W. CRAIG.
Mash-Machine.

No. 228,177. Patented June 1, 1880.

Fig. 3.

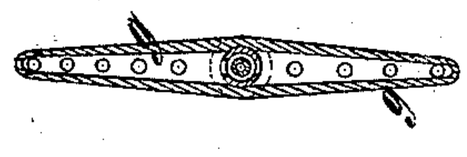


Fig. 1.

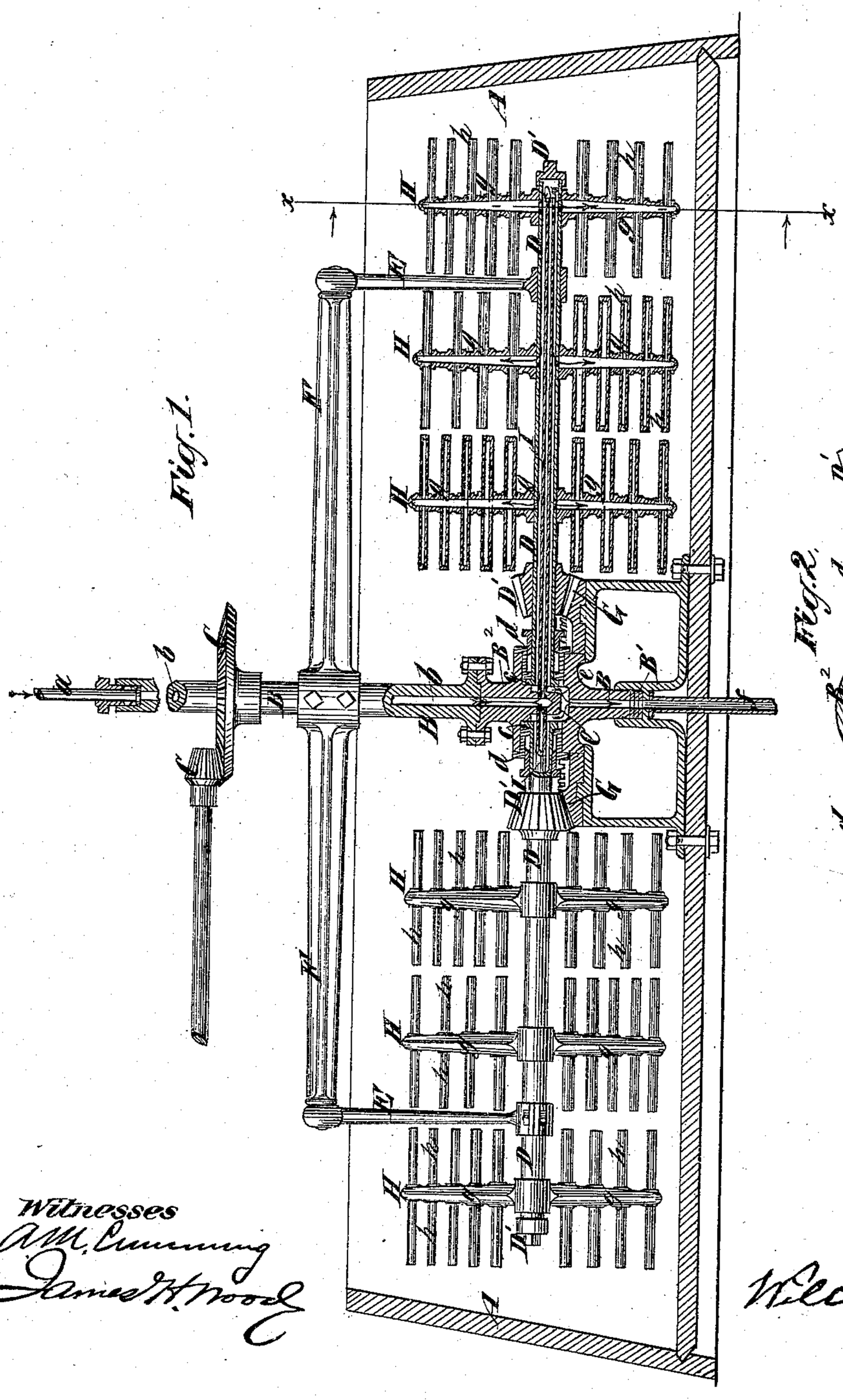
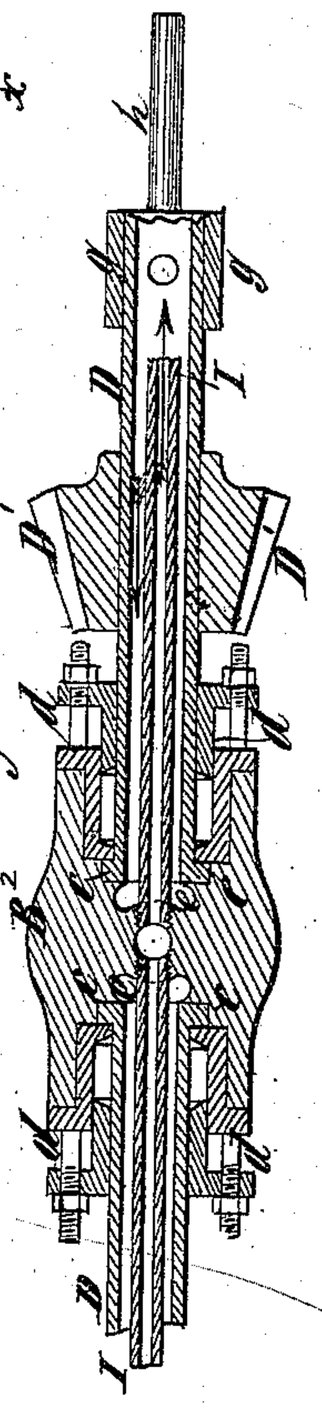


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM CRAIG, OF NEW YORK, N. Y.

MASH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 228,177, dated June 1, 1880.

Application filed February 2, 1880.

To all whom it may concern:

Be it known that I, WILLIAM CRAIG, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Mash-Machines, of which the following is a specification.

My invention relates to mash-machines in which the revolving stirrers or arms by which the contents of the mash-tub is agitated are made hollow, and in which provision is made for a proper circulation of the heating or cooling agent through the said stirrers or arms.

My invention consists in various novel features of construction and combinations of parts, whereby a convenient means is afforded for supplying a heating or cooling agent to and providing for its circulation through the shafts and stirrers or arms, and whereby a desirable means is afforded for operating the said stirrers or arms and for connecting the various parts of the operating mechanism.

In the accompanying drawings, Figure 1 represents a central vertical section through a mash-tub embodying my improvements. Fig. 2 represents a horizontal section through the upright driving-shaft and appurtenances; and Fig. 3 represents a transverse section on the dotted line *x x*, Fig. 1.

Similar letters of reference designate corresponding parts in all the figures.

The general arrangement of the mechanism within the mash-tub A is very similar to that ordinarily employed, although the construction and mode of connection of the parts are very different.

B designates a central vertical shaft which supports the mechanism for stirring or agitating the mash, and the lower end of which rests in a step-bearing, B′, at the bottom of the tub. Rotary motion may be imparted to said shaft by means of bevel-gearing C, or in any other desirable manner.

D designates horizontal shafts, (here represented as two in number,) supported at their inner ends in the shaft B, and supported at or near their outer ends by means of arms E, depending from a cross-bar, F, securely attached to and rotating with the upright shaft B.

In order to impart motion to the shafts D, they are each provided at their inner ends with bevel-wheels D′, which engage with a stationary bevel-geared ring, G, supported on a frame or bed near the bottom of the tub, and receive rotary motion therefrom as the shaft B is rotated.

H designates a series of stirrers or agitators secured to the shafts D, and rotated therewith for acting upon the mash.

The arrangement of all these parts is similar to mash-tubs as usually constructed; but the construction and manner of connecting said parts are novel, and will now be described.

The shaft B is made hollow, and is provided at the top with an inlet-pipe, *a*, for water, steam, or other heating or cooling agent, which passes down through the passage *b* in the said shaft.

In the shaft B is a hub, B^2, which receives the inner ends of the shafts D. The last said shafts are hollow, constituting pipes, and are shown as provided at their inner ends with flanges *c*, secured in recesses in the hub B^2, and kept in place by the stuffing-boxes *d*. This method of securing the shafts D in the shaft B is very clearly illustrated in Fig. 2.

The pipes D are closed at the outer ends by means of caps D′, and have arranged within them other pipes, I, the inner ends of which are fixed in the shaft B and communicate with the passage *b* in said shaft. The pipes D communicate with the space *e* around the center of the shaft B, from which extends an outlet passage or orifice, *f*.

The stirrers or agitators H, which are fitted upon the shafts or pipes D, are composed of hollow distributing-chambers *g*, from which pipes *h* extend in opposite directions and on both sides of the said shafts. The shafts D are perforated at the points where the chambers *g* are situated, so as to permit of the passage of a heating or cooling agent.

The stirrers or agitators H may be of any desired shape or construction.

The pipes *h* may be arranged on one or both sides of the chambers *g*, and any number of said stirrers may be arranged on each side of the upright shaft B.

In the operation of my machine the water, steam, or other heating or cooling agent, entering through the pipe *a* while the stirrers or agitators are in operation, passes down the shaft B, thence through the pipes I to the outer ends thereof, and back around the pipes

I, within the pipes or shafts D. From thence it passes through each stirrer or agitator as it reaches them, and afterward returns through the pipes or shafts D to the center shaft, B, and out the outlet pipe or passage *f*.

When it is desired to introduce any foreign substance into the mash the stirrers or agitators may be provided with holes or openings at any desired points, which may be opened or closed at will.

When the machine is first put in operation it may be desirable to exhaust the air therefrom for the purpose of improving the circulation of the heating or cooling agent through the machine.

As all portions of the mash are brought into contact with the stirrers or agitators, the heating, cooling, or tempering of the mash may be uniformly and thoroughly effected.

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

1. The combination of the hollow upright shaft B and hollow horizontal shafts D, the pipes I, arranged within the said shafts D, and the hollow stirrers or agitators H, arranged upon said shafts D, substantially as specified.

2. The combination, with the tub A, of the hollow upright shaft B, the hollow shafts D, provided with gear-wheels D′, the stationary bevel-geared ring G, with which said gear-wheels D′ engage, the pipes I, and the hollow rotary stirrers or agitators H, substantially as specified.

3. The combination of the hollow shaft B, having a hub, B^2, and receiving an inlet-pipe, *a*, the pipes I I, secured firmly into said hub, the hollow rotary shafts D, surrounding the said pipes I, and fitted to stuffing-boxes *d* on the said hub, and carrying the stirrers or agitators, and the outlet-pipe *f*, communicating with said hub, all substantially as specified.

WILLIAM CRAIG.

Witnesses:

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