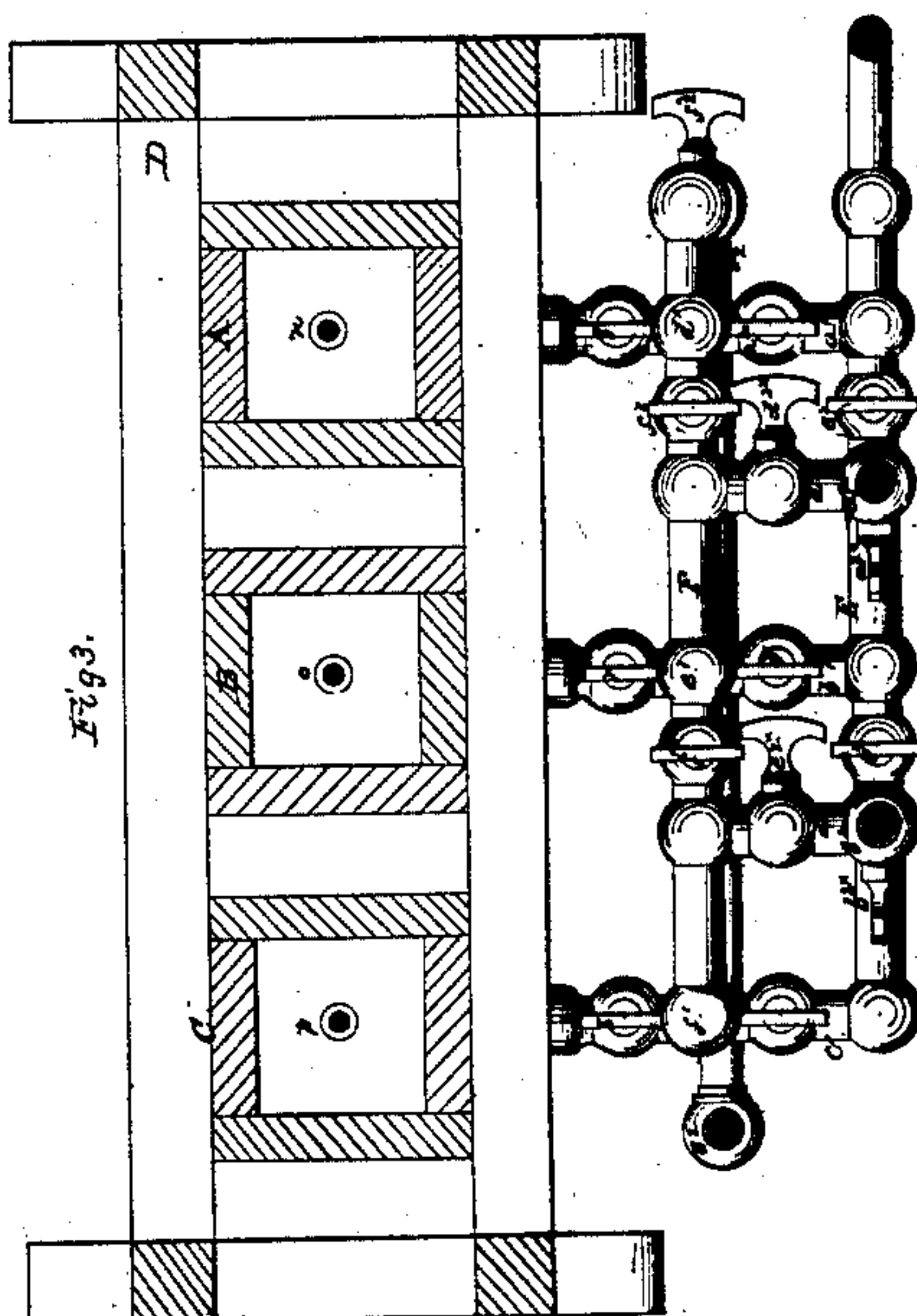
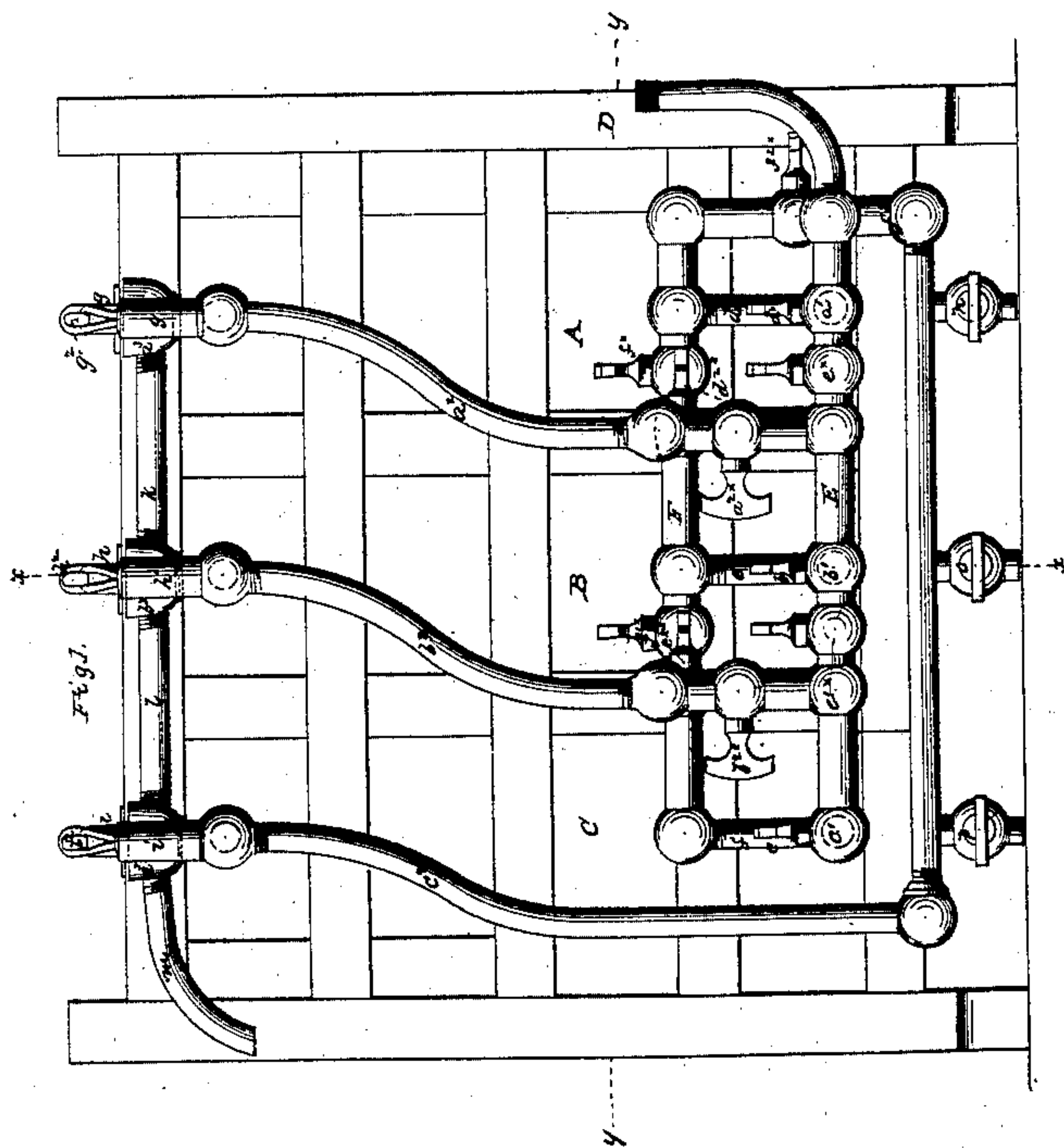
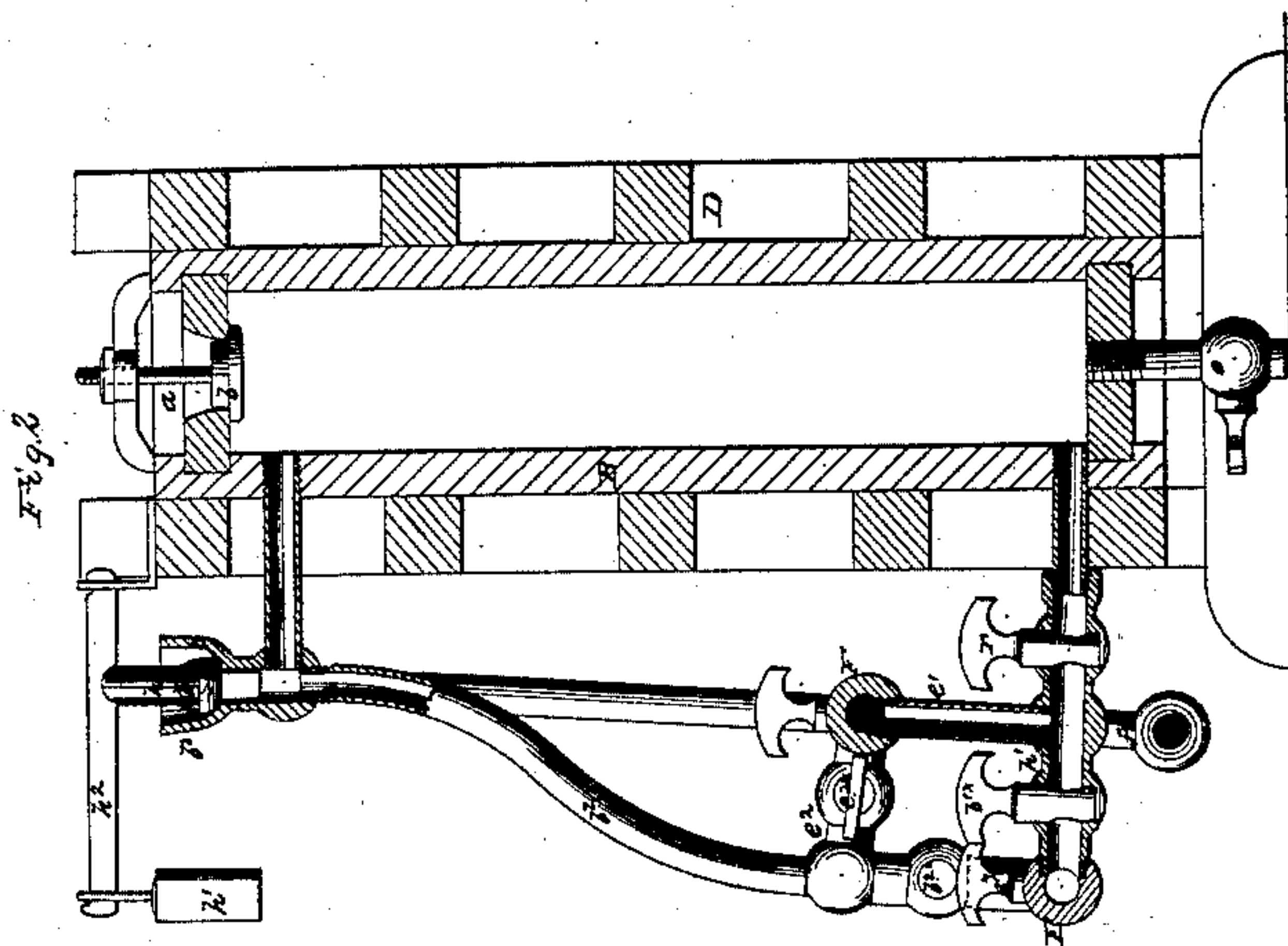


J. S. Wheat,

Tanning Apparatus,

No 34,853.

Patented Apr. 1, 1862.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH S. WHEAT, OF BERKELEY SPRINGS, VIRGINIA.

IMPROVED APPARATUS FOR TANNING.

Specification forming part of Letters Patent No. 34,853, dated April 1, 1862.

To all whom it may concern:

Be it known that I, JOSEPH S. WHEAT, of Berkeley Springs, in the county of Morgan and State of Virginia, have invented a new and Improved Apparatus for Tanning, &c.; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a front elevation of my invention. Fig. 2 is a transverse vertical section of the same, taken in the plane indicated by the line $x x$, Fig. 1. Fig. 3 is a horizontal section of the same.

Similar letters of reference in the three views indicate corresponding parts.

This invention consists in the arrangement of induction, exit, communicating, and exhaust pipes, each being provided with suitable cocks and branch pipes, in combination with a series of air-tight tanning-vats in such a manner that a current of tanning-liquid can be forced through all or a portion of said vats, and that the hides contained in the same by coming in contact with the liquor are impregnated and tanned in a comparatively short time.

It consists, further, in the arrangement of a series of valves loaded with adjustable weights—one on each of the tanning-vats—in combination with said induction, exit, communicating, and exhaust pipes, and with the cocks attached to the same in such a manner that by shifting the weights on the valves and a corresponding opening and closing of the cocks the current of the liquid passing through the several vats may be changed at pleasure, causing it to enter at the first, and from this into the second and out at the third, or to enter at the second, and from this into the third and out at the first vat, and so forth, and that by this arrangement the hides, when ready tanned, can be taken out of either one of the vats and replaced by green hides, which by coming in contact first with weak liquor that has passed through all the remaining vats and afterward with stronger and stronger liquor are gradually impregnated with the tanning substance, thereby producing in a very short time a sound and perfectly-tanned leather

with a comparatively small quantity of tanning-bark or other tanning material.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

A series of vats A B C are secured in a strong frame D, said vats as well as the frame being made of wood and firmly bolted together, so that the vats will be able to sustain a pressure of from sixty to eighty pounds per square inch without danger.

In the drawings the vats are represented in a vertical position, and in this case they are made sufficiently high for the longest hides that may have to be tanned, and if it is desired to use them for tanning calf or other small skins two tiers of skins may be suspended in each vat, one above the other. The vats might, however, be placed in a horizontal position, if desired. Each vat is hermetically closed, access being had to their interior through man-holes a , that are closed by covers b similar to the man-holes of steam-boilers. By these means the tanning-liquid can be made to act on the hides or skins under a certain pressure, whereby the tanning process is considerably facilitated.

The tanning-liquid is forced into the vats by means of a suitable force-pump through the induction-pipe E, which connects with the bottoms of these several vats through the branch pipes $a' b' c'$ and with their tops through the exit-pipes $a^2 b^2 c^2$. The branch pipes $a b c$ may be provided with check-valves d , and they connect by means of pipes $d' e' f'$ with the communicating-pipe F, which in its turn connects through pipes $d^2 e^2$ with the exit-pipes $a^2 b^2$ and through a pipe f^2 with the exit-pipe c^2 . Each of the exit-pipes $a^2 b^2 c^2$ further connects with a valve-box $a^3 b^3 c^3$, the communication between said pipes and valve-boxes being closed by valves $g h i$, that are held down by weights $g' h' i'$, and these weights slide on levers $g^2 h^2 i^2$ in such a manner that their pressure on the valves can be adjusted. The upper portions of the valve-boxes connect with each other by means of the exhaust-pipes $k l$, and from the last valve-box c^3 the exhaust-pipe m empties into the open air or into a reservoir for that purpose made and provided.

The direction of the current is governed by

cocks $e^* e'^*$ in the induction-pipe E, $a'^* b'^* c'^*$ in the branch pipes, $a^2 b^2 c^2$ in the exit-pipes, $f^* f'^*$ in the communicating-pipe F, and $d^{2*} e^{2*} f^{2*}$ in the pipes $d^2 e^2 f^2$, connecting the communicating-pipe F with the exit-pipes $a^2 b^2 c^2$.

Cocks $n o p$ at the bottoms of the vats serve to empty the same, and cocks $q r s$ on the branch pipes $a' b' c'$ and between the vats and the check-valves are used to shut off the several vats if one or the other of the check-valves should get out of order.

The operation is as follows: After the vats have been charged with hides or skins, they are closed air-tight and the liquor is forced in. In the first place, the cocks $e^* e'^*$ in the induction-pipe E and the cocks $d^{2*} e^{2*} f^{2*}$ in the pipes connecting the communicating-pipe F with the exit-pipes $a^2 b^2 c^2$ and also the cocks $f^* f'^*$ in the communicating-pipe F are closed and the cocks $a^{2*} b^{2*}$ in the exit-pipes and $a'^* b'^* c'^*$ and $q r s$ in the branch pipes $a' b' c'$ are open, and the liquor passes into the vat A at its bottom through the branch pipe a' , and out at its top through the exit-pipe a^2 , and through the branch pipe b' into the vat B, and out of it through the exit-pipe b^2 and into the vat C through the branch pipe c' . From this vat the liquid cannot escape (the cock f^{2*} being closed) until the pressure in the vat becomes high enough to lift the valve, when the liquid is permitted to find its way out through the exhaust-pipe m . It must be remarked that in order to let the liquid out through the exit-pipe c^2 from the vat C the pressure to which the valve i is loaded must be smaller than that to which the valves $g h$ of the vats A and B are loaded, for it is obvious that if the valve i should be loaded to an equal or higher pressure the liquid would not make a complete circuit through all the vats, but it would be discharged from all the vats simultaneously, or from that vat the valve of which is loaded to the smallest pressure, and in this case the liquid would be permitted to escape from the apparatus before it is entirely spent. If the valves are loaded correctly, the liquid passes into the first vat A, where the same, by gradually coming in contact with the green hides in the same, deposits a portion of its tannic acid, so that on reaching the second vat it is considerably weaker than it was on first entering the apparatus, and so forth, and on reaching the exit-pipe of the last vat it will be entirely divested of its tannic acid, and clear water, or nearly so, will be exhausted. At all events this result can be attained by increasing the number of the vats. The hides in the first vat which come in contact with the fresh or strongest liquid will of course be finished sooner than the hides in the next succeeding vats, and when this point is reached the communication between the first vat and the pump and the next succeeding vat is stopped by closing the cock a'^* , the finished hides are

replaced by a fresh supply, and the vat is brought again into the current. But now the liquid passes first into the second vat B, from this into third vat C, and from the last vat into the first vat A, which is effected by opening the cock e^* , closing the cock a^{2*} , and opening the cock f^{2*} , the cock a'^* in the branch pipe a' having been previously closed, and in order to let the liquid out of the vat A the valve g of the same has to be loaded to the smallest pressure.

From this description it will be sufficiently understood how important it is to have the weights on the valves $g h i$ arranged so that they can be shifted on the levers and that the pressure exerted by them on the valves can be regulated, and, furthermore, it is indispensable to have a valve with an adjustable weight on each vat, for if only one vat is provided with a valve the current of the liquid cannot be changed. It must always be discharged through the vat provided with the valve. By providing each vat with its own valve and by the appropriate arrangement of pipes and cocks, on the other hand, the current can be changed at pleasure, and if one vat has been supplied with green hides, while the hides in the other vats have already been partially tanned, the vat containing the green hides can be brought into the current last in the manner hereinbefore described. The green hides, therefore, will come in contact with the weakest liquor and a gradual tanning of the hides as well as a considerable saving in tanning material will be effected.

It is obvious that in practice the number of vats will be increased until the liquor, after having passed through the entire series, is completely spent and divested of its tannic acid, while at the same time the water discharged from the apparatus may be collected in a suitable reservoir and used in preparing fresh liquor.

This apparatus may also be used with advantage for dyeing cloth or other fabrics.

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

1. The arrangement of the induction-pipe E, exit-pipes $a^2 b^2 c^2$, communicating-pipe F, and exhaust-pipes $k l m$ with suitable branch pipes and cocks, as described, in combination with a series of vats A B C, constructed and operating substantially in the manner and for the purpose set forth.

2. The arrangement of valves $g h i$ with adjustable weights $g' h' i'$, one on each vat, in combination with induction-pipe E, exit-pipes $a^2 b^2 c^2$, communicating-pipe F, and exhaust-pipes $k l m$, and suitable branch pipes and cocks, all constructed, arranged, and operating as and for the purpose specified,

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Witnesses:

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S. K. HORN BROOK.