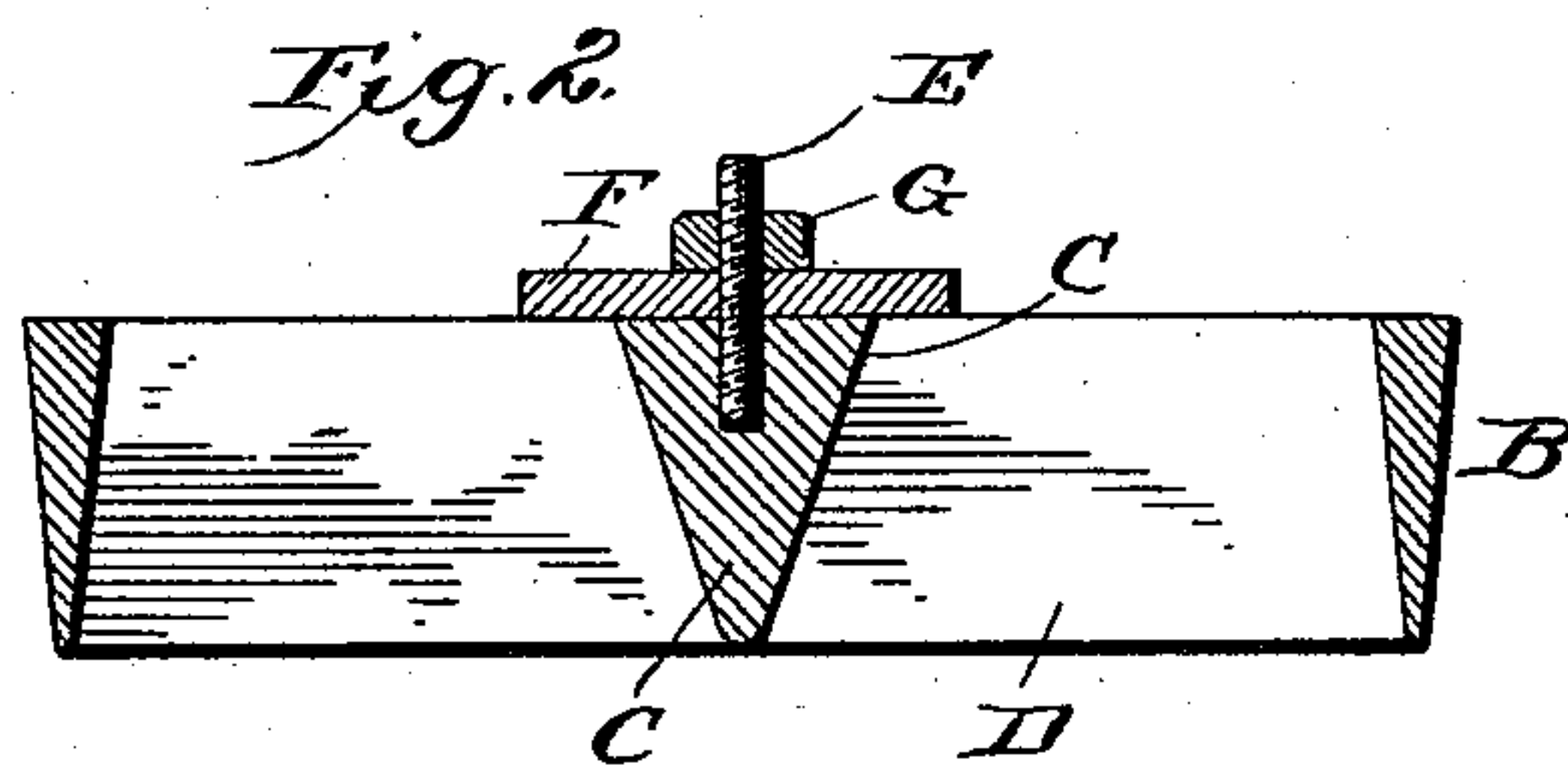
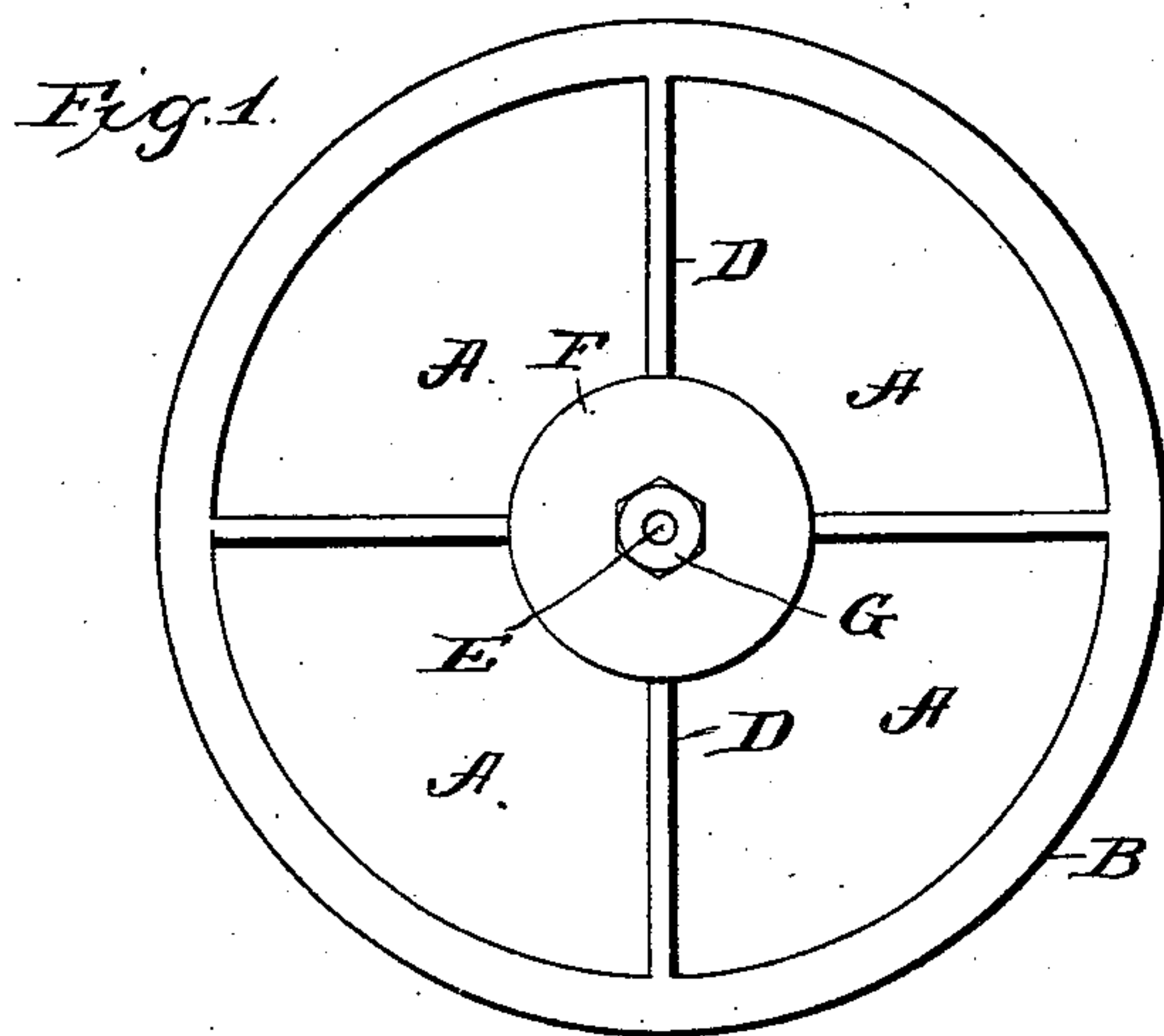


(No Model.)

J. H. EARL.  
EXHAUST NOZZLE.

No. 564,477.

Patented July 21, 1896.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN H. EARL, OF SOMERVILLE, MASSACHUSETTS.

## EXHAUST-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 564,477, dated July 21, 1896.

Application filed October 22, 1895. Serial No. 566,515. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. EARL, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Exhaust-Nozzles, of which the following is a specification.

My invention relates to a new and useful improvement in exhaust-nozzles for locomotives and the like, and has for its object to produce such a device that will be cheap in construction and effective in operation, and whereby the draft occasioned by the exhaust may be adjusted.

With these ends in view the invention consists in the details of construction and combination of elements hereinafter set forth, and then specifically designated by the claims.

In order that those skilled in the art to which my invention appertains may understand how to make and use the same, I will describe its construction and operation in detail, referring by number to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of my improved nozzle, and Fig. 2 is a section thereof.

Similar letters denote like parts in the views of the drawings.

A is the exhaust-cap, formed by the wall B, which is of any desired shape, and D are the bridges, which are wedge-shaped and extend radially inward from this wall to a center piece C, which is preferably cone-shaped, the apex being at the bottom.

E is a screw-bolt threaded into this center piece, and F is a washer passed over this bolt and resting upon the center piece and secured in place by means of the nut G.

The washer F is of larger diameter than the top of the center piece, and therefore tends to reduce the clearance in the exhaust-chamber, so as to limit the amount of steam that may pass through said chamber, so that to

increase or decrease this steam-space it is only necessary to replace the washer F with a larger or smaller washer, as will be readily understood.

As the amount of draft through the fire-box of a locomotive is determined by the clearance in the exhaust-nozzle, it will be seen that by the use of my improvement this draft may be increased or decreased, as thought best, by simply replacing one washer F with another of a different size, the advantage of which will be readily understood by those skilled in the art to which this invention appertains.

As the shape of the nozzle-wall and its mode of attachment is immaterial, I have shown but one design of nozzle, but do not wish to be limited to this exact shape, as the gist of my invention rests in the broad idea of interchangeable washers, by means of which the draft capacity of an exhaust-nozzle may be varied.

Having thus fully described my invention, what I claim as new and useful is—

1. In a device of the character described, a removable disk or washer F, secured to the base of an inverted cone C, said cone being suspended in the middle of the exhaust-nozzle by radial arms D, which are attached to the collar B, as and for the purpose described.

2. In a device of the character described, a collar B, radial arms D, an inverted cone C at the intersection of the arms, a screw E on the base of the cone and a disk or washer F, adapted to pass over the screw and a bolt G, threaded to said screw, as and for the purpose described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JOHN H. EARL.

Witnesses:

S. S. WILLIAMSON,  
HENRY JOHNSON.