

(No Model.)

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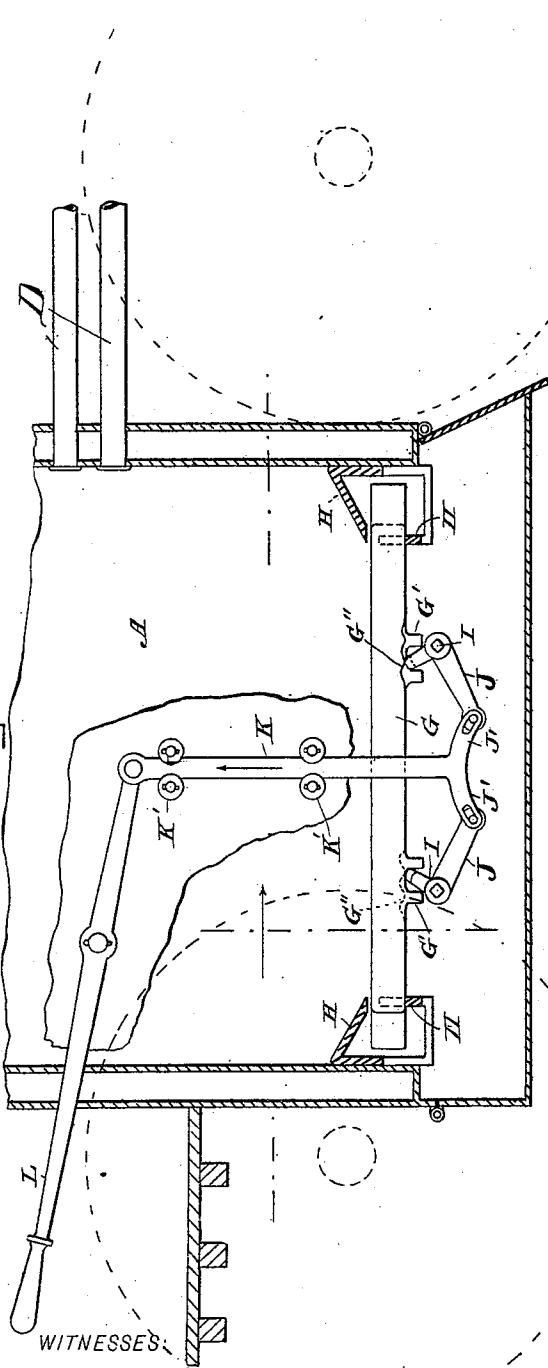
H. W. SHEPHARD.

CONSTRUCTION OF MOVABLE FIRE BARS OF BOILERS.

No. 471,440.

Patented Mar. 22, 1892.

Fig. 1.



WITNESSES:

*E. B. Bolton*  
*M. A. Walsh*

Fig. 2.

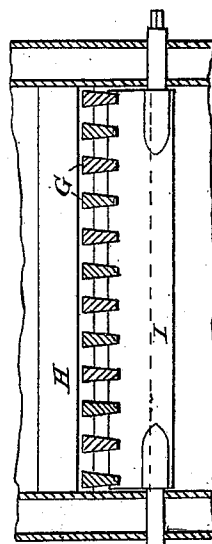
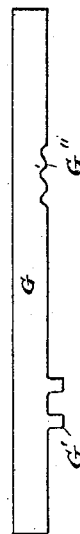


Fig. 3.



INVENTOR

*Henry William Shephard*

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ATTORNEYS

(No Model.)

2 Sheets—Sheet 2.

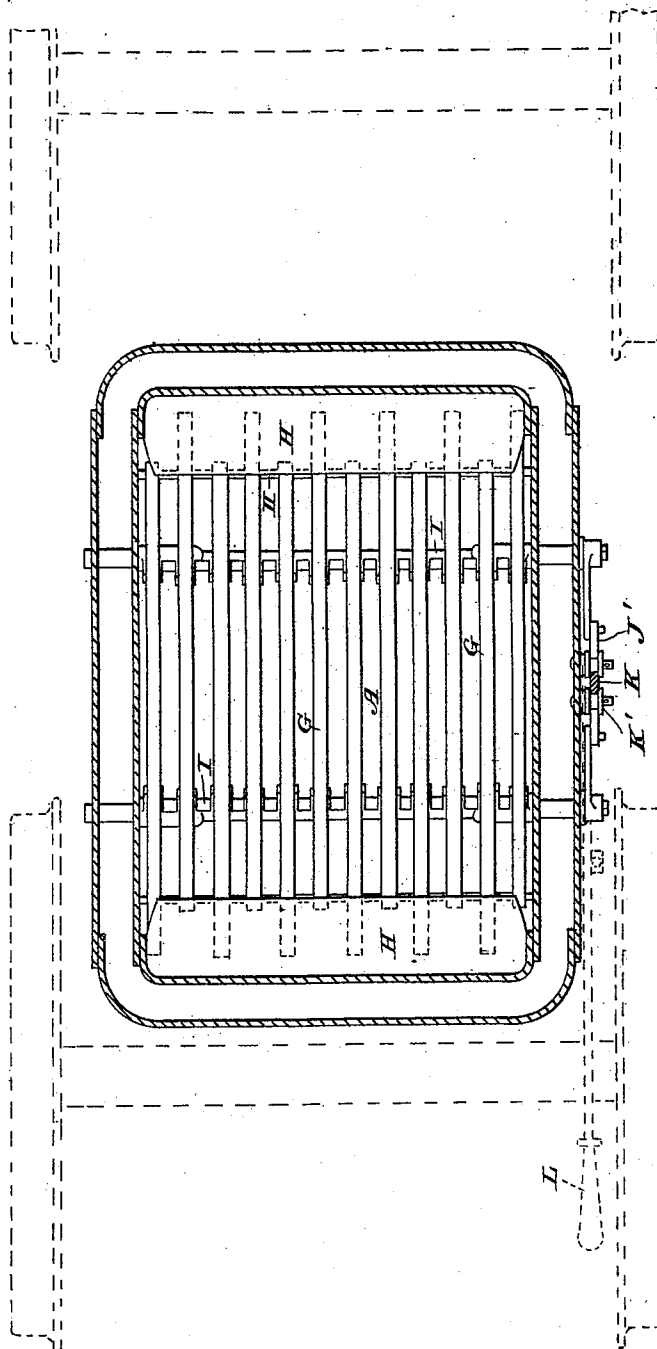
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Fig. 2.



WITNESSES:

*E. B. Bolton*  
*M. A. Walsh*

INVENTOR.

*Henry William Shephard*  
BY  
*Richard R. [Signature]*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

HENRY W. SHEPHARD, OF GRANVILLE, NEW SOUTH WALES.

## CONSTRUCTION OF MOVABLE FIRE-BARS OF BOILERS.

SPECIFICATION forming part of Letters Patent No. 471,440, dated March 22, 1892.

Application filed May 25, 1889. Serial No. 312,186. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY WILLIAM SHEPHARD, a subject of the Queen of Great Britain, residing at Granville, New South Wales, have invented certain new and useful Improvements in the Construction of Movable Fire-Bars of Boilers, of which the following is a full, clear, and exact description.

My invention has for its object an improved means for securing the more efficient combustion of fuel in the furnaces of steam-boilers, more particularly serviceable in the use of inferior qualities of coal or other fuel.

Referring to the accompanying drawings, Figure 1 is a longitudinal section of a portion of a locomotive-engine, showing the furnace of a locomotive-boiler with my apparatus attached thereto. Fig. 2 is a plan of the grate-bars. Fig. 3 is a transverse section of the same. Fig. 4 is a side elevation of one of the bars.

In Fig. 1, A is the furnace of an ordinary locomotive-boiler.

D are the tubes of the boiler.

H H are beveled covering-plates placed over the spaces at the ends of the bars.

I I are the bearers or resting-plates which carry the fire-bars, which are slightly rounded.

J are levers attached to the outer end of the bearers I.

K is the connecting-rod attached to the levers J and made to slide between the rollers K'. L is a pivoted lever also attached to the connecting-rod K for transmitting the sliding and jarring motions to the fire-bars G.

The fire-bars are constructed so as to secure a jarring or oscillating in addition to a sliding movement. I make them parallel their entire length and either parallel or slightly tapered in depth. The two horns or lugs G' at a certain distance from one end of the fire-

bars, as shown in the drawings, are cast so as sit upon the bearers or resting-plates I I, which have oscillating motion imparted to them. These horns being on either side of the bearers regulate the distance they travel. At a certain distance from the other end of the bars the corrugations G'' produce a jarring motion as the bars are alternately pushed to and fro over their respective bearers. It is essential that each bar should move independently of the adjacent bars and in an opposite direction, and for such purpose the bars occupy reverse positions—that is to say, the corrugated part of one bar is placed at the side of another bar where the horns are situated, the result being a jarring motion simultaneously at opposite ends of the furnace. The bearers I I are placed on the under side of the bars, having their ends attached to any convenient part of the furnace. In locomotives they may be secured to the bottom ring which forms the water-space. When the bearers are placed in position and the bars laid thereon, it will be found that at either end there will be spaces down which the fuel would pass to the ash-pan below. To obviate this I construct the beveled covering-plates H, which divert the fuel to the bars and prevent its exit at the ends.

I claim—

The combination of the bars G, having corrugations G'', movable bearers I I, supporting said bars, the connecting-rod K, connections between said rod and bearers, lever L, actuating said rod, and the beveled covering-plates H H, substantially as set forth.

HENRY W. SHEPHARD.

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