J. McPHAIL.

Crown Bars for Steam Boilers

No. 167,004. Patented Aug. 24, 1875.

Fig. 1.

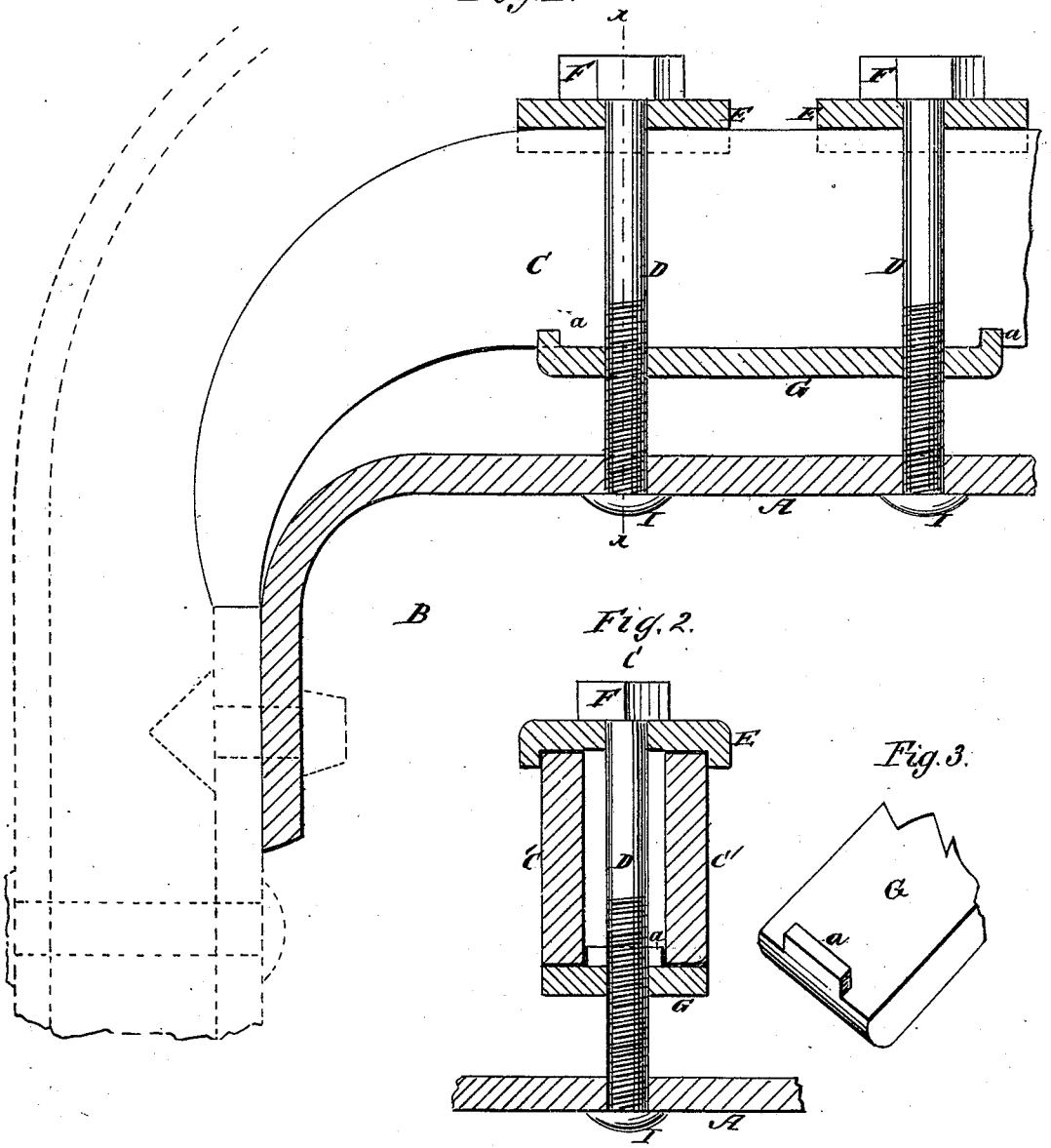

Fig. 2.

Fig. 3.

WITNESSES:

E. Wolff.

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UNITED STATES PATENT OFFICE.

JAMES McPHAIL, OF ELLIS, KANSAS.

IMPROVEMENT IN CROWN-BARS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **167,004**, dated August 24, 1875; application filed March 1, 1875.

To all whom it may concern:

Be it known that I, JAMES MCPHAIL, of Ellis, in the county of Ellis and State of Kansas, have invented a new and useful Improvement in Crown-Bars, of which the following is a specification:

Figure 1 is a sectional elevation of a fragment of a crown-bar and crown-sheet of a boiler-furnace; Fig. 2, a cross-section on line *x x;* Fig. 3, a perspective view of a fragment of the lock-bar.

The invention is an improvement upon that covered by Letters Patent No. 129,634; and consists in the employment of a detachable lock-bar, having lugs or projections on its ends, in connection with a crown-bar composed of two parallel parts or sections, as hereinafter fully described.

In the drawing, A represents the crown-sheet of a locomotive boiler-furnace, B. The crown-bar C is made of two parallel parts or bars, C′ C′, which extend (in practice) entirely across the top of the crown-sheet, and are bent down at the end, and secured to the side of the furnace-wall by means of bolts or rivets, as shown. A narrow space intervenes between the crown-sheet and crown-bar, and the former is supported from the latter by means of bolts D, having heads F resting on cross or tie plates E, and passing down between the bars C′ C′, as shown. The lower ends pass through the crown-sheet, and are riveted at I, in the usual way.

This general arrangement of bolts and crown-bar has been previously adopted. The novel feature of the combination shown is, therefore, the lock-bar G, which is applied to the under side of the crown-bar by the bolts B, which screw through it, and by its end lugs *a a*, which enter the space between the bars C′ C′.

The lock-bar aids in preserving the parallelism of the bars C′ C′, and strengthens and braces the same to such an extent as enables them to be made thinner and lighter than heretofore. It also prevents the bolts being thrown out of vertical parallelism with the bars C′ C′ by reason of the warping, bulging, or other distortion of the crown-sheet, which, owing to various causes, is an event of common occurrence, and tends to break the thread on the screw-bolts where they pass through the solid bridge-pieces at the top of the crown-bar. The use of the lock-bar likewise obviates the necessity of threading the bolts their entire length, as in the case where they screw through said bridge-pieces, and it is a useful adjunct in the finishing operation of riveting the ends I.

What I therefore claim is—

The detachable lock-bar G, having end lugs *a a*, in combination with the crown-sheet A, the crown-bar formed of the separate parts or sections C′ C′, the bolts D D, and the tie-plates E E, as shown and described, for the purpose specified.

JAMES MCPHAIL.

Witnesses:

JNO. H. EAMES,

S. K. HAMILTON.