

(Model.)

2 Sheets—Sheet 1.

O. WESTPHAL.

INJECTOR AND INJECTOR NOZZLE.

No. 322,768.

Patented July 21, 1885.

Fig. 2.

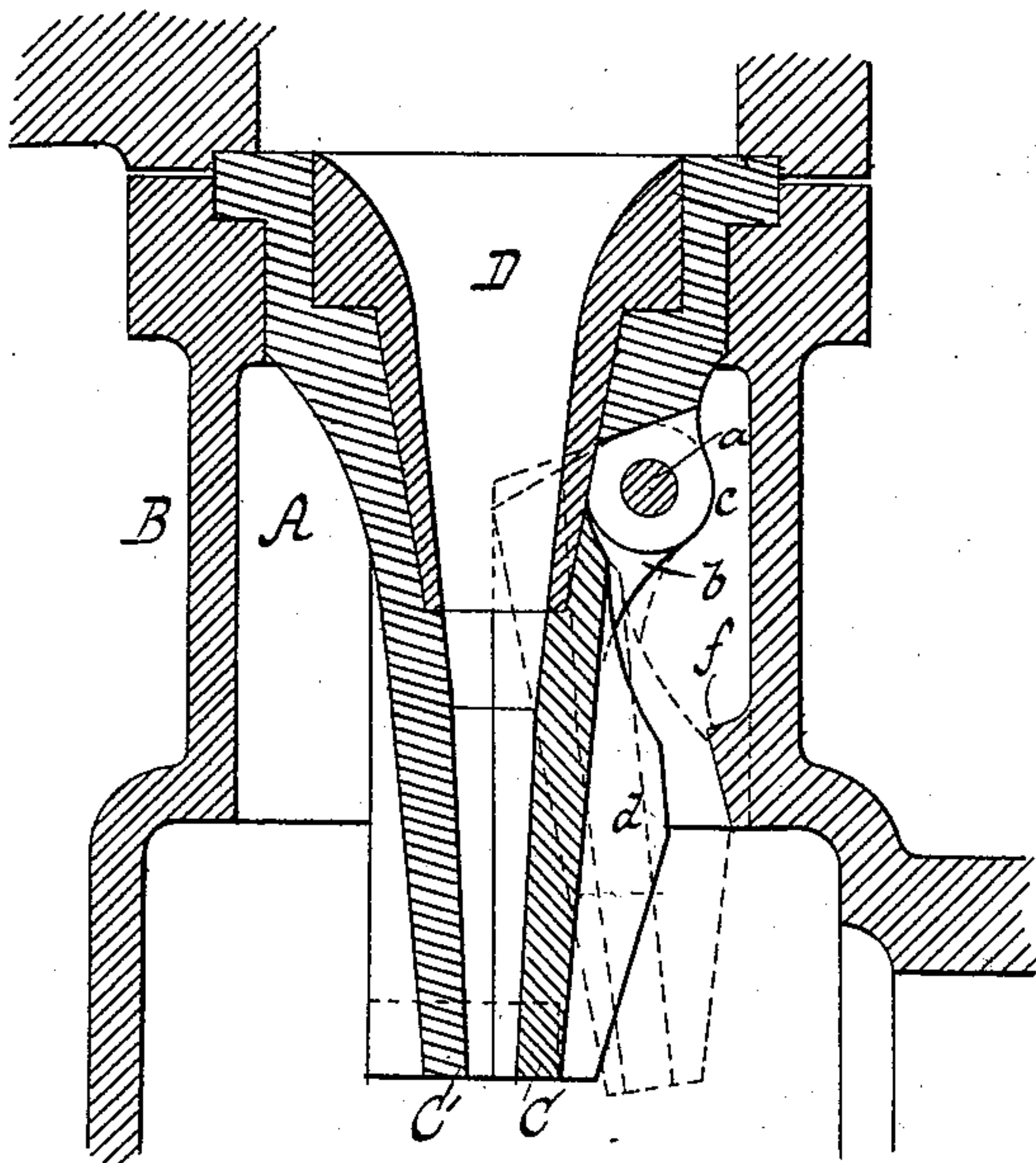


Fig. 1.

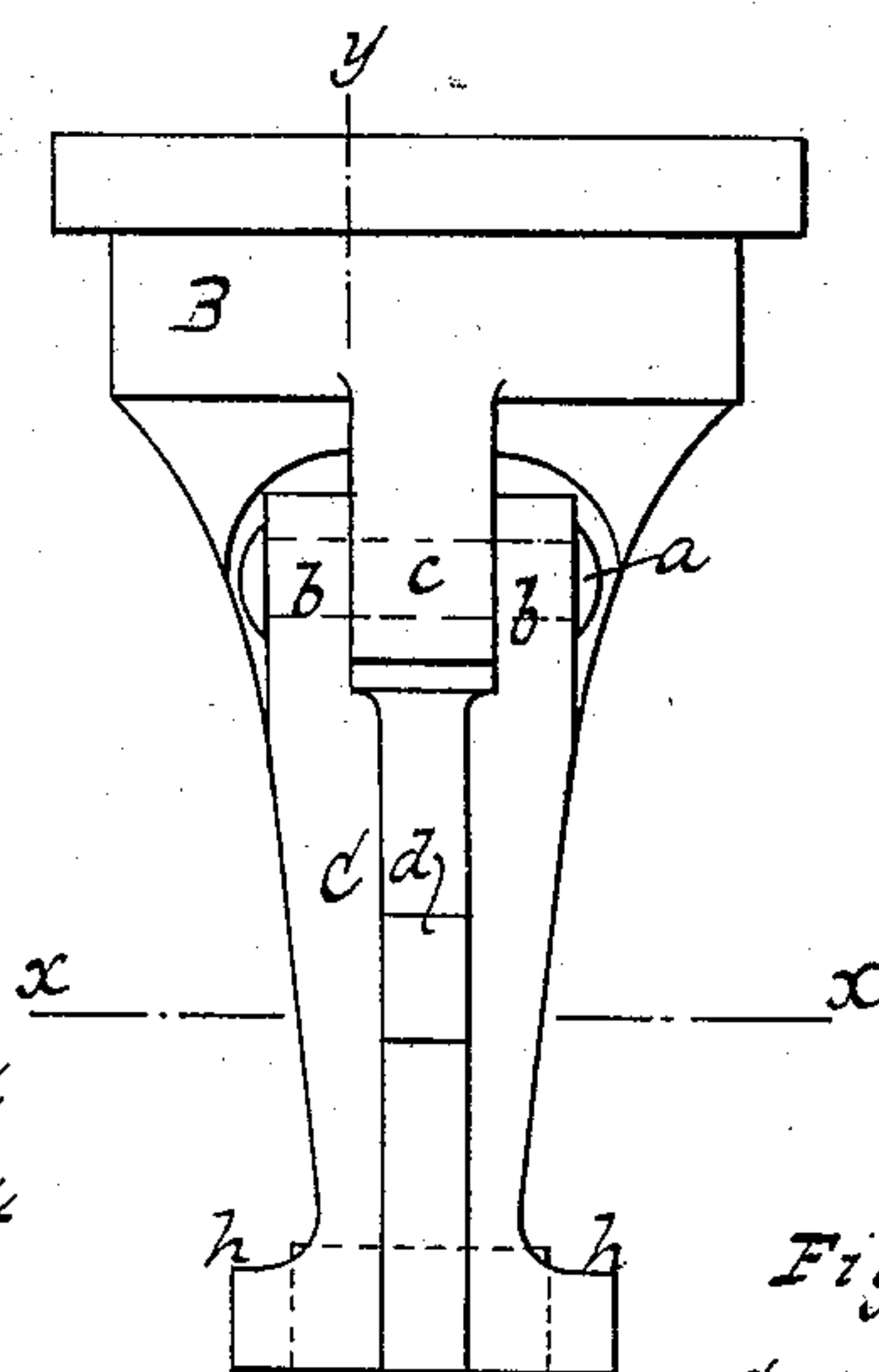


Fig. 3.

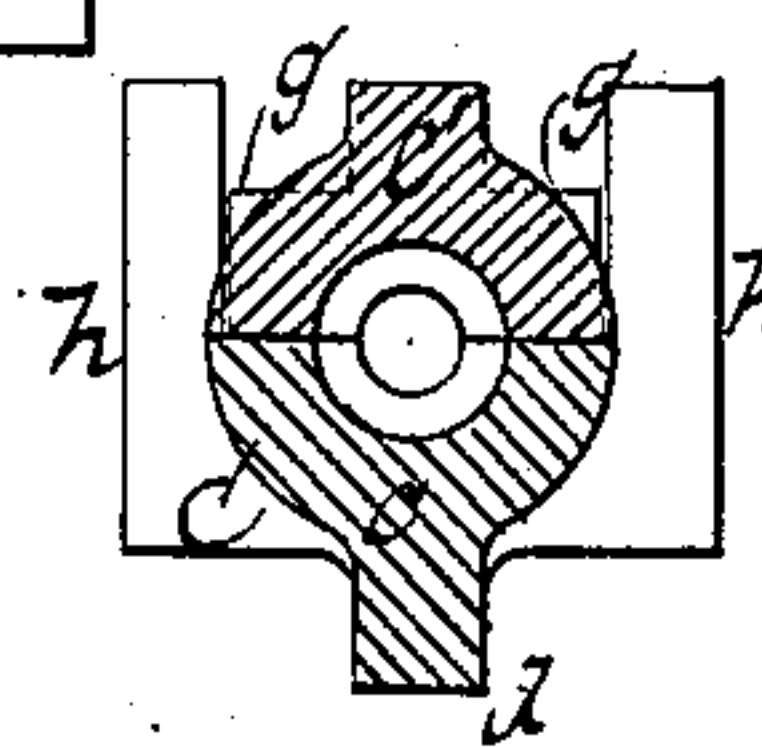


Fig. 4.

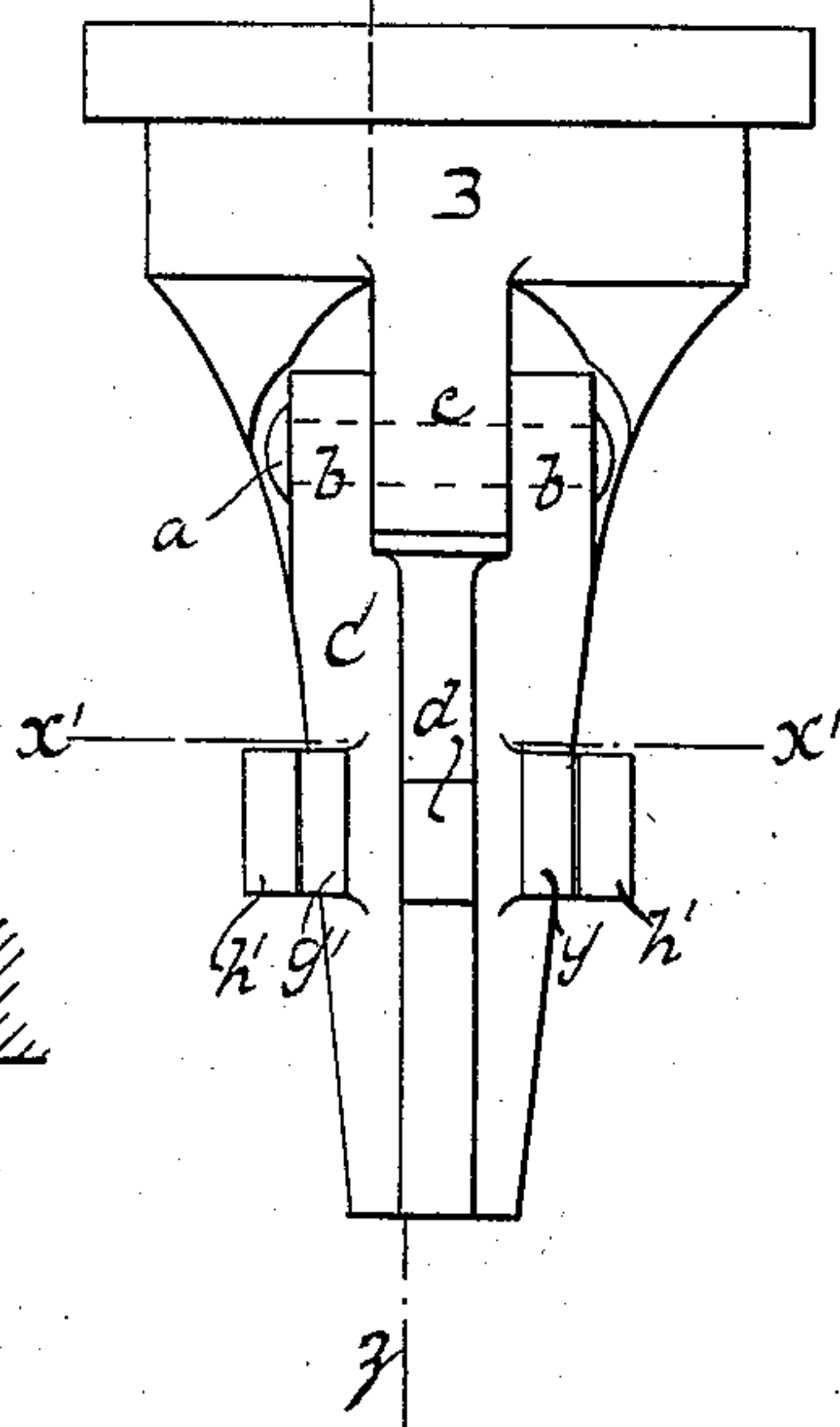


Fig. 5.

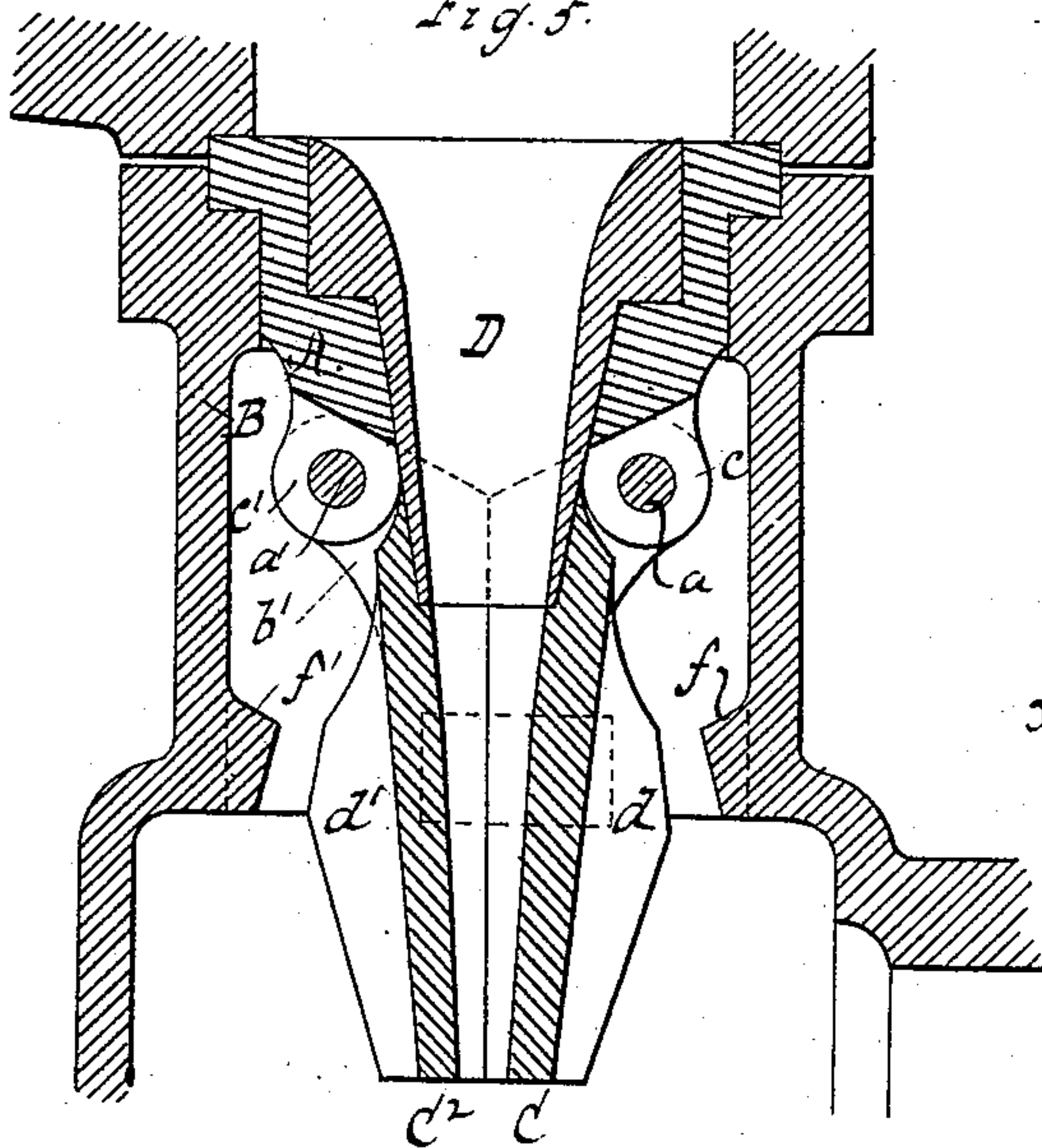
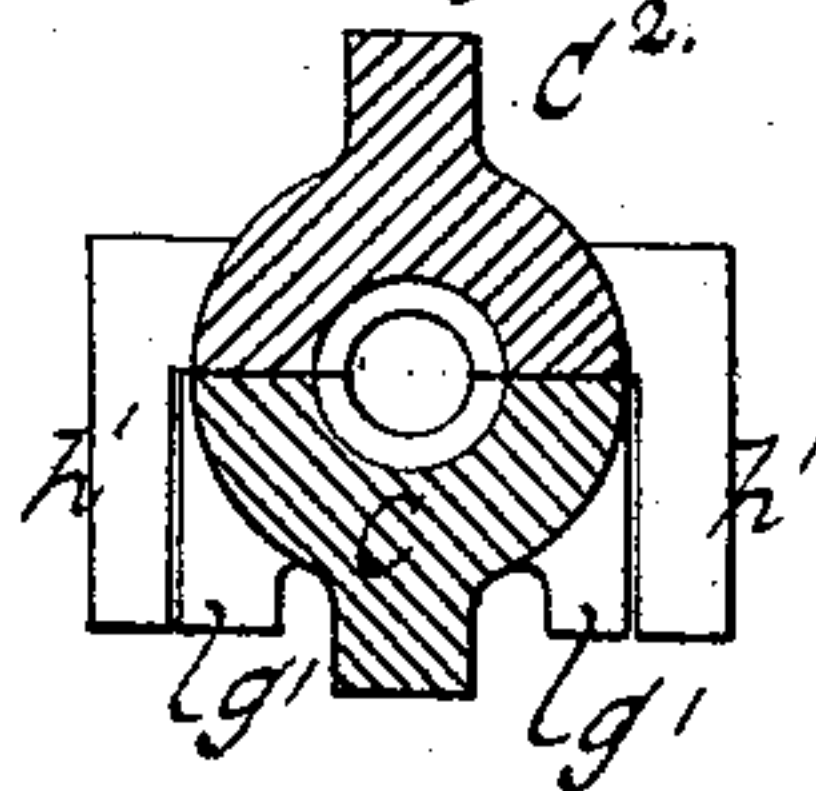


Fig. 6.



Witnesses

William Miller
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Inventor

Otto Westphal
by Van Santvoord & Hauff
his attys

(Model.)

2 Sheets—Sheet 2.

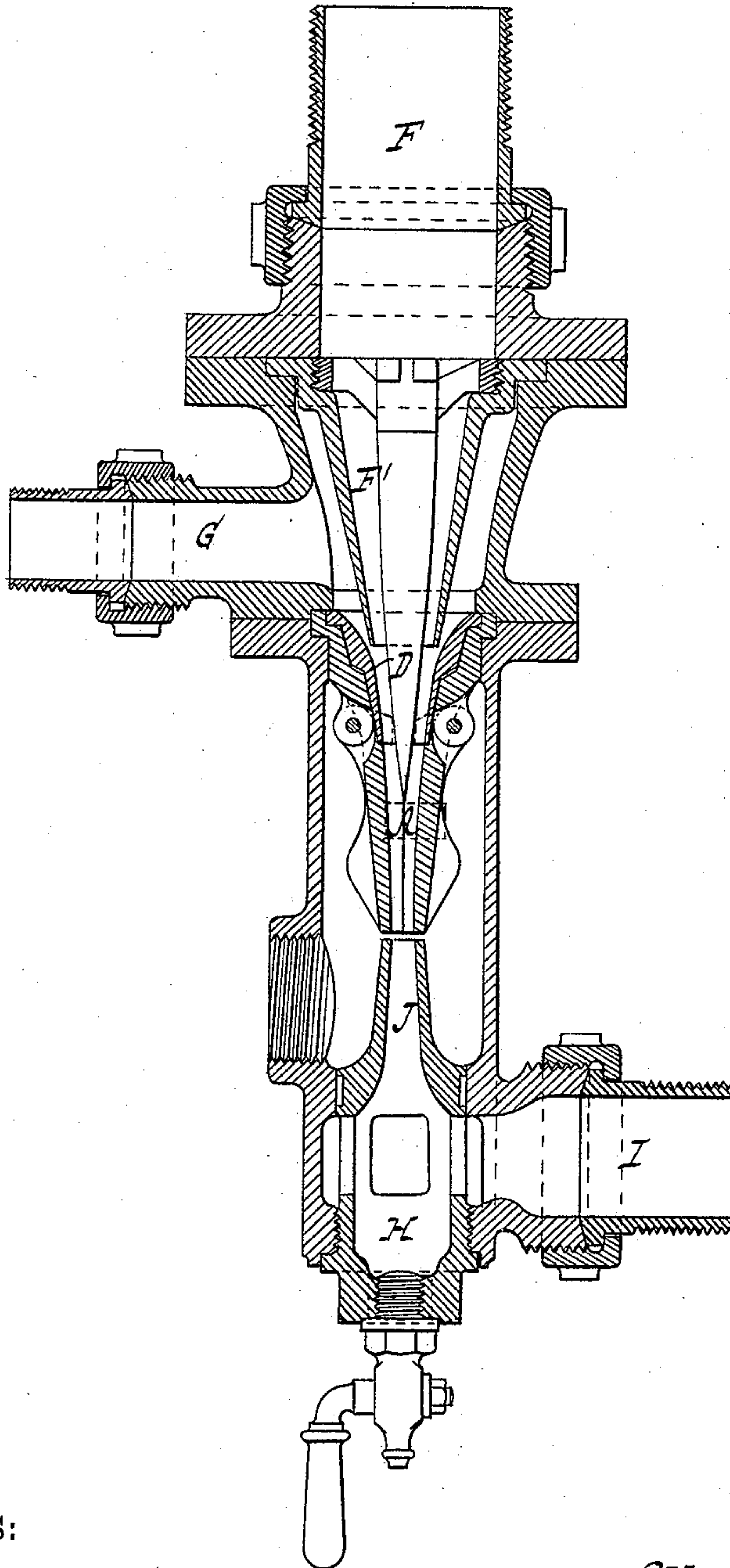
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Fig. 7.



WITNESSES:

William Miller
Faber du Faur Jr.

INVENTOR

Otto Westphal

BY

Van Santvoord & Hauff

ATTORNEYS

UNITED STATES PATENT OFFICE.

OTTO WESTPHAL, OF BUCKAU, GERMANY, ASSIGNOR TO SCHÄFFER & BUDENBERG, OF SAME PLACE.

INJECTOR AND INJECTOR-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 322,768, dated July 21, 1885.

Application filed December 4, 1884. (Model.)

To all whom it may concern:

Be it known that I, OTTO WESTPHAL, a citizen of Germany, residing at Buckau, Germany, have invented new and useful Improvements in Injectors and Injector-Nozzles, of which the following is a specification.

This invention relates to improvements in injectors for steam-boilers; and it consists in the combination, with a two-part combining-nozzle, of a secondary nozzle extending beyond the joint of the two-part combining-nozzle, and also in a two-part combining-nozzle provided with two hinged sections opening in opposite directions.

In the accompanying drawings, Figure 1 is a detached side elevation of my improved combining-nozzle. Fig. 2 is a vertical section of the same in the plane $y y$, Fig. 1. Fig. 3 is a horizontal section in the plane $x x$, Fig. 1. Fig. 4 is a detached side elevation of the two-part combining-nozzle with two hinged sections. Fig. 5 is a vertical section of the same in the plane $z z$, Fig. 4. Fig. 6 is a horizontal section in the plane $x' x'$, Fig. 4. Fig. 7 is a vertical section, on a smaller scale, of an injector provided with my improved two-part combining-nozzle.

Similar letters indicate corresponding parts.

In the drawings, Fig. 1, 2, and 3, the letter A designates a two-part combining-nozzle, similar to that shown and described in Letters Patent granted to E. Davies, No. 240,101, dated April 12, 1881. The same is screwed or otherwise secured in the casing B, and is formed with a hinged section, C, and a stationary section, C'. The section C is hinged so that it can swing laterally to the upper part of the combining-nozzle by means of a pivot, a , which passes through two lugs, $b b$, formed on the upper part of the hinged section, and a lug, c , formed on part of the combining-nozzle. On the back of the hinged section is a longitudinal rib, d , which strikes against a projection, f , on the casing B, and limits the lateral motion of the hinged section C. On the lower part of the stationary section C' is formed a block, g , which engages guides h on the hinged section C, the object of which is to obtain a proper guidance for the hinged section.

With this two-part combining-nozzle I have

combined a secondary nozzle, D, which fits and is secured in the combining-nozzle A. The lower part of this secondary nozzle D extends beyond the joint of the hinged section C, and its inner surface has the same taper as the combining-nozzle, and forms with the same a uniform continuous bore.

In an ordinary injector constructed without my secondary nozzle D, when the hinged section C is moved from the section C' by the pressure of the mixed steam and water entering the combining-nozzle A, the relative proportions of the combining-nozzle and receiving-nozzle J, Fig. 7, are disturbed, and the steam and water deviate from their course. When, however, my secondary nozzle D is used, and the hinged section C is moved laterally, the secondary nozzle D acts as a new combining-nozzle with a larger outlet. The relative proportions of the combining and receiving nozzles are now but slightly altered, and the mixed steam and water are kept more nearly in a straight course, thereby increasing the efficiency of the injector.

In Figs. 4, 5, and 6 the two-part combining-nozzle A is shown with both the sections C C' hinged. The hinging of the same is effected by means of pivots $a a'$, which pass through lugs $c c'$, each formed on the upper part of the combining-nozzle, and through lugs $b' b'$ formed on the hinged sections. Each of these hinged sections C C' is formed with a longitudinal rib, d and d' , which strikes against a projection, f and f' , on the casing B and limits the lateral motion of said sections.

To guide and steady the motion of the sections, a block, g' , is formed on the section C, which engages guides h' formed on the section C'.

My object in forming the combining-nozzle A with two hinged sections is to prevent the deviation of the mixed steam and water which enter the combining-nozzle. When only one section of the combining-nozzle is hinged the stationary section will necessarily interfere to a certain extent with the direct course of the combined water and steam, while when both sections can move laterally a disturbance of the issuing steam and water cannot take place.

In Fig. 7 my improved two-part combining-

nozzle is shown in an injector, in which F is the steam-supply pipe; F', the steam-nozzle; G, the water-supply pipe; A, the two-part combining-nozzle; D, the secondary nozzle; 5 J, the receiving-nozzle; H, the overflow-pipe, and I the feed-pipe to the boiler.

What I claim as new, and desire to secure by Letters Patent, is—

10 1. The combination, substantially as herebefore described, with the two-part combining-nozzle, of a secondary nozzle, D, extending beyond the joint of the two-part combining-nozzle.

2. A two-part combining-nozzle provided with two hinged sections, C C², opening in 15 opposite directions.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

OTTO WESTPHAL. [L. S.]

Witnesses:

WILLIAM C. FOX,
JOHS. KRACKE.