(No Model.)

J. H. LORIMER.

DRYING APPARATUS.

No. 354,199. Patented Dec. 14, 1886.

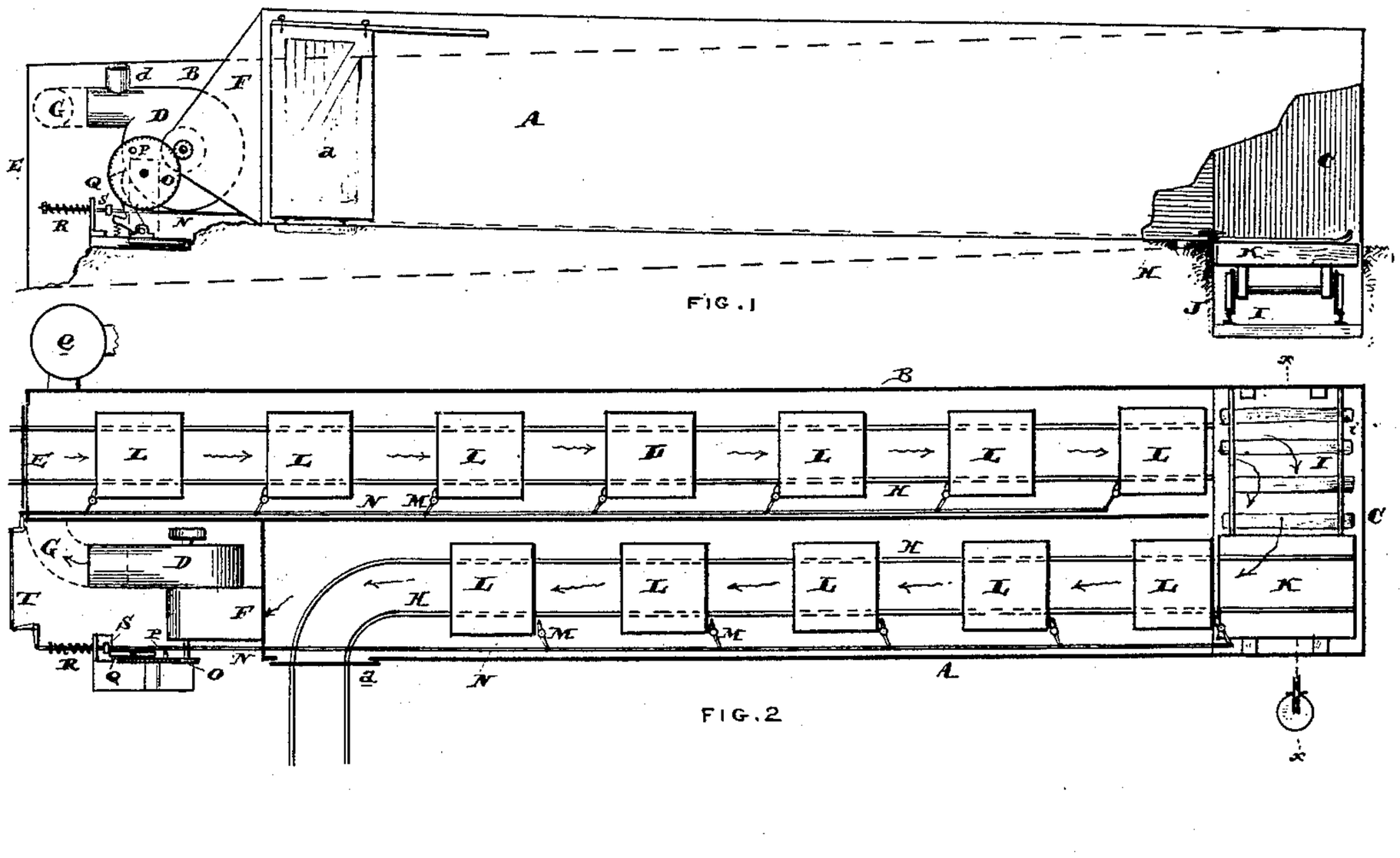


FIG. 1

FIG. 2

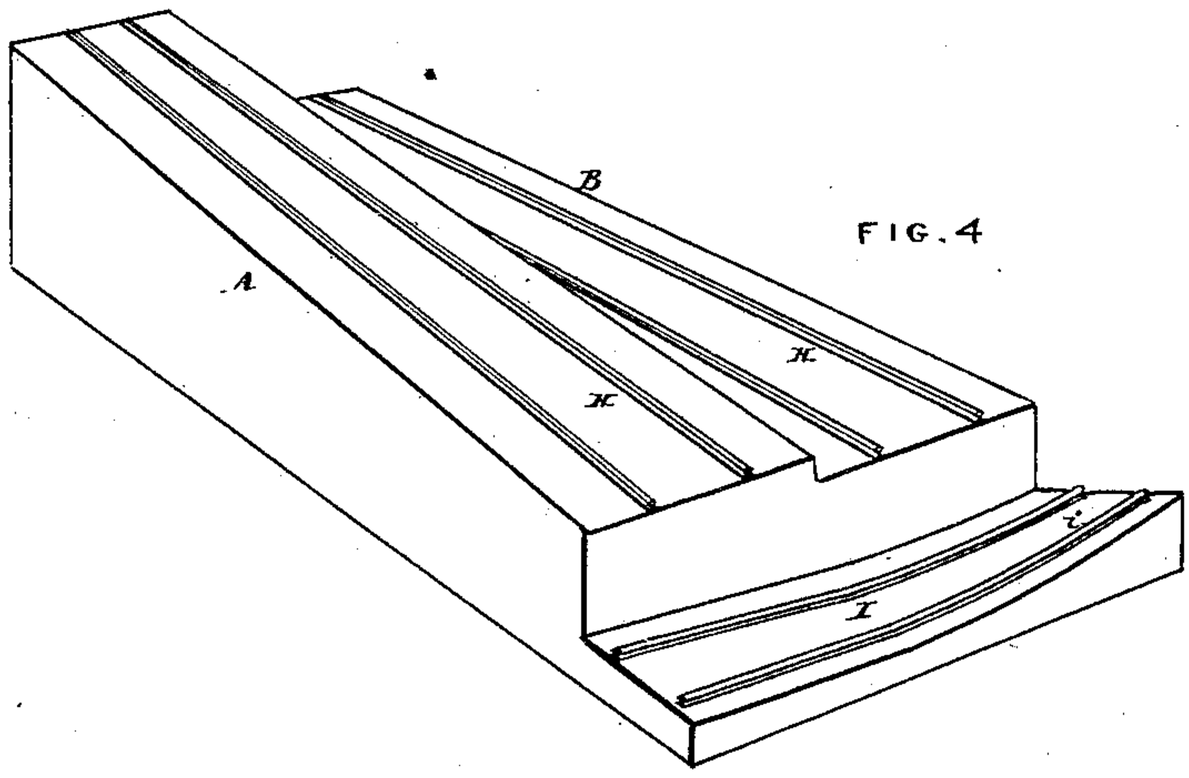
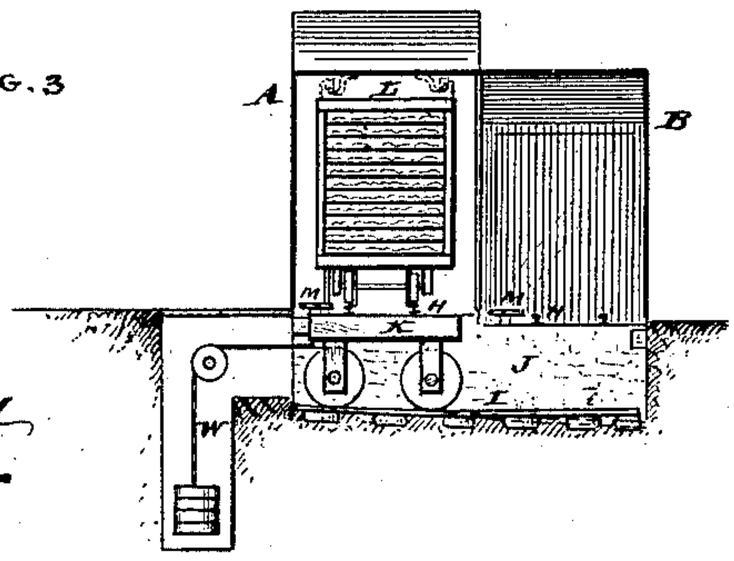


FIG. 4

FIG. 3



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JOHN H. LORIMER, OF PHILADELPHIA, PENNSYLVANIA.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 354,199, dated December 14, 1886.

Application filed March 26, 1886. Serial No. 196,641. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. LORIMER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Drying Apparatus, of which the following is a specification.

My invention has reference to drying apparatus; and it consists in certain improvements, fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

Heretofore in drying glue, skins, hides, &c., it has been customary to spread them out in layers and expose them to the action of the atmosphere or sun's rays. That method of accomplishing the result was necessarily very slow, and at the same time uncertain, as it is well known that sometimes for a week or more the sun is obscured and the atmosphere is damp and in any but a proper condition for drying. Furthermore, owing to the long time required and the fact that only a single layer of material can be treated at one time, a large area is necessary to suit the capacity of an ordinary factory in any one of the branches of industry in which these materials are to be dried in their preparation.

Aside from the above customary mode of drying substances, it has been proposed to dry tobacco by the employment of two parallel chambers connected at one end by a cross-flue, said chambers being provided with rails and said flue with a truck, whereby the tobacco is caused to pass, supported upon carriages, through said chambers, the said chambers being provided with means for injecting hot air, substantially as set out in Letters Patent No. 333,985, of 1886. It has also been proposed to dry glue by causing it to pass through longitudinal chambers made air-tight, and through which the air is circulated, said air being passed through a heater before entering one end of the chambers, and being passed through a condenser before emerging from the other end, such an apparatus being shown in Letters Patent No. 276,405, of 1883. It has also been proposed to dry lumber by passing it upon suitable trucks through heating, steaming, and drying rooms, the two former being arranged upon the ends of the latter, and through which drying-room the heated air is caused to pass, as set out in Letters Patent No. 151,731, of 1874. I therefore do not claim such constructions, my invention being an improvement upon such devices.

The object of my invention is to provide suitable drying apparatus, whereby the materials to be dried may be passed through the apparatus in a limited time, and are treated to mechanical air-drafts pure and simple, or impregnated with disinfectant or bleaching vapors or gases, whereby in a limited space of time the materials are thoroughly dried and the manufacturer is enabled to guarantee his production.

In carrying out my invention I provide one or more tubular passage-ways or chambers, through which vehicles or trucks are caused to pass, preferably in an intermittent manner—that is to say, moving a certain distance through said passage-way, and then being arrested for a period of time, then moved again and arrested, until they gradually work their way through the passage-way or chamber. The said intermittent movement could be made automatic at certain intervals of time, or could be controlled by hand and operated each time, and a new or freshly-laden truck or vehicle is run into the passage-way. Through this passage-way or chamber, preferably in an opposite direction to the movement of the vehicle, air-currents are caused to pass, being circulated by a suction-fan or other mechanical means, and this air may be either cold or heated and pure or impregnated with disinfecting or bleaching substances. Where considerable length of time is required in the drying operation two or more of these passage-ways may be connected together, so that a truck could be run successively through each of them. It is also desirable to make the vehicles move automatically, and to do this I arrange the rails on an incline, and provide suitable stops to control their progress. At the adjacent ends of two passages or chambers I provide a transverse railway and truck, whereby the vehicle passing through one chamber or passage may be conveyed to the other chamber or passage in a convenient manner, and, if desired, automatically, the transversely-moving truck resetting itself after each delivery.

A drying apparatus of this kind is well

adapted to almost all the industrial arts, as with it paper-pulp, paper boards of all descriptions, glue, hides, skins, &c., can with equal facility be dried.

In the drawings, Figure 1 is a side elevation of a drying apparatus embodying my improvements, with one portion thereof broken away to show the transversely-moving truck. Fig. 2 is a plan view of the apparatus, having the roof thereof removed to show the interior. Fig. 3 is a cross-section of the same on line *x x*, and Fig. 4 is a perspective view illustrating the relative arrangement of the rails.

A and B represent two parallel passages or chambers, which are united at one end by an opening, C.

D is a fan which draws the air from the end F of the passage or chamber A, causing fresh air to enter at the end E of the chamber B, and insuring its passage first through one chamber and then through the other. This air may be cold or may be heated by any suitable heating apparatus, *e*, before entering the chamber B. If desired, the circulating-fan D may be connected by a pipe, G, with the end E of chamber B. By this means the same air may be used over and over again, and, if desired, may be supplied with a disinfectant or bleaching gas or vapor by a pipe, *d*, which may enter the air-supply or directly into the chamber itself, and it is drawn through with the drying-air. In place of air any suitable gas might be used.

H represents rails in said chambers A and B, which are preferably set on an incline, as indicated in Fig. 4, whereby a truck would run down to the right, Fig. 2, through chamber A, and to the left through chamber B, being transferred by the truck K, running upon transverse rails I, arranged in the pit J. These rails I are also arranged on an incline descending from the chamber A to chamber B, and the outer rail may be raised, as at *i*, so as to automatically tip the truck K, and cause its burden to run off upon the rails in the chamber B. The truck K may be returned or reset by a weight and cable, W, which is sufficient to draw it back when unloaded.

L represents a series of trucks or vehicles, upon which the material to be dried is placed, which practically fill the cross section of the interior of the chambers.

M are a series of stops, adapted to prevent the continuous passage of the vehicles containing the materials to be dried, and may be operated by rods N, either automatically or by hand. When the rods N are freed, the vehicles L move past the catches or stops holding them, and are arrested by the next stops, so that their progress through the said chambers is intermittent, and one vehicle passes out at E only when a freshly-laden vehicle passes in at the entrance *a* to the chamber A; or, if desired, a single vehicle might be intermittently propelled from A to E. The rods N may be connected together, as at T, and may be drawn back into locking position by a spring, R, and locked by a pawl, Q, moving up in front of a nut, S, on the rod N. When the pawl is moved away, the weight of the vehicles trips the catches M, and they pass on to the next stop or catch after the spring R has reset the said catches and they have become one more locked by the pawl Q and nut S. This action may be made automatic by any suitable mechanism connecting with the engine or with the fan or blower.

As shown, Q represents gearing rotated by the blower and provided with a pin, P, adapted to act upon the spring-pawl Q to trip it at the right instant.

I do not limit myself to any particular form of catch or stop, as it may be constructed in a number of ways. I do not limit myself to the incline railways, as they may be horizontal and the vehicles pushed or propelled through the chambers, and in place of the railways being arranged on the ground the vehicles may run upon overhead tracks, as indicated in dotted lines, Fig. 3. Therefore, while I prefer the construction shown, I do not limit myself thereto, as the details may be modified in various ways without departing from my invention.

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

1. A passage-way or chamber, in combination with a fan to cause a current of air or gas to pass through said passage-way or chamber from end to end, inclined rails arranged within said passage-way or chamber, one or more vehicles adapted to run upon said rails to carry the material to be dried and be moved through said passage-way or chamber, and stops or catches to control the movement of said vehicles, substantially as and for the purpose specified.

2. A passage-way or chamber, in combination with a fan to cause a current of air or gas to pass through said passage-way or chamber from end to end, inclined rails arranged within said passage-way or chamber, one or more vehicles adapted to run upon said rails to carry the material to be dried and be moved through said passage-way or chamber, stops or catches to control the movement of said vehicles, and automatic mechanism to periodically actuate said stops to insure the travel of the vehicles with a given velocity, substantially as and for the purpose specified.

3. A passage-way or chamber, in combination with a fan to cause a current of air or gas to pass through said passage-way or chamber from end to end, one or more vehicles adapted to carry the material to be dried and be moved through said passage-way or chamber, and a pipe to admit a disinfectant or bleaching medium to the suction end of the drying-chamber, substantially as and for the purpose specified.

4. The combination of two or more drying-chambers arranged substantially parallel, an inclined transverse railway connecting adjacent ends of adjacent chambers, inclined railways

in said chambers, a conveying or transfer truck to run upon said transverse railway, vehicles to carry the material to be dried, adapted to run upon said railways of said chambers and be transferred by the transfer-truck, and a fan or blower to force or draw a drying medium through said chambers, substantially as and for the purpose specified.

5. The combination of chambers A B with a fan or blower to cause a circulation of a drying medium through said chambers in succession, inclined railways in said chambers, the inclination in adjacent chambers being in opposite directions, and a connecting-railway between the railways of said chambers, whereby a vehicle carrying the material to be dried may pass successively through said chambers, substantially as and for the purpose specified.

6. The combination of chambers A B with a fan or blower to cause a circulation of a drying medium through said chambers in succession, inclined railways in said chamber, the inclination in adjacent chambers being in opposite directions, a connecting-railway between the railways of said chambers, whereby a vehicle carrying the material to be dried may pass successively through said chambers, and stops arranged at intervals along said railways to control the passage of said vehicles, substantially as and for the purpose specified.

7. The combination of chambers A B with a fan or blower to cause a circulation of a drying medium through said chambers in succession, inclined railways in said chambers, the inclination in adjacent chambers being in opposite directions, and a connecting-railway between the railways of said chambers, whereby a vehicle carrying the material to be dried may pass successively through said chambers, stops arranged at intervals along said railways to control the passage of said vehicles, and connecting-rods for operating all of the stops simultaneously, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

JOHN H. LORIMER.

Witnesses:

RICHD. S. CHILD, Jr.,

R. M. HUNTER.