

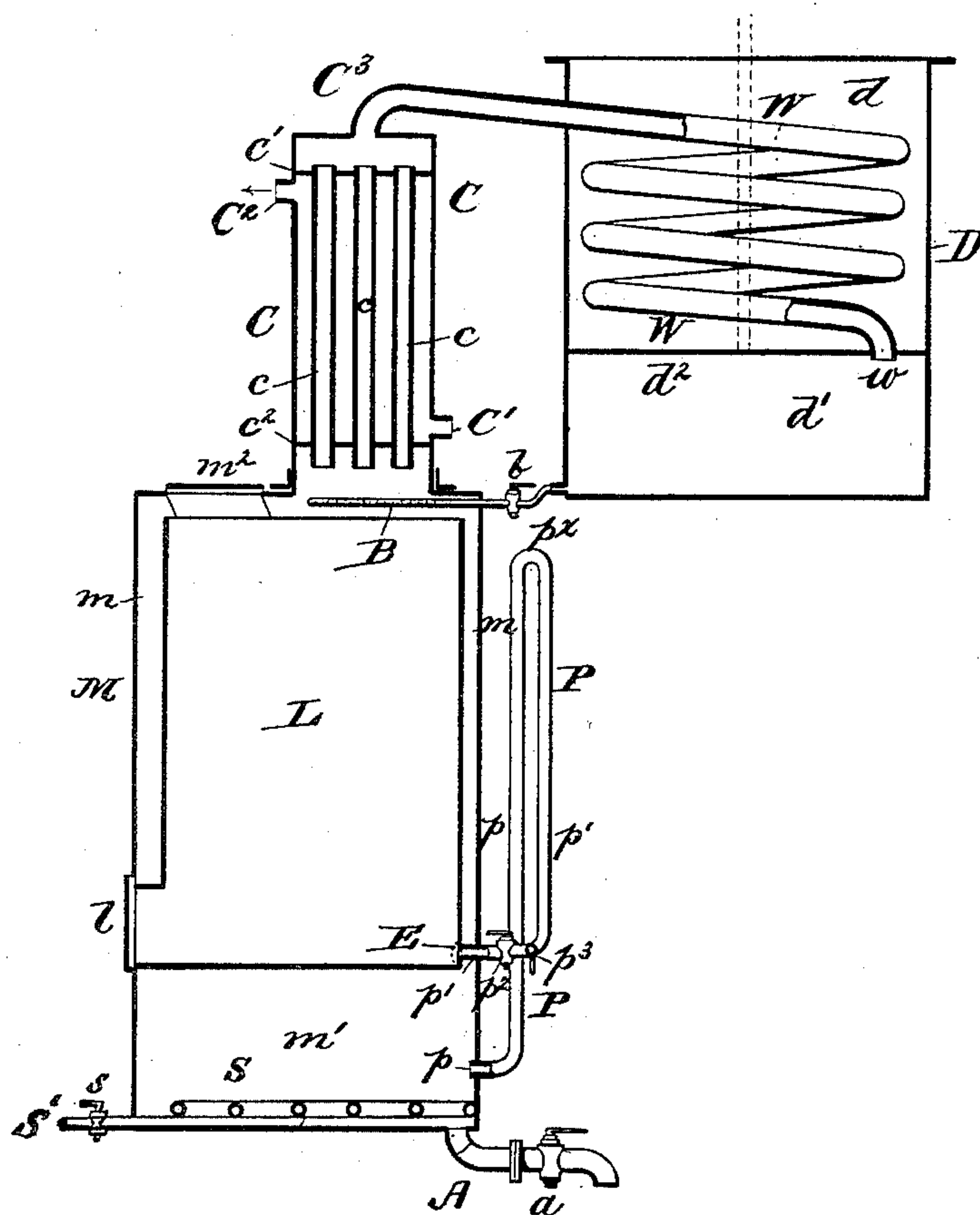
(No Model.)

J. MERZ.

APPARATUS FOR MAKING EXTRACTS.

No. 339,201.

Patented Apr. 6, 1886.



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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR MAKING EXTRACTS.

SPECIFICATION forming part of Letters Patent No. 339,201, dated April 6, 1886.

Application filed October 2, 1885. Serial No. 178,860. (No model.) Patented in Germany May 18, 1882, No. 20,742; in France May 22, 1882, No. 149,103; in Austria-Hungary September 11, 1882, No. 17,570 and No. 35,783, and in Italy May 29, 1885, XIX, 18,295, and XXXVI, 214.

*To all whom it may concern:*

Be it known that I, JOSEF MERZ, chemist, a subject of the Emperor of Austria-Hungary, residing at Brünn, in the Province of Moravia, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Extracting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters or figures of reference marked thereon, which forms a part of this specification.

This invention relates to improvements in apparatus for extracting from substances containing the same their fatty and other constituents, such as oils, sulphur, coloring-matter and in general all such constituents as are soluble in volatile solvents, such as some of the hydrocarbons, bisulphide of carbon, alcohol, ether, &c.; and it consists in the construction of the apparatus and in the combination of its several parts substantially as hereinafter fully described, and as set forth in the claims hereto annexed.

The object of the invention is to provide an apparatus of simple construction by means of which extracts may be obtained from substances generally, either in a continuous or intermittent manner, and which may also be employed for other purposes of decoloration and as a purifier.

In the accompanying drawing I have shown my improved apparatus by a vertical sectional elevation.

M indicates a closed vessel, provided with a charging-orifice closed by a suitable cap or door,  $m^2$ . In this vessel M is arranged a smaller vessel, L, so as to leave a space,  $m$ , all around the same and a chamber,  $m'$ , below it. The vessel L has a discharging orifice or opening that extends to and is connected with a like opening in vessel M, which latter opening is closed by a suitable door or gate,  $l$ .

In the chamber  $m'$  is arranged a steam-coil, S, and P is a siphon or bent pipe, the leg  $p$  of which is connected with the chamber  $m'$  of vessel M, and the leg  $p'$  with the vessel L, at or

near the bottom of said vessels, said siphon being of such height that the bent portion  $p^4$  thereof will be in a plane a little below that of the upper open end of vessel L, and said leg is provided with a stop-cock,  $p^2$ , and a try-cock,  $p^3$ .

To prevent solid matter being carried into the siphon-pipe from vessel L, I apply to the orifice a perforated diaphragm, E, or a diaphragm of a woven metallic fabric.

On top of vessel M is mounted a tubular cooler, C, the tubes  $c$  of which are open at both ends and secured to cross-partitions  $c'$   $c^2$ , forming a chamber, to which any suitable refrigerant, such as cold water or other refrigerant, is fed, the said cooler being provided with inlet and outlet pipes  $c'$   $c^2$ , at top and bottom thereof respectively.

The chamber  $c^3$ , formed by the partition  $c'$  and the top of cooler C, is connected with the worm W of a condenser, D, divided into two chambers,  $d$  and  $d'$  by a partition,  $d^2$ . In the open upper chamber is located the condenser-worm, connected at one end to cooler C and at the other,  $w$ , with the chamber  $d'$ , to which chamber is also connected a pipe, B, provided with a stop-cock,  $b$ , said pipe passing through the wall of the vessel M over the vessel L, and being perforated at that point.

The operation of the apparatus may be briefly described as follows: The chamber  $d'$  of condenser D, which constitutes the reservoir for the volatile solvent, being supplied with the necessary quantity of such, and the vessel L charged with the material to be treated, the stop-cock  $b$  is opened, and said solvent is allowed to flow onto said material in vessel L. The stop  $s$  of steam-pipe S' is then opened and steam admitted to coil S. When the level of the solvent in vessel L has risen above that of the bent portion of the siphon P, said solvent will flow through the siphon into chamber  $m'$ , to be there heated and volatilized by the heat from coil S. The vapors of the solvent will ascend in the space  $m$  formed between vessels M and L and heat the latter, and such vapors as are not condensed on the walls of said vessels ascend into the cooler to be there condensed. The condensed solvent, having



still a more or less high temperature, flows back into vessel L, from which it again flows into chamber  $m'$  as soon as the level of the solvent in L has reached the proper point.

5 The extracted matter, as will be readily understood, is carried with the solvent into chamber  $m'$  of vessel M, and the described process of extraction is continued until a sample of the liquid flowing through siphon P and  
10 drawn therefrom through try-cock  $p^3$  is free from such extracted matter. The supply of refrigerant to cooler C and of solvent to vessel L is then cut off, and steam introduced into both vessels L and M to eliminate the solvent  
15 from the extract and from the material treated, the vapors passing through cooler C into the condensing-worm W to be condensed and stored in chamber  $d'$  of condenser D for further use. After this operation the extracted mat-  
20 ter is drawn off from chamber  $m'$  of vessel L through pipe A, provided with a suitable stop-cock,  $a$ , and the contents of vessel L removed by opening the door  $l$ .

As described, the operation of extraction is  
25 a periodical one, as a certain time will elapse for the solvent to reach a proper height in vessel L to cause it to flow into chamber  $m'$  and carry with it the extracted matter. The operation may, however, be made a continu-  
30 ous one by maintaining the level of the solvent in L constant so as to cause it to continuously flow through siphon P.

When it is desired to employ the apparatus for purposes of decoloration or as a purifier,  
35 the vessel L is filled to a certain level with animal-charcoal or other desired decolorating or purifying material, and the liquid to be treated is then fed to vessel L, the operation being carried on as above described. The  
40 liquid, or the solution of such, which is continuously formed, is purified in the lower portion of vessel L, and thence flows through siphon into chamber  $m'$  of vessel M. If the specific gravity of the solvent is greater than  
45 that of the constituent extracted, it is necessary, in order to render the process of extraction continuous, to introduce the solvent at the

bottom of vessel L. To this end the pipe B may be made of such length as to project down into said vessel, and the condensed solvent  
50 from cooler C is collected in a suitable receiver and also conveyed by a suitable pipe to near the bottom of the vessel L. In this case the extract flows over the upper end of vessel L into chamber  $m'$  of vessel M, and the vaporiza-  
55 tion which takes place in the latter chamber produces a circulation in a reverse direction from that above described—that is to say, from chamber  $m'$  to vessel L, instead of from vessel L to chamber  $m'$ , as will be readily understood. Co

What I claim is—

1. In an apparatus of the class described, the combination, with an outer closed vessel, a vessel of smaller dimensions and open at top  
65 arranged within the outer vessel so as to leave a space all around the inclosed vessel, a heater located below the latter vessel, and a cooler or condenser mounted on the outer vessel ar-  
ranged to discharge into the inclosed vessel, of the siphon-pipe P, substantially as and for  
70 the purpose specified.

2. In an apparatus of the class described, the combination, with an outer inclosed ves-  
sel, a heater and a cooler or condenser ar-  
75 ranged at opposite ends of said vessel, and a vessel of smaller dimensions open at top ar-  
ranged within the outer vessel to leave a space between the two and receive the products of condensation from the cooler or condenser, of the siphon-pipe P, the steam-pipe S', and a  
80 solvent reservoir discharging into the inclosed vessel, substantially as and for the purpose specified.

3. The combination, with the vessels M L, steam-pipe S, and the cooler or condenser C,  
85 of the condenser D, said parts being arranged for operation substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEF MERZ.

Witnesses:

PHILIPP ELLINGER,  
SIMON FELDMAN.