

No. 753,792.

PATENTED MAR. 1, 1904.

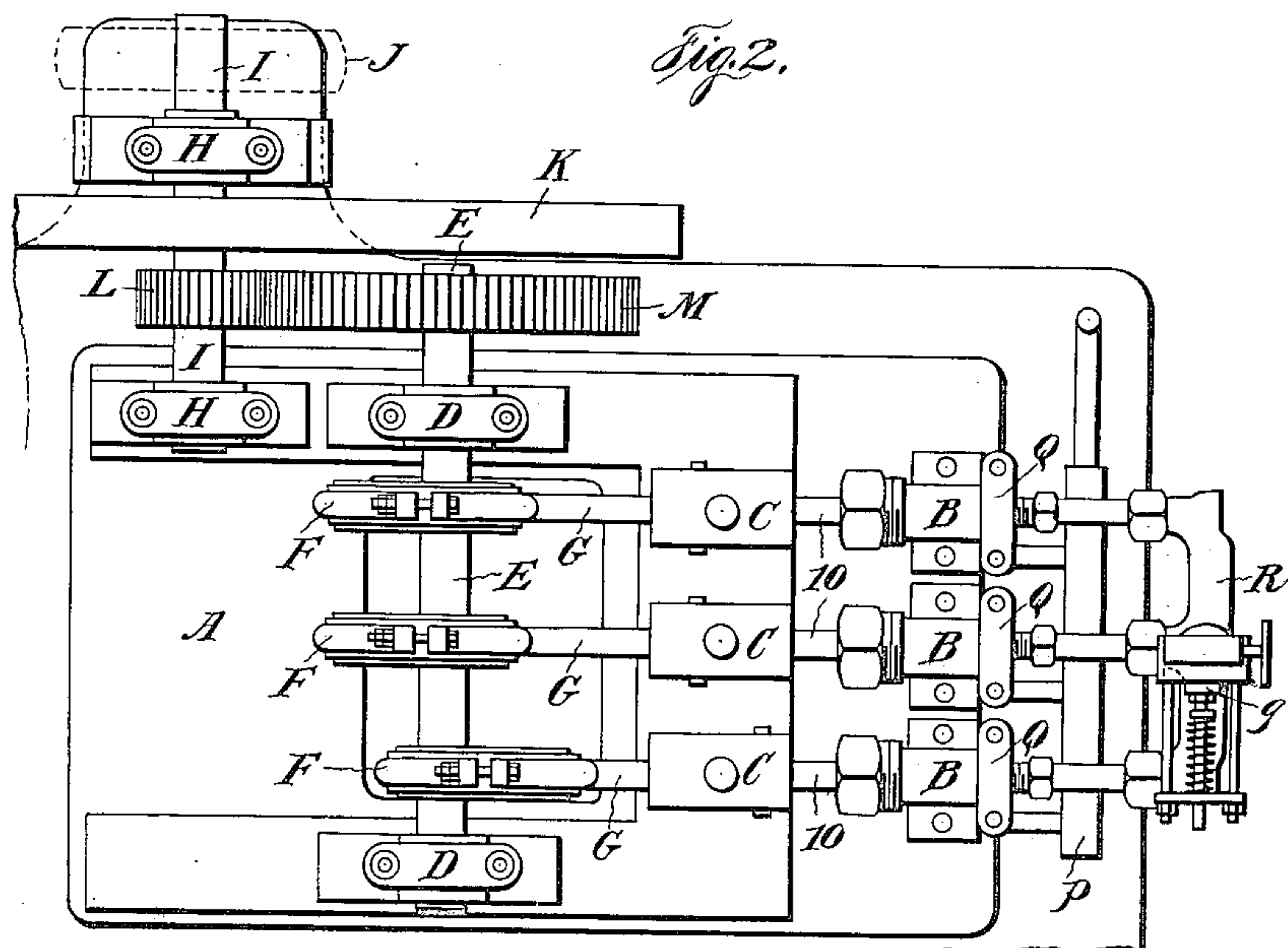
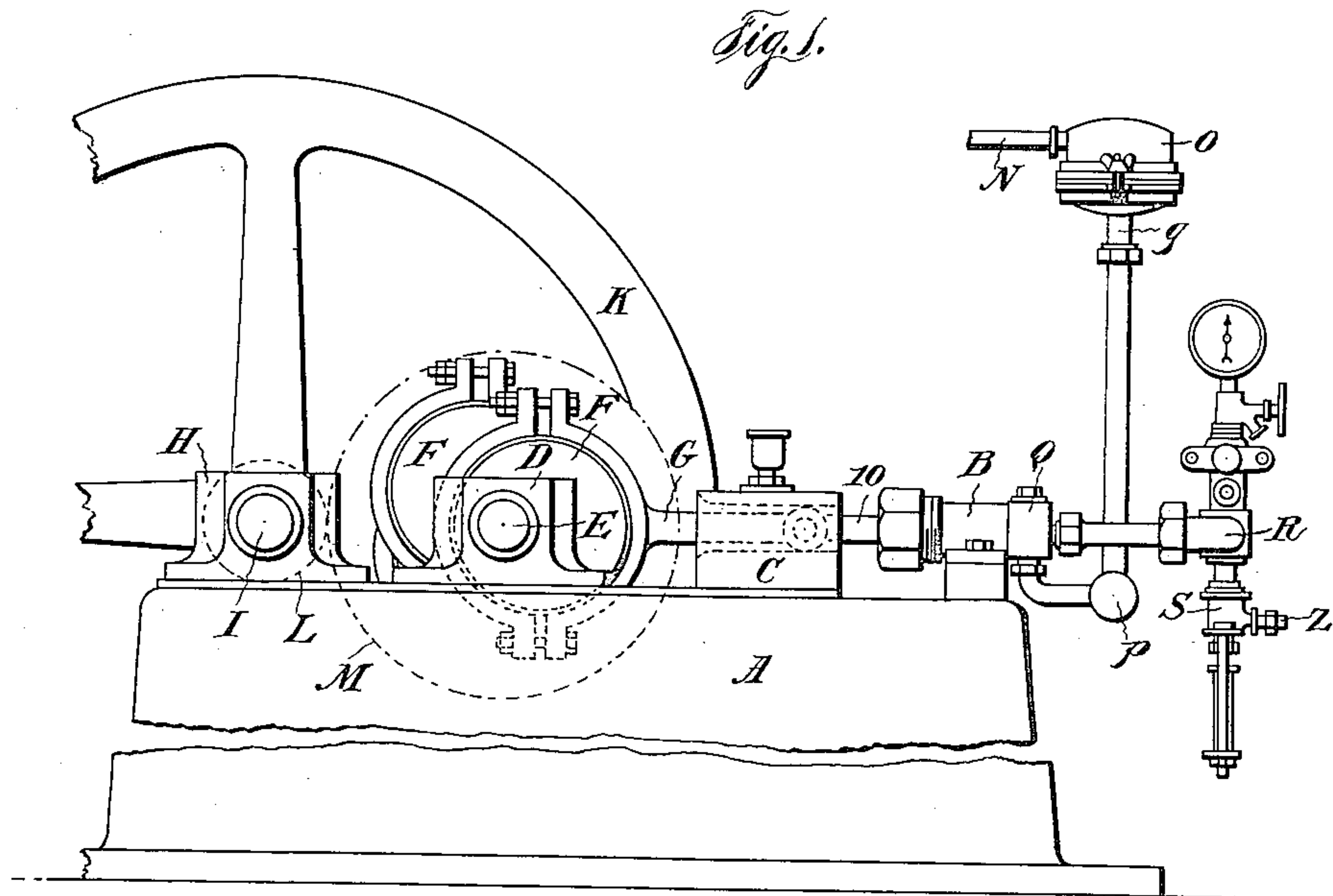
A. GAULIN.

PROCESS OF TREATING MILK OR SIMILAR LIQUIDS.

APPLICATION FILED APR. 27, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:  
C. A. Ober,  
M. E. Beall.

Inventor,  
Auguste Gaulin.  
By Henry Orthofer  
Attys

No. 753,792.

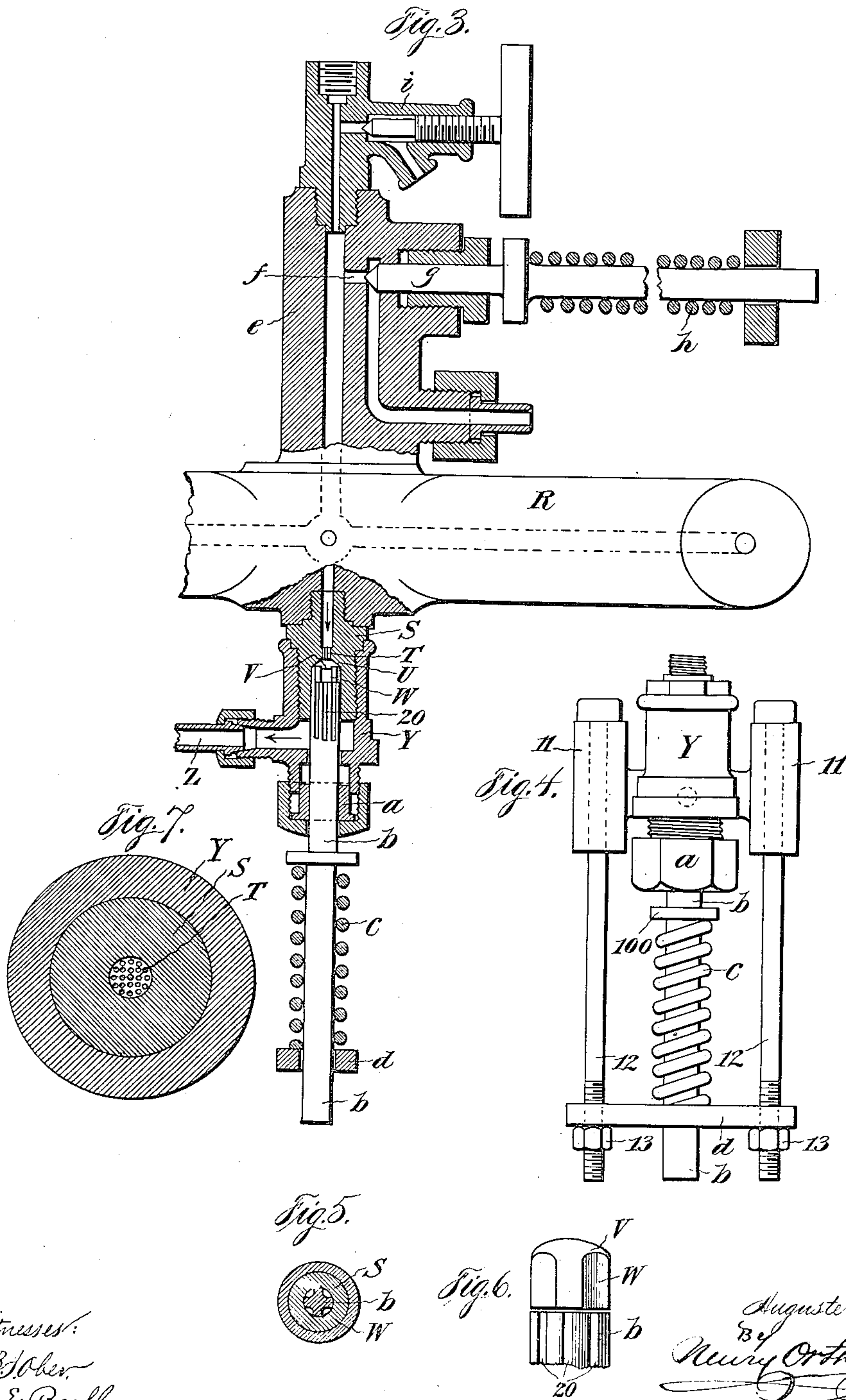
PATENTED MAR. 1, 1904.

A. GAULIN.  
PROCESS OF TREATING MILK OR SIMILAR LIQUIDS.

APPLICATION FILED APR. 27, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:  
*B. J. Ober*  
*M. E. Beall*

Inventor,  
*Auguste Gaulin*  
*By* *Newry Orth* *for*  
*Attys.*



## UNITED STATES PATENT OFFICE.

AUGUSTE GAULIN, OF PARIS, FRANCE.

## PROCESS OF TREATING MILK OR SIMILAR LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 753,792, dated March 1, 1904.

Original application filed September 30, 1902, Serial No. 125,440. Divided and this application filed April 27, 1903. Serial No. 154,494. (No specimens.)

*To all whom it may concern:*

Be it known that I, AUGUSTE GAULIN, a citizen of the French Republic, residing in Paris, France, have invented certain new and useful  
5 Improvements in Processes of Treating Milk or Similar Liquids; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains  
10 to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

The present invention relates to a process  
15 of treating milk and analogous substances to make them keep, so that they can be shipped long distances, being a division of my application, Serial No. 125,440, filed September 30, 1902; and it consists in breaking up the  
20 larger particles of the constituents of such substances and intimately mixing them preferably, though not necessarily, in connection with sterilization.

Referring to the drawings, in which like  
25 parts are similarly designated, Figure 1 is an elevation of pumps and a device to carry out the process. Fig. 2 is a plan view of the same. Fig. 3 is a view partly in section through the mixing comminuting devices.  
30 Fig. 4 is an elevation of part of Fig. 3. Fig. 5 is a horizontal section of the parts S and W. Fig. 6 is an elevation of the part W on a larger scale and a portion of the rod *b*, having an exaggerated space between them to  
35 show that they are independent of one another; and Fig. 7 is a cross-sectional view on an enlarged scale, showing the capillary passages T.

Upon a suitable bed A are pillow-blocks H, in which is journaled a driving-shaft I, having mounted thereon a fly-wheel K, a driving-pulley J, and a driving-pinion L. This pinion L meshes with a gear-wheel M on a shaft E, journaled in pillow-blocks D on the  
40 bed A.

On the shaft E are eccentrics F, whose rods G are connected to cross-heads sliding in the guides C. To the cross-heads are also connected the piston-rods 10 of the pumps B. I

have shown by way of example three pumps, the eccentrics that drive them being set at  
50 equal angles apart, so that they will alternately deliver the substance treated and thereby force a continuous stream. The milk or other liquid to be treated enters a filter or strainer O by pipe N and then passes through  
55 the pipe *g* to a reservoir *p*, that feeds the several pumps through the inlet-valves Q. The pumps then force the milk or other liquid under pressure into the reservoir R, whence it passes to the comminuting vessel S on the reservoir.  
60 This vessel S is provided with a plurality of very fine capillary passages or channels T, that end at a rubbing or squeezing surface, here shown as a conical surface U. Coöperating with this surface U is a hard block or  
65 valve W, having a complementary surface V fitting the one U, and that is preferably, though not necessarily, made of agate.

A casing Y is threaded on or otherwise secured to the part S and provided with a  
70 lateral discharge-tube Z for exit of the treated milk or other substance. The end of the casing Y is provided with a stuffing-box *a*, through which passes a rod *b*, which is urged by a spring *c* and that abuts on the  
75 under face of the agate part W to hold it against the surface U. It will be observed that the agate-part W is provided with facets and the end of the rod *b* adjacent thereto with  
80 grooves or facets 20 to enable the milk to readily flow to the outlet-pipe Z after being treated.

The surfaces U and V are exactly fitted to one another by grinding or otherwise and are pressed together by the spring *c*, the tension  
85 of which is adjustable.

On the rod *b* is a collar 100, against which one end of the spring bears. Passing through ears 11 or equivalent devices are bolts 12, threaded at their ends. These rods pass  
90 through a plate *d*, against which the other end of the spring bears and through which the rod *b* also passes. By suitably moving the nuts 13 on the threaded ends of bolts 12 the tension of the spring can be adjusted. The  
95 spring is a comparatively heavy one to exert



a pressure of two hundred and fifty to three hundred kilograms per square centimeter, and even more.

Mounted on the reservoir R is a tubular part *e*, from which leads a discharge-pipe *f*, controlled by a spring-held plunger *g*, the tension of the spring *h* on said plunger being adjusted in a manner similar to that described with reference to the spring *c*. This arrangement acts as a safety-valve to relieve the pressure in the reservoir R when the pressure therein exceeds a predetermined amount.

At the end of the tube *e* is an air-venting valve *i* of any suitable construction.

The operation is as follows: The milk or other liquid is drawn from the strainer *o*, goes by pipe *g* to the reservoir P to the pumps, which force it under pressure into reservoir R, whence it passes first through the capillary tubes or orifices T, then between the cooperating-surfaces U V to the outlet-pipe Z. The fat and casein particles in being forced through the capillary tubes or orifices T are either partly broken up or elongated into capillary filaments, and when they are further forced between the cooperating surfaces U V the capillary threads of fat and casein are mashed or squeezed, so as to completely disintegrate them, thereby producing a very fine comminution of the coarser constituent particles of the milk, so fine as to prevent them from agglomerating again, and thereby producing a product that will keep for months in the warmest climates.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The process of treating milk and similar liquids, which consists in elongating the larger constituent particles into capillary filaments, substantially as set forth.

2. The process of treating milk and similar liquids, which consists in elongating the larger constituent particles into capillary filaments and breaking up the filaments thus formed, substantially as set forth.

3. The process of treating milk and similar liquids, which consists in elongating the fat and casein particles into capillary filaments, substantially as set forth.

4. The process of treating milk and similar liquids, which consists in elongating the fat and casein particles into capillary filaments and then squeezing the filaments to break them up, substantially as set forth.

5. The process of treating milk and similar liquids, which consists in elongating the fat and casein particles into capillary filaments and then breaking up the filaments thus formed by squeezing them between capillary surfaces, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

AUGUSTE GAULIN.

Witnesses:

ANTOINE TERRICE,  
NICOLAS MAIRE.