

E. A. WILDT.
GRATE BAR.

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944,162.

Patented Dec. 21, 1909.

Fig. 1.

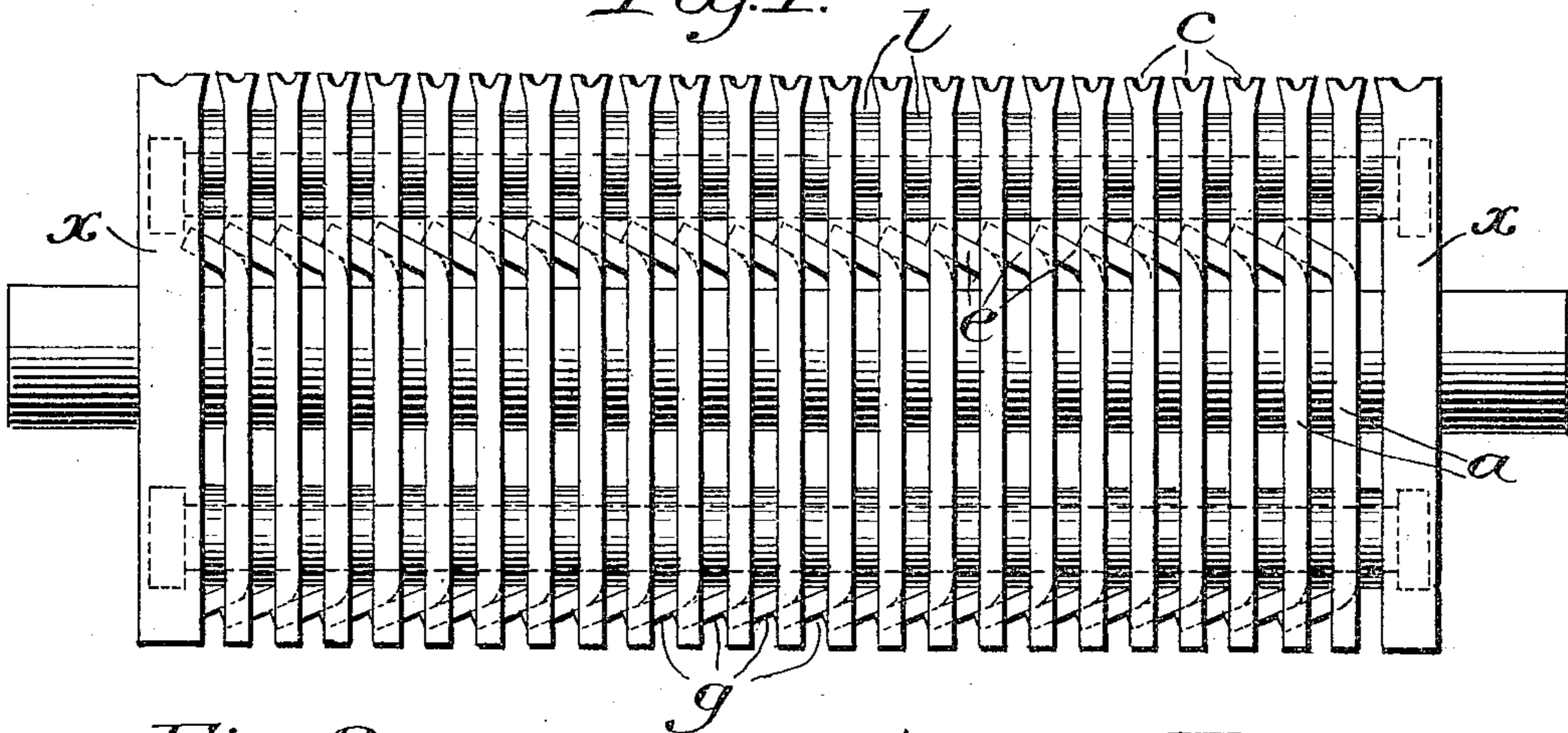


Fig. 2.

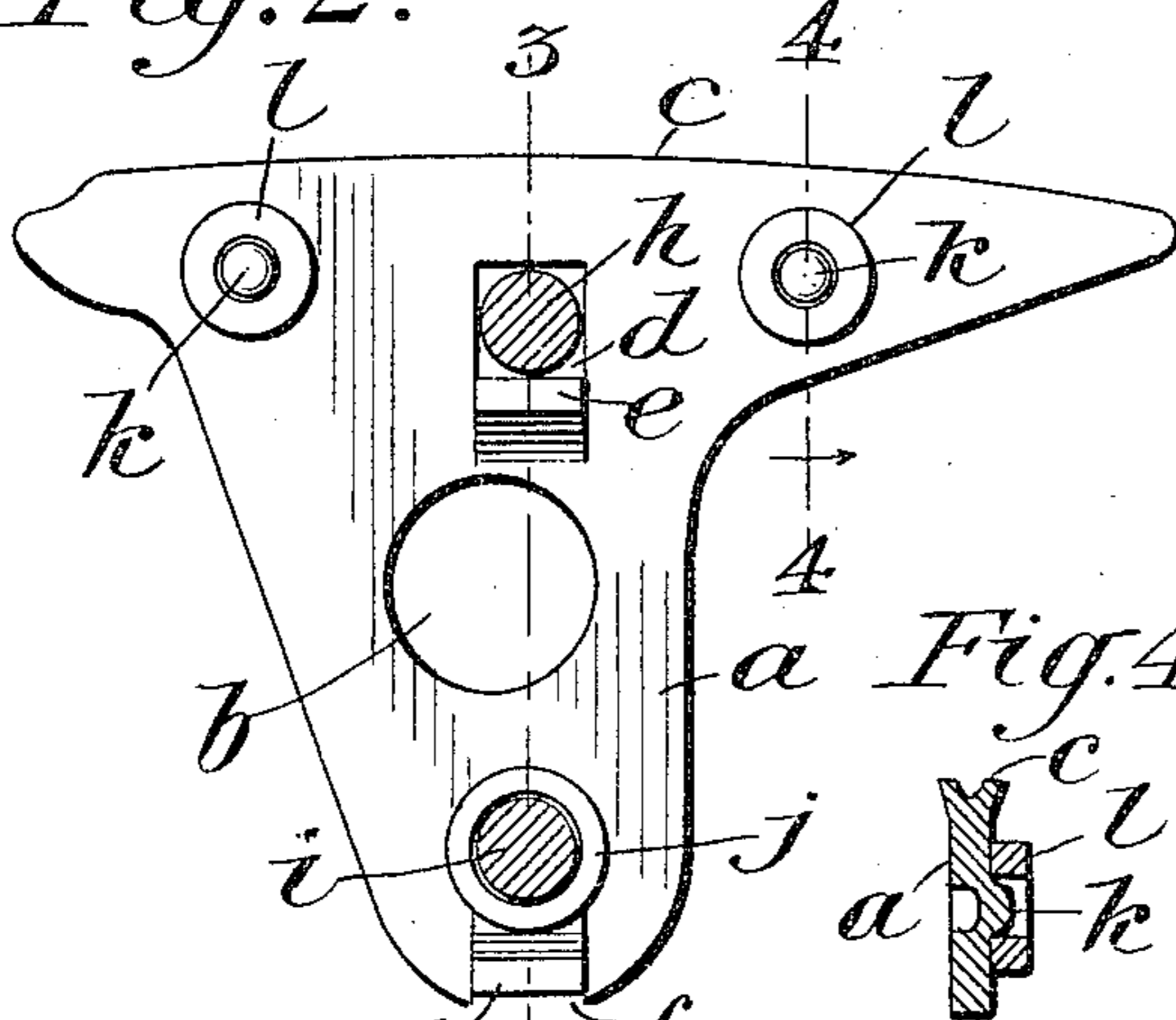


Fig. 3.

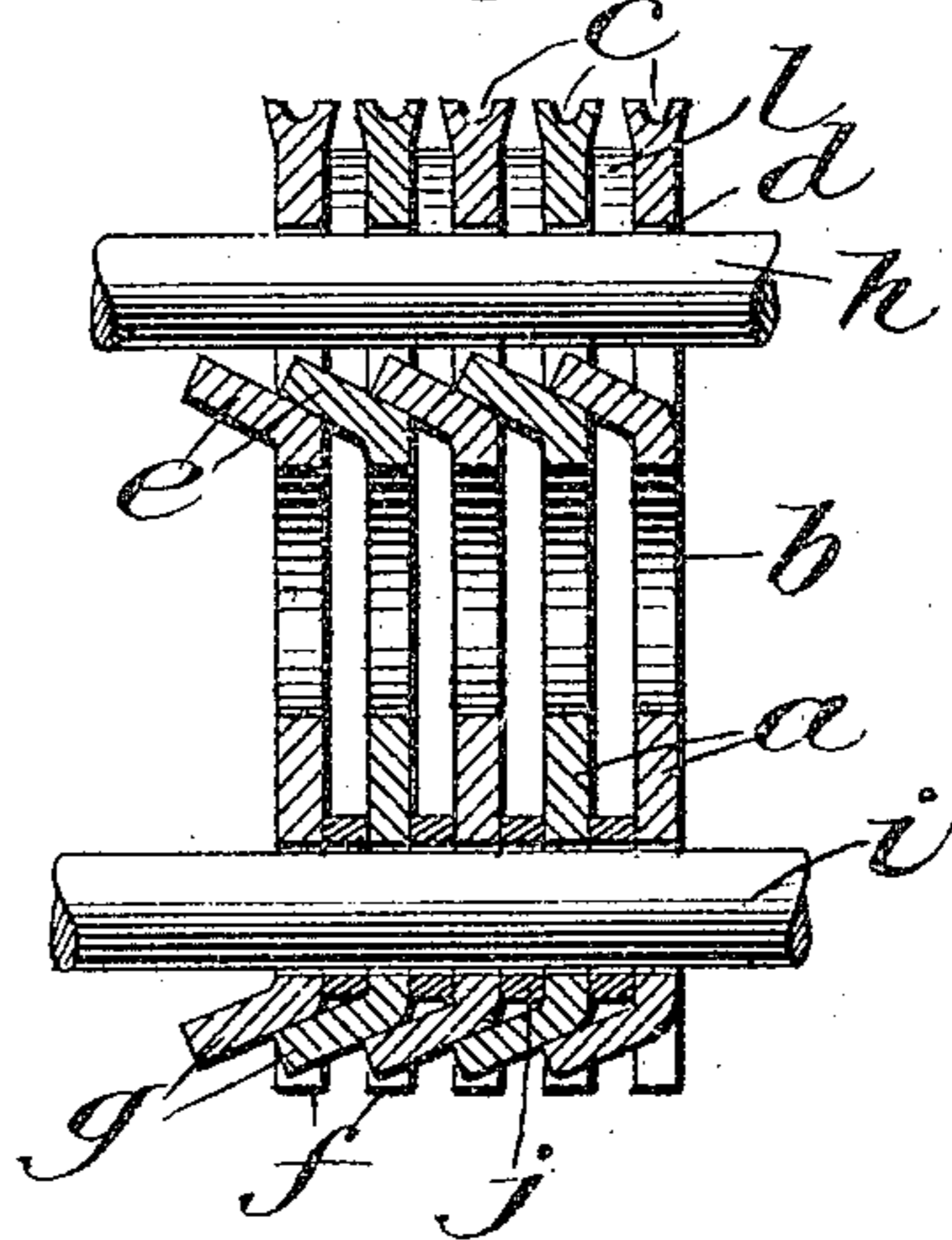


Fig. 4.



Fig. 5.

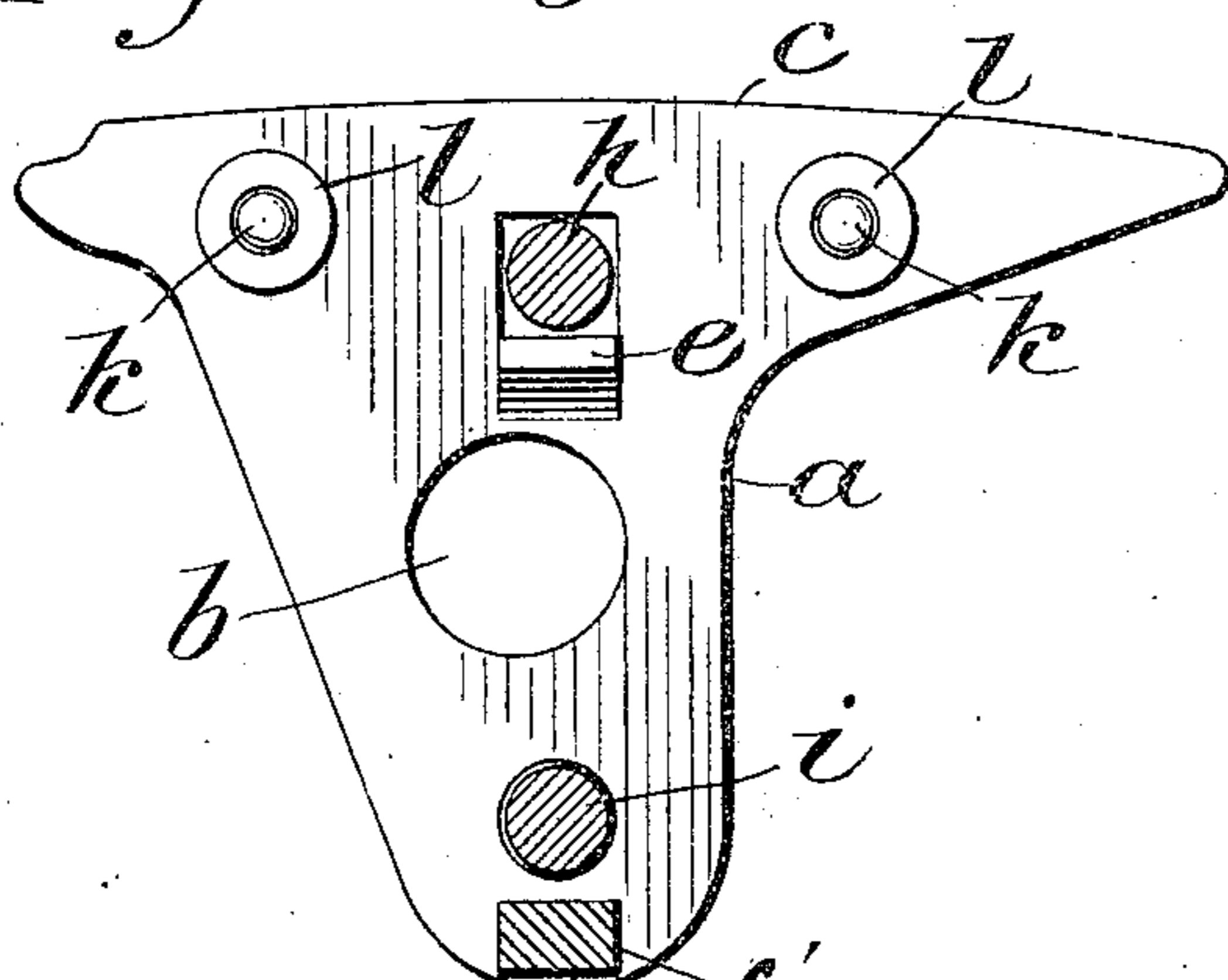
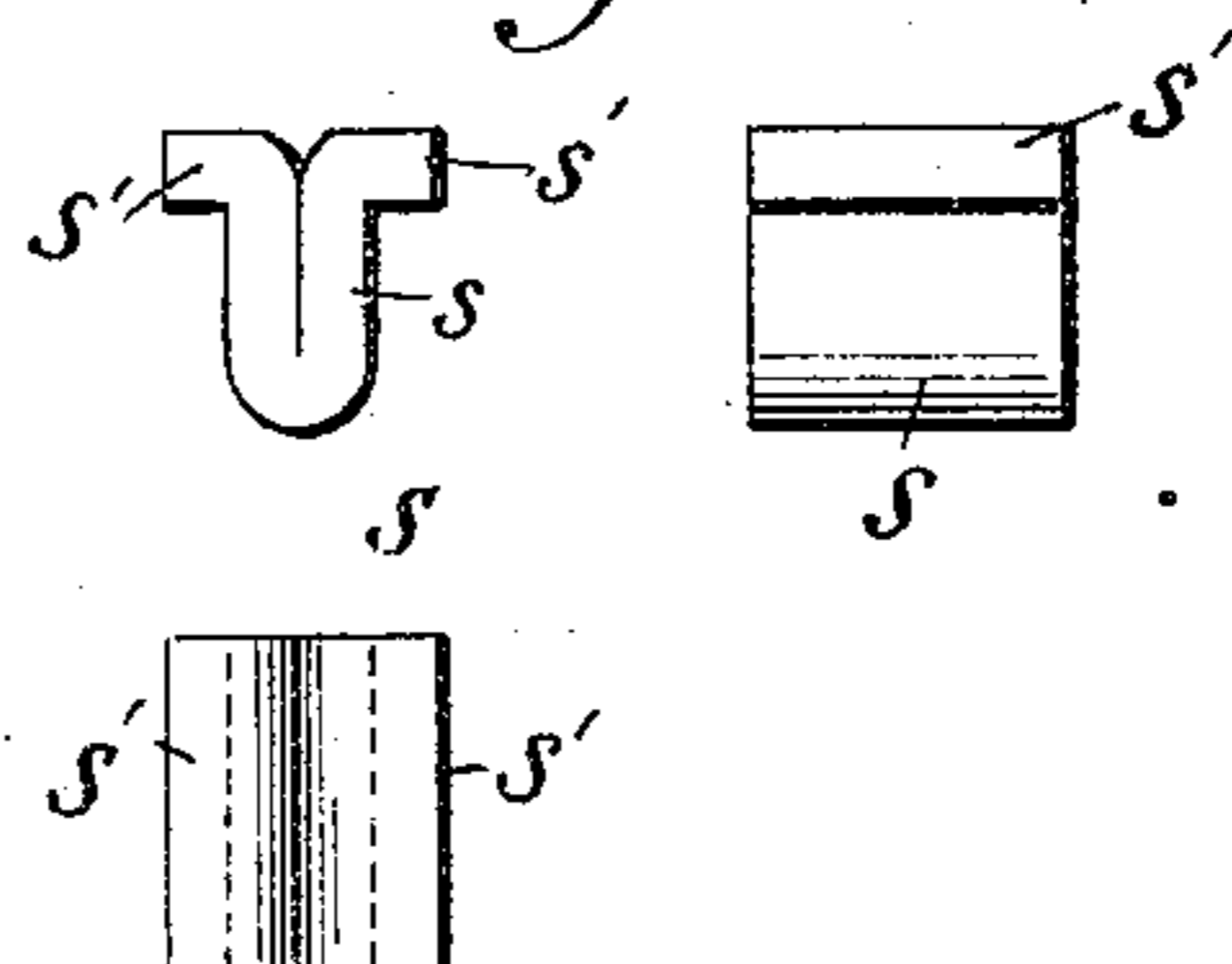


Fig. 6.



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UNITED STATES PATENT OFFICE.

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GRATE-BAR.

944,162.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD A. WILDT, a citizen of the United States, residing at Scranton, county of Lackawanna, State of Pennsylvania, have invented certain new and useful Improvements in Grate-Bars; 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.

The invention relates to sectional grate bars, and more particularly to that class of fuel supporting devices known as rocking grate bars, in which each bar is made up of a plurality of transverse sections, and the object of the invention is to provide a grate bar that is simpler in construction, more durable in operation and considerably cheaper to produce than sectional bars as heretofore manufactured.

To this end the invention comprises a grate bar made up of a plurality of transverse interlocking sections, each section being preferably and conveniently formed as a sheet metal stamping, having a portion of the body thereof partially punched out and bent laterally to form a lug adapted to engage with the orifice left by the like lug in the adjacent section, the several sections necessary to constitute the bar being assembled with the lugs engaging the corresponding orifices in adjacent sections, whereby the several sections are interlocked, the whole being rigidly connected by a tie bar or tie bars which extend through the grate sections and are secured to the end sections of the grate bar which may, if desired, be made as castings. In order to increase the fuel supporting surface of the composite bar as thus constructed, the upper edge of each section is spread or upset laterally.

These and other objects of the invention will appear more particularly in the following specification.

In the accompanying drawings, Figure 1 is a front elevation of a grate bar constructed in accordance with this invention. Fig. 2 is a cross section through the grate bar showing one of the sections in elevation. Fig. 3 is a cross section taken on line 3—3 of Fig. 2. Fig. 4 is a cross section taken on line 4—4 of Fig. 2. Fig. 5 is a view similar to Fig. 2 showing a modified construction. Fig. 6 illustrates a modification of the interlocking means in end, side and plan views.

Referring to the drawings, it will be noted that the grate bar comprises a plurality of transverse sections *a*, each of which is preferably formed as a stamping, from wrought iron of appropriate thickness which permits the grate to withstand a much higher heat than the ordinary cast iron grate, and also admits of the sections being formed with great regularity and comparatively low cost, by means of a suitable press. While the particular shape of the sections indicated in the drawings has been found advantageous, it will be understood that the invention is not limited to any specific shape. Each of the plates *a* is provided with an orifice *b*, adapted to receive the usual supporting bar upon which the grate bar is rocked and in its preferred form, each of said sections is also provided with two lugs *e* and *g* which are formed by punching rectangular sections from the upper and lower body portions of each section *a*, each of said punched sections being severed from the main body at all points except one edge, and then bending the punched portions laterally so that the lug on one section will overlie the lug on the next section and extend into the orifice from which the latter was punched, the peculiar interlocking of the lugs and orifices being more particularly illustrated in Fig. 3.

The orifice or opening *d* left in the body of each plate when lugs *e* have been bent outward serves to receive a tie rod *h* which binds the several elements of the grate together. A similar tie rod *i* may be passed through orifices punched in the several grate sections near the lower portions thereof. The bending up of the lateral lugs *g* at the bottoms of the sections causes a number of open ended slots *f* to be formed, and into each of these slots the lug of the adjacent section projects, the lugs *g* overlapping each other as indicated above. In order to space the grate sections apart accurately and regularly, it is found convenient to employ washers of wrought iron which are applied between each of the grate sections, the lower washers *j* being mounted on the tie rod *i*, as indicated in Figs. 2 and 3, while the upper spacing washers *k* are supported on bosses *l* formed on one face of each section by partially punching the metal from the opposite face of the section, as more particularly indicated in Figs. 2 and 4. It will be apparent that each plate or section may be formed as an entirety at a single operation, that is to

say, the plate may be stamped out from a sheet of metal in its ultimate form, the lugs *e* and *g* punched therefrom and given the required bend, and lugs *l*, *l* produced by the same die which stamps the plate and forms the opening *b* for the supporting bar and the smaller opening at the lower part of the section for the lower tie bar.

In order to increase the supporting surface for the fuel, the upper and slightly curved edge *c* of each section is spread or upset laterally, which may be effected in any desired manner as by running an upsetting roller along the edge.

It will be understood that the finished grate comprises a series of individual sections *a* held between two end sections *x*, *x*, which may be of cast steel, or the like, by means of the tie rods *h* and *i*, and to assemble the various parts necessary to constitute such a grate, the requisite number of sections *a* are placed one upon another with the lug *e* of each section engaging and overlying the corresponding lug of the next section and interlocking with the orifice *d* from which the lug was struck. Before each section is applied to the next subjacent, the washers *j* and *l* are slipped in place, which insures that the several sections will be maintained at the proper distance apart. After the requisite number of sections have been thus built up, they are placed in a hydraulic or other suitable press to force them together, after which the end sections *x* are applied and the tie rods *h* and *i* tightened up. By this means, a perfectly straight rigid bar without twist or wind is produced, and it will be noted that inasmuch as all of the sections are of uniform size and formed of stampings, the production of the individual sections and the assembling of the same may be effected with great facility and without the necessity of machining or working the sections down to a proper size and fit, as is always necessary where the sections are made as castings.

Instead of forming the interlocking lugs *g* on the lower portion of each section, I sometimes find it convenient to cut an open ended slot *f'* at the lower end of each section, the several slots alining when the sections are assembled so as to receive a spline-like bar *g'*, which is driven in with considerable force and serves to lock the sections rigidly together at their lower portions. The bar *g'* may be removed from the slots of the sections by a movement solely in a downward direction, just as is the case with the locking lugs *g* in the construction shown in Figs. 1 to 3, as these locking lugs can be

moved downward out of their slots when the grate bar is taken apart.

In some cases it may be found convenient to dispense with the integral lugs *e* or *g*, or both, and to employ the separate interlocking separators *s*, shown in Fig. 6, each of which comprises a strip of sheet metal bent in *U* form and provided with two angularly disposed ears *s'* which enter the punched orifices in adjacent sections *a* and serve to lock the sections together transversely and at the same time separates adjacent sections similarly as do lugs *e* and *g* and washers *l* and *j*.

What I claim is:—

1. A grate bar comprising a plurality of transverse interlocking sections, each section comprising a sheet metal stamping having a generally rectangular portion partially punched therefrom and bent laterally to form a lug, the lugs of successive sections overlapping each other and interlocking with the corresponding orifices, and a tie rod passing through the several sections.

2. In a grate bar, the combination of adjacent sheet metal sections having openings formed therein and laterally extending rectangular lugs struck up from the stock at the lower portions only of said openings, the lug of one section extending into and interlocking with the opening in the adjacent section, and a tie rod extending through the openings and located above said lugs.

3. Grate bar sections each having bosses punched up therefrom at the upper portion of one side face and at opposite sides of the center, and washers freely seated on said bosses, and spacing said sections from each other.

4. In a grate bar, a plurality of sections located side by side and each provided at the bottom with an open ended slot and a lug bent up at the edge of said slot and interlocking with the slot of the adjacent section.

5. In a grate bar, the combination of a plurality of sections located side by side and each provided at the bottom with an open ended slot and a lug bent up at the edge of the slot and entering the slot of the adjacent section, a tie rod passing through the sections just above said lugs, and spacing washers surrounding said tie rod between the sections.

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

EDWARD A. WILDT.

Witnesses:

O. B. WRIGHT,
H. E. PAINE.