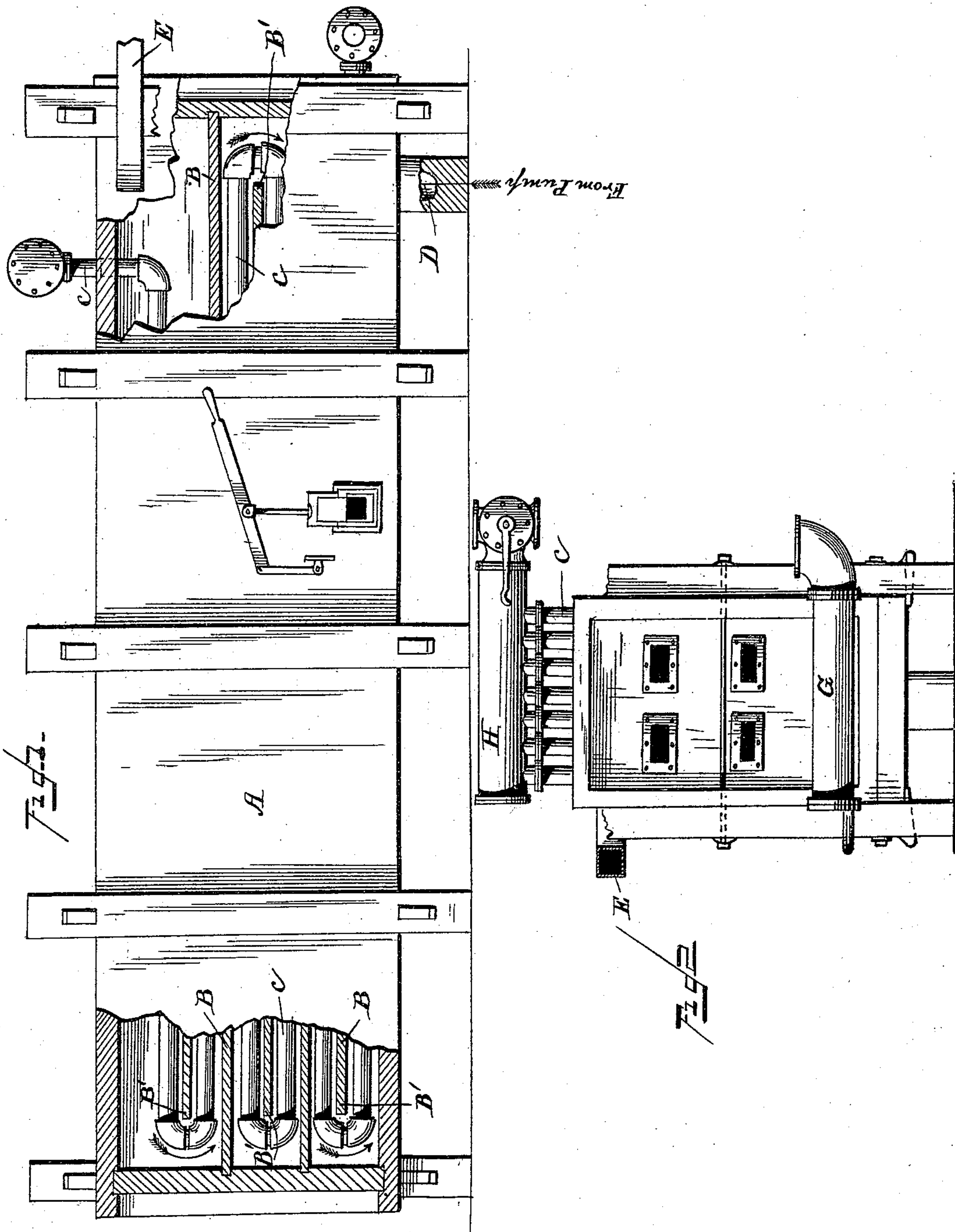


(No Model.)

O. F. CARLEY.  
PROCESS OF HEATING TAN LIQUOR.

No. 407,280.

Patented July 16, 1889.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

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## PROCESS OF HEATING TAN-LIQUOR.

SPECIFICATION forming part of Letters Patent No. 407,280, dated July 16, 1889.

Application filed March 23, 1889. Serial No. 304,402. (No model.)

*To all whom it may concern:*

Be it known that I, OLIVER F. CARLEY, a citizen of the United States, residing at Westfield, in the county of Tioga and State of Pennsylvania, have invented certain new and useful Improvements in a Process for Heating Tan-Liquor, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The object of my invention is the providing of a process for heating tan-liquor in such a manner as to prevent dilution of the liquor by direct contact with the steam, and whereby said liquor is preserved in a  
15 condition most favorable for the settling and separation of the gum from the bark, thus enabling the tanner to secure a leather far lighter than that obtained by ordinary processes, and preventing the formation of a  
20 spotted tan.

To this end I treat the tan-liquor as hereinafter specified, and provide such novel treatment of the liquor as called for in the claims attached to this specification.

25 In the drawings, Figure 1 is a side elevation of the box in which I heat the liquor, said box being shown with portions of the sides broken away to show the arrangement of the partitions in the interior of the same.  
30 Fig. 2 is an end elevation showing arrangement of the steam and liquor pipes for the best serving of the end in view.

A is a box of any convenient and suitable size, which box is divided interiorly by partitions fastened alternately at opposite ends of the box A, as shown at B. The ends B' of said shelves or partitions do not extend to the other end of the box A, thus forming a horizontal zigzag or sinuous passage through  
40 the box for the following purpose: Extending from the steam-drum H over the box A are a large number of steam-pipes c, which are carried through the box A, as shown, in a sinuous direction, extending along the  
45 whole length of each space between the partitions, dropping from one space to the next below at each end B', and returning the whole length of the box to drop again as above, and so on. After passing through the  
50 whole box, and through every space between

the partitions in this manner, these pipes find their exit at the drum G.

Under the box A is placed the pipe D, leading to the pump for the tan-liquor, which latter may be of any character, as my invention does not lie in the apparatus which I employ for this purpose, but in the method of treatment of the liquor, as set forth in the claims. It is therefore distinctly to be understood that I do not confine myself to the apparatus shown and described, as any device whereby and in which the tan-liquor can be treated as claimed hereinafter would in its use come under my invention; but I have in my application for patent, filed May 14, 1889, Serial No. 310,110, described and shown a form of an apparatus adapted to the purpose of carrying out the process described and claimed in this case.

The essential point of my invention, then, lies in the heating of tan-liquor in a confined space by the action of steam traveling in pipes in a direction opposite to the motion of the liquor. This is carried out by the admission of the steam at the point H, and thence through the pipes c until it passes out at G. The tan-liquor is pumped into the box at D, and is made to slowly travel upward from D to the top of the box and exit at E, where it may be caught and allowed to settle. The length of the pipes c and the velocity of the travel of the tan-liquor and of the steam should be so calculated that all the steam is condensed and the water has parted with most of its heat by the time it reaches G, and that the tan-liquor at its exit is of the proper temperature.

The chief advantage of this method of heating tan-liquor is that all the "churning" action invariably incident to the use of ordinary methods is obviated by the confining of the liquor within a narrow space and keeping it out of contact with the steam itself. This action, together with the gradual increase of heat to which the liquor is subjected by following along in contact with steam-pipes which are hottest at the exit-point of the liquor, causes the gum, which is always in suspension in tan-liquor, to remain in its natural state of aggregation in considerable

globules. This fact presents the great advantage of permitting the said gum to settle out of the liquor afterward with a completeness hitherto found impossible with gummy  
5 barks, such as that of the hemlock and kindred woods. By the use of my process hemlock leather may be made almost as light and even as oak leather, thus materially lessening the cost of the leather in the end.

10 The upward and sinuous flow of the liquor in narrow spaces, too, prevents the heterogeneous division of the liquor into layers of various temperatures and states of settling, as would be the case if the liquor were carried  
15 in a horizontal direction. By my method all of the liquor is evenly heated, and therefore brought into a homogeneous condition.

What I claim is—

1. The herein-described process of heating

tan-liquor, which consists in passing it in a  
20 sinuous flow over the surface of steam-pipes in a direction opposite to that of the movement of the steam within the pipes, whereby the advancing liquor is subjected to a gradually-increasing temperature, substantially  
25 as described.

2. The herein-described process of heating tan-liquor, which consists in pumping it upward through a series of sinuous passages, through which steam is circulating in pipes  
30 in a direction contrary to that of the direction of the liquor, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

OLIVER F. CARLEY.

Witnesses:

MARTIN STARK,  
J. W. HOWARD.