March 3, 1931. J. R. HOBBS 1,795,127

GRATE

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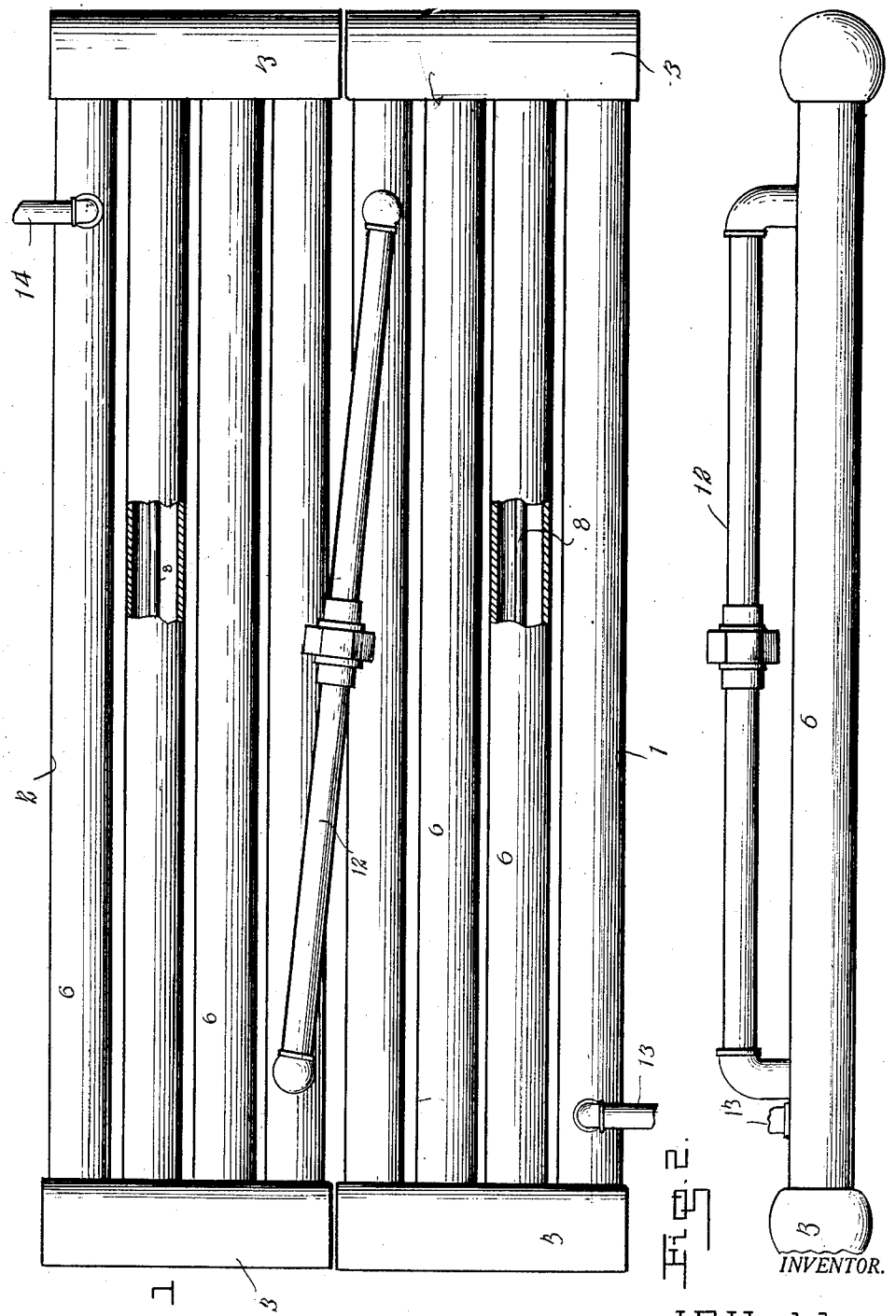


FIG. 1

FIG. 2.

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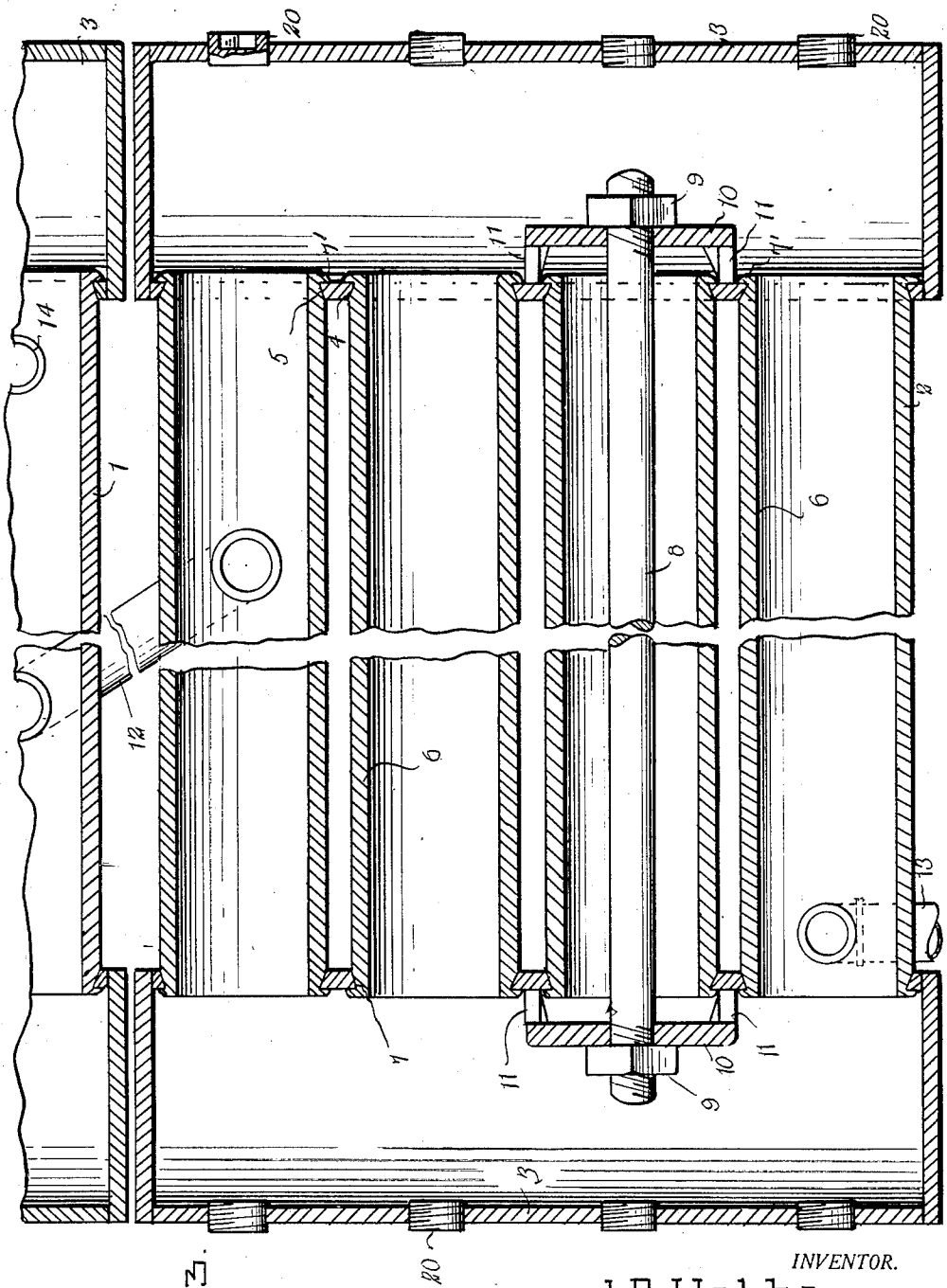


Fig. 2.

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Fig. 4.

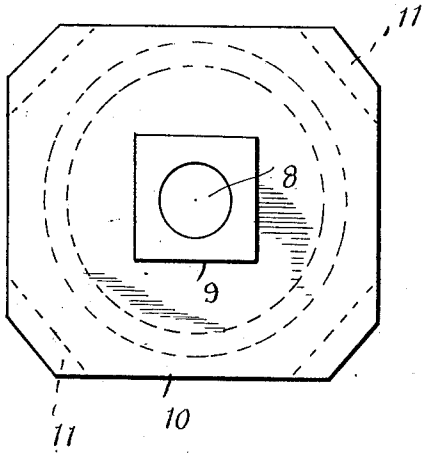


Fig. 5.

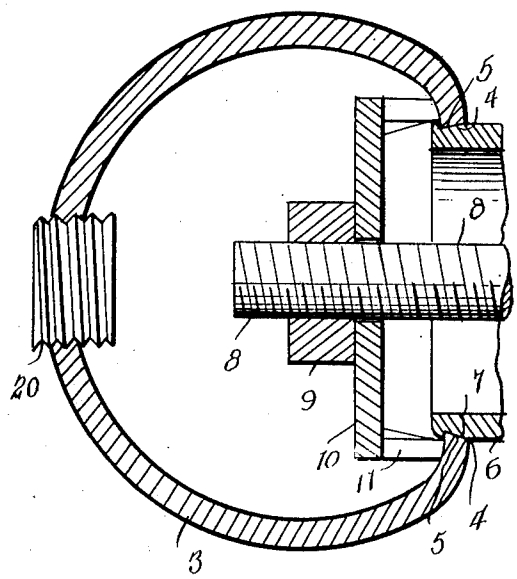
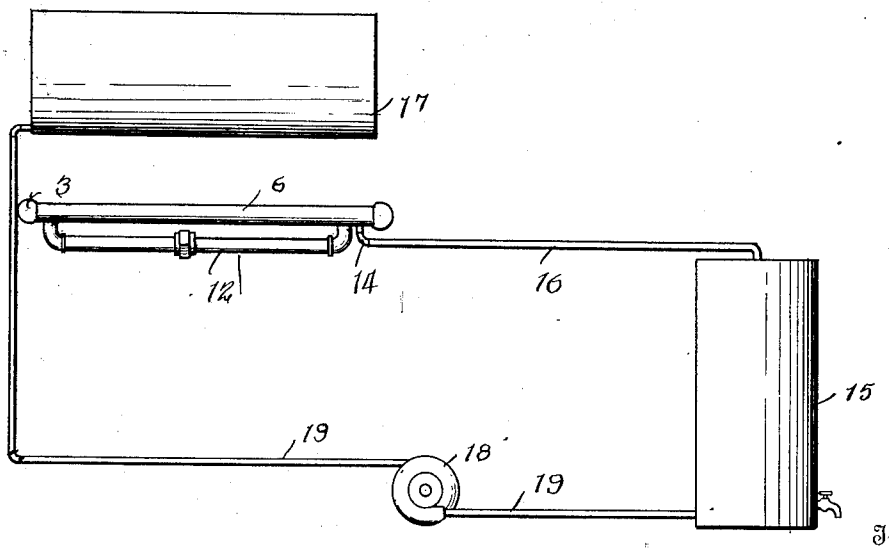


Fig. 6.



Inventor

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Patented Mar. 3, 1931 1,795,127

UNITED STATES PATENT OFFICE

JAMES R. HOBBS, OF ST. HELENS, OREGON

GRATE

Application filed December 6, 1928. Serial No. 324,201.

The present invention is directed to improvements in grates, and more particularly to one designed for use in connection with steam boilers.

The primary object of the invention is to provide a device of this character so constructed that the same can be filled with water, and replenished at intervals, the water circulating through the device serving to protect the same against the destructive action of the fire.

Another object of the invention is to provide a device of this kind constructed in such manner that the water circulating through the bars will become heated, and can be used as feed water for the boiler, or for other purposes.

Another object of the invention is to provide a boiler grate which is exceedingly simple in construction, durable, efficient in operation, and one which can be manufactured at a very small cost.

With these and other objects in view, this invention resides in the novel features of construction, formation, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawings, in which:—

Figure 1 is a bottom plan view of the device.

Figure 2 is a side elevation thereof.

Figure 3 is a longitudinal sectional view through one of the complete units, and a portion of the companion unit.

Figure 4 is an end view of one of the clamping plates.

Figure 5 is a detail sectional view through one of the rod connections.

Figure 6 is a diagrammatic view of the system for furnishing feed water to a boiler.

The grate consists of a pair of units 1 and 2, each unit comprising a pair of tubular headers 3, said headers having their confronting sides formed with a plurality of openings 4, preferably four in number, said openings having beveled walls 5, the purpose of which will appear later.

The grate bars 6 of each unit are formed from tubular sheet metal and have their ends beveled, as at 7, for snugly fitting within the openings 4 of the headers 3. The bars are of such length that the terminals thereof will project slightly into the headers when initially assembled, the extended ends of said bars being swaged, as at 7', to firmly unite the bars and headers.

A bar 6 of each unit has passed therethrough a tie rod 8, the ends of which have threaded thereon clamping nuts 9 adapted to engage the rectangular plates 10, said plates having their corners turned at right angles to the plates to provide feet 11 adapted to engage the inner surfaces of the walls of the headers 3 at points between the ends of the bars 6. The feet 11 will obviously maintain the plates spaced from the ends of the associated bars to permit free circulation of water through the bars equipped with the rods.

The nuts when forced into engagement with the plates 10 will hold the feet 11 of the plates tightly engaged with the header walls, the rods obviously serving to prevent any tendency of the headers to move outwardly, or away from each other, and will relieve strain upon the swaged ends of the bars.

The innermost or adjacent bars 6 of the units are connected by a pipe assembly 12 in order that water from the unit 1 can freely pass into the unit 2. The outermost tube of the unit 1 has connected thereto a pipe 13 through which water from a suitable source is conducted into said unit, and from thence through the pipe assembly 12 into the unit 2. The outermost bar of the unit 2 is provided with a discharge pipe 14, the respective pipes being provided with suitable controlling valves, not shown.

The discharge pipe 14 is preferably connected to a storage tank 15 by a pipe 16. The water from the tank can be used for any purpose desired, and can be used as feed water for the boiler 17 by forcing the water from the tank by the pump 18 through the pipes 19—19.

The headers 3 have carried thereby removable plugs 20 to permit insertion of a tool for swaging the ends of the grate bars 5.

A grate constructed in accordance with my invention will not only protect the bars against intense heat, but will also heat the

water circulating therethrough for use as feed water for a boiler.

It will be of course understood that the grate bars 6 can be rectangular in cross section, or any other shape desired.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, and proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What is claimed is:—

1. A grate including headers formed in their confronting sides with corresponding tapered openings, hollow grate bars formed with tapered ends fitted in the tapered openings of the headers, a tie rod passing through a grate bar and of a length to project slightly into each header, nuts within the headers threaded on the ends of the tie rod, and abutting elements on the ends of the tie rod confined between the nuts and the inner sides of the headers receiving the tapered ends of the bars.

2. A grate including headers formed in their confronting sides with corresponding tapered openings, hollow grate bars formed with tapered ends fitted in the tapered openings of the headers, a tie rod passing through a grate bar and of a length to project slightly into each header, nuts within the headers threaded on the ends of the tie rod, and abutting elements consisting of plates loosely mounted on the threaded ends of the tie rod and having portions bent to provide feet to engage the inner side of the headers adjacent the tapered ends of the grate bars.

3. A grate including headers formed in their confronting sides with corresponding tapered openings and having threaded openings in their outer sides in line with the respective tapered openings, plugs closing the threaded openings, hollow grate bars formed with tapered ends fitted in the tapered openings of the headers, a tie rod passing through a grate bar and of a length to project slightly into each header, nuts within the headers threaded on the ends of the tie rod, and abutting elements consisting of plates loosely mounted on the threaded ends of the tie rod and having portions bent to provide feet to engage the inner side of the headers adjacent the tapered ends of the grate bars.

In testimony whereof I affix my signature.

JAMES R. HOBBS. [L. S.]