

July 19, 1927.

1,636,061

C. C. E. KERSTEN

PRESERVING APPARATUS

Filed July 12, 1924

2 Sheets-Sheet 1

Fig. 1.

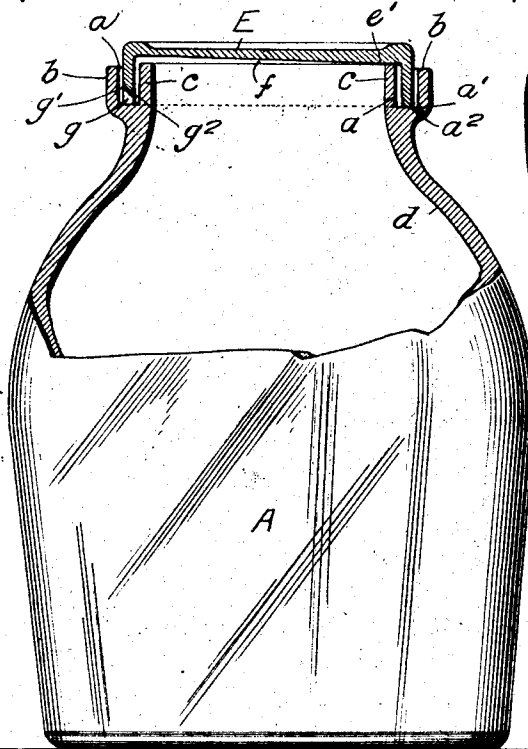


Fig. 2.

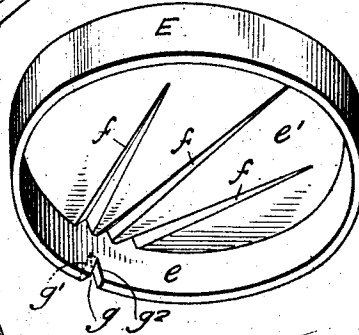


Fig. 3.

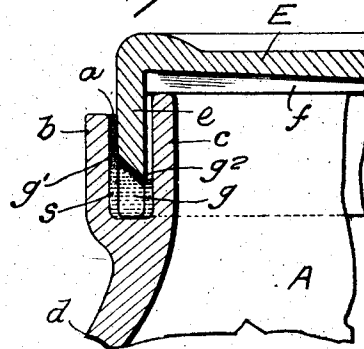


Fig. 5.

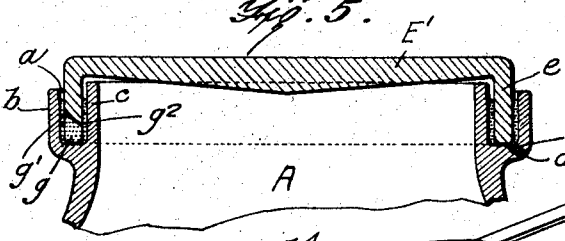
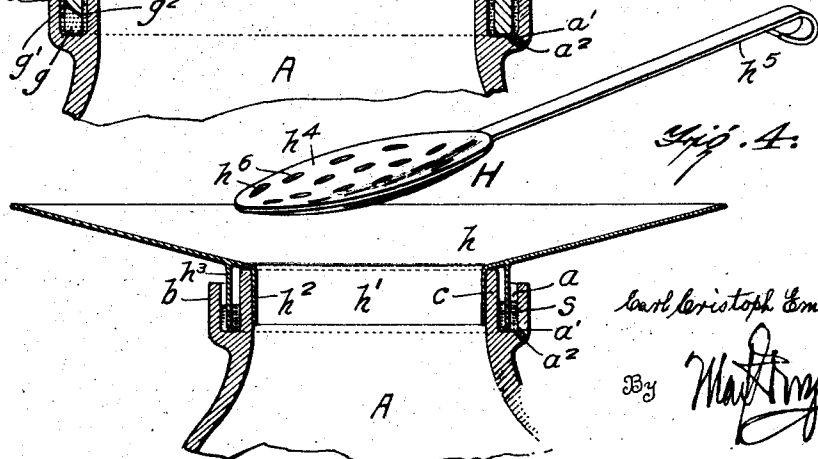


Fig. 4.



Inventor
Carl Christoph Emil Kersten
By *W. H. Meyer*
Attorney

July 19, 1927.

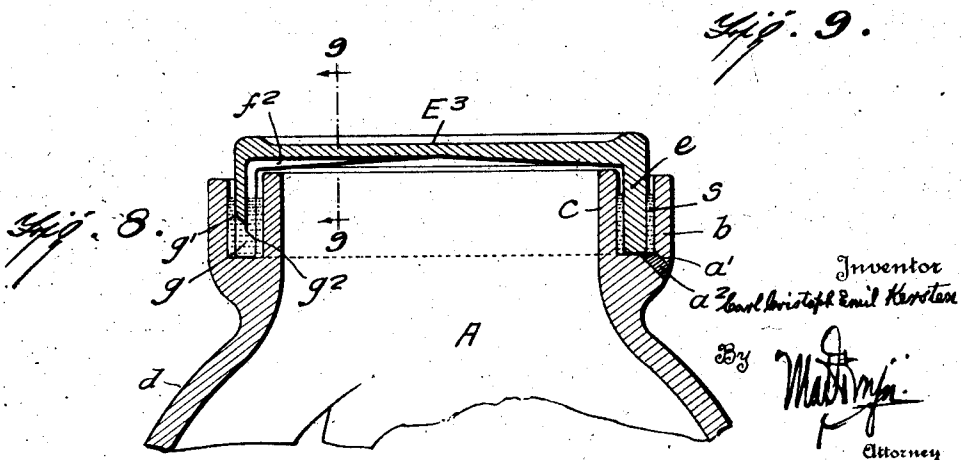
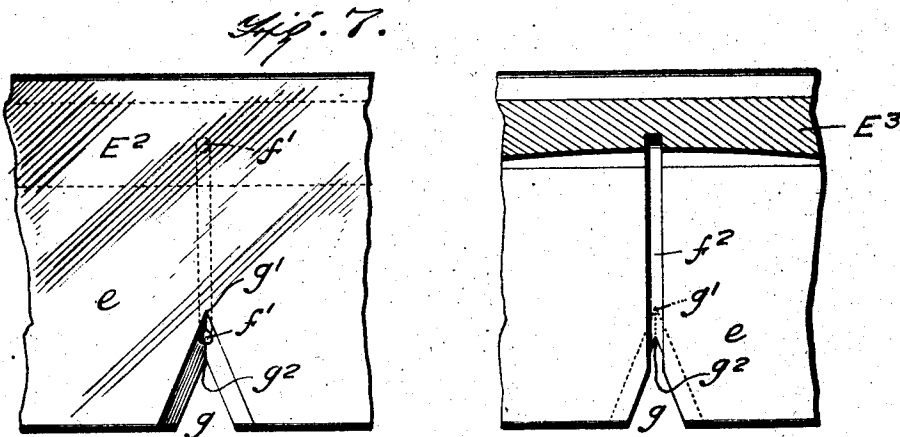
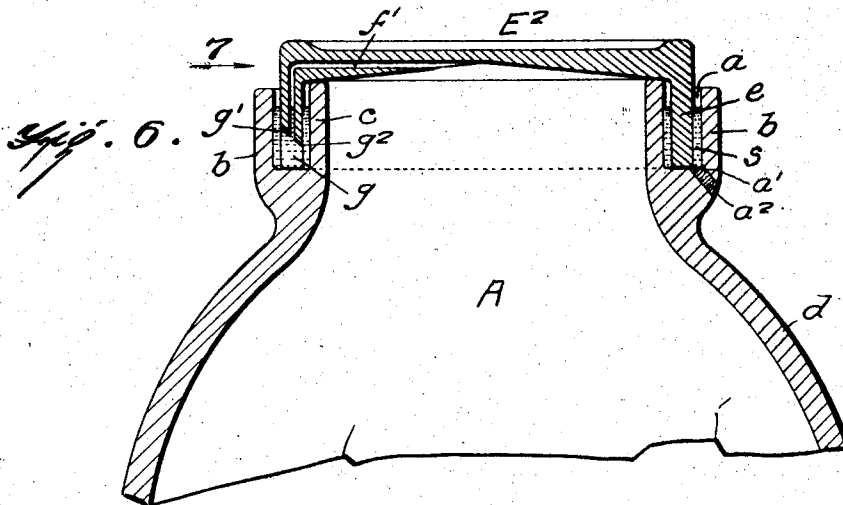
1,636,061

C. C. E. KERSTEN

PRESERVING APPARATUS

Filed July 12, 1924

2 Sheets-Sheet 2



Patented July 19, 1927.

1,636,061

UNITED STATES PATENT OFFICE.

CARL CHRISTOPH EMIL KERSTEN, OF COLUMBUS, GEORGIA.

PRESERVING APPARATUS.

Application filed July 12, 1924. Serial No. 725,630.

This invention relates to the art of preserving, and in particular to apparatus for treating perishable food material, such as vegetables, fruits, fruit juices, in such a way that it will remain in an unchanged, palatable and wholesome condition and fit for consumption for considerable time periods.

The object underlying the invention is to provide means whereby the natural changes which such substances undergo at ordinary temperatures and air conditions are utilized in conducting the preserving steps.

My invention for such purpose comprises a receptacle for the material to be preserved, such receptacle being equipped with means to permit foam and scum which form and rise from the material to be removed therefrom and with means which permit the receptacle to be sealed against the ingress of the outer air after the foaming stage has ceased, but at the same time to permit the expulsion of the air and the gases which are evolved from the body of the material as the natural changes therein proceed. Means are also provided under my invention to enable the progress of this evolution of gases and its final cessation, indicating that the process is completed and that the treated products are ready for storing away for use as required, to be observed.

The means thus outlined are embodied in their preferred form in the apparatus represented in the accompanying drawings, in which:

Fig. 1 is an elevation partly in vertical central section of a preserving receptacle or jar with sealing cover under my invention;

Fig. 2, a perspective view of the cover viewed from below;

Fig. 3, an enlarged detail view in vertical section of the upper portion of the receptacle and cover;

Fig. 4, a vertical central section of the upper or neck portion of receptacle with the foam-skimming device in place thereon;

Fig. 5 is a vertical central section of the neck and cover of a modified form of receptacle under my invention;

Fig. 6, a similar view of another modification;

Fig. 7 being an enlarged detail view of the same;

Fig. 8 is a vertical central section of still another modification under my invention, and

Fig. 9 is an enlarged detail view of the same in sectional elevation.

By referring first to Figs. 1 to 3 it will be seen that the receptacle A, which in the present instance is in the form of a jar of any suitable or desirable material, such as earthenware, glass or metal, and which may be of any desired size and capacity, is provided at its mouth with an annular trough or groove *a* formed by the two annular upwardly extending lips *b* and *c*, respectively, forming the upward termination of the walls *d* of the receptacle. As shown, the inner rim *c* is somewhat higher than the outer rim *b*, extending above the same a small distance. For closing the mouth of receptacle A, a cover or closure cap E is provided, said cover or cap having an annular depending flange or rim *e*. The flange *e* is arranged so that it will dip into the annular trough or groove *a*, extending to the bottom of the same, but only partially filling out said groove, thereby leaving lateral spaces on both sides to contain a sealing liquid. The cap E in the instance shown rests with the interior surface of its top *e'* on the inner rim *c*. The under side of the top of cap E is formed with ducts or channels which in Figs. 1 to 3 are shown in the form of grooves *f* which extend across the said under side of the cover and converge to and open at a point of the flange *e* where the notch *g* to be described below is located, as shown. The flange *e* is provided at *g* with a vent in the shape of an upwardly tapering notch, preferably triangular in shape. As shown in Figs. 2, 7 and 9, the notch is flaring outwardly and the top or apex of this notch is upwardly and outwardly inclined so as to be higher at the outer point *g'* than at the inner point *g''*, for a purpose to be hereinafter explained.

As illustrated in Fig. 4, my invention also contemplates the provision of a device which I term a scum-trap in connection with the receptacle A, and whose purpose is to receive, collect and retain the froth and scum which form and are forced upward when certain processes occur in the interior of the receptacle, as will be explained below. This scum-trap comprises a skimmer and a check plate for same. The skimmer H consists in a dish or conical receiving plate *h* having a central opening *h'* and a downwardly extending annular flange *h''* adapted to closely fit within the inner flange *c* of the receptacle.

A, and a second annular flange h^3 which is arranged to dip into the annular trough or groove a of the receptacle and within a short distance of its bottom, as shown. The check plate consists of a somewhat dished plate h^4 of a size sufficient to cover the central opening h' of the receiving plate when in position. For convenience in handling the check plate is formed with a handle h^5 . For the purpose of allowing the liquid forced up with the scum and froth to drain back into the receptacle A, the plate h^4 is provided with perforations h^6 , as shown, or is reticulate or open-work in any desired or suitable manner.

The apparatus thus described may be employed for various purposes, but is designed primarily for use in preserving field and garden products, such as vegetables and fruits or fruit juices, in a manner not heretofore known. The manner in which I treat them with the aid of this apparatus is to permit them to undergo at ordinary temperature and without artificial heat such initial changes as naturally take place in them, with complete exclusion of the outer air and the germs, spores and bacteria carried by the same, to completely eliminate the gases and other matters generated during the course of such process and to arrest further changes after the said initial changes have fully terminated.

Described in detail, my mode of proceeding with the aid of my apparatus is as follows:

When the material to be preserved or stabilized for consumption has been properly filled into receptacle A, the skimmer H is adjusted in place on the neck of the receptacle, as shown in Fig. 4, so that the inner flange h^2 fits within the rim c and the outer flange h^3 dips into the annular trough a which is to be filled from $\frac{1}{4}$ to $\frac{1}{2}$ its height with a suitable sealing liquid, such as glycerine. The receptacle is then closed off against access of germs and dust from the outer air by any suitable means, such as a sheet of cheesecloth, impermeable cloth or other textile material. The receptacle so equipped and filled is then allowed to stand. If, on the day following, foam and scum have formed on the surface of the contents of receptacle, spreading themselves over the receiving plate h , the check plate h^4 is introduced and passed below such foam and scum so as to cover the central opening h' of the skimmer, whereby the return of foam and scum into the receptacle will be prevented while permitting the liquid carried up thereby to return thereinto through the perforations h^6 . The check plate h^4 is preferably inserted under the foam on the receiving plate h when the foam is beginning to sink.

When the formation of foam and scum has ceased and the same have settled, and

also in the case of no generation of foam and scum, the skimmer and check plate are removed and any foam and scum that may be on the surface of the contents are removed, whereupon the cap E, which is to be previously sterilized, is arranged in place on the receptacle, as indicated in Fig. 1 and Fig. 3, the annular groove a being sufficiently full of sealing liquid, such as glycerine, to cause its level to rise to near the top of the rim b when the flange e is in place in the said groove a .

The gases generated in the contents of the receptacle due to the changes going on therein and the air still left within the same now serve to press on the sealing liquid in the trough, so that its level descends to the point g^2 within the flange e and to the top of rim b outside thereof, as indicated in Fig. 3. The pressure within continuing, first the upper layer of air and thereupon the gases will pass and travel from the highest point of the receptacle along the grooves f into the inner part of the trough a and thence through the notch in the form of bubbles which travel upward along the upwardly and outwardly inclined apex $g^2 g'$ and thence into the atmosphere through the sealing liquid, as indicated in Fig. 3.

The described form of the notch or vent serves to direct the escape of the gases to a single point of the apparatus and it serves to release the gases in small quantities and at rapid intervals, thereby preventing sudden and jerky flinging out and splashing of the sealing liquid and also permitting the progress of the gas evolution, and thereby the preservative changes going on in the mass, to be more accurately observed and the end of the operation to be more correctly determined than without this vent formed as described and arranged at one point of the apparatus.

By making the triangular notch flaring outwardly and forming the apex of the same so as to incline upwardly and outwardly, as at $g' g^2$, as best shown in Figs. 1, 2, 3, 6 and 7, the advance of the gas bubbles as they issue from the receptacle is accurately directed and their movement is accelerated, the buoyant action of the sealing liquid thereby cooperating with the pressure within said receptacle to establish a uniform and steady flow of the line of bubbles.

It has heretofore been proposed to provide the depending rim or flange of a jar, cover or lid with a series of semicircular notches arranged around the entire periphery of the rim. But such notches arranged and formed in this way were designed for the purpose of anchoring or securing the lid or cover against rotation in a congealed or solidified sealing liquid poured into the annular trough engaged by the depending rim. Such a multiplicity of notches was not de-

signed for the purpose of applicant's invention; nor, indeed, could it operate for such purpose. When used in connection with a sealing liquid the effect would be that, before the pressure over the contents of the receptacle to which such cover were applied would attain the degree necessary for preserving purposes, the gases would be ejected therefrom in a jerky manner, preventing any accurate observations from being made, and in most cases would soon cause the sealing liquid to be splashed out of the trough and thereby defeat not only the observation of the progress of the operation, but the preserving process also.

I have found that such process cannot be conducted and that such observations cannot be made if a number of notches on the entire periphery of the cover-flange are made, and that accurate observations can only be made if substantially a single notch at one point of the rim is formed, and preferably that such notch be substantially triangular in shape, the apex of the substantially triangular contour thereof being at the top. In other words, the contour must be gradually narrowing or tapering and running substantially to a point at the top in contradistinction to a round, semicircular or rectangular outline. The best results and extreme accuracy in observation are attained by forming the notch as shown in the drawings; that is, as an acute triangular notch having outwardly flaring sides and apex g' g^2 inclining outwardly and upwardly.

If the contents of the receptacle are for immediate consumption, they may be left in the receptacle, the cap being replaced after each withdrawal of a part thereof. If they are to be preserved for future use, they may also remain in the receptacle, the glycerine or other sealing liquid being replaced by a sealing substance which solidifies, such as paraffin, or they may be transferred to smaller receptacles, to be properly sealed.

Where peaches are to be treated, for example, sound and full ripe fruit is pressed into the previously properly sterilized receptacle, sugar being added if they are not sufficiently sweet in such quantity that the juice will be at a level of about one inch below the mouth-rim. The groove or trough is filled to about one-half its depth before putting the skimmer H in position as above set forth.

In the case of preserving fruit juice, the juice from sound, sweet berries is poured into the receptacle until the level is within about one inch from the top, adding sugar where a high keeping quality is aimed at, the rest of the treatment being as above.

Vegetables may be preserved in a similar manner in my apparatus. For example, cabbages, after being stripped of the stem and stringy parts and quartered or shredded,

are packed as tightly as possible into the receptacle, whereupon a 2 to 4 per cent solution of cooking salt in germ-free water is poured over the contents until the level thereof is about one inch from the mouth. The rest of the operation is as above set forth.

As shown in Figs. 1 and 2, the trough or groove a is provided at its bottom with a drain port a' , which permits the trough to be emptied of its contents of sealing liquid, said port being sealed by a stopper or lute a^2 when the apparatus is in use.

It will be observed that in my apparatus the air and the gases generated in the receptacle are carried off from the highest part of the interior to the vent or notch g .

In Fig. 5 is represented a somewhat modified form of apparatus which differs from the one already described, in that the lower surface of the cap E' is downwardly conical, the highest points thereof being at the periphery from which the gases enter the trough, being forced downward until they enter the vent g , to issue therefrom as in the form already described.

A further modification is represented in Figs. 6 and 7. The parts there shown are the same as in Figs. 1 and 2, except that the cap E^2 is interiorly dished conically, or highest at its middle portion, and that an L-shaped duct in the shape of a closed channel or bore f' extends through the material of the cap from said highest middle portion down to the vent g into which it discharges the gases. As seen in said Figs. 6 and 7, the channel f opens into the vent at a point midway of the apex g^2 g' .

In Fig. 7, which is an enlarged detail view in elevation of a portion of cap E^2 , looking in the direction of arrow 7 in Fig. 6, the exit opening of this closed channel f' into the vent or notch g is shown.

Still another modification under my invention is illustrated in Figs. 8 and 9. This arrangement is in all respects the same as in Fig. 6, except that the duct f^2 leading from the middle highest portion of the under side of the cap E^3 is in the shape of an open groove. The communication of this open groove with the vent g is best seen in Fig. 9; an enlarged detail view of the cap E^3 in sectional elevation on line 9—9, Fig. 8, looking in the direction of the arrows.

It is to be noted that in all of the forms shown in illustrating my invention the higher points of the interior of the receptacle are arranged in communication with the trough or groove a . In the embodiment shown in Fig. 5 the highest points are at the periphery and these points, it will be seen, are in communication with said trough, so that the gases accumulating at these points will first enter the same.

In each of the embodiments of my inven-

tion as shown in Fig. 6 and in Fig. 8, on the other hand, the gases accumulating at the middle portion will tend to enter the trough by following the duct, f' or f'' , down to the vent g , thereby facilitating the accurate observation of the process.

While I have hereinabove described and shown in the drawing the details of construction and arrangement of the scum-trap comprising a skimmer and a check device or plate, for the purpose of a full disclosure, I do not herein claim the invention embodied in these parts, since they constitute the subject-matter and are covered by claims forming part of my concurrent application filed May 28, 1927, Serial No. 195,126.

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

1. A receptacle cover provided with a depending flange, said flange being provided with a substantially triangular notch, the apex of said notch being upwardly and outwardly inclined.
2. In a device of the character set forth, a receptacle formed with a trough or groove at its mouth, in combination with a cover formed with a flange formed with an upwardly narrowed notch and arranged to loosely fit within the trough or groove, the top of the cover being interiorly of varying heights, the highest points being arranged to communicate with the trough.
3. A receptacle cover having a depending flange formed with a notch or vent and with a duct leading from the under side of the top of the cap to the periphery at a point above the notch or vent.
4. A receptacle cover having a depending flange formed with a notch or vent and with a duct leading from a middle portion of the under side of the top of the cover to the periphery and down to and terminating at the notch or vent.
5. In a device of the character set forth, a receptacle provided with an annular trough or groove at its mouth, in combination with a cover formed with an annular depending rim arranged to fit loosely within the trough or groove and provided with a substantially triangular notch in the edge of said rim the apex of said notch being uppermost.
6. In a device of the character set forth, a receptacle provided with an annular trough or groove at its mouth, in combination with a cover formed with an annular depending rim arranged to fit loosely within the trough or groove and provided with a substantially triangular notch in the edge of said rim, the apex of said notch being upwardly and outwardly inclined.
7. In a device of the character set forth, a receptacle formed with a trough or groove at its mouth, in combination with a cover formed with a depending rim provided with a vent to release small bubbles and arranged

to loosely fit within the trough or groove, the under side of the top of the cover being formed with a duct leading toward the inner periphery of the cover and to a point over the trough.

8. In a device of the character set forth, a receptacle formed with a trough or groove at its mouth, in combination with a cover formed with a depending rim arranged to loosely fit within the trough or groove, the top of the cover being interiorly highest at an intermediate portion and formed with a duct leading from said middle portion to the inner periphery of the cover and to a point over the trough.

9. In a device of the character set forth, a receptacle formed with an annular trough or groove at its mouth, in combination with a cover formed with a depending annular rim arranged to loosely fit within the trough or groove and formed with a substantially triangular notch at its edge, the under side of the top of the cover being formed with a duct or channel running toward that point of the inner periphery of the cover below which the notch is located.

10. In a device of the character set forth, a receptacle formed with an annular trough or groove at its mouth, in combination with a cover having a depending annular rim arranged to fit loosely within the trough or groove and formed with a substantially triangular notch at its edge, the top of said cover being interiorly dished or highest at an intermediate portion and provided with a duct leading from the highest point to the inner periphery of the rim and thence to the notch.

11. In a device of the character set forth, a receptacle provided with a trough surrounding the same at its top, in combination with a cover having a depending rim arranged to fit within the trough, said rim being provided at one point with a notch so formed as to release small gas bubbles, the rim being unbroken and continuous at other points.

12. A receptacle-cover provided with a depending flange provided at one point with a single upwardly tapering notch, the remaining portions of the flange being continuous and unbroken.

13. A receptacle formed with an upper encircling trough or groove, in combination with a cover having a depending encircling flange arranged to fit within said trough or groove and provided with a means of communication between the upper part of the interior of the cover and the trough, the rim of said cover being provided with a vent arranged to release small gas bubbles from the trough.

14. A receptacle formed with an upper encircling trough or groove, in combination with a cover having a depending encircling

flange arranged to engage said trough or groove and provided with a single triangular notch having its apex uppermost, the remainder of the flange being continuous and unbroken.

15. A receptacle formed with an upper encircling trough or groove, in combination with a cover having a depending encircling flange arranged to engage said trough or groove and provided with a means of com-

munication between the upper part of the interior of the cover and the trough, the rim of the cover being provided with a single triangular notch having its apex uppermost, the remainder of the flange being continuous and unbroken.

In testimony whereof I hereunto affix my signature.

CARL CHRISTOPH EMIL KERSTEN.