A. B. MARSTON.

TURPENTINE SEPARATOR,

APPLICATION FILED JULY 2, 1917.

1,262,076. Patented Apr. 9, 1918.

Fig. 1.

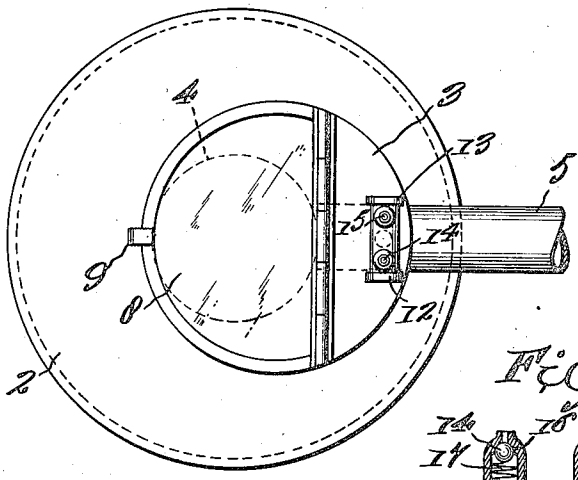


Fig. 3.

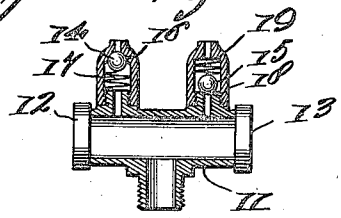
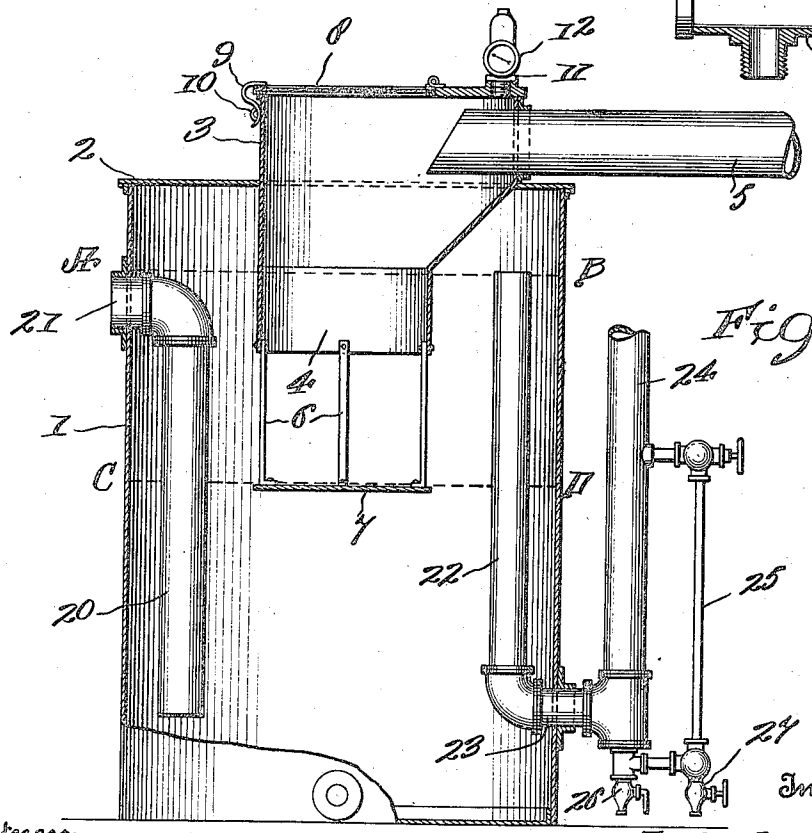


Fig. 2.



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UNITED STATES PATENT OFFICE.

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TURPENTINE-SEPARATOR.

1,262,076. Specification of Letters Patent. Patented Apr. 9, 1918.

Application filed July 2, 1917. Serial No. 178,195.

To all whom it may concern:

Be it known that I, ARCHIBALD B. MARSTON, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Turpentine-Separators; 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.

The present invention relates to improvements in turpentine separators and re-condensers, and more particularly relates to improvements in apparatus for use in the gathering and separation of the condensates from the "tail pipe," or discharge, of the condensing coils in the process of distilling crude gum or "dip" in the manufacture of turpentine and resin from the exudation of the pine tree.

It is an object of my present invention to provide an improved apparatus which will form a practical and efficient means of increasing the yield of turpentine by preventing the loss by evaporation, and rendering superior the quality of the turpentine recovered for the reason that in my apparatus the lighter fractions, which are ordinarily lost and which are very valuable, are preserved.

Heretofore it has been the custom to collect the condensates from turpentine stills in open receptacles, allowing the "tail pipes" of the condensers to discharge freely into the atmosphere and requiring the hot condensates to fall some distance through the atmosphere into the receptacles; thereby losing those lighter distillates, commonly called "non-condensable vapors," and also losing a certain percentage of recovered condensates through evaporation in the atmosphere.

Another object of my present invention resides in conducting the separation and re-condensation in a closed vessel to which the atmosphere will not have access, and which will obviate the above disadvantages attendant upon the gathering of the turpentine as now accomplished.

It is a further object of my present invention to provide an apparatus in which a superior separation of the water and turpentine will be effected, and in which the degree of pressure is maintained substantially constant so that the action may be substantially uniform and the process therefore constantly practised with the same superior results.

In the accompanying drawings forming a part of this application, and in which similar reference symbols indicate corresponding parts in the several views:

Figure 1 is a top plan view of an apparatus constructed in accordance with my present invention.

Fig. 2 is a side elevational view of the apparatus with parts broken away to show the interior thereof; and

Fig. 3 is a sectional view of a detail.

Referring more particularly to the drawings, which disclose one embodiment of my present invention, 1 designates a vessel which is closed by a tight fitting cover 2. The cover 2 is formed with an opening into which is fitted a receiving casing 3, having a lower reduced end 4. A tail pipe 5, from a turpentine worm, projects into the receiving casing 3, preferably in the manner shown in Fig. 2, and conveys from the worm to such receiving casing the condensates and non-condensable vapors. The lower reduced end 4 of the receiving casing 3 opens into the vessel 1 and carries hangers 6 for supporting a horizontal baffle plate 7, through which the separation of the turpentine and water is greatly facilitated.

A portion of the top of the receiving casing 3 is closed by a hinged glass cover 8, which has a hasp 9 fitting over an eye 10 for holding said cover 8 tightly closed. Such glass cover 8 admits inspection of the interior of the receiving casing 3 and vessel 1, so that the attendant may observe the progress of the action.

The top of the receiving casing 3 carries a fitting 11 which is shown more particularly in Fig. 3, and is provided to contain vacuum and pressure gages 12 and 13 and vacuum and pressure valves 14 and 15. The vacuum valve 14 seats in an upward direction against a seat 16 under the influence of a coil spring 17; while the pressure valve 15 is adapted to rest on an under-seat 18, against which it is urged by a coil spring 19. Both valves 14 and 15 control access from the interior of the receiving casing 3 and vessel 1 to the outside atmosphere.

The water outlet is provided by the pipe 20, the lower end of which terminates a short distance from the bottom of the vessel 1 while its upper end passes through the side

wall of the vessel 1 just beneath the turpentine level, as indicated at 21. The turpentine level is indicated by the broken line A—B, while the water level or line of separation is designated by the broken line C—D.

A pipe 22 having its upper end disposed a short distance beneath the cover 2 and approximately at the turpentine level A—B, provides for carrying off the separated turpentine; said pipe passing through the wall of the vessel 1 near the bottom thereof, as indicated at 23, and being coupled to a second exterior pipe 24 which is arranged in an upright position on the exterior of said vessel 1 and rising to a height just short of the open upper end of the inner pipe 22. A sight glass gage 25 is carried by the pipe 24, and suitable drain cocks 26 and 27 are also provided. It will be seen more especially from Fig. 2 that the pipes 22 and 24 form a trap.

The operation of the improved apparatus is substantially as follows:

The condensates and non-condensable vapors from the worm are conveyed through the tail pipe 5 and discharged into the receiving casing 3 beneath the glass cover 8, through which their entrance may be under observation of the attendant. Such condensates and vapors are directed as they issue from the tail pipe 5, down through the reduced lower end 4 of the receiving casing 3 and into the vessel 1, where their introduction will be quiet, due to the presence of the baffle plate 7, which is disposed directly in the path of such incoming products, and which causes the same to pass in all directions into the liquid in the vessel 1 with a minimum of disturbance, whereby not to interfere with the progress of the separation which is constantly taking place therein. As these products are thus delivered to the vessel 1, due to the differences in their specific gravities, the water will seek the bottom while the turpentine will rise to the top, the line of separation between the two liquids being that shown at C—D.

The weight of the combined liquid in the vessel 1, will operate to force the water through the lower end of the discharge pipe 20, and out through the connection made at 21, from which point the water may be led to a suitable destination.

The normal level of the turpentine is that shown at A—B in Fig. 2, and this level will be constantly preserved by the presence of the open upper end of the turpentine outlet pipe 22, which carries off the separated and freed turpentine and conducts the same through the connection 23 to and through the pipe 24 to a turpentine receptacle provided to receive same.

The gage glass 25 indicates the water level or the line of separation between the water and turpentine which is indicated at C—D.

The interior walls of the receiving casing 3 provide a large surface on which the non-condensable vapors may have every opportunity to condense and pass down into the vessel 1, where they will unite with the turpentine therein, which turpentine will be greatly improved by their addition.

It is of the greatest importance that the pressure within the receiving casing 3 and vessel 1 be substantially uniform, and that no abnormal vacuum or increased pressure be permitted to obtain therein at any stage of the operations, as such will affect the proper separation of the liquids and the speedy action of the apparatus; and for this purpose the vacuum valve 14 and pressure valve 15 are provided.

Whenever a predetermined degree of vacuum tends to exist within the apparatus, the atmospheric pressure acting on the valve 14 will unseat the same and permit an inrush of atmospheric air to relieve such abnormal degree of vacuum and to restore the apparatus to normal working conditions. The degree at which the valve 14 may open is controlled by the strength of the coil spring 17, which may, of course be selected to give the proper results. On the other hand, should the pressure in the apparatus become excessive, such pressure will unseat the valve 15 against the atmospheric pressure thereon, together with the strength of the coil spring 19, and will thus permit the escape of the accumulated pressure to the atmosphere without.

As soon as the abnormal pressure is relieved and the proper pressure restored, the valve 15 will be seated by the spring 19, which may be of any strength in accordance with the pressure required. Of course other types of valves than the check valve shown in Fig. 3 might be employed for this purpose with equally good results, and I do not wish to be limited to this or any other particular type of valve.

The location of the baffle plate 7, together with the relative locations of the water and turpentine outlets, may be rearranged in accordance with the specific gravities of the liquids to be separated, in this manner insuring perfect separation.

It is obvious that those skilled in the art may vary the details of construction and arrangements of parts without departing from the spirit of my invention, and therefore I do not wish to be limited to such features except as may be required by the claims.

I claim:

1. A device as described including a vessel with a tight cover having an opening therein, a water outlet communicating with the lower part of the vessel, a turpentine outlet receiving from the upper part of said vessel, a casing received through the opening in said

cover with its lower end open to the vessel, a transparent lid for inspection into said casing and vessel and to give access thereto, means held on said casing for relieving vacuum and pressure in the device, and a tail pipe delivering to said casing, substantially as described.

2. A device as described including a vessel with upper and lower outlets, a tight cover for the vessel with an opening therein, a receiving casing fitted in the opening in said cover and having a part of its top transparent, said casing having enlarged upper and reduced lower portions with a sloping surface connecting such portions, a tail pipe discharging into the upper enlarged portion above said sloping surface, and a baffle plate held a distance beneath the lower reduced portion and in the path of the fluid issuing therefrom, substantially as described.

3. A device as described including a vessel, a tight cover therefor, water and turpentine outlets for said vessel, a receiving casing let in through said cover and formed with an upper enlarged and a lower reduced portion with a sloping surface connecting such portions, the lower reduced portion being open at its lower end to the vessel, widely-spaced hangers depending from the lower end and affording unobstructed non-filtering spaces to the fluid, a baffle plate carried on said hangers and located approximately at the line of separation between the water and turpentine, and a tail pipe having its discharge end above the sloping surface in said casing, substantially as described.

4. A device of the character described including a vessel provided with a tight cover, means to remove the water from the lower part of said vessel, means to carry off the turpentine from the upper part of such vessel at the turpentine level, a receiving casing fitted through the tight cover and possessed of a large wall area on which the non-condensable vapors may condense and pass to the vessel beneath, said casing having a reduced lower end opening into said vessel, hangers depending from said reduced end, a horizontal baffle plate supported by said hangers at approximately the line of separation between the water and turpentine, a tail pipe entering said casing, a hinged transparent cover for said casing with means to keep same tightly closed, and means on said casing to preserve a definite degree of pressure in said casing and vessel, substantially as described.

In testimony whereof I affix my signature.

ARCHIBALD B. MARSTON.