

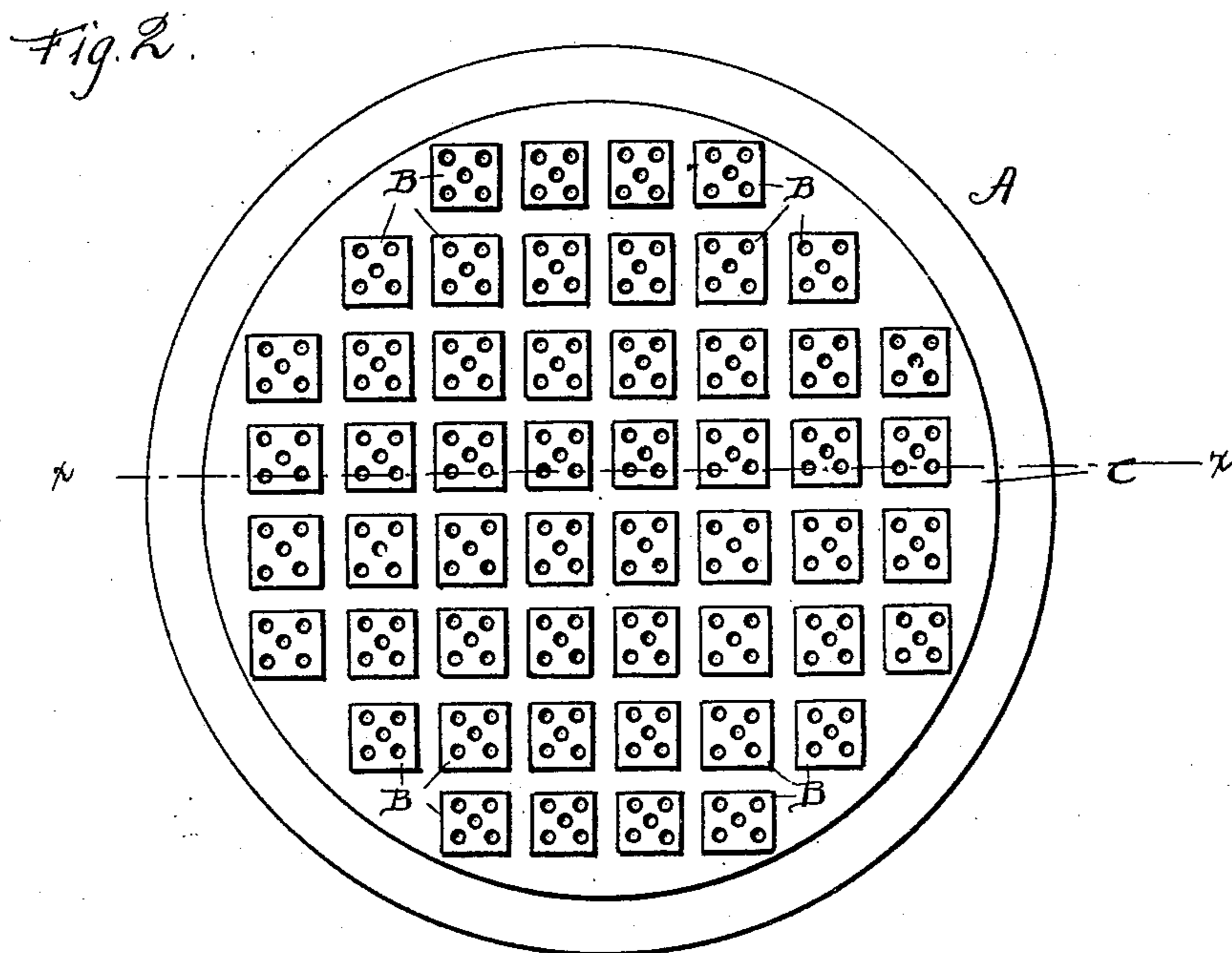
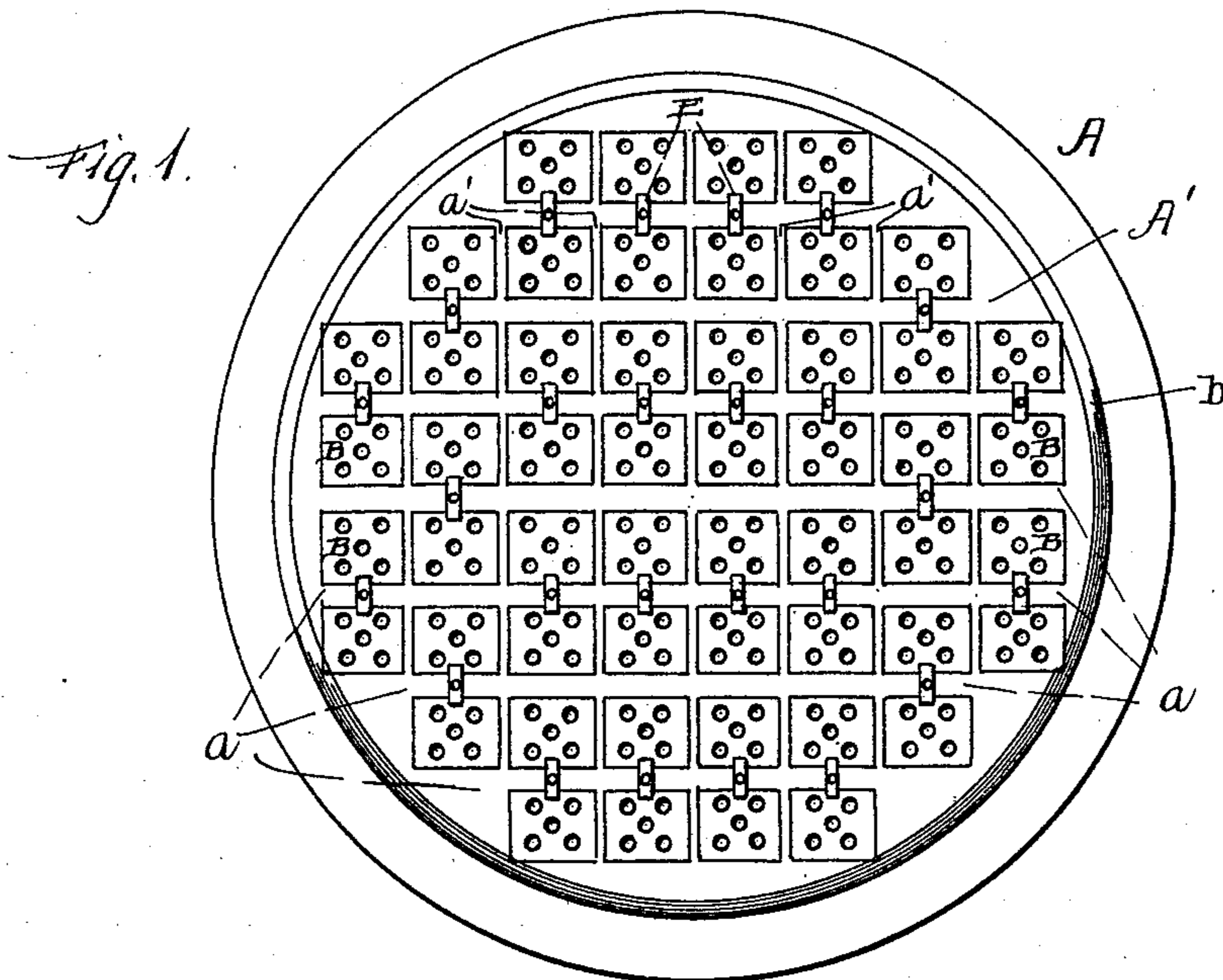
(No Model.)

2 Sheets—Sheet 1.

M. L. WILLIAMS.  
CONVERTER BOTTOM.

No. 536,904.

Patented Apr. 2, 1895.



WITNESSES

*Geo. M. Anderson*  
*Philip C. Masi.*

INVENTOR

*Morgan L. Williams*  
*by E. W. Anderson*  
*his Attorney*

(No Model.)

2 Sheets—Sheet 2.

M. L. WILLIAMS.  
CONVERTER BOTTOM.

No. 536,904.

Patented Apr. 2, 1895.

Fig. 3.

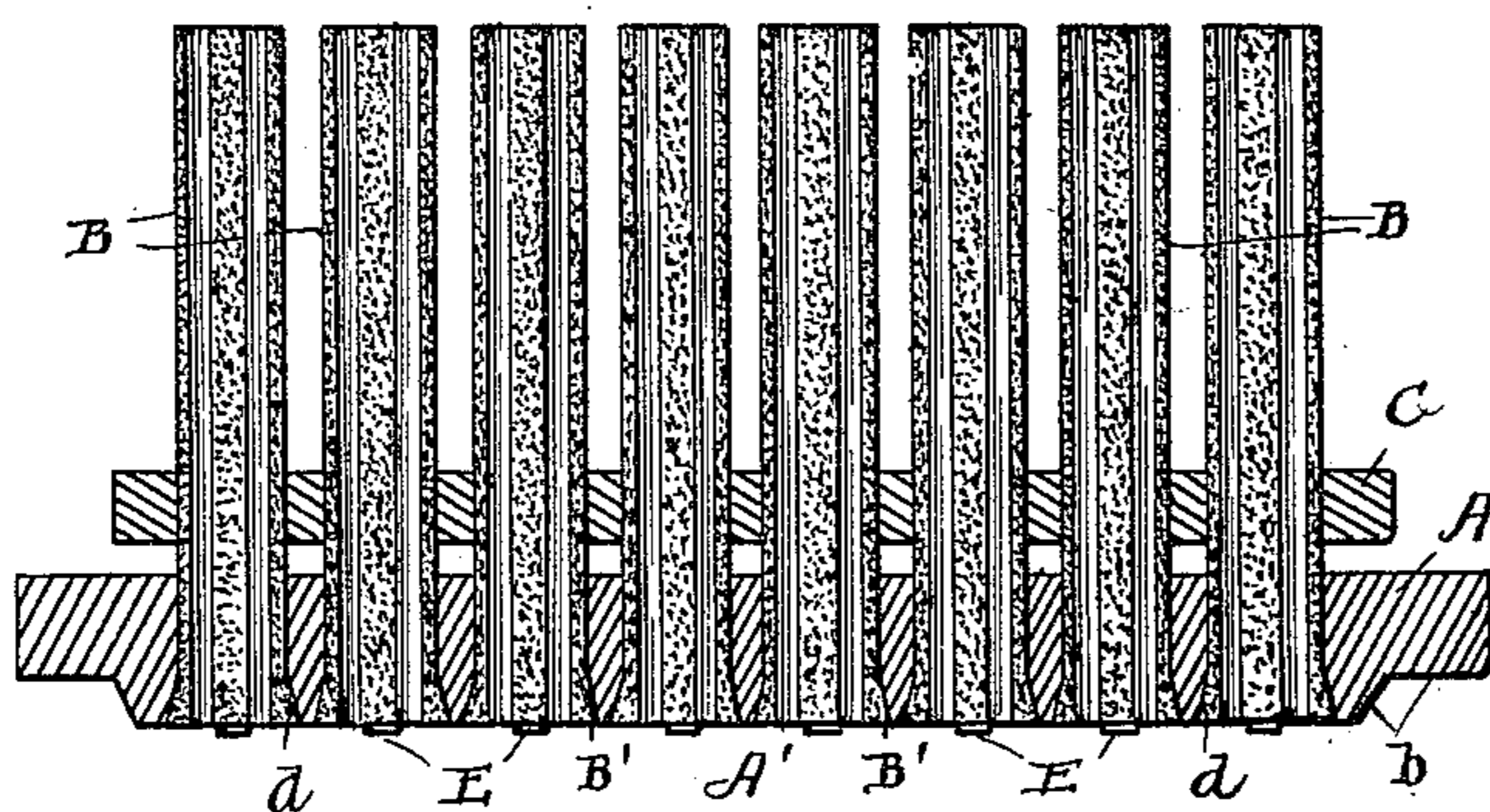


Fig. 4.

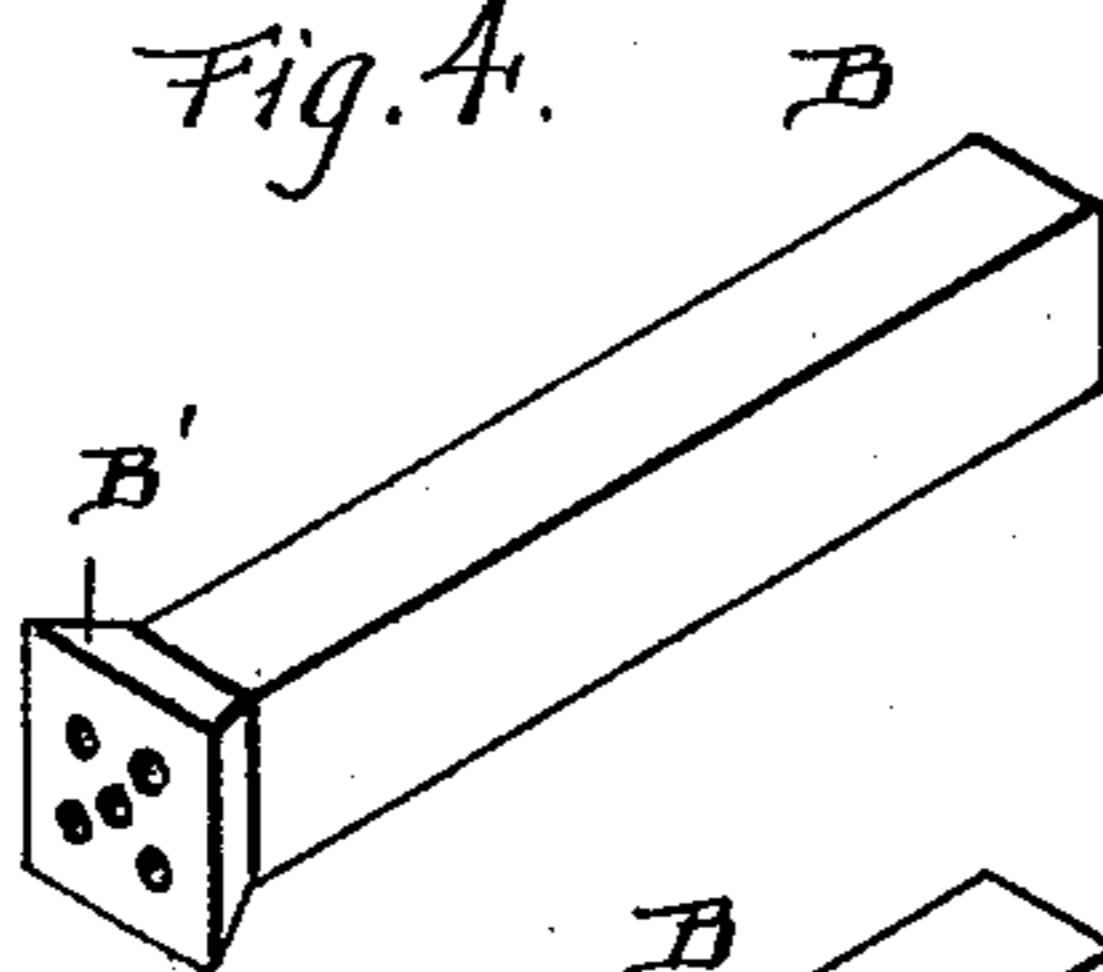
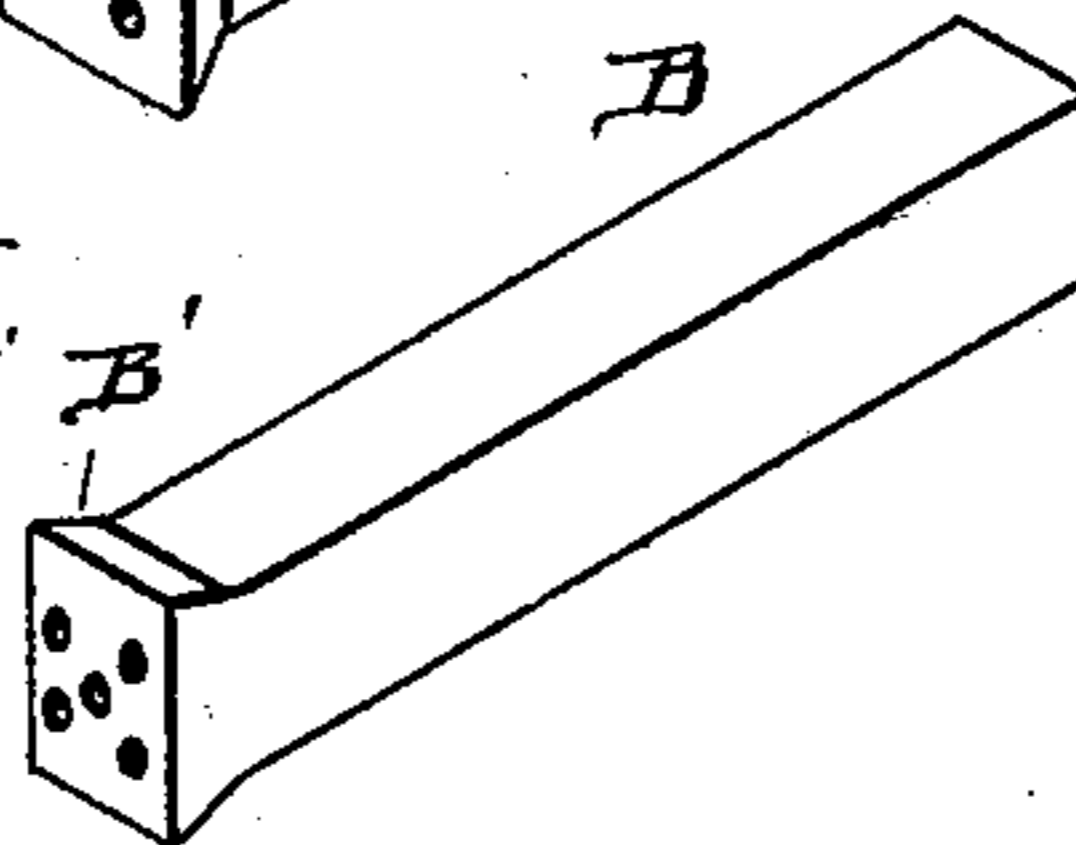


Fig. 5.



WITNESSES

*Gus. M. Anderson*  
*Philip C. Masi.*

INVENTOR

*Morgan L. Williams*  
*by E. W. Anderson*  
*his* Attorney

# UNITED STATES PATENT OFFICE.

MORGAN L. WILLIAMS, OF JOHNSTOWN, PENNSYLVANIA.

## CONVERTER-BOTTOM.

**SPECIFICATION** forming part of Letters Patent No. 536,904, dated April 2, 1895.

Application filed December 14, 1894. Serial No. 531,764. (No model.)

*To all whom it may concern:*

Be it known that I, MORGAN L. WILLIAMS, a citizen of the United States, and a resident of Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Converter-Bottoms; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a bottom plan view of the invention. Fig. 2 is a top plan view of same. Fig. 3 is a section on line  $x-x$ , Fig. 2. Figs. 4 and 5 are details of tuyeres.

This invention has relation to certain new and useful improvements in converter bottoms designed for use in the converters employed in Bessemer steel practice.

An object of the invention is to provide a tuyere of improved construction whereby it will be possible to obtain a more even distribution of the blast over the entire bottom, a result which is obviously of great advantage.

A further object is the construction of a bottom especially adapted for use in connection with the improved tuyeres, the entire bottom being capable of being constructed much easier and much cheaper than those commonly in use.

With these objects in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claim.

Referring to the accompanying drawings, the letter A designates the bottom plate which is of circular form, having a solid rim portion and an internal portion composed of two series of parallel bars  $a, a'$ , which intersect each other at right angles and which form a series of adjacent, substantially square seats for the tuyeres B. The central portion of the plate A' is somewhat thicker than the rim portion, forming an annular seat  $b$  for the bottom on the converter.

C designates a false plate which is supported a short distance above the plate A, in order to form a space through which the

molten metal can flow out in case a defective tuyere in the bottom burns down below the said plate C. Said plate C is of smaller diameter than the plate A but is of similar construction, having its central portion formed with two series of bars which intersect each other at right angles and form substantially square tuyere seats which align with the seats of the bottom plate proper.

B designates the tuyeres which are each of regular four-sided form, substantially square in cross-section, their lower end portions having a flare or swell which forms a flange or enlargement B' of the tuyere end. This flare or swell may be upon all four faces of the tuyere, or it may be upon two opposite faces only, as shown in Fig. 5.

The lower edges of the square seats in the plate A are beveled or countersunk, as indicated at  $d$  to receive these flanges or enlargements, so that the ends of the tuyeres seat perfectly flush with the bottom surface of the plate. Small pivoted buttons E are usually provided to hold the tuyeres from dropping out of the bottom.

It will be observed that the flanges or enlargements of the tuyeres prevent them from being driven by the blast beyond their proper positions, so that their upper ends are also flush with each other when seated.

It will be further observed that the square form of the tuyeres enables them to be seated more compactly than is possible with the old round or hexagonal form, bringing the corner blast openings thereof nearer together whereby it is possible to distribute the blast more evenly over the entire area of the bottom. With the old forms large spaces are left at these points which are so much dead surface.

It will also be seen that with a given cross-sectional area of the tuyere, and with the same number of blast openings, I obtain a wall of greater uniform thickness than is possible with the old forms, which adds greatly to the life of the tuyere.

Another important advantage is that the spaces between the tuyeres above the false plate are of regular form and can be filled up with fire clay, brick, or other refracting material much more readily and quickly than can the spaces left by round or hexagonal tuyeres, which require fillings of special form. This

feature reduces greatly the labor and cost of building up the bottoms.

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

The converter bottom, consisting of the bottom plate proper having a solid rim portion and an internal portion composed of two series of parallel bars intersecting each other  
10 at right angles and forming square beveled seats for the tuyeres, the parallel false bottom

plate above the first plate and separated therefrom and having corresponding seats, and the square tuyeres having the flared or enlarged lower portions seating flush in said  
15 bottom plate, substantially as specified.

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

MORGAN L. WILLIAMS.

Witnesses:

GEORGE H. PARMELEE,  
PHILIP C. MASI.