

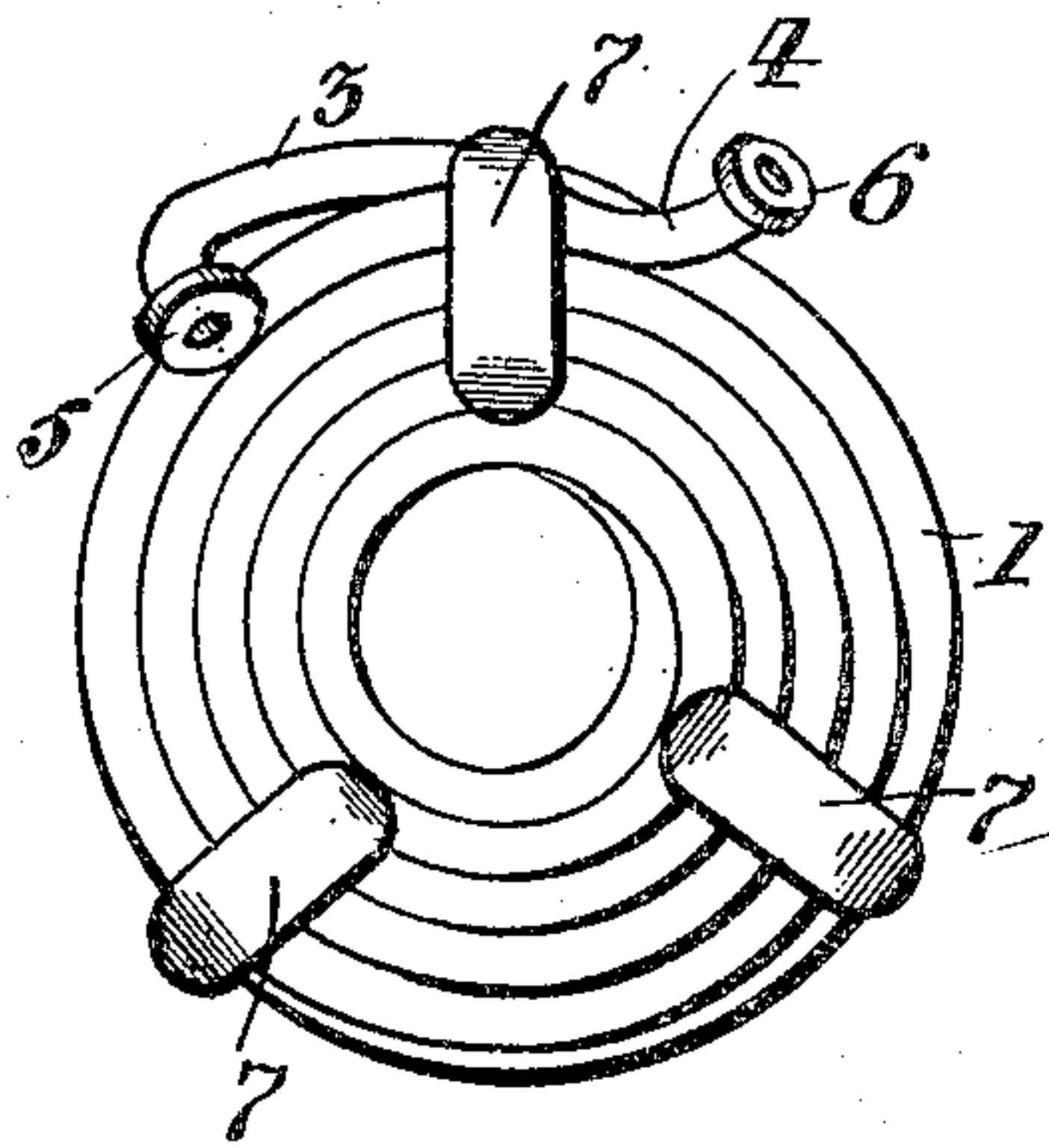
No. 793,447.

PATENTED JUNE 27, 1905.

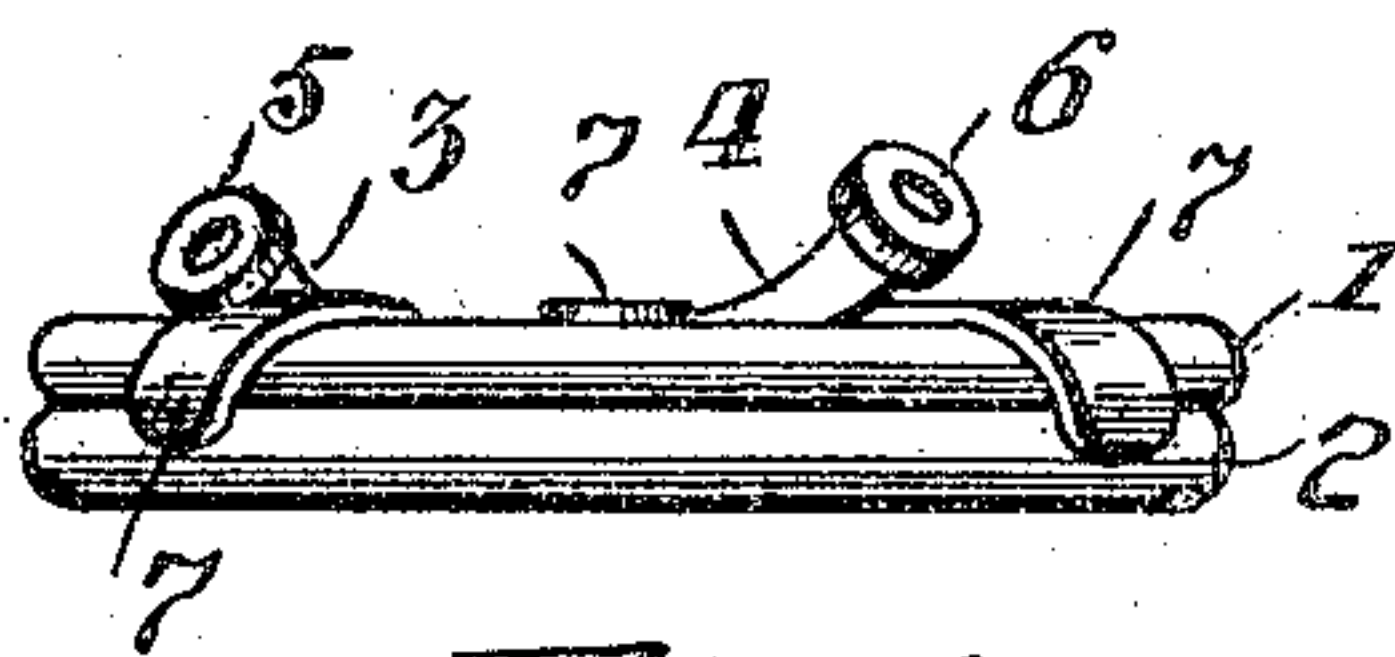
J. KIDD & A. BERNIER.

COOLING COIL.

APPLICATION FILED MAR. 31, 1904.



*Fig. 1.*



*Fig. 2.*

*Witnesses:*  
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# UNITED STATES PATENT OFFICE.

JOHN KIDD AND AUGUSTUS BERNIER, OF STEUBENVILLE, OHIO.

## COOLING-COIL.

SPECIFICATION forming part of Letters Patent No. 793,447, dated June 27, 1905.

Application filed March 31, 1904. Serial No. 200,991.

*To all whom it may concern:*

Be it known that we, JOHN KIDD and AUGUSTUS BERNIER, citizens of the United States of America, residing at Steubenville, in the county of Jefferson and State of Ohio, have invented certain new and useful Improvements in Cooling-Coils, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to cooling-coils such as are adapted to be used in refrigerators and other apparatus of like character, and has for its object the provision of a cooling-coil of novel character.

Cooling-coils as ordinarily constructed are composed of metal, usually of tin, copper, or an alloy, and these coils are objectionable for the reason that the metal of which they are composed is liable to be acted upon by the fluid passed therethrough, which results in the contamination of the fluid and the ultimate destruction of the coil.

In carrying our invention into effect we form the coil wholly of ceramic material, such as earthenware or porcelain, and we fuse the contacting surfaces of the several convolutions together and to the supporting-straps, so that the coil and the supporting-straps when completed are substantially integral blocks or masses of ceramic material.

In the accompanying drawings we have shown the improved coil which constitutes the novel article constituting the subject-matter of the present invention, Figure 1 being a top plan view, and Fig. 2 a side elevation, of the same.

In the manufacture of our improved coil we mix a batch of material suitable for the manufacture of porcelain or earthenware, and from this material we form a straight pipe, the pipe being formed in a machine of the usual and well-known character ordinarily employed for this purpose, and we then coil this pipe by hand, preferably to the form shown in the drawings—that is, in the form of a double volute, one layer or coil above the other, and with the ends of the pipe projecting above the upper coil. The coils so formed are braced and strengthened by means of radially-arranged curved straps, which

overlap the upper layer of the coil and extend down to and partly around the lower layer, these straps being formed in a suitable mold and of the same material as the coils. In applying the straps to the coils we mix a quantity of the ceramic material of which the coils and straps are composed with water, so as to produce a solution of the proper consistency, and we apply this solution or mixture to the straps, and preferably to the entire surfaces of the coils. Having placed the straps in proper position on the coils, we place the latter in a furnace and subject them to a temperature which will bake the coil and the straps into the form of earthenware or porcelain. After the coils have been baked, which operation will cause the surfaces of the coils and straps to fuse together, owing to the fusion of the mixture which has been applied, as before stated, to their surfaces, we remove them from the furnace and allow them to cool. After the coils have been cooled we dip them in or otherwise coat them and the straps with a suitable glazing material, and we also pass this glazing material through the coils, so as to coat the inner walls of the same, and we again place the coils in the furnace and fuse the glazing material upon the exterior and interior of the coils and upon the straps.

In the drawings the coil is composed of the upper and lower volute layers 1 and 2, these layers, it is to be understood, being formed of a continuous length of pipe. 3 and 4 designate the ends of the coil, which are formed previously to the first baking of the coils with collars 5 and 6, these collars serving for the attachment of the pipes by means of which the fluid to be cooled is conducted to and from the coils. 7 7 7 designate the straps, which are placed upon the top of the upper layer 1 of the coil and are formed with downwardly-inclined ends, which overlie and embrace a portion of the lower layer 2, and which, as before described, are cemented to the coils during the process of baking the same. The coils so constructed are rendered strong and durable by the adherence of the abutting surfaces and by the straps 7 7 7, and not being acted on by the fluid which passes through



them are preferable to the metallic coils commonly used.

Having described our invention, we claim—

1. As a new article of manufacture, a tubular section of porcelain or earthenware coiled to volute form, and with the adjacent surfaces of the several convolutions fused together.
2. As a new article of manufacture, a coil composed of a tubular section of ceramic material having exteriorly-arranged straps overlapping the convolutions of the coil and fused thereto.
3. As a new article of manufacture, a tubu-

lar section of ceramic material formed in a single piece and in two convolute coils, imposed one on the other, the several convolutions of each coil being fused together and the two coils being fused one to the other.

In testimony whereof we affix our signatures in the presence of two witnesses.

JOHN KIDD.  
AUGUSTUS BERNIER.

Witnesses:

J. A. HUSTON,  
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