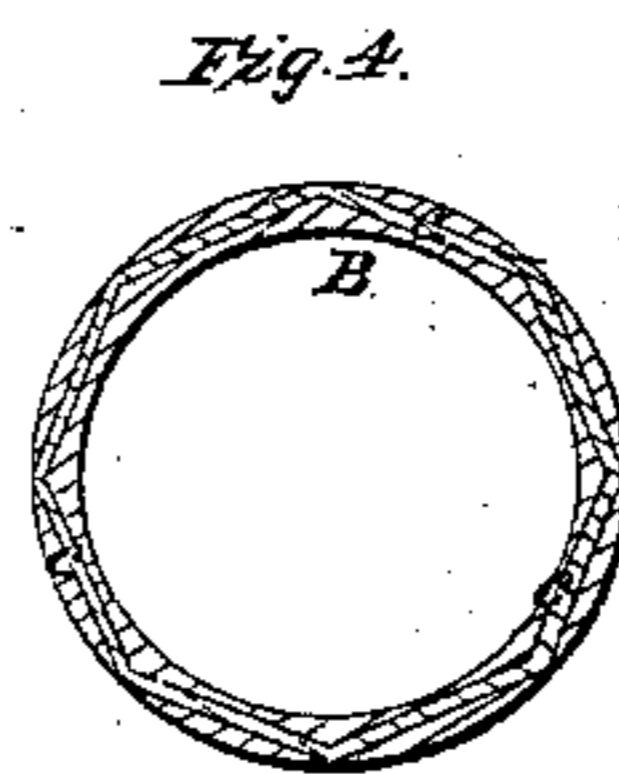
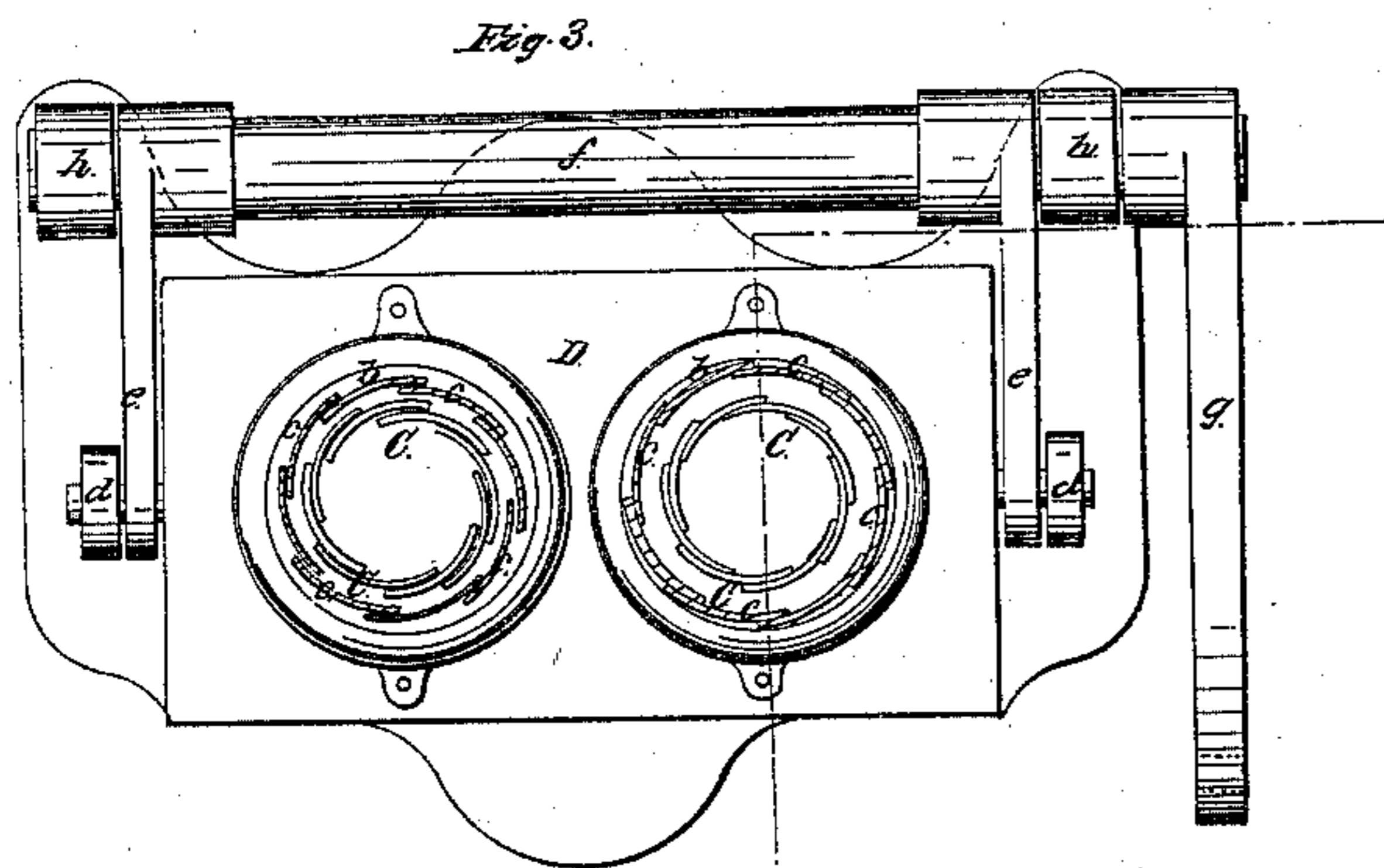
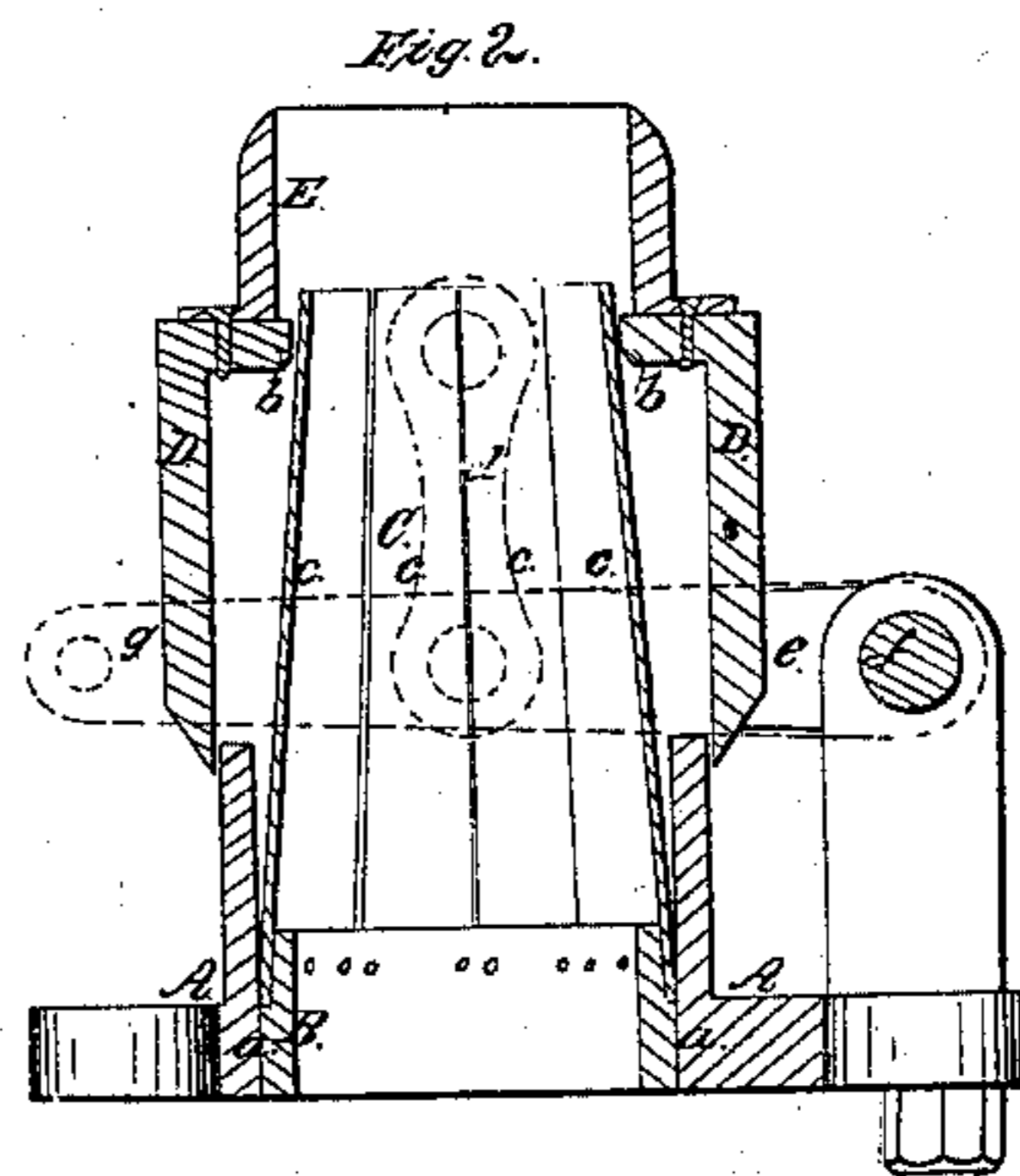
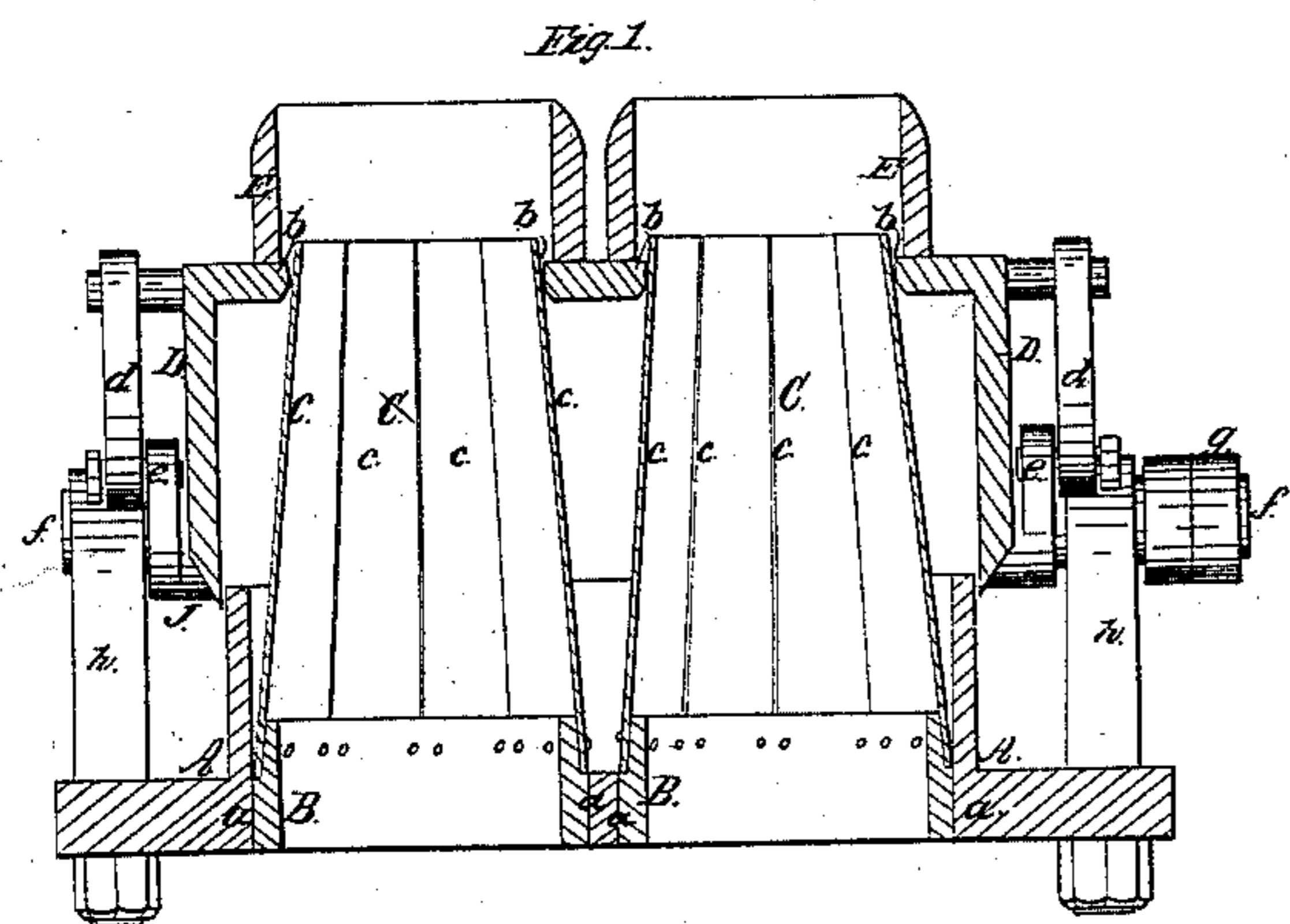


Dykeman & Bolton,

Exhaust Mechanism for Locomotives.

N^o 43,484.

Patented July 12, 1864.



Witnesses:

Henry Morris
Wm. Reed

Inventors.

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J. Bolton
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Attorneys

UNITED STATES PATENT OFFICE.

JOHN DYKEMAN AND JOHN BOLTON, OF GREENBUSH, NEW YORK.

IMPROVEMENT IN VARIABLE EXHAUSTS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. 43,484, dated July 12, 1864.

To all whom it may concern:

Be it known that we, JOHN DYKEMAN and JOHN BOLTON, both of Greenbush, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Variable Exhausts for Locomotive-Engines; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are vertical sections at right angles to each other of the apparatus by which the exhaust is varied. Fig. 3 is a plan of the same. Fig. 4 is a horizontal section of one of the expanding nozzles near its base.

Similar letters of reference indicate like parts.

The object of this invention is to provide for the contraction and enlargement of the exhaust-outlets without breaking or changing the direction of the ascending column or columns of steam; and to this end it consists, principally, in the employment of expanding and contracting nozzles or cones composed of staves of steel or other metal firmly secured at their lower ends to suitable sockets, and having their upper parts constructed to overlap each other in such manner as to enable them to be drawn together equally toward and to move outward equally from a common center.

It consists in certain means for producing the contraction of the so-constructed cones or nozzles, and of preventing any collection or settlement of dirt or ashes around their exteriors.

A is a stationary box-like vase, intended to be arranged within the smoke-box of the locomotive, and having in its bottom two circular openings, *a a*, situated over the exhaust-pipes. Into these openings are tightly inserted the sockets B of the expanding and contracting cones C C. The upper parts of these sockets are of polygonal form, and have riveted to them the lower parts of the staves of steel-plate, *c c*, of which the cones C C are composed. The lower parts of these staves, which are riveted to the sockets, are flat; but from a short distance from the said socket up to the top they are curved in their horizontal section and arranged as shown in Figs. 3 and

4, so that each closely overlaps its next neighbor on one side, and is closely overlapped by its next neighbor on the other side, but it is only at the bottom that the said staves are secured, their upper ends being free to be moved toward a common center by pressure applied to their exteriors, for the purpose of contracting the upper ends of the nozzles. The said staves must be sufficiently elastic to cause them to move back again from the center of the nozzle, and so expand the upper end thereof when the external pressure is removed.

D is a cover fitted to slip freely up and down over the upright sides of the box-like base A, and having in its top two openings, *b b*, which are large enough to receive within them the upper parts of the nozzles C C when the latter are in their most expanded condition. This cover D, fitted to the box-like base, as described, prevents the collection around the nozzles C C of ashes, dirt, &c., which might get between their staves and prevent their free expansion and contraction. The lower edges of said cover are beveled or sharpened, to enable them to scrape off any dirt that may collect on the base. On the top of the said cover there are secured, around and concentric with the openings *b b*, two short upright nozzles, E E, to surround the upper portions of the expanding and contracting nozzles C C. The nozzles C C are expanded and contracted by raising and lowering the cover D. As the cover is raised, the openings *b b*, which receive the upper parts of the said nozzles, permit the said nozzles to expand by the natural elasticity of their staves, and as the cover is lowered the said openings *b b* sliding down the conical exteriors of the said nozzles contracts them, as shown in red outline in Fig. 3. To provide for the raising and lowering of the cover D by the engineer, it is connected by links *d d* with the two short arms *e e* of a rock-shaft, *f*, which works in suitable bearings, *h h*, upon the base A, and which is furnished with a longer arm, *g*, to which to apply the power by a suitable system of connections leading to the engineer's cab.

It will be readily understood that the expanding and contracting nozzles C C operate very differently from a mere expanding and contracting opening, and that as they expand and contract from and toward their centers in all directions, and the expansion and contraction are gradual all the way down, the currents

of steam are not broken and do not have their direction changed by the expansion and contraction of the said nozzles.

We prefer to give the nozzles C C a slight inclination toward each other in an upward direction so that their axes would meet in a point some distance below the mouth of the smoke-stack.

What we claim as our invention, and desire to secure by Letters Patent, is—

The plates c c c c, &c., fastened at their lower ends to the conical sockets B, overlapping each

other from a point near their attachment, and sufficiently numerous to make them readily approximate the shape of a frustum of a cone without opening the joints, in combination with the caps E E, which by depression contract the nozzles, and by elevation admit of their expansion.

JOHN DYKEMAN.
JOHN BOLTON.

Witnesses:

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DUDLEY DEMING.