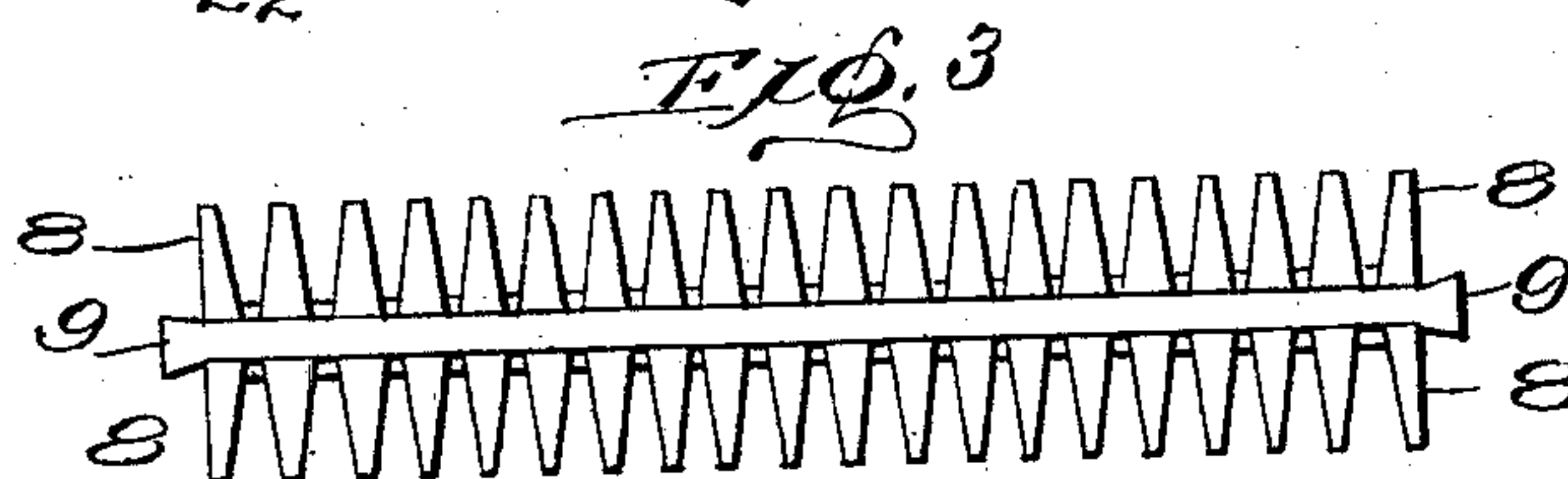
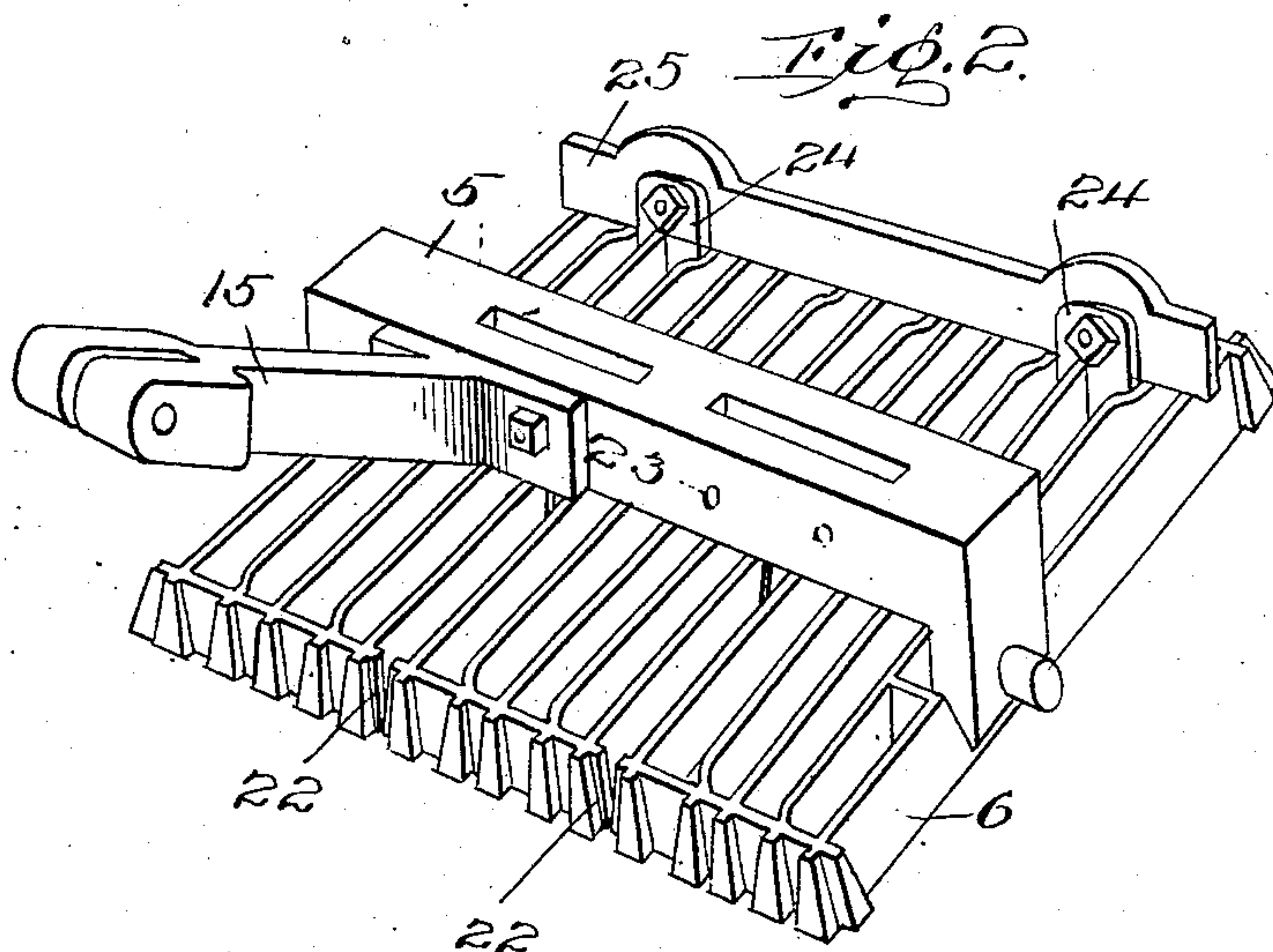
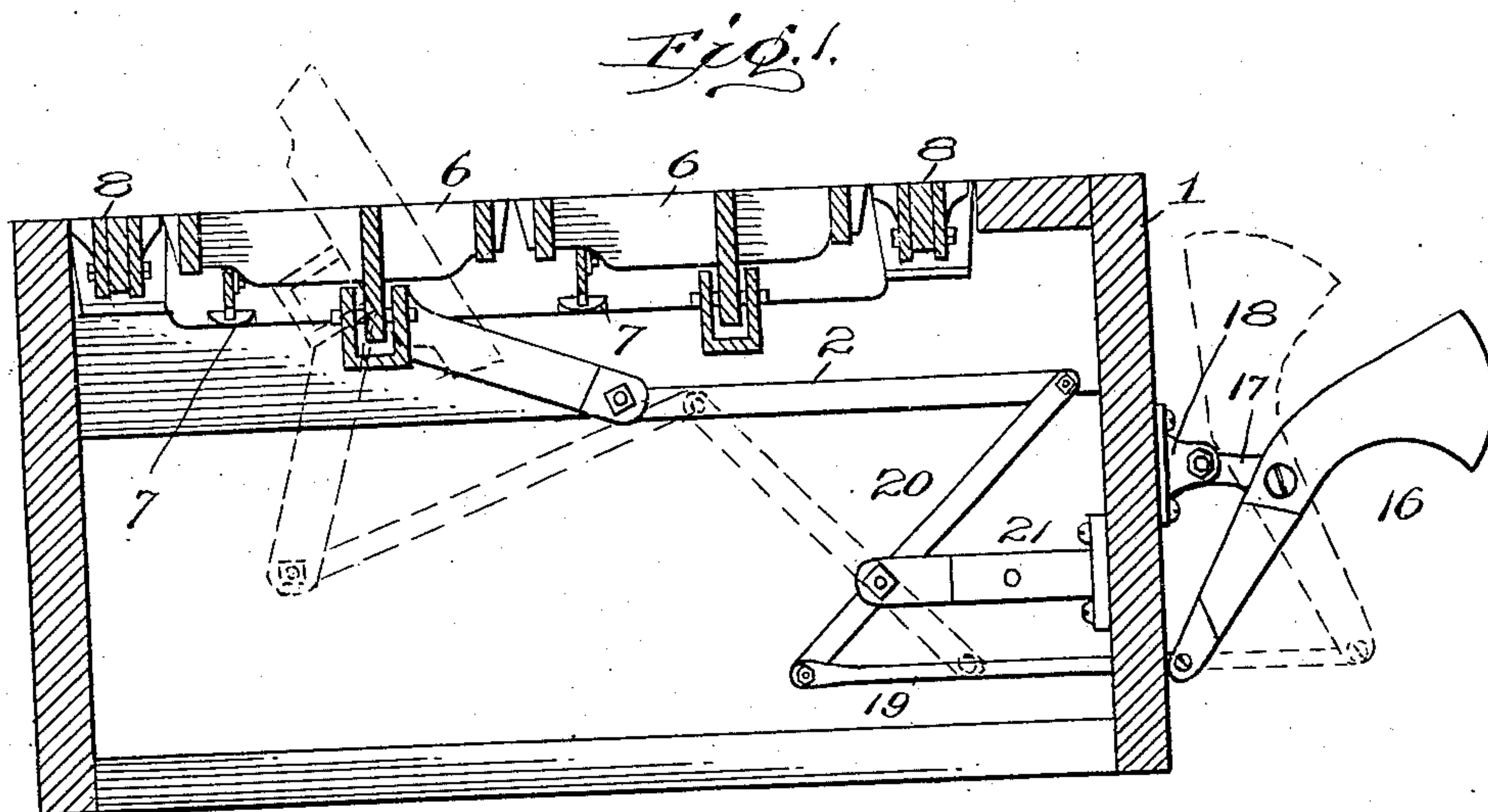


No. 854,485:

PATENTED MAY 21, 1907.

E. GIBSON.  
FURNACE GRATE.  
APPLICATION FILED APR. 4, 1906.

2 SHEETS—SHEET 1.



Inventor

*Edward Gibson*

Witnesses

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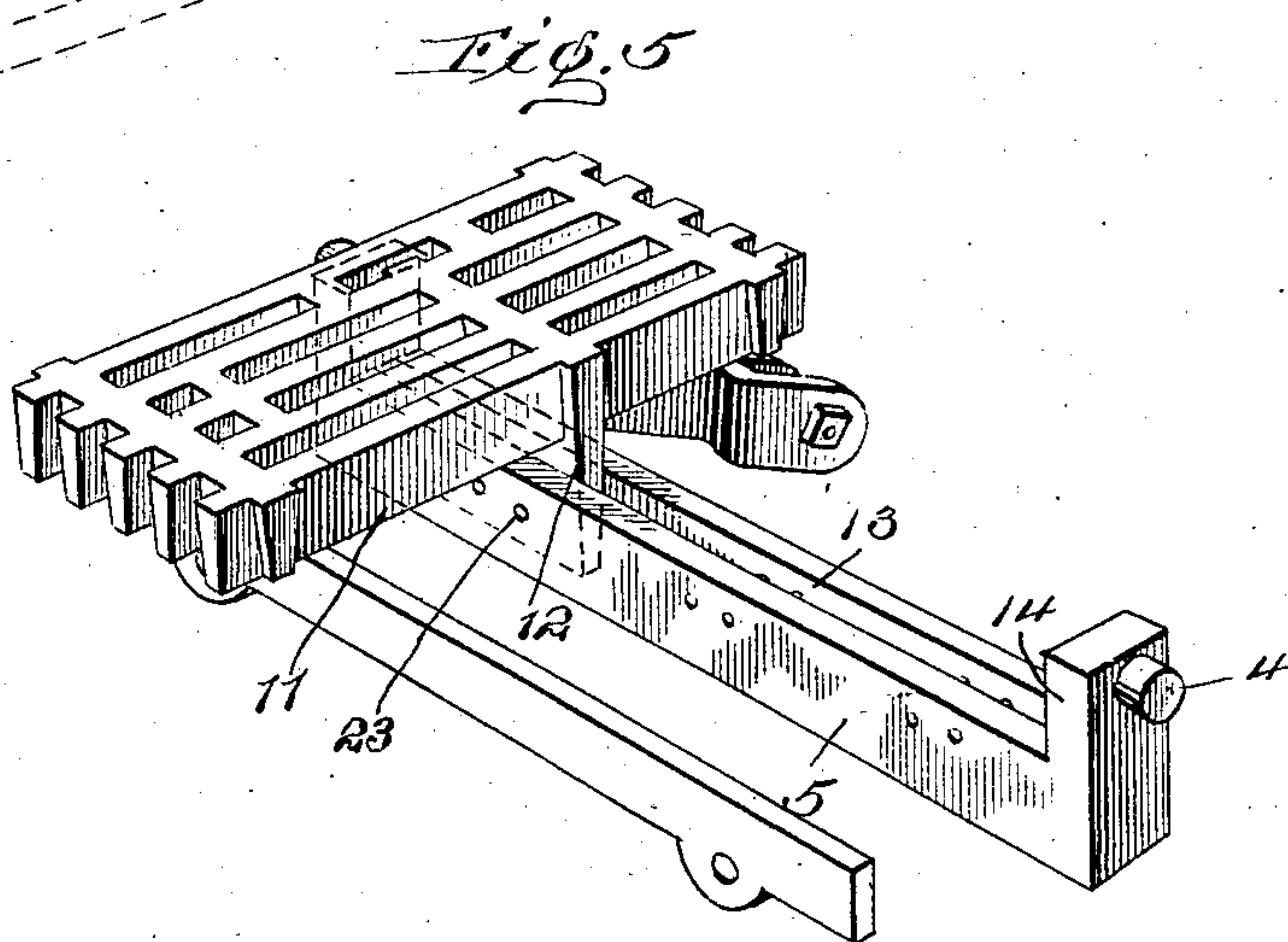
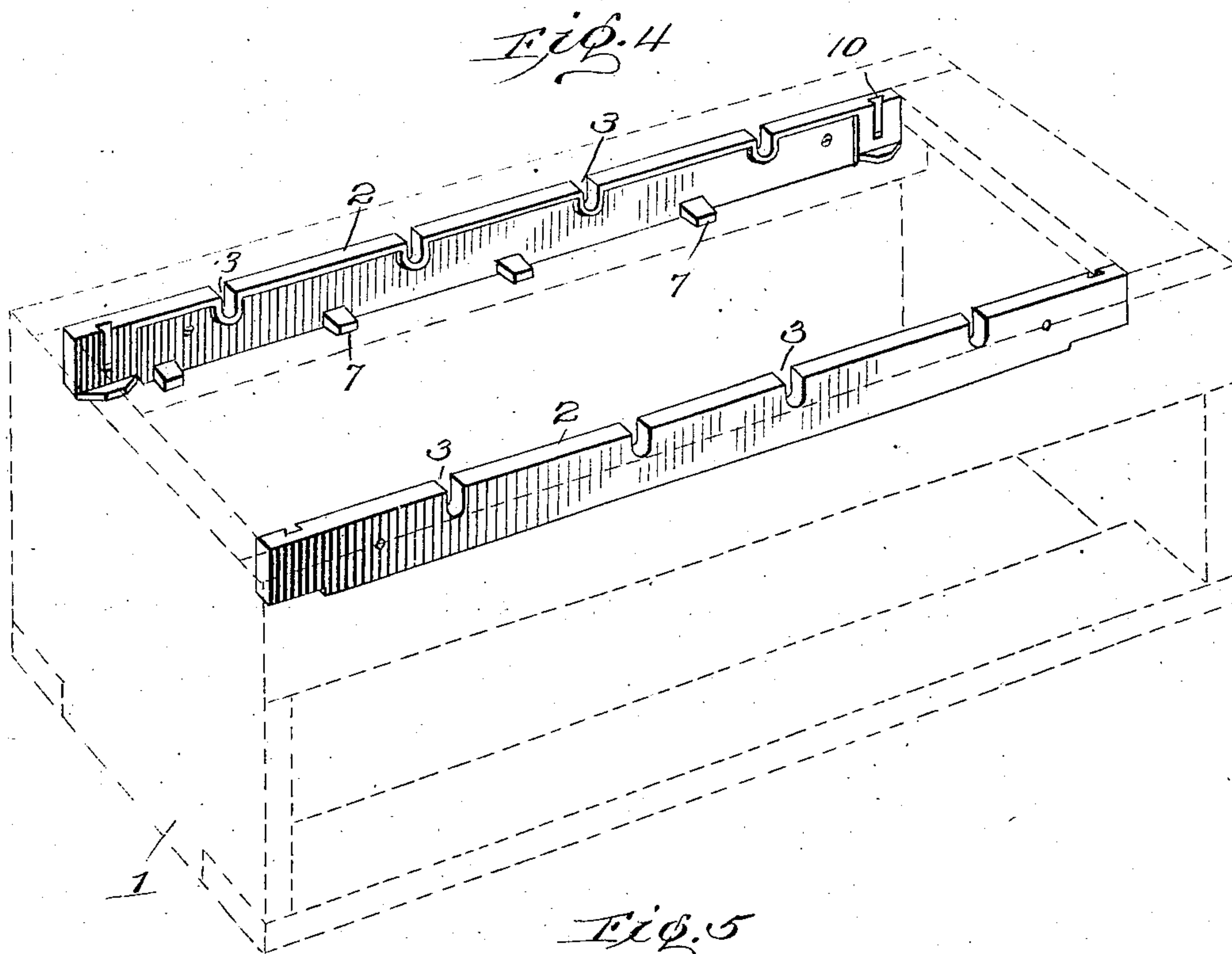
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

EDWARD GIBSON, OF FRENEAU, NEW JERSEY.

## FURNACE-GRATE.

No. 854,485.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed April 4, 1906. Serial No. 309,862.

*To all whom it may concern:*

Be it known that I, EDWARD GIBSON, a citizen of the United States, residing at Freneau, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Furnace-Grates; 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 furnaces and more particularly to grates for furnaces.

The invention consists in certain novel constructions, combinations and arrangement of parts which will be hereinafter described and claimed.

In the accompanying drawing:—Figure 1 is a vertical section through a furnace showing one of the embodiments of my invention. Fig. 2 is a perspective view of one of the dumping grate sections shown upside down with the rocking bar and bearing bar in position. Fig. 3 is a top plan view of the stationary bars secured at each end of the furnace. Fig. 4 is a perspective view of the iron frame work supporting the grate and also showing a brick foundation in dotted lines. Fig. 5 is a perspective view of a rocker bar with one of the sections of the grate in position thereon with bearing bar in place.

In the preferred embodiment of my invention, I mount my grate in the usual foundation or frame work as 1. In placing my grate structure in the furnace, I first secure in position two supporting bars as 2—2 in the brick foundation 1, as will be clearly seen in Fig. 4. This frame work is made from castings and has any suitable number of bearing apertures as 3—3 to accommodate the journals 4 of the rock bar 5. These bearings are made so as to allow the rock bar to be placed in position from above, the weight of the grate holding the same in position thereafter. Approximately midway between the bearings 3—3 are located lugs 7—7 cast integral with the bars 2—2 which form stops for arresting the downward movement of the grate sections 6. At each end of the furnace is placed a stationary grate 8—8 of any suitable width. This stationary grate is preferably secured in place by having a mortise 9 cast on each end thereof and placed in a tenon 10 in the supporting bars 2—2. Any number of dumping grate sections 6 may be used

and when four or more are used, it will be evident that they may be all dumped together or the forward bars be arranged to dump toward the center and the rear bars arranged to dump also toward the center, or they may be arranged as disclosed in the drawing, so as to all dump in the same direction and therefore, evenly distribute the ashes over the floor of the ash-pit.

The grate sections 6 are made from any suitable number of comparatively small sections 11, as will be seen in Figs. 2 and 5. These grate sections 11 are made with ribs and openings as clearly shown in Fig. 5. A securing lug or tongue 12 is cast integral with each of the sections 11 and is located a trifle nearer one end of said bar than the other. It is cast in this way so as to swing the section 11 by gravity always in one direction, so that when it is located in the frames 2—2, it will always come to rest on one of the lugs 7—7. The tongue 12 is secured in the slot, pocket or recess 13 in the rocker bar 5, as will be clearly seen in Fig. 5. Near one end of each of the grate sections 11, is cast integrally therewith, a lug 24. A bearing bar 25 is removably secured to each of said lugs 24 and in this way assists the tongue 12 in retaining the sections in correct relation to each other.

Rocker shaft 5 is preferably cast in one piece with the slot or pocket 13 running at full length in which any suitable number of sections 11 may be secured. The main body portion of this rocker shaft is of a rectangular shape and having at its ends a turned up portion 14 upon which the journal 4 is cast. At any suitable place along the main body portion of the rocker shaft 5 is preferably bolted to the rocker shaft 5, an arm 15, as will be clearly seen in Fig. 2. Secured to the outer end of the arm 15 is a system of levers for dumping the rocker shaft 5, and all the grate sections carried by the same.

The system of levers for rocking the grate sections 6 consists preferably of a stub arm 16 pivotally secured by suitable means as link 17 and bracket 18 to the outer wall of the base 1, a link 19 pivotally connected at one end to the lower end of the stub lever 16 and at the other end to a lever 20 pivoted in a suitable bracket as 21, and a connecting link 22 pivotally secured to the arm 15. By this system of levers, when it is desired to dump one of the grate sections 6, it is only necessary to insert a bar in the end of the stub lever 16 and push upward on the same. This will



operate levers 19, 20 and 22 and force arm 15 downward to the position shown in dotted lines in Fig. 1, and thus dump the grate section 6.

5 One of the important features of the invention is the particular form of rocker shaft or bar 5, which is so arranged as to be capable of receiving a number of relatively small sections, as 11.

10 The idea of casting a large number of grate sections as 11, and then assembling the same in a rocker bar with suitable space left between said sections, as 22 for expansion, is another important feature of this invention. By  
15 this construction of rocker bar with a slot or pocket formed therein for assembling small units or sections of the grate, strength is produced at the point of greatest strain. By forming the grate bars in small sections with  
20 a center tongue or rib 12 depending from the grate bar near the center of the section and fitting into the slot or pocket of the rocker bar, a grate is secured which is reinforced where the greatest strain is applied to the  
25 webs of the grate sections. By the casting of the grate in a number of small sections, warping and jamming in the furnace is avoided, because the small sections secured to the rocker bar 5 at suitable distance apart,  
30 allows for the expansion of the metal and thus gives the maximum service possible to secure.

In case any one place in the furnace should burn out, it will be comparatively easy to remove one or more of the small sections 11, by  
35 knocking out the retaining pin 23 and then inserting new sections in place. In this way, simply the parts that wear the fastest and are burned out, are renewed and not the entire grate, as in the furnaces heretofore in  
40 use. By this construction of a number of small sections or units, a furnace grate will cost to maintain, considerably less, than those now in use.

When it is desired to clean the fire, the un-  
45 burned coal and live fire are forced back from the first one or two of the grate sections 6 as may be desired and then the same are dumped by operating stub lever 16. After they have been placed in position, the fire is pulled for-  
50 ward upon the clean grates and the rear grates are dumped in the same manner as the forward grates. The fire is then evenly distributed over the entire grate and replenished as may be desired.

55 By the construction of the grates in small sections, expansion has been provided for

and by the construction of the sections 11, air may be forced up through the same directly into the fire without causing eddies or in any way disturbing the even burning of  
60 the coal.

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

1. In a grate, a frame provided with  
65 notches projected from its upper edge, lugs carried by the frame pieces between and below the notches, a rocking bar provided with alined trunnions proportioned to be journaled in the notches, grate sections provided with  
70 means for interengagement with the rocking bar, and a connecting bar provided with means for interengagement with the several grate sections, and for contact with the lugs.

2. In a grate, frame pieces provided with  
75 bearing notches projected from its upper edge, lugs formed upon the inner surface of the frame pieces between and below the spaced notches, a rocking bar comprising spaced side bars, and upturned end portions,  
80 alined trunnions carried upon the extremities of the upturned portions and proportioned to be journaled within the notches, grate sections provided with means for interengagement with the side bars of the rocking bar,  
85 and a connecting strip rigidly secured to the grate sections and positioned for engagement with a lug.

3. In a grate, a frame provided with  
90 alined bearing notches formed in its opposite sides, lugs formed upon the inner surface of the frame and between and below the bearing notches, a rocking bar comprising spaced side bars and upturned end portions, alined  
95 trunnions formed upon opposite faces of the upturned ends and proportioned to be journaled in the bearing notches, grate sections provided with webs adapted to be inserted and secured between the side bars of the  
100 rocking bar, a connecting strip rigidly secured to the several grate sections, and positioned to contact with and bear upon one of the lugs, an arm rigidly carried by and obliquely to the rocking bar, and means connected with the arm for moving the rocking  
105 bar angularly upon its trunnions.

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

EDWARD GIBSON.

Witnesses:

RALPH CONRAD,  
ELIZABETH CARTY.