A. NAEGELI.

Improvement in Apparatus for Cooling Mash.

No. 132,730. Patented Nov. 5, 1872.

Fig. 1.

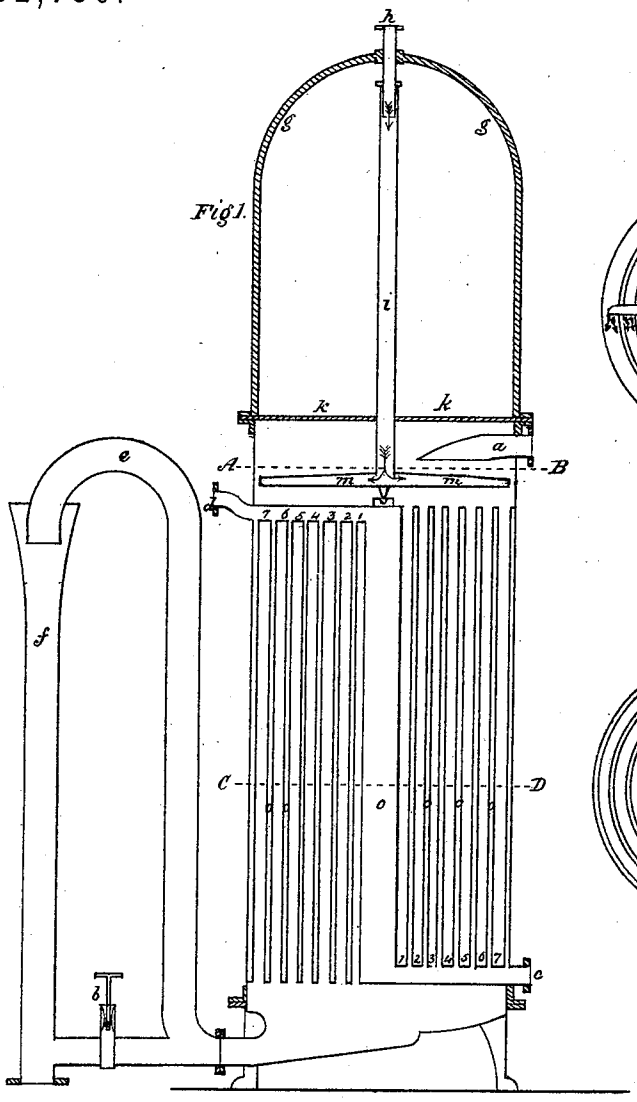


Fig. 3.

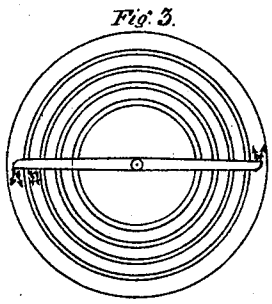


Fig. 4.

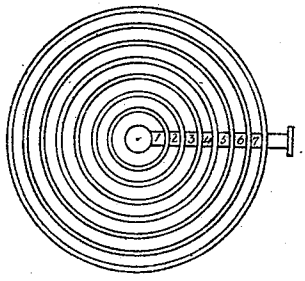
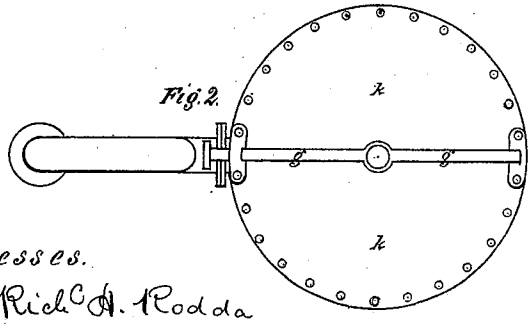


Fig. 2.



Witnesses.

Rich^d A. Rodda

Inventor:

August Naegeli

By Adolph Ott

His Attorney in fact

UNITED STATES PATENT OFFICE.

AUGUST NAEGELI, OF WEGELEBEN, GERMANY.

IMPROVEMENT IN APPARATUS FOR COOLING MASH.

Specification forming part of Letters Patent No. 132,730, dated November 5, 1872.

To all whom it may concern:

Be it known that I, AUGUST NAEGELI, of Wegeleben, Kingdom of Prussia, Empire of Germany, have invented certain Improvements in Apparatus for Cooling Mash, of which the following is a specification:

The first part of my invention relates to a system of concentric cylinders vertically placed, of which the spaces of each two alternately are closed at both ends, they being only connected by short pipes at the two opposite ends, on top and bottom. The space thus formed serves for the reception of the water, like the cooling-tub in distilleries, the water entering from below and being discharged from above. The intermediate spaces formed by this system of cylinders serve for the reception of the mash. The second part of my invention relates to a pipe placed vertically above the cooling apparatus and terminating in two arms, which are provided with small openings at their lower and opposite sides, as shown in Fig. 3, so that by conducting water into it a revolving motion may be imparted to the same. The shower produced in this manner thoroughly washes the sides which come in contact with the mash.

Figure 1 is a vertical transverse section of my apparatus. Fig. 2 is a plan of the same. Fig. 3 is a transverse section, showing those parts of the apparatus which are below the line A B drawn across Fig. 1; and Fig. 4 is another section, showing those parts that are below the line C D.

The cylindrical vessel represented in Fig. 1 consists of iron, and has a diameter of about thirty-three inches and five and a half feet in height. In the interior of the same there are a number of copper cylinders, of which each two alternately have an intermediate space of about two and three-fifths of an inch. The smaller intermediate spaces are closed on both ends, they being only connected by the short pipes 1 2 3 4 5 6 7 with each other, as shown by Fig. 1 and partly by Fig. 4. They serve to receive the cooling-water; the wider spaces, however, serve for the mash. When the conversion of the starch into sugar is completed it is pumped into the cooling-vessel through pipe *a*, Fig. 1, the slide *b* being closed, so that the iron cylinder and the two inch-wide spaces may gradually be filled with the mash. In the meantime cold water flows into *c*, which, when the small cylindrical spaces are filled to the top, will flow out at *d*. When the mash-space is filled to A B, (pumping being continued,) the mash is discharged through pipe *e* and flows into the funnel-shaped pipe *f*, from which it is conducted into the fermenting-vat. By this arrangement a considerably large cooling-surface may be produced by a proportionally small space, which is the more effective, as the mash to be cooled flows downward while the cooling-water is pressed upward, thus requiring only a small amount of water to produce the desired effect. When the mash ceases to flow through *a* the slide *b* is opened, so that the mash yet contained in the apparatus may be discharged into the fermenting-vat without passing through pipe *e*. Upon this the surface which has been in contact with the mash is rinsed off by conducting water into pipe *h* resting on iron brace *g g* and pipe *i*. The latter passes through cover *k k* and divides itself below into two opposite directions. From the horizontal pipes *m m*, into which *i* terminates, the water to be used for cleansing passes as a shower in two opposite directions through small openings provided for it, as shown in Fig. 3. As thereby a revolving motion is imparted to the pipe, all the surfaces are rinsed. In the center there is an iron pivot securely fastened, turning in a core. The bottom of the apparatus consists of cast-iron, and is provided with feet similar to those of the sugar-beet macerators of Schutzenbach.

As to the work performed by my apparatus experience has shown that one thousand and fifty gallons of mash may be cooled from 145° Fahrenheit to 60° Fahrenheit by using one thousand and fifty gallons of water of 52° Fahrenheit.

I claim as my invention—

1. An apparatus for cooling mash, containing a system of concentric cylinders, of which the spaces formed by each two alternately—viz, 0 0 0 0—are closed at bottom and top, they being only connected with each other by the pipes 1 2 3 4 5 6 7, substantially as and for the purpose set forth.

2. The pipe *i*, terminating in two hollow arms, *m m*, perforated at their lower sides and opposite to each other, in combination with the system of cylinders hereinbefore described, and for the purpose set forth.

AUGUST NAEGELI.

Witnesses:
CHRISTIAN SCHUMANN,
AUGUST HERTE.