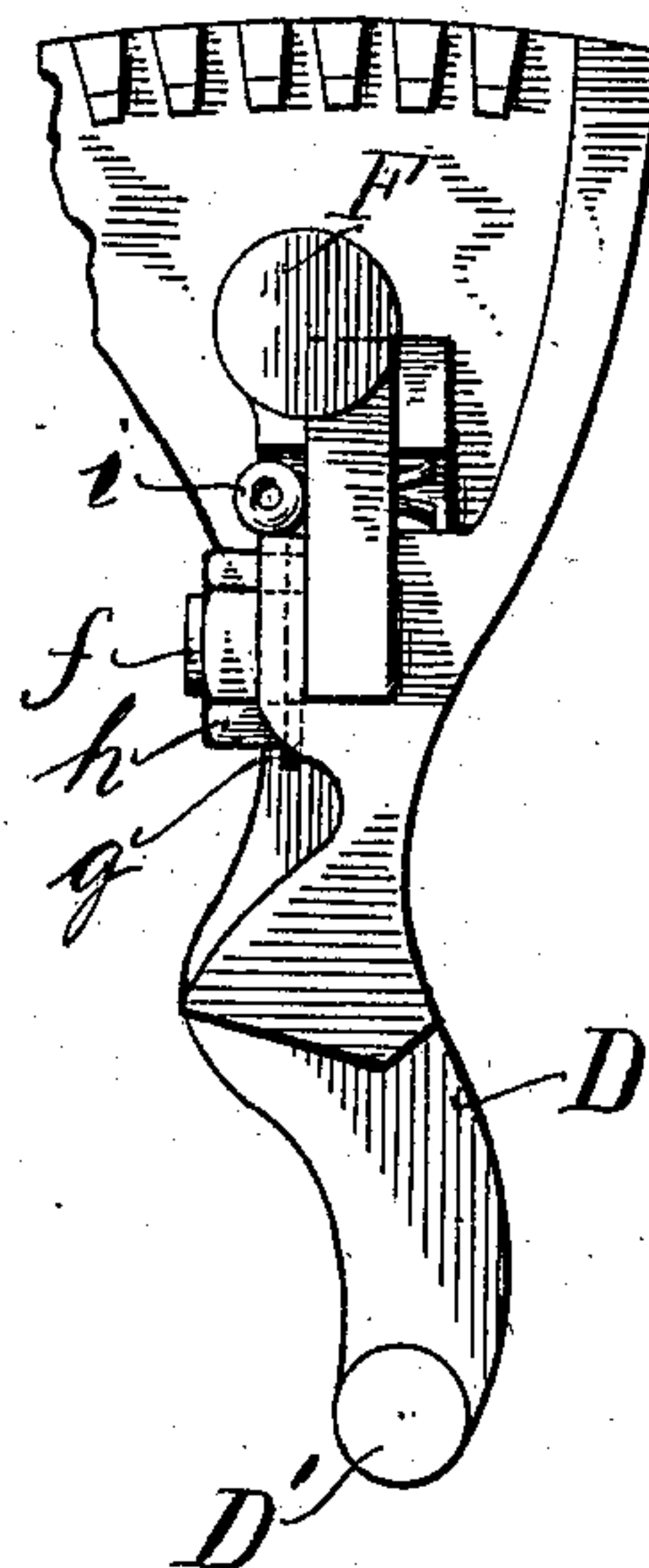
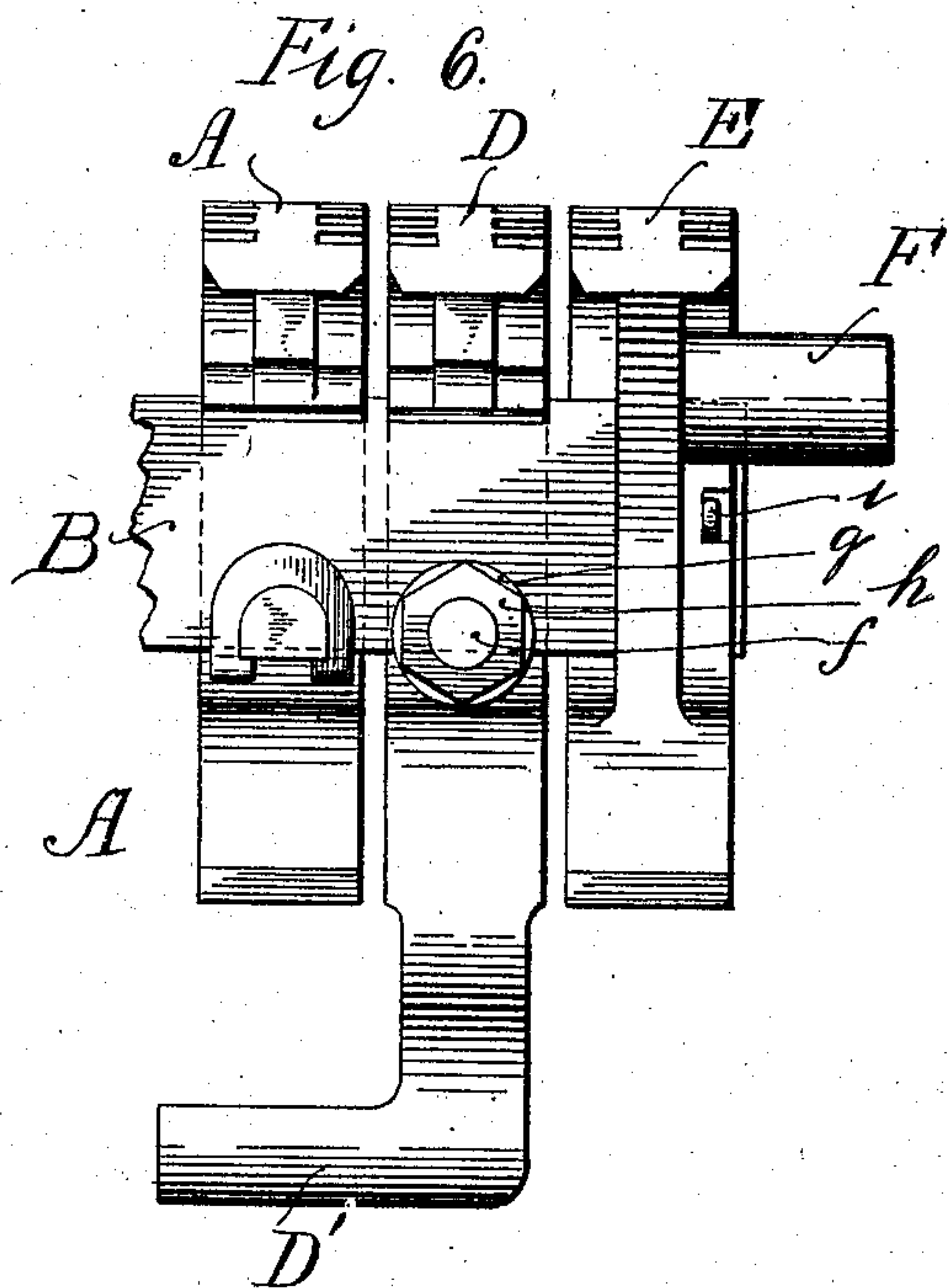
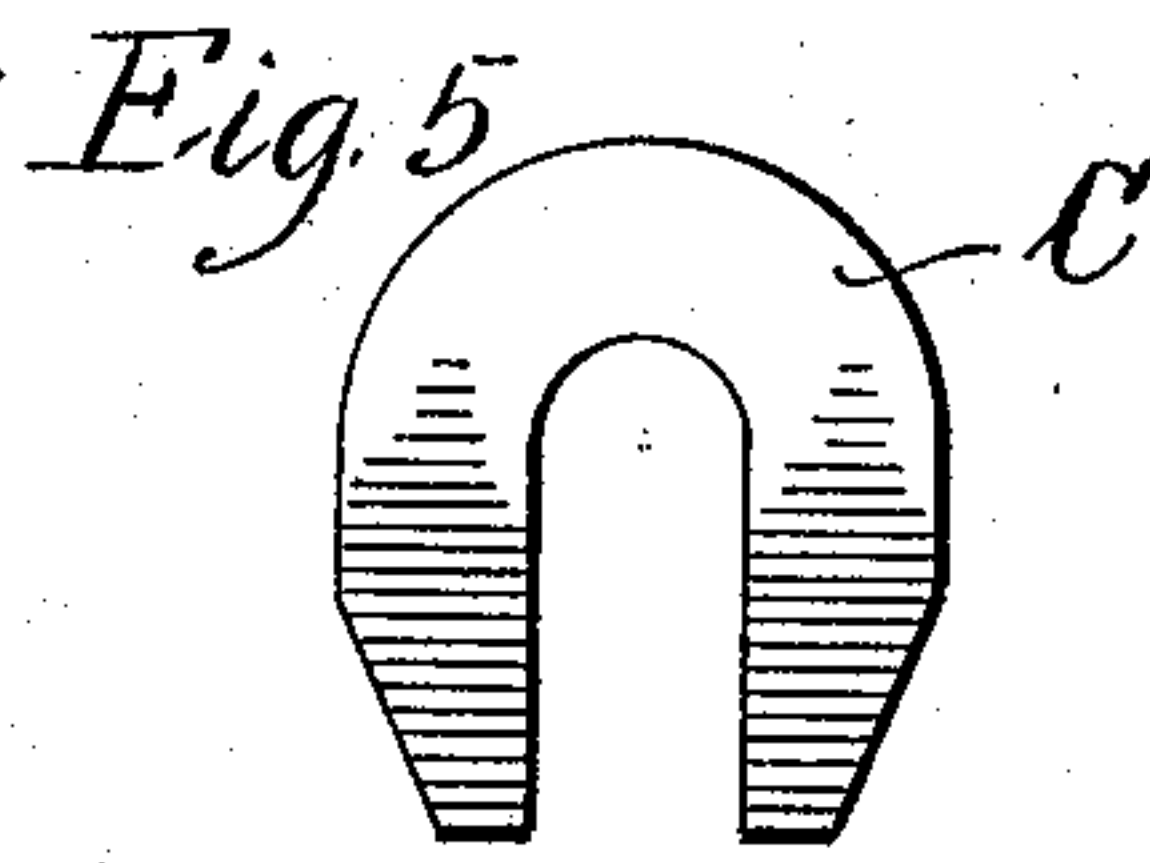
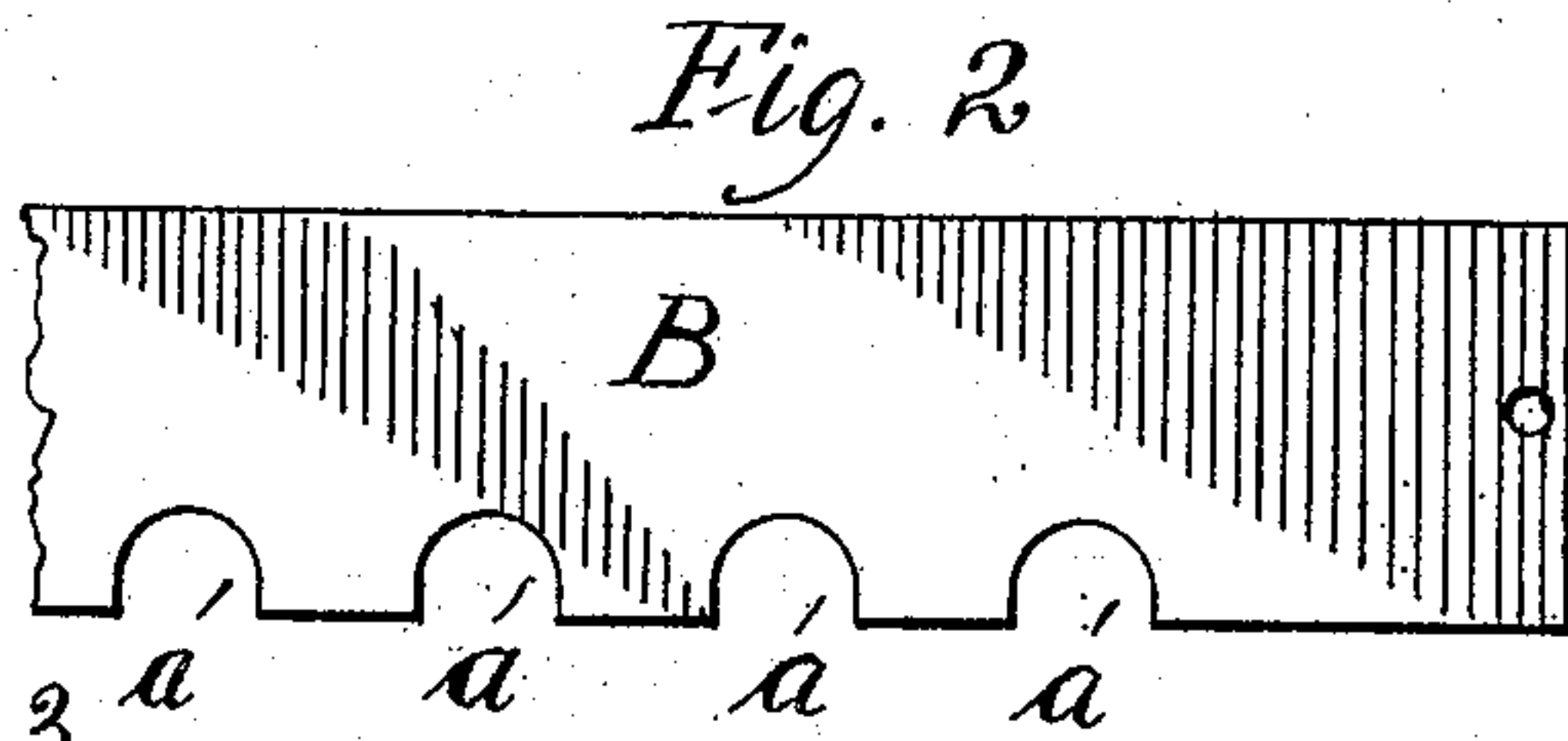
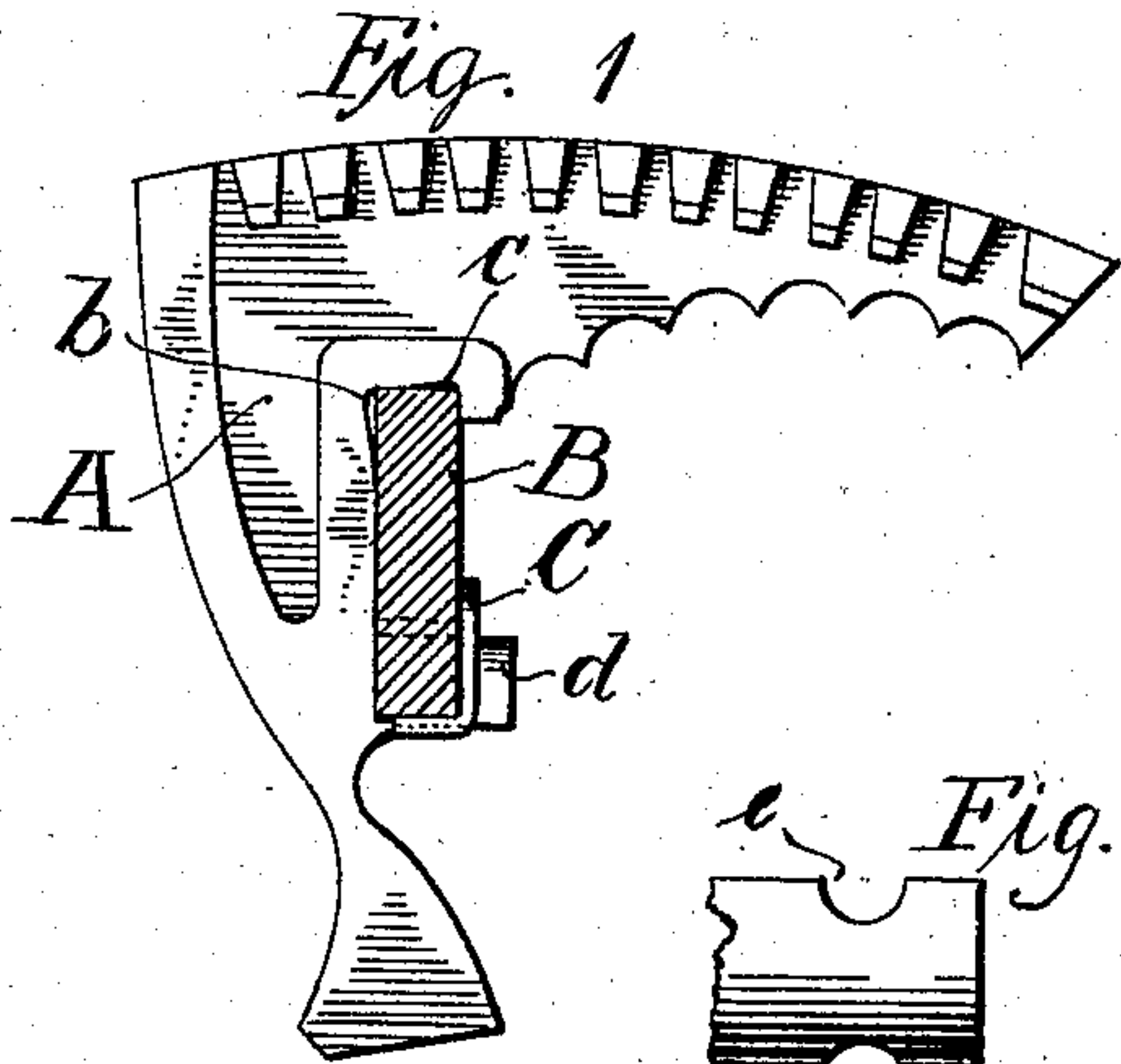


No. 806,122.

PATENTED DEC. 5, 1905.

G. A. ELLIS.
FURNACE GRATE BAR.
APPLICATION FILED DEC. 26, 1903.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE A. ELLIS, OF MOUNT VERNON, NEW YORK.

FURNACE-GRATE BAR.

No. 806,122.

Specification of Letters Patent.

Patented Dec. 5, 1905.

Application filed December 26, 1903. Serial No. 186,664.

To all whom it may concern:

Be it known that I, GEORGE A. ELLIS, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Furnace-Grate Bars, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention has special relation to that class of bars for furnace-grates commonly known as "pocketing and cutting-off bars"—that is, bars which are rocked through the medium of depending projections and suitable connections, the said bars being so constructed that when rocked in one direction they will catch and hold or pocket a portion of the material from above the grate, and when rocked in the opposite direction they will cut off the pocketed portion, drop it through between the bars, and then afford a grate-surface for maintaining the fire-bed above.

The principal objects of my present invention are to simplify and improve the construction of the grate-bars themselves—that is, to make each bar of separate pieces, which are mounted upon and easily removable from a longitudinal supporting-bar without disturbing any of the other sections on the supporting-bar or disturbing or dismounting the bar itself.

To accomplish these objects and to secure other and further advantages in the matters of construction, application, operation, and use, my improvements involve certain new and useful peculiarities of construction and relative arrangements and combinations of parts, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of one of the intermediate removable sections of the grate-bar, the same being shown as locked in position upon the supporting-bar, which latter is represented in cross-section. Fig. 2 is a front view of a portion of the supporting-bar shown in Fig. 1. Fig. 3 is a top view of the projecting piece of the grate-bar section which enters the recess in the lower portion of the supporting-bar, showing the side notches which accommodate the locking-washer, the view being enlarged beyond that of Fig. 1. Fig.

4 is an end elevation corresponding with Fig. 3. Fig. 5 is a face view of the bifurcated washer shown in Fig. 1 and employed to lock the grate-bar section in place upon the supporting-bar. Fig. 6 is a front view of a fragment of a grate-bar constructed in accordance with my invention, showing one of the intermediate removable sections, one section arranged to receive the means by which power is applied to rock the bar, and an end section which has a trunnion on its outer face. Fig. 7 is a side view corresponding with Fig. 6, showing the end section with its trunnion, a portion of the fuel-supporting leaf being broken away or omitted.

In all the figures like letters of reference, wherever they occur, indicate corresponding parts.

Several grate-bars going to make up the grate-surface, of whatever extent that may be, are each journaled at their ends and rocked by suitable means located below the journals, each complete bar being preferably slightly curved on top and having a front portion slightly sharpened, so as to effect the desired cutting off of the spent fuel, the bars being first rocked backwardly, when the lower portions of the bars form pockets to receive a portion of the material, then rocked forward to cut off the pocketed portion from the remainder of the fire-bed and drop this portion into the ash-pit below, the operation of pocketing and cutting off being repeated as often as may be necessary.

A represents one of the intermediate removable sections of the bar, of which there may be any number, according to the desired length of grate-bar.

B is a supporting-bar on which the several separate sections are to be mounted. This supporting-bar may be of any desired shape in cross-section, and it is preferably made of rolled or merchantable iron or steel, being cut off to the proper or desired length and recessed on its lower margin, as at *a a a*, the recesses being located at the proper distances from each other so as to properly separate or space the applied sections of the grate-bar.

The sections A are fashioned so as to hook over and rest upon the top of the supporting-bar B, a projection being provided on each section to enter one of the recesses *a*. In the form shown in Fig. 1 the recess for accommodating the top of the bar B is carried back a trifle, as at *b*, and up a trifle, as at *c*, and the pro-

jection d is so located as to enter the recess a easily, leaving a slight distance above the projection d when finally located. The sections are hooked over the top of the supporting-
 5 bar and then swung to place, as shown in Fig. 1, the recessed portion b and c permitting of this movement without cramping.

The projection d extends from one side of the bar beyond the other side and serves to
 10 prevent the section from rising with respect to the supporting-bar, and when the section is firmly locked in place it must move with the supporting-bar. Any simple and convenient means of locking the sections in place
 15 may be adopted. According to the form shown I supply the projection d with a shallow recess, as e e , on each side and into these recesses drop a bifurcated washer, as C, Fig. 5, afterward bending the ends of this washer
 20 under the supporting-bar, as indicated in Fig. 1. This forms a substantial lock for the section and holds the latter in its working position on the supporting-bar. To dismount one of the sections sustained as above explained,
 25 it will only be necessary to remove the washer and then swing the section out of place. This construction enables new sections to be readily substituted for others which may be broken or damaged, and this without disturbing
 30 any of the adjacent sections and without the necessity of removing the bar from its position in the grate. To provide for this ready and convenient removal and substitution is one of the chief features of my invention and one of its prominent advantages.
 35 If a section be broken, as sometimes occurs, it is of no further value, and the projection d may be broken off by a blow with a hammer rather than to take the trouble of straightening
 40 out the washer and pulling it out of place. When the projection d is broken off or the washer otherwise removed, of course the section may be easily dismounted from its supporting-bar, and then another section may be
 45 substituted for the one removed.

By locating the supporting-bar at one side of the axis or the line on which the grate-bar rocks it will be apparent that I obviate the occupation of room in the space below the top
 50 of the grate which constitutes the pocket when the grate-bar is rocked back. Of course I may locate the supporting-bar at any desired point beyond the axis of the grate-bar; but it is very desirable to set it back far
 55 enough to afford the requisite capacity of pocketing, so as to obviate the necessity of too much working of the grate-bars.

At D is a removable section also applied to the supporting-bar B, this section having an
 60 arm D', to which the means for rocking the grate-bar may be applied. This section D may be located at any point within the length of the supporting-bar, and obviously it should be connected with the supporting-bar in a
 65 substantial manner, for it is through it that

the power is communicated to the bar. It is made to hook over and rest upon the top of the bar in the same way as the other sections before described, and at the bottom it is preferably secured by means more substantial
 70 than the washer heretofore described. For this connection I have shown a bolt f , a washer g , and a nut h . With this construction if it be necessary to remove this section D the nut
 75 may be easily removed, together with the washer, when the section may be swung off in the same way as the other intermediate sections.

Of course the grate-bar must be supplied with trunnions, and for this purpose I mount
 80 upon the ends of the supporting-bar end sections, as E, supplied with trunnions, as F, to rest in the seats or beds provided for them. In these end sections are recesses which admit the ends of the supporting-bar, and the
 85 end sections are keyed to the supporting-bar by any convenient form of key or pin, as the cotter-pin i , which passes through a perforation in the extremity of the supporting-bar.

The advantages of making the grate-bar in
 90 sections instead of in one solid casting are obvious, and the advantages of making the different sections separately detachable and replaceable without disturbing the grate-bar or
 95 any of the adjacent sections must also be apparent. The two end sections are similar in construction except that one is made for the right-hand end of the bar and the other for the left-hand end.

In former constructions it has been pro-
 100 posed to slide separate centrally-perforated sections upon an axial bar. This necessitates an enlargement of the material of the section in the portion required for the pocket and consequent diminution of the capacity of the
 105 pocket, and therefore too frequent working of the grate-bars in order to effect the desired clearing of the fire-bed. It also necessitates dismounting of the entire grate-bar whenever
 110 repairs to any one section are required and precludes the possibility of replacing one section without disturbing any of the others.

Being constructed and arranged substantially in accordance with the foregoing explanations, my improved grate-bar will be
 115 found to answer all the purposes or objects of my invention hereinbefore alluded to.

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

1. In a pocketing and cutting-off bar for
 120 grates, the combination with a supporting-bar of separate fuel-supporting sections mounted thereon, and means for keying the sections in place, said sections being each recessed as ex-
 125 plained and adapted to be hooked over the top of the supporting-bar and having projections formed integrally with them and extending under and beyond the supporting-bar and being keyed to the bar and removable there-
 130

from without disturbing the remaining sections, substantially as and for the purposes set forth.

2. In a grate-bar of the character herein set forth, the combination with the supporting-bar, of the separate grate-bar sections mounted thereon, the supporting-bar being provided with a number of recesses on its under side, the sections being supplied with projections for entering said recesses, and means for locking the said projections, substantially as shown and described.

3. In a grate-bar of the character herein set forth, the combination with the supporting-bar recessed on its under side of separate fuel-supporting sections held on the bar by projections on the sections extending in the cor-

responding recesses from one side of the bar beyond the other side and there secured, each fuel-supporting section mounted on the bar and made removable therefrom without disturbing the other sections, one of said sections being provided with means for receiving the power appliance and arranged to move the grate-bar, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE A. ELLIS.

Witnesses:

C. SEDGWICK,
WORTH OSGOOD.