

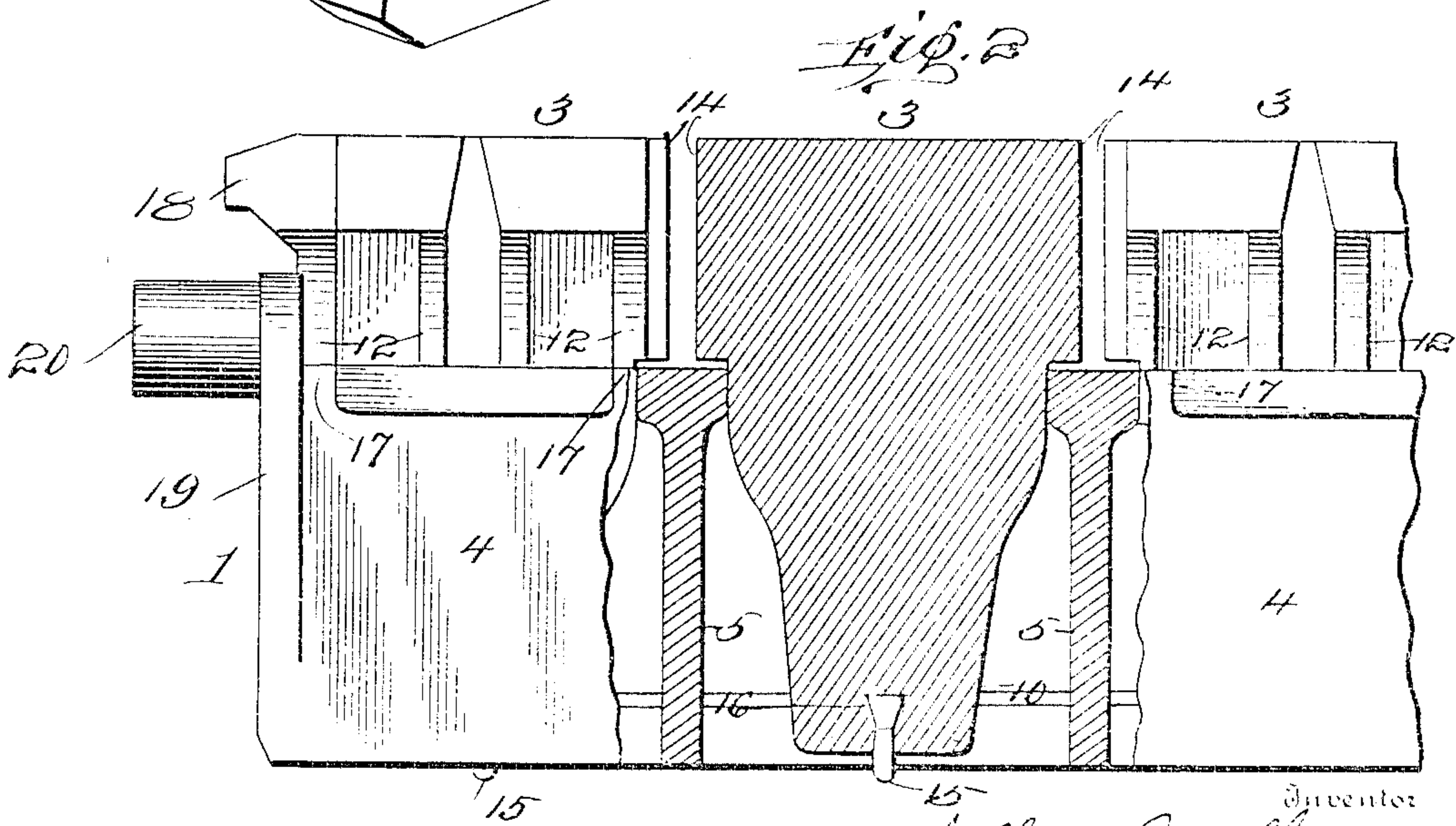
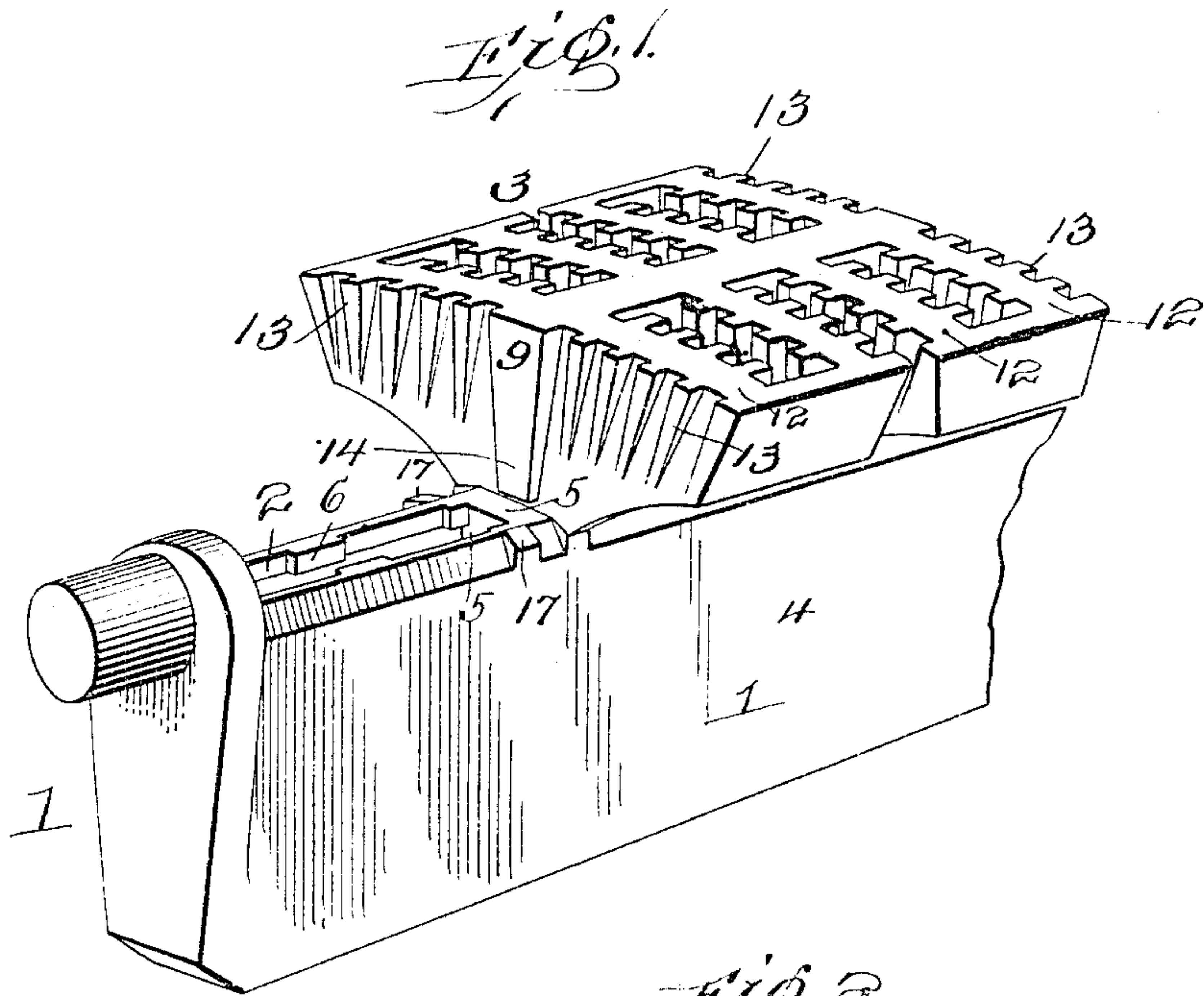
No. 804,668.

PATENTED NOV. 14, 1905.

W. McCLAVE.  
GRATE BAR.

APPLICATION FILED JUNE 8, 1904.

2 SHEETS—SHEET 1.



Inventor  
William McClave,

Witnesses  
J. M. Fowler Jr.  
Florence Mapes Patrick

By  
Mason, Fenwick & Hammece  
Attorneys

No. 804,668.

PATENTED NOV. 14, 1905.

W. McCLAVE.

GRATE BAR.

APPLICATION FILED JUNE 8, 1904.

2 SHEETS—SHEET 2.

FIG. 3.

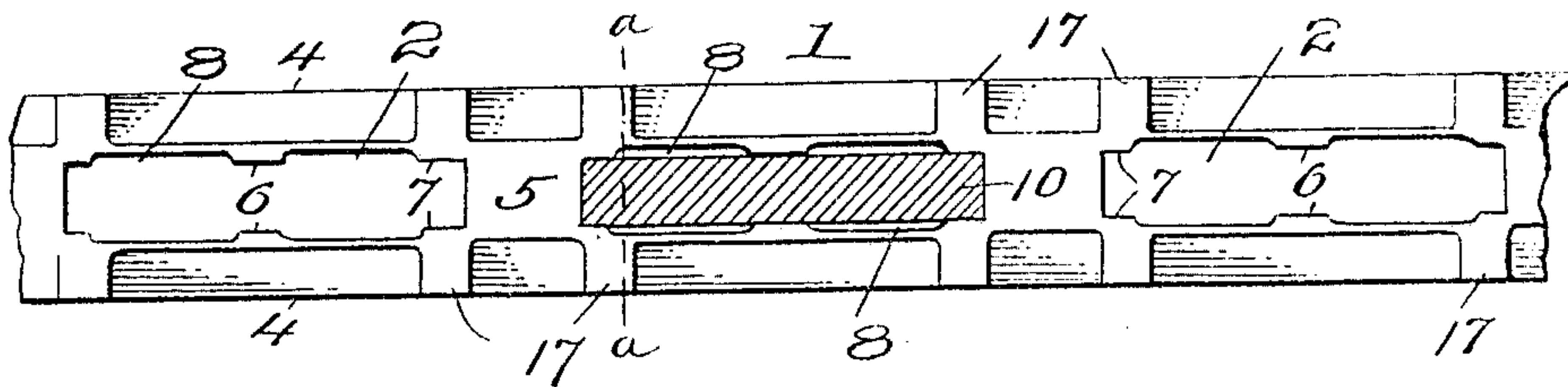
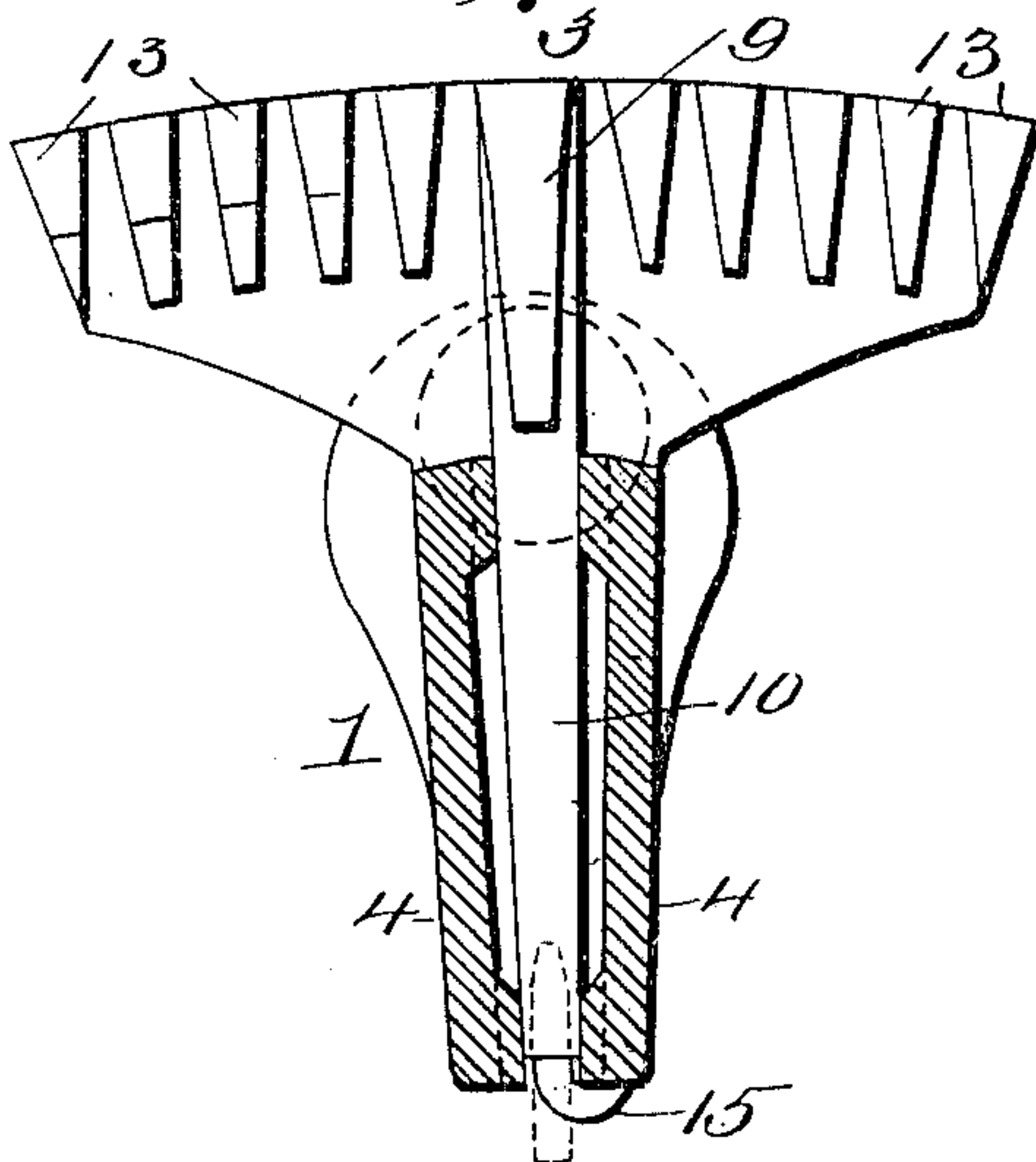


FIG. 4.



Witnesses

J. M. Fowler Jr.  
Florence Mapes Patrick

William McClave, Inventor

By Mason, Fenwick & Lawrence  
Attorneys



# UNITED STATES PATENT OFFICE.

WILLIAM McCLAVE, OF SCRANTON, PENNSYLVANIA, ASSIGNOR  
TO McCLAVE-BROOKS COMPANY, A CORPORATION OF PENN-  
SYLVANIA.

## GRATE-BAR.

No. 804,668.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed June 8, 1904. Serial No. 211,699.

*To all whom it may concern:*

Be it known that I, WILLIAM McCLAVE, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Grate-Bars; and I do hereby 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 appertains to make and use the same.

This invention relates to improvements in grate-bars, the structure being adapted for use in connection with rocking or stationary grates, as found desirable.

It is the object of the invention, among other things, to provide a grate-bar for furnaces which shall be provided with a body portion having its upper and lower edges strengthened by reason of their formation; and it is the object of the invention to provide fuel-engaging caps for such a body portion, the caps having shanks extending into sockets formed in the body portion, the shape of the shanks being such that a protecting air-space is secured in each socket around the shank mounted therein.

With these and other objects in view the invention comprises certain novel constructions, combinations, and arrangements of parts, as will be fully described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a portion of the grate-bar, showing some of the caps removed therefrom. Fig. 2 is a view, partially in section and partially in elevation, of my improved grate-bar, the same being shown on an enlarged scale. Fig. 3 is an enlarged plan view of a portion of the body portion of the grate-bar, the shank of a removable cap being shown in section. Fig. 4 is an enlarged transverse sectional view taken through the body portion of the bar on the line *a a* of Fig. 3, the removable cap portion being shown in elevation in the socket of the bar.

The grate-bar which constitutes the subject-matter of the present invention makes it possible to produce a fuel-supporting surface for either stationary grates or rocking grates, which is made up of a body portion and caps and is admirably adapted for handling all kinds of fuel, the caps being of such contour as to offer short lines of metal for the most part to the action of the heat generated by the combustion of fuel upon the grate. While

the caps are not likely to become burned out quickly, they can be readily removed and replaced in the event of anything detrimental happening to them.

In the drawings, 1 represents the body portion of the bar having a series of elongated sockets or slots 2 formed therein adapted to receive the shanks of fuel-engaging caps 3. The shape of the shanks and the interior contour of the sockets which receive the shanks are such that the ashes cannot well accumulate at any point so as to clog the grate or hold a great amount of heat at any one point thereon. The body portions 1 are formed with side walls 4, extending from end to end of the grate-bar and connected at suitable intervals by partitions 5, which not only serve to strengthen the body portion and hold its walls 4 in proper relation with respect to each other, but also serve to form, in conjunction with the wall 4, the sockets 2, which receive the shanks or stems of the grate-caps. The partitions 5 are made thicker at the top than at the bottom, as clearly shown in Fig. 2, the upper portions of the said partitions bearing against the edges of the shanks of the caps and preventing their movement longitudinally of the bar. The walls of the body portion preferably do not touch the shanks or stems of the caps for their entire width, but have inwardly-projecting portions 6 and 7 formed at the sides of the elongated slots for bearing upon the sides of the shank and holding them positively in position. In this manner elongated openings 8 are left upon each side of the cap-shanks, through which a circulation of air may be secured at all times for preserving the parts in a sufficiently cool condition. The portions of the said body portion both at the top and bottom which engage the shanks of the caps extend inwardly, as shown in Fig. 4. The lower portion of the body portion engages the lower end of each shank, there being an air-space left for the greater portion of the shank upon each side thereof, as shown in said Fig. 4.

The construction of the caps forms an improved feature of the present invention, and each of said caps is made up of a tapering head 9, extending in reduced size to form a shank 10, which shank projects below the fuel-supporting portion of the cap. The head and shank are made at the top the full



width of the cap 3, while below the fuel-engaging portion and the webs thereof the shank tapers not only in thickness, but in width, as clearly shown in Fig. 2. The tapering shape of the shank or stem thus leaves a considerable space between the said stem and the adjacent partitions 5. In this manner not only is there secured a large air-space upon each side of the shank or stem, but ashes or materials which may work their way into the sockets of the body portion will have ample opportunity to drop from said sockets. In this way there is very little chance for the accumulation of ashes in any portion of the bar. The fuel-engaging portions of the cap are formed by means of laterally-extending webs 12, which project a suitable distance from each of the side faces of the head 9. The upper edges of these webs are formed with laterally-projecting teeth 13, which project a short distance from the side surfaces of the webs. The effect of the webs and their lateral edges is such as to produce a grided or checkered fuel-engaging top surface for the bar-caps. The size of the spaces between the teeth and the fingers of the caps may be large or small, in accordance with the size of the fuel which is to be used upon the grate. The webs 12, as also the teeth 13, are made so as to taper downwardly, and this construction, in addition to the tapering construction given to the head and shank of the cap, makes it possible to draw the casting out of the sand in the molding of the caps with great facility. The outer ends of some of the webs 12 are connected, as shown in Fig. 1, while others are left disconnected. In a cap made of the size shown in Fig. 1 it is usually sufficient to connect the outer pair of webs at their ends, leaving a space between the outer ends of the inner webs on each side of the bar. The head 9 of the cap is extended at its upper edges to form laterally-projecting shouldered portions 14, which overhang the upper ends of the partition 5 when the caps are in position. The caps are preferably held rigidly in place in the sockets of the body portion by means of pins 15, which are secured in the lower ends of the shanks, as clearly shown in Fig. 2. The pins 15 are preferably secured to the shanks of the caps by pouring the molten metal when casting the caps around the said pins. The pin may, if desired, be formed with a flaring head 16, so that when cast in position the pin cannot be withdrawn from the shank, but becomes practically integral therewith. The pins 15 may be made of wrought metal, so that when the shanks of the caps are inserted in the sockets of the body portion of the bar the pins may be turned or headed over against the lower edge of the said body portion, as shown in Fig. 4, and the cap will thus be held firmly in place. If it becomes necessary to remove one of the

caps, it is very easy to straighten the pin or knock it to one side by means of a cold-chisel or other suitable implement.

The outer webs at each edge of the head 9 are preferably made to fit upon inclined upper projections or lugs 17, formed upon the upper edge of the body portion of the bar adjacent to the partition 5. The caps are thus further held against movement with respect to the said body portion.

A grate-bar constructed as above described will be seen to be admirably adapted for handling all kinds of fuel, and especially small anthracite fuel, without the danger of melting the grate under excessive heat, since the tapering shape of the caps and the upper edges of the body portion of the bar prevent the accumulation of ashes at any point along the grate-bar and also permit of a sufficient circulation of air to maintain the entire structure of the bar in a comparatively cool condition. The end caps of the bar may be made slightly different from the intermediate caps, such end caps being preferably provided with overhanging portions 18, which project outwardly over the end wall 19 of the body portion. If the bar is a rocking bar, the supporting-trunnions 20 are secured to the upper ends of the said walls 19, as shown in Fig. 2. It will be observed that the upper edges of the body-portion walls 4 fall away from the caps, except at the lugs 17, with a sharp angle, so that there will be no accumulation or collection of ashes along the upper edge of the said body portion.

The wide tapering shanks of the caps are admirably adapted for holding the said caps in position upon the body portion of the bar, preventing any possibility of the caps turning or twisting in their sockets. It will be observed that these flattened shanks extend transversely of the cap portion, but longitudinally of the body portion of the bar.

Having now described the nature of my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A grate-bar, comprising a body portion having elongated sockets formed therein, the upper and lower edges of the body portion along the sockets extending inwardly to give it strength, and caps for the body portion having shanks capable of fitting in the said sockets, the inwardly-extending edges only of the body portion bearing against the sides of the shanks for holding them and thereby the caps in place.

2. A grate-bar comprising a body portion provided with elongated sockets, the edges of the body portion along the sockets being extended inwardly to give the bar strength and removable caps for the bar provided with shanks extending therefrom, the said shanks fitting in the sockets, the inwardly-extending edges of the socket-walls having projections extending beyond the remainder of their in-



ner surfaces for engaging and holding the shanks in position.

3. A grate-bar comprising a body portion having sockets formed therein, the walls of the body portion at the upper and lower edges of the sockets extending inwardly at an angle to strengthen the said walls, removable caps for the body portion, shank portions projecting therefrom and capable of fitting in the said sockets, the angular edges of the socket-walls being cut away to form air-passages about the shank portions and shank-engaging bearings on said edges for holding the caps in position.

4. A grate-bar comprising a body portion having cap-holding sockets formed therein, the upper and lower edges of the walls of the sockets turning inwardly at an angle to strengthen the said walls and forming enlarged central spaces about the shanks of the caps, caps for the said bar, shank portions extending therefrom and fitting into the sockets, the walls of the sockets only engaging the shank portions near the upper and lower ends thereof.

5. A grate-bar, comprising a body portion having elongated sockets formed therein, the said sockets having inwardly-turned strengthening edges, caps for the said bar provided with shanks projecting therefrom, the said shanks being reduced in width toward their lower ends so as to increase the space between their edges and the walls of the socket the said walls only engaging the lower ends of the shanks at their sides.

6. A grate-bar having a body portion formed with elongated slots therein, the side walls of the slots turning inwardly at their upper edges to form strengthening edges, caps supporting lugs projecting upwardly from the upper intumed edges of the bar, caps mounted upon the bar and having shanks for en-

gaging said slots, and webs projecting from the heads of the caps and resting upon the lugs of the said body portion.

7. A grate-bar comprising a body portion having elongated sockets formed therein, the upper outer edges of the bar being beveled, lugs projecting upwardly from the beveled edges of the body portion, caps mounted upon the body portion and provided with shanks fitting in said sockets, laterally-projecting webs, extending from the said shanks, some of said webs having downwardly-extending shouldered portions fitting upon the lugs upon the upper edge of the said body portion, and means for holding the caps in position in the said sockets.

8. A grate-bar, comprising a body portion having sockets formed therein, fuel-engaging caps having shank portions projecting downwardly from the caps capable of extending into the said sockets and inwardly-extending projections at the upper and lower edges of the sockets for engaging the shanks, the central portions of the shanks being thus entirely surrounded by an air-space.

9. A grate-bar, comprising a body portion and fuel-engaging caps, the body portion having sockets formed therein, shank portions projecting from the caps and capable of extending into the sockets, shank-engaging portions at the upper edges of the sockets contacting with the sides and ends of the shank portions, and shank-engaging portions at the lower edges of the sockets engaging the sides of the shank portions only.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM McCLAVE.

Witnesses:

MAX F. HENKELMAN,  
P. L. WALSH.