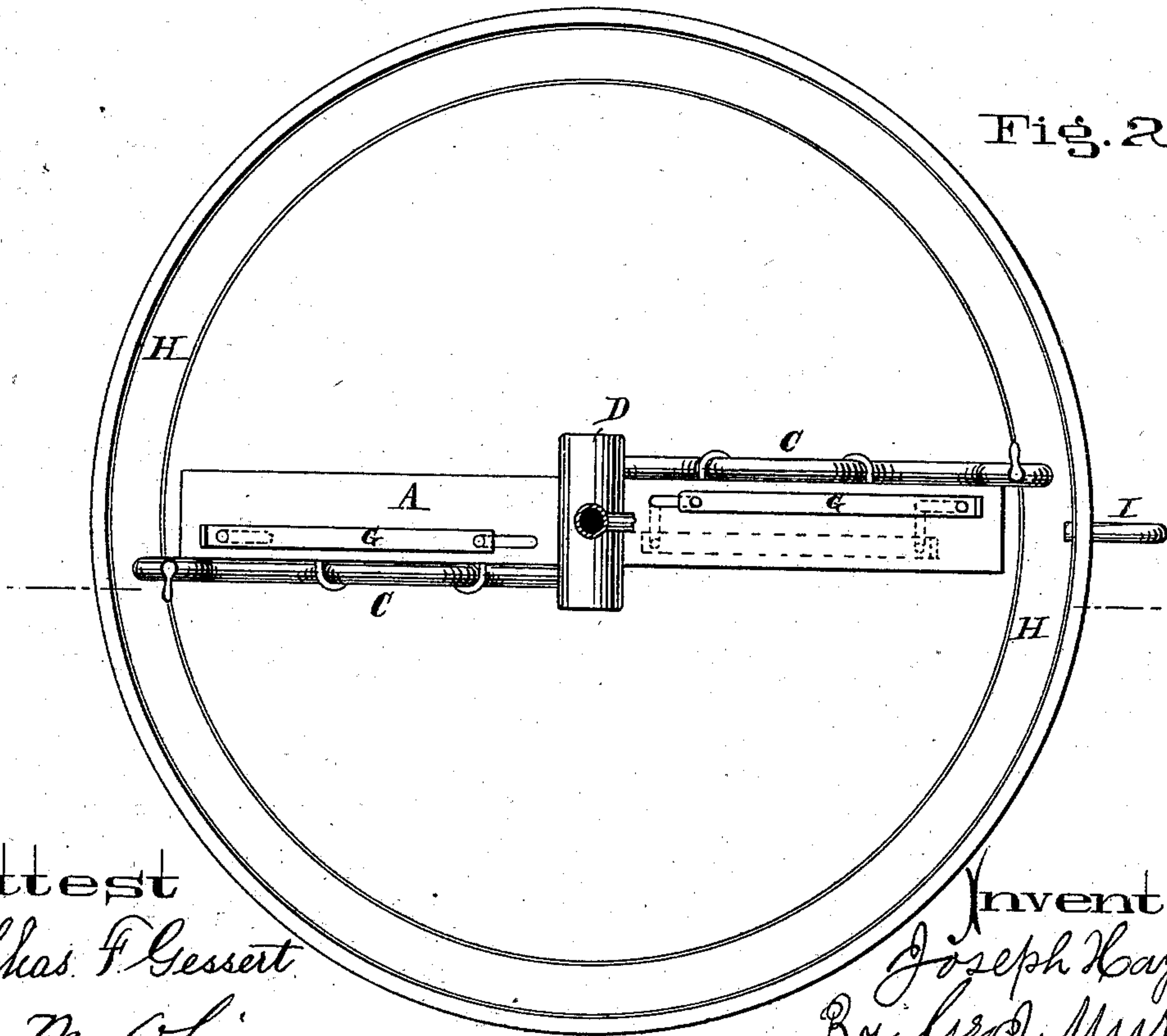
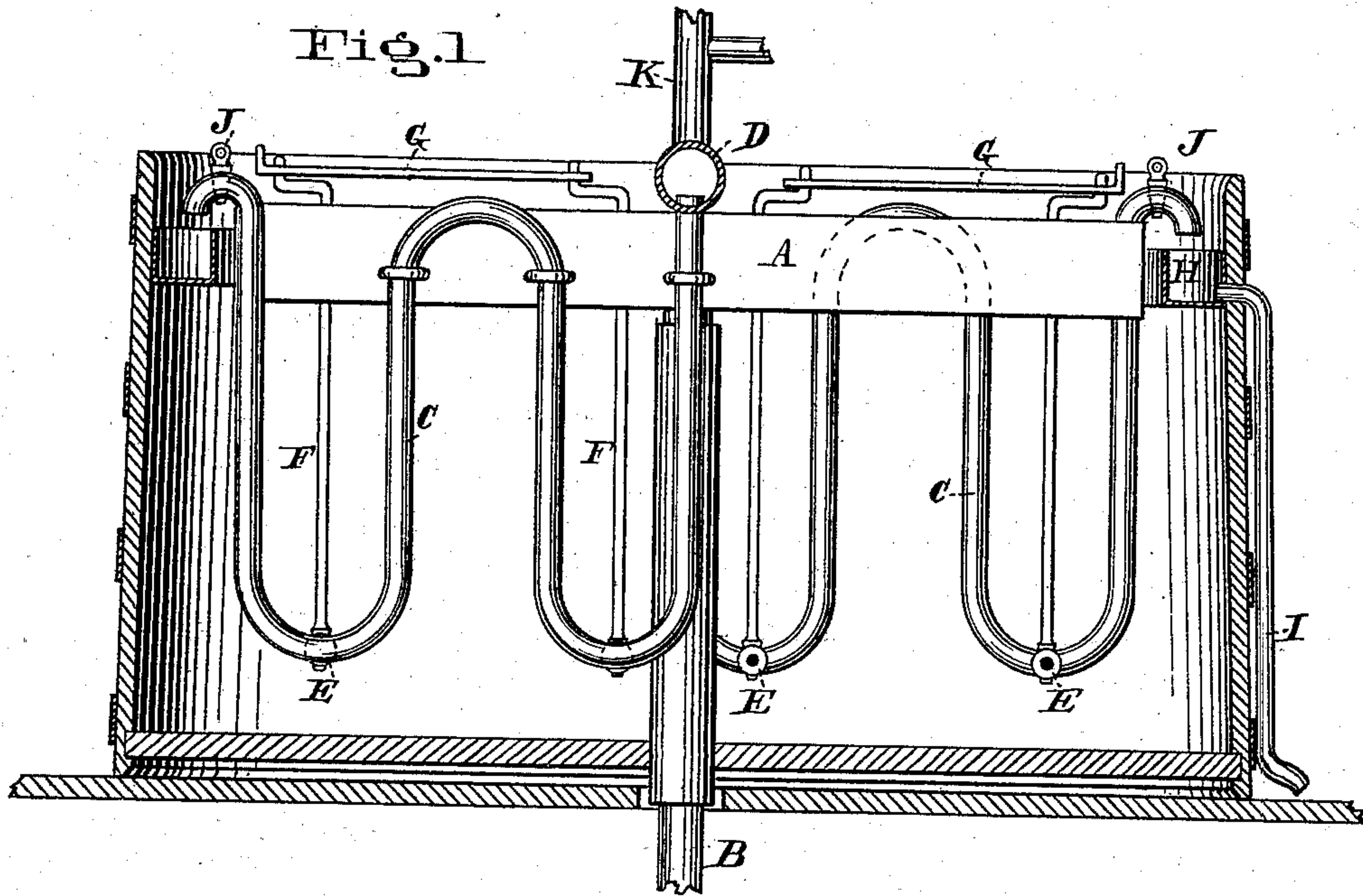


J. HAYDEN.  
Mash-Heater.

No. 215,455.

Patented May 20, 1879.



Attest  
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# UNITED STATES PATENT OFFICE.

JOSEPH HAYDEN, OF OXFORD, OHIO.

## IMPROVEMENT IN MASH-HEATERS.

Specification forming part of Letters Patent No. **215,455**, dated May 20, 1879; application filed October 7, 1878.

*To all whom it may concern:*

Be it known that I, JOSEPH HAYDEN, of Oxford, in the county of Butler and State of Ohio, have invented a new and useful Improvement in Mashing-Machines, of which the following is a specification.

Heretofore, in rakes of this class, the steam and fluids for heating and cooling the mash have been admitted and graduated from a valve or cock above the rake-head and outside the mash. By this means the heat could not be properly regulated or regularly distributed through the mash, as if only a moderate head of steam were used the pipes near the center would be too much heated, while the steam would be condensed before reaching the outer parts, and if a full head of steam were kept on there would be a needless waste, and in cooling the air or other fluids would be discharged into the mash.

My invention consists of a tubular rake capable of being attached to any of the rake-heads now in common use, the coiled tubes which form the rake-teeth being provided with stop-cocks at their lower turns, adapted to be operated simultaneously for the purpose of admitting the fluids in any desired quantity, or turning them entirely off, if desirable, and discharging through upper bends into a trough encircling the tube above the mash.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a vertical central section of a mash-tub fitted with my improvements, and Fig. 2 a top-plan view of the same.

A is a rake-head, of ordinary construction, secured to its shaft B, which passes down through a central tube to receive a cog or pulley beneath, by which the rake is rotated in the usual manner. C C are coils of pipe secured to the rake-head, and united by a cross-pipe, D. In the lower bends of the pipes C are cocks E, which have their plugs F extending up through the rake-head, and bent at an angle, so as to form a crank for operating them together. The cranks are united by a bar, G, for this purpose.

The upper outer bends of pipes C overhang a trough, H, which extends around the tub, and has a waste-pipe, I, to carry off the water or other fluid discharged into the gutter through

pipes C C. The outer bends of the pipes are furnished with stop-cocks J. K is a branch pipe, united to cross-pipe D by a swivel-joint. One of the branches of the pipe K is to be attached to the boiler or steam-feeder, and the other branch to a tank of water or a hydrant-pipe.

The operation of my device is as follows: The tub being supplied with the requisite quantity of mash, cocks J stopped, and nipples E open, steam is turned into the pipes C C, and the rake started. During the operation of cooking the mash the supply of steam can be regulated at will or stopped off altogether by moving the crank-bar G. It will be seen that whether a greater or less quantity of steam is admitted to the mash it will always be forced into it under full pressure. After the operation of cooking is completed the supply of steam is cut off, cocks F turned to close the orifices in the lower bends of pipes C C, and the cocks J opened. Cold water is now turned into the pipes C, and, taking the heat from the mash as it passes through them, is discharged into the trough H, and thence carried off through waste-pipe I to a tank or well, to be used over again or for other purposes, if desired.

By means of cocks J the supply of water to the pipes is allowed to pass off as it becomes heated.

In practice, I find it best to have two tanks of water, one being cooled by ice. At first the water at its natural temperature is run through the pipes, which reduces the temperature to about 100° in about twenty-five minutes. After this point is reached the ice-water is turned into the pipes, and reduces the heat about as rapidly until the mash is brought to about 80°, when it is ready to be drawn off.

If it is desired to cool the mash more rapidly, the number of pipes C C may be doubled, so that the rake would have four wings instead of two, as shown.

It will be seen that in my machine the cold fluid is admitted first into the center of the mash, and the cooling progresses from the middle, where the greatest heat is, to the outside.

My cooling process is also applicable to lard-tanks and rendering-kettles.

I claim—

1. In combination with a mash-tub, a revolving rake consisting of bent pipes C C, fitted with cocks at their lower bends, said cocks being regulated from above by means of plugs F, substantially as specified.

2. A revolving rake consisting of the head A and continuous bent pipes C C, having cocks at their lower bends and stop-cocks J at their outer ends, in combination with a vessel provided with a trough, H, and waste-pipe I, the

outer bent ends of said pipes C C overhanging said trough, substantially as shown, and for the purpose specified.

3. In a revolving rake, the combination, substantially as specified, of head A, bent pipes C C, cocks E, plugs F, and links G.

JOSEPH HAYDEN.

Witnesses:

M. M. OLIVER,  
JAMES MOORE.