

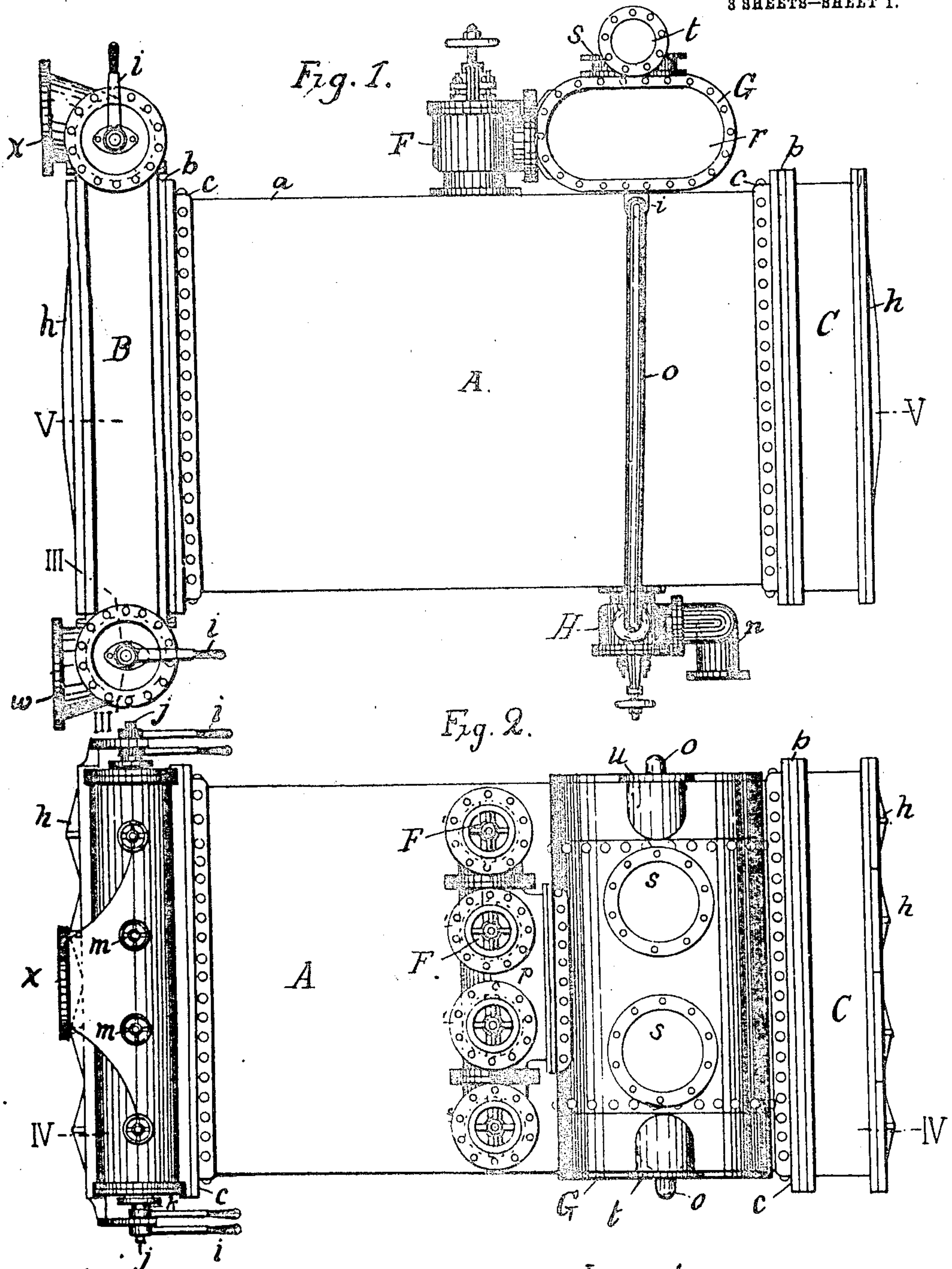
No. 849,866.

PATENTED APR. 9, 1907.

O. N. TATARNICOFF.
SURFACE CONDENSER.

APPLICATION FILED FEB. 7, 1907.

3 SHEETS—SHEET 1.



Witnesses.

James A. Bricker

J. Pinegin

Inventor.

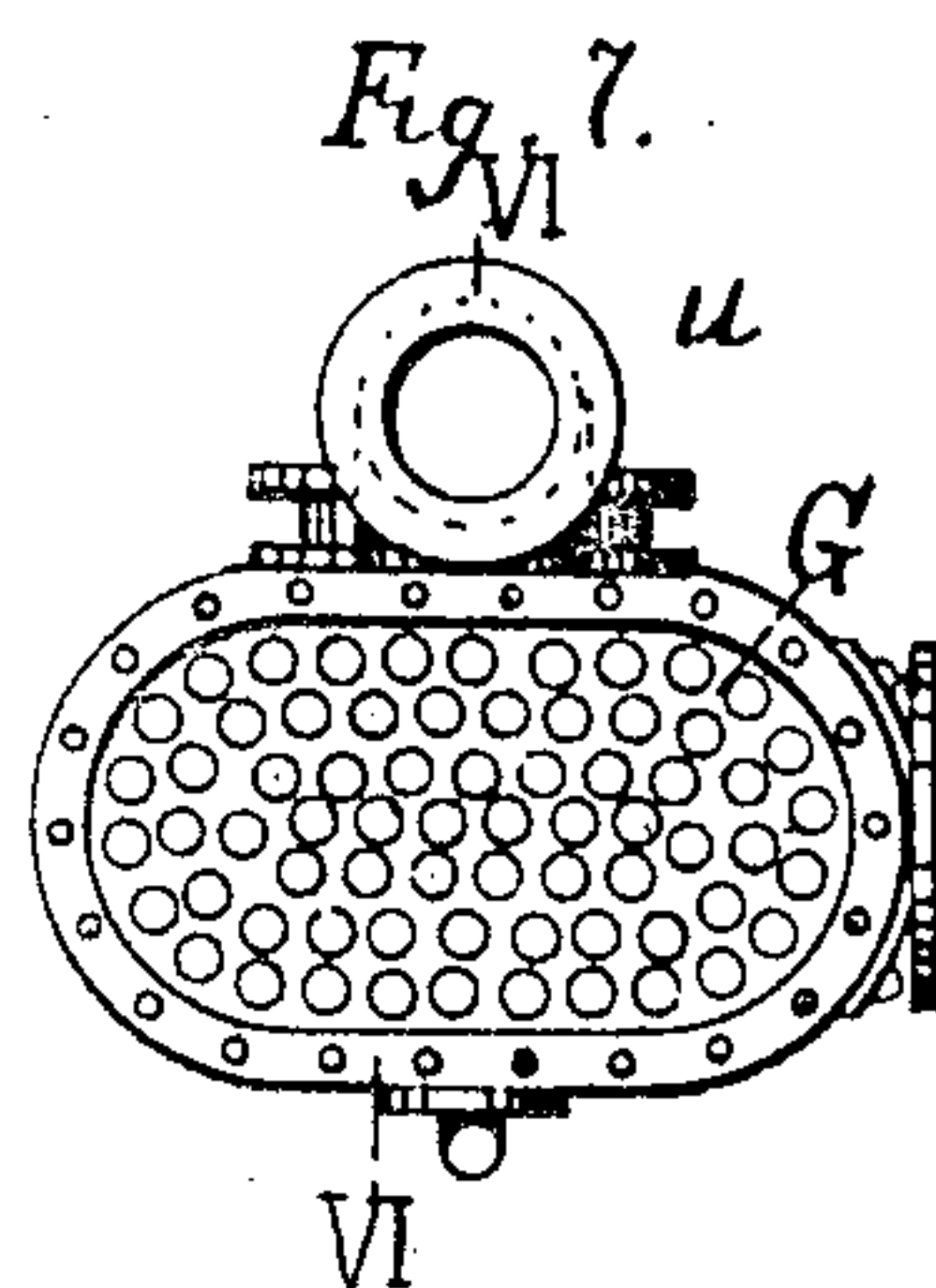
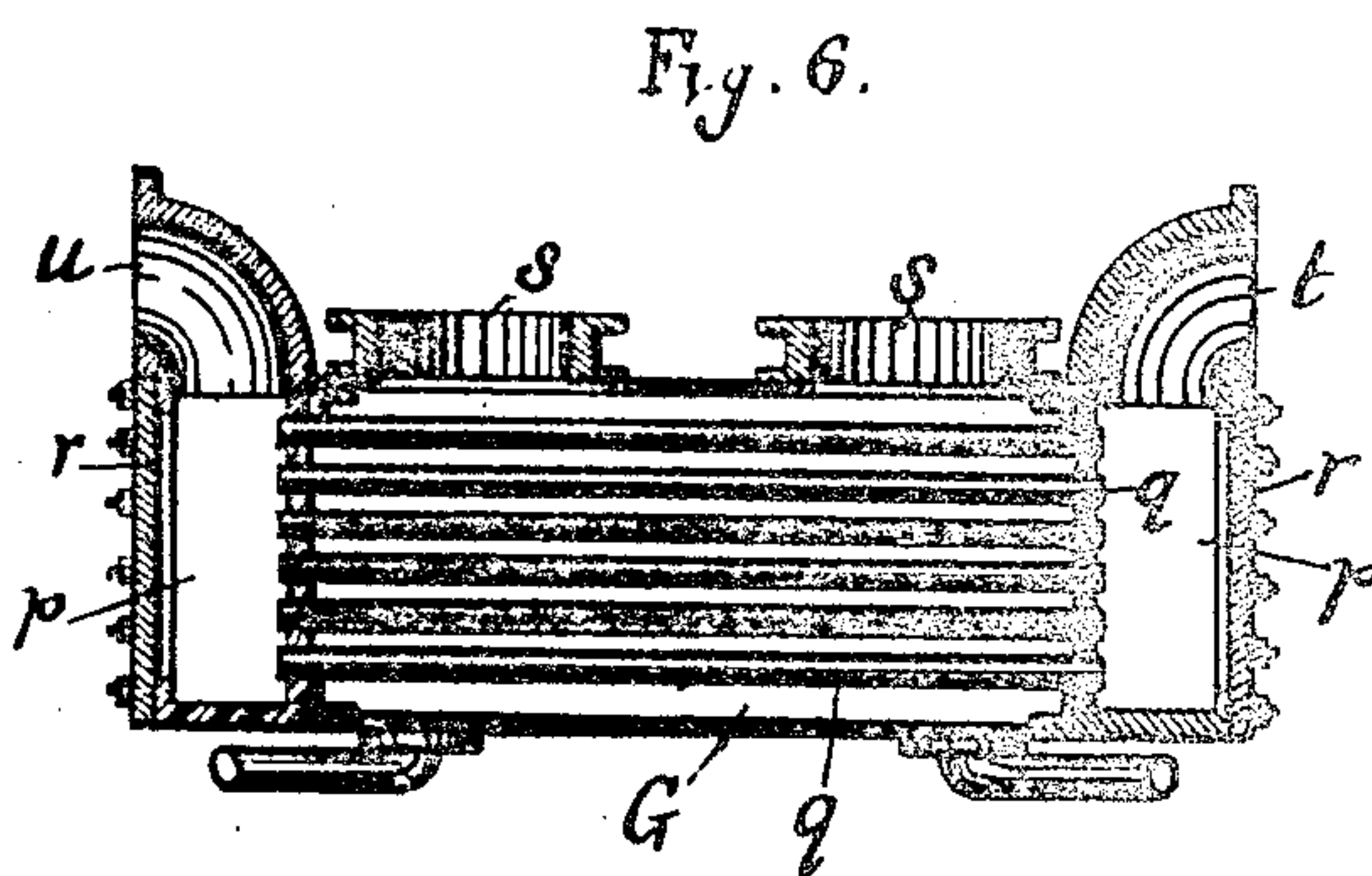
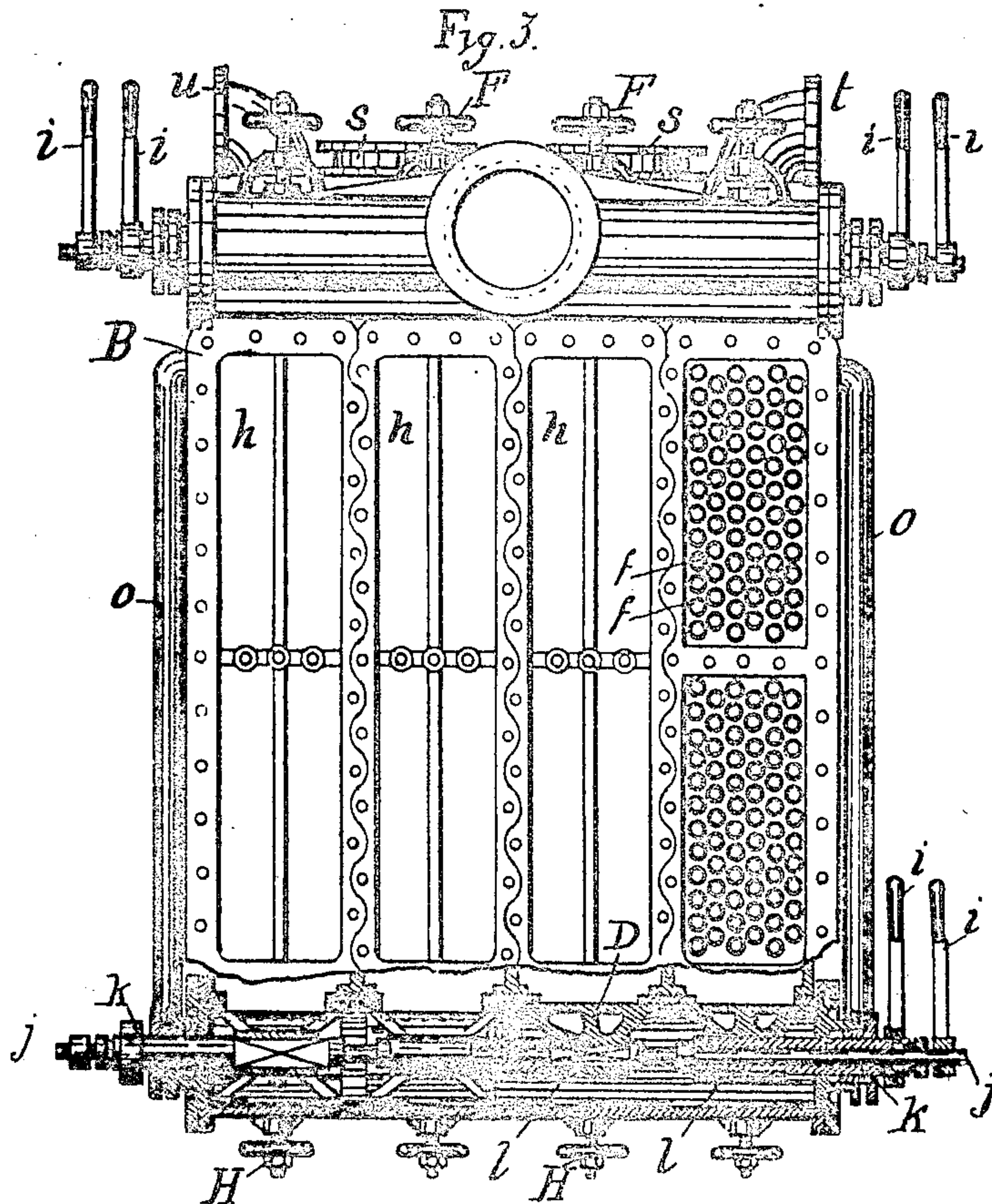
Constantin N. Tatarnicoff

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C. N. TATARNICOFF.
SURFACE CONDENSER.
APPLICATION FILED FEB. 7, 1907.

3 SHEETS—SHEET 2.



Witnesses
Alfred A. G. Schuch
J. Pinegin

Inventor.
Constantin N. Tatarnicoff

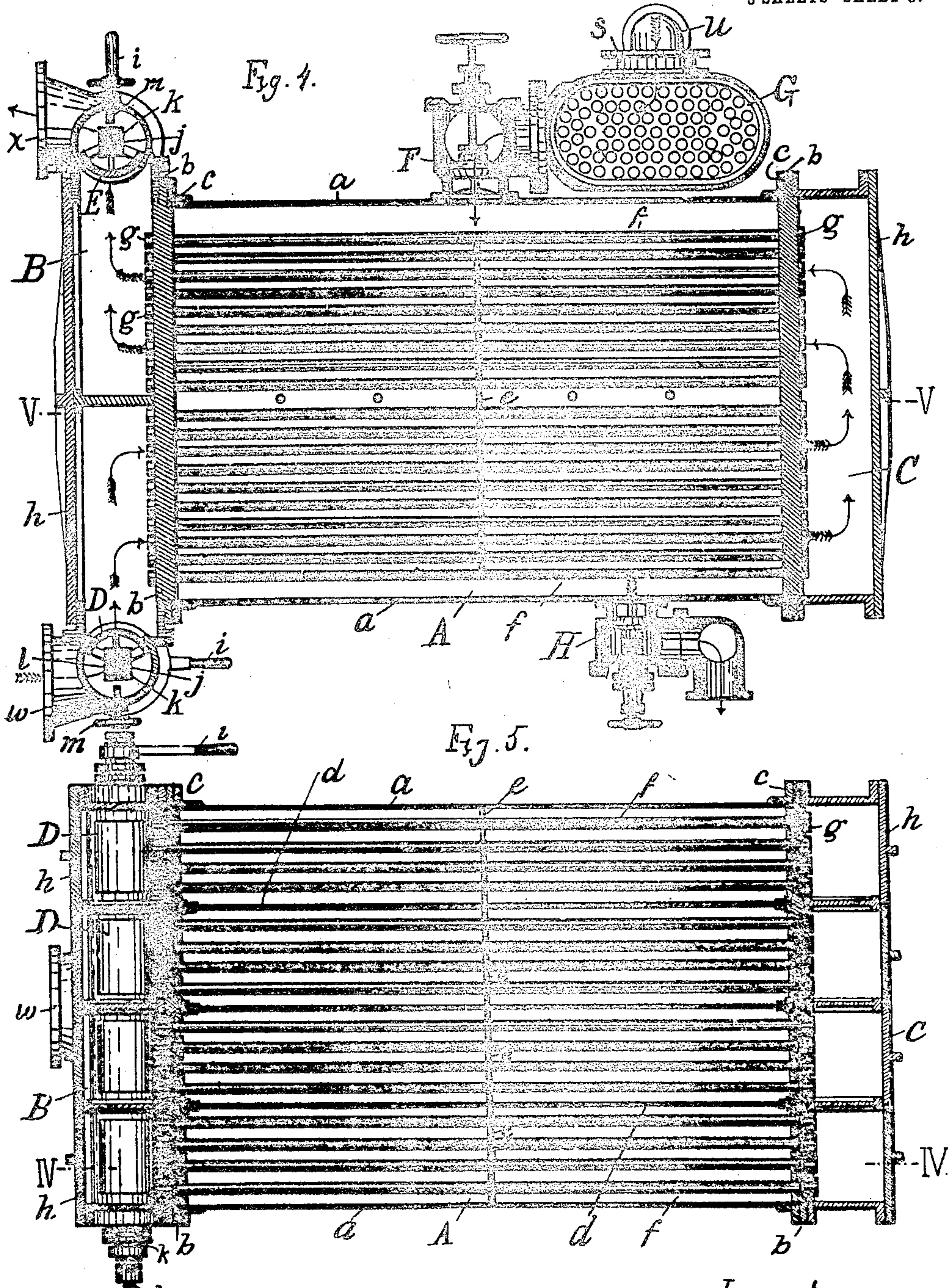
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3 SHEETS—SHEET 3.



Witnesses:
Leaser A. Krilushchuk
G. Pinegin

Inventor.
Constantin N. Tatarnicoff

UNITED STATES PATENT OFFICE.

CONSTANTIN N. TATARNICOFF, OF YONKERS, NEW YORK.

SURFACE CONDENSER.

No. 849,866.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed February 7, 1907. Serial No. 356,280.

To all whom it may concern:

Be it known that I, CONSTANTIN N. TATARNICOFF, a citizen of Russia, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Surface Condensers, of which the following is a specification.

My invention relates particularly to condensers for exhaust-steam in marine service; but I do not confine my invention to this particular use.

The object of the invention is to provide a condenser of compact form, sectional, so that any portion may be cut out of use for the purpose of repair without stopping the other sections and necessitating stoppage of the engines.

In the accompanying three sheets of drawings, which form a part of this application, Figure 1 is a side view of a surface condenser embodying my invention. Fig. 2 is a plan view of the condenser. Fig. 3 is a front view of the condenser, with one water-chamber left open and the lower valve-chambers broken away, on the line III III of Fig. 1. Fig. 4 is a vertical section on the line IV IV of Fig. 2. Fig. 5 is a horizontal section along the line V V of Fig. 1. Fig. 6 is a longitudinal section of the feed-water heater. Fig. 7 is a front view, with end plate removed.

My surface condenser, as illustrated, consists of a main rectangular tubular body A, formed of riveted sheet-metal sides *a a* with perforated heads *b b*, united thereto through flanges *c c*. The main body is divided into four chambers by vertical bulkheads *d d*, which are riveted to the sheet-metal body at the top and bottom sides. In the middle of the body there are a series of transverse perforated plates *e e*, which are inserted to brace the sides of the body against crushing by the pressure of the atmosphere. These plates do not reach to the top or the bottom of the body, since these sides of the body are sufficiently braced by the bulkheads. Metal tubes *f f*, preferably of brass, pass through the tubular body of the condenser, their ends being secured in the perforated heads by packing-collars *g g*. A box B, which is divided into eight compartments, is built up on the perforated head at one end, and a box C, divided into four compartments, is built up on the perforated head at the other end. Covers *h h* close each of the sev-

of the boxes B C. Valves with rectangular inlets for admitting and cutting off the influx and efflux of water are provided for each of the eight chambers of the box B. The inlets are covered by segmental valves D D, and the outlets are covered by segmental valves E E. The valves are operated by means of levers *i i* for the purpose of turning on or isolating any section of the condenser for the influx of cooling-water or for inspection and repair. The two levers on each side operate the two adjoining valves through two rock-shafts *j k*, one of which shafts passes through the other shaft. Each valve is provided with a hub *l l* with an oblong slot, in which the squared end of its shaft engages.

By reason of the slots being oblong the valves may be pushed against their seats by means of screws *m m* without straining the rock-shafts. Four valves F F of ordinary type for the admission of exhaust-steam, one for each chamber of the condenser, are placed on top of the body of the condenser and riveted thereto. The end valve-chambers are connected with the chamber for the middle valves, which are set in one body, and through this body connection is made with a feed-water heater G. There are also valves H H of smaller size, one at the bottom of each of the chambers of the condenser. These valves connect to a pipe *n*, from which water and air is led from the condenser to the air-pump. Connection is also made by pipes *o o* between the feed-water heater and the pipe to the air-pump conveniently through the chambers of the end valves underneath the condenser to lead off any water condensed from steam in the feed-water heater.

The body of the feed-water heater is formed of sheet-brass, riveted in oval form, with chambered heads *p p*, which are connected by tubes *q q*. By removing the covers *r r*, which are bolted to the heads, access is given to the interior so that they may be cleaned or repaired. On the top of the heater are flanged openings for a feed-water pipe from the boiler.

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open. The water condensed from the steam leaves the chambers at the bottom through the four lower valves and is conducted to the air-pump. It is returned to the boilers from the air-pump through the feed-water heater, entering one of the chambered heads at the flanged opening *t*, passing through the tubes, and leaving the other head at the flanged opening *u*. The cold water for cooling the condenser, usually salt water in marine service, is introduced into the valve-chambers through the flanged opening *w* and passes to the lower sets of tubes in the four chambers of the condenser, or into the lower sets of the tubes of such of the chambers as have the valves therefor open, thence along these tubes up at the box at the other end, back through the upper sets of tubes into the upper valve-boxes, through the upper valves, and out at the flanged opening *x*.

I do not wish to limit myself to the specific arrangement of connections of the condenser herein set forth, and it is obvious that many other modifications in details may be made without departing from the spirit of my invention.

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

1. A surface condenser comprising a series of chambers in a unitary body portion, with separate inlet and outlet valves for each of the chambers, and tubes through the chambers with separate inlet and outlet controlling-valves for the tubes of each chamber, substantially as described.

2. A surface condenser comprising a series of chambers in a unitary body portion, separate inlet and outlet valves for each of the chambers, heads with corresponding sets of chambers at the ends of the body portion, tubes connecting each of the sets of chambers of the heads through the corresponding chambers of the body portion, and separate inlet and outlet valves for each of the sets of chambers, substantially as described.

Signed by me at Yonkers, New York, this 2d day of February, 1907.

CONSTANTIN N. TATARNICOFF.

Witnesses:

LASAR A. GRIBESCHOCK,
G. PINEGIN.