

T. C. MORRISON, E. J. MILDREN, & McC. MOORE.  
Forge.

No. 200,562.

Patented Feb. 19, 1878.

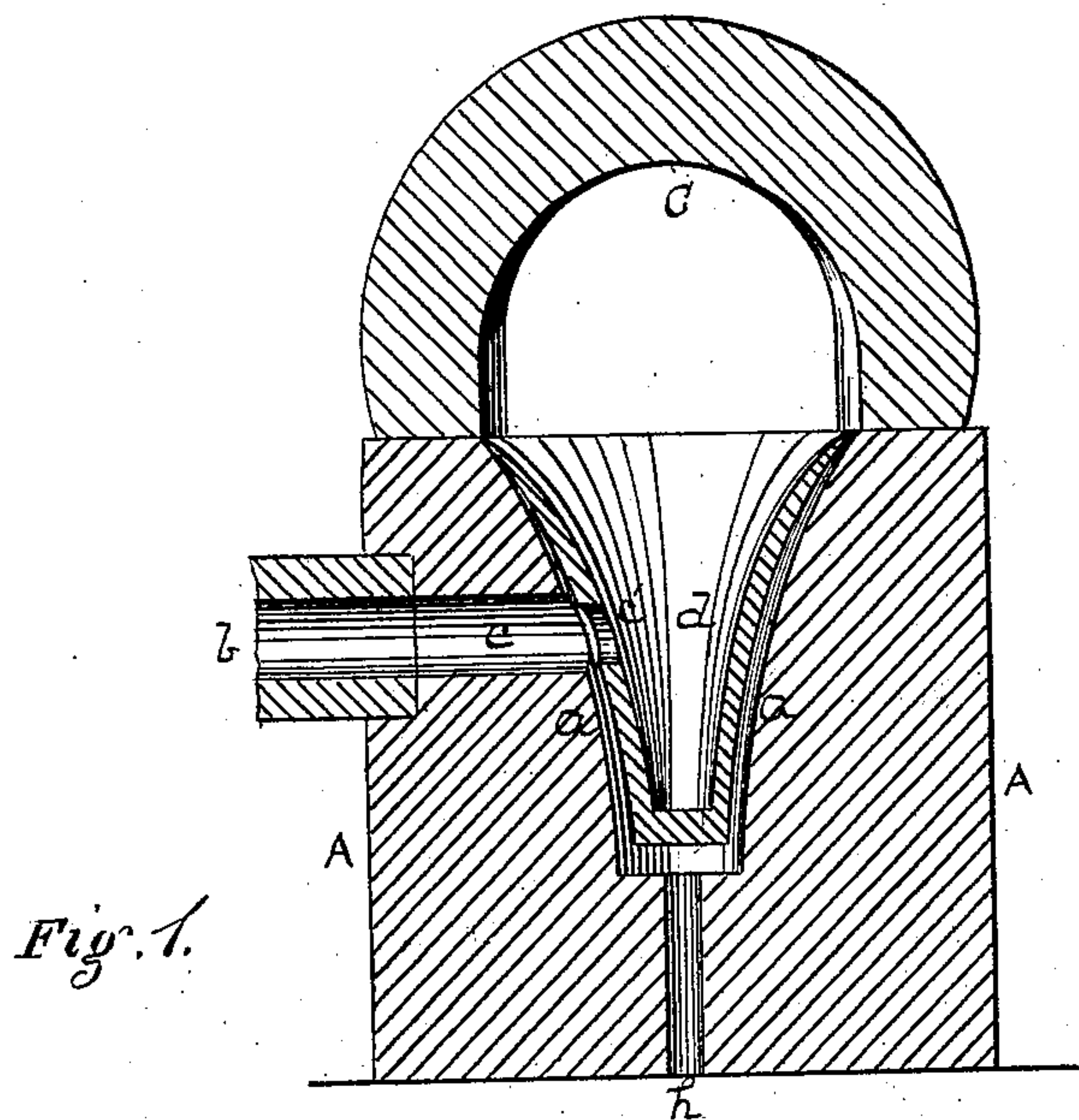


Fig. 1.

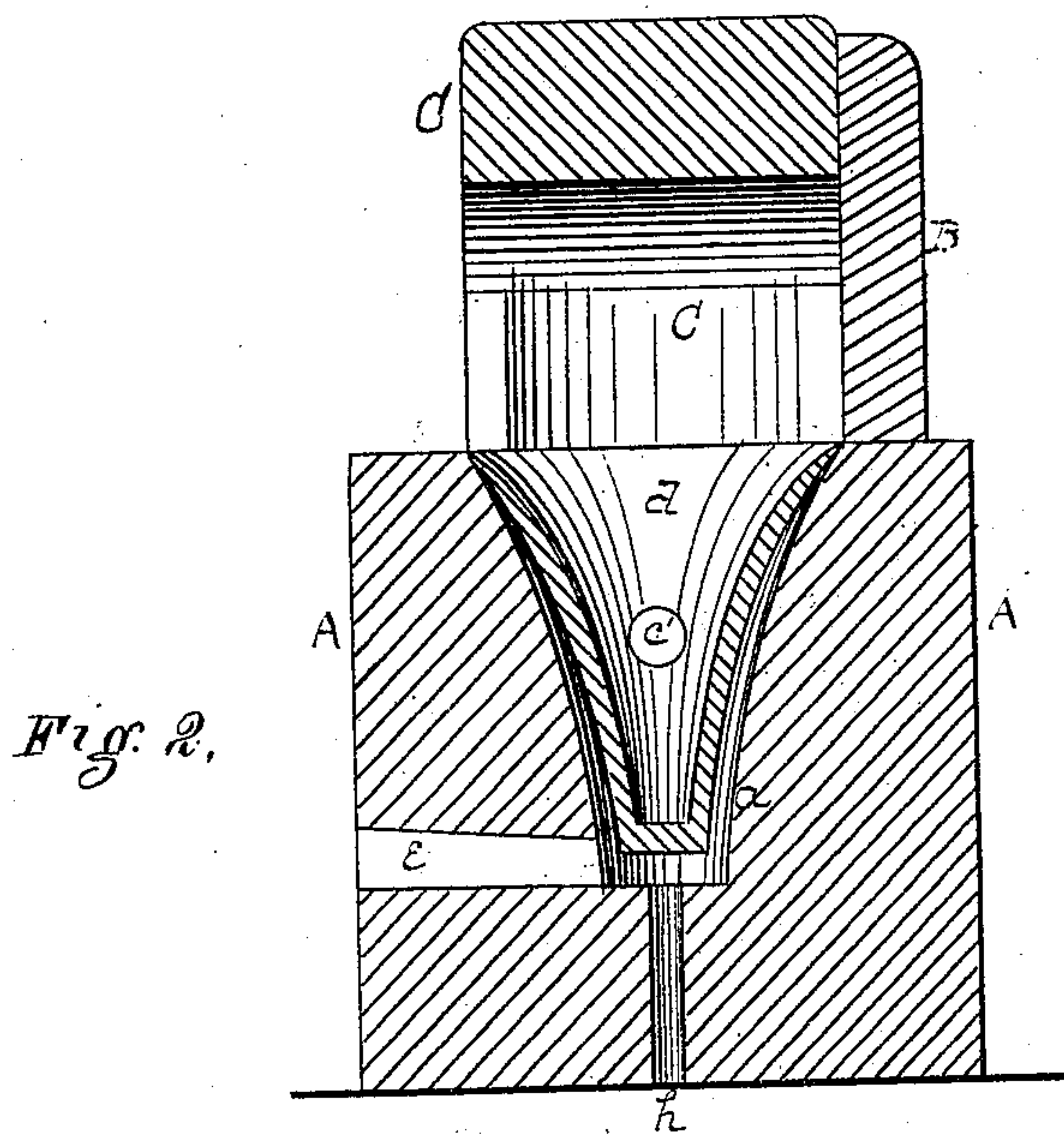


Fig. 2.

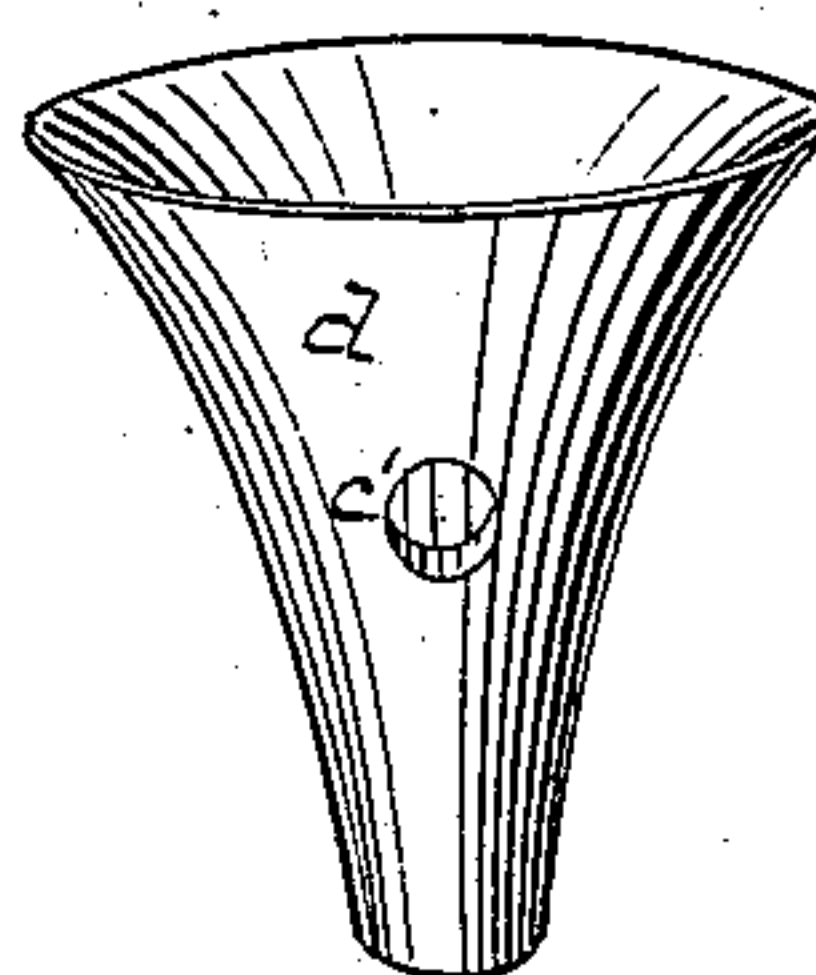


Fig. 3.

Witnesses  
John J. McConnell  
Claudius L. Parker

Inventors Thomas C. Morrison,  
Edward J. Mildren,  
McCormick Moore.  
by George A. Christy  
their Atty-



# UNITED STATES PATENT OFFICE.

THOMAS C. MORRISON, OF BRADY'S BEND, AND EDWARD J. MILDREN AND  
McCONNEL MOORE, OF BLACK LICK, PENNSYLVANIA.

## IMPROVEMENT IN FORGES.

Specification forming part of Letters Patent No. **200,562**, dated February 19, 1878; application filed  
November 24, 1877.

*To all whom it may concern:*

Be it known that we, THOMAS C. MORRISON, of Brady's Bend, Armstrong county, State of Pennsylvania, and EDWARD J. MILDREN and McCONNEL MOORE, both of Black Lick, county of Indiana, State of Pennsylvania, have invented or discovered a new and useful Improvement in Forges; and we do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a vertical sectional view of our improved hearth for forges, showing a cross-section of the reflecting-arch and a longitudinal section of the blast pipe or nozzle. Fig. 2 is a vertical sectional view of the device, taken at right angles to the plane of section shown in Fig. 1; and Fig. 3 is a perspective view of the lining employed in the hearth.

In forges designed for heavy work, as in manufacturing or repairing oil-well tools, railway supplies, &c., it is customary to "bank up" the fires, as it is termed, in order to retain the heat, as far as possible, within the fire. Considerable time is required to perform this operation and bring the fire to a proper working condition. Inconvenience and loss of time are also incurred in clearing such fires of cinders, ashes, &c.

Our invention is designed to overcome these difficulties, and in so doing we are enabled to economize fuel and secure a better fire than can be had by the means in common use.

Our improvement consists of a hearth or bed, A, which may be supported at the proper elevation in the usual or any convenient way. The size of this hearth may be varied to adapt it to different classes of work, and its outer configuration or form may be polygonal or circular, as convenience may suggest.

We prefer to make this hearth of some considerable depth, as shown, and from its upper face we make a conical or bell-shaped cavity, *a*.

A blast-pipe, *b*, is connected with the hearth, which introduces the usual air-blast to the cavity *a* through the hole or opening *c*.

We prefer to arrange the opening *c* above the bottom of the cavity *a*, so as to allow

space below the point of introducing the blast for ashes, cinders, &c.

We also prefer to make use of a lining, *d*, for the cavity *a*, the form of which is adapted to the general form of the cavity. An opening, *c'*, is provided in this lining corresponding to the blast-opening *c*.

Several advantages attend the use of such a lining, as the fact that it may be cheaply and easily replaced with a new one, and thus continually prevent the hearth from becoming worn away by use; and, again, by introducing a lever through the opening *c*, the lining may be started from its seat and removed to empty out the refuse of the fire.

The hearth may be used without such lining, however, and in that case we provide a hole, *h*, in the hearth, through which the cavity *a* may be readily cleared.

In order to retain the heat and obviate the necessity of banking the fire, we provide a reflecting hood or arch, C, which closes the fire in from above and on two sides. This reflecting-arch may rest on the hearth A, or on other convenient supports, and, if desired, may be secured in place in any convenient way.

When irons of considerable length are to be heated, this reflector is left open on two opposite sides, as shown in Fig. 1, and the iron is passed through the fire under the reflecting-arch. But when the ends of irons or short pieces are to be heated, we prefer to close one of these open ends of the arch C by means of a tile, B, Fig. 2, and thus more effectually inclose the fire and retain the heat. This tile B may be secured in place in any convenient way, so that it may be readily removed when desired.

We prefer to make the several parts of this device—as the hearth A, lining *d*, arch C, and tile B—of fire-clay or other plastic refractory material, which is manipulated in the usual way in working such material.

We are aware that it is not new to mount a hinged hood on a forge-hearth, so that it may cover and inclose the fire, except at vent and smoke holes, on all sides; but such construction gives in effect a close fire. The manipulations necessary to forge operations, such as adding fuel, stirring up the fire, shifting the



position of irons, &c., cannot in such construction be performed without removing the hood. The arch which we have described and shown, with or without the back tile, gives, in effect, an open fire, in which all forge operations may be carried on while the arch is in place, or without changing its position.

We claim herein as our invention—

1. The forge-hearth A, of fire-clay or other plastic refractory material, having a cavity, *a*, a lateral blast-hole, *c*, for air, and a bottom hole, *h*, for cleaning, substantially as set forth.

2. The combination of hearth A and removable fire-clay lining *d*, substantially as described.

3. As a device for promoting combustion and heat in open fires, while not interfering with ordinary forge operations, a fixed as distinguished from a hinged arch, C, open its entire or nearly its entire height and width

on two opposite sides, in combination with the hearth A, substantially as set forth.

4. A fixed as distinguished from a hinged arch, C, open in front its entire or nearly its entire height and width, in combination with tile B, which closes an otherwise correspondingly open rear side, and with the hearth A, substantially as set forth.

In testimony whereof we have hereunto set our hands.

THOMAS C. MORRISON.  
EDWARD J. MILDREN.  
McCONNEL MOORE.

Witnesses for Morrison:

JOHN MILDREN,  
J. L. MILDREN, Jr.

Witnesses for Mildren and Moore:

HALSEY W. SHANNON,  
JOHN A. CRIBBS.