

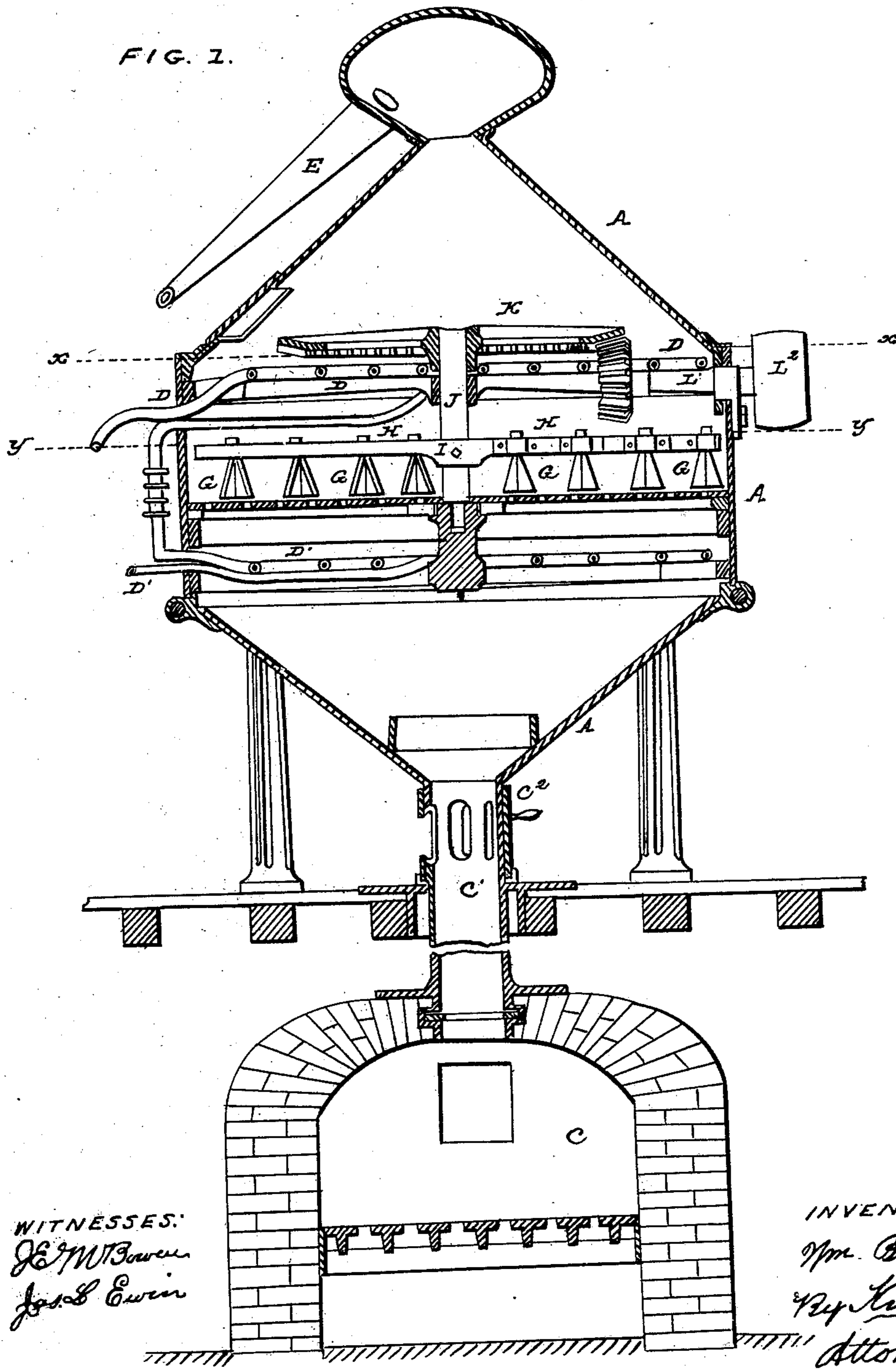
W. BLAKEY.

Malt Kiln.

No. 69,534.

Patented Oct. 8, 1867.

FIG. 1.



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FIG. 2.

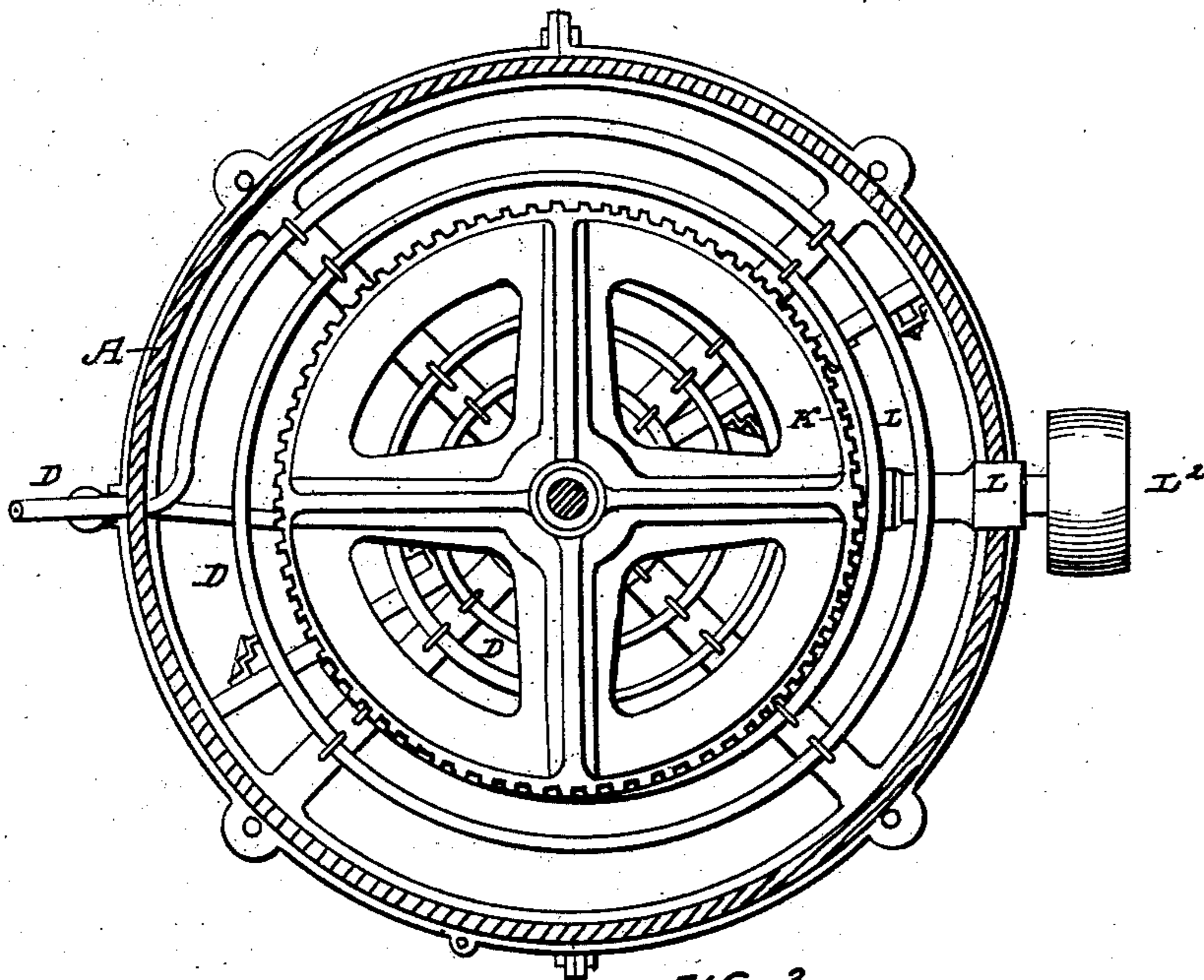
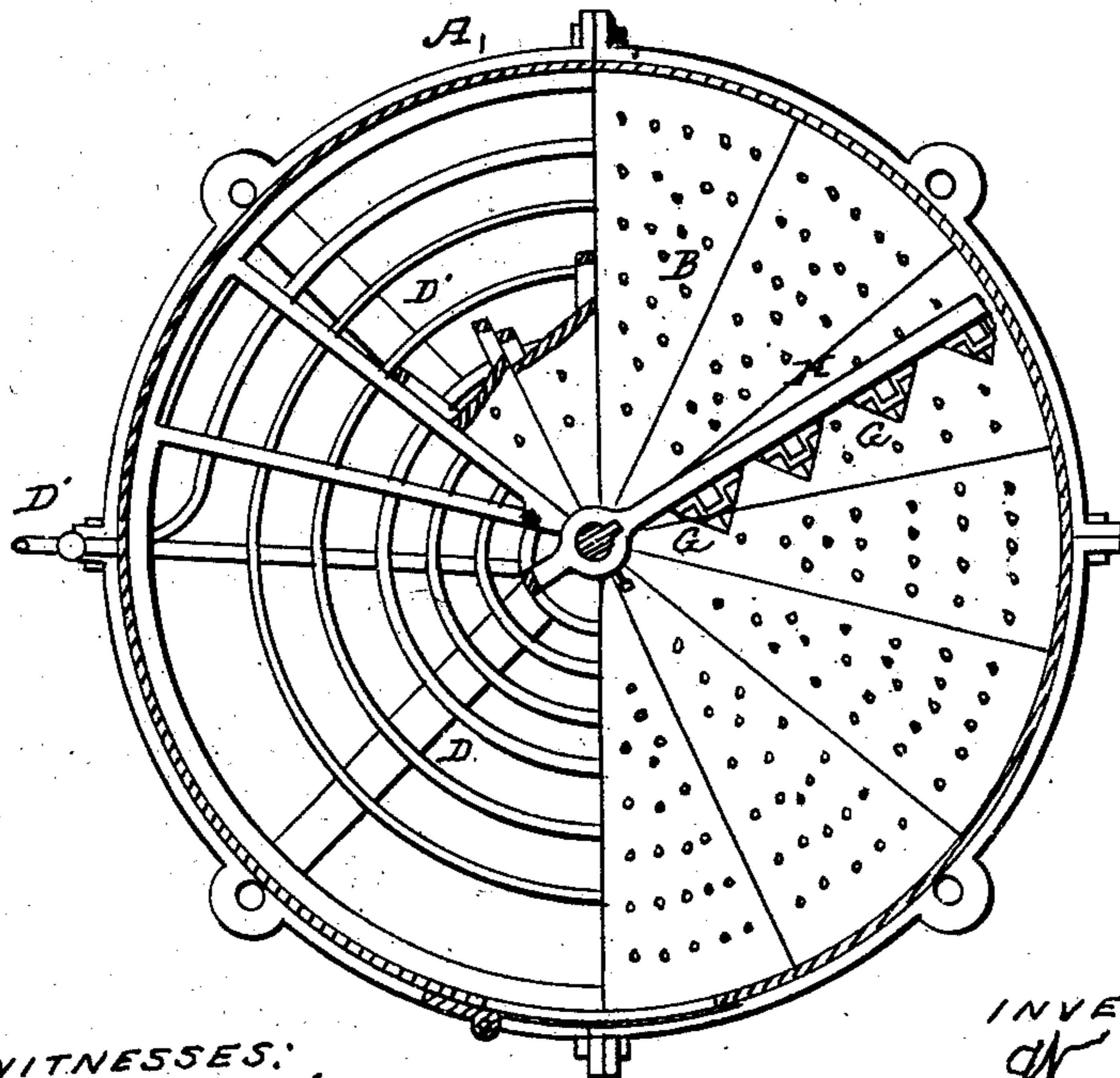


FIG. 3.



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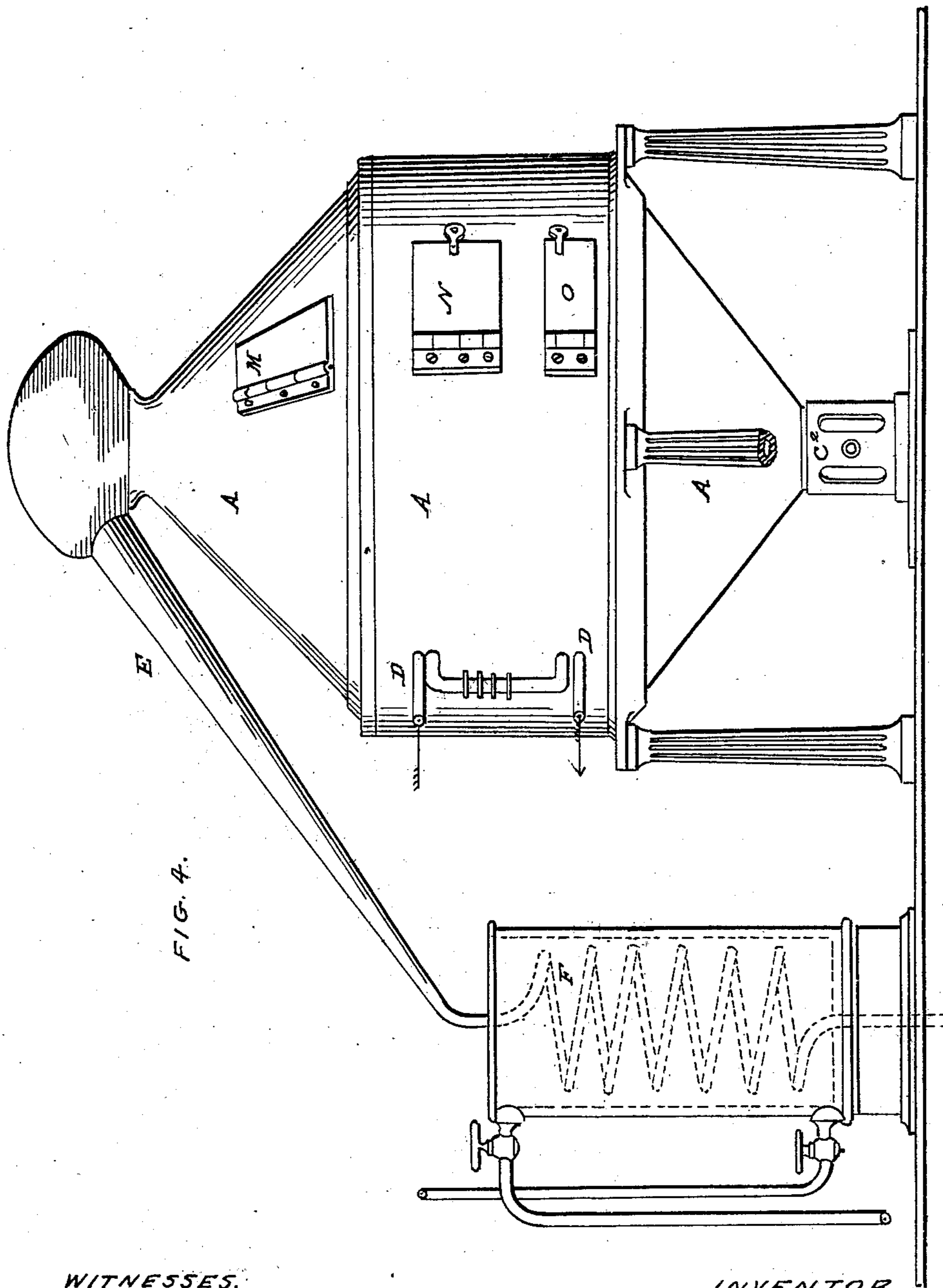
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3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

WILLIAM BLAKEY, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN MALT-KILNS.

Specification forming part of Letters Patent No. 69,534, dated October 8, 1867.

*To all whom it may concern:*

Be it known that I, WM. BLAKEY, of the city and county of Baltimore, and State of Maryland, have invented new and useful Improvements in Malt-Kilns; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which are made part of this specification.

This invention relates to the kilns in which barley is dried after steeping in the process of malting or drying any wet grain.

My invention consists chiefly, first, in the provision of mechanical means for stirring and turning the barley or other grain while under the action of the heat within the kiln, hand turning and stirring being the most laborious and arduous work in this process, as heretofore conducted; secondly, in novel means for heating, whereby I am enabled to produce the more rapid saccharification of the grain and avoid loss of alcohol by evaporation and of sugar by acidulation.

Figure 1 is a vertical central section of a malt-kiln embodying my improvements. Fig. 2 is a horizontal section of the same in the plane indicated by the line *x x*, Fig. 1. Fig. 3 is a section on the line *y y*. Fig. 4 is an elevation of the kiln and condenser.

Similar letters of reference indicate corresponding parts in the several figures.

A represents the shell or casing constituting the body of the kiln, the upper and lower portions of which may be conical, while the central intermediate part may be cylindrical, as shown in Figs. 1 and 4 of the drawings. The casing is preferably of galvanized iron, as this material conserves and economizes the heat.

B is a perforated floor suitably supported within the kiln A, at or near the mid-height thereof. The grain being placed upon this floor is dried by the conjoint action of the heat of the furnace C and of the steam-pipes D D'. The vapors emanating from the grain may be distilled by means of the worm E, which communicates with the top of the still and conveys the vapors to the condenser F, Fig. 4.

C' represents the pipe affording communication between the furnace and the kiln, the heat being controlled by the register C<sup>2</sup>, where-

by cool air is admitted in any desired quantity to the interior of the kiln or entirely excluded, as occasion may require.

The heating surface or capacity of the upper steam-coil, D, may be double that of the lower coil, or equal thereto. By having the upper heating-surface great than the lower the increased rarefaction above produces a constant upward current of air and carries off any condensed vapors which might otherwise return and settle upon the grain. The provision of this increased heating-surface above also reduces the atmospheric pressure upon the grain, prevents the contraction of the latter, and superinduces the more rapid saccharification. This advantage in a great degree arises from the heating appliances independently of the double heating capacity above, as the means are such as to insure more rapid formation of sugar, and by carrying off the aqueous vapors constantly and freely avoid all danger of acidulous fermentation.

G G G may represent a series of plows or stirrers adjustably attached to radial arms H H H, which join a common hub, I, which is keyed to the vertical central shaft, J. This shaft carries a bevel-gear wheel, K, with which meshes the bevel-pinion L, whose shaft L' carries at its outer end a pulley, L<sup>2</sup>, upon which works a band driven by an engine. This arrangement, or any substantially equivalent mechanical means, enables the plows to be regularly and more effectually kept in motion, preserving the level of the grain, while keeping it well stirred and detaching the germs.

The grain may be introduced through the door M and removed from the kiln through the door N.

The plows may be so set or adjusted as to throw the grain in one direction. Hence they may be made to discharge the grain through the opening left by the removal of one of the sections composing the floor B, a chute being placed so as to receive the grain and conduct it out through the lower door, O. A hand-hole for inspection may be employed.

The stirring apparatus may be used in connection with the furnace without the steam, or the steam may form the sole heating medium. A common ventilator may be substituted for the worm. The sheet-iron, of which the shell

of the kiln is composed, may be corrugated to oppose greater strength in case of expansion or contraction.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The provision, in a malt-kiln, of mechanical appliances for stirring the grain, substantially as set forth.

2. The combination of one or more steam-pipes and a furnace for supplying heat in a

malt-kiln or grain-drier, substantially as and for the purpose set forth.

3. The combination, with a malt-kiln, of the worm E and condenser F, substantially as and for the purpose described.

4. A galvanized iron casing in a malt-kiln, for the purposes set forth.

WM. BLAKEY.

Witnesses:

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J. E. M. BOWEN.