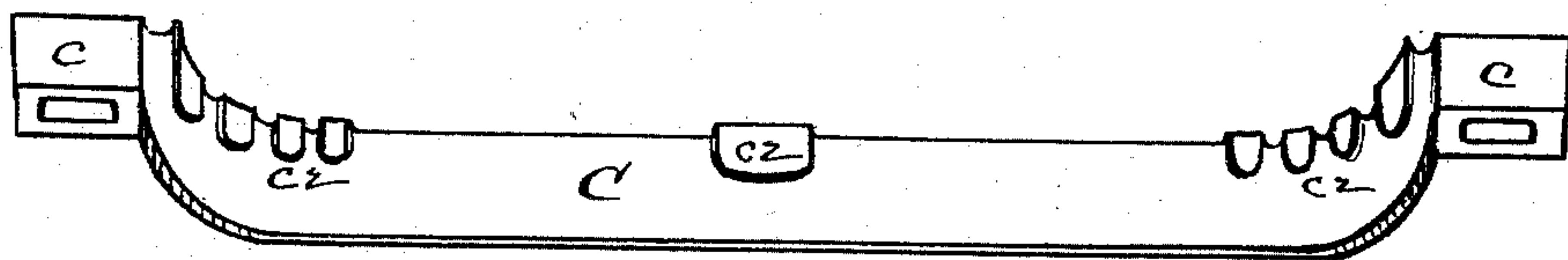
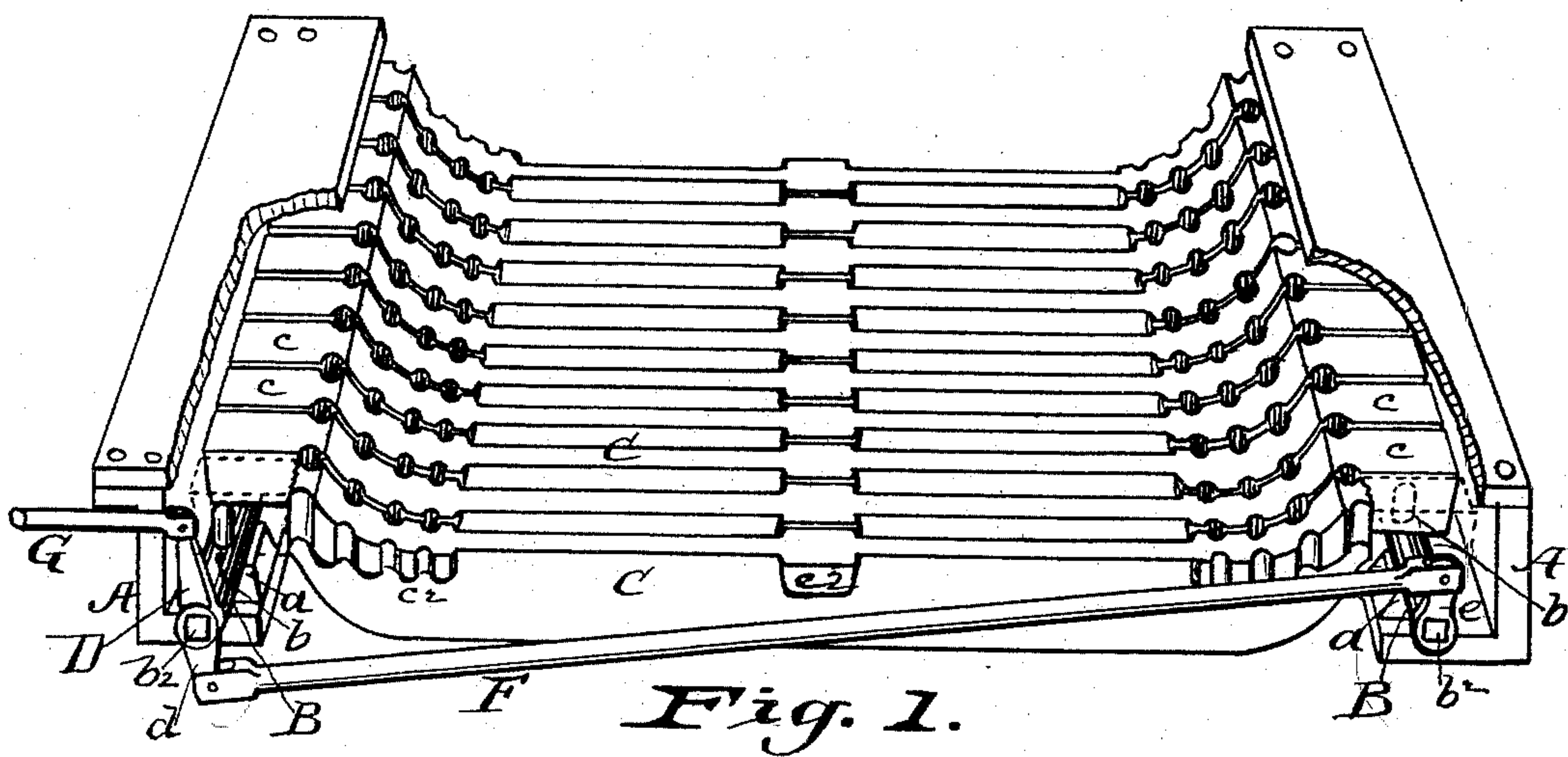
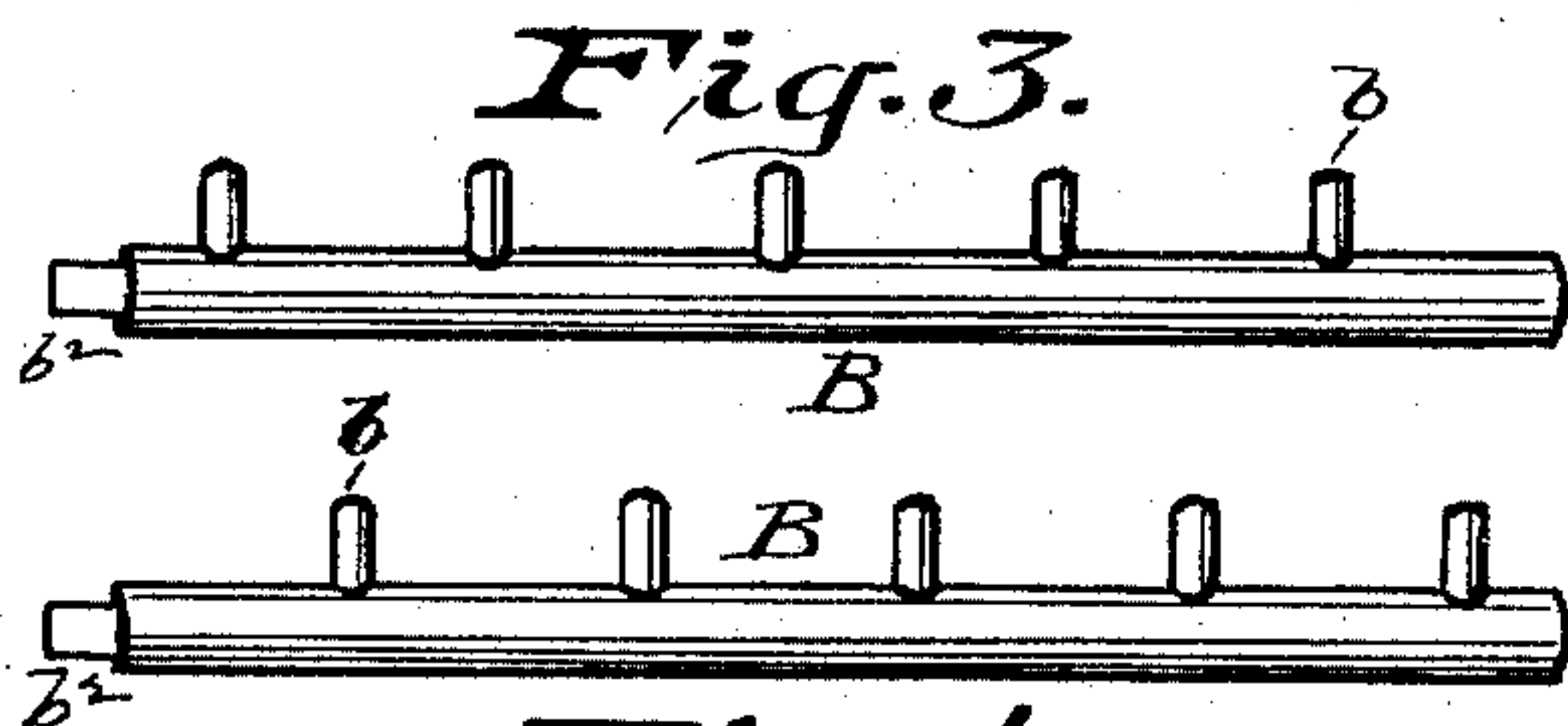


(No Model.)

C. E. MARK.  
SHAKING GRATE.

No. 482,452.

Patented Sept. 13, 1892.



*Fig. 2.*

Witness,

*M. E. Norton.*  
*M. H. Carroll.*

Inventor,

*Charlie E. Mark,*  
*By Geo. W. Tibbitts atty.*

# UNITED STATES PATENT OFFICE.

CHARLIE E. MARK, OF CLEVELAND, OHIO.

## SHAKING-GRATE.

SPECIFICATION forming part of Letters Patent No. 482,452, dated September 13, 1892.

Application filed October 26, 1891. Serial No. 409,923. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLIE E. MARK, a citizen of the United States, residing at Cleveland, Cuyahoga county, State of Ohio, have  
5 invented certain new and useful Improvements in Shaking-Grates, of which the following is a specification.

This invention relates to grates for furnaces; and it consists in the peculiar construction and combination substantially as hereinafter described, and pointed out in the claim.

In the accompanying drawings, Figure 1 is a perspective view of my new shaking-grate, portions broken away to show construction  
15 and operation. Fig. 2 is a view of one of the grate-bars. Figs. 3 and 4 are detached views of rock-shafts.

A A represent two angle bars or plates, which are to be suitably attached in the forward and rear sides of a furnace-fireplace and which support the working parts of the grate-bars and the shaking mechanism. At suitable intervals on said bars or plates are provided curved seats *a* for the rock-shafts to  
25 rest and rock in.

B B are the rock-shafts, having on their upper sides a row of pins, lugs, or projections *b*, and each of said shafts has a square tenon *b*<sup>2</sup>  
30 on one end.

C C are the grate-bars, which may be made in the form shown, provided on each end with a square portion *cc*, in the undersides of which are made cavities or recesses designed to set  
35 upon and over the aforesaid pins or lugs *b*. The central portions of the grate-bars are made thinner than the ends and have near the ends and at the middle part side lugs or projections *c*<sup>2</sup>. The grate-bars are also made

dishing with a downward curve at the ends 40 next to the square heads. The purpose of this is to reduce the thickness of bed of fuel at the forward and back part and provide better draft at those points. These grate-bars are supported on the aforesaid rock-shafts B B, 45 one end of each bar being placed with its cavity over a pin or lug *b* in alternate order—that is, a bar resting at its forward end over a pin has its rear end resting on the rock-shaft between pins, and vice versa, the pins 50 on the two rock-shafts standing in alternate order, as shown in Figs. 3 and 4, the purpose obviously being to provide for the alternate movement of the bars while shaking.

Upon the front shaft is placed a lever D, 55 having a depending arm *d*, and the rear shaft has an upright crank-arm *e*, and this is connected by a link or rod F to the arm *d*, by which the rear shaft is given an oppositely-reciprocating movement to that of the front 60 shaft. To the lever D is attached a rod G, which may reach through the front wall of the furnace, by which the said movements may be imparted to the grate.

Having described my invention, I claim— 65

In a shaking-grate, the angle-plates A, having seats for the rock-shafts, rock-shafts B B, mounted therein and provided with the pins or lugs *b b*, grate-bars C C, having socketed heads *c c*, supported on said pins in reverse 70 order, and means for rocking said shafts oppositely, whereby the grate-bars have imparted to them the reciprocating movements, substantially as and for the purpose specified.

CHARLIE E. MARK.

Witnesses:

GEO. W. TIBBITTS,  
E. JAY PINNEY.