

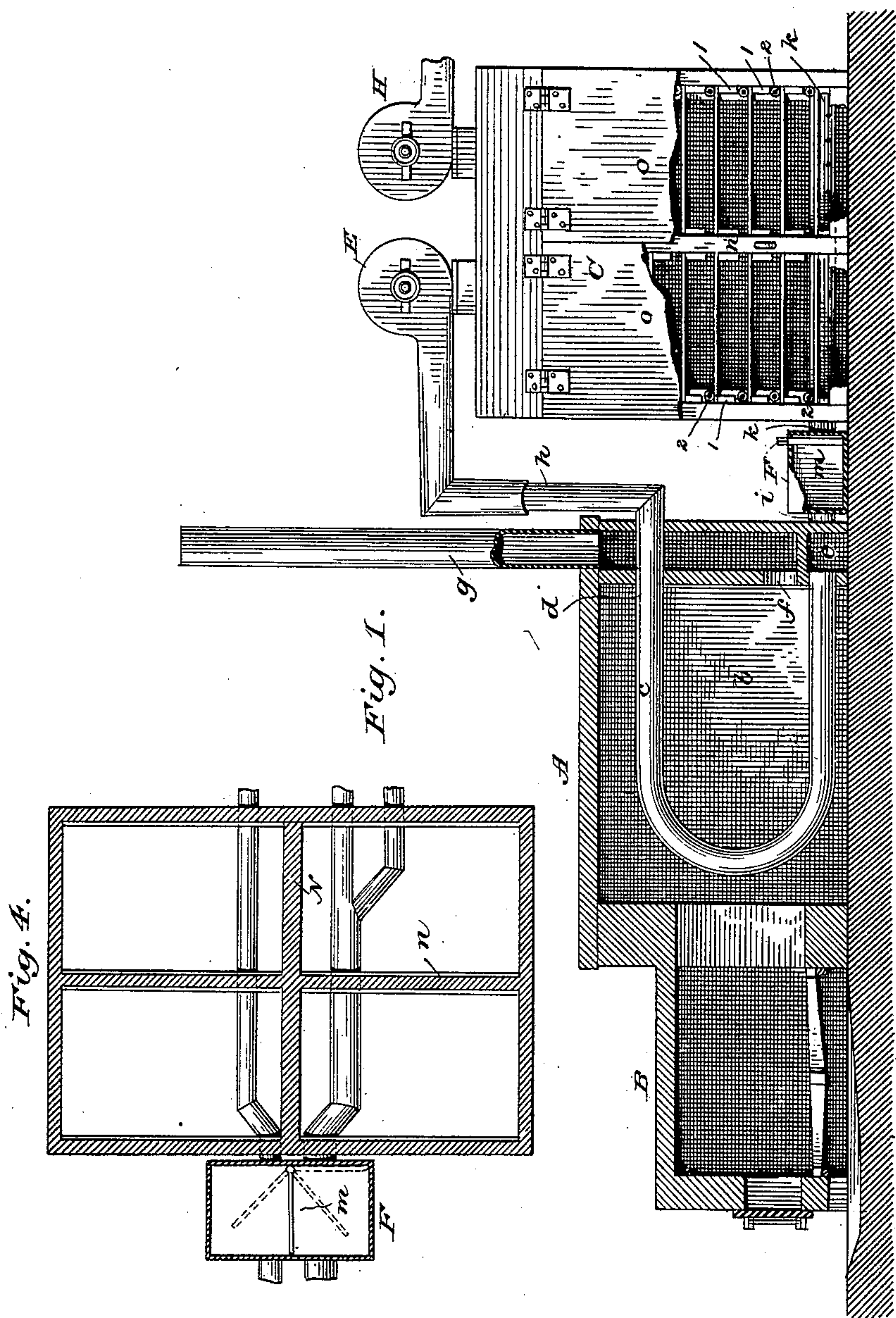
(No Model.)

2 Sheets—Sheet 1.

E. V. WINGARD.
Drier.

No. 231,133.

Patented Aug. 10, 1880.



Attest:

R. F. Barnes.
[Signature]

Inventor:

Edwin V. Wingard
by *[Signature]*
Attorney

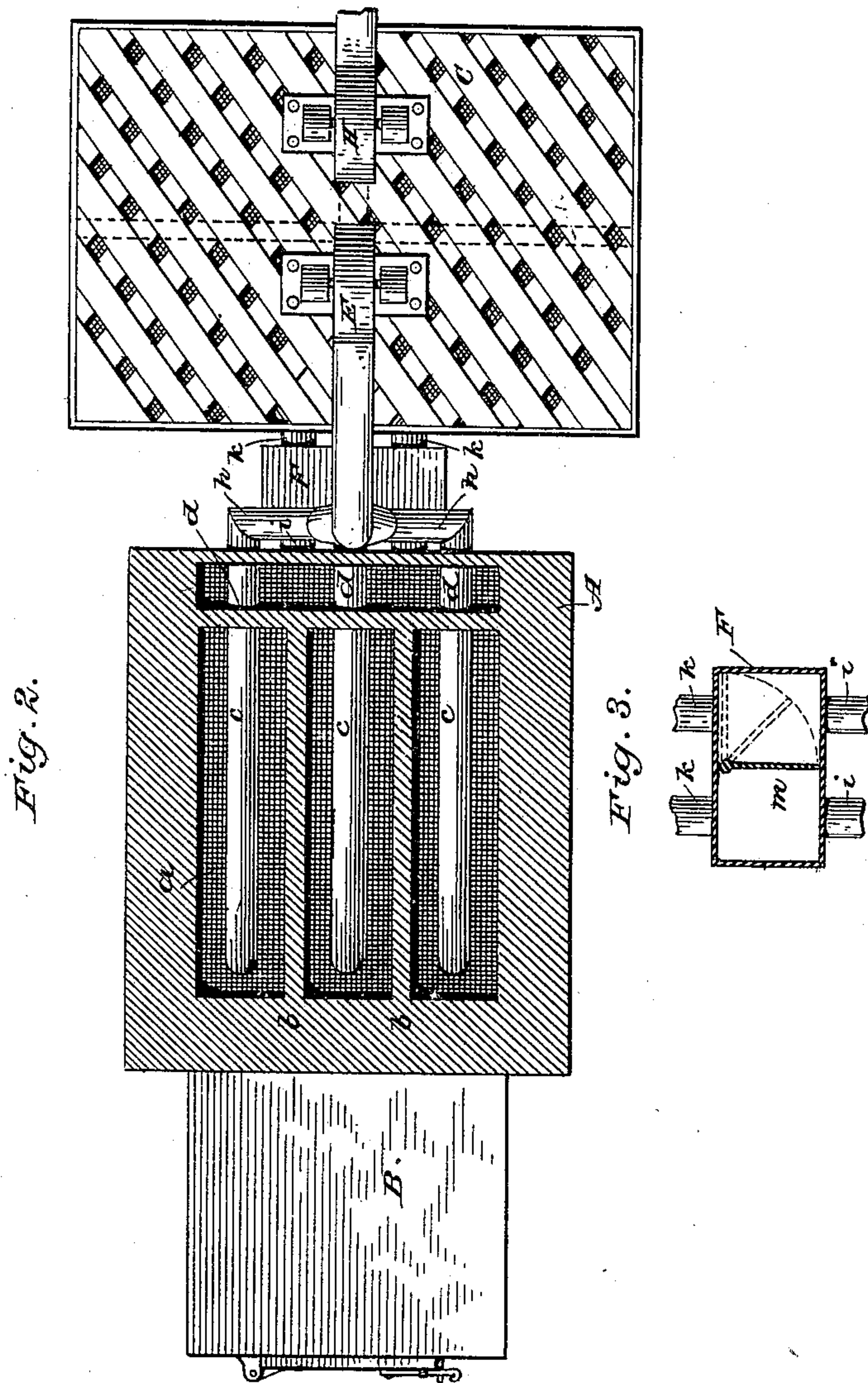
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Edwin V. Wingard
by *Ellis Spear*
Attorney.

UNITED STATES PATENT OFFICE.

EDWIN V. WINGARD, OF VINCENNES, INDIANA.

DRIER.

SPECIFICATION forming part of Letters Patent No. 231,133, dated August 10, 1880.

Application filed March 15, 1880. (No model.)

To all whom it may concern:

Be it known that I, EDWIN V. WINGARD, of Vincennes, in the county of Knox and State of Indiana, have invented a new and useful Improvement in Driers; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to drying apparatus of the same general class as that shown in application filed by me on the 25th day of October, 1879, and now pending in the Patent Office.

The object of my invention is to simplify the apparatus and render it more efficient in use.

It consists of certain details of construction hereinafter fully set forth, and particularly indicated in the claims.

In the drawings hereunto attached, Figure 1 represents the apparatus partly in side elevation and partly in section. Fig. 2 is a top view of the drier with the heating apparatus in horizontal section. Fig. 3 represents the switch. Fig. 4 is a plan view of the drying-chamber.

In these drawings, A represents the chamber in which the air is heated; B, the furnace, and C the drier. The furnace consists of a gas-chamber, *a*, which may be divided, if desired, into compartments by means of the partitions *b b*, extending vertically from end to end. Within this gas-chamber I arrange air-pipes *c c*, preferably in separate series, entering above, as shown at *d d d*, and connected below to the hot-air conducting-pipe *e*, through which the heated air is carried into the distributing-pipes in the drier. These heating-pipes are represented as extending back and forth once in the length of the gas-chamber or heater; but it is obvious that any number which may be desired of these bends or coils may be used. They are arranged lengthwise of the chamber, in line with the passage of the products of combustion, which products impinge against and surround the hot-air pipes, and impart to them their heat. The products of combustion escape from the chamber through openings *f* in the wall, and pass upward through chimney *g* into the open air.

The air-pipes at their cold ends are connected by branch pipes *h* to a blower or blowers, E,

which may be located on the top of the drier, as shown, or in any other convenient place.

As the drier in the construction shown by me is a double drier, formed with a partition dividing it into two independent sections, which it is desirable to use sometimes independently of each other, I have arranged between the heating apparatus and the drier a valve-chest, F. In the form shown in the drawings, this valve-chest is connected to the hot-air passage *e*, and thence to the pipes *c*, by means of two pipes, *i i*. On the opposite side of the valve-chest are two similar pipes, *k k*, leading into the drier. These pipes may be laid either above or below the floor, and are preferably cased in cement. They enter one on one side and the other on the opposite side of the longitudinal partition N. I do not, however, confine myself to any specific number of distributing-pipes in the drier.

Within the valve-chamber is a vertical valve, *m*, arranged to swing horizontally upon a pivot located at the rear wall of the valve-chamber next to the drier. The valve extends from top to bottom of the chamber, and when turned to extend directly across said chamber it allows the air to flow freely through both pipes and equally into both sides of the drier. When, however, it is turned slightly to one side, as shown in dotted lines, it shuts off partly one of the pipes *k* and permits the heated air to pass principally into the other side, and when turned against the side it compels the whole to pass into one side of the drier.

I prefer to have the drier located as close as possible to the air-heating chamber, it being necessary only to leave sufficient space for the valve-chamber between the two. The pivot of the air-valve extends through the upper wall of the valve-chamber, by means of which the valve may be operated in any convenient way.

The longitudinal partition N, referred to heretofore, is shown in Fig. 4. This partition, extending from bottom to top, in connection with the valves and duplicate pipes, makes the drier a double one, capable of being used with one side alone or with both together.

The valve being turned in the manner heretofore described, all the heat may be directed

into one side of the drier, and the operation of drying may be carried on there alone while the other side is discharging or filling; or a greater degree of heat may be directed to one side or the other, as circumstances may require.

Whether the drier be made double, as just described, or single, manifestly it may be subdivided at pleasure by the transverse partitions *n*, each one of these subdivisions being provided with a door, *o*. The drier may be made of any length, and any number of compartments or subdivisions may be made. These doors are hinged at their upper ends, and are adapted to swing upward and be held in that position by any suitable hooks or catches. They close upon and are fastened to the central partition, *n*, by means of staples and pins.

Ledges *l l* are fixed upon the sides of the drying-chamber for the purpose of holding the shelves upon which the material is to be placed. These subdivided compartments, when used for brick or tile, may be made to suit the owner, preferably about thirty inches wide by fifty-six inches deep, being arranged, as shown in the figure, across the main chamber. For lumber they may be of any size desired.

The main pipes *k* extend along near the central partition at the bottom of the chamber, and are provided with openings or branch pipes to supply the proper amount of heated air to each compartment. Connected with these main pipes I have also shown perforated branch pipes *22*, extending along the partition-walls between the shelves, in order to pass the heated air between the courses of material when it will bear very rapid drying.

The top of the drying-chamber may be made full of holes, or of lattice-work, as shown in the drawings, for the escape of the vapor and heated air; or an exhaust-fan, *H*, may be used for drawing off the air when the material to be dried will bear a very strong current.

The compartments are made entirely independent of each other, and charge or discharge at the side, and each is supplied by independent branch pipe or pipes or openings from the main pipe or pipes.

Any number of heaters and sections may be used, according to the pleasure of the owner.

This heating-chamber may be of any length

which may be desired, and have any number of compartments, and I do not limit myself to this special arrangement of hot-air pipe.

The switches may, if desired, be placed underneath the driers. I contemplate ordinarily using only a switch or set of switches between the drier and the air-heater; but another in some cases may be used to advantage, being located at a point about two-thirds of the way from the heater to the end of the drier. This may serve to turn a larger part or all of the current of air (at that point of less strength) to one side or the other, as circumstances may require.

The switches give the operator full control of the hot air, and he may thereby economize the use of it.

The pipes may extend along under the series of compartments either near the partition or near the middle of the sections, as may be found most convenient. If more rapid drying be required for one side, the pipe on that side may be made larger and divided into two branches, running through or beneath the compartments.

I do not claim, broadly, the combination of a blower and pipes passing through a heating-chamber to a bin or drying-chamber, such devices having been shown in grain-driers; but

What I claim as my invention is—

1. The heating-chamber *A*, having a furnace, *B*, connected therewith, and also smoke-passages, in combination with the pipes *c c*, connected to a suitable air-supply at one end and at the other with the drying-chambers, substantially as described.

2. The combination of the heating-chamber with the pipes *c c*, the connecting-passage *e*, main pipes *i i*, and smoke-passages, substantially as described.

3. The combination of the heating-chamber and air-pipes located therein with the valve-chamber and valve, the double drying-chamber, and the pipes connecting said parts, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN V. WINGARD.

Witnesses:

JAMES REYNOLDS, Jr.,
C. G. MATHESIE.