

(No Model.)

C. H. PRENTISS.

APPARATUS FOR EXTRACTING PARAFFINE FROM OILS.

No. 316,058.

Patented Apr. 21, 1885.

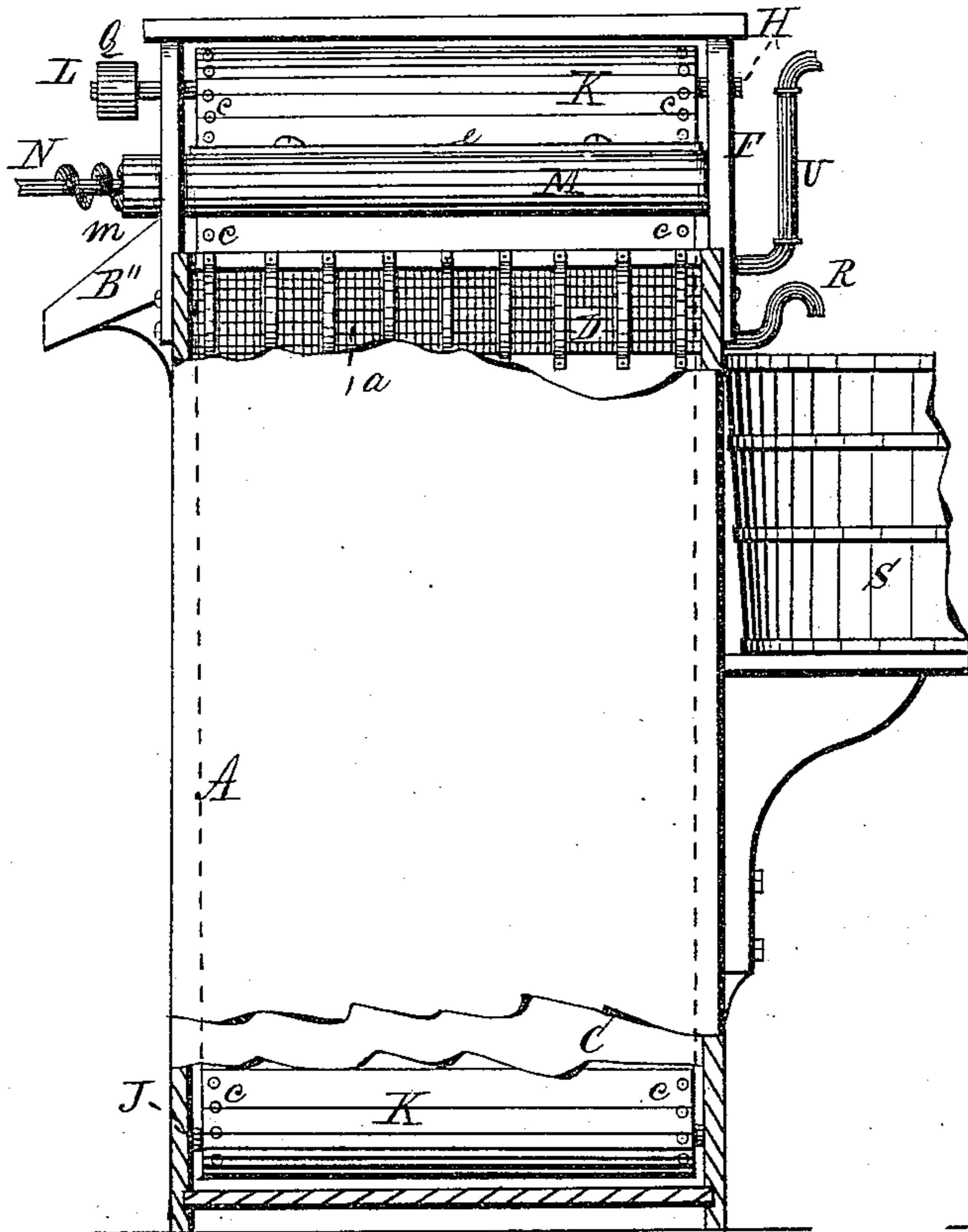


Fig. 1.

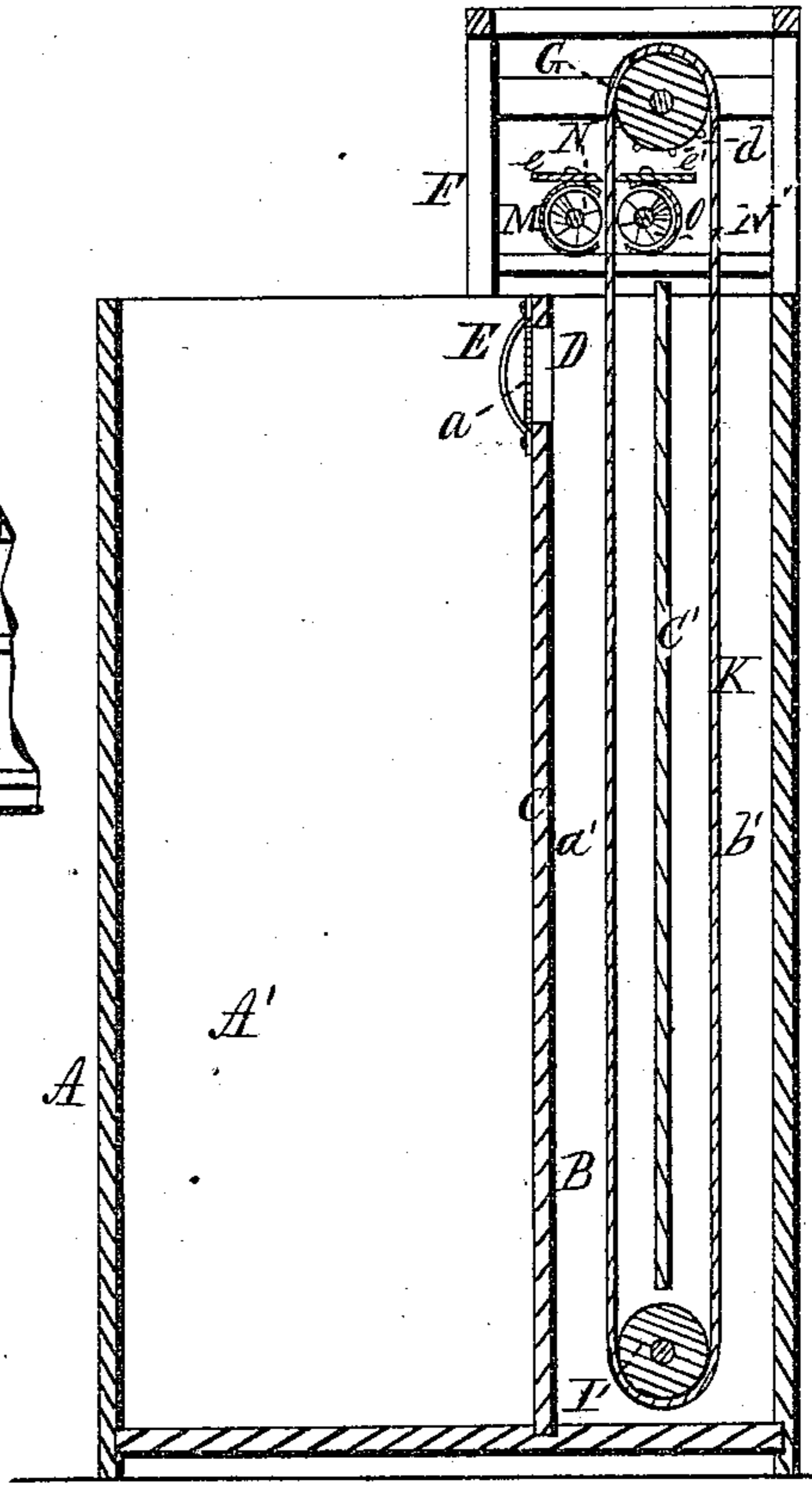


Fig. 2.

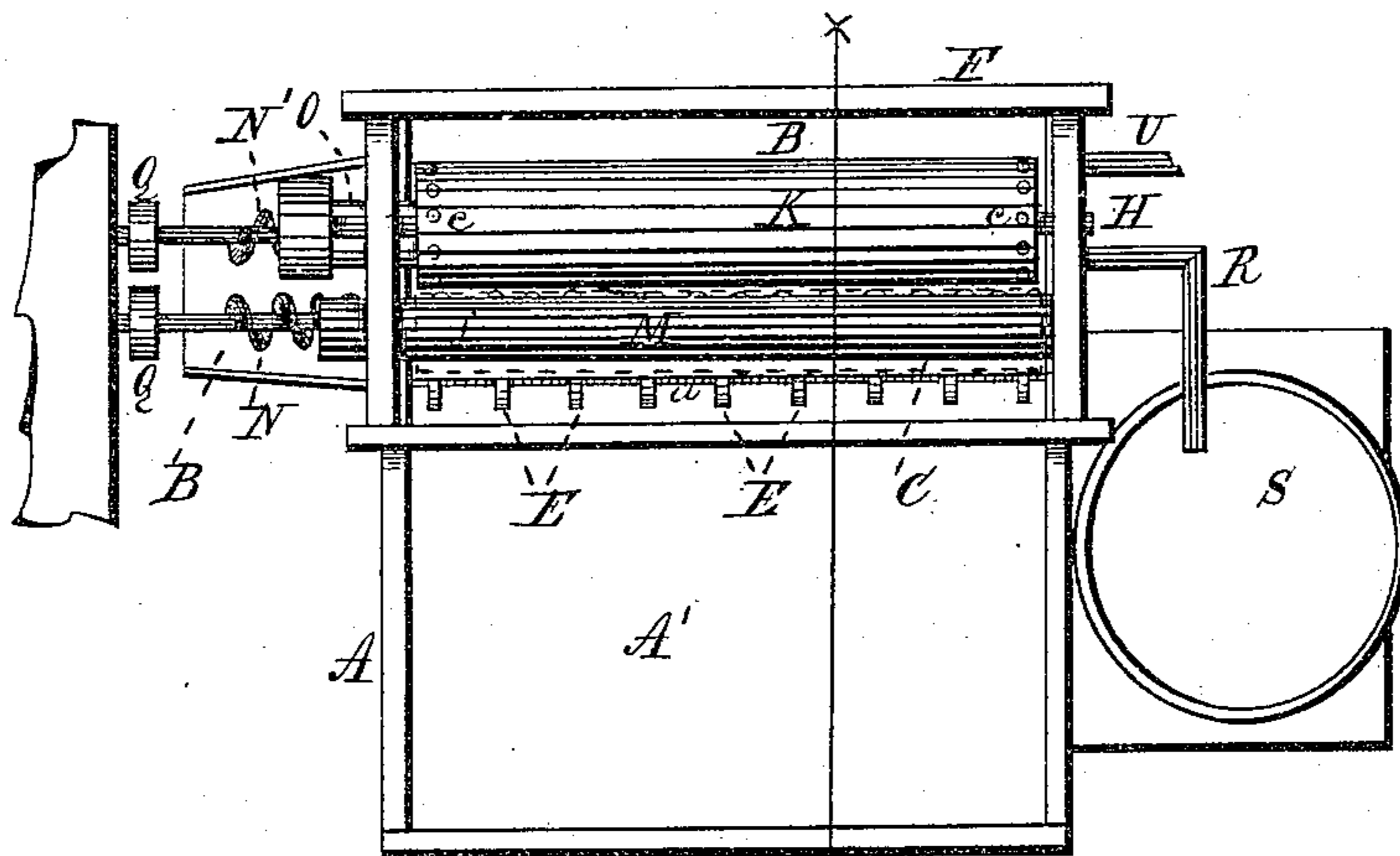


Fig. 3.

Witnesses.

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APPARATUS FOR EXTRACTING PARAFFINE FROM OILS.

SPECIFICATION forming part of Letters Patent No. 316,058, dated April 21, 1885.

Application filed December 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. PRENTISS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful
5 Improvements in Apparatus for Extracting Paraffine from Oils; and I do hereby declare that the following is a full and exact description thereof.

The apparatus above referred to is constructed substantially as shown in the drawings and described in the following specification, of which the drawings form a part.

Figure 1 of the drawings represents a side elevation of the apparatus. Fig. 2 is a transverse vertical section through the line *xx*. Fig. 3 is a plan view of the same.

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

The body of the apparatus consists of a deep rectangular-shape tank, A, of any holding capacity that may be desired for the purpose specified. Said tank is divided into two compartments, A' and B, formed by the partition or wall C, Fig. 2, of which A' is the ice-box,
25 and B the oil-freezer. The two compartments have no communication one with the other, except through the opening D near the top of the partition, and which opening is covered by a strainer, *a*, and guards E for protecting the
30 strainer.

The compartment B alluded to is provided with a partition, C', thereby dividing the compartment into two sections, *a'* and *b'*, which have an open relation with one another under
35 the lower end of the partition.

On the top of the tank, and in special relation to the compartment B, is secured a frame, F, into which is journaled a roller, G, of which H is the shaft. Near the bottom of the compartment B is a corresponding roller, I. Around said rollers is stretched tightly an endless apron or belt, K, which may consist of canvas or of other suitable material. That the belt may not slip on the rollers when in
40 motion, each end of the rollers is provided with sprocket-teeth *d*, adapted to engage the eyelet-holes *c* along each edge of the belt, as shown in Fig. 2. The roller G is revolved by any suitable power applied by a belt to the pulley L.

50 It will be noticed in Fig. 2 that the partition C' above alluded to is between the two sides

of the belt; hence as the belt revolves it passes down on one side of the partition and up the other.

Transversely across the face of the belt K 55 is arranged a conduit, M, in the side of which, facing the belt, is a longitudinal opening the entire length thereof. It will be noticed that the edges of the said opening do not touch the belt, but are distant therefrom. In the conduit is arranged, so as to revolve therein, a
60 spiral conveyer, N, Figs. 1 and 2, the wings of which project through the opening in the conduit so far as to nearly touch the belt, as seen in Fig. 3.

Directly on the opposite side of the belt is a corresponding conduit and spiral conveyer, as seen at O and N', the screw or conveyer of which has the same relation to the belt as the one above described, so that as the belt revolves it passes between the spiral conveyers in close proximity thereto, one on each side of the upward moving part of the belt, as shown in Fig. 2. The conveyers may be operated by belts or gearing, for a purpose presently shown. 65

Adjustably secured to the top of each of the conduits, and lengthwise therewith, is a scraper, respectively *e* and *e'*, Fig. 2. A longitudinal edge view of one of them is shown at *e* in Fig. 1. In Fig. 3 the scrapers are not shown. 80 R is an overflow-pipe having its outlet in the freezing-compartment B below the top thereof. Said pipe ascends upward to within a short distance of the top of the tank, and ends in a goose-neck for discharging into the over- 85 flow-receiving vessel S. Section *b'* of the compartment B is put in communication with an oil-containing vessel (not shown in the drawings) by an oil-induction pipe, U.

Having described the construction and the arrangement of the apparatus, attention is now called to the operation of the same, which is substantially as follows: The compartment or ice-box A' of the tank is filled with a refrigerant, which may consist of ice and salt, forming
90 a brine, which is allowed to flow from the ice-box through the opening D into section *a'* of the compartment B, and fill it and section *b'* up to the overflow-pipe. The refrigerant, issuing from the overflow-pipe, is discharged into the receiving-vessel S, from which it is pumped back into the ice-box, thereby pro- 100

5 ducing a circulation of the refrigerant from the ice-box into the freezing-compartment B. Down section *a'* thereof it flows to the end of the partition *C'*, under which it passes into
 10 section *b'*, up which it ascends to the overflow-pipe and discharges into the vessel S and is returned therefrom to the ice-box, as before said, by means of a pump. (Not shown in the drawings.) The oil to be chilled or frozen is
 15 discharged into section *b'* of the compartment B upon the refrigerant-fluid therein. The oil, being lighter than the refrigerant, will float upon the surface thereof, forming a body of oil above the outlet of the overflow-pipe, and
 20 therefore cannot pass out with the overflow in view of the elevated neck of the overflow-pipe. The apparatus being thus charged with a refrigerant and oil, the belt K is then made to revolve in the direction of the arrows. The
 25 oil on the top of the refrigerant in section *b'* of the freezing-compartment B adheres to the surface of the belt, and is carried down thereby through the refrigerant-fluid to the bottom of the tank, and passes around the roller I, thence
 30 upward through the refrigerant in section *a'* to the conduits M and O, between which the belt passes, and in so doing the chilled or frozen oil, adhering to the sides of the belt, is scraped therefrom by the scrapers *e* and *e'*, and by the
 35 revolving conveyers N is carried through the conduits to the ends *m* thereof, from which it falls into the chute *B''*, and conducted thereby to a receiving-box in a solid frozen condition, fitting for the press, for which it may
 40 be at once prepared and subjected in the usual way for extracting therefrom the paraffine. The oil flows continuously into section *b'* onto the refrigerant, and as fast as it is taken up by the revolving belt and carried out by
 45 the conveyers N N'; hence there is no interruption nor delay in the operation of the apparatus for removing therefrom the frozen oil. In carrying the oil down through the refrigerant by means of the descending side of the
 50 belt, it is reduced to a low degree of temperature, but not, perhaps, as low as the refrigerant-fluid; but the oil becomes so by continuing therein during the upward movement of the belt, so that on the arrival of the oil to the scrapers it is completely reduced to a solid
 55 condition, as above mentioned. The low temperature of the refrigerant in the compartment B is maintained by the overflow therefrom being returned to the ice-box, through which it passes, and thereby reduced in temperature before again passing into the said
 60 compartment B. Thus a current of freezing fluid is continuously flowing from the ice-box into section *a'* of the said compartment, and its course therein made in the opposite direction of the moving belt, so that the oil adher-

ing thereto is continued to be exposed to a counter-current of renewed refrigerant-fluid in its passage through the compartment B.

I do not confine myself to the exact shape and arrangement of the devices constituting the apparatus herein described and shown in the drawings, as the same may be modified without changing the essential nature of my invention, which consists, mainly, of an endless apron or belt revolving in a tank, by which oil is carried down through and upward through a refrigerant agent, by which the oil adhering to the belt is chilled or frozen thereon, and removing the oil from the belt by means of scrapers arranged to operate for that purpose immediately as the frozen oil leaves the refrigerant, as herein described.

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

1. In an apparatus for chilling or freezing paraffinized oil for extracting therefrom paraffine, a tank consisting of an ice-box and oil-freezing compartment in open relation with each other by means of an opening, D, for the passage and interchange of the refrigerant agent, and in said compartment an endless apron or belt adapted to revolve therein around the partition *C'*, for the purpose of carrying the oil to be frozen down through and upward through the refrigerant agent, substantially as described, and for the purpose herein set forth.

2. In combination with the revolving belt K, the conduits M and O, arranged, respectively, on each side of said belt, and having therein conveyers adapted to be in close proximity to the surface of the belt, and scrapers *e* and *e'*, constructed and arranged to co-operate for the purpose specified, and substantially as described.

3. An apparatus for chilling or freezing oils, consisting of a tank having two compartments—viz., an ice-box and an oil-freezing compartment—in communication one with the other by an opening in the partition C, rollers G and I, and belt adapted to revolve on said rollers in the compartment B of the tank, conduits M and O, arranged, respectively, on each side of the ascending part of the belt, and having therein conveyers, scrapers, and oil-induction pipe, overflow-pipe, and vessel S, constructed and arranged in the manner substantially as described, and for the purpose specified.

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

CHARLES H. PRENTISS.

Witnesses:

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