

No. 624,245.

Patented May 2, 1899.

W. H. PRINZ.
MALT HOUSE.

(Application filed Oct. 4, 1897.)

4 Sheets—Sheet 1.

(No Model.)

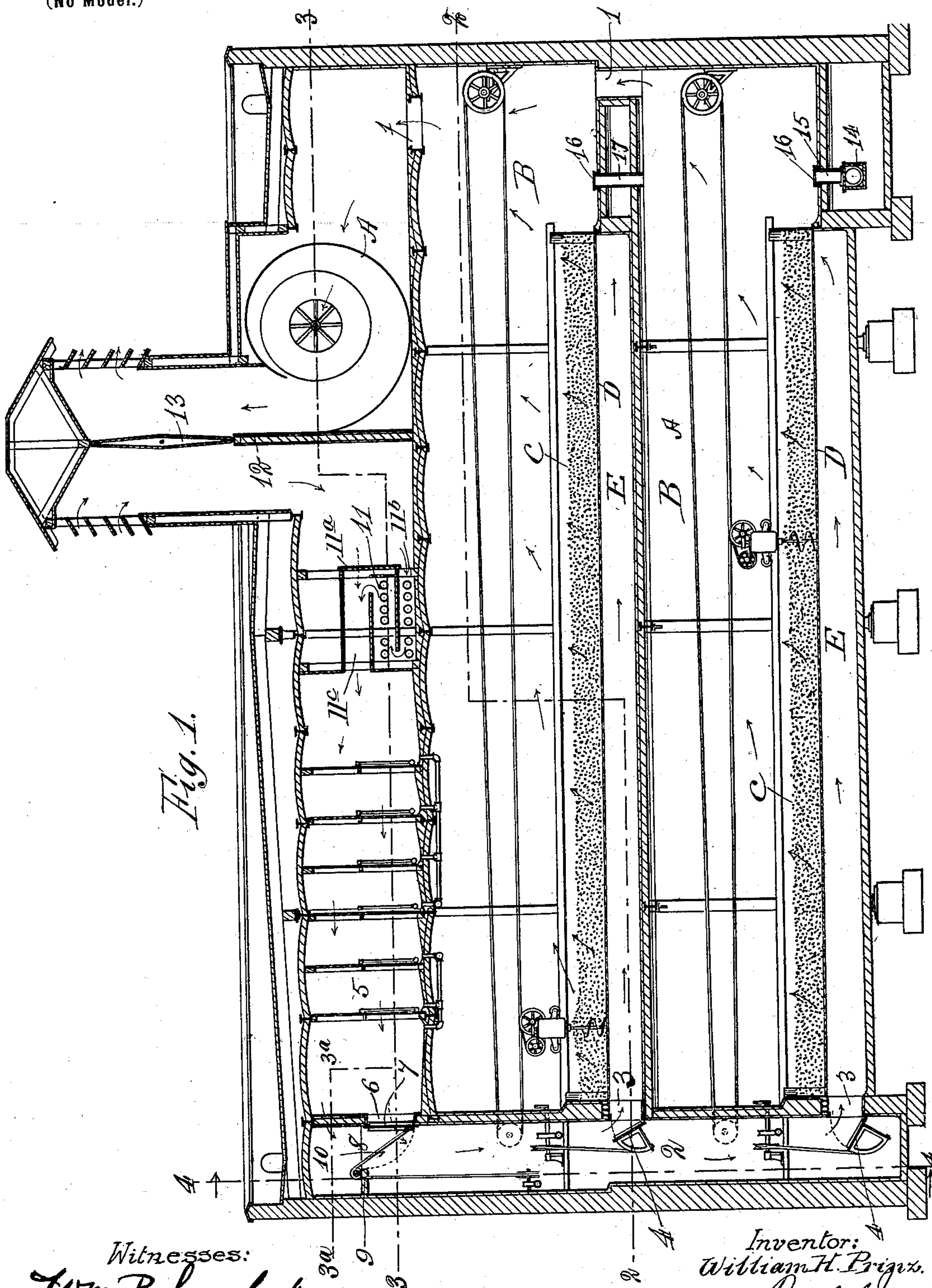


Fig. 1.

Witnesses:
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Inventor:
William H. Prinz.
By *Rudolph M. [Signature]*
Att'y

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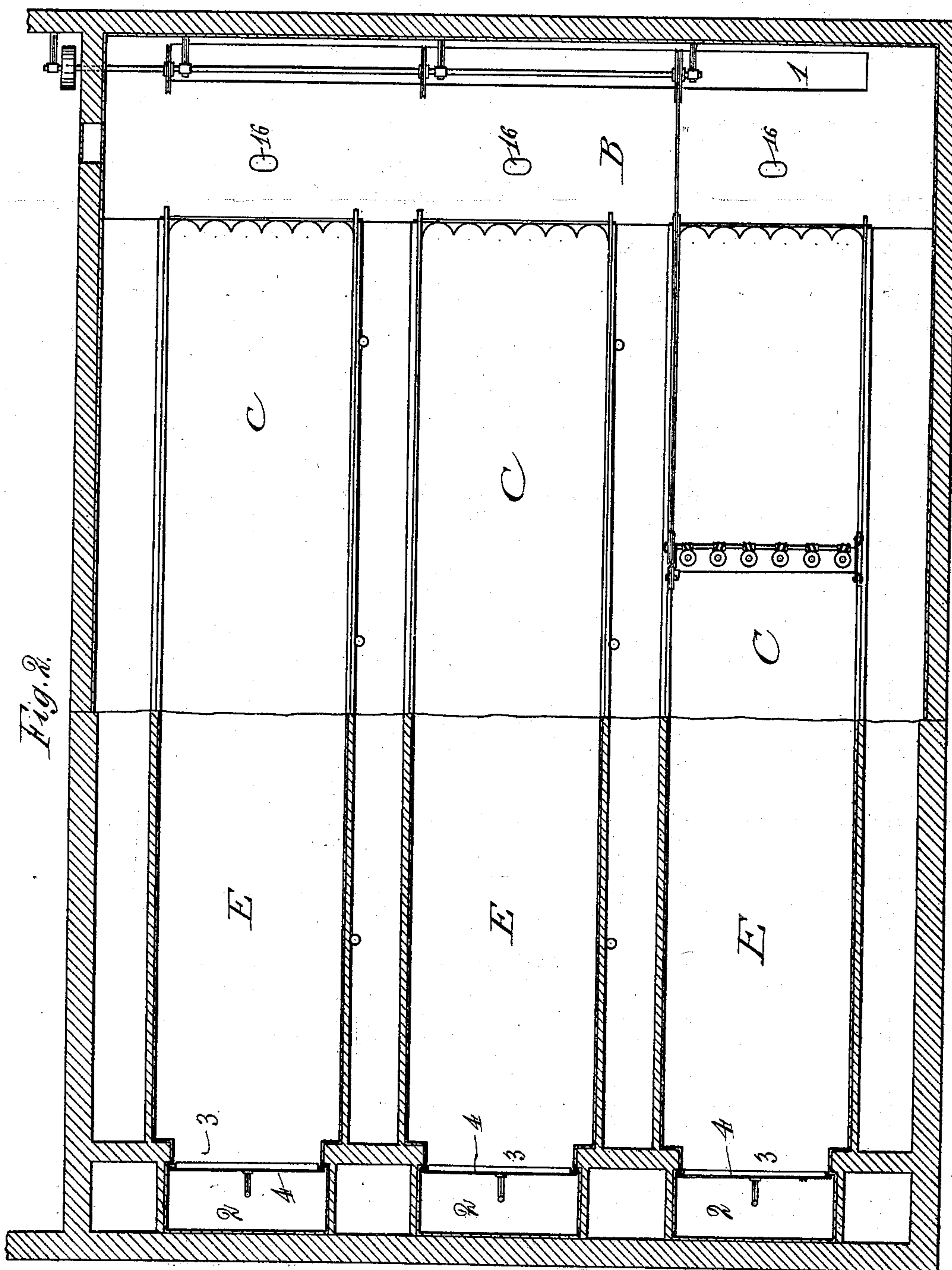
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4 Sheets—Sheet 2.



Witnesses:

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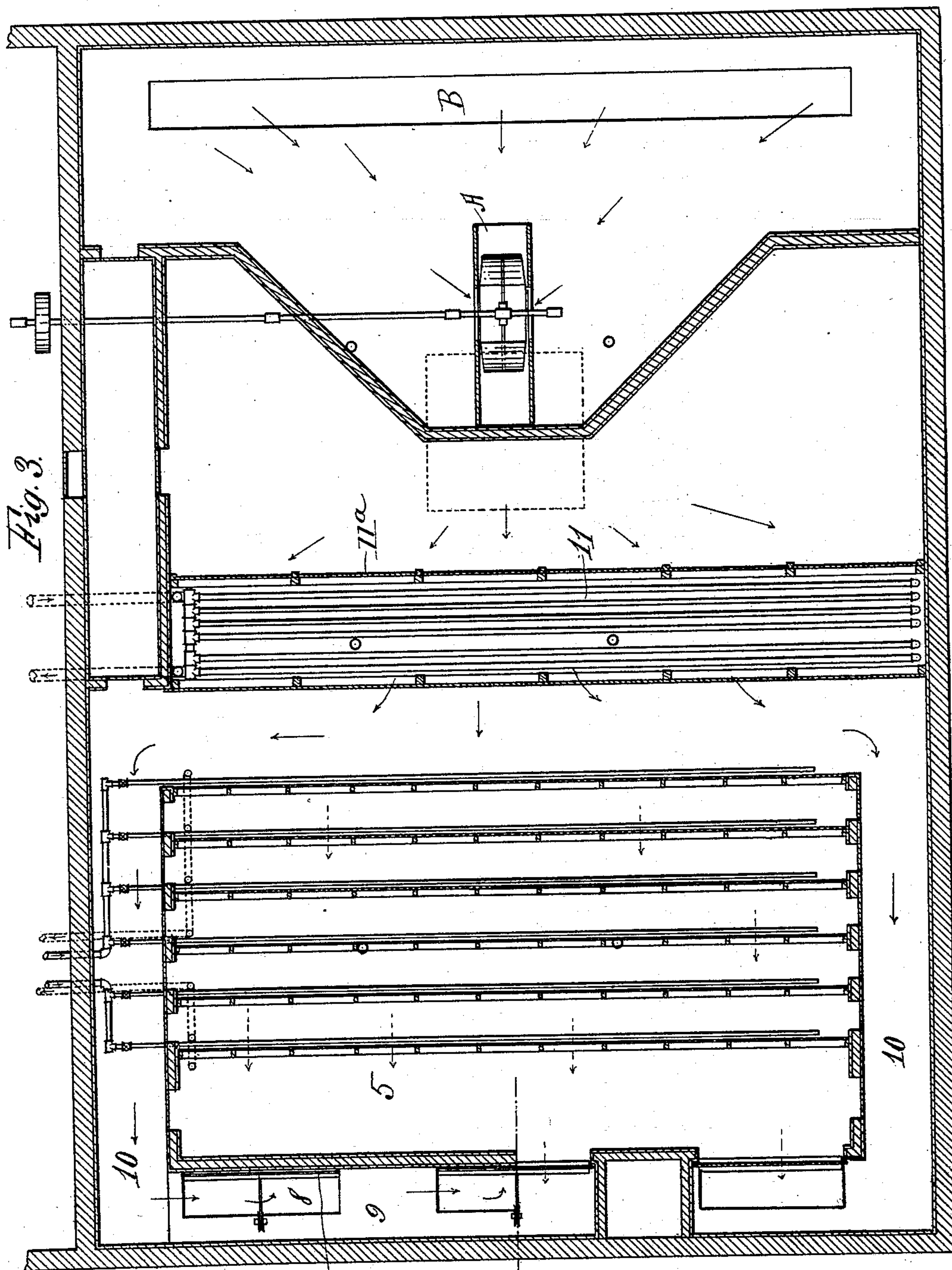
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(No Model.)

4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

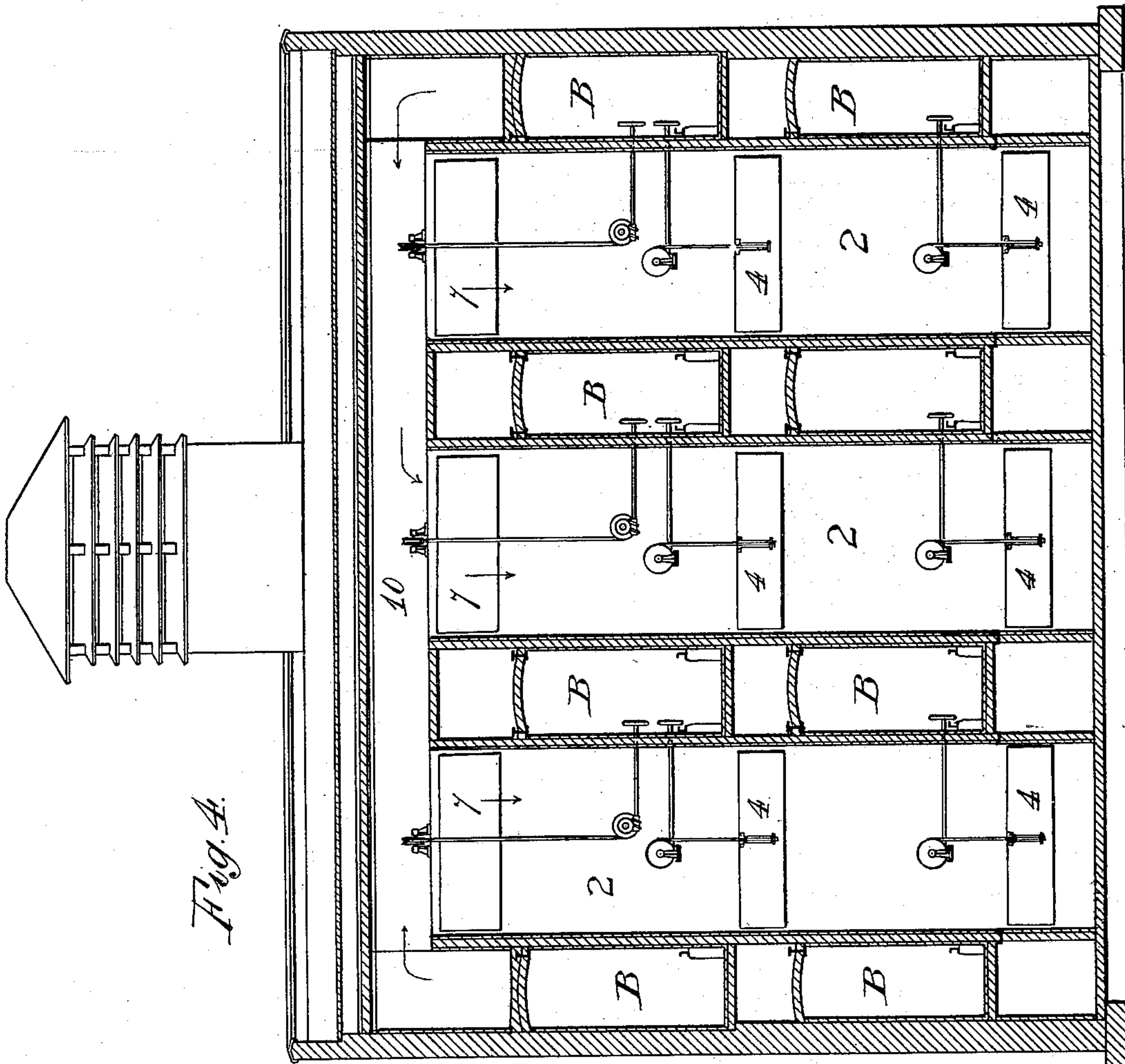


Fig. 4.

Witnesses:

Wm B. Snowhook
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UNITED STATES PATENT OFFICE.

WILLIAM H. PRINZ, OF AUSTIN, ILLINOIS, ASSIGNOR TO THE SALADIN PNEUMATIC MALTING CONSTRUCTION COMPANY, OF CHICAGO, ILLINOIS.

MALT-HOUSE.

SPECIFICATION forming part of Letters Patent No. 624,245, dated May 2, 1899.

Application filed October 4, 1897. Serial No. 654,063. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PRINZ, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Malt-Houses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a novel construction in a malt-house, the object being to provide a device of this description in which the air can be delivered to the malt in any desired condition to obtain the best results; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical longitudinal section of a malt-house constructed in accordance with my invention. Fig. 2 is a horizontal section of same on the line 2 2 of Fig. 1. Fig. 3 is a sectional view of same on the line 3 3 of Fig. 1 and partially on the line 3^a 3^a. Fig. 4 is a vertical transverse section on the line 4 4 of Fig. 1.

In this construction of malt-house I employ what is termed "upward ventilation"—that is, the air is passed upward through the malt in the compartments. To this end I employ a suction-fan A, whose suction end is connected with the germinating-room B through the passage 1. By means of this fan I create a partial vacuum in the germinating-room, and owing to the size of the latter it will be obvious that said partial vacuum will be equal in all parts. The air rushing to fill this vacuum must pass equally through all parts of the mass of grain, thus malting said grain uniformly throughout.

Each of the malting-compartments C is provided with a perforated floor D in the usual manner and with an air space or passage E underneath the perforated bottom D, which communicates with the air-shaft 2 through an opening 3, controlled by a valve 4, which is operated from the germinating-room.

In this construction of malt-house I provide, preferably, a plurality of germinating-floors,

one above the other, in which the compartments are in vertical alinement, and connect the air-spaces underneath each set of said compartments in vertical alinement with a vertical air-shaft 2, which is divided from the air-shafts communicating with the adjacent compartments. Said air-shafts 2 communicate with the air temperating and moistening chamber 5 through openings 6, controlled by valves 7, pivoted above said openings and also controlling openings 8 in a horizontal partition 9, which divides said air-shafts 2 from the passage 10, extending around the chamber 5 and communicating with the stack through the attemperor 11. The said attemperor 11 is controlled by the valve 11^a, which is adapted to be operated to shut off the passage 11^b and open the passage 11^c, whereby the air would avoid the attemperating-passages in an obvious manner. When said valves are in the position shown in Fig. 1, it will be obvious that the air instead of being drawn through the chamber 5 will follow the passage 10, Figs. 3 and 4, and pass through the opening 8 into the air-shaft 2, thence into the spaces underneath the compartments which communicate with said air-shaft, thence through the malt in said compartments into the germinating-room, and thence to the exhaust-fan, while if said valve 7 is turned on its pivot so as to uncover said opening 6 and close said opening 8 the air will be obliged to pass through the chamber 5, thus becoming moistened before passing on its course, as above described. The valve 7 could, obviously, also be set in other positions to cause the air to pass partially through the chamber 5 and partially through the passage 10. In this manner I am enabled to control the condition of the air delivered to the grain in a very simple and efficient manner, and by means of the valves 4 I can control the quantity of the air. It will also be apparent that by means of said separate air-shafts 2 and said valves 7 I am enabled to pass moist attempered air through the malt in the compartments communicating with one of said shafts 2 and dry attempered air through the malt in the compartments communicating with another of said air-shafts 2, while

through the malt, in still another set of said compartments, I can pass a mixed air. This it has been impossible to do heretofore, and I am enabled to accomplish this result only
 5 by means of upward ventilation unless the germinating-rooms be divided by partitions extending from floor to ceiling and communicating with said air-shafts 2 above the malt in the compartments. This modification I
 10 have not shown, as I consider it unnecessary.

The delivery end of the fan A is connected with the stack, which is provided with a partition 12, dividing it into two parts, one of which forms the air-inlet and the other of
 15 which serves as the air-outlet. The said partition 12 extends only partially up through the stack, and the opening above the same is occupied by a valve 13, which is adapted to be turned to cause the air or a part of it
 20 which would otherwise pass out to pass into the inlet end of the stack and thence again through the malt, as is sometimes desirable.

The green malt when finished is transported to the kiln by means of the conveyer 14, extending underneath the floor of the lower-
 25 most germinating-room and communicates with the latter through pipes 15, adapted to be closed by means of covers 16. In vertical alinement with said pipes 15 are pipes 17,
 30 passing through the floor of the upper germinating-room, through which the malt on said upper floor is adapted to pass. Said pipes 15 and 17 are adapted to be connected by removable pipes, which I have not shown,
 35 so that the grain from the upper germinating-room will pass directly into the conveyer 14. In this manner I am enabled to dispense with a separate conveyer for each floor.

The operation of my malt-house is as follows: The suction-fan A obviously creates a
 40 partial vacuum in the germinating-rooms B, with which its inlet end communicates through the openings 1. This partial vacuum is communicated to the spaces underneath
 45 the perforated floors of the compartments through the malt in such compartments, thus causing the air to pass upwardly through the malt on its way to the fan. The said spaces communicate through valve-controlled open-
 50 ings 3 with vertical air-shafts 2, which in turn communicate through valve-controlled openings with an air moistening and attemperating chamber 5, and with a passage 10 around
 55 said chamber 5, so that the air can be drawn into said shafts either from said chamber 5 or passage 10, as may be desired. Said chamber 5 and passage 10 communicate with the attemperating apparatus 11, which is inter-
 60 posed between said chamber and passage and the stack through which the air enters. The passages and valves controlling the same are so arranged, as hereinbefore described, as to enable the maltster to cause either dry or moist attemperated air to pass through any
 (5 one, all, or several of said compartments to cause dry attemperated air to pass through one or several compartments and moist at-

temperated air to pass through the remaining compartments, to wit: If it is desired to pass
 70 dry attemperated air through the middle compartment on each floor, the valve 7, controlling the middle air-shaft 2, would be turned to close the middle opening 6, which establishes communication between the air-moistening chamber 5 and said middle air-shaft 2. 75
 This would obviously leave the opening 8 free, and thus the air would be drawn into said middle shaft 2 from the passage 10, into which it is drawn from the attemperating devices 80
 11, without passing through the moistening-chamber 5, thus remaining dry. If at the same time it were desired to pass moist attemperated air through either of the outer compartments, the valve 7, controlling the in-
 85 lets to the shaft 2, feeding said said compartments, would be turned to close the opening 8, thus shutting off communication with the passage, so that the air fed to said shaft 2 would be obliged to pass through the cham-
 90 ber 5, where it is moistened. Again, if it were desired to supply a partially-moistened air to the other outer compartments the valve 7, controlling the shaft 2, feeding said compartments, would be turned so as to leave
 95 both openings 6 and 8 free, thus causing partially-dry and partially-moist air to pass into said shaft and thence through the malt in the compartments fed from same. This air would obviously mix during its passage, thus forming a partially-moist instead of saturated or
 100 dry air. Thus at the same time I am enabled to pass air in three conditions separately through three different sets of compartments.

I claim as my invention— 105

1. In a malt-house, the combination with a germinating-room divided into a plurality of malting-compartments, and a chamber containing air attemperating and moistening apparatus, of means for passing air through
 110 said attemperating apparatus and through said moistening apparatus and through the malt in said compartments, and means for connecting each of said compartments independently with said attemperating and moistening apparatus or either, whereby the malt
 115 in all of said compartments can be simultaneously ventilated with air of different qualities, substantially as described.

2. In a malt-house, an air-inlet, a passage
 120 connecting said inlet with an air moistening and attemperating chamber, a passage extending around said moistening and attemperating chamber, an air-shaft, openings establishing communication between said moistening and attemperating chamber and said
 125 air-shaft and between the latter and said passage around said attemperating-chamber, a single valve common to both said openings, valve-controlled openings establishing communication between said air-shaft and air-
 130 passages underneath the malting-compartments, and a suction-fan connected at its inlet end with the germinating-room and at its

outlet end with the stack, whereby the air is caused to pass upwardly through the malt, substantially as described.

3. In a malt-house, a germinating-room containing a plurality of malting-compartments, a chamber containing air-attemperating and air-moistening apparatus, means for passing air through either of said apparatus or both, means for independently connecting each of
5 said compartments with said last-named chamber, and valves interposed in said connections, whereby each malting-compartment can be connected with either or both said apparatus in said last-named chamber and all
10 of said compartments simultaneously ventilated with air of different qualities, substantially as described.

4. In a malt-house, an air-inlet, an air-attemperating chamber communicating therewith, an air-moistening chamber communicating with said attemperating-chamber, a plurality of separate air-shafts communicating with said moistening-chamber and adapted to feed air-shafts underneath the malting-
25 floors, and communicating with said attemperating-chamber independently of said moistening-chamber, valves controlling said connections, whereby moist air can be caused to pass through malt in compartments fed from
30 one air-shaft and dry air through malt in compartments fed from another shaft and means for forcing air through said shafts and through the malt in said compartments.

5. In a malt-house, a germinating-room divided into a plurality of compartments, provided with air-shafts underneath the same, openings establishing communication between said compartments and vertical air-shafts, and with a suction-fan, means for establishing communication between each of
40 said vertical air-shafts and an air-moistening chamber and independent means for establishing communication between said air-shafts and an air-attemperating chamber, and valves
45 controlling such communication, whereby air of different quality can be passed through the

malt in different compartments at the same time.

6. In a malt-house, a plurality of germinating-floors situated one above the other and divided into a plurality of compartments having perforated floors whereby each of said compartments is divided horizontally to form air-shafts one of which communicates with a suction-chamber and the other of which communicates with a vertical air-shaft connecting similar divisions of compartments on all of said floors in vertical alinement with each other, with an air-moistening chamber and with an air-attemperating chamber, and an independent passage establishing communication between the attemperating-chamber, and the air-shafts and valves controlling the flow of attemperated air through or around the moistening-chamber, whereby air of different quality can be passed through the malt in different compartments on each of said floors at the same time.

7. In a malt-house, an air-attemperating chamber, an air-moistening chamber communicating therewith, a passage connecting said attemperating-chamber with vertical air-shafts and by-passing said moistening-chamber, openings establishing communication between said moistening-chamber and said air-shafts, a single valve in each of said air-shafts controlling the communication between the same and said moistening-chamber and passage, whereby either moist or dry air can be simultaneously supplied to different air-shafts, malting-compartments having horizontal air-shafts underneath and communicating with said vertical air-shafts, and means for causing air to pass from said air-shafts through the malt in said compartments.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. PRINZ.

Witnesses:

RUDOLPH WM. LOTZ,
WM. B. SNOWHOOK.