

No. 889,698.

PATENTED JUNE 2, 1908.

J. LEES.
GRATE.

APPLICATION FILED OCT. 10, 1907.

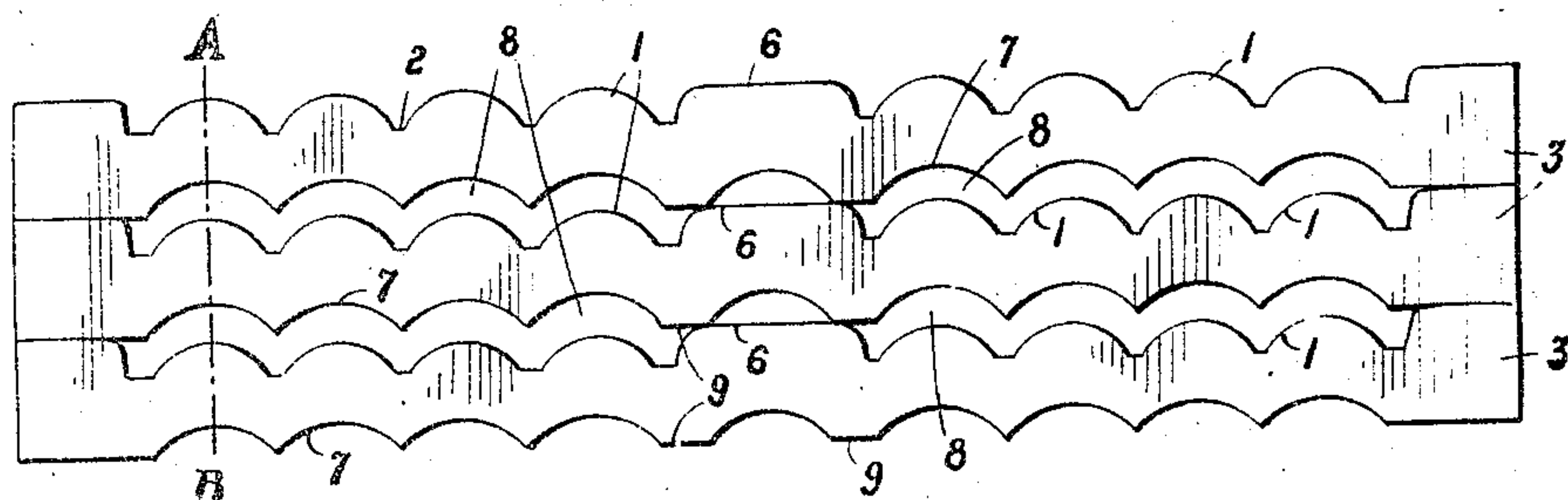


Fig. 1.

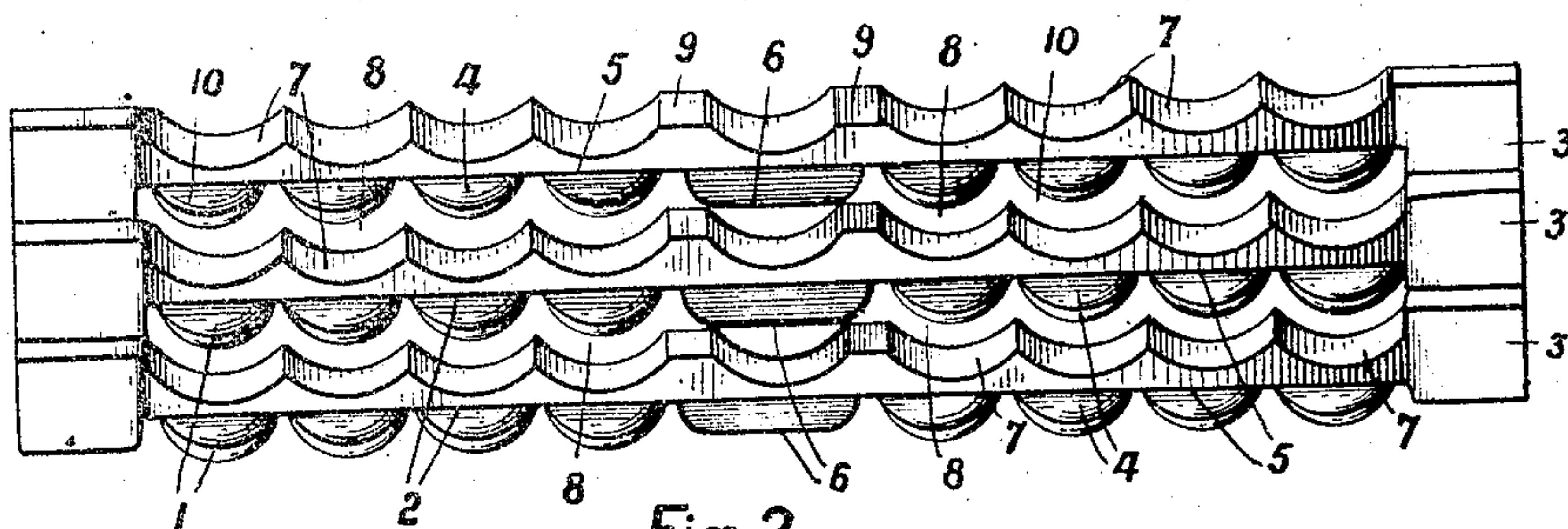


Fig. 2.

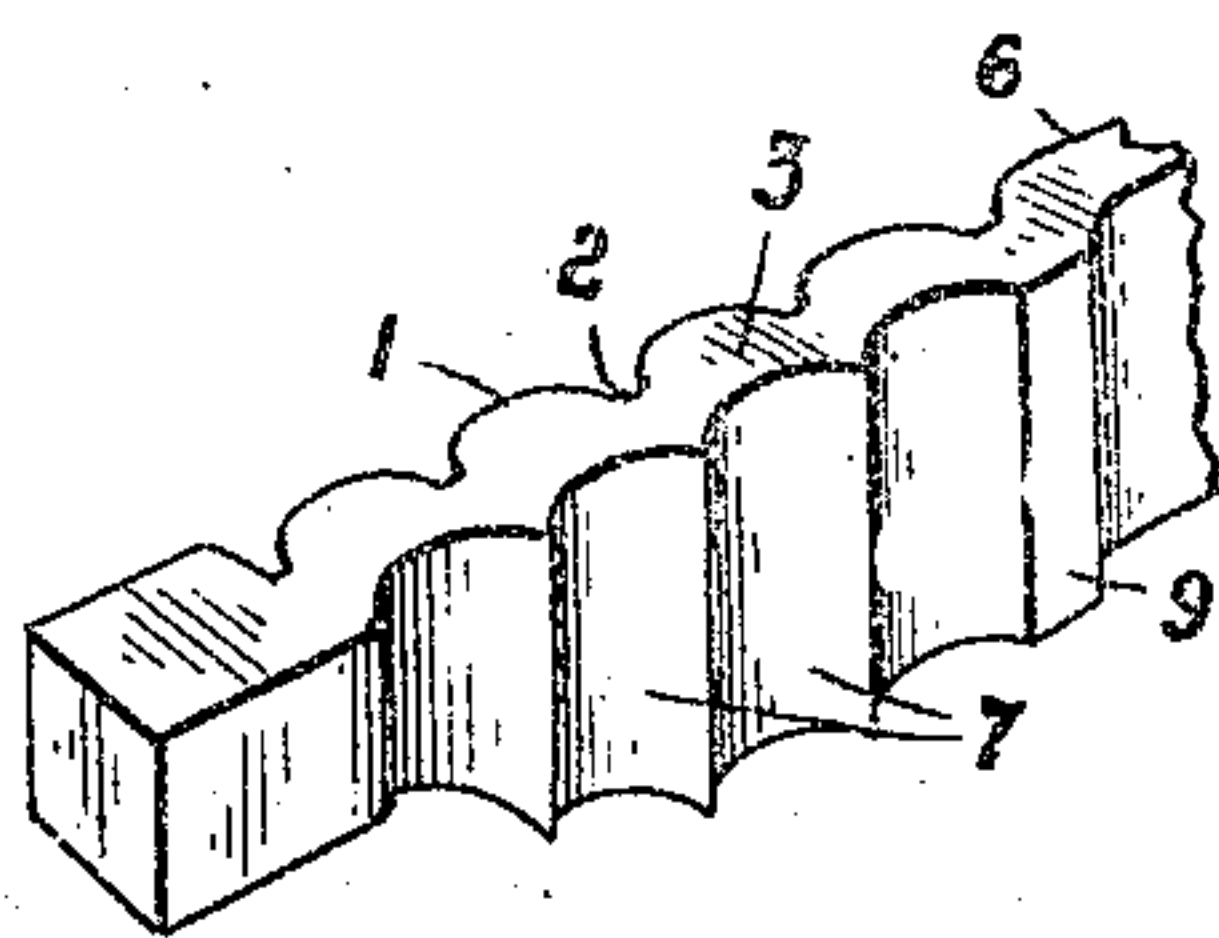


Fig. 4.

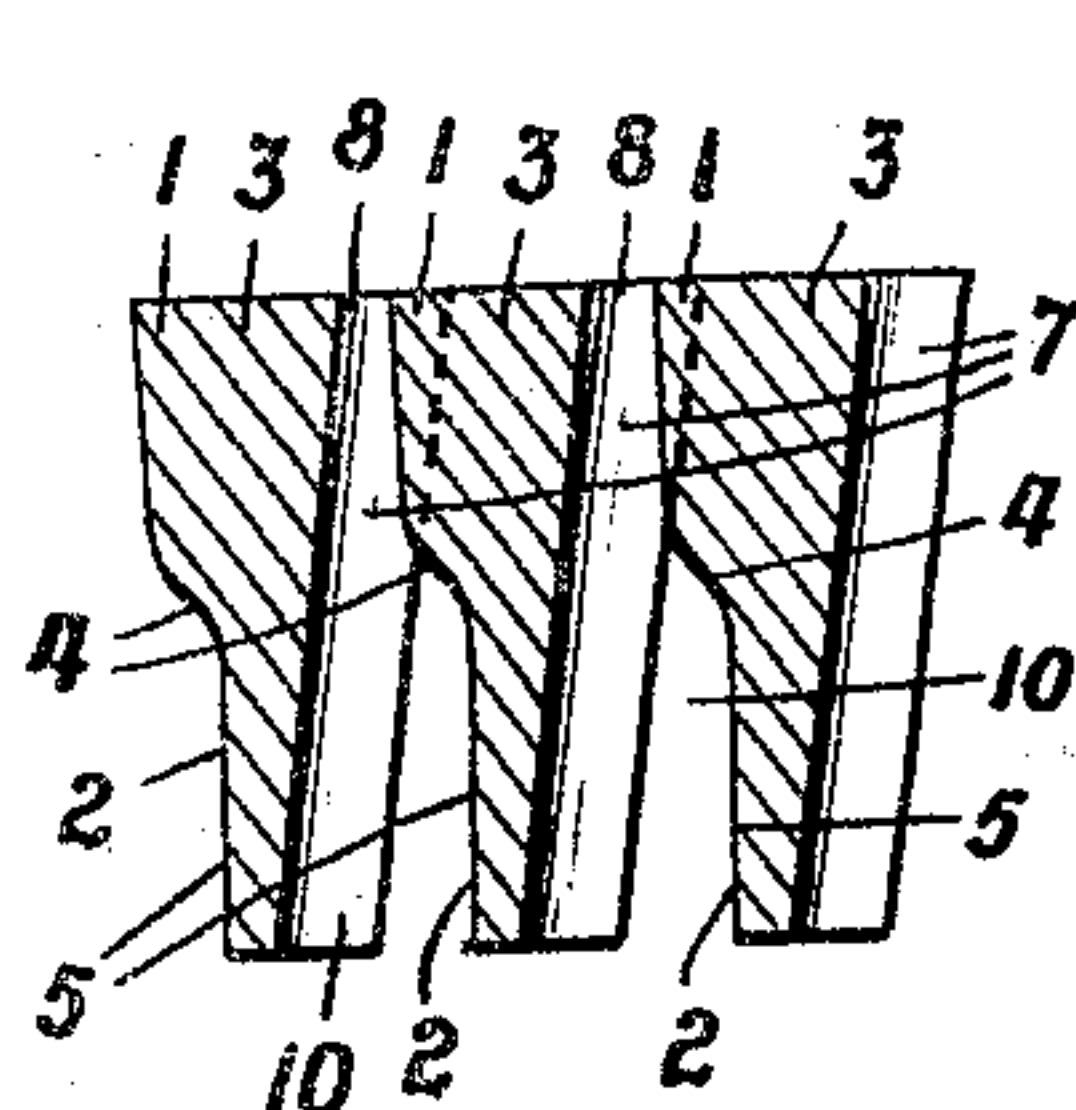


Fig. 3.

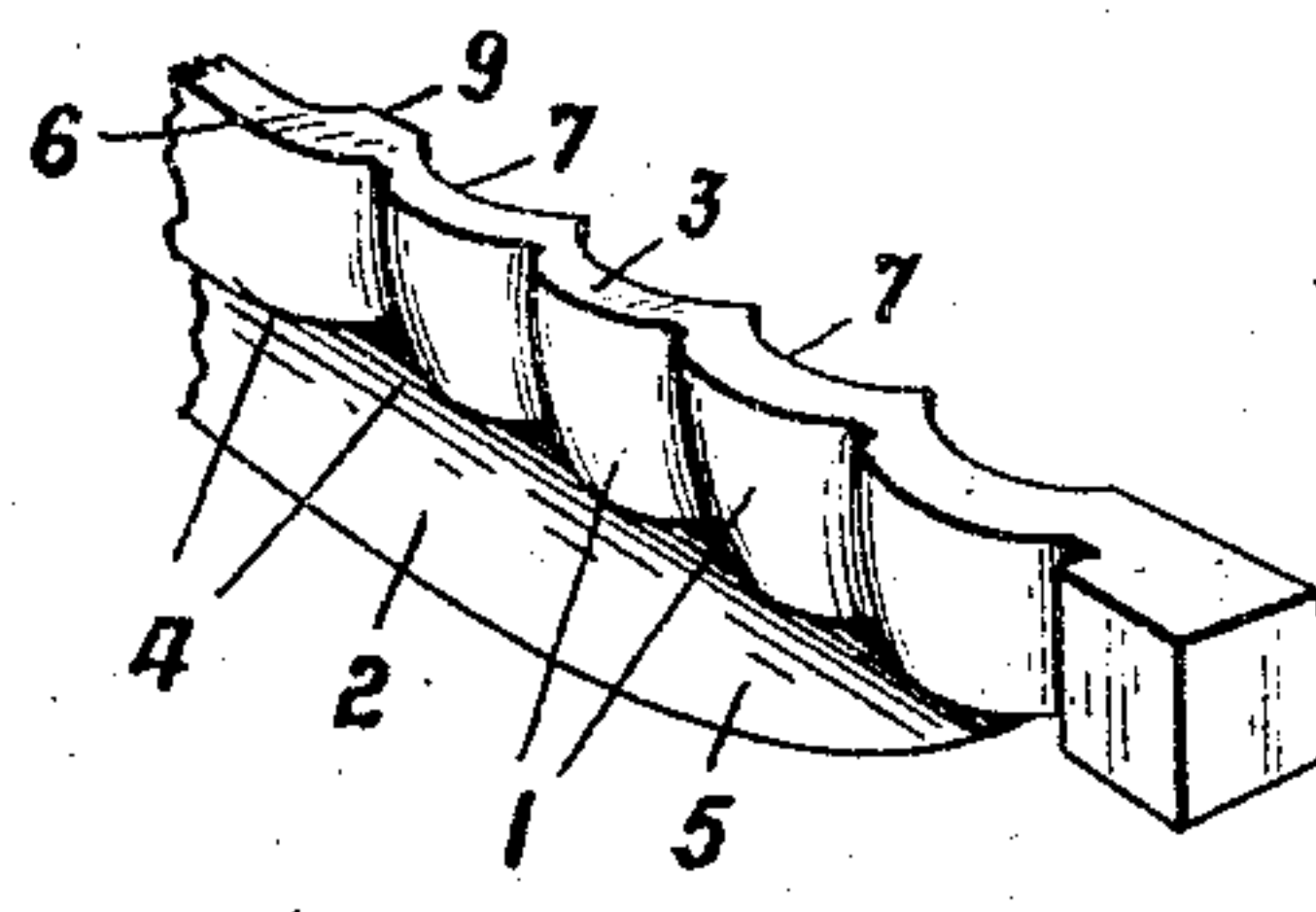


Fig. 5.

Witnesses.

Wm. Blackmore
P. Shee

Inventor.

James Lees
by *E. J. Fetherstonhaugh* Atty.

UNITED STATES PATENT OFFICE.

JAMES LEES, OF MONTREAL, QUEBEC, CANADA.

GRATE.

No. 889,698.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed October 10, 1907. Serial No. 396,825.

To all whom it may concern:

Be it known that I, JAMES LEES, a subject of the King of Great Britain, residing at 155 Park avenue, in the city and district of Montreal, in the Province of Quebec, in the Dominion of Canada, have invented certain new and useful Improvements in Grates, of which the following is a specification.

The invention relates to improvements in 10 grates, as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially in the novel construction and arrangement of parts 15 whereby the flow of air is directed to narrow crescent-shaped apertures from a comparatively wide space therebelow between neighboring grate bars.

The objects of the invention are to increase 20 the total area of the air inlet through said grate to the fire box and yet not widen the distance between bars and to increase the velocity of the air flow.

In the drawings, Figure 1 is a plan view 25 of the fuel surface of a portion of a grate. Fig. 2 is a plan view from the underside of a portion of the grate. Fig. 3 is a cross sectional view on the line A—B in Fig. 1. Fig. 4 is a perspective detail view of a portion of a 30 grate bar showing the recessed side. Fig. 5 is a perspective detail view of a portion of a grate bar showing the bossed side.

Like numerals of reference indicate corresponding parts in each figure.

35 It is known in the construction of grate bars to form them in corrugations longitudinally and also to arrange grate bars with half moon-shaped openings leading into a fire box, but it is not known, as far as I am 40 aware, to apply an established principle in the flow of fluids, that is increasing the velocity of the flow by narrowing the aperture through which it escapes without reducing the total area, to the construction of grate 45 bars and in this invention the lower end of the bosses represent the shoulder formed to begin the reduction of the width of the air apertures through the said grate bars.

Referring to the drawings, 1 are bosses 50 formed on the otherwise plain walls 2 of the grate bars 3, the said bosses tapering slightly from their upper ends and extending downwardly a short distance from the fuel surface and at their lower ends forming curved shoulders 4 merging into the plain surface 5 beneath the said bosses on each of said bars.

The bosses 1 are crescent-shaped in cross section, the crescent of the middle of said bosses in each bar being slightly elongated and flattened at 6. 7 are crescent-shaped recesses 60 vertically arranged on the other side of each of said bars, the said recesses directly opposing corresponding bosses on the neighboring bar and forming a succession of narrow crescent-shaped apertures 8 leading into the fire 65 box from the space below. The middle one of said recesses in each bar is flanked by the two walls 9 preferably meeting the flattened surfaces 6 of the middle ones of the said bosses. The said recesses 7 extend down- 70 wardly from the fuel surfaces of each of said bars through to the lower edge and form to all intents and purposes a succession of vertical channels 10 leading to the apertures 8.

The general arrangements of the grate bars 75 and their supports may be much the same as in the different forms of grates, the supporting frame not being shown in the accompanying drawings.

The utility of this grate will be understood 80 from the foregoing explanation, as it has been explained that there is a principle involved in narrowing the outlet aperture from the wider mouth, and it will be seen from the description of the details of this invention, 85 that the wider mouth in each instance is the lower end of the vertical channels 10, which are narrowed near the aperture by the bosses 1, having the sloping shoulders 4 thus giving an impetus to the air leaving the aperture 90 and greatly increasing the draft into the fire box.

What I claim as my invention is:

1. In a grate, a plurality of parallel bars, each of said bars having continuous rows of 95 vertical arc-shaped recesses extending from top to bottom in a side wall and bosses at the top of the other side wall of corresponding arc-shape in cross section and in continuous rows, said bosses having a slight taper and 100 inwardly inclined shoulders at their lower ends forming glancing walls in the air passages through said grate, substantially as described.

2. In a grate, a plurality of parallel bars, 105 each of said bars having a central vertical groove forming an arc-shaped recess in one of its side walls, and flat surfaces to each side of said recess and a succession of vertical grooves in the same side wall between 110 the upper edge of said flat surfaces and the ends of the bar forming arc-shaped recesses

extending from the bottom to the top of the bar, and a central flat surfaced projection from the upper portion of the reverse side wall of the bar adapted to engage the central
5 flat surfaces of a neighboring bar, said projection having an abruptly sloping shoulder at its lower end and a succession of bosses, arc-shaped in cross section, and having abruptly sloping shoulders at their lower end
10 and extending from the upper portion of said reverse side of the bar between said central boss and the ends, said sloping shoulders forming glancing walls in the upward pas-

sage for the flow of air through said grate and said bars in arrangement forming an 15 upper and flush fuel surface having a succession of arc-shaped apertures between the center thereof and the ends of the bars.

Signed at the city and district of Montreal, in the Province of Quebec, in the Dominion 20 of Canada, this 3rd day of October, 1907.

JAMES LEES.

Witnesses:

G. H. TRESIDDER,
P. SHEE.