

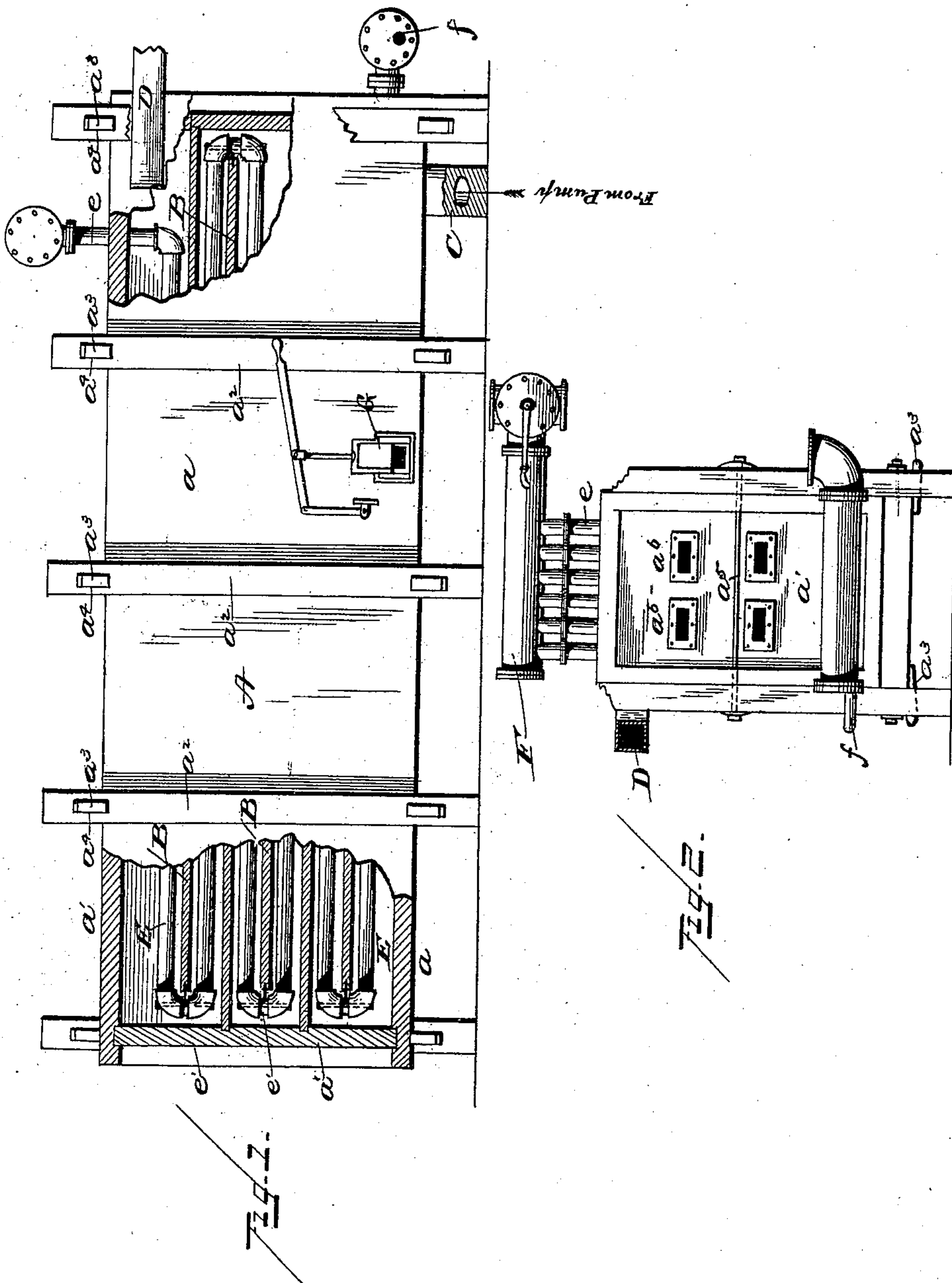
(No Model.)

2 Sheets—Sheet 1.

O. F. CARLEY.
APPARATUS FOR HEATING TAN LIQUOR.

No. 407,281.

Patented July 16, 1889.



WITNESSES
F. L. Curand.
Russell Severance.

INVENTOR
Oliver F. Carley,
By *R. Deane*
his Attorney.

(No Model.)

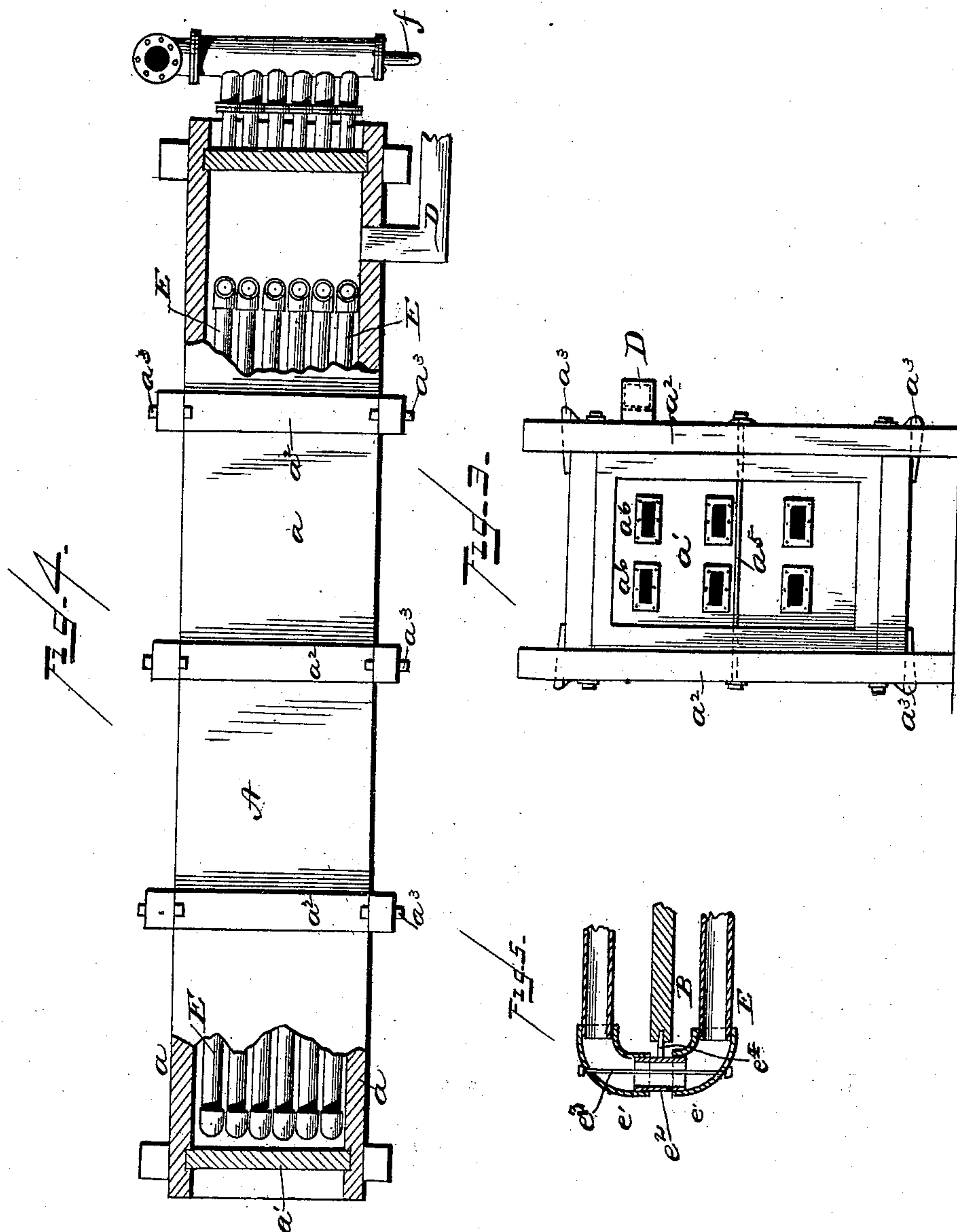
2 Sheets—Sheet 2.

O. F. CARLEY.

APPARATUS FOR HEATING TAN LIQUOR.

No. 407,281.

Patented July 16, 1889.



WITNESSES
J. L. Ourand
Ezra Overance.

INVENTOR
Oliver F. Carley,
By *X. Deane*
his Attorney.

UNITED STATES PATENT OFFICE.

OLIVER F. CARLEY, OF WESTFIELD, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO DEWITT C. CONKLIN, OF OLEAN, NEW YORK, AND STEPHEN E. YOUNG, OF COLUMBUS, OHIO.

APPARATUS FOR HEATING TAN-LIQUOR.

SPECIFICATION forming part of Letters Patent No. 407,281, dated July 16, 1889.

Application filed May 14, 1889. Serial No. 310,110. (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 Tan-Liquor-Heating Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Figure 1 is a side elevation of this device with the sides of the tank partly broken away. Fig. 2 is an elevation of one end. Fig. 3 is an elevation of the other end. Fig. 4 is a top plan view with parts broken away to show the interior; Fig. 5, a detail showing how the bends of the coils are united together, also the lug on each entering the partition to act as a support.

This invention is designed to heat the liquor used in tanning leather; and the novelty consists in the construction and combination of the several parts of the apparatus, all as will now be more fully set out and explained, as well as pointed out in the claims, reference being had to the accompanying drawings.

In the drawings, A denotes the outside casing or tank, which may be of the knockdown order—that is, it consists of side, bottom, and top walls a , end pieces a' , and binders or studs a^2 at the sides, top, and bottom, held together by keys a^3 , which are inserted in the slots a^4 (shown in the drawings) and held by wedges, or in any like and convenient way. The end pieces are held in place by rods a^5 , passing from side to side through the binders at this point and held by nuts at each end. When set up and in use, these sides, ends, and top and bottom can be brought sufficiently tight and close together to prevent any serious leak of the fluid inside. Within this tank or case are horizontal partitions B, tongued into the side walls and extending alternately from one end nearly to the other, so as to afford a zigzag flow for the liquor as it is forced by the pump C from the bottom up through the tank and out of the discharge D at or near the top.

Between the partitions B are placed the steam pipes or coils E, so that each space is thus supplied. There may be as many of these coils as may be desired; but I preferably use such as are now shown. Steam is admitted to these pipes at the top from the inlet F, provided with a three-way or any suitable cock. Thus the inflow of steam is perfectly controlled. The steam flows downward in a zigzag course through the coils and escapes as water or spent steam at the outlet f in the lower end, preferably right under the inlet, so as thus to secure a complete flow through the tank.

If it is desired to clean the outside of the steam-coils, any or all of the covers a^6 , attached to the end pieces a' , can be readily removed by withdrawing the screws that hold them. Thus will be afforded direct access to any or all of the different portions of the coils; or, when the liquor is out of the tank, either end piece can be taken off by withdrawing the rods a^5 , and access can then be had for repair or cleaning to the entire system of the steam-coils as well as to the interior of the tank.

When it is desired to draw off the liquor from the tank for cleaning out or any like purpose, or when the pump is not working, the gate G at the lower side is raised and an outlet is afforded for that purpose.

The operation of this apparatus is as follows: The tank is secured in the building directly over or at a suitable position above the vats. The pump is operated and the liquor forced from the bottom and in zigzag passage up through the tank and out of the discharge-opening through any suitable pipe or nozzle or vent. Simultaneously with the pumping operation steam has been let through the pipes e into the zigzag coils E, each pipe leading to its own coil E, and thus the steam in a course opposite to that of the tanning-liquor flows down in zigzag course to the lower outlet, so that in this operation the steam at its highest temperature meets the liquor just as it is flowing from or passing out of the tank. The liquor is in the very best condi-

tion to do effective work in the vats, into which it is led by proper pipes after it has left the tanks.

In the detail in Fig. 5 I have shown a very simple way of uniting the ends e' of the coils at the bends. Between them is placed a short piece e^2 , fitting at its ends snugly in each, and these parts are all secured together by means of the rod e^3 , which passes through them and is provided with nuts on its ends, so that the joints can be made sufficiently tight; but any usual or ordinary means can be employed in making or packing this joint. In order that the steam pipes or coils may not come in contact with the partitions B, there is provided a projecting lug e^4 at each bend or joint, which is adapted to enter a hole in the end of the partition or shelving, and thus constitutes a support or stay for the coil or pipe. The advantage of this is that there is thus provided free circulation of the liquor about the pipe and no opportunity for the collection of sediment. It is evident that in the mere mechanical detail of this construction many changes can be made which will in no degree change the essential ideas that have been above set forth and explained—namely, an apparatus adapted to secure throughout the tank or vessel for holding the tanning-liquor a zigzag flow of the liquor, a steam heater or coil also having a zigzag course through the zigzag passages for the liquor, and means for forcing the liquor through the tank, and such arrangement of parts and such operation thereof as shall insure that the steam and liquor shall flow in opposite directions, and the liquor as it escapes from the tank shall be in contact with the steam-pipes at their highest point of temperature.

In my application for patent filed March 23, 1889, Serial No. 304,402, is set out a process for heating tan-liquor which can be carried out in an apparatus like that embodied in this case. In this case no claim is therefore made to such a process.

I claim—

1. A tank for heating tan-liquor, provided with a zigzag passage for the liquor and a zigzag steam-heating coil within the liquor-passage, substantially as and for the purposes set forth.

2. In combination with the tank A, having partitions B to afford a zigzag passage throughout it, the zigzag steam pipes or coils E, the inlet F, the connections e , the pump C, for forcing the liquor through the tank, and steam or water outlet f , all as set forth.

3. In combination with the tank A, made as described and having zigzag passages for the tan-liquor and steam, a gate G, for letting off the liquor when desired.

4. In a tank for heating tan-liquor, the end pieces a' and rods a^5 for holding them in position, whereby, when occasion requires, the said pieces, or either of them, can be removed and access had to the entire inner part of the tank, substantially as set forth.

5. In an apparatus for heating tan-liquor, the combination of the following elements, viz: a knockdown tank having zigzag passages for the liquor, zigzag heating-pipes in said passages, means for forcing the liquor through the tank, doors by which each coil can be inspected, removable end pieces by which the entire interior of the tank can be inspected, and a gate to draw off the liquor as occasion demands.

6. In an apparatus substantially as described, the combination of the steam pipe or coil having a projecting lug e^4 at each bend or joint, as set forth, with the partitions B, whereby the coil or pipe is supported in the manner and for the purposes explained.

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

OLIVER F. CARLEY.

Witnesses:

CASELL SEVERANCE,
THOS. STORRS.