

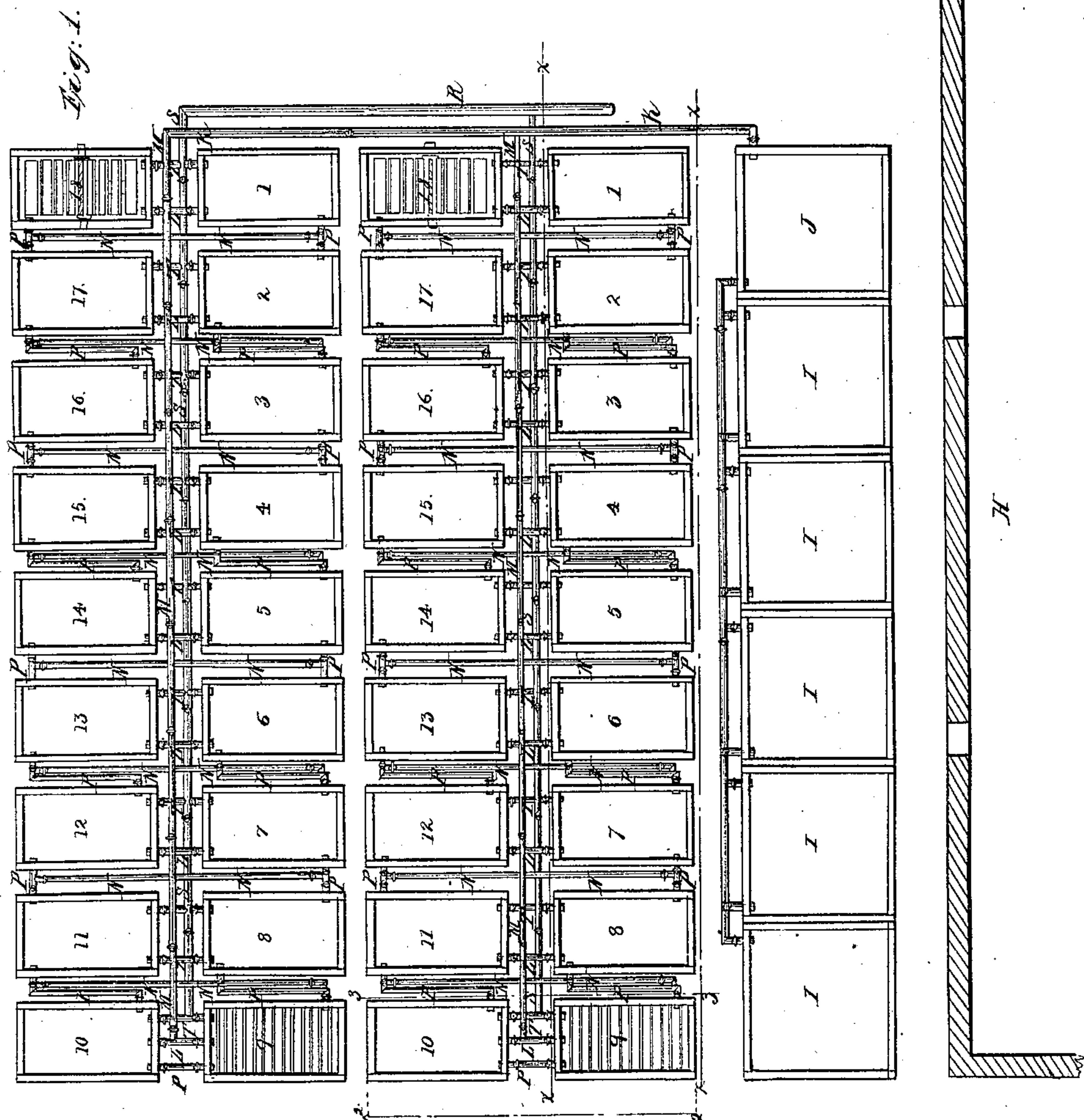
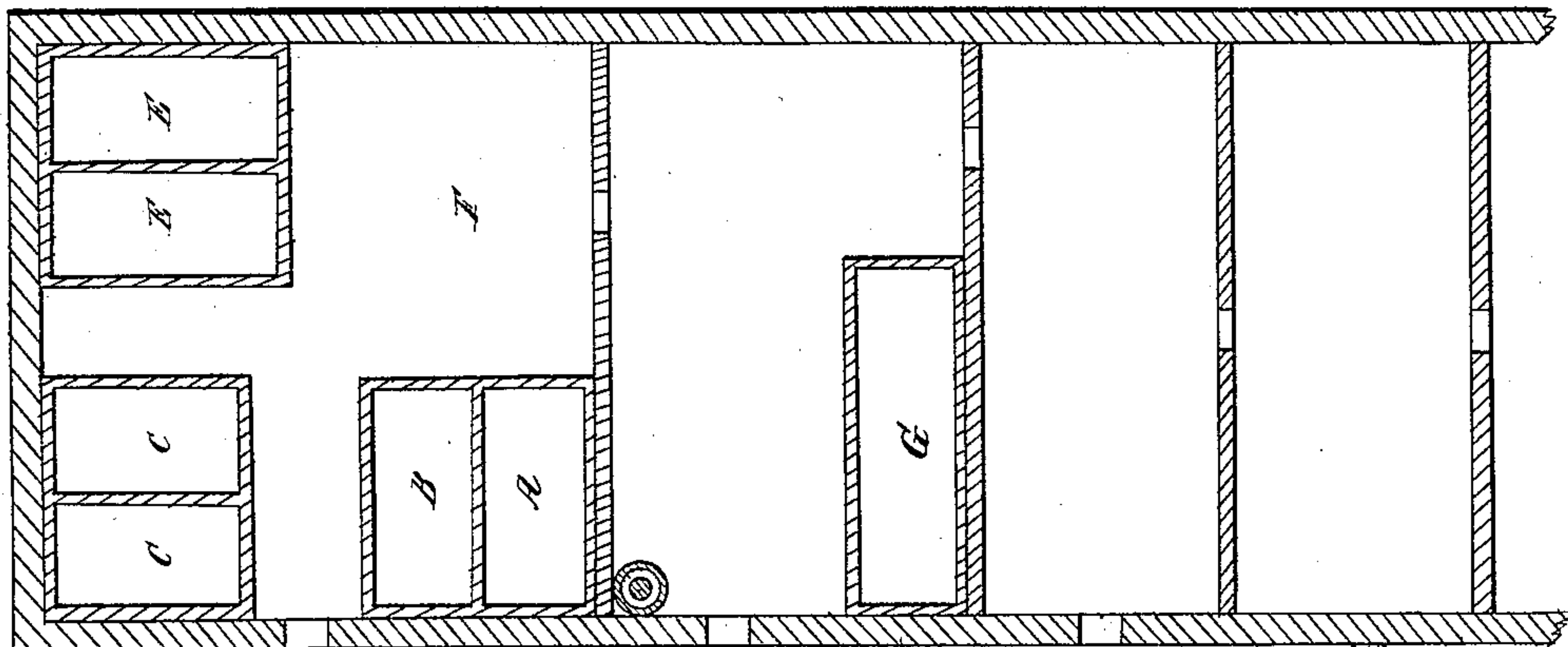
D. H. Kennedy

2 Sheets - Sheet 1

Tanning Hides

N^o 14,135

Patented Jan. 22, 1856.



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Fig. 4.

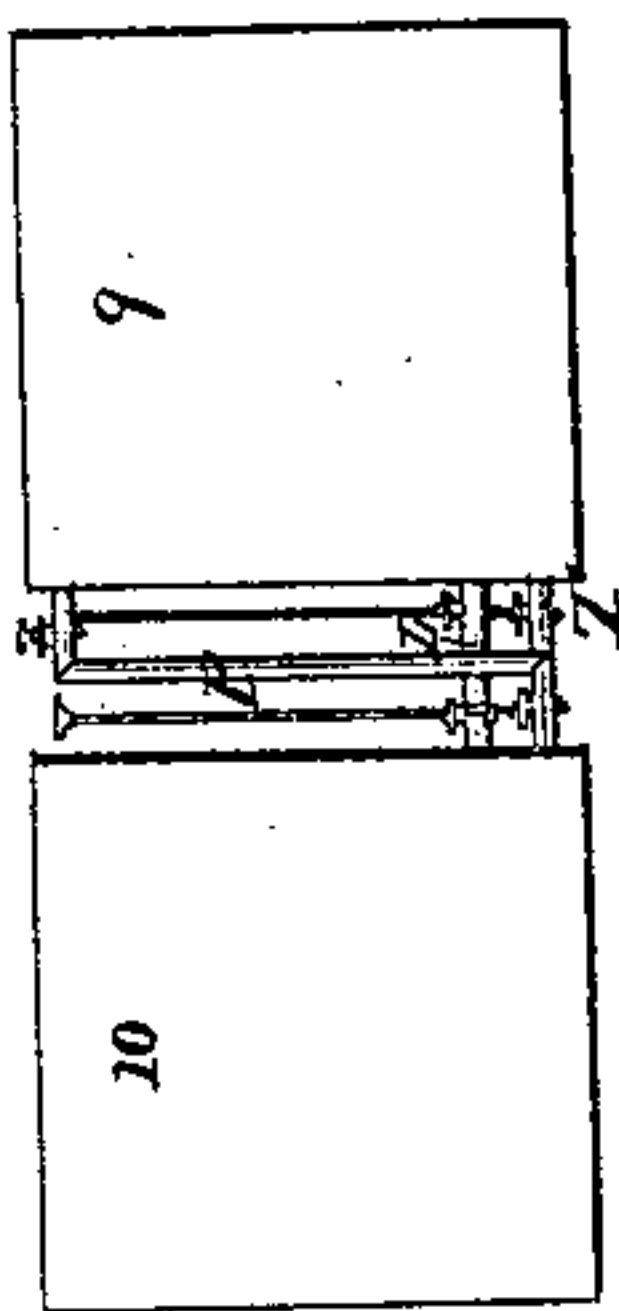


Fig. 5.

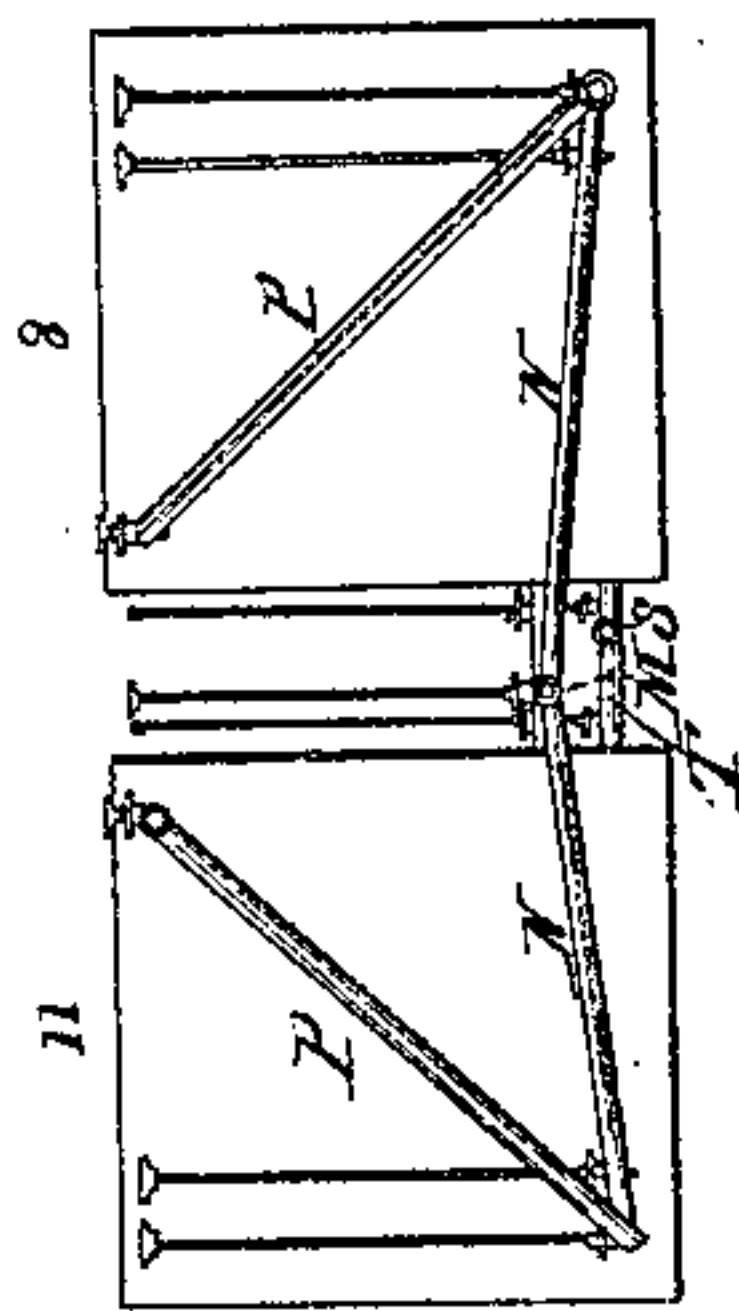


Fig. 2.

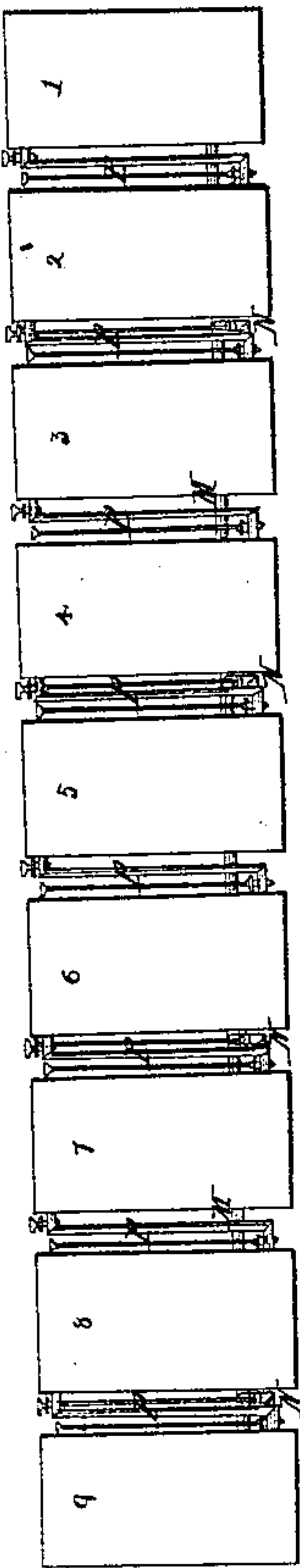


Fig. 3.

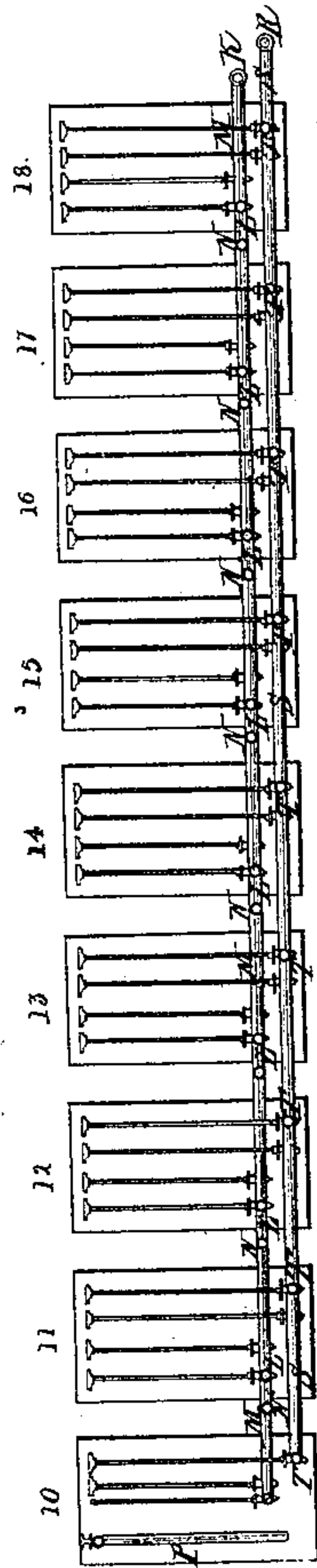
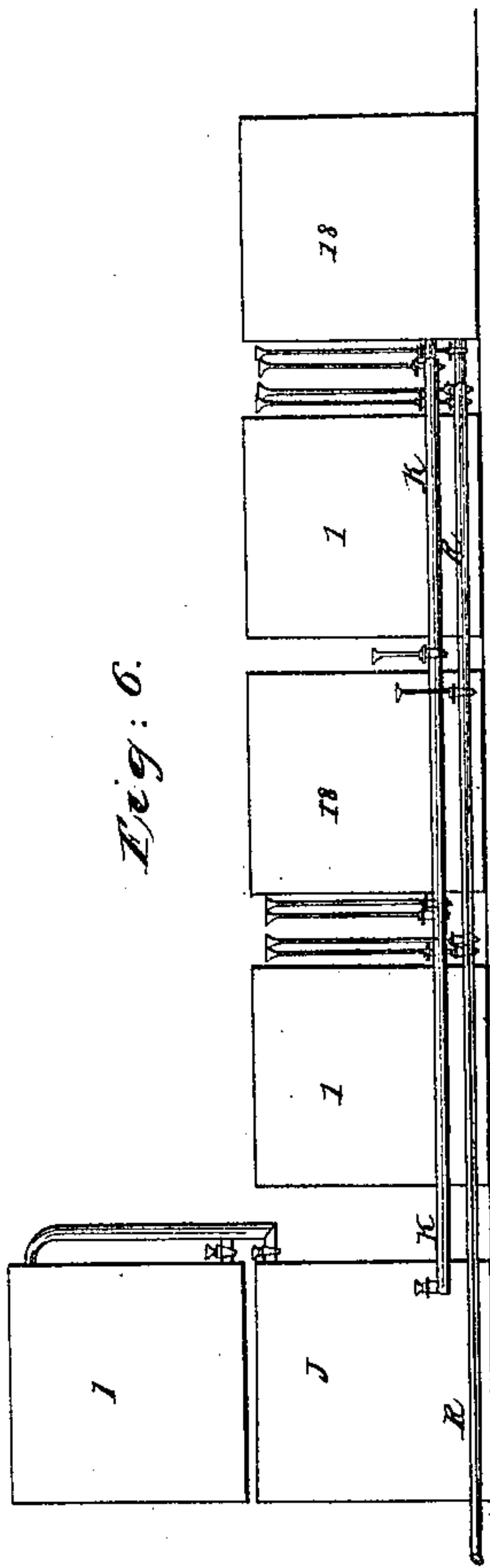


Fig. 6.



UNITED STATES PATENT OFFICE.

DAVID H. KENNEDY, OF READING, PENNSYLVANIA.

ARRANGEMENT OF TAN-VATS.

Specification of Letters Patent No. 14,135, dated January 22, 1856.

To all whom it may concern:

Be it known that I, DAVID H. KENNEDY, of Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Tan-Yards, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, which make part of this specification, and in which—

Figure 1, represents a general plan of a tan yard, having two series of tanning vats, constructed and arranged upon my improved plan; Fig. 2, an elevation of the vats and their connecting pipes, at the line $x x$ of Fig. 1; Fig. 3 represents a vertical section at the line $x x$ of Fig. 1, to show an elevation of the arrangement of the pipes and cocks for regulating the supply and circulation of the ooze or tan liquor; Fig. 4 represents an end elevation of a portion of the vats opposite the line 2, 2, of Fig. 1; and Fig. 5, a section at the line 3, 3, of Fig. 1 and Fig. 6 represents an elevation of that end of the tanning vats, liquor-tank, and leaches, adjacent to the lime-vats and bark-mill.

In my improved tan yard all hides except such as are green, are moistened in water in a vat (A), whence they are transferred into a vat (B), to be soaked in any of the chemical preparations in common use, preparatory to liming. Green hides are placed directly in the vat (B). On the completion of the soaking of the hides in the vat (B) they are transferred to the lime vats E. The chemical part of the depilatory process being complete, the hides are removed from the lime vats into the beam house (F) where the hair is scraped off them, and they are well cleansed, preparatory to being subjected to the action of the breaking or softening mill (G). After the hides have been worked in the mill until thoroughly softened, they are removed to the beam house (F) and well scraped and scoured and then placed in the bating vats (C), prepared in the usual manner for their reception. After the bating is complete the hide is again scoured, until thoroughly cleansed, when if the foregoing operations have been severally performed with care and judgment, the hide is in good condition for the application of the tanning liquor.

Preparatory to describing the manner in which the hides are treated in the tan vats,

I will briefly describe the arrangement of the several parts of the tan-yard, and the manner of preparing the tanning liquor, or ooze, and supplying it to the vats.

The tanyard I have represented in the drawings is nearly square. One side of this square is occupied by a bark shed (H), in which the supply of bark is stored. Another side adjacent to the bark shed is occupied by a building, say two stories high, the ground plan of which is represented in the figure, and is occupied by apartments and apparatus for the preparation of the hides for the tanning process, while the upper story may be used for finishing processes subsequent to the tanning.

Directly in front of the bark shed, and with only space enough for a carriage way between them, are a series of leeches (I) for the preparation of the ooze, which is an infusion or decoction of bark containing tannin, and at the end of the row or series of leeches, a tank, or reservoir for the ooze is placed, which, by means of a pipe with suitable branches, and stop cocks can communicate with any one or all of the leeches. The top of the tank is on a level with the bottom of the leeches, in order that the latter may empty their liquor into the former by the force of gravitation alone.

The leeches are first supplied with ground bark, and then as much water is added as the vat will contain. When the water has taken up tannin enough to make ooze of the requisite strength, the liquor is allowed to run off into the tank, a fresh supply of water can then be admitted to the bark, and when it has acquired the requisite strength, should be run off, and a fresh supply of water again admitted, repeating the process until the bark is spent or exhausted of its tannin, when it must be removed, and the leeches replenished with fresh bark. The remainder of the square is occupied with two series of vats, in this instance, eighteen in each, but a greater or less number may be employed as experience, and the peculiar circumstances of each case may suggest, or require; and so, also, the number of series or sets of vats may be augmented or diminished at will. The ooze runs from the tank (J), into a pipe (K) by which it is conducted to the vats of each series, and this liquor runs from vat to vat, entering at the bottom and passing out at the top of each,

in the order of their numbers, until it reaches the last, where it is discharged, it being then spent, as it has been deprived of all its available tannin by circulating among the hides with which each vat is provided; those in the most advanced stages of the operation being in vats 1, 2, 3, &c. and those in the least, in 18, 17, 16, &c, the raw hide being entered in 18, and transferred from vat to vat as the operation progresses, until it is taken out at 1 completely tanned. The hides entered in vat 18 in the weakest liquor, are suffered to remain there from three to six days, being handled every day; and as fast as they reach the proper stage in the operation, whether that be sooner or later they are advanced to the next vat, where the liquor is stronger. The hides are allowed to remain about the same average length of time in each vat until they reach vats 3, 2, and 1, where the ooze is strongest, and where they remain until the tanning is complete, whether it takes a longer or shorter period for that purpose.

The hides are thrown into the first half of the series of vats, viz: from 18 to 9 inclusive, in mass, but from 8 to 1 inclusive, the hides are hung by the middle on sacks, which allow the butt and neck, which are the thickest and most difficult to tan, to descend to the lower part of the vat, where the ooze is strongest, while the thinner portions, in the middle, which tan more readily, are kept at the top of the vat, where the liquor is weakest. The progress of the hides from vat to vat, and through the whole series, is in proportion to the avidity with which they feed upon or take up the tannin, as those which combine with the tannin readily will be advanced from vat to vat more rapidly than those which combine more slowly.

As the stronger liquor enters at the bottom of the vat of weaker liquor into which it flows, and its specific gravity being in proportion to its strength, it follows that the strong liquor remains below and displaces the weaker liquor above; in this way as effectual a transfer of liquor from vat to vat is effected, as if one was pumped dry before the other was emptied into it, and thus effecting a very important saving of labor; as by other methods heretofore known, the liquor of one vat could not be transferred to a second without mixing with that of the second, unless that of the second was first pumped out. I however substitute the method of transfer by the displacement of one liquor by another of superior specific gravity, instead of transferring it by the method of pumping.

The main supply pipe (K) lies on a level or thereabout with the bottom of the tan vats, and has branches (M) extending among each series of vats. From these branches of the main pipe (K), branching

tubes (L) connect with the bottoms of the several vats, and other longer branching tubes (N) are so arranged between the adjacent vats, as to communicate through the pipe (P) with the top of one vat and the bottom of the other. Stopcocks are placed in the pipes (M) between the branch tube. The branch tubes (N) are for the purpose of allowing the liquor to flow out of one vat into the branch pipe, to be conveyed past one or more vats of the series which for the time being are not in operation, and then back into the succeeding vats, to flow on as if it had not thus been interrupted, and in this case the cock of the branch pipe immediately back of the long egress tube (N) of the vat, and that of the branch pipe immediately in front of the ingress tube of the vat into which the liquor is to be run are open; all the intermediate cocks except those in the tubes from the vat out of which the liquor flows, and to the vat into which it is conducted being stopped.

The main discharge pipe (R) is provided with branches (S) that lie among the vats, and these branches are provided with side tubes (T), one of which leads into the bottom of each vat, and is fitted with a stopcock, in order that the liquid contents of the vat may be emptied through it at will.

By this arrangement of pipes, any one of the vats may be at once insulated from the system of circulation, and the liquor can be emptied out of it by simply adjusting the cocks of its supply and discharge tubes properly. This operation is always necessary when the vat springs a leak, either letting out the ooze, or letting in the water from the surrounding earth, which is always acid and highly deleterious to the hides, and if not stopped off at once will often occasion great loss. Not only may any one, but also any number of the vats in the series be shut off from the circulation and kept empty to make repairs or for other purposes. This arrangement obviously affords extraordinary facilities for repairing the vats.

When all the vats are in good repair, and working, the strong liquor enters at the bottom of each through the pipe (P); and the partially spent liquor passes off at the top of the vat, through the tube (P) by which it is conveyed to the bottom of the next vat, being the strong liquor of the vat it is entering, and the weak or spent liquor of the vat it is leaving. Not more than one third of the labor consumed in the old process will be required in this, while at the same time leather of a better and more uniform quality will be obtained.

What I claim as my invention and desire to secure by Letters Patent is—

The arrangement of a tank, the tan vats, the main supply pipes, and their branches,

and the discharge pipe and branches substantially as herein set forth, whereby the tanning liquor may be caused to flow regularly through a series of vats from one to
5 another, without the aid of pumps, and any one or more of the vats may be insulated from the system of circulation, for any required length of time, without impeding a

regular circulation of the tanning liquor through the rest.

In testimony whereof, I have hereunto subscribed my name.

DAVID H. KENNEDY.

Witnesses:

P. H. WATSON,
A. C. HANNAY.

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