No. 654,174. Patented July 24, 1900.

E. MURMANN & A. OPAWSKI.

HEATING APPLIANCE FOR CANNED FOOD.

(Application filed Jan. 5, 1899.)

(No Model.)

Fig. 1.

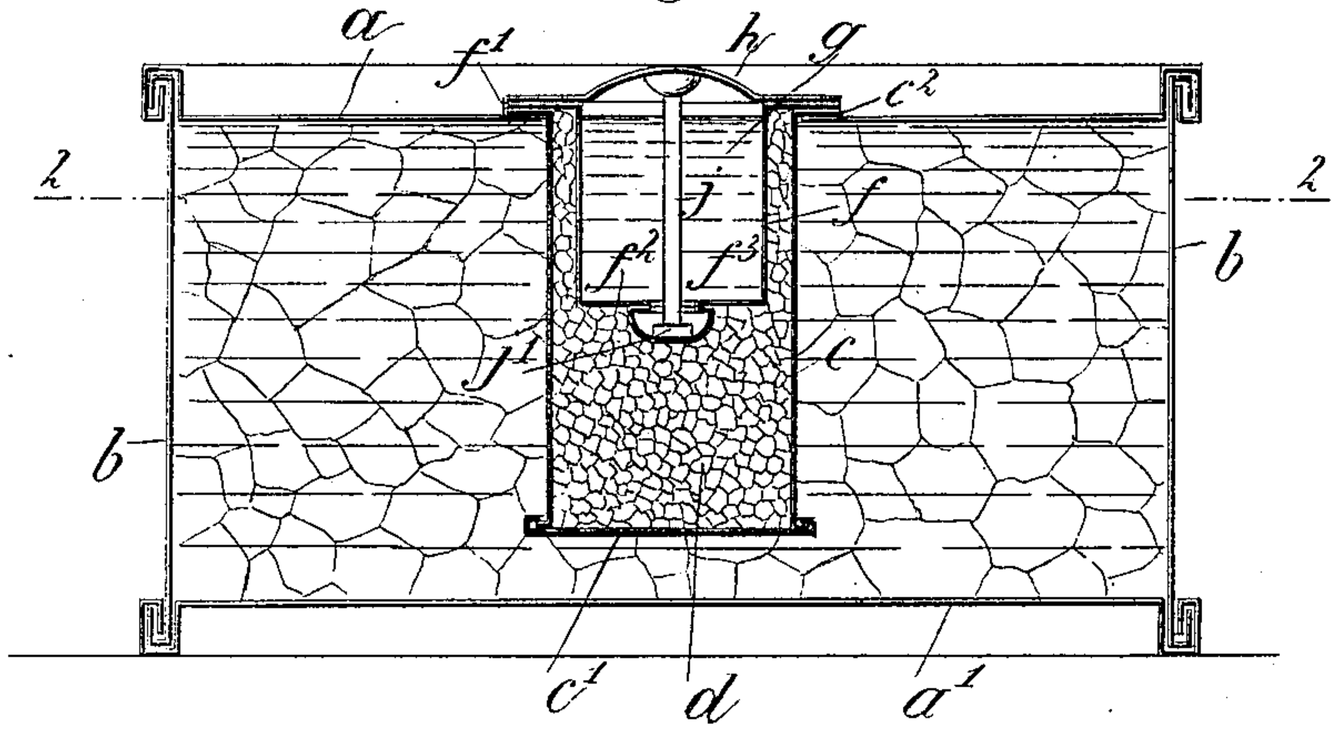
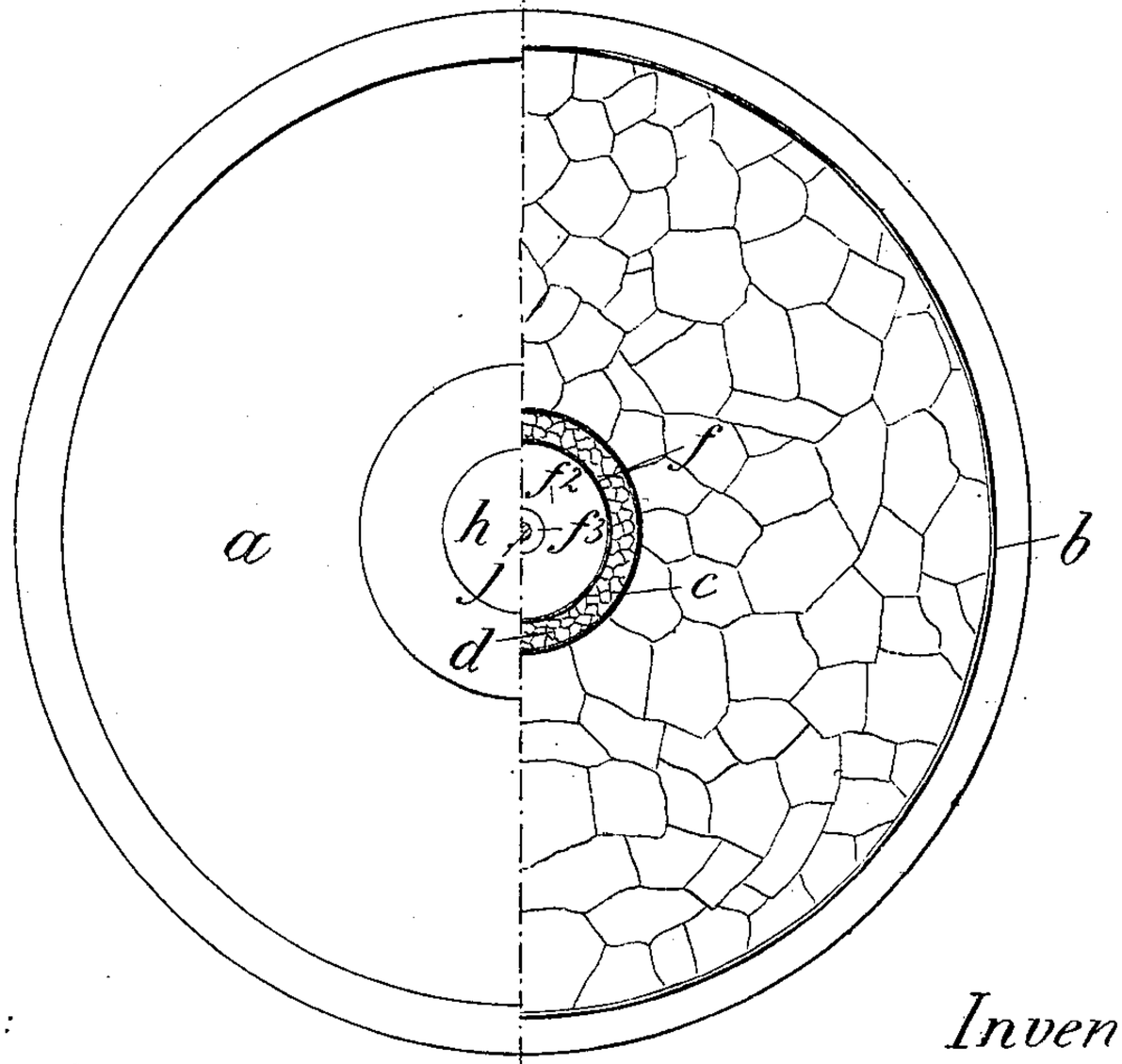


Fig. 2.



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ERNST MURMANN AND AUGUST OPAWSKI, OF VIENNA, AUSTRIA-HUNGARY.

HEATING APPLIANCE FOR CANNED FOOD.

SPECIFICATION forming part of Letters Patent No. 654,174, dated July 24, 1900.

Application filed January 5, 1899. Serial No. 701,287. (No model.)

To all whom it may concern:

Be it known that we, ERNST MURMANN and AUGUST OPAWSKI, subjects of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria and Empire of Austria-Hungary, have invented a new and useful Improvement in Heating Appliances for Canned Food, of which the following is a specification.

This invention relates to sealed sheet-iron cans containing preserved food of such a nature as to require heating before being eaten. Hitherto it was necessary for heating such preserved foods to provide hot water or a wood or spirit fire. Now, our invention has for its object to obviate this necessity.

According to the invention a two-chambered sheet-iron receptacle is so connected with the can that the sides of the said receptacle are either in contact with the contents of the can or are partly formed by the sides of the said can. The two chambers of the receptacle, separated from each other by a partition, are filled with two different substances having chemical affinity with one another and one of them being in a liquid state, whereby on the partition between the two chambers being pierced chemical reaction takes place and heat is developed. If one of the two substances referred to be water, which may be found nearly everywhere in nature, the said receptacle may have but one chamber. In this case the outer side of the receptacle is pierced when the food is required for use and water is introduced therein.

In the case of two-chambered receptacles one of the chambers may contain a permanent device for piercing the partition between the two chambers or for loosening a soldered-in partition, the said device consisting of a pin so held in position in the chamber that it pierces or loosens the partition when a portion of the receptacle is knocked in.

On slaking freshly-burned quicklime thirteen thousand six hundred calories of heat are evolved per molecule of hydrate formed. For this reason it has been repeatedly proposed and tried to utilize this process for the purpose in question. However, the reaction between quicklime and ordinary water goes on comparatively slowly, and it is yet more retarded if alcohol or glycerin have been added to the water in order to prevent it from freezing fast. Most sensibly the reaction is delayed by keeping the quicklime, after its burning, some time, of course at exclusion of air. In this case a quarter of an hour may often elapse before the evolution of heat begins, and the same is but weak. Especially with quicklime in small pieces and in contact with a good conductor of heat it is scarcely perceptible.

According to our invention we also utilize the reaction between quicklime and water; but we accelerate the same essentially and in any required measure by causing not only water, but also a water-transferrer, to act upon the quicklime. There are, indeed, numerous salts and acids having the property that on their being dissolved in water they immediately combine with some molecules of water, but in so loose a manner that these molecules of water are more readily yielded to other compounds than molecules of the groups of molecules forming the water. As soon as the water taken up by the salts and acids in question has been yielded to the other compound present the said salts or acids again combine with molecules of water severed from the surrounding water, and so on. It will thus be seen that the salts and acids referred to, so to speak, take the molecules of water from the water in presence and transfer them to the other compound.

As between the agents for transferring water, calcium chlorid is most effective. Next to it come calcium bromid and iodid, to which follow, with gradually-decreasing effectiveness, magnesium chlorid, bromid and iodid, ammonium chlorid, bromid and iodid, zinc chlorid, bromid and iodid, and all soluble chlorids, bromids, and iodids of inorganic bases—for instance, ferrous oxid—and organic ones—for instance, anilin, phenyl hydrazine—which can be decomposed by lime. There are only excepted the fixed alkalies, the chlorids of which exert no action at all, while the effect produced by the bromids and iodids is but weak. Highly-diluted hydrochloric, hydrobromic, and hydroiodic acid give rise to the formation of the corresponding haloid compounds of calcium, and consequently they act quite as accelerating as the calcium compounds themselves. In the second rank stand, as weakly accelerating, the nitrates of cal-

cium, magnesium, potassium, sodium, and baryum, highly-diluted nitric and sulfuric acid, magnesium sulfate, ammonium molybdate, &c. No accelerating action or even a strongly-retarding action is exerted by alkali sulfates, alkali fluorids, nitrites, alkali carbonates, alkali lyes, sodium tungstate, &c.

The action of calcium chlorid is so energetic that, for instance, quicklime, which but weakly enters into reaction with distilled or well water and not before about ten minutes, causes in a few seconds steam to be evolved if brought together with an aqueous solution of calcium chlorid at one-half per cent. When the quicklime in question is thrown into an aqueous solution of calcium chlorid at but three per cent., the evolution of heat takes place explosion-like.

In order to make our invention fully understood, we shall hereinafter describe it in detail, with reference to the accompanying sheet of drawings, in which—

Figure 1 is a sectional elevation of a can provided with our heating appliance; and Fig. 2, in its left-hand half a top view of the said can and in its right-hand half a sectional view on line 2 2, Fig. 1.

Referring to the drawings, c is a cylindric sheet-iron receptacle having a bottom c' and being, by means of its top flange c^2, soldered into a hole of the cover a of the can b. The diameter of the receptacle c is so chosen that with a given capacity the said receptacle extends nearly to the bottom a' of the can b. The receptacle c is destined to receive quicklime or a mixture of the same with a water-transferrer. Into the open top end of the receptacle c is soldered another receptacle f of similar form, but of smaller dimensions, and provided with a flange f', superposed upon the flange c^2. The receptacle f is filled with water or with an aqueous solution of a water-transferrer. At its top the receptacle f is closed by a soldered cover h, convex to the outside, and the receptacle contains the pin j, destined to pierce the partition between both chambers referred to above, this partition being formed by the bottom f^2 of the receptacle f. It will be seen that the pin j projects through a hole f^3 of the bottom f^2 and carries below the bottom a head j', which is so soldered to the said bottom as to close the hole f^3. By flattening down the convex cover h by a blow with a heavy body the head j' of the pin j is severed from the bottom f^2 and the liquid is allowed to pass into the receptacle c. It is obvious that the said pin j may also be dispensed with, as the liquid contained in the receptacle f may also be given access to the quicklime and water-transferrer or mere quicklime filling the receptacle c by piercing from without with any suitable implement, such as a nail, both the cover h and bottom f^2. We prefer, however, to use the described pin for piercing the partition without breaking the cover, as in this way the steam evolved is utilized for heating, while it otherwise escapes through the pierced cover.

If the loss of heat in the form of escaping steam be not a sensible drawback, as will be the case when more or less weight of the cans is not cared for, and consequently a comparatively-great quantity of quicklime may be used, and the heating appliance may be formed of a unique chamber containing quicklime and a water-transferrer.

What we claim as our invention, and desire to secure by Letters Patent, is—

In a heating appliance for canned food, the combination with the can of a sheet-metal receptacle tightly inserted into a hole of the sides of the can and extending within the hollow of the can nearly to the opposite side, a cross-partition dividing the hollow space of the receptacle into an inner and an outer chamber and being provided with a hole, a headed pin having its head so soldered to the inner surface of the partition that it closes the hole of the partition, and its stem extending into the outer chamber, a bellied-out sheet-metal cover tightly closing the outer chamber and bearing against the free end of the pin, quicklime filling either chamber, water filling the other chamber, and a water-transferrer added to the contents of either chamber, substantially as described and for the purposes set forth.

In witness whereof we have signed this specification in presence of two witnesses.

ERNST MURMANN.
AUGUST OPAWSKI.

Witnesses:
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