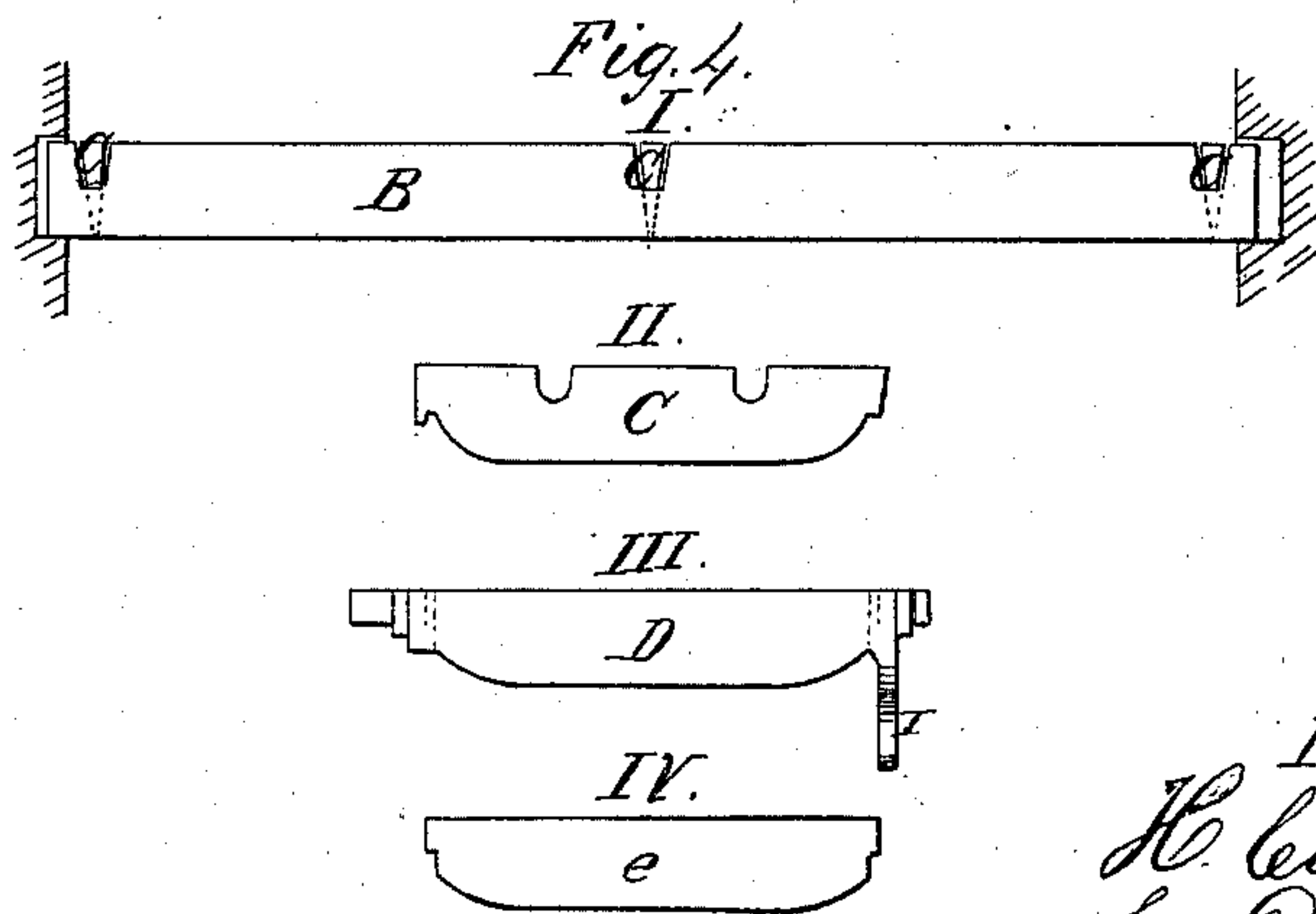
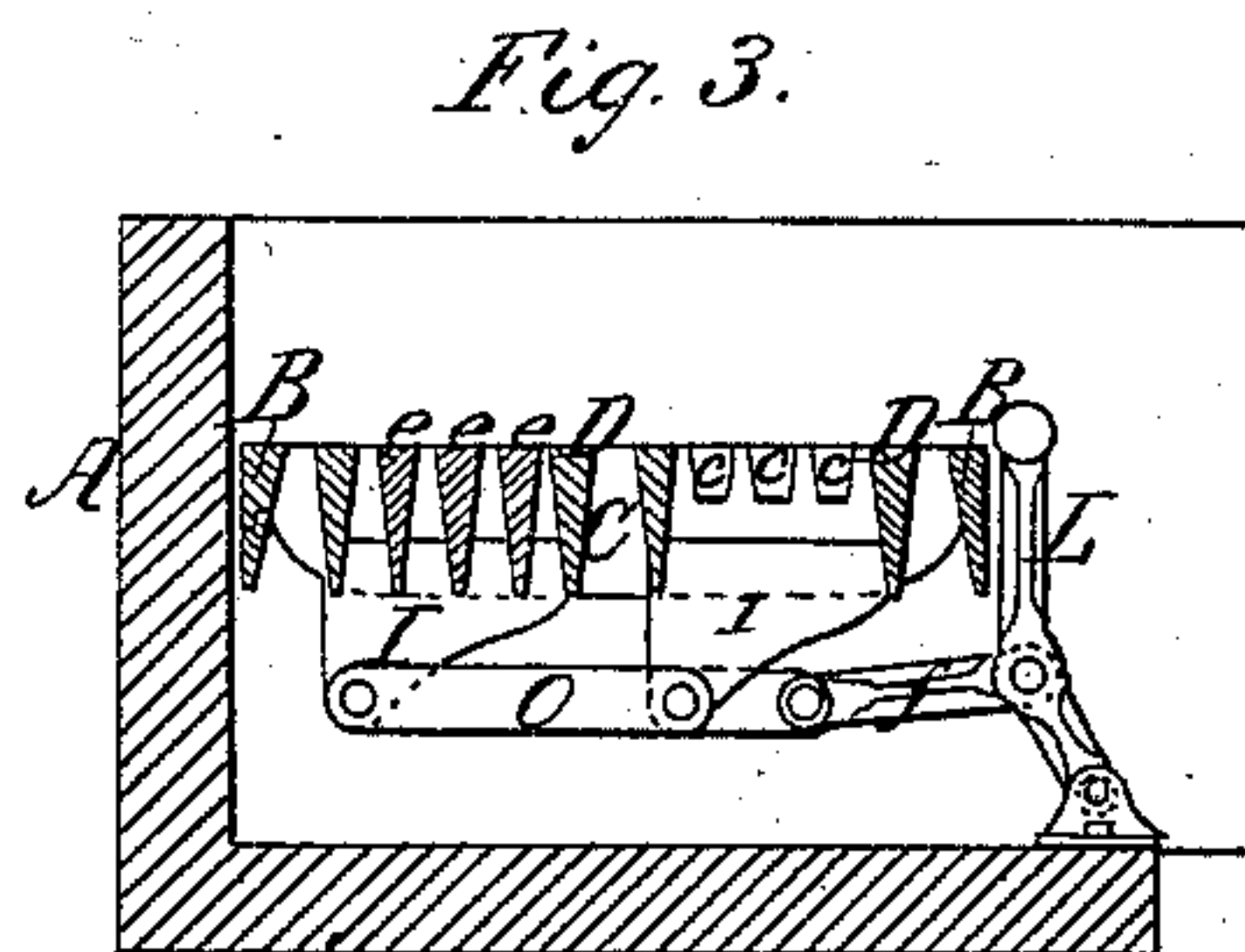
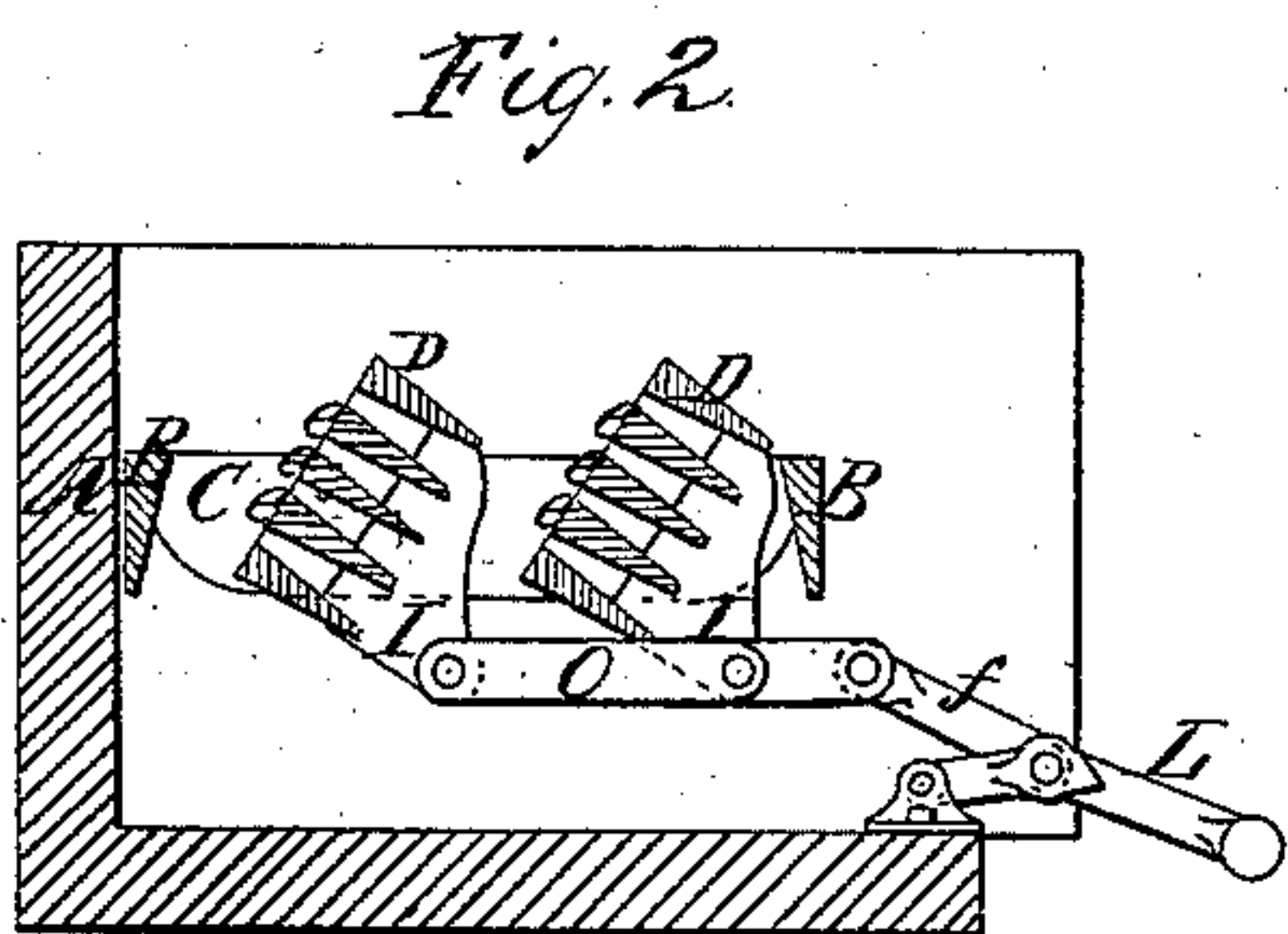
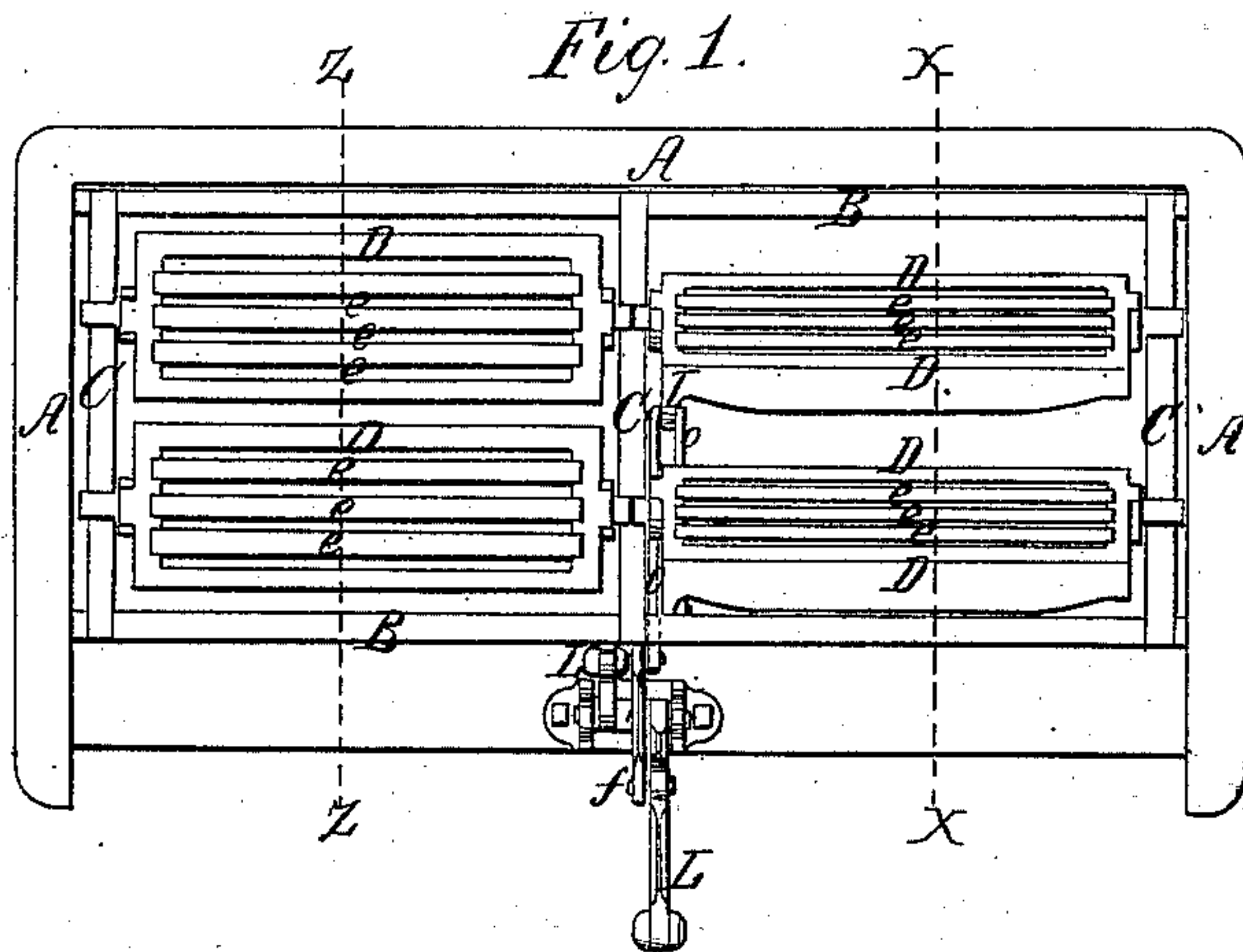


H. Collinson.

Grate Bar.

No 99,640.

Patented Feb. 8, 1870.



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United States Patent Office.

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Letters Patent No. 99,640. dated February 8, 1870.

IMPROVEMENT IN GRATE-BARS

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY COLLINSON, of Dorchester, in the county of Norfolk, and State of Massachusetts, have invented certain new and useful Improvements in Furnace-Grates; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

My invention relates to grates for furnaces; and

The invention consists in a novel manner of constructing the same, whereby one part can be operated independent of the rest, and a part or the whole can be removed or replaced at pleasure, without disturbing the brick-work of the furnace, as hereinafter more fully explained.

Figure 1 is a top plan view of a furnace-grate, on my plan;

Figure 2 is a cross-section on the line *x-x* of fig. 1;

Figure 3, a similar view on the line *z-z* of fig. 1; and

Figure 4 are views of the pieces composing the frame, detached.

The ordinary method of constructing furnace-grates for locomotives, steamboats, and steam-engines, is to make the whole grate stationary, the bars being detachable, but not otherwise movable, so that when it is desired to clear or clean the grate, it becomes necessary, generally, to open the furnace-doors, thus admitting a draught of cold air, which lowers the temperature, and thereby the pressure of the steam. When brick-work is used, it is also customary to set the frame in the same, in such a manner, that when it is desired to change the same, more or less of the brick-work has to be torn away, and then rebuilt.

It is to remedy these difficulties that my invention is designed; and to accomplish that object, I make the grate proper of a series of frames or sections, *D*, rectangular in form, with journals at each end, so that they may be hung in a frame, in such a manner as to permit them to be rocked or shaken, tilted or tipped.

These frames *D* may be cast with recesses in their end-pieces, as represented at *c*, fig. 3, so that the bars *e* may rest loosely therein, to permit them to expand or contract without injury to the frames *D*, and also to be replaced when necessary.

These frames *D*, I make with a pendent or arm, *I*, at one end, so that any desired number of them may be connected by rods or bars *o*, as represented in figs. 2 and 3.

I divide the grate into two or more sections, according to its size, and in each section or part I mount a

series, two or more of the frames, *D*, with their bars *e*, inserted as represented in fig. 1.

All the frames *D* in one part, I connect by a rod or bar, *O*, underneath, and the end of this rod *O*, I connect by another rod, *f*, to a lever, *L*, located outside of the furnace, so that by means of the lever all the frames or sections in one part of the grate may be shaken or tilted, without opening the furnace-door, or disturbing those in the other part.

There may be any number of such parts or divisions in the furnace, each series of sections or frames *D* in the separate parts being connected and provided with a separate lever, *L*.

To support these sections or frames, I construct the main frame of two or more bars, *B*, the ends of which rest loosely in suitable recesses made for them in the walls of the furnace, as represented by No. 1, fig. 4. The recesses in the walls are deep enough to allow the bar *B* to move longitudinally, so as to be removed when desired.

These bars *B*, being formed with recesses or notches to receive the ends of cross-bars *C*, which latter are provided with circular recesses or notches, for the reception of the journals of frames *D*, the main frame is thus composed of a series of independent bars, each and all of which can be removed or replaced at pleasure, without injuring or removing the brick-work, and which also permits the various parts to expand and contract without injury.

Any form of grate-bars may be used with this arrangement. In this case I have represented the ordinary plain bar, one being shown detached, at No. 4 of fig. 4, although it is obvious that any other style may be used equally well.

This plan of constructing and operating grates may be applied to all kinds of furnaces, its advantages being obvious to any one familiar with the subject of grates, as ordinarily used in furnaces.

Having thus described my invention,

What I claim, is—

1. A furnace-grate, consisting of two or more sections or nests of frames, each of the frames being provided with loosely-fitting grate-bars, and so journaled and connected with the frames of the same section, that each section of frames may be shaken or tilted from the outside, independently of the other, substantially as herein described.

2. The frames *D*, provided with the journals, and having recesses for the reception of the bars *e*, as set forth.

3. The main frame, consisting of the bars *B* and *C*, constructed and arranged substantially as described.

Witnesses:

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B. POOLE,

A. ROULSTONE FOX.