

No. 897,162.

PATENTED AUG. 25, 1908.

G. S. SERGEANT.
GRATE BAR.

APPLICATION FILED FEB. 5, 1908.

2 SHEETS-SHEET 1.

Fig. 1.

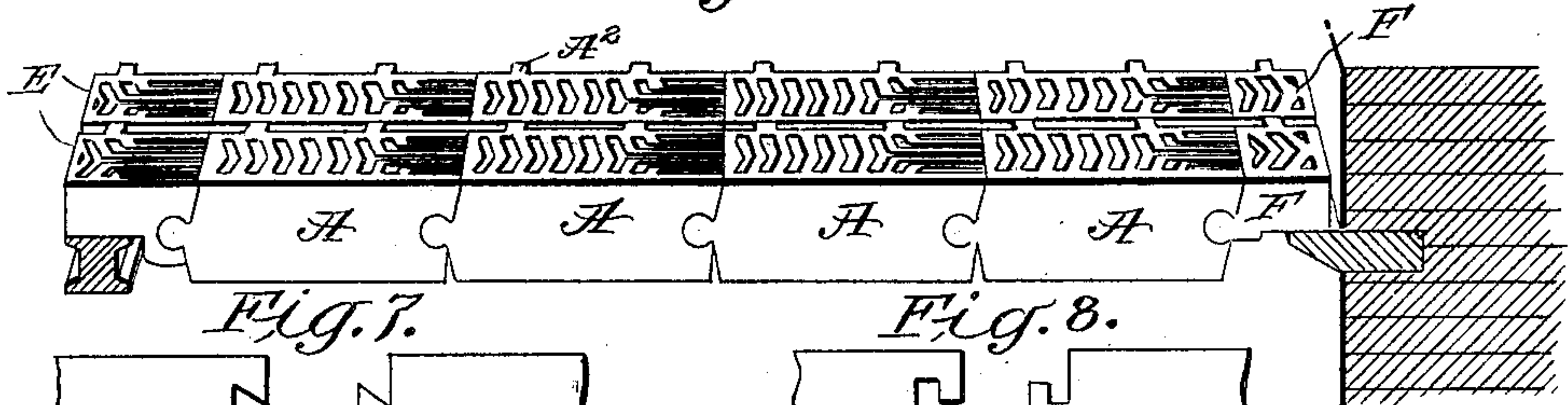


Fig. 7.

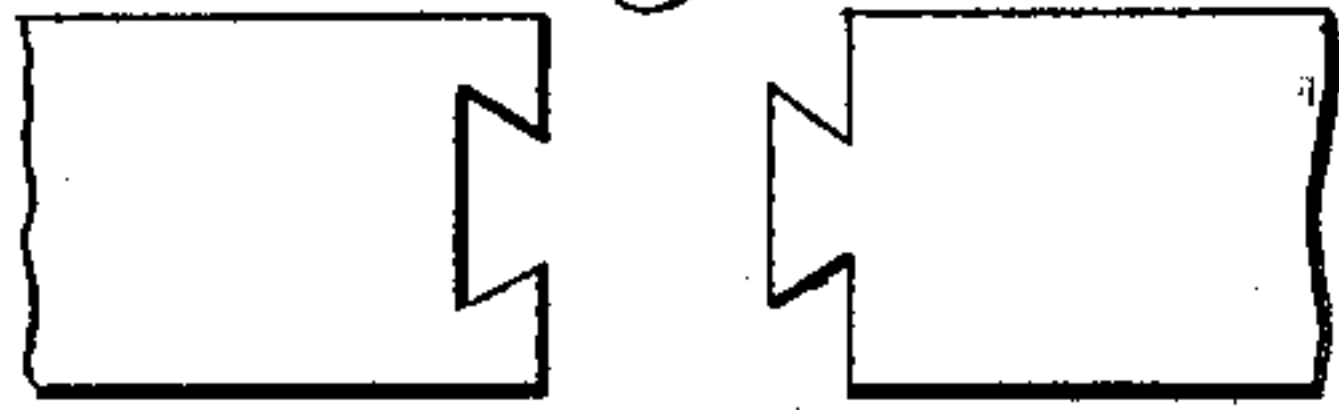


Fig. 8.

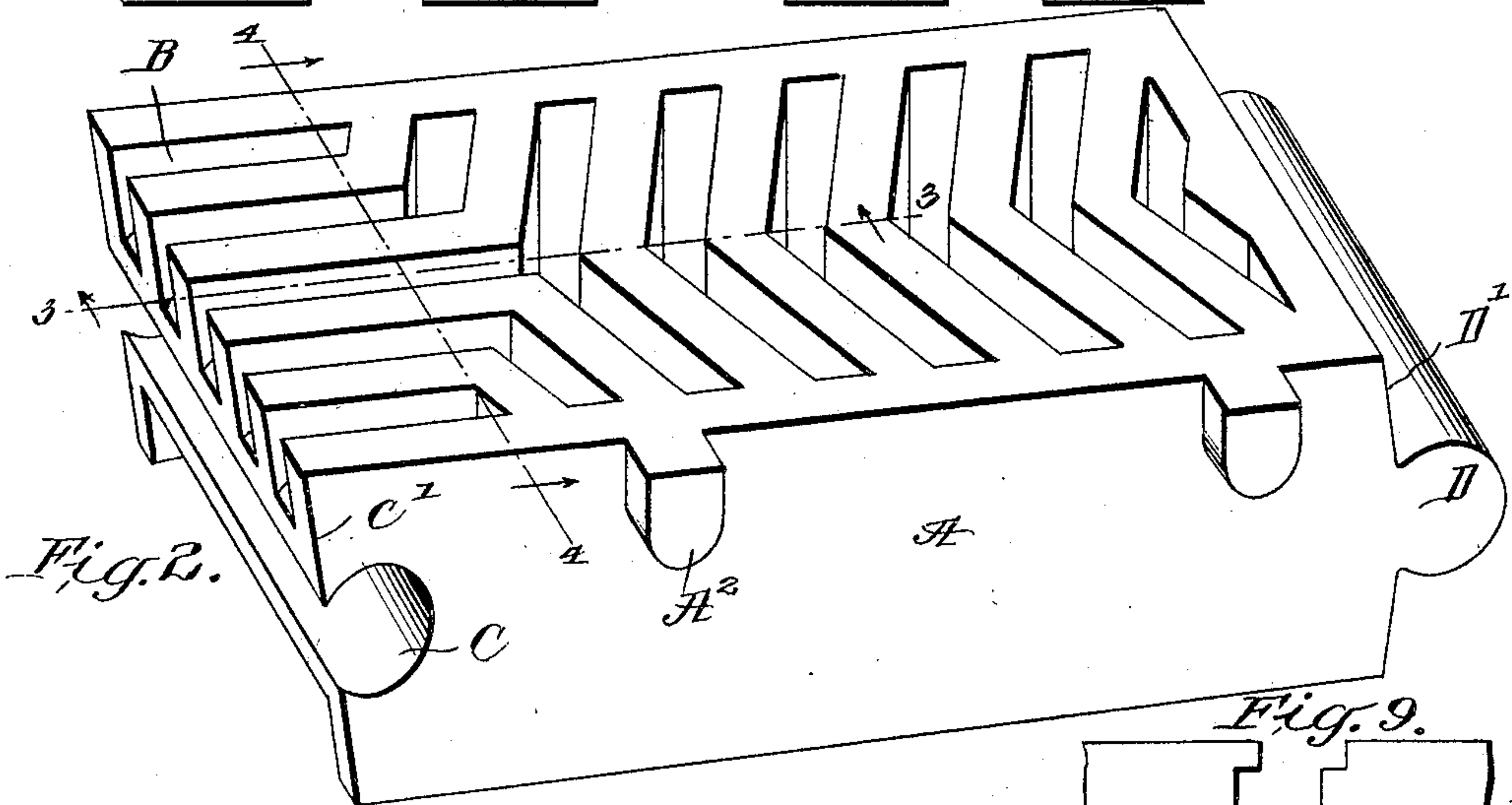
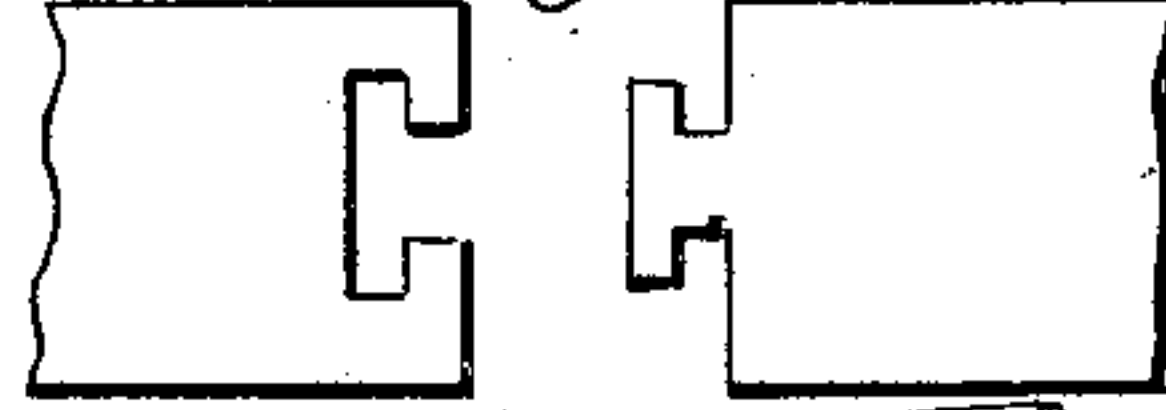


Fig. 4.

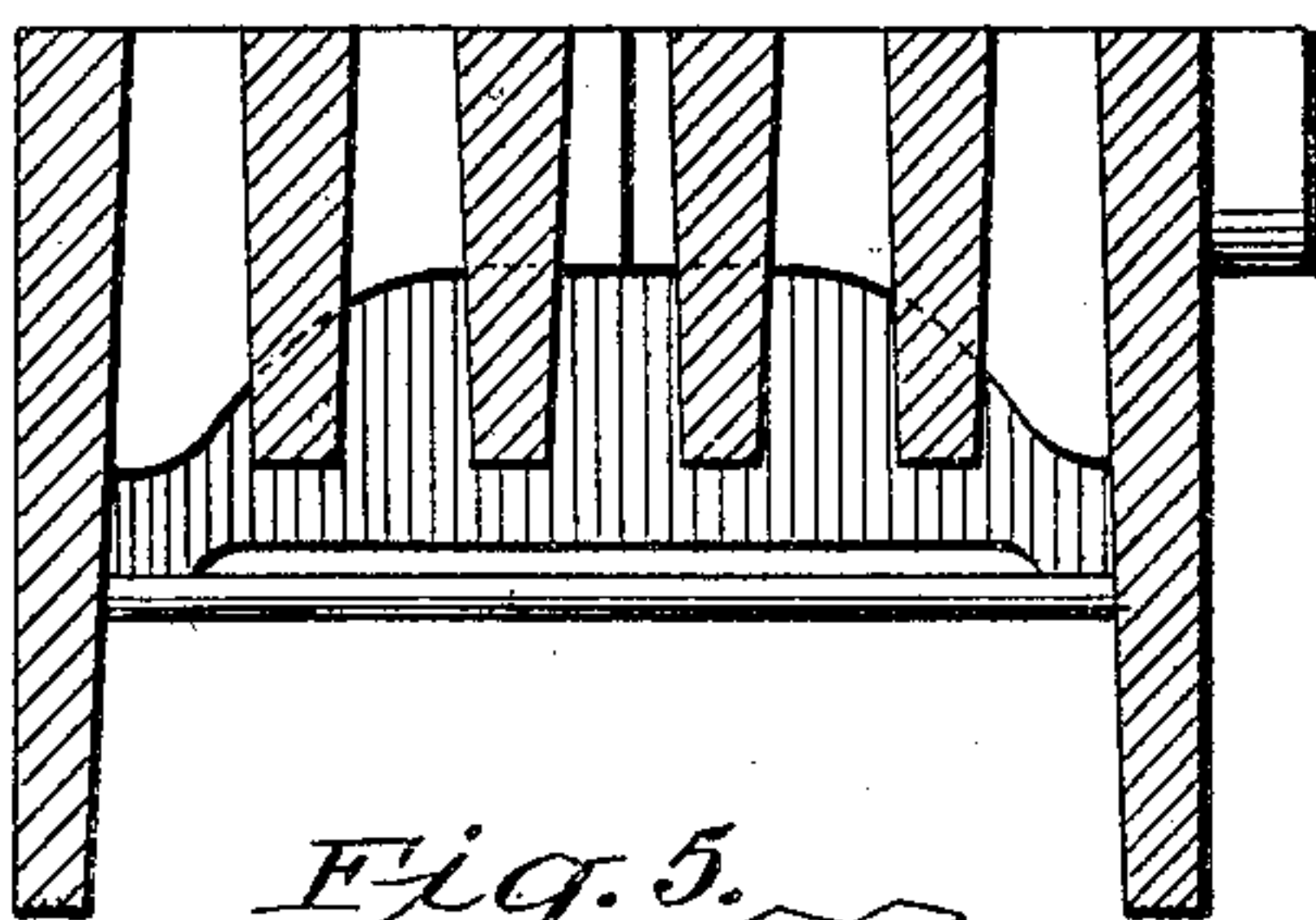


Fig. 3.

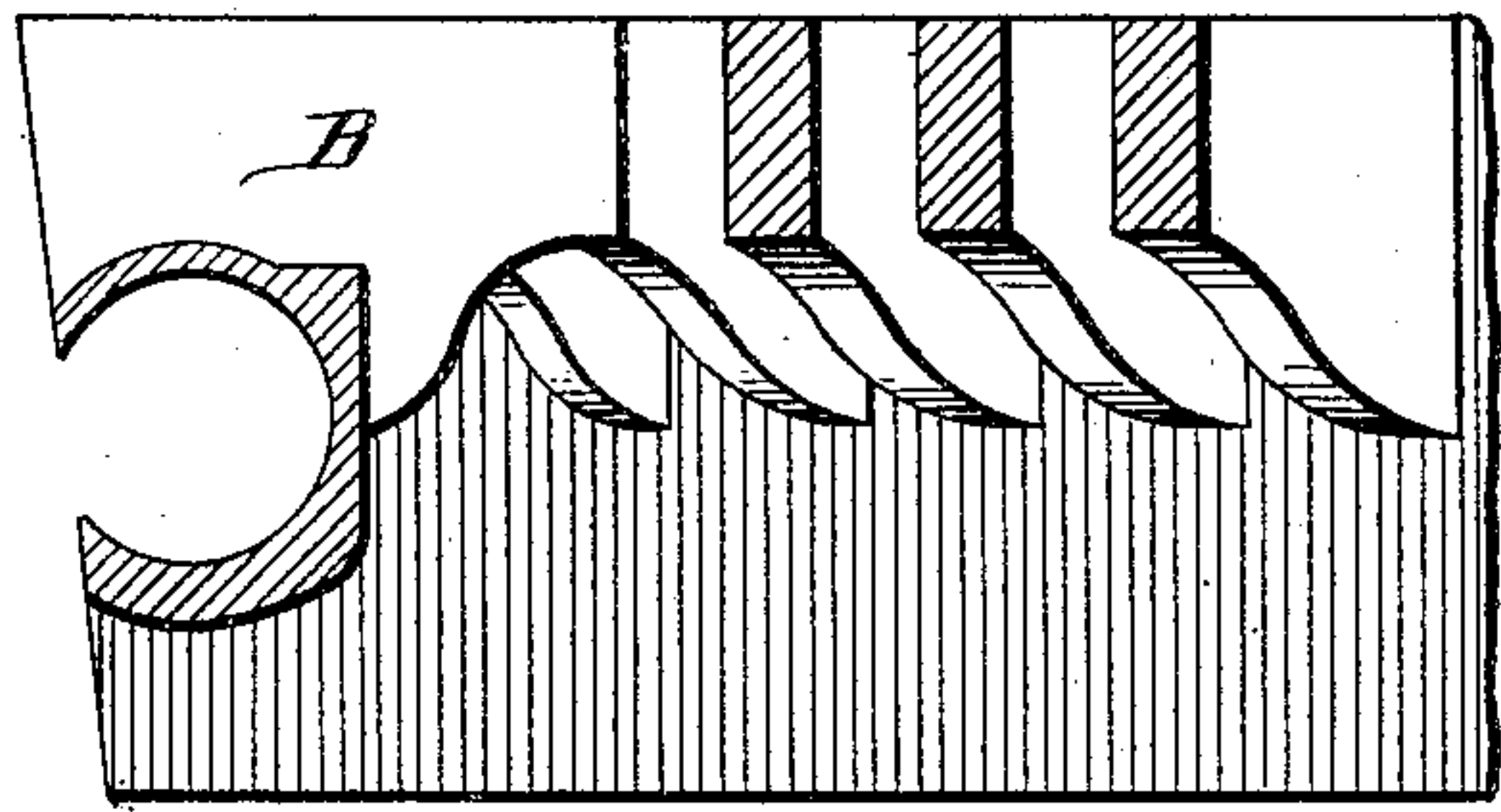


Fig. 5.

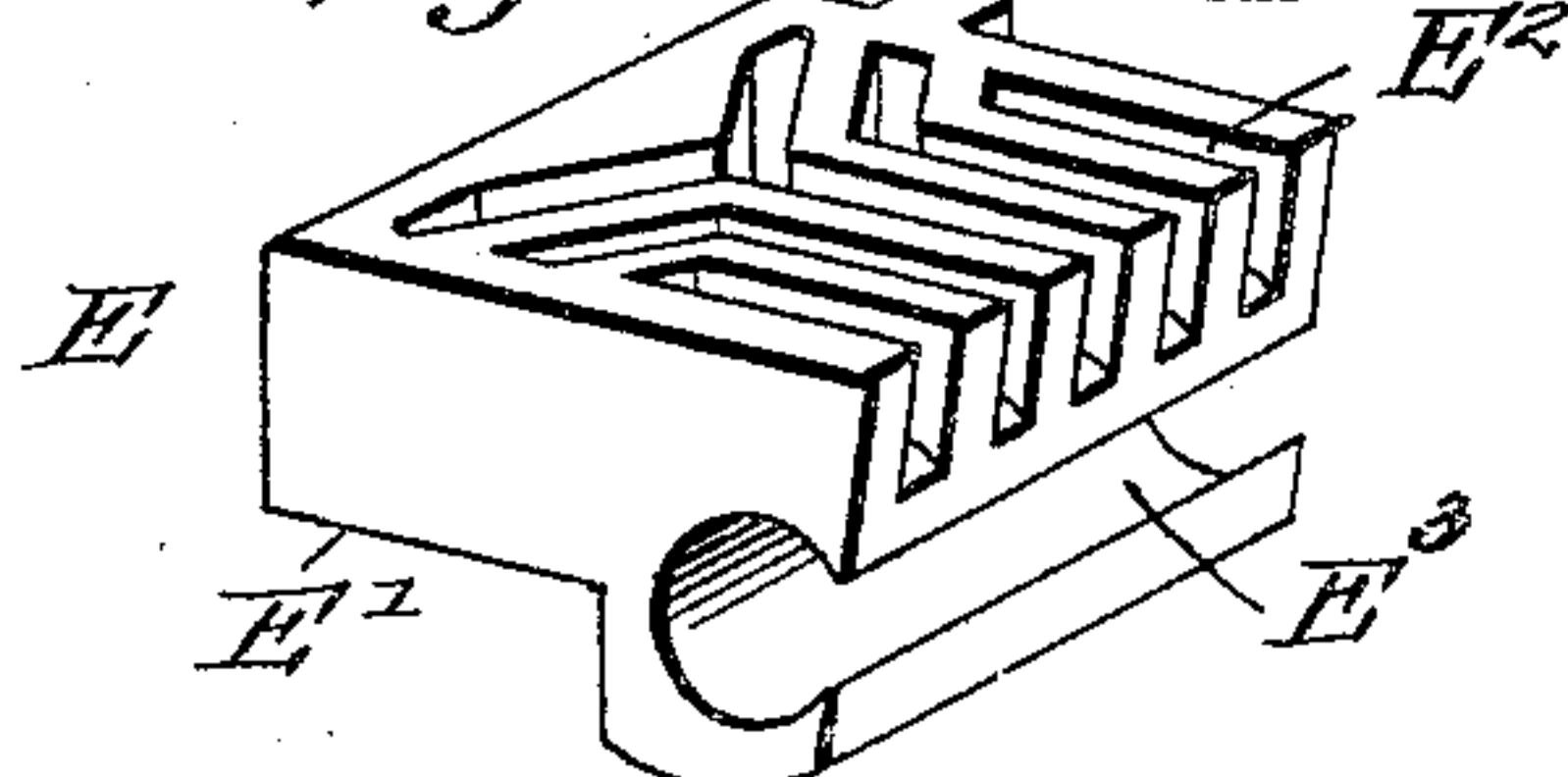
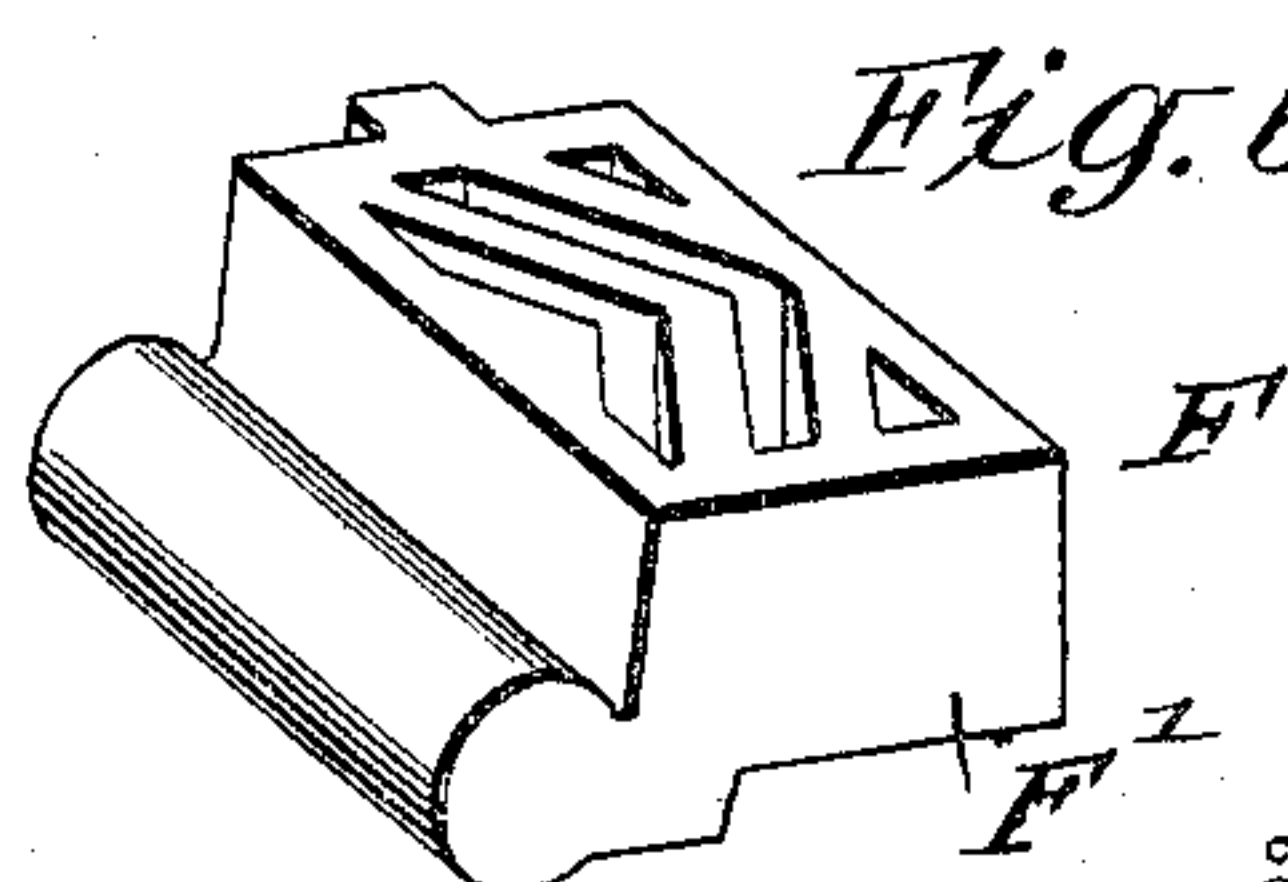


Fig. 6.



Witnesses
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Cory B. Turpin

Fig. 10.



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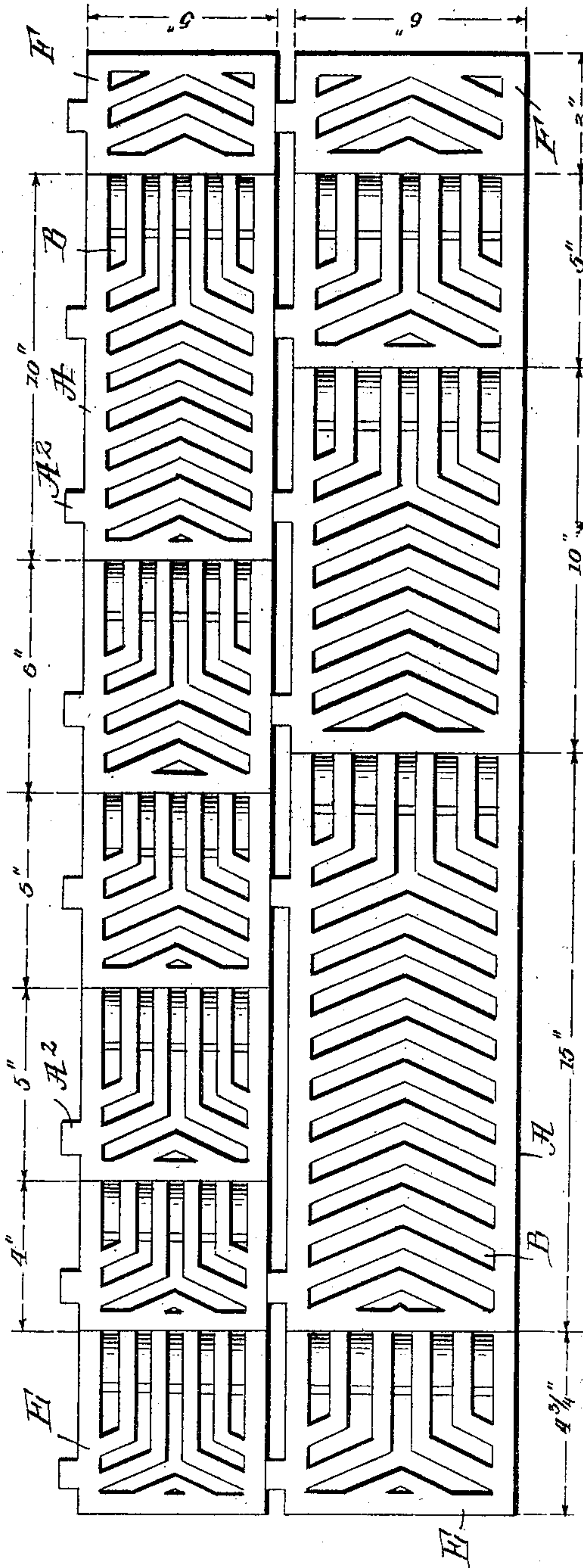
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2 SHEETS—SHEET 2.

Fig. 11.



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UNITED STATES PATENT OFFICE.

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GRATE-BAR.

No. 897,162.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed February 5, 1908. Serial No. 414,341.

To all whom it may concern:

Be it known that I, GEORGE S. SERGEANT, a citizen of the United States, and a resident of Greensboro, in the county of Guilford and State of North Carolina, have made certain new and useful Improvements in Grate-Bars, of which the following is a specification.

This invention is an improvement in grate bars and has for an object to provide a novel construction of sectional grate bar in which the bars composed of detachable sections will be united end to end by interlocking means integral with their respective sections; and the invention consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawings, Figure 1 is a sectional perspective view of a portion of a grate bar embodying my invention. Fig. 2 is a detail perspective view of one of the main sections of the grate bar. Fig. 3 is a detail vertical section of a portion of the main section on about line 3—3 of Fig. 2. Fig. 4 is a cross section on about line 4—4 of Fig. 2. Figs. 5 and 6 are detail perspective views of the end sections, which, for convenience of reference, I term "enders", and Figs. 7, 8, 9 and 10 show somewhat different forms of interlocking connections within some of the broad principles of my invention, and Fig. 11 is a top plan view of a grate having a plurality of bars of different widths and in which the grate bars are made up of sections of different lengths.

In a former patent, No. 663,365, of December 4, 1900, I show a grate bar made in longitudinal sections with the meeting ends of the sections overlapped, together with a cuff or clasp fitting over the overlapped portions and securing the same in connection with each other. In the patented construction the connection of the grate bar sections depends upon the cuff, which holds the sections in connection with each other, and it is found that under some circumstances the depending side portions of the said cuff will spread under the influence of extreme heat and release the overlapped portions of the grate bar sections and permit the latter to fall. In my present invention I seek to avoid this by uniting the ends of the grate bar sections by means integral with their respective sections as distinguished from uniting the ends by means of a separate applied

cuff as in my former patent before referred to. This idea of uniting the sections end to end by the integral interlocking means, distinguishes my present invention from my patented one and marks the broad feature of my present invention. This broad idea may be carried out by various constructions as will be more fully described hereinafter, but in the specific embodiment of the invention illustrated in Figs. 1 to 6, I so form the interlocking means between the adjacent main sections as to avoid diminishing or reducing the air spaces at the upper surface of the grate bar, this being important in grate bars as is well understood by those skilled in the art.

Generally speaking, the main sections A of the grate bar may be alike and may be of ordinary construction except as hereinafter described. Thus, for instance, the said sections have their air spaces secured by the well known herring-bone pattern shown in Figs. 1 and 2, but each of the sections is provided at one end with the longitudinal air spaces B, extending to the extremity of said end and overlying the interlocking means C at such end of the section. In this construction the interlocking means as shown in Figs. 1 and 2, is secured by providing one end of the section A with a transversely extending rib D, which is undercut and preferably made approximately circular in cross section and extends horizontally across the end of the section A at a point below the upper surface of the grate bar, and the opposite end of the section A is provided with a groove C corresponding to the rib D at the opposite end of the section. This groove C receives the rib D of the adjoining section when the latter is moved laterally into engagement with its mating section.

The groove C as best shown in Figs. 1 and 2, is located below the upper surface of the section A and the air spaces B extend over the interlocking construction C in such manner as to afford a circulation of air to the extreme end of the section A. This, as before suggested, is important because it maintains the desired proportion of air space at the upper surface of the grate and is also important as by extending such air space over the interlocking means, the danger of injuring the said means by the heat of the fire on the grate bars is greatly lessened and is practically avoided.

In assembling the sections A, they are

fitted together sidewise with the ribs D entering the grooves C of the adjoining sections and the sections A are provided above the ribs D with surfaces D', and above the grooves C with surfaces C', which abut when the grate bar sections are assembled as shown in Fig. 1, so that the sections are self-sustaining when formed into lengths to constitute complete grate bars as shown in Fig. 1 of the drawing.

The enders E and F are shouldered at E' and F' to rest upon the supporting surfaces of the furnace and are provided with transverse ribs and grooves to receive the same and the section ender E has its air spaces E² extended over its transverse groove E³ as best shown in Fig. 5 of the drawing.

The sections A are provided on one side with the laterally projecting lugs A² and these lugs are preferably provided on the same side of the several sections so that in assembling a number of grate bars in which one grate bar may be made up of sections of different lengths from those of the adjoining one, the lugs or projections A² will not interfere in forming a complete grate bed in the practical operation of the invention.

While the curved cross sectional form of the interlocking rib and groove shown in Figs. 1 and 2 may be preferred because of its simplicity, the ease with which it can be constructed by casting, and the fact that it avoids any abrupt angles or projections, it will be understood that this undercut form may be varied and constructions such as illustrated in Figs. 7, 8 and 9, be employed without departing from the broad idea of the invention. In these constructions as in the construction shown in Figs. 1 and 2, the idea of moving the abutting sections laterally into interlocked connection is retained; but manifestly this may be departed from in some instances, although it is much preferred, and the construction shown in Fig. 10 may be employed, in which a hook G' at one end of a grate section G enters a seat H' formed in the end of an adjoining section H.

In the preferred construction as shown in Figs. 1 and 2, the form of the ribs and the grooves for receiving the same, being curved in cross section, distributes the strain of the weight on the grate bars and the fire thereon when the parts are assembled as shown in Fig. 1.

Manifestly the sectional construction of the grate bars is important as it permits the sections to be interchanged so that new burning surfaces may be brought into play, thus permitting the sections to be changed at intervals in order that the sections may be adjusted from time to time to the portion of the grate bed subjected to the greatest heat. Another advantage, however, results from making the main sections A in varying lengths and widths. Thus in practice I find it de-

sirable to make the grate bars in two widths, five and six inches, and in five lengths of four, five, six, ten and fifteen inches, so that by properly coupling up sections of different lengths, a furnace of any length and any width in inches can be instantly fitted with a set of grate bars.

It will be noticed in practice that the interlocking rib and groove at the meeting ends of the sections, form what might be considered, a journal and bearing upon which the meeting ends of the sections may rock upwardly, a slight rocking of the joint being permitted in order to afford the clearance desired in the making of castings for the purpose in view, and also to permit the joint to rock upward slightly with the longitudinal expansion of the bars under the influence of heat.

I claim—

1. A grate bar made in longitudinal sections one of said sections being provided at its end with a transversely extending rib arranged below the upper surface of the section and curved in cross section and the meeting section being provided in its end with a transversely extending groove conformed to the rib of the other section said groove being arranged below the upper surface of its section, and said grooved end of the section being provided with air spaces extended over the grooved portion thereof to the corresponding end of the section, all substantially as and for the purpose set forth.

2. A suspended grate bar composed of detachable sections united end to end by interlocking means integral with their respective sections and which lock the sections together as against endwise detachment and render the sections self sustaining at the juncture thereof with each other and prevents the separation of the sections by the vertical movement of either section.

3. A suspended grate bar composed of detachable sections having interlocking means integral with their respective sections, and composed of a horizontal undercut rib at the end of its section, and a corresponding horizontal groove in the end of its section whereby to lock the sections together as against endwise detachment and render the sections self sustaining in a vertical direction at their joints.

4. A grate bar composed of detachable sections having at their meeting ends, one a horizontally extending undercut rib, and the adjoining section having in its end a horizontally extending groove conformed to the rib of the adjoining section and in which said rib has a limited rockable movement whereby the sections may be detachably united at their meeting ends by interlocking means integral with their respective sections substantially as set forth.

5. A grate bar composed of detachable sections provided at their meeting ends, one

with a transversely extending groove, and the other with a transversely extending rib fitting the groove and having the air spaces at the grooved end of the section extending
5 over the said groove, substantially as set forth.

6. A grate bar composed of detachable sections united end to end by a transverse connection having a transverse axis and upon

which the sections are capable of upward 10 rocking movement when the upper surface portion of the sections expands, substantially as and for the purposes set forth.

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Witnesses:

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SOLON C. KEMON.