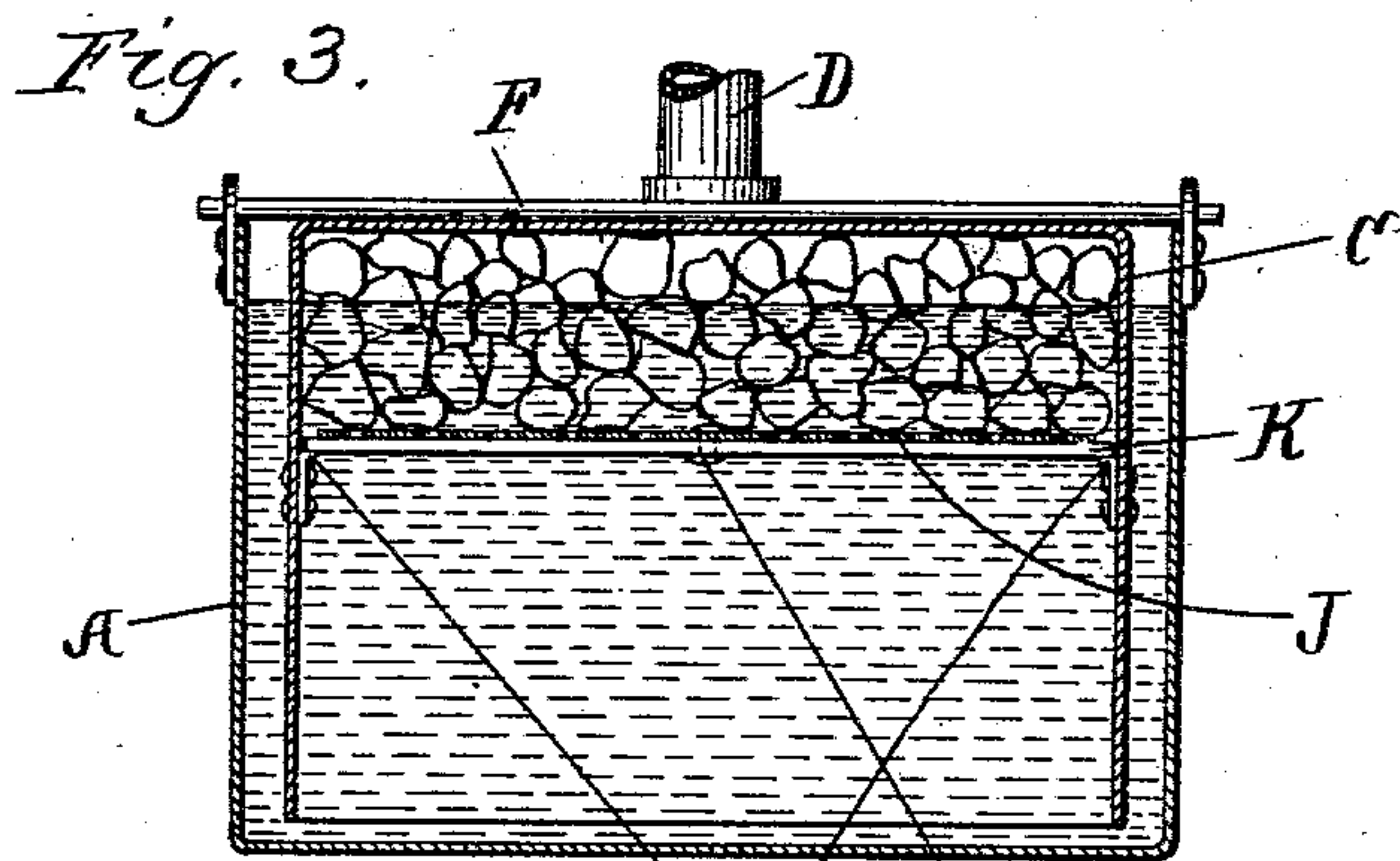
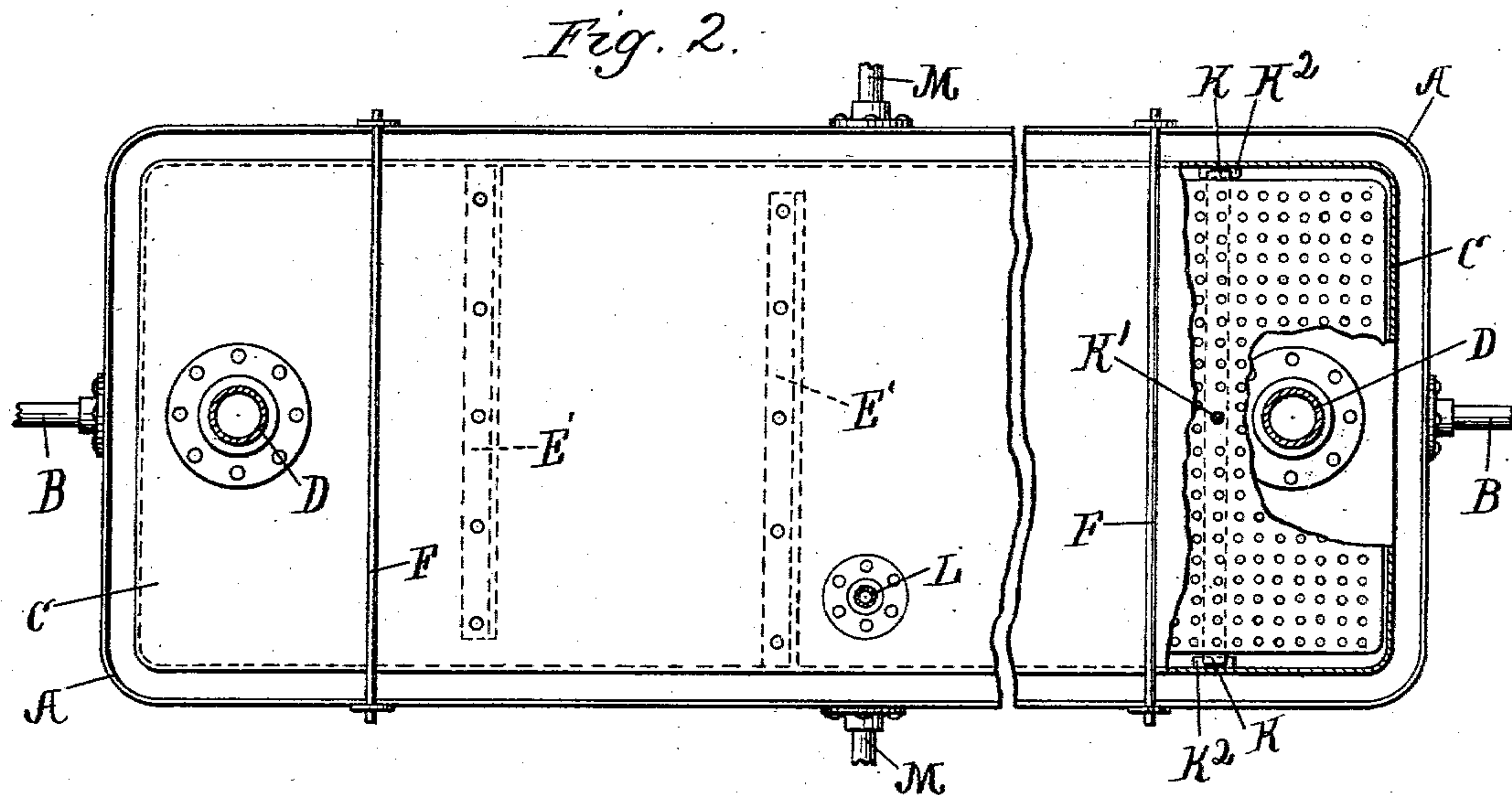
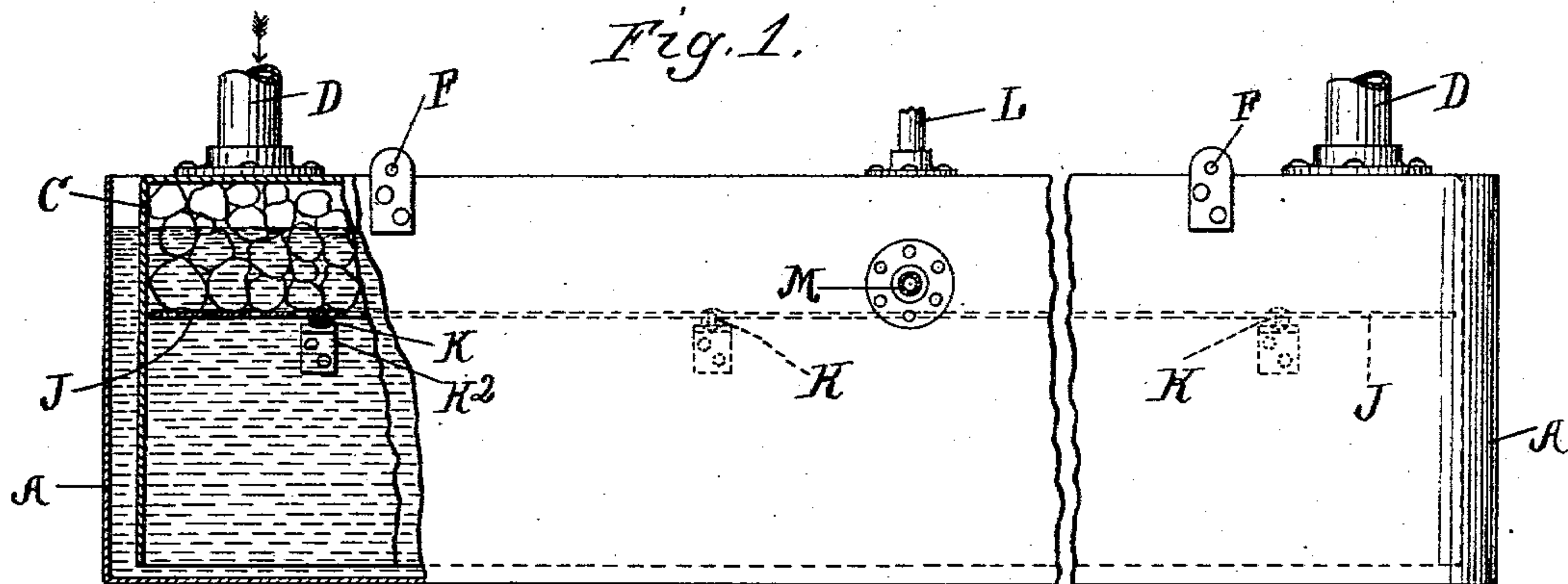


C. I. TENNEY.
APPARATUS FOR PURIFYING GAS.

APPLICATION FILED DEC. 29, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.
Edward T. Wray.
Weston B. Kagar.

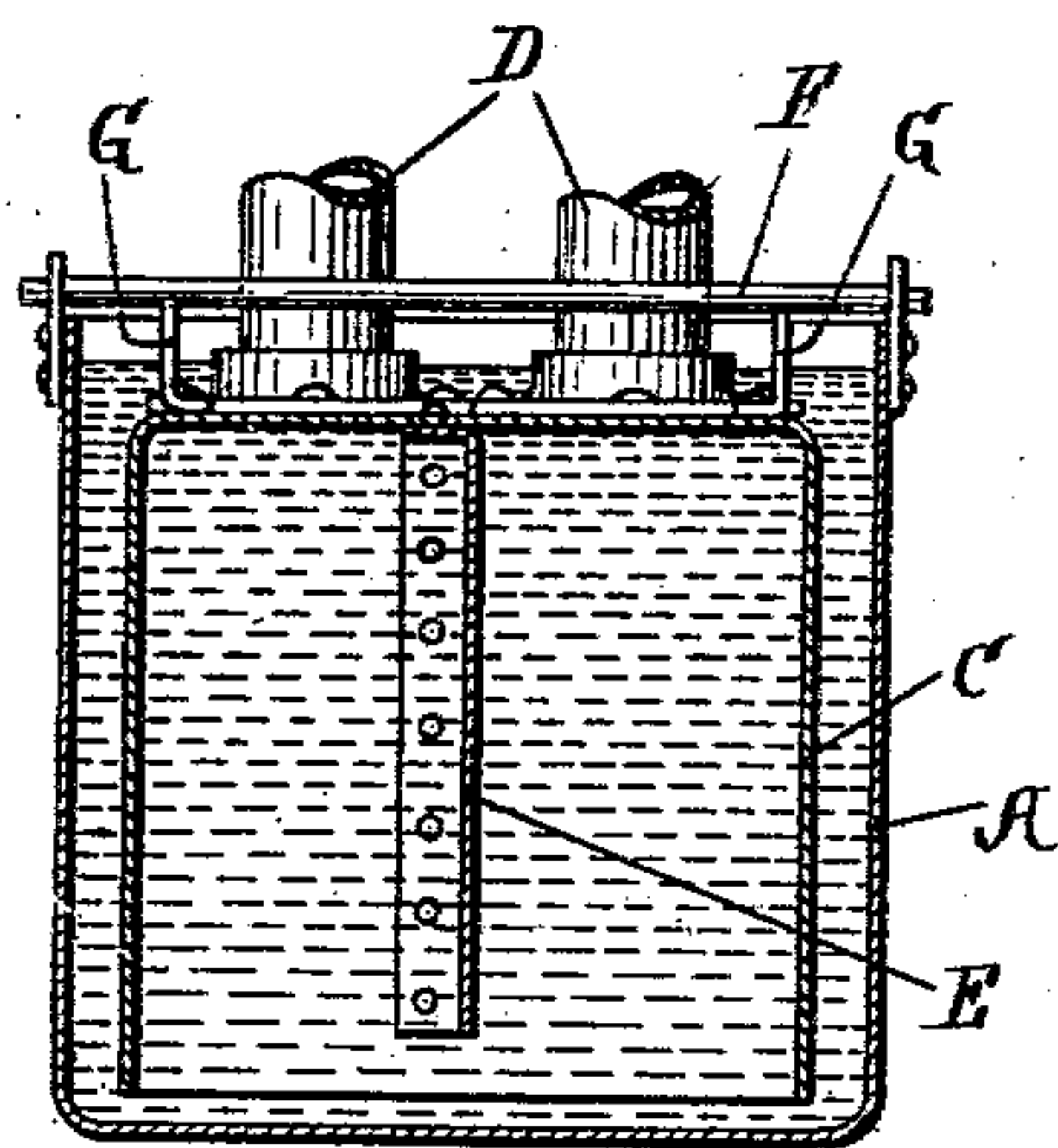
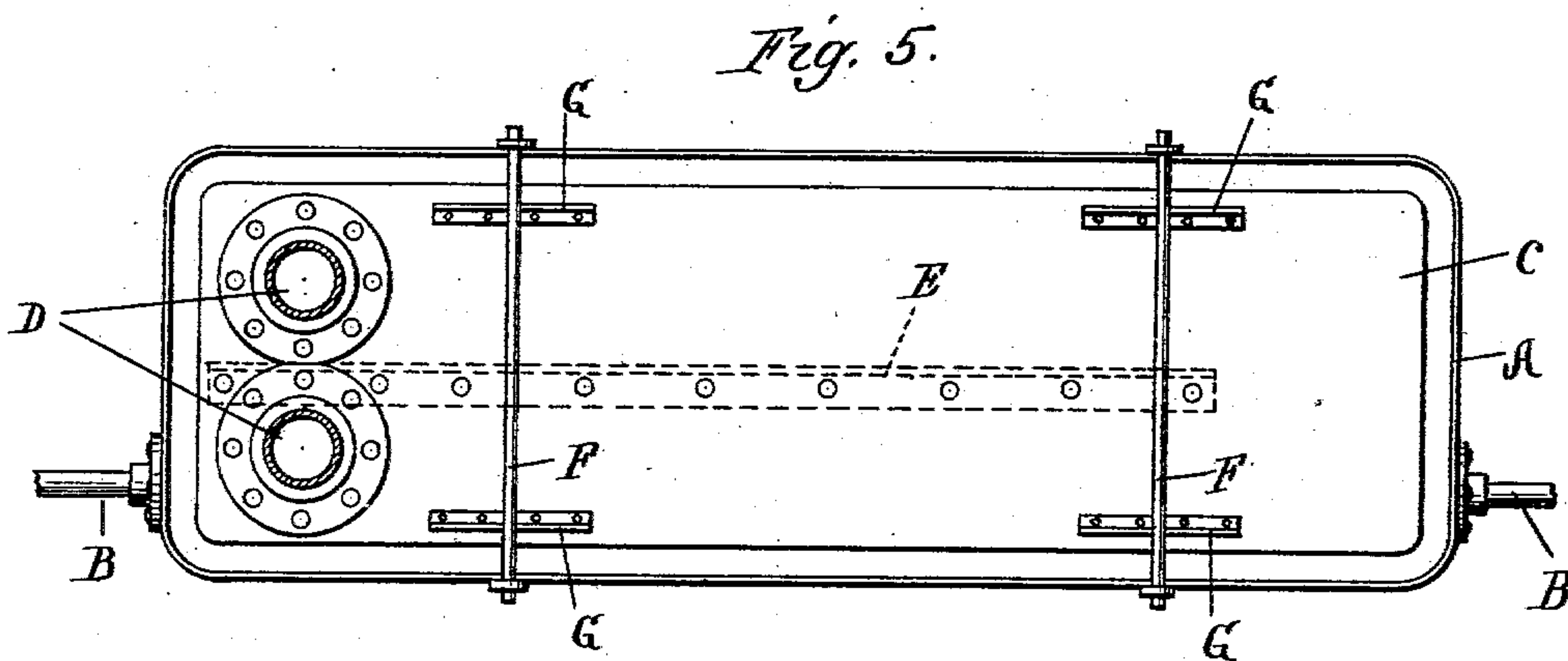
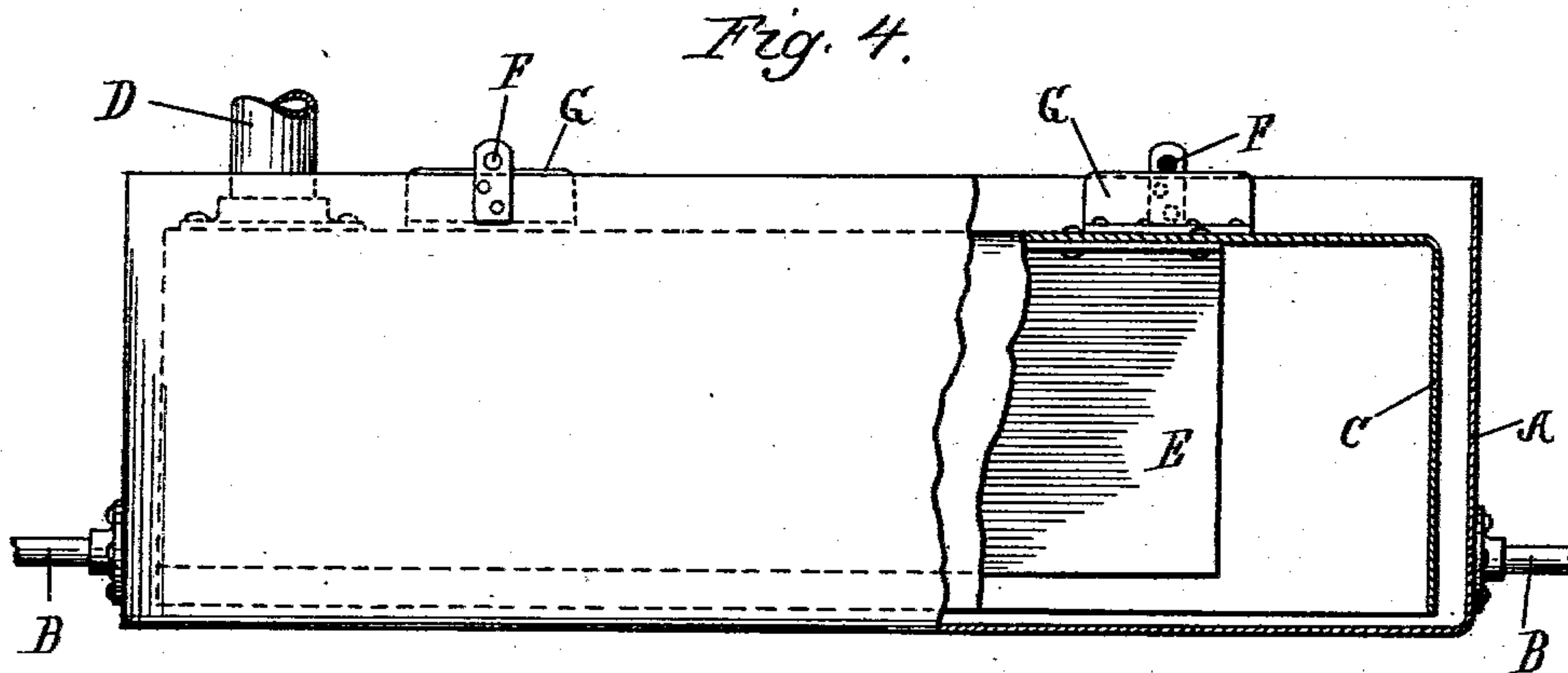
Inventor.
Charles I. Tenney.
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APPARATUS FOR PURIFYING GAS.

APPLICATION FILED DEC. 29, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses.

Edward T. Wray.
Nestor B. Hazen.

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UNITED STATES PATENT OFFICE.

CHARLES I. TENNEY, OF MASON CITY, IOWA, ASSIGNOR TO PRACTICAL GAS CONSTRUCTION COMPANY, OF NORTH CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

APPARATUS FOR PURIFYING GAS.

SPECIFICATION forming part of Letters Patent No. 743,591, dated November 10, 1903.

Application filed December 29, 1902. Serial No. 136,979. (No model.)

To all whom it may concern:

Be it known that I, CHARLES I. TENNEY, a citizen of the United States, residing at Mason City, in the county of Cerro Gordo and State of Iowa, have invented a certain new and useful Improvement in Apparatus for Purifying Gas, of which the following is a specification.

My invention relates to an apparatus for scrubbing or cleansing gas and to the features of construction of the apparatus intended to perform one or both of these functions.

I have illustrated my invention by two forms of apparatus, in one of which a somewhat circuitous pathway for the gas is provided and in the other of which the gas is carried through a cleansing material like coke either through the water or not.

Figure 1 is a side view of my apparatus with parts broken away. Fig. 2 is a plan view of the same with parts broken away. Fig. 3 is a cross-section. Fig. 4 is a side view with parts broken away, showing a modification. Fig. 5 is a plan of same. Fig. 6 is a cross-section of same.

In the drawings like parts are indicated by the same letter throughout.

A is an exterior tank provided with circulating-pipes B B, which open thereinto. The position of these pipes is not material.

C is an inner inverted tank or a tank opening downwardly within the other tank. It is provided with two pipes D D, which open into it from above, which pipes may be placed side by side or one at one end and the other at the other end of the tank, as determined by the diaphragm E, which if placed within the tank C divides the same into two sections, and the pipes D D can then be placed side by side, as indicated in some of the figures. The tank C may be held within the tank A by means of the cross-pieces F F, against which the upper portion of the tank may bear, as indicated in Fig. 2, or against which the upwardly-projecting pieces G G of the tank C may bear, as indicated in Figs. 4 and 6.

For convenience I have separated the several features of my invention; but it is obvious that the charcoal or the like could be used in

the device of Figs. 4, 5, and 6 and also that the diaphragm of Fig. 6 could be used in the device of Figs. 1, 2, and 3. In this latter case of course there will be a modification of the diaphragm which supports the charcoal. This diaphragm J is supported upon cross-pieces K, which are pivoted to it at K' and which are adapted to be received upon the lugs K² at the side, thus to hold in the charcoal or other material.

I do not wish to be limited to the precise construction shown, as of course my devices can be considerably varied without departing from the spirit of my invention and some of the features of my invention may be used without employing the others.

In Fig. 2 I have shown in dotted lines diaphragms E' E', similar to the diaphragm E, though in this case they will be shorter, not extending below the perforated diaphragm J. For cleansing the tank I have also shown the pipes L and M M, the latter opening into the sides of the tank A and the former into the top of the tank C. By forcing water through the pipe L it will pass downwardly through the charcoal and outwardly through the two side pipes M M, thus carrying with it the impurities contained in the charcoal. The current of course can be reversed, as is the case with all the other pipes suggested.

In cleansing gas it is desirable to remove from it the impurities which it contains, but not to cause it to absorb any great quantity of water. In passing gas for the purpose of thus purifying it through a body of water the tendency for the gas to absorb such water is increased in proportion to the water-pressure on such gas. It is for this reason that the gas, which is purified by passing into the bottom of a body of water and allowing it to escape at the top, is heavily charged with moisture. One object of my invention is to prevent this by causing the gas to make a considerable circuit or travel through the water, but in the very upper strata thereof, so that it will be purified by the effect of the water without having to overcome the water-pressure or be subjected thereto, so as to become heavily charged with moisture.

The use and operation of my invention are as follows: It is necessary in such constructions to have a seal, as it were, and this I provide by having the inner tank, through which
 5 the gas is passed, inverted in the outer tank, which may be practically full of water. The gas passing through the upper portion of the inner tank is of course retained by this water seal. One of the features of my invention
 10 is to pass the gas through a cleansing material, such as coke or the like, and this I can do either by passing it through the inner tank C under the water or through the upper portion thereof and above the water surface, but
 15 through the coke. In other words, the water may be maintained at any desired level. If it is desirable to pass this gas through a circuitous route, either with or without passing through charcoal, it may be done by providing the diaphragm of Fig. 2 or the diaphragm
 20 of Fig. 6. In either case charcoal may or may not be used, as desired. In such case I prefer to raise the level of the water, so as practically to fill the inner tank. The gas
 25 then is forced in through one of the pipes D and is compelled to travel along the very top of the inner tank or in connection with the uppermost layer of water in such tank around the edge of the diaphragm or diaphragms,
 30 thence to the outlet-pipe D. When I rely upon the water alone, as suggested in Figs. 4, 5, and 6, it is more important to have the diaphragm than the circuitous path. In Fig. 5, for example, the gas passes down the side
 35 of the tank on one side of the diaphragm and back on the other. This is what is called the "process" of scrubbing the gas. The purifying, or "cleansing" process, as the word is commonly used, is carried out more especially
 40 by the charcoal. The charcoal-cleansing will take place whether or not the diaphragms be

used, although they may be useful in lengthening the travel of the gas. The perforated diaphragm J is held in position by the cross-bar, and when desired the cross-bar K can be
 45 turned and the perforated diaphragm be free, so that the charcoal can be removed. The charcoal can be cleansed by forcing water through it by means of the pipes shown in Figs. 1 and 2. I do not show the controlling-
 50 valves for the several pipes; but they will of course be understood as being properly positioned.

The route along which the gas is to travel is horizontal, and it passes, preferably, through
 55 the upper layers of water in the inner tank, or if the inner tank be not quite full of water then through the charcoal only in the inner tank.

I have spoken of the "exterior" and "interior" tank, but do not wish therefore to be understood as indicating that they are detached elements. The particular form of parts which I have shown is but one of many which could be utilized to produce the desired
 65 result.

I claim—

In a gas cleansing and purifying apparatus the combination of an exterior tank with an interior inverted tank, gas inlet and outlet
 70 pipes connected with the inner tank and means for giving a circuitous horizontal route to the gas passing through the upper part of such inner tank, said means consisting of a downwardly - depending interrupted dia-
 75 phragm, and a layer of cleansing material such as charcoal within such inner tank and within the path of such gas.

CHARLES I. TENNEY.

Witnesses:

F. A. KIRSCHMAN,
 WILLIAM NETTLETON.