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C. GOODALL

2,006,018

DRYING OF TIMBER OR OTHER MATERIALS

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2 Sheets-Sheet 1

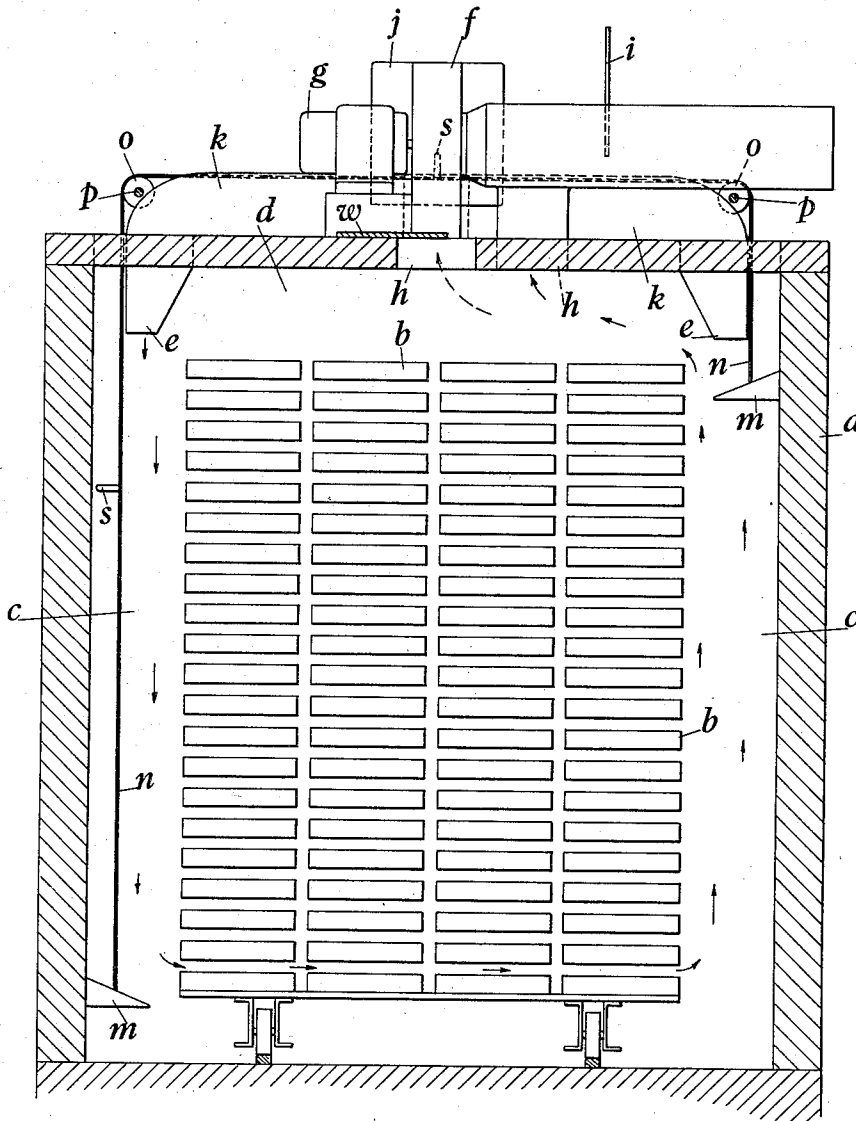


Fig.1

C. Goodall
INVENTOR

By: Marks & Clerk
ATTYS.

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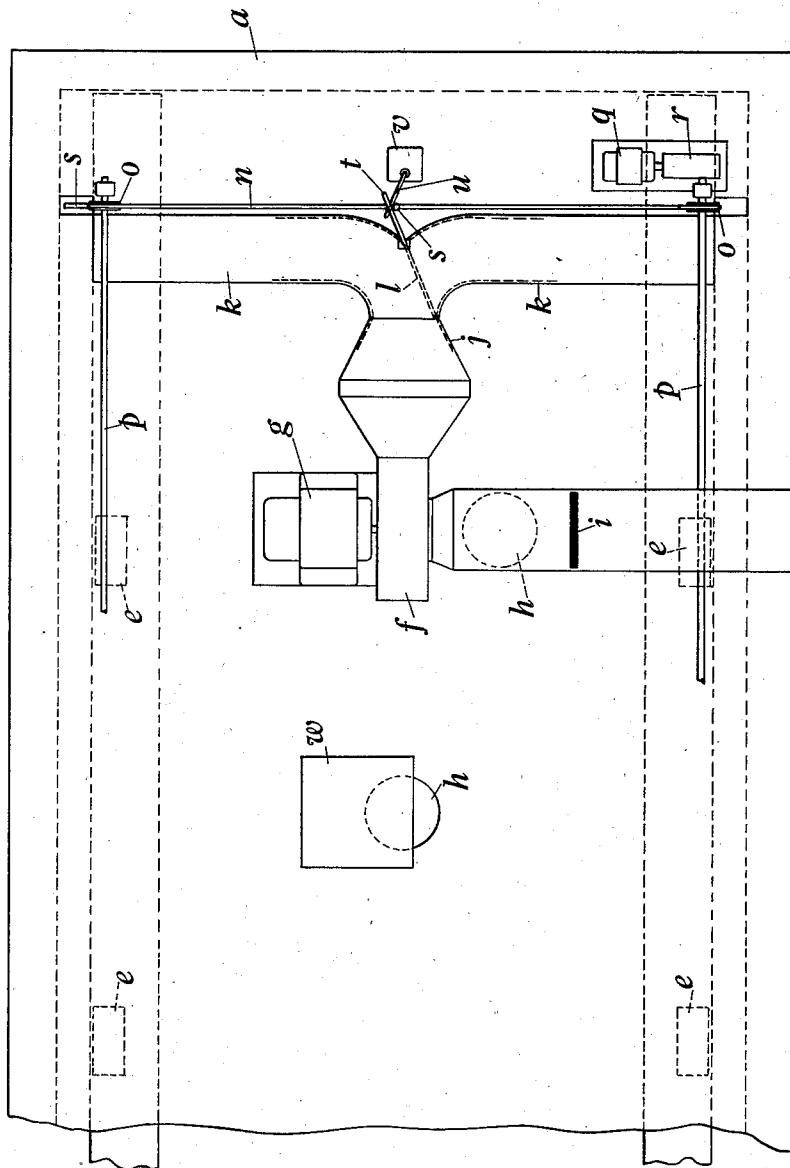
C. GOODALL

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C. Goodall
INVENTOR

By: Marks & Clerk
Attys.

UNITED STATES PATENT OFFICE

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DRYING OF TIMBER OR OTHER MATERIALS

Charles Goodall, Tutbury, Burton-on-Trent,
EnglandApplication March 15, 1934, Serial No. 715,709
In Great Britain December 30, 1933

2 Claims. (Cl. 34—46)

This invention relates to apparatus for use in the drying of timber and other materials, the apparatus being of the kind comprising a chamber in which the materials can be stacked with air spaces between them, and means for producing a flow of air or other gases through the said spaces.

The object of the present invention is to provide improved apparatus in which the flow of air can be more effectively regulated so as to produce uniform drying of all parts of the materials stacked in the chamber.

By the term air I mean not only atmospheric air but any gas or mixture of gases which can be advantageously used for the purpose of drying the materials undergoing treatment in the chamber.

In the two accompanying sheets of explanatory drawings:—

Figure 1 is a cross section and Figure 2 a plan of a portion of a timber drying apparatus constructed in accordance with this invention.

In carrying the invention into effect as shown, I employ a chamber *a* of rectangular cross section. The timber *b* or other material to be dried is stacked on the floor of the chamber, horizontal spaces being arranged between the successive layers of the stack. Spaces *c* are also provided at the two sides of the stack, and another space *d* is provided at the top of the stack.

At the upper end of each of the side spaces *c* are arranged inlets *e* for a stream of air supplied by a fan or blower *f* driven by an electric motor *g*. Outlets *h* which may be controlled by dampers *w* are also arranged at the top of the chamber. One or more of the outlets may be connected to the inlet of the fan, so that the fan may draw air either from the chamber or from the outer atmosphere. The connection between the fan and the outer atmosphere is controlled by a damper *i*. Further an air heater *j* may be arranged at any convenient position, as for example, at the outlet of the fan.

On looking at the plan in Figure 2, it will be seen that air is supplied to the inlet apertures *e* by a culvert *k* connected to the delivery side of the fan. To enable air to be delivered to either of the spaces *c* the culvert *k* is provided with a pivoted flap valve *l* whereby the air stream from the blower can be delivered to either the left hand or the right hand side space *c* of the drying chamber.

Within each of the side spaces *c* is mounted a deflector *m* which is disposed in the path of the air stream, leaving a space between it and

the adjacent side of the stack. These two deflectors are interconnected by cords, chains, or other flexible means *n* passing over pulleys *o* carried on shafts *p*, one of which is driven by an electric motor *q* through reduction gearing *r*, so that a rising or falling movement of either deflector is accompanied by the opposite movement of the other deflector. Each deflector receives a slow and continuous up and down movement.

Assuming one of the deflectors *m* to be in its lower position as shown at the left hand side of Figure 1, and the other in its upper position as shown at the right hand side, air flowing down the left hand space *c* is deflected laterally and caused to flow horizontally through the spaces in the stack adjacent to the deflector. After passing through the stack the air rises in the right hand space and is returned to the fan or is allowed to escape to the atmosphere. With the slow upward movement of the left hand deflector *m* the position at which the air is deflected into the stack is progressively varied, so that during the movement of the deflector from its lower to its upper position the air stream is caused to pass through all of the horizontal spaces of the stack. When the deflector reaches the upper position its motion is reversed. The reversal of motion of the deflectors is also accompanied by reversal of the air stream, so that while the left hand deflector is descending air is directed down the right hand space and is deflected horizontally by the right hand deflector, the air being now caused to flow horizontally through the stack in the reverse direction to that first described. After flowing down the right hand space until the right hand deflector reaches the top of its movement, the air stream is again reversed so that it flows down the left hand space, and the cycle above described is repeated.

By proceeding as above described, the horizontal part of the air stream is at any given instant localized in a part of the stack, and the position at which the stream passes through the stack gradually changes. Previously it has been the practice in timber drying processes to cause the air to pass through all parts of the stack at the same time, and this has resulted in certain disadvantages which are avoided by my present invention. It is well known that in the drying of timber there is always present a risk of excessively rapid drying (or case hardening) of the surfaces exposed to the air stream. One of the consequences of this condition is that the moisture contained in the inner parts of the timber is not removed by the continued action of the

air stream, and another consequence is that the surface portions of the timber are liable to develop cracks. When timber is treated by my present process the action of the air stream on any given part of the stack is intermittent because the position at which the stream is being directed into the stack is continuously being changed. While the air is flowing moisture is being removed, but the time for which the flow is maintained at a given part of the stack is relatively small, and during the periods in which no air is flowing through that part moisture can diffuse out of the interior of the timber to the dried or drier outer surfaces prior to removal when the air stream is again directed over that part. In this way I am able to ensure thorough and uniform drying without cracking or distortion, and also I am able to reduce the normal total time required for drying.

Periodic reversal of movement of the air current is conveniently effected by arranging on one of the chains or the like *n* a pair of strikers *s* either of which can engage a lever *t* on the valve *l* and cause it to swing to slightly beyond its central position, the movement of the valve being completed by pressure of the air acting on the valve. At the same time the same striker *s* engages a lever *u* on a reversing switch *v* controlling the motor *g*, and by operating the switch causes the motion of the motor to be reversed. At the end of the next phase in the movement of the deflectors the other striker *s* will engage the levers and effect reversal of the air valve and switch.

Instead of admitting the air at the top of the side spaces it may be introduced at the bottom. Also the air may be withdrawn from the bottom of the drying chamber if desired.

The invention is not limited to the example above described as subordinate details may be varied to suit different requirements.

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

1. In apparatus for use in the drying of timber or other materials, the combination of a chamber in which the timber or other material can be stacked leaving spaces within and around the stack, a deflector vertically movable in each side space and adapted to direct the air horizontally through the stack, flexible means interconnecting the deflectors so that upward movement of one is accompanied by downward movement of the other, reversible actuating means for the deflectors, a fan, means for conveying air from the fan into each side space alternately, a reversing valve situated between the fan and chamber inlets, and a striker associated with the deflector actuating mechanism for reversing the said valve, substantially as described.

2. In apparatus for use in the drying of timber or other materials, the combination of a chamber in which the timber or other materials can be stacked leaving spaces within and around the stack, means for delivering air into the two side spaces in the chamber, deflectors situated in the said side spaces, a plurality of flexible elements interconnecting the deflectors, guide pulleys supporting the said elements, shafts carrying the said pulleys, a reversible electric motor connected to one of the shafts, a reversing switch, and a striker on one of the said elements for actuating the switch, substantially as described.

CHARLES GOODALL.