

No. 698,184.

Patented Apr. 22, 1902.

J. F. DUFFY.

METHOD OF REFINING, AGING, MELLOWING, AND PURIFYING ALCOHOLIC LIQUORS.

(Application filed Sept. 30, 1901.)

(No Model.)

3 Sheets—Sheet I.

FIG. 1.

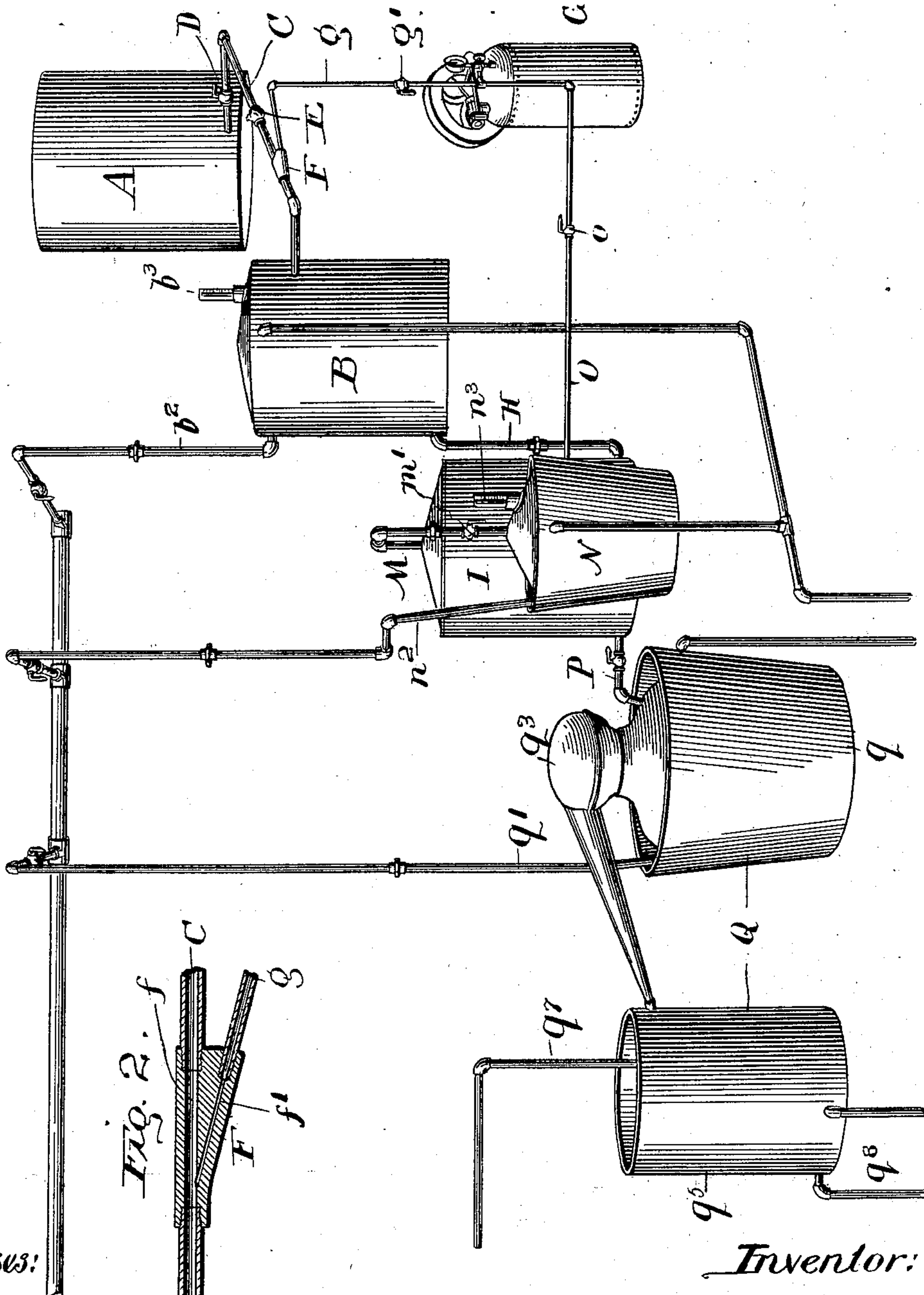
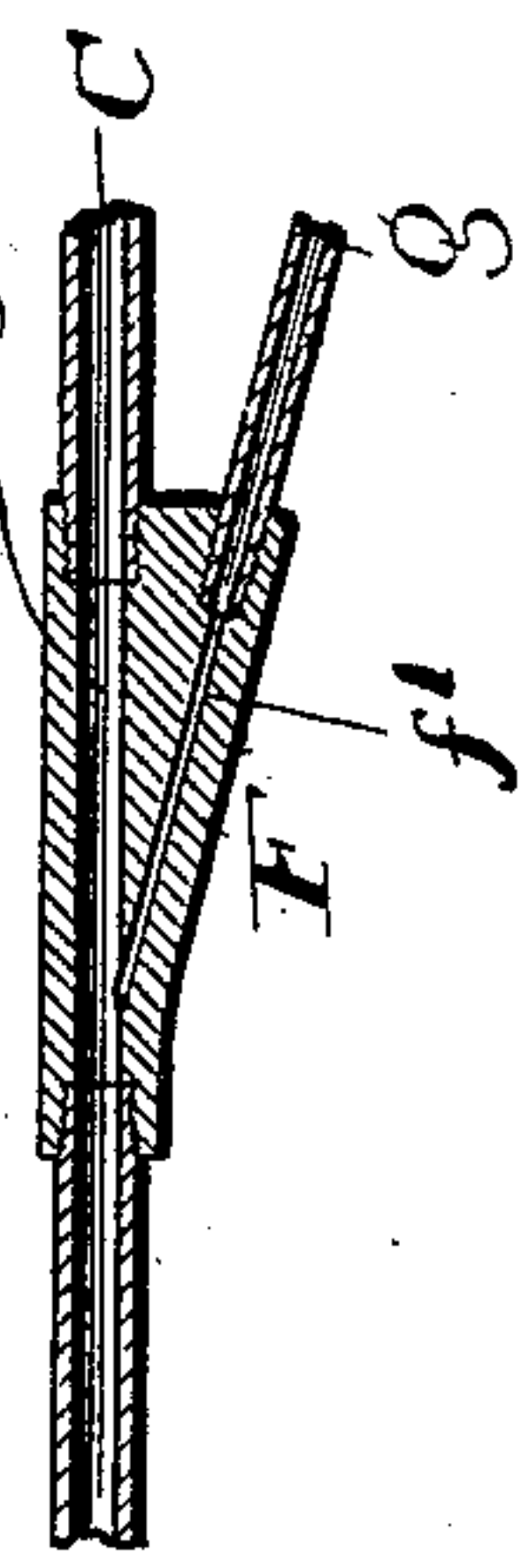


FIG. 2.



Witnesses:

S. Bliss
M. B. Bliss

Inventor:

James Franklin Duffy
by H. Bitner,
Atty

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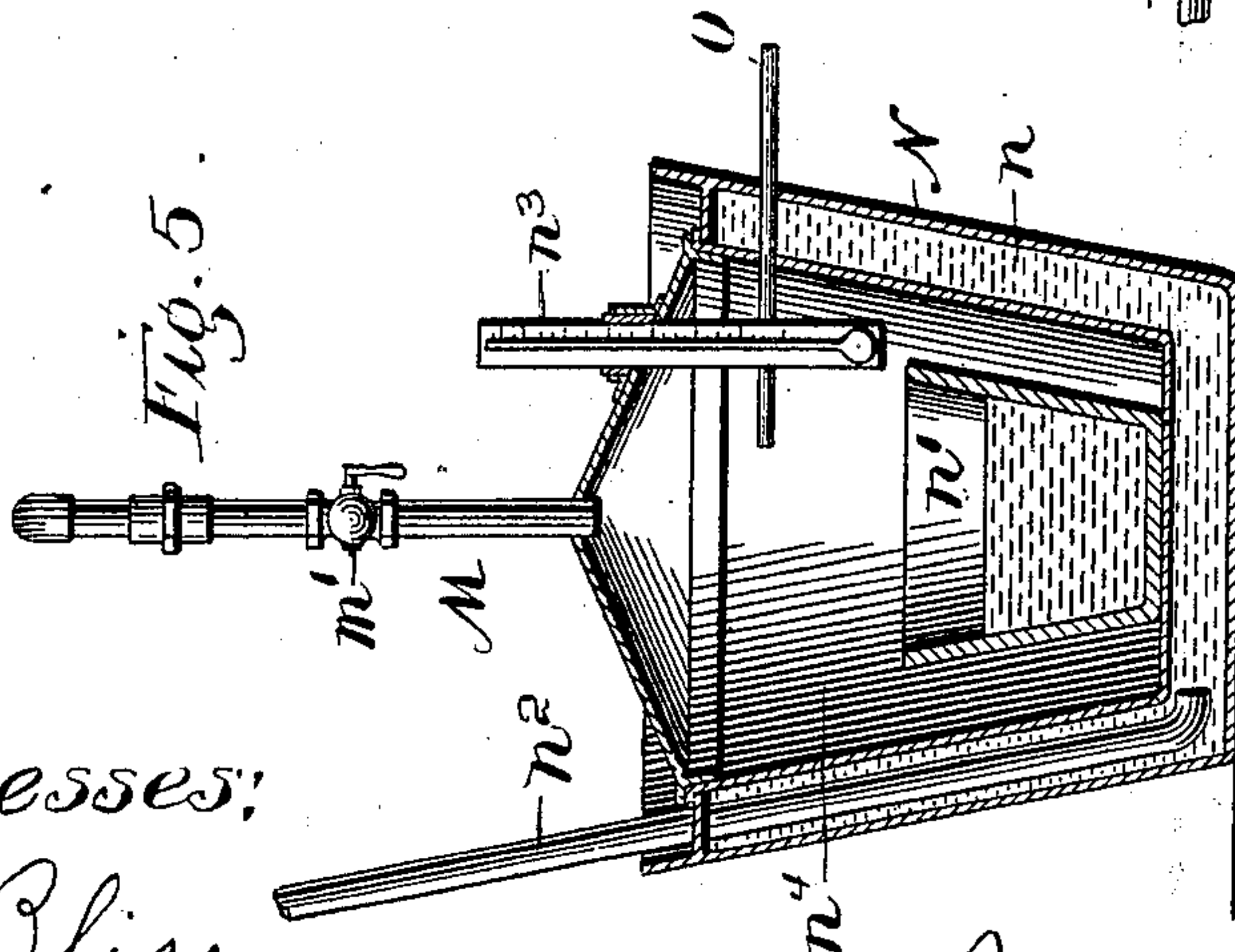
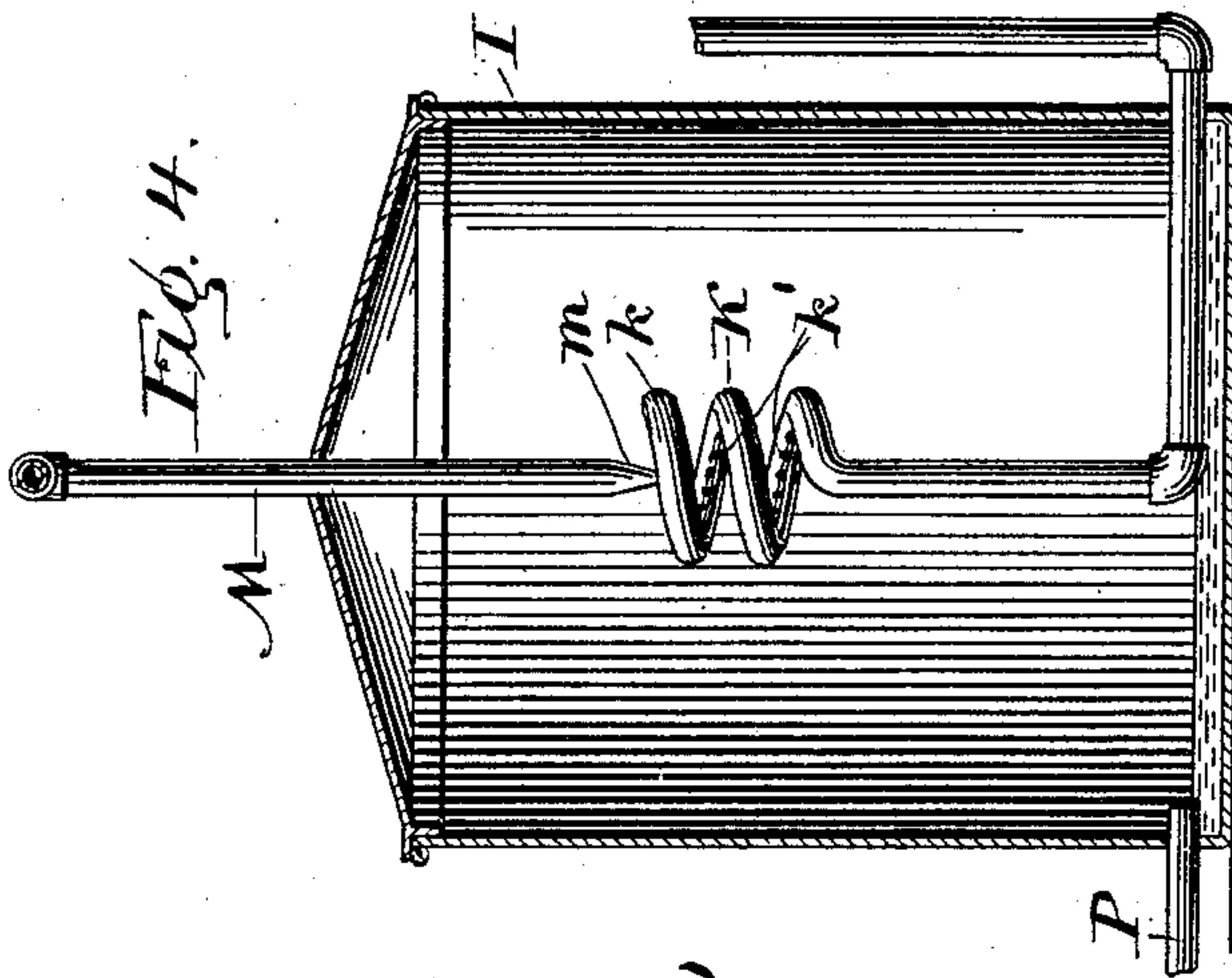
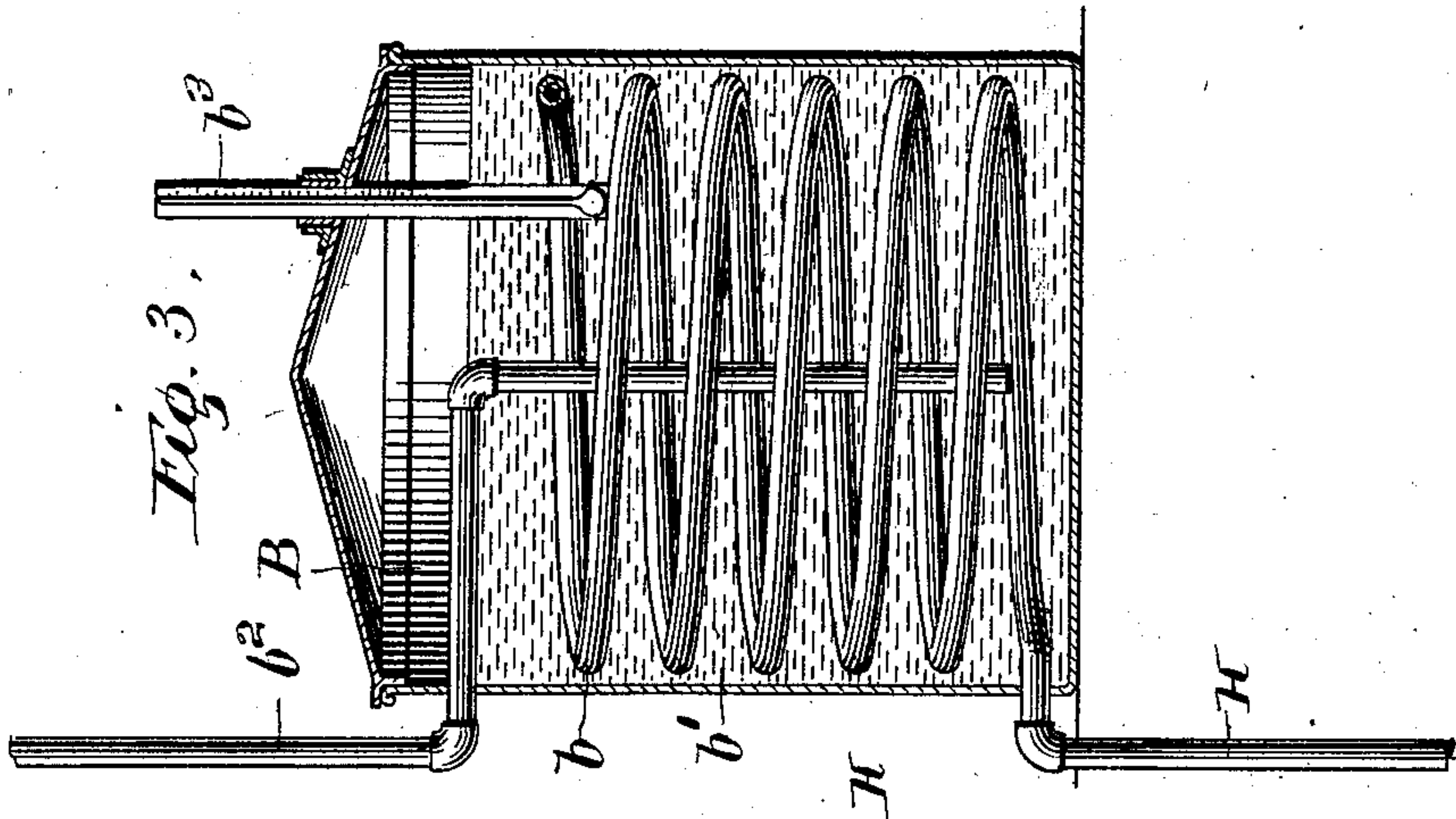
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3 Sheets—Sheet 2.



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Inventor:

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by H. Bitner,
Att'y.

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J. F. DUFFY.

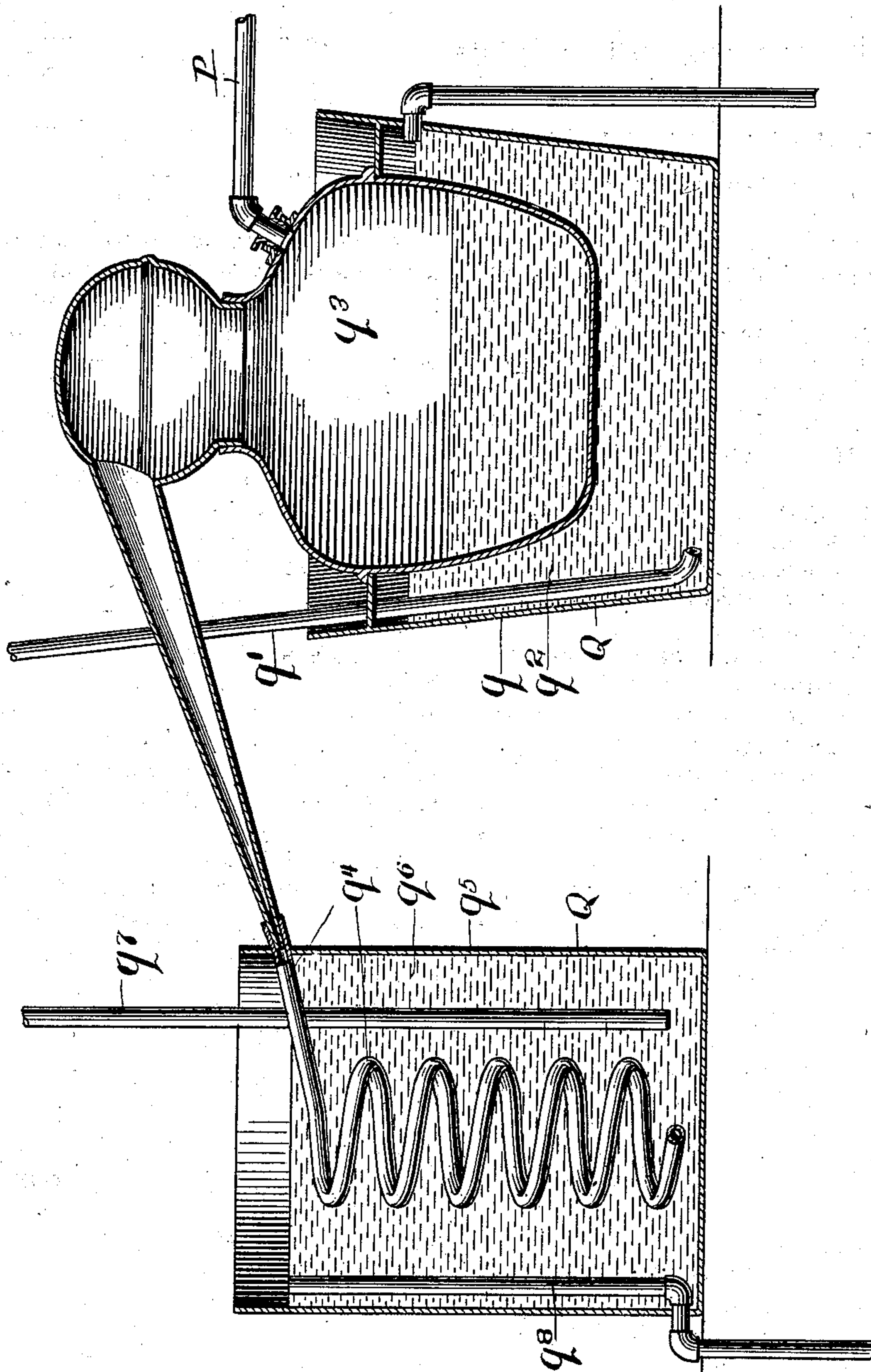
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3 Sheets—Sheet 3.

Fig. 0.



Witnesses:

S. Bliss.
M. B. Bliss.

Inventor:

James Franklin Duffy,
by H. B. Bittner,
Att'y.

UNITED STATES PATENT OFFICE.

JAMES FRANKLIN DUFFY, OF CHICAGO, ILLINOIS.

METHOD OF REFINING, AGING, MELLOWING, AND PURIFYING ALCOHOLIC LIQUORS.

SPECIFICATION forming part of Letters Patent No. 698,184, dated April 22, 1902.

Application filed September 30, 1901. Serial No. 77,009. (No specimens.)

To all whom it may concern:

Be it known that I, JAMES FRANKLIN DUFFY, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Methods of Refining, Aging, Mellowing, and Purifying Alcoholic Liquors, of which the following is a specification.

My invention relates to a certain improved method or process for the treatment of liquors in the same particulars as is usually accomplished through a considerable period by the ordinary aging process.

Under the term "liquor" as used herein I include all alcoholic or spirituous fluids, either distilled or fermented; and it is the purpose of the invention to purify said liquors, to eliminate all injurious qualities therefrom, and to supply the ripe, pure, and mellow qualities which time alone has done heretofore.

The invention consists in the treatment of the liquor by means of the various steps of the process, all of which will appear from the description and be clearly pointed out in the claims.

An apparatus suitable for the working of the process is illustrated in the drawings, in which—

Figure 1 is an elevation of the complete apparatus. Fig. 2 is a detail of an air-mixer; Fig. 3, a vertical diametrical section of a heating-tank; Fig. 4, a similar section of an atomizing-chamber; Fig. 5, a similar section of a receptacle for the mingling with air of a suitable reagent, and Fig. 6 a similar section of a still adapted to the final step of my improved process.

Referring to the drawings, A is a supply tank or vat in which the liquor is placed and from which it flows, preferably by gravity, into the next portion of the apparatus.

B is a second tank connected with the first by a pipe C, in which is interposed nearest the tank A a stop-cock D, then a check-valve E, then an air mixer or injector F.

G is an air-compressor of ordinary construction, from which a pipe *g* leads to the injector F. In Fig. 2 the preferred construction of said injector is shown, the same containing a port or passage *f* in line with the

pipe C and a similar port or passage *f'* in line with the pipe *g* and at an acute angle to the port *f*. A stop-cock *g'* controls the passage of air to the injector. By means of the air-compressor and the connections described a quantity of air, such as may be found desirable, may be mingled with the liquor during its passage through the pipe C, said air aiding in the oxidation of the portions of the liquors to be removed therefrom.

The pipe C passes into the tank B, enters a coil *b* therein, Fig. 3, and emerges into a pipe H. The tank B is preferably filled with water *b'*, heated by means of a steam-pipe *b²*, and preferably kept at about 170° Fahrenheit, at which temperature the essential oils and noxious ingredients of liquors are more easily separated without injury to their aroma. A thermometer *b³* provides means for determining the temperature of the interior of the tank B. From the tank B the pipe H leads into the third tank I and terminates, preferably, in about the center thereof in a spray-nozzle K, shown as consisting of a coil *k* of pipe containing inner perforations *k'*. The pressure back of the liquor at this point should force it from the perforations with an atomizing effect, and a nozzle *m* in the end of the pipe M ejects into the spray discharged from the atomizer a current of air impregnated with tannic or acetic acid adapted to impart to the wine a certain astringency and also to aid in the etherization of such impurities as may remain therein at this point. The impregnated air is furnished from a tank N, Fig. 5, having a water-jacket *n*, inclosing an inner receptacle *n⁴*, in which is placed a vessel *n'*, containing tannic or acetic acid. A steam-pipe *n²* affords means of heating the receptacle, and a thermometer *n³* indicates the temperature thereof. An air-pipe O, controlled by a stop-cock *o*, leads from the air-compressor to the inner receptacle, and the pipe M leads from the top of the receptacle to the nozzle *m*. A stop-cock *m'* enables the flow of air in the pipe M to be controlled. I prefer to heat the air in the receptacle *n⁴* to about 150° Fahrenheit to assist it in taking up the tannic or acetic acid and also to maintain the desired temperature at the point of discharge through the nozzle *m*.

From the lower portion of the tank I a pipe

P leads to an ordinary distilling apparatus Q, as shown in Fig. 6, the same consisting of a heater q , heated by a steam-pipe q' and preferably containing water q^2 , a still q^3 , the upper portion of which is connected with a worm q^4 in a cooler q^5 , supplied with cold water q^6 through the pipe q^7 , the water passing off through the overflow-pipe q^8 .

In the practical working of the process the liquor to be treated is placed in the tank A, flows therefrom through the pipe C, wherein it is mingled with air injected under pressure from a compressor G. From the pipe C the liquor passes into the coil b in the tank B, and the mixture of air and liquor is then heated, preferably to about 170° Fahrenheit. The heated mixture then flows on through the pipe H into the tank I and is ejected in the form of a spray from the spray-nozzle K. A suitable reagent—as, for instance, tannic or acetic acid—is placed in the vessel n' , is evaporated therefrom into the receptacle n^4 , passes through the pipe M, and is ejected from the end of said pipe within the tank I so as to mingle with the spray from the nozzle K. From the vessel I the mixture then proceeds, preferably, to the still Q. As the liquor reaches the still the volatile ether will pass off in the first working of the still in the form of gas and the products of oxidation will remain in the bottom of the still, to be cleaned out prior to the receiving of a new charge. The product may be redistilled in the ordinary way and will have the same taste and properties as are imparted to it by aging, according to the method commonly practiced.

The apparatus described herein is claimed in another application of even date herewith, which has been designated by the Serial No. 77,008.

I claim as new and desire to secure by Letters Patent—

1. In a process for the treating of liquors, the following steps in the order mentioned, to wit: the mingling therewith of air under pressure, the heating of the mixture, the addition thereto of a suitable reagent and the distillation of the products; substantially as described.

2. In a process for the treating of liquors, the following steps: first, the mingling with the liquor, of air under pressure; second the heating of the mixture; third, the atomizing of the heated mixture; fourth, the impregnating of air with a suitable reagent, and fifth, the mingling of the impregnated air with the atomized heated mixture; substantially as described.

3. In a process for the treating of liquors, first, the mingling with said liquors, of air under pressure; second, the heating of the mixture thus formed; third, the atomizing of the heated mixture; fourth, the impregnating of air with a suitable reagent; fifth, the mingling of the impregnated air and the atomized mixture; sixth, the distilling of the product; substantially as described.

4. In a process for the treating of liquors, the atomizing of the liquor and the mingling of a suitable reagent with said liquors, while the latter are in the form of a spray; substantially as described.

In witness whereof I have hereunto set my hand, at Chicago, in the county of Cook and State of Illinois, this 27th day of September, A. D. 1901.

JAMES FRANKLIN DUFFY.

Witnesses:

S. BLISS,

M. B. BLISS.