

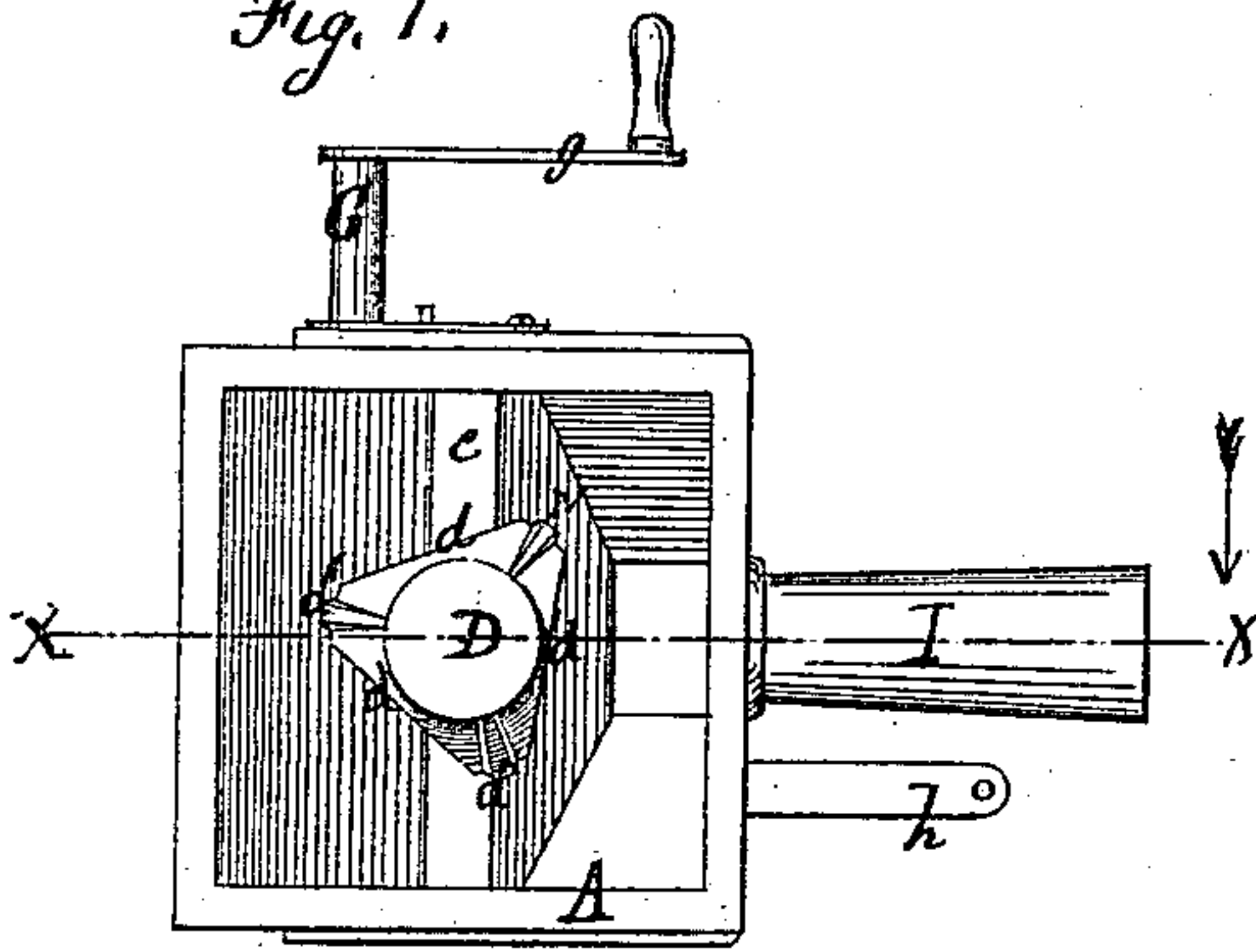
*B. K. Taylor,*

*Tuyere.*

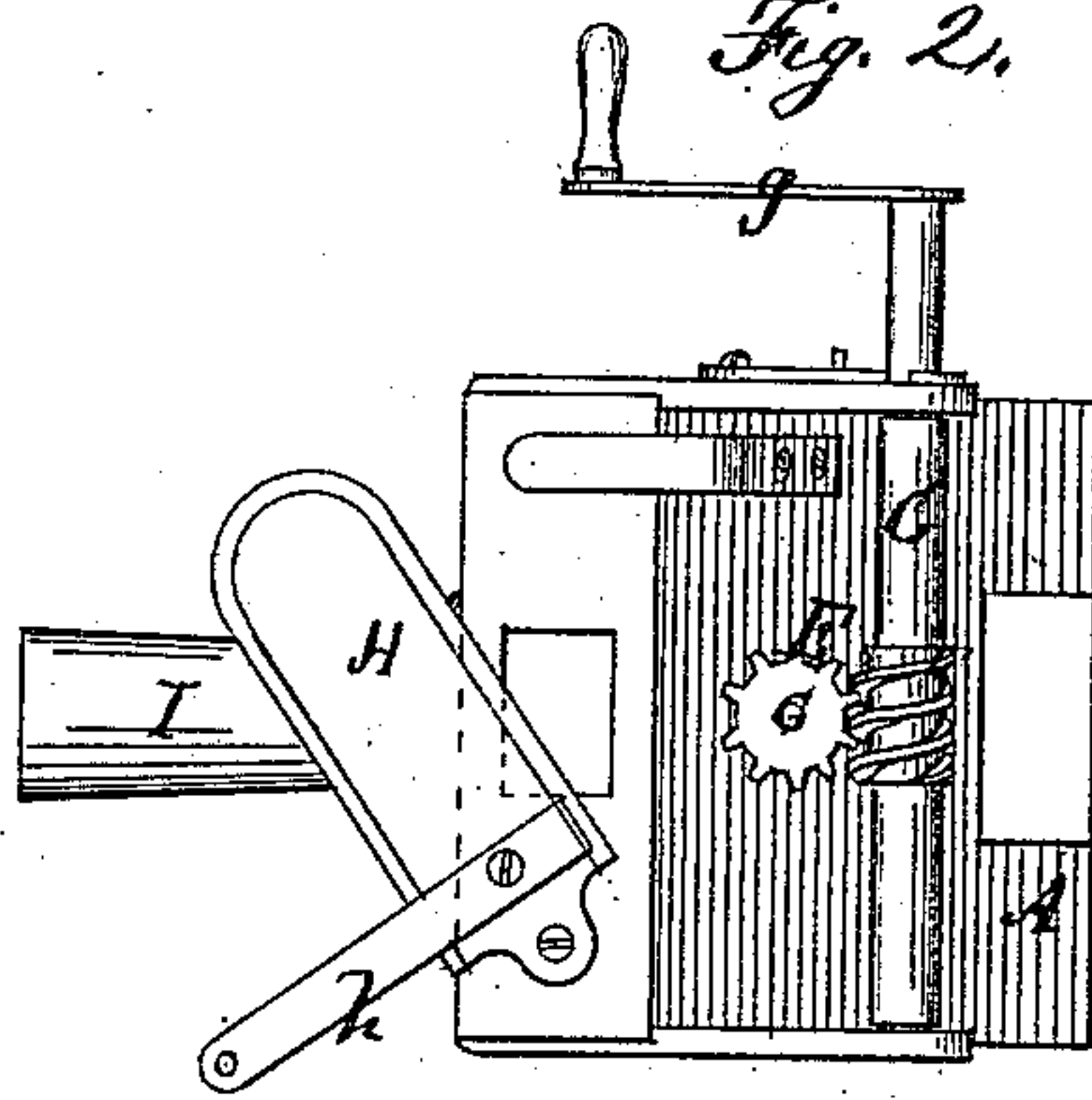
*No. 94,147.*

*Patented Aug 24, 1869.*

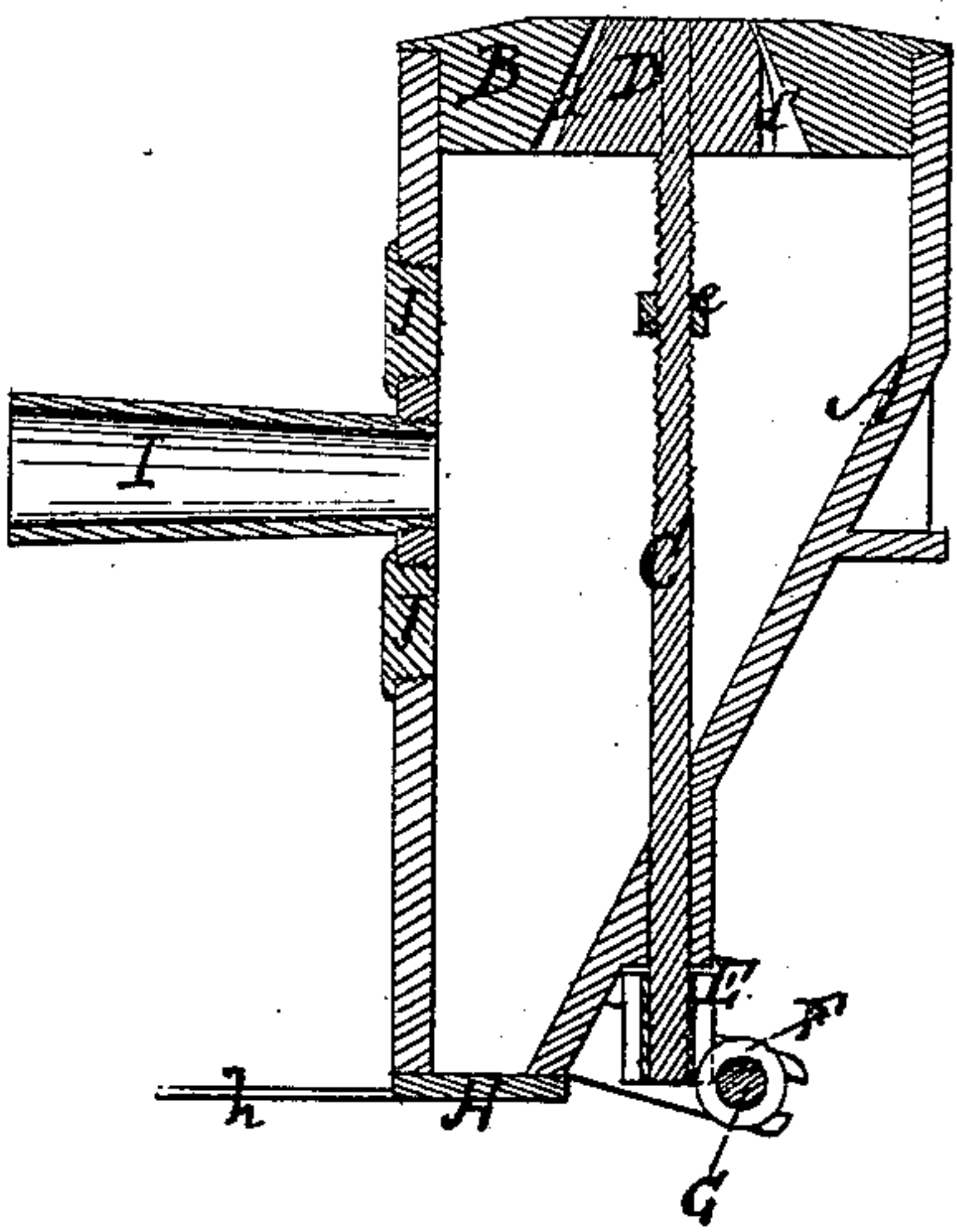
*Fig. 1.*



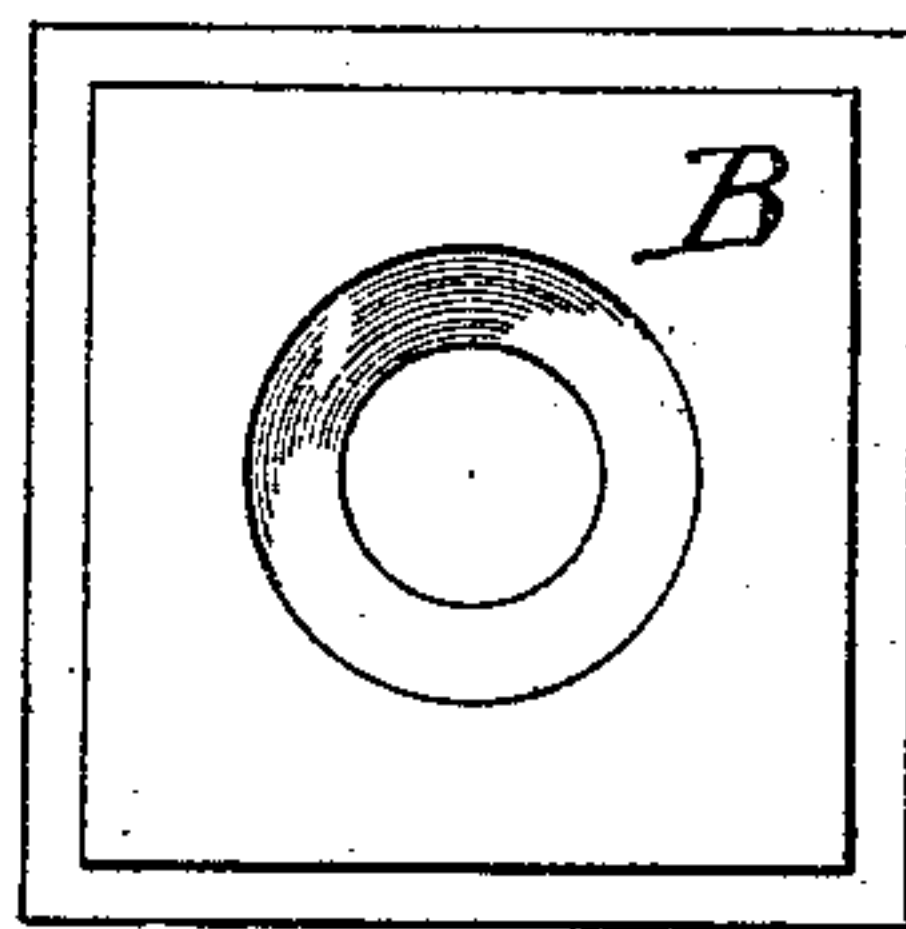
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Witnesses.*  
*E. R. Brown,*  
*Gaspard*

*B. K. Taylor*  
*Inventor.*

*By J. L. Shear*  
*his attorney.*



# United States Patent Office.

B. K. TAYLOR, OF HARRISBURG, PENNSYLVANIA.

Letters Patent No. 94,147, dated August 24, 1869.

## IMPROVED TUYERE.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that I, B. K. TAYLOR, of Harrisburg, in the county of Dauphin, and State of Pennsylvania, have invented a new and useful Improvement in Tuyeres; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon.

The nature of my invention consists—

First, in bringing the blast of air from the bellows or blower in contact with the fire at a point above the forge-plate, instead of immediately on the plate.

Second, in regulating the force and velocity of the blast to any desired degree, at the pleasure of the operator.

Third, in adjusting the tuyere and the height of the bellows to each other.

Fourth, in a device for facilitating the clearing of the shell from cinders and dirt.

To enable those skilled in the art to which my invention appertains, to make and use the same, I will proceed to describe its construction and operation.

In the drawings—

Figure 1 is a top view of my improved tuyere, with the top plate removed.

Figure 2 is a bottom view.

Figure 3 is a central vertical section, taken in the line *z z*, fig 1.

Figure 4 is a view of the under side of the top plate.

A represents the shell, which may be of any suitable form, provided with a removable top plate, B, in the centre of which is an opening, the sides of which are tapering, so that the opening is smaller at the top than at the bottom.

C is a shaft, on the upper portion of which is a screw-thread, which engages with a cross-bar, *c*, placed across the inside of the shell.

On the upper end of the shaft C is a tapering plug, D, which is first formed into a frustum of a cone somewhat smaller than the tapering hole in the top plate B, and then has three pieces cut out of its sides, forming three flat or concave surfaces, *d*, the greatest width of each being equal to about one-half the height of the plug D, and the greatest length equal to nearly one-third of its circumference; so that when the plug D is placed in the tapering hole, there are three cavities between the flat or concave surfaces *d* and the sides of the tapering hole in the top plate.

Between the flat or concave surfaces of the plug D are ribs, *d'*, which may be cast or formed with the plug, or attached to it afterward. Their angle of inclination is the same as that of the tapering hole in the top plate, so that when the plug D is in the hole,

the ribs *d'* form three channels for the air to pass through.

At the lower end of the shaft C is a pinion, E, which engages with a worm, F, on a horizontal shaft, G, which is provided with a crank, *g*, or other suitable means for turning it.

At the bottom of the shell A is an aperture, which is closed by a pivoted door, H, provided with a handle, *h*.

On the side of the shell, where the nozzle of the bellows is introduced, are three or more openings, corresponding with the size of the nozzle, placed one above another, and provided with plugs J, for closing them.

The operation of my invention is as follows:

The nozzle I is inserted in the opening best suited to the height of the bellows, and the remaining openings are closed by the plugs J.

The air entering the shell is forced upward through the three channels between the plug D and the sides of the tapering hole, in three currents, concentrating at a distance above the top plate, varying according to the angle of inclination of the sides of the tapering hole and of the conical or upper portion of the plug D.

The portions of the channels lying between the flat or concave surfaces *d* and the sides of the tapering hole, being larger than the portions above said flat or concave surfaces, the currents of air increase in velocity as they pass through said channels.

The force and velocity of the blast may be increased or diminished by raising or lowering the plug D, which may be effected by turning the shaft G, when the worm F will engage with the pinion E and rotate the screw-shaft C to the right or left, thus widening or narrowing the channels between the ribs *d'*.

The force and velocity of the blast may be further diminished by opening the door H, when a portion of the air will escape through the aperture in the bottom of the shell.

By leaving the door H open, sufficient draught will be created to prevent the fire from going out when not in immediate use.

The door H may also be opened in order to remove any ashes or cinders which may accumulate in the shell.

By rotating the plug D back and forward, the ribs *d'* serve to clean the tapering hole in the top plate B, and keep it free from clinker.

Among the advantages of my invention, it may be stated that in ordinary tuyeres, the blast comes in contact with the fire on the bottom plate of the forge, immediately over the mouth of the tuyere, which soon burns out said plate and tuyere; while in my invention, the three currents of air concentrate at such a

distance above the plate, that while sufficient fire is maintained a few inches above the plate, the plate itself is kept cold and prevented from burning out, the air between said plate and the point of concentration being always cold.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

The plug D, provided with the flat or concave surfaces *d* and ribs *d'*, in combination with the plate B, when constructed and operating as herein shown and described.

B. K. TAYLOR.

Witnesses:

G. A. C. SMITH,  
E. R. BROWN.