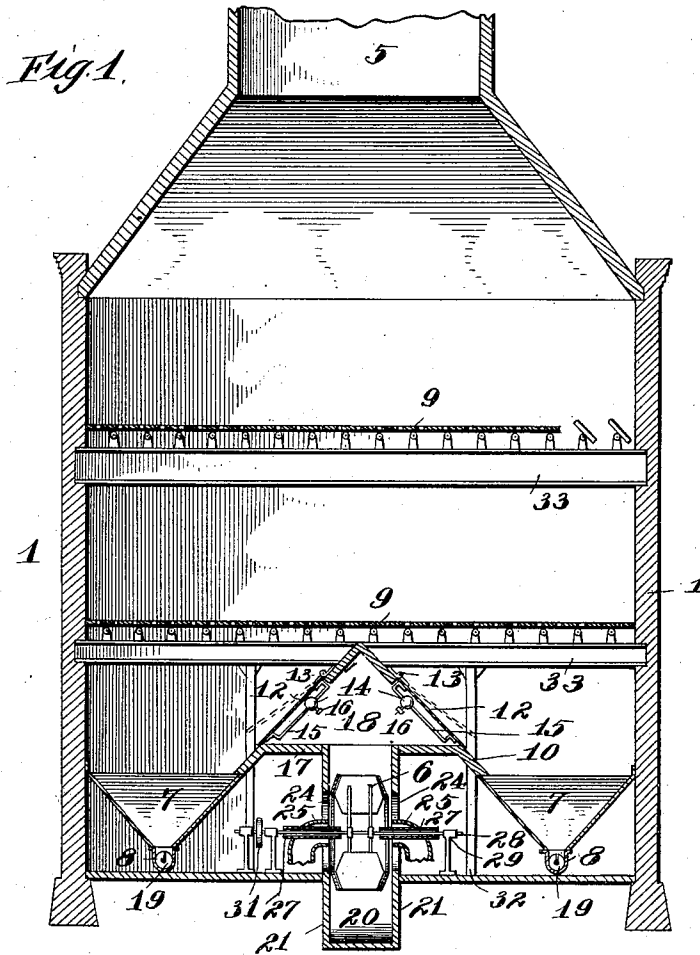
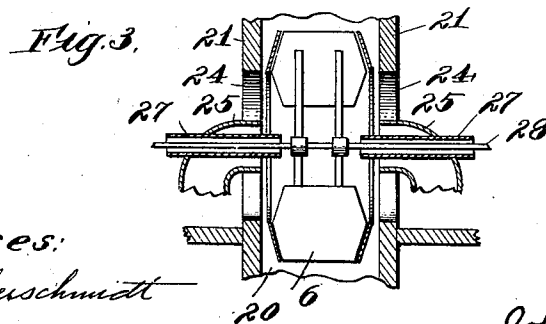


J. F. DORNFELD.
MALTING KILN.

APPLICATION FILED JUNE 15, 1906.

2 SHEETS—SHEET 1.



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No. 890,031.

PATENTED JUNE 9, 1908.

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2 SHEETS—SHEET 2.

Fig. 2.

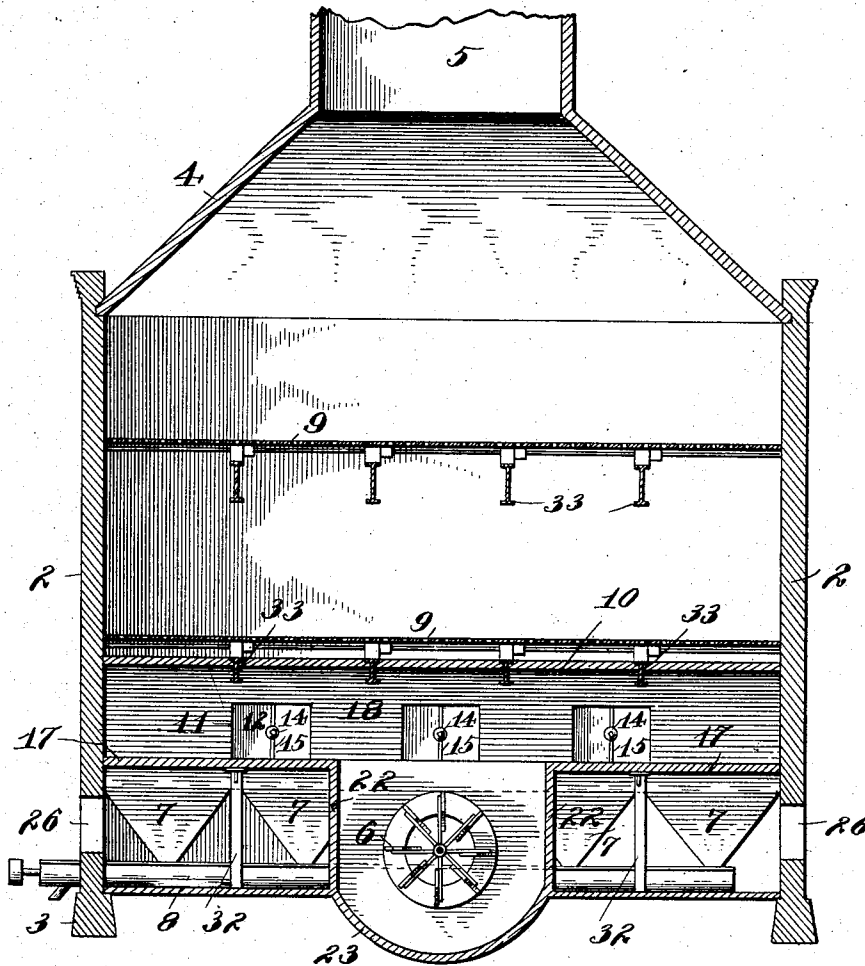
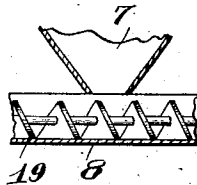


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MALTING-KILN.

No. 890,031.

Specification of Letters Patent.

Patented June 9, 1908.

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To all whom it may concern:

Be it known that I, JOHN F. DORNFELD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Malting-Kilns, of which the following is a specification.

Malting kilns as heretofore constructed comprise buildings of considerable height, in the upper part of which are arranged the malting floor or floors, and in the lower part are introduced the hot gases and products of combustion from a furnace, together with a quantity of fresh air. No means is provided for mixing the hot and the cold air to produce a uniform temperature throughout the kiln and as a consequence the hot air rises in columns through the cooler surrounding air reaching the top of the kiln and there escaping through the ventilator at a temperature considerably in excess of the cool fresh air remaining in the bottom of the kiln.

One of the objects of this invention is to obviate the difficulty mentioned by mixing by mechanical means, the hot air and gases with cool fresh air, making a uniform mixture and introducing said mixture into the kiln.

Further objects of the invention are to reduce the height of the kiln building, which reduction is rendered possible by locating the furnace outside of the kiln proper, and in other ways to improve the construction of such kiln.

In the accompanying drawings, Figure 1 is a transverse vertical sectional view through a malt kiln embodying the features of my invention. Fig. 2 is a longitudinal vertical sectional view through the malt kiln. Fig. 3 is a transverse view through the air mixing fan and Fig. 4 is a fragmental longitudinal sectional view through one of the conveyers.

In the construction of a malt kiln embodying my said invention, I provide a kiln house comprising side walls 1 and end walls 2. This house has any suitable foundation as 3, a roof 4, and a ventilator 5. In the lower part of the kiln are arranged a mixing fan 6, hoppers 7, and two conveyer troughs 8, and above said fan and hoppers are located one or more dumping floors 9 of any suitable construction. The hoppers 7 are rectangular in horizontal

section and in the present embodiment are eight in number. Their outer edges are in contact with and secured to the side walls 1 of the kiln and their inner sides are continued upwardly in an angular apron 10 of any suitable material, which apron extends throughout the length of the kiln. The angular apron 10 is provided with a number of openings 11 in the present instance six in number which openings are closed by light sheet iron doors or shutters 12, pivotally connected at their upper edges by hinges 13 with the apron 10 in such manner that said shutters close upon the upper side of said apron and are there adapted to shut the openings 11. A weight 14 slidably mounted upon a rod 15 fixed to but offset from the underside of said shutters and adjustably secured upon said rod by means of a set screw 16 provides a means for increasing or diminishing the resistance offered by said shutters to air pressure below them tending to open them. The angular apron 10 is provided with a bottom or floor 17 extending the entire length of said apron and said kiln excepting at a point above the fan casing to be hereinafter described, forming a longitudinal distributing flue or chamber 18 for the heated air.

The conveyer troughs 8 are located upon opposite sides of the kiln below the restricted lower ends of the hoppers 7 with which they communicate, and in each of said troughs is rotatably mounted a screw conveyer 19 of ordinary construction. The screw conveyers 19 are rotated in the troughs 8 in any desirable and well known manner to pass malt from the hoppers through the troughs 8 to any desired point of delivery. The hoppers 7 and the angular apron 10 form a surface upon which the malt from the malting floors is dumped when said malt is dried. The inclination of the apron is sufficient to permit the malt falling thereon to slide into the hoppers, the closures 12 at their upper hinged edges forming a tight joint in order to prevent malt from falling through the openings 11.

A fan casing 20 having side walls 21, end walls 22 and a curved bottom wall 23 is supported within the lower part of the kiln immediately below the bottom 17 of the apron 10 and as before stated opens into the air flue

18 formed within the angle of said apron. Each of the side walls of the fan casing is provided with an inlet opening 24 for the admission of air, both hot and cold, to be
 5 mixed by the fan and forced into the air flue or chamber 18. Pipes 25, one at each side of the fan casing 20, communicate with a heating apparatus (not shown) of any suitable construction by means of which heated air
 10 and gases are supplied to said pipes and fan. Cool air is admitted to that portion of the building beneath the walls of the hoppers through air openings 26 in the end walls 2 of the kiln and this cool air is introduced into
 15 the fan through that portion of the air openings 24 in the side walls of the fan casing that is not filled by the hot air pipes 25, also through the inner tubes 27 extending through the curved upper ends of said hot air flues and
 20 communicating between the cool air in the lower part of the building and said fan.

A shaft 28 rotatably supported in bearings 29 and extending through the fan casing 20 carries within said casing a fan 6 of ordinary construction. The fan shaft 28 extends
 25 through the cool air tubes 27, which tubes are intended to protect the shaft and the fan thereon from the direct heat of the hot air within the pipes 25. Near one of its ends
 30 said shaft carries a fixed drive pulley 31 which latter provides a means for rotating the shaft 28 and the fan 30. Columns 32 are provided for partially supporting the beams 33 which carry one of the malting floors of
 35 the kiln.

In the operation of this malting kiln, hot air is supplied to the hot air pipes 25 and power to rotate the fan at a fair rate of speed is provided. The hot air is drawn from the
 40 heating apparatus into the fan casing and the rotation of the fan also draws cool air from the cold air chamber in the lower part of the building into the fan casing through the openings 24 in the opposite sides thereof.
 45 The rotation of the fan mixes the hot air and the cool air evenly together and discharges it upward into the distributing flue or chamber 18 beneath the angular apron 10. By reason of the rotation of the fan air is dis-
 50 charged into said distributing flue or chamber 18 under some pressure, said pressure being sufficient to raise the closures 12, permitting the escape of said heated mixture into the lower part of the kiln below the
 55 lower malting floor. The pressure within the flue 18 is regulated by means of the adjustable weights 14. Greater pressure within the flue 18 is obtained by moving the weights toward the free ends of their closures
 60 and less pressure by moving the weights toward the pivoted ends of the closures. In similar manner more or less air may be delivered through one closure or a part of them

than through the others should it be desirable to deliver more of the heated mixture to
 65 one portion of the kiln than to another portion thereof.

From the foregoing it is clear any of the common forms of fan or apparatus may be employed in my improved kiln and that the
 70 furnace for heating air may be placed within the walls of the kiln instead of in a separate building. It also is obvious that the kiln structure may be built in other and different forms, that the hoppers may be differently
 75 located that the form of the angular apron herein shown and the closures thereon may be altered without departing from the spirit and scope of my invention.

For the various reasons mentioned I desire to have it understood that I do not wish
 80 to limit myself hereby to the particular form and details of the present embodiment of my said invention, but on the contrary wish to claim my said invention broadly.

I claim as my invention:

1. A kiln house having a first floor; means located centrally of said first floor for passing heated air through the building; malt
 90 hoppers on said first floor at opposite sides of said means; and a dumping floor constituting the second floor of the kiln.

2. A kiln house having a first floor; a mixing fan upon said floor and located centrally thereof; means for supplying air to said fan;
 95 a distributing flue extending longitudinally of the building above said fan; hoppers on said first floor at opposite sides of said fan and below said distributing flue; and a dumping floor constituting the second floor of the
 100 house.

3. A kiln house having two rows of hoppers therein, said hoppers having inclined sides; a gable housing extending longitudinally and centrally within said building and
 105 forming a continuation of the inclined sides of said hoppers, said gable housing providing a longitudinal central distributing flue; a fan located between said rows of hoppers and communicating with said distributing flue;
 110 and a dumping floor above said gable housing.

4. A kiln house having a first floor; two rows of hoppers on said first floor, said hoppers having inclined sides; a gable housing extending longitudinally and centrally within
 115 said building and forming a continuation of the inclined sides of said hoppers, said gable housing providing a longitudinal central distributing flue; a fan located on said first floor between said rows of hoppers and
 120 communicating with said distributing flue; and a dumping floor above said gable housing and constituting the second floor of the house.

5. A kiln house having a gable housing
 125 therein extending longitudinally and cen-

trally within the house and providing a longitudinal central distributing flue; air supplying means connected with said distributing flue, said gable housing having openings
5 in its opposite sides; a closure for each of said openings pivoted at its upper end to said gable housing; and a weight mounted upon the inner side of said closure and adjustable toward and away from the upper end of the closure.

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Witnesses:

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