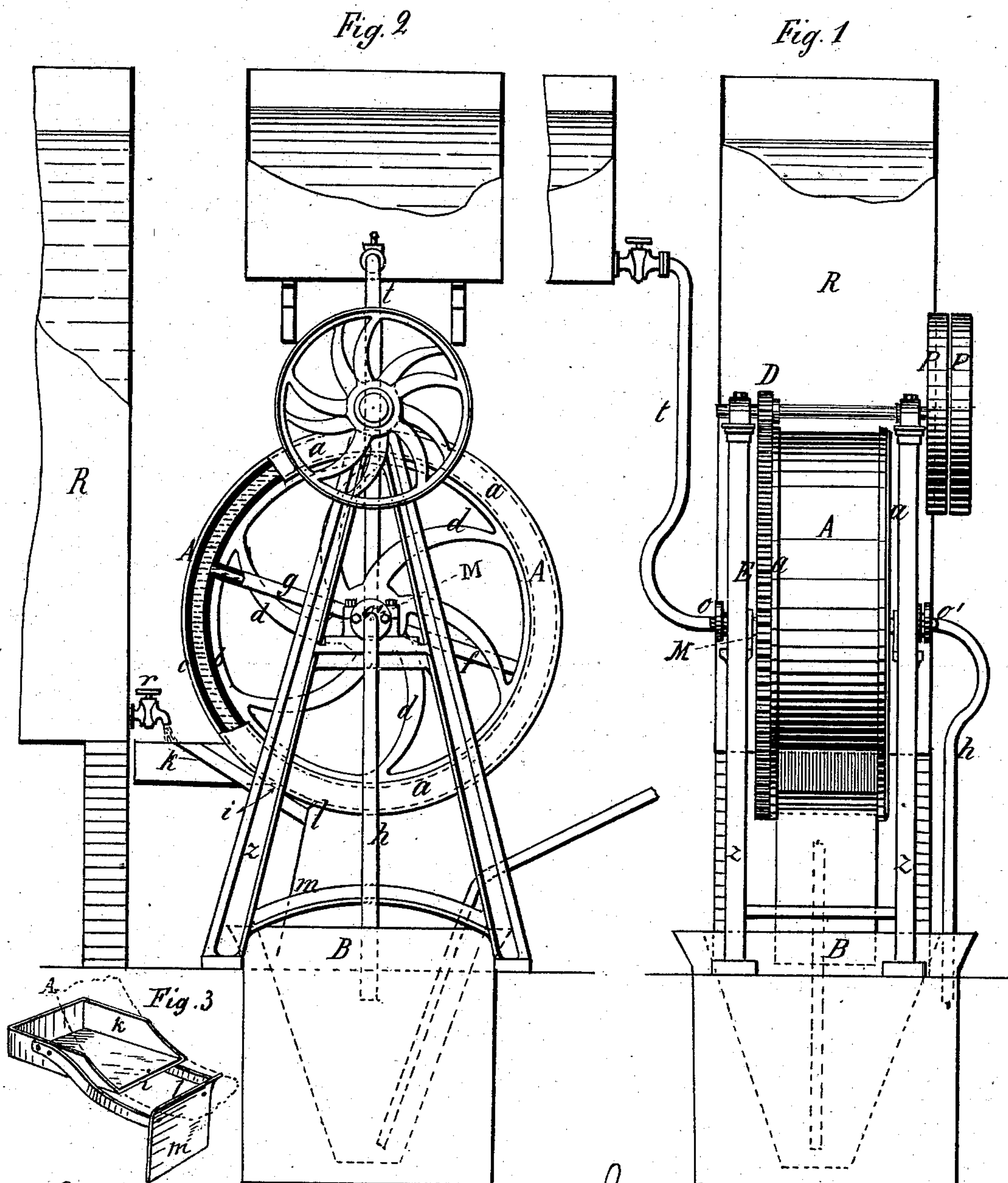


E. J. PETIT.
Apparatus for Cooling Liquids.

No. 238,961.

Patented March 15, 1881.



E. J. Petit
witnesses.
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UNITED STATES PATENT OFFICE.

EMILE J. PETIT, OF PARIS, FRANCE.

APPARATUS FOR COOLING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 238,961, dated March 15, 1881.

Application filed July 14, 1879.

To all whom it may concern:

Be it known that I, EMILE JULES PETIT, of Paris, in the Republic of France, have invented certain new and useful Improvements in Apparatus for Cooling Liquids, specially applicable to the treatment of fatty acids, of which improvements the following is a specification.

In the treatment of the fatty acids in stearine-works the oleine which flows from the cold press carries with it portions of margarine and other bodies, the quantity of which is greater or less in proportion to the temperature of the medium in which the presses are. In summer, especially, this proportion is very considerable. There would be a notable loss in the manufacture if, by a combination of operations, the margarine or other bodies were not separated from the liquid parts. It is chiefly to effect this result under simpler and more economical conditions than hitherto that the process and apparatus for cooling which form the subject of the present invention have been devised.

The construction of the improved apparatus is based upon the circumstances that fatty bodies are very bad conductors of heat, and that it is very difficult to solidify them in the mass. For this reason the principle of cooling in thin layers in order to produce the solidification is adopted. This principle is carried out in a continuous and mechanical manner by means of the apparatus the construction and action of which I now proceed to describe.

Figure 1 is an end elevation of the apparatus, and Fig. 2 a side elevation, partly in section. Fig. 3 is a detail view on an enlarged scale.

The essential part of the apparatus is a hollow drum, A, open through the center. It is formed of two cheeks or ends, *a*, of copper or other non-attackable metal, connected by an outer and an inner drum or cylinder, *b* and *c*, so as to form between these drums an internal annular space, through which a continuous circulation of cold water is to be kept up. The outer drum or cylinder, *c*, which constitutes the cooling-surface, is preferably made very thin—of zinc, for example. The annular drum is carried, by means of arms *d*, by a horizontal shaft, M, to which a slow continuous rotary

movement is imparted by hand or mechanically by means of the pulley P and gear D E.

In order to effect the continuous circulation of water through the drum A, the ends of the shaft M are made hollow. The cold water obtained by a pipe, *t*, is conducted by a pipe to one end, *o*, of the shaft, from which it is carried by another pipe, *f*, into the drum. It leaves the drum at the other side by a pipe, *g*, and by the other end, *o'*, of the shaft, from which a pipe, *h*, conducts it into the jacketed side of a vessel, B, hereinafter referred to. The outer surface of the revolving drum constitutes the cooling-surface for the liquid to be solidified. An inclined trough, *k*, supported by a bracket from the frame Z, is placed at the back of the drum, as low as possible, and below the reservoir R, containing the liquid which runs from the cold press. The flow from the press is regulated by means of a cock, *r*. This trough, upon which a sheet of liquid falls, is made to fit closely against the drum by the interposition of a small strip of caoutchouc, *i*. Should, however, any drops of liquid pass between the trough and the drum they would be caught in the basin B below. The liquid, as soon as it comes into contact with the outer surface of the drum, coagulates in a granular and crystalline state. It forms on the drum *c* a thin continuous and solid or concrete layer, which is removed at the other side of the drum by an elastic scraper, *l*. This material falls in the state of shavings against a vertical plate, *m*, which conducts it into the jacketed vessel B, hereinbefore mentioned, in which it is kept in this state by the circulation of cold water. It is from this vessel B that the material is taken to the filter-presses. It is then submitted to the mechanical treatment, which effects the separation of the liquids by the ordinary means.

The apparatus is applicable not only to the special purpose hereinbefore described, but also to other operations and manufactures, where a liquid body is required to be cooled, either to thicken and solidify it or to lower its temperature.

Instead of employing water as the cooling medium, other agents—such as air or ice, for example—may be used, and, if necessary, re-

frigerating-mixtures, according to the degree of cold to be obtained.

Having thus described my said invention and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for cooling liquids, the annular drum formed of an outer and an inner cylinder and journaled in bearings, in combination with inlet and outlet pipes communicating with the annular space between said cylinders, substantially as described.

2. The combination of a drum journaled in

bearings, a trough fitting closely against the drum, a jacketed vessel or basin located under the drum, and an elastic scraper arranged to remove adhering matter from the surface of the drum, substantially as set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

EMILE JULES PETIT.

Witnesses:

ROBT. M. HOOPER,

A. CABY.