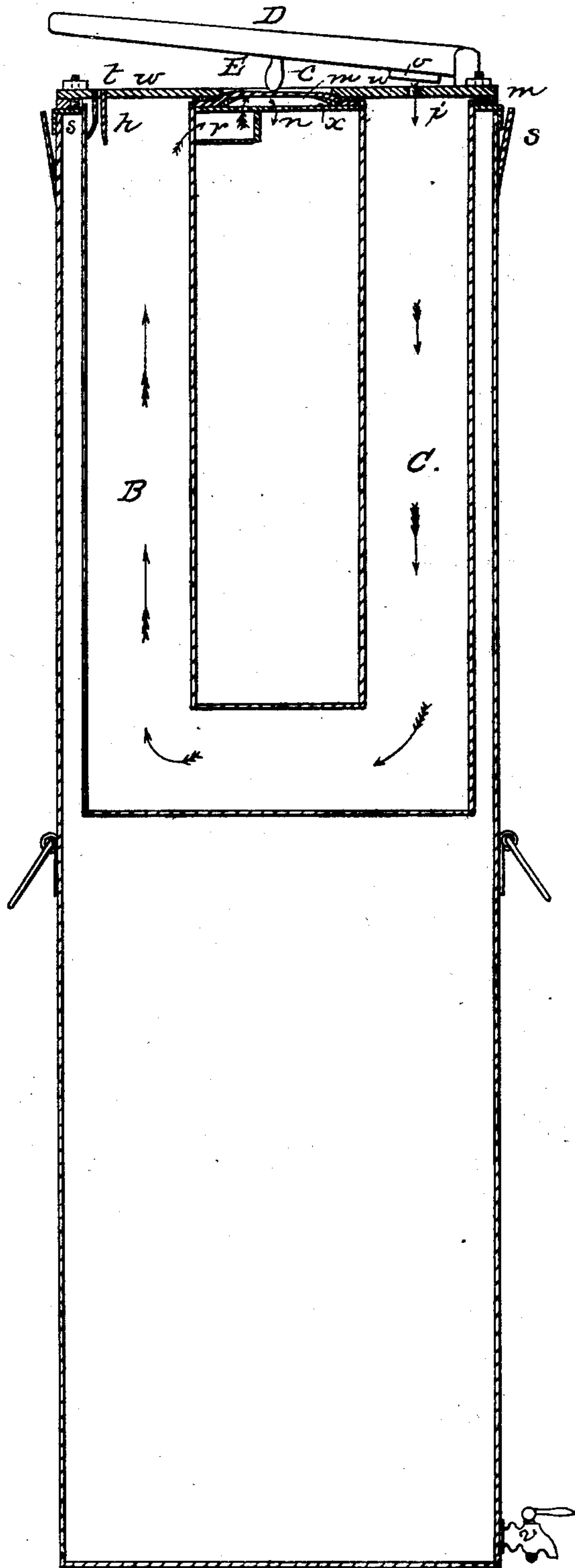


A. S. LYMAN.
Preserving Food.

No. 20,209.

Patented May 11, 1858.



UNITED STATES PATENT OFFICE

A. S. LYMAN, OF NEW YORK, N. Y.

IMPROVEMENT IN CANS FOR PRESERVING FOOD.

Specification forming part of Letters Patent No. 20,209, dated May 11, 1858.

To all whom it may concern:

Be it known that I, A. S. LYMAN, of the city, county, and State of New York, have invented certain new and useful Improvements in Cans for Preserving Food by Filtering from the Air the Causes of Decomposition; and I do hereby declare that the following is a full and exact description of the principles of my invention, reference being made to the accompanying drawing, making a part of this specification.

The nature of my invention consists in combining with a can of large size, having an arrangement for drawing off its contents, a reservoir of some material which shall filter from or neutralize in the air any substance which may act as the cause of the commencement of the process of decomposition, so that whenever any of the food is drawn off air or gas free from the primary cause of putrefaction shall supply its place.

The figure represents a vertical section of the apparatus.

A represents the can, which generally consists of a cylinder holding from five to thirty gallons; V, the valve for drawing off its contents; B C, the filter as constructed for using charcoal; *m m*, colored blue, metallic rubber packing and elastic valve for closing the hole *n*; *w w*, colored yellow, a plate bearing on the packing *m m* and covering the tops of the filter-tubes; *i*, a small opening for admitting air when food is drawn off. It is closed by the valve *o*, attached to the lever D. D, a lever for opening and closing the air-valves *i* and *n*; *r*, a small tube leading from the filter up under the cap *x*; *x*, a cap for supporting the rubber sheet used for closing the hole *n*.

If the lever D is raised and food is drawn off from the valve V, a portion of air from the upper part of the branch B of the filter passes in the direction of the arrows through the small tube *r* up under the cap *x*, covered by the sheet *m*, and down through the valve *n* into the can, supplying the place of the food, while air flows up the branch B of the filter from the branch *c*, and this in turn is supplied by air from the atmosphere by the valve *i*.

Great care must be taken, if charcoal is used, that the filter be hot at the time it is introduced into the can, and that the charcoal be fresh burned and properly packed.

I have made the reservoirs for filters of

tinned iron with soft solder in the joints, and have prepared them for use as follows: First, I set the empty filter-chamber B C, which is attached to the cover, into another can of hot water without any cement in the top, and take living soft-wood coals from the fire, drop them into the filter-tubes, and with an iron rod crush them there. By the time the tubes can be properly packed and are full, if white-pine coal or other soft wood is used, there is no fire except a very little at the upper end. Then place the packing *m m* around the openings at the top of the filter. Upon this packing place the plate *w w*, covering the openings of the filter, and draw it down with screws and nuts. Now lift the filter out of the can of hot water and set it immediately into the can of food while the steam is escaping from the food. The steam will in a few moments have forced the air from the can off at *s* under the joints of the cover; but there is probably some uncombined oxygen in the small tube *r* and under the cap *x*, and possibly a little between the charcoal and top plate above the branch B of the filter. To drive this out I open a small hole at *t* and the valve *n* and turn the cement into the outer joint, *s*. The vapor will then escape by the valve *n*, in a direction contrary to the arrows, down into the upper part of the branch B of the filter, up through the tube *h*, and off by the hole *t*. It probably dampens the charcoal in the top of that branch of the filter through which it passes; but if it deposits nothing there but pure distilled water it is thought that no harm will result. When the vapor has escaped a few moments from the hole *t*, I close this hole *t* effectually and immediately remove the can from the heater. Air now enters the filter at *i* and passes, in the direction of the arrows, down into the branch *c* of the filter, while air deprived of its oxygen, also of all animalculæ and of all impurities which might act as a ferment, moves up from the branch B of the filter, thence by the small tube *r* up under the cap *x*, down the valve *n* into the space above the food, filling the vacuum being formed by the condensing steam.

It is not impossible but that a very small portion of carbonic acid may pass with the first nitrogen from the filter into the can; but it is believed that as long as no free oxygen enters the can the carbonic-acid gas will do

no harm. After the first few minutes nothing but pure nitrogen can enter the can.

If the filter is proportioned as shown in the figure, the can containing twenty-five gallons of food, the filter would contain over two gallons of charcoal, and all the air entering the can must pass a distance of over four feet in this filter. The charcoal in the filter will absorb five times as much oxygen as is contained in a can full of atmospheric air. The charcoal also absorbs any impurity which might by acting as a ferment cause decomposition.

When we wish to transport this can of food or let it stand a long time without being used, fasten down the lever D, so as to close the openings *i* and *n*. When this is done, the fluid cannot be dashed over into the charcoal filter. All communication is also by this means cut off between the charcoal filter and the atmosphere. If we would preserve the filter in the most perfect condition possible, we should open the passages (by raising the lever D) only when we would draw off food from the pan.

It is a somewhat serious defect in this can that fruit cannot be preserved in it without not only being deprived of its skin and stones, but also mashed, so that it will flow from the valve. Fresh fish must be deprived of its bones, floured, and mixed with gelatine or water, so that it can be drawn off. Beef, mutton, and other meats must also be prepared in the same manner.

The filter may perhaps be made much smaller and more convenient by using merely a small reservoir of binoxide of nitrogen, which immediately seizes the free oxygen of the air and converts it into nitrous-acid vapors. These vapors are absorbed by water, but I believe do no harm in small quantities; but,

though I have tried several other substances, I prefer the filter of charcoal, believing that the primary cause of putrefaction is not simply atmospheric oxygen, nor animalculæ or fungi, but also minute particles of impure gas, which act as a ferment or leaven; that these particles, already in a state of decomposition, floating in the atmosphere, come in contact with and inoculate the meat, milk, or other substance, and that the filter of charcoal absorbs all these particles that would otherwise enter. It also absorbs the oxygen, and will, I believe, strain out all animalculæ or fungi. At any rate, it answers the purpose well, and is everywhere easily obtained.

It is evident that we may vary the materials used for the filter and the form and size of their reservoir without altering the general principles of the apparatus in any important particular. It will, however, be found true in every arrangement of this improved can that whenever we draw off food by the valve V air to supply its place enters the can, leaving in the filter the oxygen, the animalculæ, the leaven, or whatever it may be that causes the commencement of the process of decomposition.

I claim as my improvement in cans for preserving food—

The combination of the reservoir or filter of suitable material with a can having an arrangement for discharging its contents in such a manner that whenever any food is drawn off air or gas deprived of the primary cause of decomposition shall supply its place, substantially as and for the purposes specified.

AZEL STORRS LYMAN.

Witnesses:

J. W. POST,
WM. T. LYMAN.