(No Model.) 2 Sheets—Sheet 1.

LA FAYETTE C. VAN DUZER.

LUMBER DRIER.

No. 440,451. Patented Nov. 11, 1890.

Fig. 1.

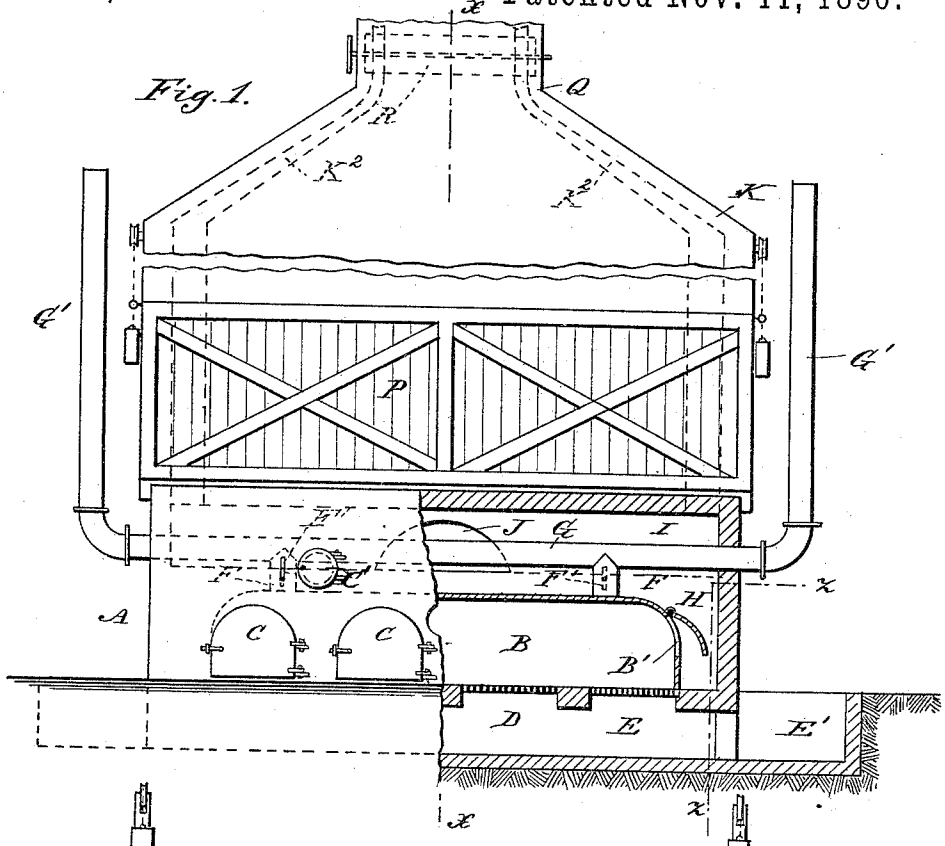
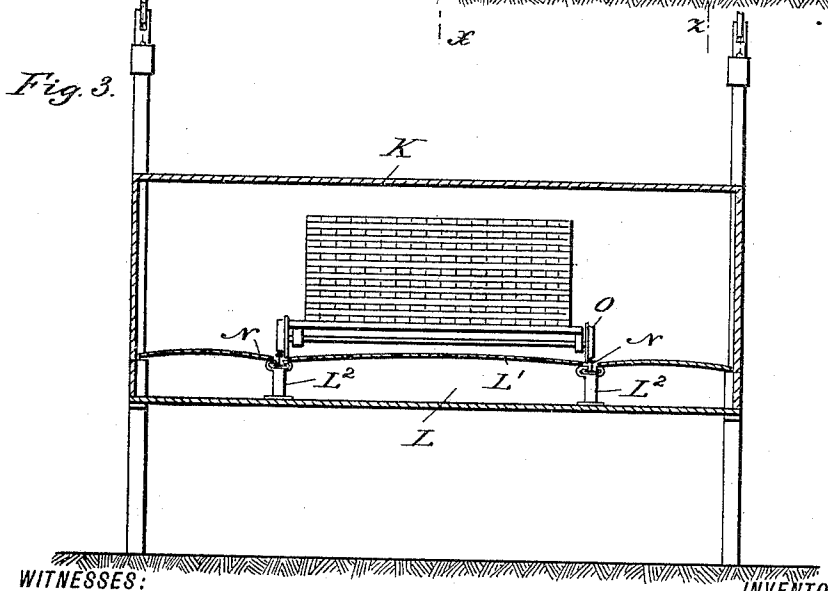


Fig. 3.



WITNESSES:

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C. Sedgwick

INVENTOR:

L. C. Van Duzer

BY

Munn & Co.

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

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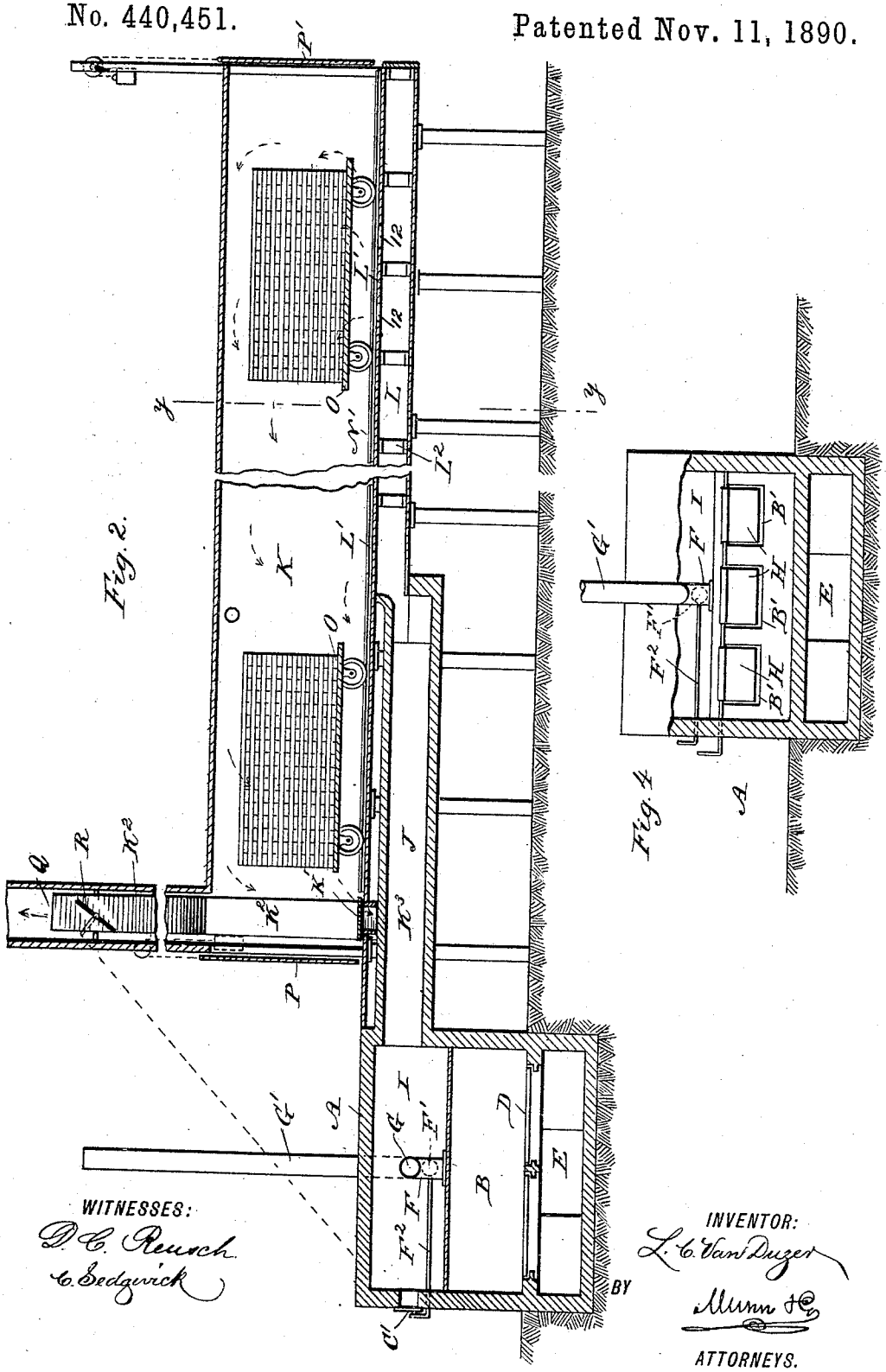


Fig. 2.

Fig. 4.

WITNESSES:

D. C. Reusch

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INVENTOR:

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UNITED STATES PATENT OFFICE.

LA FAYETTE CLAY VAN DUZER, OF LILLEY, ARKANSAS, ASSIGNOR TO ELIZABETH F. VAN DUZER, OF SAME PLACE.

LUMBER-DRIER.

SPECIFICATION forming part of Letters Patent No. 440,451, dated November 11, 1890.

Application filed July 30, 1889. Serial No. 319,208. (No model.)

To all whom it may concern:

Be it known that I, LA FAYETTE CLAY VAN DUZER, of Lilley, in the county of Ouachita and State of Arkansas, have invented a new and Improved Lumber-Drier, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved lumber-drier which is simple and durable in construction, very effective in operation, and adapted to dry the lumber by means of the heat and gases of a furnace, or by hot air only generated by the furnace.

The invention consists of certain parts and details and combination of the same, as will be hereinafter described, and then pointed out in the claim.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the improvement with parts in section. Fig. 2 is a sectional side elevation of the same on the line *x x* of Fig. 1. Fig. 3 is a transverse section of the same on the line *y y* of Fig. 2, and Fig. 4 is a sectional side elevation of part of the furnace on the line *z z* of Fig. 1.

The improved lumber-drier contains a furnace A, provided with a fire-box B, into which lead the doors C for introducing the fuel, and also provided with doors C′ for regulating the temperature of the air in the heating-chamber I, hereinafter referred to. The fire-box B is provided with the usual grate-bars D, leading into the ash-pit E, located, preferably, under ground and connected with a side entrance E′. (See Fig. 1.) In the sides of the fire-box B are arranged a number of openings B′, each adapted to be covered by a damper H, operated from the outside of the furnace A. The fire-box B is surrounded by a heating-chamber I, adapted to be connected by the said dampers H with the interior of the fire-box B. From the top of the fire-box B lead the flues F, each provided with a damper F′ and connected with a transversely-arranged flue G, extending to the outside of the furnace A and provided with the upwardly-extending ends G′ for carrying off the smoke and gases when the dampers F are opened.

The inner end of the heating-chamber I is connected with one end of a channel J, extending under the front end of the floor of the kiln K, as shown in Fig. 1. The rear end of the channel J connects with a second channel L, covered by metallic plates L′, which form the floor of the kiln K and permit a ready radiation of the heat passing into the channel L. The plates L′ are supported on the posts L^2, which also support rails N, on which are adapted to travel the cars O, carrying the lumber to be dried.

On the front end of the kiln is held a vertically-sliding door P, and a similar sliding door P′ is arranged on the rear end of the kiln, as shown in Fig. 2 of the drawings. On the front end of the kiln is held a chimney Q, provided with a damper R, operated by any suitable means. The metallic plates L L′ extend throughout the length of the kiln and form the top of the channel L only, such plates being formed with openings 12 12 in their rear ends, so that the hot air from the channel J passes to the rear end of the kiln before it enters therein, and whereby it is caused to travel from the rear end of the kiln through the lumber to the front end and then pass out through the chimney Q in case the damper R is open. In the floor of the kiln, below the chimney Q, a transverse opening K^3 is provided, the ends of which communicate with vertical flues K^2, disposed near the inner sides of the kiln-chamber K, the upper ends of such flues extending into the chimney Q and ending above the damper R, a damper-plate K′ being employed, which covers the opening K^3 between the end flues K^2. By this construction it will be seen that when it is desired to employ a lower draft to dry the lumber by closing the damper R and removing the damper-plate K′ the hot air entering the kiln from the rear will circulate therein in the direction indicated by dotted arrows in Fig. 2, and escape by entering the opening K^3 and passing up through the flues K^2 and out into the chimney. By opening the damper R and closing the opening K^3 an upward draft of the hot air through the kiln is obtained.

The operation is as follows: In the fire-box B may be burned any suitable fuel, such as

sawdust, shavings, or other material. When the dampers F′ in the flues F are closed, the dampers H are opened, so that the heat and gases generated in the fire-box B pass through the openings B′ into the heating-chamber I, the sparks being deflected downward by the dampers H and settling in the sides of the heating-chamber I. The heat and gases pass through the channel J into the channel L, so that the heat radiates through the metallic floor L′ into the interior of the kiln K. A number of cars O are then moved into the front end of the kiln, so that they are exposed to the heat of a low temperature, and are gradually moved to the rear end over the channel L, in which they are exposed to heat of a higher temperature. The lumber is thus gradually moved from a low temperature to a higher temperature, whereby warping of the lumber is prevented and the latter is evenly dried, and finally moved out through the rear door P′. The smoke and gases pass through the rear end of the channel L to the outside. When the operator desires to heat the kiln K by hot air only, he opens the door C′, opens the dampers F′, and closes the dampers H, so that the heat and gases generated in the fire-box B pass through the flues F into the flue G and through the upwardly-turned end G′ of the same into the open air. The air from the doors C′ passing over the fire-box B in the heat-chamber I is heated by the heat radiating from the fire-box, and the heated air passes into the channel J, and from the latter to the channel L through the openings 12 12 into the kiln to dry the lumber.

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

In a lumber-drier, the combination of a kiln formed with openings in the floor near its rear end, a chimney located at its forward end provided with a damper R, channels J and L, disposed below the kiln, the channel L, communicating with the kiln and with channel J, a transverse opening K^3, arranged in the floor of the kiln, vertical flues K^2, arranged at the sides of the kiln, communicating at their lower ends with the opening K^3, a damper-plate K′, covering said opening between the flues K^2, said flues extended into the chimney to a point above the damper R, an air-heating chamber I, connected with the channel J, a fire-box located in the said heating-chamber, smoke-flues provided with dampers and leading from said fire-box, and dampers H, connecting said fire-box with the said air-heating chamber, all arranged substantially as and for the purpose specified.

LA FAYETTE CLAY VAN DUZER.

Witnesses:
THOS. W. HARDY,
GEO. N. APPLEBY.