

No. 747,641.

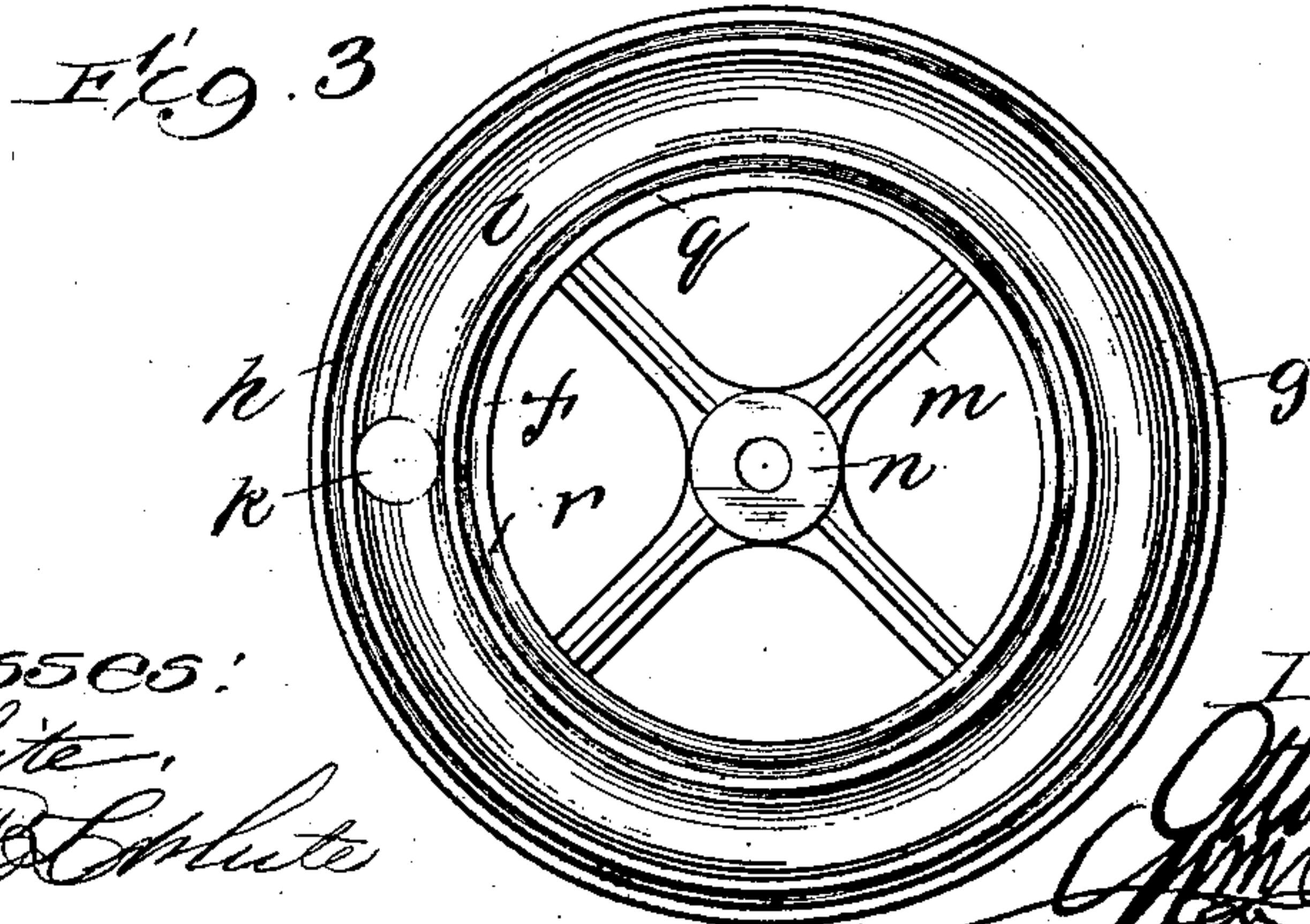
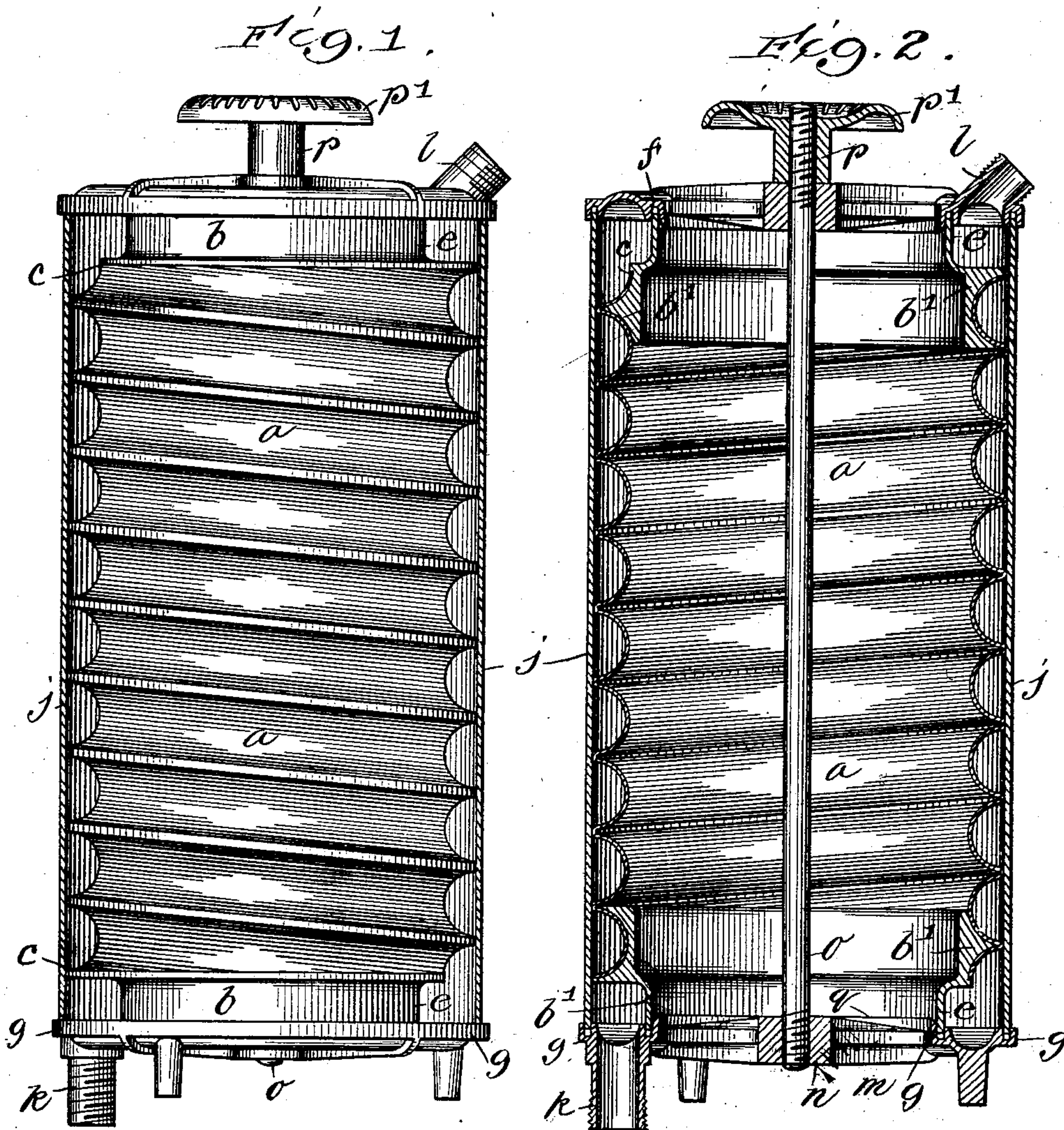
PATENTED DEC. 22, 1903.

O. RODERWALD.  
LIQUID COOLER.

APPLICATION FILED JAN. 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:  
Ray White,  
Harry B. White

Inventor:  
O. Roderwald  
Atty.

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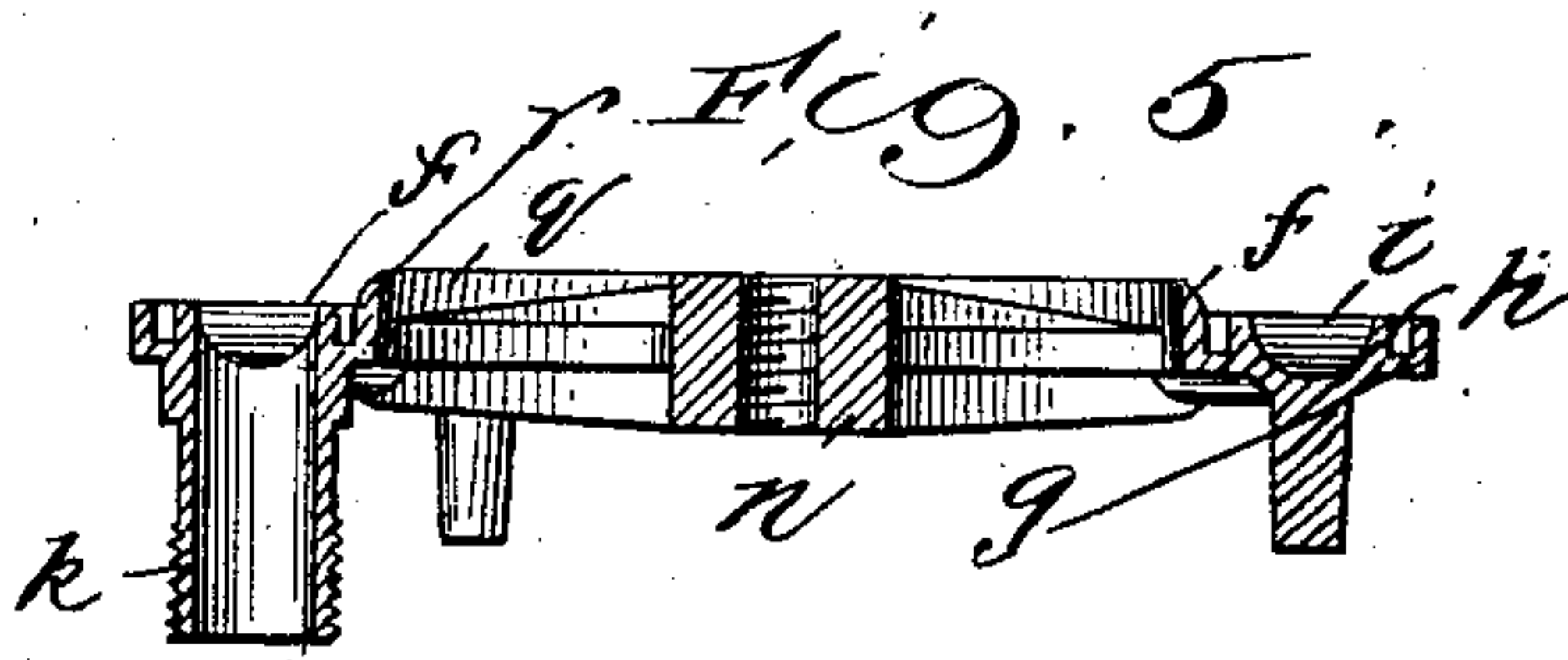
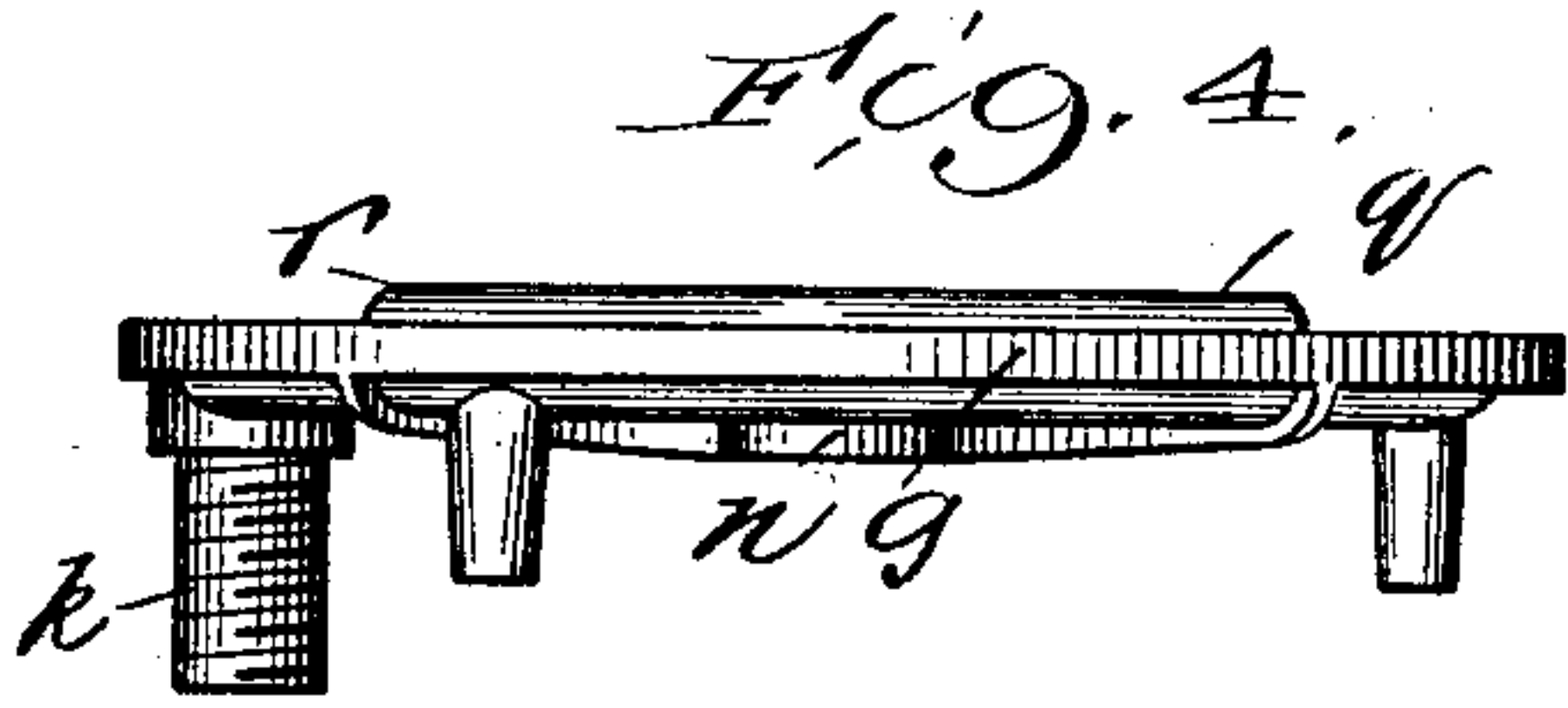
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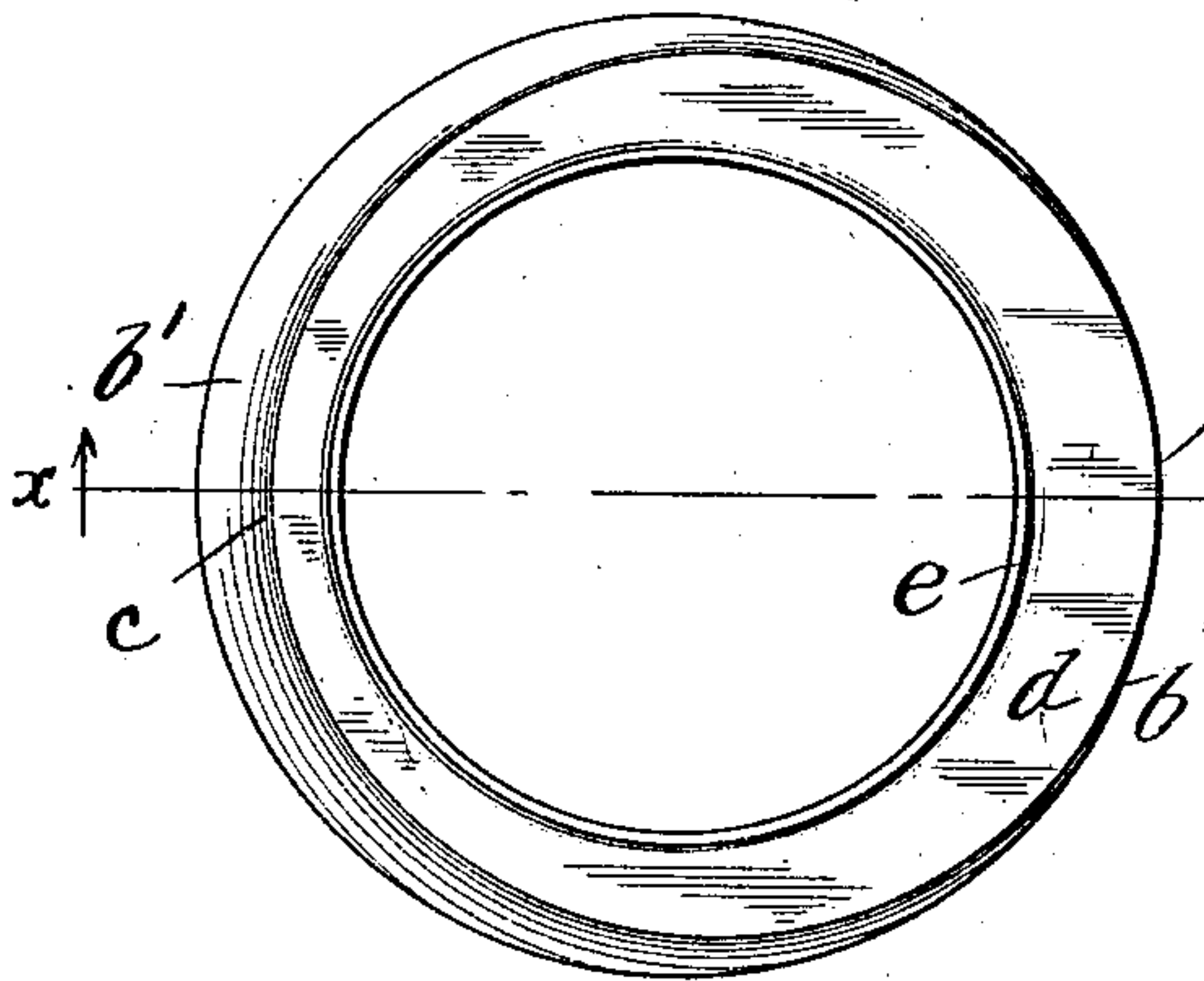
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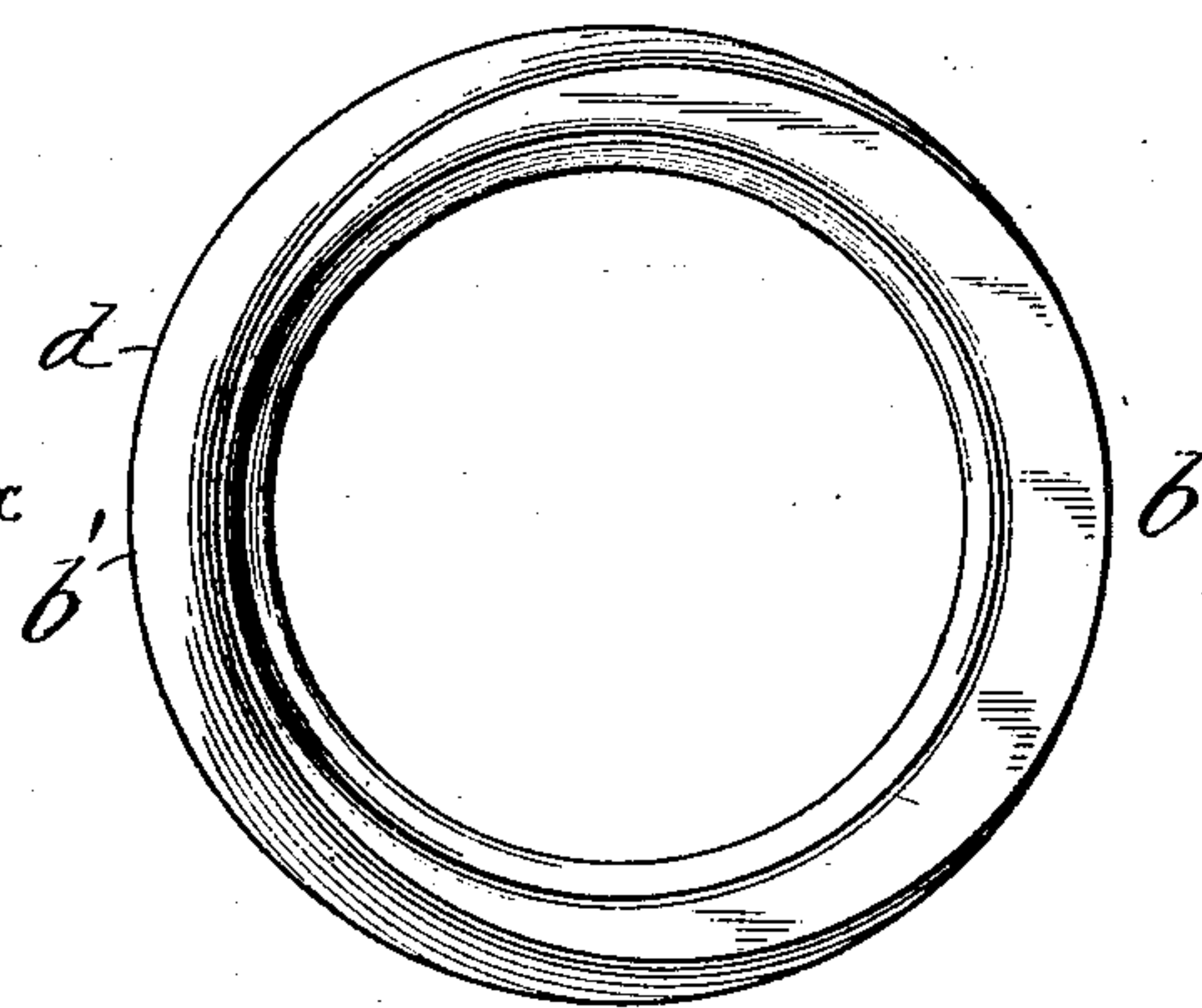
2 SHEETS—SHEET 2.



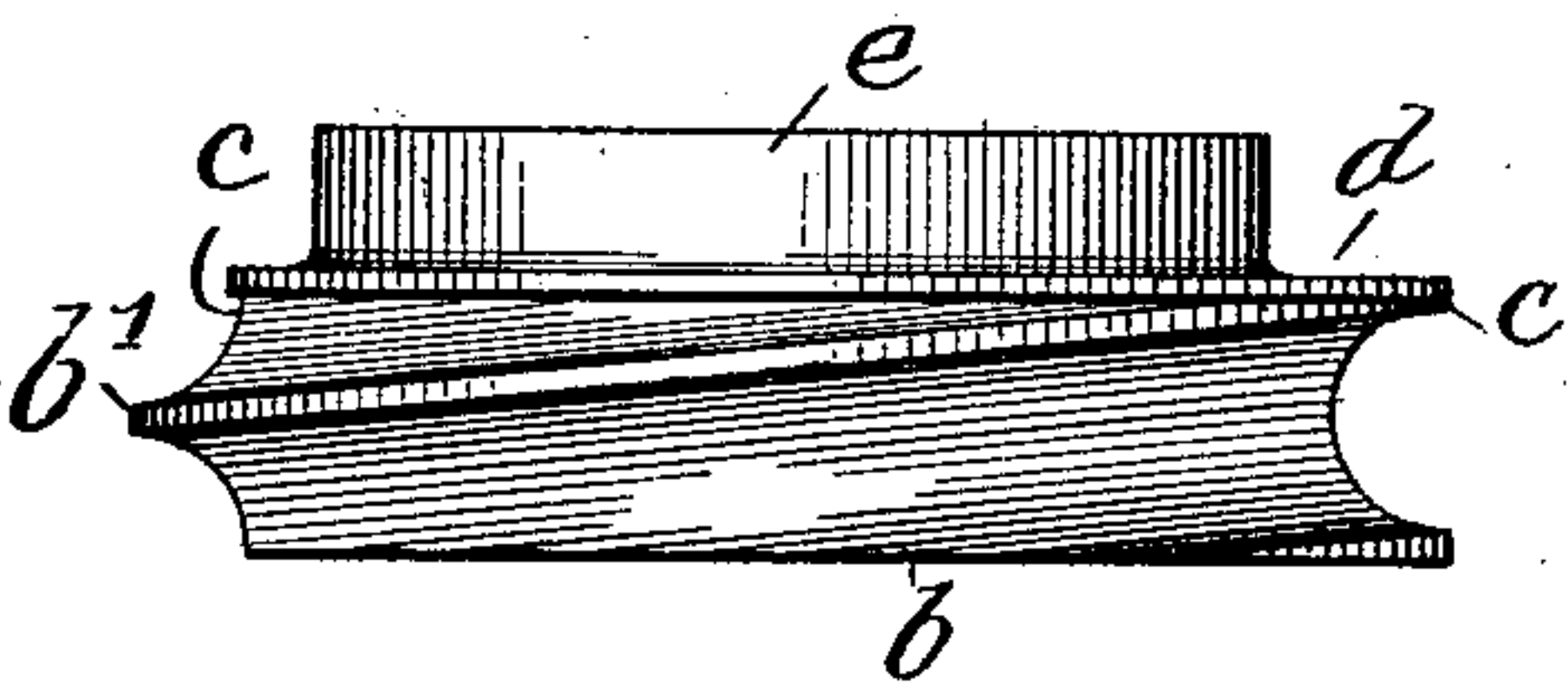
*Fig. 6.*



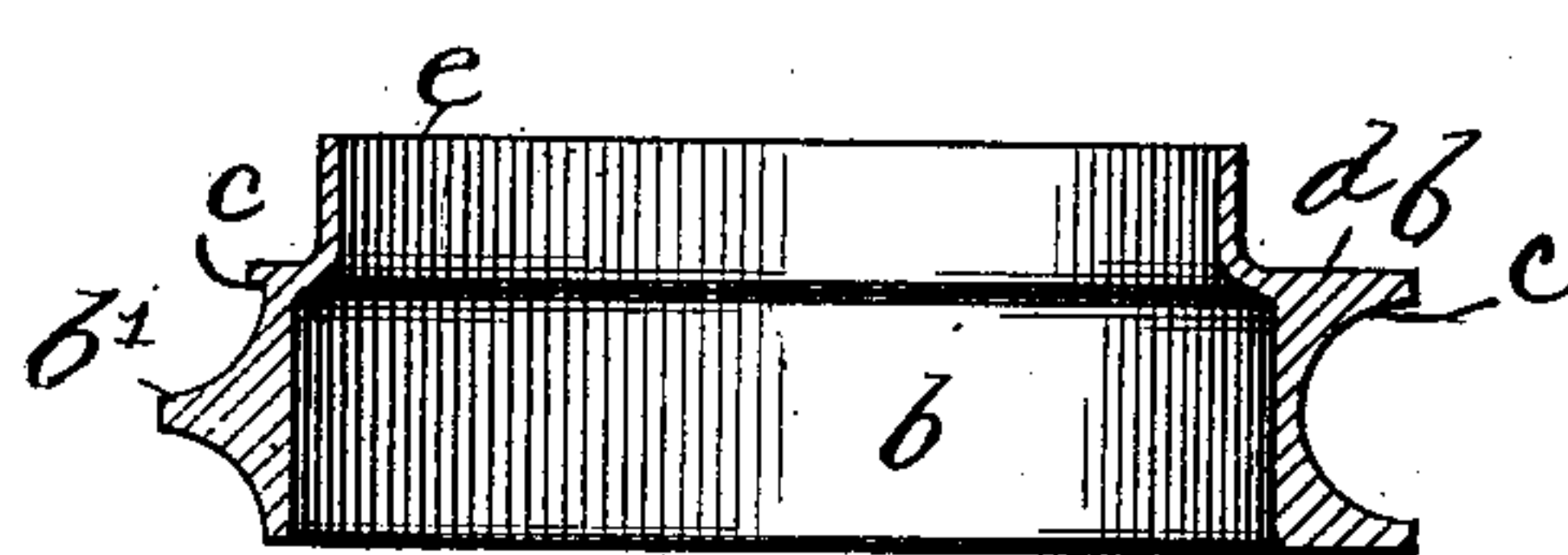
*Fig. 7.*



*Fig. 8.*



*Fig. 9.*



Witnesses:  
Ray White  
Harry C. White

By

Inventor:  
Otto Roderwald  
H. Zimmerman  
Atty.



# UNITED STATES PATENT OFFICE.

OTTO RODERWALD, OF CHICAGO, ILLINOIS.

## LIQUID-COOLER.

SPECIFICATION forming part of Letters Patent No. 747,641, dated December 22, 1903.

Application filed January 8, 1903. Serial No. 138,257. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO RODERWALD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Liquid-Coolers, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 shows my said new liquid-cooler in elevation with its outer shell in central longitudinal section. Fig. 2 shows said device in central sectional elevation. Fig. 3 shows an end plate or head end in plan, as seen interiorly. Fig. 4 shows the bottom end or head in elevation. Fig. 5 shows a central vertical section taken through an inlet-pipe. Fig. 6 shows a top view of the removable ends of the spiral worm; and Fig. 7 shows Fig. 6 from its opposite end, as if revolved on the cutting-plane  $x x$  of Fig. 6. Fig. 8 shows Fig. 6 in elevation; and Fig. 9 shows a central sectional elevation through Fig. 6, as indicated by the cutting-plane and arrows.

Like reference-letters denote like parts throughout.

The object of my invention is to improve and cheapen the construction of that class of liquid-coolers in which the cooled liquid passes through coils of pipe in a refrigerant. To attain said end, I construct my said new device in substantially the following manner, namely: To the ends of the cylindrical shell or part  $a$  whereof the surface is formed into a semicylindrical worm, as shown, are fitted removable end pieces  $b$ , which are provided with a spiral part  $b'$ , adapted to fit closely within the ends of the shell  $a$  and to screw into each of its ends up to a shoulder  $c$ , which fits closely upon the ends of the shell or worm  $a$ , as clearly indicated in Figs. 1 and 2. Said shoulder  $c$  forms the outer and lower edge of an axially-transverse plate  $d$ , integral with said spiral portion, and upon the outer surface of said plate and as an integral part thereof is a smooth cylindrical end portion or neck  $e$ , whereof the ends rest within grooves  $f$  in the counterpart ends  $g$  of my said device. There is a transversely-cylindrical groove  $i$  in said ends  $g$ , and outside thereof is a channel  $h$ , into which fits the outer and straight cylindrical jacket  $j$ , which also fits closely upon the spiral edges of the groove or worm of the shell  $a$ . The rings  $g$  have arms  $m$ ,

holding a hub  $n$ , whereof the lower one is threaded to receive and fixedly hold the end of the threaded rod  $o$ , but the opposite and threaded end of said rod passes freely through the upper hub and is there provided with a nut  $p$  on a hand-wheel  $p'$ . The upper opening  $l$  is set at an angle of forty-five degrees to the plane of the plate to enable easier handling of the wheel  $p'$ , while the other end of the cooler at  $k$  may be at right angles to its plane, as shown, or it may have any other convenient direction. As the liquid may be passed into either end and out at the opposite one, as convenient, either  $k$  or  $l$  may be the entrance into the worm.

The arms  $m$  admit both water and ice to the interior of the cylinder  $a$ , and thus both the interior and exterior of the worm-cylinder may be exposed to said or any other refrigerant, and the work may thereby be correspondingly expedited.

The object of forming the ends  $b$  as shown is to enable me to more easily form a watertight joint in the ends  $g$ , which is very difficult when made integral with the part  $a$ , especially when said part is made of sheet metal.

For the purpose of quickly and correctly placing the end of collar  $e$  into the channel  $f$  the wall  $g$  is extended and provided with a rounded outer face  $r$  for the purpose of causing the neck  $e$  to slip easily over and quickly and certainly to its place, a feature of much importance when the device must be taken apart and cleaned frequently, as when beer and like liquids are cooled in this device. When the spirally-grooved shell  $a$  is correctly assembled to the heads or ends  $g$ , the correct position of the remaining parts follows inevitably.

What I claim is—

In a liquid-cooler, the combination of a spiral shell, a head having an annular groove in its inner face, and an end piece having a spiral projection on its outer side internally engaging the spiral of the shell and an annular shoulder fitting against the end of the shell and provided with a cylindrical neck beyond said shoulder fitting within the annular groove in the head.

OTTO RODERWALD.

Witnesses:

WM. ZIMMERMAN,  
HARRY R. L. WHITE.