

(No Model.)

O. G. BURNHAM.

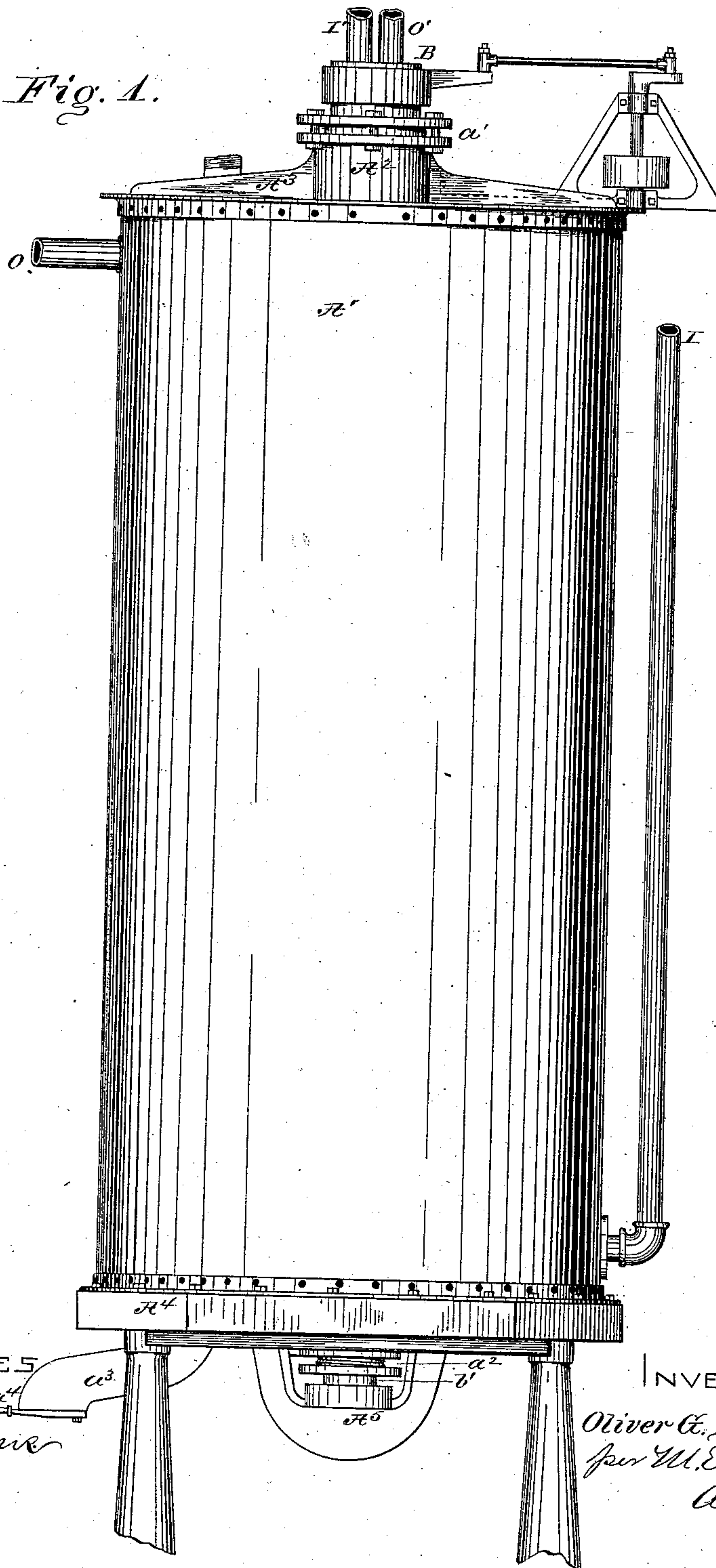
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LARD COOLER.

No. 289,809.

Patented Dec. 11, 1883.

Fig. 1.



WITNESSES

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(No Model.)

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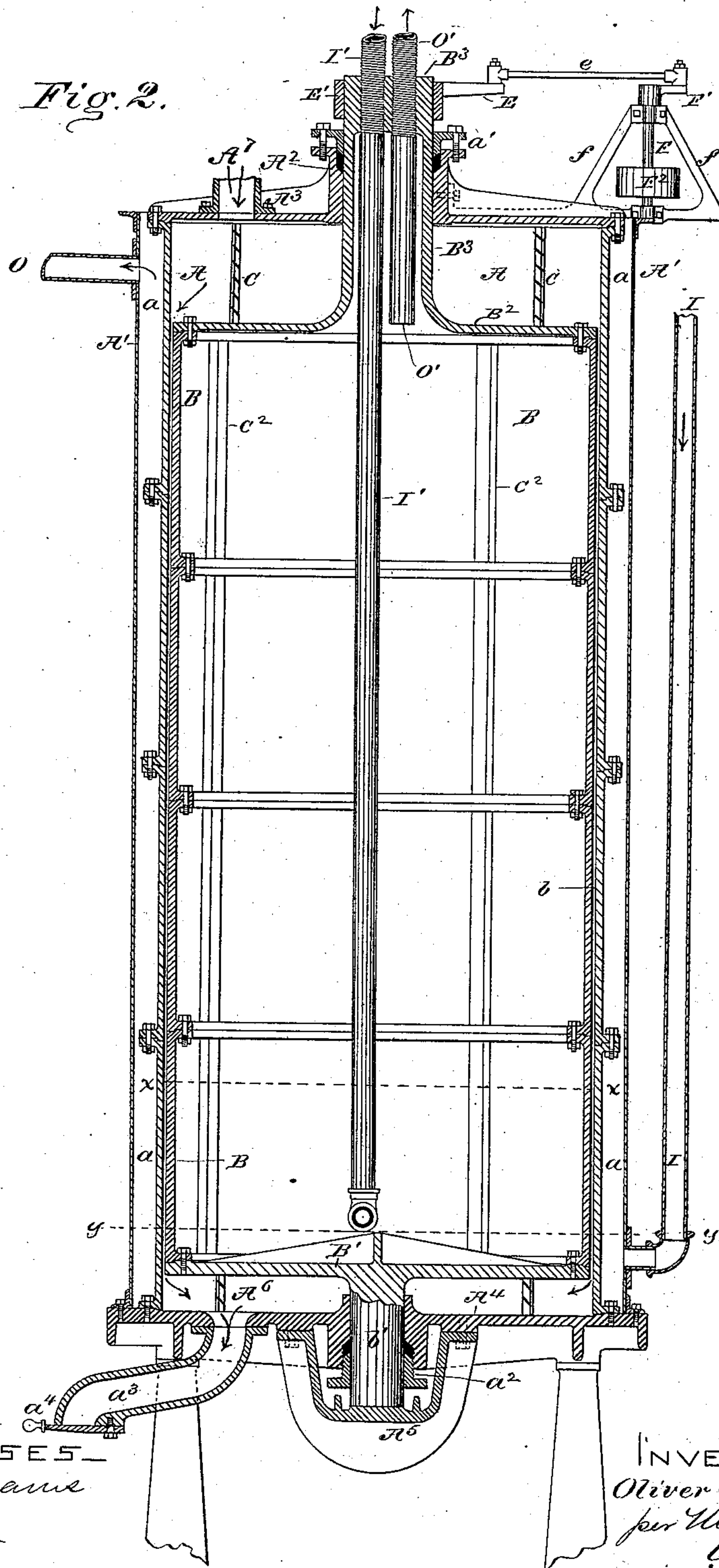
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Fig. 2.



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Fig. 3.

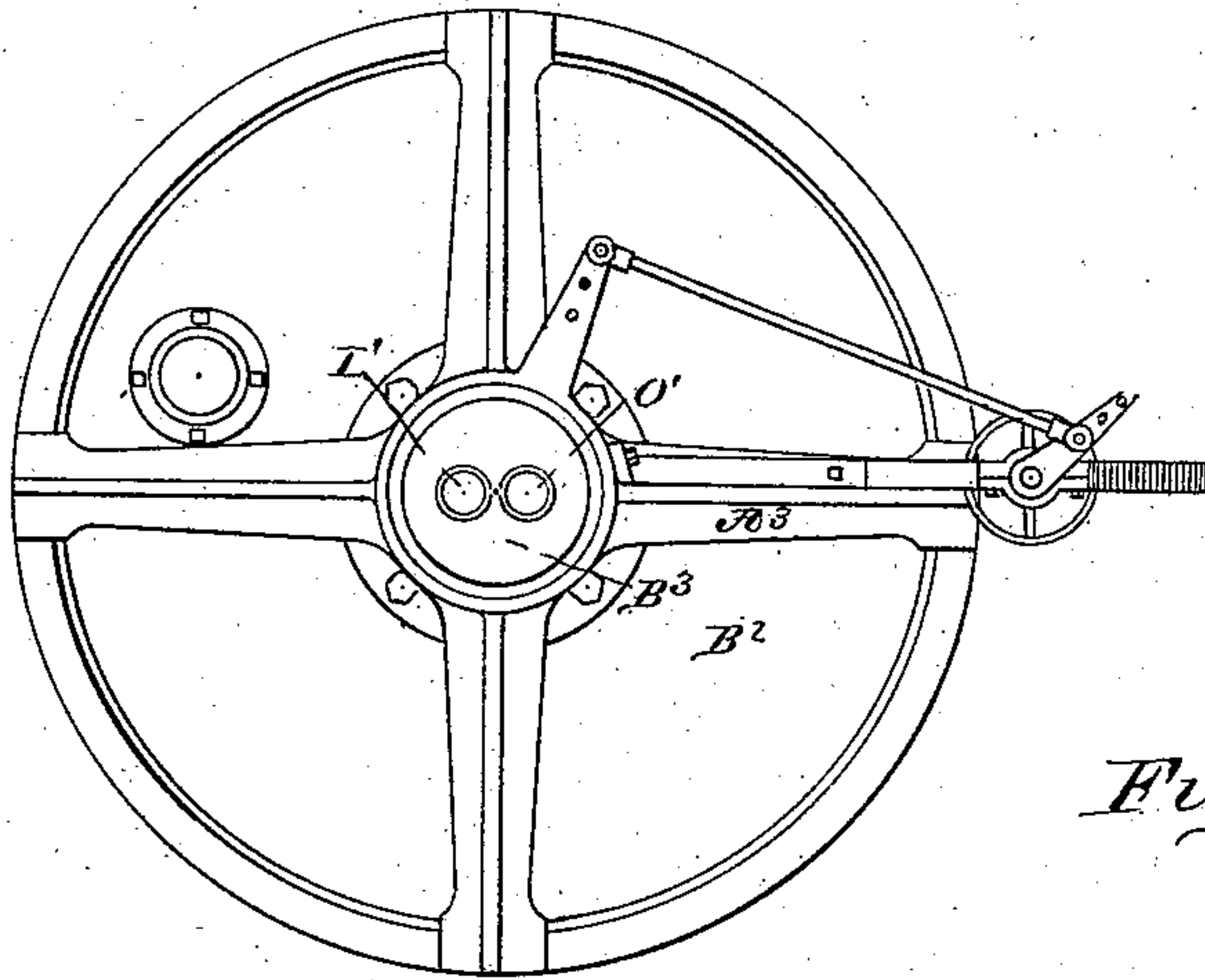


Fig. 4.

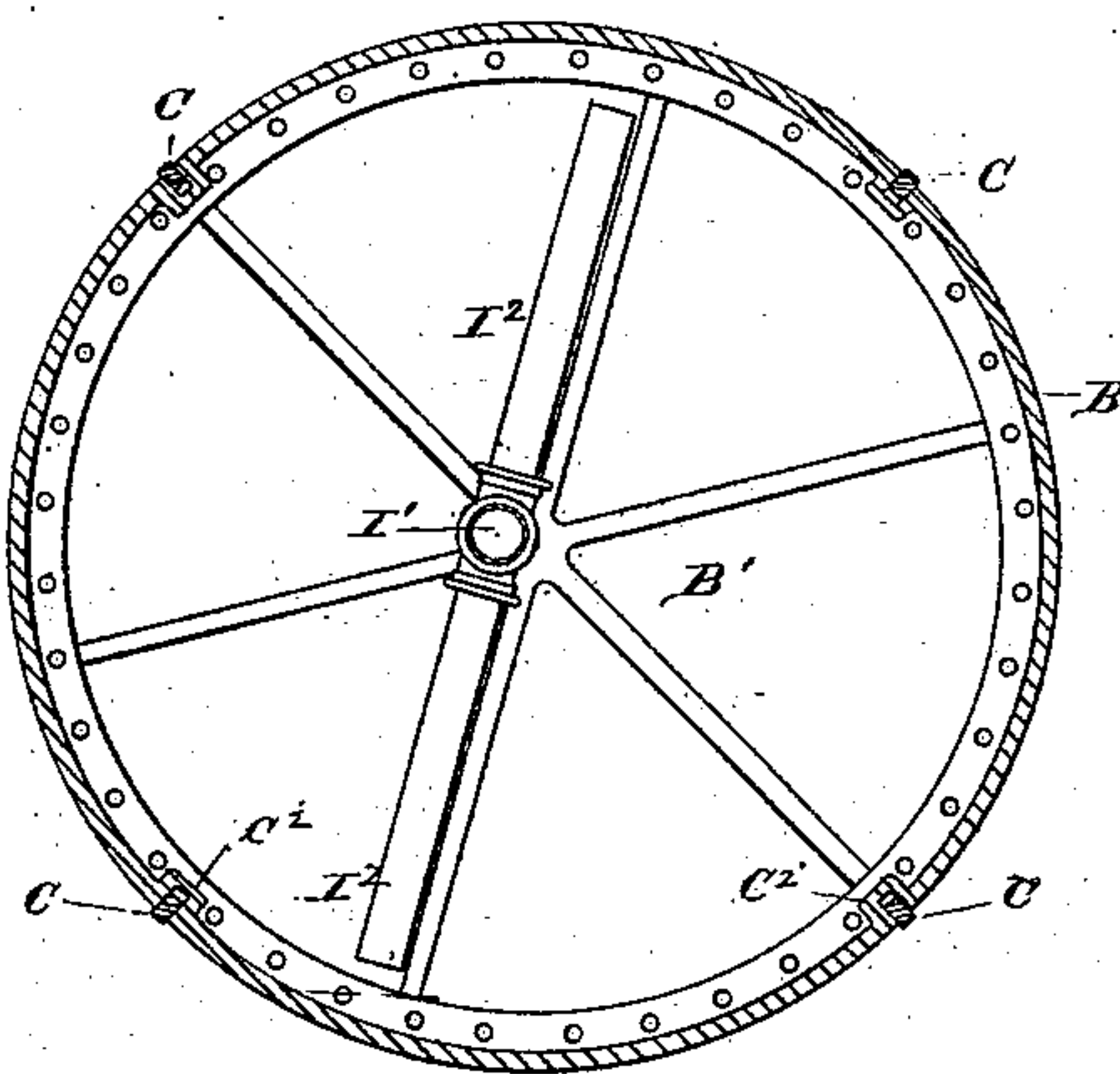


Fig. 6.

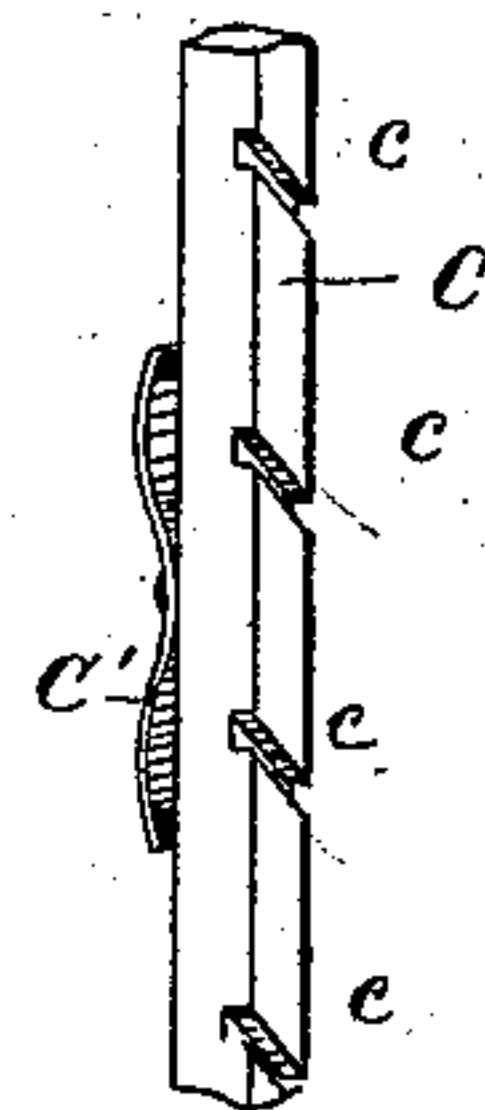
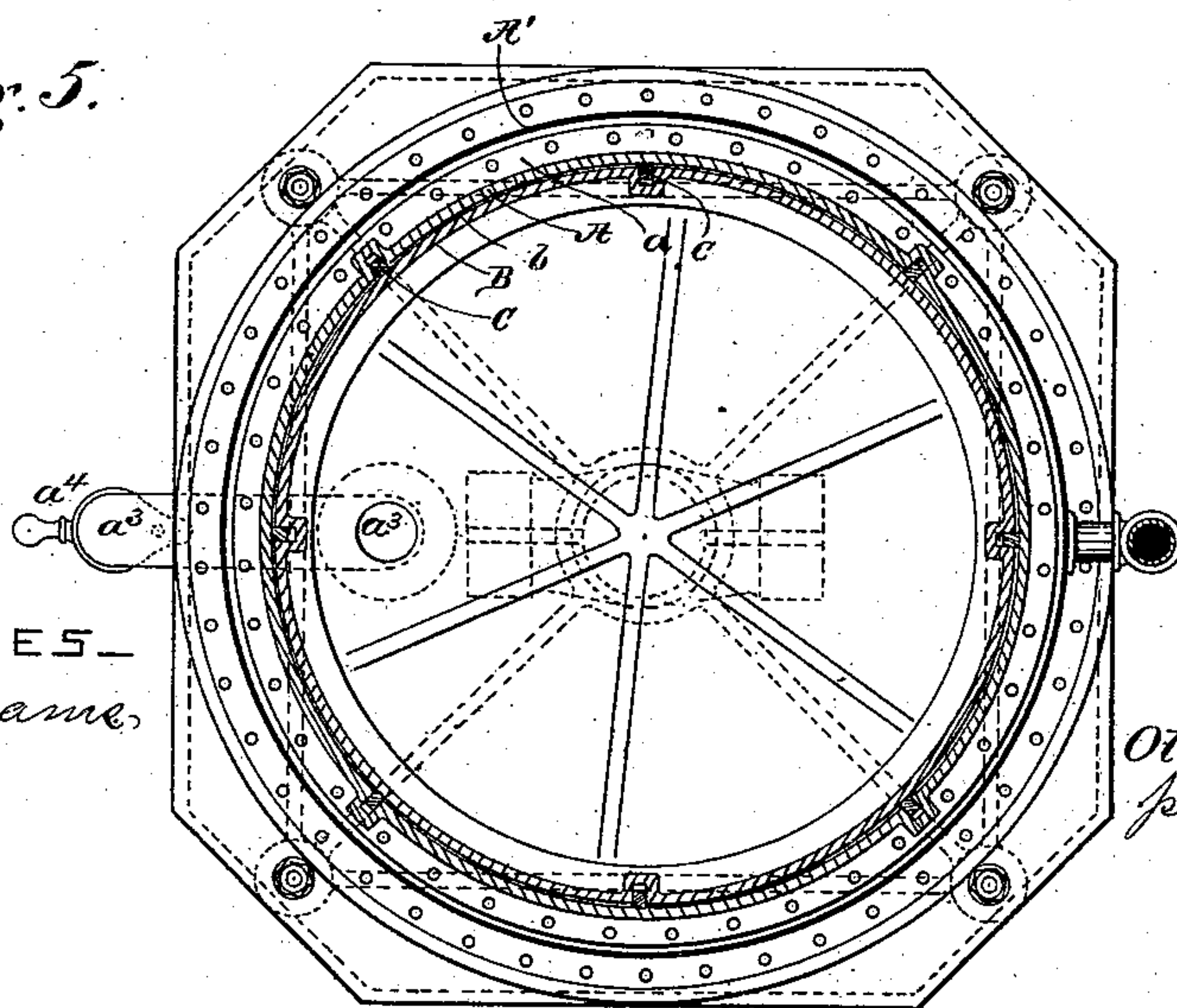


Fig. 5.



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UNITED STATES PATENT OFFICE.

OLIVER G. BURNHAM, OF CHICAGO, ILLINOIS.

LARD-COOLER.

SPECIFICATION forming part of Letters Patent No. 289,809, dated December 11, 1883.

Application filed November 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, OLIVER G. BURNHAM, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lard-Coolers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to devices for cooling lard and similar substances; and it consists in the several matters hereinafter set forth, and pointed out in the appended claims.

The object of the invention is to provide means for facilitating the passage of the lard or other substance to be cooled through a thin space, in which it is exposed to one or more cooling-surfaces.

In the machine illustrated in the drawings, and embodying my invention, the thin space through which the lard is passed, and within which it is cooled, is annular, and is obtained by the arrangement of one metal cylinder within another and slightly larger cylinder, and the cooling is effected by cold water acting through both cylinders. The desired movement of the lard through the cooling-space is obtained by means of a force-pump, and is facilitated by an arrangement of the cylinders in a vertical position and an oscillating motion of the inner cylinder, the several proximate surfaces of the cylinders being provided with projecting strips, which bear upon the surfaces of the opposite cylinders. By these means a successful operation of the apparatus is effected with a cooling-space much thinner than has heretofore been employed, and with consequently better results.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a central vertical section. Fig. 3 is a top view. Fig. 4 is a horizontal section of the inner cylinder through x of Fig. 2. Fig. 5 is a horizontal section through y of Fig. 2. Fig. 6 is a fragment of one of the bearing-strips detached.

A is a metal cylinder, which sets in a vertical position on a suitable bed-plate, A^1 , riveted or otherwise permanently secured thereto. B is a second metal cylinder, mounted within and concentric with the cylinder A.

The cylinder B is of exterior diameter somewhat less than the interior diameter of the cylinder A, so as to leave a thin annular space, b , between the two.

B^1 is a close bottom of the cylinder B, provided with a central gudgeon, b^1 , which passes through a stuffing-box, a , in the bottom plate A^4 , and rests on a step, A^5 , secured to the latter. Said gudgeon may, however, be seated in a recess of the bottom plate.

B^2 is a close top affixed to the cylinder B, having a central neck or hollow shaft or gudgeon, B^3 , which passes through a suitable bearing, A^3 , in the close top plate, A^2 , affixed to the top of the cylinder A. The cylinder B is shorter than the cylinder A, so as to afford a considerable space, A^6 , between the bottom plates, B^1 and A^4 , or beneath the cylinder B, as seen in Fig. 2. The top of the inner cylinder is also considerably below the top of the outer one, so that ample room is afforded for the admission of a mass of substance to be cooled within the upper walls of the outer cylinder and between the top plates of the two cylinders.

A^7 is an inner pipe in the plate A^3 , connected with a pump for forcing the lard into the space between the cylinders.

A^8 is a cylinder surrounding the cylinder A, at some little distance therefrom, affording a chamber, a , for water or other cooling agent. I is an inlet-pipe for conducting water to said chamber a , near the bottom, and O is an outlet near the top thereof, to conduct the warmer portion of the water away. The inner cylinder, B, is also provided with an inlet-pipe, I' , and an outlet-pipe, O' , arranged to respectively deliver at the bottom and discharge at the top.

As a means of securing the pipes I' and O' , the upper end of the gudgeon B^3 is cast solid for a suitable distance to admit of the pipes being threaded into the same, as shown in Fig. 2. The plate A^4 is provided with an opening, with which is connected a pipe, a^3 , having a gate or valve, a^4 , which may be opened more or less to deliver the stock with such rapidity as to insure its proper temperature.

As a means of oscillating the inner cylinder, B, the upper protruding end of the gudgeon B^3 is provided with a crank-arm, E, which may be vibrated by any suitable connection for the

purpose—as, for example, by the pitman *e*, connecting the arm *E* with a revolving crank, *F'*, on a shaft, *F*, which is rotated by a belt trained over the pulley *F''*.

5 In order to aid the force applied to carry the lard or other substance downward through the thin passage *b*, the proximate surfaces of the cylinders are made smooth, and each is provided with projecting strips *C C*, which
10 bear against the surface of the opposite cylinder. Said strips are usually and preferably of wood, and are set in continuous vertical recesses in the surface of either cylinder, as plainly seen in the horizontal sections of the
15 drawings. On their bearing-surfaces said strips are transversely and obliquely notched at *c*, and they are made to bear outwardly against the opposite cylinder by means of springs *C'*, Fig. 6, arranged beneath the strips,
20 and preferably secured thereto. Usually four strips will be set in each cylinder, and those of the cylinder *B* will be placed in alternation with or between those of the cylinder *A*. In the oscillatory movement of the cylinder *B*,
25 the bearing-strips *C* thereof will be carried from a point near one strip of cylinder *A* to a point near an adjacent strip on said cylinder. In other words, the bearing-strips of one cylinder will sweep the surface of the other cylinder
30 nearly or quite the entire distance between its strips. In this operation, the substance cooled upon the several cylinders is displaced or scraped off, and particularly the thin film in immediate contact with the cylinders, which will usually be cooled to hardness.
35 Under the continued action of the pump and scrapers, a downward movement of the mass is maintained toward the chamber *A'* and through the outlet *a''*, as described. The transverse grooves or notches *c c* in the bearing-
40 faces of the strips allow the hard lard to pass, to some extent, from one side to the other of the several strips, so that no violence is done to them when one set is brought forcibly into
45 proximity with the other. In the general movement of the lard or other stock being cooled, the mass is constantly commingled, so as to have a uniform temperature and consistency. The springs *C'* cause the strips *C*
50 to bear constantly against the opposing cylinder-face, even if the cylinders are not perfectly concentric, and also serve to provide for the wear of said strips, arising from friction thereof with the opposing surface.
55 It is intended that a constant flow of water shall be maintained through the chamber *a*, and through the inlet and outlet pipes *I'* and *O'* of the inner cylinder. To permit the oscillation of the cylinder *B*, the pipes *I'* and *O'*
60 may obviously be connected exteriorly with flexible tubes.

While the outer cylinder is shown, and will always preferably be the stationary cylinder and the inner one the oscillating or movable one, this order may be reversed without de- 65 parture from my invention. The desirable chamber or space *A'* at the bottom, constituting a sort of collecting-reservoir intervening between the annular space *b* and the outlet *a''*, may also be otherwise provided than in the 70 manner shown—as, for example, by an annular enlargement of the outer, or by a similar contraction of the inner, cylinder at the bottom. Of course, if thought sufficient, but one of the cylinder-surfaces need be cooled by the 75 application of water or other means, as shown.

I am aware that coolers have heretofore been constructed in which the lard or other material to be cooled is placed in the space between two concentric cylindrical cooling-surfaces; 80 and I am also aware that revolving scrapers have been used for removing the solidified material from the surfaces of such cylinders. I do not therefore claim either of such devices, broadly; but my invention is limited to the 85 matters set forth in the following claims:

I claim as my invention—

1. A lard-cooler consisting, essentially, of outer and inner cooling-cylinders having their proximate cooling-surfaces separated by a thin 90 space, means for forcing the lard through such space, and means for clearing the cooling-surfaces, substantially as described.
2. In combination with an outer cooling-cylinder having inlet and outlet passages at 95 top and bottom, an inner cooling-cylinder of dimensions affording spaces at its opposite ends, and a thin space between the adjacent cylindric surfaces, means for oscillating the inner cylinder, and means operated by the 100 movement of the said inner cylinder for clearing the surfaces of both cylinders, substantially as described.
3. The combination, with the outer and inner smooth-surfaced cylinders, *A* and *B*, concentrically arranged, as shown, of bearing- 105 strips *C*, secured alternately to the opposite cylinders, and means for oscillating one of the cylinders, substantially as described.
4. In combination with the cylinders arranged and operating as set forth, and provided with longitudinal recesses in their proximate faces, strips *C*, having transverse notches *c*, and springs *C'*, arranged beneath the strips, 110 substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

OLIVER G. BURNHAM.

Witnesses:

M. E. DAYTON,
PETER J. ELLERT.