

W. B. SNOW.

Improvement in Apparatus for Distilling Petroleum.

No. 130,668.

Patented Aug 20, 1872.

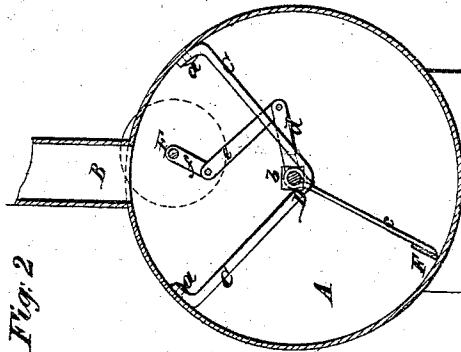


Fig. 2

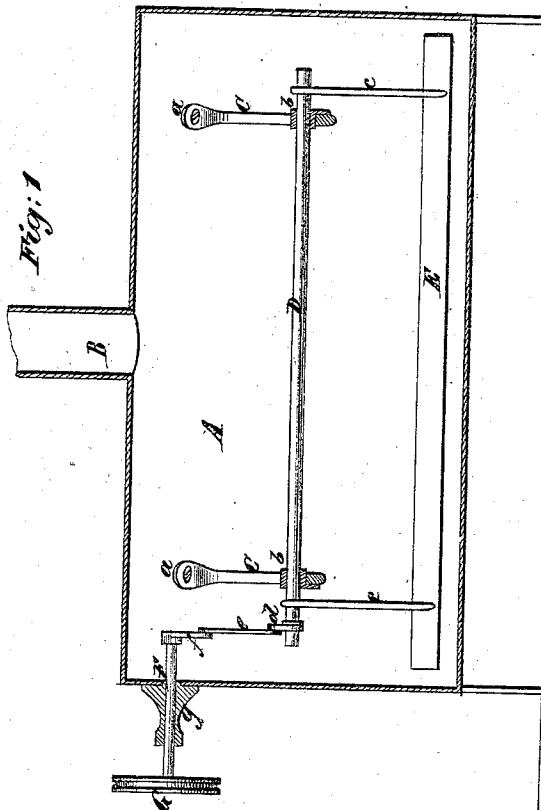


Fig. 1

Witnesses:
Geo. Hays
Geo. Mack

W. B. Snow

UNITED STATES PATENT OFFICE.

WILLIAM B. SNOW, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN APPARATUS FOR DISTILLING PETROLEUM.

Specification forming part of Letters Patent No. **130,668**, dated August 20, 1872.

To all whom it may concern:

Be it known that I, WILLIAM B. SNOW, of Brooklyn, in the county of Kings, and State of New York, have invented certain new and useful Improvements in Apparatus for Distilling Petroleum; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a vertical longitudinal sectional view of an apparatus constructed according to my invention. Fig. 2 is a transverse vertical section of the same.

Similar letters of reference indicate corresponding parts in both the figures.

In the distillation of petroleum oils in the ordinary "still," comprising a sheet-metal tank with a fire underneath, as soon as vapor begins to pass off from the crude material that portion of the latter in contact with the bottom, or most highly heated part of the tank, is burned by the comparatively intense heat, and forms a film of carbonaceous matter upon the surface just mentioned, this being accompanied by the formation of carbonic-acid gas, which passes into and dilutes the vapors generated by the process of distillation, within certain narrow limits. The film or deposit serves a good purpose, inasmuch as a continuous removal, as, for example by scraping, would not only expose a constantly fresh surface of highly-heated metal to the oil, and, of course, cause a still more rapid carbonization and a greatly increased waste, but would also result in a constant powdering of the deposit which, mingling with the crude oil, would be highly detrimental to the complete volatilization of the hydrocarbons. On the other hand, if the deposit be left alone it rapidly accumulates, interfering with the proper working of the still, causing a waste of the oil by the consumption of a portion thereof in the carbonization just specified, diluting the condensible vapors with carbonic acid and deteriorating the quality of the distillate, this latter for the reason that the heavier constituents of petroleum which, from their superior gravity, sink to the bottom of the still, and are the first to be attacked and decomposed by the heated metallic surface, are also those from which oils having the highest fire-test are ob-

tained. To avoid, therefore, these drawbacks, and to provide a means whereby the practical advantages of the film of carbonaceous matter in the heated surface of the shell may be obtained without any material or hurtful increase in such film or deposit, I have recourse to, and my invention consists in, the combination, with the tank or body of a suitable still, of reciprocating blades and dashers, so constructed, arranged and operated as to keep up a constant agitation of the contents of the tank during the distilling process, without any scraping action whatever upon the bottom of such tank, by which means the desired object is effectually obtained. My invention also consists in certain novel combinations of parts whereby the more efficient operation of the just-mentioned feature of my said invention is secured.

To enable others to understand the nature and operation of my invention, I will proceed to describe it with reference to the drawing.

A is the metallic tank or body of the still, of any suitable configuration or construction, furnished with appropriate means for maintaining a fire underneath and provided with an outlet-pipe, B, through which the vapors generated or evolved during the process of distillation pass to the condenser. Within the tank, one near each end thereof, are hangers C, the general form of which is more particularly shown in Fig. 2, and which are bolted firmly to the upper part of the tank, as shown at *a*. These hangers carry the bearings *b* of a rock-shaft, D, wholly within the tank and provided with two radial arms *c*, to the outer end of which is attached the blade or dasher E, which has a position longitudinal with that of the tank. The bearings *b* are so located that the sweep or movement of the dasher is concentric with the bottom of the still, and near, but quite out of contact with the same. The hangers by which the bearings *b* are sustained, being attached, as set forth, to the upper part of the tank, are wholly out of the way of the dasher in its movement, hereinafter more particularly explained, and at the same time allow a more facile adjustment of the bearings and obviate, in a greater degree, any strain upon the tank in the working of the apparatus than if the said bearings *b* were filled upon the ends of the tank. Upon one end of

the rock-shaft D is a crank-arm, *d*, which connects, by a rod, *e*, with a crank, *f*, on the inner end of a driving-shaft, F, which passes through a long bearing, *g*, in the end, but at the upper part thereof of the tank. This driving-shaft has at its outer end a pulley, G, by which a rotatory motion is given thereto. The rotation of the driving-shaft F acting through the crank *f*, rod *e*, and crank-arm *d*, communicate motion to the rock-shaft D, and cause the dasher E to move to and fro with a vibratory or reciprocating motion, just clear of the adjacent surface of the bottom of the tank, and in such manner as to thoroughly agitate the contents of such tank, thereby maintaining a uniform admixture throughout the whole of its lighter and heavier components, and preventing any portion of the whole from remaining in contact with the bottom for a length of time sufficient to become carbonized, or to add in any material degree to the film designedly allowed to accumulate and remain thereon, in the manner and for the purpose herein previously explained—the distillation of the entire quantity of petroleum or crude oil being by this means secured without the excessive waste arising from the carbonization of that portion of the oil allowed to come in contact

with the heated bottom of the tank. It will be noticed that as the rock-shaft and its appurtenances are wholly within the tank they are protected from injury from external causes, at the same time that compactness and symmetry in the form of the apparatus are provided for. The shape, moreover, of the tank, may be varied, the essential principle of my invention being applicable to tanks of other configuration than that herein particularly described.

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

1. The arrangement within the tank of the rock-shaft D, carrying the dasher E, the crank *f*, rod *e*, and crank-arm *d*, of the driving-shaft F, for operation substantially as and for the purpose specified.

2. The arrangement of the hangers C, attached to the upper part of the tank and sustaining the bearings *b* of the rock-shaft D, carrying the dasher E, situated wholly within the tank, substantially as and for the purpose specified.

W. B. SNOW.

Witnesses:

FRED. HAYNES,
R. E. RABEAU.