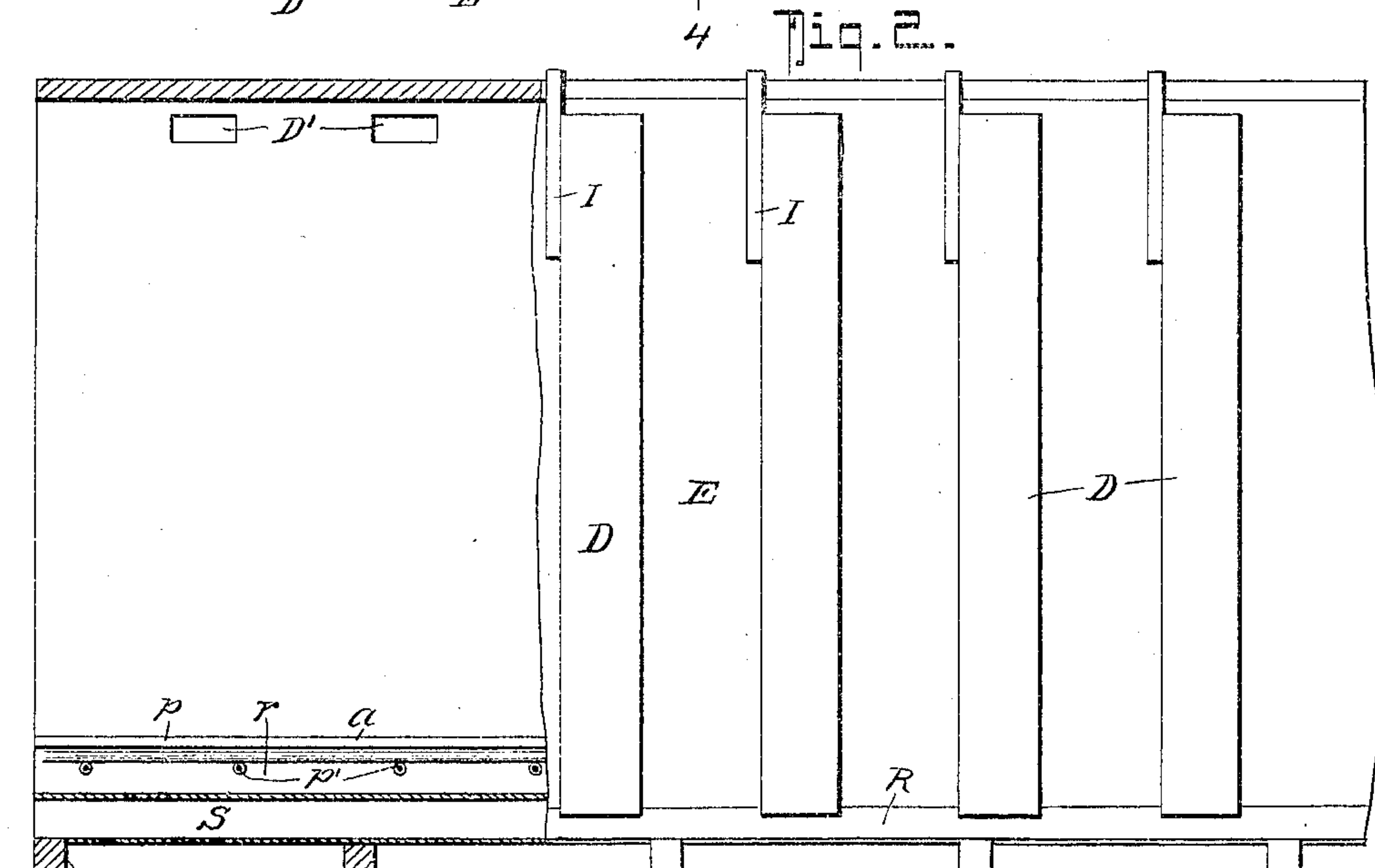
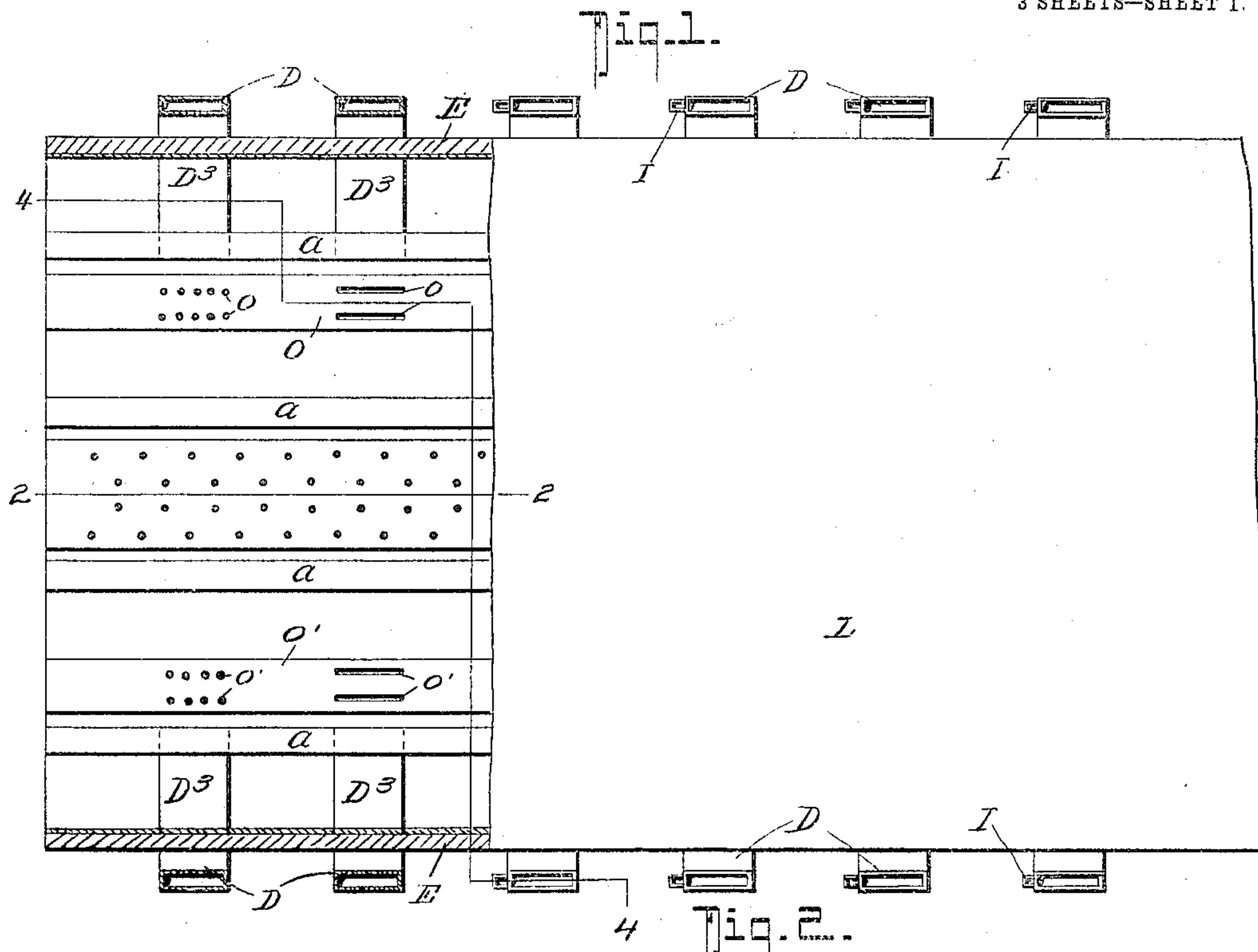


No. 822,481.

PATENTED JUNE 5, 1906.

C. D. ROSS.
LUMBER DRYING KILN.
APPLICATION FILED DEC. 29, 1905.

3 SHEETS—SHEET 1.



WITNESSES:
Th. C. Gibson.
John T. Schwett.

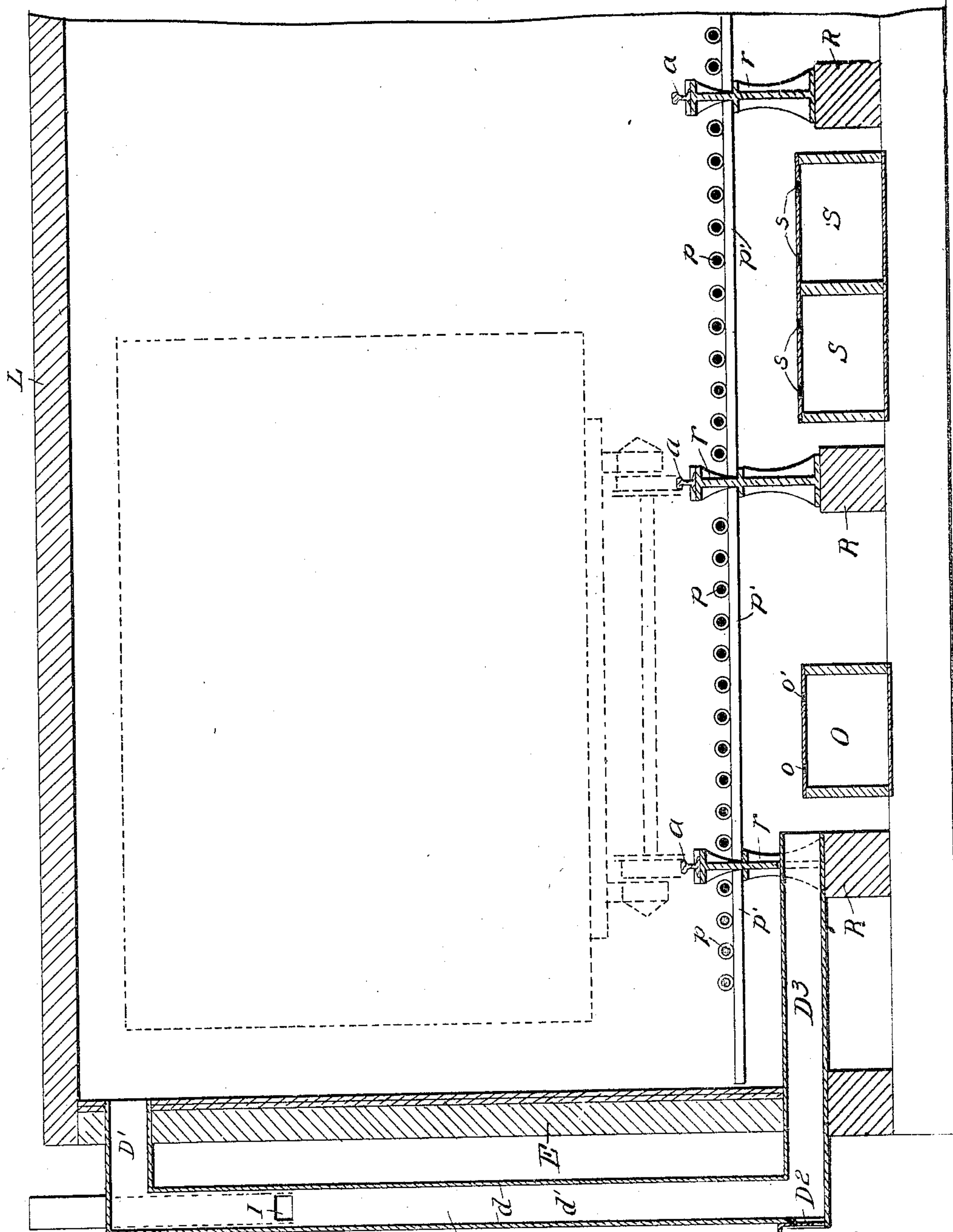
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3 SHEETS—SHEET 2.



WITNESSES:

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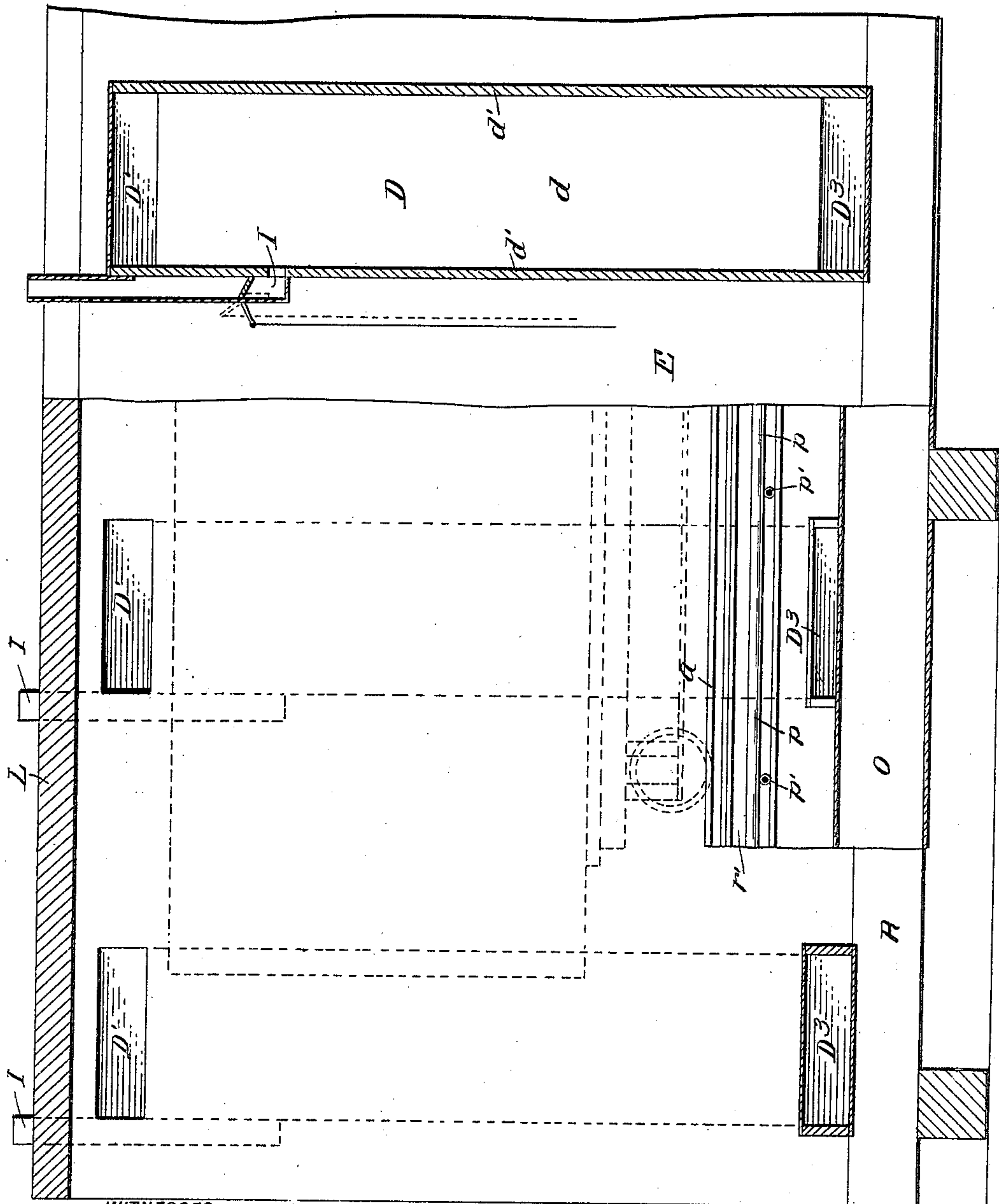
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3 SHEETS—SHEET 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES D. ROSS, OF PORTLAND, OREGON.

LUMBER-DRYING KILN.

No. 822,481.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed December 29, 1905. Serial No. 293,723.

To all whom it may concern:

Be it known that I, CHARLES D. ROSS, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and Improved Lumber-Drying Kiln, of which the following is a specification.

This invention seeks to provide an improved construction of lumber-drying kiln in which the moisture derived from or drawn out of the material being dried is utilized during the initial steps of drying for maintaining the circulation of moist air within the kiln to assist in the preservation of the lumber during the process of drying and whereby to cause the external surfaces of the lumber to remain soft to such extent that the heat can penetrate through the said softened external surface of lumber to the center thereof, while at the same time providing for the absorption and escape of the excess moisture, pitch, and other foreign substances as it is drawn out of the lumber.

My invention comprehends generally a kiln structure in which is included a plurality of circulating and condensing chambers or casings arranged externally of the kiln-chamber and communicating with the said chamber at the upper or crown end thereof and arranged to discharge into the kiln-chamber in such manner that the surplus moist air that is drawn from the kiln is forced back into the kiln-chamber at a point of the feed of the fresh air into the said chamber whereby to become thoroughly intermixed and then to circulate with the fresh air as the same passes to the air-heating devices.

In its details of construction my invention consists in certain combination of parts and the peculiar arrangement thereof, all of which will be hereinafter fully explained, pointed out in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a horizontal section of my improved construction of kiln, parts being in plan view. Fig. 2 is a vertical longitudinal section thereof, partly in side elevation and taken substantially on line 2 2 of Fig. 1. Fig. 3 is a transverse section of one side portion of the kiln. Fig. 4 is a side elevation of that portion of the kiln shown in Fig. 3, parts being in section.

In the practical application of my invention the same may be incorporated with any of the general forms of lumber-drying kilns,

and in the drawings I have shown an ordinary type of kiln structure which comprises end walls E E, the top or crown L, longitudinal base timbers R R, upon which at suitable intervals are mounted vertical brackets $r' r'$, which support the cross members of the heat-circulating pipes $p p$, said brackets also supporting the longitudinal rails $a a$, upon which the lumber-holding carriages may be caused to travel in the usual manner.

Upon the outside of each longitudinal wall of the kiln is arranged a series of longitudinally-disposed condensing-chambers or casings D, which are preferably formed of metallic side walls d and wooden end walls d' , and these casings, as best shown in Fig. 3, are located at some distance from the kiln-wall to provide circulating air-spaces between the said chambers or casings D and the kiln and means to prevent the said chambers from being heated by heat radiating from the kiln-walls and in consequence keep the said casings sufficiently cool to provide for rapid condensation of the moist air that enters into the upper end of the casings, as shown.

The upper end of each of the hollow chambers or casings D, which casings in practice may be of any desired size in horizontal cross-section, terminates in an inwardly-projecting branch D' , that opens into the kiln-chamber near the crown or top thereof, and the lower ends of the several chambers D terminate in inwardly-extending branches D^3 , that project into the kiln-chamber at a point under the heat pipes or coils $p p$ and have their discharging end disposed in close proximity to the fresh-air end inlets $o o'$ of the air-supplyboxes or conveyers O O', which latter extend lengthwise of the kiln, one at each side of a central fresh-air-supply box s , having fresh-air inlets or feed-slots s' , as shown.

So far as described it will be readily apparent that by reason of the peculiar manner in which the condensing chambers or casings D are constructed and coöperatively combined with the kiln, that since the said chambers D are located on the outside of the kiln out of contact therewith and with all sides thereof exposed to atmosphere, they are constantly cooled by the atmosphere, and hence the moisture that passes from the kiln into the chambers D as it enters the said chambers D and engages the metallic side walls thereof is condensed, and since the lower ends of the chambers D are at all times

the coolest portion of the said chambers the moisture as it is constantly condensed is also drawn toward the bottom of the said chambers or casings, and the surplus moisture that is not condensed is thereby drawn back into the kiln and caused to discharge, intermix with, and dampen the hot air that is forced up through the lumber, and, again, since the heated air from the pipes *p p* is thus constantly moistened a moist-air circulation is created within the kiln-chamber, which serves to materially assist in maintaining the surface of the lumber moistened at all times, thereby preventing the lumber from curling up at the edges or checking, and overcomes practically all danger of the lumber becoming too dry or case-hardened.

By drawing off the moisture from the top of the kiln, condensing it in the manner before stated, and then turning the surplus moist vapors back in the kiln in such direction that the fresh-air currents will direct the same over the heat-coils the heated air is caused to freely circulate through the lumber being dried, it being understood that as the air within the kiln-chamber increases in temperature, density, and humidity the moisture in the air keeps the lumber sufficiently soft and by reason thereof permits of the maximum extraction of the moisture from the center of the lumber.

To provide for the escape of the surplus moisture when drying lumber containing a very large amount of moisture—such as, for example, cottonwood and other woods of like wet nature—a number or all of the condensing chambers or casings *D* are each provided with a relief vent-pipe *I*, which communicates with the casing *D* near the upper end and projects up above the crown of the kiln.

Each of the vent-pipes may be controlled by a valve *i*, and the said vent-pipes when opened will allow for the escape of the moist vapors as the latter are drawn from the kiln-

chambers into the condensing casings or chambers *D*.

Each of the condensing-chambers at the lower end may be provided with a valve-outlet *D'* for drawing off the product of condensation and other foreign matter from the chamber *D* when required.

Having thus described my invention, what I claim is—

1. In a kiln of the character described, in combination with a drying-chamber, of air-offtakes that communicate with the kiln-chamber at the upper end thereof and which are located externally of the kiln and extend down to a point substantially in line with the bottom of the kiln and project in lateral extensions that discharge in the kiln, said offtakes having supplemental or vent portions near their upper ends for the purposes described.

2. In a kiln of the character described, the combination with the kiln having fresh-air feeds at the bottom, heating devices within the kiln located above the fresh-air inlets and said kiln having outlets in the top of the kiln near the crown thereof; of a casing or chamber located outside of the kiln, each having an entrant portion at the top that connects with the several outlets from the kiln-chamber and having discharge-laterals at the lower end provided with valved outlets for the residuum that may collect therein, said laterals being extended into the kiln under the heating devices therein and to discharge at points near the fresh-air inlets, each of the casings or chambers having a valved offtake near the upper end that discharges to atmosphere, substantially as shown and for the purposes described.

CHARLES D. ROSS.

Witnesses:

MIRIAM T. STEPHENS,
A. T. LEWIS.