

(No Model.)

2 Sheets—Sheet 1.

I. UNGAR.  
KILN FOR DRYING WOOD.

No. 494,045.

Patented Mar. 21, 1893.

Fig. 4.

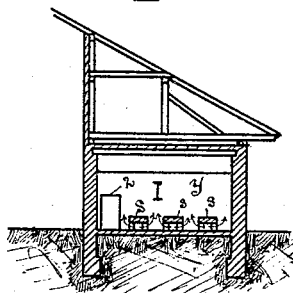


Fig. 5.

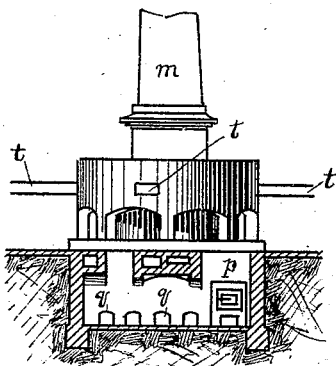


Fig. 6.

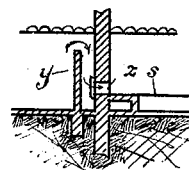
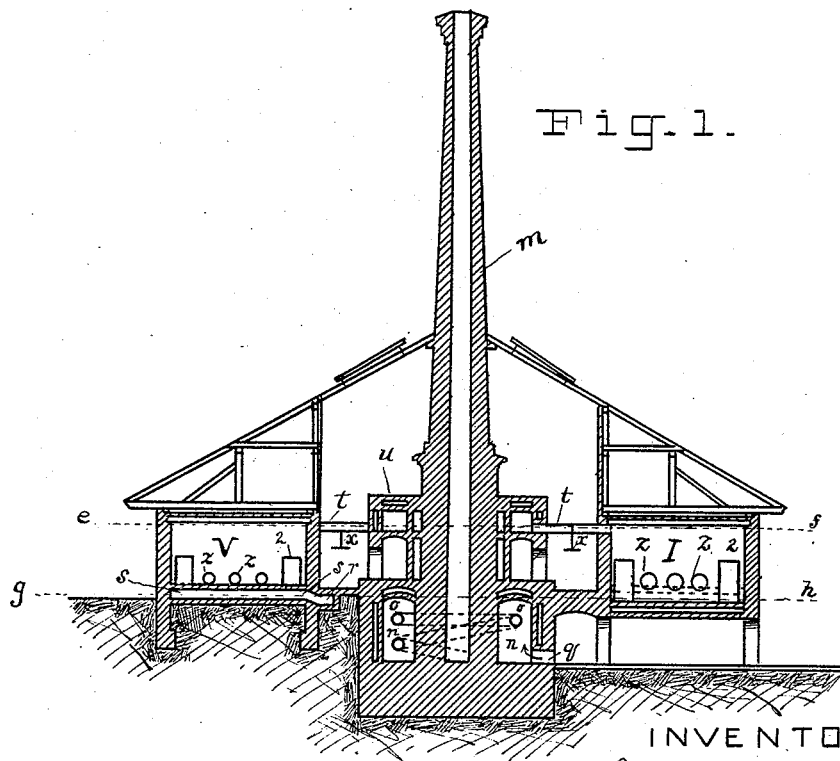


Fig. 1.



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Fig. 2.

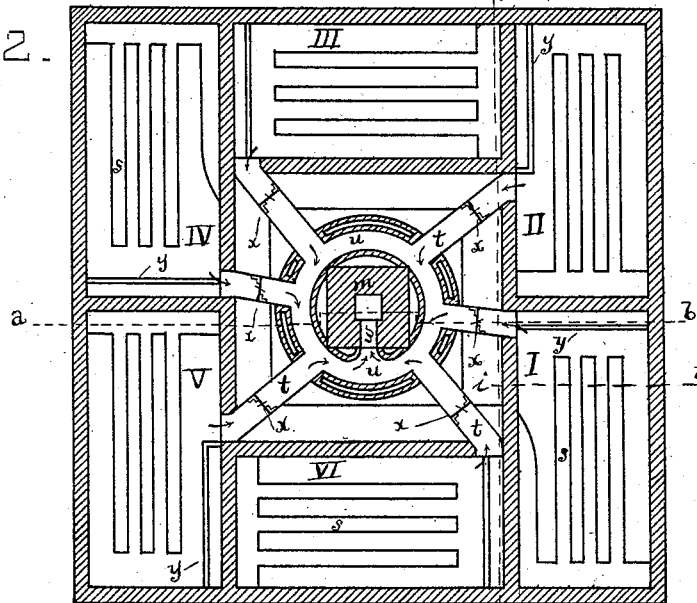
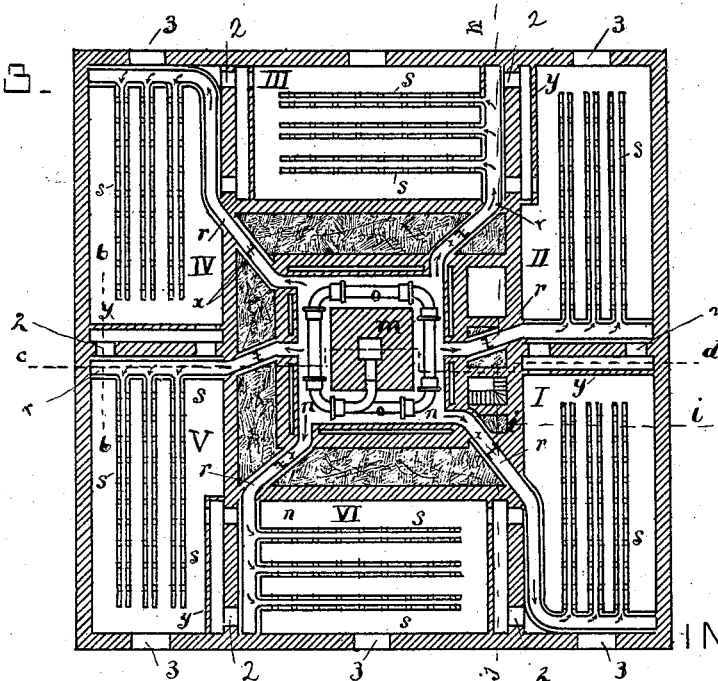


Fig. 3.



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Richardson  
his Attorneys.

# UNITED STATES PATENT OFFICE.

IGNATZ UNGAR, OF BUDA-PESTH, AUSTRIA-HUNGARY.

## KILN FOR DRYING WOOD.

SPECIFICATION forming part of Letters Patent No. 494,045, dated March 21, 1893.

Application filed February 12, 1890. Serial No. 340,113. (No model.) Patented in Germany December 29, 1889, No. 57,487.

*To all whom it may concern:*

Be it known that I, IGNATZ UNGAR, a subject of the Emperor of Austria-Hungary and King of Hungary, residing at Buda-Pesth, Austria-Hungary, have invented a new and useful Improvement in Kilns for Drying Large Quantities of Wood and other Organic Substances, (patented in Germany December 29, 1889, No. 57,487,) of which the following is a full, clear, and exact description.

The object of this invention is to provide a kiln for drying wood and other organic substances in larger quantities, at less expense and in a shorter time than where such substances to be dried are merely piled up for the purpose in a highly heated locality where no provision is made for conveying off the accumulating vapors, and where consequently a long time is required to effect even a partial drying, and where a complete drying is perhaps impossible.

With my invention the wood, boards or other substances to be dried are placed in a room or rooms or large apartments or drying chambers of a kiln especially adapted to the purpose and constructed in such a way that large quantities of heated air are by the natural draft of a chimney caused to enter the rooms and after becoming charged with the products of evaporation escape through the chimney.

A kiln of my invention is illustrated in the annexed drawings, which form a part of this specification, wherein

Figure 1 represents a vertical section of the kiln partly on line *a b* of Fig. 2 and partly on line *c d* of Fig. 3. Fig. 2 represents a horizontal section of the kiln on line *e f* of Fig. 1. Fig. 3 represents a horizontal section of the same on line *g h* of Fig. 1. Fig. 4 represents a transverse vertical sectional view of one of the drying chambers on lines *i i* of Figs. 2 and 3. Fig. 5 represents a vertical part sectional view of a part of the kiln on line *j k* of Fig. 3. Fig. 6 represents a longitudinal vertical sectional view on line 6—6 Fig. 3 of portions of two adjacent drying chambers. The arrows indicate the course of the heated air in passing from one chamber to the other.

Like letters of reference refer to like parts in the several drawings.

In this example of my invention there are

six drying chambers severally indicated by the numerals I, II, III, IV, V and VI.

In the center of the kiln is a tall chimney *m*, around which the six chambers are arranged and covered by a single roof the whole constitutes a large rectangular building as fully represented in the drawings. The combustion chamber, stove, or furnace, may be of any suitable construction and for economy of fuel should be placed within the heating chamber or vaulted room *n*, and connect therein with the radiating tubes or heater *o* through which tubes the smoke and flames from the furnace are conducted into the chimney as represented in Fig. 3. *p* Fig. 5 indicates the furnace door. To avoid crowding Figs. 1 and 3 the furnace and its connection with tubes *o* are omitted therefrom and as my invention does not involve any special construction of furnace no drawing of a furnace is necessary to a complete description of my said invention. Cold air enters the heating chamber *n* through openings *q*. While detained therein it absorbs heat from the furnace and from the radiating tubes *o* and is conducted thence and through passages *r* into distributors *s* from which it escapes through numerous openings, represented in the drawings, into the lower part of the drying chambers. From the drying chamber, it passes through large exhaust channels *t* into an annular receptacle *u* surrounding the chimney and from thence enters the chimney through an opening *w*, and is discharged therefrom into the surrounding atmosphere. The natural draft of the chimney is amply sufficient to provide for the required circulation of air. Each of the several passages or channels *r* and *t* is provided with a gate or valve *x* which can be opened or closed at pleasure. By the use of these valves *x* any one or more of the several chambers can be shut off from communication with the furnace or chimney for the purpose of placing or removing the material operated on while the drying process goes on uninterruptedly in the other chambers.

In operating the kiln the heated air is conducted from one drying chamber into another before being discharged into the chimney, the valves *x* being so manipulated that the heated air is retained long enough in the kiln,

though in constant and rapid motion, to secure a maximum result from the fuel consumed.

The object of allowing the heated air to pass from one chamber to another is, that if it were only to circulate in one chamber there would be a great waste of the heated air which would pass directly up through the chimney, therefore it is allowed to circulate through several of the chambers at the same time so that there will be no waste whatever.

$y, y$ , are partitions over the tops of which the air passes on its way to openings  $z$  through which it enters the adjoining drying chamber as indicated by arrows in Fig. 6. These openings  $z$  may be arranged as shown in Fig. 1 or the side openings may be omitted.

I have treated daily, in a six chamber kiln of my invention, a carload of ten thousand kilograms of boards which after treatment weighed only from eight thousand two hundred to eight thousand six hundred kilograms, which demonstrates that from fourteen to twenty per cent. of the weight had been driven off while the boards were in the kiln. The presence and manipulation of the valves render it possible to regulate and vary the passage of the air as desired. The air may be passed from a first chamber to a second chamber and thence to the outer air for a certain time only, the current being afterward sent directly through the first chamber and out or to another chamber.

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

1. In combination the smoke stack, the heating chamber  $n$  about the same, the series of drying chambers about the heating chamber, each having a passage  $r$  leading to the heating chamber, the annular receptacle  $u$  about the chimney and communicating therewith, and a second series of passages  $t$  leading from the drying chambers and entering the receiving chamber, substantially as described.

2. In combination the smoke stack, the central heating chamber, the series of drying chambers about the heating chamber, the passages  $r$  leading from the heating chamber to the drying chambers and the passages  $t$  leading independently from the drying chambers, and connecting with the smoke stack, each of said passages having a valve whereby each chamber may be cut off from direct communication with the chimney and heating chamber and the ports or passages connecting the drying chambers, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

IGNATZ UNGAR.

Witnesses:

BERNHARD GENTSCH,  
WILLIAM MARIASSY.