

No. 775,328.

PATENTED NOV. 22, 1904.

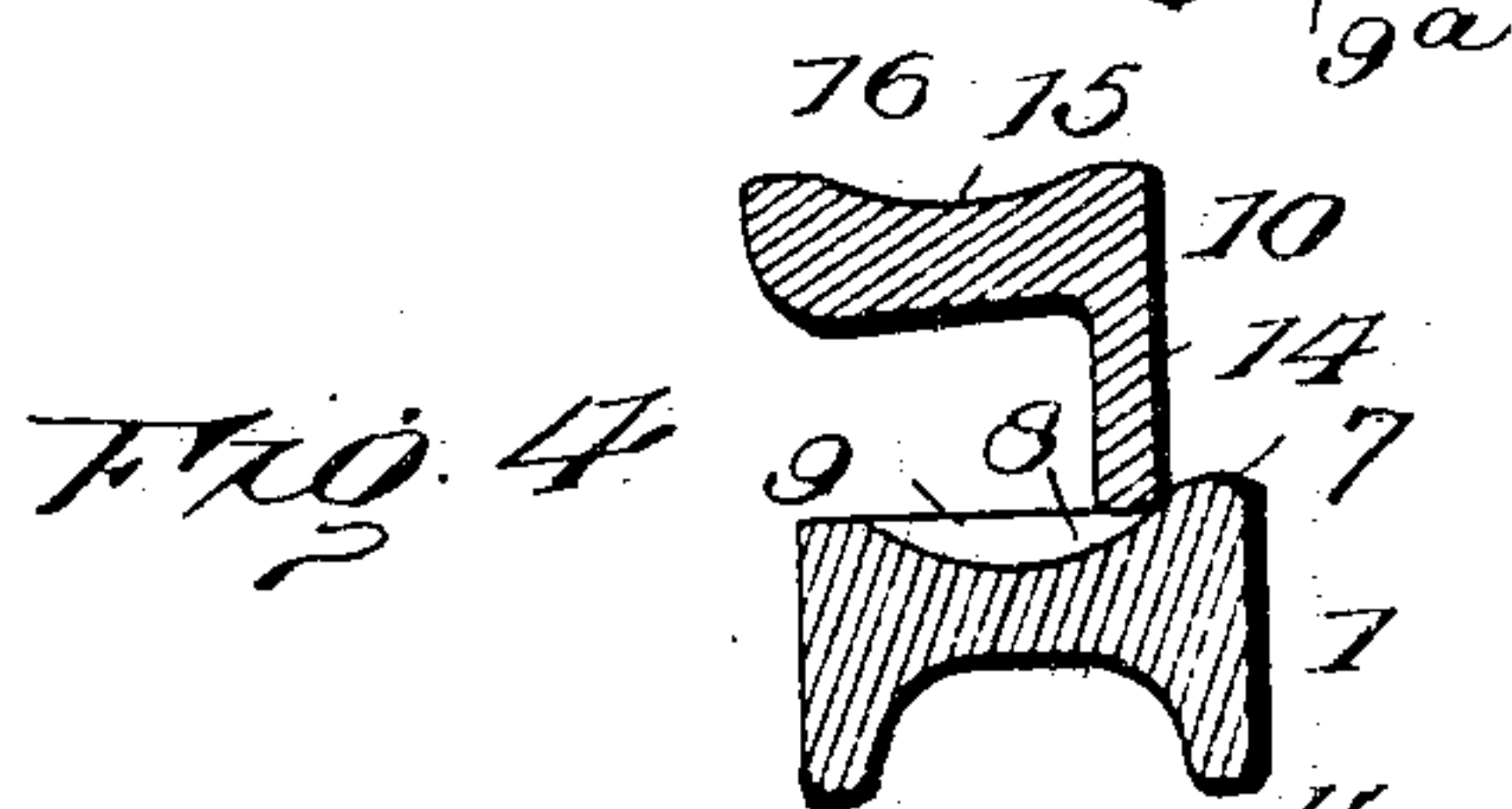
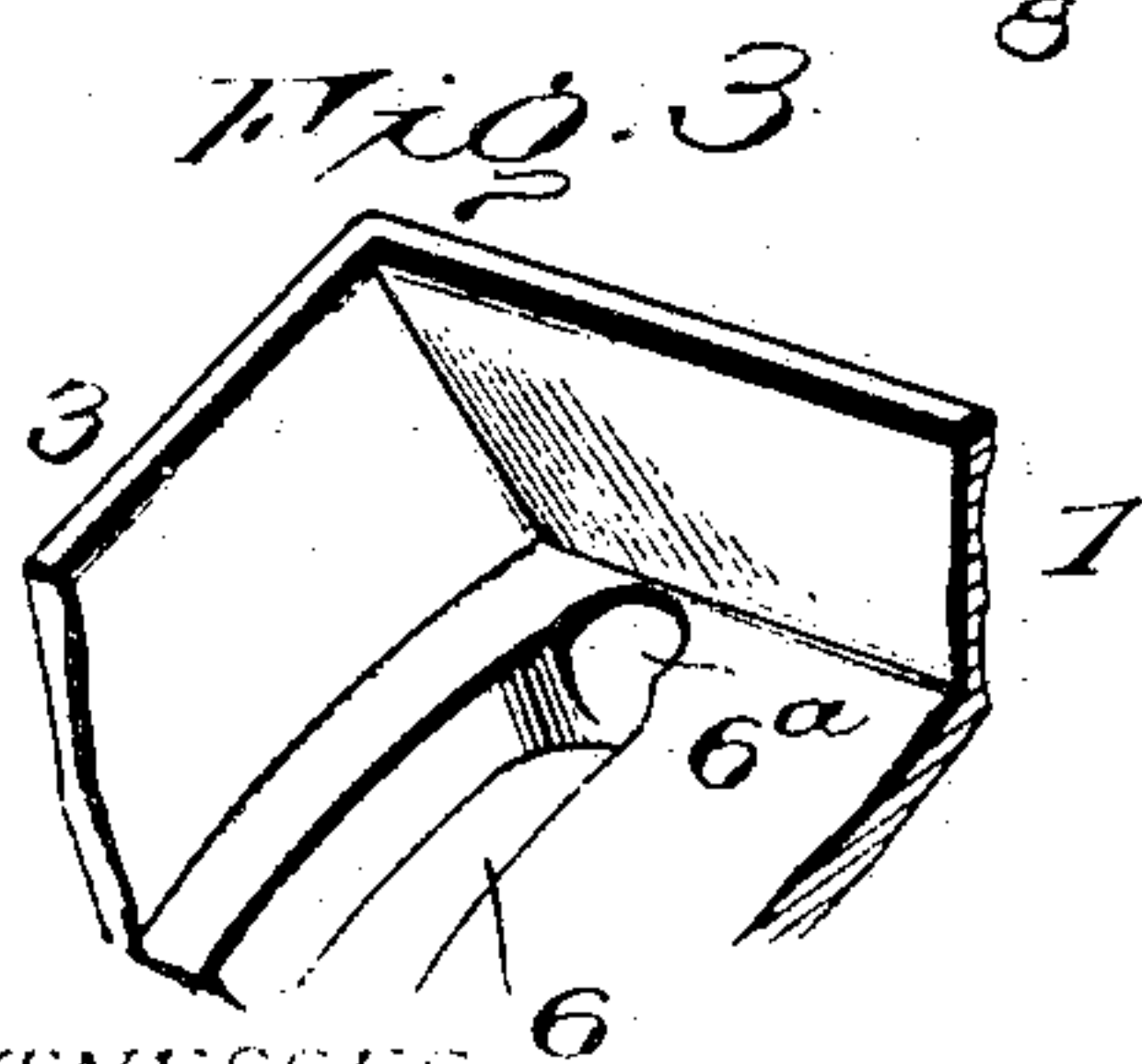
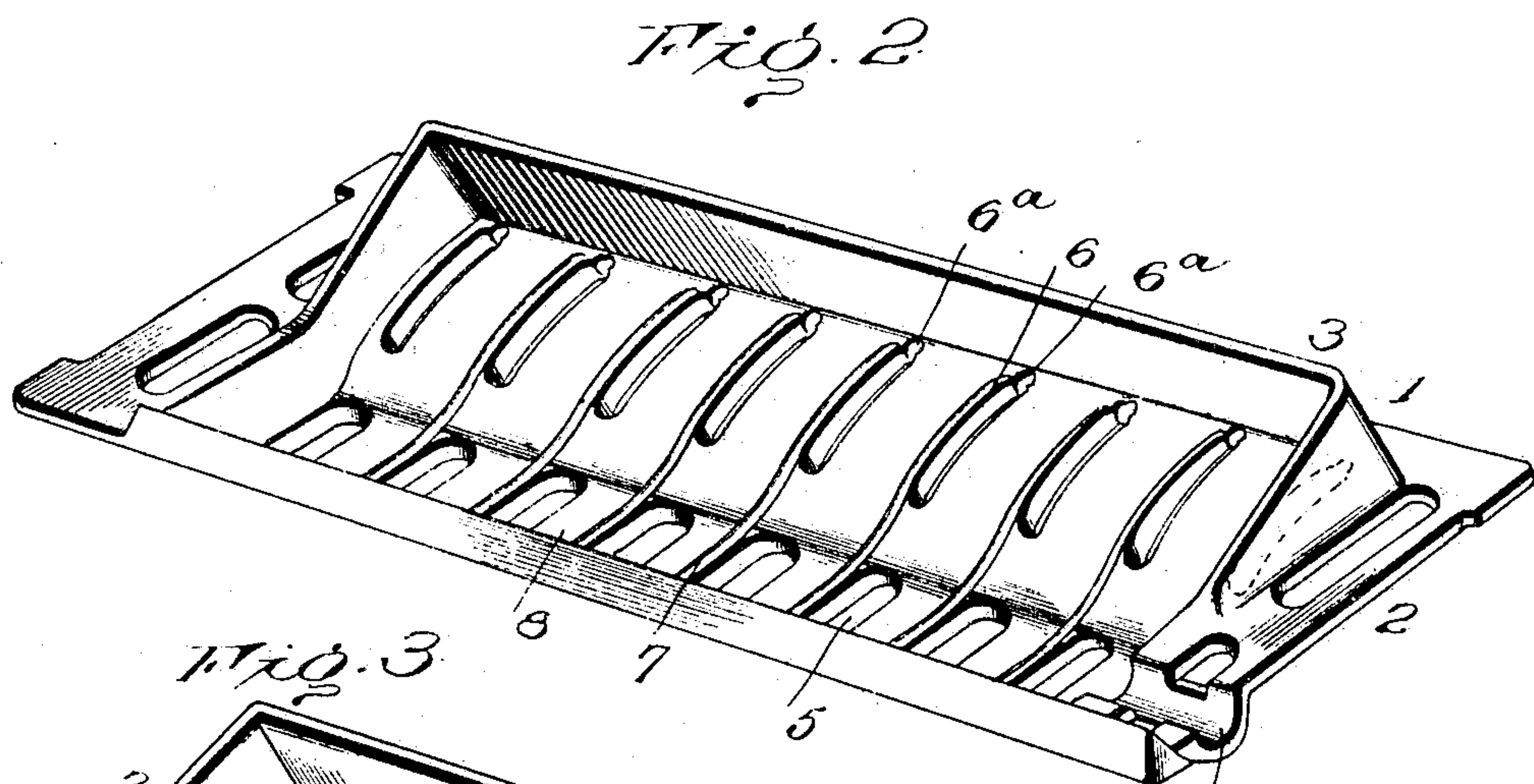
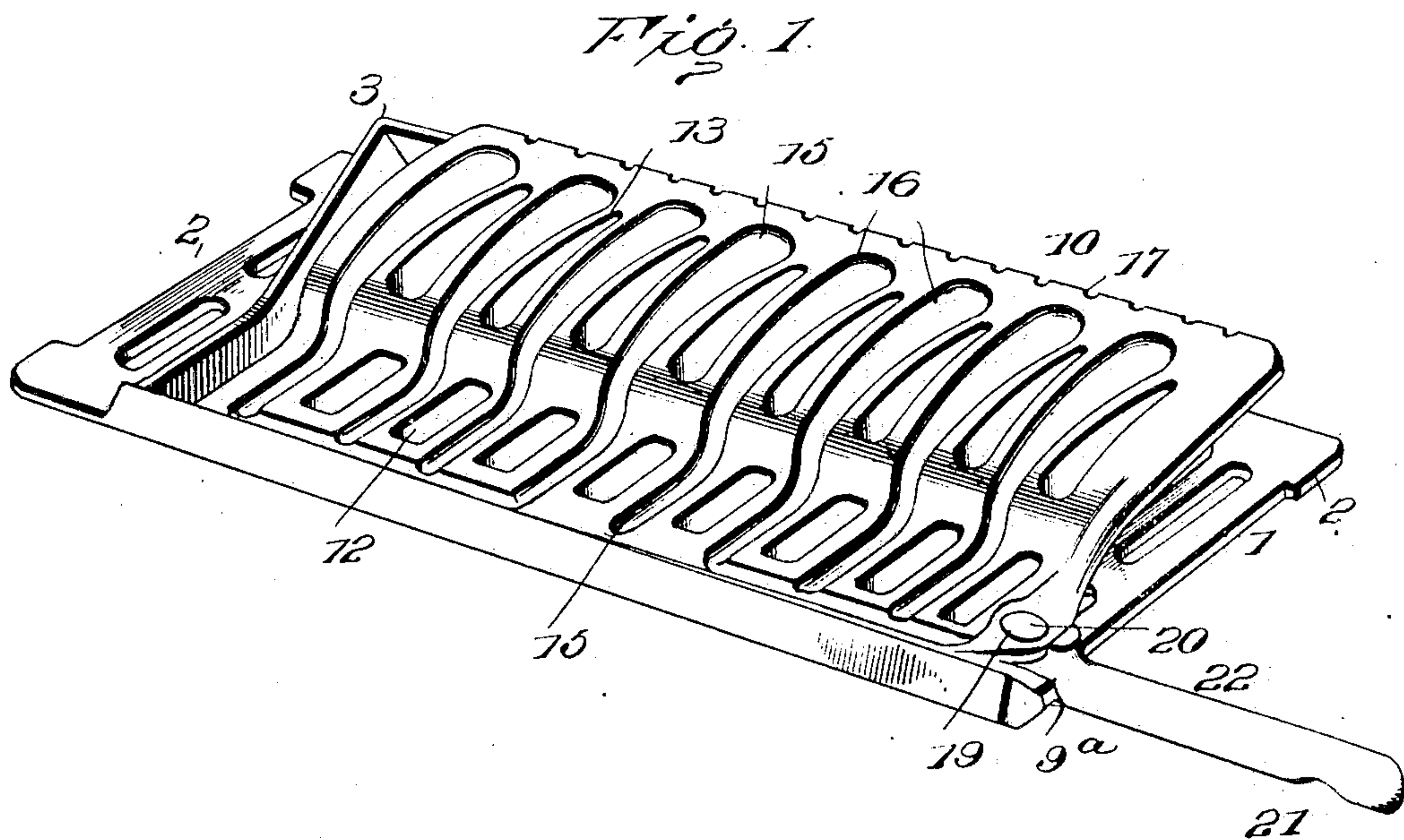
E. R. CAHOONE.

GRATE.

APPLICATION FILED AUG. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

John W. Wheeler.
Alvin Matthews.

INVENTOR

Edwin R. Cahoon

By

J. W. Miller Attorney

No. 775,328.

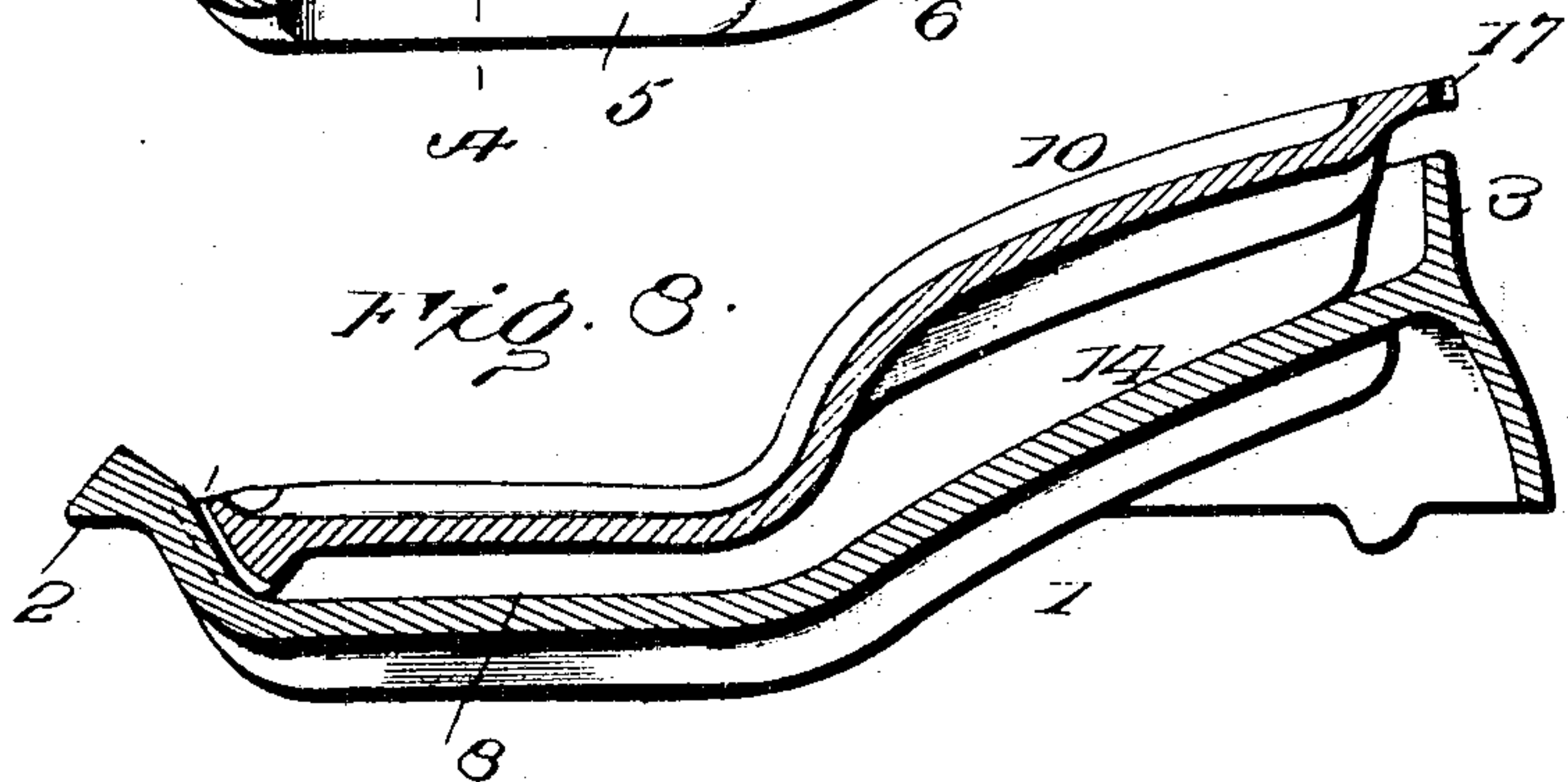
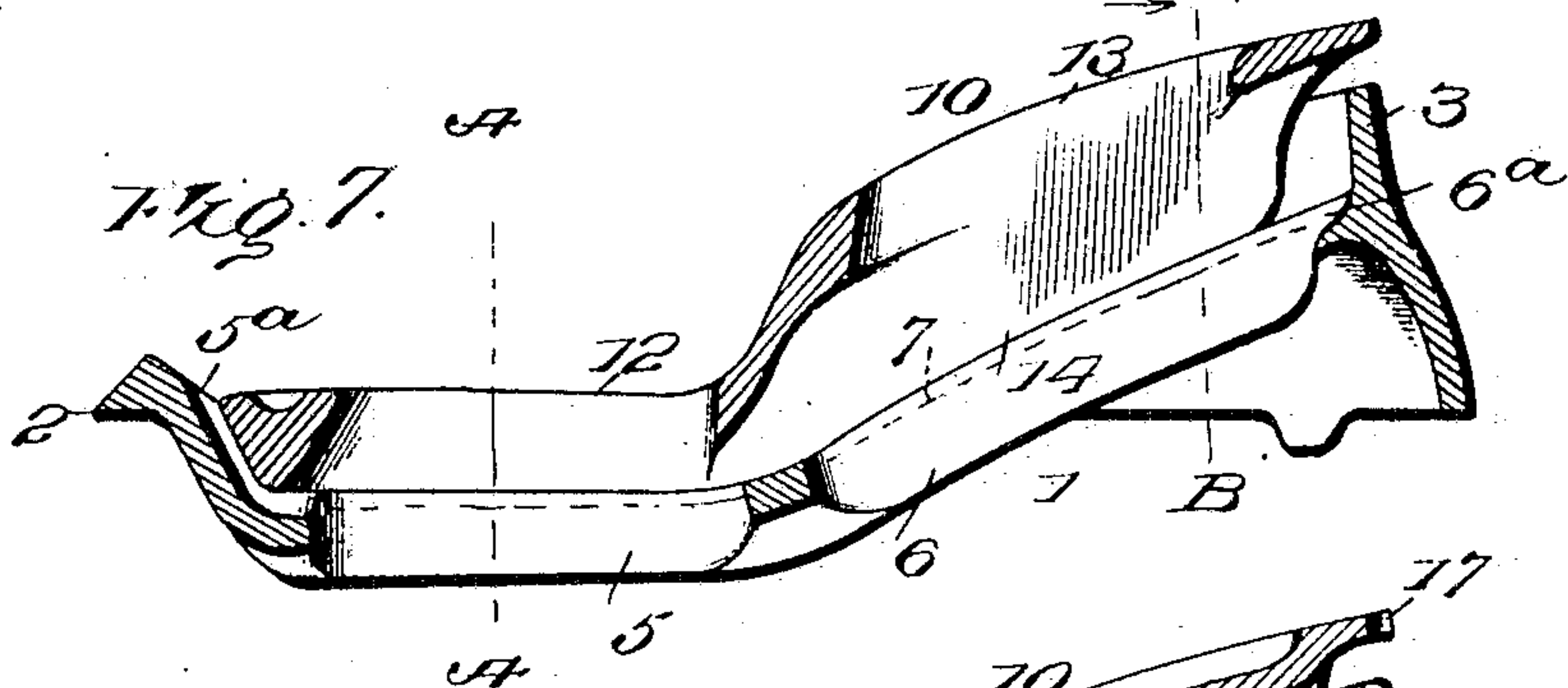
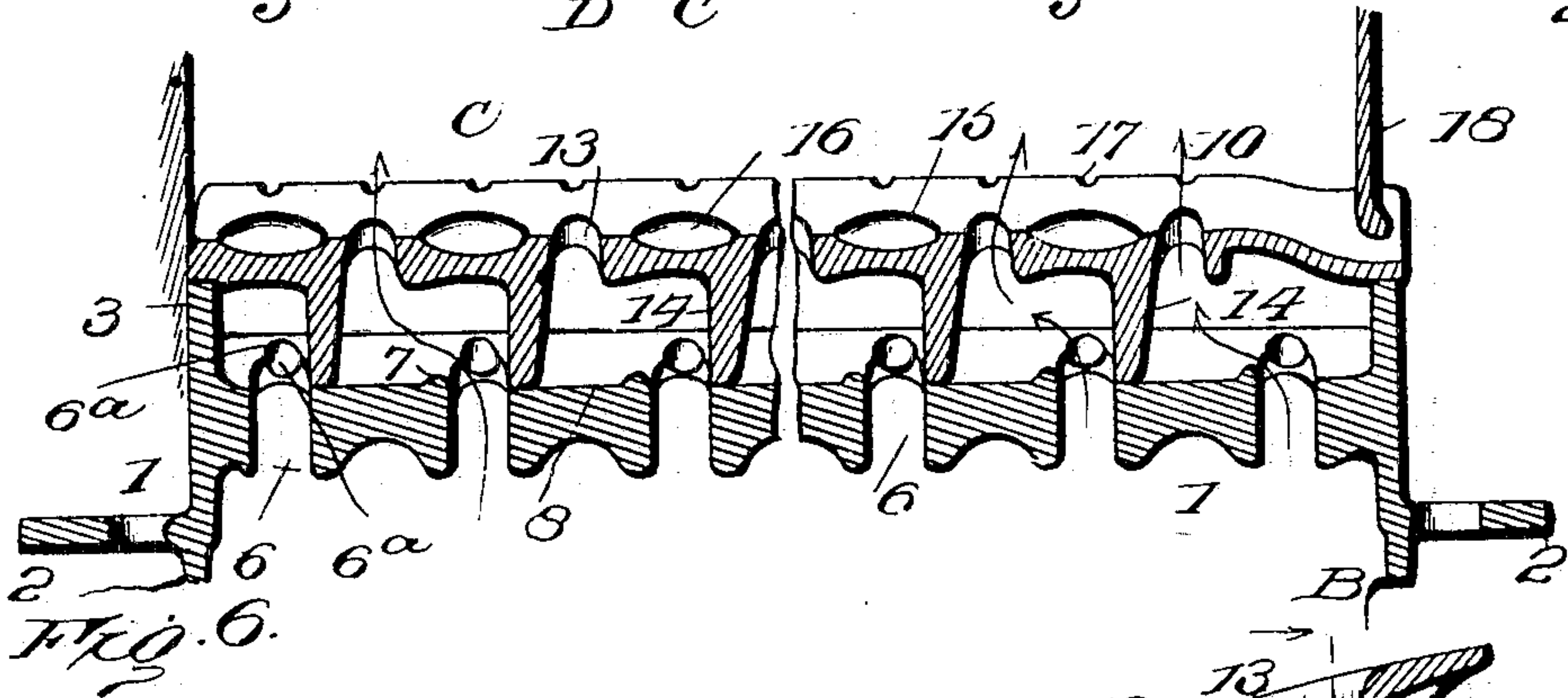
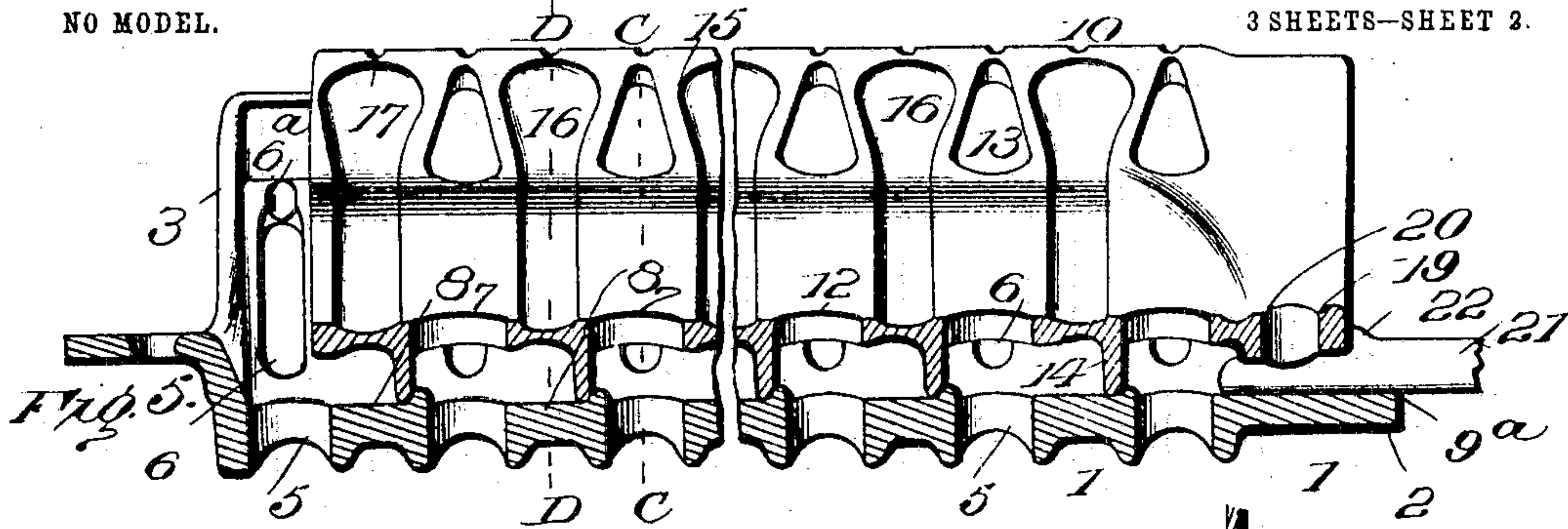
PATENTED NOV. 22, 1904.

E. R. CAHOONE.
GRATE.

APPLICATION FILED AUG. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 2.



WITNESSES:

John W. Wheeler.

Benjamin Matthews

INVENTOR

Edwin R. Cahoon

By *[Signature]*
Attorney

No. 775,328.

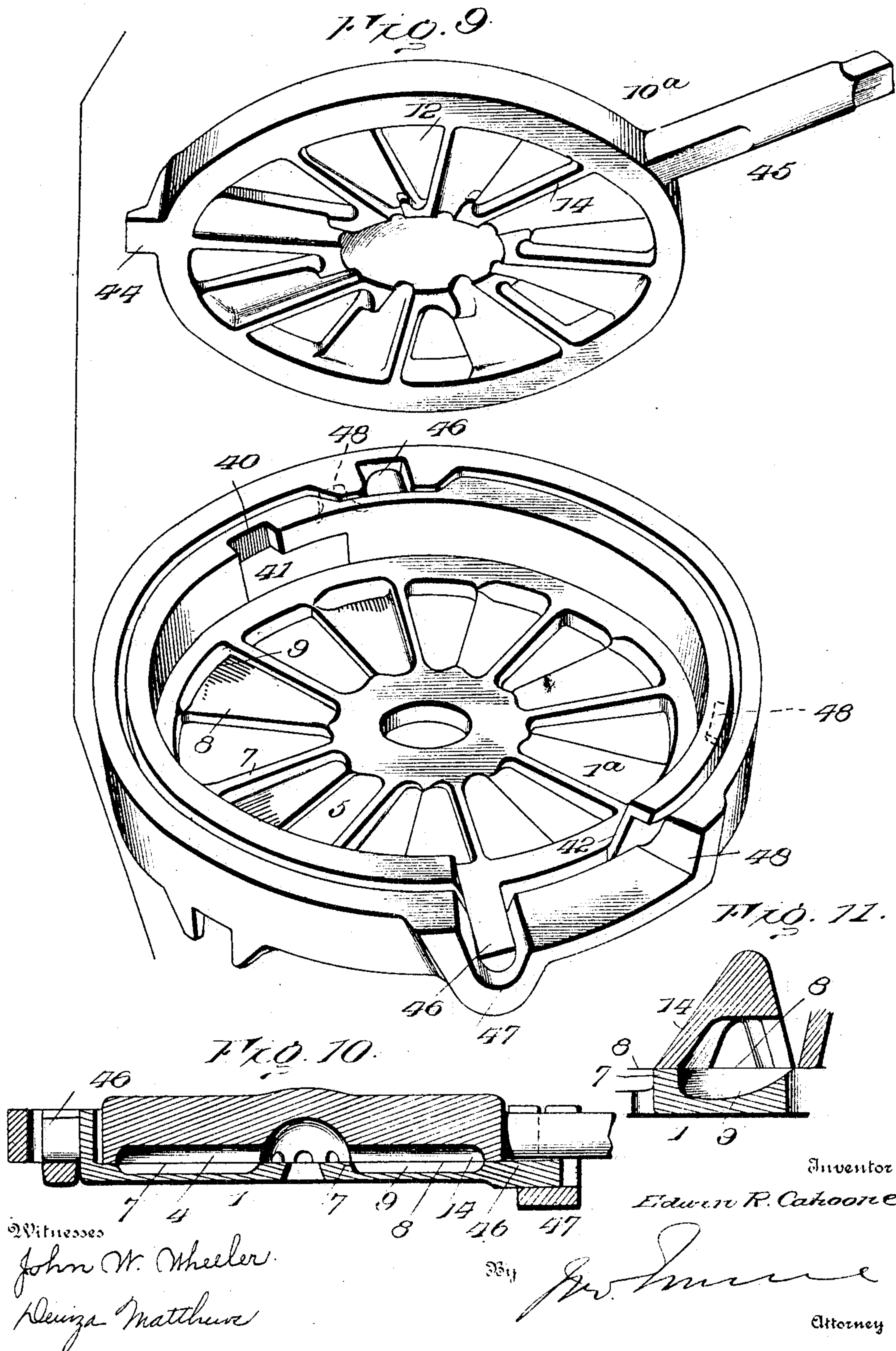
PATENTED NOV. 22, 1904.

E. R. CAHOONE.
GRATE.

APPLICATION FILED AUG. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 3



UNITED STATES PATENT OFFICE.

EDWIN R. CAHOONE, OF TROY, NEW YORK.

GRATE.

SPECIFICATION forming part of Letters Patent No. 775,328, dated November 22, 1904.

Application filed August 14, 1903. Serial No. 169,458. (No model.)

To all whom it may concern:

Be it known that I, EDWIN R. CAHOONE, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Grates, of which the following is a specification.

This invention relates to improvements in grates, wherein a movable grid is mounted over and spaced from the stationary grid.

In burning lignite and other bituminous fuel it is of the utmost importance that the grate be of such structure as to effectually prevent the powdered or fine particles which form the major part of the lignite when burning from falling from the fire-pot, yet free ingress of draft to the fuel must be had. Both of these essential requirements are necessary in consuming the fuel mentioned, and in addition thereto means must be present for the convenient cleaning of the grids, together with means for regulating the withdrawal of the ashes. It is my purpose to construct a grate to meet these requirements, and I accomplish the desired ends by spacing a movable grid over a stationary grid and arrange adjacent the openings of the latter depending scrapers. Normally the openings of the movable grid are out of alinement with those of the stationary grid, and when the movable grid is vibrated its depending scrapers draw the accumulated ashes off the platforms between the openings of the stationary grid to the extent desired into the ash-pit. Such a combination of grids spaced from each other will permit of the draft entering the under side of the fuel, and yet the latter is prevented from falling direct to the ash-pit by the platforms between the slots of the stationary grid, and the operation of shaking the ashes is not at all prevented.

With these primary objects in view I will describe the construction and arrangement of the parts which enable me to perform the ascribed functions, the elements being particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of my improved grate. Fig. 2 is a perspective view of the stationary grid. Fig. 3 is a detail perspective view of a portion of the

same to more fully illustrate the construction of one of the terminals of a grid-opening. Fig. 4 is a detail cross-section of a slight modification. Fig. 5 is a transverse section on the line A A, Fig. 7. Fig. 6 is a transverse section on the line B B, Fig. 7, the movable grid being moved to bring its openings in alinement with the openings of the stationary grid. Fig. 7 is a vertical section on the line C C, Fig. 5. Fig. 8 is a similar view on the line D D, Fig. 5. Fig. 9 is a perspective view of a modified form of my invention, the parts being separated. Fig. 10 is a vertical section of the modification. Fig. 11 is a detail cross-section of the form of grate-bar shown in Fig. 9, taken through one of the grate-bars.

The numeral 1 represents a stationary grid having a surrounding supporting-flange 2 and an upwardly-extending flange 3 to receive the movable grid. Two sets of openings 5 and 6 are formed in the grid 1, the openings 5 being of smaller area than the openings 6, and the ends of the openings are provided with grooves 5^a and 6^a to permit the free passage of ashes and air. A slight flange 7 extends along one edge of each pair of the transversely-alined openings 5 and 6 upon the upper face of the grid, and, if desired, the platforms 8 between the said openings may be slightly concaved, as at 9, to more readily facilitate holding the fuel. This modification is disclosed in Fig. 4. That portion of the grid within the bounds of the flange 3 is of such cross-sectional shape that the openings 5 are approximately on a horizontal plane, while the openings 6 incline upwardly, the purpose of which will be hereinafter described.

A groove 9^a is formed in the flange 2 at one end to accommodate the movable-grid shank, which is guided therein when vibrating the movable grid.

The movable grid is designated by the numeral 10 and forms the most essential part of my invention. This grid, like the grid 1, is provided with two sets of openings 12 and 13, the former being of smaller area than the latter, and the openings of both grids are substantially of the same shape and proportions. From the under side of the movable grid 10 and transversely of the length thereof de-

pend a series of scrapers 14, each arranged in alinement with an edge of a forward opening 12 and a rear opening 13, as clearly seen in Fig. 7. The surfaces 15 between the openings are concaved, as at 16, said concaves being wider adjacent the openings 13, and along two edges of the grid I provide grooves 17 for the passage of currents of air when the grids are assembled.

One or both ends of the grid 10 incline downwardly somewhat into a long compound curve of such shape that when it is vibrated the ashes are prevented from packing under the linings 18 of the fire-pot or between the two grids. I have shown only one end so formed; but, if desired, both ends may be likewise constructed. An opening 19 in one end of this grid receives the lug 20 of a handle 21, and an additional lug 22 engages the outer edge of the grid to grip and secure the handle 21 of said grid in position in the groove 9^a of the stationary grid.

Referring particularly to Fig. 6, in which the parts are represented as in their normal position, it will be observed that when fuel is placed on the grate it will fall through the openings 13 onto the platforms 8, where it is supported. The scrapers form a retaining-wall on one side of the platform against which the fuel rests, while the other side of it will be free to receive draft coming through the openings 5 and 6, as indicated by arrows in Fig. 4. The slight flanges 7 assist in preventing the fuel falling through the slots into the ash-pan, and as a further preventive the platforms may be concaved, as represented in Fig. 4. The two grids being spaced from each other by the scrapers ample draft is insured, and at the same time the fuel is prevented from freely running through the openings 12, 13, 5, and 6 to the ash-pan.

In vibrating the movable grid to remove the ashes from the grate the scrapers 14 operate to force the accumulations upon the platforms 8 toward the openings 5 and 6, through which the refuse finds its way to the ash-pit. It is evident that the movement of the scrapers may be regulated to remove a smaller or larger quantity of the refuse from platforms 8, and in this possibility of regulation resides a material feature of my invention. A full movement of the scrapers would aline the openings in the respective grids and furnish a direct outlet for the powdered fuel to the ash-pit. Hence this full movement is to be avoided except when desired to fully clean or "dump" the grate. A movement of the scrapers, however, to a less extent than the full movement would force a greater portion of the refuse from the platforms 8 and secure the desired clearance for draft without fully alining the said respective openings, and hence the grate as constructed may be thoroughly shaken or cleared of sufficient of the refuse without permitting the escape of

any of its lignite fuel. The amount of refuse forced through the openings 5 and 6 depends upon the movement of the scrapers, and hence is effectively controlled by the operator.

The function of the grooves 17 in the movable grid is to form pockets for the fuel, and at the same time they afford valleys between the fuel for the passage of the draft. If the fuel is lumpy, obviously air in entering the openings 5 and 6 readily finds its way amid the fuel and ignition soon takes place, and the air entering through the openings in the stationary grid is introduced to the fuel in individual currents through the groove 17, and any ashes accumulating at the upper portion of the stationary grid are conveniently directed to the slots by the grooves 5^a and 6^a.

I have found it advantageous to accommodate the grate to stoves in use to shape the edge to fit under the lining, which prevents the liability of the fuel packing between these two elements and likewise prevents it falling between the two grids.

In Figs. 9, 10, and 11 the invention is applied to a circular grate, and as the essential details are in every respect the same as in the form previously described it is thought unnecessary to reiterate the description. The supporting element has been slightly changed to adapt the improvement to a circular grate, as hereinafter described. The stationary grid 1^a is provided with a notch 40, communicating with a slot 41, and its front portion is cut away at 42. The movable grid 10^a has a lug 44 and handle 45, the lug fitting in the slot 41 and the handle passing through the cut-away portion 42. At opposite points on the stationary grid are trunnions 46, which find bearings in a ring 47, fixed within a stove. Ring 47 is also cut at 48 in alinement with the cut-away portion 42 of the stationary grid.

Obviously the movable grid can be reciprocated as previously described, and both grids may be tilted on the trunnions to dump the ashes. Lugs 48 limit the movement of the stationary grid.

What I claim as new is—

1. A grate comprising two grids spaced apart, one of said grids being fixed and the other movable, both of said grids being formed with openings, the openings of the movable grid being normally out of alinement with the openings of the fixed grid, and the movable grid being operable to clear the grate of ashes without fully alining the openings of the respective grids.

2. A grate comprising two grids spaced apart, one of said grids being movable and the other fixed, and both of said grids being formed with openings, the openings of the movable grid being normally out of alinement with the openings of the fixed grid, and means connected to the movable grid to force the material from the stationary grid

without fully alining the openings in the respective grids.

3. A grate comprising two grids spaced apart, one of said grids being movable and the other fixed, and both formed with openings, the fixed grid having refuse-receiving platforms between its openings, and scrapers depending from the movable grid to force the material from said platforms without fully alining the openings in the respective grids.

4. A grate comprising two grids spaced apart, one of said grids being movable and the other fixed, and both formed with openings, the fixed grid having refuse-receiving platforms between its openings, and scrapers carried by the movable grid to force the material from said platforms without fully alining the openings in the respective grids.

5. The combination with a stationary grid having openings and a flange upon its upper surface along one edge of each opening a movable grid having openings and a series of depending scrapers adjacent the edges of said openings, the respective openings of the two grids being normally out of alinement and the depending scrapers moving the ashes accumulating on the stationary grid when the movable grid is vibrated.

6. A grate comprising two grids spaced apart, one of said grids being movable and the other fixed, each of said grids being formed with openings, the openings in the movable grid being normally out of alinement with the openings of the fixed grid, the fixed grid having platforms between its openings, and scrapers depending from the movable grid adjacent the openings therein, said scrapers in the operation of the movable grid forcing the material from said platforms without fully alining the openings of the movable and fixed grids.

7. The combination with a stationary grid having a series of openings arranged in transversely-alined pairs, of a flange contiguous one edge of each pair of openings, a movable grid having openings and depending scrapers intermediate the openings, the openings of one grid being spaced from and normally out of alinement with the openings of the other grid.

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

EDWIN R. CAHOONE.

Witnesses:

WM. SHAW,
K. BELLE KELLY.