

(No Model.)

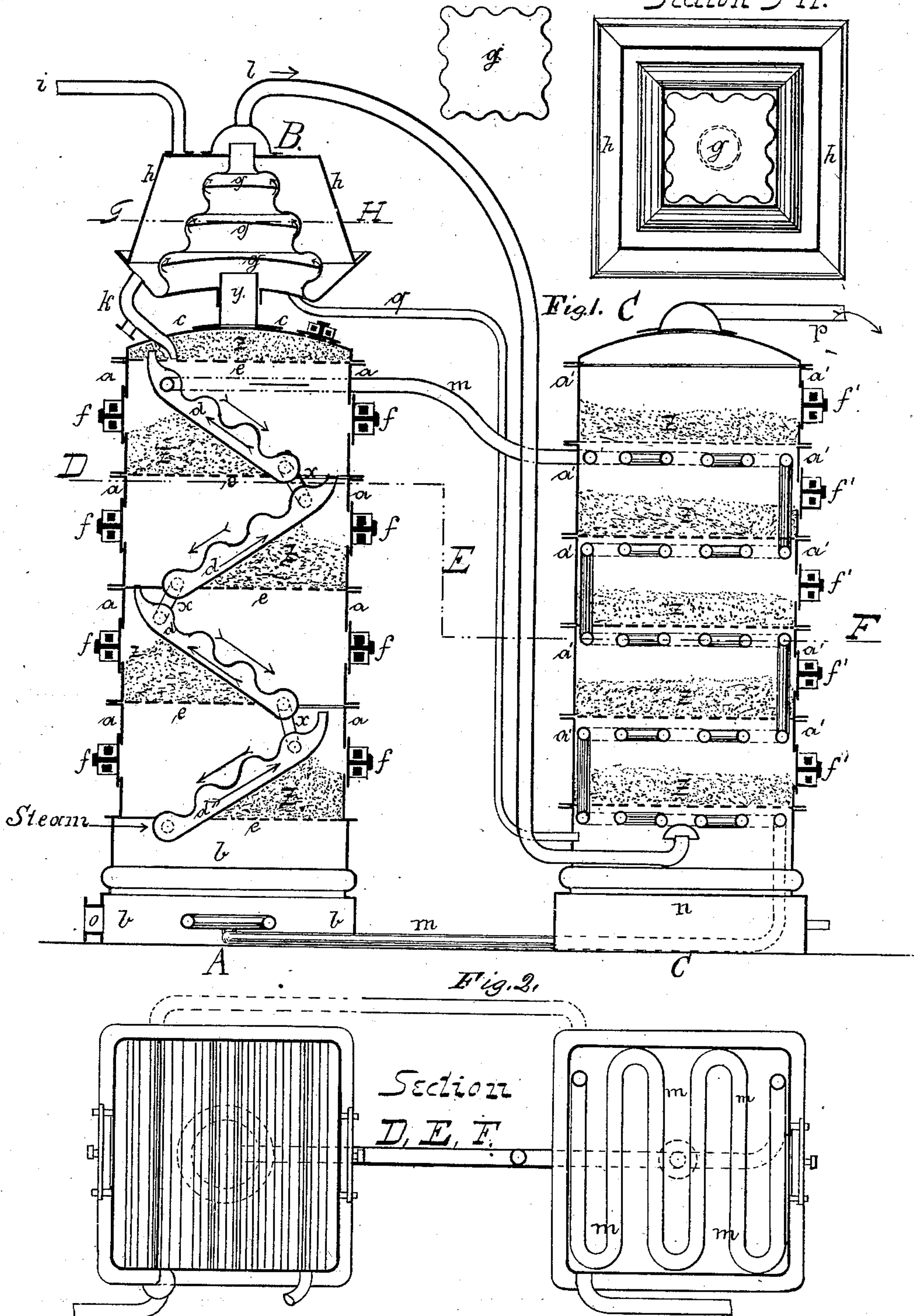
K. TROBACH & A. CORDS.

PROCESS OF AND APPARATUS FOR DISTILLING ALCOHOL.

No. 266,925.

Patented Oct. 31, 1882.

Section J H.



Witnesses.

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# UNITED STATES PATENT OFFICE

KONRAD TROBACH AND ALFRED CORDS, OF BERLIN, GERMANY.

## PROCESS OF AND APPARATUS FOR DISTILLING ALCOHOL.

SPECIFICATION forming part of Letters Patent No. 266,925, dated October 31, 1882.

Application filed December 30, 1881. (No model.)

*To all whom it may concern:*

Be it known that we, KONRAD TROBACH and ALFRED CORDS, both of Berlin, in the Kingdom of Prussia and Empire of Germany, have invented an Improved Process of Distilling Alcohol and Apparatus for Same, of which the following is a specification.

Figure 1 is a vertical central section of our improved apparatus. Fig. 2 is a transverse section of the same on the line D E F, Fig. 1. Fig. 3 is a similar section on the line G H, same figure.

Our invention relates to an improved method of producing pure alcohol direct from the mash by means of chemically dephlegmating and freeing the spirits from amylic alcohol or fusel-oil, and it also relates to an improved apparatus for carrying out our said invention.

In order to obtain the distillate of the mash in a pure and concentrated state, we make use of asbestos having been treated with a saturated solution of chloride of barium. For this purpose we preferably apply the asbestos in a fibrous felted or woolly state, and after heating the same in a pan or similar receptacle we pour over it the said solution, which consists of about fifteen per cent. of chloride of barium and eighty-five per cent. of water. The water then will evaporate while the chloride of barium is mixed with the asbestos. We separate the alcohol from the water and fusel-oil by heating the mash to the boiling-point, and pass the steam originating from the boiling mash through the apparatus illustrated in the accompanying drawings, the same being provided with layers of asbestos impregnated with chloride of barium. It is a peculiar feature of the hygroscopic qualities of asbestos-wool to retain especially steam at a very high temperature, and, together with the steam, it will also retain the fusel-oil by means of the impregnation of the asbestos with the chloride of barium.

In order to carry out our said invention, we have constructed an apparatus, as shown in the accompanying drawings, in which the spirits are freed from the fusel-oil by the sole action of asbestos treated with chloride of barium, through which the steam originating from the mash is forced to flow.

Our improved apparatus, as shown in the

drawings, consists of the main parts—that is to say, first, the distilling-column A; second, the condenser and first heater, B; third, the refining apparatus C, for rectification.

Referring, first, to the distilling-column A, *a* are compartments, arranged one above the other, resting upon the receptacle *b* for the dregs or residue, and being closed near the top by the vaulted cover *c*. In each of the said compartments *a* is arranged diagonally a steam-tight box, *d*, made of corrugated plate metal. The said boxes *d* are fastened in the upper and lower diaphragm of the said compartments *a*, and are connected with each other by means of the short pipes *x*. The compartments *a* are provided with sieve-bottoms *e* and apertures *f*, which are applied for introducing the asbestos into the compartments *a*, and may be closed by any suitable means during the operations of our apparatus after a layer, *Z*, of the said asbestos treated with chloride of barium has been placed upon the said sieve-bottoms *e*.

The condenser B, by means of the short pipe *y*, is connected to the distilling-column A, the same being made of corrugated plate metal, having a corrugated conical or tapering form, and provided with two or more bottoms or diaphragms, *g*, having their rims corrugated, so as to form on all sides apertures between the said bottoms *g* and the inner walls of the said condenser. The entire corrugated vessel is surrounded by a covering, *h*, to which are connected the mash-pipe *i*, the mash-eduction pipe *k*, and the connecting-pipe *l*.

The refining apparatus C also consists, the same as the mash apparatus, of several compartments, *a'*, having similar apertures, *f'*, and the sieve-bottoms, being covered with similar layers of asbestos treated with chloride of barium, rest upon the hot steam-conduit *m*. The said compartments *a'* are supported by a receptacle, *n*, of a similar construction as the receptacle *b*, the same being connected to the condenser by means of the alcohol-steam connecting-pipe *l*, and eduction-pipe *q* serving as a conduit for the water of condensation.

*m* designates the hot-steam pipe leading throughout the apparatus. Steam enters the lower box, *d*, in the distilling-column A, as indicated by the arrows, passes through the pipe



*m* to the refining apparatus C, and this is led off into the dregs accumulating in the receptacle *b* and frees the same of the last remainder of the spirits.

5 Our said invention operates as follows: Each of the sieve-bottoms in both the distilling-column and refining apparatus is provided with layers of chloride-of-barium asbestos of any suitable thickness. The apparatus is then  
10 heated by means of the hot-steam conduit *m* until the layers of asbestos treated with chloride of barium, Z, are heated to about 140° to 160° Fahrenheit. The mash, by the pipe *i*, is then led into the first heater, consisting of the  
15 casing *h*, arranged around the condenser, and through the pipe *k* enters the distilling-column A and runs down the corrugated upper surface of the box *d* of the topmost compartment *a*, and then proceeds in the direction indicated by  
20 the arrows until it enters the receptacle *b*. The boxes *d* are arranged in staircase form within the column D, extending from its top to bottom. The mash, by means of the corrugated staircase-like form of the boxes *d*, is compelled  
25 to flow slowly from compartment to compartment and to spread in thin layers over the large surface of evaporation offered by the corrugations of the boxes *d*, in consequence whereof it is quickly freed from the spirits, while  
30 the dregs flow down into the receptacle *b*, where they are freed from the last remainder of spirits by means of steam entering from the hot-steam conduit *m*, opening into receptacle *b*. The vaporous spirits or alcohol-steam freed  
35 from the mash rise through the sieve-bottoms *e*, arranged above the said surfaces of evaporation, and then pass through the layer of asbestos treated with chloride of barium, Z, covering the said sieve-bottoms, whereupon they  
40 enter the corrugated conical or tapering condenser B freed of nearly all amylic alcohol or fusel-oil. The vaporous spirits or alcohol-steam not condensed by the condenser B, being of a strength of 95° to 98° Tralles, proceed to the  
45 refining apparatus or column C, and pass in an upward direction from the receptacle *n* through the said sieve-bottoms and layers of asbestos treated with chloride of barium, in consequence whereof they are fully freed from  
50 the remaining fusel-oil and water, when, by the pipe *p*, they are led to the cooling apparatus. The steam or vapors condensed by the

condenser B also enter the said receptacle *n* by means of the waste-pipe *q*, and are heated by the lowest coiled part of the conduit *m*, in  
55 consequence whereof they are freed entirely of the remainder of the alcohol they still contain. The alcoholic vapor-fluid proceeds through the said layers of asbestos treated with chloride of barium and enters the cooling apparatus or  
60 refrigerator through the said pipe *p*. The water of condensation from the receptacle *n* and the dregs from the receptacle *b* are educted by means of pipe-conduits in any convenient manner.  
65

The refining apparatus C may as well be combined with a distillery of common construction, and will form the subject-matter of a subsequent application for patent.

We obtain by our new process, when using  
70 the apparatus hereinbefore described, first, most exhausted dregs; second, alcohol of a very high degree freed of every particle of fusel oil; third, all the fusel-oil. The latter is recovered in regenerating the asbestos treated with chlo-  
75 ride of barium in an iron retort exposed to a very high temperature, the fusel-oil being obtained as a product of distillation. The said material—that is to say, the asbestos treated with chloride of barium, being then freed of  
80 fusel-oil at the same time—may be applied over and over again without losing its efficiency.

Having thus described our invention, what we claim is—

The distilling-column A, having a series of  
85 compartments, *a*, one arranged above the other, and separated by perforated partitions, each partition having upon it a layer of asbestos impregnated with chloride of barium, and having upper corrugated surfaces, and placed as  
90 described, the said column being provided with a surrounding case, *h*, provided with a pipe, *i*, and its interior chamber connected to the column A by a pipe, *k*, which enters the same above the upper part of the box or pipe *d*, sub-  
95 stantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

KONRAD TROBACH.  
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Witnesses:

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BERTHOLD ROI.