

G. H. MEYER.
MALTING APPARATUS.
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998,027.

Patented July 18, 1911.

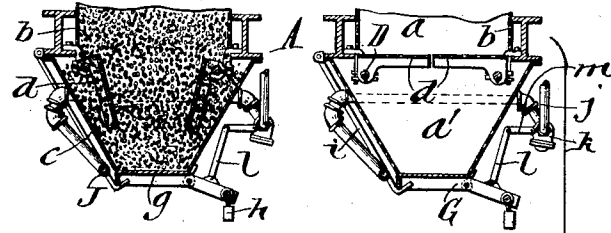


Fig. 2.

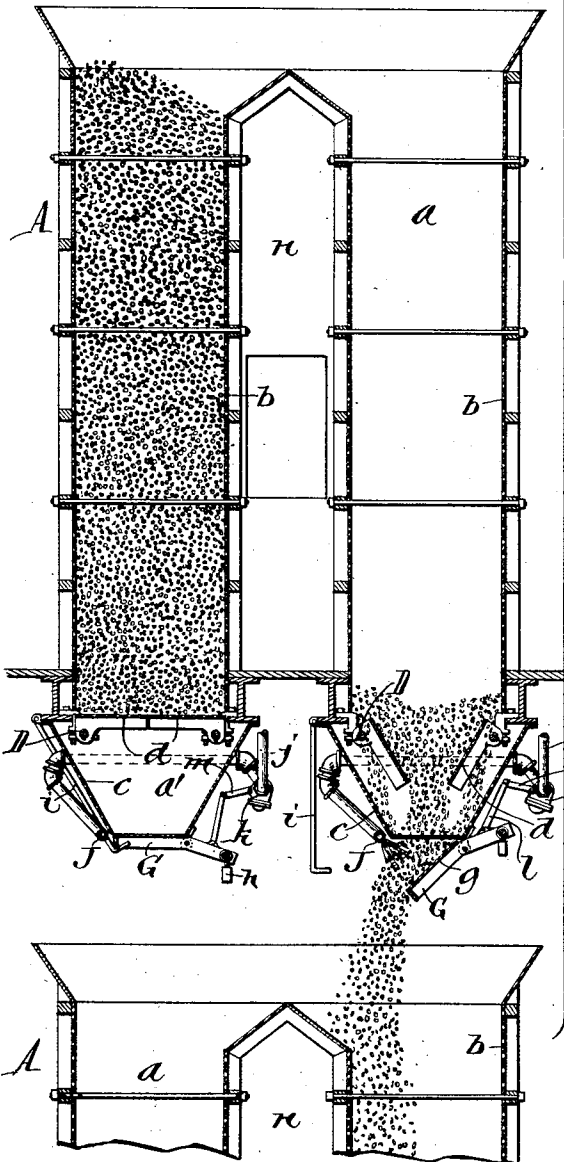
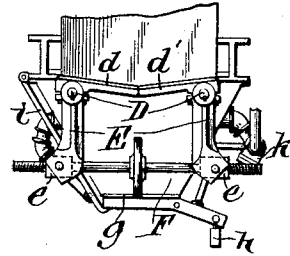


Fig. 1.

Fig. 3.

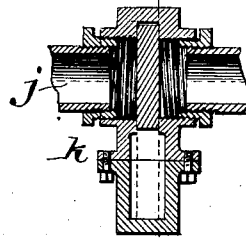
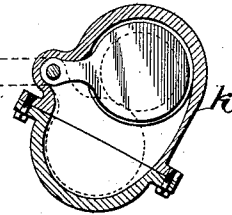


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MALTING APPARATUS.

998,027.

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To all whom it may concern:

Be it known that I, GEORGE H. MEYER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Malting Apparatus, of which the following is a specification.

This invention relates to a malting apparatus.

One of the objects of this invention is to provide simple and efficient means for loosening the malt when the same becomes packed or matted, thus improving the quality of the malt.

A further purpose of this invention is to provide means whereby the grain is watered as the same is discharged from a malting chamber, which means are preferably so connected with the valve which controls the discharge of grain that the grain valve and water valve are opened and closed simultaneously.

In the accompanying drawings: Figure 1 is a fragmentary vertical section of a malting apparatus embodying my improvements. Fig. 2 is a fragmentary side elevation of one of the sections of the malting apparatus showing the means for operating the grain valves. Fig. 3 is a fragmentary longitudinal section, on an enlarged scale, of one of the water valves. Fig. 4 is a vertical cross section in line 4-4, Fig. 3.

Similar letters of reference indicate corresponding parts throughout the several views.

A represents a plurality of units or sections of the malting apparatus each of which preferably comprises an upper main malting or germinating chamber *a* which is comparatively high and of large capacity and a lower malting or germinating chamber *a*¹ which is arranged below the upper chamber and which is comparatively low and of small capacity. The upper chamber has perforated vertical walls *b*, an inlet at its upper end and an outlet at its lower end. The lower chamber has perforated downwardly converging or inclined walls *c* and it has an inlet at its upper end which normally communicates with the outlet of the upper chamber and the same also has an outlet at its lower end. Between the outlet of the upper chamber and the inlet of the lower chamber is arranged a grain closure or valve

whereby communication between these chambers may either be established or cut off. This grain valve preferably comprises two vertically swinging upper perforated gates *d* which normally are arranged horizontally between the upper and lower chambers and meet at their opposing inner or free edges while their outer edges are secured to longitudinal rock shafts *D* which are journaled in bearings on the adjacent parts of the lower chamber. While the upper gates stand horizontal they close the outlet of the upper chamber and confine the grain in the same during the germinating period. But upon swinging the upper grain gates downwardly the outlet of the upper chamber is opened and the grain is permitted to discharge downwardly therefrom. The opening and closing of the upper grain gates may be effected in various ways but preferably by the means which are shown in Fig. 2 of the drawings and which comprise two depending rock arms *E* secured to the rock shafts *D* outside of the malting chambers, swiveling screw nuts *e* mounted on the rock arms *E*, and an adjusting shaft *F* provided centrally with a hand wheel and engaging its threaded ends with the screw nuts. Upon turning the adjusting shaft in one direction the gates *d* are opened and upon turning said shaft in the opposite direction said gates are closed. While the grain is confined in an upper chamber air is drawn transversely through the same and the perforated vertical walls by means of an air exhausting device of any suitable construction. The outlet of the lower malting chamber is also controlled by a closure or valve which preferably comprises a single vertically swinging gate *g* mounted on the inner arms of rock levers *G* which are pivoted adjacent to one of the lower edges of the lower chamber. The lower grain gate *g* is yieldingly held in its closed position by means of weights *h* suspended from the outer arms of the rock levers *G*. This lower gate may also be locked in its closed position by means of one or more latches or hooks *i* each pivoted on the outer side of the chambers and engaging the bill at its lower end with the free front end of one of the rock levers *G*.

During the operation of making malt the

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upper chamber of each unit or section is first filled with grain and permitted to germinate therein the required length of time, while the upper grain gates are closed. When the grain becomes packed or matted the upper gates are opened and the grain is permitted to enter the lower compartment while the gate at the outlet of the latter is closed. Inasmuch as the lower compartment has but a small capacity only part of the grain is permitted to escape from the upper to the lower compartment, this being sufficient, however, to agitate and loosen the grain so that the air is able to pass freely through the same, thereby thoroughly aerating the grain and promoting the proper germination of the same. When the grain has been thus dropped partly into the lower chamber the external air is drawn upwardly through the walls of the lower chamber and the grain therein into the upper chamber and joins the current of air which is drawn crosswise through the grain in the upper chamber. After the grain has germinated the desired time in a section the lower grain gate is opened and the grain is discharged therefrom preparatory to undergoing the next stage of the germinating operation. As the grain escapes from the lower chamber in a stream the same is turned and becomes thoroughly mixed preparatory to entering the next compartment in which the following period of germination is effected. At the same time that the grain escapes from the lower compartment water is spread uniformly over the same so as to moisten the grain and facilitate germination. This water is preferably delivered to the grain by means of a perforated water spray pipe *J* arranged adjacent to that lower edge of the lower chamber opposite the pivot of its gate valve. This spray pipe is preferably supplied with water from any suitable source by means of a supply pipe *j* containing a water gate valve *k*. The latter is preferably operatively connected with the lower grain valve so that the water valve is opened and closed automatically and simultaneously with the opening and closing of the lower grain valve. This connection may be variously arranged but preferably comprises a link *l* which is connected at one end with the rear arm of one of the levers of the lower grain valve while its other end is connected with the rock arm *m* of the water valve *k*, as shown in Figs. 1 and 4. By thus opening and closing the lower grain valve and the water valve simultaneously it insures uniform moistening and germinating of the grain and the production of superior malt.

In a malt house equipped with my improved apparatus a plurality of upright tiers or columns of units or sections such as

the one just described are employed and the sections in each tier or column are so arranged that the lower outlet of each upper section is above the upper inlet of each lower section, as shown in Fig. 1, whereby the grain issuing from each upper section can flow directly into the next lower section, whereby the turning and agitating of the grain can be effected periodically by gravity and without the expenditure of any power. In the preferred installation the units or sections of adjacent tiers are arranged in pairs and the opposing sides of their upper chambers are connected with the same exhaust conduit *n*, as shown in Fig. 1.

I claim as my invention:

1. A malting apparatus comprising a perforated main malting chamber having an inlet at its upper end and an outlet at its lower end, a perforated supplemental malting chamber arranged below the main chamber and having an outlet at its lower end, means for opening and closing the outlet of the main chamber, and means for opening and closing the outlet of the supplemental chamber.
2. A malting apparatus comprising a perforated main malting chamber of comparatively large capacity having an inlet at its upper end and an outlet at its lower end, means for controlling said outlet, a perforated supplemental malting chamber of comparatively small capacity arranged below the main chamber and having an outlet at its lower end, and means for controlling the outlet of the supplemental chamber.
3. A malting apparatus comprising an upper main chamber having vertical perforated walls, and an inlet at its upper end and an outlet at its lower end, a lower supplemental chamber arranged below the main chamber and having inclined perforated walls and an outlet at its lower end, and means for controlling the outlets of said chambers.
4. A malting apparatus comprising an upper main chamber having vertical perforated walls, and an inlet at its upper end and an outlet at its lower end, a lower supplemental chamber arranged below the main chamber and having inclined perforated walls and an outlet at its lower end, perforated gates controlling the outlet of said upper chamber, and imperforate gates controlling the outlet of the lower chamber.
5. A malting apparatus comprising a malting chamber having an outlet, a grain valve controlling said outlet, a pipe arranged to deliver a spray of water upon the grain as the same issues from the outlet, a water valve controlling the supply of water to said spray pipe, and means for causing said valves to open and close simultaneously.

6. A malting apparatus comprising a
malting chamber having an outlet, a verti-
cally-swinging grain valve controlling said
outlet, a water spray pipe arranged adja-
cent to said outlet and adapted to deliver a
5 spray of water into the grain as the same
issues from said outlet, a water valve con-
trolling said water pipe, and connections be-
tween said grain valve and water valve

which operate to cause said valves to open 10
and close simultaneously.

Witness my hand this 29th day of Septem-
ber, 1910.

GEORGE H. MEYER.

Witnesses:

THEO. L. POPP,
ANNA HEIGIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
