

V. NOBACK.  
MALT-KILN AND GERMINATOR.

No. 176,406.

Patented April 18, 1876.

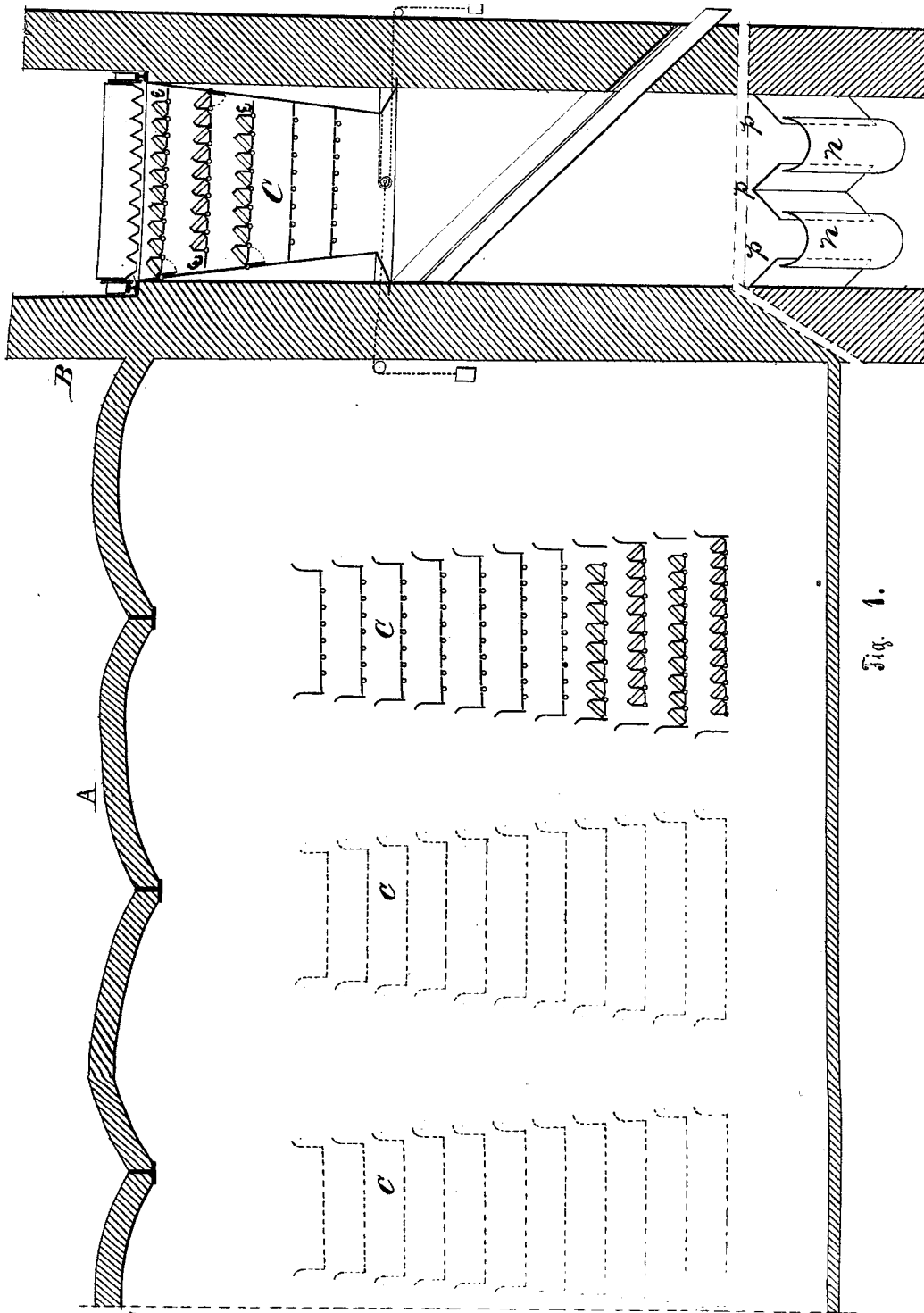


Fig. 1.

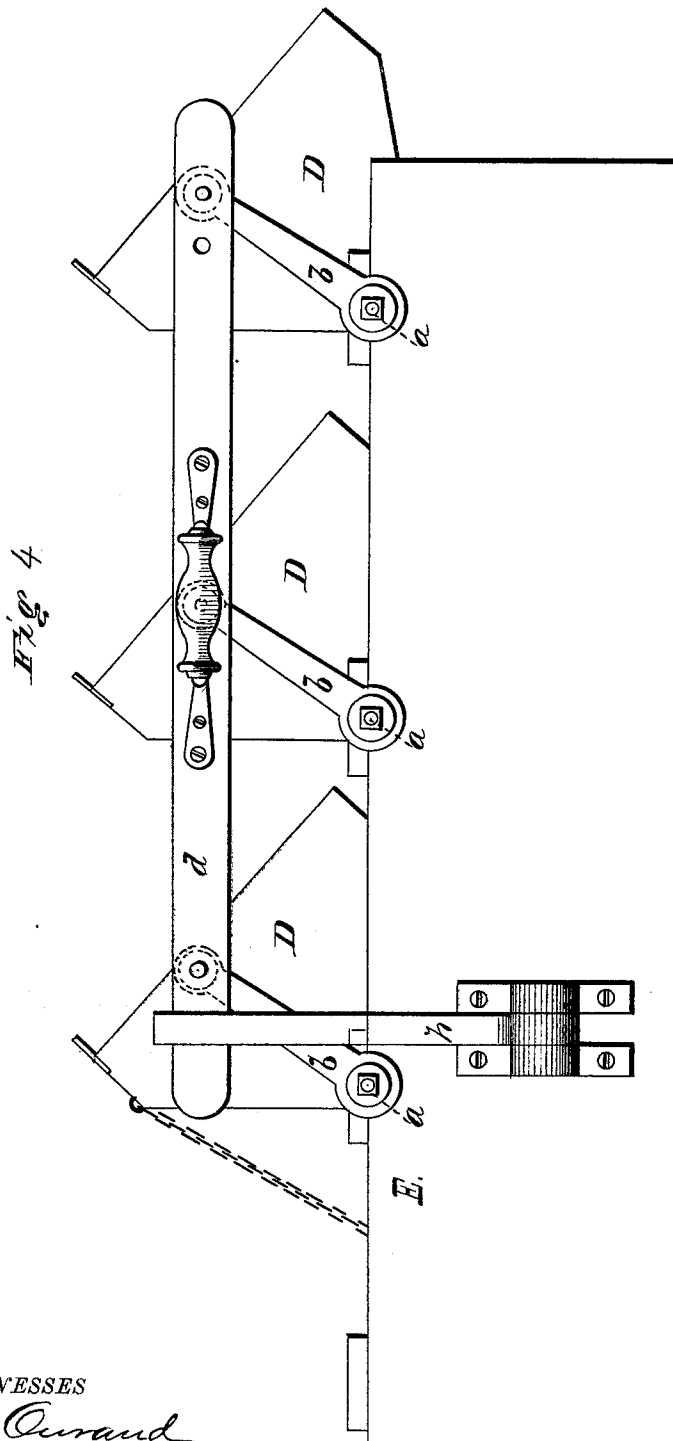
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*Prag* Inventor;

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MALT-KILN AND GERMINATOR.

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WITNESSES

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# UNITED STATES PATENT OFFICE.

VICTOR NOBACK, OF PRAGUE, AUSTRIA.

## IMPROVEMENT IN MALT KILNS AND GERMINATORS.

Specification forming part of Letters Patent No. **176,406**, dated April 18, 1876; application filed January 22, 1876.

*To all whom it may concern:*

Be it known that I, VICTOR NOBACK, of Prague, Empire of Austria, have invented an Improved Method and Apparatus for the Preparation of Malt, of which the following is a specification:

My invention relates to the preparation of malt for brewers' use; and it consists in the construction and arrangement of the germinating-chamber, the kiln for drying, and the various devices therein, as will be hereinafter more fully set forth.

In the annexed drawings, forming part of this specification, Figure 1 is a longitudinal vertical section of the germinating-chamber and drying-kiln. Fig. 2 is an enlarged section through one of the floors. Fig. 3 shows modifications of the construction of the floors, but involving the same principle. Fig. 4 is a side elevation, showing devices for operating the troughs.

A represents the germinating-chamber, in which the process of germination of the malt takes place; and B is the kiln, in which the germinated malt is afterward dried. Both of these are provided with a series of floors or trays for holding the malt, placed one above the other, as shown.

It is well known that during the process of germination the mass of grain increases in volume, or swells—oftentimes up to seventy-five per cent.—and that during the process of drying it is reduced nearly to its original volume. It is also found by experience that to obtain good malt it is necessary to treat the same in layers of as near equal thickness as possible, and that the grain must be often turned and stirred.

In view of these facts, and to accomplish the object intended, I have constructed the floors or trays C in the germinating-chamber A of gradually-increasing width from top to bottom, so that as the barley swells during the process of germination, and is turned from one floor or tray to the next one below, the size of the latter will compensate for the increase in volume, and allow the grain to be spread thereon in a layer of about the same thickness as it was on the upper tray. In the kiln B this order is re-

versed, or, in other words, the floors or trays gradually diminish in size for the same purpose, as in this case the mass of grain contracts the farther the process of drying is proceeded with.

In the germinating-chamber the floors or trays are arranged in two or more series or columns, as shown in Fig. 1, leaving a space around each series for the free circulation of air, for the purpose of carrying off all carbonic-acid gas set free during the process of germination.

The farther the process of germination advances the oftener the grain should be turned. To accomplish this object without any material increase in the number of floors or trays, which would necessitate a very high germinating-chamber, I construct a certain number of the lower floors or trays in the following manner: Each of these floors or trays consists of a series of V-shaped troughs, D D, hung upon pivots at their angles in a frame, E, and one of the pivots *a* of each trough provided with a crank, *b*, and all of said cranks connected by a connecting-bar, *d*. These troughs are so arranged that whichever direction they are turned in, one side will be horizontal for supporting the grain. When these troughs are turned or canted the grains fall from one side to the other, and are thereby turned, so that other parts of their surface will become exposed and the grains also separated. This turning or canting may be repeated as often as considered necessary.

The same kind of canting-troughs are used in the upper floors or trays of the kiln; and in this case the troughs nearest the walls are provided with wings *e*, of imperforate sheet metal, to prevent the hot air from rising at the side of the tray. Provision is made for emptying the troughs by tray-door *d*.

The remaining floors of both the germinator and kiln are of the well-known tilting form—that is, they have flaps or doors, turning upon pivots, for emptying the grain to the floor or tray below.

In the germinator the floors or tray may be made of wood or other suitable material, while in the kiln they are to be made of any kind of

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SKIRT-SUPPORTER.

No. 176,407.

Patented April 18, 1876

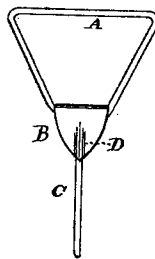


Fig. 1.

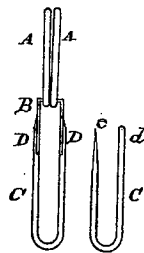


Fig. 2.

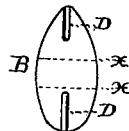


Fig. 3.

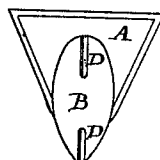


Fig. 4.

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