

(No Model.)

2 Sheets—Sheet 1.

H. J. MORTON & R. B. ANDREWS.
LUMBER DRIER.

No. 426,463.

Patented Apr. 29, 1890.

Fig. 2.

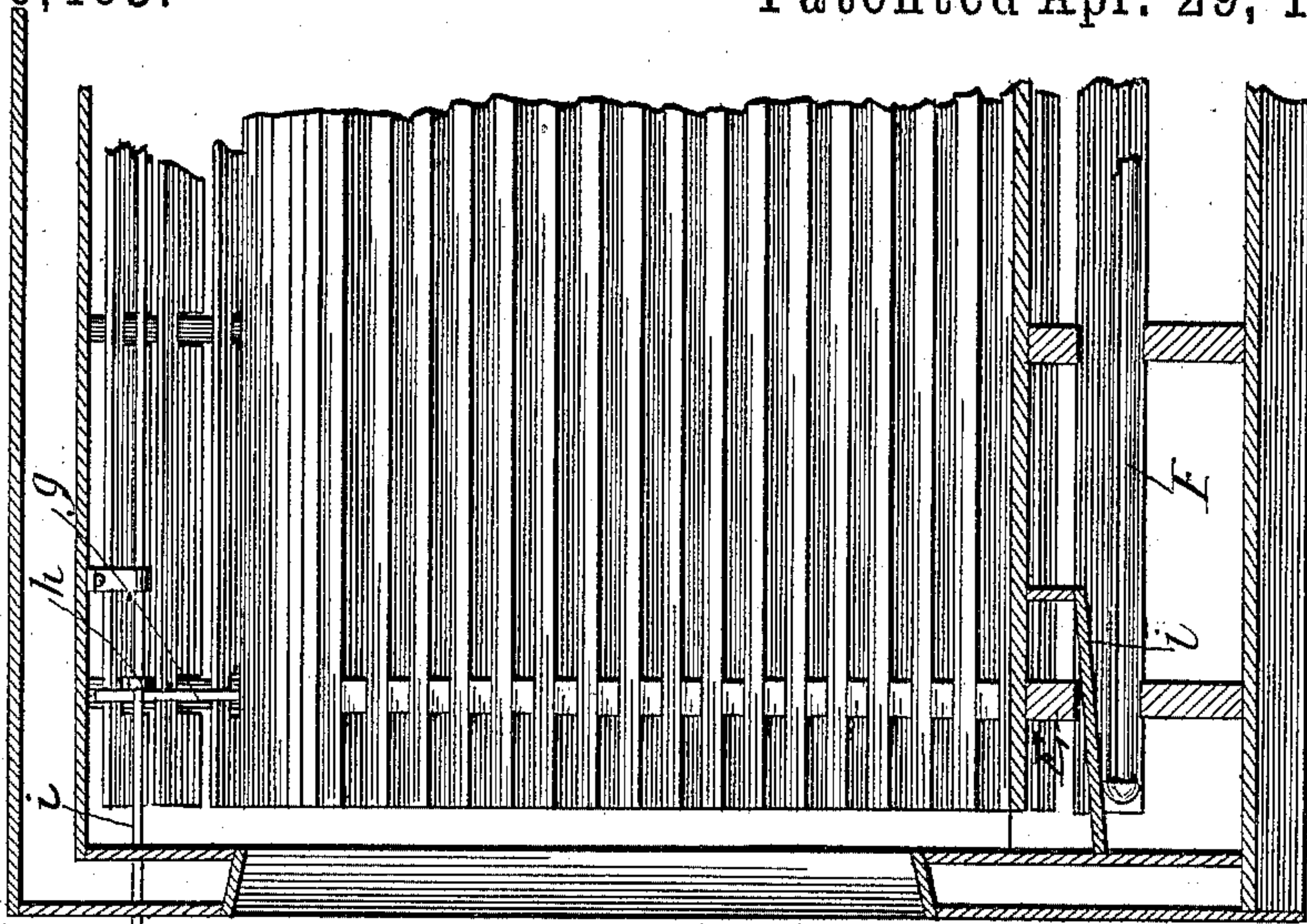
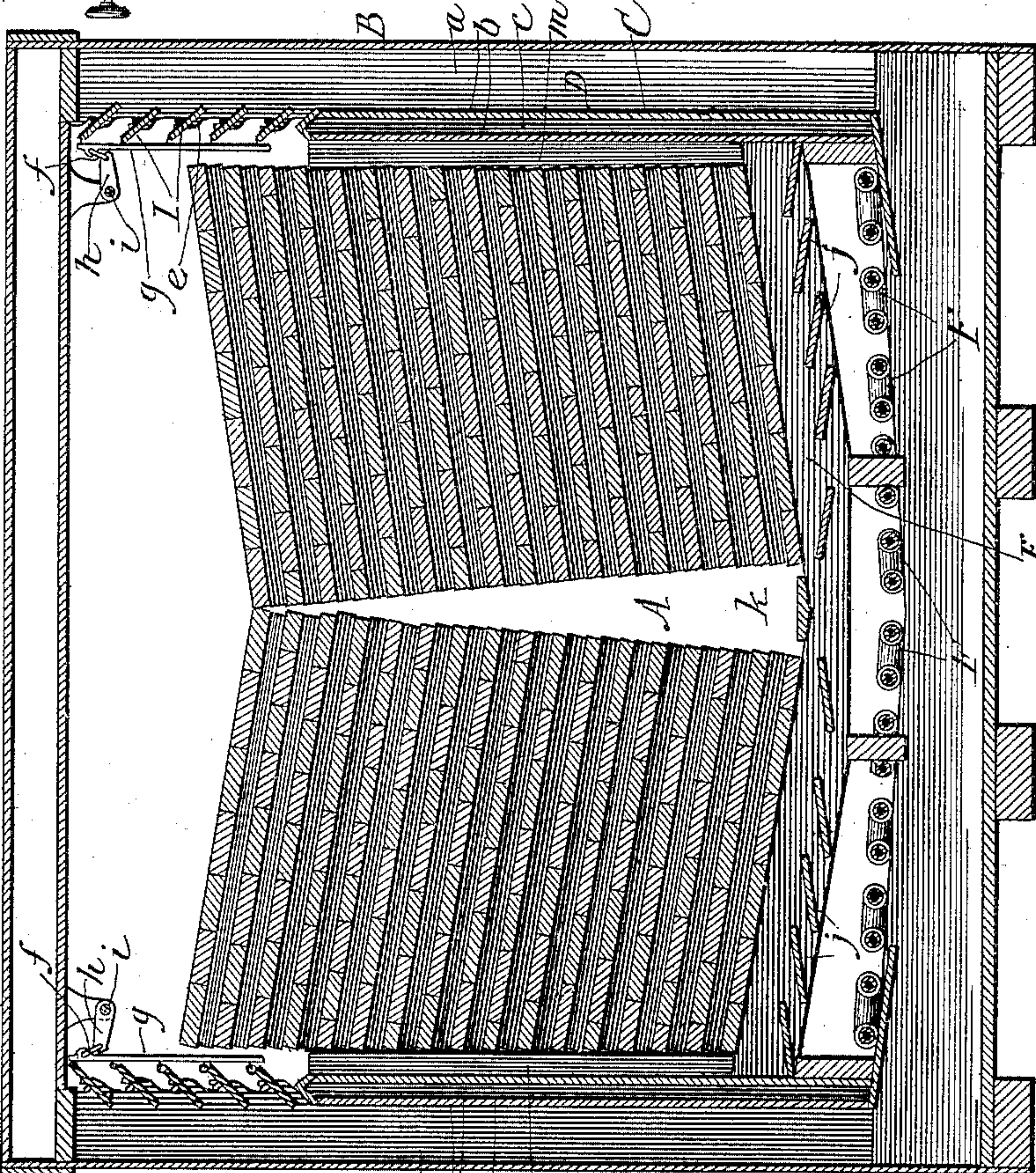


Fig. 1.



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Harry T. Jones.

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(No Model.)

2 Sheets—Sheet 2

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Fig. 3.

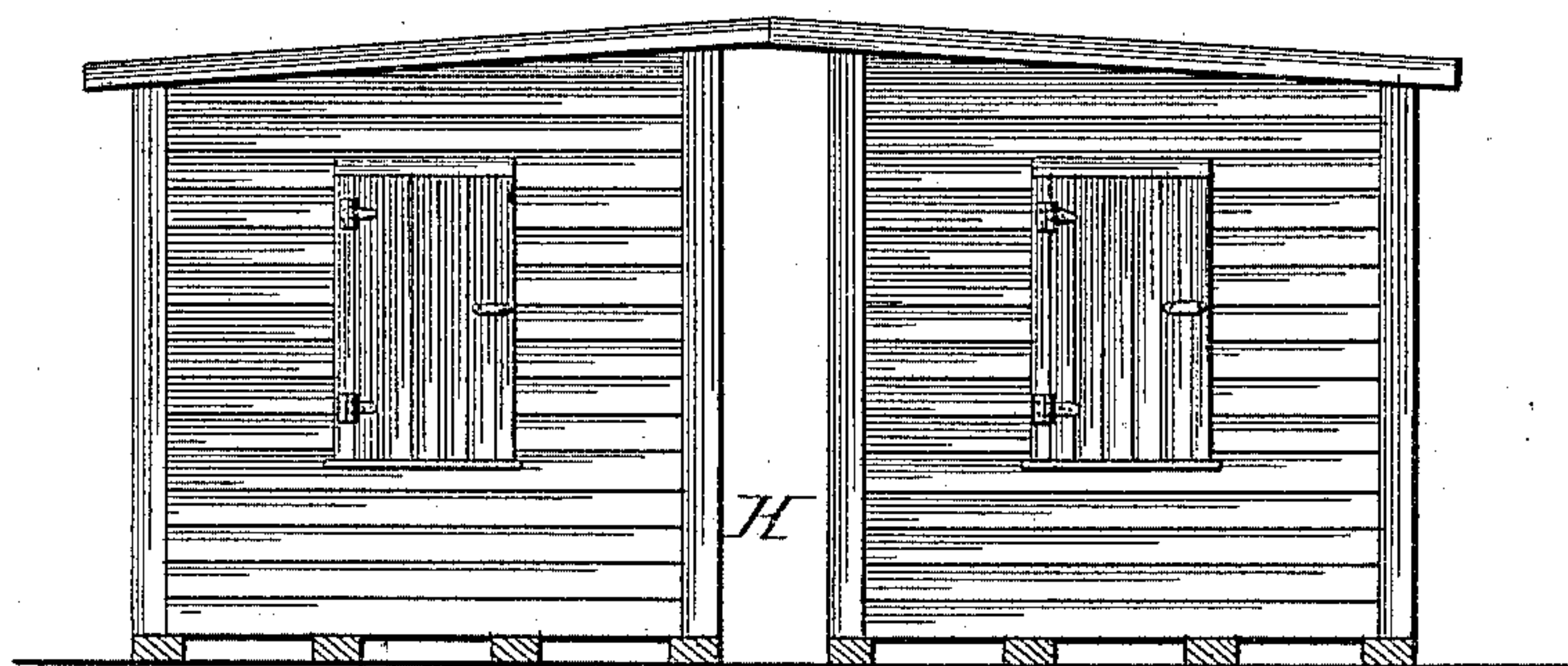


Fig. 4.

Fig. 6.

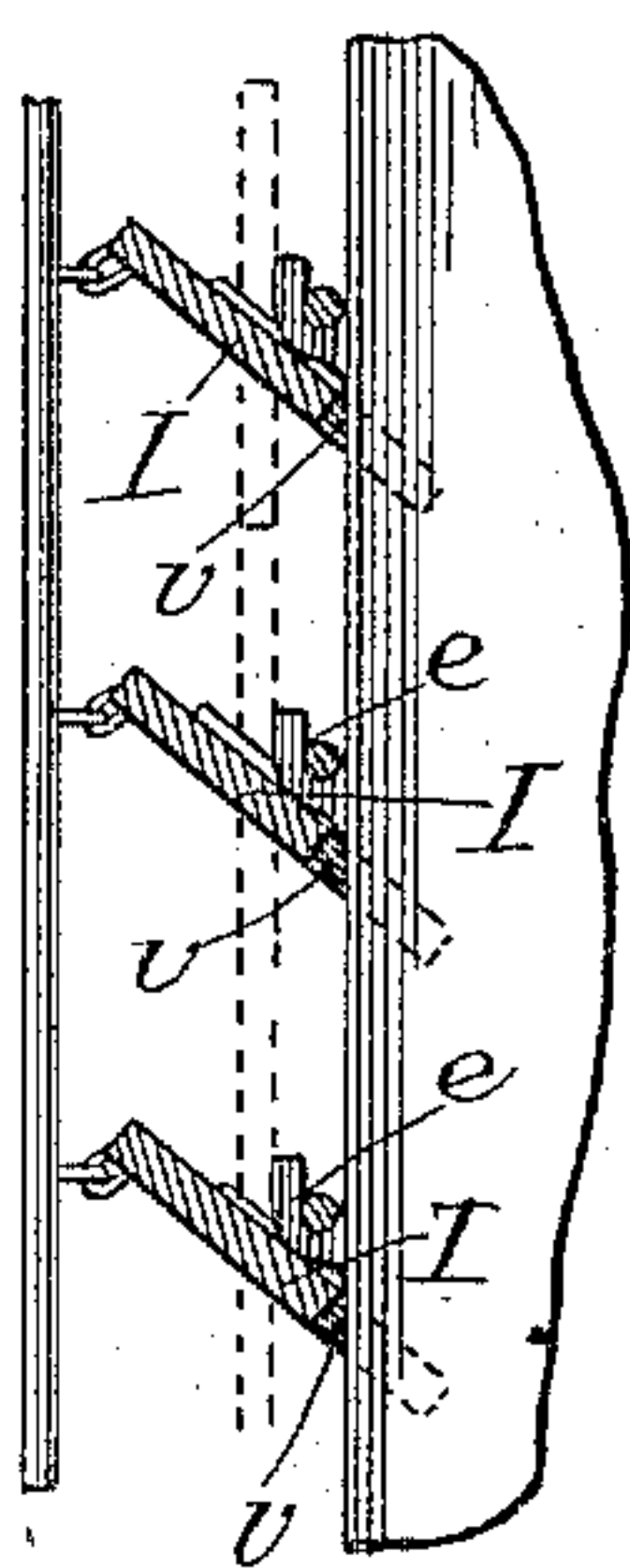


Fig. 5.

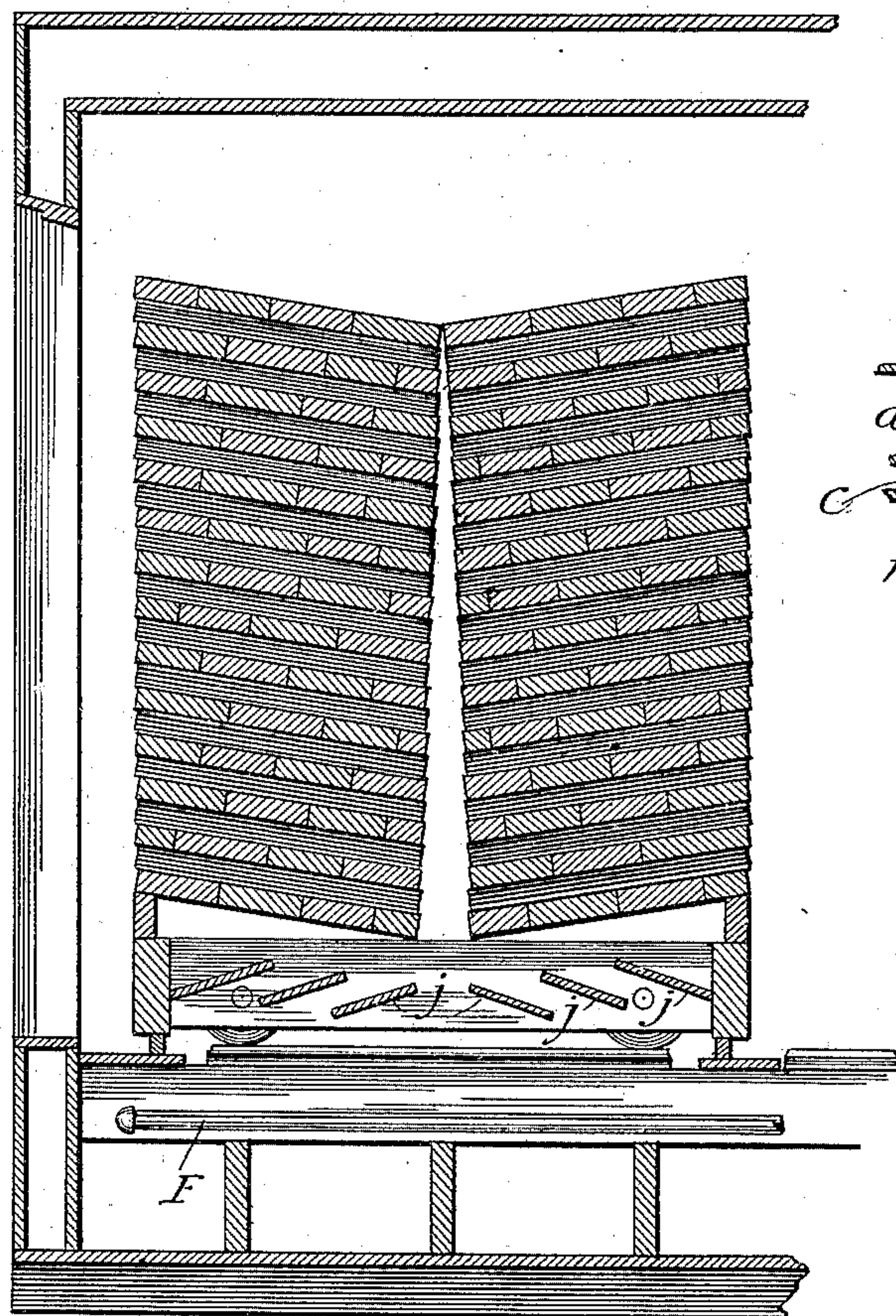
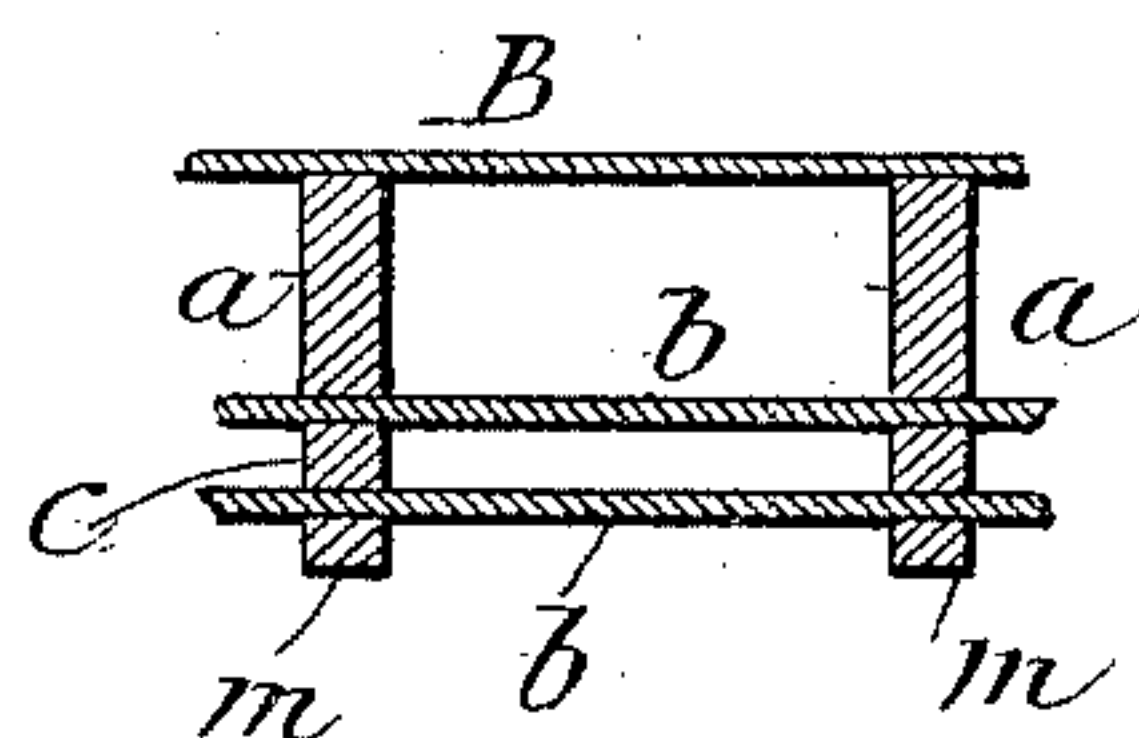
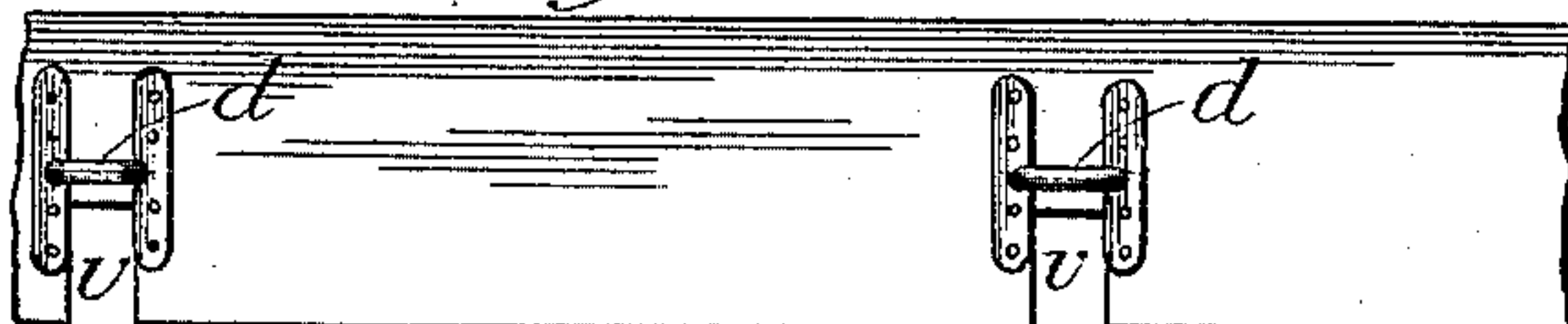


Fig. 7.

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UNITED STATES PATENT OFFICE.

HORACE J. MORTON AND RODERICK B. ANDREWS, OF CHICAGO, ILLINOIS.

LUMBER-DRIER.

SPECIFICATION forming part of Letters Patent No. 426,463, dated April 29, 1890.

Application filed April 20, 1888. Serial No. 271,368. (No model.)

To all whom it may concern:

Be it known that we, HORACE J. MORTON and RODERICK B. ANDREWS, residing at Chicago, in the county of Cook and State of Illinois, and citizens of the United States, have invented new and useful Improvements in Lumber-Driers, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical cross-section. Fig. 2 is a longitudinal section showing one end of the kiln. Fig. 3 is an elevation showing two kilns side by side, with a space between. Fig. 4 is a vertical longitudinal section taken through one end of the kiln, showing a car on which the lumber is piled, the car and lumber thereon being in cross-section. Fig. 5 is a detail, being a section through one of the side walls of the kiln. Fig. 6 is a sectional view of pivoted slats that are provided to permit the passage of air from the drying-chamber into the spaces between the walls. Fig. 7 is a rear view of one of the slats or wings, showing the device by means of which the same is suspended. Figs. 5, 6, and 7 are enlarged.

Our invention relates primarily to that class of drying-kilns which are provided with condensing-surfaces, on which moisture from the air used in the drying-chamber can be deposited, and in which the air is returned from the drying-chamber to the heating devices.

The leading objects in the invention are to provide improved means for maintaining circulation of the air and effecting condensation, to provide devices by means of which the circulation of the air can be arrested when desired, and to provide other minor improvements, all of which we accomplish as illustrated in the drawings hereinafter described.

Those things which we claim as new will be pointed out in the claim.

In the drawings, A represents the drying-chamber, the front and rear walls of which may be constructed in any suitable known manner.

B B represent the outer walls of the side walls of the kiln, which walls B B are to be made of sheet metal secured to studding *a*. (Shown in Fig. 5.)

C is an inner double wall extending from the floor of the kiln to a point some distance below the top of the drying-chamber and closed at top and bottom, as shown in Fig. 1. This inner wall C may be made in any known manner. As shown, it is composed of boards *b*, secured to studding *c*, as shown in Fig. 5. The spaces between the upper ends of the wall C and the top of the drying-chamber are passages for air from the top of the drying-chamber to the passages between the side walls. We provide a series of slats or wings *I*, so arranged that they can be partially opened, as shown in Figs. 1 and 6, to permit the passage of air from the drying-chamber into the spaces between the walls B C. As shown, these slats or wings are supported by means of eyes or straps *d*, secured to the outer side of the slats, as shown in Fig. 7, which eyes engage with hooks *e*, secured at suitable intervals to the studding or to strips, which are fastened to the studding. Each slat or wing is provided with slots *v*, as shown in Fig. 7, which permit the slats to be placed in an inclined position, as shown in Fig. 6. The slats or wings can be operated from either end of the kiln by any suitable known device. As shown, this is accomplished by means of links *f*, the upper ends of which are secured to rods *g*, which are connected with the slats by means of staples. The lower end of each link is connected with a crank or arm *h*, which is rigidly secured to a rod *i*, which is supported in bearings, one end of which rod extends outside of the kiln. The slats or wings can be divided into two sections, one section being operated from one end of the kiln, the other section being operated from the other end of the kiln.

E are timbers, which are placed at an incline, and on which the lumber may be piled, as shown in Fig. 1.

F are steam-pipes for heating air, which may be arranged in any known manner.

j, Fig. 1, are strips of board arranged lengthwise of the kiln and between the timbers E, designed to deflect the air which passes from the heating-coils, so that it will not directly pass to the under side of the lumber. The lumber, as shown in Fig. 1, is so piled that at

the bottom there is considerable space *k* between the two piles on opposite sides of the kiln, while at the top the two piles are in contact, or nearly so.

5 *l* is a deflector across the end of the kiln to prevent hot air from passing directly to the ends of the lumber. The lumber is so piled that it does not touch the wall C, and to render certain that there shall be a little space
10 between this wall and the lumber we have provided furring-pieces on the inside of the walls C, (indicated by *m*, Fig. 5.)

The ceiling G of the drying-chamber is made double, and there should be a roof over
15 this ceiling, which is not shown except in Fig. 3.

When two or more kilns constructed according to our plan are used, the adjoining kilns should be located a little distance apart,
20 as shown in Fig. 3, so that there may be a space H between them, through which cool air will come in contact with the metal walls B.

Our improvements can be used in kilns in which cars are used to hold the lumber, a car
25 being shown in Fig. 4, the deflectors *j* being placed between the cross-timbers at the bottom of the car. In Fig. 1 the boards are placed longitudinally. In Fig. 4 they are placed on the car transversely to the kiln. Doors are
30 provided for the kiln, as usual.

The operation is as follows: If the slats or wings I be open, as shown in the drawings, the air heated by the coils F will pass up between the several layers of boards, and will
35 at last reach the upper part of the drying-chamber, from which it will pass through the open slats I and the passages D at the sides of the kiln, and by coming in contact with the cold metal walls B the air will be cooled
40 and the moisture will be deposited on these walls, and will pass down thereon, and may be conducted outside of the kiln. The cool air will come again to the hot coils and be

heated, and will pass again up through the lumber.

It will be sometimes desirable to retain the hot air in the drying-chamber a short time for the double purpose of increasing the temperature and retaining moist air in contact with the lumber. This can be accomplished by closing the slats. The deflectors *j* *l* prevent the hot air from passing directly to the lower surface or ends of the lumber.

Any suitable known equivalent device may be used, instead of the slats or wings, for the purpose of controlling the passages for air from the top of the chamber to the passages between the side walls.

By closing the inner double wall C at top and bottom, as shown in Fig. 1, a dead-air space is formed that prevents overheating of the outer metallic walls B, and these outer walls being composed wholly of metal and directly exposed to the atmosphere on their outer sides are kept comparatively cool and make more efficient condensing-surfaces than a metal lining to the ordinary outer wooden or brick walls of a kiln.

What we claim as new, and desire to secure by Letters Patent, is as follows:

In a lumber-drier, the combination, with a drying-chamber having outside metal walls B, which serve as condensing-surfaces, of the double inner walls C, closed at top and bottom, but not extending to the top of the drying-chamber, said outside walls B and double inner walls C constituting air-passages between said inner and outer walls, and a dead-air space between the double inner walls, substantially as shown and described.

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