

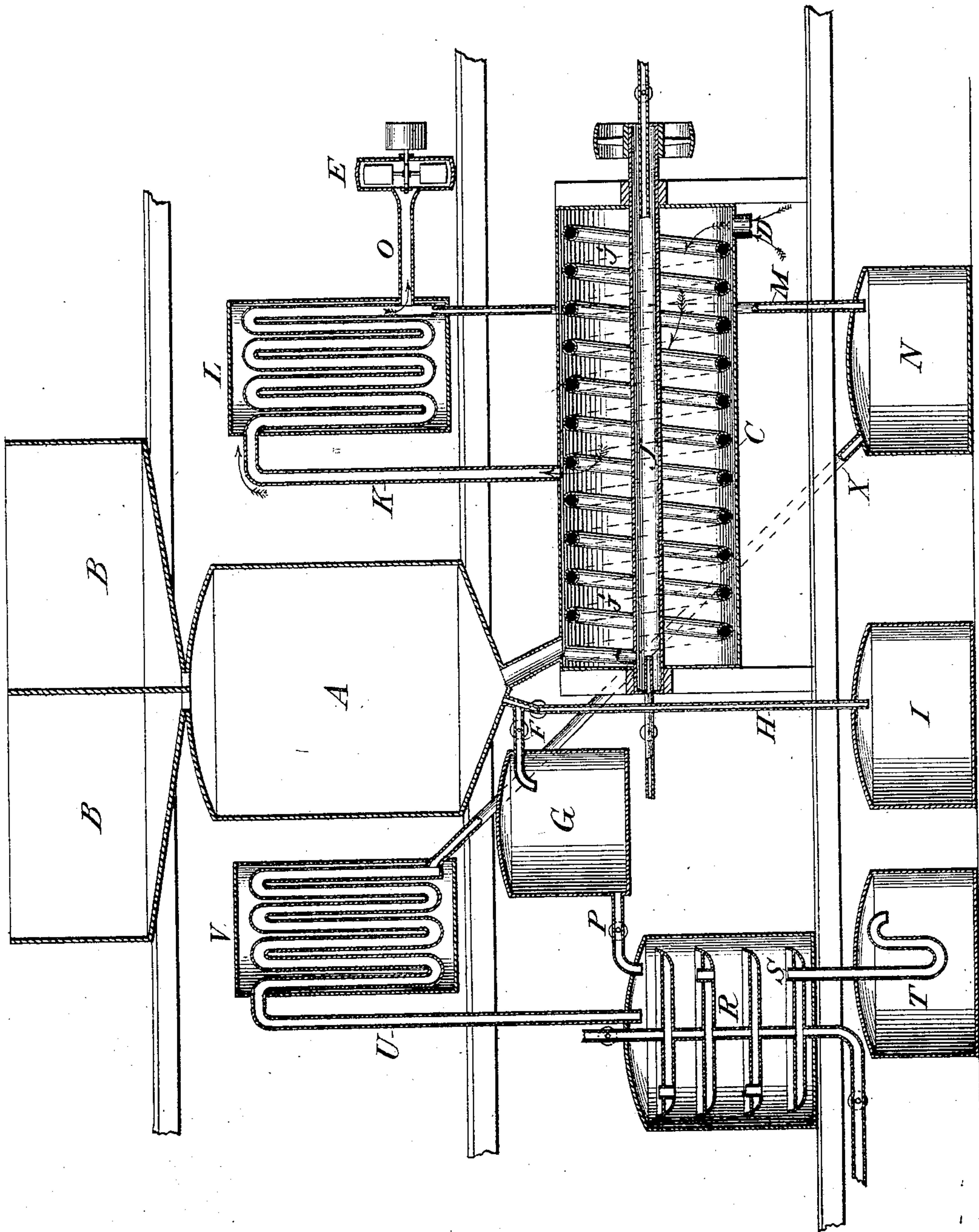
(No Model.)

W. N. MATTHEWS & M. LANCASTER.

EXTRACTING VEGETABLE OILS.

No. 246,172.

Patented Aug. 23, 1881.



Witnesses:  
J. B. Goodman.  
Jno. A. Harcoster

Inventors.  
William N. Matthews  
Morris Lancaster  
By J. B. Hunt  
Atty



# UNITED STATES PATENT OFFICE.

WILLIAM N. MATTHEWS AND MORRIS LANCASTER, OF RICHMOND, INDIANA, ASSIGNORS OF ONE-THIRD TO WILLIAM MENDENHALL, OF SAME PLACE.

## EXTRACTING VEGETABLE OILS.

SPECIFICATION forming part of Letters Patent No. 246,172, dated August 23, 1881.

Application filed March 20, 1880. (No. model.)

*To all whom it may concern:*

Be it known that we, WILLIAM N. MATTHEWS and MORRIS LANCASTER, citizens of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in the Process of and Apparatus for Extracting Vegetable Oils, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which illustrates a vertical section of the apparatus constructed in accordance with our improvement.

The principal object of our invention is to reclaim the solvent employed in extracting oils from vegetable meal without subjecting the latter to the action of steam, the employment of which renders the meal liable to become sour and unfit for further use.

To this end our invention consists in the combination and arrangement of tanks, pipes, condensers, and evaporators, as hereinafter more fully described, and specifically pointed out in the claims.

In the drawing, A indicates the percolator, which consists of a vessel adapted to receive the meal from the soaking tank or tanks B, in which the meal and solvent are first placed. One or more of these soaking-tanks may be employed, and they can be either placed directly above the percolator and adapted to communicate therewith by suitable openings, or they can be arranged in any other convenient position and their contents pumped out at the proper time into the percolator. The percolator connects with a tank, G, by means of a pipe, F, provided with a suitable stop-cock for opening or closing communication between the two, said pipe being employed for the purpose of drawing off the combined oil and solvent from the percolator. A second pipe, H, is employed for connecting the percolator with a tank, I, the object of this latter pipe being to draw the thin solution from the percolator after the solution, which is of the proper consistency for separation, has been drawn into the tank G.

C designates the evaporator, which is connected with the percolator, so that the meal

from the latter can be passed into one end of the evaporator. This evaporator is provided with a hollow rotary shaft, J, surrounded by a coil of steam-pipe, J', said pipe being secured to the shaft, so as to rotate therewith, and thereby act as a conveyer for agitating and conveying the meal from the inlet end of the evaporator to the discharge-spout D at its opposite end. A pipe, K, leads from the evaporator to a condenser, L, into which the vaporized solvent from the evaporator is conducted and condensed, a pipe, M, leading to a tank, N, being provided for the purpose of drawing off the condensed solvent. The condenser also connects with the fan-cylinder E of a rotary fan by means of a pipe, O, by means of which a current of air is induced through the evaporator and the condenser for the purpose of carrying the vaporized solvent from the former to the latter. This current of air can, however, be created by a blast from a fan, if desired.

The tank G communicates with the heater or evaporator R by means of a pipe, P, provided with a suitable stop-cock, said evaporator being provided with a series of shelves, or being constructed in any of the ways usually adopted for separating volatile and heavy liquids. The evaporator R is provided with a pipe, S, leading to a tank, T, for the purpose of drawing off the oil, and it also is provided with a pipe, V, into which the vaporized solvent will rise, and, after condensation therein, be conveyed to the tank N through the medium of a pipe, X.

It will be understood without further description that the several pipes employed in this apparatus will have suitable stop-cocks for opening or closing the same.

The operation is as follows: The material from which the oil is to be extracted is placed in the soaking tank or tanks B and saturated with any of the solvents employed for the above purpose. After being sufficiently permeated with the solvent the material is conveyed to the percolator A, and the combined oil and solvent drawn from the percolator into the tank G as long as the solution is of the proper consistency for separation in the evaporator R, into which it is drawn from the tank,



and the solvent vaporized, the solvent rising into the condenser V, where it is condensed and drawn off to the tank W, and the oil passing down through the pipe S into the tank T.

5 The remainder of the solution left in the percolator, which is too thin for separation, will be drawn off through the pipe H into the tank I, from which it will be returned to the soaking tank or tanks B. After the fluids have  
10 been drained off from the contents of the percolator the meal or residuum is passed into the evaporator C, in which it is heated, so as to vaporize the solvent remaining therein, by means of heat imparted to it from the steam-  
15 coil and the hollow shaft. The meal is conveyed from the inlet end of the evaporator to the discharge end thereof by the rotary movement of the coil, and is also agitated by the same means, so as to thoroughly expose it to  
20 the action of a current of air which enters through the discharge tube or spout D and passes through the evaporator, so as to carry off the vaporized solvent into the condenser L through the pipe K. The current of air passes  
25 out from the condenser through the pipe O, and the condensed solvent descends through the pipe M into the tank N, in which the solvent from the condenser V is also collected.

What we claim is—

30 1. The combination, in an apparatus for reclaiming the solvent employed in extracting oils from vegetable meal, of the percolator-vessel A, which receives the meal from the soaking-tank, with the evaporator R, into which  
35 the combined oil and solvent of a proper consistency for separation is drawn from the per-

colator, the condenser V, for condensing the vaporized solvent, connected with said evaporator, the evaporator C, connected with the percolator for receiving the residuum there- 40 from, and provided with a rotary coil of steam-pipe, said latter evaporator being also provided with an air-inlet, and being connected with the condenser L, into which the vaporized product is drawn by a current of air induced through 45 the said evaporator and the condenser, substantially as described.

2. The combination, in an apparatus for reclaiming the solvent employed in extracting oils from vegetable meal, of the percolator- 50 vessel A, for receiving the oil and meal, the evaporator R, connected with the percolator-vessel by means of a tank, G, and pipe-connections, and adapted for receiving the combined oil and solvent of a proper consistency 55 for separation, the condenser V, connected with the evaporator, the pipe H, for drawing off the thin solution from the percolator-vessel after the solution of the requisite consistency for separation has been drawn into tank G, 60 the evaporator C, provided with a rotary coil of steam-pipe, the condenser L, connected with the said evaporator, and a fan arranged to induce a current of air through the evaporator and the condenser, all substantially as de- 65 scribed.

WILLIAM N. MATTHEWS.  
MORRIS LANCASTER.

Witnesses:

A. LANCASTER,  
L. F. MATTHEWS.