

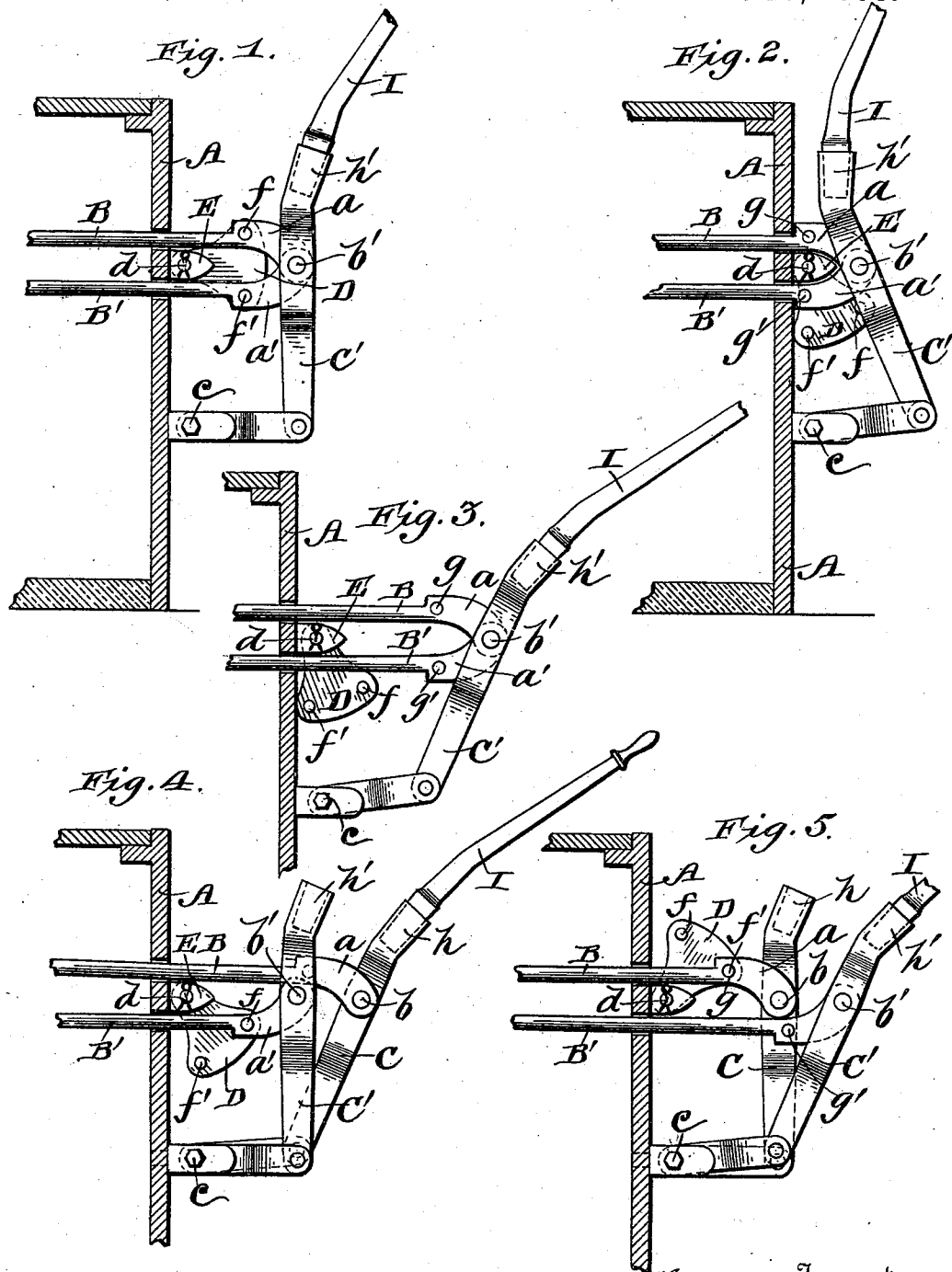
(No Model.)

3 Sheets—Sheet 1.

W. McCLAVE.  
GRATE FOR BOILER OR OTHER FURNACES.

No. 550,191.

Patented Nov. 19, 1895.



Witnesses

*Everance*  
*John L. [unclear]*

Inventor  
*William M. Clave*  
by *Masson, Fenwick & [unclear]*  
his

Attorneys.

(No Model.)

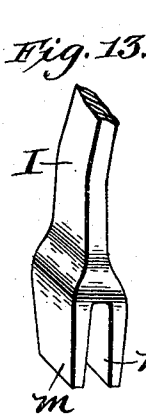
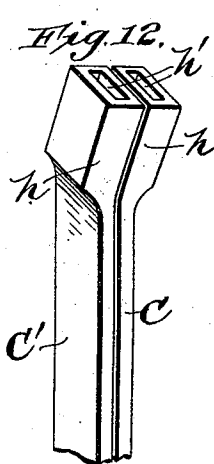
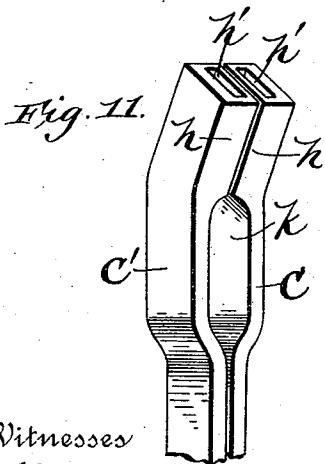
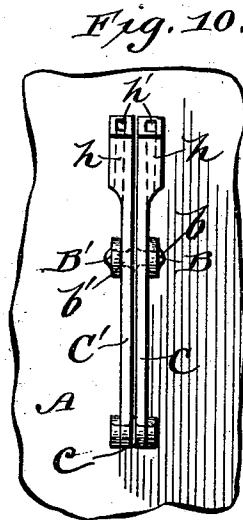
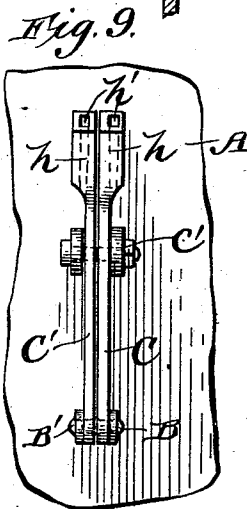
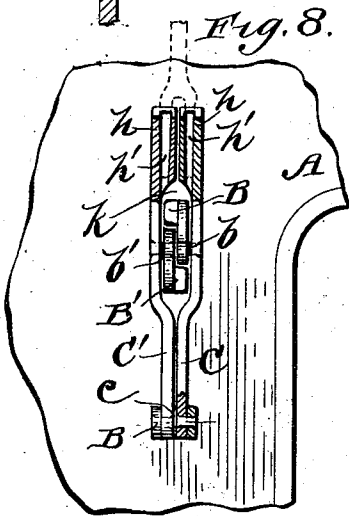
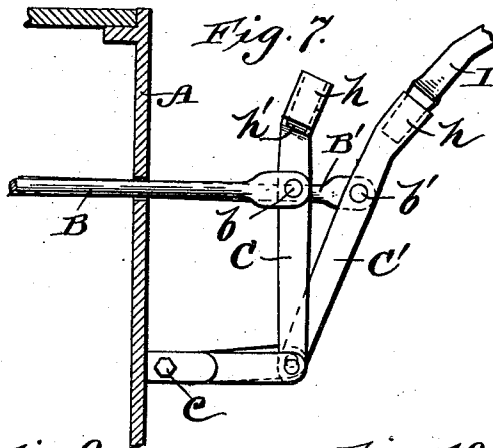
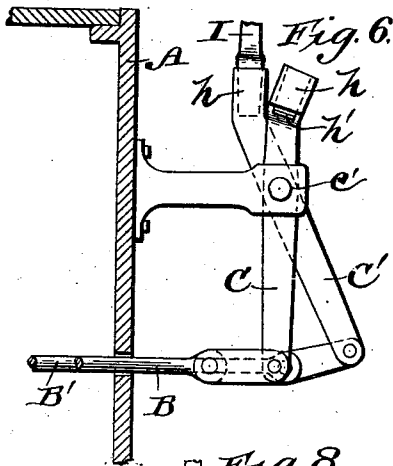
3 Sheets—Sheet 2.

W. McCLAVE.

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No. 550,191.

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Witnesses  
Geverance  
Luther L. Cope

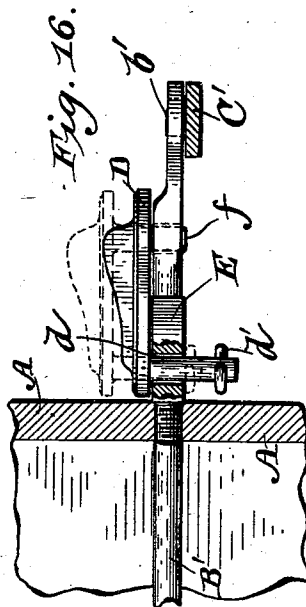
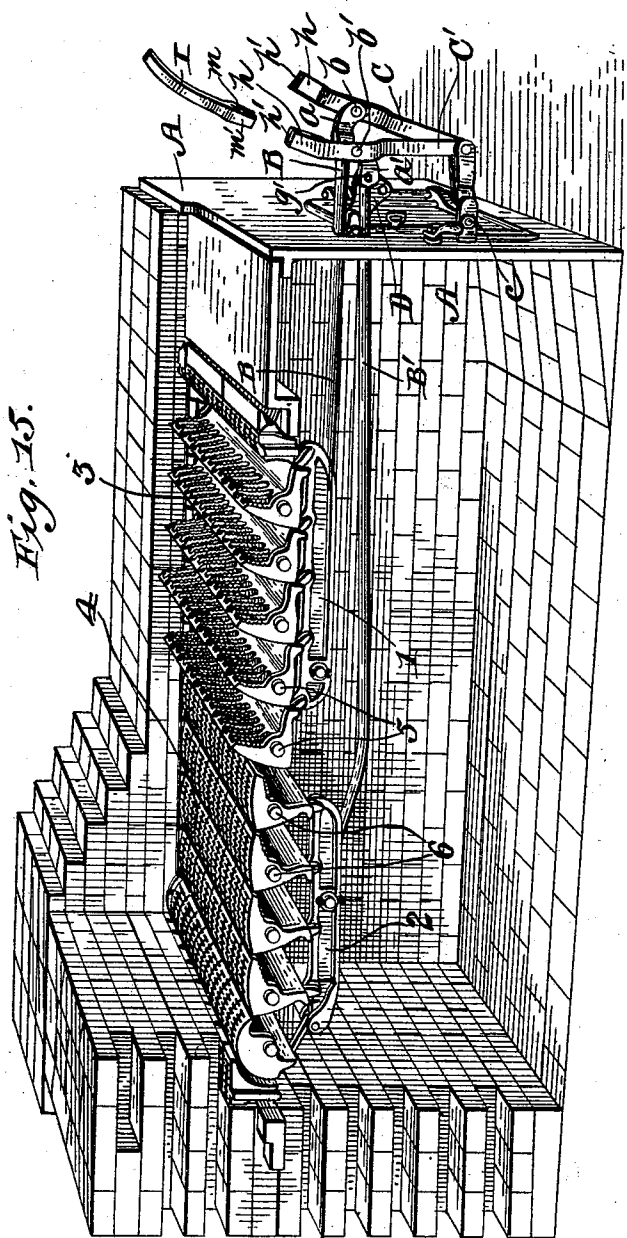
Inventor  
William M. Clave  
by Mason, Fenwick & Hannan  
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WITNESSES

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# UNITED STATES PATENT OFFICE.

WILLIAM MCCLAVE, OF SCRANTON, PENNSYLVANIA.

## GRATE FOR BOILER OR OTHER FURNACES.

SPECIFICATION forming part of Letters Patent No. 550,191, dated November 19, 1895.

Application filed May 26, 1894. Serial No. 512,542. (No model.)

### *To all whom it may concern:*

Be it known that I, WILLIAM MCCLAVE, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Grates for Boiler or other Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to rocking and cut-out grates of boiler-furnaces, and is specially useful in connection with grate-bars journaled to one side of their median line, or have a preponderance of leverage and weight forward of their journals.

My invention consists in the combination, with rocking and cut-out grate-bars journaled to one side of their median line, of twin levers, having pockets or openings in their upper ends, and a forked or pronged hand-operating lever.

It is found important, in connection with grate-bars constructed and journaled as above stated, to form the pockets or prongs in the upper parts of twin stub-levers and to provide a forked or pronged hand-operating lever, because, by reason of the superior weight of the forward or longer portions of grate-bars of the type mentioned above, there is often an unequal depression of the forward portions of the respective grate-bars, on account of the unequal distribution or weight of the coal or fuel resting upon them, and consequently one of the twin levers may be caused to stand out of a perpendicular with the horizon while the other is perpendicular therewith, and, thus standing, it is a very difficult operation to place an auxiliary handle, having twin sockets in its head or lower end, upon their ends, and considerable time is lost in adjusting the said hand-lever and the twin levers and operating the grate-bars therewith; but by making the twin levers themselves with pockets or openings at their upper ends and constructing the auxiliary hand-lever with two prongs to enter said pockets much difficulty is avoided as well as labor and time saved, and there is no inconvenience from clogging by clinkers or any other substances

lodging in the passages, as the same will pass down and out.

In the accompanying drawings, Figure 1 is a vertical section of a portion of a furnace with my improved levers and auxiliary handle in elevation and in normal position. Fig. 2 is a similar view, the levers and auxiliary handle being forced backward for rocking the whole grate. Fig. 3 is a similar view, the levers and handle being drawn forward for rocking the whole grate in an opposite direction. Fig. 4 is a similar view, the auxiliary handle having been applied to one of the twin stub-levers and drawn forward for cutting out debris on one portion of the grate. Fig. 5 is a similar view, the auxiliary handle having been applied to the other twin stub-lever for cutting out debris on the other portion of the grate. Figs. 6 and 7 are views similar to Figs. 4 and 5, showing another form of twin stub lever. Figs. 8, 9, and 10 are front views of a portion of a furnace and front elevations of the different types of levers used. In Fig. 8 parts are shown in section. Figs. 11 and 12 are enlarged detail perspective views of the twin stub-levers shown, respectively, in Figs. 8 and 9 and also in other preceding figures of the drawings. Fig. 13 is a perspective view of the auxiliary operating-handle. Fig. 14 is a perspective view of another form of twin stub-levers. Fig. 15 is a perspective view of a portion of a furnace provided with my improved handle and twin levers, the auxiliary handle being shown out of connection with the twin levers; and Fig. 16 is a horizontal section of a portion of the furnace, showing one of the pitmen, the twin stub-levers, and a latching device.

A in the drawings represents a portion of a furnace, and BB' pitmen extending through the front of the furnace and connected with separate operating-bars 1 and 2 of different series of rocking or rocking cut-out grate-bars 3 and 4, as shown. These pitmen may, if desired, be connected to the grate-bars in any other suitable manner. The grate-bars 3 and 4 in the illustration given are provided with short journals 5 and 6, and these journals are out of the median line of said bars, so that the greater portion of each of the bars is forward of its journals and the preponder-

ance of weight and leverage falls in front of the journals, and consequently if the fuel is not distributed evenly upon the grate-bars the forward part of one grate-bar will be depressed to a greater extent than that of another bar and the pitmen will be acted upon unequally, and the twin levers C C', to which these pitmen are connected, will also be operated upon unequally, and one lever may be left standing in strictly upright position, while the other stands slightly inclined, and it would be difficult to apply a hand-operating lever with twin sockets in its head or lower end to levers standing in such position. The twin stub-levers C C' have the reversely-curved ends *a a'* of the pitmen pivoted to them respectively by separate pivots *b b'*. These twin stub-levers may have their fulcrums located at *c*, as indicated in Figs. 1, 2, 3, 4, 5, 7, 8, and 10, or at *c'*, as indicated in Figs. 6 and 9.

D is a swinging latch-plate pivoted at *d* to a lug E, projecting from the front of the furnace. The pivot *d* is rigidly connected to the latch-plate D and constructed and arranged to slide horizontally in the lug E, it being of greater length than the width of the lug and confined by a cotter-pin *d'*, passed vertically through it near its end, so as to stand some distance from the lug and allow the pin with the latch-plate to have a movement sufficient to draw the pins *f f'* out of the holes in the pitmen whenever occasion demands. The movement of the plate D is at right angles to the pitmen. The pins *f f'* are rigidly attached to the latch-plate and they can be made to enter either one or both of the holes *g g'* in the pitmen, so as to latch either or both of the pitmen, accordingly as circumstances require in operating the grate. The adjustments of the pins *f f'* are effected by swinging the plate on its pivot and sliding it and the pivot at right angles to the pitmen. The sliding movement of the latch-plate and pin takes place both in the withdrawal and the insertion of the pins *f f'*.

Each of the twin stub-levers is formed with a slight angular bend at its upper end, and this upper portion is enlarged, as indicated at *h*, and the metal which gives the increased size may project beyond either the inner or outer sides of the lever, and in this enlarged portion a pocket or passage *h'* is provided. The passage is preferably extended through, so that any substance entering it at the top may pass out at the bottom. When the enlargement is produced on the outer face of each of the levers, the latter can lie side by side close together along their whole length, as illustrated in Figs. 9, 10, and 12, while the pitmen can be applied on the outside of

the levers, as shown in Figs. 9 and 10, and when the enlargement is produced on the inner face of each lever a yoke-shaped space *k* will be formed for the flattened ends of the pitmen to play in, as shown in Figs. 8, 11, and 14. In Fig. 14 the upper ends of the twin levers are formed, respectively, with a passage *h<sup>2</sup>*, which is open at one of its sides; but in all other respects the passages are the same as those lettered *h'*, and their purpose is the same, with the additional advantage of allowing clogging matters to pass out of the passages at the sides as well as at the ends of the passages. This construction lessens the weight of the levers and may be found more desirable than the passages *h'*.

I is an auxiliary operating-handle. At its lower end it is enlarged and is bifurcated or formed with prongs, as indicated at *m m'*. The prongs *m m'* are designed for entering either the passages *h'* or *h<sup>2</sup>* separately, or both at the same time, as illustrated in Fig. 8.

From the accompanying drawings and foregoing description it will be seen that the prongs of the auxiliary operating-handle can be very readily entered into either the passage *h'*, shown in Figs. 1 to 12, or the passages *h<sup>2</sup>* shown in Fig. 14, from the fact that the openings to said passages are below the pronged end of the handle and can at once be seen, whereas if the passages were in the auxiliary operating-handle, where they cannot be seen while applying the handle, it is necessary to feel with the handle in order to effect a coincidence of the sockets with the twin levers, and thus time is lost and inconvenience experienced, whereas by shaping the levers in the particular manner described and employing a forked handle convenience with compactness are secured, as well as time saved, in adjusting the handle to position for operating them. Should the twin levers not stand vertical with one another, it is more convenient to bring them to this condition when the levers and handle are constructed in accordance with my invention.

What I claim as my invention is—

The combination with locking and cut out grate bars journaled to one side of their median line, of twin stub levers having pockets or openings in their upper ends, and an auxiliary hand operating lever, having prongs at its lower end set to align with the pockets or openings in the said twin stub levers, substantially as described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

WILLIAM MCCLAVE.

Witnesses:

ROSCOE DALE,  
EVERETT WARREN.