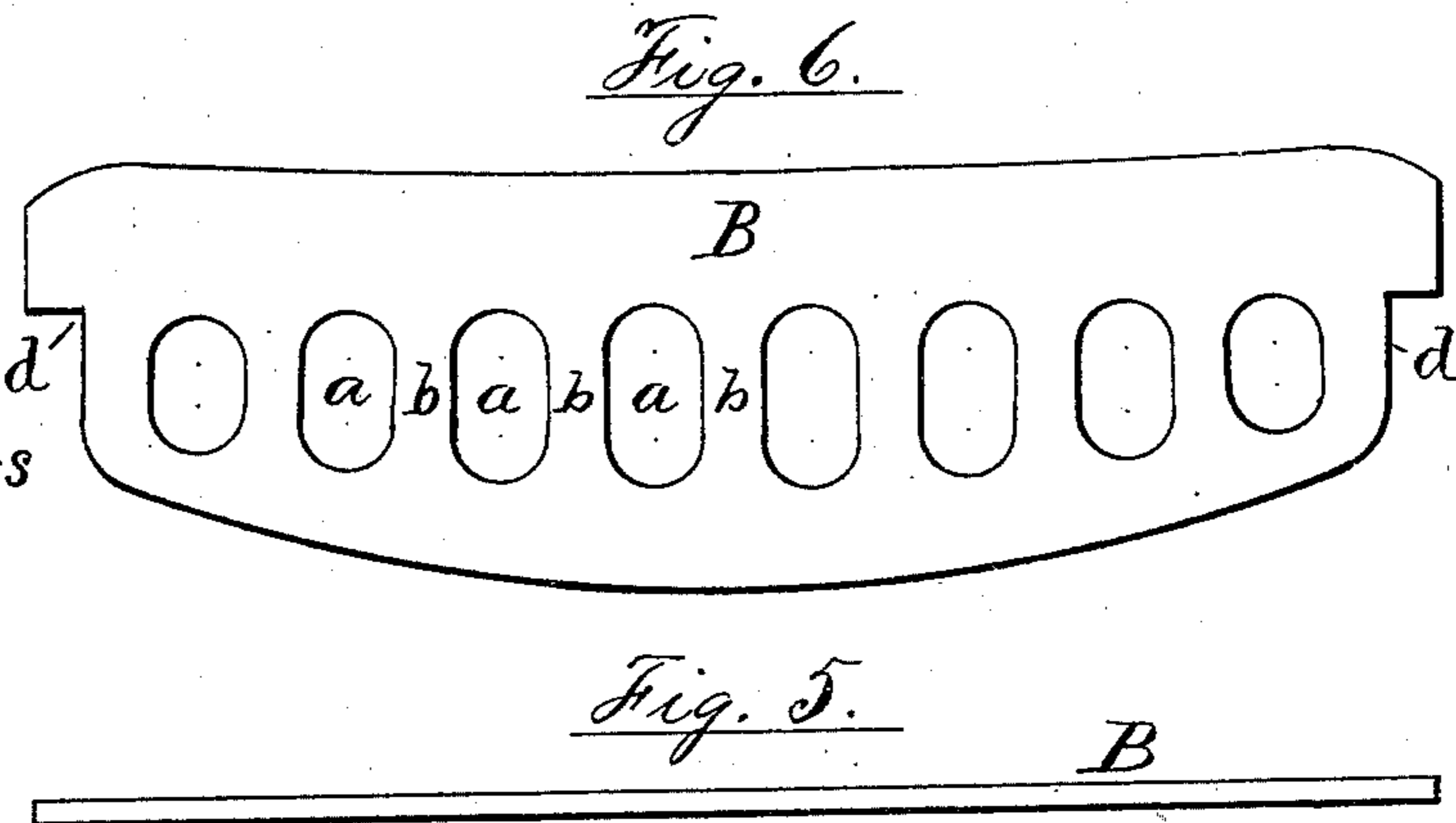
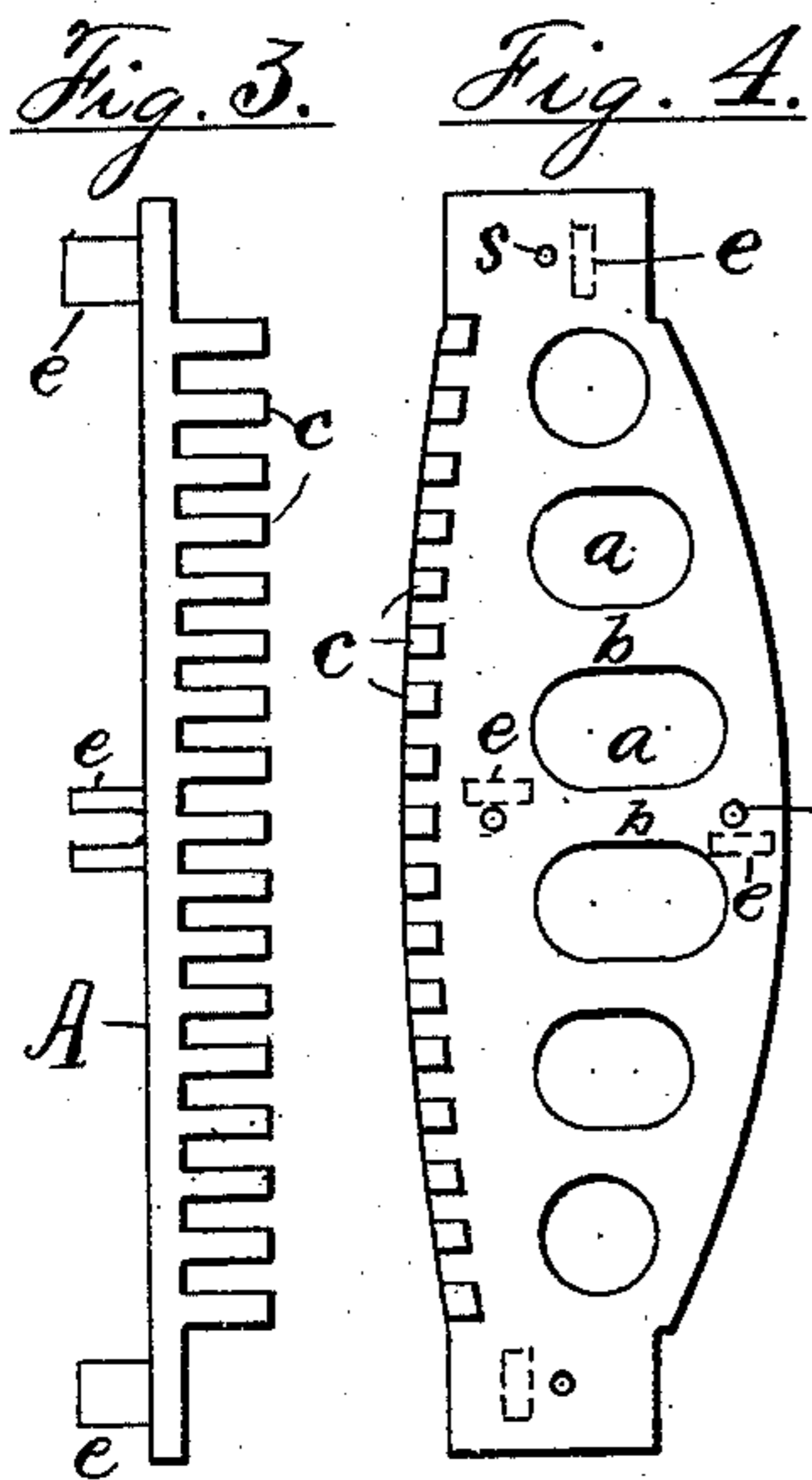
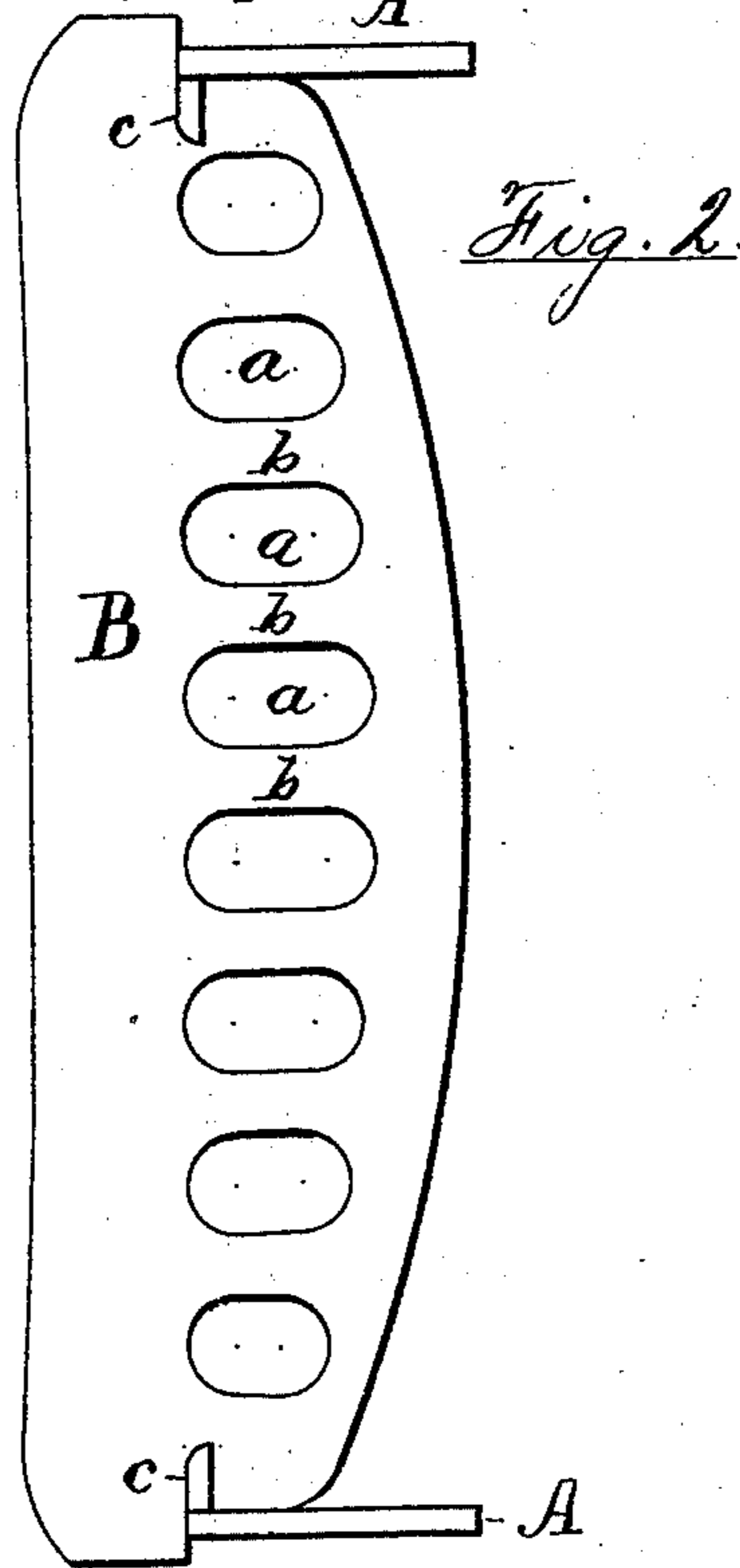
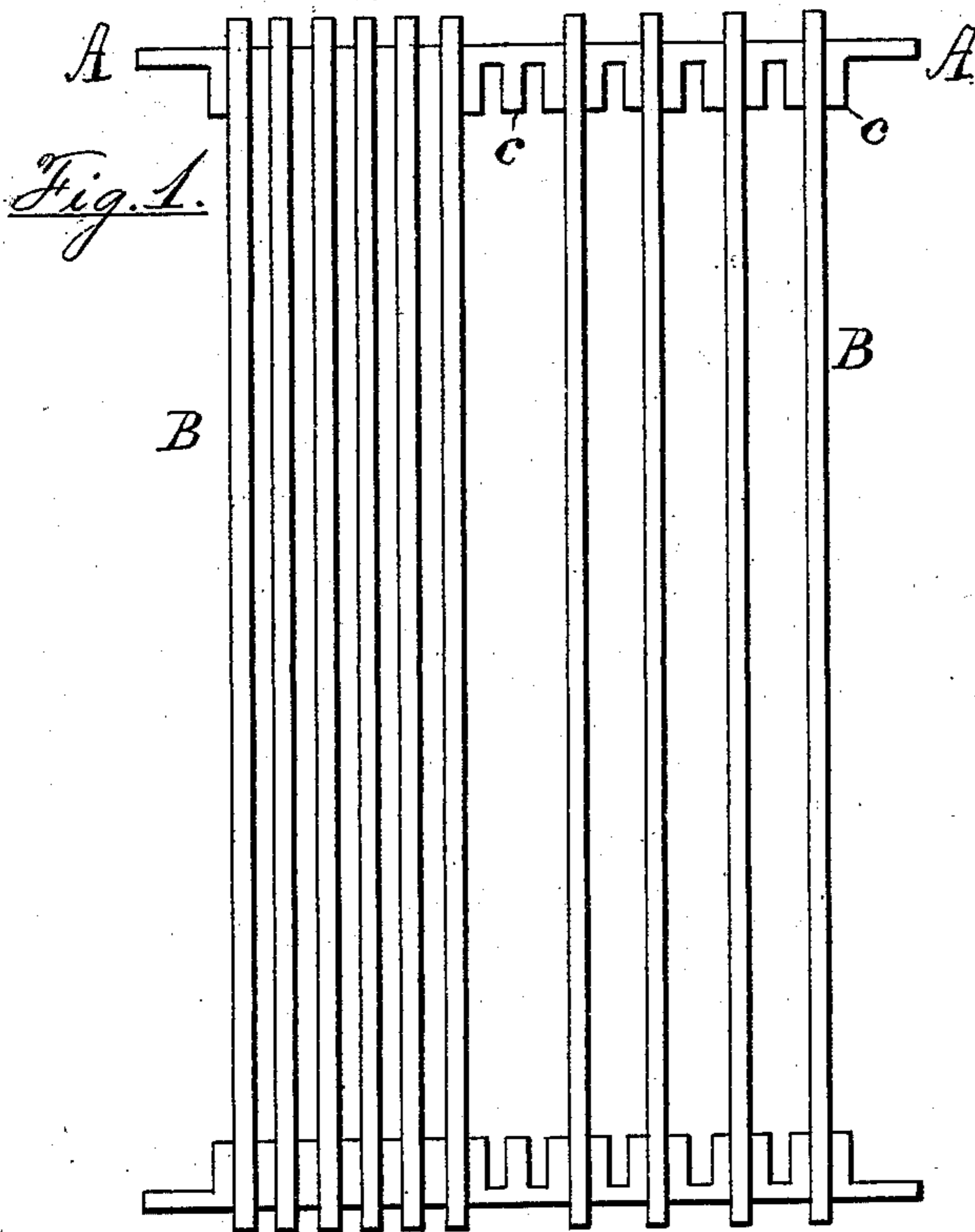


(No Model.)

W. KEARNEY.
FURNACE GRATE.

No. 285,040.

Patented Sept. 18, 1883.



Attest:
W. F. D. Crane.
Henry Sheberath

Inventor.
W. Kearney, per
Thos. S. Crane, Atty.

UNITED STATES PATENT OFFICE.

WILLIAM KEARNEY, OF BELLEVILLE, NEW JERSEY.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 285,040, dated September 18, 1883.

Application filed April 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KEARNEY, a citizen of the United States, residing in Belleville, Essex county, New Jersey, have invented certain new and useful Improvements in Furnace-Grates, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention consists in an improved form of bearer for affording a rocking motion to individual grate-bars, and to the construction of the bars to adapt them to tip freely when the poker is applied to them in the furnace.

The invention will be understood by reference to the annexed drawings, in which Figure 1 is a plan of a grate as set for use, A being the bearers, and B the bars. Fig. 2 is a side view of the same. Fig. 3 is a plan of one bearer. Fig. 4 is an inside view of the same, and Figs. 5 and 6 are a plan and side view of one grate-bar.

Both bearer and grate are composed of a single thin web, provided with numerous vertical slots *a*, separated by vertical partitions *b*. The bottom of each is made deeper in the middle than at the ends, as usual; but the tops of the same, instead of being made straight and level, as usual, are curved in opposite directions, the bearer upward and the grate-bar downward. These curves or profiles are plainly shown in the drawings, and are thus formed for the reason that in use the pieces tend to warp in just the opposite direction. Thus it is common for single bars of the kind my invention requires to expand upon the top as they become burned, and to assume a rounded form that is very annoying in the use of the cleaning-tools. The bearers, on the contrary, always bend downward with age and use, probably because the hot ashes and coals in the ash-pit affect their lower sides more rapidly than the fuel above can do through the overlying grate-bars. I therefore make the upper surface of the bearer convex longitudinally, as shown in Fig. 4, and the grate-bars concave, as shown in Figs. 2 and 6, and find that in practice the surface of the grate can be maintained more nearly even during the consumption of a set of bars than with those that are made straight. The curvature is somewhat exaggerated in the drawings, but in practice varies from one-sixteenth to one-eighth of an

inch per foot of length. By forming the bar with many holes having vertical partitions *b*, I find that I secure a greater degree of lightness than with round holes, and an equal amount of strength, and a great degree of ventilation and freedom from warping. The bars are constructed as thin plates, with a rectangular notch, *d*, at the under side of each end to fit upon the top of the bearer and between guide-lugs *c*, formed upon the side of the latter.

Lugs or notches have been formed heretofore upon the top edges of bearing-bars, merely to regulate the spaces of the separate grate-bars; but in such construction the bars become packed tightly in their places by dirt or ashes, and cannot be readily removed. If any bars warp sidewise, the jamming is greatly aggravated, and that jarring of the bars which is so great an aid to cleaning the fires and discharging the cinders and ashes becomes impossible, even from the packing alone. In my invention I construct the bearer with the projecting studs upon the side of the bar, and form them at such a distance apart and of such limited depth that each grate-bar hangs loose upon the upper side of the notch *d*, and can be readily tipped from its vertical position in moving the poker over it.

The narrow contact of the grate-bars and lugs *c* sidewise is shown in Fig. 2 at *c*; but the freedom of play which each grate-bar requires in practice between said lugs cannot be shown, because of the smallness of the drawings. In effect, each bar hangs freely, like a pendulum, and can be tipped and rocked as readily as if provided with pivots, this effect being secured by making the top of the bearers perfectly smooth and placing no vertical obstruction between the separate grate-bars, as is done in the case of notched bearers.

In Figs. 3 and 4 the bearer is shown provided with studs *e*, arranged upon the side opposite the lugs *c*, so that two bearers may be secured together back to back by bolts passed through holes *s*. The studs are placed, as shown, alternately upon opposite sides of the holes *s*, that two castings may fit together as rights and lefts, if made from the same pattern.

In Fig. 1 two arrangements of the grate-bars are shown, one adapted for fine coal, where

the bars are spaced by each single intervening lug, and one for coarse coal, where two lugs are placed between each bar.

With my improvements the entire furnace-grate is more durable, better ventilated, and much more effectively cleaned with ordinary tools than in similar constructions.

I am aware that a double-webbed grate-bar has been combined with a bearer having brackets projected from the side to enter the open space between the webs of each bar, and I do not therefore claim side projections as new. Such double-webbed bars are not, however, adapted at all to perform the functions of mine in tipping upon the bearer to shake off the ashes, as they have a double bearing upon the support beneath them, and have been provided with the usual side studs or projections to keep them at fixed distances apart. Such studs form contacts with the adjacent bars and entirely prevent the rocking motion attainable with my bars, which are kept at the desired distance apart exclusively by projections upon the bearer, and are formed without any side studs to make a contact with other bars. It will be seen, therefore, that my invention consists in making the bars of a plain, flat, single web, and in mounting them upon the bearer, so as to tip freely.

I am aware that vertical slots have been formed in double-webbed bars, as in United States Patent No. 51,455; but the same do not perform the same function as in mine, but serve to form a communication with an inner longitudinal space. I do not therefore claim such slots, broadly; but

I claim my improvements in the bar and bearer in the following manner:

1. The combination, with the bearer A, having lugs *c* formed at the side, of the single-web grate-bars B, provided with the notches *d* at the end, and fitted loosely between the lugs *c*, so as to tip and rock when pushed laterally, substantially as shown and described.

2. The grate-bar B, formed of a single web, without any side projections, and constructed with concave top, convex bottom, vertical slots *a*, and rectangular notches *n* at the ends, substantially as shown and described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM KEARNEY.

Witnesses:

THOS. S. CRANE,
H. THEBERATH.