

(No Model.)

2 Sheets—Sheet 1.

W. P. MURPHY.
DRY KILN.

No. 515,604.

Patented Feb. 27, 1894.

Fig. I.

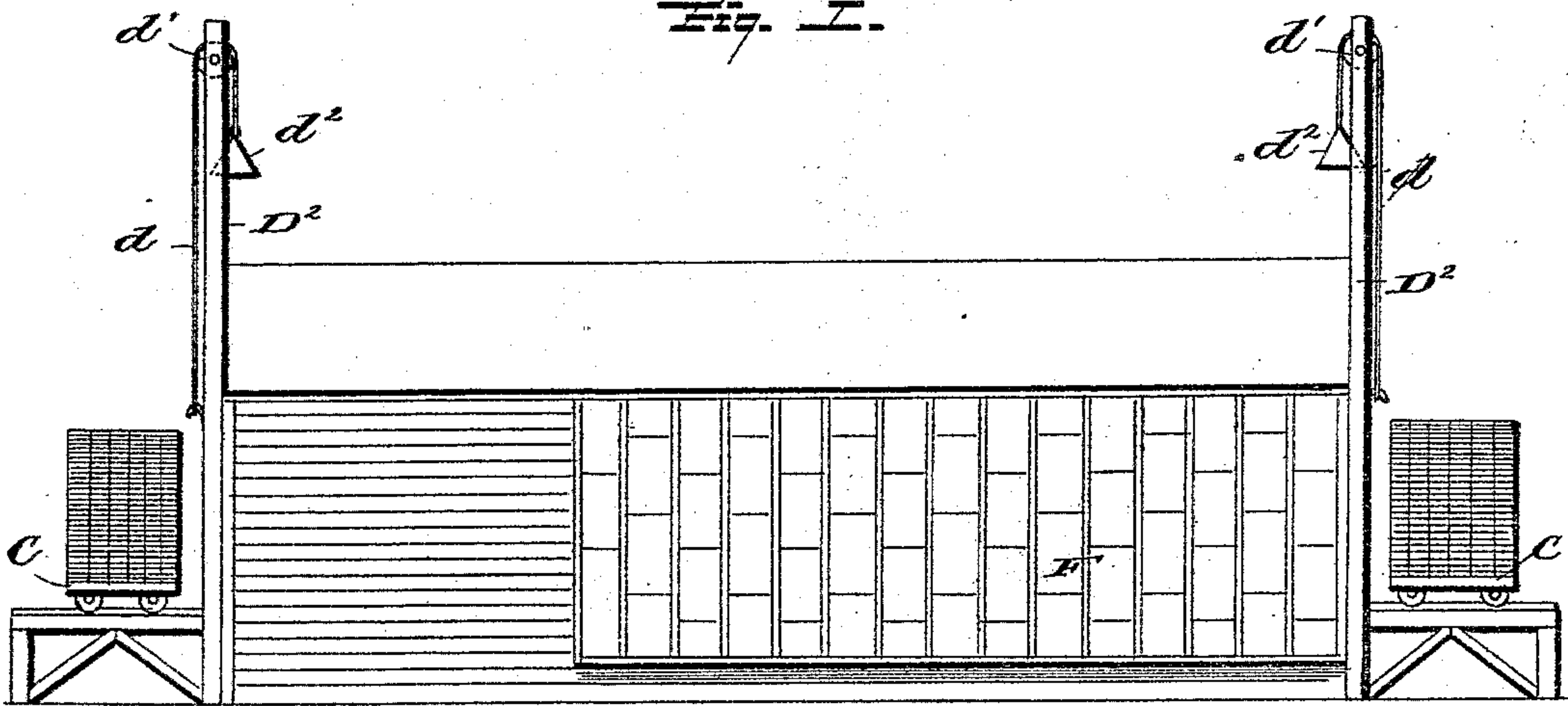
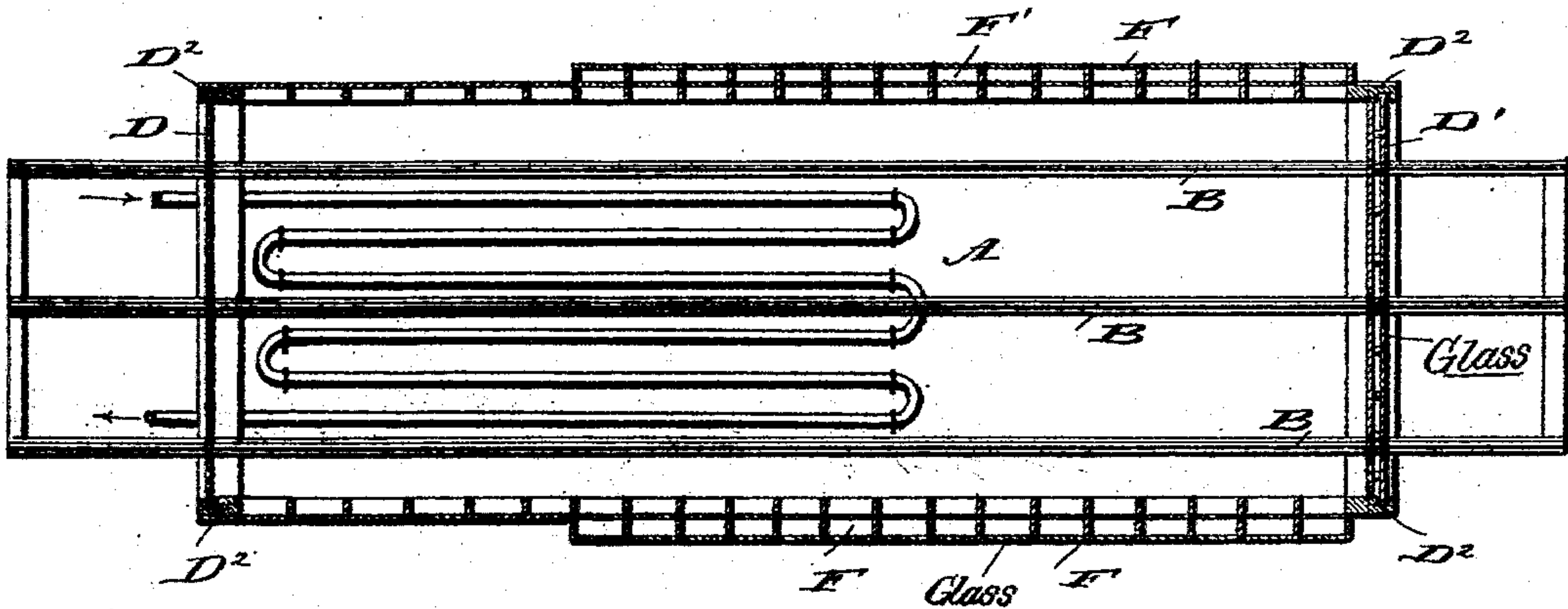


Fig. II.



Witnesses
L. C. Hills.
E. A. Bond

Inventor:
Walter P. Murphy
By E. B. Stocking Attorney

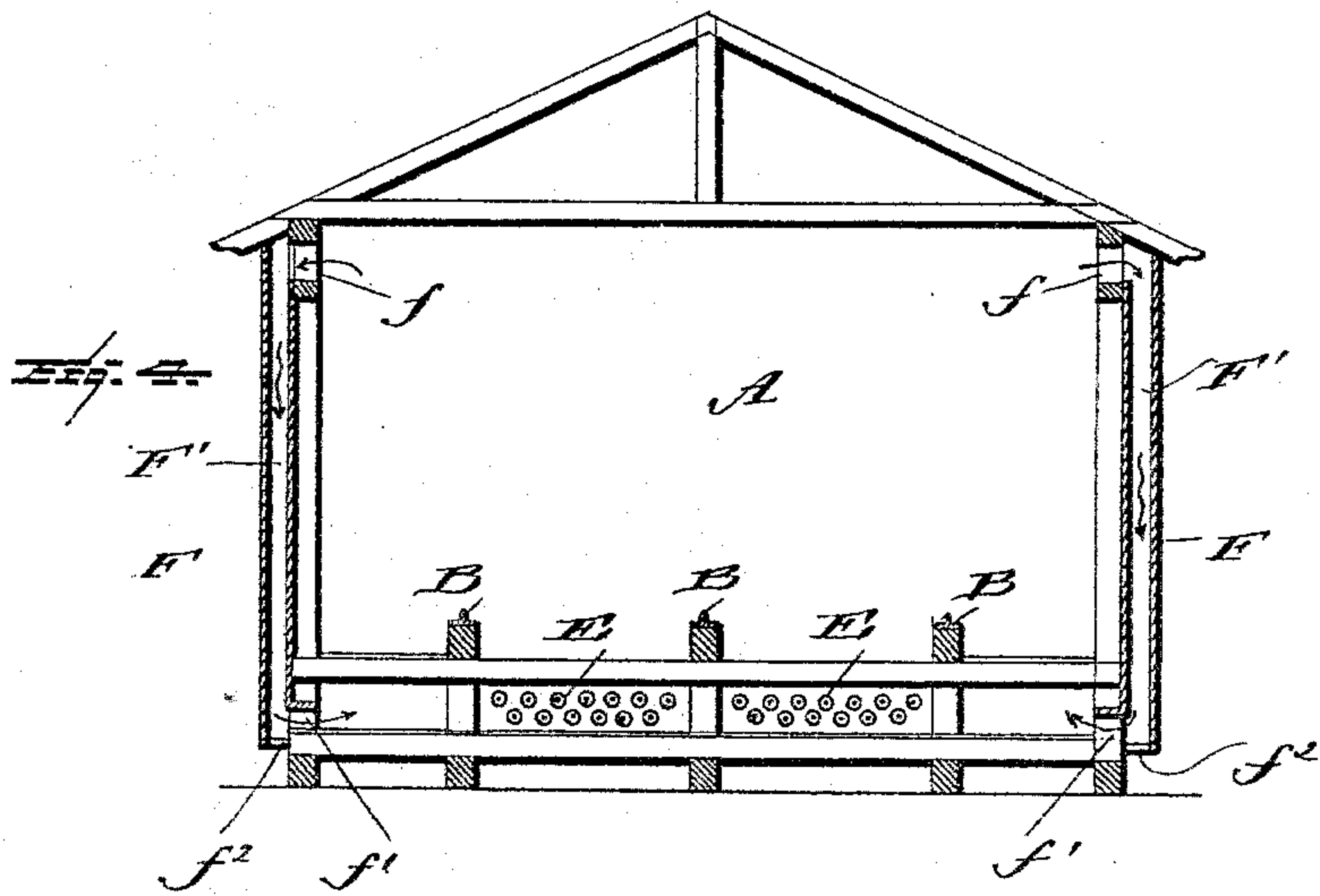
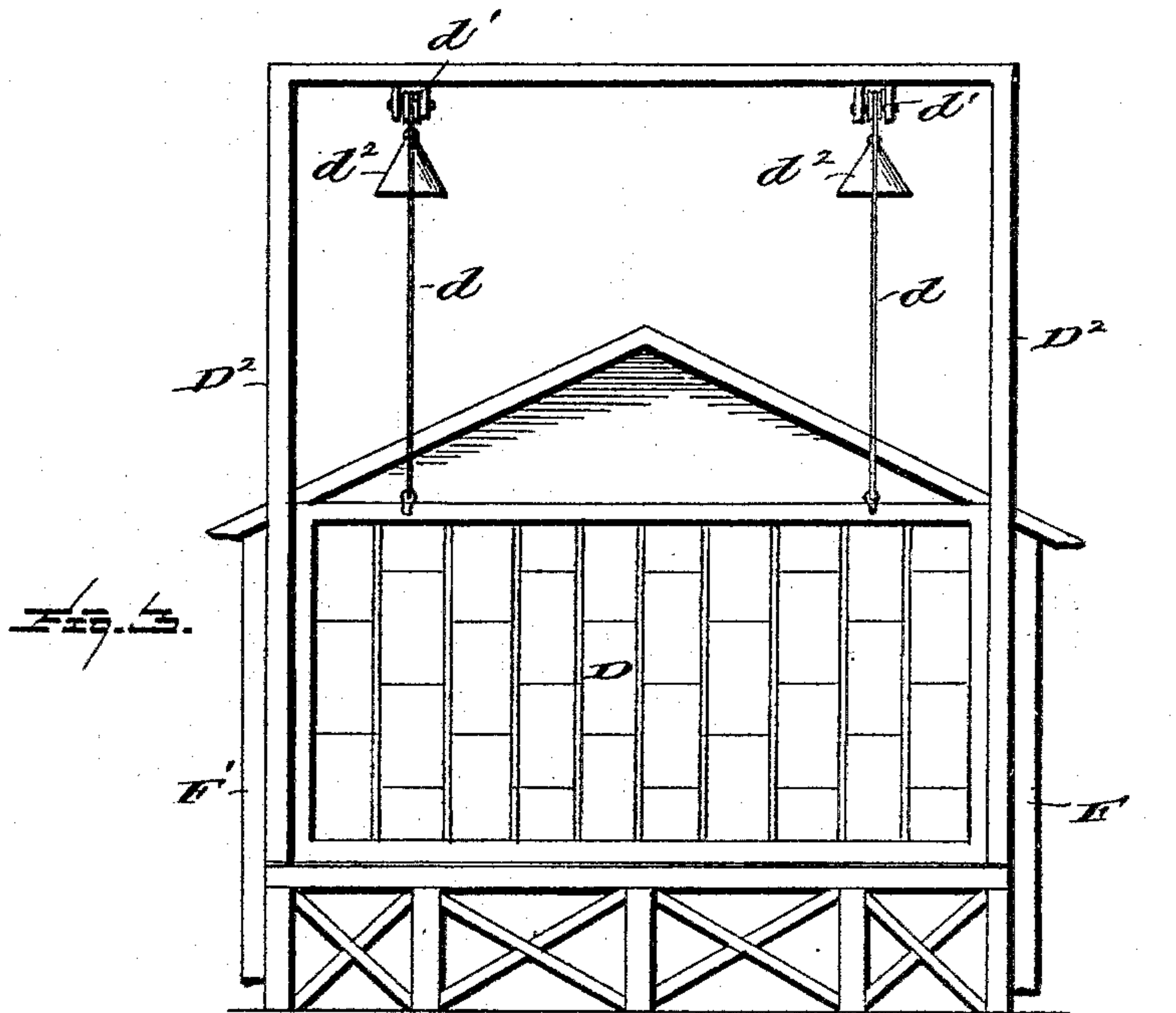
(No Model.)

2 Sheets—Sheet 2.

W. P. MURPHY.
DRY KILN.

No. 515,604.

Patented Feb. 27, 1894.



Witnesses:
L. C. Hills.
E. M. Pond

Inventor:
Walter P. Murphy.
By E. B. Stocking
Attorney

UNITED STATES PATENT OFFICE.

WALTER P. MURPHY, OF RIDGWAY, PENNSYLVANIA.

DRY-KILN.

SPECIFICATION forming part of Letters Patent No. 515,604, dated February 27, 1894.

Application filed March 16, 1893. Serial No. 466,365. (No model.)

To all whom it may concern:

Be it known that I, WALTER P. MURPHY, a citizen of the United States, residing at Ridgway, in the county of Elk, State of Pennsylvania, have invented certain new and useful Improvements in Dry-Kilns, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in kilns for drying lumber and other materials, and it has for its objects among others to provide a simple and cheap kiln in which provision is made for the rapid condensation of the moisture whereby better results are attained and the moisture readily conducted away from the kiln as it is evaporated or drawn from the lumber or other material being dried. I construct a kiln with glass sides for condensing chambers and with means for conducting the water of condensation by gravity from the said chambers. The door at the end where the material enters is also formed of glass while that at the other may be and preferably is of wood of known construction. Communication is afforded between the condensing chambers and the interior of the kiln at the top and bottom, and the bottoms of the condensing chambers are provided with openings through which the water of condensation may pass out of the kiln.

Among the many material advantages secured by constructing the kiln, as above stated, is that in addition to the well known characteristic of glass as being a good condenser I have found by experiment that it also produces currents of air flowing toward its inner surface so that by a judicious disposition of the glass in and as constituting the walls of the kiln desired circulations of the air therein may be secured. By constructing the receiving door of the kiln for lumber, brick and the like mainly of glass and the delivering door mainly of other material and by introducing the heating means or medium at the lateral door and into the kiln for a desired distance, usually within from twelve to sixteen feet from the glass door, the latter produces such longitudinal currents within the kiln as to carry the heat of greater temperature at the delivering end where it enters longitudinally through the kiln toward

the glass door at the opposite end whereby all of the exposed surfaces of the lumber within the kiln, are subjected to constantly-changing currents of air. It is understood that the lumber is piled upon the trucks with strips between each layer to space the lumber to facilitate the passage of the currents of heated air therethrough. This construction obviates the necessity of using a fan or blower to mechanically produce such a circulation of the air within the kiln. The same advantage exists in the employment of glass sides to the kiln as it tends to the production of lateral and circumscribing currents of air. These gather the moisture escaping from the ends of the lumber piled upon each truck and frees the moisture from the spaces between the trucks. It is quite important to note that the lumber rests lengthwise upon the trucks across the kiln and that the glass receiving door therefor acts upon the air between each layer of boards on the trucks which constitute, practically longitudinal flues extending the entire length of the kiln. There is a material advantage in constructing a portion for example, two thirds of each side wall of the kiln of glass or it may be of one side, as the actual operation of kiln drying may be readily inspected, the condensation being greatest at the end of the kiln where the steam or other heat is admitted and growing gradually less toward the receiving end so that practically no condensation appears upon the glass and the lumber is then ready to be moved into the remaining unglazed portion of the kiln for the final drying at the increased temperature which exists at that end by reason of the thorough condensation and removal of the moisture by the remaining glazed portion of the kiln. I find by experience that the protection of the glazed walls given by the adjacent air chambers results in a great saving of steam or other heating medium. The heat radiated from the system of pipes employed is prevented from direct contact with the glass by the air contained within the chambers adjacent to the glass walls. Practically I have ascertained that this construction causes the saving of fifty per cent. in the steam capacity required by the kiln over that where no intermediate air chambers are employed. The glass wall

is kept at a comparatively lower temperature and can therefore perform its function of condensation more fully and also perform the duty of producing and maintaining the desired circulation of air. While it is preferable that the adjacent air chambers should be open ended at top and bottom still it is apparent that if they be closed at one or the other end they still would constitute what are known as head air chambers and thus prevent direct radiation of heat against the glass walls.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings which, with the letters of reference marked thereon, form a part of this specification and in which—

Figure 1 is a side elevation of my improved kiln. Fig. 2 is a horizontal longitudinal section through the same looking downward. Fig. 3 is an end elevation thereof. Fig. 4 is a vertical cross section through the same.

Like letters of reference indicate like parts throughout the several views in which they appear.

Referring now to the details of the drawings by letter, A designates the kiln, of any desired capacity, through which run the tracks B upon which are designed to run the trucks C of any well known or approved form of construction. The tracks or rails are suitably supported as shown, and the kiln is designed to be heated in any suitable manner, as for instance, by the steam pipes E which may be connected with any suitable source of steam. At each end I provide a vertically sliding door mounted to slide in suitable guides or ways and counterbalanced by suitable weights in any well known way. That at the end through which the green material is designed to enter is formed of glass as seen at D with an adjacent partition of wood forming an air space and that at the other end, designated by the letter D', may be either of glass or wood, preferably of the latter material.

D² are the guides or ways for the doors, and d are the ropes or chains which are connected with the doors and run over pulleys d' and at their other ends carry the weights d², as seen in Figs. 1 and 3.

The major portion of both sides of the kiln are formed of glass as seen at F, and glass may constitute both the inner and outer walls at such places or the outer walls only; the glass forms a good condensing surface for the moisture, and between the inner and outer walls there are formed condensing chambers F' as seen best in Figs. 2 and 4. The condensing chambers communicate at the top with the interior of the kiln as seen at f in Fig. 4, and also at the lower ends as seen at f', while the bottoms of the chambers are provided with openings f² through which the

water of condensation may pass out of the kiln, as will be readily understood from Fig. 4. The condensing chambers may be subdivided as seen in Fig. 2 if desired.

In operation the material is introduced into the kiln at one end and moved along in the usual manner, being removed at the opposite end. The air is admitted to the kiln and heated in the usual manner, the hot air rising as indicated by the arrows in Fig. 4 and passing down through the condensing chambers, the moisture being condensed upon its contact with the glass and flowing down and through the outlets at the bottom of the chambers as will be readily understood from Fig. 4.

The advantages of readily condensing the moisture will be readily appreciated by any one familiar with drying devices of this character, and the time necessary to thoroughly dry the lumber or other material will be greatly lessened.

Modifications in detail of construction may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. A drying kiln for lumber and the like having one end constructed principally of glass, with adjacent air spaces, the other end constructed of other material and having at the latter end means for admitting heat into the kiln, substantially as specified.

2. A drying kiln having a wall consisting of a glazed and air chambered portion for a part of its length and unglazed air chambered portion for the remainder of its length, substantially as specified.

3. In a drying kiln, a wall formed of a glazed portion, a vertically-disposed air chamber and an intermediate air chamber or space whereby direct contact of radiant heat with the glazed portion is materially prevented, substantially as specified.

4. In a drying kiln, the combination with the kiln proper, of doors at opposite ends thereof, exterior walls of glass forming condensing chambers extending for a portion of the length of the side walls and vertical partitions in said kiln proper and condensing chambers subdividing said condensing chambers into independent vertical unobstructed passages with communication at the top with the interior of the kiln and near the bottom with a space beneath the floor thereof, the bottoms of said passages having openings, beneath the horizontal passages into the space beneath the floor, for the automatic egress of the water of condensation, substantially as specified.

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

WALTER P. MURPHY.

Witnesses:

THOS. J. MAXWELL,
S. F. ANDERSON.