

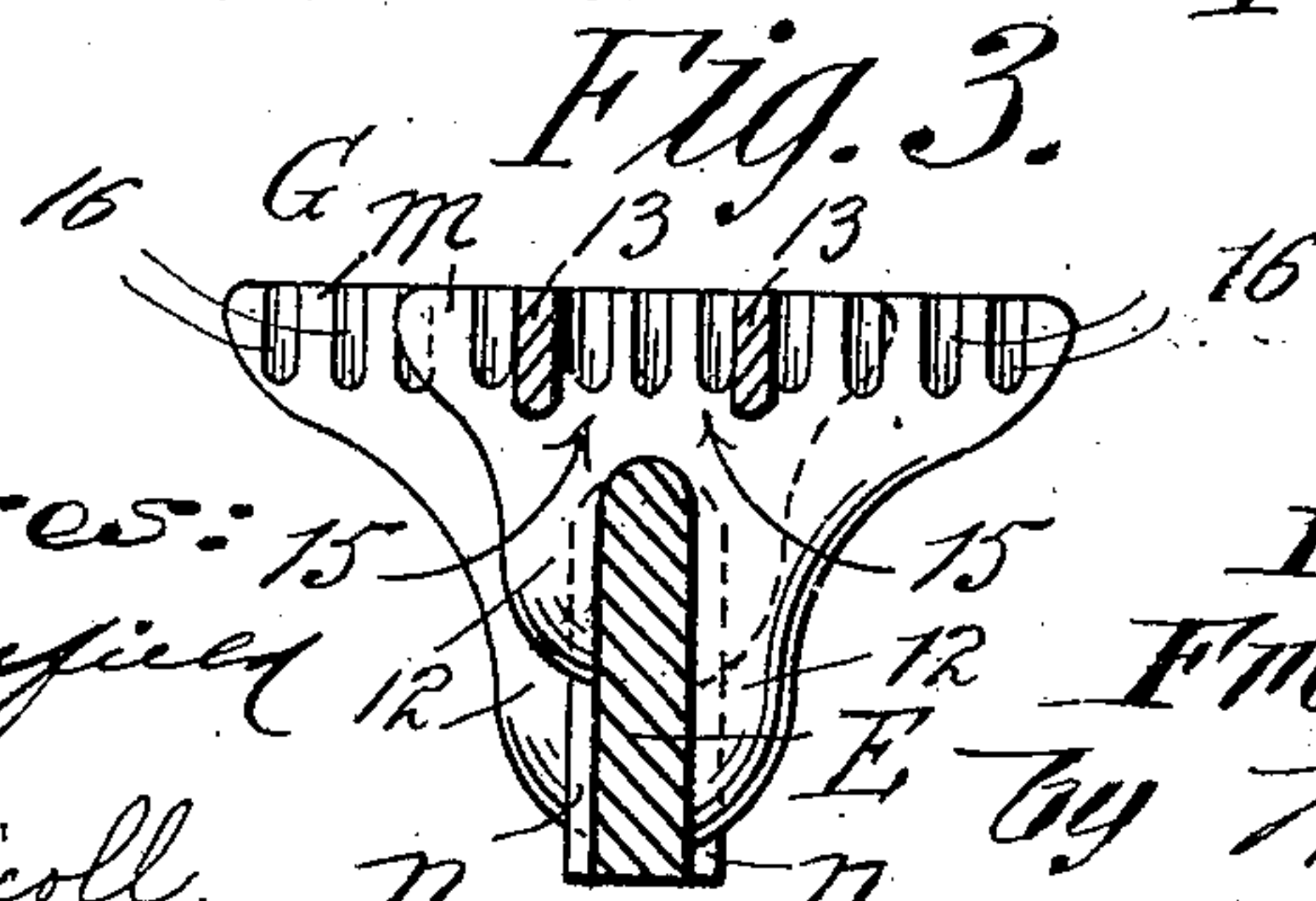
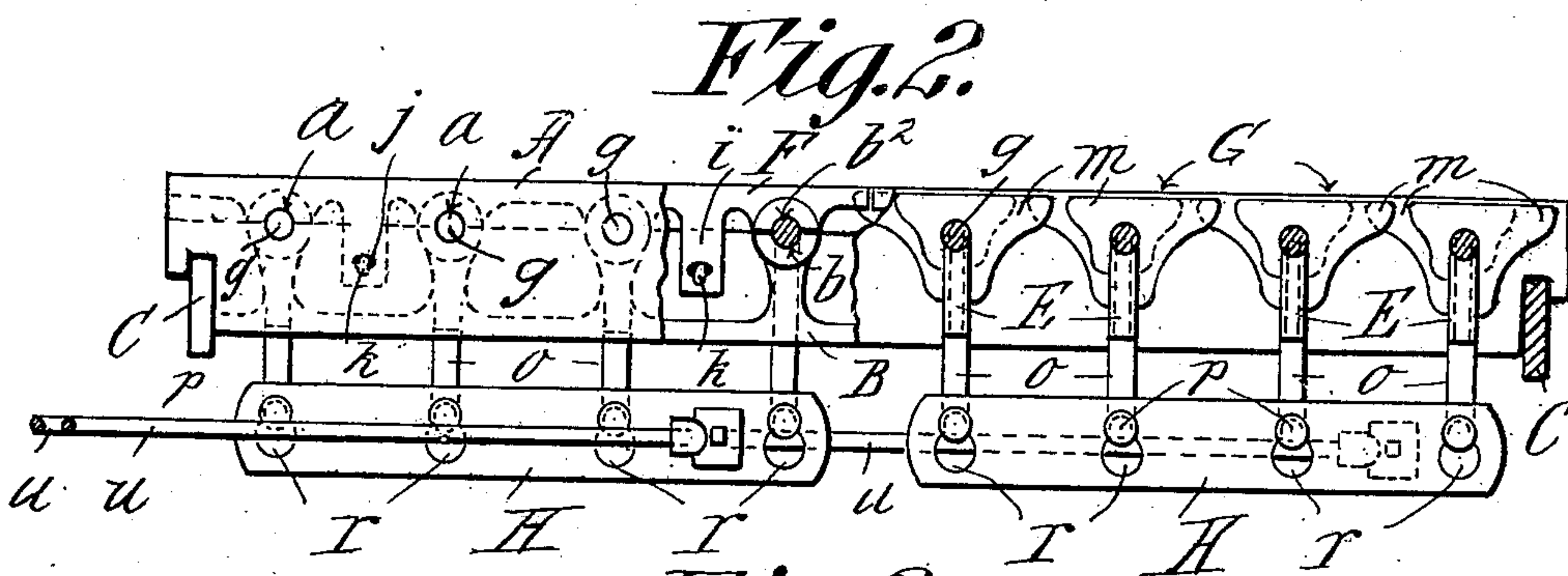
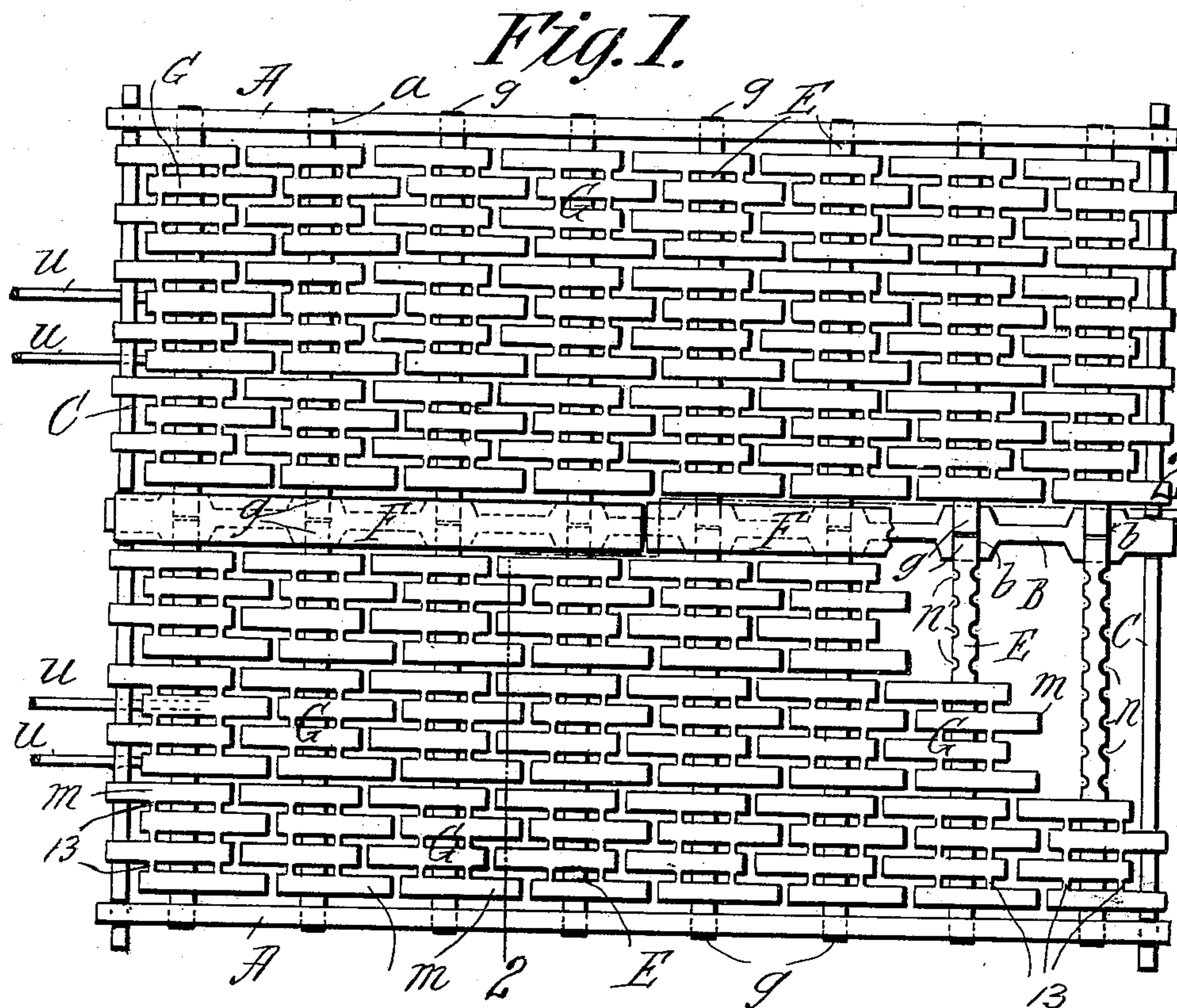
No. 862,585.

PATENTED AUG. 6, 1907.

F. W. RIDLON.
ROCKING BAR FURNACE GRATE.

APPLICATION FILED OCT. 8, 1906.

2 SHEETS—SHEET 1.



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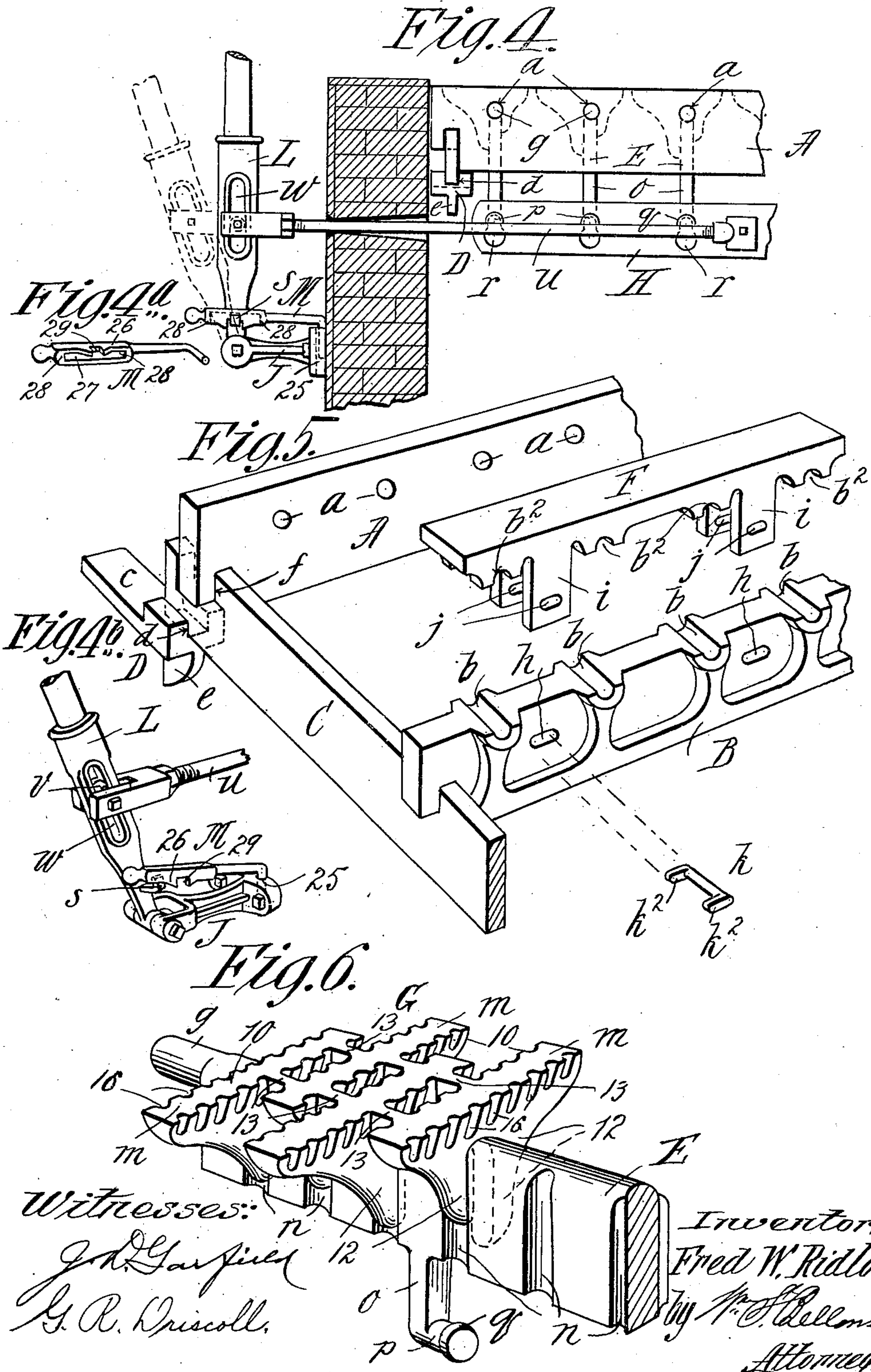
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

FRED W. RIDLON, OF SPRINGFIELD, MASSACHUSETTS.

ROCKING-BAR FURNACE-GRATE.

No. 862,585.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed October 8, 1906. Serial No. 337,860.

To all whom it may concern:

Be it known that I, FRED W. RIDLON, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Rocking-Bar Furnace-Grates, of which the following is a full, clear, and exact description.

This invention relates to improvements in furnace grates of the rocking bar type.

10 The objects of the invention are to provide a grate construction which is of extremely simple and inexpensive character made largely of interlocking parts which require no screws, bolts, or rivets for their fastenings or engagements one with another, and to produce a grate,
15 extremely well adapted for use in furnaces or fire boxes for steam boilers, susceptible of being operated with unusual convenience.

Other objects are attained in and by the organization of the parts as will hereinafter be rendered apparent.

20 The improved grate will be described in its entirety in conjunction with the accompanying drawings and the novel constructions, arrangements, and other characteristics comprised therewithin are defined in the sub-joined claims.

25 In the drawings,—Figure 1 is a plan view of the grate. Fig. 2 is a side elevation with parts in vertical section as taken on line 2—2, Fig. 1. Fig. 3 is a vertical sectional view on a larger scale, taken transversely through one of the rocking grate bars, and through the connecting bars or web which unite the individual teeth of a
30 connected group or gang of teeth. Fig. 4 is a vertical sectional view through the masonry at the front of the furnace, showing in elevation a portion of the grate bar rocking means, and the means for locking against movement, and for limiting the movements of the rocking devices. Fig. 4^a is a perspective view of a part constituting the locking and limiting device for the locking mechanism. Fig. 4^b is a perspective view showing such catch in relation to the rocking mechanism. Fig.
40 5 is a perspective view showing a portion of the grate frame, and showing one of the caps or saddles combined therewith, and the confining means therefor. Fig. 6 is a perspective view of a portion of one of the rocking grate bars, and a group or gang of grate teeth inter-
45 locked thereon.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings,—the grate frame is shown as consisting of opposite side bars A A having horizontally alined
50 round holes *a a* to constitute journal sockets, and an intermediate frame bar B parallel with the frame bars A A having upwardly opening journal seats or semi-circular sockets *b, b*, and front and rear frame bars C C which are interlocked with, and extend between the opposite
55 side bars A A.

As shown in Figs. 4 and 5 particularly, the frame is

supported on corner bracket lugs D, each comprising a horizontal shank member *c* to be embedded in the furnace wall masonry, and having at its extremity an upwardly open recess *d*, and a depending steadying or
60 bracing lug *e* to bear against the inner side of the furnace wall.

The front and rear frame bars C C have supporting engagements in the recesses *d* of the bracket lugs, and they have upwardly open transverse recesses *f* in which
65 are seated and engaged the end portions of the side frame bars;—the engagements between the intermediate frame bar B and the middle portions of the front and rear frame bars being similarly effected.

E E represent the grate bars having round end journals *g g*, these grate bars being arranged in series within the spaces between the side and intermediate bars of the grate frame, and the outer end journals are engaged in the journal holes *a a*, and the approached inner end journals are supported in the seats or sockets *b b*.
70
75

F F represent caps or saddles formed with complementary journal seats *b²* to overlie and to fit the adjoined inner end journals of the grate bars, each cap being shown as of a length to extend over several of the said inner end journals.
80

The intermediate frame bar B has at suitable intervals, horizontally elongated slots *h h* formed there-through; and the aforesaid caps or saddles F are made with opposite depending fork-like members *i i* to embrace the intermediate frame bar extending down at the
85 opposite sides thereof; and in these depending members *i i* are horizontally elongated slots *j j* arranged to match with the frame bar slots *h*, and to receive the engagement therethrough of locking pins *k* having angularly
90 turned extremities or end lugs *k²* to normally gravitationally assume depending positions, and to engage the outer sides of the saddle members *i i*, securely confining the latter against displacement except as wilfully accomplished by a proper manipulation of the locking pins.
95

G G represent gangs of the grate teeth comprising a plurality of the individual teeth *m*. Each individual tooth consists of a transversely arranged top member
100 10 and a bifurcated depending extension comprising the side members 12, 12, to embrace and engage the
105 grate bar E. The several individual teeth of a set are united by the integrally cast connection bars 13, 13, in pairs, having their locations above the top of the grate bar E, and separated one from another by a space somewhat greater than the width of the grate bar E, thus af-
110 fording courses 15 upwardly through the grated structure for draft, as seen in Fig. 5.

Each grate bar has at its opposite sides a series of properly spaced vertical grooves *n, n*, in which the separated depending members 12, 12, of the grate teeth
110 have engagements at the opposite sides of the bar. A plurality of these depending opposite members 12 in

one gang or set having a respective number of engagements with the grate bar are prevented from having any twisting movement relatively to the grate bar, which would not be prevented if the grate teeth were
5 separately or individually constructed and dependent for engagement on only the one depending pair of members 12.

As shown in the drawings, every other one of the tops 10 is extended to the rightward further than to the leftward, while the tops of the relatively intermediate teeth project further to the leftward than to the rightward, so that when the entire area of the grate surface or bed is constituted by a sufficient number of grate teeth gangs, there is, as shown in Fig. 1, an intermeshing of
15 the alternated teeth of one series relatively to the relatively intermediate teeth of the next. At the portions of the grate near the side frame thereof single teeth or sets of teeth having less number than those usually employed throughout the intermediate portions of the
20 grate, may be provided and used to fill out the entire grate area. After protracted use, when some of the grate teeth are found to be impaired and require replacement, it is only necessary to lift away such of the gangs of teeth as are defective, replacing the same by
25 new and perfect sets; and in accordance with the construction here illustrated, the entire grate may be constituted by castings, requiring no machine work or finishing, and manifestly, therefore, at very small cost.

The grate bars E journaled for rocking movements as
30 above described, have depending arms *o o*, provided with laterally offset studs having end flanges or heads *q*, and the bar H provided in common to a plurality of the rocking grate bars is arranged with a series of apertures *r* made enlarged at their lower portions, as shown in
35 Fig. 2. By holding the bar H horizontally and at a height with the centers of the enlarged portions of the apertures coincident with the flanged heads of the studs *p*, and then moving the bar transversely towards the depending grate bar members, and then allowing the
40 apertured bar to be lowered, an engagement of said bar with the depending members *o o* of a series may be made whereby the bar constitutes in substance a link connection between the said depending members.

J represents a forwardly extending horizontal bracket
45 secured on the front of the furnace wall, having a vertical socket 25 therein, and a rocking lever L is by its lower end pivoted to the extremity of the said bracket J, and is provided with a laterally offset angularly formed catch lug *s*.

50 M represents a catch bar formed with double separated members 26, 27, at opposite sides of a recess; and in one of said side walls or members is a recess 29 opening to its lower edge.

u represents a rod bolted or otherwise secured to the
55 bar H; and its forward end is formed bifurcated, and supports a roller *v* which is engaged through a vertical slot *w* in the rocking lever.

In the representation of the grate made in Figs. 1 and 2, four sets or sections of grate bars are comprised, for
60 which it is to be understood there are four of the link bars H. One rocking lever L, and connections between the same and the link bar H is provided for each section of grate bars, so that any desired section of the grate may be moderately rocked to shake down the
65 ashes, or rocked in the extreme extent for dumping,

and without imposing more than a proper amount of strain on the respective rocking means therefor.

When the grate is in its normal or unlocked condition, the catch bar M has its lower edge recess 29 in its one side wall 26 engaged over the catch lug *s* on the then
70 vertically disposed rocking lever, locking the latter against movement. And this provides a safeguard whereby the fireman, habituating himself to leaving the rocking lever always locked, may not accidentally
75 permit, for any protracted length of time, the grate teeth to be in their upwardly rocked position, extending into the body of the fire, and thereby to be quickly destroyed by burning.

On desiring to rock the grate bars of a given section, the catch bar M is slightly raised, by either springing it
80 in an upward direction, or insuring the sliding thereof by the depending member thereof which engages in the aforementioned socket 25 so as to disengage the catch notch 26 from the lug, whereupon on swinging the catch bar very slightly laterally, the rocking lever is
85 free for its rocking movements within the limits as imposed by the end walls 28, 28, of the recess therewithin.

It will be perceived by reference to Figs. 3 and 6, that the tops of the grate bars E are upwardly convergent, as by being made of rounded form; and by reason
90 of the tooth connecting bars or webs 13 being above the round top grate bars, and also outside thereof, no lodgments for ashes are produced in the spaces under and between the said uniting webs.

In the left hand upper corner, Fig. 1, and in Figs. 3
95 and 6, the opposite sides of the individual tooth of a teeth gang G are alternately vertically ribbed and grooved, or corrugated, as indicated at 16, while as represented in other portions of Fig. 1, the grate space is shown as filled in by gangs of teeth which are not cor-
100 rugated in their opposite sides.

It is apparent that the grate surface may be readily made up by gangs of teeth of a character appropriate to the kind of fuel to be burned; and the making of the corrugations on the sides of the teeth arranged
105 quite closely together, make it practicable to support and burn pea coal or very fine coal with all required draft.

I claim:—

1. In a rocking bar grate, the combination with a frame
110 comprising opposite side bars having horizontally aligned journal sockets, and an intermediate frame-bar having upwardly open journal seats, of two series of tooth-provided grate bars having end journals, the oppositely arranged outer journals of both series being engaged in the
115 side bar sockets, and the adjacent inner end journals of the grate bars being supported in the upwardly open sockets of the intermediate frame bar, caps or saddles having depending fork-like members mounted on and embracing the intermediate frame bar, covering the adjacent
120 journal ends of the grate bars, and confining devices engaging through the depending members of the saddles and through the intermediate frame bar.

2. In a rocking bar grate, the combination with a frame
125 comprising opposite side bars having horizontally aligned journal sockets, and an intermediate frame-bar having upwardly open journal seats, and provided with horizontally elongated slots below said journal seats, of two series of teeth carrying grate bars having end journals, the oppositely arranged outer journals of both series being
130 engaged in the side bar sockets, and the adjacent inner end journals of the grate bars being supported in the upwardly open sockets of the intermediate frame bar, caps or saddles having depending fork-like members mounted on and embracing the intermediate frame bar, covering the
135

adjacent end journals of the grate bars, and having, in said depending members, horizontal slots arranged to match with said slots in the intermediate frame-bar, and pins having angularly turned ends, to engage through the matched slots, and by said angularly turned ends, normally in depending positions, to engage the outer sides of the depending saddle members.

3. In a rocking bar grate, a grate frame consisting of corner bracket lugs each comprising a horizontal shank member to be embedded in the furnace wall masonry, and having at its extremity an upwardly open recess, front and rear frame bars having supporting engagements in said recesses, and having upwardly opening recesses at their end portions, opposite frame-side-bars having supporting engagements in the recesses of the front and rear frame bars, tooth-provided grate-bars journaled for rocking movements in said frame, and means for rocking said grate-bars.

4. In a rocking bar grate, a grate frame consisting of corner bracket lugs each comprising a horizontal shank member to be embedded in the furnace wall masonry, and having at its extremity an upwardly open recess, and a depending shoulder, front and rear frame bars having supporting engagements in said recesses, and having upwardly open recesses at their end portions, and having upwardly open recesses at their intermediate portions, opposite frame-side-bars having supporting engagements in the end recesses of the front and rear frame bars, and an intermediate frame bar having a supporting engagement in the middle recessed portions of the said front and rear frame bars, tooth-provided grate-bars, in series, journaled for rocking movements in and extending between the side and intermediate frame bars, and means for rocking the grate bars.

5. In a rocking bar grate, in combination, a grate frame, a series of tooth provided grate-bars journaled for rocking movements in said frame and having depending arms provided with laterally offset studs, a bar having a series of apertures engaging the studs of the depending bars, and forming link connections therebetween, a pivotally mounted rocking lever having a vertical slot therein, and a rod connected with said bar and having a transverse stud engaged through the slot in the rocking lever, and a separate, pivoted latch for engaging and locking said lever, said latch being swingable in a plane at right angles to the plane of movement of said lever.

6. In a rocking bar grate, in combination, a grate frame, a series of tooth provided grate-bars journaled for rocking movements in said frame and having depending arms, a bar having connections with the depending arms of a series of the grate bars, a pivotally mounted rocking lever

having a laterally offset catch lug, a catch bar pivotally mounted adjacent the rocking lever for a swinging movement in a horizontal plane, and having a recess in its lower edge whereby it is adapted to engage with and to be disengaged from the rocking lever catch lug, and a rod connected with said depending arm-engaging bar, and having an engagement with the rocking lever.

7. In a rocking bar grate, in combination, a grate frame, a series of tooth provided grate-bars journaled for rocking movements in said frame and having depending arms, a bar having connections with the depending arms of a series of the grate bars, a horizontally extending bracket secured on the front of the furnace wall having a vertical socket therein, a rocking lever pivoted at its lower end to the extremity of said bracket provided with a laterally offset catch lug, a catch bar formed with double separated members one of which is provided with a recess in its lower edge, and said bar having a depending stud member to engage in said bracket socket, and a rod connecting the aforesaid depending arm-engaging bar and the rocking lever, for the purposes set forth.

8. In a furnace, the combination of rockable grate bars, with an external pivoted lever for rocking said bars, and a separate latch for engaging said lever and locking the same in position, said latch being pivoted to swing in a plane at right angles to the plane of movement of said lever.

9. In a rocking bar furnace grate, a grate surface section consisting of a gang of grate teeth, said teeth being of uniform length, and disposed side by side in parallel spaced relation, alternate teeth of a gang being offset on opposite sides of a center line through the section, all of such staggered teeth of a gang being connected by a double series of integral uniting webs.

10. In a rocking bar furnace grate, the combination with a plurality of grate bars, and means for rocking them, of a grate surface comprising a plurality of sections, each section comprising a gang of grate teeth, said teeth being of uniform size, and disposed side by side but in staggered relation, the teeth of one gang intermeshing with those of the next, depending lugs from each tooth adapted to engage said grate bars, and uniting bars or webs extending between and connecting the separated teeth of a gang, said uniting webs lying on either side of a vertical plane through said grate bars.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

FRED W. RIDLON.

Witnesses:

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