

2 Sheets—Sheet 1.

Patented Dec. 10, 1895.



INVENTOR
Edward Foles
By J.R. Nottingham atty.

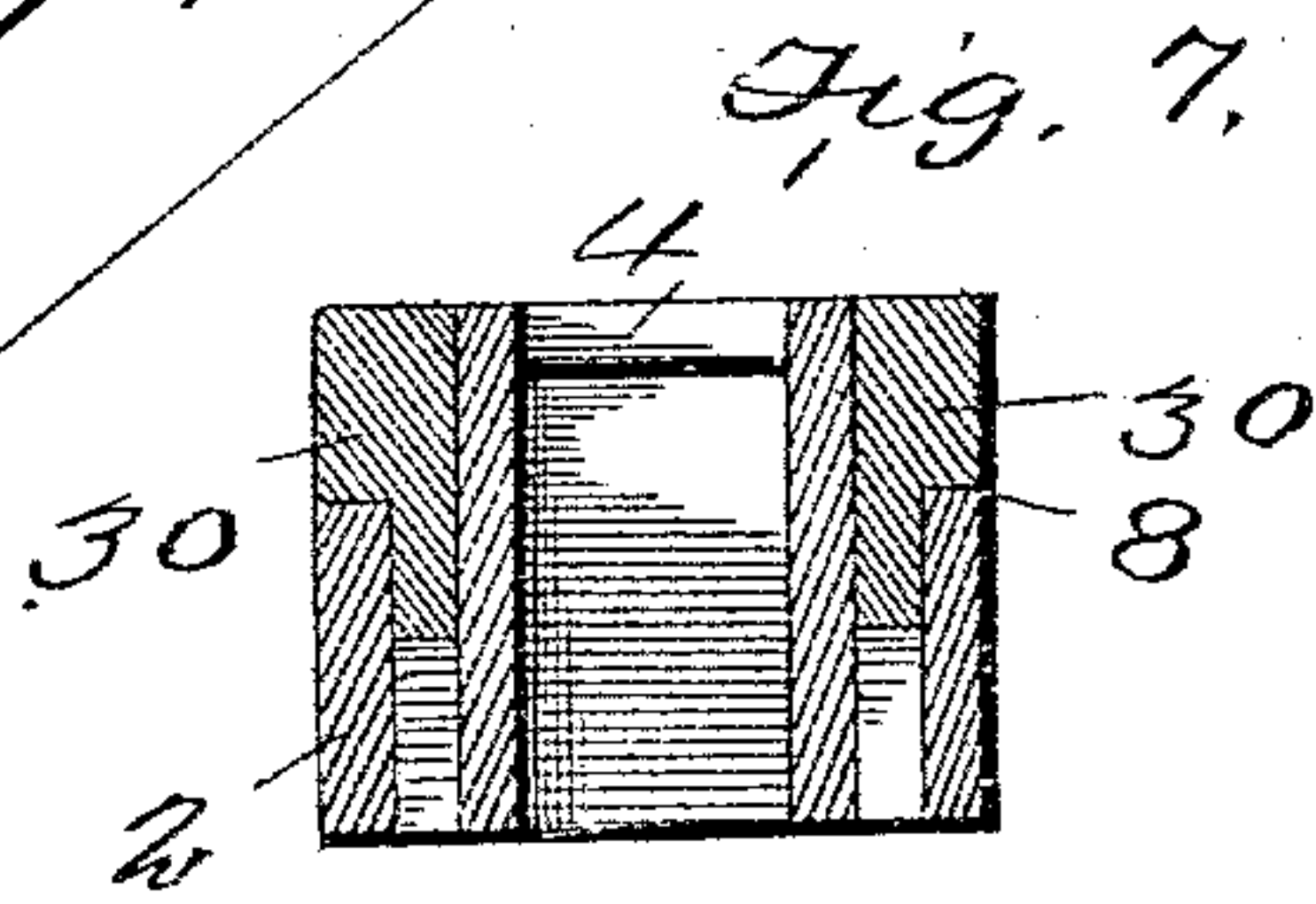
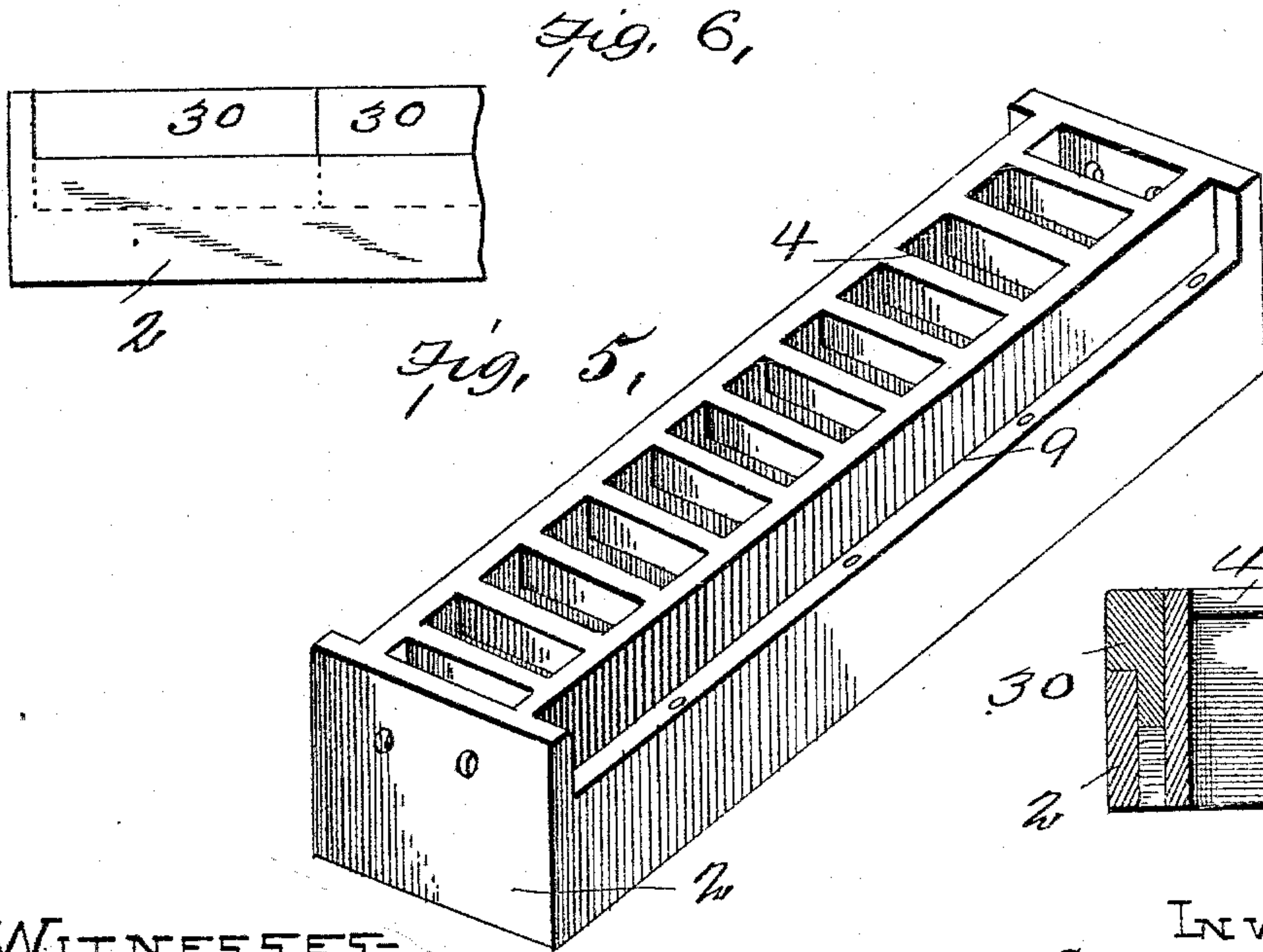
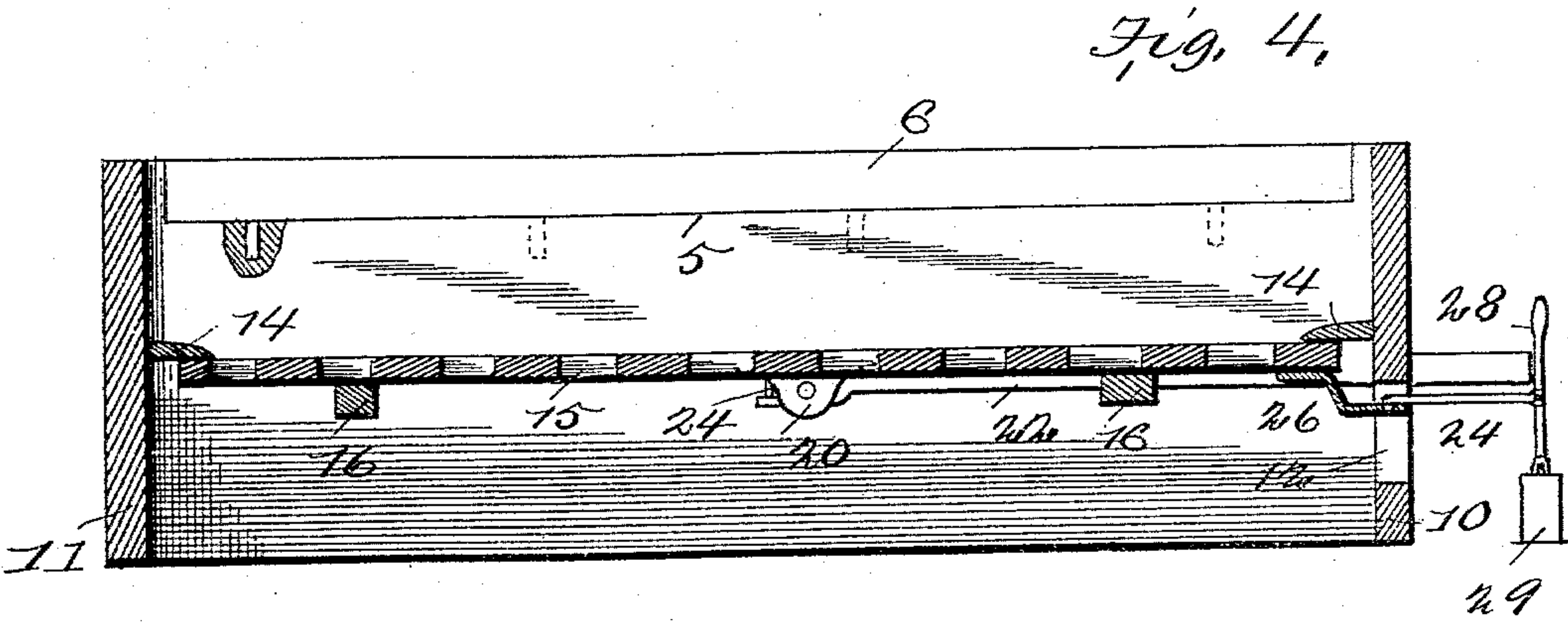
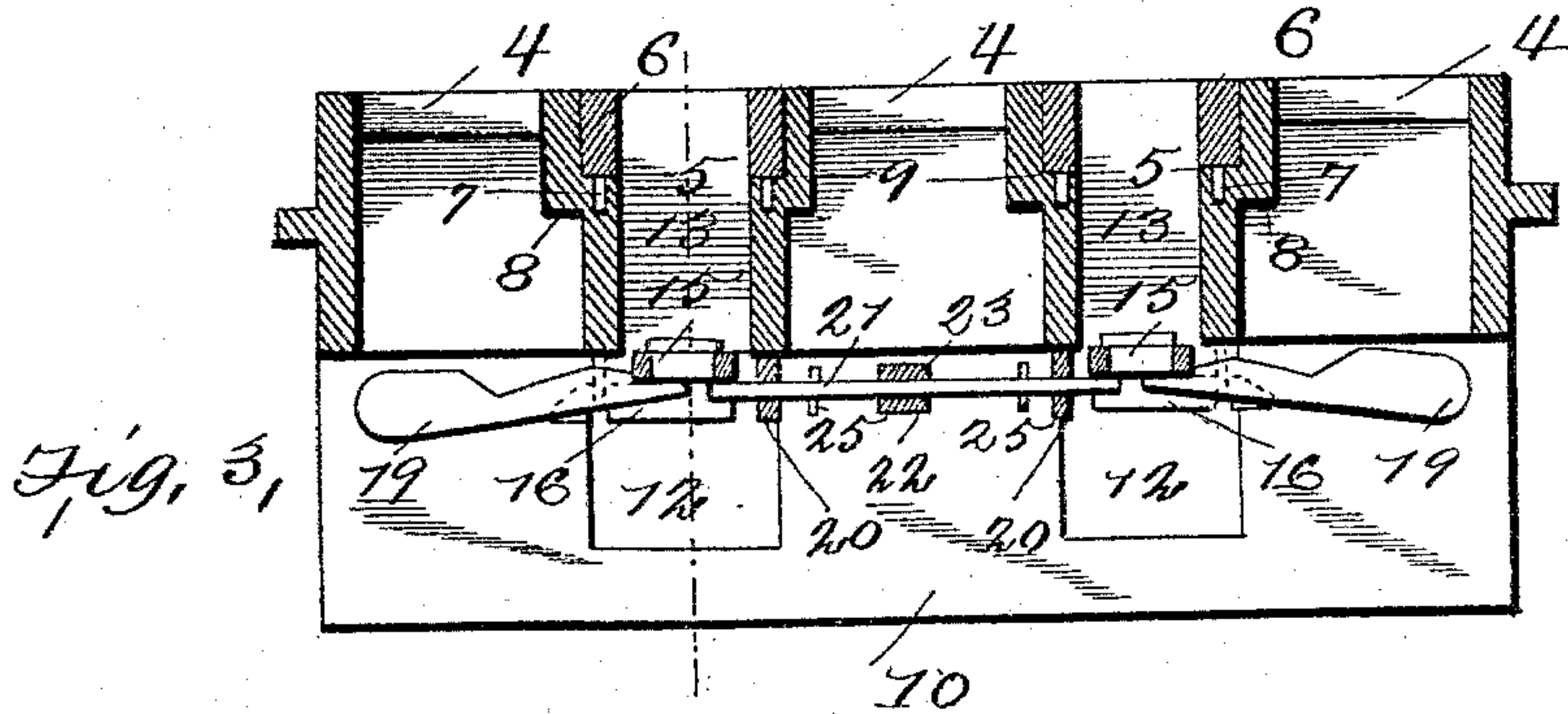
(No Model.)

2 Sheets—Sheet 2.

E. FALES.
FURNACE GRATE.

No. 551,269.

Patented Dec. 10, 1895.



WITNESSES
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UNITED STATES PATENT OFFICE.

EDWARD FALES, OF WINTHROP, MASSACHUSETTS.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 551,269, dated December 10, 1895.

Application filed June 12, 1895. Serial No. 552,536. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FALES, a citizen of the United States, residing at Wintthrop, in the county of Suffolk and State of Massachusetts, 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 certain improvements in that class of grates which are provided with a series of grate-bar sections arranged alternately in different horizontal planes, the spaces between the upper and lower grate-bar sections forming pockets for the fuel, such grates being technically known as "pocket grates."

In this class of grates it has been found that the upper edges of the sides of the pockets, owing to the intense heat at the plane in which they lie, rapidly burn out, rendering the grate-bar sections useless, and one object of the invention is to obviate this objection, which I do by forming such edges of refractory material in the manner hereinafter to be described.

Another object of the invention is to provide for the shaking and dumping of this class of grates, and this is accomplished by the novel arrangement of the lower grate-bar sections, as will be hereinafter more fully explained and specifically set forth in the claims.

The above-mentioned objects are attained by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a top plan view of my improved grate; Fig. 2, a bottom plan view; Fig. 3, a transverse vertical section through the center of the grate; Fig. 4, a longitudinal vertical section through one of the pockets; Fig. 5, a perspective view of the central grate-bar section; Fig. 6, a side elevation of a portion of the said central section, showing a modified form of the slabs of refractory material and manner of providing the upper edges with said slabs; and Fig. 7, a transverse section of the same.

Referring to the drawings, the numerals 1 2 3 indicate a series of grate-bar sections, three

of such sections being shown in the present instance, although a less or greater number may be employed, if desired. The sections consist each of a rectangular oblong frame having parallel imperforate sides and ends and an open bottom. The tops of the frames are provided with transverse bars 4, which serve to brace the sides of the frame and between which air is admitted to the fuel, said bars and frame being cast integral. The inner upper edges of the side sections are formed with longitudinal rabbets 5, which constitute seats for strips or slabs 6 of refractory material, preferably metal, which are held in place by pins or keys 7, or in any other suitable manner, and the inner sides of the frames, opposite said rabbets, are formed with offsets 8, to permit the formation of the rabbets without requiring an undue thickness of metal, thus reducing the weight of the sections. The strips or slabs of refractory material, when in place, have their upper edges flush with the upper edges of the frames, as shown.

The central section of the grate is constructed with rabbets 9 at both upper side edges, similar to those of the side sections, but in other respects is constructed in the same manner as said side sections.

The numerals 10 and 11 indicate two plates which form, respectively, the front and rear of the grate. The front plate is provided with doors 12 leading to the ash-pit below the grate-bar sections. The said sections are rigidly secured at their ends between the front and rear plates in such manner that their upper surfaces will be flush with the upper edges of said plates, the sections being so placed that spaces or pockets 13 will be formed between them, as shown in the drawings. The front and rear plates on the inner side are provided with ledges 14, preferably cast integral with said plates, which ledges extend into the pockets at the ends thereof above the lower edges of the plates.

The numeral 15 indicates two reciprocating grate-bar sections which form the bottoms of the pockets. Each section, at one side thereof, is provided with lugs 16 having slots 17, whereby said sections may be hinged to brackets or staples 18, which are cast in or fastened to the lower inner edge of the respective side sections, in such manner that said reciprocating

ing sections may have a longitudinal movement, for the purpose of shaking, and swing thereon in order to dump the grates. The reciprocating sections are provided with weights 19 on their hinged sides, which partly counterbalance the sections, so as to facilitate their manipulation.

The lower edges of the central section, about midway between their ends, are provided with hangers 20, which may be cast integral therewith or formed separately and bolted thereon, said hangers being provided with bearings for a sliding bolt 21, which is of such length and so arranged that, when in normal position, it will support the reciprocating sections at their inner edges, and when moved to either side will release one of the sections in order to dump it without releasing the other, thus permitting but one section to be dumped at a time.

The numeral 22 indicates a lever which is fulcrumed in an opening 23 in the front plate of the grate. The inner end of the lever is bifurcated and straddles the sliding bolt, a pin 24 being provided to prevent it from being drawn off of said bolt. At each side of the lever the bolt is provided with pins 25, against which the end of the lever strikes to move said bolt laterally. The respective ends of the reciprocating sections set under the ledges 14 on the front and rear plates, said ledges serving to prevent pieces of coal and cinders from getting between the ends of said reciprocating sections and thereby interfering with the free manipulation of the sections. The forward end of each section is provided with an angle-bracket 26, which is preferably cast integral therewith, or may be bolted thereon, each bracket being perforated to receive the bent end of a rod 27, by means of which the section is reciprocated to shake the ashes. The rod, at its outer end, is pivoted to a lever 28, whose lower end is forked to straddle a staple in the upper end of a short post or standard 29, secured to the floor of the furnace-room in a suitable position in front of the respective ash-pit doors. The lever being being detachable, when not in use it may be removed, with its rod, from its connection with the staple and placed aside.

In the modification illustrated in Figs. 6 and 7 the central grate-bar section is shown formed with double side walls, the outer walls being lower than the inner walls, so as to form rabbets or seats for the thickened portion of rabbeted slabs or blocks 30 of refractory material, the thin portion of said slabs or blocks being seated in the spaces between the inner and outer walls of the section.

The inner side of the respective outside sections may be similarly constructed and provided with the rabbeted slabs or blocks of refractory material.

It will be evident that the improvements herein described may be applied to pocket-grates of a circular form, and I therefore do not wish to be understood as limiting the invention to grates of a rectangular form.

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

1. A grate-bar section having its sides joined and braced by short cross-bars and its side edge or edges rabbeted to form a seat or seats, and a slab or slabs of refractory material secured in said seat or seats and abutting one of said sides, substantially as specified.

2. A grate-section constructed with parallel double side walls, the outer walls being lower than the inner walls and arranged to form seats for rabbeted blocks of refractory material, substantially as specified.

3. The combination, with the side and center grate-bar sections having double parallel side walls arranged to form seats and spaces of rabbeted slabs of refractory material having the thin portion seated in the spaces and the thick portion in the rabbets, substantially as specified.

4. In a pocket grate, the combination of two or more grate-bar sections, arranged contiguous to each other to form a pocket or pockets of uniform width and having one or both side edges rabbeted, and a slab or slabs of refractory material seated in said side edge or edges, flush with the side or sides of said sections, substantially as specified.

5. The combination, with two or more grate-bar sections, arranged to form a pocket or pockets, of a reciprocating grate-bar section below each pocket and supported, at one side, by means of slotted lugs engaging depending hangers or brackets attached to the side of one of the grate-bar sections, whereby the reciprocating section may be given a reciprocatory movement, and supported at the other side by means of a sliding-bolt, substantially as specified.

6. The combination, with two or more grate-bar sections, arranged to form a pocket or pockets, of a reciprocating grate-bar section arranged below each pocket and having slotted lugs which engage depending hangers or brackets secured to one side of the grate-bar sections, whereby said reciprocating section has a longitudinal movement thereon, a sliding-bolt for normally supporting the free edge of the reciprocating section, and means for reciprocating the same, substantially as specified.

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

EDWARD FALES.

Witnesses:

E. A. PAUL,

J. R. NOTTINGHAM.