

(No Model.)

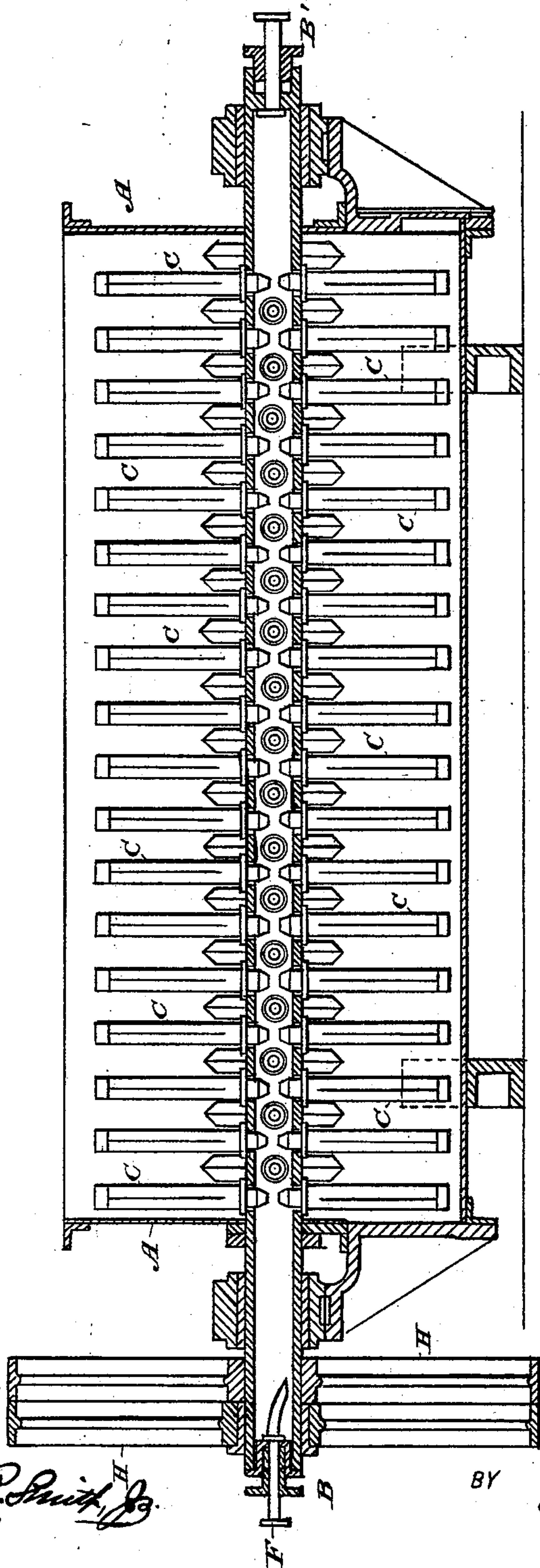
2 Sheets—Sheet 1.

W. VENULETH.
EVAPORATING APPARATUS.

No. 464,166.

Patented Dec. 1, 1891.

Fig-1-



WITNESSES:

E. B. Bolton

David R. Smith, Jr.

INVENTOR

Wilhelm Venuleth
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ATTORNEYS

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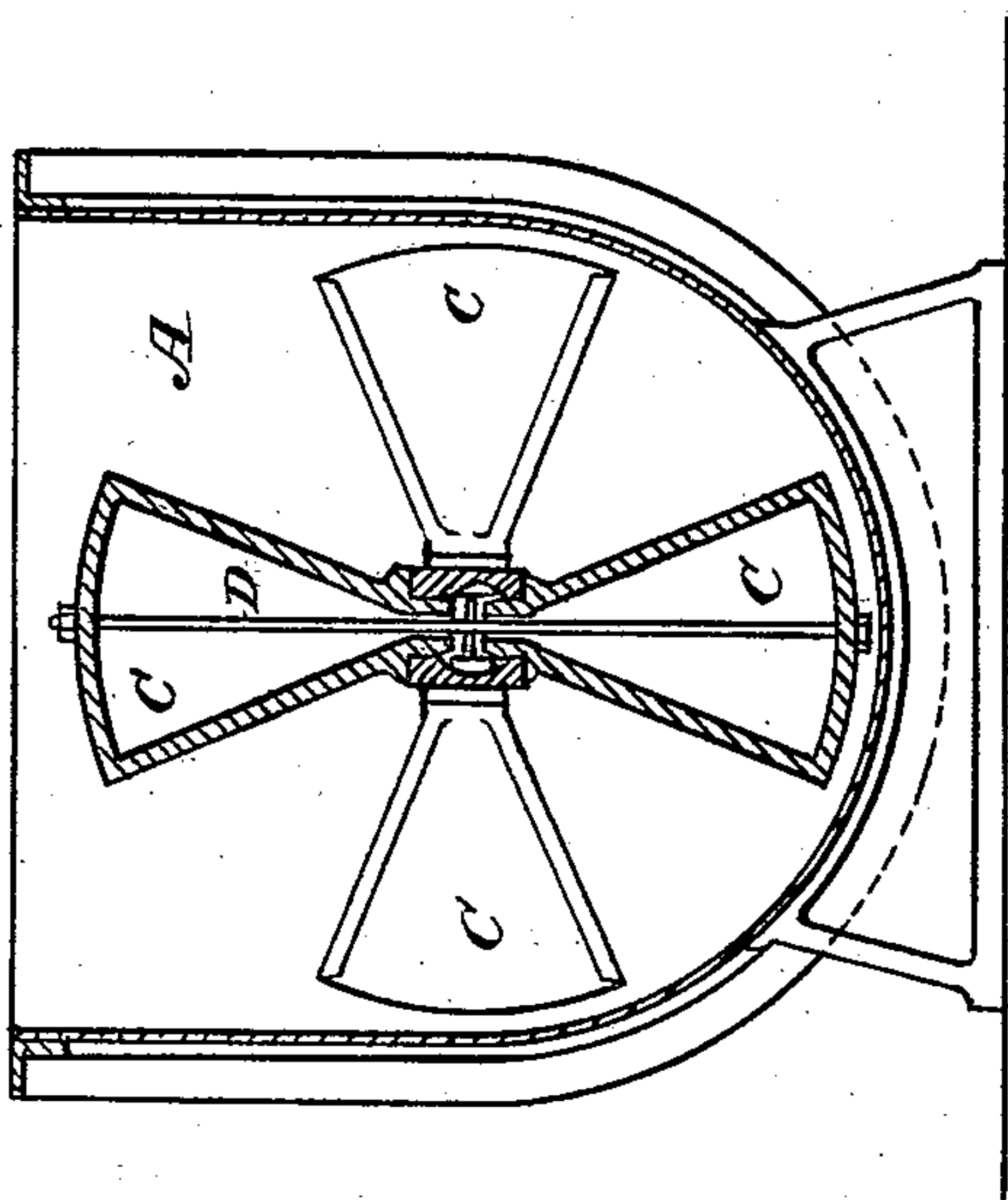


Fig. 2-

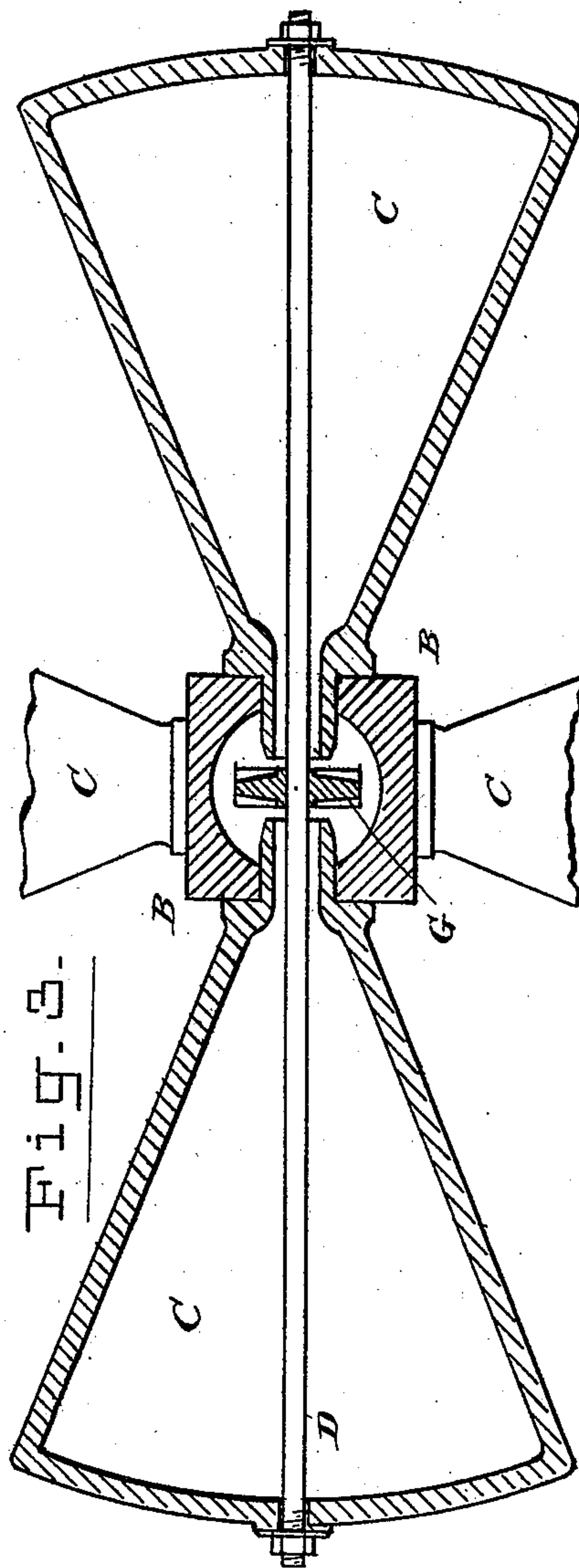


Fig. 3-

WITNESSES:

E. B. Rolton
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INVENTOR

Wilhelm Venuleth
BY *Richardson*

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UNITED STATES PATENT OFFICE.

WILHELM VENULETH, OF DARMSTADT, GERMANY.

EVAPORATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 464,166, dated December 1, 1891.

Application filed April 14, 1890. Serial No. 347,868. (No model.)

To all whom it may concern:

Be it known that I, WILHELM VENULETH, a subject of the Emperor of Germany, residing at Darmstadt, Germany, have invented
5 new and useful Improvements in Evaporating Apparatus for Semi-Liquid Substances, of which the following is a full, clear, and exact description.

In the annexed drawings, which form a
10 part of this specification, Figure 1 represents a longitudinal section of the apparatus. Fig. 2 represents a cross-section of the same, and Fig. 3 represents on an enlarged scale a cross-section of the hollow shaft and stirrers.

15 A hollow shaft B B' rotates in a vessel A of suitable form—in this example of a trough-like shape—containing the mash which is to be evaporated. This hollow shaft is provided along its entire length within the vessel with
20 hollow fan-shaped stirrers C, arranged in pairs, as represented in the drawings, in such manner that the two stirrers of each pair are opposite each other, so that both can be fastened to the shaft B B' with a single screw-
25 bolt D. The steam used for heating purposes is introduced at B', passes through the hollow shaft and the hollow stirrers, and the water of condensation is discharged through the pipe F.

As shown in Fig. 3, the stirrers are inserted
30 in the shaft B B' with their tenons projecting into the hollow thereof nearly to the center, so that the water of condensation collecting in the lower part of the shaft hollow cannot flow into the stirrers. In order to pre-
35 vent the water of condensation formed in the upper stirrers from dropping into the opposite stirrers, I have arranged small movable plates or automatic valves G between the tenons of the stirrers and sliding on the
40 screw rod or bolt D, which valves will automatically drop down on and close the opening or mouth of the lower stirrer.

The rotary motion of the shaft is obtained by means of pulleys or wheels H. At every
45 revolution of the shaft the stirrers will empty

the water of condensation therein into the central longitudinal hollow part of the shaft, so that the heating-surfaces are kept free from water of condensation, and will consequently better transmit the heat. The whole
50 arrangement will effect strong circulation of the mash, which insures a rapid evaporation.

The peculiar fan-shaped form of the heating-pipes, the heating-surfaces of which are located in the planes of rotation, will prevent
55 the burning of the mash on the heating-surfaces, while in consequence of the continued friction and motion of mash and heating-surfaces no particle of the mash can settle on the stirrers. 60

The whole apparatus is arranged slightly inclining toward B', in order to effect a quicker discharge of the water of condensation from the hollow shaft.

Having fully described my invention, what
65 I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for evaporating, consisting, essentially, of a hollow shaft, fan-shaped
70 pipes arranged in pairs and on opposite sides of said shaft, tenons on said pipes inserted in said shaft, screw-bolts connecting the pipes of each pair, passing through their hollow part and tenons, and movable valves carried by
75 said screw-bolts between these tenons, substantially as and for the purpose specified.

2. In an evaporating apparatus, the combination, with the shaft and the hollow stirrers having tenons, of screw-bolts passing through
80 and connecting said stirrers, and movable plates or valves between the tenons of the stirrers and adapted to slide on said screw-bolts, substantially as and for the purpose specified.

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

WILHELM VENULETH.

Witnesses:

RICHARD WIRTH,
FRANZ HASSLACHER.