

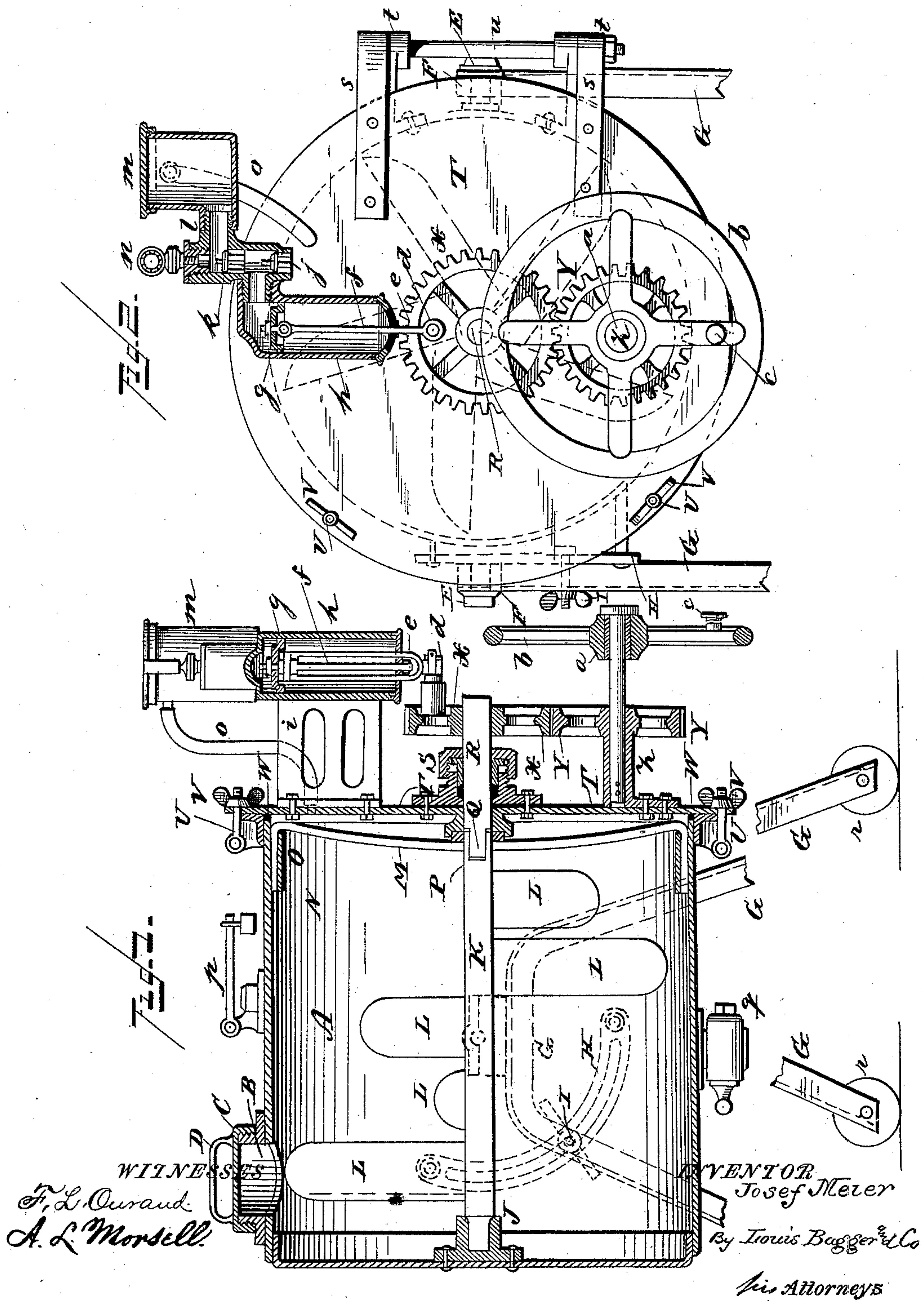
(No Model.)

J. MEIER.

APPARATUS FOR MIXING AND AERATING WORT AND YEAST.

No. 424,325.

Patented Mar. 25, 1890.



UNITED STATES PATENT OFFICE.

JOSEF MEIER, OF EDINGEN, GERMANY.

APPARATUS FOR MIXING AND AERATING WORT AND YEAST.

SPECIFICATION forming part of Letters Patent No. 424,325, dated March 25, 1890.

Application filed April 24, 1889. Serial No. 308,363. (No model.) Patented in Germany May 13, 1888, No. 45,513, and January 8, 1889, No. 48,474; in France June 26, 1888, No. 191,444; in Belgium June 26, 1888, No. 82,342, and in Austria-Hungary January 21, 1889, No. 29,934.

To all whom it may concern:

Be it known that I, JOSEF MEIER, a subject of the Emperor of Germany, residing at Edingen, in the Grand Duchy of Baden, Empire of Germany, have invented certain new and useful Improvements in Apparatus for Mixing and Aerating the Wort and Yeast in the Manufacture of Malt Liquors, (for which I have obtained Letters Patent in the following countries, to wit: Germany, No. 45,513, dated May 13, 1888; Germany, (supplementary patent,) No. 48,474, dated January 8, 1889; Austria-Hungary, No. 29,934, dated January 21, 1889; France, No. 191,444, dated June 26, 1888, and Belgium, No. 82,342, dated June 26, 1888;) and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a vertical longitudinal sectional view of my apparatus, and Fig. 2 is an end elevation of the same with certain of the parts of the apparatus shown in section.

Like letters of reference denote corresponding parts in both the figures.

My invention relates to apparatus used in the manufacture of malt liquors; and it consists in the improved construction and combination of parts of a combined mixing and aerating apparatus for mixing and aerating the unfermented malt liquor or "wort" and the yeast in such manner that the mixture of the wort and yeast may be effected expeditiously and thoroughly while undergoing aeration for the purpose of facilitating fermentation.

Reference being had to the accompanying drawings, the letter A designates a cylindrical vessel or drum made of any suitable sheet metal and provided at one end or on one side with an inlet-opening B, adapted to be sealed hermetically by a screw cap or cover C, provided with the hand-hold D. The drum A is provided on opposite sides with trunnions E, whereby it is pivoted in boxes F in the upper ends of the frame G, as clearly shown

in full lines in Fig. 2 and indicated by dotted lines in Fig. 1.

In order to permit the vessel or frame A to be tilted or adjusted at the proper angle relative to the frame or bearing G, the drum is provided on one side with a slotted segment, (shown in dotted lines in Fig. 1 and marked H,) said segment having the trunnions E for its center. The adjacent arm G of the fixed frame is provided with a binding screw and nut I, projecting through the slot in the segment H, so that after the drum A has been adjusted at its proper angle relative to the frame or bearing G it may be fastened in its proper position simply by tightening this nut I.

One of the heads of the drum is provided with an inwardly-projecting bearing J, into which is stepped one end of the central revolving shaft K, which is provided with a series of dashers or beaters L, arranged spirally and radially and constructed of sheet metal or other suitable material. The other end of the shaft K works in a bearing in the removable brace or cross-piece M, which is provided at opposite ends with downwardly-projecting tongues N N, adapted to be held in place by keepers O O, fastened to the inner walls of the drum diametrically opposite to each other. The same end of shaft K which projects through the aperture or bearing in said cross-bar M has a squared recess P, adapted to receive and fit the square tenon Q at the inner end of the central drive-shaft R, so that when a rotary motion is imparted to the said drive-shaft R the horizontal shaft K, with its dashers or beaters L, will revolve with it.

The drive-shaft R projects through and is boxed in a stuffing-box S, mounted centrally upon and forming part of the removable head or cover T. The latter is fitted air-tight upon the drum A, and may be held in place by means of pivot-bolts U, adapted to fit into slots in the projecting rim or flange of the cover and provided with thumb-nuts V, so that by tightening down these nuts the head T will be locked firmly in place upon the drum. In order to make the joint between the drum and its head absolutely air-tight, I

provide a rubber packing or gasket W, which is placed around the inner rim of the drum and bears against the innerside of the removable head T.

5 A rotary motion is imparted to the drive-shaft R and dasher staff or shaft K by the pinion X, which is fastened upon the outer end of the drive-shaft and meshes with another pinion or gear-wheel Y, revolving upon the
10 horizontal axle Z. The hub of this latter pinion Y is fastened to the hub *a* of the fly-wheel *b*, which is provided with a crank *c* for turning it by couplingsaid crank or wrist pin *c* to the connecting-rod of the engine; or, if
15 preferred, the fly-wheel *b* may be constructed like a belt-pulley, in which case it may be operated by means of a belt in the usual and well-understood manner.

The central pinion X is provided with a
20 projecting wrist-pin *d*, which is coupled to the yoke *e* of the piston-rod *f* of the piston *g* of an air-pump *h*, which is attached to a bearing *i*, fastened upon and projecting from the cover T. The yoke *e* is pivoted to the upper
25 end of piston *g* by pivot-pin *f'*, so as to oscillate thereon, the bottom of the air-pump being provided with the slots *f''*, (see Fig. 2,) through which the yoke passes. The air-pump *h* is connected by a valve *j* with the
30 outer air and by another valve *k* (see Fig. 2) with a pipe *l*, leading into the air-receiver *m*. A manometer *n* is located in the connecting-pipe *l* for the purpose of measuring the air-pressure in the receiver *m*. A pipe *o* leads
35 from the receiver *m* through the head T into the interior of the drum A.

The upper side of the drum A may be provided with a safety-valve of the usual construction to blow off air if the pressure in-
40 side of the drum should become too great, and the bottom or under side of the drum is provided with an outlet-valve *q*, through which the aerated mixture of wort and yeast may be drawn off.

45 For the sake of convenience the frame G, upon which the machine is mounted, may be provided with wheels or rollers *r*, so that the machine may readily be transported from one place to another, as may be desired. The
50 head or cover T, closing one end of the machine, is provided with parallel projecting arms *s*, the outer ends of which form hinges *t*, through which a stout hinge-bolt *u* is inserted of sufficient strength to hold the head
55 with its attachments firmly in place upon one end of the drum in conjunction with the nutted bolts U, as described.

From the foregoing description, taken in connection with the drawings, the operation
60 of this machine will readily be understood without requiring further explanation. The wort is fed into the drum through the opening B, after which a suitable quantity of yeast is added, and the opening is then closed
65 by means of the screw cap or cover C. The

air-receiver *m* is filled with any suitable innocuous chemical adapted to purify the atmospheric air on its passage from the air-pump to the drum, and the machine is then set in motion by coupling the main drive-
70 wheel *b* to the motive power. The revolution of the central shaft K, with its spirally-arranged beaters L, will thoroughly beat up and mix the wort with the yeast, and during this operation the mixture is aerated by the
75 purified compressed air supplied by the air-pump *h* through the purifier or receiver *m* and pipe *o*, the excess of compressed air escaping through the safety-valve *p* on the top of the cylinder. This operation of beating and
80 mixing the wort and the malt may be expedited by occasionally changing the angle of the drum upon its frame or bearing G by loosening the binding-screw I and tilting the
85 drum upon its trunnions first to one side and then to the other. After the contents of the drum have been thoroughly mixed and properly aerated the machine is stopped and the contents are drawn off through the outlet-
90 valve *q*.

If at any time it is desired to clean out the drum, this may readily be accomplished by removing the movable head T and its attachments, which permits of the removal of the central dasher-shaft and beaters. In
95 this manner the interior of the drum may be thoroughly and effectively cleaned as well as the staff and beaters, which is of importance for the satisfactory operation of the machine.

Having thus described my invention, I
100 claim and desire to secure by Letters Patent of the United States—

In an apparatus for mixing the wort and yeast and aerating the same, the combination of the movable supporting-frame, the drum
105 or cylinder having trunnions journaled in bearings in opposite sides of said frame and provided with an inlet and an outlet valve, means, substantially as described, for adjusting the angle of the drum relative to its
110 standard or bearing, the central shaft having spirally-arranged beaters, the drive mechanism for revolving said shaft, mounted upon the removable head of the drum, the air-pump also mounted upon said head and op-
115 erated by the pinion on the central shaft, the air receiver or purifier connected with the pump, and the pipe leading from the purifier into the drum through the removable head of the same, all constructed and combined to
120 operate substantially as and for the purpose herein shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in the presence of two witnesses.

JOSEF MEIER.

Witnesses:

W. HEUHEIM,
THEODOR JACOBY.