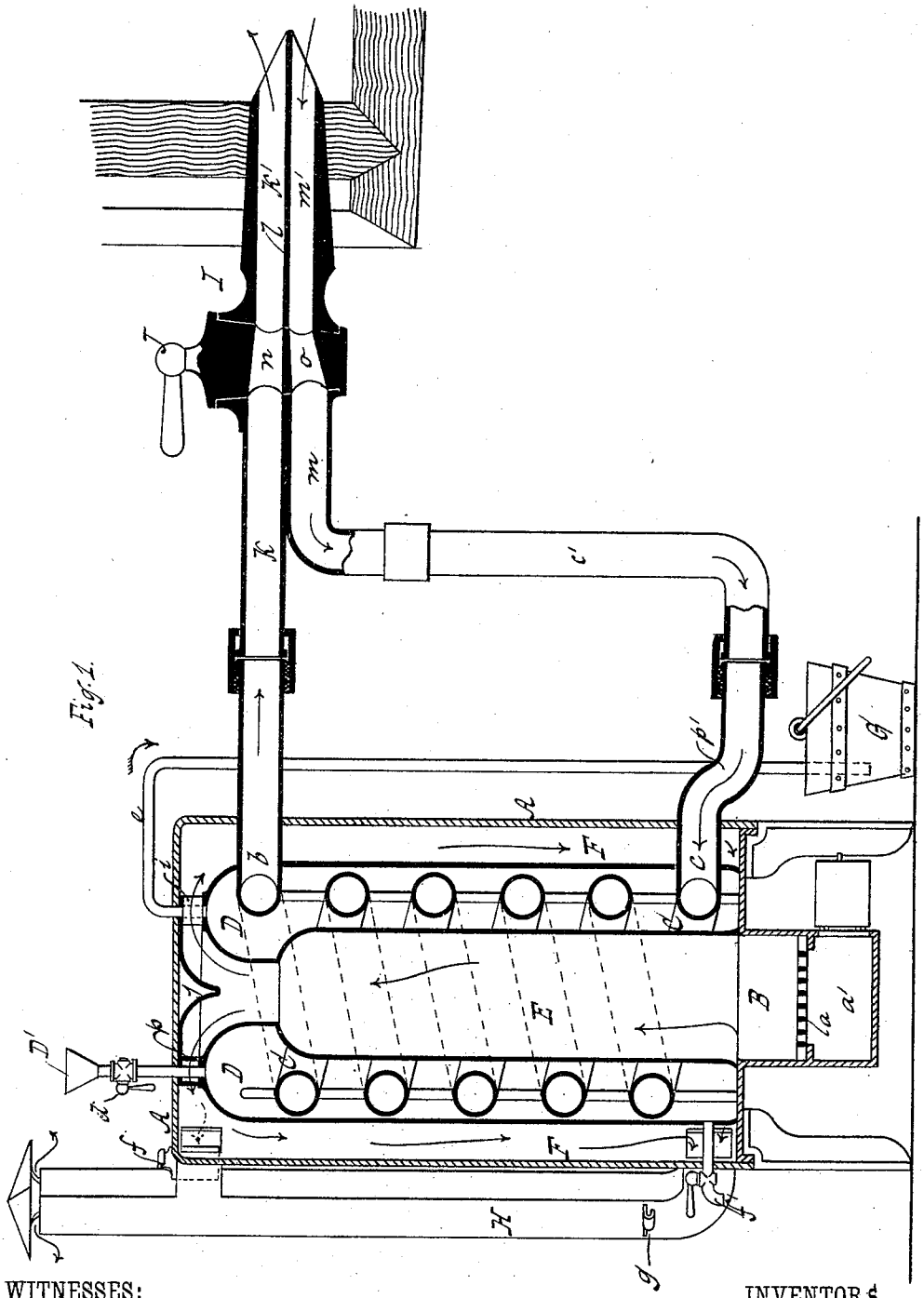
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F. ANTAL, F. J. KUGLER & B. MÁTYÁS.

APPARATUS FOR HEATING LIQUIDS.

No. 319,874. Patented June 9, 1885.

Fig. 1.



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Fig. 2.

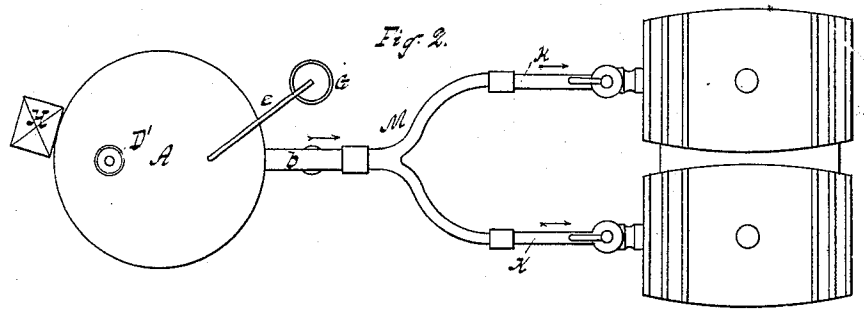


Fig. 3.

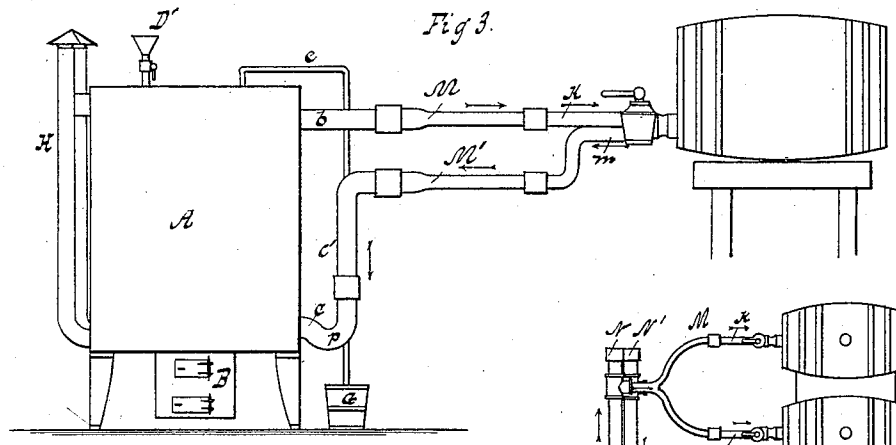


Fig. 4.

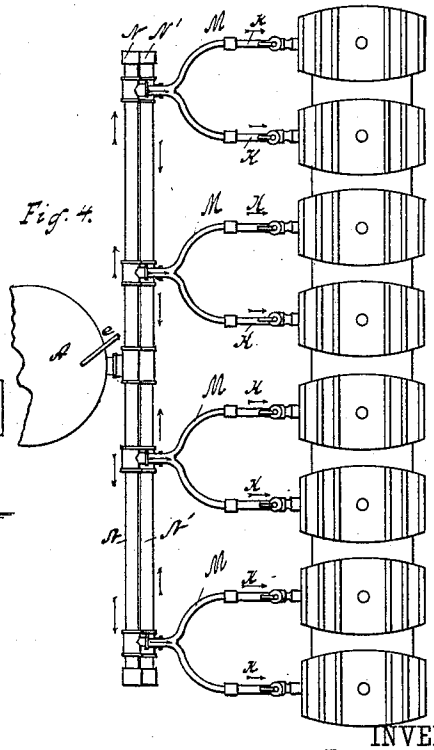
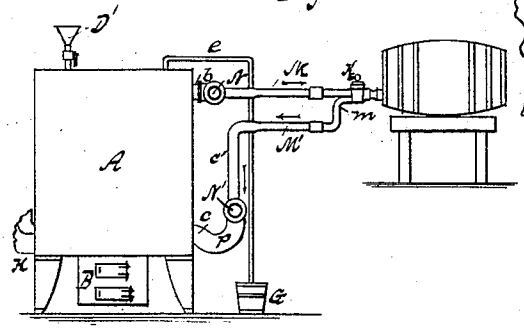


Fig. 5.



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UNITED STATES PATENT OFFICE.

FROMM ANTAL, FRANZ JAKOB KUGLER, AND BALLÓ MÁTYÁS, OF BUDA-PESTH, AUSTRIA-HUNGARY.

APPARATUS FOR HEATING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 319,874, dated June 9, 1885.

Application filed February 5, 1885. (No model.)

To all whom it may concern:

Be it known that we, FROMM ANTAL, FRANZ JAKOB KUGLER, and BALLÓ MÁTYÁS, all subjects of the King of Hungary, residing at Buda-Pesth, in the Kingdom of Hungary and the Empire of Austria-Hungary, have invented new and useful Improvements in Apparatus for Heating Liquids, of which the following is a specification.

This invention consists in the combination, with a coil, a jacket inclosing said coil, and a fire-place situated in the jacket beneath the coil, of a twin pipe or twin pipes, a partition situated in the interior of this pipe and extending from its mouth, and two branch pipes which form the connections of the twin pipe with the coil; also, in the combination, with the coil, of a water-chamber inclosing the coil, the jacket surrounding the water-chamber, the fire-place situated in the jacket, the twin pipe, the partition situated in the interior of this pipe, and two branch pipes which form the connections of the twin pipe with the coil; also, in the combination, with the coil, the jacket inclosing said coil, and the fire-place situated in the jacket beneath the coil, of the twin pipe, the partition situated in the interior of this pipe and extending from its mouth, two branch pipes which form the connections of the twin pipe with the coil, and the trap formed in that branch pipe which connects with the lower end of the coil.

In the accompanying drawings, Figure 1 represents a vertical longitudinal cross-section of our improved heating apparatus connected with a cask containing wine or other liquid which is to be heated. Fig. 2 is a plan view of the same, showing the method of connection when it is desired to heat the contents of two casks at once. Fig. 3 is a side elevation of the same. Fig. 4 is a plan view showing the method of connecting several casks with my apparatus. Fig. 5 is a side elevation of the same.

Similar letters indicate corresponding parts.

In the drawings, (referring especially to Fig. 1,) the letter A indicates a jacket, made preferably of wrought-iron, and B is the fire-place, which is situated in the lower part of the jacket A, and is provided with a suitable grate, *a*, and ash-pit *a'*. C is the coil of pipe, which pipe is best made of copper lined with tin or silver, in order to present a surface which is not easily oxidizable, and also not capable of imparting poisonous qualities to the wine or other liquid which is to be heated. In order that the temperature of the liquid which passes through the coil may not exceed to any extent 212° Fahrenheit, this coil C is placed in a water-chamber, D, and is connected at its upper and lower ends with pipes *b c*, which extend through both the walls of the water-chamber D and the jacket A. The water-chamber D is of an annuiar cross-section, and the inner space, E, together with the annular space F between the exterior of the water-chamber and the jacket A, forms a combustion-chamber for the furnace-gases, which is connected with a smoke-pipe, H, both at its top and bottom, by openings the size of which, and consequently the ensuing draft, is regulated by suitable dampers, *f g*. When the damper *f* is closed, the gases from the furnace pass up through the space E, are deflected downward, and pass through the space D out through the lower opening into the smoke-pipe H, as indicated by the arrows; but when the damper *f* is open the gases pass directly through the upper opening into the chimney. Water is introduced into the water-chamber D by means of the funnel D', which is provided with a cock, *d*, in its stem; or the chamber D may be directly connected with a water-faucet by a rubber tube. The filling of the water-chamber is continued until the water begins to run out through the bent overflow-pipe *e*, which leads to a water bucket or tank, G, and then the cock *d* is closed. By this means the water-chamber can be completely filled, and in the subsequent heating any superfluous water is expelled through the overflow-pipe, the end of which is open, and is kept constantly below the surface of the water in the bucket or tank, so that on the cooling of the water-chamber water instead of air will be drawn into the same. The water-chamber can be emptied by a cock, *f'*, at the bottom of the same, which extends through the jacket

A. Those parts of the funnel D′ and overflow-pipe *e* which extend into the combustion-chamber are protected from the action of the flames by fire-shields *p i*, which surround said parts, and the top of the boiler is likewise protected by a sheet-metal deflector, *j*.

Having described the heating part of our invention, we will now describe the means employed to connect the same with a tank, cask, &c. The pipe *b*, connected with the upper end of the coil C, extends some distance beyond the jacket A, as before mentioned, and is connected by means of a union or other suitable coupling with a branch pipe, *k*, which is connected with a twin-pipe faucet, I. The twin-pipe faucet I is provided with a partition, *l*, which extends from its mouth to the two branch pipes *k* and *m*, forming passages *k′* and *m′*. The second branch pipe, *m*, is connected with the lower pipe, *c*, preferably by a rubber tube, *c′*. The twin pipe I is made detached from the coil C, in order that it may be driven into the bung-hole of a cask or tank, as shown in the drawings. The flow of the liquid from the cask into the coil is regulated by a cock, J, which is provided with two transverse holes, *n o*, which correspond in position to the passages *k* and *m*, formed by the partition *l*, and in order to prevent the water from backing up through the lower pipe, *m*, the latter is provided with a trap, *p′*. Connections having been made with a cask containing the liquid to be heated—say, for instance, wine—the wine flows through the connecting-pipes and fills the coil C, and on heating the coil by fire on the grate the wine circulates from the cask through the passage *m′*, the lower branch pipe, *m*, up through the windings of the coil C, through the upper branch pipe, *k*, passing *k′*, back to the cask in the direction indicated by the arrows, and by this circulation the contents of the cask are uniformly heated. As before stated, the liquid cannot back into the cask through the lower branch pipes, *m*, because the heated wine or other liquid tends to rise, and in order to pass through the trap *p′* it would have to fall, which could not occur. When the temperature of the liquid reaches 212° Fahrenheit, which is the limit, as no pressure can arise in the water-chamber, the circulation of the liquid ceases, and this temperature can be maintained as long as desirable, or else the cask can be removed by closing off the connections.

When the heating apparatus is to be used for heating water in house-boilers, for heating the lower grades of wines, or in heating liquids in general where the rising of the temperature above 212° Fahrenheit will not occasion serious consequences, we construct our apparatus without the water-chamber D, and allow the coils to be exposed directly to the action of the fire, and regulate the temperature by carefully-constructed dampers, and in this manner can keep approximately any desired temperature.

In order to heat the liquid contained in two casks, &c., at one time, we form the upper and lower branch pipes, *b c*, each with a forked pipe, M M′, and to each pair of upper and lower branches is secured a twin-pipe faucet of the construction before described, and each one of the twin-pipe faucets is connected with its respective barrel in the same manner as before, Figs. 2 and 3. The circulation of liquid is now as follows: from the casks through the branch pipes *m*, Fig. 3, the forked pipe M′, pipes *c′* and *c*, up through the coil, then through pipe *b*, forked pipe M, pipes K, into the casks again. By so connecting the two barrels, as stated, their contents are at the same time thoroughly mixed, which is of advantage in certain cases.

When several casks or tanks containing liquid to be heated are to be connected at one time with the heating apparatus, the casks, &c., are arranged in line, the heating apparatus is preferably placed centrally with the barrels, and the upper and lower branch pipes which connect with the coils are connected with pipes N N′, which extend for the length of the row, and are closed at the ends. In each cask is secured a twin-pipe faucet, its lateral branches *k* and *m* being joined, respectively, with the upper pipe, N, and the lower pipe, N′, by which means circulation is established through all the casks, as follows: from the cocks through the branch pipes *m*, forked pipe M′, pipe N′, pipe *c*, up through the coil, through pipe *b*, pipe N, forked pipe M, branch pipes *k*, into the casks, &c., Figs. 4 and 5.

We do not wish to restrict ourselves to one coil, as several coils placed inside of each other may be used to obtain a more rapid heating of the liquid.

When it is desired to heat wine or similar liquids when contained in bottles, we use a circular tank filled with water, and which is provided with a rotating horizontal rack, on which the bottles are placed, submerged in the water. This tank is then connected with the coil C in the manner before described.

In the heating of fine wine our apparatus fulfills all the requirements necessary, as it heats the liquid from the bottom upward, keeps the same out of contact with the air, and when the water-chamber is used the temperature does not exceed 212° Fahrenheit at any time.

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination, substantially as herein described, with the coil C, the jacket A, inclosing said coil, and a fire-place situated in the jacket beneath the coil, of a twin pipe, I, a transverse horizontal partition, *l*, arranged in the interior of this pipe, and extending from its mouth and forming the separate passages *k′* and *m′*, and two branch pipes, *k m*, which form the connections of the two passages of the twin pipe with the coil.

2. The combination, substantially as herein described, with the coil C, of a water-chamber, D, inclosing the coil, the jacket A, sur-

rounding the water-chamber, the fire-place situated in the jacket, the twin pipe I, the transverse horizontal partition *l*, arranged in the interior of the twin pipe, and extending from its mouth to form the two passages *k'* and *m'*, and the two branch pipes *k m*, which form the connections of the said passages of the twin pipe with the coil.

3. The combination, substantially as herein described, with the coil C, the jacket A, inclosing said coil, and the fire-place situated in the jacket beneath the coil, of the twin pipe I, the transverse horizontal partition *l*, arranged in the interior of this pipe and extending from its mouth to form the two passages *k'* and *m'*, two branch-pipes, *k m*, which form the connections of the two passages of the twin pipe with the coil, and the trap formed in that branch pipe which connects with the lower end of the coil.

In testimony whereof we have hereunto set our hands and seals in the presence of two subscribing witnesses.

FROMM ANTAL. [L. S.]
FRANZ JAKOB KUGLER. [L. S.]
BALLÓ MÁTYÁS. [L. S.]

Witnesses:
ANER MEURK,
REISZ GYULAP.