

(No Model.)

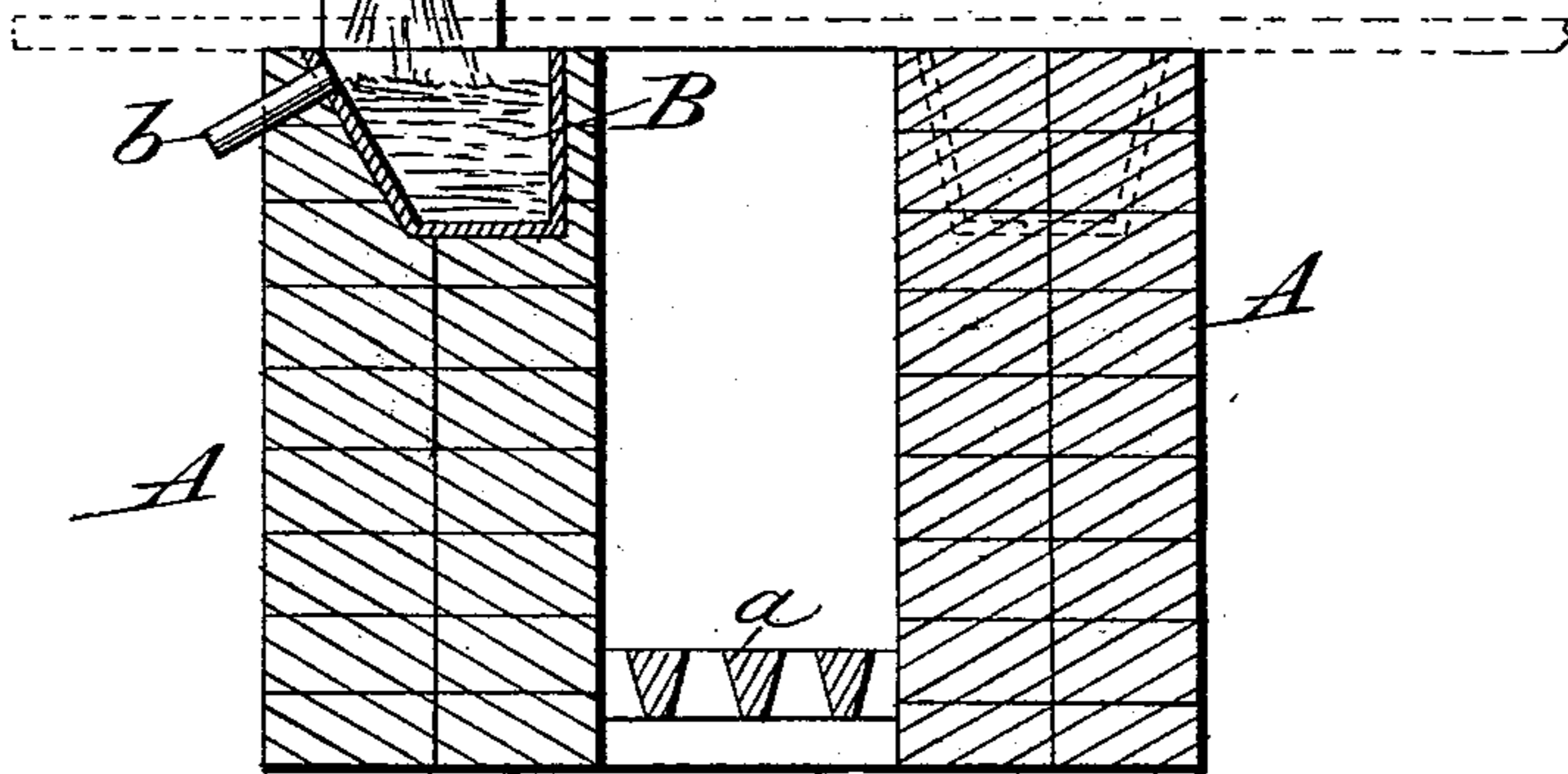
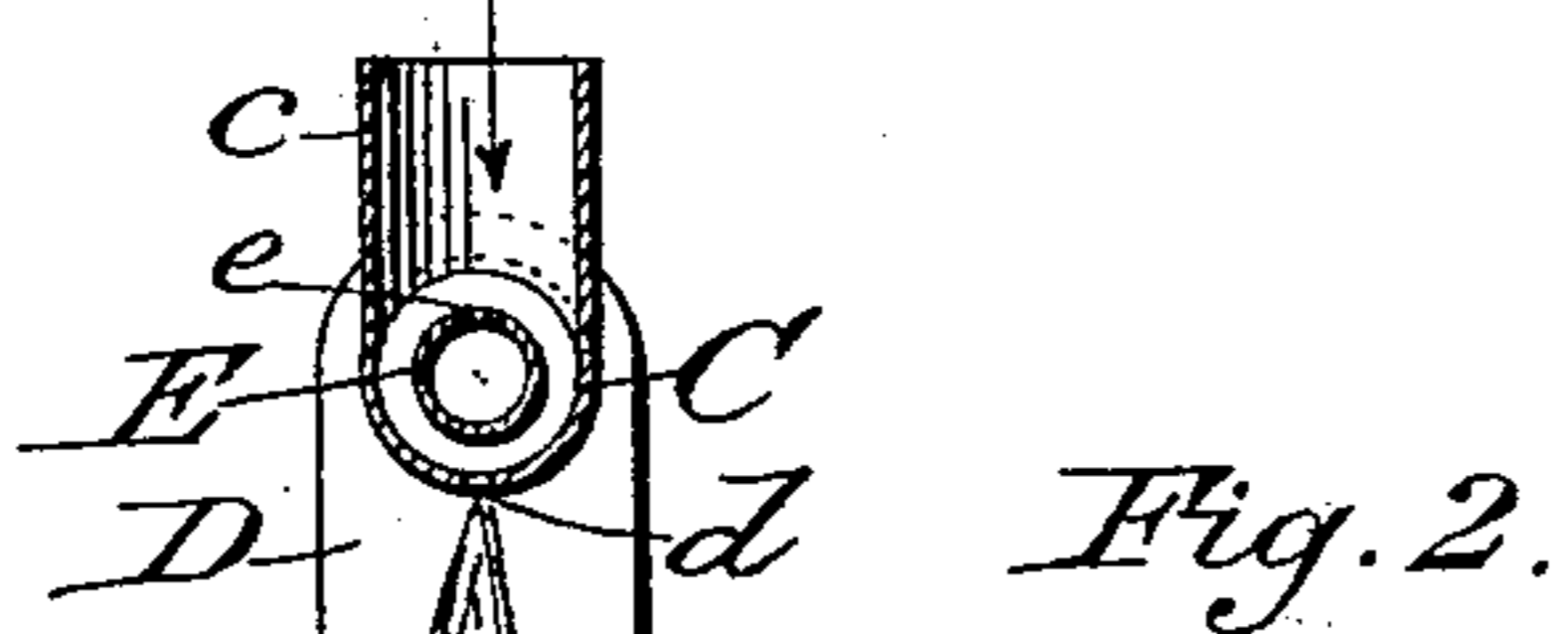
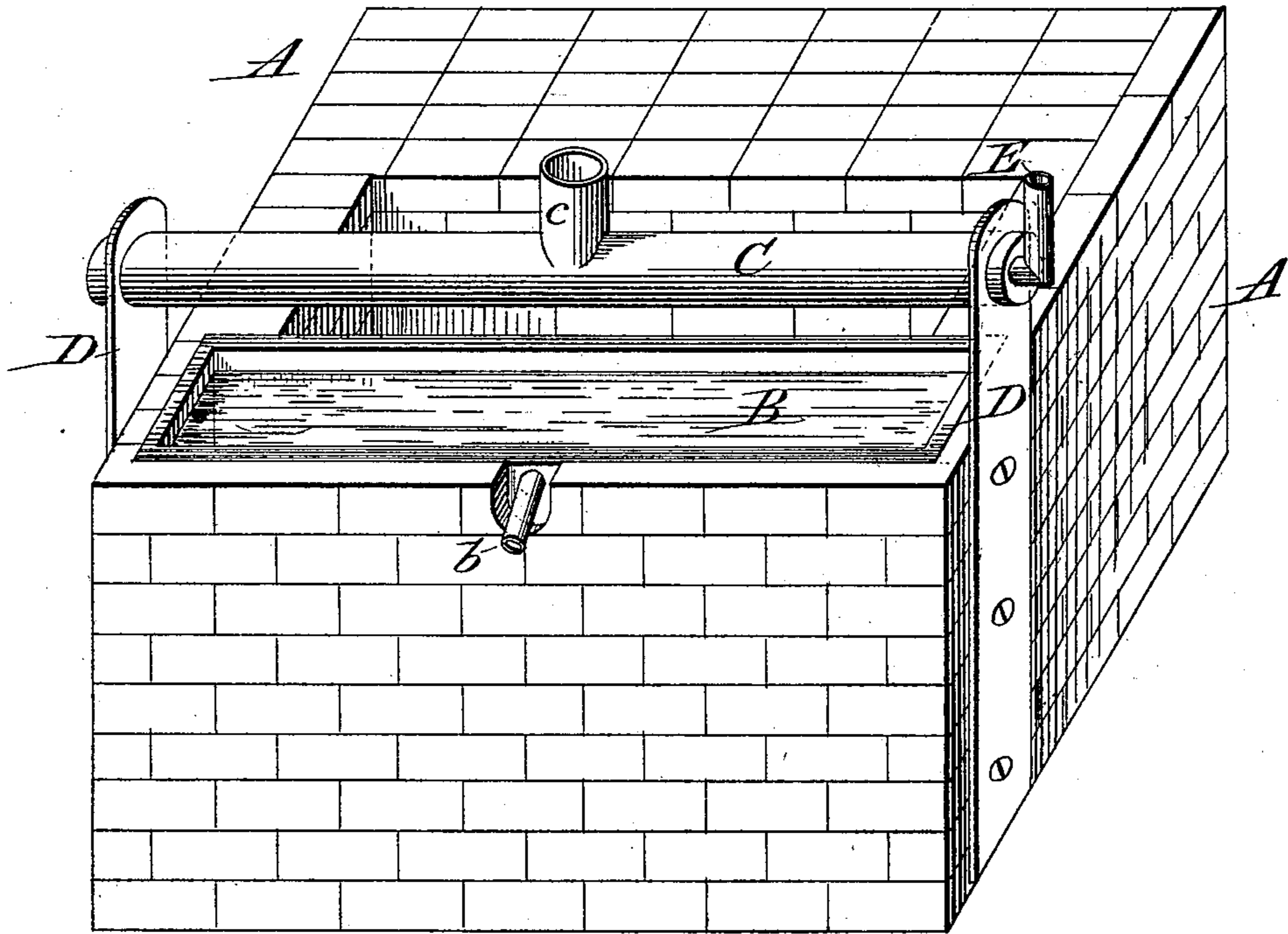
S. F. REYNOLDS.

FURNACE FOR HEATING METAL BARS.

No. 262,477.

Patented Aug. 8, 1882.

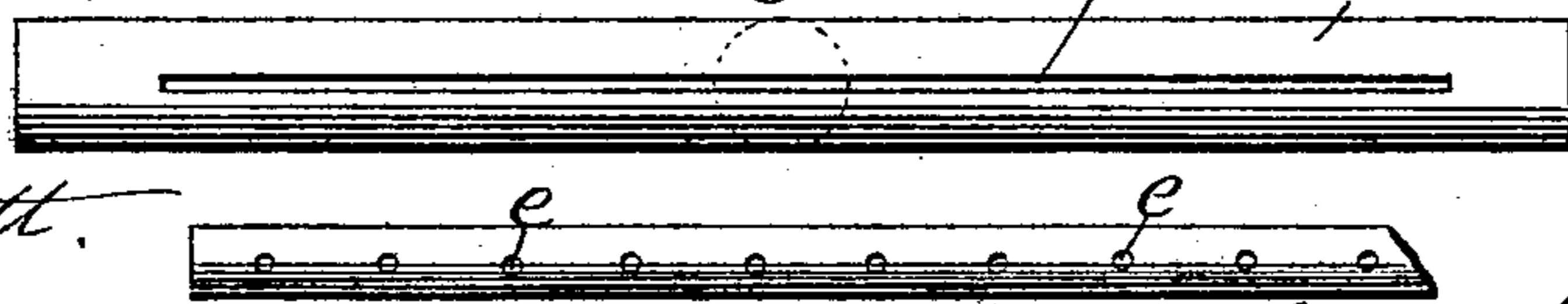
*Fig. 1.*



*Fig. 3.*

Attest:

*J. H. Schott.*  
*A. R. Brown.*



Inventor:

*Samuel F. Reynolds*  
*C. H. Watson & Co.*

# UNITED STATES PATENT OFFICE.

SAMUEL F. REYNOLDS, OF AUBURN, NEW YORK.

## FURNACE FOR HEATING METAL BARS.

SPECIFICATION forming part of Letters Patent No. 262,477, dated August 8, 1882.

Application filed November 3, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL F. REYNOLDS, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in a Forge or Apparatus for Heating Metals, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a forge or apparatus for heating metals, the object being to provide means for controlling the heat and limiting the extent of surface subjected to its action.

The invention consists in the construction and arrangement of devices for dropping or forcing water under pressure of an air-blast upon a portion of the metal under treatment, as hereinafter more fully described and claimed.

In the annexed drawings, which represent an apparatus embodying my invention, and in which like parts are denoted by like letters in the several views—

Figure 1 is a perspective view of my improved forge or apparatus for heating and chilling metals. Fig. 2 is a transverse section of the same, and Fig. 3 represents detail views of air and water pipes.

The letter A denotes a furnace, which is provided with a grate, *a*. This furnace may be constructed of fire-brick or other suitable material, and is arranged in any convenient form or manner, according to circumstances. At its upper part, on one or both sides, is arranged a water trough or tank, B, which is inclined inward on its outer side and provided with an exit-tube, *b*, which rests in a notch or groove formed in the side of the furnace.

Above the water-trough B is suspended an air or blast pipe, C, which is supported in brackets or standards D D, arranged at each end of the forge or furnace. This air-pipe is provided with an inlet, *c*, that communicates with a suitable fan or other device for driving air which escapes from the pipe C through a longitudinal slot, *d*, formed therein. Within the air-pipe C is arranged a smaller pipe, E, having perforations *ee* for the passage of water, which will be driven by the blast of air in

a thin sheet through the slot *d* in the air-pipe. The bars of iron or other metal to be treated are laid transversely over the top of the furnace, as shown by dotted lines in Fig. 2.

In swaging or upsetting iron bars for wagon-axles, crank-pins, and similar pieces of work requiring a shoulder or collar upon the bar, I have found it advisable to keep a certain portion of the iron cold, so that the shoulder or collar may be formed at the proper place and with increased facility. By limiting the extent of surface to which the heat is applied the bar may be worked and handled with greater convenience and without the use of tongs. It will be seen that by placing the bars of metal upon the forge in such manner that the portions upon which shoulders or collars are to be formed will come above the water-trough and beneath the slot in the blast-pipe, so as to be subjected to the action of the air and water forced through said slot, a cooling effect will be produced upon the bars at these points, which will prevent them from being influenced by the heat to which the remaining portions of the bars are exposed. If the bars are now removed and their heated portions hammered or otherwise manipulated under the action of rolls or draw-plates, the necessary collars or shoulders may be formed with great facility at those portions of the bars previously cooled by the water and air-blast. The water, after passing in a sheet through the slot in the pipe C and thence upon the bars of metal, falls into the water-trough B and overflows through its exit-tube *b*. The water trough or tank is preferably faced with fire-clay, and forms a complete water-back, the incline on its rear side serving to throw the water toward the inner side of the furnace, and, by cooling the same, assists in limiting the spread of heat upon the bars under treatment.

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

1. In an apparatus for heating metal bars preparatory to forming collars or shoulders upon the same, the combination, with a forge, of a perforated water-pipe inclosed in an air-

pipe having a longitudinal slot, said pipes being adapted to force water under pressure of an air-blast against those portions of the bars upon which collars or shoulders are to be  
5 formed, substantially as set forth.

2. The combination, with the furnace A, having water trough or tank B, of the air-pipe C, having a longitudinal slot, *d*, and the perforated water-pipe E, arranged within said air-  
10 pipe, whereby water may be forced under press-

ure of an air-blast against portions of metal bars placed over said furnace, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL F. REYNOLDS.

Witnesses:

M. B. KIMBARK,

S. M. POWELL.