

(No Model.)

L. PASSMORE.

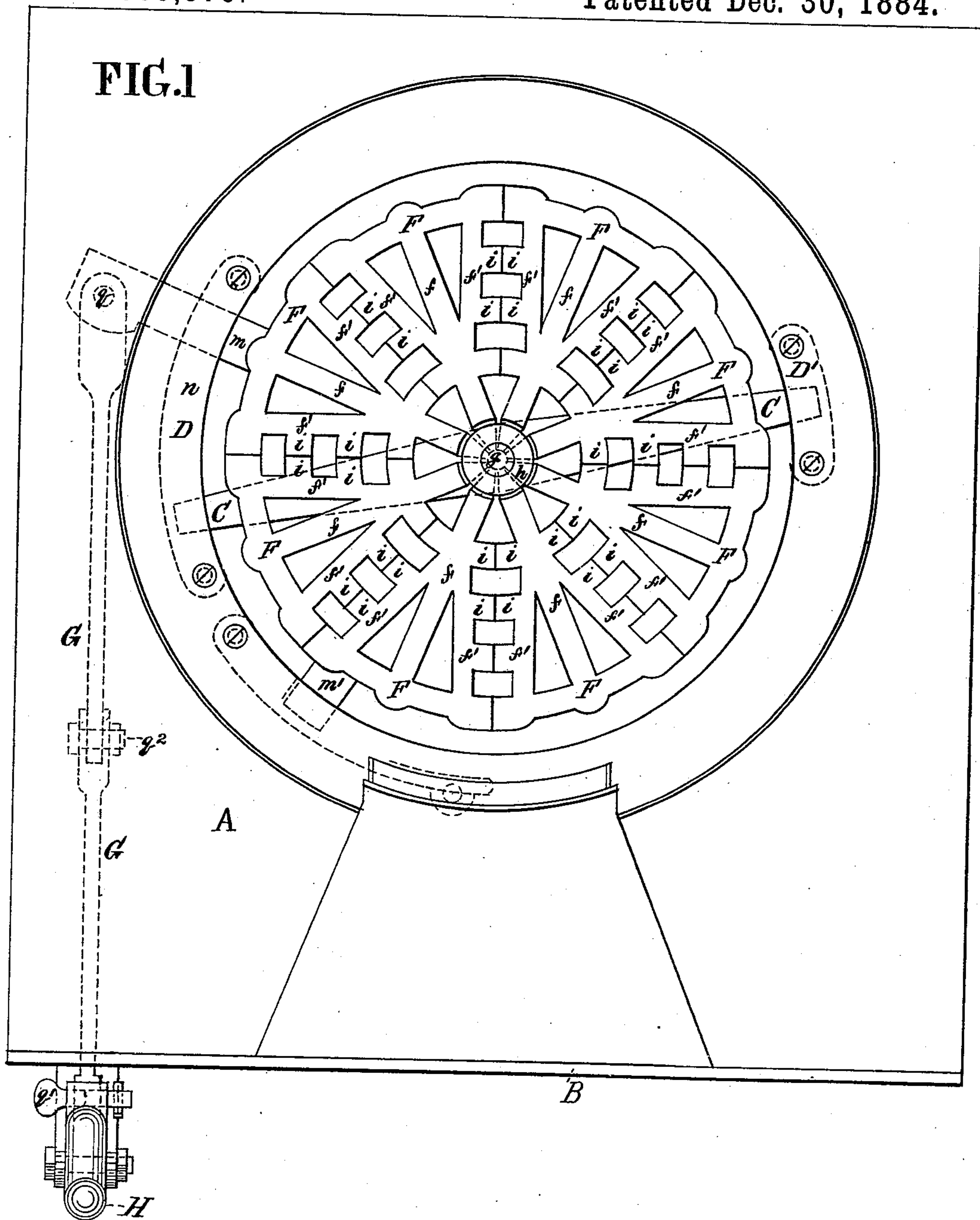
6 Sheets—Sheet 1.

GRATE.

No. 309,979.

Patented Dec. 30, 1884.

FIG. 1



Witnesses.

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per Stephen Ustick atty

(No Model.)

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GRATE.

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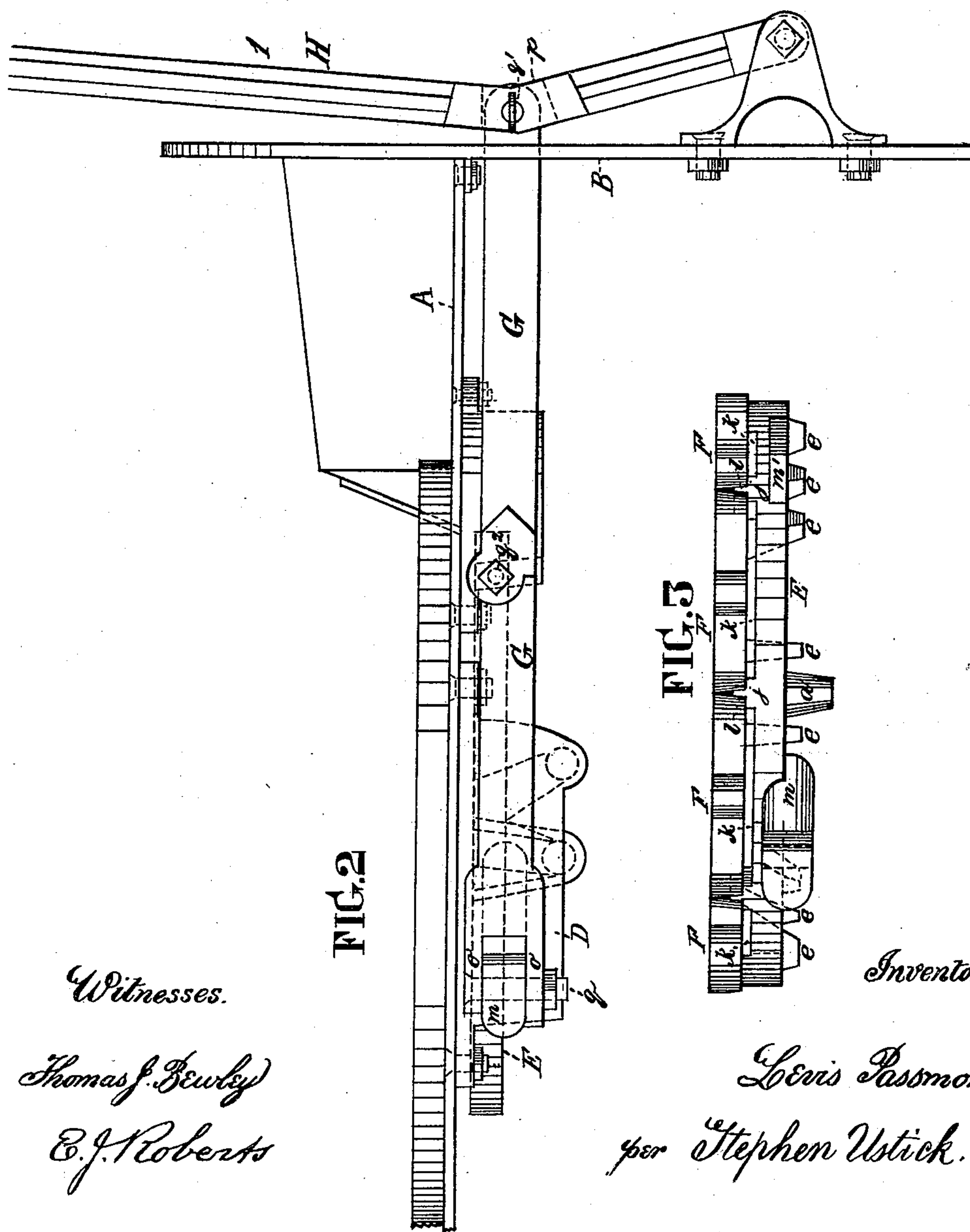


FIG. 2

FIG. 3

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GRATE.

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FIG. 5

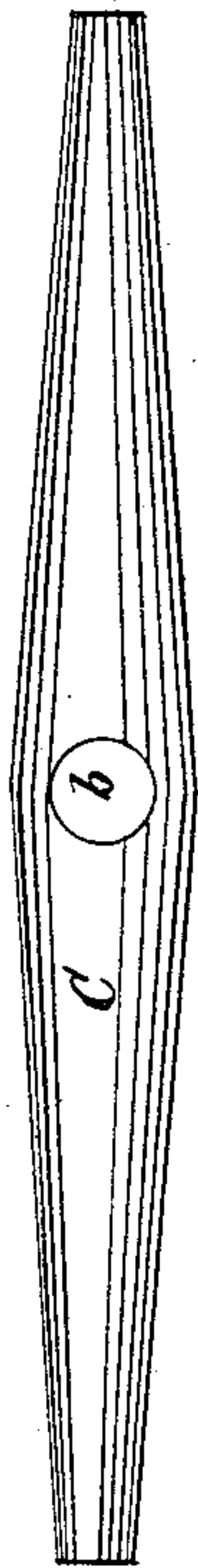


FIG. 6

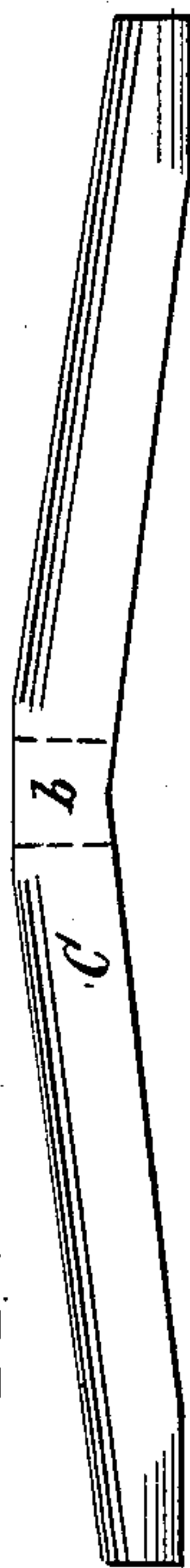


FIG. 4

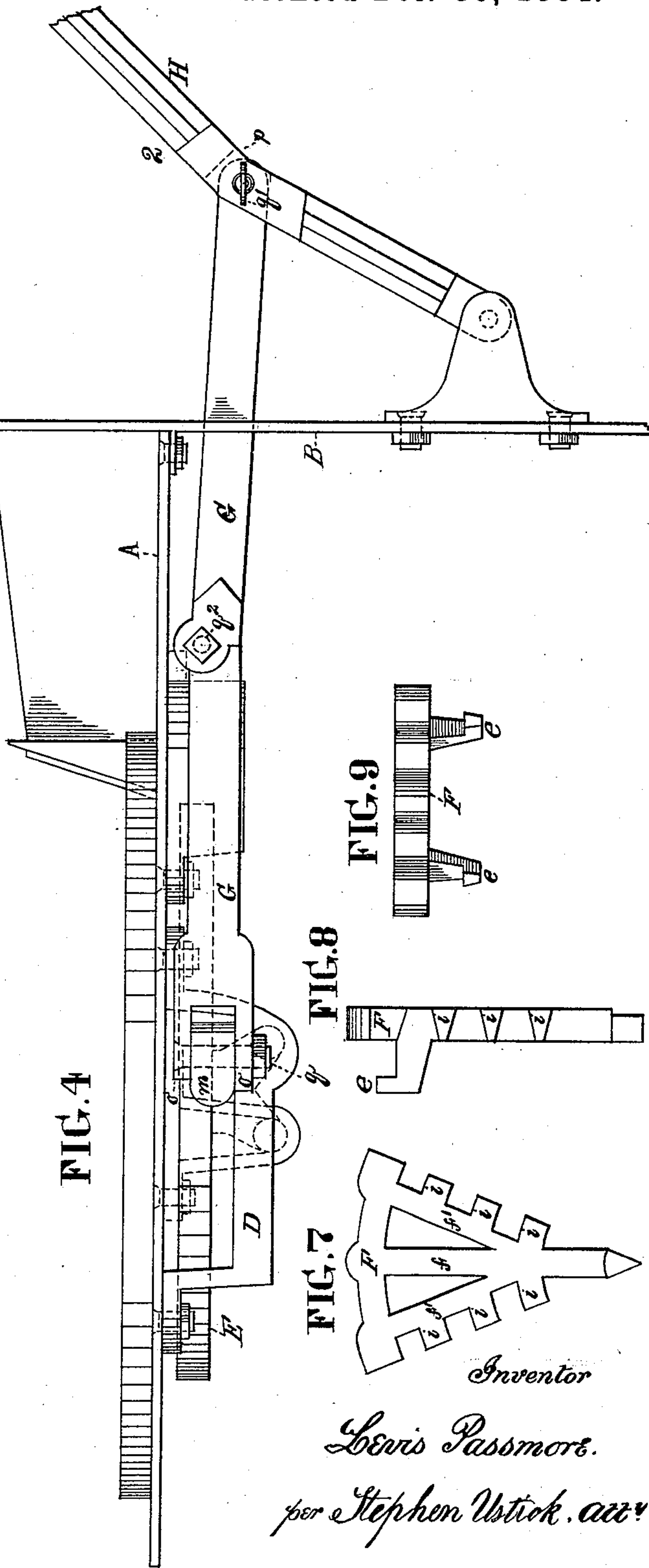


FIG. 7

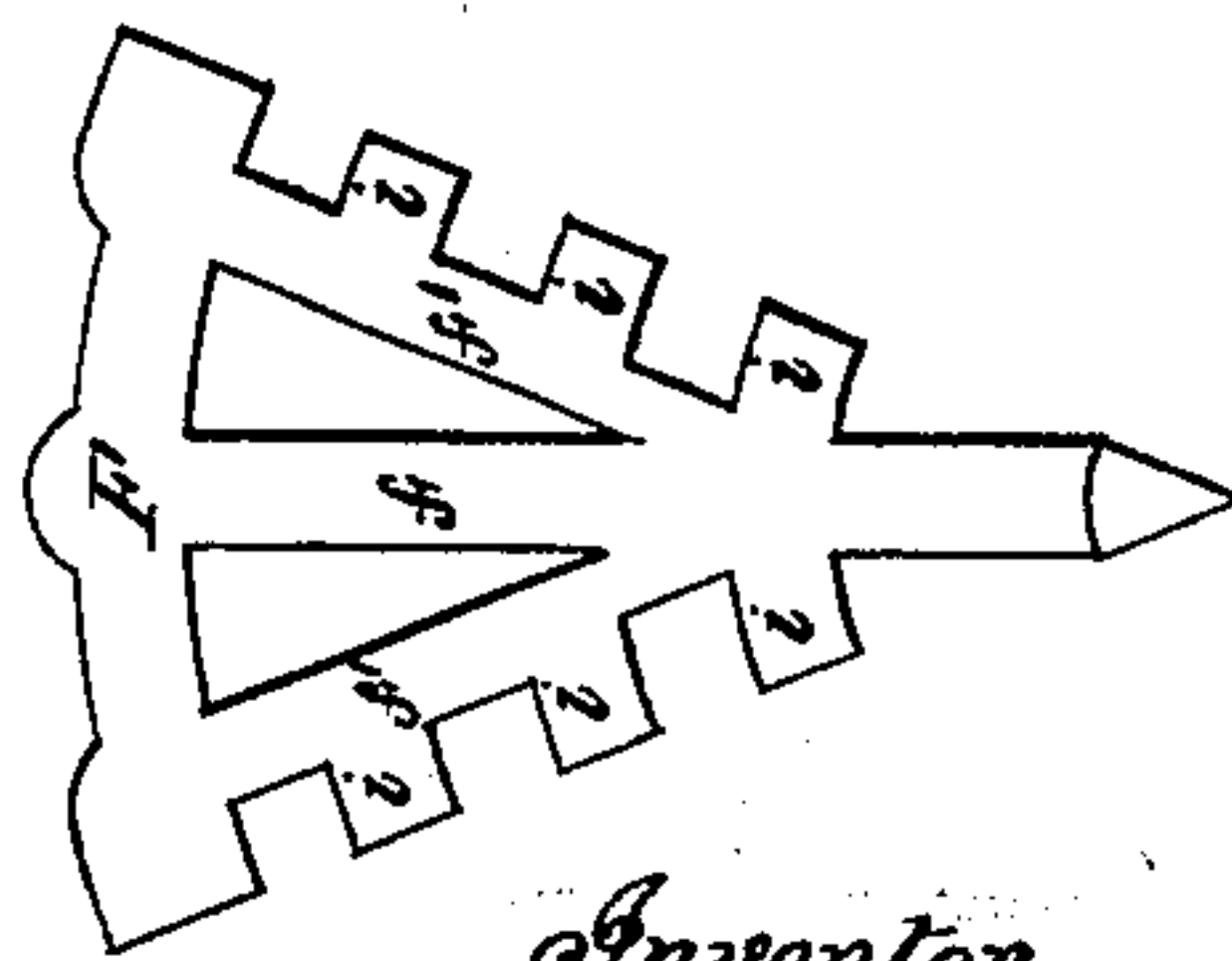


FIG. 8

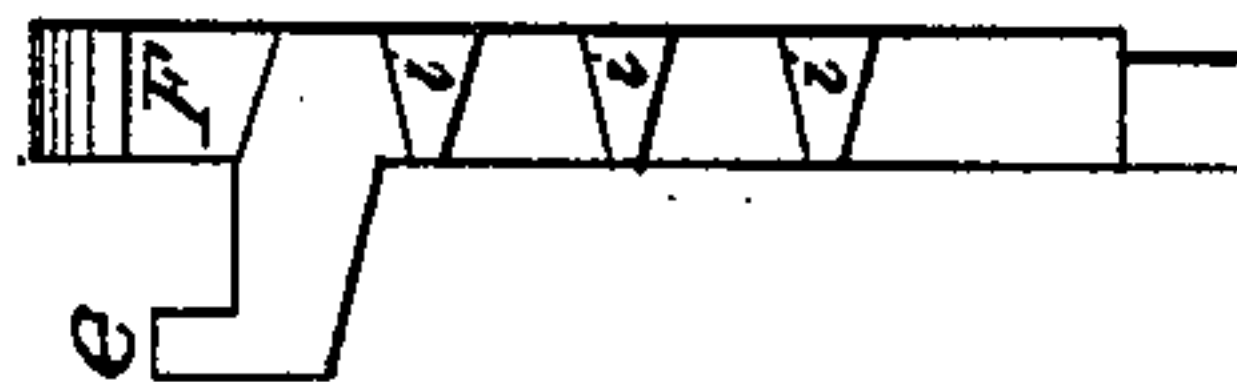
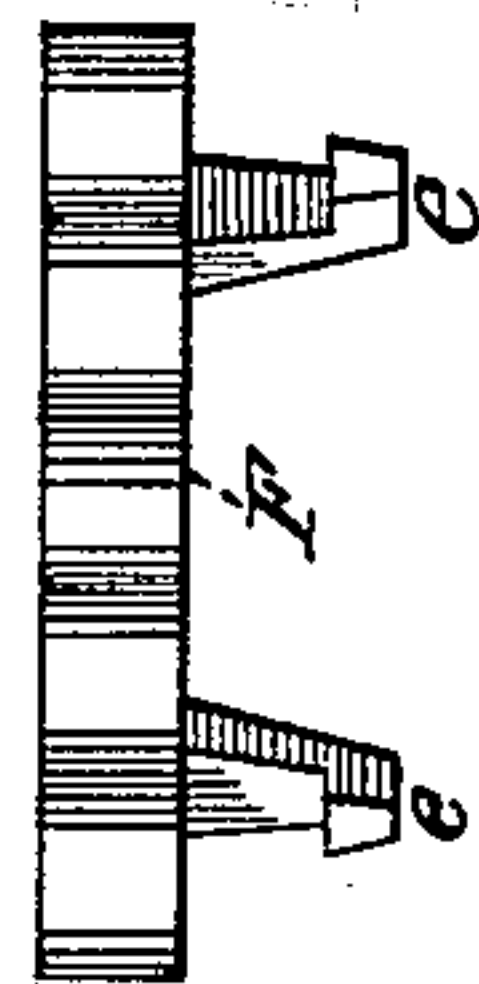


FIG. 9



Witnesses.  
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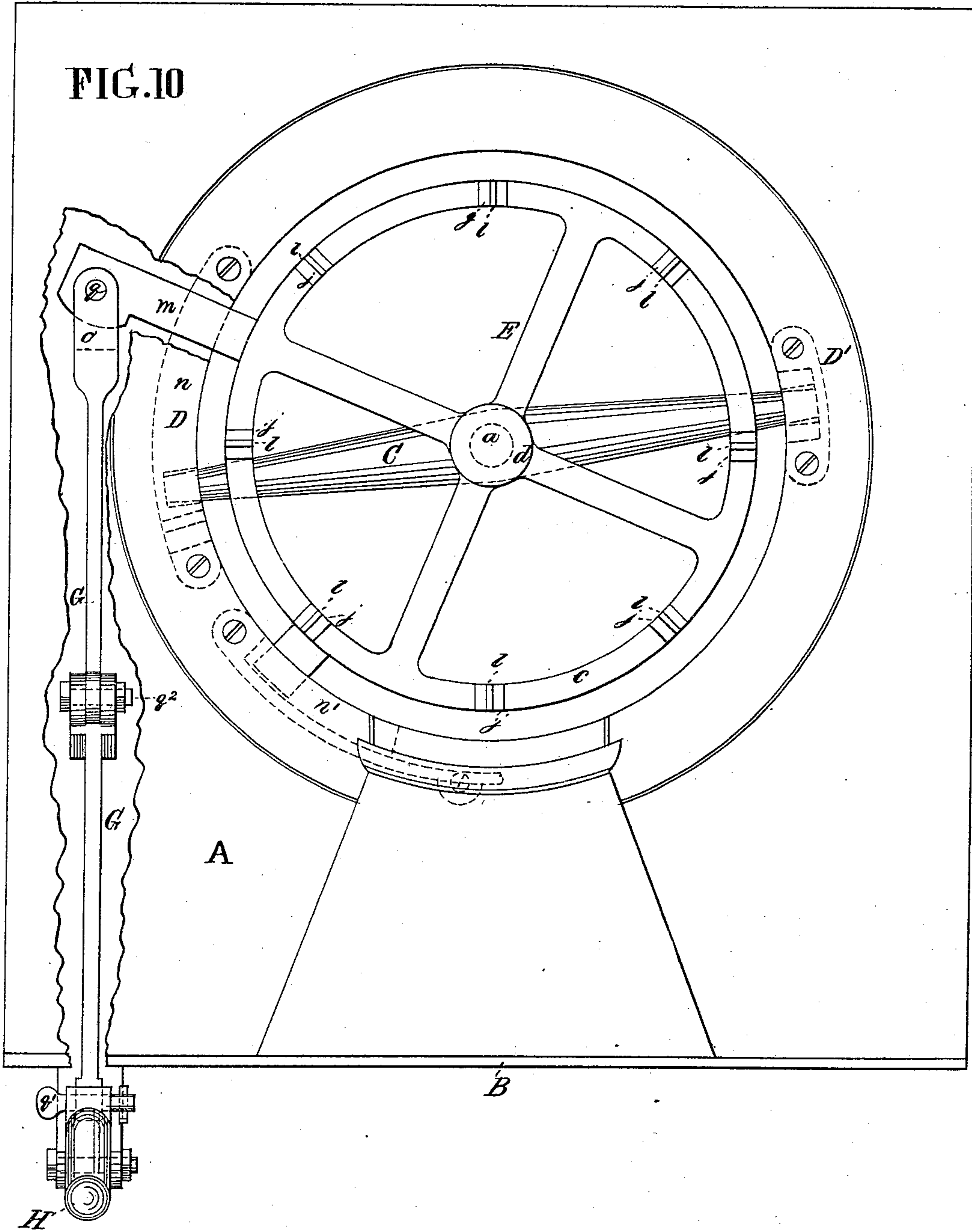
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L. PASSMORE.

GRATE.

No. 309,979.

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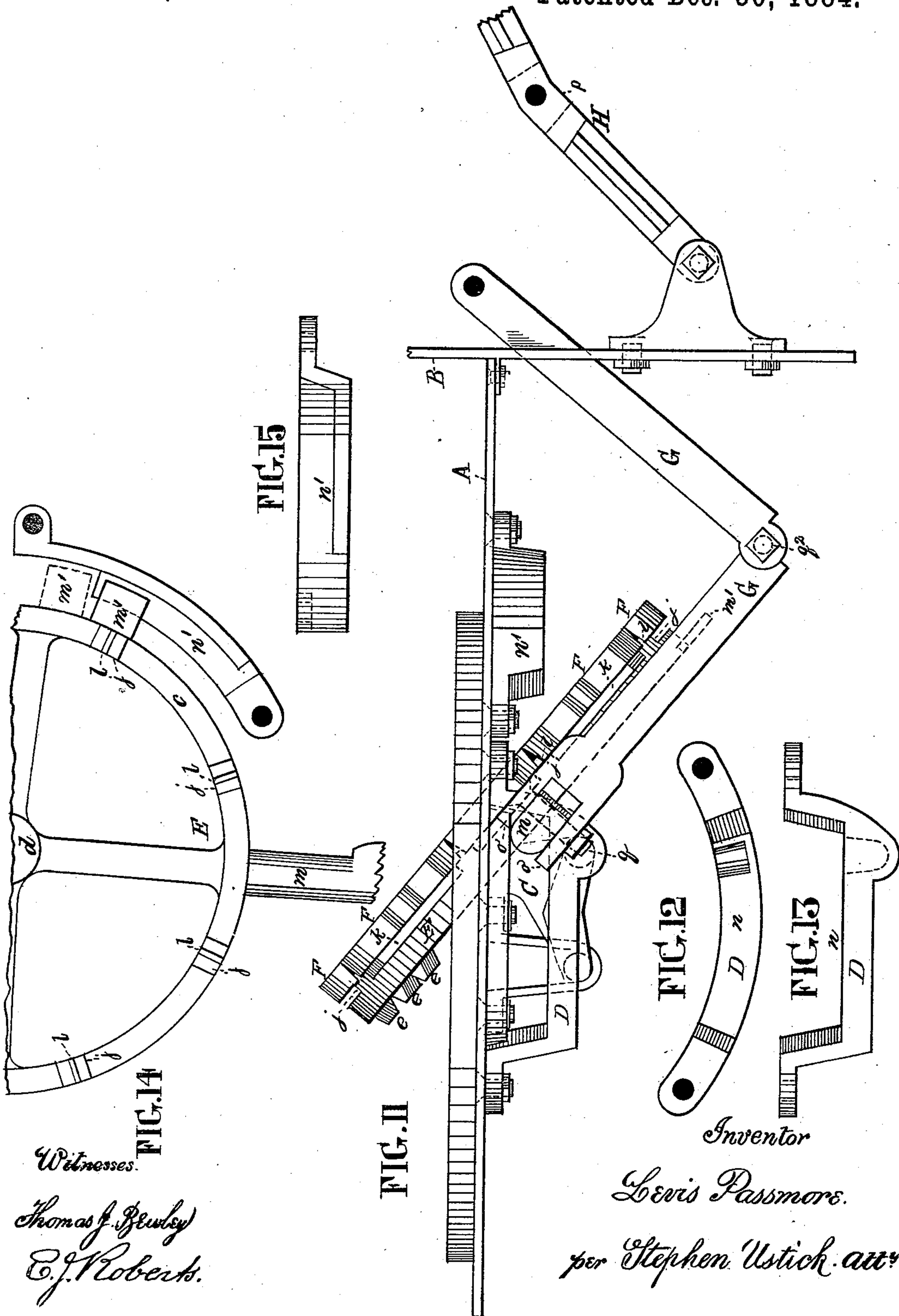
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GRATE.

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(No Model.)

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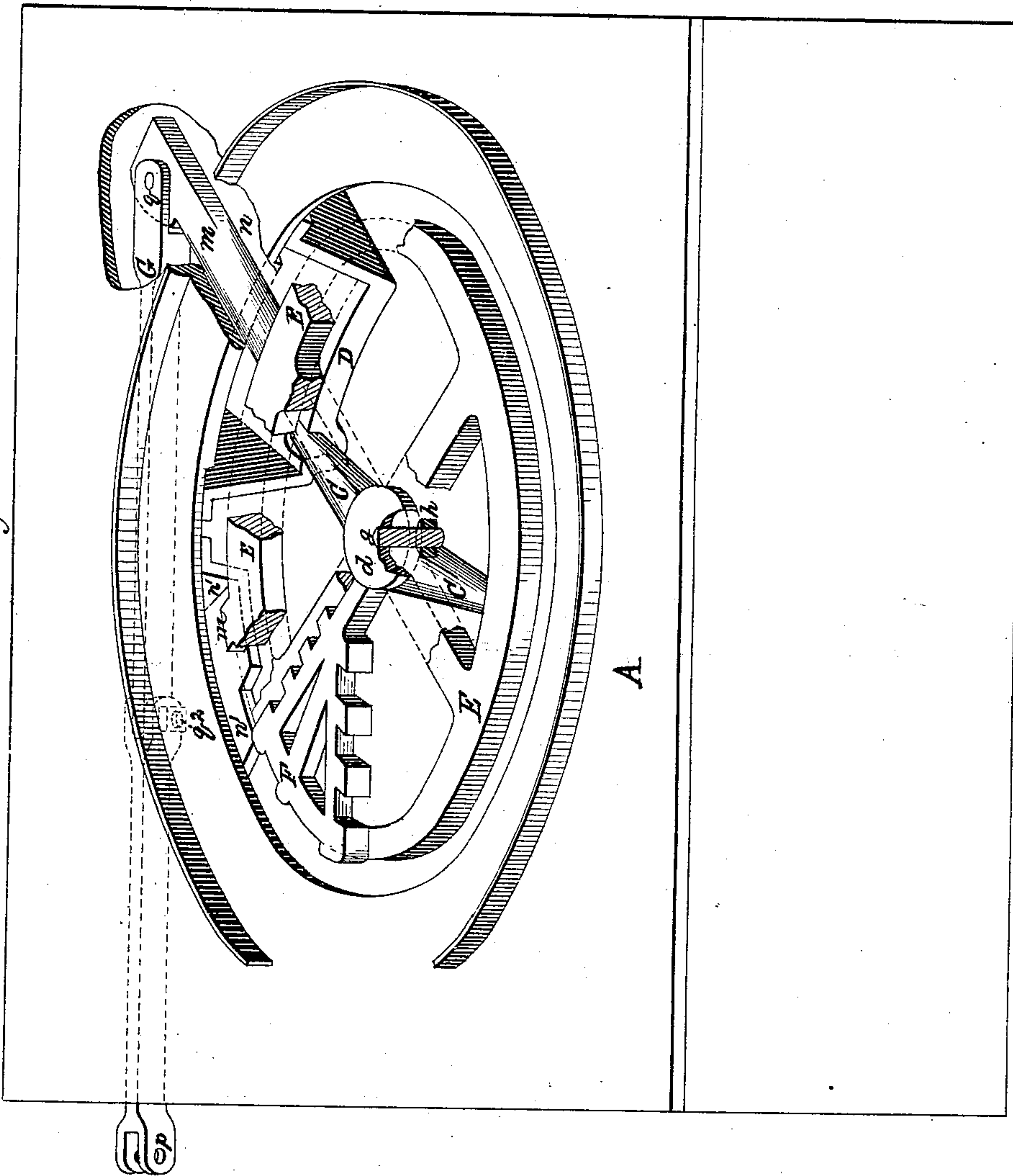
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GRATE.

No. 309,979.

Patented Dec. 30, 1884.

Fig. 16.



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# UNITED STATES PATENT OFFICE.

LEVIS PASSMORE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
STEPHEN MORRIS AND EDWARD W. MORRIS, BOTH OF SAME PLACE.

## GRATE.

SPECIFICATION forming part of Letters Patent No. 309,979, dated December 30, 1884.

Application filed January 30, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, LEVIS PASSMORE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Grates for Furnaces, Stoves, &c., of which the following is a specification.

The objects of my invention are, first, such a construction of a grate for furnaces, stoves, &c., in sections as will admit of being permanently connected in an expeditious manner, or a removal of one section, when necessary, for the insertion of another in its place; second, a means of effectually admitting cold air to the under side of the grate-bars to prevent their being warped by overheating; third, such a combination of the shaking apparatus as will completely prevent the dumping of the grate while being shaken; and my invention relates, in the first place, to the construction of the grate in sections, which meet each other in radial planes from the center of the grate, and have hooks on their under sides at their peripheries, which are locked under the rim of a bed-plate of the grate, whereby the sections are firmly held at that point; second, the connection of the sections at their inner ends with the hub of said bed-plate by means of a central bolt and washer to complete their connection with the bed-plate; third, providing the rim of said bed-plate with lugs on its upper side, on which the sections are seated at their peripheries, to leave spaces between them and the surface of the rim for the passage of cold air to the under side of the grate, to prevent its being sprung by overheating; fourth, the combination of a connecting-rod with an arm of the grate-bed and the shaking-lever in such a manner that when the lever gets to the forward end of the stroke required for shaking the grate the lower edge of the front end of the rod connected with a slot of the lever is brought to bear against the bottom of the slot to arrest the forward movement of the grate before it reaches its dumping position, thereby effectually preventing the dumping of the grate without detaching the lever from the connecting-rod, and thus preventing

the accidental dumping which might otherwise occur; fifth, the connection of the shaking-arm of the grate bed-plate with parallel broad flat surfaces to the connecting-rod, having corresponding cheeks which firmly fit the same, whereby the arm is held firmly in line with the rod in one direction while it is permitted to turn on the joint-pin in another direction in the reciprocating movements of the grate, to admit of the same arm which forms the journal at that side of the grate-bed answering for the connection of the connecting-rod, the said rod having a joint in its middle part to give ease to the working of the grate in dumping and returning to its horizontal position, as hereinafter described.

In the accompanying drawings, which make a part of this specification, Figure 1 is a plan view of my improved grate and mechanism for dumping the same in connection with the front and bed plates of a furnace. Fig. 2, Sheet No. 2, is a side elevation of the same. Fig. 3 is a side elevation of the grate-bed E and sections F in connection therewith. Fig. 4, Sheet No. 3, is a side elevation like Fig. 2, with the exception of the shaking-lever H being at the termination of its forward stroke. Figs. 5 and 6 are a top view and side elevation, respectively, of the bridge-bar C. Figs. 7, 8, and 9 are, respectively, a top view, side and end elevations of one of the sections F of the grate. Fig. 10, Sheet No. 4, is a plan view like Fig. 1, with the exception that the grate-sections F are removed from the bed-plate E. Fig. 11, Sheet No. 5, is a side elevation showing the lever H detached from the connecting-rod G and the grate dumped. Figs. 12 and 13 are a top and side elevation, respectively, of the stirrup D. Fig. 14 is a top view of the way *n'* detached and a part of grate bed-plate E. Fig. 15 is an inside edge elevation of said way *n'*. Fig. 16 is a perspective view of the grate with parts of the same removed.

Like letters of reference in all the figures indicate the same parts.

A represents the bed-plate of a furnace; B, the front plate, and C a bridge-bar, (shown in Figs. 5 and 6,) which supports the grate at its center, the journals of the bar resting on



bearings of the stirrups D and D'. The bar is made of curved arch form, as represented, to give maximum strength thereto to cause the coals or clinkers which drop from the grate upon it to glide off freely, and thereby prevent the choking of the grate, and also to obtain a leverage in the dumping operation, as hereinafter described.

E is a bed-plate for the connection of the sections F of the grate. It is connected with the bar by means of a center-pin and socket *a* and *b*, respectively. It has a rim, *c*, to which the sections F are connected at their periphery, and a hub, *d*, to which the inner ends of the same are connected, and which has the center-pin *a* projecting from its under side. The sections, one of which is shown in detail in Figs. 7, 8, and 9, have hooks *e e'* at their periphery, which fit under the rim *c* of said bed-plate, as seen in Fig. 3, whereby they are firmly secured to the bed-plate at that point. The middle bars, *f*, of the sections fit each other radially on the hub *d*, and are confined thereto by means of the center-pin *g* and washer *h*, the pin having a confining-nut on its lower end. The side bars, *f' f'*, of the sections have lugs *i*, the lugs of each section meeting those of adjoining sections in radial planes, as seen in Fig. 1. The sections are all cast from the same pattern, so that when one becomes worthless by being burnt, or otherwise, it is readily replaced with a new one, it being readily removed when the center-pin *g* is withdrawn. There are lugs *j* on the upper side of the rim *c*, upon which the sections F rest at their peripheral edges, for the purpose of forming spaces *k* for the passage of cold air to the under side of the sections, to prevent them being overheated and warped at their peripheral edges. These lugs are provided with teats *l*, which separate the sections. The grate bed-plate E is provided with an arm, *m*, which rests on the horizontal way *n* of the stirrup D, the bearing part being round to provide for a partial turning on the way during the tilting of the grate for dumping the coal. There is also a short arm, *m'*, which has its bearing on the way *n'*, that is bolted to the under side of the bed-plate A of the furnace, whereby the grate is held in a horizontal position until the bed-plate E, with the grate, is moved around far enough for dumping, the way terminating at the dumping-point to permit the arm passing off the way. The arm *m* of the grate-bed is projected outside of the way *n*, and has broad, flat, parallel, and horizontal surfaces, which meet corresponding surfaces of the cheeks *o o* of the connecting-rod G, being held in connection therewith by means of the joint-pin *q*. By such connection the grate is securely held in its horizontal position until the inner section of the connecting-rod G is brought to an inclined position to dump the grate. The front end of the connecting-rod is jointed to the shaking-lever H by means of the slot *p* and

joint-pin *q'*. The connecting-rod is separated in the middle and connected by means of the joint-pin *q''*, whereby to admit of the parts being brought on an angle with each other, to effect the dumping of the grate, as hereinafter described. A reciprocating movement is given to the lever between the point 1 in Fig. 2 and the point 2, Fig. 4, for shaking the grate, a like movement as the connecting-rod G, moved frontward and backward, being given to the grate as the center-pin *a* of the bed-plate E turns back and forth in the socket *b* of the bridge-bar C. During this operation the dumping of the grate is prevented by the bottom of the slot *p* of the lever forming a stop for the lower edge of the front end of the connecting-rod G and the arm *m'* of the grate-bed E being still on the way *n'* of the bed-plate A, as shown in Fig. 14. When the dumping of the grate is required, the joint-pin *q'* is withdrawn, to detach the lever H from the connecting-rod G, and the former is drawn forward, as seen in Fig. 11. Then the dumping is effected by the manipulation of the connecting-rod, the grate being turned farther around until its arm *m'* passes off the way *n'*, as shown by dotted lines in said Fig. 14, which admits of the grate being dumped, as shown in Fig. 11, and the drawing forward of the grate as soon as the arm *m'* leaves the way *n'* inclines the upper edge of the bridge-bar C forward, whereby the pin *a* of the bed-plate E, which forms a pivotal connection with the bar, is drawn in front of the vertical plane of its journal, and the gravity of the bed-plate and the grate assists the dumping. A leverage is also obtained by the angular position of the two parts of the jointed rod G, which aids the dumping, and also returning the grate to its horizontal position.

I claim as my invention—

1. A grate for furnaces, stoves, &c., made in sections, which meet each other in radial planes, and are supported at their peripheral edges by the rim of a partially-revolving bed-plate, and at the center by a hub of the same, and are held on the rim by hooks which project from their under sides at their peripheries and at their inner ends by means of a center-pin and washer beneath its head, substantially as described.

2. A grate having sections F, which meet each other at radial edges, in combination with the bed-plate E, having a rim, *c*, and hub *d*, the sections being provided with hooks *e e'* on their under side, which lock them at their peripheries to the rim *c*, and being firmly secured at their inner ends to the hub *d* by means of the pin *g* and washer *h*, substantially as described.

3. The grate-bed E, having a rim, *c*, provided with lugs *j*, upon which the sections F are seated at their peripheries, whereby to form spaces *k* between the rim and the sections for the passage of cold air, substantially as and for the purpose set forth.



4. The connecting-rod G, jointed at its middle, in combination with the lever H, and the arm *m* of the grate bed-plate E, the arm having broad flat parallel surfaces, and the  
5 connecting-rod cheeks *o o*, between which the arm is firmly fitted, substantially as and for the purpose set forth.

5. The lever H, having a stop-slot, *p*, whereby as the lower edge of the connecting-rod G

is brought to bear on the bottom of the slot, *ro* in the forward movement of the lever in shaking the grate the movement of the latter is arrested to prevent its dumping, substantially as described.

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Witnesses:

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