

A. VON SCHLEMMER.

STIRRING APPARATUS FOR MALT-KILNS.

No. 170,134.

Patented Nov. 16, 1875.

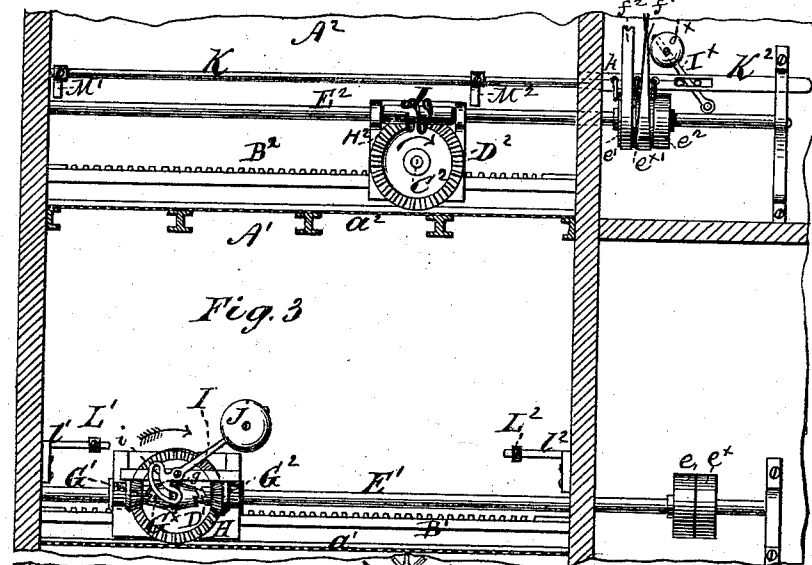


Fig. 3

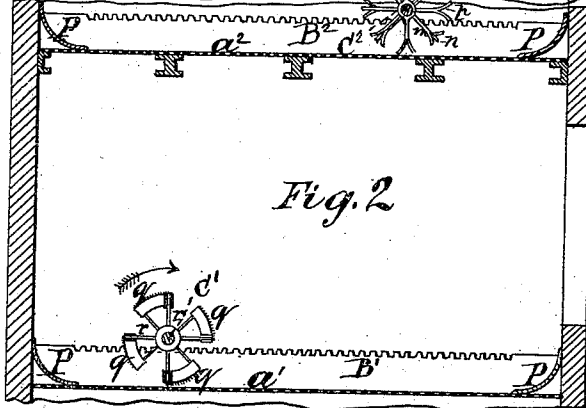


Fig. 2

Fig. 4

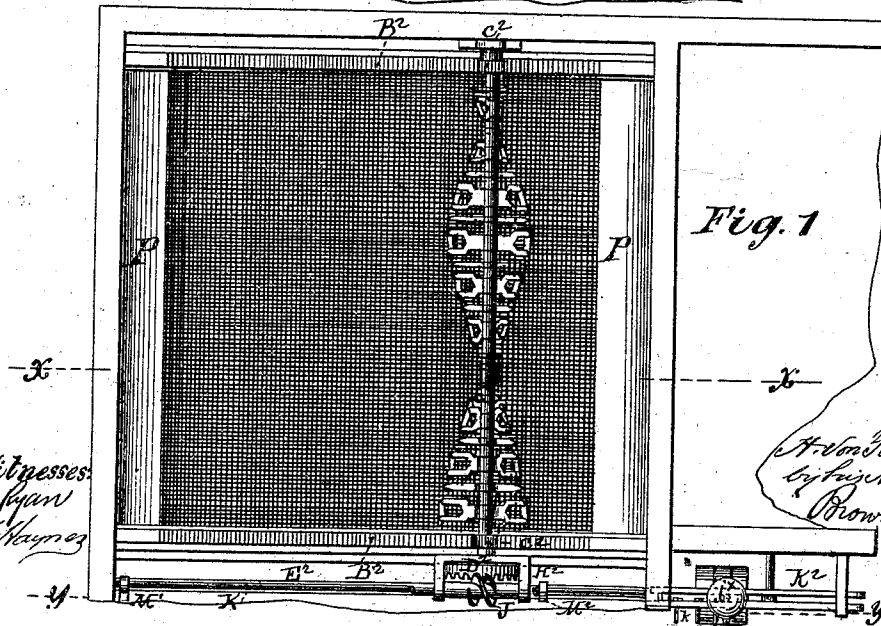
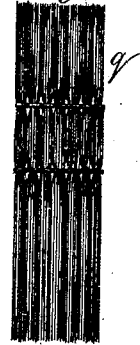


Fig. 1

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UNITED STATES PATENT OFFICE.

AUGUST VON SCHLEMMER, OF HOCHHEIM-ON-THE-MAIN, GERMANY.

IMPROVEMENT IN STIRRING APPARATUS FOR MALT-KILNS.

Specification forming part of Letters Patent No. 170,134, dated November 16, 1875; application filed September 16, 1875.

To all whom it may concern:

Be it known that I, AUGUST VON SCHLEMMER, of Hochheim-on-the-Main, Germany, have invented an Improved Stirring Apparatus for Malt-Kilns; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing making part of this specification.

My invention relates to certain improvements in stirring apparatus, applicable to either single or double kilns; and it consists in a novel construction and arrangement of the various parts, whereby their successful operation is insured.

In the accompanying drawing, Figure 1 is a horizontal sectional view of a malt-kiln provided with my improvements. Fig. 2 is a vertical sectional view taken in the line *xx* of Fig. 1. Fig. 3 is a vertical sectional view taken in the line *yy* of Fig. 1.

The kiln is here represented as of the construction known as a "double kiln," being divided into two compartments, $A^1 A^2$, one above the other, with the floors $a^1 a^2$ of the construction usual in malt-kilns. The stirring apparatus in the upper compartment is different from that in the lower one. The mechanism for operating the stirrers is also shown as of a different construction in the two compartments; but either of the forms of such mechanism is equally applicable to either one of the stirring devices.

The upper compartment A^2 is intended for green or moist malt, and the stirrers consist of radial spokes *p*, with their ends pointed, or of blades *n*, attached to forked radial arms *m*, said spokes and arms being arranged spirally on the shaft to which they are attached. The lower compartment A^1 is intended for dry malt, and the stirrers consist of split quills *q* bolted, clamped, or otherwise attached to radial arms *r* on the stirrer-shaft.

Heretofore, in some cases, it has been customary to use bristles in the stirring apparatus for dry malt; but it has been found in practice that they are not able to stand the heat of the kiln (ranging from about 144° to 180° Fahrenheit) for any great length of time, and consequently they soon become worn out and worthless. I have, therefore, adopted

the split quills for the stirrers, as I have found that they accomplish the desired result in a satisfactory manner, and are more durable than bristles.

In each compartment of the kiln, on two opposite sides, a short distance above the floors, are racks $B^1 B^2$, with the teeth of which engage pinions $c^1 c^2$, attached to shafts $C^1 C^2$ near their ends. To these shafts are attached the stirrers, before described. Either or both of these shafts may be driven by either of the two forms of driving mechanism shown herein. I will, however, describe said mechanism as here represented, commencing with the lower compartment. On the shaft C^1 , outside of the rack B^1 and pinions c^1 , is a bevel-gear wheel, D^1 , attached to said shaft, so as to turn therewith. A horizontal shaft, E^1 , is journaled in the frame-work of the kiln, at right angles with the stirrer-shaft C^1 , and is provided with pulleys $e e^x$, for the reception of a belt for rotating it. On the horizontal shaft E^1 are two bevel-wheels, $G^1 G^2$, attached loosely to said shaft so as to slide longitudinally thereon, and allow said shaft to turn without imparting motion to them. These bevel-wheels gear with the wheel D^1 . On the shaft E^1 , between the bevel-wheels $G^1 G^2$, is a double-acting clutch, G^x , attached to said shaft by a feather, so as to turn therewith, but slide longitudinally thereon. About midway of the length of the clutch is a ring or collar, *g*, working loosely between shoulders on the clutch, so as to enable it to give longitudinal motion thereto, and at the same time allow the clutch to rotate. From one side of the ring or collar *g* projects a pin or stud, which engages with a curved slot, *i*, in the lower or short arm of a lever, *I*, which is pivoted in a frame or plate, *H*, and carries a weight, *j*, at its upper end.

In the frame or plate *H* are the bearings for the shafts C^1 and E^1 . To the two opposite walls of the kiln, in line with the shafts E^1 , are attached two bars, $L^1 L^2$, projecting inward toward the center. On these bars are two arms, $L^1 L^2$, which may be provided with set-screws, or other suitable means, for adjusting them on the bars at a greater or less distance from the walls of the kiln.

When the lever *I* is inclined in one direction the double-acting clutch G^x is thrown

into gear with one of the bevel-wheels, by reason of the engagement of the slot i with the pin or stud on the collar g ; and when the lever I is inclined in the other direction, the clutch engages with the other bevel-wheel. By this means the shaft E^1 is allowed to revolve continuously in the same direction without the necessity for reversing it in order to change the direction of travel of the stirring apparatus.

When the lever I is inclined in the direction shown in Fig. 1, the clutch G^x is engaged with the bevel-wheel G^1 , which in turn is in gear with the bevel-wheel D^1 , by which means the wheel D^1 is rotated in the direction indicated by the arrow, so as to rotate the stirrer-shaft C^1 in a corresponding direction, while the engagement of the pinion c^1 with the rack B^1 causes said shaft to travel toward the right-hand wall of the kiln. As the stirring apparatus reaches the desired distance from the wall, the inclined lever I comes in contact with the arm L^2 , which raises the lever to an upright position, and then inclines it to the reverse position, so as to disengage the clutch from the wheel G^1 , and throw it into engagement with the wheel G^2 , by which means the motion of the wheel D^1 and the travel of the stirring apparatus are reversed, and continues until the lever I is again arrested and reversed by the arm L^1 .

By this construction and arrangement of parts the desired rotary and to-and-fro motions of the stirring apparatus are communicated in a simple and effectual manner.

The driving mechanism, represented as applied to the stirring apparatus in the upper compartment is arranged as follows: The stirrer-shaft C^2 is provided with a pinion, c^2 , gearing with the rack B^2 , and with a gear-wheel, D^2 , outside of said rack. The shaft C^2 has one of its bearings in a frame or plate, H^2 , which also furnishes bearings for a shaft, E^2 , similar to the shaft E^1 , before described, and provided with pulleys e^1 $e^{x'}$ e^2 , for the reception of a cross-belt, f^1 , and an open belt, f^2 . The shaft E^2 carries a worm, J , which gears with the wheel D^2 , and imparts a rotary motion thereto.

I am aware that a stirring apparatus for malt-kilns has been provided with a worm engaging with a gear-wheel, for imparting rotary motion to the stirrer-shaft; but the teeth of the gear-wheel were arranged on its face, and the worm-shaft was arranged on a lower plane than that of the stirrer-shaft, in consequence of which the diameter of the gear-wheel was necessarily limited, and its power reduced.

In my invention the teeth are formed on the side of the wheel D^2 , and the worm-shaft

is arranged on a higher level than that of the stirrer-shaft, so that the worm will engage with the upper portion of the wheel.

By this arrangement I am enabled to increase the diameter of the gear-wheel, and thereby obtain a greater leverage, so as to increase the driving-power, which is of great advantage in a working machine.

In the two opposite walls of the kiln a sliding rod, K , is arranged, parallel with the shaft E . On this rod are two adjustable arms, M^1 M^2 , similar to the arms L^1 L^2 , before described. The outer end of the sliding rod K is attached to the inner end of another sliding rod, K^2 , which carries forks k , for shifting the belts. A lever, I^x , has its lower end pivoted to a fixed point, and carries a weight, j^x , at its upper end, and about midway between its ends it engages with a slot in the sliding rod K^2 . As the shaft E^2 revolves in one direction the wheel D^2 is rotated in the direction indicated by the arrow, until the frame or plate H^2 strikes the arm M^2 , by which means the sliding rods K K^2 are moved longitudinally toward the right-hand side of the kiln, so as to throw the cross-belt f^1 from the fast pulley $e^{x'}$ to the loose pulley e^2 , and the open belt f^2 from the loose pulley e^1 to the fast pulley $e^{x'}$, and thereby reverse the motion of the shaft E^2 , and consequently of the stirring apparatus, which reversed motion continues until again arrested and reversed by the contact of the frame or plate H^2 with the arm M^1 .

In order to provide for the thorough stirring and turning of the malt, the ends of the kilns are provided with inclined or curved concave plates P at the points where the ends of the floors join the vertical walls. These plates may be curved to describe an arc of a circle corresponding with that described by the revolution of the stirring apparatus around its shaft, by which means no corners will be left for the malt to lie in, so as to be free from contact with the stirrers.

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

1. The combination, with the stirrer-shaft C and its gear-wheel D^1 , of the bevel-wheels G^1 G^2 , the double-acting clutch G^x , the driving-shaft E^1 , the pivoted weighted lever I , and the arms L^1 L^2 , arranged and operating as herein shown and described.

2. The stirrers, composed of split quills q , as herein described, for the purpose specified.

In testimony that I claim the foregoing, I have hereunto set my hand this 9th day of July, 1875.

AUG. v. SCHLEMMER.

Witnesses:

FRANK WIRTH,
FRANZ HASSLACHER.