No. 883,046. PATENTED MAR. 24, 1908.

C. PEKAT.

GRATE.

APPLICATION FILED MAY 11, 1907.

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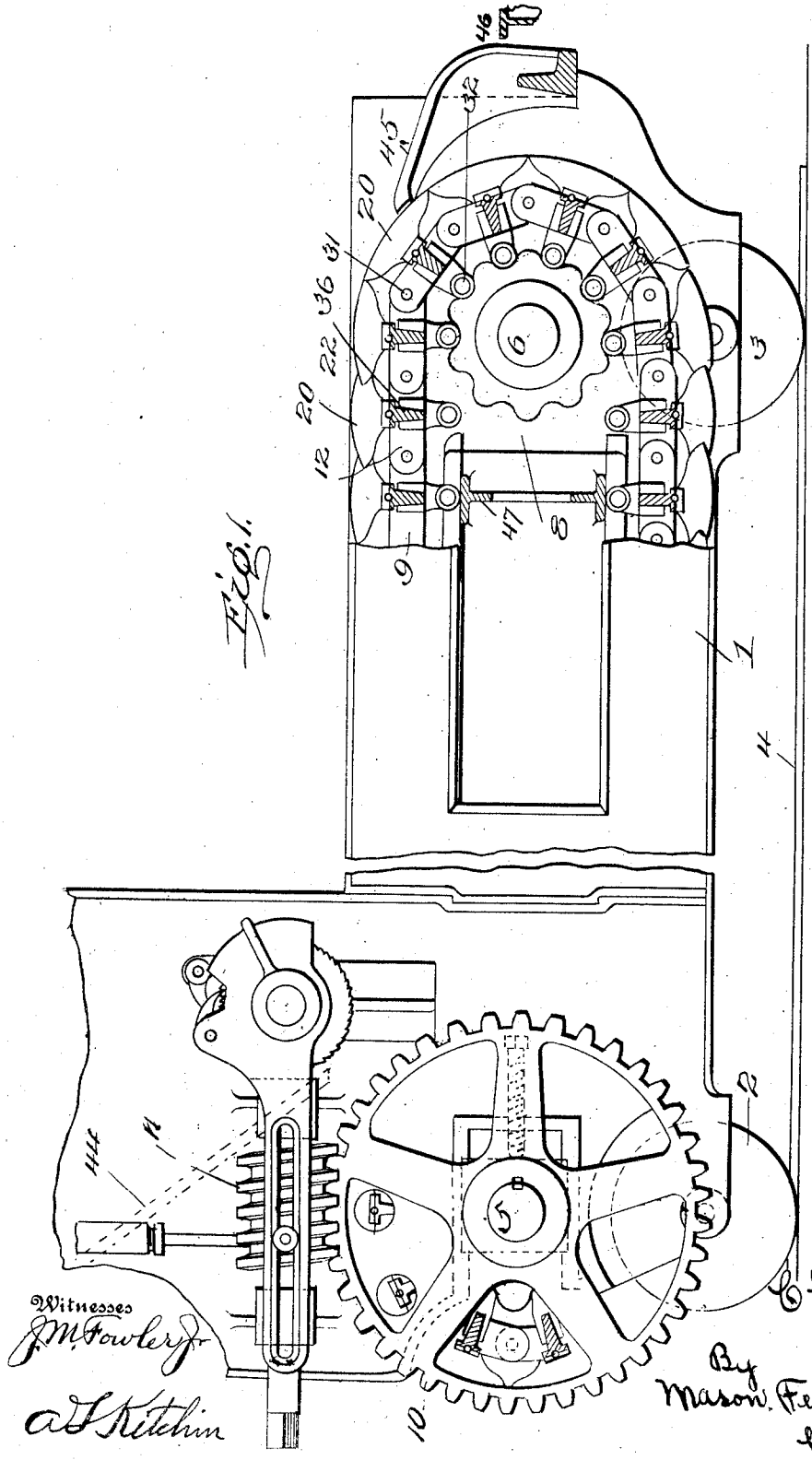


Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 2.

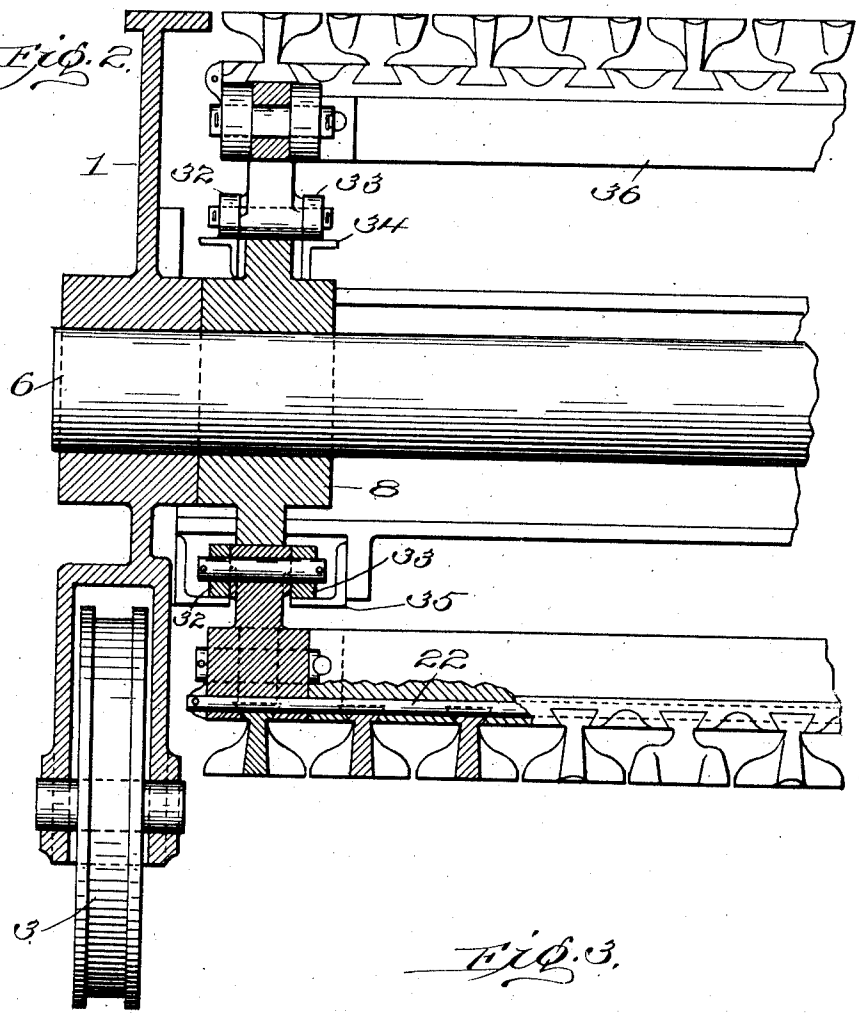
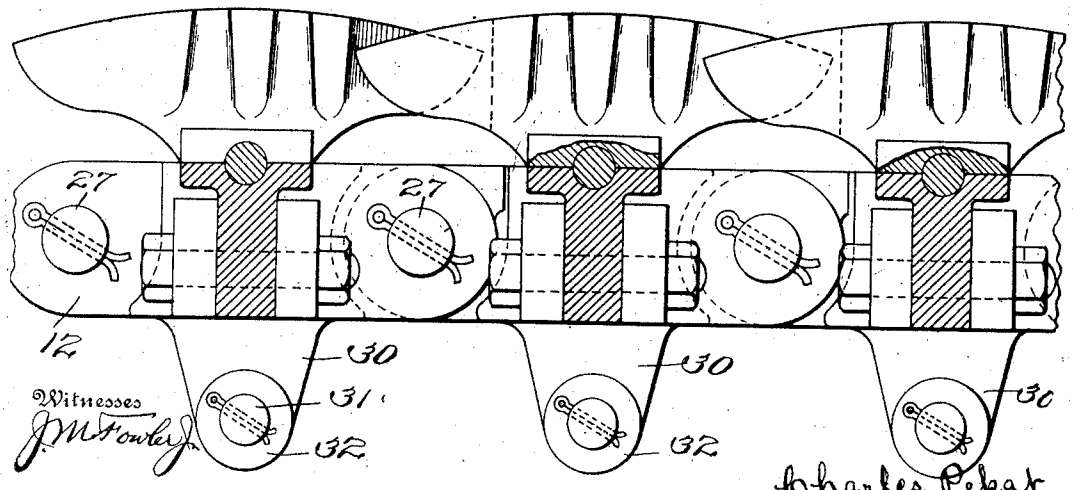


Fig. 3.



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4 SHEETS—SHEET 3.

Fig. 4.

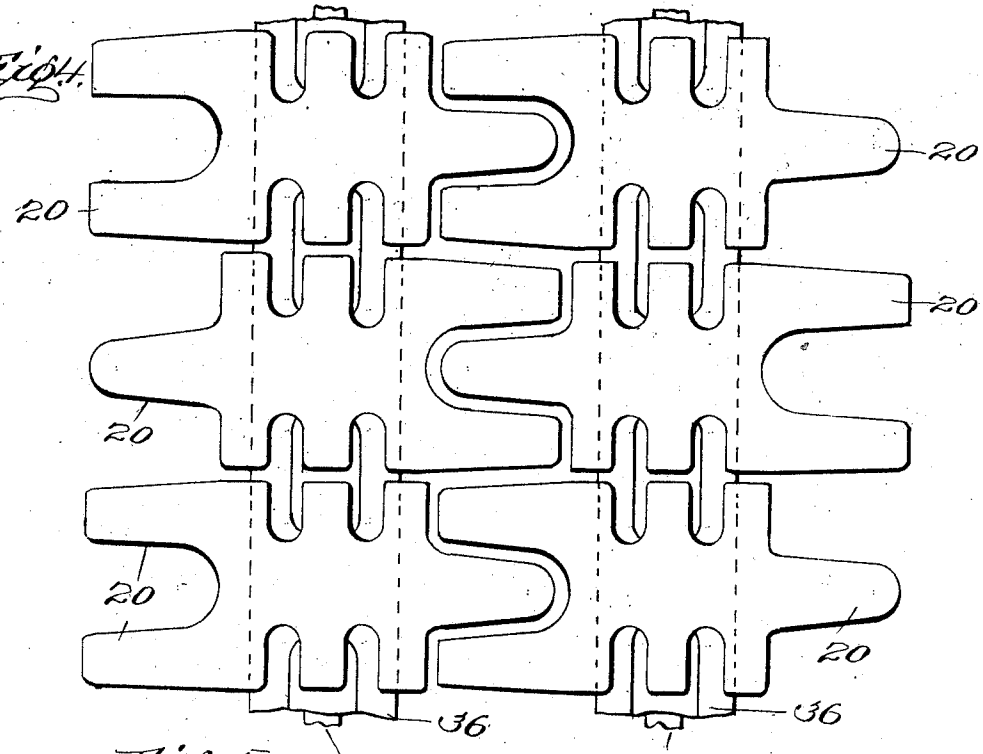


Fig. 5.

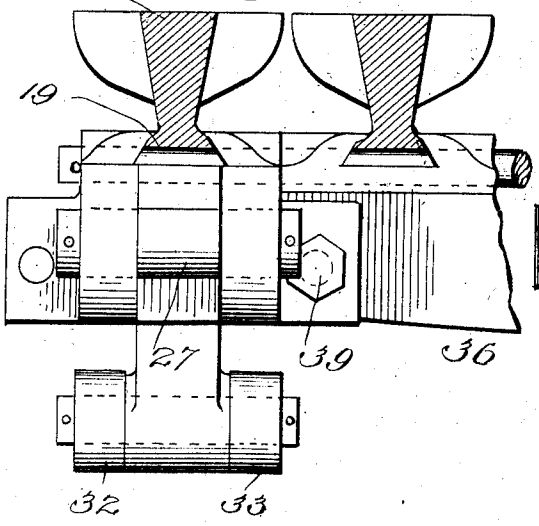
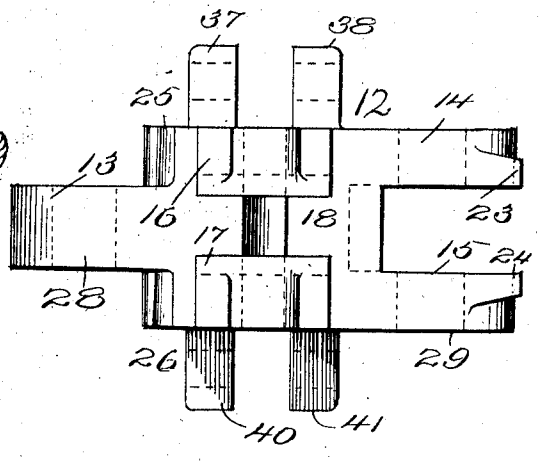


Fig. 6.



Witnesses

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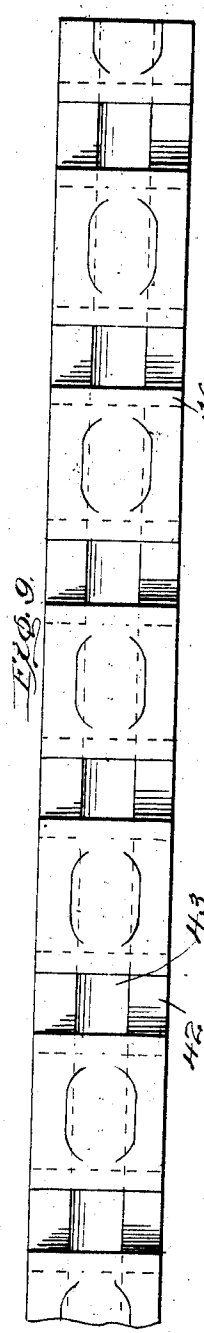
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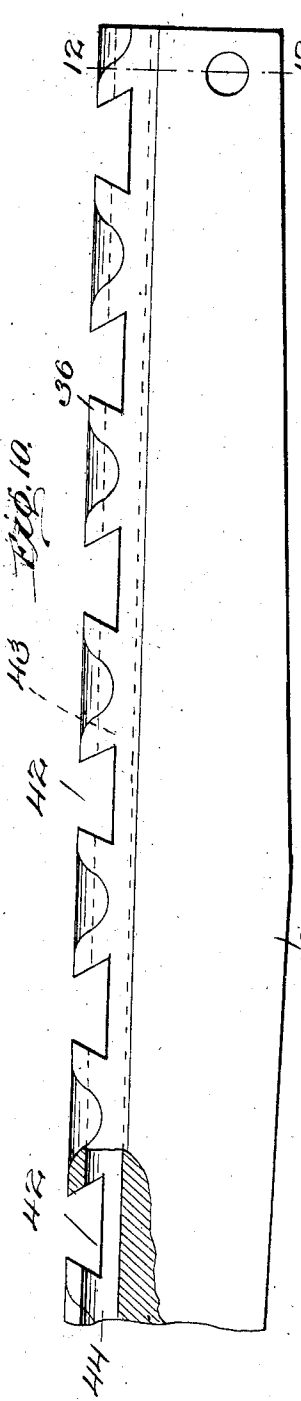
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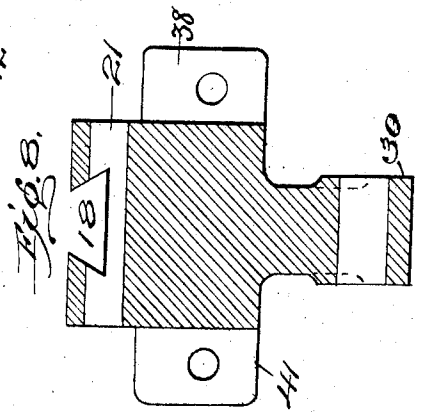
GRATE.

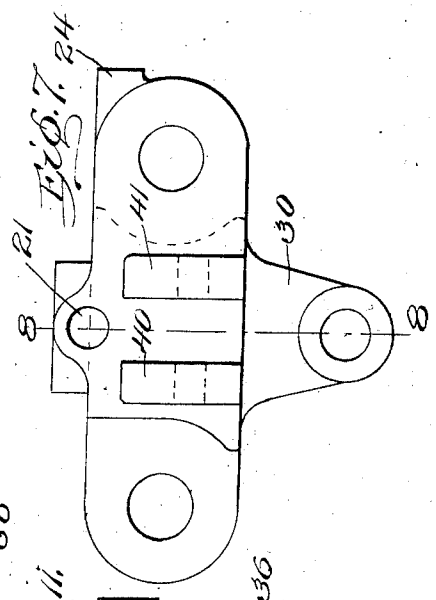
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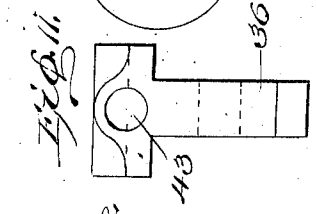
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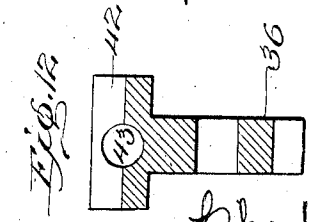












Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES PEKAT, OF CHICAGO, ILLINOIS.

GRATE.

No. 883,046. Specification of Letters Patent. Patented March 24, 1908.

Application filed May 11, 1907. Serial No. 373,105.

To all whom it may concern:

Be it known that I, CHARLES PEKAT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in 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 improvements in furnaces and particularly to furnace grates.

The invention comprises the production of a frame work, a movable furnace grate mounted thereon, and means for moving the movable grate for feeding fuel into the furnace.

The invention further comprises the production of a substantial chain grate provided with means for receiving removable grate sections that are securely keyed in position during operation, but may be easily and quickly removed whenever desired.

The invention still further comprises the production of a grate that is positioned on a truck or other frame, and adapted to be forced into a furnace in proximity to a dumping grate and adapted to feed fuel into the furnace and finally dump the same upon the dumping grate, the carriage being adapted to have secured thereto means for feeding or moving the grate.

The invention still further comprises the production of links and grate bars formed with dovetail therein and apertures at right angles to the dovetails for receiving dovetail grate sections and a locking or keying pin for holding the grate sections to the grate bars and links.

The object of the invention is the production of a movable grate that may be forced in or removed from a furnace, and so constructed as to provide a moving surface for feeding fuel into the fire box.

A still further object in view is the production of a movable or chain grate formed with a plurality of grate sections that are adapted to pass around a sprocket wheel in the interior of a furnace and at the same time form a substantially perfect semi-circle so as to provide a structure that will permit the use of a stationary grate positioned substantially against the moving grate for receiving the fuel or the unconsumed fuel that may reach the inner end of the grate.

A still further object in view is the production of a movable grate of the chain type, that has a plurality of links and bars with removable grate sections therefor, the grate sections being formed on the surface in the arc of a circle, so as to form a substantial semi-circular surface as the same may pass around the sprocket wheels at each end of the frame carrying the grate.

With these and other objects in view, the invention comprises certain novel constructions, combinations and arrangement of parts as will be hereinafter more fully described and claimed.

In the accompanying drawings Figure 1 is a side elevation of a grate formed according to the present invention, certain parts being broken away to better disclose the construction of the grate. Fig. 2 is an enlarged detail fragmentary section through one end of the furnace, certain parts being broken away to better disclose the invention. Fig. 3 is an enlarged detail side elevation of a number of links and grate sections forming a part of the present invention, certain parts being broken away to better disclose the construction thereof. Fig. 4 is a top plan view of several grate sections formed according to the present invention. Fig. 5 is a detailed fragmentary view, partly in section, of one of the links and grate bars. Fig. 6 is a top plan view of one of the links formed according to the present invention. Fig. 7 is a side elevation of Fig. 6. Fig. 8 is a section through Fig. 7 on line 8—8. Fig. 9 is a top plan view of part of the supporting grate bar formed according to the present invention. Fig. 10 is a side elevation of Fig. 9. Fig. 11 is an end view of Fig. 9. Fig. 12 is a sectional view of Fig. 10 through line 12—12.

In constructing a furnace according to the present invention, I provide a truck or frame 1, which is supported upon wheels 2 and 3 designed to move upon a track 4 so that the frame and mechanism carried thereby may be moved into and from a furnace, as may be desired. Mounted upon each end of frame 1 by means of journals 5 and 6 are any desired number of sprocket wheels 7 and 8, which are designed to receive and move a chain 9. Sprocket 8 is simply designed to receive and guide chain 9 while sprocket 7 is designed to be rotated by a gear 10, which in turn is rotated by a worm 11. The worm 11 is preferably continually rotated for slowly revolving gear 10 and sprocket 7 by any convenient means, the same not forming any part of the present invention.

Chains 9 are made for acting as a chain proper and as a supporting means for the grate sections, as clearly seen in Figs. 3 and 5 to 8 inclusive. The chains 9 Fig. 6 are formed of links 12, which are formed with an end or lug 13 at one end and a bifurcated portion, or a double set of ends 14 and 15 on the opposite side of the link. Formed preferably central of the link 12 are lugs 16 and 17 which have formed therebetween a dovetail opening 18, which is designed to receive a dovetail portion 19, of one of the grate sections 20. An aperture 21, preferably circular in contour, is formed at right angles to dovetail opening 18, and is designed to pass through link 12 in such a position as to extend half way above and half way below the bottom of dovetail opening 18. The dovetail extension 19 of grate sections 20 is also formed with a semi-circular opening which is designed to coincide with aperture 21 so that a key or pin 22 may be forced through aperture 21 and thus prevent the grate members 20 from being moved out of link 12. From this it will be observed that members 20 may be easily fitted into links 12 and keyed in position by insertion of key 22, which will positively hold the same from being accidentally removed or from being jarred out of place. Formed on one end of each of the links 12 are extensions 23 and 24 that are formed at right angles to the upper surface of the links so that the same may impinge against shoulders 25 and 26, also formed at right angles to the upper surface of the link. The lugs or extensions 23 and 24 of one link will impinge against the shoulders 25 and 26 of the following link, and will prevent the chain from bowing downward to any considerable extent, but will not interfere in the least with the chain passing around sprockets 7 and 8. By thus providing means for holding grate sections upon the upper surface of the chain, the grate surface is increased and also the chain is protected from the heat of the fire box. The various links are pivotally secured together by suitable pins 27 passing to apertures 28 and 29 respectively, as clearly seen in Fig. 6. Formed on the lower surface of each of the links 12 is a lug 30, which is designed to receive a shaft or journal 31, which in turn carries any desired friction means as rollers 32 and 33. The rollers 32 and 33 are designed to rest against suitable tracks 34 and 35 in their travel, so as to positively prevent the sagging or bowing down of the chain 9 and various grate sections secured thereto.

Secured to each of the links 12 is a grate bar 36. The grate bars 36 are secured to links 12 in any convenient way, preferably by having the end thereof pass between ends or lugs 37 and 38, and having a bolt 39 pass through the lugs 37 and 38 and end of the grate bar 36. The links 12 are also formed with ears or lugs 40 and 41, designed to receive another grate bar, as 36, on the opposite side to the grate bar received by lugs 37 and 38, for making an additional surface for the grate proper. In constructing a grate any number of chains 9 may be used and the lugs 37 and 38, or 40 and 41, will be adapted to receive grate bars 36, upon which various grate sections 20 are designed to be positioned. The top of grate bar 36 is formed similar to the top of links 12, namely, with a dovetail opening 42 and an aperture 43 at right angles to the opening 42, for accommodating pin or key 22.

As clearly seen in Fig. 4, a number of grate sections 20 are shown in position upon grate bars 36. As will be observed, each of the grate bars 36 carry a number of grate sections 20, independent of the remaining grate sections, and form what might be termed a section of the grate sections proper. If for any reason any of the grate sections 20 should become broken or burnt out, the respective key 22 may be removed and the respective section 20 slid out of the dovetail opening in the bar 36, and a new section 20 inserted in lieu thereof, and a key 22 again placed in position for locking all of the sections 20 in position. It will also be observed that bar 36 extends from the inner surface of chain 9 to the inner surface of another chain 9, but keys 22 extend entirely through both of the chains 9 and bars 36, so as to firmly lock the grate sections 20 positioned above chains 9, as well as lock in position the sections 20 positioned above bars 36.

In operation, the frame 1, with any desired number of chains 9, bars 36, and grate sections 20, may be moved into a furnace and divide the furnace opening into what is termed a fire box and an ash pit, the surface above the grate being the fire box and that below the ash pit or opening for removing the burnt products of combustion. The fuel is placed upon the grate by permitting the same to pass down over hopper plate 44. The chains 9 and connected grate mechanism are gradually moved so as to feed the fuel into the furnace, and as the same are fed into the furnace the fuel is consumed. As the fuel approaches the inner end of the grate the same is entirely consumed, or substantially so, and is finally forced upon a stationary grate 45 and from thence to a dumping grate 46. As chains 9 pass around sprockets 8 the upper surface of the grate sections 20 forms a substantial semicircle, as clearly seen in Fig. 1, so that stationary grate 45 may be placed in very close proximity to the grate sections 20 for receiving substantially all of the burnt fuel. In case any of the fuel reaches grate 45 before the same is entirely consumed, it remains upon grate 45 or grate 46 for a con-

siderable period until entirely consumed, and then grate 46 is dumped into the ash pit, or upon a conveyer, as may be most desirable, and removed in any convenient manner. As chains 9 pass from sprocket 7 to sprocket 8, anti-friction rollers 32 and 33 rest upon tracks 34 and 35 respectively, for preventing any undue sagging or bowing downward of the grate surface. Tracks 34 and 35 are held in position in frame 1 by any convenient means, as brace 47. By constructing the grate of comparatively small units, as sections 20, a grate is produced that is comparatively very flexible, and one that may have the parts positioned close together, but provide ample space for passage of air in any desired quantity. The grates 45 and 46, when covered with ashes or partly consumed fuel, will prevent any undue influx of cold air into the fire box.

What I claim is:

1. A furnace grate comprising a plurality of moving chains, grate bars directly and removably secured to said chains, grate sections removably secured to said bars and to said chains, and a key running longitudinally of said bars for locking said grate sections in position.

2. A grate comprising a plurality of chains, grate sections mounted on said chains, a plurality of grate bars mounted between said chains grate sections mounted on said grate bars, a single means for securing said grate sections directly to said chains and to said grate bars, and means for supporting said chains.

3. A chain grate comprising grate bars formed with beveled ways and chains comprising links, each link of said chains being formed with a lug on one side thereof having a beveled way therein, said beveled way extending longitudinally of said chain, said lug also having an aperture passing through said link at right-angles to said beveled way and communicating therewith, grate sections directly secured to said grate bars and chains, said beveled ways being adapted to receive said grate sections, and locking means passing through said chains and said bars for locking in position said sections, said aperture accommodating said locking means.

4. A chain grate comprising a plurality of chains, grate bars mounted therebetween, grate sections secured to said bars, grate sections secured directly to said chains, means for moving said chains, and a plurality of lugs positioned on the links of said chains for preventing undue sagging of the chains, the lugs of one link impinging against the end of adjoining link.

5. A grate comprising parallel chains, sustaining members depending therefrom, arc-shaped grate sections secured directly to said chains, sprocket wheels for supporting said sustaining members, grate bars carried by said chains, a plurality of grate sections supported directly by said chains, and tracks for supporting the sustaining members, between the sprocket wheels, in combination with a stationary grate at the discharge ends of the chains, in contact with the outer surface of the grate sections.

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

CHARLES PEKAT.

Witnesses:

GEORGE E. WISSLER

CHARLES C. SPENCER