(No Model.) 2 Sheets—Sheet 1.

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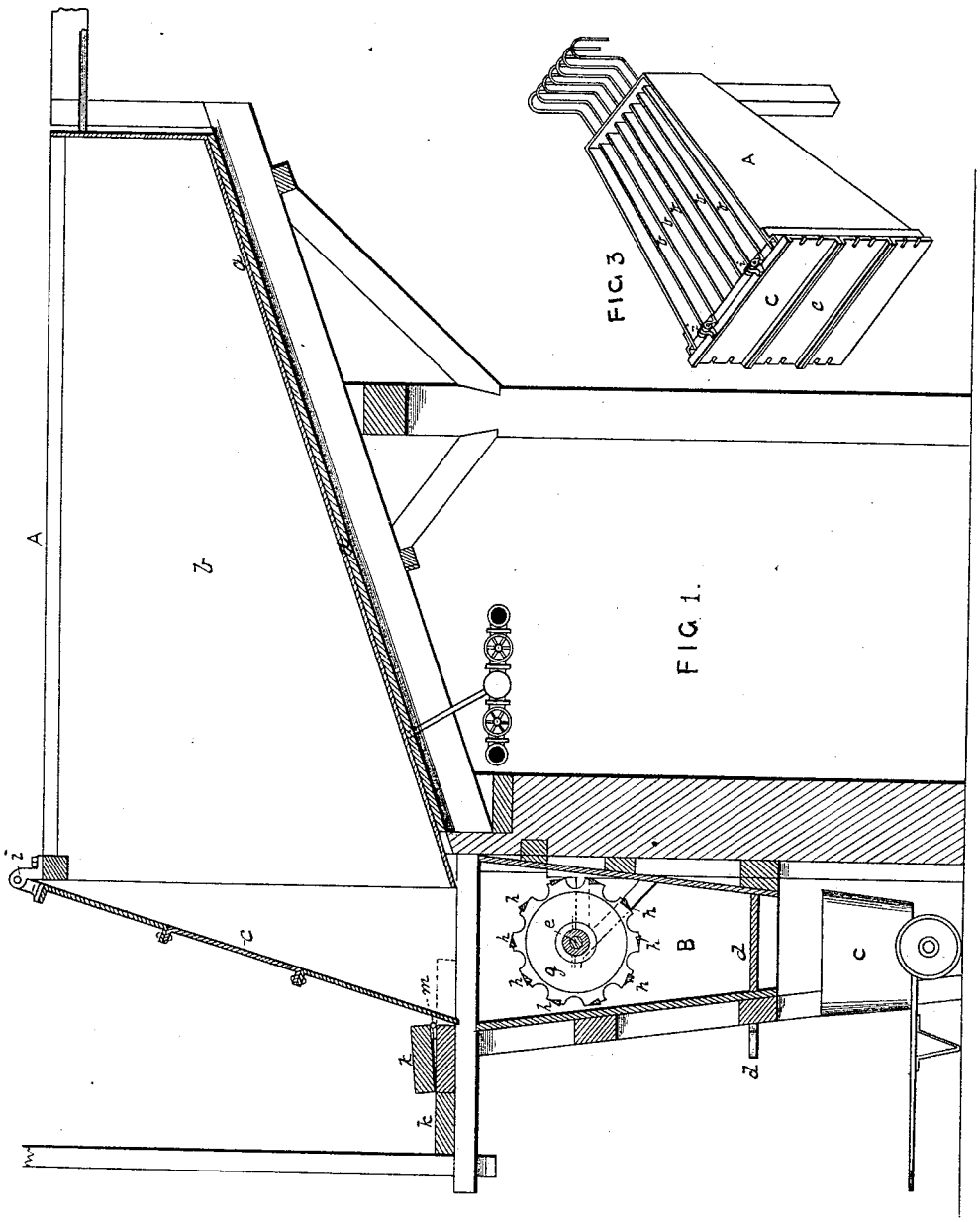
APPARATUS FOR CUTTING UP PARAFFINE DISTILLATE.

No. 346,447. Patented July 27, 1886.



WITNESSES.

J. A. Burns

H. L. Gill

INVENTOR,

Clarence Vose

by Bakewell & Kerr

ATTORNEYS.

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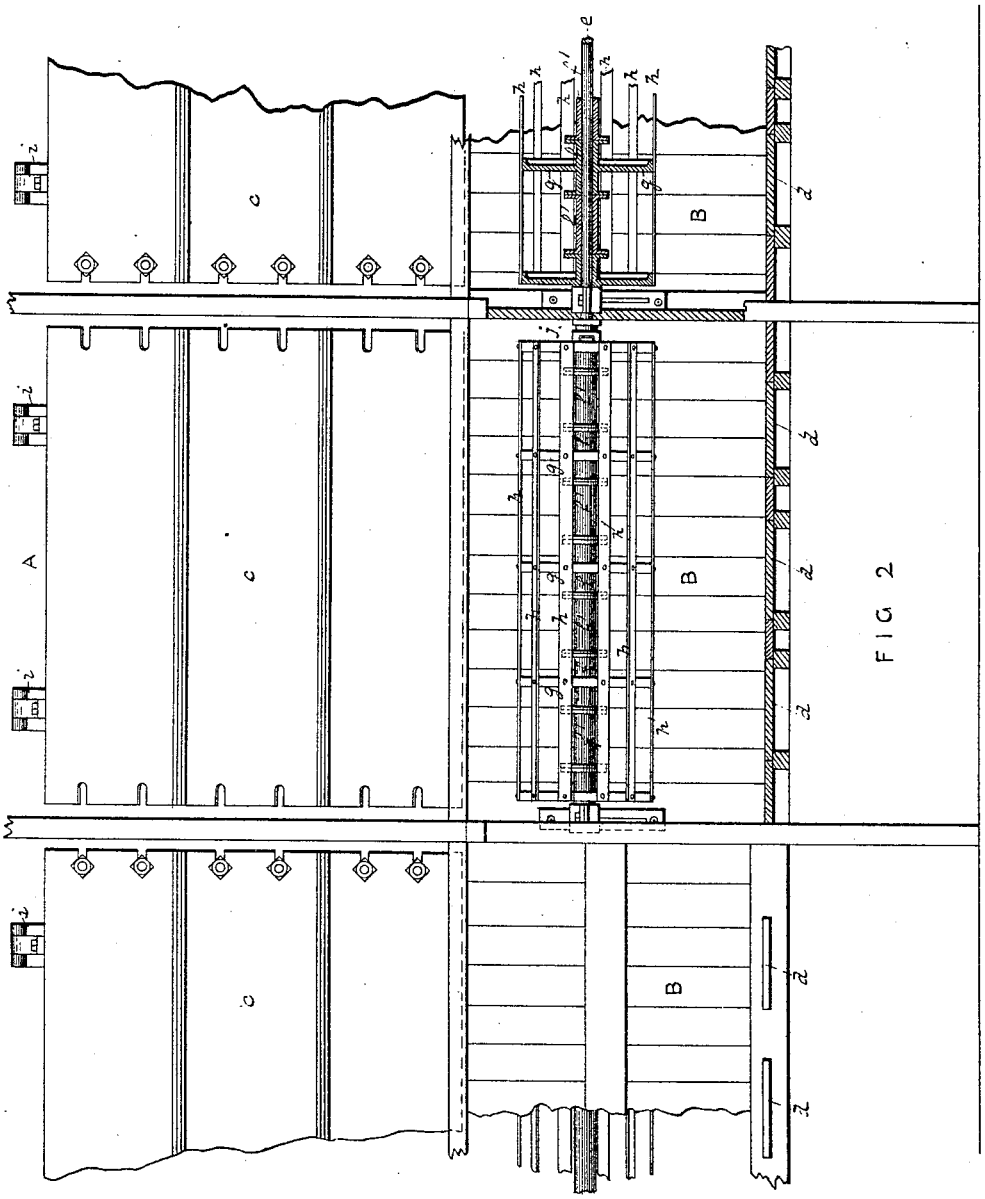

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UNITED STATES PATENT OFFICE.

CLARENCE VOSE, OF BROOKLYN, ASSIGNOR TO THE PRATT MANUFACTURING COMPANY, OF NEW YORK, N. Y.

APPARATUS FOR CUTTING UP PARAFFINE DISTILLATE.

SPECIFICATION forming part of Letters Patent No. 346,447, dated July 27, 1886.

Application filed December 14, 1885. Serial No. 185,668. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE VOSE, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Apparatus for Cutting up Paraffine Distillate; and I do hereby declare the following to be a full, clear, and exact description thereof.

Paraffine, which exists in petroleum in an amorphous condition, becomes separable from the lighter and liquid hydrocarbons by the process of distillation; and, in order to effect the removal of the solid particles of paraffine from the liquid products of distillation, the practice is to subject the heavy petroleum distillate to a sufficient degree of cold to harden the entire mass, when, by subjecting the frozen distillate inclosed in canvas bags to the action of a hydraulic press, the petroleum is separated from the paraffine, which is forced by the pressure into a solid cake. In this condition, however, the paraffine is impure and needs to be subjected to further treatment to produce the paraffine of commerce.

My present invention has reference to apparatus for treatment of the petroleum distillate after it has been hardened by cold, and before it is subjected to pressure, to separate the liquid distillate from the paraffine.

The process which I employ for obtaining paraffine from paraffine distillate, and which I have more particularly described in another specification filed contemporaneously herewith, is briefly as follows: The distillate, as it comes from the stills and while in a heated condition, is run into a box or vessel, the bottom of which inclines downward toward the front end of the box, which is furnished with a vertical removable door, preferably hinged to the top of the box. This box is divided by vertical partitions into a series of narrow compartments of the same height as the box, or thereabout, and placed nearer together at the rear or shallow end of the box than at the front end. These partitions are hollow, and each is connected with a pipe at the bottom and an outlet-pipe at the top, whereby a refrigerating liquid or fluid is passed through the partitions without entering the compartments of the box. A series of such boxes may be used, their construction and the mode of operating them being shown and described in Letters Patent, No. 316,400, granted to Henry H. Rogers and myself on the 21st day of April, 1885. The refrigerating-liquid used for congealing the paraffine distillate in these boxes may be fresh water cooled to about 52° Fahrenheit, or saline water cooled to a much lower temperature—say 10° below zero Fahrenheit, depending upon the stage of the operation at which they are used. The distillate, as it comes from the stills, and containing usually about eighteen per cent. of paraffine, is first chilled to about 26° Fahrenheit. This must be done gradually, as a too rapid cooling impairs the crystallization. In order to effect this gradual cooling, cold water may be first run through the partitions of the freezing-boxes, afterward saline water or brine cooled to between 10° and 45° Fahrenheit, and finally brine cooled to from —10° to +20° Fahrenheit. By this means the distillate is rendered quite hard and solid. The front of the cooling-box is then opened or removed and the frozen distillate is started, with a bar or other tool, toward the front in the several compartments, after which it slides down and out by its own gravity, and is cut off in slices as it emerges from the cooling-box by a slicing-bar and falls into the trough or hopper of a cutting apparatus, by which it is cut up into small pieces and falls into a box or barrow, by which it is conveyed to the presses, where it is placed in bags and subjected to severe pressure to remove as much as possible of the separable oily portion of the distillate; but the paraffine-wax which remains in the bags after the first freezing and pressure still retains too much oil. It is therefore melted and returned to the distillate-freezing boxes, where it is subjected to a treatment with water at about 52° Fahrenheit, by which it is chilled to about 65° Fahrenheit. It is then removed from the freezing-boxes in the manner before described, again cut into pieces by the cutting apparatus, and again subjected to pressure to remove the remaining oil.

My present invention consists in apparatus for cutting up the frozen masses of paraffine distillate, and combining the same with the

freezing-chambers, so as to facilitate and save time in conducting the operation.

In the accompanying drawings, Figure 1 is a sectional side view of one of a series of cutting-boxes in connection with a freezing-chamber. Fig. 2 is a front elevation of freezing-chambers and cutting-boxes, shown partly in section. Fig. 3 is a perspective view of one of the freezing-boxes on a smaller scale.

In the drawings, like letters of reference denote similar parts.

In the drawings, A represents one of the freezing-boxes before referred to, having an inclined bottom, *a*, and furnished with partitions *b b*, forming compartments which taper in width toward their rear end. In front of the freezing-box is a door, *c*, hinged at *i* to the top of the box, so as to be opened, as shown in Fig. 1, by loosening the bolts which secure it when closed to the sides of the box. Immediately in front of the freezing-box A is placed the cutting-box B, the top of the cutting-box being on a level with or a little below the bottom of the freezing-box, and the length of the cutting-box being preferably somewhat greater than the width of the freezing box, as shown in Fig. 2.

The cutting-box B may be made of wood or other material, and of any convenient dimensions in height and width, depending on the capacity of the freezing-box connected therewith. In the bottom of the cutting-box are slides *d*, which may be closed or opened at pleasure, and are placed a sufficient height above the floor of the factory to permit of a wheeled truck or other vessel, C, being run under the cutting-box to receive the frozen distillate after it has been cut into small pieces. A horizontal shaft, *e*, extends lengthwise through the interior of the cutting-box B, which is rotated by a steam-engine or other motor. On this shaft are placed a series of short cast-iron sleeves, *f*, which are flanged at their ends, and fastened together by bolts passed through the flanges. Attached to these cast-iron sleeves (or preferably cast in one piece with them) are circular iron disks *g*, of about two feet diameter, (more or less,) which serve to carry the knives or cutters *h*. These disks *g* may be about two feet apart, and if the sleeves are shorter than that length each alternate sleeve *f'* may be made without a disk, *g*, as shown in Fig. 2. The cutters are strips of wrought-iron or steel of about two inches in width, and tapering from about three eighths of an inch at the back to an edge at the front. The edges, however, do not need to be sharp. If the disks are about two feet in diameter, ten such cutters will suffice; but the number of cutters is not very important. The cutters extend lengthwise of the cutting-box to within a short distance of each end, and are screwed or otherwise removably attached to the peripheries of the disks *g*.

Where a number of freezing-boxes are used, as will generally be the case in all large factories, they are preferably placed side by side, but not touching. In this case a corresponding series of cutting-boxes are used—one for each freezing-box—the cutting-boxes being closed at each end, and a single shaft, *e*, may extend throughout the entire length of the series of cutting-boxes. In this case a clutch, *j*, is keyed to the shaft between each pair of cutting-boxes, with a sliding crab connected with the end of the outermost sleeve, *f*, of each cutting-box, so that any of the cutters of the series may be started in motion when the freezing-box connected therewith is being emptied of its contents.

The floor of the platform *k* above the cutting-boxes and on a level with the bottom of the freezing-boxes is hinged at *m*, a point above the edge of the cutting-box farthest from the front end of the freezing-box, as shown in Fig. 1, so that that portion of the floor of the platform which is immediately over the top of the cutting-boxes may be conveniently removed to permit of the free discharge of the frozen distillate from the freezing-boxes into the cutting-boxes, the hinged door of the freezing-boxes serving as a guide to the mass of distillate in its descent to the cutting-boxes.

The utility and operation of this apparatus is obvious, as it saves time in preparing the frozen distillate for the presses, and prevents to a great degree the absorption of heat, and consequent softening of the frozen mass before it is removed to the hydraulic press, and greatly simplifies the operation.

Having thus described my improvement, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a freezing-chamber for paraffine distillate having an inclined bottom to facilitate the discharge of the frozen mass, of a hopper or box having a revolving cutter, substantially as described.

2. The paraffine-distillate cutter consisting of a box adapted to receive the frozen distillate as it passes from the freezing-chamber, and a revolving wheel furnished with a series of longitudinal knives and placed within the cutting-box, substantially as described.

3. The combination of a freezing-chamber having inclined bottom, and a door in front hinged at top, with a box or hopper having a rotary cutter and placed in front of and below the freezing-chamber, so that the front or door of the freezing-chamber shall serve as a guide to the frozen distillate as it enters the cutting-box, substantially as described.

In testimony whereof I have hereunto set my hand this 5th day of November, A. D. 1885.

CLARENCE VOSE.

Witnesses:
WM. G. WING,
CHAS. W. SMITH.