

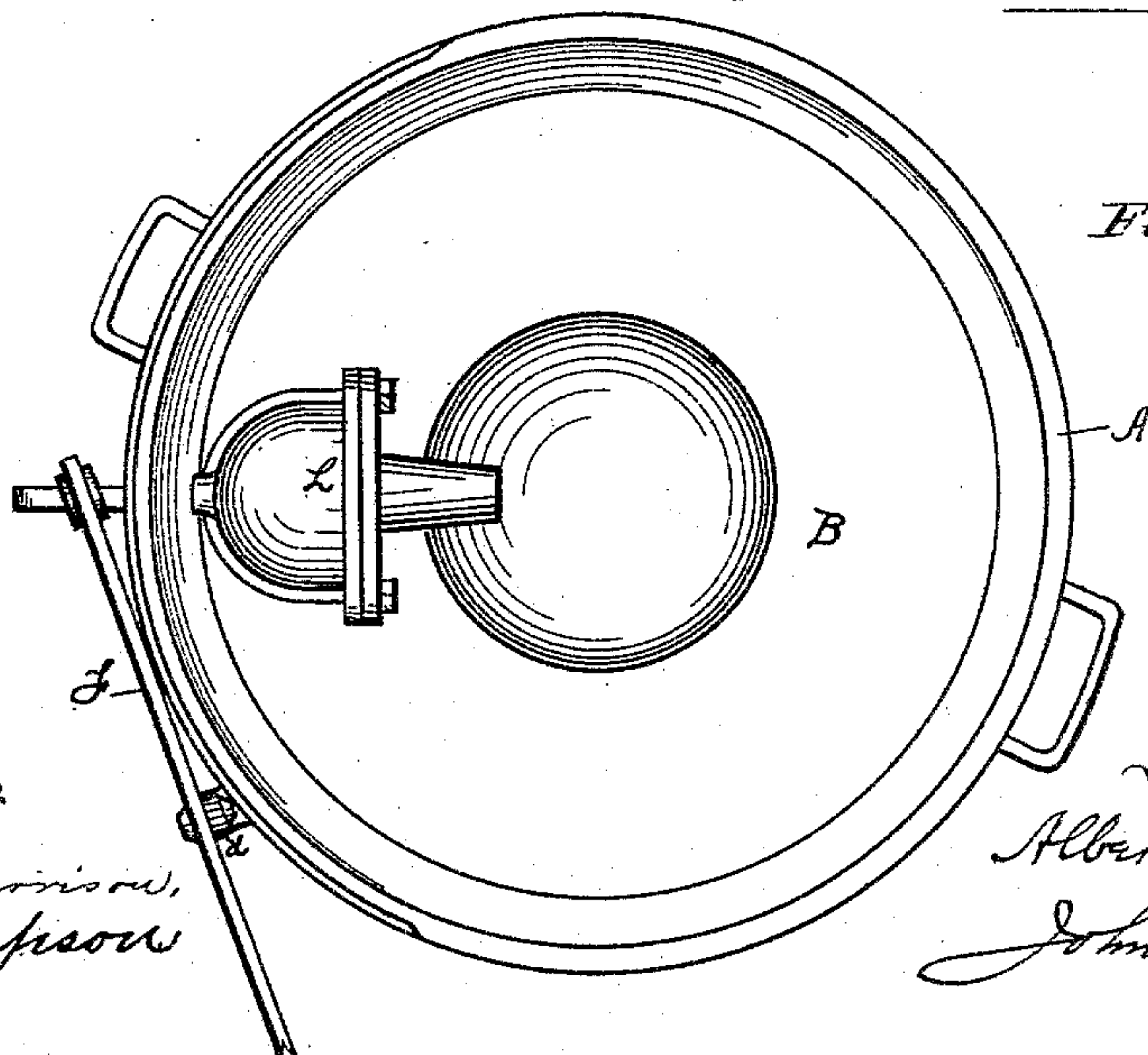
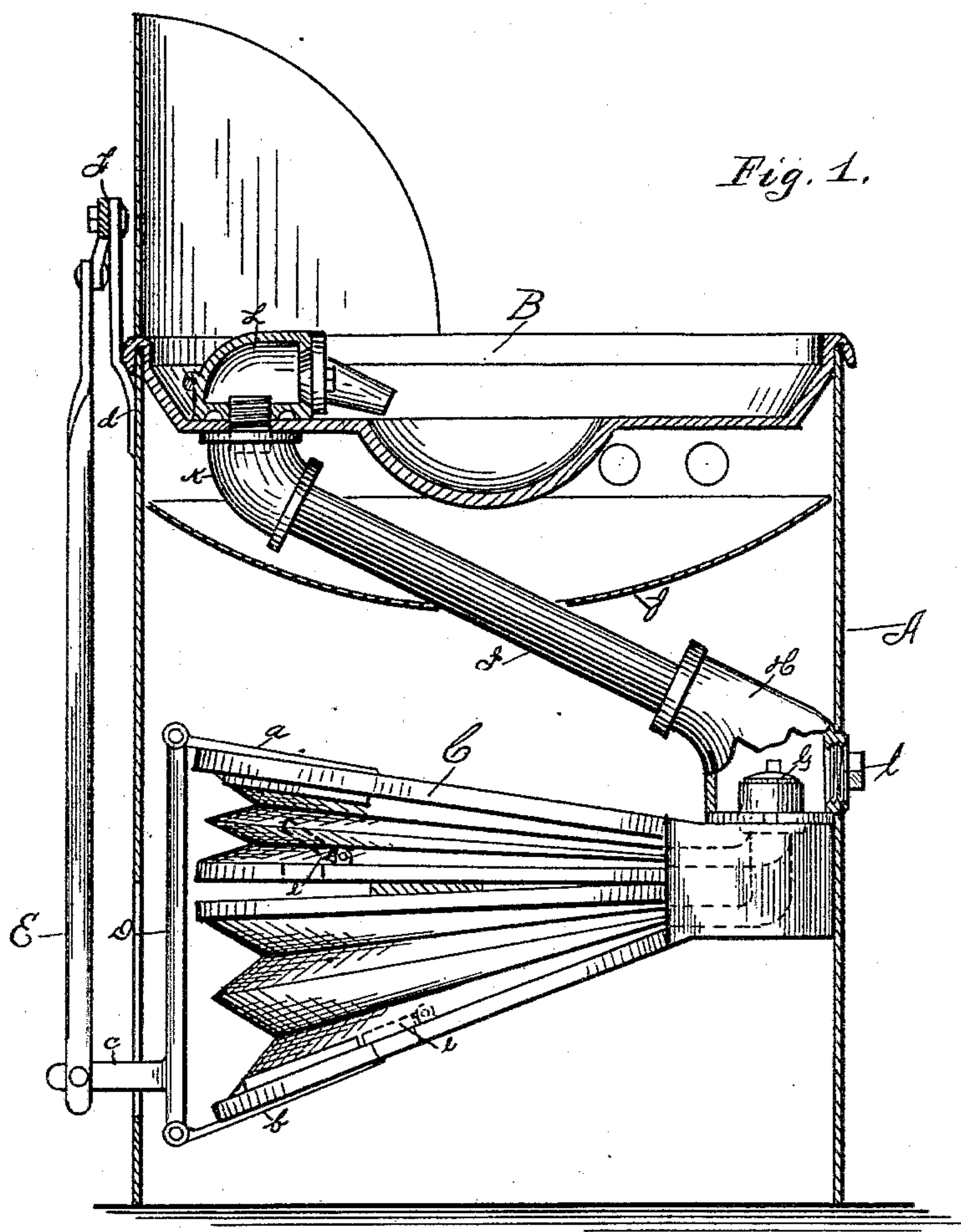
(No Model.)

2 Sheets—Sheet 1.

A. E. DAIN.  
PORTABLE FORGE.

No. 411,760.

Patented Sept. 24, 1889.



Witnesses:  
M. E. Harrison,  
J. Simpson

Inventor.  
Albert E. Dain  
per  
John H. Roney  
Attorney

(No Model.)

2 Sheets—Sheet 2.

A. E. DAIN.  
PORTABLE FORGE.

No. 411,760.

Patented Sept. 24, 1889.

Fig. 3.

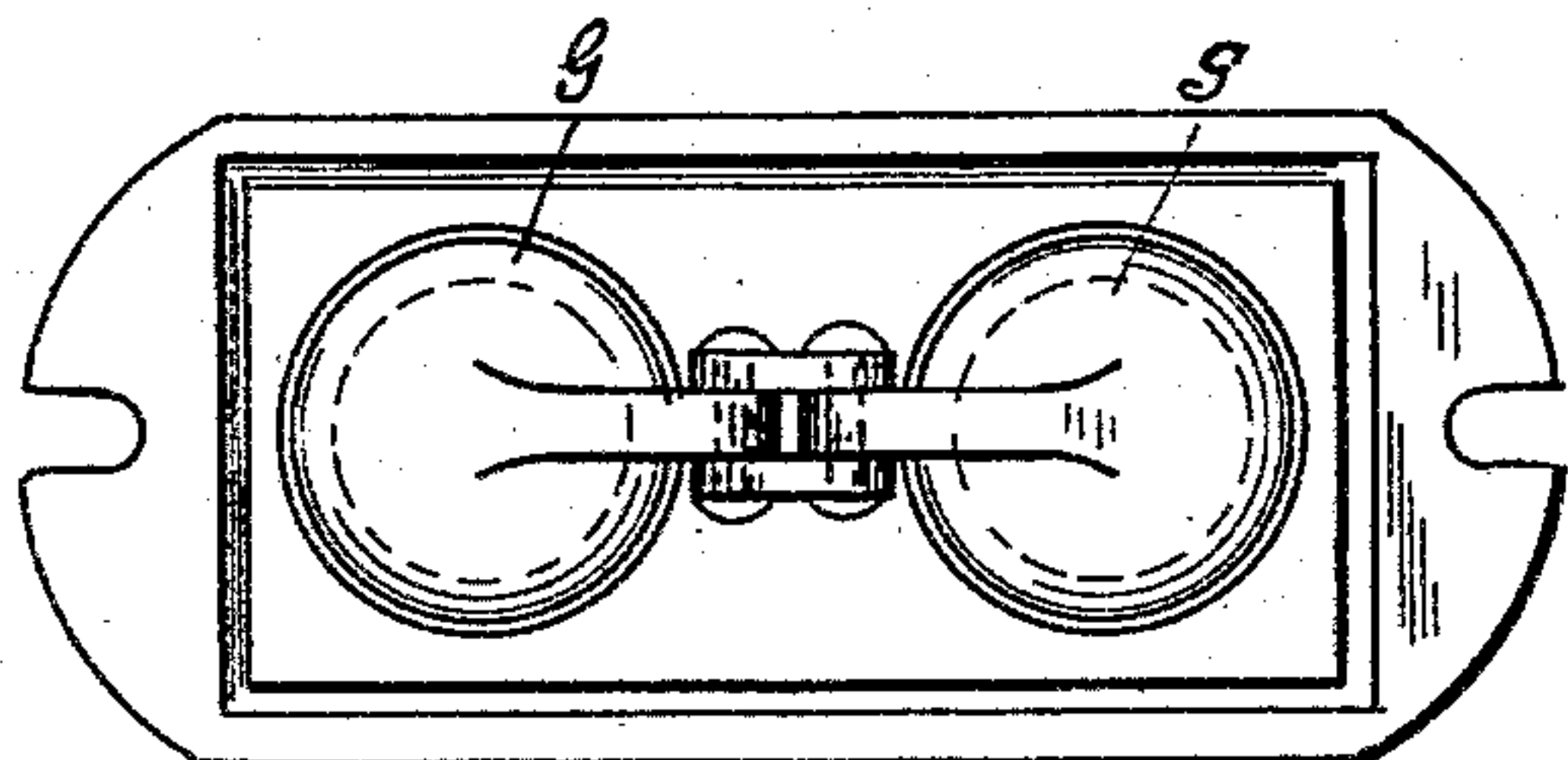


Fig. 4.

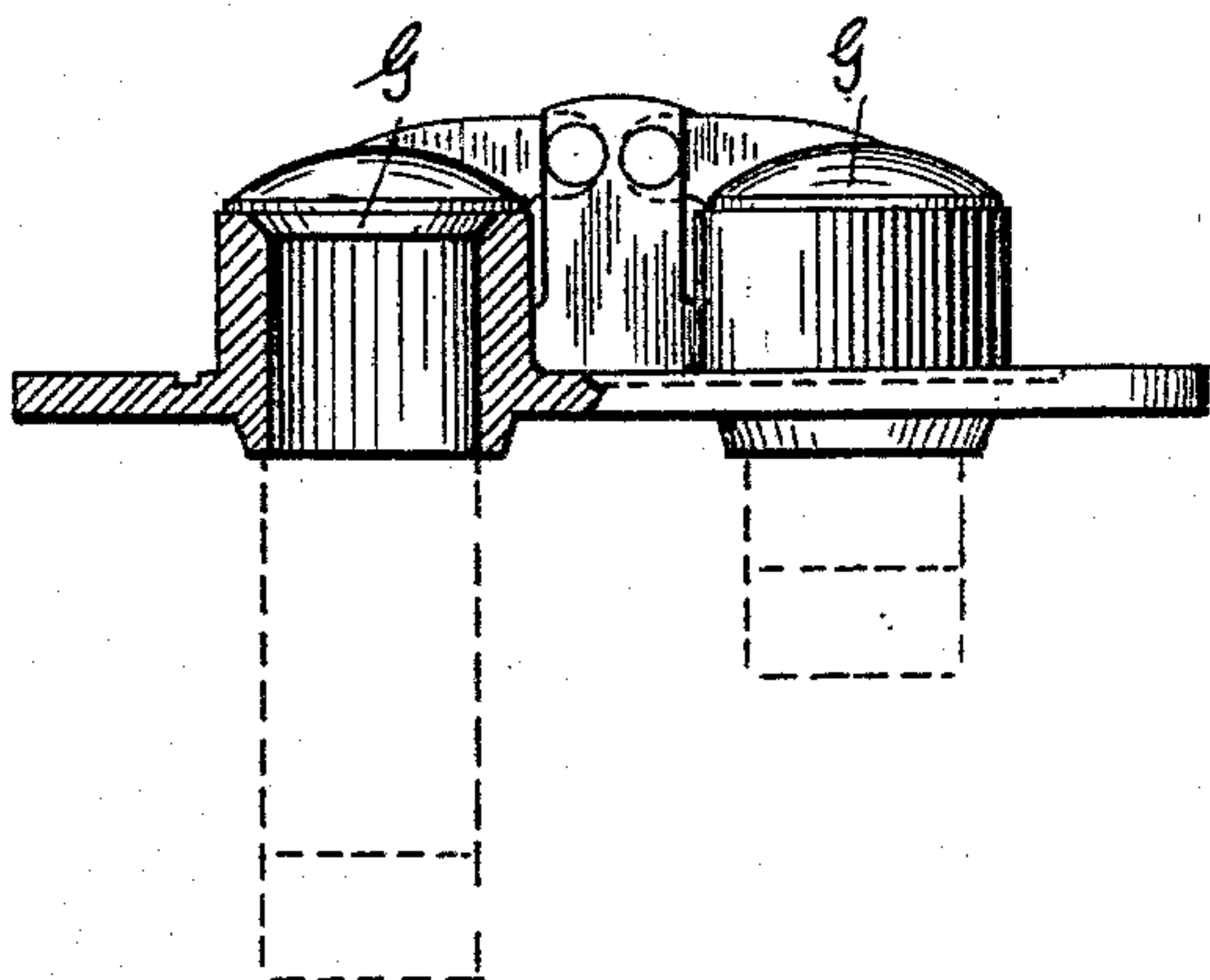


Fig. 6.

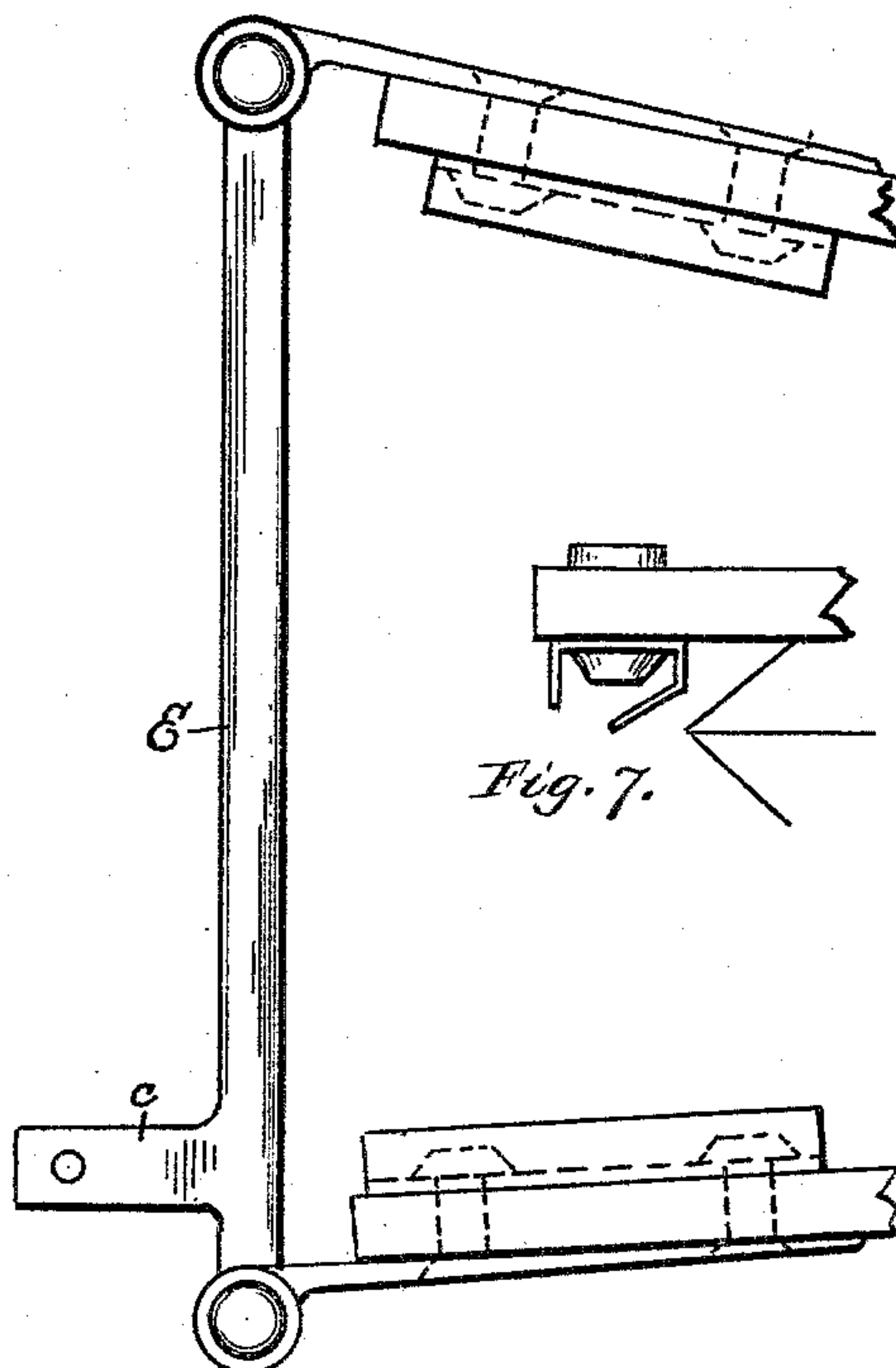
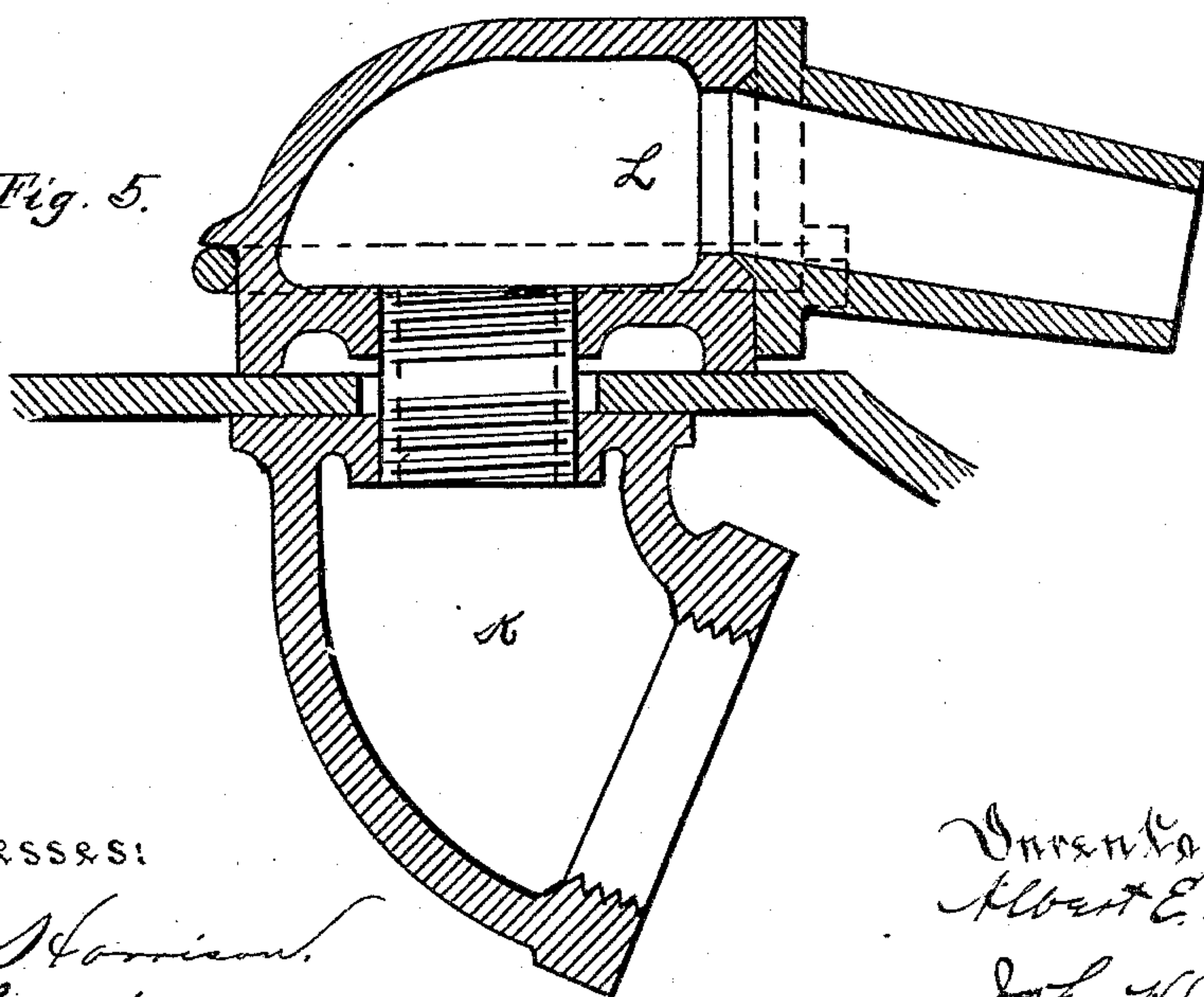


Fig. 7.

Fig. 5.



Witnesses:

M. E. Harrison.  
C. J. Simpson

Inventor.  
Albert E. Dain  
per  
John H. Roney  
Attorney



# UNITED STATES PATENT OFFICE.

ALBERT E. DAIN, OF PITTSBURG, PENNSYLVANIA.

## PORTABLE FORGE.

SPECIFICATION forming part of Letters Patent No. 411,760, dated September 24, 1889.

Application filed June 8, 1889. Serial No. 313,622. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT E. DAIN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Portable Forges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 indicates a sectional elevation of my improved portable forge. Fig. 2 is a plan of the same. Fig. 3 is a plan of the valves. Fig. 4 is a side elevation, partly in section, of the same; Fig. 5, a sectional elevation of the tuyere. Fig. 6 is a side elevation of the device which connects and operates alternately either section of the bellows. Fig. 7 is a detail of the bolt-head-covering device.

Like letters indicate like parts wherever they occur.

The object of my invention is to produce a portable bellows-forge in which the draft upon the fuel is constant, thereby obviating the disadvantages incident to those at present in use, in which the draft is intermittent. I believe I have accomplished this object by the device herein described.

In the drawings, A is the casing of a portable forge, formed of heavy sheet-iron or other suitable material, to the upper part of which is bolted or otherwise suitably secured the fire-hearth B, which is formed, preferably, of one piece. C is a bellows suitably secured in the lower portion of the interior of said casing, and is formed of two separate sections firmly connected together, as shown in the drawings, thereby forming a double-acting bellows the upper section or compartment of which is adapted to receive air while the lower section thereof is discharging air, and vice versa, whereby a constant draft is had upon the fuel upon the fire-hearth of the forge. Upon the top of the upper section is suitably secured by bolts or otherwise an iron strap or rod *a*, to the outer end of which is attached by a hinged joint the shaft D, the lower end of

which is similarly attached to a flat bar or strap *b*, similarly secured upon the bottom of the lower section. Attached to or forming part of said shaft D is a short horizontal arm *c*, which projects through an opening at the rear lower part of the casing. To the outer end of said arm is secured the lower end of the long vertical rod or shaft E, the upper end of said shaft being attached to a lever F, which is pivoted near its outer end upon the brace or bracket *d*.

*e e* are valves for the admission of air into either section of the bellows, respectively; and G G are valves suitably attached to the forward part or nozzles of either section, respectively, either of which is adapted to close automatically the instant the other is opened by the expulsion of the air from the compartment to which it is attached into the chamber or box H. Attached to the upper and inner end of said chamber is a pipe I, which projects through an opening in a screen J, suitably secured in the interior of the casing between the bellows and the fire-hearth of the forge. To the upper end of said pipe is secured an elbow *k*, which is threaded upon its lower inside surface for that purpose, and is also provided with a thread upon its upper inside surface, into which is screwed the tuyere L of the forge, as shown in Figs. 1 and 5.

*l* is a cap adapted to close the hole in the side of the casing, through which the valves may be repaired, if necessary.

It is obvious that instead of two connected bellows, as shown in the drawings, the same may be formed in one with two separate compartments by substituting a thick divisional partition for the bottom and top of the bellows, respectively, as shown, and by cutting out a check in the rear of said partition for the valve to admit air into the upper compartment. It is also obvious that the bellows may be advantageously used in forges other than portable ones.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A forge-bellows formed of two separate compartments, either of which is adapted to

be expanded when the other is contracted, whereby a constant draft is had, substantially as and for the purpose herein set forth.

2. In a portable forge provided with a suitable fire-hearth, the combination of the bel-  
5 lows, substantially as described, and means for contracting and expanding either section alternately, whereby a constant draft is had, the valves attached to the nozzle of either sec-  
10 tion, respectively, and the air-chamber con-

nected by a pipe or tube with the tuyere, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I hereunto affix my signature this 1st day of June, A. D. 1889.

ALBERT E. DAIN. [L. s.]

In presence of—

C. S. SIMPSON,

C. C. LEE.