

No. 751,886.

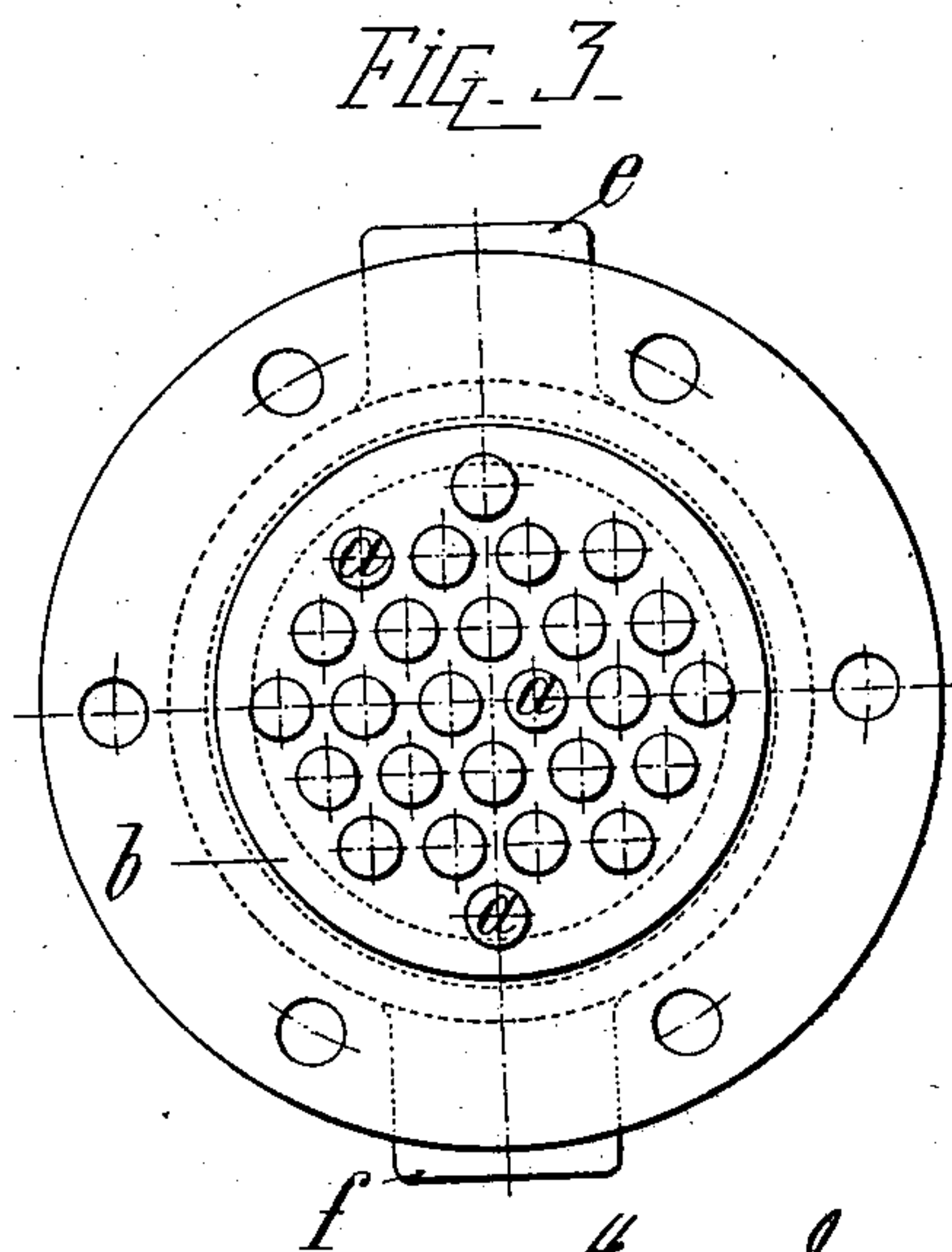
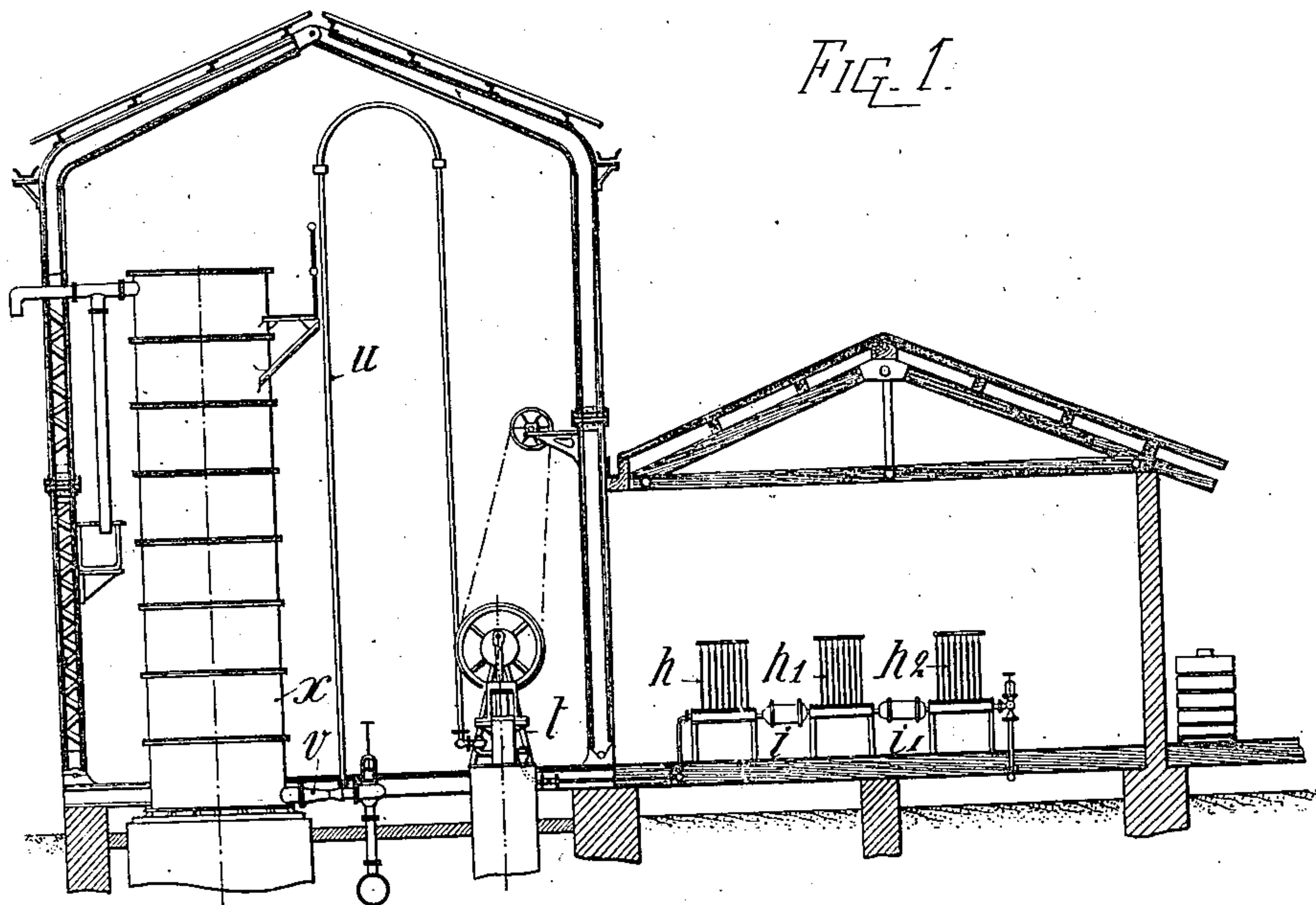
PATENTED FEB. 9, 1904.

H. J. WESSELS.
APPARATUS FOR STERILIZING WATER.

APPLICATION FILED JUNE 22, 1903.

3 SHEETS—SHEET 1.

NO MODEL.



Witnesses:

Wm B. Kerne
Gustave R Thompson

Henry Jacques Wessels Inventor
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3 SHEETS—SHEET 2.

NO MODEL.

FIG. 2

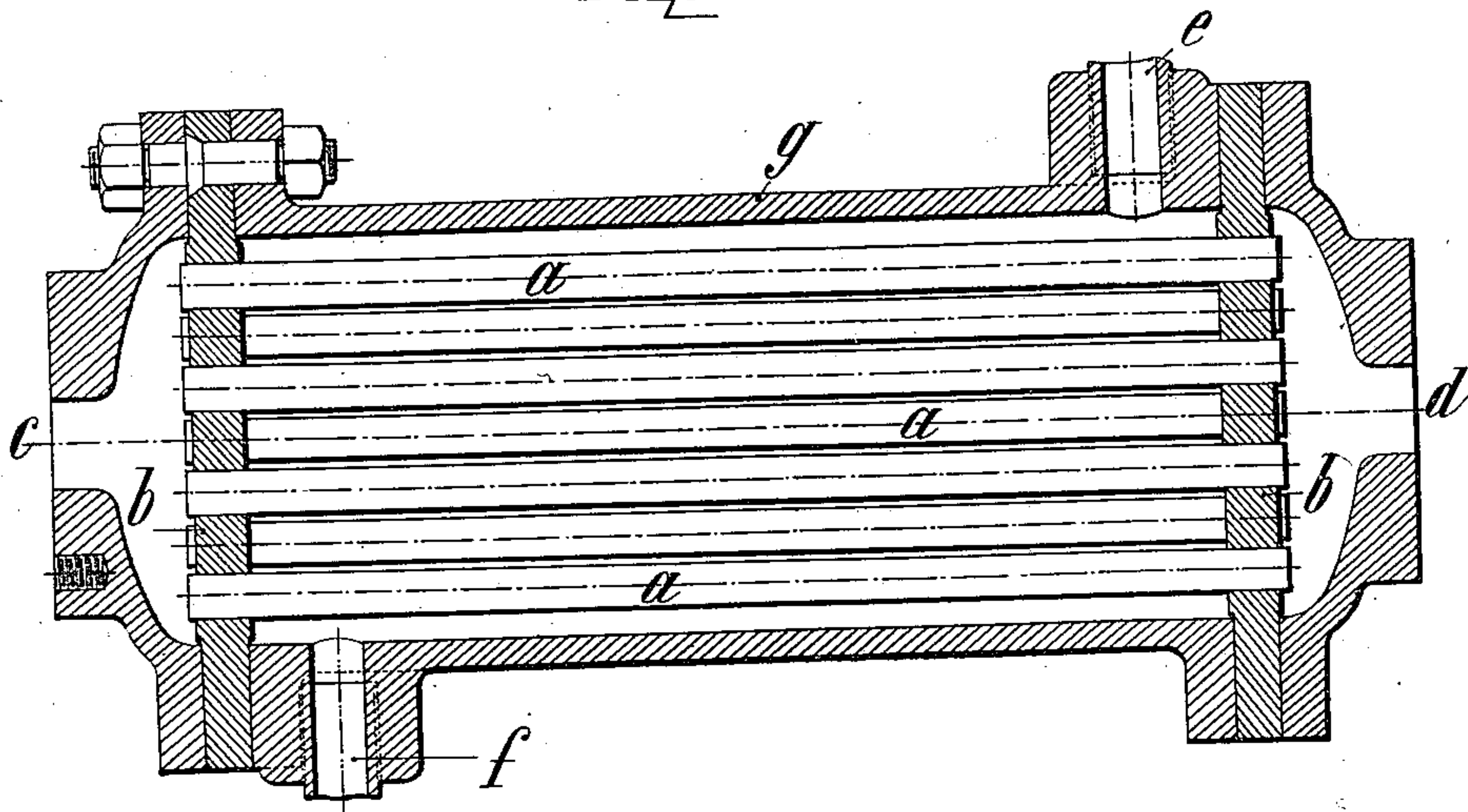
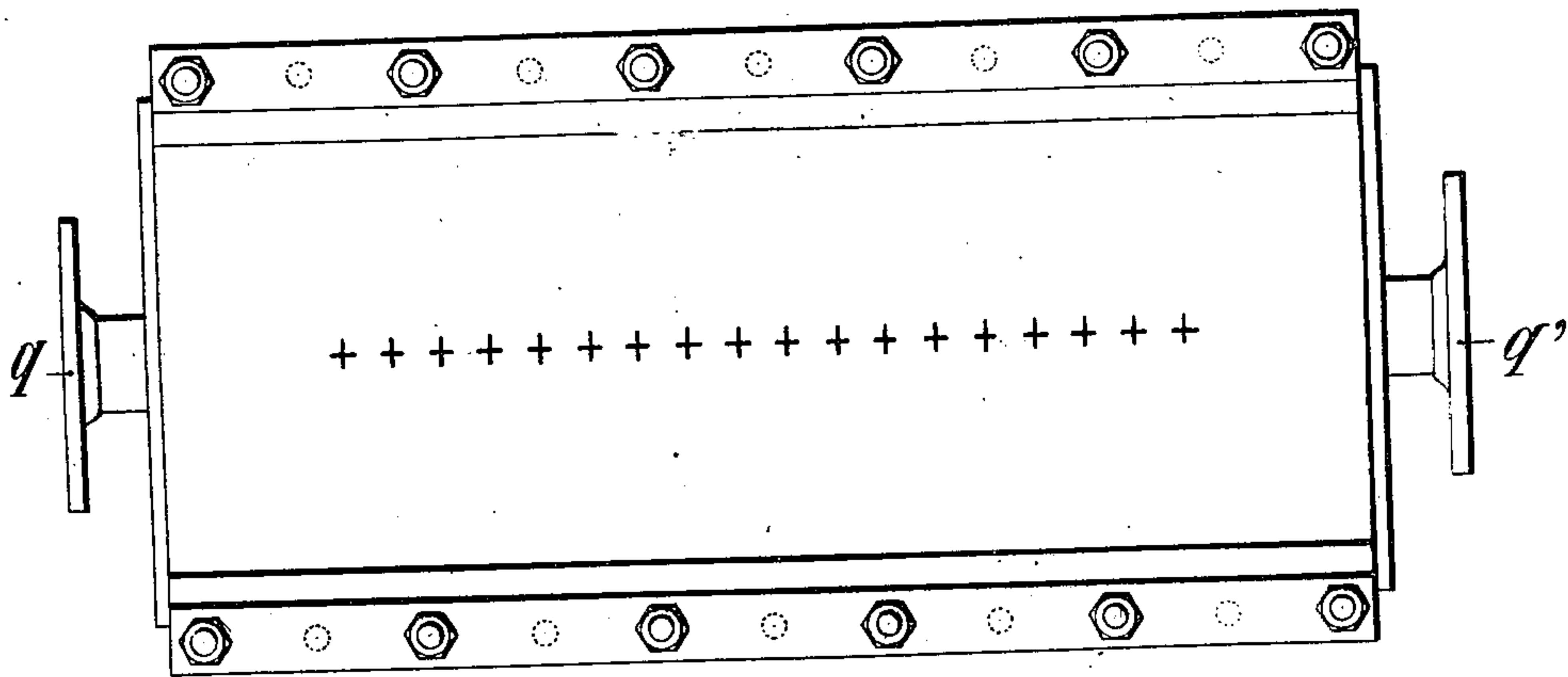


FIG. 5



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NO MODEL.

3 SHEETS—SHEET 3.

FIG. 4.

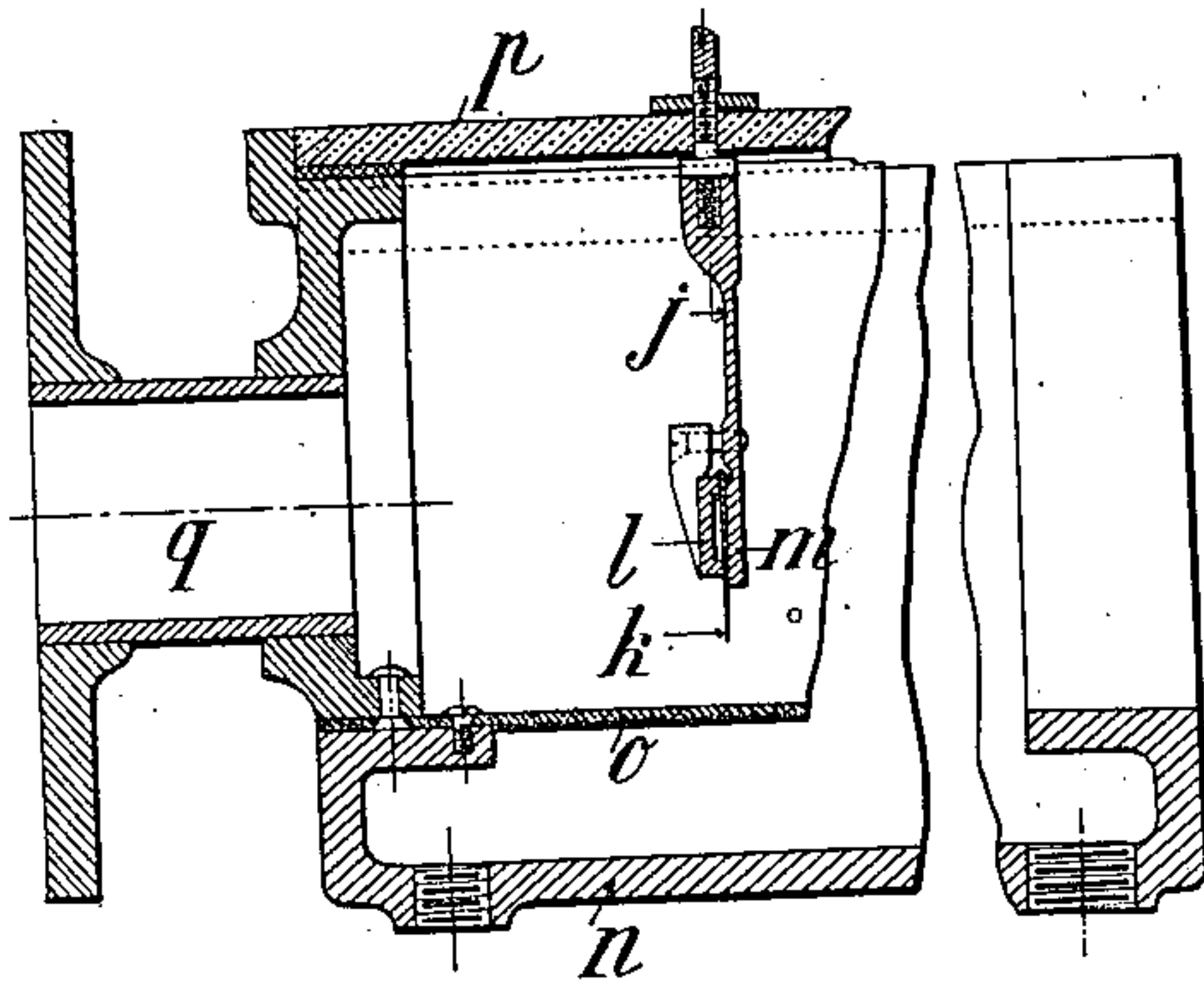
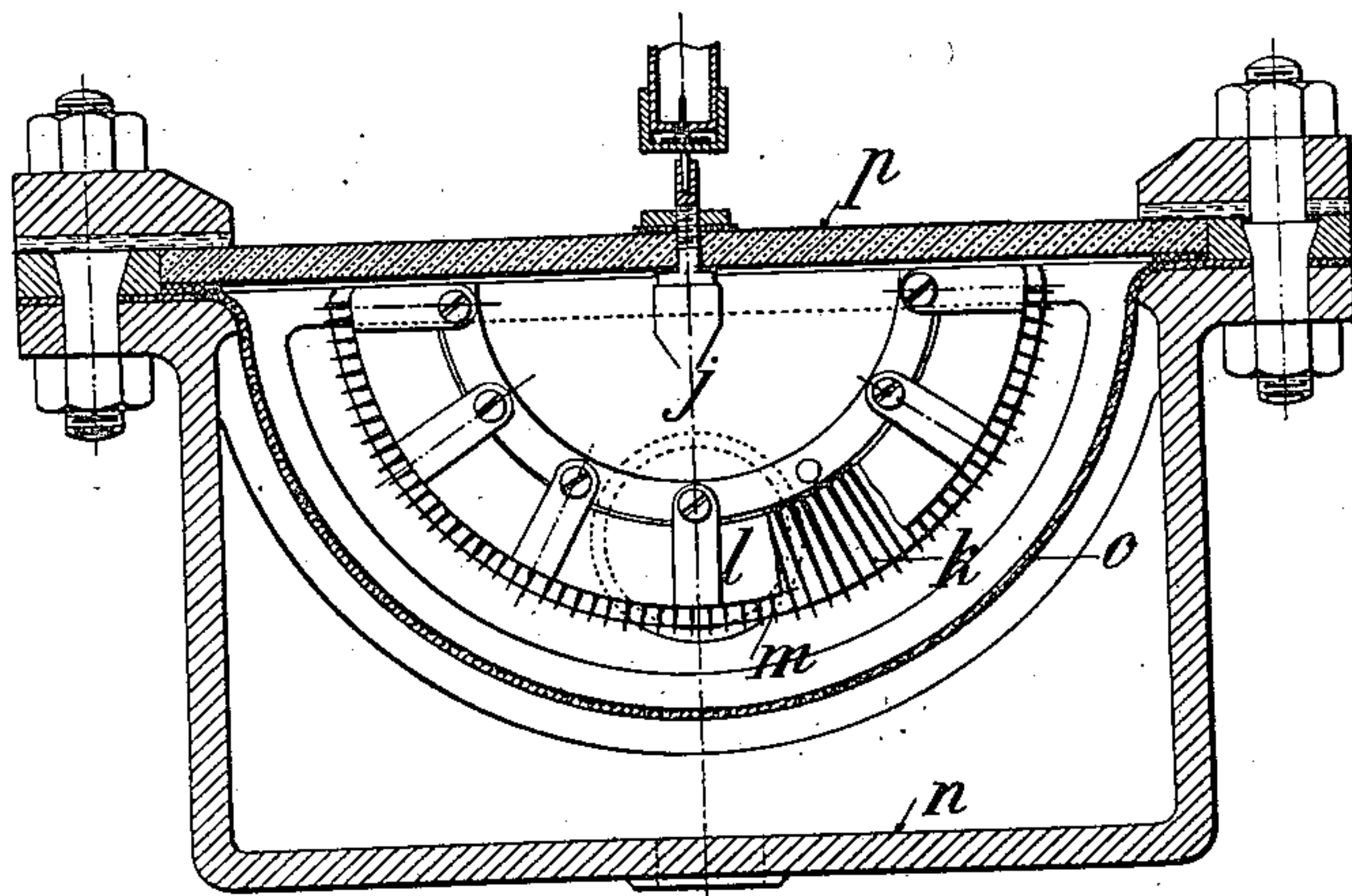


FIG. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY JACQUES WESSELS, OF PARIS, FRANCE.

APPARATUS FOR STERILIZING WATER.

SPECIFICATION forming part of Letters Patent No. 751,886, dated February 9, 1904.

Application filed June 22, 1903. Serial No. 162,637. (No model.)

To all whom it may concern:

Be it known that I, HENRY JACQUES WESSELS, Comte de Frise, a subject of the Queen of the Netherlands, and a resident of Paris, in the Republic of France, have invented new and useful Improvements Relating to Apparatus for the Sterilization of Water, which improvements are fully set forth in the following specification.

This invention has for its object an apparatus for the sterilization of water by means of ozone.

The apparatus is represented, by way of example, in the accompanying drawings.

Figure 1 is a general view of an installation comprising the ozone-producing appliances and the appliances for sterilizing the water. Figs. 2 and 3 are detail views of a cooler or temperature-exchanger arranged between the consecutive ozonizers. Figs. 4 and 5 represent, upon a larger scale, cross and longitudinal sections, respectively, through an ozonizer. Fig. 6 is a diagrammatic view in plan of an ozonizer.

The ozone appliances utilized are of the type of those described in United States patent to Tindal, No. 636,868, dated November 14, 1899, but in which some important modifications have been introduced.

It has been recognized that the air in becoming heated under the action of electric discharges producing ozone did not become ozonized under good conditions. In order to reduce this air to the temperature which it should not exceed during the ozonizing process, a temperature-exchanger or cooler is introduced between two consecutive ozonizers. This temperature-exchanger is represented in detail in Figs. 2 and 3. It consists, essentially, of an assemblage of tubes a , supported by two transverse walls b , constituting the ends of a vessel the lateral wall of which, g , may be of any desired section—of circular section, for example. The hot ozonized air enters the temperature-exchanger at c , passes through the assemblage of tubes a , and issues by the conduit d in order to reach the following ozonizer. In the vessel g , around the assemblage of tubes, there circulates a cold fluid. With this object the vessel g is provided with

an inlet-passage e and an outlet-passage f for the admission and discharge of the fluid. In Fig. 1 the installation is represented as comprising three ozonizers h h' h'' , with the interposition of two temperature-exchangers i and i' .

The ozonizers are represented in detail in Figs. 4, 5, and 6. They present a special feature as regards the production of the electric discharge. The electrodes j instead of being formed by semicircular disks with a smooth edge are formed by a series of points k , maintained pressed between the two disks l and m , Fig. 5, fixed one to the other by means of rivets or bolts.

Instead of isolated points sheet-metal sectors may be employed. It is advantageous that the metal points should be such that they oxidize with difficulty.

The ozonizer is composed, as previously, of a semicylindrical trough o , of metal, provided with a jacket n , of enamel. A glass cover p forms the top of the apparatus and supports the electrodes, which have just been described. The electric discharges take place between the electrodes and the trough o . The gas to be ozonized enters the apparatus by the orifice q and issues by the orifice q' , Fig. 6. Between the trough o and the jacket n a cold fluid circulates.

In the apparatus as a whole the air is displaced, as shown in Fig. 1, by a pump t , which through the conduit u sends the ozonized air into the injector v . The water to be sterilized is carried along by the displacement of the air, and the two fluids enter the sterilizer-tank x , where intimate contact is produced between the air ozonized and the water to be sterilized.

If the water to be sterilized enters under pressure, it may be caused to pass through the inner ajutage of the injector. In this manner it carries with it the air, thus relieving the air-pump and decreasing the heating of the air which this latter compresses.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In combination, a sterilizing-tank, a series of ozonizers, a conduit for connecting the same with the tank, cooling means intermediate the ozonizers and connected therewith,

electrodes in said ozonizers comprising a metal trough and semicircular disks provided with a series of projecting points, suitable current leads for the electrodes, and a cooling-jacket
5 for each ozonizer.

2. In combination, a series of ozonizers, cooling means intermediate the ozonizers and connected therewith, each ozonizer comprising a semicylindrical trough of metal consti-
10 tuting one electrode, a semicircular disk provided with projecting points constituting the

other electrode, suitable leads for the electrodes, and an enamel jacket located below said trough.

In testimony whereof I have signed this
specification in the presence of two subscrib-
15 ing witnesses.

HENRY JACQUES WESSELS.

Witnesses:

EMILE LEDRET,
AUGUSTUS E. INGRAM.