

E. W. BLANCHARD.

GRATE BAR.

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951,797.

Patented Mar. 15, 1910.

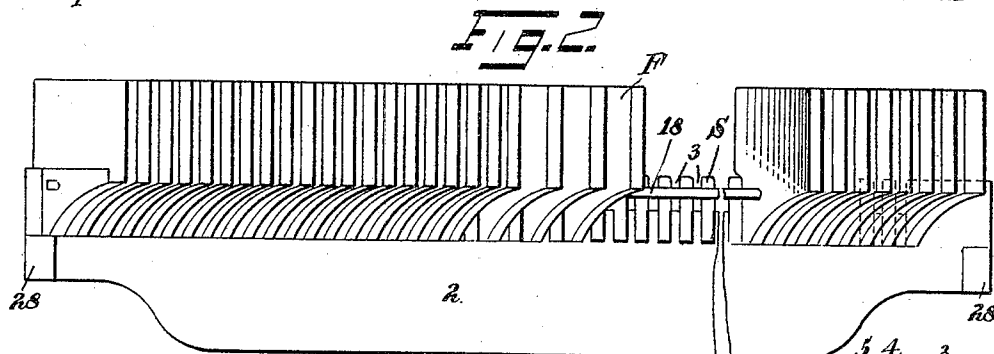
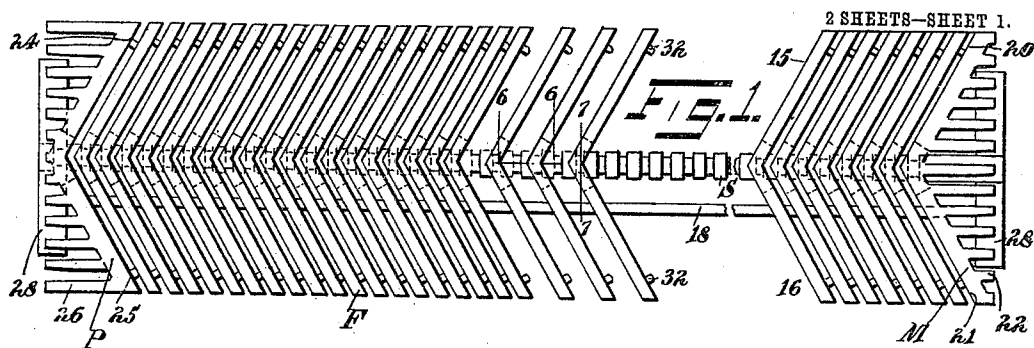


FIG. 4.

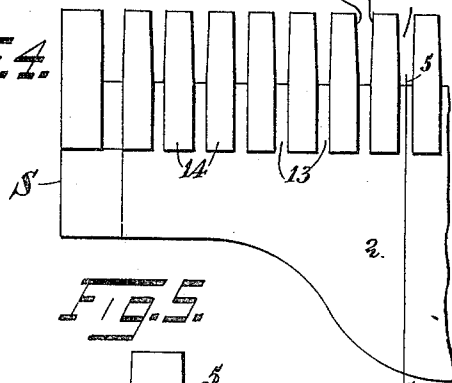


FIG. 5.

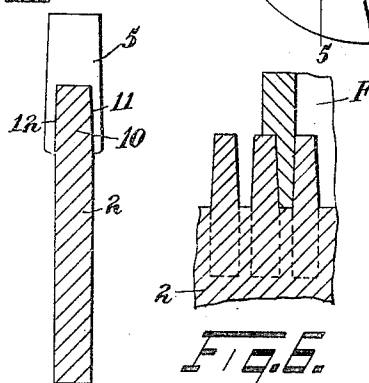


FIG. 6.

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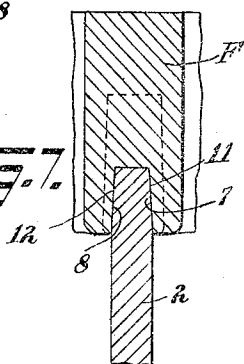
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FIG. 7.



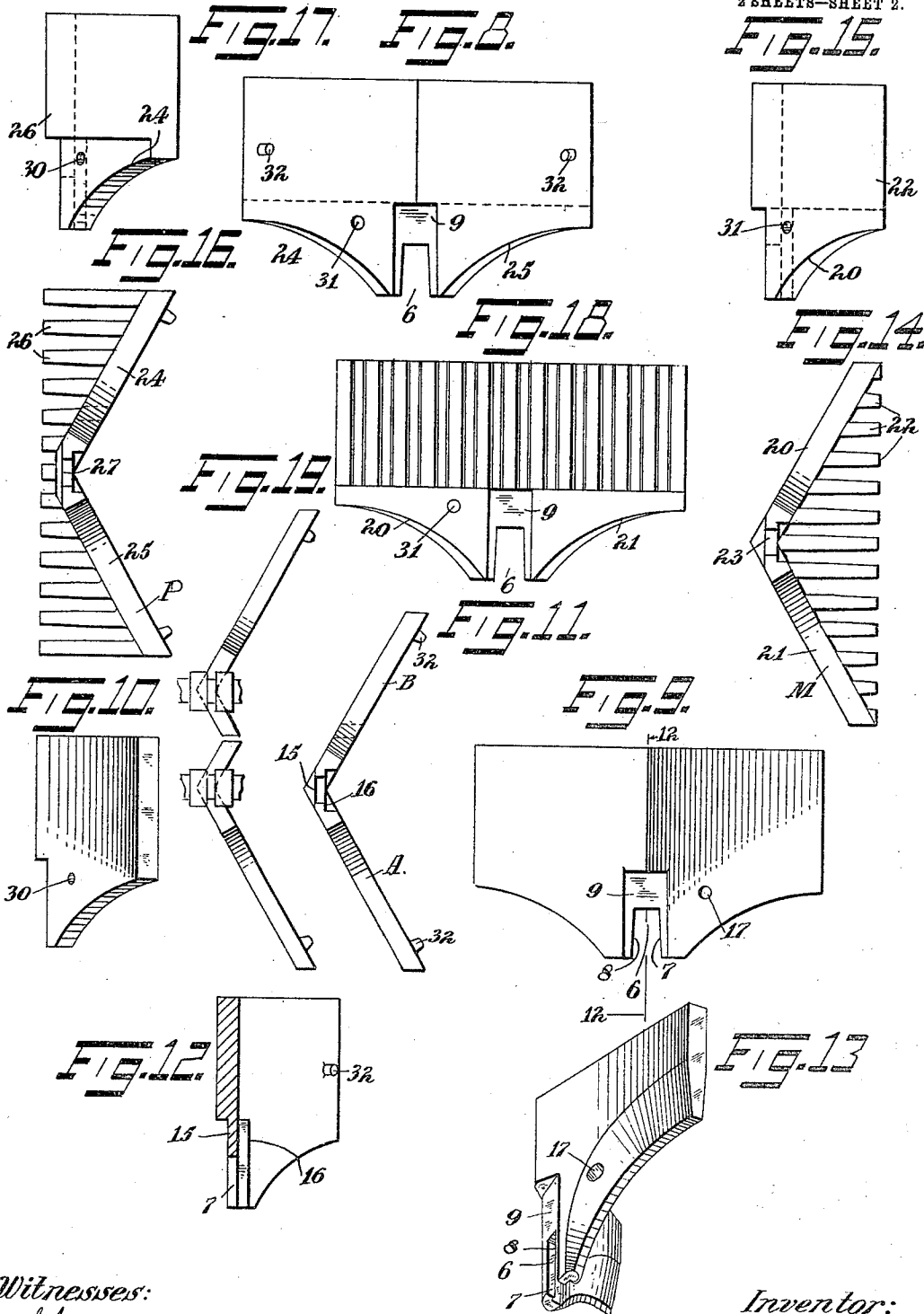
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

EDWARD WYATT BLANCHARD, OF NEW YORK, N. Y.

GRATE-BAR.

951,797.

Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed December 7, 1908. Serial No. 466,222.

To all whom it may concern:

Be it known that I, EDWARD WYATT BLANCHARD, a citizen of the United States, residing in New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Grate-Bars, of which the following is a specification.

This invention relates to grate bars of the character where there is one or more supporting bars each carrying a series of removable fire bars, whereby the separate fire bars can be replaced when they burn out or break.

One of the objects of the invention is to provide an improved form of joint or connection whereby the fire bars are connected with and carried by the supporting bar.

A further object of the invention is to provide locking means for the fire bars without engagement with the supporting bar.

Another object of the invention is to provide removable end members for the fire bars projecting beyond the end portions of the supporting bar, that can be replaced when necessary.

In the accompanying drawings representing embodiments of my invention Figure 1 is a fragmentary plan view of a single supporting bar with the fire-bars and end members thereon some of the firebars being omitted. Fig. 2 is a side elevation of the parts shown in Fig. 1. Fig. 3 shows an end elevation of the same. Fig. 4 is a fragmentary view enlarged of the end portion of the bar. Fig. 5 is a section on the line 5—5 indicated in Fig. 4. Fig. 6 is a section on the line 6—6 of Fig. 1. Fig. 7 is a section on line 7—7 of Fig. 1. Fig. 8 is a side view of one of the end members. Fig. 9 is a view similar to Fig. 8 taken from the opposite side. Fig. 10 is an end elevation of one of the fire-bars. Fig. 11 is a bottom view of a fire-bar. Fig. 12 is a vertical section on the line 12—12 indicated in Fig. 9. Fig. 13 is a perspective view of a fire-bar. Fig. 14 is a bottom view of the end member shown at the right hand end in Fig. 1. Fig. 15 is a side elevation of the member shown in Fig. 14. Fig. 16 shows in bottom plan the end member at the left hand end in Fig. 1. Fig. 17 is a side elevation of the member shown in Fig. 16. Fig. 18 is an end elevation of the member shown in Fig. 14; and Fig. 19 is a bottom view of a modification.

The device comprises essentially a supporting bar denoted generally by S, and a number of fire bars denoted generally by F. The supporting bar comprises a body portion 2 having in its upper edge a series of slots 3, that may have their sides 4 and 5 substantially parallel; but preferably slightly tapered to facilitate the insertion and removal of the fire-bars, and also for the purpose of assisting in the operation of casting the members.

The fire-bars F each have along the lower edge, preferably at an intermediate or middle part, a slot 6. This slot may have its side walls 7 and 8 substantially parallel, but preferably slightly inclined. These slots in the two members, that is, in the supporting bar, and in the fire-bars, are of a width and shape corresponding with the portion of the other member immediately beyond the slotted portion. The fire-bars are placed on the supporting bar at each slotted portion, and the walls 4 and 5 of the slot 3 will engage the portion 7 of the fire-bar beyond the slot, that are preferably made slightly tapering as shown in Fig. 6, and the side walls 7 and 8 of the slot 6 engage the body portion 10 of the bar S at the bottom of the slots, whose side faces 11 and 12 engage the side faces 7 and 8, as shown in Fig. 7. By this arrangement each fire bar projects into a slot of the supporting bar, and each fire bar has a slot into which projects a portion of the supporting bar. To afford additional security for the fire bars, the supporting bar on each side is provided with a series of notches 13 alining with the slots 3, into which extend the side wall portions 7 and 8 of the slots 6 in the fire-bars. In the construction illustrated the slots 13 are practically formed by lugs or projections 14 on the side faces of the supporting bar, which lugs practically extend to the top edge of the supporting bar and serve to widen the opposite side walls of the slots 3 in the bar.

In the construction illustrated the fire bars are of the herring-bone type, being made angular in plan view that is formed of two side portions denoted by A and B respectively, that meet at an angle preferably at the middle of the intermeshing connection at the slotted portions of the fire-bars and supporting bars. With such construction, the grate bars have the engaging portions 9 beyond the slots formed with opposite parallel faces 15 and 16 substantially perpendicular

lar to the plane of the supporting bar. These faces are extended along the margins of the side walls 7 and 8 to the lower extremity of the fire-bars, in order to engage the opposite side walls of the notches 13 in the supporting bar. The fire-bars may have the portions A and B on the opposite sides of the supporting bar of equal length which would be the usual construction. But when desired these two portions may be of unequal length as indicated in Fig. 19, in which case, two supporting bars may be brought into close proximity if desired.

It is desirable to lock the various supporting bars together in order to prevent their dislocation in the act of removing clinker or ashes that may stop up the space between any two bars. Means are shown whereby the whole or sets of the bars can be locked together without being locked to the supporting bar. As shown each fire-bar is provided with an aperture 17, which apertures are in alinement and permit the insertion of the rod or wire 18, as indicated in Figs. 1 and 2 that may pass through the entire set; or which may be in sections and pass through several sets of bars. By this arrangement, only the entire series of bars, or a set of bars can be removed or disturbed. This is of especial advantage where such a form of grate is mounted to rock or shift for the purpose of removing or dumping the ashes, as is frequently done in fire grates.

With the angular arrangement of fire-bars as shown, there would be triangular spaces left at each end of the grate between the fire-bar and the grate wall. Heretofore it has been customary to build up the supporting bar with an integral portion to fill this space. But with such arrangement when this built-up portion becomes broken or warped it is necessary to provide an entire new supporting bar. I have shown a removable section at each end constituting an end member that performs this function. At one end there will be a substantially triangular space formed in which is placed an end member such as a member M shown in Fig. 4 as comprising a body portion formed by two angular plates 20 and 21, from which extend parallel plates 22 substantially vertical, with their ends in alinement in a plane at right angles with the supporting bar. This end member is provided with a slot 23 corresponding to the slot 6 in the fire bars, and can be inserted in one of the slots 3 of the supporting bar in the same manner. By this arrangement the end member can be adjusted along the end of the bar as desired.

At the opposite end of the grate bar, there will be formed practically two similar triangular spaces one on each side. To fill up this space an end member P is provided as shown in Figs. 16 and 17 comprising two angular plates 24 and 25 from which ex-

tend parallel plates 26, whose ends are in alinement in a vertical plane. This member is provided with a slotted portion 27 corresponding to the slot 6 in the fire-bars, for insertion in one of the slots 3 of the supporting bar. The supporting bars are practically slotted to their outer ends as shown in Fig. 4, and may be provided with a cross bar 28 at each end at the lower portion. The end members M and P are provided with apertures 30 and 31 respectively, alining with the apertures 17 in the fire-bars through which the rod 18 may be passed in order to lock the whole set together. From this construction, it will be seen that any one of the grate bars can be readily removed upon merely withdrawing the locking rod and another substituted. If a wide space is desired, the fire-bars may be placed in the alternate slots, as indicated in Fig. 1 at the middle portion. By the form of end members set forth, they are separately removable to be replaced when needed, without disturbing the supporting bar or interfering with the other fire-bars. And the end members serve to protect the supporting bar thoroughly from the intense heat of the fire so that the bar will last a long time. Furthermore these end members can be adjusted in several positions along the end portion of the supporting bar. Obviously, the projecting plates on the end members can have their extremities lying in a curved plane or any desired shape to conform to the contour of the fire wall. With this arrangement of a single intermediate supporting bar and the fire-bars a maximum amount of air is admitted to the fire between the bars. If desired the fire bars can be provided with lugs 32 cast thereon, that will serve to properly space the bars and prevent a tendency to twist in the socket. It will be observed from Figs. 2 and 3 that the lower portion of the end member P rests on the cross bar 28 at that end which serves as an additional support or bearing for this member.

Having thus described my invention, I claim:

1. In a grate bar, a supporting bar provided with a series of slots along its upper edge and also having ribs projecting on each side intermediate of said slots and parallel therewith, a series of fire bars each being bent at an angle at the middle part and V-shaped in plan, the fire bar having on one side at its lower edge the apex of the angle removed to form a flat face, the inner portion of the angle being reduced to form a flat face located opposite the said flat face and parallel therewith, said portion of the bar at the flat faces having a slot extending upward from the bottom for a part only of the flat face portion, and of less width than the flat face portion, said portions of the

bars being shaped to permit the bar to be inserted in the said slotted portion of the supporting bar whereby the flat faces beyond and above the slotted portion are engaged by the opposite walls of the slots in the supporting bar, and the said side ribs on the supporting bar engaging the flat face portions on each side of the slotted portion of the fire bar.

2. In a grate bar, a supporting bar provided with a series of slots along its upper edge and also having ribs projecting on each side intermediate of said slots and parallel therewith, a series of fire bars each being bent at an angle at the middle part and V-shaped in plan, the fire bar having on one side at its lower edge the apex of the angle removed to form a flat face, the inner portion of the angle being reduced to form a flat face located opposite the said flat face and parallel therewith, said portion of the bar at the flat faces having a slot extending upward from the bottom for a part only of the flat face portion, and of less width than the flat face portion, said portions of the bars being shaped to permit the bar to be inserted in the said slotted portion of the cross bar whereby the flat faces beyond and above the slotted portion are engaged by

the opposite walls of the slots in the supporting bar, the said side ribs on the supporting bar engaging the flat face portions on each side of the slotted portion of the fire bar, and removable end members each comprising an angular portion arranged at its lower part corresponding with the angular portion of the said cross bars for engagement with the said slotted portion of the fire bar, said angular portion of the end members having vertical plates extending parallel with the cross bar on the outer face thereof.

3. In a grate bar, the combination of a supporting bar, provided at its end with rest engaging portions, a series of fire bars V-shaped in plan and removably carried by the supporting bar, and removable end members each comprising an angular portion corresponding with the said V-shaped fire bars and a series of vertical plates extending from the said angular portion parallel with the supporting bar and located above the said rest engaging portions of the supporting bar.

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