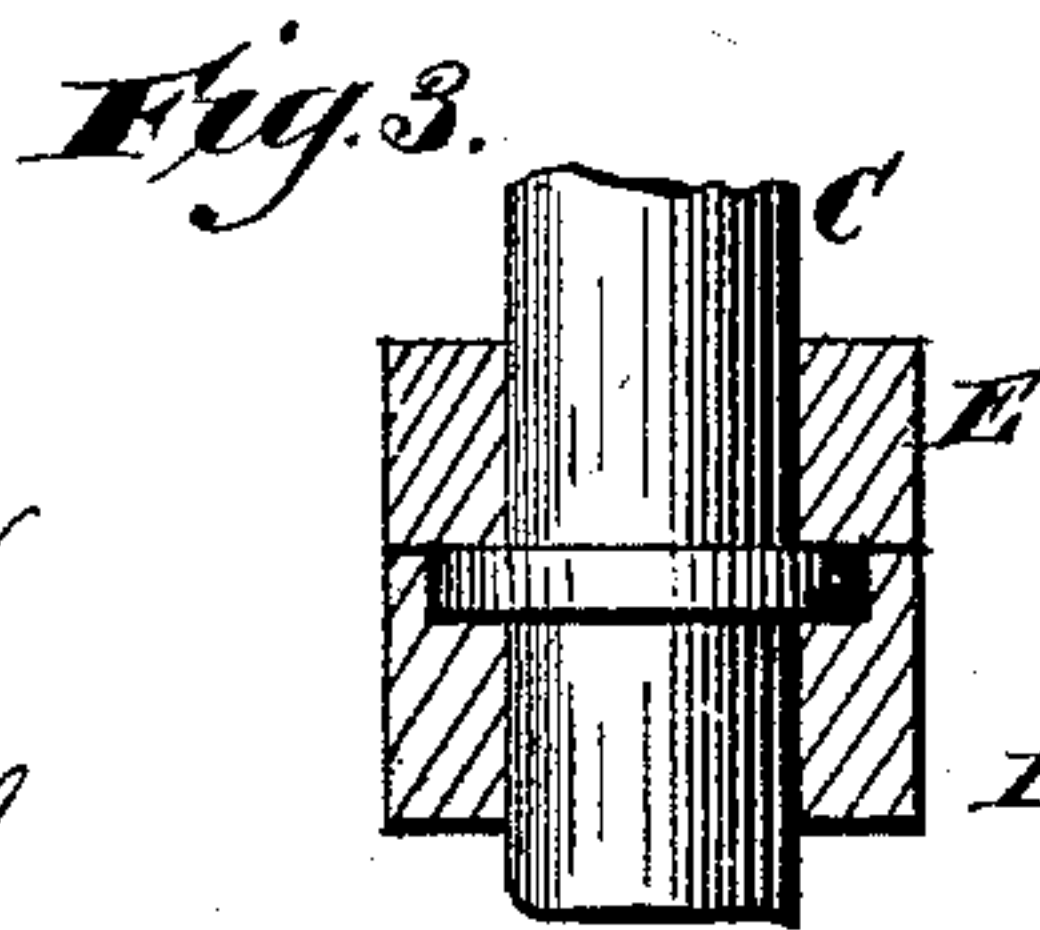
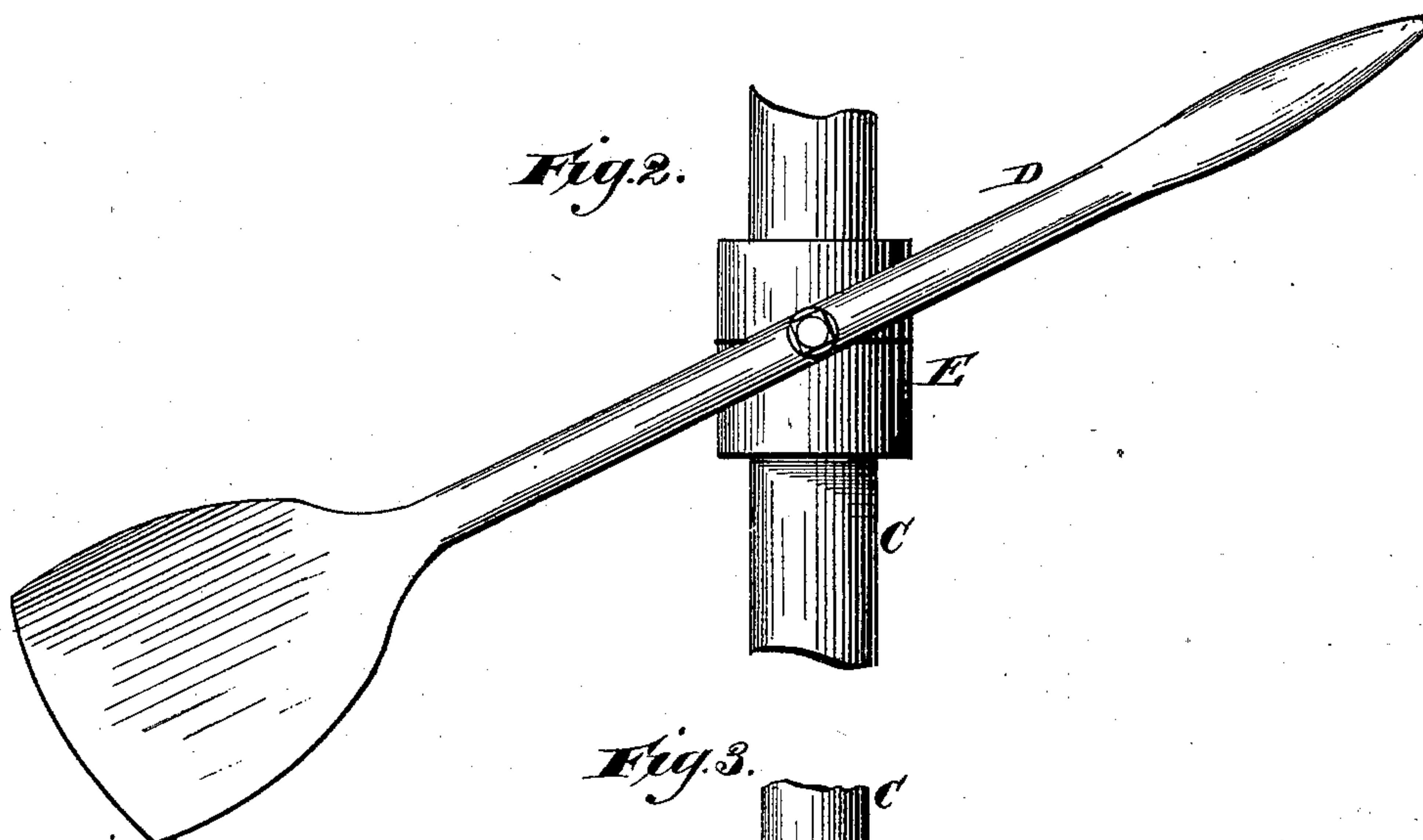
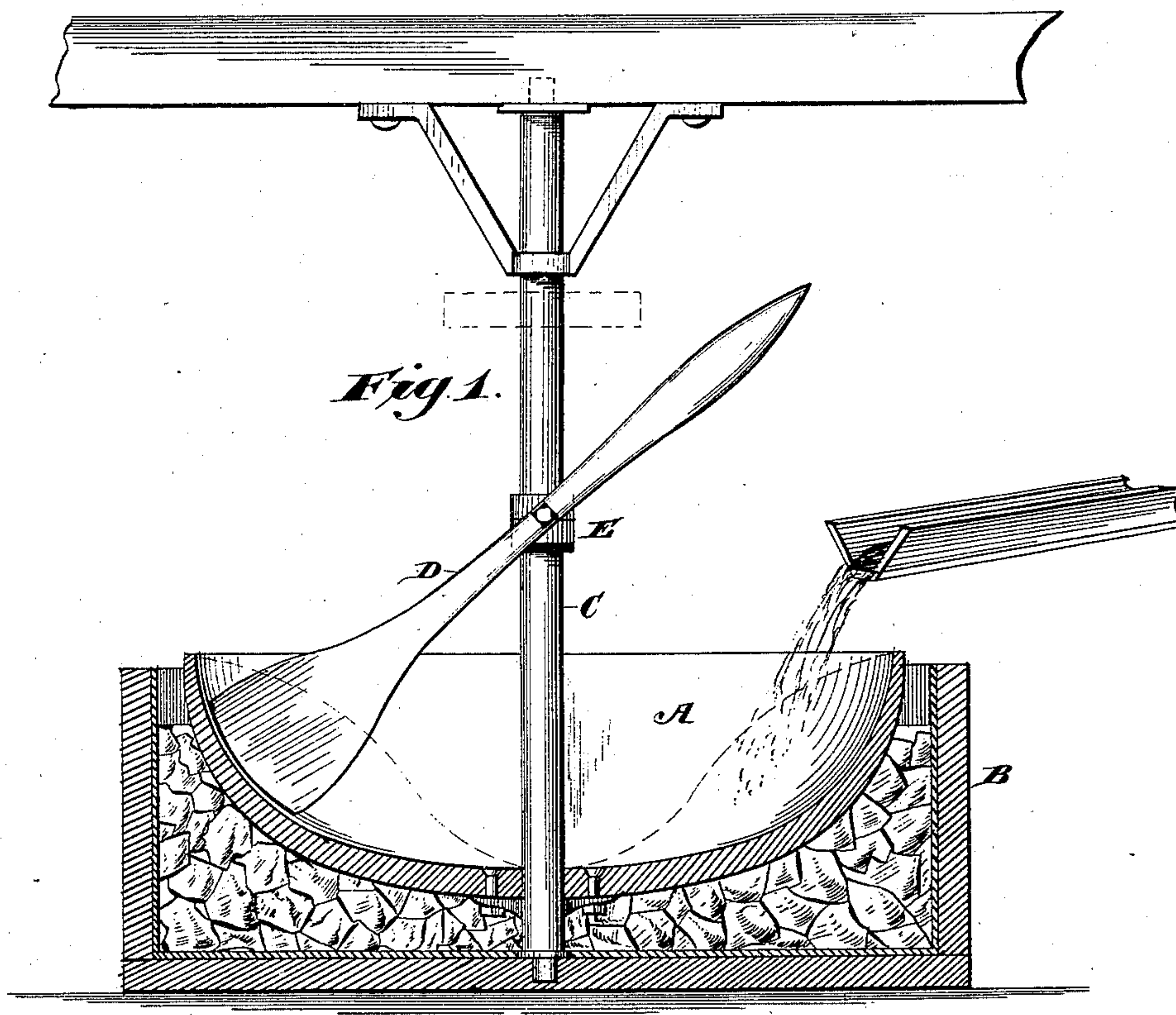


(No Model.)

A. J. CHASE.  
MANUFACTURE OF ARTIFICIAL BUTTER.  
No. 286,778. Patented Oct. 16, 1883.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

ANDREW J. CHASE, OF BOSTON, MASSACHUSETTS.

## MANUFACTURE OF ARTIFICIAL BUTTER.

SPECIFICATION forming part of Letters Patent No. 286,778, dated October 16, 1883.

Application filed May 24, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW J. CHASE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Manufacture of Artificial Butter, of which the following is a specification.

My invention relates to the manufacture of artificial butter from animal-oils and similar substances; and it consists in a novel method of treating the material, whereby a better, cheaper, and purer product is obtained, with economy of both time, labor, and refrigerating material.

Heretofore the manufacture of butter of this class has been carried on by churning or agitating the animal-oils from which the product is obtained until the oil-globules are ruptured and caused to assume an opaque or granular appearance, the mass being then as speedily as possible subjected to a refrigerating temperature before the oil has had time to again resume its globular form, thereby solidifying the churned oils and obtaining the crystalline condition of genuine butter. This process is subject to the objection that as the churned oils have to be congealed or solidified by cold at the earliest moment possible after the churning ceases, it has been found expedient to allow the mass to run from the churn directly into a body of water cooled to the required point by ice, and afterward skimming it off the surface. This operation not only contaminates the butter with all the impurities of the ice, but, as a certain mechanical union is formed between the particles of the congealed fat and the water, it becomes necessary to work the butter very thoroughly in order to separate them, which involves considerable labor and time. Moreover, the large tanks of water used require great quantities of ice, and are the cause of constant slopping, besides the further objection that they occupy a very considerable space.

For the purpose of avoiding these objections and producing a purer and cheaper article, my invention consists in a novel process of manufacture by churning or agitating and congealing the oils simultaneously, and possibly in the same vessel.

It also consists in a novel method of churn-

ing and congealing by placing the oils in a rapidly-revolving vessel, applying refrigerating material to the outer surface of the latter, and operating upon the revolving mass with a stirrer.

It also consists in certain apparatus for practicing the process mentioned, all of which will be fully described, and then pointed out in the claims.

Referring to the drawings, Figure 1 is a central vertical section. Fig. 2 is a front elevation. Fig. 3 is a detail view.

Similar letters of reference indicate like parts in all the figures.

A in the drawings indicates a cylindrical vessel, made of some metal which is a good conductor of heat, such as copper. It is of suitable size, and is either mounted upon or suspended from a shaft, by which it can be revolved with considerable rapidity. Surrounding this vessel is a receptacle, B, adapted to contain ice or any other refrigerating material which may be brought into contact with the outer walls of the vessel. The animal-oils are conveyed to the vessel A by any suitable means, and are caused to enter it near one side. The vessel being in rapid revolution, the centrifugal force throws the oil against the sides and holds it there with a force proportioned to the rapidity of revolution. As the heat is quickly removed by convection, the oil becomes congealed in a very short time and forms a solid mass, which adheres to the sides of the vessel. Upon some suitable support—such, for example, as the shaft C, upon which the vessel A is mounted—is placed a strong wooden stirrer, D, having one end so shaped that it may be used to scrape the sides of the vessel A, as well as to stir and agitate the congealed or congealing mass. If mounted upon the shaft C, it may be pivoted to a loose sleeve, E, within which the shaft turns, and will thus have a radial motion, by which its end may be swept from the center of the bowl to its edge. As the oil enters the bowl A while in rapid rotation, the operator, seizing the handle of the stirrer and using the shaft as a fulcrum, causes the spud upon its end to thoroughly agitate the congealing oil, scraping it from the sides of the bowl, and churning it, as far as possible, under the rapid motion given it. By this operation the



oil-globules are broken up and a violent movement of the individual particles of the mass is produced, and the butter is "grained."

If desired, the oils may be churned before they are allowed to enter the congealing-vessel, and they may flow from the churn directly to the latter; but it will be found that the shorter process, and yielding equally good results, is the first described. The churning and congealing thus are carried on at the same time and in the same vessel, thereby virtually making a single operation, instead of several distinct and consecutive ones. It is evident that a great saving in time is thereby effected. This saving is more apparent when it is remembered that by the processes heretofore used the churned oils have been solidified by pouring them into cold water, thereby requiring a third operation of skimming the congealed mass off the surface, and a fourth of working it to expel the water.

If the stirrer is fulcrumed upon the shaft of the bowl, the shaft should be properly braced to meet the strain.

The sleeve E may rest upon a collar formed upon the shaft; or it may be supported by a groove in one and a spline upon the other, running in said groove.

The advantages gained by this invention will be apparent when it is remembered that by the processes heretofore used the product is not only exposed to varying temperatures by being exposed in large-surface sieves to drain off the water, as far as possible, before it goes to the working-machine, but is also exposed to floating dust and insects. Moreover, it is necessary to work the butter a second time during the salting process. By my method hereinbefore set forth all these operations are carried on at one and the same time, with the exception of the separation of the water, which is wholly avoided. The butter, therefore, is exposed to the same temperature throughout the entire operation, and may be in a great measure protected from dust and other impurities. Moreover, the time occupied by the process of manufacture being greatly diminished, and the exposed surface of the product being comparatively small, the objection last mentioned is almost, if not entirely, avoided.

I am aware that in treating artificial butter the emulsion or cream has been churned, then delivered to a tray, by which the emulsion is subdivided into several streams, the latter falling into a body of clear water cooled by ice in a separate compartment, the emulsion becoming solidified and cooled in the water-tank, from which it is removed by ladles. This dif-

fers from my invention, as hereinbefore stated, in that I agitate and congeal the oils simultaneously in a rapidly-revolving vessel surrounded by refrigerating material, so that the oils are subjected to a low temperature, and at the same time the centrifugal force throws the oil against the sides of the refrigerated vessel, and holds it there with a force proportioned to the rapidity of revolution, in such manner that the refrigerated vessel rapidly extracts the heat. The oil becomes quickly congealed and forms a solid mass, such mass being stirred while congealed or becoming congealed, and the oil-globules broken up, a violent movement of the particles being produced.

Having thus described my invention, what I claim is—

1. The method herein described of manufacturing butter from animal-oils, said method consisting in subjecting the oils to a low temperature, and at the same time agitating them, both during the process of solidifying, and afterward, as set forth.

2. The method herein described of solidifying animal-oil in the manufacture of butter, said method consisting in introducing the oil into a vessel surrounded by refrigerating material and revolving at high speed, substantially as specified.

3. The method herein described of manufacturing butter from animal-oil, said method consisting in introducing the oil into a vessel surrounded by refrigerating material, said vessel being revolved at high speed, and agitating the congealing mass within said vessel, substantially as specified.

4. The apparatus described, consisting of a vessel having conducting properties, a receptacle surrounding said vessel and containing refrigerating material, a shaft or equivalent means for imparting rotary motion to said vessel, and a device for stirring the contents of the latter, substantially as described.

5. The combination, with the vertical shaft, of a sleeve loosely mounted thereon and supported by a collar or spline, and a stirring implement mounted upon a horizontal pivot projecting from said sleeve, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ANDREW J. CHASE.

Witnesses:

FISHER AMES,  
THOMAS F. FEE.