(No Model.)

C. FEY.

APPARATUS FOR THE MANUFACTURE OF MALT.

No. 345,128. Patented July 6, 1886.

Fig. 1.

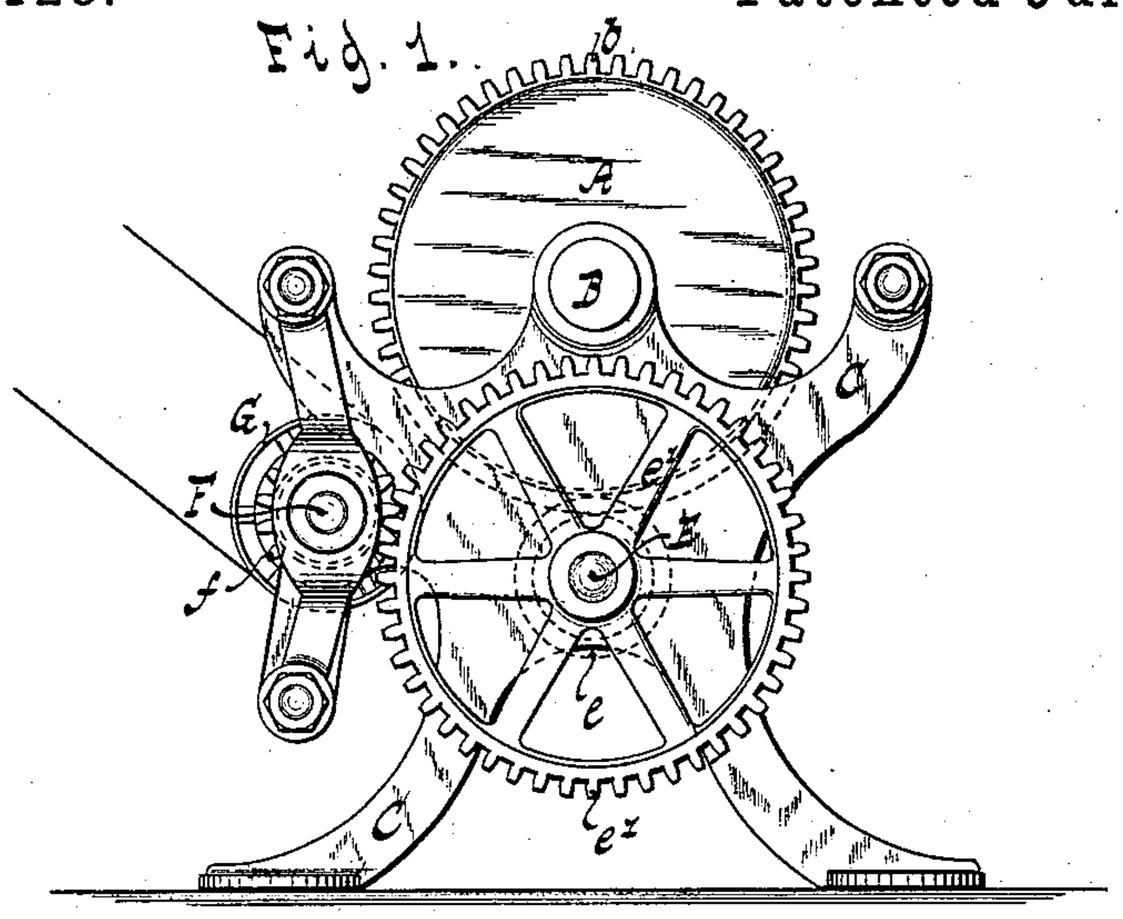


Fig. 2.

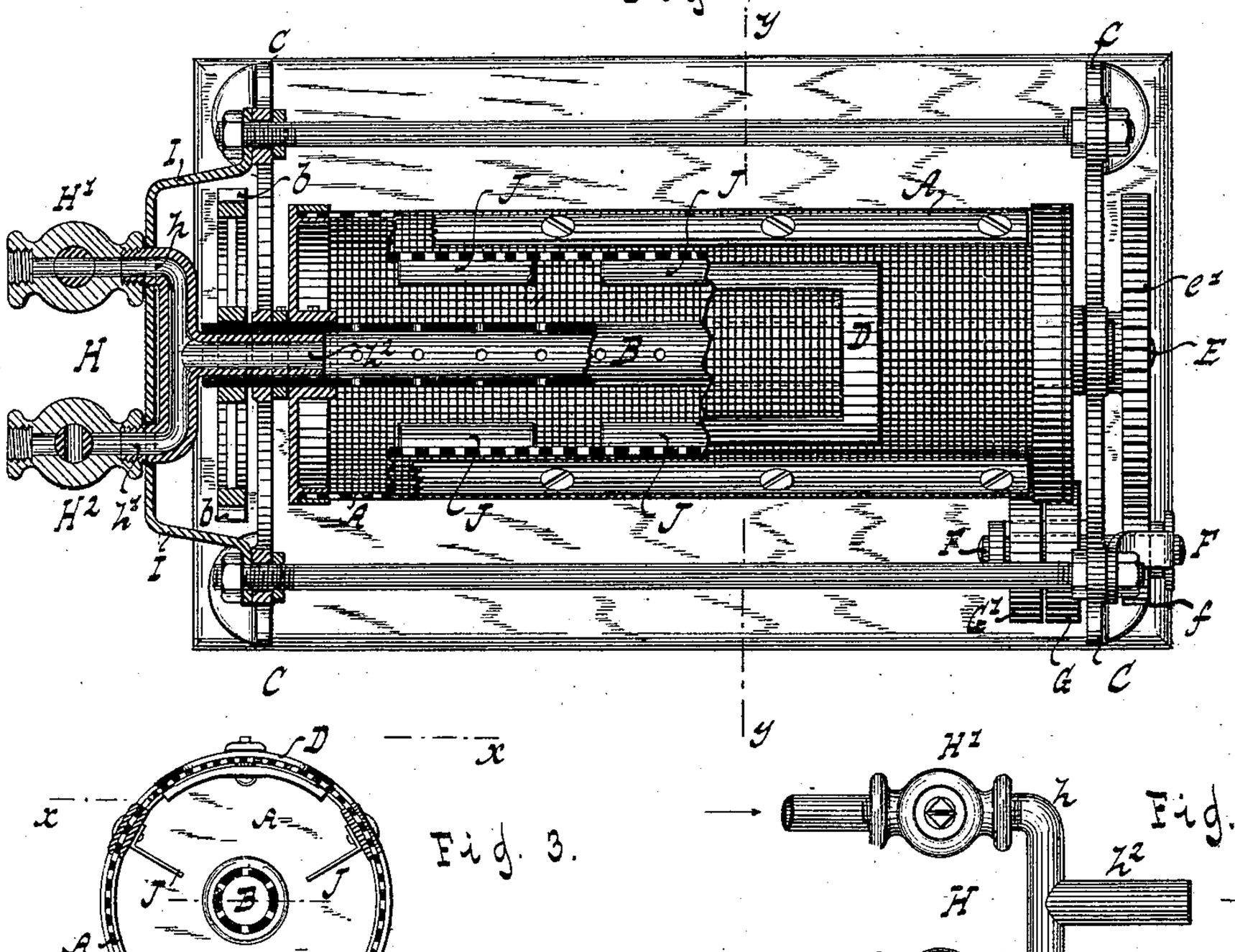


Fig. 3.

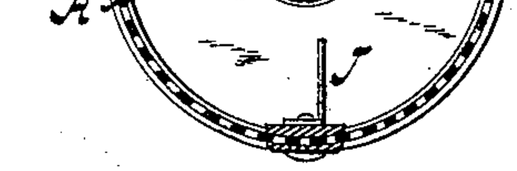
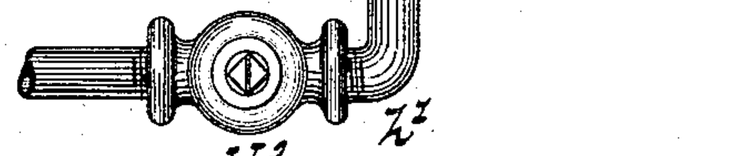


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES FEY, OF BROOKLYN, NEW YORK.

APPARATUS FOR THE MANUFACTURE OF MALT.

SPECIFICATION forming part of Letters Patent No. 345,128, dated July 6, 1886.

Application filed February 11, 1886. Serial No. 191,626. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FEY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Apparatus for the Manufacture of Malt, of which the following is a specification.

This invention has for its object to provide novel means for manufacturing malt; and it consists in the combination of devices hereinafter described and claimed, reference being made to the accompanying drawings, illustrating the invention, in which—

Figure 1 is an end elevation of my improved apparatus. Fig. 2 is a horizontal section in the plane *x x*, Fig. 3. Fig. 3 is a vertical section in the plane *y y*, Fig. 2, of the rotating drum and injection-pipe. Fig. 4 is a plan view of the twin-pipe nozzle detached.

Similar letters indicate corresponding parts.

In carrying out my invention I introduce the barley or other grain which is to be subjected to the process in a dry state into a perforated drum, A, that is mounted upon and rotates with a perforated injection-pipe, B. Jets of water are now forced into the interior of the moving mass, which completely fills the drum, and this injection of liquid is continued until the grain is thoroughly steeped, which usually occupies a period of about twenty-four hours. The grain during this process is agitated, by means hereinafter to be described, so that the same is uniformly and thoroughly steeped. The next step is to germinate the steeped grain, which is accomplished without removing the mass from the perforated drum A by injecting through the pipe B air at a suitable drying temperature—for instance, about 70° Fahrenheit. This air, being injected centrally into the interior of the moving mass, thoroughly permeates the grain, which is kept agitated, and the injection of air is continued for about four days, at the end of which time the grain is in the proper condition for drying. After germination has been produced, as described, air heated to about 140° to 180° Fahrenheit is forced into the interior of the moving mass for about ten or twelve hours, whereby the malt is rendered free from moisture, and can be removed from the rotating drum. It will be observed that during these three stages of the process, which are essential to the formation of malt, the grains subjected to the said process are not removed from the drum, whereby a great saving of time and labor is accomplished. The perforated injection-pipe B, previously mentioned, is supported in standards C C, so as to be capable of rotation, and the perforated drum A, which is provided with a suitable charging-opening, is secured to the pipe B by suitable means, so that the injection-pipe and drum rotate together. The discharge-opening is closed during the rotation of the drum by a cover, D, which is removably secured thereto by any suitable means.

To impart a rotary motion to the injection-pipe, it is provided with a gear, *b*, which meshes into a gear-wheel, *e*, Fig. 1, on the driving-shaft E, to which latter motion is imparted from a counter-shaft, F, by gear-wheels *e'* and *f*, mounted on the respective shafts. The counter-shaft F also carries a tight pulley, G, and a loose pulley, G'.

H, Figs. 2 and 4, is a stationary nozzle, having two inlet-branches, *h h'*, which discharge into a common outlet-branch, h^2, and each of these branches *h h'* is provided, respectively, with a valve, H' H^2, whereby the quantity of fluid entering either branch can be regulated. This twin-pipe nozzle H is supported at one end in a bracket, I, secured to the standard C, and its outlet-branch h^2 extends into the injection-pipe B. The object of the use of this twin nozzle is to provide means for regulating the temperature of the fluid which is forced into the mass under operation—that is, for instance, one branch may be coupled to a hot-water and the other to a cold-water pipe, and by regulating the quantity of each by means of the valves H' H^2 in the branches of the nozzle any desired degree of temperature can be obtained.

To agitate the mass in the rotating drum, I employ agitators J, which are arranged upon and secured to the walls of said drum. By causing both the drum and injection-pipe to rotate the injection-pipe is not liable to become choked.

I am aware that the rotating drums have been used in steeping and germinating grain. Therefore I do not claim such as my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the standards C, the

perforated injecting-pipe B, rotating in said standards, the perforated drum A, rigidly secured to the end portions of the shaft, and rotating therewith, the twin-pipe nozzle H, having the outlet-branch h^2 inserted in one end of the injection-pipe, and on which the latter rotates, and two valves, H′ H², arranged, respectively, in the inlet-branches h h' of the twin-pipe nozzle, substantially as described.

2. The combination of the standards C, the perforated injection-pipe B, rotating in said standards, the perforated drum A, rigidly secured to the end portions of the shaft, and rotating therewith, the bracket I, rigidly secured to one of the standards, the twin-pipe nozzle H, having two inlet-branches, h h', supported in said bracket, and an outlet-branch, h^2, inserted in one end of the injection-pipe, and on which the latter rotates, and two valves, H′ H², arranged, respectively, in the inlet-branches of the twin-pipe nozzle, substantially as described.

3. The combination of the standards C, the perforated injecting-pipe B, rotating therein, and provided with the gear b, the perforated drum A, rigidly secured to the end portions of the shaft, and rotating therewith, the driving-shaft E, provided with the gear-wheels e and e', and the counter-shaft F, carrying the fast and loose pulleys G and G′, and having the gear-wheel f, the combination being and acting substantially as described and shown.

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

CHARLES FEY. [L. S.]

Witnesses:
W. HAUFF,
E. F. KASTENHUBER.