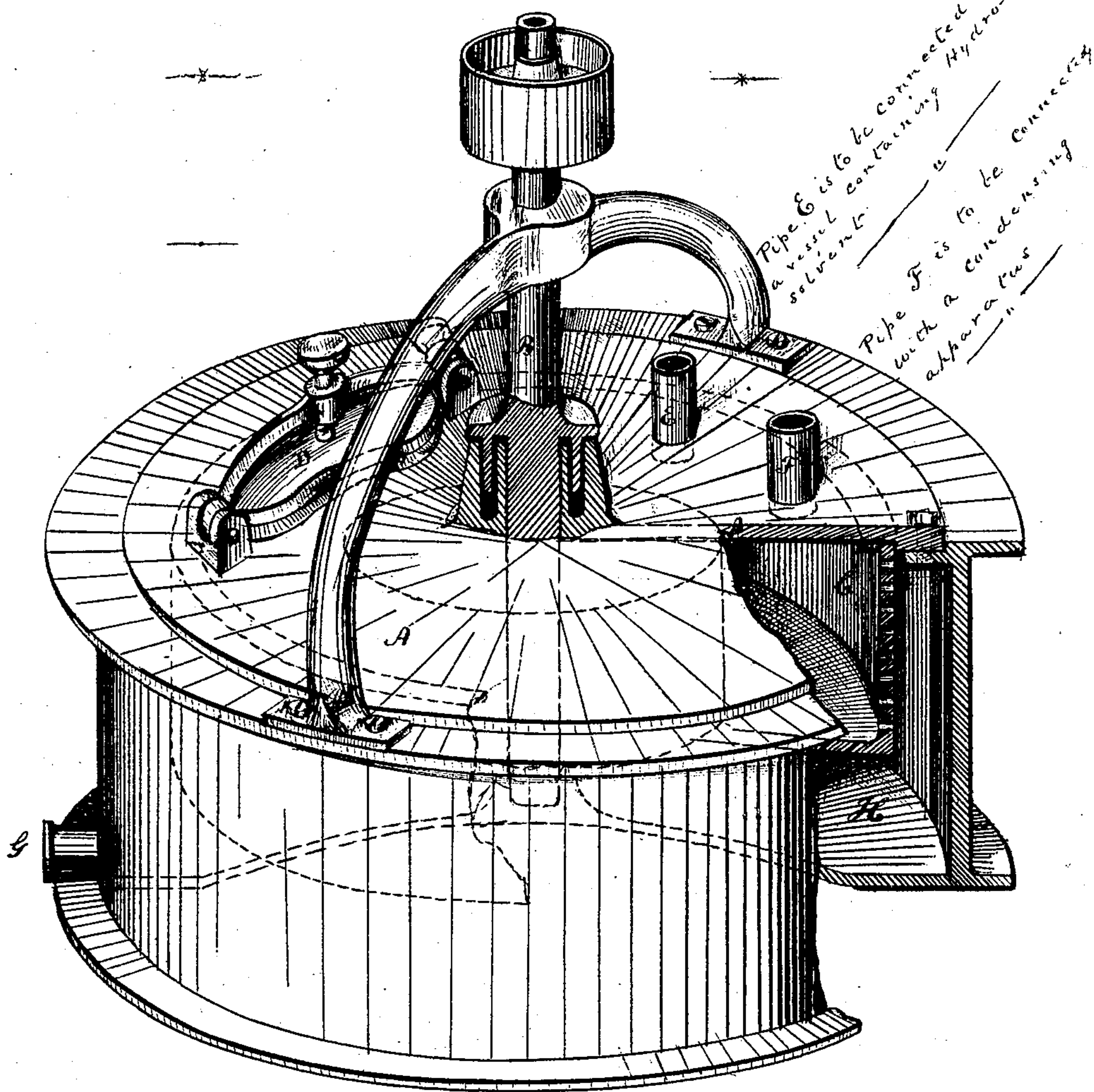


H. A. STEARNS.
APPARATUS FOR EXTRACTING OIL FROM ANIMAL AND VEGETABLE
SUBSTANCES.

No. 103,519.

Patented May 24, 1870.



WITNESSES.

Peter F. Hughes
Orville Peckham

INVENTOR.

Henry A. Stearns

United States Patent Office.

HENRY A. STEARNS, OF SMITHFIELD, RHODE ISLAND.

Letters Patent No. 103,519, dated May 24, 1870.

IMPROVEMENT IN APPARATUS FOR EXTRACTING OIL FROM ANIMAL AND VEGETABLE SUBSTANCES.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, HENRY A. STEARNS, of Smithfield, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Apparatus Employed in the art of Extracting Oil from Animal and Vegetable Substances, by the use of hydrocarbon solvents; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

It is a well-known fact that the light hydrocarbons, which can be obtained from coal-oil, shale-oil, and petroleum, though differing from each other in the relative proportions of their constituents of carbon and hydrogen, are all distinguished for a common property of being able to dissolve animal and vegetable oils. Accordingly, this agent has been employed for extracting essential oils from seeds and other vegetable products, and for cleaning machinery waste.

To employ this process upon any considerable scale, special machinery is necessary, which shall be adapted to the use of a cleansing and solvent agent so volatile and so dangerous as the light hydrocarbons of petroleum and earth oils.

It is practically impossible to manipulate any large mass of cotton waste, for example, which is saturated with a hydrocarbon solvent, under circumstances where the fumes can escape into the atmosphere, both on account of the danger involved from the explosive nature of the solvent, as well as the loss of material due to its volatility.

Furthermore, it is essential to the economical working of the process that the solvent, after it has performed its intended office, should be extracted from the fibrous or other material subjected to its action, together with the animal or vegetable oils with which it has combined, with the view of subsequently recovering separately, for further uses, the hydrocarbon solvent and the oil which together compose the mixed solution.

My invention relates to certain improvements in the apparatus to be employed in the art of cleansing waste or other material by the use of hydrocarbon solvents, and consists in the employment of a centrifugal extractor, so constructed as to prevent the escape of the hydrocarbon vapors into the open atmosphere, in combination with a close vessel containing a supply of hydrocarbon solvent, and with a condenser to condense and liquefy the vapors which escape from the mixed solution within the extractor during the process of extraction.

In the drawings there is represented an apparatus which, were it open at the top, would be the hydro extractor in common use in various manufacturing

establishments. To adapt it for the purpose designed, I add to it a lid or cover, A, which should be packed at the joint, so as to sustain a considerable internal pressure without any leakage.

The spindle B, which drives the interior revolving basket C, peculiar to such machines, should also be packed at the joint.

In the top of the cover A is made an opening, of sufficient size to introduce and remove the waste or other material to be cleansed, and this opening is furnished with a removable man-hole plate, D, which should be packed at the joint, and, when the machine is in use, be secured by a suitable yoke-clamp, a convenient form for which is shown in the drawing.

E is an inlet-pipe, which, it is to be supposed, is connected with a close vessel containing the light hydrocarbon to be used, and through which the solvent is admitted at pleasure to the extractor by means of a stop-cock, the vessel containing the hydrocarbon being placed at a higher elevation than the extractor, or, if preferred, its contents are forced into the extractor under pressure.

F is an exit-pipe for the vapors disengaged from the hydrocarbon solvent, and it is to be supposed that it is in connection with a worm, or other suitable condenser, by means of which apparatus vapors passing through the same can be condensed into liquids.

G is a pipe located near the bottom of the cistern H, and furnished with a stop-cock for drawing off at pleasure the liquid contents of the cistern.

The operation of the apparatus will be readily understood to be as follows:

The basket C having been supplied with a suitable quantity of soiled waste, for instance, the stop-cock in the pipe E, connecting with the close tank containing hydrocarbon, is opened, and the cistern H filled with the solvent. After the waste has been subjected to the action of the solvent for the necessary length of time to dissolve the oil which it contains, the stop-cock in the discharge-pipe G is opened, and the fluid contents of the cistern are drawn off into an appropriate close receiver. The centrifugal extractor is then set in motion, and the fluid matters contained in the fibers of the waste are driven off and run through the discharge-pipe G into the receiver. In the course of the process of extraction vapors are constantly rising, which find their way through the exit-pipe F, thus relieving any internal pressure from the same, and are condensed into a liquid form.

The whole process of cleansing and drying the waste is thus conducted, without danger or inconvenience from the fumes of the hydrocarbon, and with the loss of a very small percentage of the solvent agent.

I am aware that Letters Patent of the United States have been granted to Frederick Lambe, on the 19th day of April, A. D. 1870, for certain improvements in the process of treating and purifying paraffine, involving the use of an apparatus which consists of revolving beaters, in combination with a hydro extractor. Such apparatus would be unsuitable for the art for which my invention is applicable, and I make no claim to any of the machinery described in said patent.

What I claim as my invention, and desire to secure by Letters Patent, is—

An apparatus adapted for use in the art of treating

material which has been subjected to the solvent action of light hydrocarbons, and like volatile agents, said apparatus consisting essentially of the following apparatuses or organisms in combination: first, a centrifugal extractor, constructed substantially as described; second, a vessel for containing the volatile solvent agent; and, third, a condenser for liquefying the vapors disengaged during the process—all substantially as hereinbefore described.

HENRY A. STEARNS.

Witnesses:

PETER F. HUGHES,
ORVILLE PECKHAM.