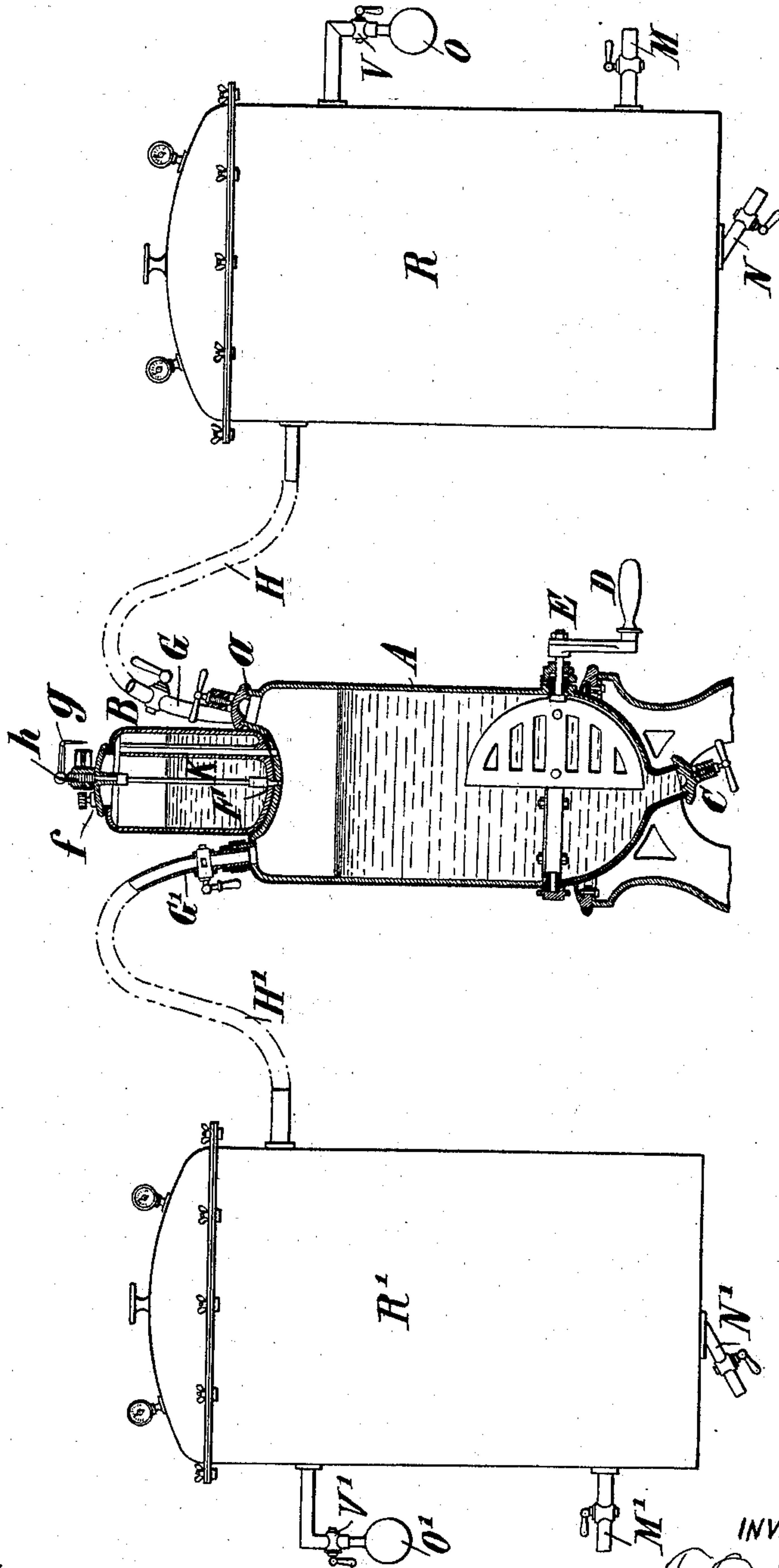


(No Model.)

F. O. JACOB.  
METHOD OF PRESERVING FOODS.

No. 580,696.

Patented Apr. 13, 1897.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

FRANÇOIS OSCAR JACOB, OF PARIS, FRANCE.

## METHOD OF PRESERVING FOODS.

SPECIFICATION forming part of Letters Patent No. 580,696, dated April 13, 1897.

Application filed June 24, 1896. Serial No. 596,741. (No specimens.) Patented in France July 22, 1895, No. 249,052.

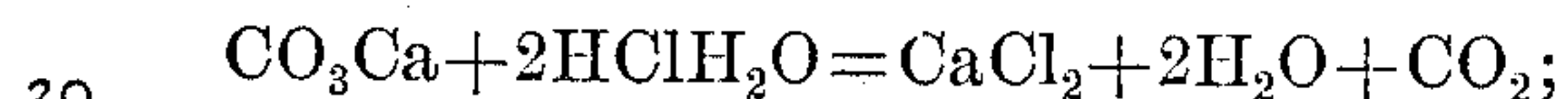
*To all whom it may concern:*

Be it known that I, FRANÇOIS OSCAR JACOB, engineer, a citizen of the Republic of France, residing in Paris, France, have invented a  
5 Process for Preserving Solid Organic Alimentary Substances, (for which I have obtained a French patent, dated July 22, 1895, No. 249,052,) of which the following is a specification.

10 This invention relates a process for preserving solid organic alimentary substances. To preserve these matters from fermentation and decomposition, it is proposed for certain of them to make use of an acid reaction and  
15 for others of a basic or neutral reaction.

The process which forms the subject of the present invention has two well-defined or distinct phases, as will be gathered from the following description, reference being also had  
20 to the accompanying drawing.

The first phase of the process consists in submitting the matters to be preserved to the action of carbonic anhydrid. To obtain this gas economically, two different modes may  
25 be employed: first, by the action of carbonate of lime in presence of sulfuric or hydrochloric acid according to the following equation:



second, by the reaction of bicarbonate of soda in presence of sulfuric or hydrochloric acid according to the equation



These reactions are produced, the one or the other, in the apparatus represented, partly in section, on the annexed drawing. This apparatus consists of a cylinder A, of steel or  
40 copper, lined with lead and provided with an agitator, the rod E of which passes through a stuffing-box and receives at its outer end a crank-handle D. This cylinder A has at the bottom C means for emptying it and at the  
45 top an opening  $\alpha$ , closed by a pressure-screw, for the introduction, for example, of the bicarbonate of soda, and also two tubes provided with cocks G G' to carry off the carbonic-anhydrid gas produced by the reaction,  
50 as will be seen farther on. At the upper part of the cylinder is a reservoir B, lined with lead, intended to contain the hydrochloric or

sulfuric acid from which it runs into the cylinder A. An opening  $f$ , closed by a screw bung or stopper, allows for the introduction  
55 of the acid into the reservoir B. A hole F forms the connection between the reservoir B and the cylinder A. This hole F receives a conical plug which, more or less raised, permits the flow, more or less rapid, of the  
60 acid. The rod of this conical plug has at its upper part a thread  $h$ , which engages with a fixed threaded part and receives a rod  $g$ , which is displaced with regard to a graduated sector, fixing the amount of flow. A tube  $k$   
65 of lead makes connection between the upper part of the cylinder A and the upper part of the reservoir B to equalize the pressure in the two vessels.

The apparatus is completed by two receivers  
70 R and R' of sheet-steel in connection, respectively, with the cylinder A by the tubes H and H', connected to the tubes G and G'. These receivers are each provided with a suitable cover, carrying a manometer and an indicator of vacuum. They possess, also, each  
75 an emptying-cock N N', a cock M M' to make the vacuum, and a cock V V', on which is screwed a ball O O', capable of resisting a considerable pressure.  
80

The meat or organic substances are placed in the receivers R and R'. One of them can be working while the other is being charged. The cylinder A is full, say, of bicarbonate of soda and the reservoir B of hydrochloric acid.  
85 All the openings are closed and the conical plug F, which closes the hole of communication, is opened. The acid runs more or less quickly onto the soda, which is agitated by turning the handle D to hasten the reaction.  
90 Carbonic anhydrid is thus produced which, as soon as the cocks G and G' are opened, rushes into the receivers R and R' and surrounds entirely the organic substances therein contained. The pressure is calculated ac-  
95 cording to the coefficient of resistance of the meat to the penetration and the size of the pieces to be operated upon.

It may be here mentioned that the reaction above described does not produce pure carbonic anhydrid, but there is also produced  
100 chlorin gas in a nascent state, which gives a very pronounced flavor to the alimentary substances contained in the receivers R and



R'. If the meat is left in this state, the acid vapors will quickly produce acetic fermentation and then putrefaction. It is here that comes in the second phase of the process. To  
5 destroy the effect of the acid vapors and prevent entirely the production of micro-organisms in the tissue of the meat taken from the apparatus, formaldehyde ( $\text{CH}_2\text{O}$ ) is employed. Once the meat has been bathed  
10 in the carbonic anhydrid, as indicated above, the cocks G and G' are closed, in order to isolate the receivers R and R' from the generator A. By means of the cocks MM' the gas is removed from the receivers R and R' and  
15 a stout india-rubber tube is attached to the cock and connected to a suitable pump by which a vacuum may be produced. During this time the cocks V V' are closed and the balls O O' are removed, filled with a solution  
20 of one-tenth formaldehyde, ( $\text{CH}_2\text{O}$ ), and then replaced. When sufficient vacuum is obtained, the cocks V V' are opened, so that the liquid contained in the balls O O' vaporizes instantly. To obtain a tension of vapors suf-  
25 ficient, the ball O may be heated in any convenient manner. It is necessary that the pressure be equal to that of the first operation. After the meat has been treated in these vapors for about a quarter of an hour  
30 it can be taken out of the apparatus. It can then be kept in the air without any package for more than a month. It has no smell and it contains no toxic principle or anything contrary to the hygiene of alimentation.

It will be understood that any suitable ap- 35  
paratus may be employed in carrying out my process.

Although I have hereinbefore described the treatment with formaldehyde as subse- 40  
quent to that with carbonic anhydrid, I desire it to be understood that the sequence of steps may be reversed, or both treatments may be performed simultaneously. That is, according to my invention the substances to be preserved are treated with carbonic anhy- 45  
drid and formaldehyde, said agents being applied either successively or simultaneously.

I claim—

1. For the preservation of meat, fish, fruit, vegetables, and all solid organic alimentary 50  
substances, the process herein described, which consists in submitting the substances successively to the action of the vapor of carbonic anhydrid and the vapor of formaldehyde under pressure. 55

2. The herein-described method for preserving organic alimentary substances, consisting in subjecting the substances to the action of carbonic anhydrid and formaldehyde, as set forth. 60

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANÇOIS OSCAR JACOB.

Witnesses:

LEVI FRANCKEN,  
CLYDE SHROPSHIRE.