

H. SIMS.
 FLUID GUIDE FOR FLUID CONVEYING TUBES.
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985,216.

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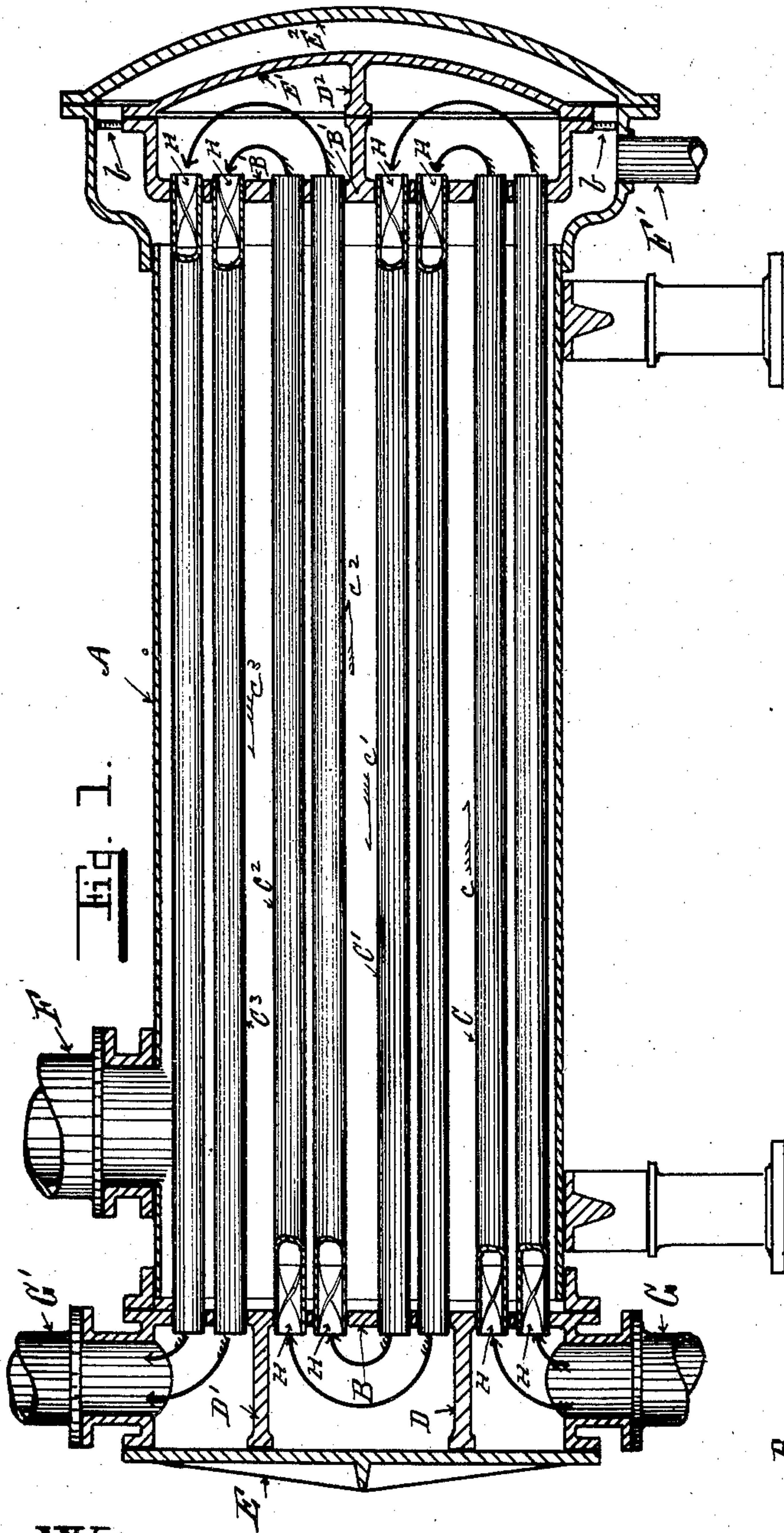


Fig. 1. A

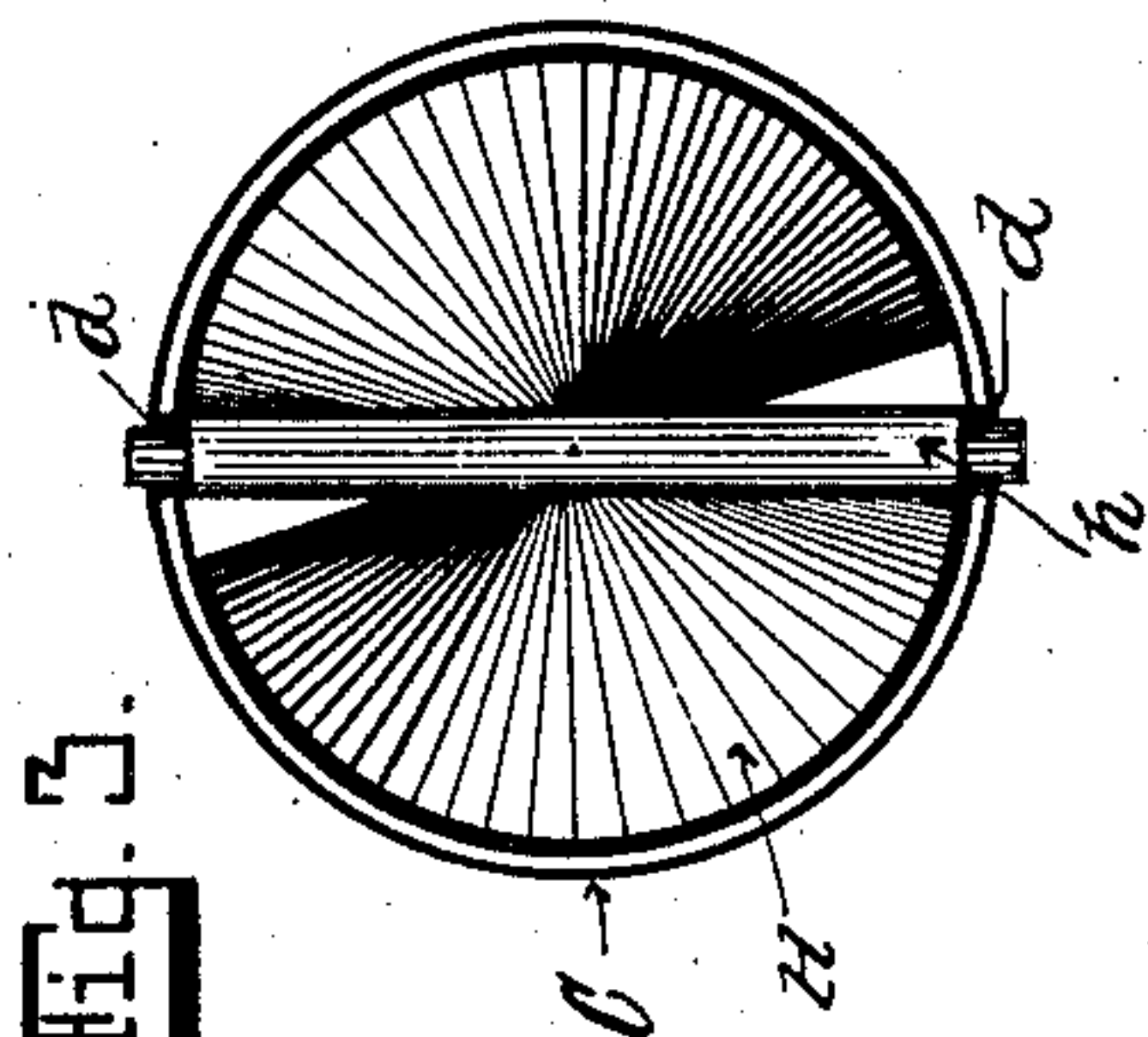
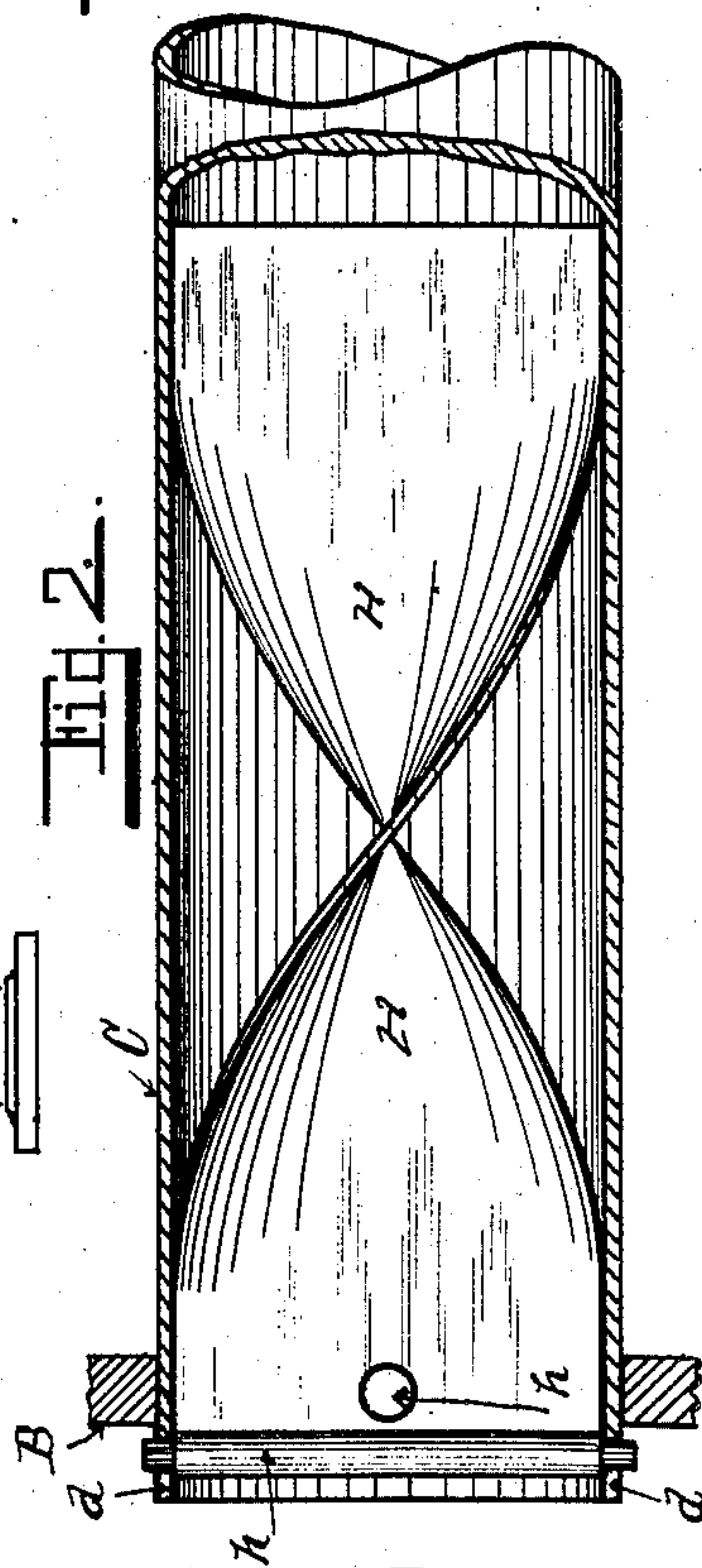


Fig. 3.



UNITED STATES PATENT OFFICE.

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FLUID-GUIDE FOR FLUID-CONVEYING TUBES.

985,216.

Specification of Letters Patent.

Patented Feb. 28, 1911.

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To all whom it may concern:

Be it known that I, HENRY SIMS, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Fluid-Guides for Fluid-Conveying Tubes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to fluid guides for the fluid conveying tubes of fluid heaters, in which the fluid to be heated passes through tubes surrounded by steam, and has for its object the insertion in the inlet ends of the tubes helix shaped fluid guides which operate to give a spiral or rotary motion to the fluid flowing through the tubes. This feature has proven to be particularly advantageous, when such heaters are used for heating cane juice carrying lime and other foreign matter in suspension, as well as in such heaters used for heating other fluids carrying foreign matter in suspension therein, as the spiral or rotary motion imparted to such fluid while flowing through the tubes, prevents such foreign matter held in suspension therein from settling upon the inner walls of the tubes. This spiral or rotary motion so imparted to the fluid during its traverse through the tubes also tends to exercise a scouring action upon the inner surfaces of the tubes, and prevents scale and other impurities forming thereon.

The features of my invention are herein after fully set forth and explained, and illustrated in the accompanying drawings in which:

Figure 1 shows a longitudinal section of a fluid heater, embodying my invention. Fig. 2 is a detail view showing an enlarged section of one of the tubes, showing my im-

proved spiral fluid guide therein. Fig. 3 is a detail view showing an enlarged end elevation of the same.

In these drawings A indicates the shell of the heater; B an inner head secured in one end of the shell; B' a floating inner head in the opposite end of the shell A, retained centrally therein by lugs *b*; C, C', C², C³ groups of tubes secured in the heads B and B'; D D' dividing walls between the groups of tubes C C', and C² C³ and extending from the head B, to the outer head E, secured to the end of the shell A; D² is a division wall between the groups of tubes C, C', and C², C³, and extending from the floating head B' to the auxiliary head E', secured thereto; E² the outer head secured to the shell A; F the steam inlet; F' the condensed water outlet; G the fluid inlet, and G' the fluid outlet.

In the inlet ends of the tubes C, C', C² and C³ I removably insert helix-shaped fluid guides H, provided at their outer ends with transverse pins *h* adapted to engage notches *d* in the inlet ends of the tubes C &c., whereby the guides H are held firmly against rotation, but may be easily withdrawn from the tubes. For conveniently removing the guides H, I provide holes *h'* therein adapted to be engaged by a suitable hook adapted therefor.

In operation when the fluid enters the fluid inlet G below the wall D, it passes through the tubes C in the direction of the arrows *c*, and back through the tubes C' in the direction of the arrow *c'*, and is discharged above the wall D, where it enters the tubes C² passing therethrough in the direction of the arrow *c*² above the wall D², and thence back through the tubes C³ in the direction of the arrow *c*³ above the wall D', and to the outlet G'; meanwhile at the entrance of each group of tubes C, C', C² and C³ the fluid has passed over the spiral or helix-shaped guides H and has been given a spiral or rotative motion as it passes through

said tubes, which operates to prevent foreign matter held in suspension by such fluid from settling and adhering to the tubes.

Having thus described my invention so
5 as to enable others to construct and utilize the same what I claim as new and desire to secure by Letters Patent is:

A fluid guide for fluid carrying tubes,
comprising substantially a spiral plate
10 adapted to be inserted into the inlet end of

said tube, and a cross bar on said guide engaging notches in the end of the tube to prevent the rotation of the guide therein, substantially as set forth.

In testimony whereof I affix my signature, 15
in presence of two witnesses.

HENRY SIMS.

Witnesses:

H. M. STURGEON,
FLORENCE STOCKERT.