

(No Model.)

3 Sheets—Sheet 1.

G. COWING.

PROCESS OF AND APPARATUS FOR CHILLING PARAFFINE OILS.
No. 308,593.

Patented Dec. 2, 1884.

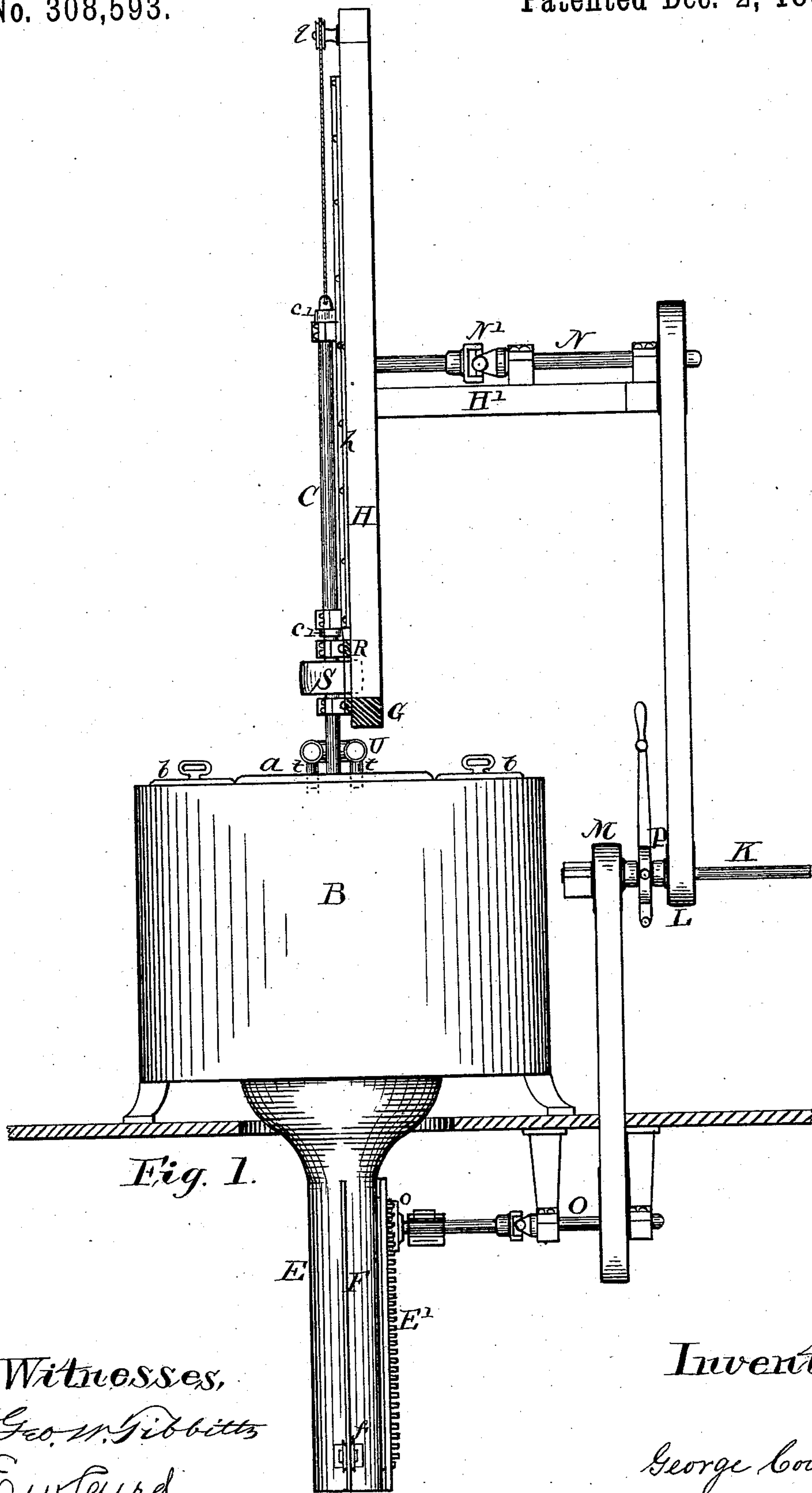


Fig. 1.

Witnesses,
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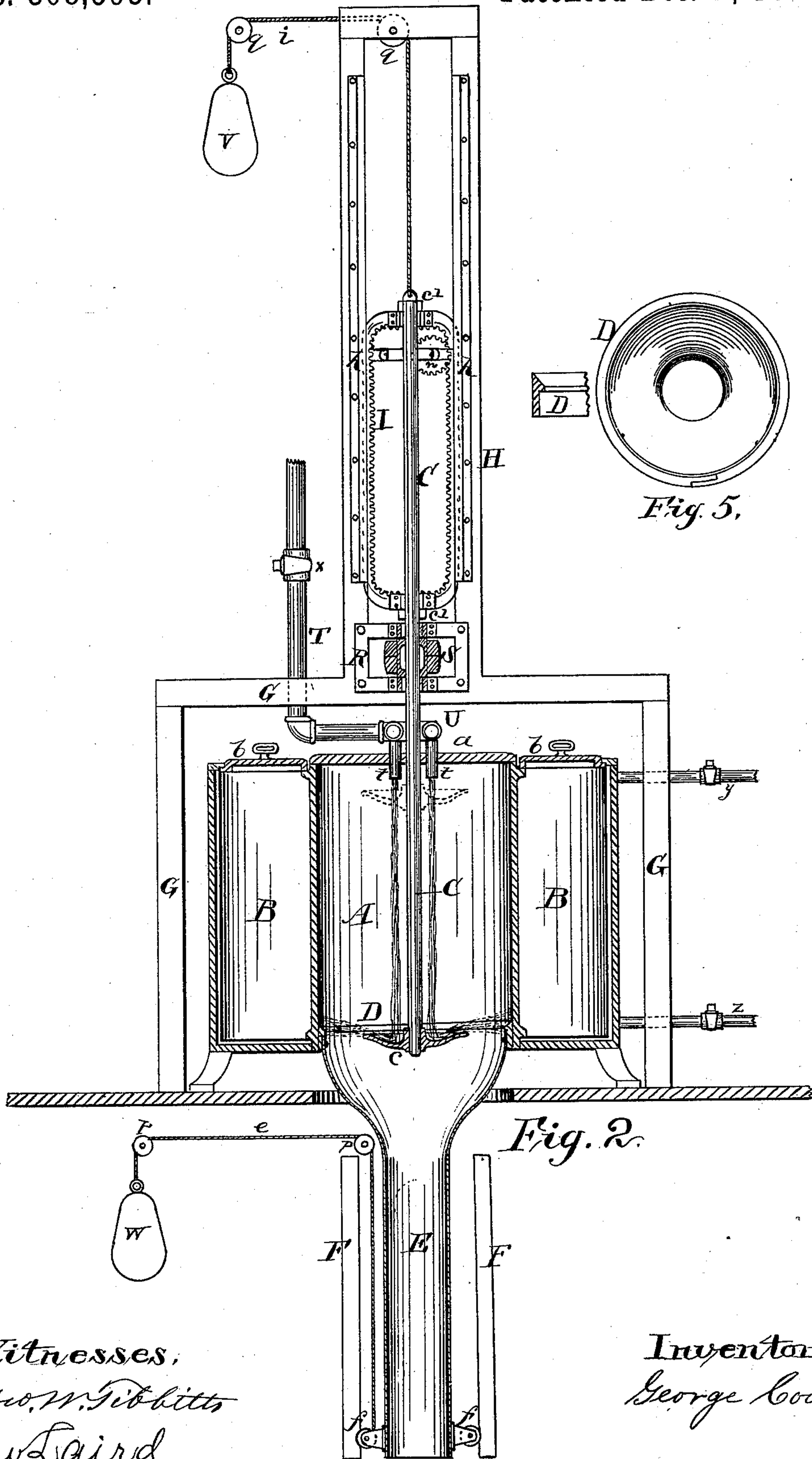
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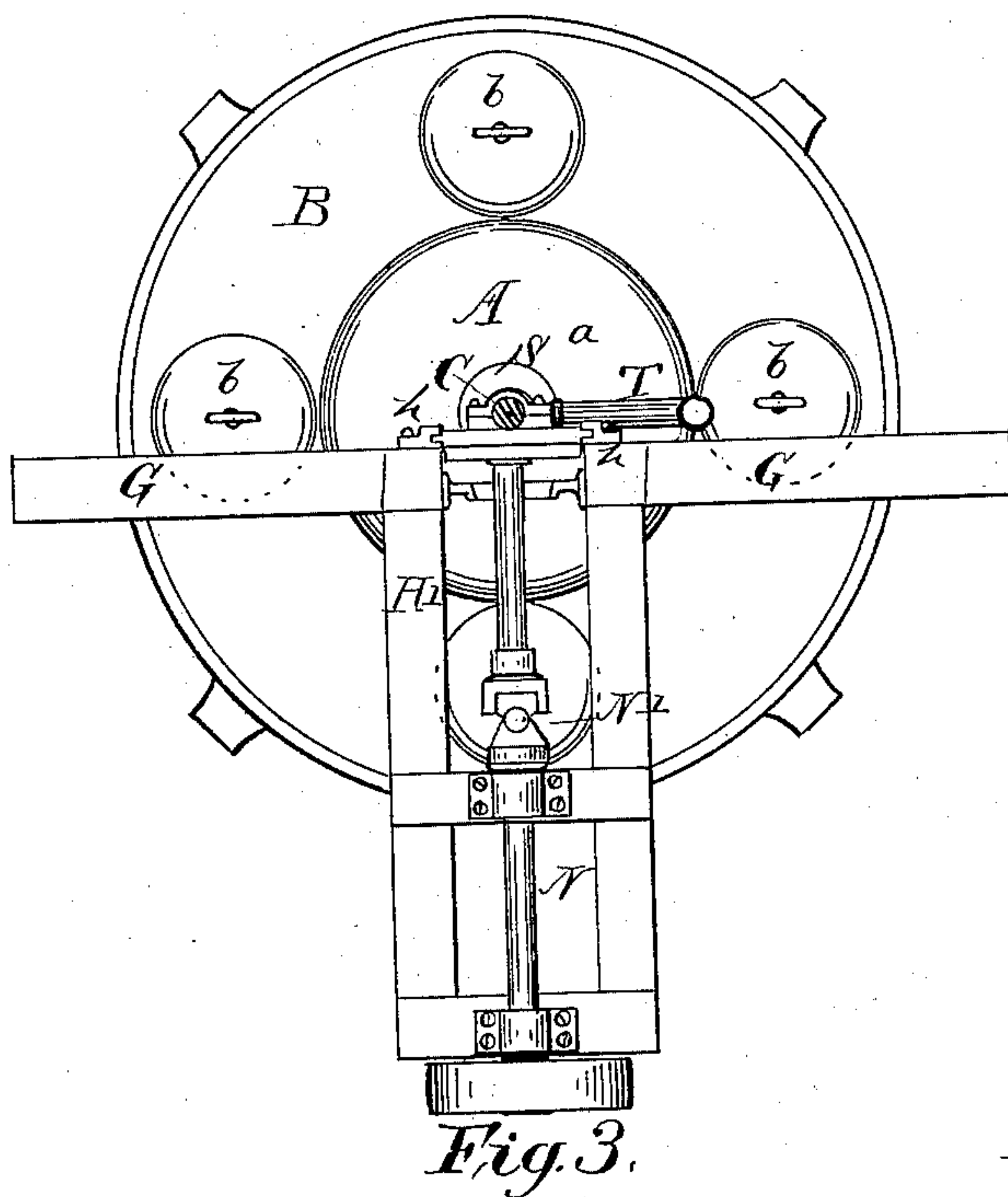
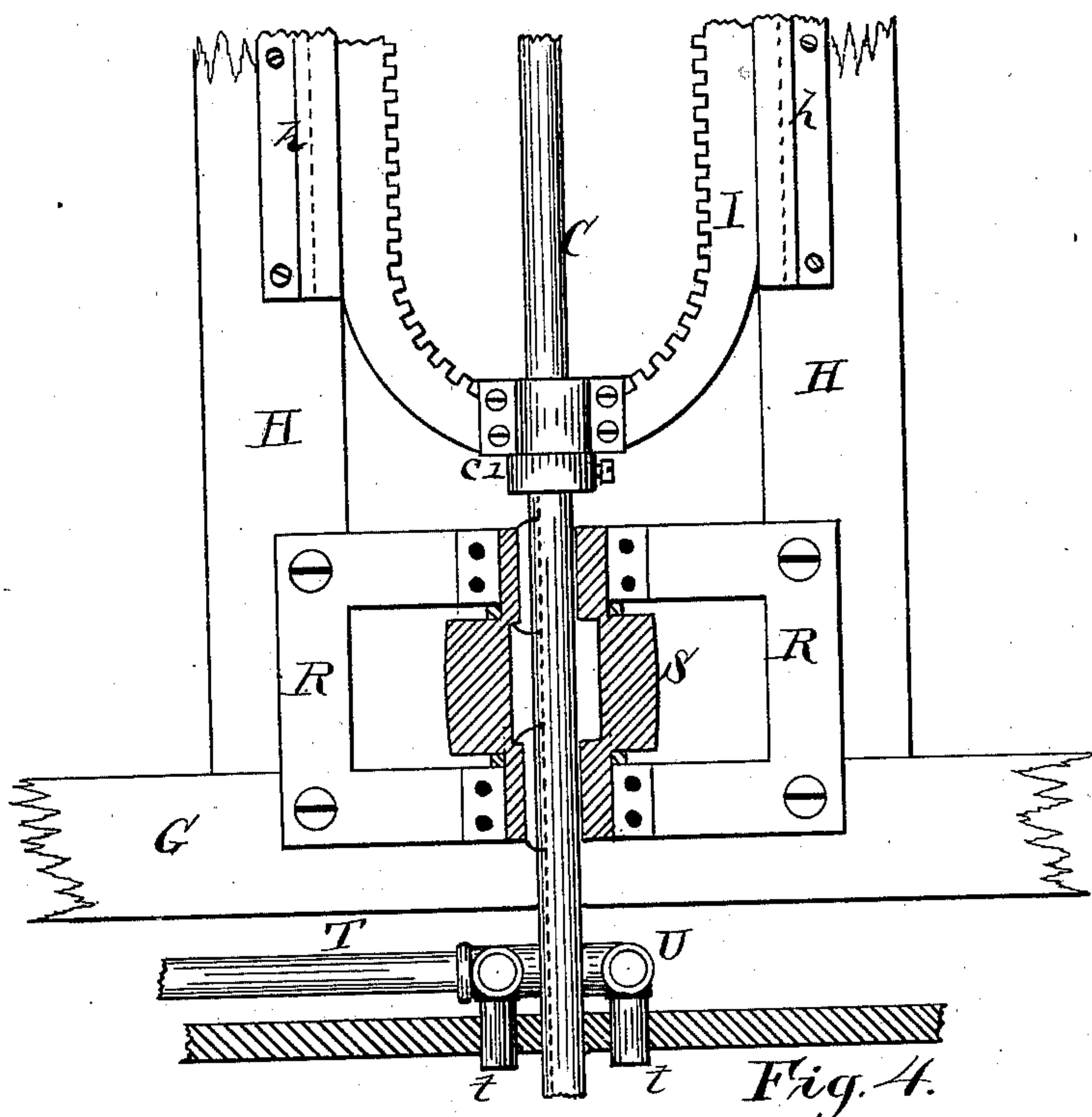
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UNITED STATES PATENT OFFICE.

GEORGE COWING, OF CLEVELAND, OHIO, ASSIGNOR TO JOHN TEAGLE, OF
SAME PLACE.

PROCESS OF AND APPARATUS FOR CHILLING PARAFFINE-OILS.

SPECIFICATION forming part of Letters Patent No. 308,593, dated December 2, 1884.

Application filed March 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE COWING, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and
5 useful Improvements in Process of and Apparatus for Chilling Paraffine-Oils, of which the following is a full, clear, and exact description.

In the process of extracting paraffine from petroleum and other paraffine oils or distillate,
10 it is necessary to reduce the temperature of the fluids containing the paraffine to a very low degree, so that the paraffine may congeal or crystallize before being subjected to the press for extracting therefrom the crude paraffine.
15

The object of my invention is to provide an improved means or apparatus for securing, in an economical manner, a rapid congelation of the paraffine-oils or distillate.

20 The construction and operation of my apparatus are substantially as hereinafter described, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a vertical section. Fig. 3 is a top view. Fig. 4 is an enlarged sectional view of the feathered pulley for operating the reciprocating centrifugal spreader or atomizer. Fig. 5 is a detached view of the expanding ring scraper.

30 A is an iron cylinder having a straight smooth interior surface, and is placed in the center of an iron tank, B, of considerably greater diameter. The cylinder A is open at the bottom, and is suitably secured in a corresponding hole in the bottom of said tank B, which is closed at the top, and is provided with suitable man-holes and covers, *b*. The top of cylinder A is also provided with a convenient cover or lid, *a*. The space in tank B
40 surrounding the cylinder is designed to contain the refrigerant material, and the inside surface of the cylinder constitutes the chilling-surface for chilling the paraffinized oil.

Through the cap *a* of cylinder A is passed
45 a vertical shaft, C, the lower end of which carries a concave disk, *c*, the rapid revolutions of which throw the fluids from its periphery in form of spray against the interior surface of the said cylinder A.

50 The means of imparting rotary and recip-

rocating motions to the said shaft and disk will be described further on.

D is an expanding ring scraper fitting closely the inside of the cylinder A. It is made and arranged to be self-adjusting, so as
55 to readily accommodate itself to the cylinder without binding.

E is a discharge-pipe having a funnel top, and is attached to the aforesaid ring D, and may extend down through the floor upon
60 which the apparatus stands for convenience of conveying the paraffine to receptacles or presses. Said pipe E is set between guide posts or rails F and provided with guide-rollers *f f*, and is counterbalanced by a weight, *w*,
65 attached to the end of a cord, *e*, passing over pulleys *p p*, suitably arranged for that purpose. A reciprocating motion is imparted to the said pipe and scraper by means described further on. Over the said tank is placed a
70 frame, G, supporting an upright frame, H, over the center of the cylinder A, in which is arranged the mechanism for giving the aforesaid rotary and reciprocating motions to said shaft C.

75 Playing in slides *h h* on said frame H is a rack-frame, I, having in its ends bearings for the shaft C, collars *c'* being secured on said shaft, whereby it is carried with said rack-frame in its up and down movements. This
80 rack-frame and shaft is counterbalanced also by a weight, *v*, and cord *i*, running over pulleys *q q*, suitably arranged for that purpose.

The mechanism for operating the said reciprocating scraper D and reciprocating and ro-
85 tating spreader *c* consists of a shaft, K, conveniently located, and from which power is derived, and is transmitted by pulleys L M and belts to two other shafts, N O.

Between the pulleys L M is interposed a
90 friction-clutch, P, provided with a hand-lever for operating it. The upper shaft, N, is fixed in suitable bearings on a branch frame, H', on said frame H, and is provided with a universal joint, N', the end of which carries a
95 pinion, *n*, which meshes with the said rack I, and by an oscillating movement propels said rack back and forth, thus imparting the aforesaid reciprocating movements to the shaft C. Upon side of the discharge-pipe E is also at-
100

5 attached a rack, E', operated by a pinion, o, on the jointed shaft O. These movements are controlled by the operator with the hand-lever alternately by throwing the clutch to the right or left, as may be required.

10 To the lower end of frame H is attached an iron frame, R, supporting a pulley, S, on the shaft C, for the purpose of giving the rotary motion thereto. Said pulley is loosely placed on the shaft, so that the shaft may slide up and down through the pulley, the shaft having a longitudinal groove in its lower part below the rack-frame I, in which a feather, s, in said pulley fits. Power for driving said pulley and shaft is imparted thereto by belt from convenient source.

20 T is a pipe leading into cylinder A for conveying the paraffinized oil thereto for treatment. This pipe is provided with a hollow ring, U, surrounding the shaft C, which has nozzles *t t* reaching through the cover *a* of the cylinder, the purpose of which is to discharge the oil onto the disk *c* near the center thereof. The pipe T is provided with a stop-cock, *x*, for shutting off the flow of oil as may be required in operating the apparatus. The tank B is also provided with an inlet-pipe, *y*, at the top, and an outlet-pipe, *z*, at the bottom, having stop-cocks for the admission and withdrawal of the refrigerant material. The tank B is also surrounded with a wooden casing, leaving a little space, and is designed as a protection to the tank against radiation and waste of the refrigerant material.

35 The operation of this apparatus is as follows: The oil is admitted to the cylinder by the pipe T, which falls from the nozzles onto the disk *c*. At the same time motion is imparted to the rack by the operator throwing the clutch to the right. Rotary motion also is given to the shaft C. The rapid revolutions of the disk *c* cause the oil to be thrown in fine spray or atoms against the inside chilling-surface of the cylinder, the traversing up and down during this movement spreading the entire interior surface with the spray. When a sufficient quantity or what surface of the cylinder will hold has been deposited, the admission is stopped. Then the hand-lever is carried over to the left, which changes the clutch to pulley M, thereby setting the shaft O in motion. This causes the pipe E and

scraper D to move upward, removing the congealed paraffine from the cylinder, which falls down through the pipe into such receptacle as may be provided. This operation is repeated as often and as long as necessary, and is found to be a rapid and economical process for obtaining congealed oil products.

Having described my invention, I claim— 60

1. The improved method or process of preparing paraffine or other oils for the extraction of crude paraffine, by atomizing the oil and depositing it upon the interior surface of a cylinder, the exterior of which is surrounded by a refrigerant material, and removing the congealed oil from the interior of the cylinder, substantially as herein set forth. 65

2. The improved method or process of rapidly reducing the temperature of oils, which consists in a stream of oil coming in contact with a disk revolving at a high velocity, which atomizes the oil, and the centrifugal force depositing it upon the interior surface of the cylinder, which is surrounded by a refrigerant material, substantially as herein set forth. 70 75

3. The process of separating such elements from a fluid compound as will congeal at a higher temperature than the other elements, consisting in atomizing the compound and depositing it by a centrifugal force upon the interior surface of a cylinder, the exterior of which is surrounded by a refrigerant material, substantially as herein set forth. 80

4. In an apparatus for freezing or chilling paraffine-oils, a cylinder inclosed in a refrigerant-tank provided with a centrifugal distributor, substantially as herein described, and for the purpose set forth. 85

5. The expanding ring scraper attached to the reciprocating discharge-tube, in combination with the cylinder A, for removing the congealed paraffine, substantially as herein described, and for the purpose set forth. 90

6. In combination with the cylinder A, an inlet-pipe constructed and arranged to deliver the oil upon the centrifugal distributor, substantially as herein described, and for the purpose set forth. 95

GEORGE COWING.

Witnesses:

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