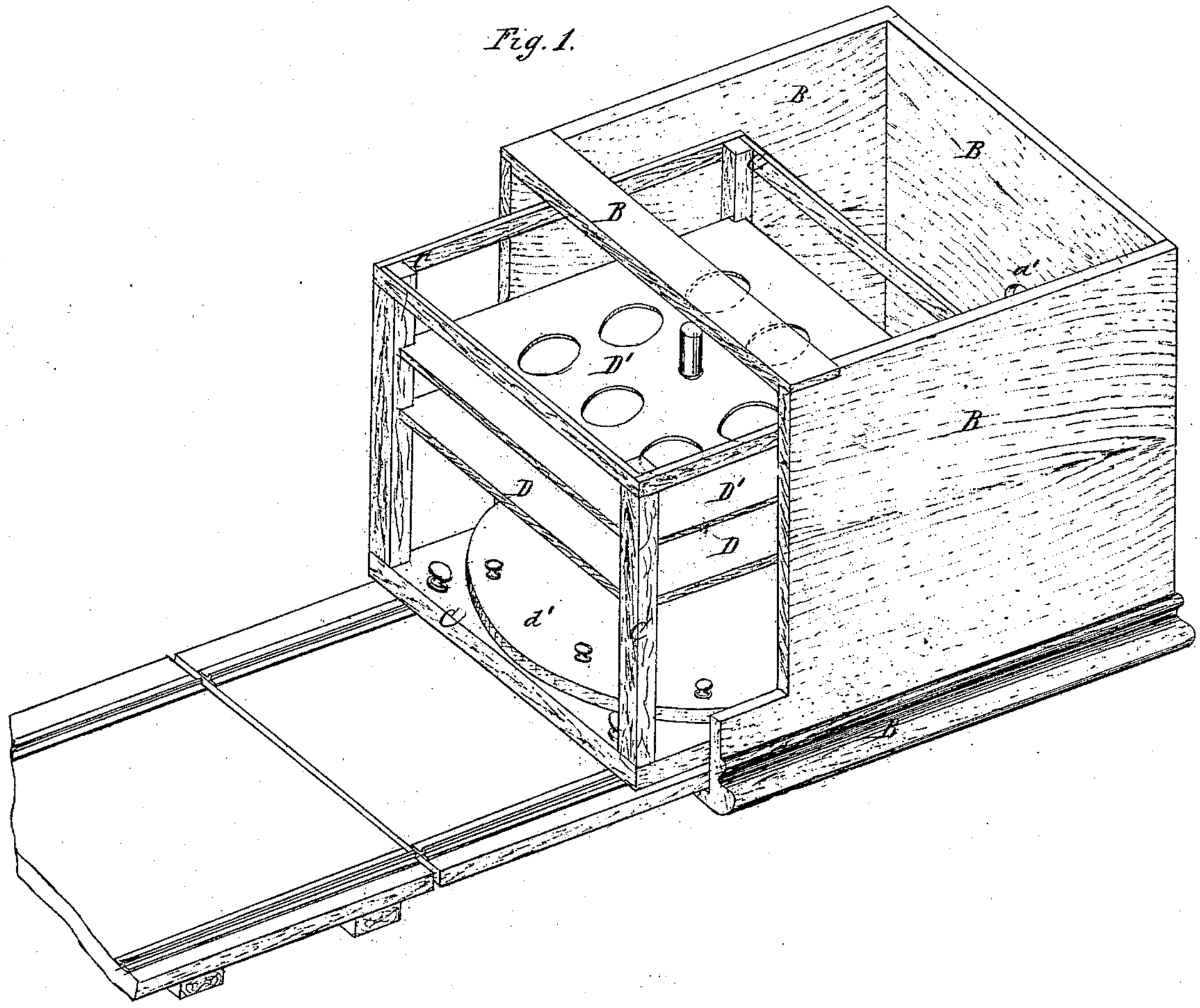
2 Sheets—Sheet 1

N. H. SHIPLEY.

APPARATUS AND PROCESS FOR CANNING AND PRESERVING MEATS, FRUITS, VEGETABLES, &c.

No. 111,264. Patented Jan. 24, 1871.

Fig. 1.



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2 Sheets—Sheet 2.

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Fig 2

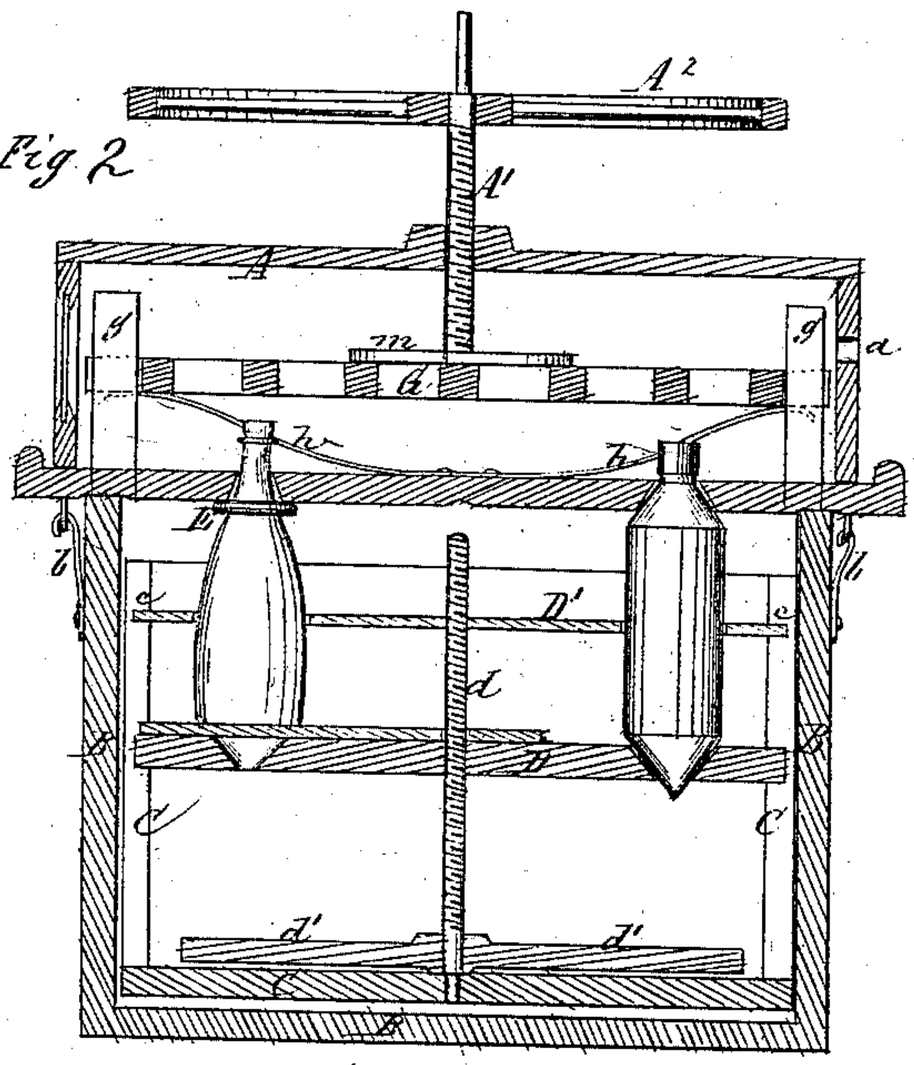


Fig. 7

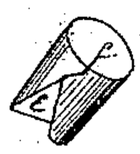


Fig. 5

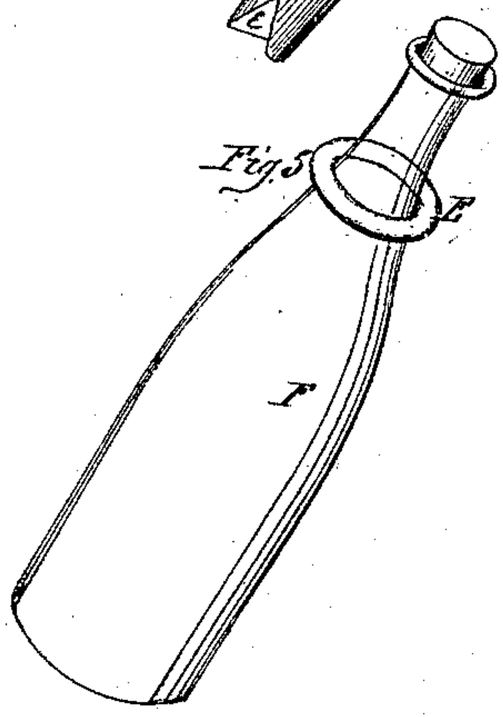


Fig. 8.

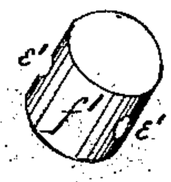


Fig. 6

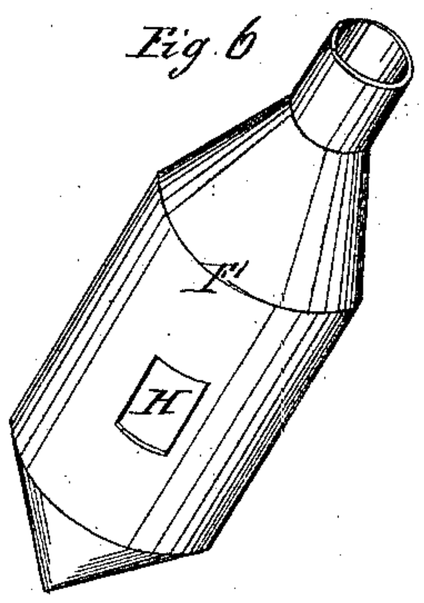


Fig. 3.

Fig. 4

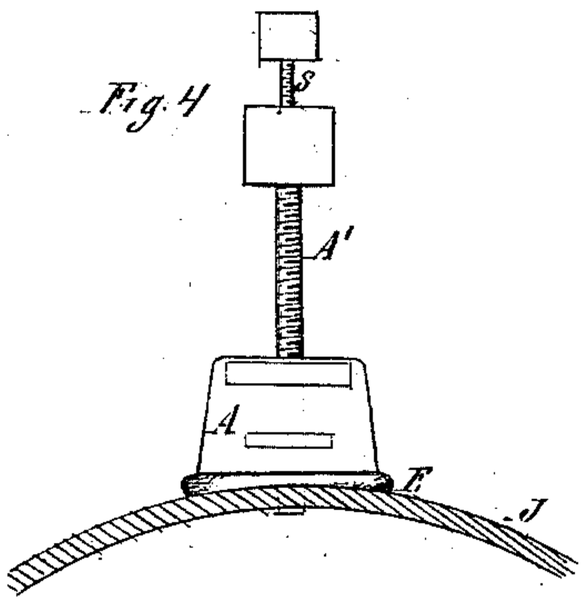
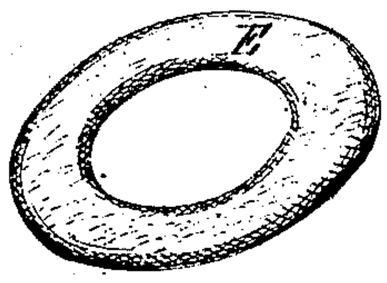


Fig. 9



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Letters Patent No. 111,264, dated January 24, 1871.

IMPROVEMENT IN APPARATUS AND PROCESSES FOR CANNING AND PRESERVING MEATS, FRUITS, VEGETABLES, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, NICHOLAS H. SHIPLEY, of Baltimore, in the county of Baltimore and State of Maryland, have invented new and useful Improvements in Apparatus and Process for Canning and Preserving Meat, Fruit, Vegetables, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a perspective view.

Figure 2 is a vertical section.

Figure 3 is a vertical section, showing one form of the device as adapted to the exhaustion of a single vessel.

Figure 4 is a vertical section, showing another form adapted to a similar purpose.

Figures 5 and 6 are perspective views, showing different forms of bottles or flasks adapted for use in connection with my exhausting apparatus.

Figures 7 and 8 are perspective views, representing the stopples of the flasks shown in figs. 5 and 6.

Figure 8 is a perspective view of the elastic air-cushion employed with my apparatus.

The object of my invention is to provide for public use an improved apparatus for readily and easily exhausting atmospheric air from any number of vessels simultaneously, with or without the application of heat thereto, for the purpose of scientific experiment, and for domestic use in preserving meats, fruits, vegetables, &c.

The apparatus is designed to substitute gases for the atmospheric air exhausted from vessels, and pertains also to certain novel features of construction and arrangement of parts, and to novel processes, as hereinafter described. To this end,

My machine consists—

First, of a peculiarly-constructed receiver of an air-pump, through the plate of which, from beneath, are passed the mouths (V-necks) of the vessels containing the substances to be subjected to its action, which vessels thus penetrating the receiver are, of course, exhausted simultaneously therewith. The receiver contains also a mechanism for stopping the vessels thus entering it while *in vacuo*, and is constructed very carefully with a view to the economy of space covered, so as to make it, as near as may be, a mere channel for the exhaustion of these secondary receivers.

Second, of one or more frames or carriages for supporting the vessels to be exhausted, and applying them to and securing them in the openings prepared for them in the plate of the receiver, and for removing them therefrom and supplying their place by other, when exhausted, with despatch.

Third, the body of the vessels with their mouths so placed under the receiver are capable of being inclosed in a tight chamber formed by the outer walls of the apparatus, so as to be subjected to the action of heat or cold at will by means of a jet of steam or cold water.

When the vessel to be exhausted is very large, by means of a receiver adapted to that purpose, I apply it immediately to the vessel, constituting it (the vessel) a plate for the operation.

In the drawing—

B is a box, provided with a cover, B′, which is fastened upon it by any suitable means, *b b*, and also provided with side doors, through which access may be had to its interior, the whole being made as perfectly air-tight when closed as possible.

C is a car or stand sliding or running on wheels into the box B, for the purpose of supporting and adjusting the bottles or flasks F F′, which are to be exhausted. The latter are stepped in or upon a platform, D, which can be raised or lowered by turning a screw, *d*, by means of a hand-wheel, *d′*.

The bottles are held in an upright position by means of a guide-plate, D.

Conical apertures are made in the cover B, directly over the flasks, which allow the necks of the flasks, when they are raised, to project up through the cover, the shoulders of the flasks fitting closely to the sides of the openings, so as to form an air-tight joint, and being packed in any suitable manner.

Among other packing devices, the annular rubber air-cushion E, figs. 2, 4, 5, and 9, may be employed, being adjusted upon the shoulders of the flask so as to fit closely against the under side of the cover around the apertures, as represented in figs. 2 and 5, or attached to the under side of the cover B′.

In connection with the apparatus above described, I employ a "receiver," A, which fits air-tight upon the cover or plate B′, over the mouths of the flasks. It is made of any required length and width, but not more than two or three inches deep, so as to inclose the smallest practicable space. A screw-stem, A′, projects down into it, provided with a hand-wheel, A″, and serves to raise or depress a platform, G, within it.

The platform is composed of crossed bars, and is kept in a horizontal position at all times by means of guide-posts *g g*. It may be both raised and depressed by means of the screw, or it may be raised by means of springs *h h*.

A stop-cock may be applied to the receiver at *a*, capable of being connected to an air-pump, a condenser, or a force-pump.

A stop-cock may also be applied to box B at *a'*, fig. 1, capable likewise of being connected to a steam or water-pipe.

The flasks may consist of glass bottles, F F, of the usual form, provided with corks or stopples *f*, having a notch, *e*, cut in their lower end; or they may consist of a metallic can, F', fig. 6, having a cap, *f'*, provided with lateral perforations *e'*. Or, instead of the notched or perforated stopple or cap and the obvious equivalents thereof, a common stopple or cap can be employed, if preferred.

It is also obvious the perforations or notches may be made in the neck of the flask, instead of the cap and stopper, respectively, with equally good results.

The flasks, especially when made of metal, may be of any practicable size; and when designed to receive large objects a door or opening, H, may be constructed for the purpose of admitting the object, and may be properly closed and sealed afterward.

The best form of flask for most purposes is that represented in fig. 6, consisting of a cylindrical sheet-metal body, having a conical bottom and top, surmounted by a short tubular neck, adapted to be closed air-tight by a stopple or cap.

While this form of flask is best for many purposes, however, any form may be used, according to the nature of the experiment or operation.

The space over plate B', up to the level of the mouth of the flasks when they are in position, as seen in fig. 2, may be filled up in any suitable manner, so as to diminish the air-space that must be exhausted.

It will be understood, of course, that all the joints about the instrument may be packed or rendered air-tight by any of the usual appliances for that purpose.

As thus constructed, the instrument is designed for exhausting the air from several flasks at once, and its operation for that purpose is as follows:

The flasks, filled or partially filled with the substance to be preserved, having been placed in position, as shown in fig. 2, and the stopples or caps being placed upon them, but not pressed down, so that the air within them can escape through the notch *e* or openings *e' e'*, the platform G' is placed in the guides and the receiver A fitted on. An air-pump is then connected with the receiver by means of the cock attached at *a*, and the air within the receiver and in the flasks is exhausted by the pump as far as possible. The platform G is then depressed till it comes in contact with the stopples or caps, forcing them down and closing the flasks air-tight. The receiver may then be taken off the box B, opened, and the flasks removed.

In certain cases, as in preservation of dead bodies, the air is exhausted, and its place filled with some gas in which decomposition of the subject cannot take place. In that case the process with my apparatus is to exhaust the air as above described, and then detach the air-pump and attach in its place the pipe through which the gas is to be supplied, leaving the gas to flow freely in and occupy the flask or other vessel until an equilibrium of pressure is established between the gas within and the air without the vessel. There will then be no tendency to a displacement of the gas, either by its pressure to escape or by the pressure of the air to enter, and the equilibrium thus established will continue for any length of time.

If preferred, the gas may be forced in under heavy pressure, so as to cause it to permeate every part of the substance in the flasks. It may then be allowed to escape till an equilibrium is established, when the flask may be closed and sealed. Of course, where it might be deemed necessary, the flask could be closed and sealed with the gas within under pressure, in which case, although some of the gas could, perhaps, afterward force its way out of the flask, yet no air could enter, and the subject would be perfectly preserved for an indefinite length of time.

My apparatus is adapted to the use of heat and cold in connection with the processes above described. In canning fruits, vegetables, &c., I inject a jet of steam into box B, through cock *a'*, which, under the diminished atmospheric pressure, raises the temperature around the lower end of the cans sufficiently to cause them to boil, although not sufficiently to cook their contents. The ebullition thus caused effectually expels such air as may not have been exhausted, and when this has been accomplished the steam is shut off and the cans closed and removed, as before.

In case the aid of a steam-jet is resorted to for the purpose of rendering the vacuum more complete when gas is afterward to be introduced into the flasks, I may, after shutting off the steam and connecting the gas-pipe, as described, introduce into box B a jet of cold water or spray, to cause a sudden decrease of temperature and shrinking of the contents of the flasks. This will cause the gas more freely and effectually to enter the flasks and permeate their contents from top to bottom.

But the special advantage of the process consists in this, that when the contents of the flasks have taken up or received all the gas which can be readily forced in, a jet or stream of cold water let into the box, or directed upon the flasks themselves, will cause a contraction of their contents and a condensation thereof, which will create a slight vacuum for the admission of an additional quantity of gas. This done, the corks are forced in at once.

Having thus described some of the processes by which scientific specimens, dead bodies, meats, fruits, vegetables, &c., may be preserved by the use of my apparatus, it remains now to describe a simpler form thereof, which can be employed when but a single vessel is to be exhausted, and which will be of the greatest utility in removing the air from burial-cases, barrels, and other larger reservoirs or receptacles, including even railway-cars and the holds of ships, as well as the smaller flasks, bottles, &c., heretofore described.

This form of apparatus is shown in figs. 3 and 4, and consists of a single receiver, A, of glass or other suitable material, having an opening or cock, *a*, on one side, to which to attach the air-pump or gas-pipe, and resting on a plate, B', fig. 3, adapted to accommodate necks of the bottles, F F', as heretofore described, or to be set upon the barrel, burial-case, or other receptacle, J, fig. 4, which is to be exhausted.

When set directly upon the vessel to be exhausted the annular rubber air-cushion, E, is introduced between them, the air-cushion resting on the barrel or vessel around the air-opening therein, and the bottom of receiver A resting upon the cushion. The cushion will accommodate itself to any unevenness in the shape of the vessel, as shown in fig. 4; and if the receiver which rests upon it should not sit vertically, or should accidentally be jostled or inclined during the operation, it will merely force some of the air from one side of the rubber ring to the other, preserving the joint perfectly air-tight all the while. Thus attached, the pump is connected and the air exhausted, as above described.

The stopple or cap may then be forced into the neck of the vessel by screwing down the rod A', figs 3 and 4.

If at any time desirable to remove them without letting the air into the receiver again, or to manipulate them in any way, it may be readily and easily done by means of an interior screw-stem, *s*, extending down through the center of the rod A', and bearing at its lower end any suitable device for grasping and turning or withdrawing the cork, stopple, or cap.

There are certain modifications in the details of construction shown in the drawing which it might be well here to refer to, although they are not essentials of the invention. For example: the platform G might be made of wires or of a board perforated at suitable

points, as well as in many other ways; and, instead of having the bars directly over the stopples or cans, they may be so arranged that when the platform is depressed the bars composing it will come between the necks of the cans or flasks and partially fill the open space there shown in the drawing. When thus constructed the upper side of the platform should be covered with a thin sheet or plate of wood, metal, or other material, like that shown at *m*, but broader. This plate will strike and adjust the stopples while the bars serve to fill up the vacant spaces, and thereby diminish the extent of the space to be exhausted or to be filled with gas.

Again, it is obvious that the functions performed by the several screw-rods might, though perhaps not as well, be performed by sliding rods, or rods and levers suitably packed. The platform D might thus be raised and lowered, as well as the platform G. If preferred, two or more screws instead of one might be used to raise and lower the several platforms.

Railways, *r r*, may be employed upon which to run the car or box C into or out of place, and such railways may be attached to one of the side or end doors of box B, or to a sliding inner floor or false bottom of box B, or in any other suitable way.

Having thus described my invention,

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

1. The flask F′, constructed as described and shown, and for the purpose specified.

2. The stopples *f f′*, when constructed with notches or holes and adapted to be employed in connection with the flasks, substantially as described and for the purposes set forth.

3. The combination of box B, receiver A, and plate B′, provided with tapering apertures to receive the necks of the flasks, substantially as described.

4. The vertically-movable platform D, arranged in the box, in combination with the box B, plate B′, and receiver A, substantially as described.

5. The vertically-movable platform G, arranged in the receiver, in combination with the box B and plate B′, substantially as described and for the purpose set forth.

6. The combination of box B, car C, platform D, guide D′, and screw-rod, or equivalent, *d*, as and for the purposes set forth.

7. The combination of receiver A, fig. 3, with the rods A′ *s*, and a device at the bottom of the latter for the purpose of grasping the cork or stopple, substantially as described.

8. The process herein described of exhausting atmospheric air from vessels to which heat is applied, and then condensing the contents of the vessels by applying cold through the medium of water in a stream or spray, as described.

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