No. 817,253. PATENTED APR. 10, 1906.

G. M. KNEUPER.

FILTER.

APPLICATION FILED NOV. 30, 1904.

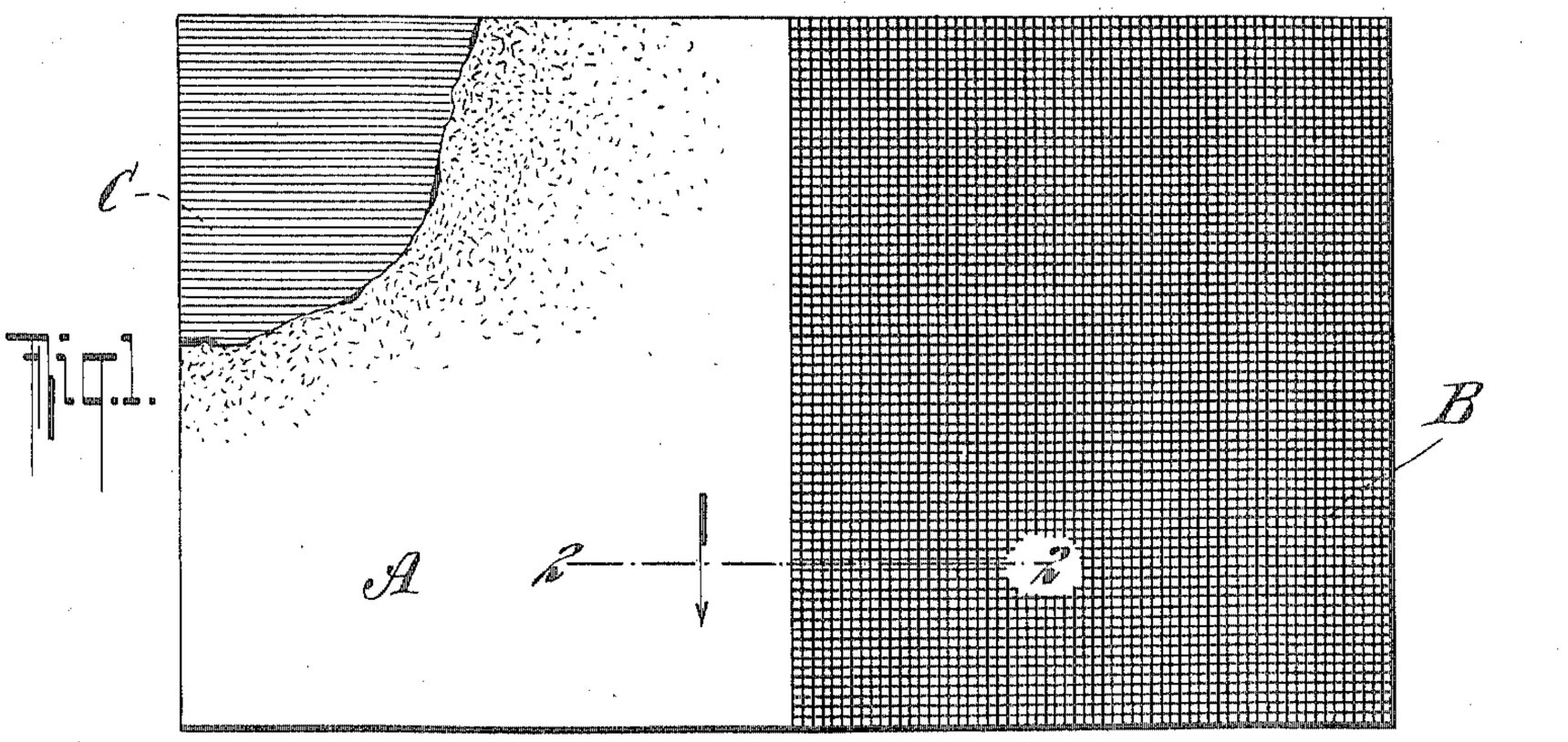

Fig. 1.

Fig. 2.

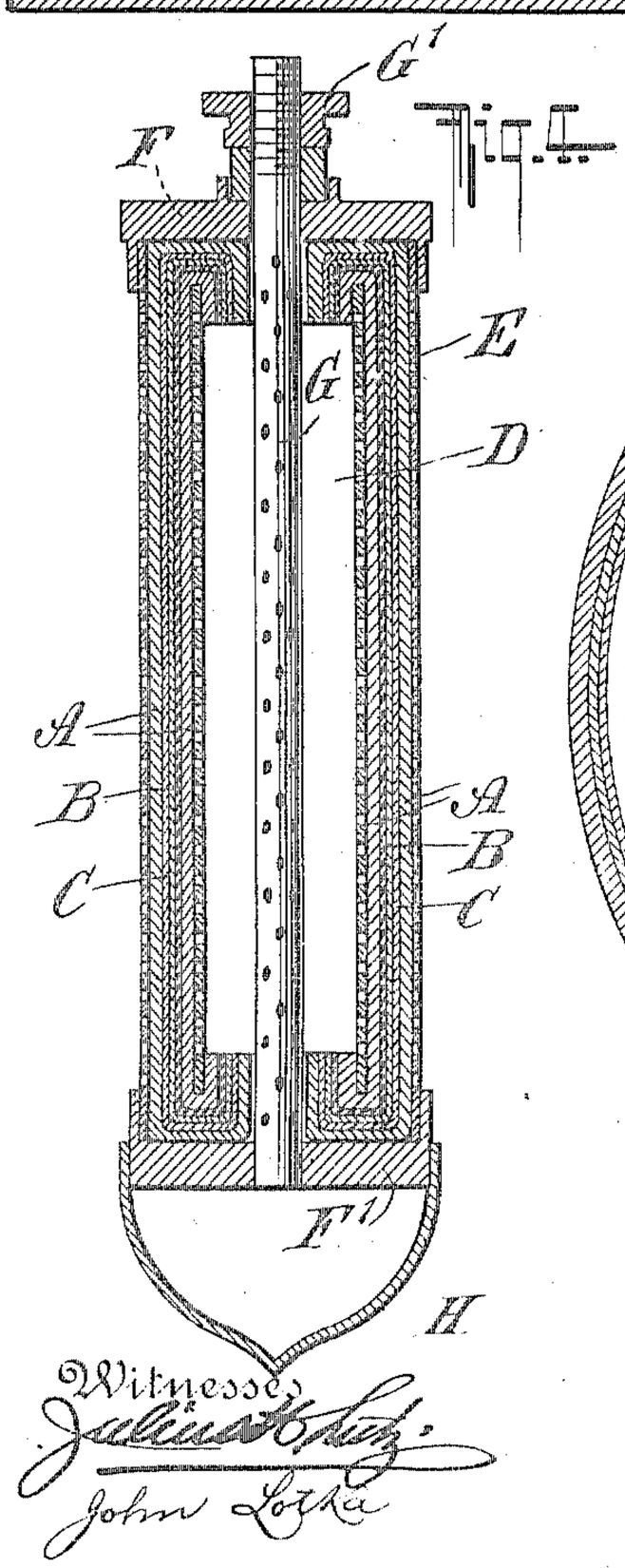

Fig. 4.

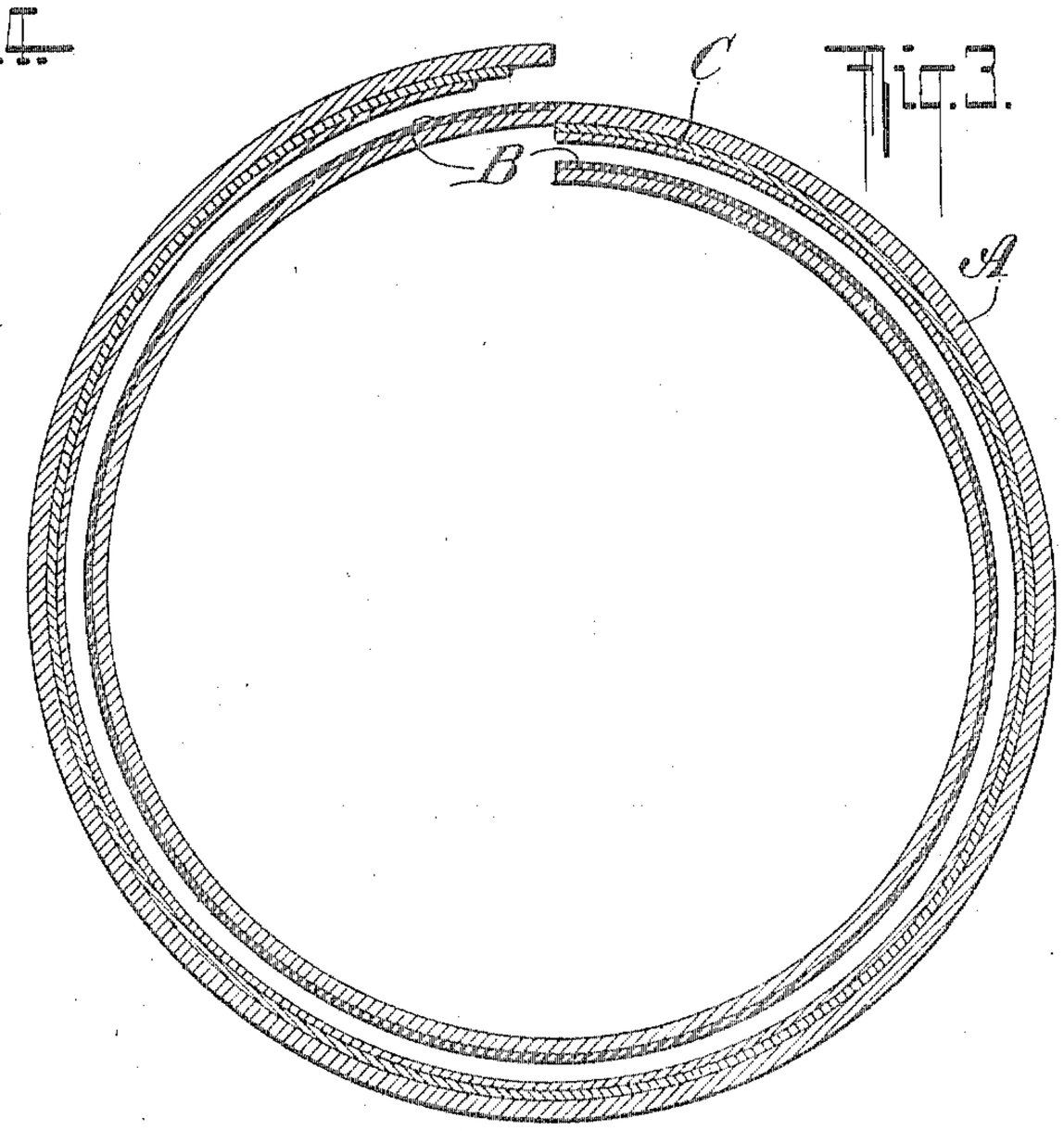

Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE M. KNEUPER, OF NEW YORK, N. Y.

FILTER.

No. 817,253. Specification of Letters Patent. Patented April 10, 1906.

Application filed November 30, 1904. Serial No. 234,858.

To all whom it may concern:

Be it known that I, GEORGE M. KNEUPER, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Filters, of which the following is a specification.

My invention relates to filters, and has for its object to provide an extremely efficient filter; and it consists more particularly in a new filtering material which can be made in the form of sheets to be wrapped around a suitable holder.

The characteristics and advantages of the invention will be fully set forth hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a face view of my improved filtering material with a portion broken away. Fig. 2 is a partial cross-section on line 2 2 of Fig. 1. Fig. 3 shows the new filtering material in substantially its wrapped condition, and Fig. 4 is a sectional elevation of a complete filter embodying my invention.

I employ suitable flexible porous carrier A, such as a sheet of cotton batting, upon one side of which and preferably only on about one-half of that surface I apply a coating B, containing a filtering substance. This coating may consist, for instance, of calcium phosphate, twelve parts, by weight; charcoal, twelve parts, by weight; gum-tragacanth, one part, by weight. In the other half of the other side of the carrier A, I may apply one, two, or more layers C of a flexible porous material of a closer texture than the carrier A—for instance, paper.

In using the filtering material prepared as above described I may, for instance, take a perforated cylinder D, made of sheet metal and of a length somewhat smaller than the width of the sheet or carrier A, and on this cylinder I wrap the sheet, beginning with that portion on which the coating B has been applied. The sheet should be of such length as to go around the cylinder D at least twice, as has been shown in Fig. 3. As a result of this, the coating B, containing the filtering substance, will lie against the paper or other material C, it being understood that the sheet is so wrapped on the cylinder D as to have the coating B on the outside of the first layer. The projecting edge portions of the sheet are then folded inward, as shown in Fig. 4, and the structure, consisting of the cylinder D with the filtering material wrapped around it, is put into another perforated cylinder E, which is of greater diameter than the cylinder D and also slightly longer. The cylinders are then fastened between two heads F F′, as by means of a nut G′, fitting on a screw-threaded portion of the pipe G, which passes loosely through the head F and is fastened in head F′. The body portion of the pipe G is perforated, as shown, so as to allow the liquid to be filtered to be introduced and forced into the central chamber surrounded by the cylinder D. The liquid then passes out through the filtering material and the cylinders D E and is collected and led off in any suitable manner—for instance, by letting it run down a guide H. During the passage of the liquid the coating B is partially or entirely transferred from the outer surface of the first layer of the filtering material to the inner surface of the second layer—that is, to the paper C in case such paper is used. The gum-tragacanth being a soluble substance is gradually carried away; but this is without effect on the filtering action, since said gum is used only as an initial binder.

My improved filtering material will remain efficient for a very long time and may then, if desired, be cleaned, as by brushing it; but in most cases it will be found more convenient to simply discard the spent filtering material and substitute a new sheet.

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

1. A filtering material consisting of a porous flexible carrier, which on one half of one of its surfaces, is provided with a coating containing a filtering substance, and on the other half of the other surface is provided with a

porous flexible material of greater density than the carrier proper.

2. A filtering material consisting of a porous flexible carrier, coated with a compound containing charcoal and gum-tragacanth.

3. A filtering material consisting of a porous, flexible carrier A, coated on one half only of one surface with a compound B containing a filtering substance and adapted when coiled to have the carrier A embrace the compound B on both sides.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE M. KNEUPER.

Witnesses:

JOHN LOTKA,

JOHN A. KEHLENBECK.