

(No Model.)

2 Sheets—Sheet 1.

W. M. BARBER.  
FURNACE GRATE.

No. 581,804.

Patented May 4, 1897.

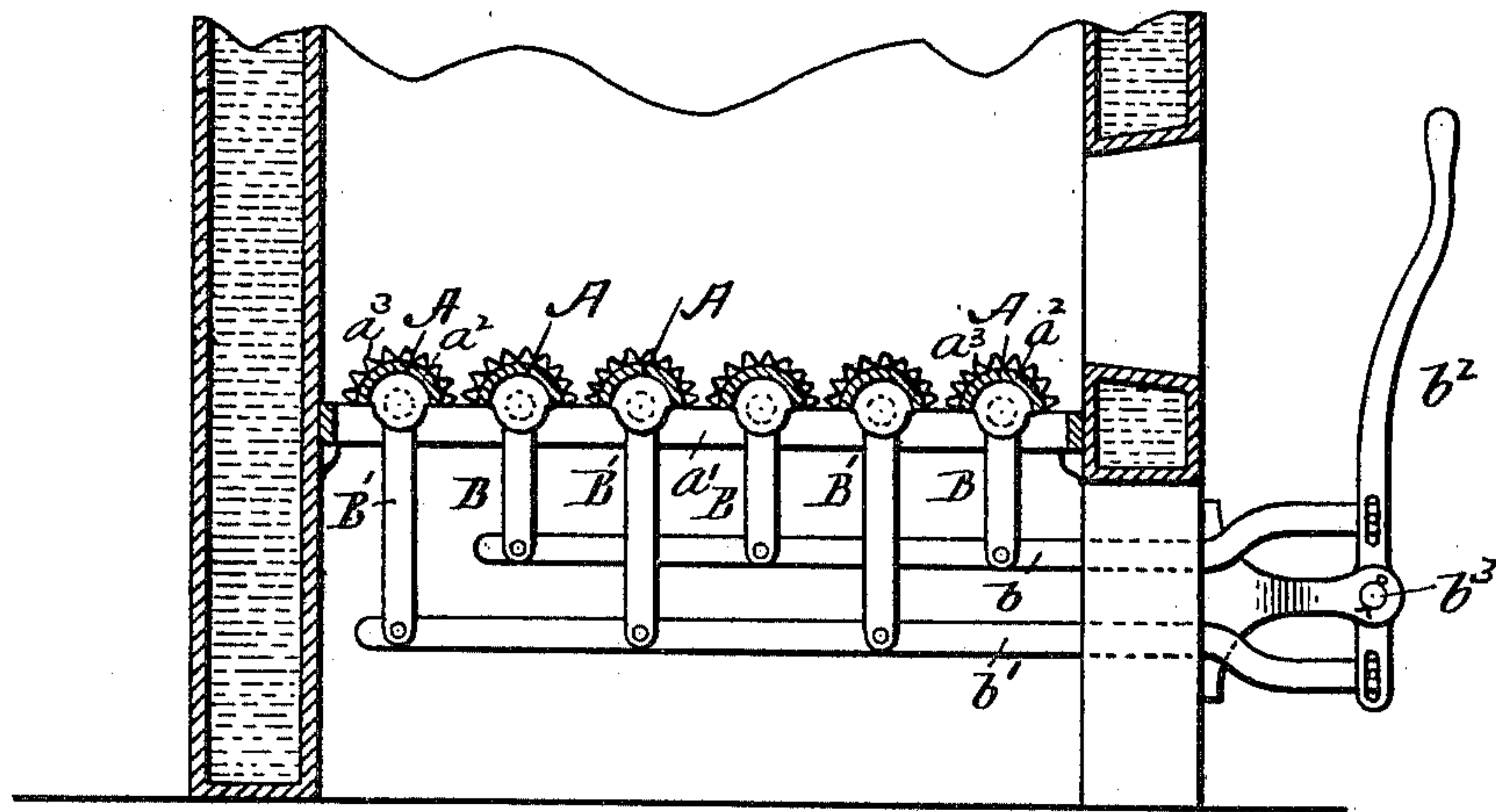


Fig. 1.

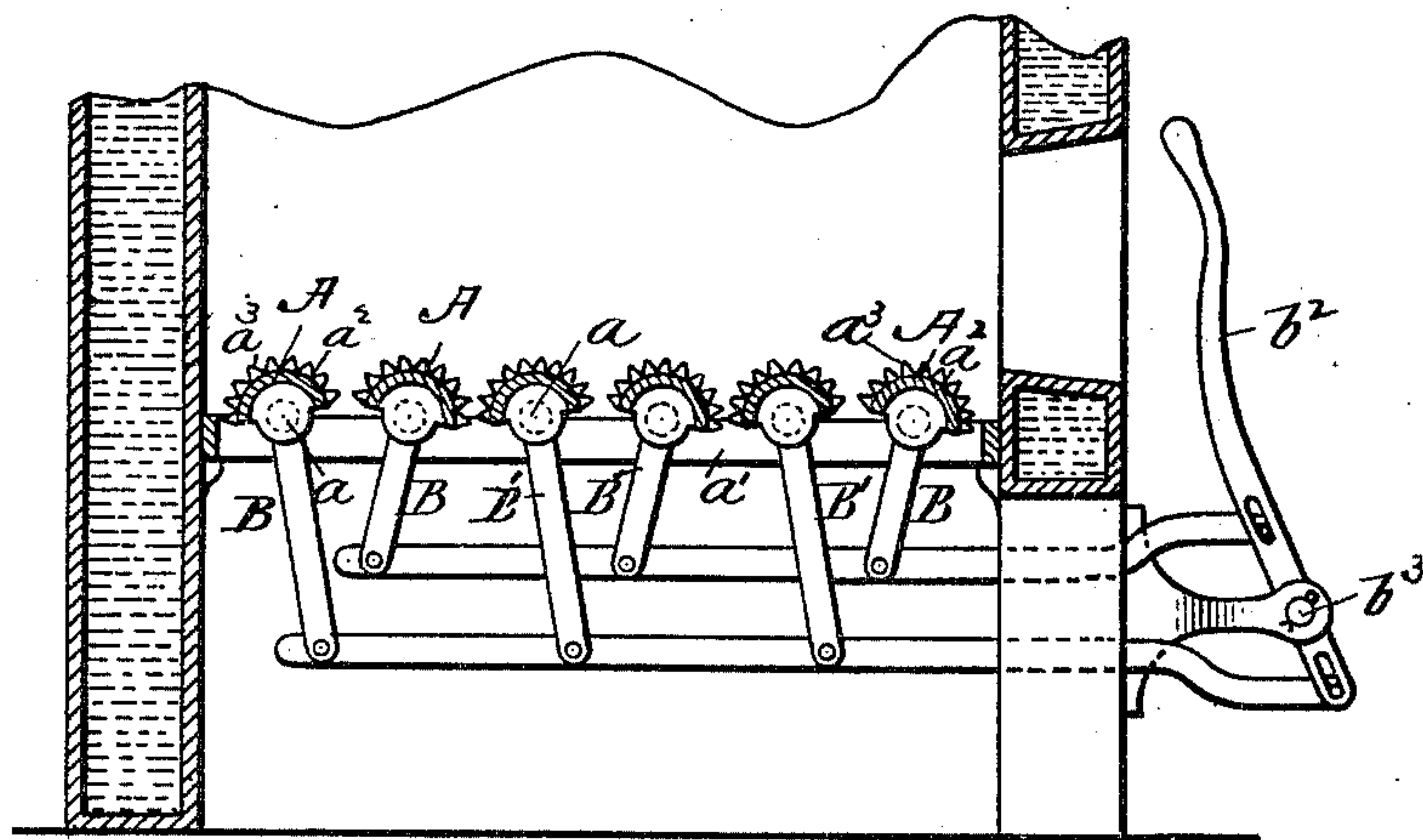


Fig. 2.

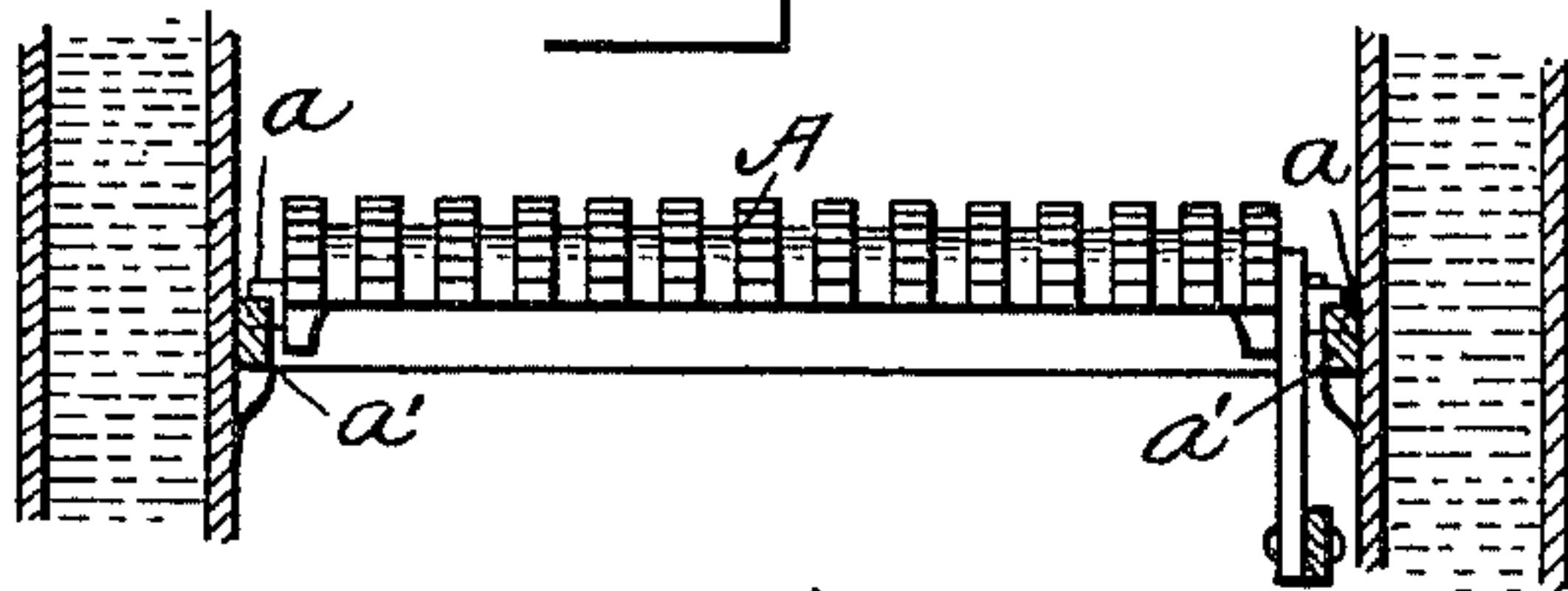


Fig. 3.

WITNESSES.

J. W. Dolan.  
J. T. Butler.

INVENTOR

William M. Barber  
by his attys  
Clarke & Raymond.

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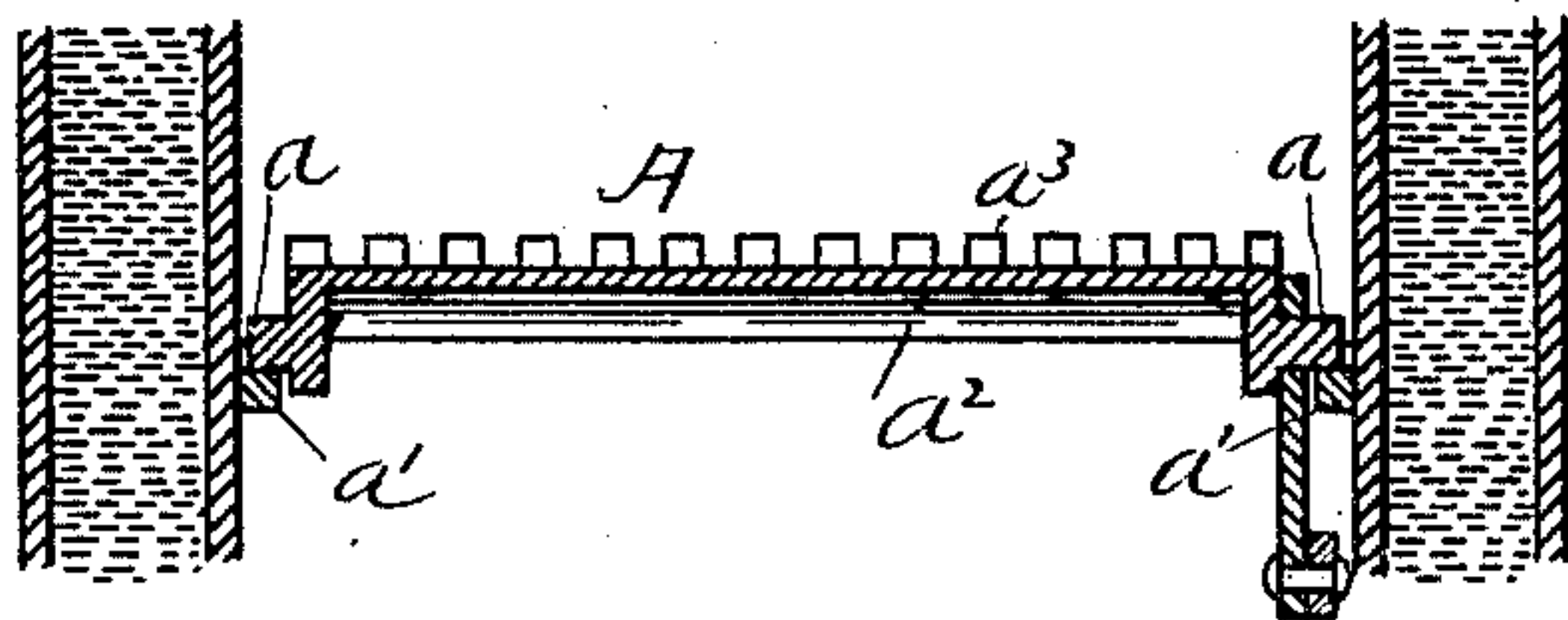


Fig. 4.

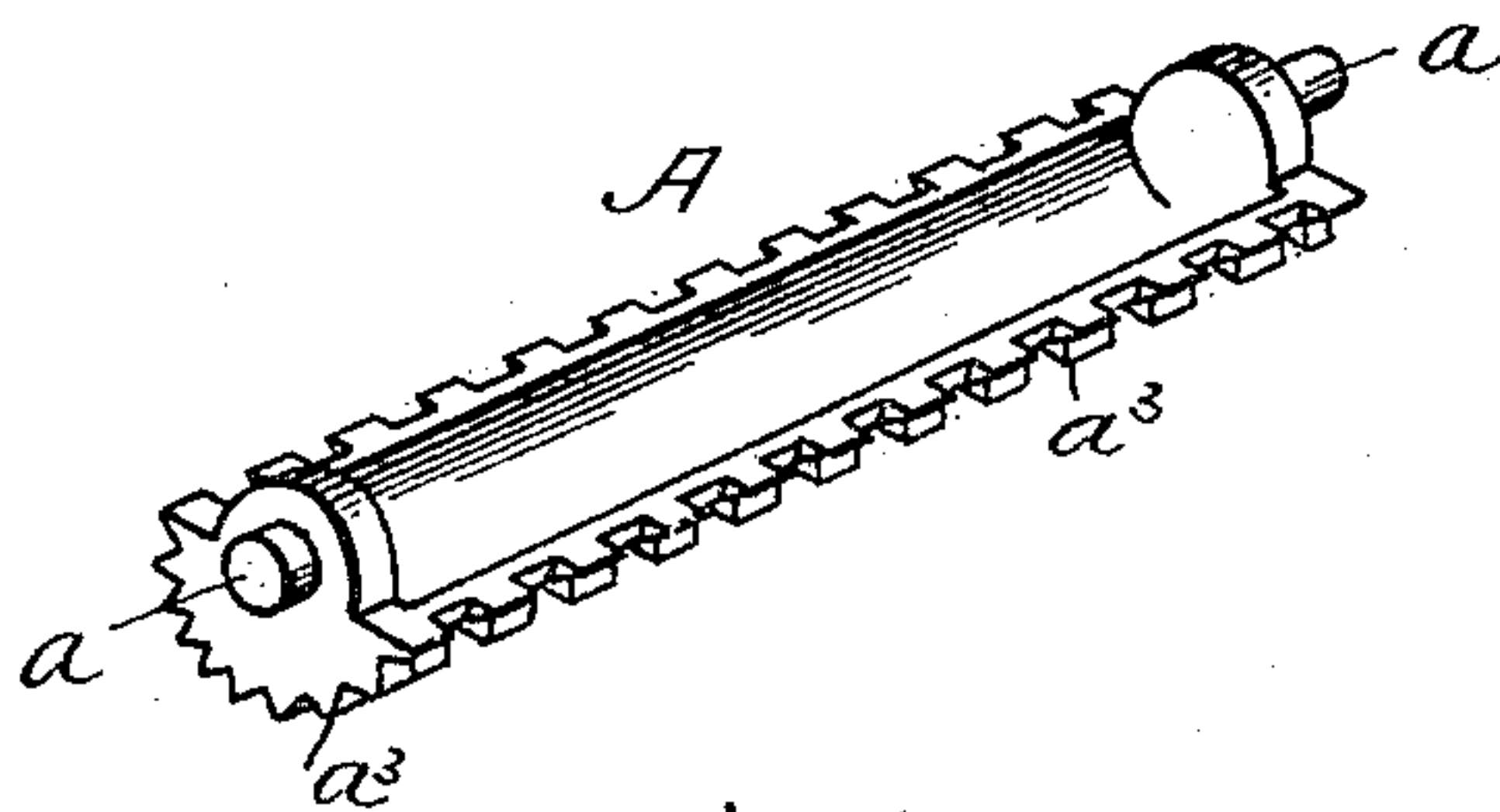


Fig. 5.

WITNESSES

J. W. Dolan

L. A. Walsh

INVENTOR

Wm. M. Barber

by his atty

Charles Raymond



# UNITED STATES PATENT OFFICE.

WILLIAM M. BARBER, OF SOMERVILLE, MASSACHUSETTS.

## FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 581,804, dated May 4, 1897.

Application filed April 13, 1896. Serial No. 587,308. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM M. BARBER, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Furnace-Grates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to the improvement in furnace-grates herein described, and comprising, essentially, a number of grate-bars of peculiar shape arranged parallel with each other and connected together by a mechanism which is adapted to turn them alternately toward and from each other in pairs. The grate-bars have a curved or hemispherical upper surface, from which extend, preferably in lines, teeth of a triangular or similar form. The bars are not placed closely together, but upon the turning of the bars the teeth are moved toward and from each other, as will hereinafter be described, and act to break up the clinker and ashes lodged thereon, and also remove them from the under surface of the fire.

In the drawings, Figure 1 is a vertical section through a furnace provided with my invention, showing the grate in its ordinary position. Fig. 2 is a similar view showing the position of the grate-bars when the actuating-lever has been moved, as hereinafter described. Fig. 3 is a vertical section at right angles to that shown in Fig. 1. Fig. 4 is a central longitudinal section of the grate-bar shown in Fig. 3. Fig. 5 is a view in perspective of the under side of a grate-bar.

A conventional furnace is shown in the drawings, it being understood that the grate is adapted to be used with any type.

A represents the various grate-bars, and as many may be employed as is necessary. They have at each end bearings or pivots  $a$  to rest upon supports or bars  $a'$ . Each grate-bar has the curved or semicircular surface  $a^2$ , from which extend, preferably in rows, the teeth or projections  $a^3$ . The interior of the bar between the ends is hollow. The bars are separated from each other to provide a space  $a^4$  between them, or, in other words, the teeth

do not intermesh, and this provides not only an air-passage, but also means whereby the refuse material—like slag, ashes, &c.—may be removed from the fire by the movement of the grate-bars hereinafter indicated.

The grate-bars are formed in two series, which are placed alternately. The bars of one series are connected by the short depending arms B to the connecting-bar  $b$ . The bars of the other series are connected by the relatively longer depending arms B' to the connecting-bar  $b'$ . The bar  $b$  is connected to a lever  $b^2$ , pivoted at  $b^3$ , above its fulcrum, and the bar  $b'$  is attached to the said lever below the fulcrum. By this mechanism or any equivalent the grate-bars are turned upon their axes alternately in pairs toward and from each other, so that the surface of any given bar and the teeth thereon are first moved in one direction toward a companion bar, which is being moved toward it or in a reverse direction, and upon a reverse movement of their actuating-levers the turning movements of the grate-bars are caused to be reversed.

It will be seen that the teeth of each grate-bar upon one side at each turning action thereof are caused to be moved downward, while the teeth upon the other side of the bar are caused to be moved upward, and that these movements alternate with the same teeth, so that there is first a movement in alternate sections of the grate-surface upward and downward. The action of the teeth thus actuated upon the fire causes any material which may have become lodged between them upon the surface of the grate to be agitated and also to be ground and removed from the fire, the grate-bars alternately discharging upon one side and upon the other, according as they are turned upon their axes.

In furnaces of more than ordinary width two sets of grate-bars may be employed, each of which may have a common central support, and each may be actuated by a separate actuating-lever and connecting device.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

The combination in a furnace-grate, of the lever  $b^2$  pivoted at  $b^3$ , the connecting-bar  $b'$

attached thereto beneath its fulcrum, the bar  
*b* attached to the lever above its fulcrum and  
the grate-bars *A* arranged alternately in two  
series, one series being pivoted to the bar *b'*  
5 by the long arms *B'* and the other series be-  
ing pivoted to the bar *b* by the short arms *B*  
so that the movement of the lever *b*<sup>2</sup> will cause

the two series of grate-bars to rock toward  
each other and present opposite grinding-sur-  
faces, substantially as described.

WILLIAM M. BARBER.

In presence of—

J. M. DOLAN,

K. T. BUTLER.