

(No Model.)

T. D. FAIRFIELD.

PROCESS OF AND APPARATUS FOR CHILLING PARAFFINE OILS, &c.

No. 290,016.

Patented Dec. 11, 1883.

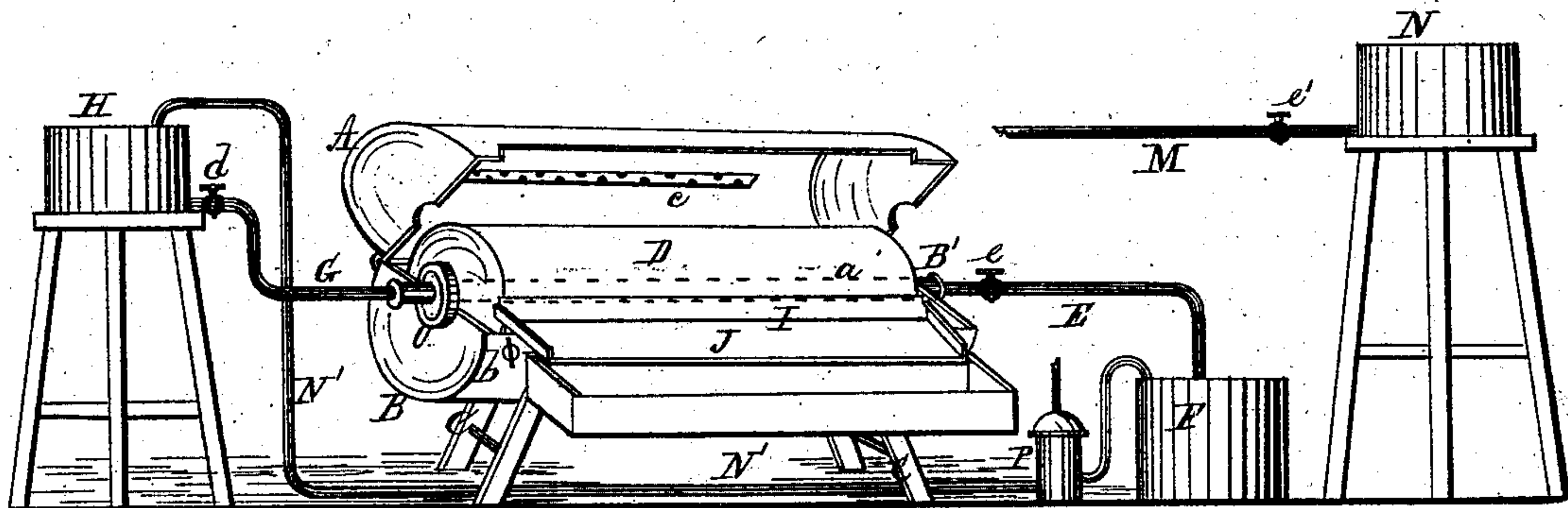


Fig. 1.



Fig. 4.

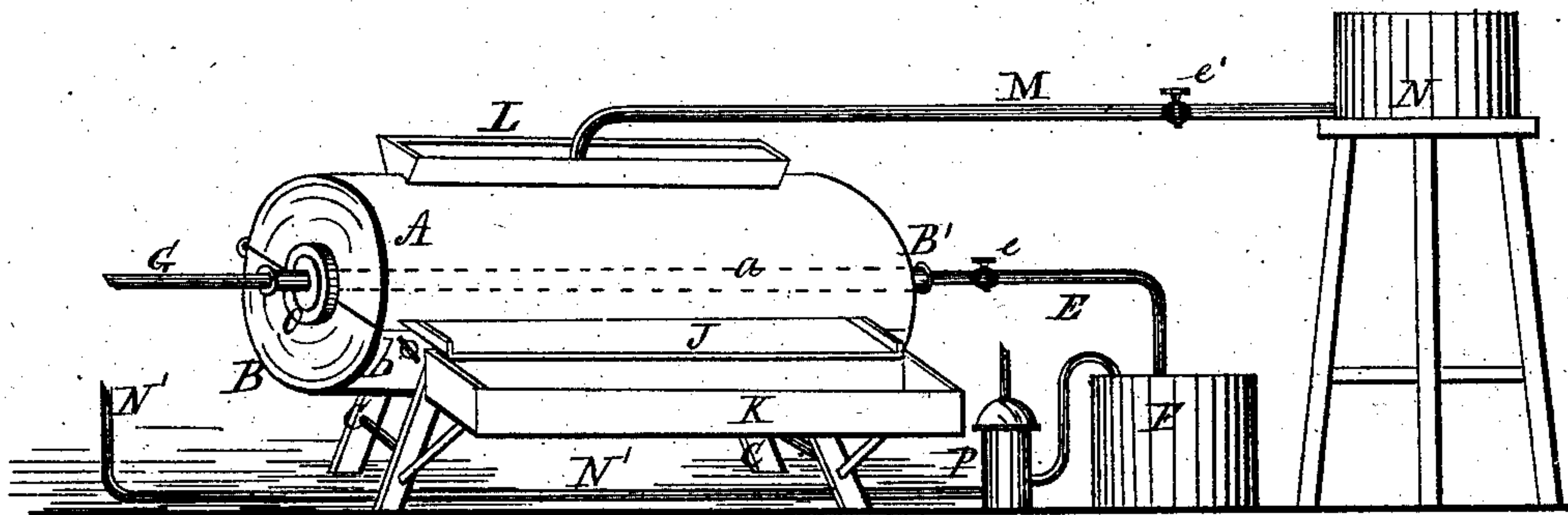


Fig. 2.

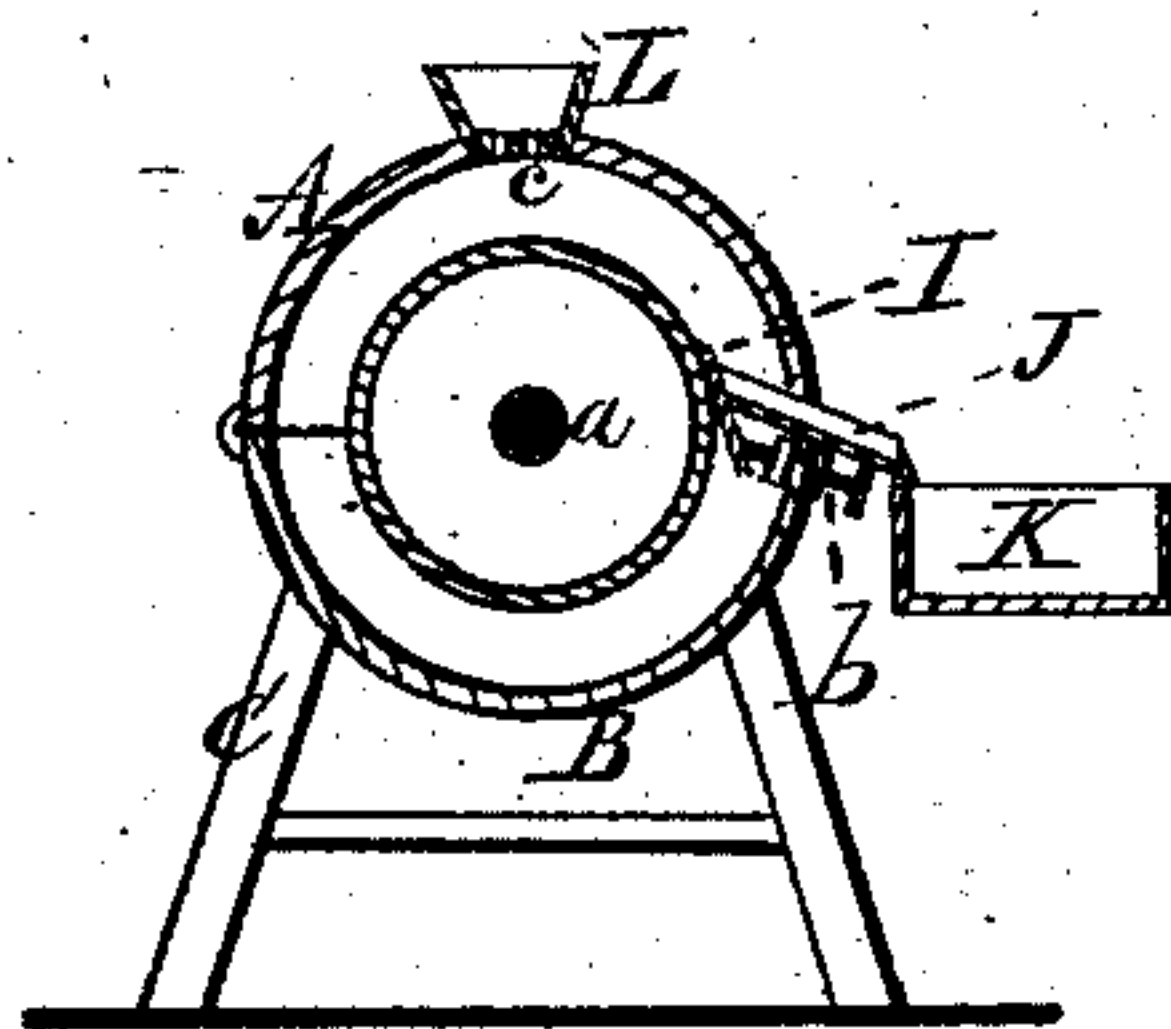


Fig. 3.

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UNITED STATES PATENT OFFICE.

THOMAS D. FAIRFIELD, OF CLEVELAND, OHIO.

PROCESS OF AND APPARATUS FOR CHILLING PARAFFINE-OILS, &c.

SPECIFICATION forming part of Letters Patent No. 290,016, dated December 11, 1883.

Application filed November 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS D. FAIRFIELD, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Process of and Apparatus for Chilling Paraffine-Oils, &c.; and I do hereby declare that the following is a full, clear, and complete description thereof.

In the process of extracting paraffine from petroleum and other paraffine-oils, said oils are first chilled or frozen before being subjected to the press for extracting therefrom the crude paraffine, for the above-specified chilling or freezing of the paraffine-oils is the special purpose of the apparatus above alluded to, the construction of which is substantially as follows, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective side view of the apparatus, showing the upper part of the inclosing shell or case open, that the inside thereof may be seen. Fig. 2 is a perspective view of the same, with the inclosing case or shell closed. Fig. 3 is a transverse sectional view.

Like letters of reference refer to like parts in the several views.

The body of the aforesaid apparatus consists of a cylindrical shell or case divided longitudinally into two sections, A and B. Section B—the lower part of the case—is supported upon legs C, or on other suitable supports.

D is a hollow cylinder, through which passes a hollow shaft, (indicated by the dotted lines *a*.) Fig. 4 represents a detached portion of said shaft. The ends of the shaft projecting, respectively, through the ends of the cylinder serve as tubular journals on which the cylinder revolves, and which have their bearings in the ends of section B of the case.

To the end of said hollow shaft, or the tubular journal B' thereof, is connected a pipe, E, by means of a rotative sleeve-coupling similar to such as are in ordinary use for connecting revolving tubular shaftings and pipes; hence a description of the coupling is not essential, as the same is well known in the arts. The pipe E alluded to extends from the cylinder to a receptacle, F, in which it terminates, the use of which will presently be shown.

To the opposite end of the hollow shaft, or the tubular journal thereof, is in like manner connected a pipe, G, extending therefrom to a tank, H, elevated above the cylinder, as seen in the drawings.

Longitudinally along the side of said cylinder D is arranged an adjustable scraper or knife, I, which, by means of adjusting-screws *b*—one at each end of the scraper—the scraper may be adjusted in tactile relation to the face of the cylinder, or at a distance therefrom, as may be required. One of the above-mentioned adjusting-screws, in its connection with the scraper, is shown in Fig. 3. The purpose of said scraper will presently be shown.

From the lower edge of the scraper, and lengthwise therewith, extends to the trough or box K an inclined chute, J, for conducting therefrom to the box the material scraped off from the surface of the cylinder.

Along the top of section A of the shell or case inclosing the cylinder D is a hopper or funnel, L, communicating with the interior of the case by perforations in the bottom thereof, as seen at *c* in Fig. 1. In said funnel terminates one end of a pipe, M. The opposite end of the pipe extends to and communicates with the interior of an oil-tank, N, located above the case, that the contents of the tank may flow therefrom into the funnel.

As hereinbefore said, the above-described apparatus is for chilling or freezing paraffine-oils preparatory for the press for extracting therefrom crude paraffine, the chilling being a step in the process of producing paraffine from paraffine-oils. To this end the cylinder D is charged with a refrigerant fluid, which may consist of brine or other suitable liquid refrigerating agent contained in the tank or vessel H, which flows therefrom through the pipe G into the tubular shaft *a* of the refrigerating-cylinder D, and is discharged into the cylinder through the perforations in the hollow shaft, whereby the cylinder is reduced to a low degree of temperature. The oil to be chilled is conducted by the pipe M from the oil-tank N to the funnel L, from which it falls through its foraminous bottom upon the surface of the refrigerating-cylinder inclosed in the case now closed, as seen in Fig. 2. As the oil is continued to be (preferably) sprayed upon the refrigerating-cylinder, the cylinder is revolved

by a belt applied to the drum or pulley O, or by other equivalent means. As the oil chills upon the surface of the revolving refrigerating-cylinder and accumulates thereon, it is
 5 scraped off from time to time by the scraper, which may be forced inward by the adjusting-screws *b* more or less, as required; or the scraper may remain stationary and the frozen material scraped off continuously as fast as it
 10 gathers on the surface of the cylinder. The material thus scraped off falls into the chute J, and is conducted thereby into the box K, from which it is taken and prepared for the press. The refrigerant fluid passing into the
 15 cylinder flows therefrom through the eduction-pipe E into the vessel F, from which it is returned through the pipe N' to the tank H by a force-pump, P, (which may be such as are in ordinary use and well known in the
 20 arts,) and again used for cooling the revolving cylinder by being conducted therein, as above described. By this means is established a circulation of a refrigerant fluid through the revolving refrigerating-cylinder, keeping it in a
 25 low degree of temperature and unexposed to the outside air by being covered by the case in which it revolves, so that chilling or freezing the paraffinized oil is quickly and effectually done, and removed therefrom with facility, as above described.

I do not confine myself to the use of an aqueous fluid for chilling the cylinder, as cold air or ammoniacal gas may be employed for that purpose substantially in the same way. The
 35 induction into the cylinder and its eduction therefrom of the refrigerant fluid are regulated by the cocks *d* and *e*, and the supply of oil from the tank N is regulated by the cock *e'*. Should the oil congeal upon the face of the cylinder
 40 sufficiently fast, the scraper may be allowed to remain adjusted thereto, so as to continually scrape off the frozen mass, or adjusted from time to time for that purpose, as above said. If the petroleum-oil or other paraffine-oil contained in the tank N be too heavy or thick to
 45 flow readily therefrom to the refrigerating-cylinder, an ordinary force-pump may be employed to impel it therein, which may be attached to the pipe M, or elsewhere, for that
 50 purpose.

The refrigerating-cylinder may revolve on tubular journals or trunnions, which may extend into the cylinder for discharging the refrigerant therein, instead of a hollow perforated shaft passing through it, and the ends of
 55 the shaft serving as journals for the cylinder.

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

1. In an apparatus for freezing or chilling paraffine-oils, a hollow revolving refrigerating-cylinder provided with tubular trunnions on which to revolve, or a hollow perforated shaft, the ends of which form journals for the cylinder, and through one end of which shaft the cylinder is charged with a refrigerant fluid by
 60 being connected to an induction-pipe leading from a vessel containing said refrigerant fluid, and the opposite end of the shaft connected to an eduction-pipe, in combination with an inclosing shell or case, substantially as herein described, and for the purpose set forth.

2. Arranged in relation to and in combination with the revolving refrigerating-cylinder, an adjustable scraper, chute, and receiving-box, substantially as described, and for the
 75 purpose specified.

3. In combination with the case and revolving refrigerating-cylinder, an induction oil-pipe extending from the oil-tank to the inclosing-case and terminating in the foraminous
 80 bottom funnel communicating with the interior of the case, for discharging upon the refrigerating-cylinder revolving in said case the paraffine-oil for being chilled, substantially as herein set forth.

4. An apparatus for chilling or freezing paraffine-oils, consisting of a hollow revolving cylinder provided with tubular trunnion or a hollow perforated shaft on which to revolve, and by which the cylinder is charged with a refrigerant fluid, and discharged thereof by being
 90 connected to induction and eduction pipes, adjustable scraper, chute, and inclosing shell or case, provided with a foraminous bottom funnel through which to discharge upon the refrigerating-cylinder the paraffine-oil to be chilled, substantially as herein set forth.

5. In the process of chilling or freezing paraffine-oils, depositing the said oils upon a hollow revolving refrigerating-cylinder charged
 100 with a refrigerant agent and removing the chilled mass from the surface of the cylinder by a scraper, from which it is taken for further treatment for separating the paraffine from the oil, substantially as herein set forth.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS D. FAIRFIELD.

Witnesses:

J. H. BURRIDGE,
 C. H. TURNEY.