L. A. DeLine.

Refining Liquors.

No. 93,286. Patented Aug. 3, 1869.

Fig: 1.

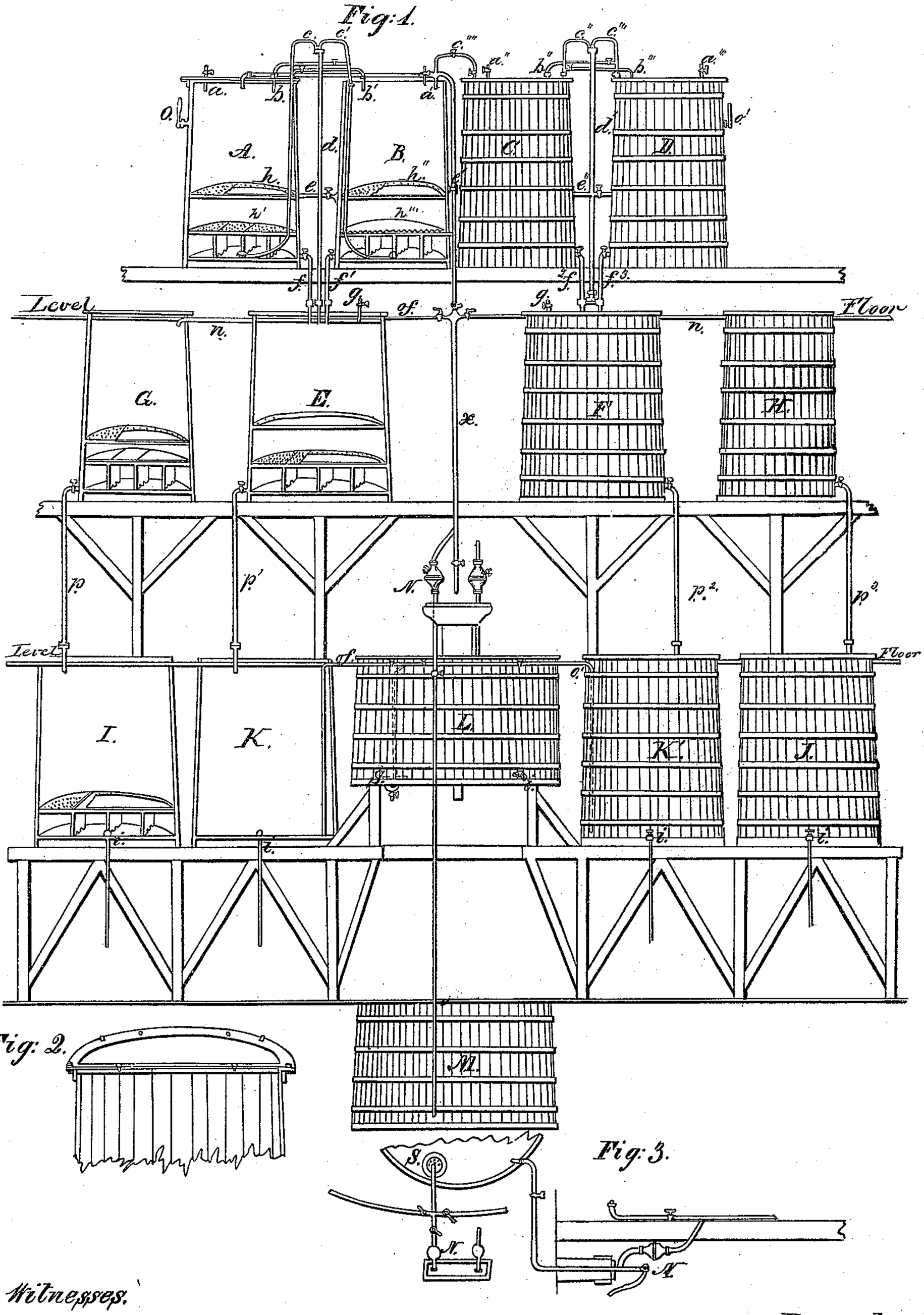

Fig: 2.

Fig: 3.

Witnesses.

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L. A. DE LIME, OF ST. LOUIS, MISSOURI.

IMPROVED APPARATUS FOR PURIFYING WHISKY AND OTHER ALCOHOLIC SPIRITS.

Specification forming part of Letters Patent No. **93,286**, dated August 3, 1869.

To all whom it may concern:

Be it known that I, LOUIS AMABLE DE LIME, of St. Louis, in the county of St. Louis and State of Missouri, have invented a new and useful Improved Refining Apparatus for Whisky and other Alcoholic Productions, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making a part of this specification, and representing my apparatus with a portion of same in section.

The nature of my invention consists in an apparatus for refining alcoholic liquors by the oxidation of the fusel-oil and the separation of the various ethers and gaseous substances which injure the liquors, and doing this by the action of the air on the liquor.

The tubs L and M are connected by the pipe *x* with the tub A. *d* is an air-pipe connecting with E and, by means of *c e'*, connected with the bottom of A and B. By means of pipes *b* and *b'* the tubs are also connected. C and D have the same arrangement, and B and C are also connected by *c''''*. By means of a pipe, *e*, A and B are also connected, as are B and C by *e'*, and C and D by *e''*. On A and D are gages O O' at the same level, and on A, B, C, and D are cocks *a a' a'' a'''*. About half-way from the bottom of A is a false bottom, *h*, perforated and covered with a blanket, and midway between it and the bottom is another false bottom, *h'*, also perforated and covered with a blanket, the space between *h'* and the true bottom being divided into three air-chambers, connected by passages, as shown. On top of *h'* is a layer of fine gravel about two inches thick, and above this about sixteen inches of coarse maple charcoal. B, C, D, E, and F have the same arrangement of false bottom, gravel, and charcoal. The tubs E and F have vent-pipes *g g'*, and G and H are, by means of pipes *n n'*, connected with *x*, and, by means of *p p' p'' p'''*, G, E, F, and H are connected with I J K K', which also have pipes by which their contents may be drawn off. I and J have each a single false bottom, like that in A, marked *h'*, covered with blankets, one foot from the bottom of the tubs being clear. G and H have no charcoal, but a layer of fine gravel eight inches in depth. The tubs A B C D E F are made perfectly air-tight, the tops being made to fit closely and lined with copper and secured by flanges and screws, as shown in Fig. 2, so that they can be readily removed.

A force-pump, N, which is shown more in detail at the bottom of the drawing in Fig. 3, is arranged above L and connected with it and also with M, K, and K'', as seen, its connection with one or the other being cut off at pleasure by means of appropriate cocks, as clearly shown in the drawing.

The liquor is placed in L and M (if desired, of course there need be but one mixer) and brought to the proper proof. Then the pipe *b* in A being opened, the liquor is forced into A, driving the air out into B, till the liquid having reached the gage, which is but a few inches from the top of the tub, the pipe *b* is closed and *b'* and *e* opened, when the liquid rushes into B, driving the air back through *c* into A and up through the bottom, as shown, and through the liquor. When A and B are filled, the connections between B and C are opened, the liquid rushes into C, driving the air out, and thence it is passed into D, in each case the air being driven out and caused to pass through the liquid and circulating back and forth between A and D. The contents are then run down to the tubs E and F, by the pipes *f f' f'' f'''*, the air in E and F rushing out through *d d'* into A B C D, and out through the vent-tubes *a a' a'' a'''*, previously opened, conveying with it the ether or gas contained in the liquid. This completes the process which constitutes the peculiarity of my invention. After this, the air-cocks *g g'* being opened, the liquid is run, by means of *p' p''*, into the receivers K K', in which it receives its coloring and flavoring matter, and from which it may, if desired, be pumped again into A and again passed through the process. It is then pumped up to the filtering-tube G H, by the same force-pump N, by means of the pipes *n n'*, connected with *x*, which is united to the tubs by *o o'*, a simple arrangement of cocks, as shown, enabling this connection to be made at pleasure. From these it is drawn off into the receivers I and J, and is then ready to be barreled for use.

The action of the oxygen coagulates the fusel-oil which is in excess, (leaving enough to give the requisite quality to the liquor,) and deposits it on the blankets in the six tubs

A B C D E F. In running one hundred barrels a day, it is found that the blankets need not be cleaned oftener than every three months, and the charcoal need not be touched oftener than every six months.

By my process I use less charcoal—only a thin layer—and so save a large percentage of what is lost by absorption when charcoal is used, as in the ordinary process. Any other porous substance will answer as well as charcoal, except in the matter of expense. I also save all loss by evaporation, as the tubs are air-tight.

Whisky made by my process will "age" in one year as much as other whisky in five years. A charge may be run through in from three-quarters to one hour, according to the quality of the liquor.

The tubs should be made high rather than broad, so as to allow the air to act better on the liquor; and are better made conical—that is, broader at the bottom than at the top. The size of the tubs is regulated by the quantity to be refined, so that there may be a sufficient supply of oxygen to thoroughly act upon the fusel-oil. For example: If the tubs L and M contain each fifty-five barrels, A B C D should contain, say twenty-five barrels each, and E F thirty-five barrels each, being made, say eight feet high, and the first four about four feet in top diameter and five feet at bottom, while the latter are about five feet at top and six feet at bottom.

As above stated, the six tubs A B C D E F constitute the peculiarity of my apparatus, the remaining tubs being but adjuncts whose construction and arrangement may be varied at pleasure, their office being that of ordinary receivers and filters.

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

An apparatus for refining whisky and other alcoholic productions, composed of tubs A, B, C, D, E, and F, provided with false bottoms, covered with blankets and a filtering substance, as shown and described, and connected, the one with the other, by pipes and tubes, in the manner shown and stated, so that the liquid may pass from one to the other, in its passage forcing the confined air through the liquid, and all arranged for joint operation, and constructed and operating substantially as and for the purpose shown and specified.

L. A. DE LIME.

Witnesses:
SAML. S. BOYD,
LEWIS MYERS.