

(No Model.)

N. O. SWENSON.

## TUYERE FOR FORGES.

No. 283,435.

Patented Aug. 21, 1883.

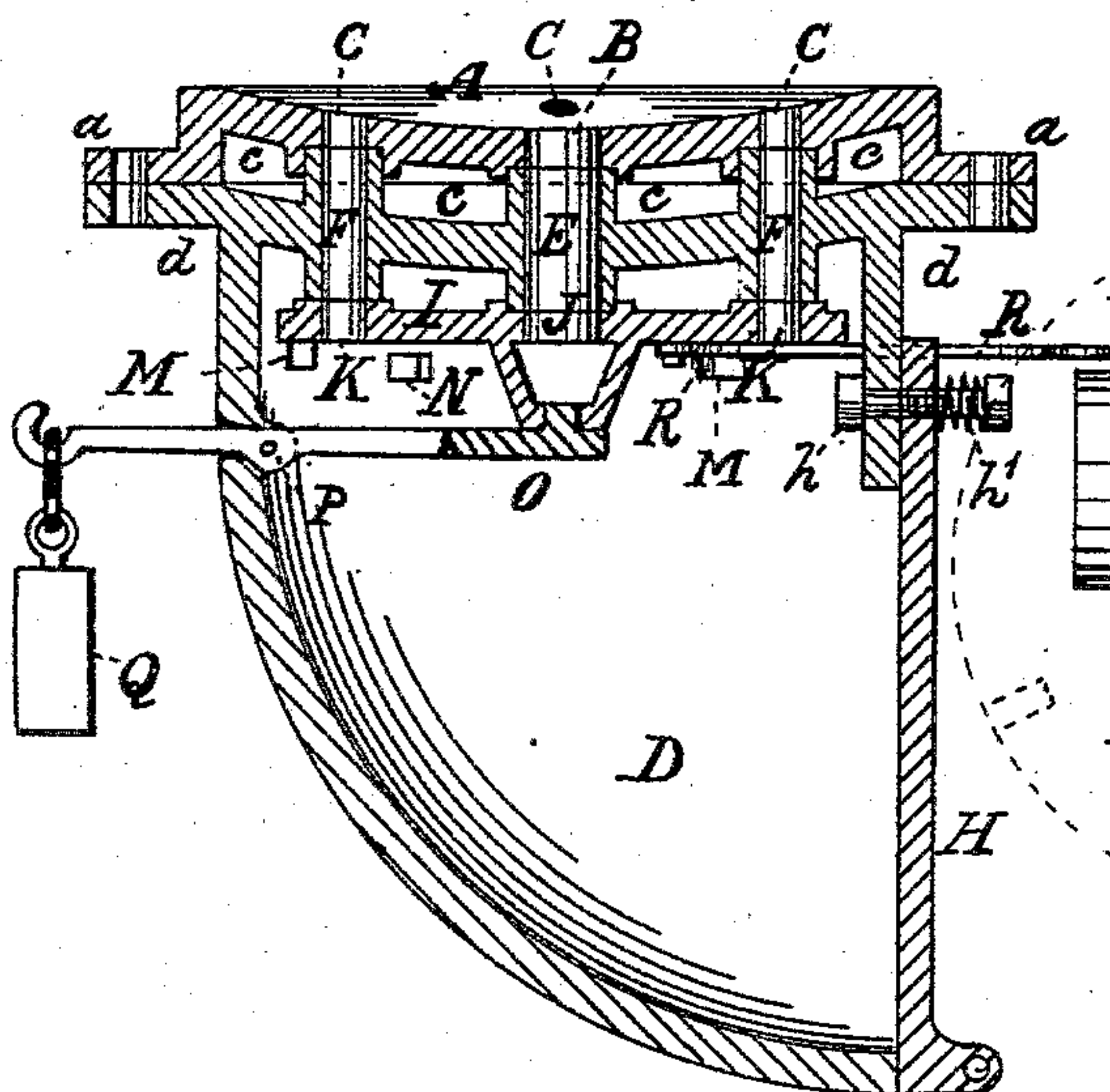


Fig: 1.

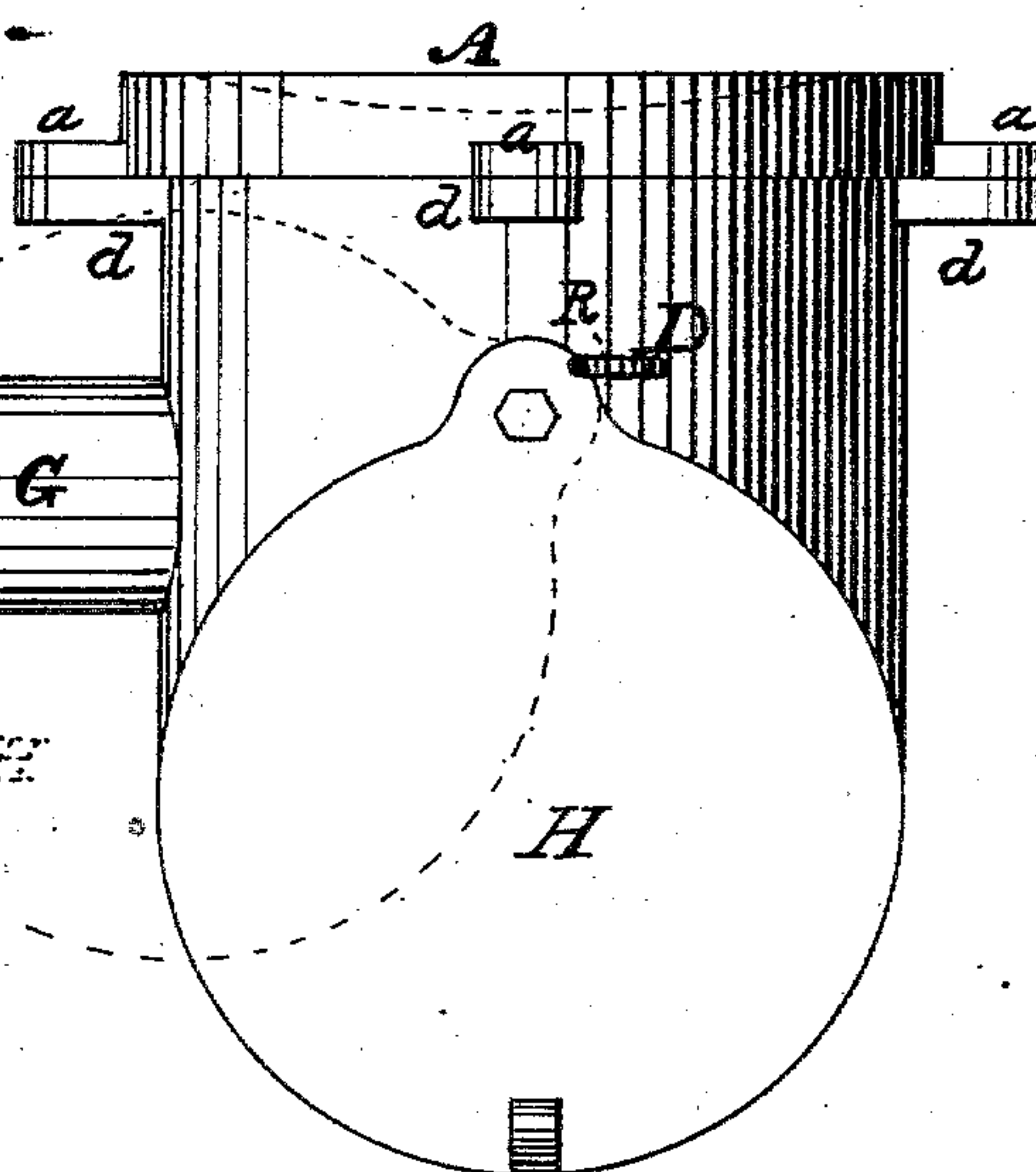


Fig: 3.

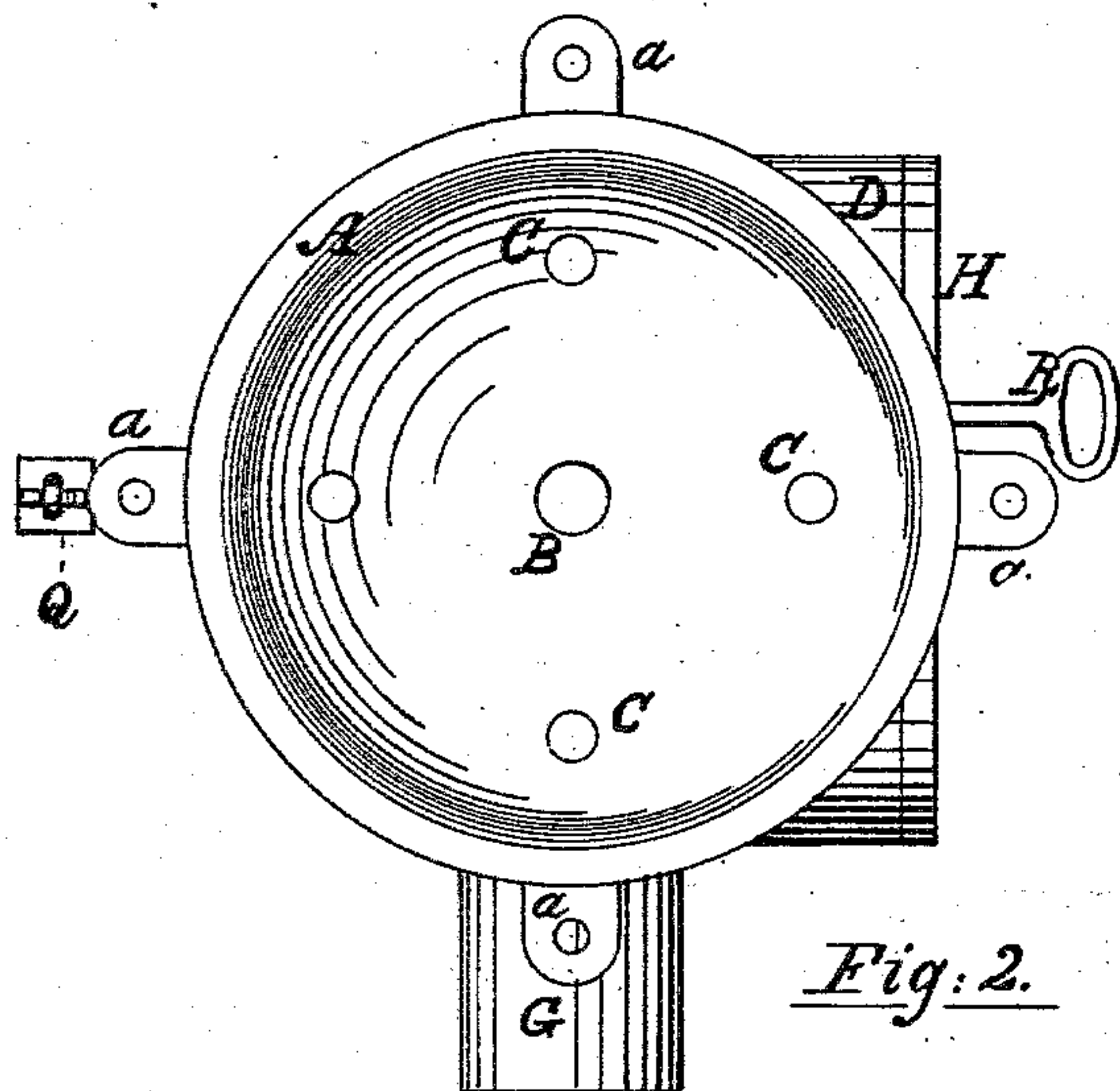


Fig: 2.

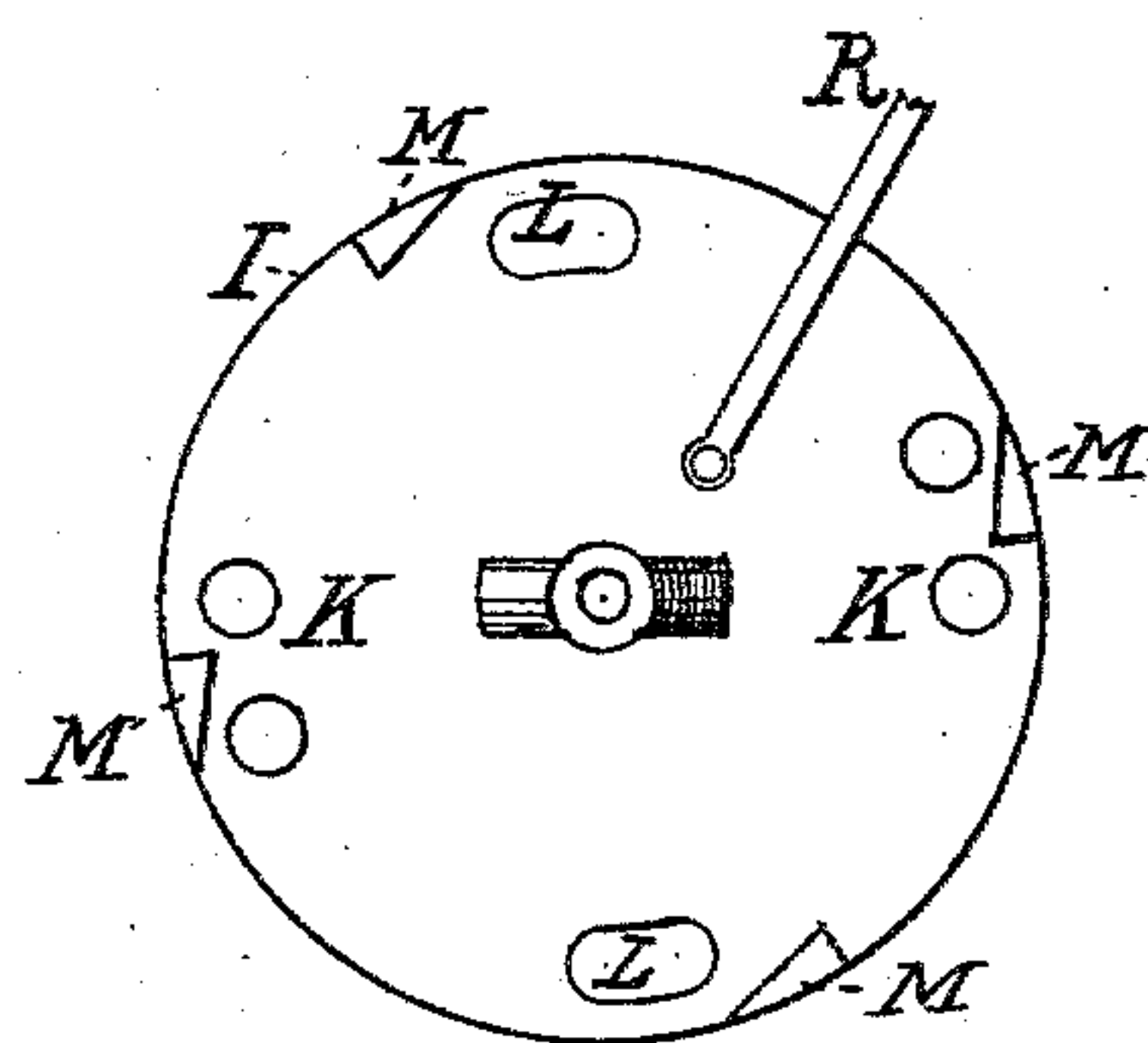


Fig: 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

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## TUYERE FOR FORGES.

SPECIFICATION forming part of Letters Patent No. 283,435, dated August 21, 1883.

Application filed November 10, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, NILS O. SWENSON, of Lead City, Lawrence county, Dakota Territory, have invented a new and useful Improvement in Tuyeres for Forges, of which the following is a full, clear, and exact description.

The object of this invention is to so regulate the air-blast that the full force of air may be concentrated at the center of the fire or in several directions crosswise of the fire, as may be required for different work.

Reference being had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures, Figure 1 is a sectional side elevation. Fig. 2 is a plan. Fig. 3 is a front elevation, showing in dotted lines the cover or door H for the air-box as when open. Fig. 4 is an inverted plan of the regulator.

A represents the concave face-plate of the tuyere. In the center of said face-plate A is formed a large opening, B, surrounded by four equidistant smaller openings, C. Beneath the face-plate A is formed the air-box D, having an inlet-pipe, G. The face-plate A is formed somewhat in the shape of a concaved box-cover having a flange which completely surrounds its sides and rests upon the top of the air-box D, and by means of this construction an air-chamber, *c*, is formed between the face-plate A and the top of air-box D, thereby preventing any damage to said air-box D from overheating the face-plate A. In the top of the air-box D are formed vertical air-passages E F, the upper ends of which are connected with the openings B C in the face-plate A, while the lower ends connect with the openings in the regulator, to be hereinafter clearly described.

With the outer end of the inlet-pipe G is designed to be connected a pipe leading from a bellows or blower supplying the air to the forge.

Access may be had to the inside of the air-box D at any time by sliding to either side the cover H, for the purpose of clearing it from any ashes, small particles of coal, or cinders that may fall through the air-passages from the top of face-plate A.

Projecting horizontally from the uppermost part of the sides of the air-box D are flat lugs *d*, which are designed to rest upon and hold the tuyere suspended between an iron framework or the brick-work composing a forge. Upon the sides of the face-plate A are lugs *a*, which may rest upon and be bolted to the lugs *d* of the air-box D, and thereby secure the face-plate A firmly thereto.

The air-box D may be cast separate from the top plate, in which are formed the air-passages E F, or they may be combined together as shown in Fig. 1. If, however, they be cast in one piece, the regulator must be passed in through the door H, and the lugs N will be riveted to the sides of the air-box D underneath the regulator I, for the purpose of preventing said regulator from falling too low in the air-box, and also preventing the regulator from being rotated too far either to the right or to the left by means of contact with the lugs M. The central projection on the lower side of the regulator I, as shown in Figs. 1 and 4, is provided with a small hole for the reception of a pivot in the inner end of the supporting-lever O, hinged at P to the air-box D, at which point an opening is provided through which it passes. The outer end of lever O is held down by either a spring or a weight, Q, as shown in Fig. 1, thereby exerting a continual upward pressure upon the inner end of said lever O, which forces the regulating-plate I against the lower projecting ends of the pipes E F.

For large forges these tuyeres will be constructed larger than for small ones, and the passages B C, E F, and J K will also be proportionately larger. It may become necessary, therefore, in the larger sizes of tuyeres, to provide some form of sieve for the said air-passages B C, E F, or J K, in order to prevent large pieces of coal from dropping through into the air-box D.

In the regulator I, upon the opposite sides of the center openings, J, are formed four smaller openings, K, (two on a side,) corresponding in size with the four air-pipes F, and separated from each other a distance equal to the diameters of one of the air-pipes F multiplied by three, (more or less,) as shown in Fig.



4. The two elongated openings L in the regulator I (also shown in Fig. 4) are so placed on the opposite sides of center opening, J, and between the openings K as will enable the  
5 air to pass from the air-box up and through all of the air-pipes E F at the same time, and by pushing the rod R the regulator may be rotated, and thereby admit the air to but two of the air-pipes F; or the regulator I may be so  
10 rotated as to prevent the air from entering any of the pipes F, the center air-pipe being at all times open.

Having fully described my invention, I claim—

15 1. An air-tuyere constructed substantially as herein shown and described, and consisting of a face-plate, A, having vertical air-passages B C, connected with air-passages E F, formed in the top of air-box D, inlet-pipe G, and  
20 sliding door H, the passage of air through any except the central opening being at all times wholly under control by means of the regulator I, provided with openings J K, which may be readily connected with passages E F and B  
25 C, as and for the purpose hereinbefore specified.

2. In an air-tuyere, the combination of an air-box, D, constructed substantially as shown, having upon the side thereof an inlet-pipe, G, and upon the front side a door, H, the top of  
30 said air-box being provided with outlet-pipes E F, connecting with openings B C, formed in the face-plate A, said face-plate resting upon the top of pipes E F, thereby forming an annular space or air-chamber, c, between the top  
35 of air-box D and said face-plate A, as and for the purpose herein described.

3. In combination with an air-box, D, the regulating-plate I, provided with lugs M, a large center opening, J, four smaller openings,  
40 K, and two elongated openings, L, so constructed as that any or all of said openings may be connected with those in top of air-box D, when desired, by rotating said regulator I, held in  
45 position and supported by lever O, substantially as and for the purpose herein described and set forth.

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Witnesses:

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