

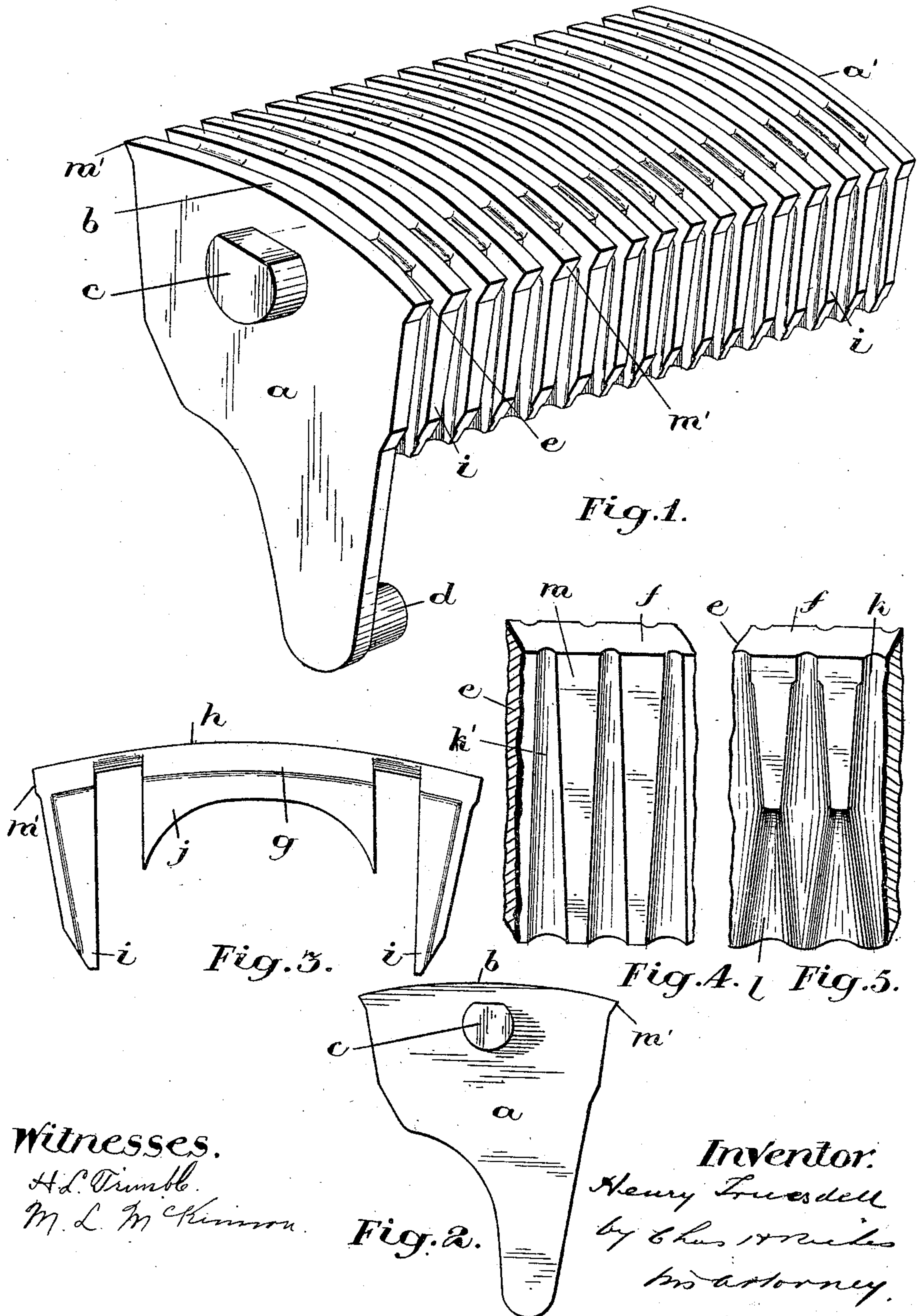
No. 855,823.

PATENTED JUNE 4, 1907.

H. TRUESDELL.
GRATE BAR.

APPLICATION FILED OCT. 6, 1905. RENEWED MAY 2, 1907.

2 SHEETS—SHEET 1.



Witnesses.

H. L. Trumble.

M. L. McKinnon.

Fig. 2.

Inventor.

Henry Truesdell

by Charles McKinnon

his attorney.

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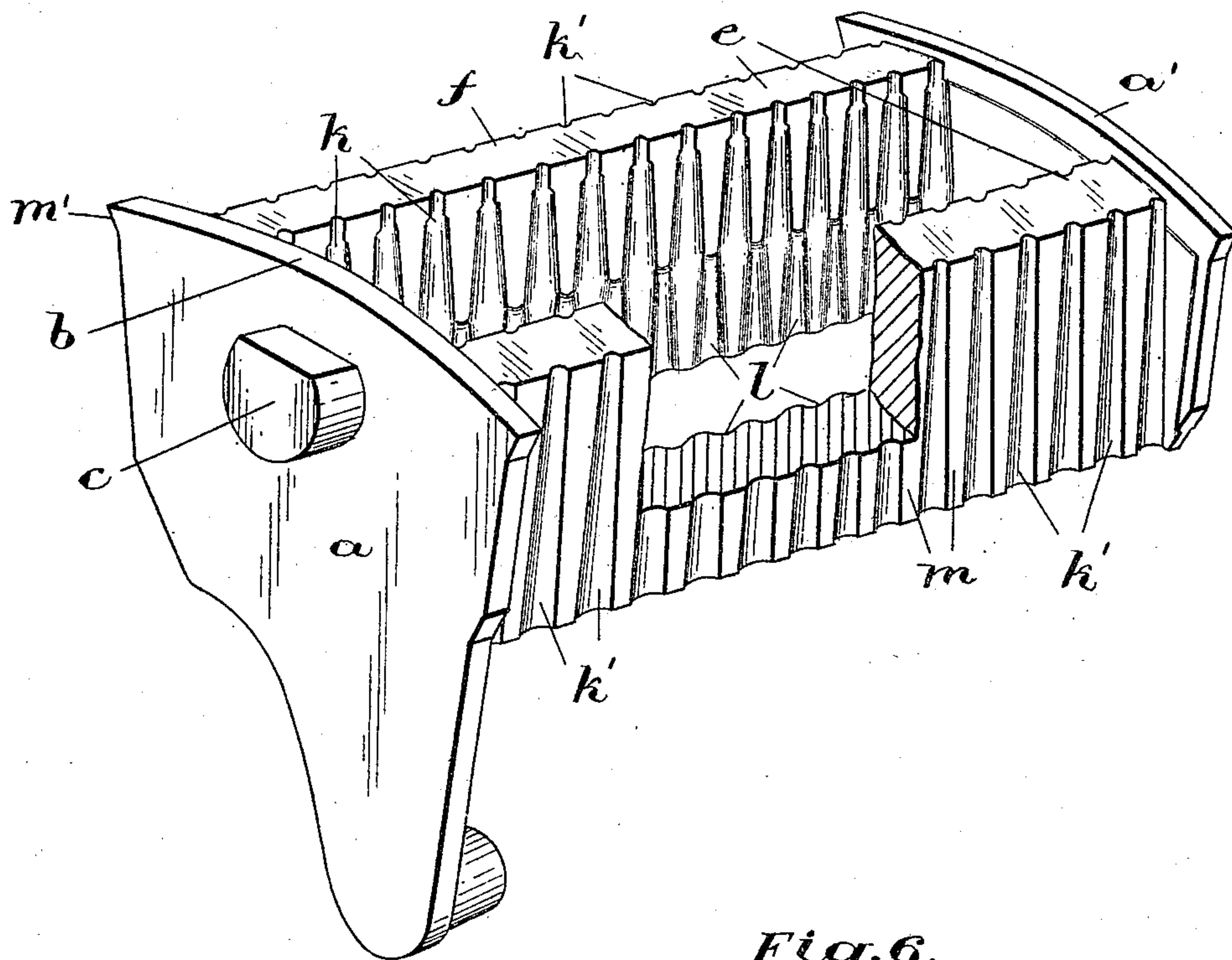


Fig. 6.

Witnesses.

A. L. Drimble.

C. B. Sheffield

Inventor.

Henry Truesdell
by Charles H. Miller
his attorney

UNITED STATES PATENT OFFICE.

HENRY TRUESDELL, OF TORONTO, ONTARIO, CANADA, ASSIGNOR TO THE
CYCLONE GRATE BAR COMPANY, LIMITED, OF TORONTO, CANADA, A
CORPORATION OF ONTARIO.

GRATE-BAR.

No. 855,823.

Specification of Letters Patent.

Patented June 4, 1907.

Application filed October 5, 1905. Renewed May 2, 1907. Serial No. 371,472.

To all whom it may concern:

Be it known that I, HENRY TRUESDELL, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Grate-Bars; and I do hereby declare that the following is a full, clear, and exact description of the same.

In my former patent #702891, dated June 17th 1902, I have shown and described a grate bar consisting of a unitary casting, and comprising two ends each having corrugations in their top surfaces, trunnions formed upon the outer faces of the ends, a lug depending from the lower portion of one of the ends so that a series of the bars may be secured to be rocked in unison, a pair of parallel side bars connecting the ends together and having their top surfaces grooved and in line with the corrugations of said ends, transverse sections parallel with the ends and supported by the side bars, said transverse sections being provided with corrugations similar in shape and number to the corrugations of the ends and having the corresponding ones in line therewith and with those of said side bars, said transverse sections having their lower edges in the same line but above the lower edges of the side bars, and brace webs connected to the inner faces of the ends and adjacent faces of the transverse sections, intermediate of the side bars so that each brace web groove is in line with the central corrugations of the ends and transverse sections.

The present invention relates to an improvement upon the construction of the grate bar shown and described in the above mentioned patent and outlined in the foregoing description whereby the areas of the air courses between the transverse sections can be increased without any increase of the width of the intervals between them and whereby the force of the draft can be increased as it passes from the bottom to the top of the grate bar, and the invention further relates to a means whereby the clinkers are broken and disintegrated during the rocking of the grate bars so that they can be dumped into the ash pit, as hereinafter more fully set forth and more particularly pointed out in the claims.

For a full understanding of the invention

reference is to be had to the following description and to the accompanying drawings in which,

Figure 1 is a perspective view of one of the grate bars. Fig. 2 is an end view of the same. Fig. 3 is a view showing the conformation of one of the transverse sections. Fig. 4 is a detail view of a portion of one of the parallel bars looking at its outer face. Fig. 5 is a similar view of the same looking at its inner face. Fig. 6 is a perspective view of the grate bar casting stripped of the transverse sections.

Like letters of reference refer to like parts throughout the specification and drawings.

The grate bar constituting the present invention may be described as consisting of a unitary casting comprising two ends *a*, *a'* having curved top surfaces *b*, trunnions *c* formed on the outer faces of the ends *a*, *a'*, a depending lug *d* from the lower portion of one of the ends so that a series of bars may be secured to be rocked in unison, a pair of parallel side bars *e* connecting the ends together and having their top surfaces *f* below the plane of the top surfaces of the ends, a series of transverse sections *g* parallel with the ends and having their top surfaces *h* curved to correspond with the curvature of the top surfaces thereof and in the same curvilinear plane so that the top surfaces of the side bars will be the same distance below the top surfaces of the transverse sections as they are below the top surfaces of the ends, to form air courses all of equal capacity, between the top surfaces of the side bars and the transverse sections, the ends *a*, *a'*, and the transverse sections projecting equally beyond the outer faces of both side bars and the projecting ends of the transverse sections strengthened by brace webs *i* extending from near their top surfaces to the outer faces of the side bars, and the middle parts of the transverse sections strengthened by arched brace webs *j* united with the inner faces of the side bars but not extending to their lower edges.

The side bars are substantially wedge shape in cross section with the sides converging from their top to their bottom edges and of greater thickness at their upper than at their lower parts to sustain the load upon the grate bars while the transverse sections are of

a similar shape, in cross section to retard their destruction by the erosive and corrosive action of the fire and to facilitate the unrestricted circulation of the air currents.

5 To increase the areas of the air courses without increasing the width of the intervals between the transverse sections, the inner and outer faces of the side bars have vertical channels k and k' respectively located at the
10 ends of the intervals between the transverse sections and extending from the top edges of the side bars to the lower edges of the brace webs. The brace webs j do not extend to the bottom of the inner faces of the
15 side bars and as the channels k only extend to the bottom of the brace webs the area of the opening between the side bars may be increased by forming channels l in their inner faces from the brace webs j to their lower
20 edges, said channels l being located out of line with the channels k and directly opposite the ridges m between the channels k' on the outer faces of the side bars so that the side bars will not be materially weakened by the pres-
25 ence of the channels l .

The air currents enter at the bottom of the grate bar between the inner faces of the side bars and the ends, the channels l increasing the area of the opening thereof to allow of the
30 admission of the greatest possible volume of air. The air ascends through the space between the inner faces of the side bars and ends and through the air courses formed by the intervals between the transverse sections
35 intermediate the side bars the capacity of which has been increased by the presence of the channels k but without any increase in the width of the intervals between the transverse sections. The air currents also course
40 up the outer faces of the side bars and through the intervals between the projecting parts of the transverse sections the capacity of which has been increased by the presence of the channels k' . The air when it reaches
45 the top of the side bars passes through the air courses formed between the top surfaces of the side bars and the top surfaces of the transverse sections so that the whole of the fuel will be subjected to the action of the air
50 currents and a practically perfect combustion will be effected.

The grate bars when mounted in the fire box are arranged in parallel planes and their lugs are coupled together so that they may be
55 rocked in unison to clear the fire of ashes, clinkers and other refractory substances which if solidified would retard the action of the air currents. To crush the clinkers, the ends of the transverse sections project
60 slightly beyond the edges of the brace webs to form clinker breakers m' which engage the clinkers and crush them as the grate bars are rocked so that the crushed clinkers may pass into the ash pit through the openings be-
65 tween the grate bars.

By means of the above described construction it is possible to supply sufficient atmospheric air to the fire to insure a practically perfect combustion of the fuel and by arranging the projecting ends of the transverse sections so that they will engage and crush the
70 clinkers it is possible to remove all solid refractory substances from the top surfaces of the grate bars as they are rocked upon their trunnions.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is;

1. A grate bar consisting of a unitary casting comprising two ends, trunnions
80 formed on the outer faces thereof, a depending lug from the lower portion of one of the ends, so that a series of the grate bars may be secured to be rocked in unison, and a pair of
85 side bars connecting the ends together and having their top surfaces below the plane of the top surfaces of the ends, transverse sections parallel with the ends and having their top surfaces to correspond with the top sur-
90 faces of the ends and in the same plane therewith so that the top surfaces of the side bars will be the same distance below the top surfaces of the transverse sections as they are below the top surfaces of the ends to form air
95 courses all of equal capacity between the top surfaces of the side bars and those of the transverse sections and ends, the ends and the transverse sections projecting equally be-
100 yond the outer faces of both side bars, the projecting ends of the transverse sections strengthened by brace webs extending from near their top surfaces to the outer faces of the side bars, the middle parts of the trans-
105 verse sections strengthened by brace webs extending to the inner faces of the side bars, channels formed in the inner and outer faces of the side bars at the intervals between the transverse sections and extending to the bot-
110 tom of the brace webs, and other channels extending from the inner faces of the side bars ex- tending from the brace webs to the lower edges of the side bars.

2. A grate bar consisting of a unitary casting comprising two ends, trunnions
115 formed on the outer faces thereof, a depending lug from the lower portion of one of the ends, so that a series of the grate bars may be secured to be rocked in unison, and a pair of
120 bars connecting the ends together and having their top surfaces below the plane of the top surface thereof, transverse sections supported by the side bars and having their top surfaces to correspond with the top surfaces of the ends and in the same plane therewith
125 so that the top surfaces of the side bars will be the same distance below the top surfaces of the transverse sections as they are below the top surfaces of the ends to form air
130 courses, all of equal capacity, between the top surfaces of the side bars and those of the

transverse sections and ends, the ends and the transverse sections projecting equally beyond the outer faces of both side bars, the projecting ends of the transverse sections
5 strengthened by brace webs extending from near their top surfaces to the outer faces of the parallel bars, the middle parts of the transverse sections strengthened by brace webs extending to the inner faces of the parallel bars, channels formed in the inner and
10 outer faces of the side bars at the intervals between the transverse sections and extending to the bottom of the brace webs, other channels formed in the inner faces of the side bars extending from the brace webs to the
15 lower edges of the side bars, and clinker breakers formed on the projecting ends of the transverse sections.

3. A grate bar consisting of a unitary casting comprising two ends, trunnions formed on the outer faces thereof, a depending lug from the lower portion of one of the ends, so that a series of the grate bars may be secured

to be rocked in unison, and a pair of side bars connecting the ends together, transverse sections supported by the side bars and parallel with the ends and projecting beyond the outer faces of the side bars, brace webs forming an integral part of the transverse sections and extending to the outer faces of the side bars, other brace webs extending from the middle parts of the transverse sections to the inner faces of the side bars, channels formed in the inner and outer faces of the side bars at the intervals between the transverse sections and extending to the bottom of the brace webs, and other channels formed in the inner faces of the side bars extending from the brace webs to the lower edges of the side bars.

Toronto, July 15th, A. D. 1905.

HENRY TRUESDELL.

Signed in the presence of—

CHAS. H. RICHES,

H. L. TRIMBLE.