

(No Model.)

4 Sheets—Sheet 1.

F. W. WEAVER & D. NORTON.

FIRE GRATE.

No. 255,479.

Patented Mar. 28, 1882.

Fig. 1.

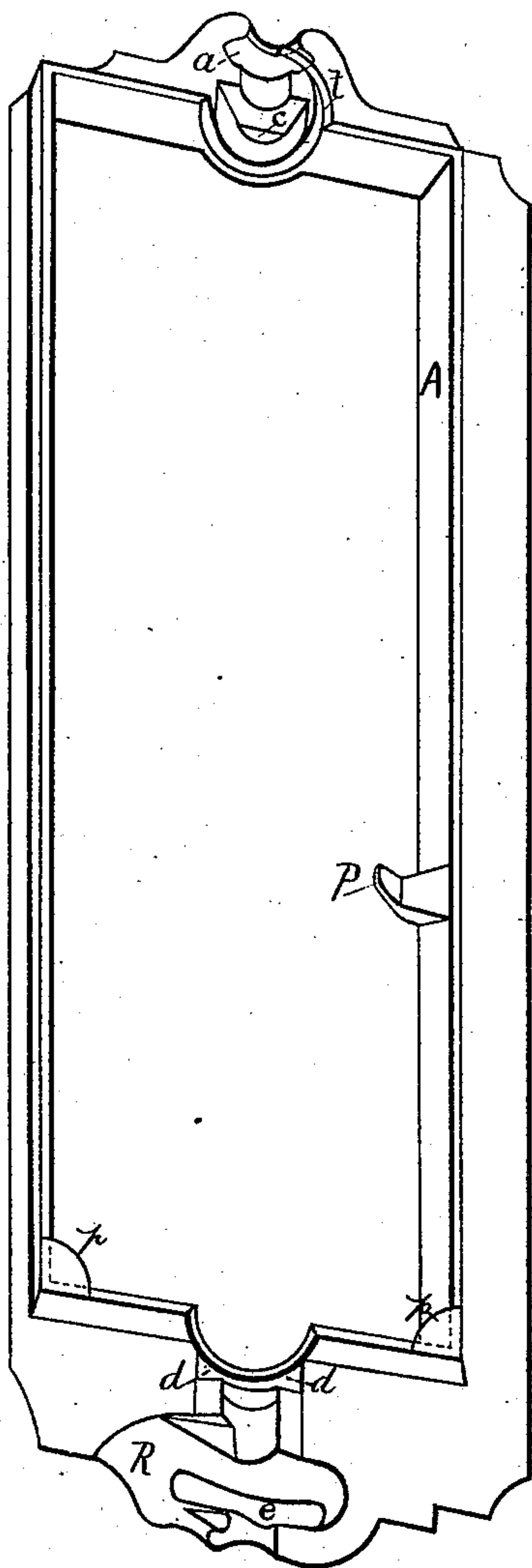
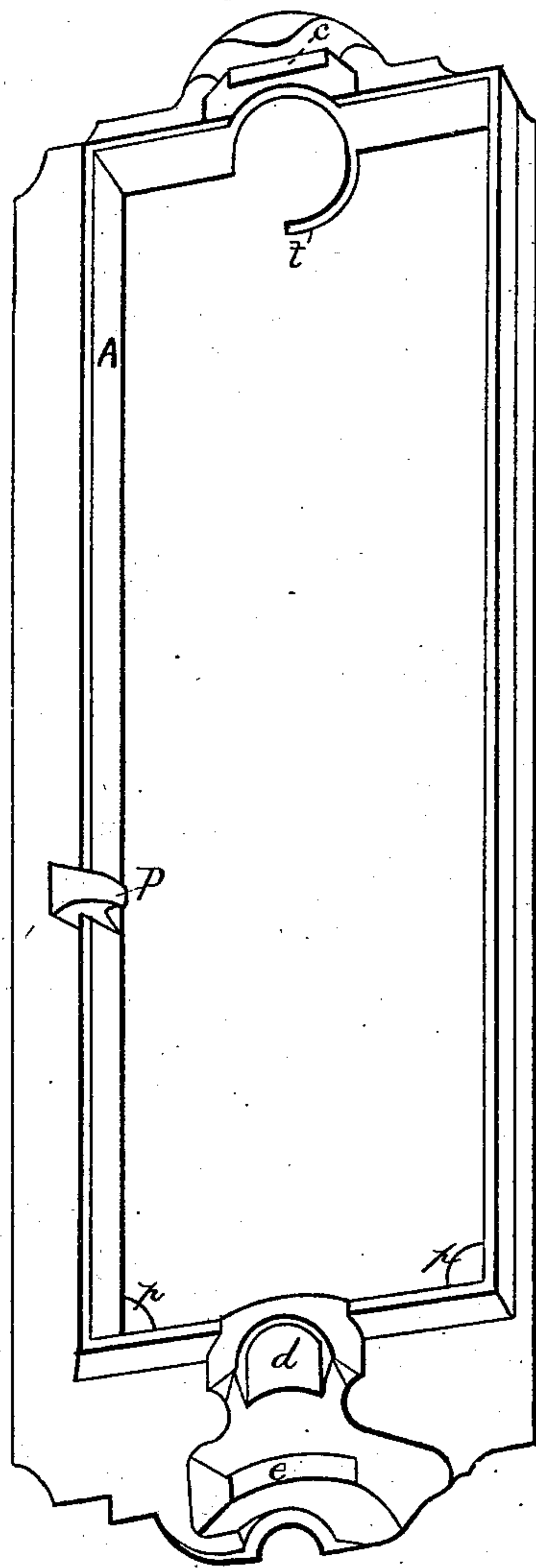


Fig. 2.



Attest:

*John Bucklev.
A. M. Pierce.*

*F. W. Weaver and D. Norton,
Inventors:
By North Osgood,
Attorney.*

(No Model.)

4 Sheets—Sheet 2.

F. W. WEAVER & D. NORTON.

FIRE GRATE.

No. 255,479.

Patented Mar. 28, 1882.

Fig. 3.

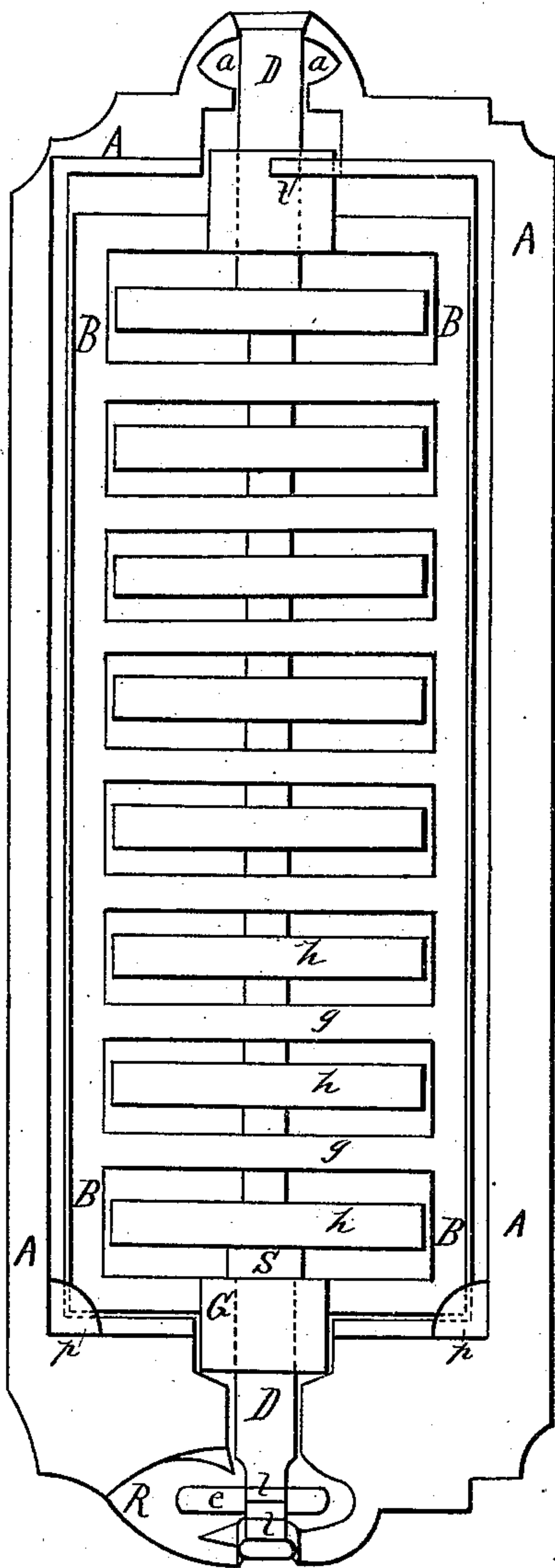
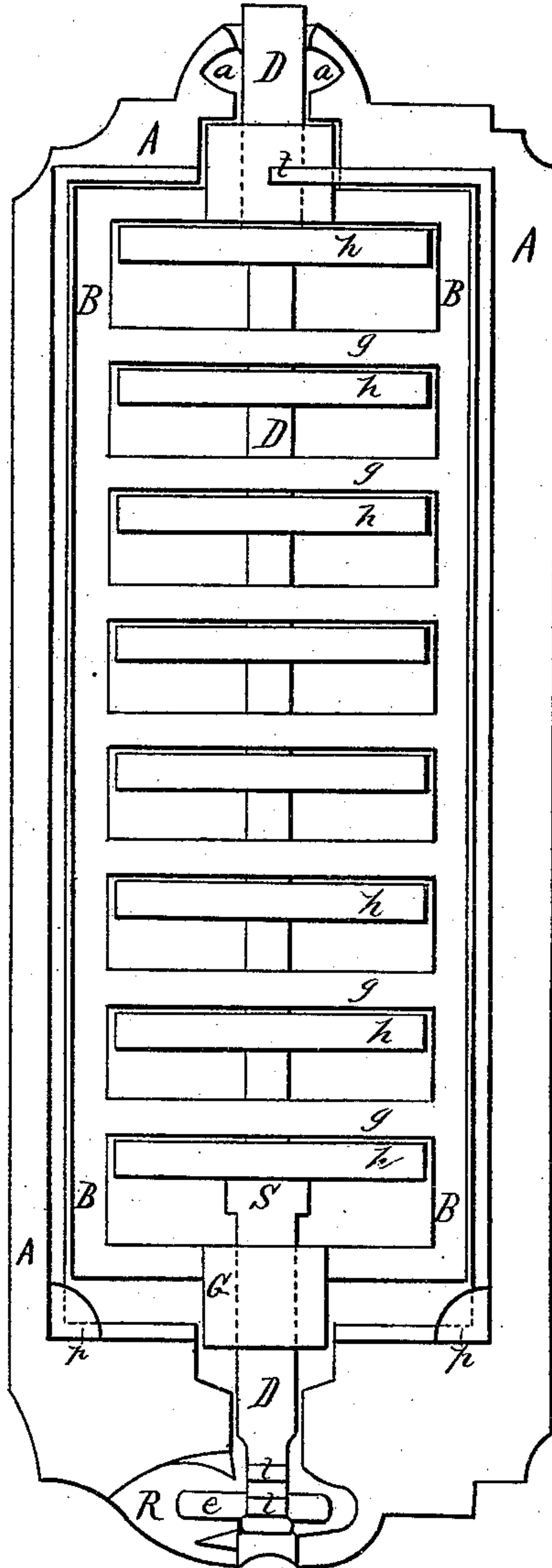


Fig. 4.



Attest:
John Buckler,
A. M. Pierce

F. W. Weaver and D. Norton,
Inventors:
By North Osgood,
Attorney.

(No Model.)

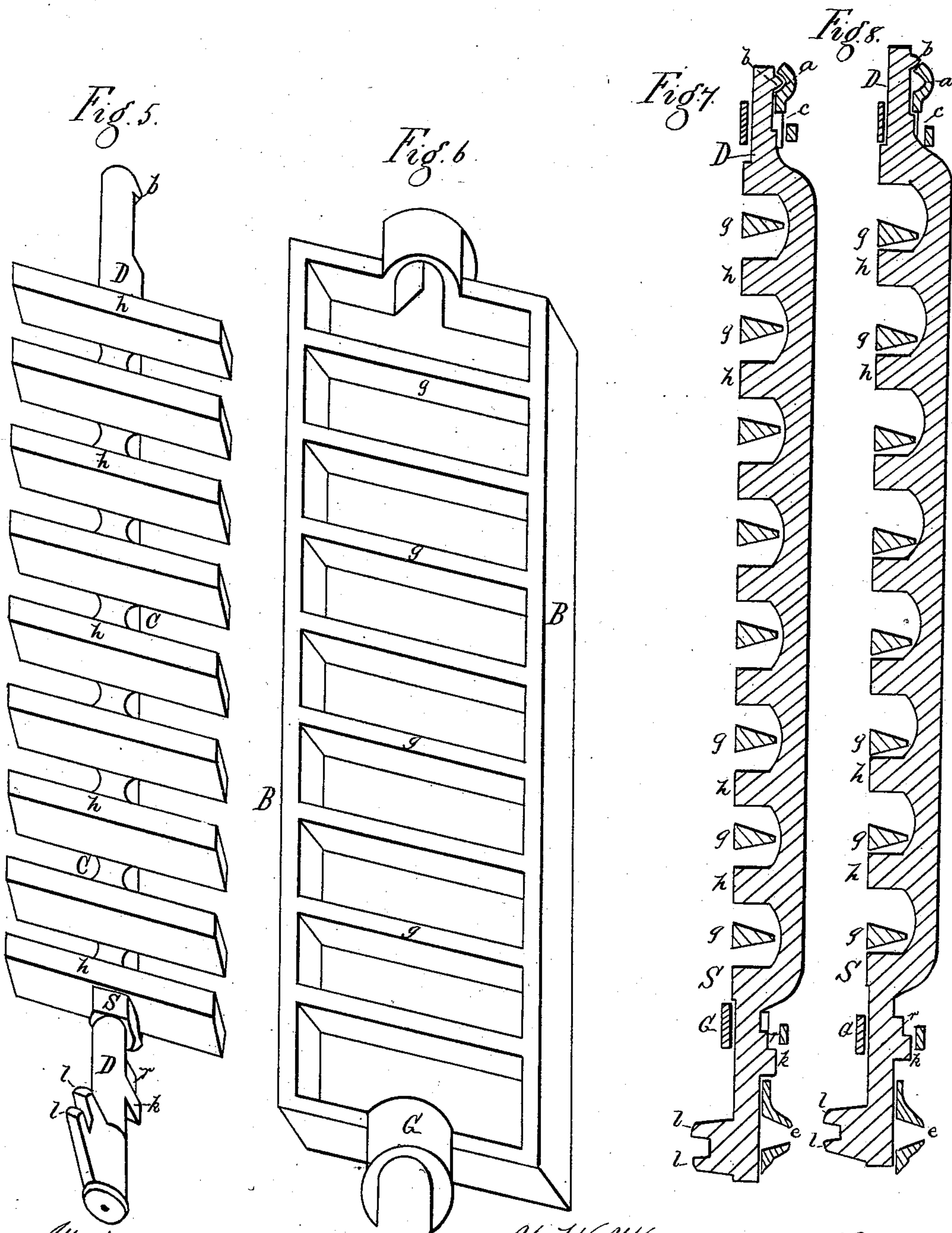
F. W. WEAVER & D. NORTON.

4 Sheets—Sheet 3.

FIRE GRATE.

No. 255,479.

Patented Mar. 28, 1882.



Attest:

John Ruckler,
A. M. Pierce

F. W. Weaver and D. Norton,

Inventors:
By Worth Ogden,
Attorney.

(No Model.)

4 Sheets—Sheet 4.

F. W. WEAVER & D. NORTON.

FIRE GRATE.

No. 255,479.

Patented Mar. 28, 1882.

Fig. 9.

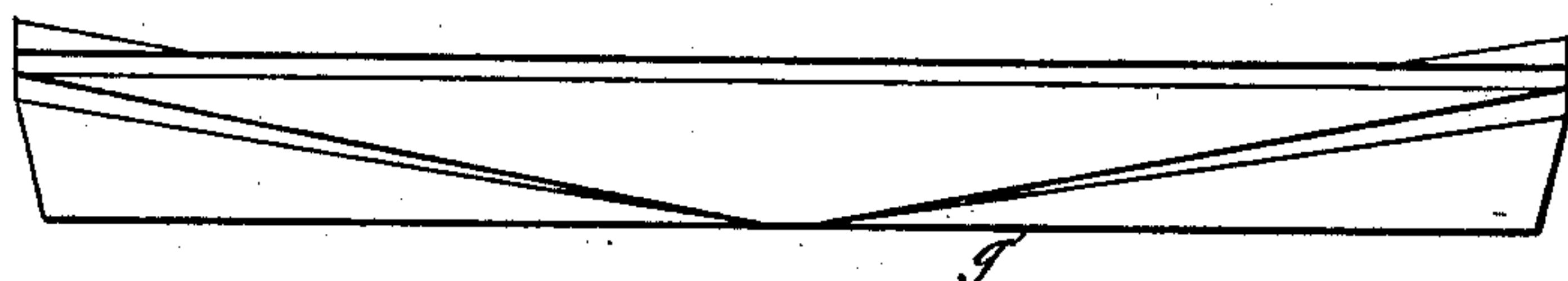


Fig. 10.

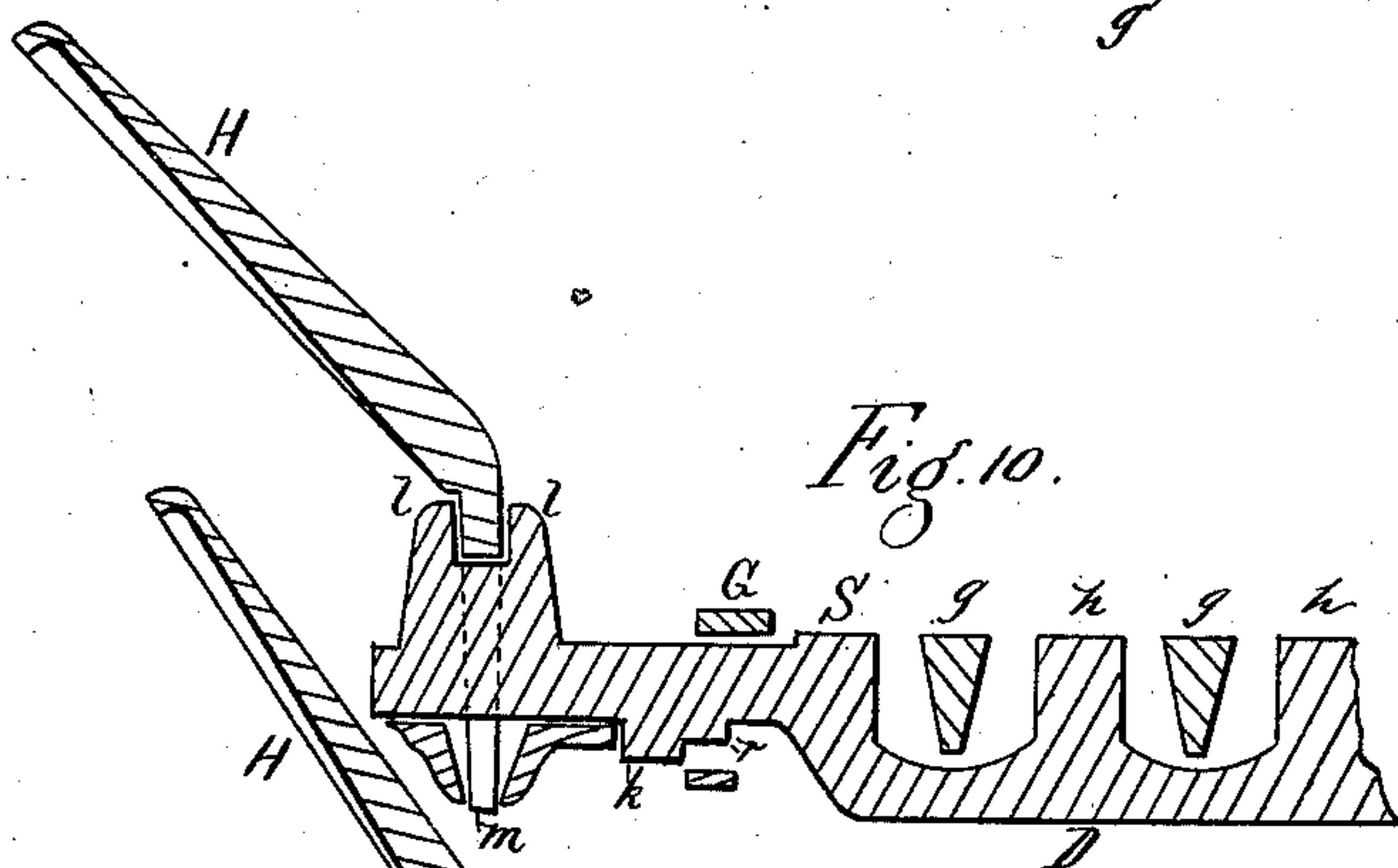


Fig. 11.

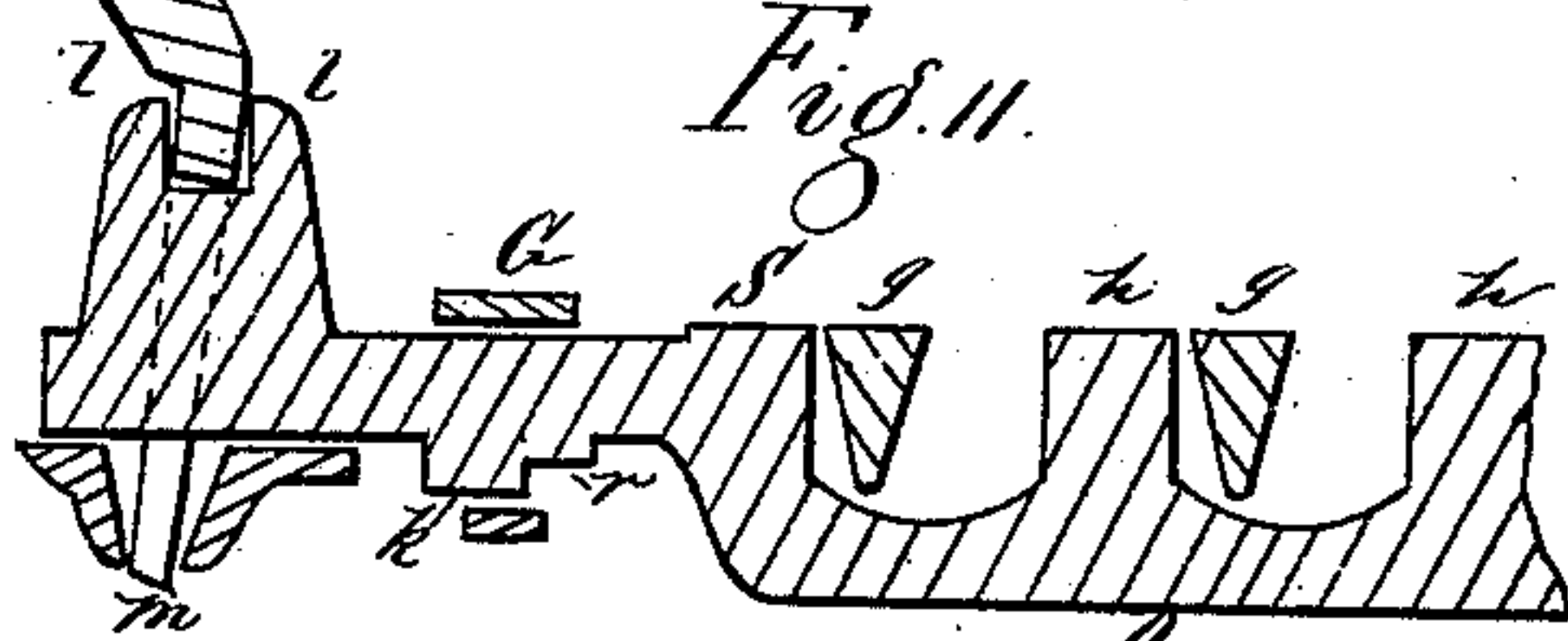


Fig. 12.

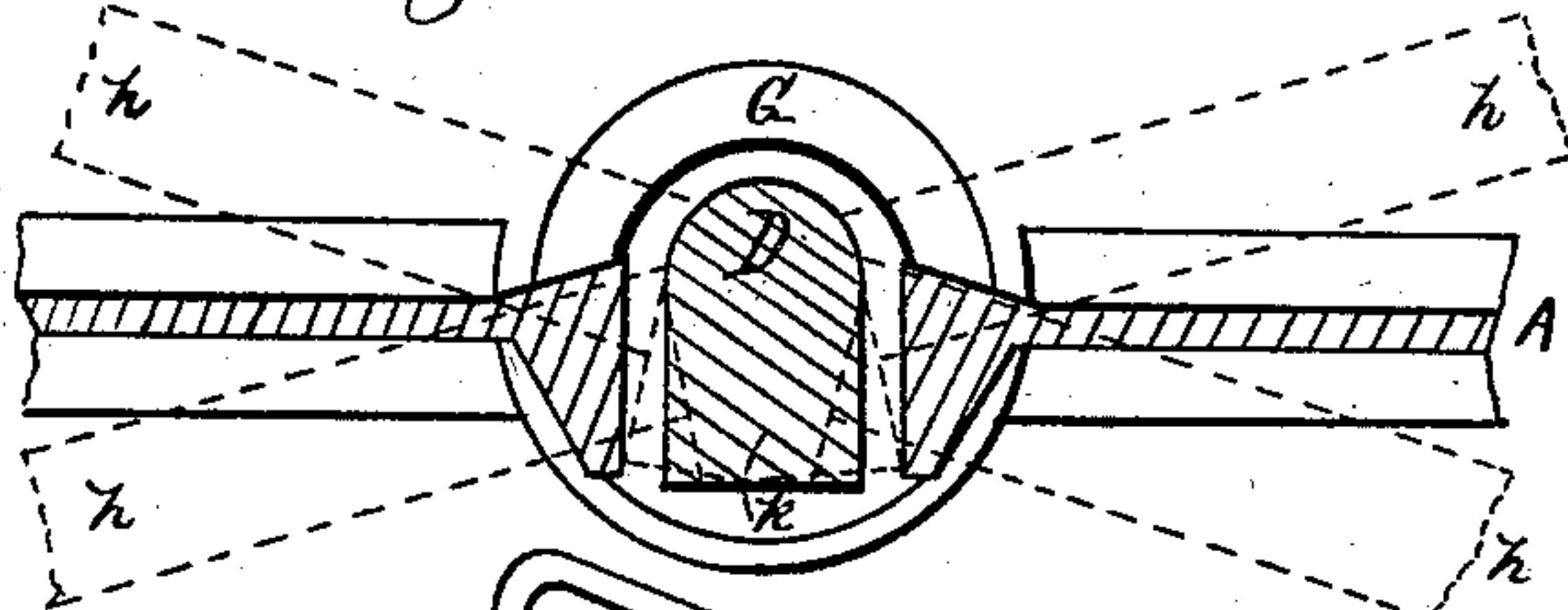


Fig. 13.

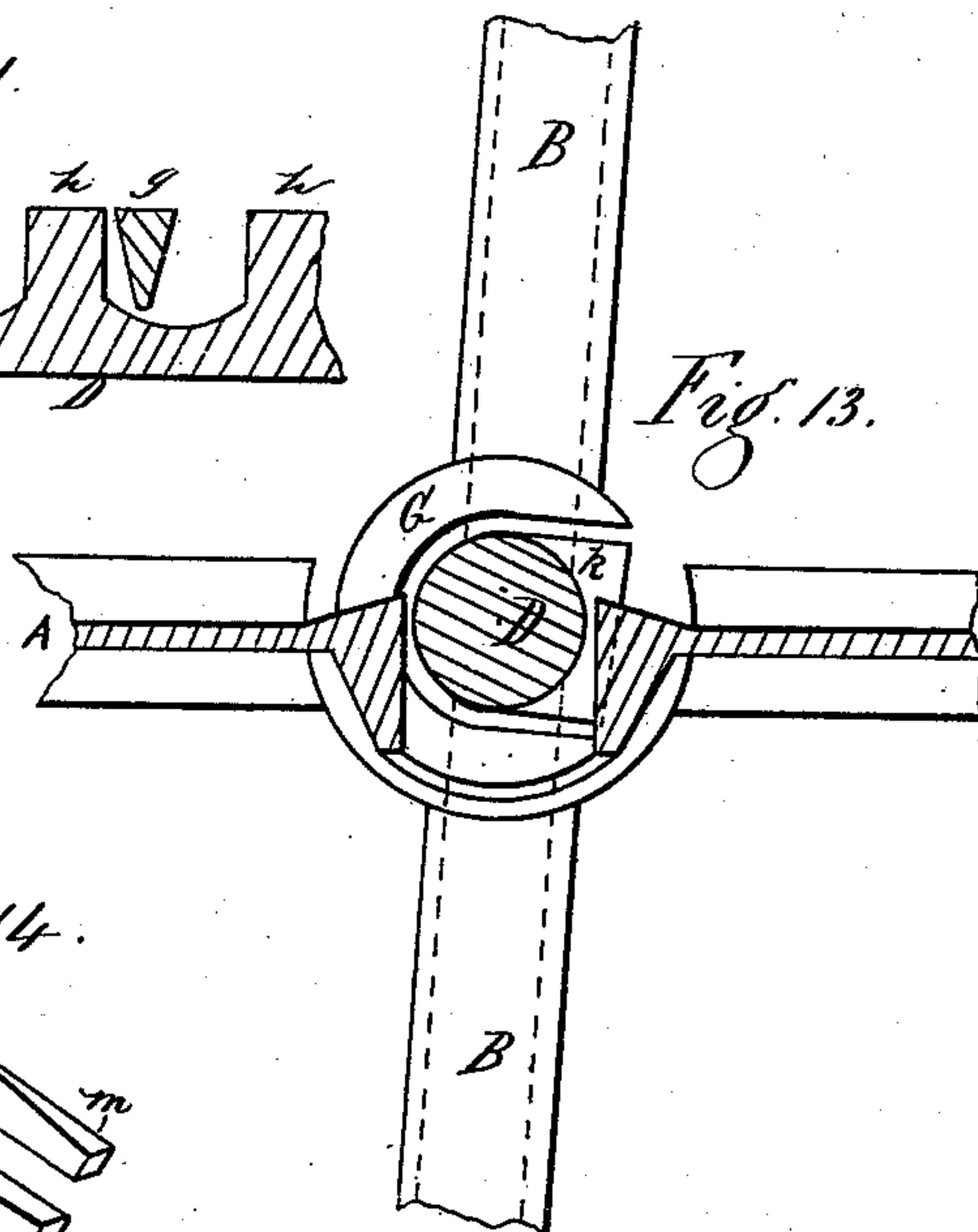
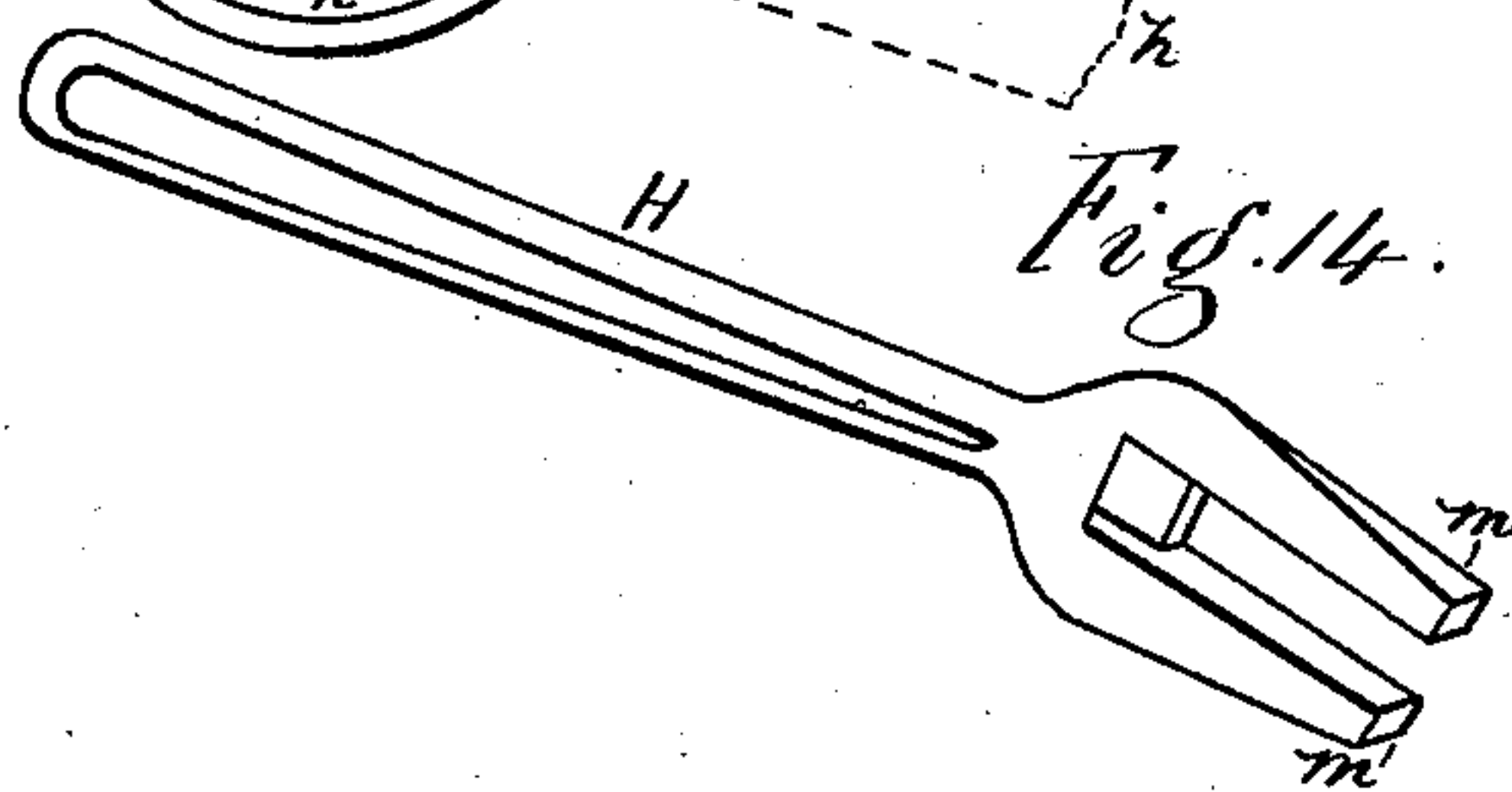


Fig. 14.



Attest

John Buckles.
A. M. Pierce.

F. W. Weaver and D. Norton,
Inventors.
By Worth Osgood,
Attorney.

UNITED STATES PATENT OFFICE.

FREDRICK W. WEAVER AND DANIEL NORTON, OF TROY, NEW YORK.

FIRE-GRATE.

SPECIFICATION forming part of Letters Patent No. 255,479, dated March 28, 1882.

Application filed August 3, 1881. (No model.)

To all whom it may concern:

Be it known that we, FREDRICK WM. WEAVER and DANIEL NORTON, residents of Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Fire-Grates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Our invention has relation to that class of devices denominated "fire-grates," and intended for the support of the fuel in stoves, heaters, furnaces, open fire-places, boiler-furnaces, or other situations.

The object of our invention is to provide a grate in which the spaces between the bars thereof may be enlarged or contracted at pleasure, in which the fire or the bed of coals may be shaken without danger of dumping the whole mass, in which the fire may be entirely dumped when desired, and in which the removal of clinkers and debris from over the top of the grate is rendered easy and certain, all this with a simple, cheap, and durable arrangement of parts, which are not liable to get out of order, and which may be operated by any person without difficulty.

To accomplish the above-named object the invention involves several novel and useful combinations or arrangements of parts and details of construction, as well as principles of operation, all of which will be herein first fully described, and then pointed out in the claims.

In the drawings we have chosen the grate of an ordinary cook-stove for the purpose of illustrating our invention, (or the several features thereof;) but it should be understood that our improved grate is adapted equally well for use in other structures, as before intimated.

In the accompanying drawings, which form part of this specification, Figure 1 is a perspective view of the bed-plate or frame intended for the reception of the improved grate, showing the top or upper face; and Fig. 2 is a similar view of the same, showing the under side, or the reverse. Fig. 3 is a plan view of the grate and bed-plate assembled for use, the bars of the grate being shown as located at

about equal distances from each other; and Fig. 4 is a plan of the same, showing the grate-bars of the movable section as located close to those of the other section. Figs. 5 and 6 are perspective views of the two parts of the grate as they appear when separated from each other. Figs. 7 and 8 are axial sections through the parts assembled as respectively shown in Figs. 3 and 4. Fig. 9 is a perspective view of one of the grate-bars of the second section, the same being inverted and detached from the other parts, so as to show its form and outline. Fig. 10 is a fragmental section, showing the application of the shaking implement when the two parts of the grate are relatively located as in Figs. 3 and 7; and Fig. 11 is a similar view, showing the application of the shaking implement when the two parts of the grate are forced to take the relative positions indicated in Figs. 4 and 8. Fig. 12 is a cross-section, indicating by the dotted lines the movements of the bars of the shaking-section of the grate when the two parts are not in position to be dumped; and Fig. 13 is a similar view, indicating the dumping movement, which can take place only when the parts are disposed as in Fig. 4; and Fig. 14 is a perspective view of the shaking implement detached from the grate.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

A is the bed-plate or frame intended to support the grate, which may be of any desired size or shape and contain any desired number of grate-bars. This bed-plate is recessed at each end, substantially as indicated, to form the bearings for the shaft of the grate. At one end it is provided with a guiding-slot, *a*, to receive a lug, *b*, on the end of the shaft of the grate, so that while the shaking-section is free to be moved within its proper limits it is held against accidental longitudinal displacement or disarrangement.

At *c* is an opening through the bed-plate for the passage of dust and ashes, so that the bearing for the axis may be kept free and clear, and the grate thus allowed to be moved without difficulty or undue wearing or grinding of its projecting shaft.

At *d* is a slot for limiting the motion of a lug

upon the shaft of the shaking-grate, preventing said grate or section from being moved too far in either direction when rotating or shaking the same; and at *e* is still another slot to receive the jaws of the grate-shaker, as will be hereinafter explained.

The grate or fire-bed is made in two main but independent parts, B and C. The part B carries the principal grate-bars *g*, of any desired size or form, but wider apart than the bars in an ordinary grate. Upon B are hollow axles at each end, which rest and move in the recesses provided for them in the bed-plate or frame. The grate-bars *h* of the independent part C are mounted upon the axle D in such manner that they will, when in proper place, make, with bars *g*, a substantially level grate-surface for sustaining the fuel. Upon the axle D, at one end, is the lug *b*, which, when the bars *h* are in their usual position midway between the bars *g*, rests in the slot or race *a* and prevents any longitudinal disarrangement of the axle, but when cleaning the fire of clinkers, &c., or when dumping the entire grate, projects over the end of the bed-plate and permits the axle to revolve freely. The stud *k* on the lower side of the shaft D is free to move within the limits of the slot *d* when the bars *h* fall midway between the bars *g*, and in this position the part C of the grate may be shaken or partially rotated independently of the other part, B. When the axle D and its attached bars are so moved longitudinally as to bring the bars *h* close to those at *g* the stud *k* enters the lower opening in the hollow axle G, and thus keys the two parts of the grate firmly together, so that both may be dumped or shaken together at the pleasure of the operator. On the upper side of the shaft D are the two studs *l l*, which together form a bearing for the shaking implement H. This implement has two jaws, as at *m m*, for grasping the square or flattened portion of shaft D in the region of the studs *l l*, and these jaws are inclined toward the handle of the implement, substantially as shown.

The grate so constructed, being located properly upon the bed-plate, is operated as follows: Under ordinary circumstances the two parts of the grate are so disposed with respect to each other that the bars are about equally distant. Then to simply shake the grate the shaking implement is applied to the axle D, its jaws embracing the flattened part between the studs *l l*, and the axle or shaft D is rotated. By this motion the bars of the part C only are shaken, and the ashes are allowed to drop between the other bars, which during this motion remain stationary. The part B is preferably secured against movement when thus shaking the part C by the two small corner-pieces *p p*, attached to the bed-plate and projecting over the edge of the part B when the parts are assembled as in Fig. 3; but these corner-pieces may be replaced by any other suitable stops, or they may be omitted altogether, if desired. By move-

ment of the part C, as above described, the lower part of the bed of coals is easily cleaned of ashes, and there is no danger of dumping the fire by undue movement of the grate-surface, as in ordinary constructions. The dotted lines in Fig. 12 indicate the various positions of the bars when so moved.

To remove the clinkers and coarser refuse from off the grate, the shaking implement is applied as before and the handle thereof is elevated. The lower ends of the jaws, abutting against the walls of the slot *e*, are prevented from moving, and the part of the implement which bears against the inner stud, *l*, forces the shaft along in the direction of its length, and this carries the bars *h* close up to bars *g* on one side and leaves large openings on the other sides for the clinkers, &c., to fall through. The plan, Fig. 4, indicates the bars so moved. By thus increasing the size of these openings between the grate-bars the clinkers will to a considerable extent fall through of their own weight; but if a poker be inserted over the grate-surface they may be very readily cleaned from off the entire surface, and not alone at the edges of the grate, as in those constructions wherein the clinker-space is located at the front or side only. By forcing the shaft forward the two parts of the grate are locked together by the lug or stud *k*, and the part B is carried along and out from under the corner-pieces *p p*, if any such be used, and the whole grate may then be dumped or shaken by simply rocking the shaking implement one way or the other.

By depressing the handle of the shaking implement the shaking-section of the grate is brought back to a position where it may be agitated freely without disturbing the other section. The walls of the slot *d* prevent the lug *k*, and consequently the shaking-section, from being moved too far in either direction. At some convenient point or points on the bed-plate we locate a suitable stop, as at P, on which the section B of the grate may rest, and this will, if it be desired to use it, prevent the grate from being dumped except by movement in one direction.

In advance of the stud *k* is a similar but smaller stud, *r*, which, when the shaking-section is being agitated, abuts against the walls of the slot in the sleeve G and operates to return the section B of the grate to its proper level and down on the stop P on the back of the grate-bed in case of necessity. The section B does not of itself turn from its normal horizontal position while shaking the other section; but the stud *r* is applied to the shaft to bring the section B back to its proper level should it by any chance become displaced during the process of cleaning the grate.

The bars *g* of the section B are preferably made so that their under edges shall be narrower than the tops or faces, and for this purpose may be constructed as shown in Fig. 9, which, as before explained, is a perspective view of the bar detached and inverted. The

bars of the other section being constructed with substantially vertical sides, as indicated in the sectional views, the two together form an opening between them which gradually increases in size from the grate-surface downward, and this causes such clinkers and obstructions as pass between the two bars to drop down, and not tend to be forced back by the shaking of the grate-section C, as would be the case if all the bars were made plain-faced. Though this is a convenient and good form for the bars, other forms might be adopted, and we do not intend that our invention shall be limited to any particular form.

For convenience of illustration we have chosen a rectangular form of grate; but it should be understood that a square, round, or other form may be adopted, our improvements and the principles of operation remaining the same and independent of the shape of the grate.

At *t* is a projection connected with the bed-plate, and intended to partially overlap the hollow axle at one end of section B, to hold the same in place against undue movements. The two parts of the grate being assembled, the end is slipped under *t* and the two together are dropped in place in the bed-plate. This projection *t* may be cast with the bed-plate, or may be made separately and afterward attached.

The recess R in the bed-plate receives the adjacent portion of the shaking implement when the latter is turned down into the position for dumping the grate.

When thus formed and arranged the improved grate is simple and easy to construct and mount, not liable to get out of order, and fully answers the purposes of the invention, as previously stated.

The projection S on the axle abuts against the inner edge of the hollow portion G when the section C is drawn fully back, and thus prevents the said section C from moving, except in one direction for the purpose of enlarging the openings between the bars; but this lug or projection S might, if desired, be omitted and the bars *h* be allowed to approach *g* from either side. The independent shaking-section obviates to a great extent the use of the poker, since by slightly agitating this section the grate-surface will be cleaned at every point.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a grate of the character herein specified, for use in any form of stove or heater, the section C, having bars *h* located between those of section B and on substantially the same level, the said section C being made movable in the direction of the axis of the grate to vary the width of the openings through the grate, and capable of being rocked either independ-

ently of said section B or together therewith, substantially as and for the purposes set forth.

2. In a grate composed of the two movable or operating sections, as specified, the combination, with the shaft of the shaking-section, of the locking-stud *k*, for engagement with the walls of the lower opening in the hollow axle G for the purpose of keying the two sections together, substantially as and for the purpose specified.

3. The combination, with the shaft of the shaking-section C, of the lug *b* at one end thereof, for bearing against the walls of a corresponding groove or race formed in the bed-plate, whereby the section C is maintained in its proper place, substantially as shown and described.

4. In a grate composed of two movable sections, having grate-bars located as explained, the combination, with the shaft of the grate, of two lugs, *l l*, forming bearings for the shaking implement, by the use of which the shaking-section can be forced in the direction of the greatest length of the grate for the purpose of varying the width of the openings between the bars of the two parts of the grate, substantially as shown and described.

5. The herein-described shaking and dumping grate, composed of the two principal sections B and C, the bars *g* and *h* of which form the fire-bed, section C being adjustable longitudinally with respect to section B, both sections being capable of being revolved together, and the axle being provided with locking and guiding studs *b* and *k*, substantially as shown and described, and for the purposes set forth.

6. In a fire-grate composed of the two sections, as set forth, the combination, with the shaking-section, of a lug or stop applied thereon for the purpose of limiting the movement of the said shaking-section in one direction, substantially as explained, so that its bars will close up against the bars of the other section on one side only, as set forth.

7. The projection or half-ring applied on the bed-plate and overlapping the axle of the double grate at one end, the parts being arranged and combined substantially as shown.

8. The projecting end of the bed-plate, recessed, substantially as shown, to receive the projecting jaws of the shaking implement and to accommodate the side of said implement when turned down for dumping the grate, all substantially as shown and described.

In testimony that we claim the foregoing we have hereunto set our hands in the presence of two witnesses.

FREDRICK WILLIAM WEAVER.
DANIEL NORTON.

Witnesses:

E. SMITH STRAIT,
CHAS. J. LANSING.