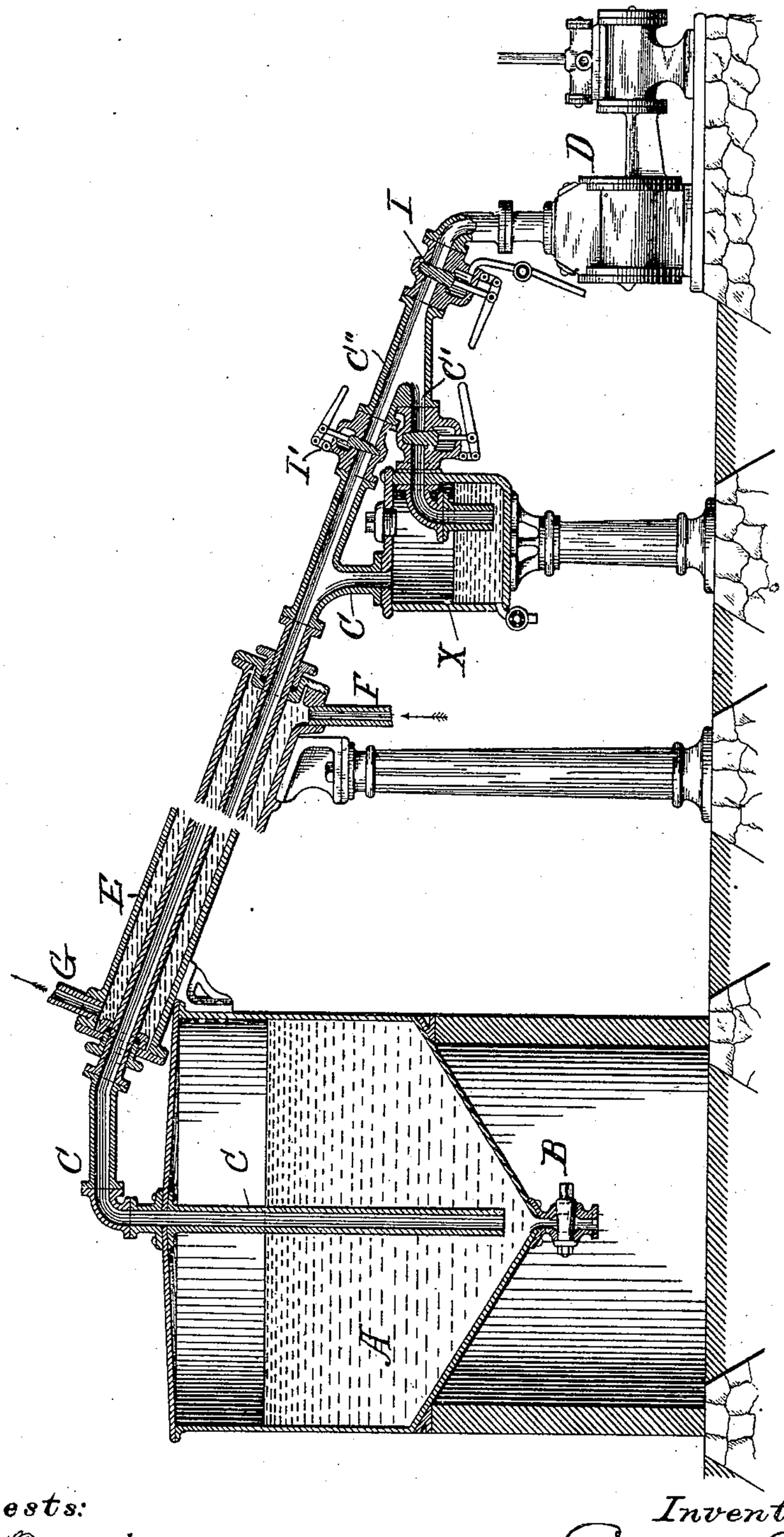
(No Model.)

G. H. PERKINS.

Apparatus for Cooling and Drying the Air Blast Employed in the Process of Cooling and Refining Oil.

No. 240,923. **Patented May 3, 1881.**



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UNITED STATES PATENT OFFICE.

GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE ATLANTIC REFINING COMPANY, OF SAME PLACE.

APPARATUS FOR COOLING AND DRYING THE AIR-BLAST EMPLOYED IN THE PROCESS OF COOLING AND REFINING OIL.

SPECIFICATION forming part of Letters Patent No. 240,923, dated May 3, 1881.

Application filed November 4, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. PERKINS, of the city of Philadelphia, in the State of Pennsylvania, have invented an Improvement in Apparatus for Cooling and Drying the Air-Blast employed in the Processes of Cooling and Refining Oil.

The object of my invention is the agitation of oils in such manner and by such means that the temperature of the mass of oil during agitation is kept at so low a point as to facilitate the separation of tar and other impurities therefrom.

Heretofore the process of agitating oil for purifying purposes has consisted, essentially, of the following steps—viz., warm distillate or oil from the still is mixed with cold water in an agitator. The mixed mass is agitated by means of a blast of air forced through it. The water is then drawn off from the bottom of the agitator and the cooled oil is dried or freed from moisture, as well as from tar, by the addition of sulphuric acid and by agitation together therewith, by means of a blast of air forced into and through the mixture in the agitator. By the above treatment the water and tar have been caused to separate from the oil and to fall to the bottom of the agitator, at which point they are drawn off. In the above operation, however, the temperature of the oil is gradually raised by reason of the increase of temperature of the air-blast, due to the force and velocity with which it is forced into the agitator, and by reason of the action of the sulphuric acid upon the water or moisture in said air-blast, with the result that the separation of tar from the oil is rendered more slow and incomplete as the temperature of said mass increases.

My invention consists in providing an apparatus for cooling and drying the air-blast employed in connection with oil-agitators.

The drawing is a vertical longitudinal central view, partly in section and partly in elevation, of my improved apparatus.

A is an agitator, in the present instance shown with conical top and bottom, and provided at its bottom with an outlet and cock B.

D is a blower or blast engine of any convenient construction, upward from which extends a blast-pipe, C′, which leads into and discharges its blast near the bottom of a tightly-covered acid-proof tank, X, and beneath the surface of sulphuric acid with which the tank is partly filled.

From the top of the tank X an air-blast pipe, C, extends to and through the top of the agitator A, and downward to within a short distance of the bottom of the same.

C″ is a connecting-pipe between the pipe C′ and the pipe C, provided with a valve I′, the office of which pipe C″ is to allow of a direct communication between the blower D and the pipe C, when it is desired that the blast shall not pass through the acid in the tank X, but pass directly from the blower to the agitator.

E is a water-jacket, surrounding the blast-pipe C, provided at its lower end with a water-inlet, F, and at its upper end with a water-outlet, G, and arranged in such manner as to be constantly fed with a supply of cold water, by means of which the air in its passage through the pipe C is cooled, and the moisture in said blast, which has not already been absorbed by the acid in the tank, is condensed.

I is an air-valve, to regulate the blast.

In operation the air-blast is forced by the blower into and through the acid in the tank X, by which the air is deprived, to a large extent, of its moisture. In the subsequent passage of the blast through the pipe C it is cooled and deprived of any moisture which may have escaped absorption by the acid in the tank X.

The agitator A, blower D, blast-pipe C C″, and water-jacket E, hereinbefore referred to, are shown and described in an application for Letters Patent by William G. Warden, of even date herewith, and to these devices I lay no claim.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

An apparatus for cooling and purifying oil, which consists in a vessel or agitator for containing oil, an air-blower, an air-blast pipe extending from said blower into a bath of sul-

phuric acid contained in an air-tight tank, an air-blast pipe extending from the top of said acid-tank to a point within said agitator in proximity to the bottom thereof, and a water-jacket surrounding said last-named blast pipe and adapted to contain cold water, all substantially as set forth.

In testimony whereof I have hereunto signed my name this 15th day of October, A. D. 1880.

GEORGE H. PERKINS.

In presence of—

W. C. STRAWBRIDGE,

J. BONSALL TAYLOR.