

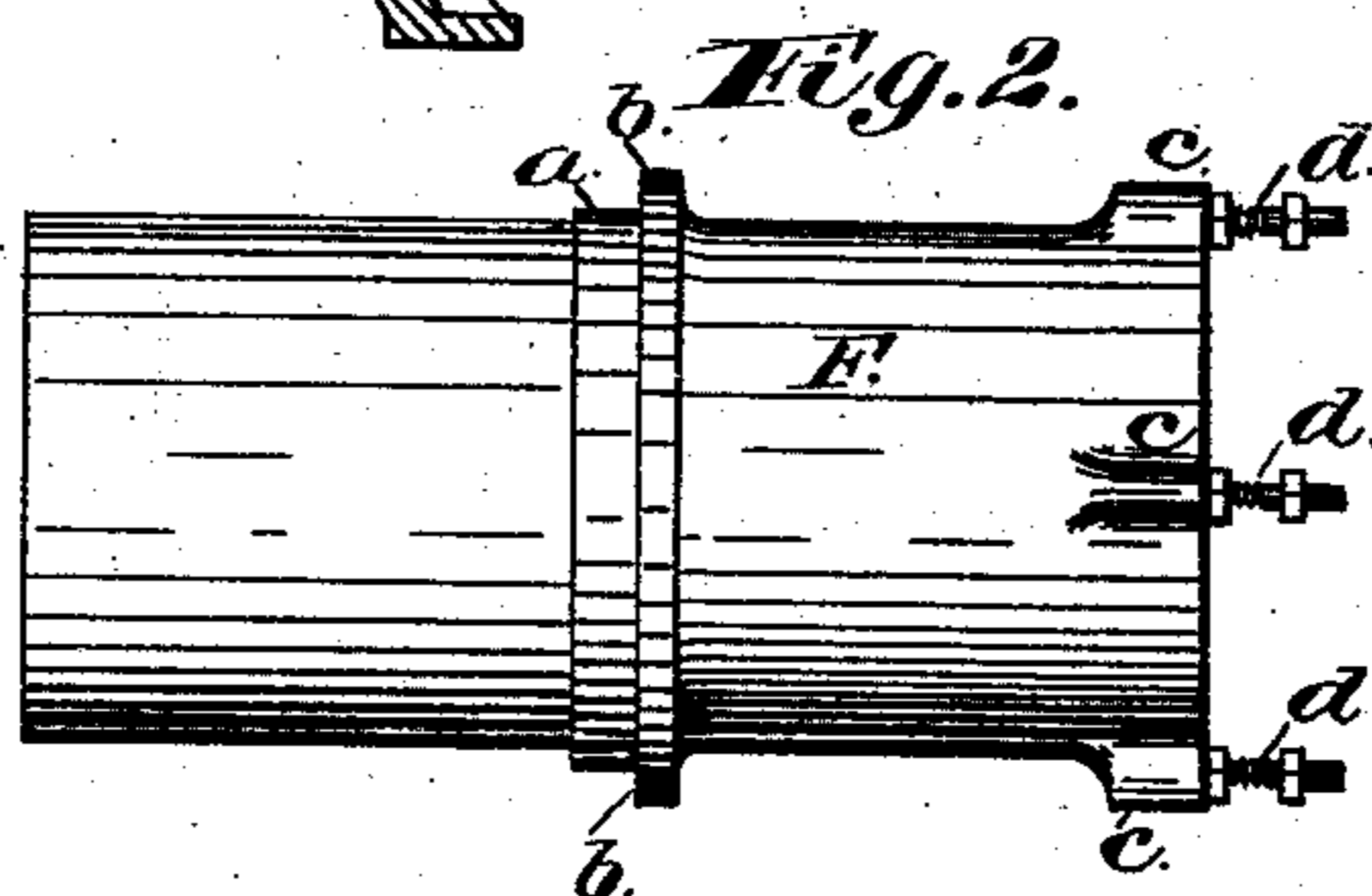
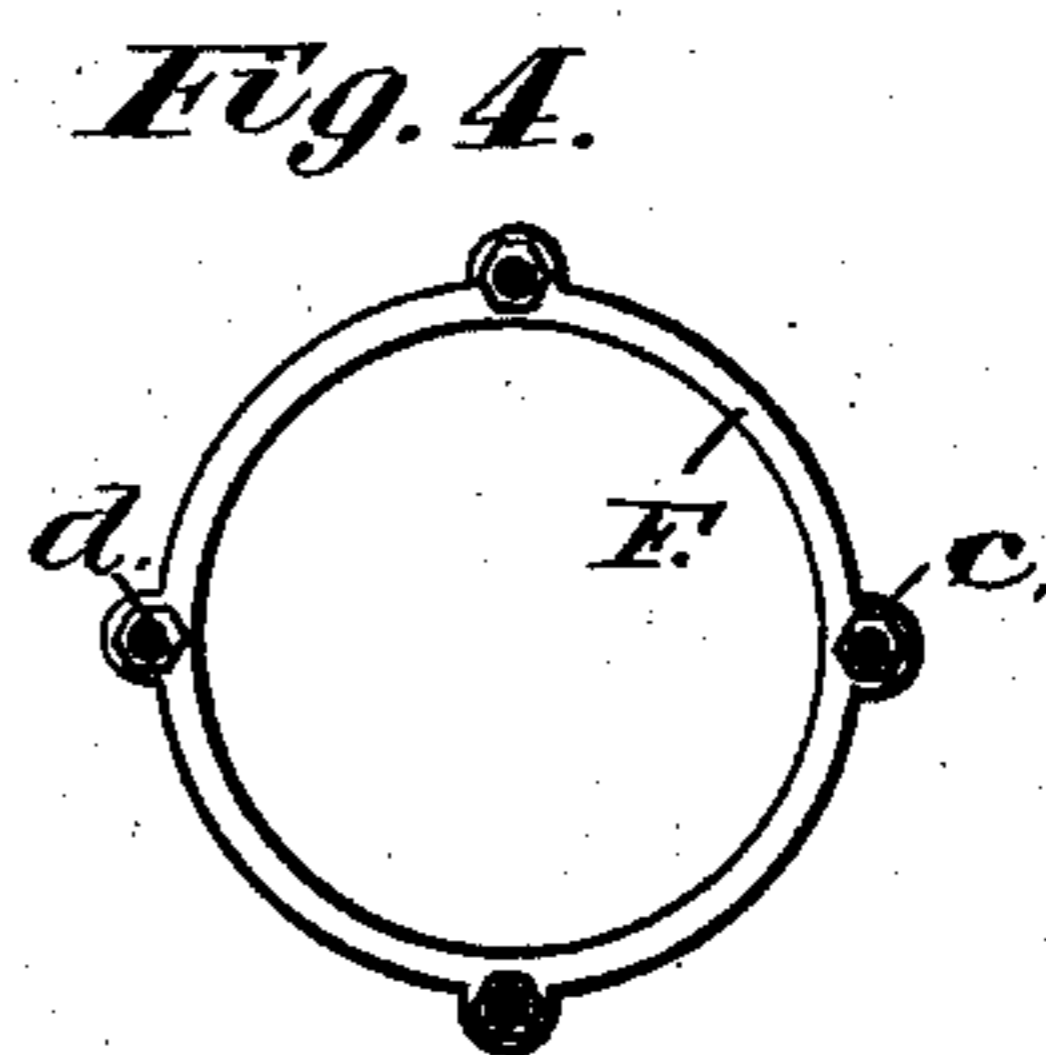
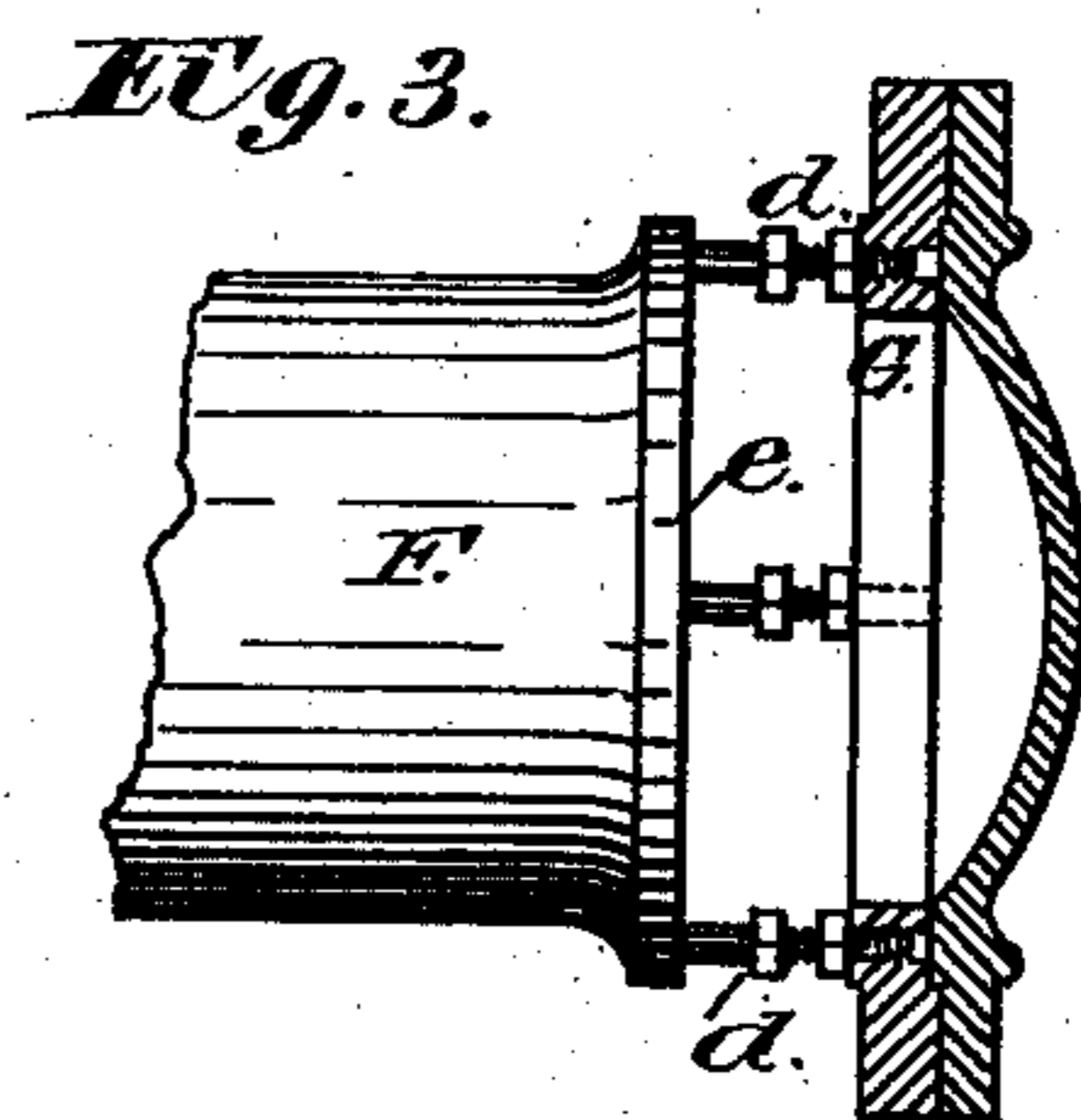
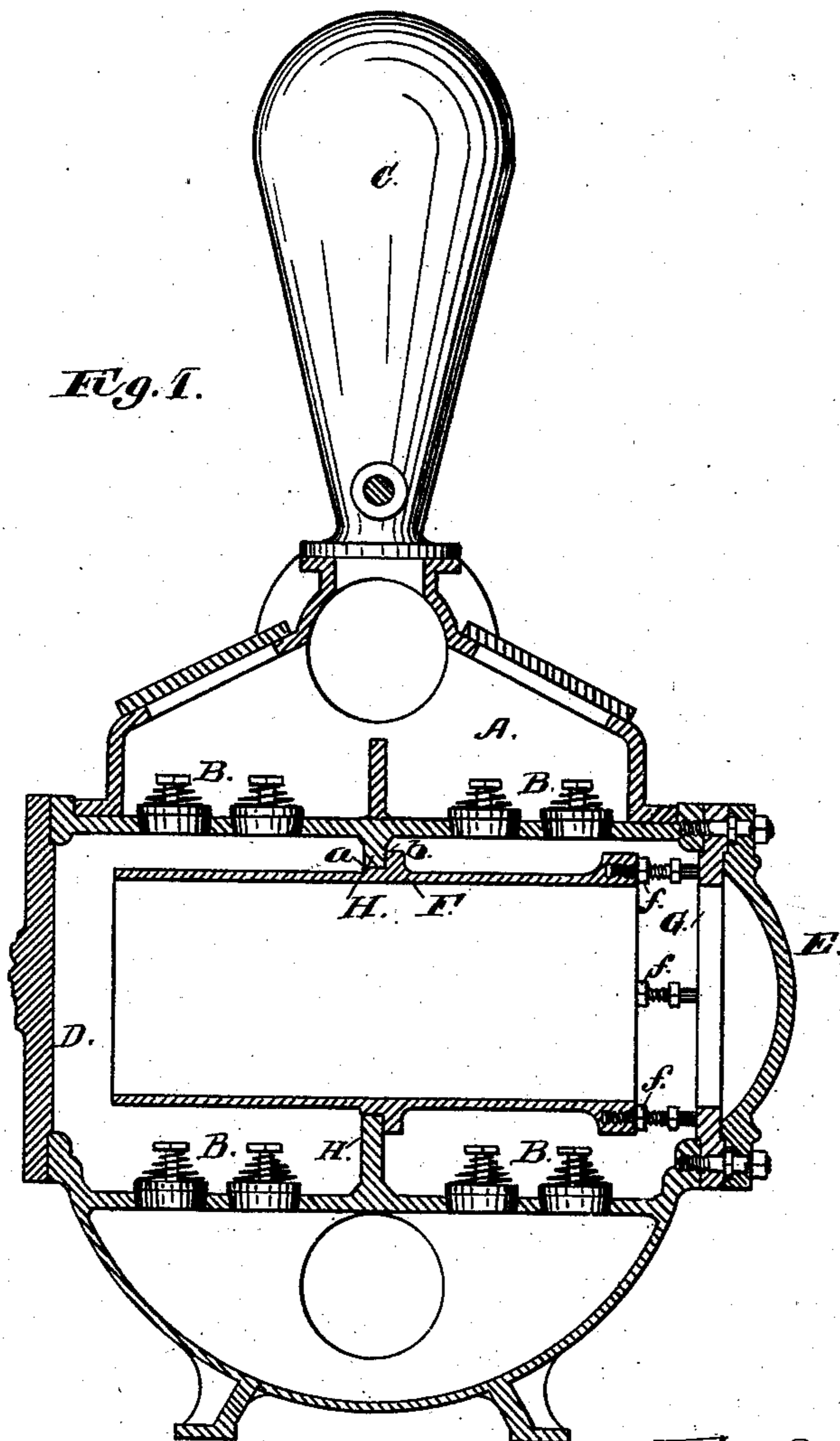
(No Model.)

J. H. VAILE.

REMOVABLE CYLINDER FOR STEAM PUMPS.

No. 248,069.

Patented Oct. 11, 1881



*Attest;*  
*Jeremiah F. Furhig.*  
*Eus A Meyer*

*Inventor;*  
*John H. Vaile*  
*by Peck & Ritchie*  
*his Atty's*

# UNITED STATES PATENT OFFICE.

JOHN H. VAILE, OF DAYTON, OHIO.

## REMOVABLE CYLINDER FOR STEAM-PUMPS.

SPECIFICATION forming part of Letters Patent No. 248,069, dated October 11, 1881.

Application filed April 11, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. VAILE, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful  
5 Improvements in Removable Cylinders for Steam-Pumps; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improvement in  
10 removable cylinders especially designed for pumping-engines; and the object of the invention is to provide a universally-adjustable cylinder which can be readily inserted into the exterior cylinder or jacket, and which, when so  
15 inserted, will be held perfectly tight and rigid against longitudinal or other strain.

The novelty consists in the construction, combination, and arrangement of the parts composing my improved cylinder, and in the  
20 method of its attachment, all as will be here-with set forth.

In the accompanying drawings, Figure 1 is a side elevation in longitudinal central section through the pumping-chamber. Fig. 2 is a  
25 side elevation of the removable cylinder. Fig. 3 is a detail view, showing a modification in the construction. Fig. 4 is an end elevation of Fig. 2.

Hitherto in the construction and attachment  
30 of removable cylinders of this class the fastenings have been either insecure or very troublesome to get at, or else the cylinder was not universally adjustable in its chamber, by which I mean that it had to be inserted in a par-  
35 ticular position in order to have the ports at one end fit the corresponding openings in the shell or chamber, and in consequence the cylinder could not be inserted at haphazard and insure the coincidence of these openings. The  
40 result was that the cylinders had to be especially made for the particular pumps into which they were to be inserted.

By my improvement a universal cylinder is produced which has to be varied only in size  
45 to fit any pump.

In the drawings, A represents any pump, with its valves B, air-chamber C, and cylinder-heads D and E.

F is the removable cylinder, having a true  
50 cylindrical bore open at both ends, and without any ports or other openings. This cylinder

is cast comparatively light, and has at about its middle a double circumferential flange, turned true on both its faces *a* and *b*, to form a gasket-joint, as seen in Fig. 1. One end of the  
55 cylinder, as seen in Fig. 2, has four or more equidistant integral tapped and threaded lugs or ears, *c*, into which screw-bolts *d* are fitted, as represented. Instead of these lugs *c*, the end of the cylinder may be flanged all around, as  
60 shown at *e* in Fig. 3. Now, to secure the cylinder thus constructed into the main surrounding cylinder of the pump, I interpose an intermediate flange or annular disk, G, between the  
65 end of said cylinder and its head E. This head may be bulging in shape, as shown, and it is bolted to the cylinder over the flange G in any suitable manner; but the cylinder F must be  
70 inserted and secured before the head E is applied.

At about the middle of the main cylinder is an inwardly-extending flange, H, forming an opening just large enough to permit the pas-  
75 sage through it of the cylinder F and its trued joint-face *a*. Before applying the flange G the cylinder F is inserted with the joint-surfaces  
80 *a* and *b* bearing against the flange H, as seen in Fig. 1. The flange or disk G is then bolted on securely, and through the opening in this disk the bolts *d* are reached, and are made to  
85 bear against the inner side of the flange G, as shown, thus forcing the cylinder F into place and effecting a tight joint with the flange H.

Lock-nuts *f* upon the bolts *d* may be used to prevent their turning after the cylinder is in-  
serted.

I do not propose to limit myself to the precise location or number of bolts used, for, as seen in Fig. 3, the bolts may be screwed into the flange G and be made to bear against the  
90 flange upon the cylinder F, or they may pass through said flange and be made to bear against the central flange. The only essentials are that an intermediate flange or disk, G, shall be  
95 interposed between the main cylinder and its head, to form a bearing resistance to lock the removable cylinder in its place and effect a tight gasket-joint at or about the center.

The advantages of the above construction and of removable cylinders generally are ob-  
100 vious, and need not be stated further than I have already mentioned.

Having thus fully described my invention, I claim—

1. A removable universally-adjustable cylinder for pumping-engines, having a double  
5 flange at or about its center to form a gasket-joint, and held in place by locking-bolts, substantially as set forth.

2. The combination, with a removable cylinder for pumping-engines, held in place by

locking-bolts, of an intermediate disk or flange 10 to form a bearing resistance for said bolts, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand.

JOHN H. VAILE.

Witnesses:

PATRICK H. GUNCKEL,  
CHAS. M. PECK.