

(No Model.)

R. A. PALMER.  
GRATE CONSTRUCTION.

No. 459,948.

Patented Sept. 22, 1891.

Fig. 1.

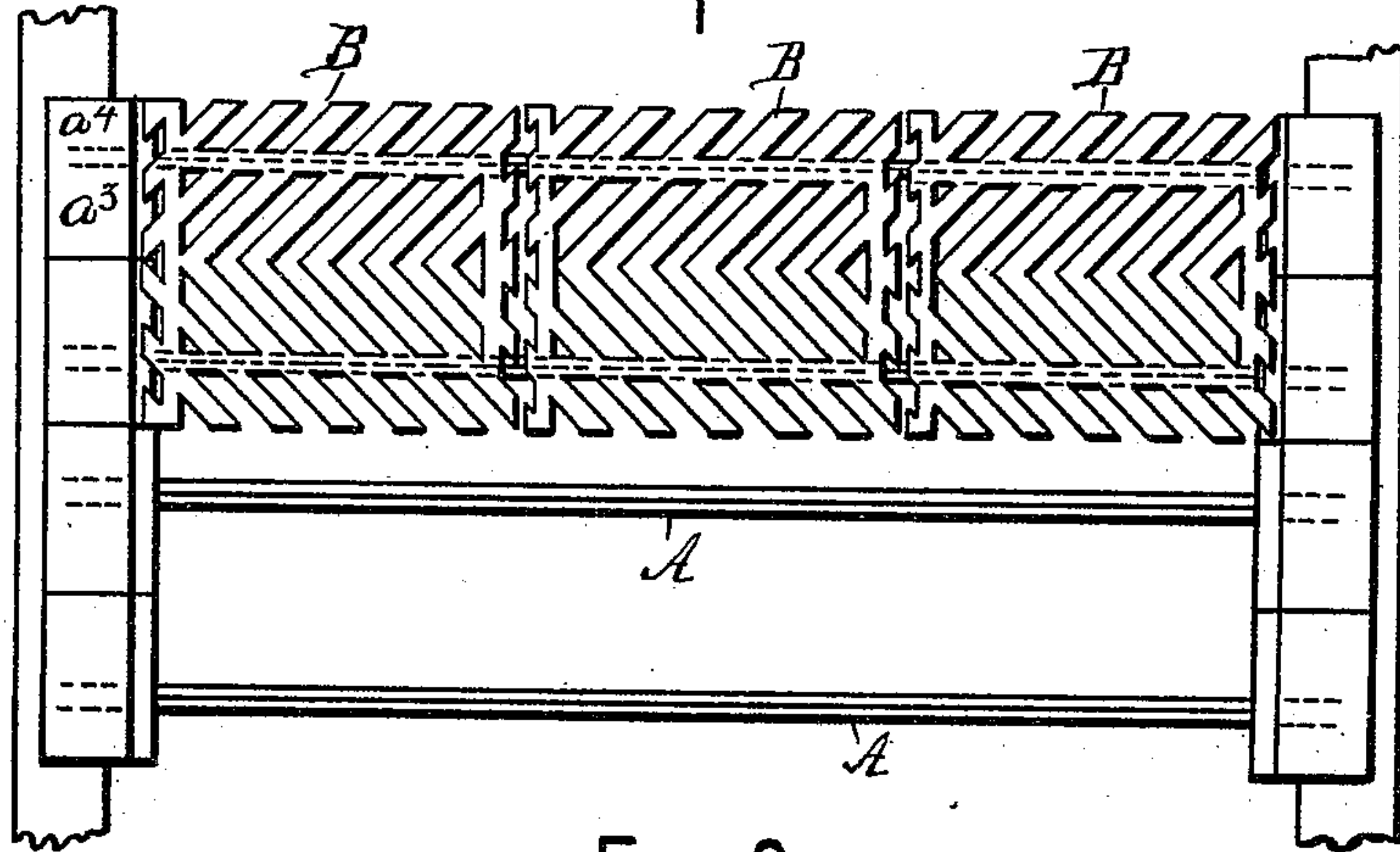


Fig. 2.

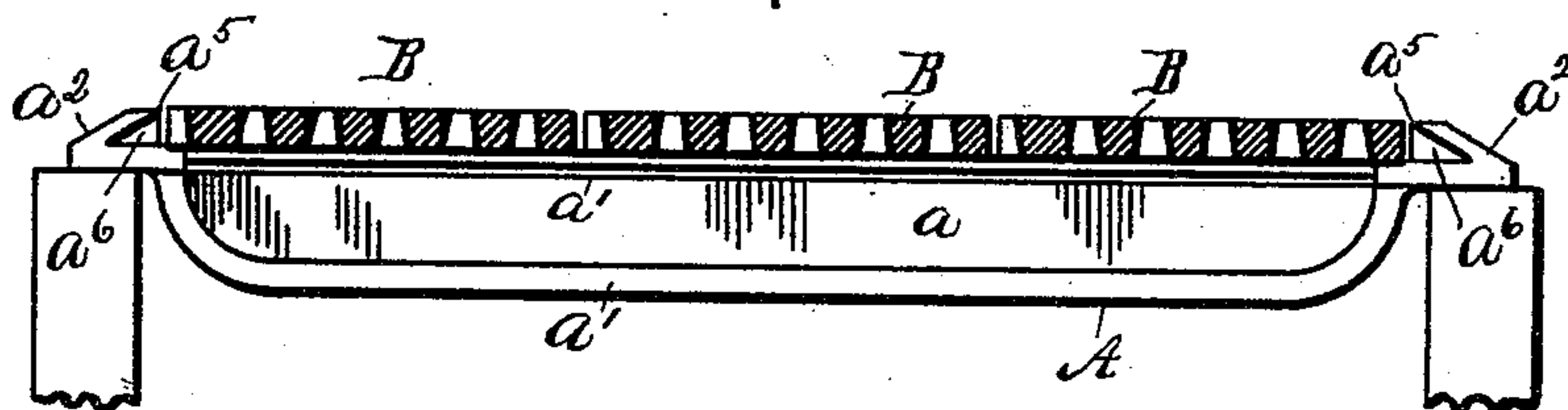


Fig. 3.

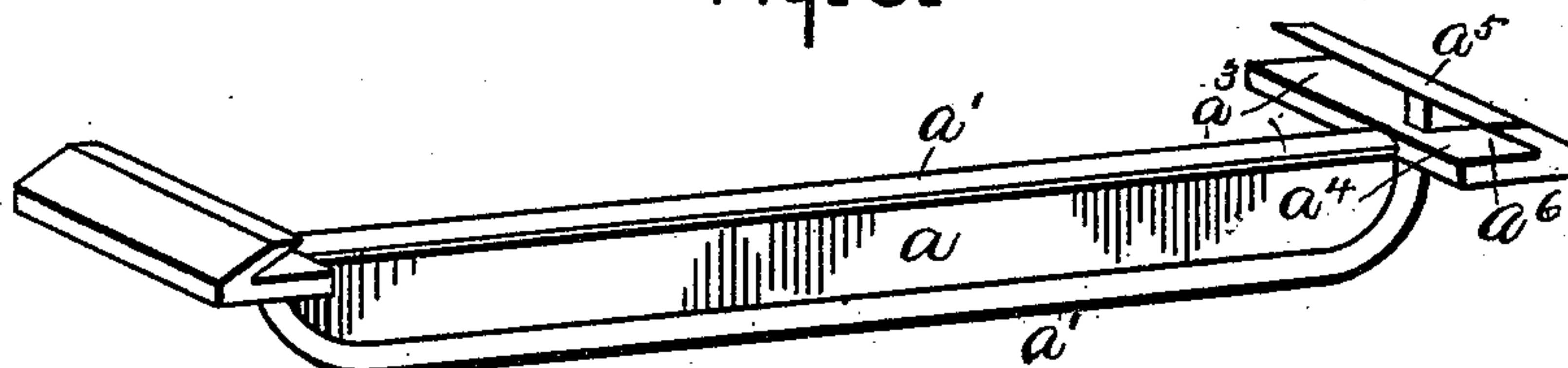


Fig. 4.

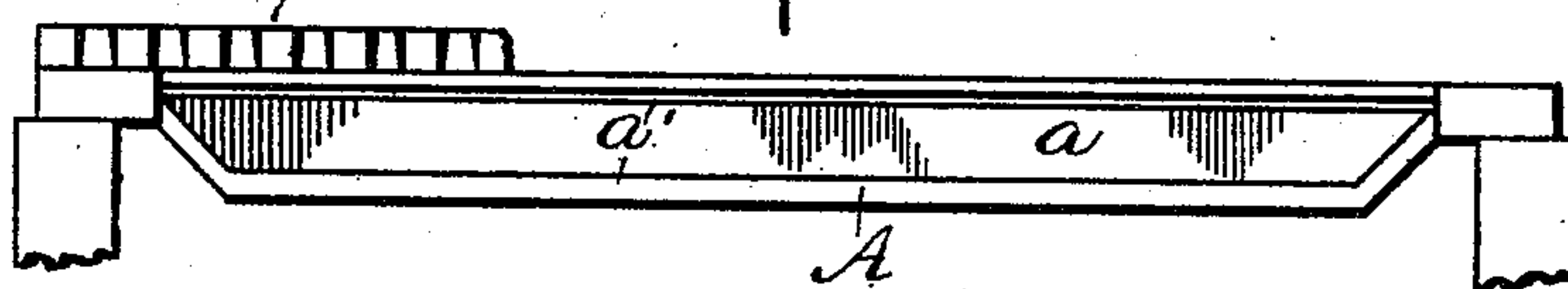
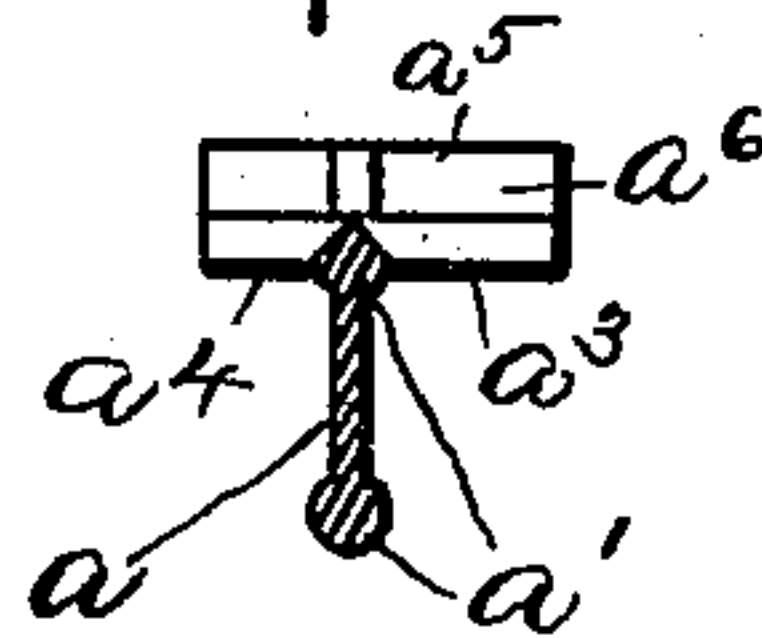


Fig. 5.



WITNESSES

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# UNITED STATES PATENT OFFICE.

RANDALL A. PALMER, OF SAGINAW, MICHIGAN, ASSIGNOR TO THE VALLEY MACHINE COMPANY, OF SAME PLACE.

## GRATE CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 459,948, dated September 22, 1891.

Application filed December 11, 1890. Serial No. 374,377. (No model.)

*To all whom it may concern:*

Be it known that I, RANDALL A. PALMER, a citizen of the United States, residing at Saginaw, county of Saginaw, State of Michigan, have invented a certain new and useful Improvement in Grate Construction; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a plan view of a grate embodying my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a separate perspective view of one of the supporting-bars. Fig. 4 is a side elevation of one of the grate-supporting bars, showing a modification of my invention; and Fig. 5 is a transverse sectional view of the grate-supporting bar exhibited by Figs. 1, 2, and 3.

It is the purpose of my invention to produce a grate construction in which there shall be little liability to burn out or warp the grate-supports and in which the grate proper is made up of sections which can be removed and replaced at very little expense in case any section may become burned out.

The invention consists of the combinations of devices and appliances hereinafter specified, and more particularly pointed out in the claims.

In carrying out my invention A represents the grate-supporting bars. These bars each consist of a stiff web  $a$ , provided with a strengthening-bead  $a'$  at its top edge, which is beveled at opposite sides to form a knife-edge bearing or is otherwise made narrow at its upper edge, so as to present as little surface as possible to the under side of the grate-sections, thereby conducing to safety against burning out said sections. At the end of each grate-supporting bar it is formed at  $a^2$  to rest upon a suitable support, and is projected at its edges at  $a^3$  and  $a^4$ , so as properly to space the said bars. I space the bars so that each grate-section shall rest on two bars disposed near its edges, in order to give them stability and prevent liability to tilt up about either support when in use. To accomplish this irregular spacing of the bars, I

make one of the projections  $a^3$  longer than the other projection  $a^4$ . Then, by reversing end for end the alternate bars, it is manifest that the proper spacing is accomplished, as shown in Fig. 1.

The grate-sections are preferably made small, so as to effect the greatest economy in repairing, and the shorter they are the less liability exists of their warping in use. These sections may extend only as far as the shoulder  $a^5$ , in which event I prefer to hollow out the grate-supporting bar under the shoulder  $a^5$ , as shown at  $a^6$ , so as to permit air from beneath to pass up around the end and so assist in effecting combustion clear to the end of the grate-supports and at the same time keeping the grate-bars at a proper temperature. The sections may, however, extend clear to the extreme end of the supporting-bars, as shown in Fig. 4, in which event the portions  $a^5$  and  $a^6$  are dispensed with.

B represents the grate-sections. They are cast preferably of uniform depth throughout, so as to afford least liability to work under variations of heat. The openings through them are preferably of least dimensions at the upper surface, so that should anything pass in between the grate-bars at the top it will be sure to pass out freely beneath, as shown at  $b$  in Fig. 2.

The sections B are so constructed as to rest edge to edge and make an unbroken and uniform fuel-surface, and preferably extend longitudinally of the supporting-bars.

These grates are adapted for steam and heating furnaces, grates, and, in fact, for all places where grates are employed.

What I claim is—

1. A grate comprising grate-supporting bars, each consisting of a web provided along its upper and lower edges with stiffening-beads and at its ends with laterally-projecting spacing-beads  $a^3$  and  $a^4$ , of different lengths, the said bars being arranged in pairs and each pair supporting near their edges a number of grate-sections extending from bar to bar, substantially as described.

2. A grate comprising grate-supporting bars, each consisting of a web provided along its upper and lower edges with stiffening-beads, the upper bead being beveled and pre-

senting a knife-edge to the grate-sections,  
and at its ends with laterally - projecting  
spacing-beads  $a^3$  and  $a^4$ , of different lengths,  
the said beads being provided with shoulders  
5  $a^5$  and hollowed out beneath the shoulder to  
form a space  $a^6$  for the passage of air, the  
said bars being arranged in pairs and each  
pair supporting near their edges a number of

grate-sections extending from bar to bar,  
substantially as described. 10

In testimony whereof I sign this specifica-  
tion in the presence of two witnesses.

RANDALL A. PALMER.

Witnesses:

WILL A. BREWER,  
STANLEY LORTH.