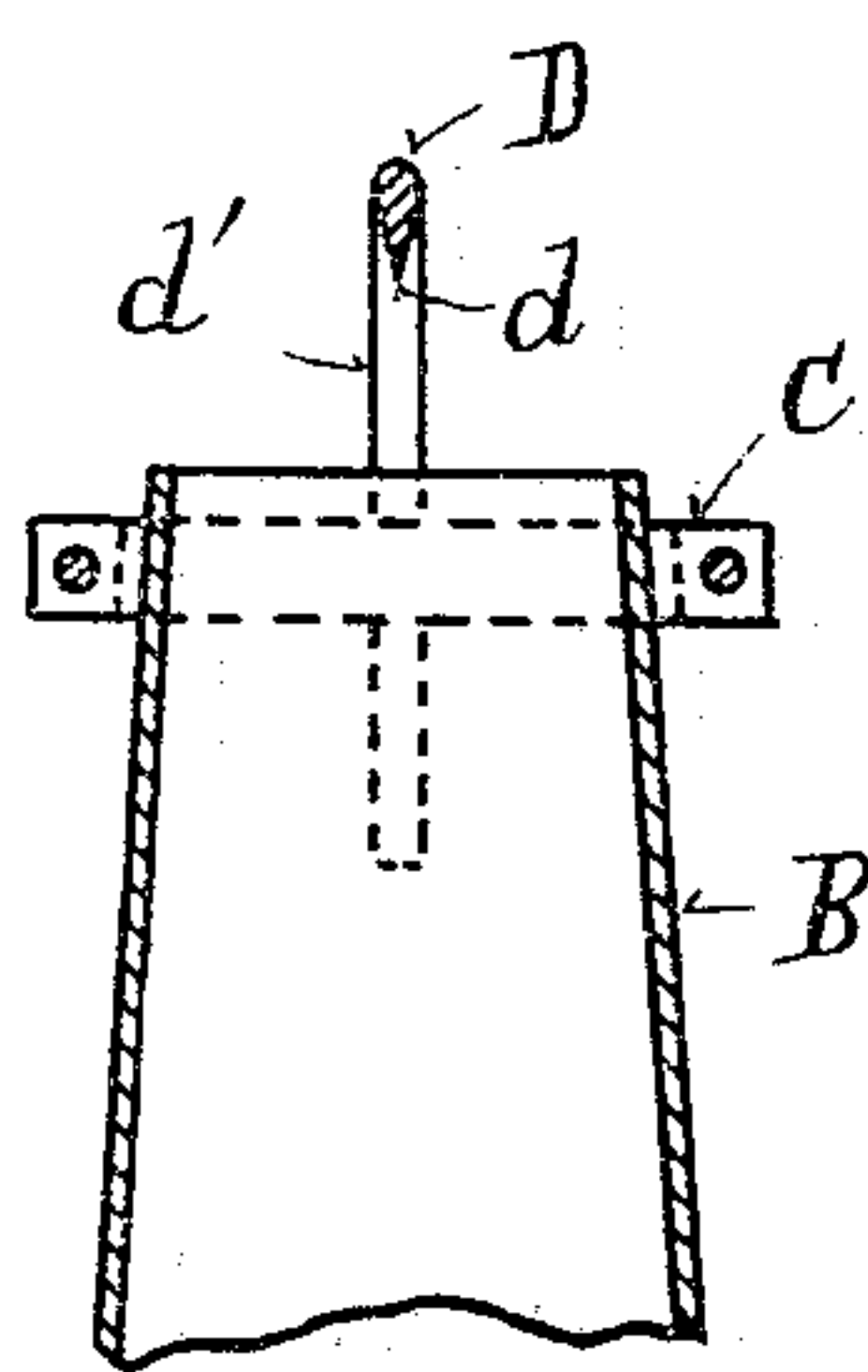
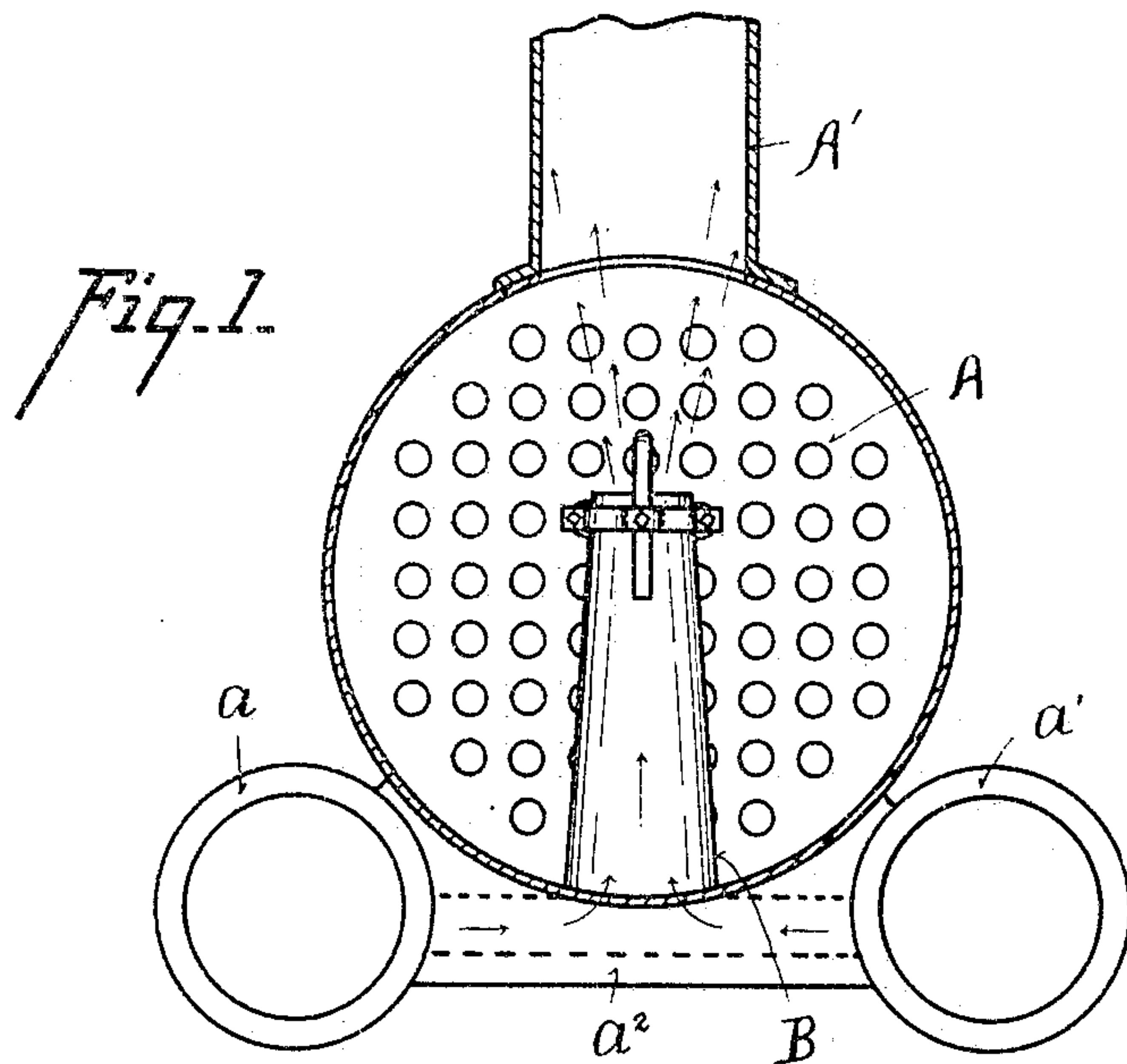


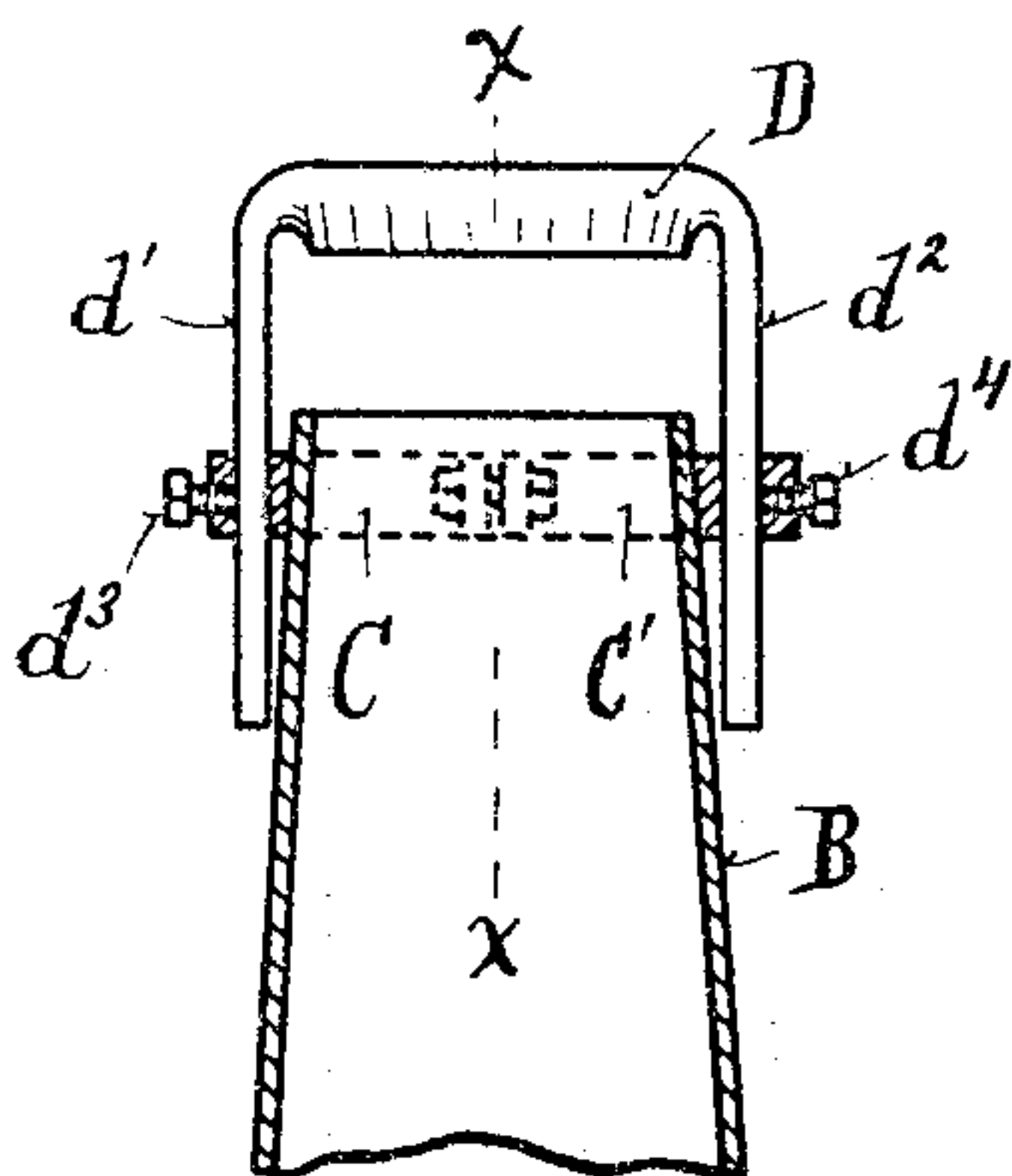
No. 782,250.

PATENTED FEB. 14, 1905

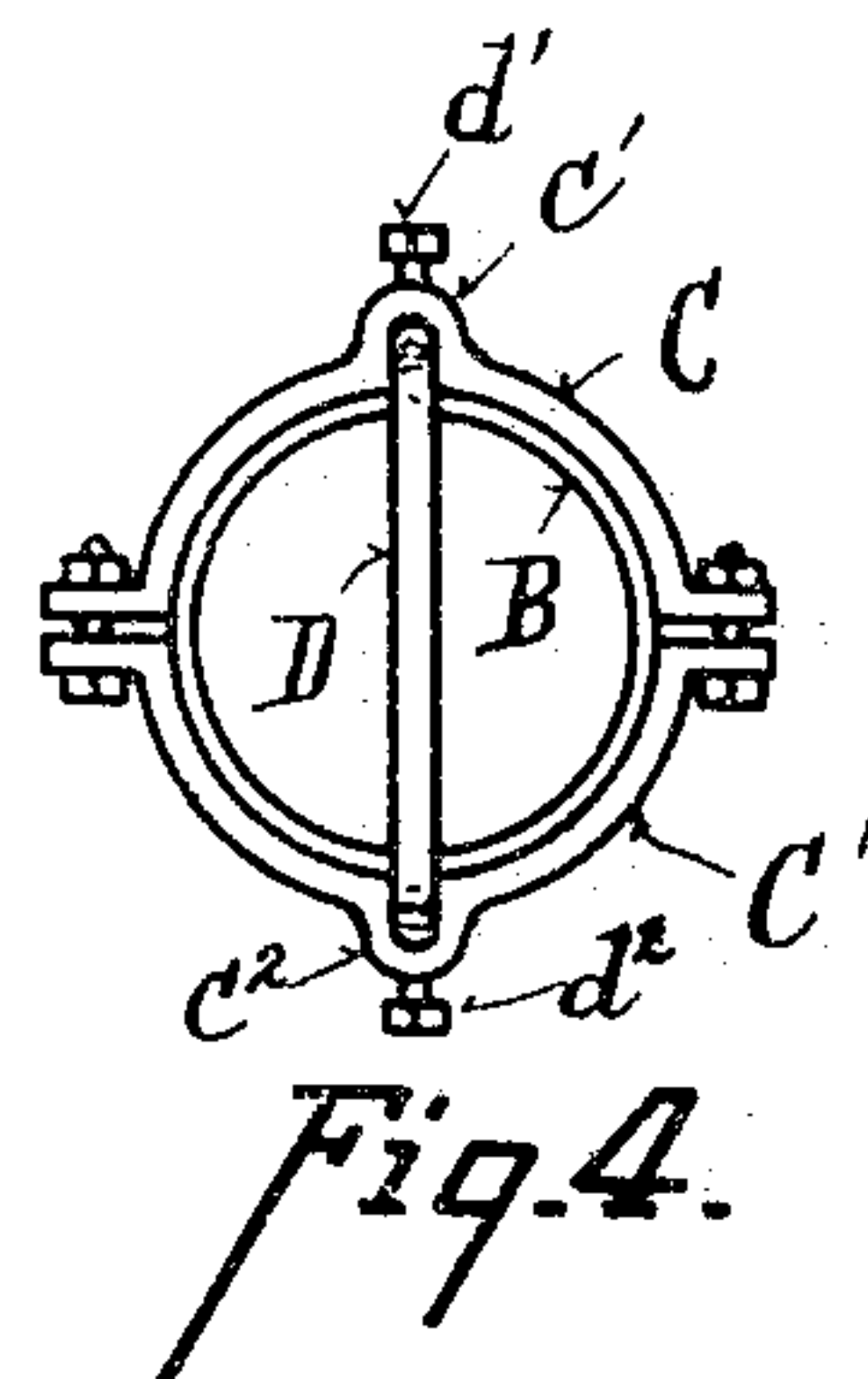
J. B. IRVING.  
NOZZLE FOR LOCOMOTIVE STEAM ENGINES.  
APPLICATION FILED JULY 5, 1902.



*Fig. 2.*



*Fig. 3.*



*Fig. 4.*

Witnesses

C. W. Mills.

A. Mc Cormack.

Inventor

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# UNITED STATES PATENT OFFICE.

JAMES B. IRVING, OF COVINGTON, KENTUCKY.

## NOZZLE FOR LOCOMOTIVE STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 782,250, dated February 14, 1905.

Application filed July 5, 1902. Serial No. 114,384.

*To all whom it may concern:*

Be it known that I, JAMES B. IRVING, a citizen of the United States of America, and a resident of Covington, county of Kenton, State of Kentucky, have invented certain new and useful Improvements in Nozzles for Locomotive Steam-Engines, of which the following is a specification.

I had found that when the nozzle of a steam-engine was opened beyond a certain degree the fire did not burn so well and accounted for the fact, thus, that when the nozzle was open the exhaust-steam shot through the smoke-stack so quickly that it did not expand and fill the same to cause an upward draft therethrough and that if the nozzle were contracted so as to cause the exhaust-steam to pass more slowly through the stack, so as to expand therein, the back pressure against which the engine had to work was very detrimental.

The object of my invention is a means by which the nozzle of a steam-engine may be enlarged to open more widely, which at the same time increases the draft through the furnace. This object is attained by the means described in specification and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of as much of the engine as is necessary to illustrate my invention, with an attachment embodying my invention secured upon the top of the nozzle thereof. Fig. 2 is a vertical sectional view of the nozzle and my attachment, taken upon line *x x* of Fig. 3. Fig. 3 is a side elevation of the same. Fig. 4 is a top plan view thereof.

Referring to the parts, the flues A, the stack A', the steam-cylinders *a a'*, the exhaust-steam pipes *a''*, leading from the cylinders into the nozzle B, are all of ordinary construction and need not be specifically described.

Secured about the upper edge of nozzle B are removable straps C C', which have lateral perforated lugs *c' c''*, which support bridge D. Lugs *c' c''* stand at diametrically opposite points when the straps are fitted upon the nozzle. Bridge D consists of a bar having its lower edge *d* wedge-shaped and having downwardly-projecting vertical arms *d' d''*, which pass down through lugs *c' c''* and may

be adjusted at any height above the nozzle by means of set-screws *d''' d'''*. Bridge D is to be secured upon the nozzle with its wedge-shaped end standing diametrically across the top thereof. The nozzle of steam-engines stands vertically beneath the smoke-stack, so that the bridge D likewise will stand vertically beneath the same. Exhaust-steam passing up through the nozzle will be split by the bridge D and spread outwardly against the sides of stack A', thereby filling the same and causing the desired draft to be created through the furnace. The height at which bridge D is to be adjusted above the end of the nozzle depends upon the height of the nozzle and the degree of draft that is desired through the furnace. If the nozzle comes at a greater distance than usual below the lower end of the stack, the bridge would be adjusted at a greater height above the same so, that the exhaust would not be spread thereby before it reached the stack. If it were found that the bridge were creating too great a draft, the same might be lessened by raising the bridge, so as to throw the point of expansion of the steam in the stack higher up therein.

With my attachment I have found that I may open the nozzle to a much greater extent than I have heretofore been able to do, thereby lessening the back pressure against which the engine has to work, and that with my attachment the draft is not thereby lessened, but increased through the furnace, thereby not only getting a hotter fire from a smaller amount of fuel, but also getting better results from the engine out of the same or a less amount of steam.

What I claim is—

1. In combination with the nozzle of a steam-engine a bridge having downwardly-projecting arms, and means for securing said bridge across, and above the nozzle substantially as specified.

2. The combination of a nozzle of a steam-engine, a strap for engaging the upper end of the nozzle and having lateral perforated lugs, a bridge having downwardly-projecting arms to engage lugs, and means for setting the bridge at the desired height above the nozzle, substantially as shown and described.



3. In combination with the nozzle of a steam-engine, a strap having lateral perforated lugs and being fitted around the upper end of the nozzle, a bridge with a lower tapering end  
5 and downwardly - projecting arms passing through the lugs, and set-screws in the lugs for adjusting the bridge at the desired height above the nozzle, substantially as shown and described.  
10 4. In combination with the exhaust-nozzle

of a steam-engine, a wedge-shaped bridge spanning the nozzle a short distance from the end of the nozzle, and means for adjusting the bridge toward or from the nozzle to secure the maximum result.

JAMES B. IRVING.

Witnesses:

W. F. MURRAY,  
A. McCORMACK.