

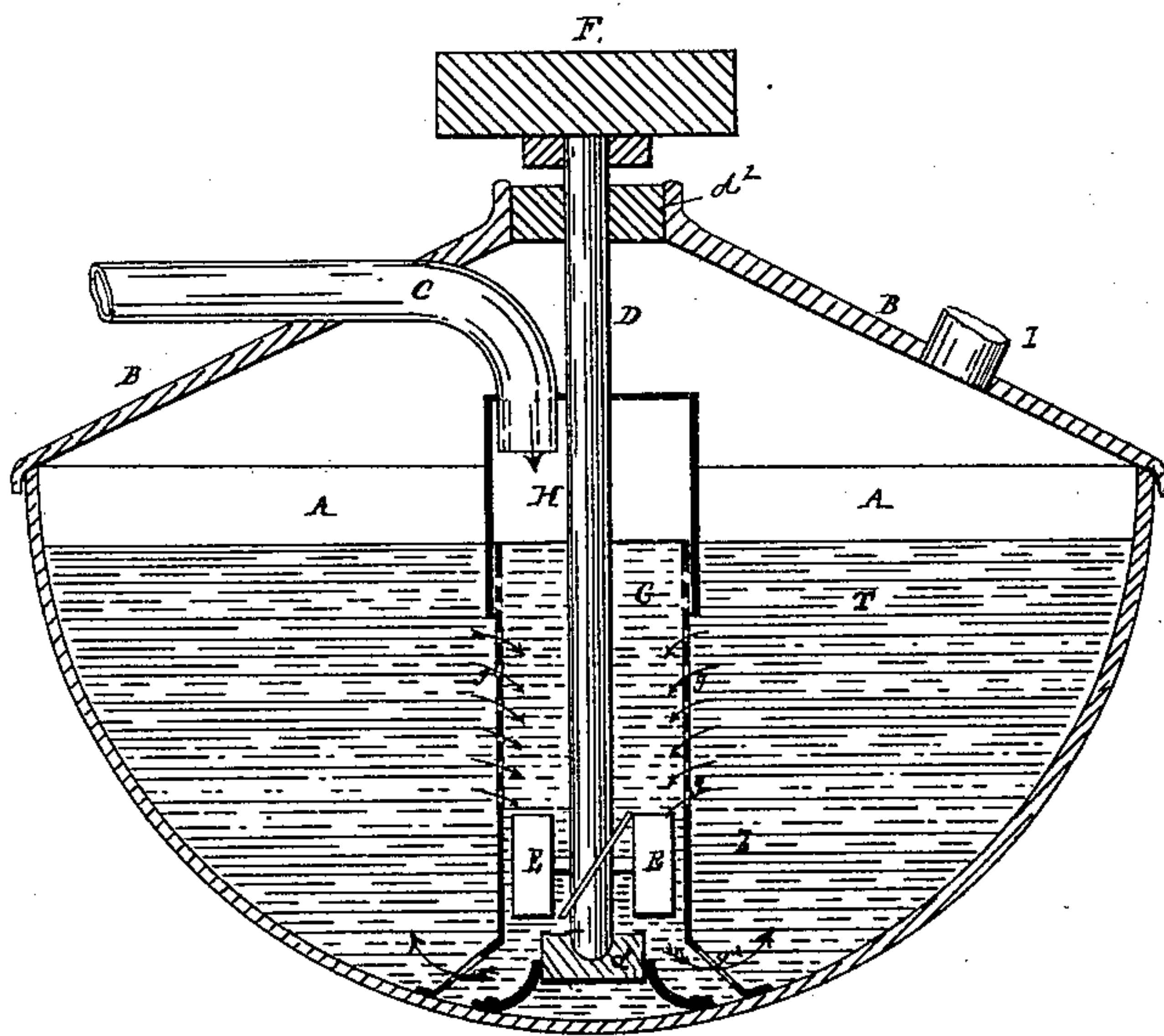
(No Model.)

A. F. ANDREWS.

APPARATUS FOR OXIDIZING OILS AND TAR.

No. 366,991.

Patented July 19, 1887.



WITNESSES:

C. H. Pritchard,
M. E. Nicoll.

INVENTOR

Albert F. Andrews

BY *Wm. G. Butters*
his
ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT F. ANDREWS, OF AVON, CONNECTICUT, ASSIGNOR TO THE CLIMAX FUSE COMPANY, OF SAME PLACE.

APPARATUS FOR OXIDIZING OILS AND TAR.

SPECIFICATION forming part of Letters Patent No. 366,991, dated July 19, 1887.

Application filed February 18, 1887. Serial No. 223,070. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. ANDREWS, a citizen of the United States, residing at Avon, in the county of Hartford and State of Connecticut, have invented an Improved Process of and Apparatus for Concentrating and Oxidizing Tar, Drying Oils, and Similar Liquids or Semi-Liquids, of which the following is a specification.

My invention consists in boiling the tar in a closed kettle, the tar being kept in continual circulation and constantly exposed to a strong current of air blown through it or upon its surface.

To carry out this process I make use of a kettle covered at the top and heated in any convenient manner, either internally or externally. I place a vertical shaft in this kettle, stepped into a support at the bottom and supported by bearings at the top. A pulley is attached at the top of the shaft to rotate it and a series of paddles at the bottom. I inclose this shaft in a vertical inclosure or tube secured to the bottom of the kettle and rising to or slightly above the level of the tar. This tube is provided with large openings at the bottom, and a series of small openings or holes encircle it in tiers to the top. Over this tube I place a second or telescopic tube, open at the bottom, but closed at the top, and carrying a pipe through which a blast of air can be blown.

In the drawing, (which is a vertical section through pipe C,) A is the kettle having a cover, B, which also acts as a support for the rotating vertical shaft G, resting in a step, *d*, at the bottom of the kettle and in the upper bearing, *d*². C is an air-blast pipe; I, an air and gas escape opening. This shaft D carries at its lower end the agitating-paddles E, and is driven by means of a pulley, F, at the top. A tube, *b*, open at the top and pierced with numerous holes, *g*, from the upper level of the paddles to its top, is secured to the bottom of the kettle. Larger openings, *g*², are made at the bottom for the escape of the liquid current drawn in through the holes *g* by the action of the paddles. Over G a tube, H, closed at the top, slides telescopically, carrying with it the air-blast pipe C, which can either slide tel-

escopically or be attached by a flexible connection.

T is the tar or similar liquid to be evaporated. The arrows indicate the direction of the flow of air and liquid.

The paddles are to be set quite near to the bottom of the kettle, and are of any required size. Eight inch blades will handle seven hundred gallons per minute when running at six hundred turns per minute.

The circular case or tube should be of nearly the same diameter as the paddles. This case may extend above the surface of the tar. At its upper end this case should be thickly perforated with holes from a quarter of an inch to one and one-half inch in diameter. A telescopic tube, H, a little larger than the stationary perforated tube, should surround this, so that by moving up and down a larger or smaller number of the holes will be opened, as may be desired.

The operation of this device, which is very simple, is as follows: The shaft is rotated, forcing the tar downward to the heated bottom of the kettle, creating a suction in the perforated case or tube and drawing in the tar through the numerous holes. The air-blast is turned on, and the jets of tar mixed with the air come in contact with the paddles, which comminutes the tar and brings it into intimate mixture with the air in a very fine state of division. The tar, mixed with air, is thrown to the bottom of the kettle, and, receiving additional heat, passes upward along the inside of the kettle to the surface of the tar, where the air and gases escape, and the tar moves to the center again to go through the same process. The operation is continuous and rapid, more so than any that I am acquainted with.

The entire contents of the kettle can every minute be mixed with a fresh volume of air. The telescopic tubes can be adjusted according to the amount of tar, and the blast of air can be increased or diminished, as may be desired.

While this device and process are primarily designed for the evaporation and condensation of tar, it may also be used to oxidize linseed-oil, or for the evaporation of sugar-sirups,

either in the vacuum-pan or outside and independent of it, in the latter case the air-blast being heated to from 120° to 150° Fahrenheit.

In any case where rapid evaporation is desirable it is preferable to use a hot-air blast.

The paddles may be of any number and of any shape, plane or curved.

While the use of the cover to the kettle is important, it may be omitted when the liquid does not spatter too much.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An improved apparatus for concentrating tar and other liquids or sirups, consisting of the combination of a covered heating-vessel with a perforated inner inclosure placed in said vessel and provided with an adjustable

telescopic cover, a rotating shaft and suitable paddles or propeller-blades, and an air-blast pipe connecting with the inner inclosure, all constructed and arranged substantially as specified.

2. An apparatus for concentrating tar, oils, and other liquids, consisting of the combination of the outer vessel, A, the cover B, air-inlet pipe C, air-exit pipe I, inner perforated inclosure, G, telescopic cover H, shaft D, and paddles or propeller-blades E, all constructed and arranged substantially as specified.

In witness whereof I have hereunto set my hand this 12th day of February, 1887.

ALBERT F. ANDREWS.

Witnesses:

W. B. CURTISS,

GEO. A. SAUNDERS.