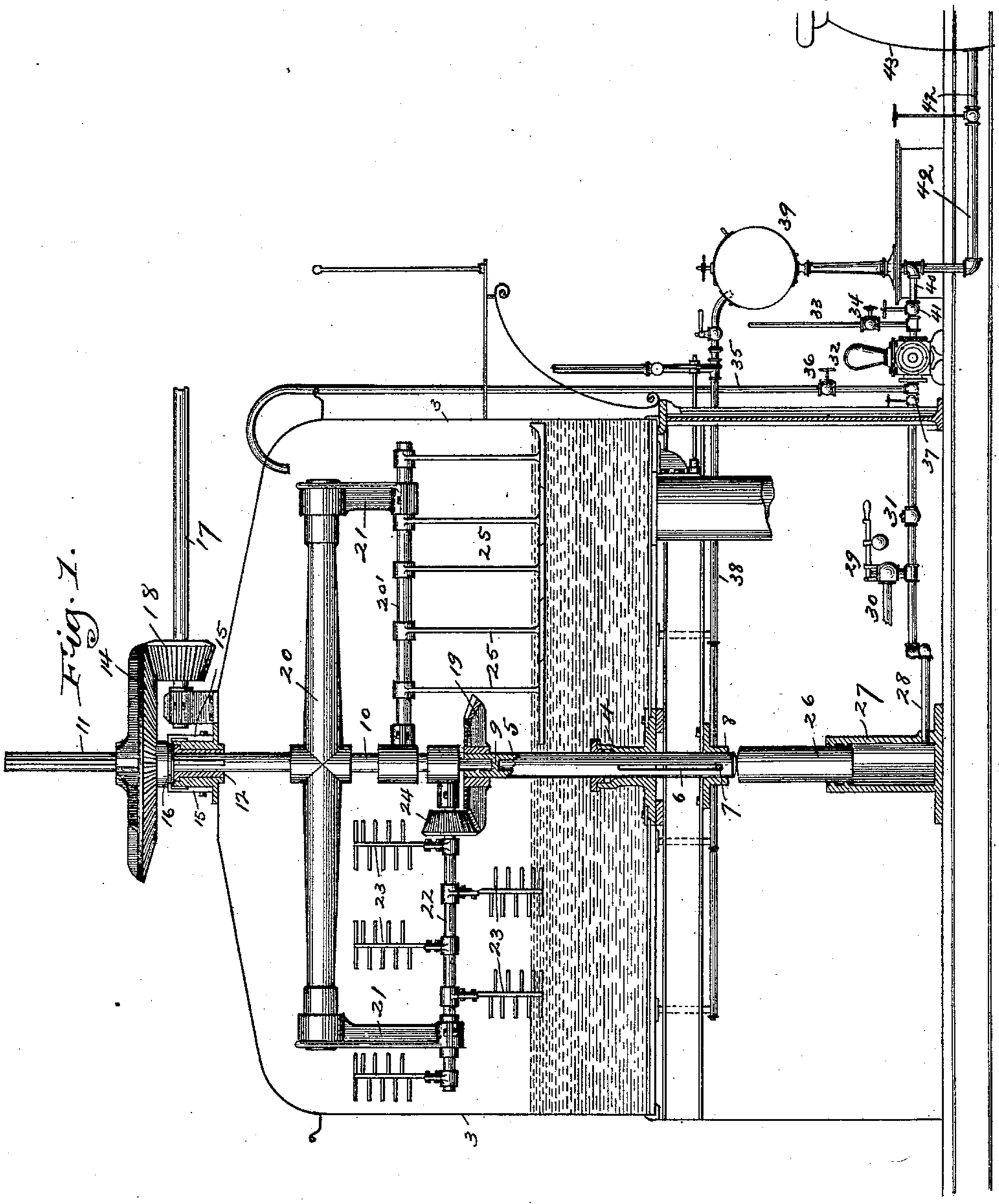
(No Model.) 2 Sheets—Sheet 1.

C. KAESTNER.

ADJUSTING DEVICE FOR MASHING MACHINES.

No. 471,613. Patented Mar. 29, 1892.



Witnesses,
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(No Model.) 2 Sheets—Sheet 2.

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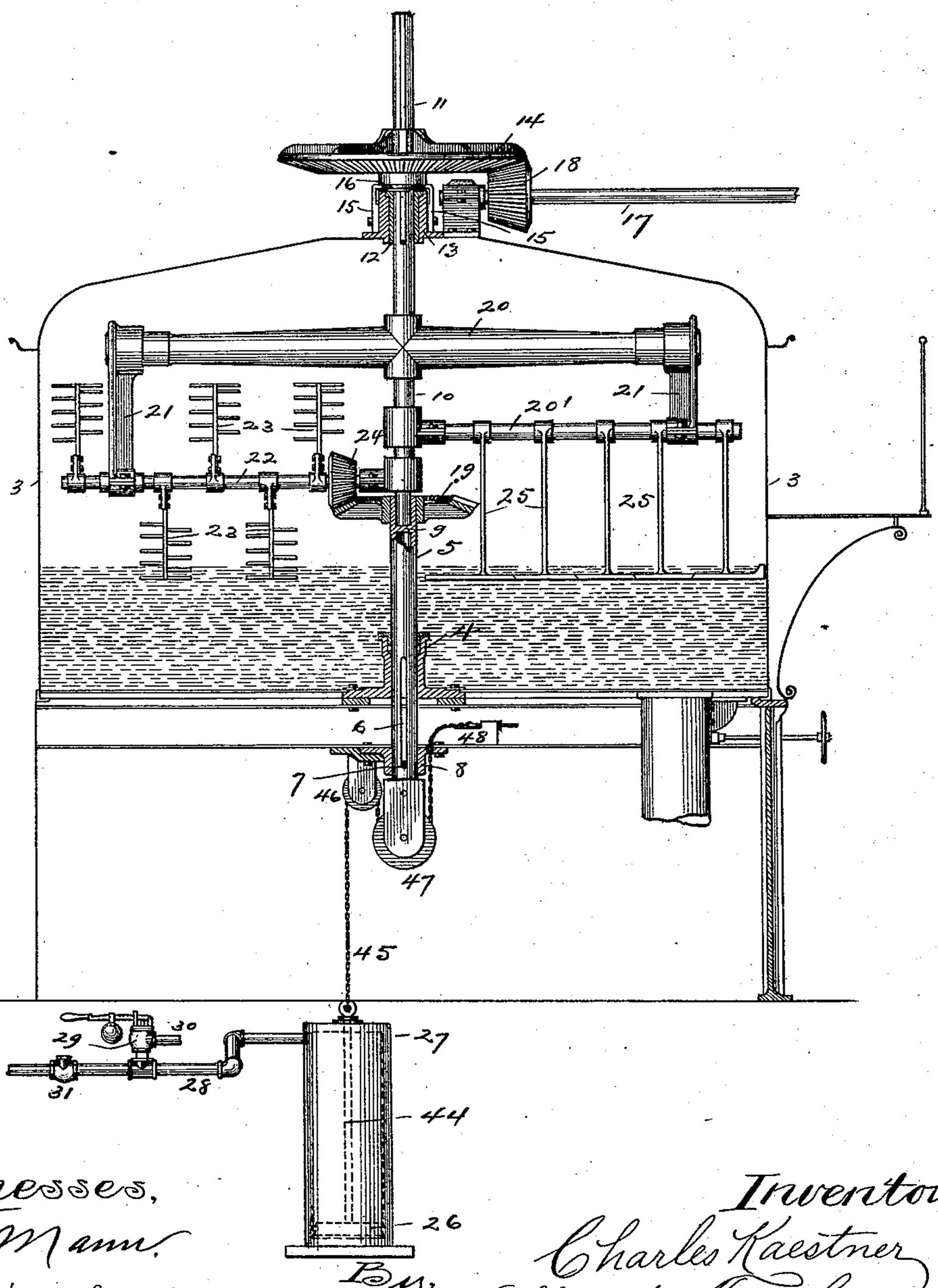
Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES KAESTNER, OF CHICAGO, ILLINOIS.

ADJUSTING DEVICE FOR MASHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 471,613, dated March 29, 1892.

Application filed September 27, 1890. Serial No. 366,363. (No model.)

To all whom it may concern:

Be it known that I, CHARLES KAESTNER, of Chicago, Illinois, have invented certain new and useful Improvements in Adjusting Devices for Mashing-Machines, of which the following is a specification.

Brewers' mashing-machines are usually provided with a vertically-positioned rotatable shaft bearing sweep-arms, from which depend hangers having bearings for shafts, whereon are mounted mash rakes or scrapers, which are rotated by bevel-gearing from the vertical shaft. In the same constructions the mash-rakes are revolved, while the scrapers are fixed on their shaft and have only one movement—that is, around the tub. It is desirable at some stages of the operation of mashing to elevate the rakes and scrapers above the top of the mash, and numerous patents have been granted on means to this end. It has been proposed in some instances to elevate the scrapers and rakes by elevating the vertical power-shaft, and to this end gearing has been employed and hydraulic jacks have been proposed.

My improvements relate to the operation of mashing-machines wherein the vertical power-shaft is movable in order to elevate the rakes or scrapers above the mash, and in the accompanying drawings I have illustrated a mash-machine wherein revolving mash-rakes are mounted upon a shaft on one side of the vertical shaft and non-rotating scrapers are mounted upon a beam on the other, the power-shaft being driven by gearing applied above the top of the mash-tub, and the means for elevating the central shaft comprising an engine, which in one construction is placed immediately beneath the central shaft and has a piston, which is made to engage and lift said shaft when the motor-fluid is forced into the cylinder beneath said piston. In the preferred form of the construction I have employed a cylinder having therein a piston whose rod is projected through the cylinder-head, and a flexible connection or cable is carried about sheaves in such manner as to lift the central power-shaft of the mashing-machine when the piston in the cylinder is forced in one direction by the motor-fluid.

My invention relates more particularly to a novel construction of the central power-shaft, the latter being made in two sections, one of which is rotatable and the other fixed. I thus obviate many inconveniences which have arisen in the application of the central power-shaft to mash-tubs.

I have also made certain improvements in the arrangement of the pump and connections for elevating the first run of the wort back into the mash-tub and for operating the engine to elevate the power-shaft and have devised a novel application of the engine itself.

In the drawings, Figure 1 is an elevation, partly in section, with some of the parts broken away and showing a mash-tub whose central shaft carries sweep-arms, one supporting a revolving rake-shaft and the other carrying a beam, from which depends a series of scrapers. There is also shown in this view a hydraulic jack whose piston is projected and supports the central power-shaft with the rakes and scrapers in an elevated position. In this view is also shown the pump and various pipes and connections for elevating the first run of the wort and operating the jack. Fig. 2 is a similar view showing the preferred form of the hydraulic engine.

In the drawings, 3 indicates the wall of the mash-tub, which is usually secured in an elevated position. In the bottom of the mash-tub is a stuffing-box 4, through which reciprocates the standard 5. Said standard has an elongated aperture 6, through which passes a pin 7 of the guide 8. This shaft may be hollow and toward its upper end have a bridge 9, so as to form a step to receive the lower end of the revolving shaft 10. Said shaft has toward its upper end a feather 11, and a bush 12 is secured to turn with the shaft within a bearing 13 in the top wall of the mash-tub.

14 is a beveled gear having a groove to receive the spline on the shaft 10, and the straps 15, secured with the bearing, have bent ends, which project into a groove 16 on the hub of the gear 14.

17 is a driving-shaft having a beveled pinion 18 enmeshed with the gear 14, whereby motion is imparted to the shaft 10. The standard is held against rotation by the pin 7, and on its upper end it bears the beveled gear 19.

20 is a beam secured midway between its ends with the rotating shaft 10 and from its

upper ends depend hangers 21, one having a bearing for the support of a shaft 22, having thereon the mash-rakes 23 and adapted to be rotated by a gear 24, enmeshed with the fixed gear-wheel 19. The other hanger supports the outer end of the beam 20′, carrying scraper-arms 25.

26 indicates the piston of a hydraulic engine, which, as shown in Fig. 1, is placed beneath the standard.

In the bottom of the cylinder 27 there is tapped a pipe 28, having a safety-valve 29, provided with a discharge-pipe 30. Beyond the safety-valve a check-valve 31 is placed, and the pipe 28 leads to a pump 32. Water is delivered to the pump through the pipe 33, having a valve 34 therein, by means whereof the supply of water to the pump may be cut off.

35 indicates a pipe joined by a union to the pipe 28, leading from the pump, and it is provided with a valve 36. A valve 37 is placed in the pipe 28 between the check-valve 31 and the junction of the pipe 35. The pipe 35 rises alongside the mash-tub and its upper end is bent to discharge over the side thereof.

38 indicates the wort-pipe, which discharges into the reservoir 39, from which leads a pipe 40, having a valve 41 therein, to the pump 32. A second pipe 42 leads from the tank 39 to a kettle indicated at 43.

By the above-described arrangement of pipes and valves the pump may be utilized to operate the engine so as to lift the mash rakes and scrapers above the mash. Then by manipulating the safety-valve 29 manually the mash rakes and scrapers may be lowered gradually. The first run of the wort is usually required to be re-elevated, and this can be done with the pump by opening the valve 41 and permitting the wort to flow into the pump, and then by opening the valve 37 and closing the valve 36 the wort can be forced up and discharged into the tub. In raising and lowering the central shaft the standard 5 moves up, being guided by the pin 7 and the stuffing-box, and the rotating shaft 10 is lifted, thereby carrying the rakes and scrapers up with it and without the necessity of stopping the operation of the machine or disturbing the gearing above the top of the mash-tub.

The construction shown in Fig. 2 is substantially the same in principle, except that the piston 26 in this instance is of disk shape and has a piston-rod 44, to which is connected a chain 45, carried over a sheave 46 and thence beneath a sheave 47, upon whose block the lower end of the standard 5 is seated, the end of the chain or cable being made fast, as at 48. The motor-fluid is discharged into the cylinder 27 at the top and above the piston, and, forcing the latter down, elevates the central shaft through the intervention of the cable. This form of construction is available in situations where there is not space beneath the mash-tub to place the jack in a vertical position, in which case it may be conveniently placed horizontally or in any other available position. With this construction it is also possible to place the engine in a basement or at a distance from the mash-machine.

I do not, of course, limit my invention to the use of a hydraulic engine, as it is obvious that a pneumatic engine may be used in all conditions and with very slight change in the construction, and where I have spoken of the use of water it is evident that other fluids may be substituted therefor, and in some instances to advantage—as, for example, oil or alcohol or other non-freezing liquids may be employed.

I am aware that it has been proposed to elevate the mash-working devices by projecting the central shaft through the bottom of the tub; but said shaft has heretofore been constructed in a single piece and has been exceedingly difficult to mount within the tub. By making it in two sections it is much cheaper and easier to construct and place in position.

My invention can be readily applied to machines already in use by substituting for the fixed standard generally employed a reciprocating standard here shown, the only further change necessary being to put a feather on the shaft, so as to adapt it to be moved vertically without disturbing the gears.

Instead of using a pump to operate the jack, the latter may be operated by hand in the usual way, or other devices may be employed for lifting the central shaft.

I claim—

1. In means for adjusting the mash-working devices of brewers' mashing-tubs, the combination, with a standard projecting through the bottom of the tub and secured against rotation and having a step or bearing formed in its upper end, of a rotatable shaft seated in said step or bearing at its lower end and carrying the mash-working devices, means for rotating said shaft, and means applied to the standard for moving it vertically, whereby to raise and lower the mash-working devices, substantially as described.

2. The combination, in a mashing-machine, of a central standard vertically positioned and adapted to reciprocate through a stuffing-box in the bottom of the tub and having a step in its upper end, a guide for the standard, having a pin projected through an elongated aperture in the standard, a rotatable shaft whose lower end is seated in the step of the standard and carrying the mash-working devices, and gearing applied to the shaft for rotating it, and said shaft being adapted to be adjusted vertically, whereby the mash-working devices may be raised and lowered within the mash-tub, substantially as described.

CHARLES KAESTNER.

Witnesses:
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