

(No Model.)

W. McCLAVE & J. A. PRICE.

FURNACE GRATE.

No. 252,049.

Patented Jan. 10, 1882.

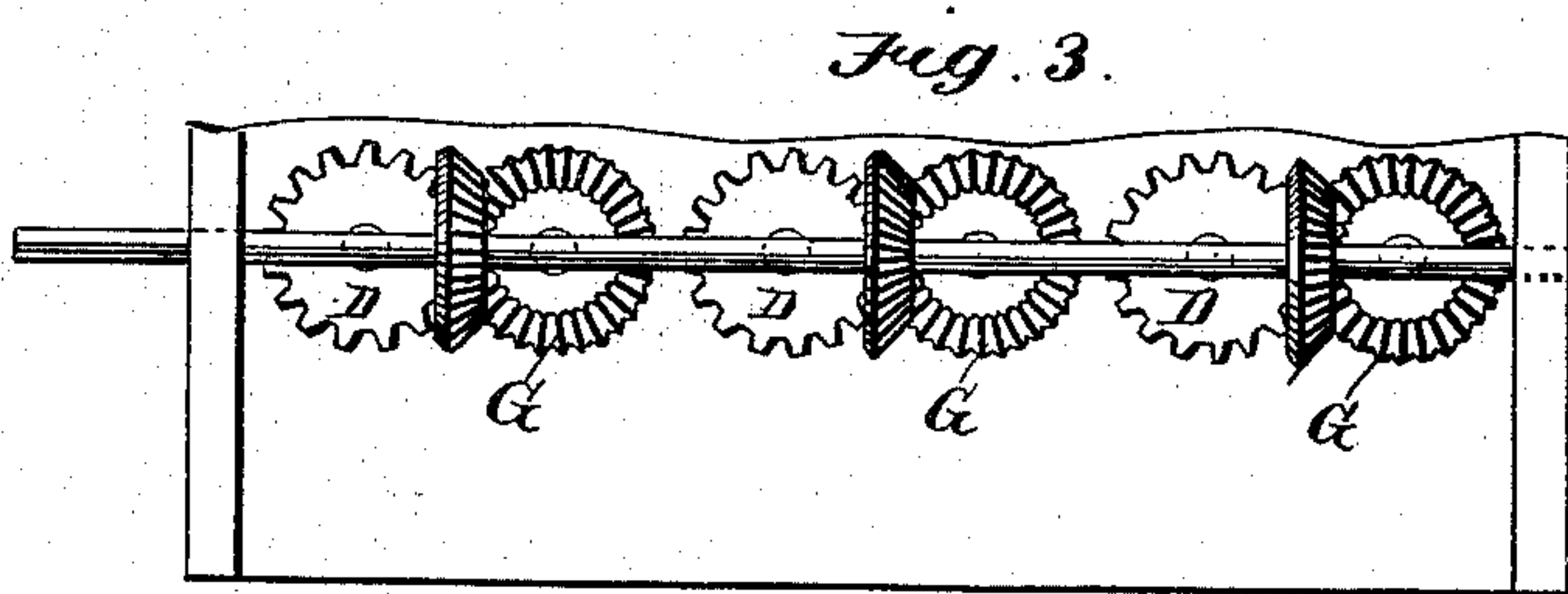
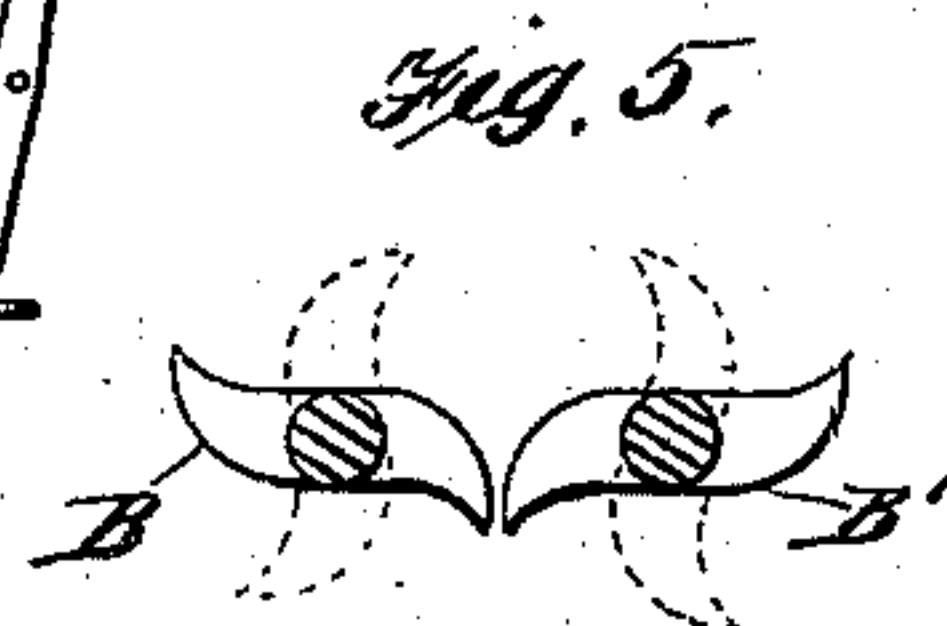
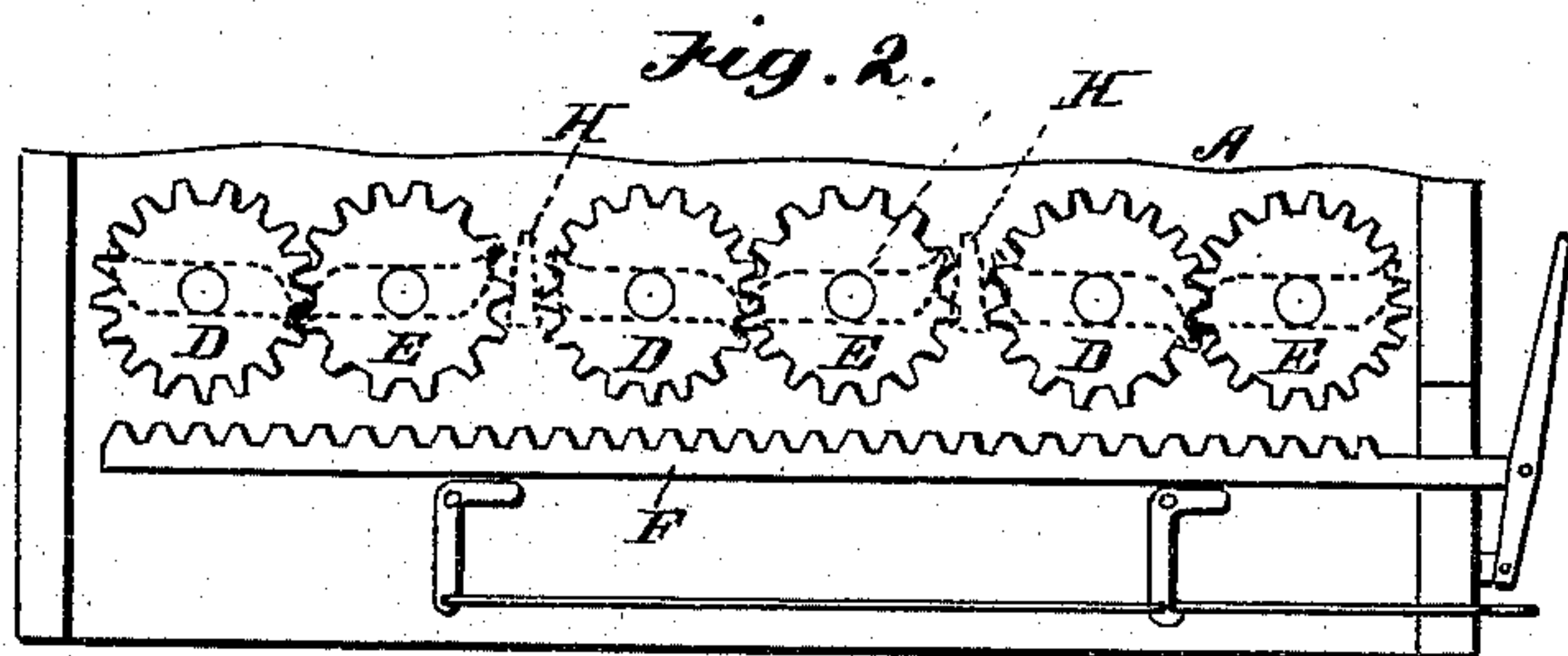
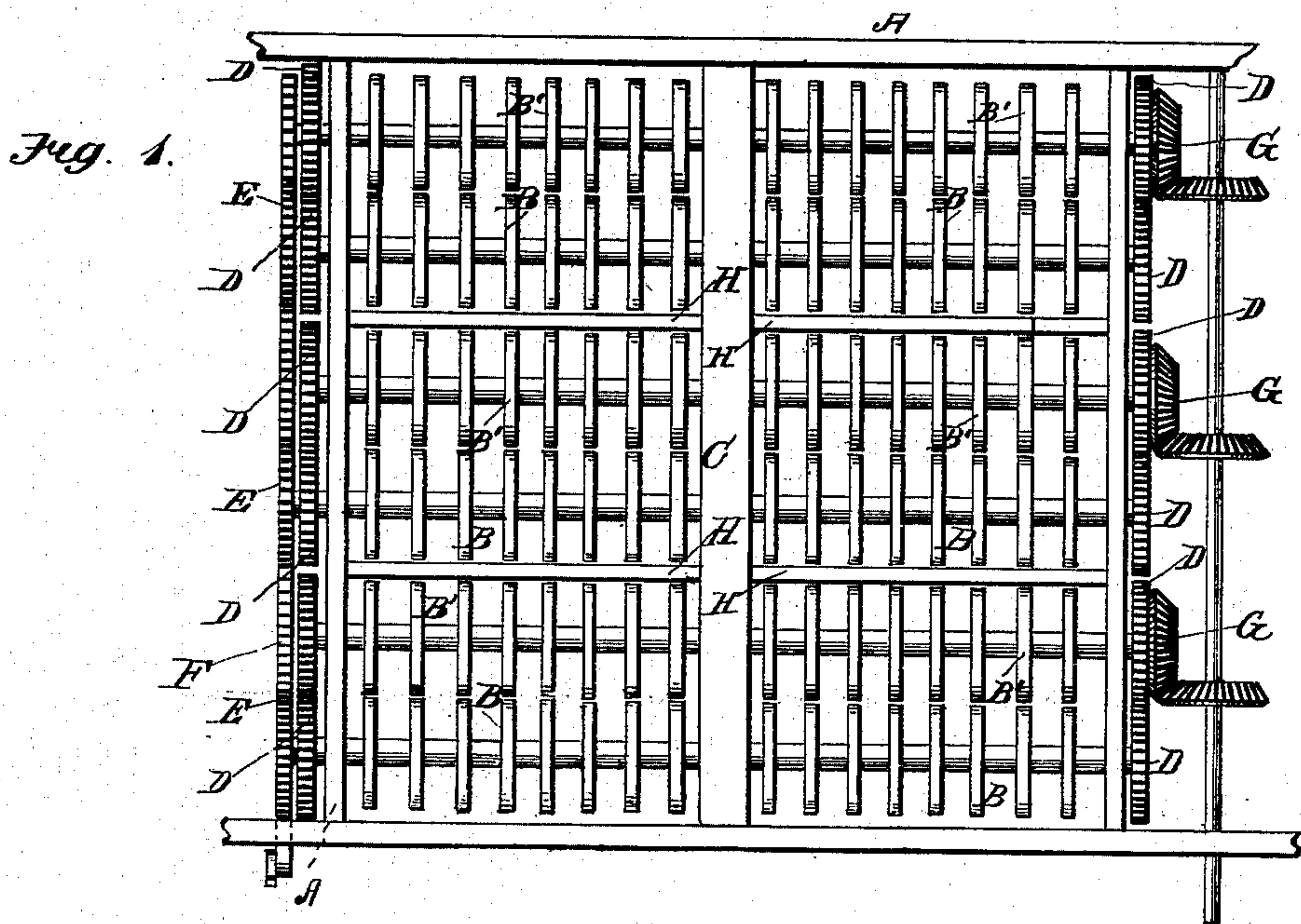
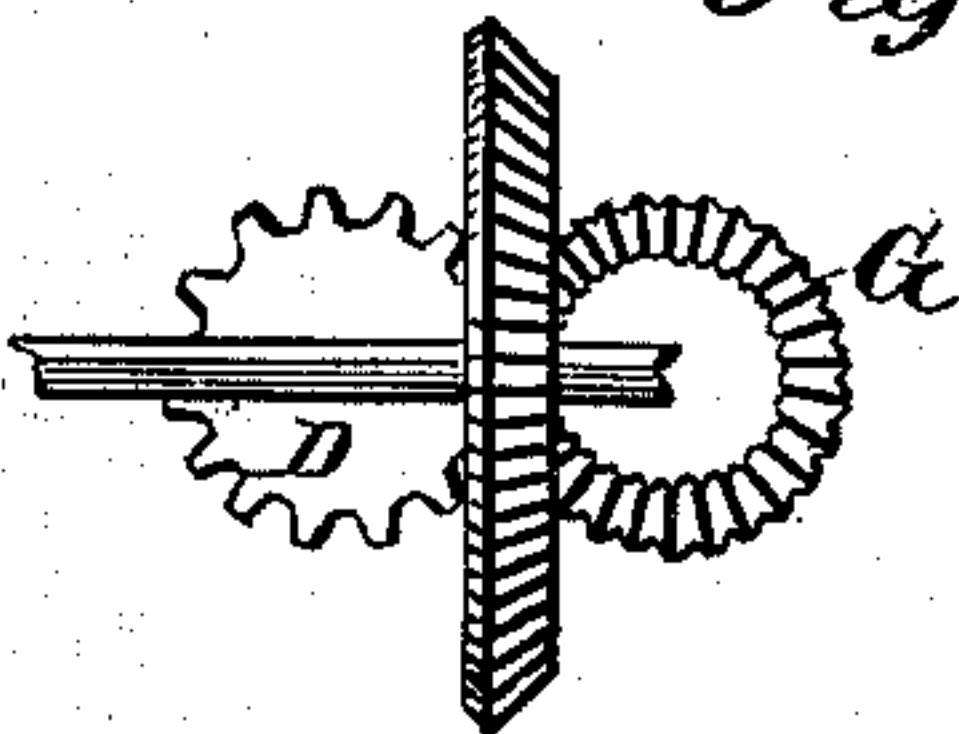


Fig. 4

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Their atty.



# UNITED STATES PATENT OFFICE.

WILLIAM McCLAVE AND JOHN A. PRICE, OF SCRANTON, PA.; SAID McCLAVE  
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## FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 252,049, dated January 10, 1882.

Application filed August 31, 1881. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM McCLAVE and JOHN A. PRICE, of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Grates for Locomotives and other Furnaces; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a top plan view of our improved furnace. Fig. 2 is a view of one end of the furnace. Fig. 3 is a view of the other end of the furnace, and Fig. 4 is a view showing the enlarged bevel-pinion on the operating-shaft. Fig. 5 is a sectional view taken transversely through a pair of grate-sections.

Similar letters of reference in the several figures denote the same parts.

Our invention has for its object to improve the construction and operation of furnace-grates; and to this end it consists, primarily, in a grate composed of a series of revolving U-shaped grate-sections, geared together by continuous gearing and operating in pairs to cut out and remove ashes and other refuse matter from the fire.

It further consists in arranging a separating-bar or short partition between each pair of grate-sections in the series for the purpose of increasing the effective action of each pair of sections.

It further consists in arranging the grate-sections in double series and journaling the inner ends of the sections of each series in a central supporting-bar and the outer end in a suitable supporting-frame and in applying the operating-gearing to the outer ends of the sections.

It further consists in providing the journal of every alternate grate-section with an additional gear-wheel and in combining therewith suitable mechanism for operating upon all of the said additional gear-wheels simultaneously, whereby to cause a simultaneous dumping of all the pairs of grate-sections in the series; and it consists, finally, in certain other novel combinations of parts, which we will now proceed to describe.

In the drawings, A represents the walls of the furnace.

B B' represent a series of pairs of grate-sections, each section of which is U-shaped in cross-section, or has the same contour on both sides, so as to present a like surface to the fire when either side is uppermost. These pairs of grate-sections may be arranged in a single series, or, as shown in Fig. 1, they may be arranged in a double series, in which latter case the inner ends of the sections of each series are journaled in a supporting-bar, C, extending through the middle of the furnace, while their outer ends are journaled in the outer walls or frame of the furnace. The outer ends of the journals of the grate-bars of each series are provided with gear-wheels D D, which may be meshed so as to form a continuous train of gearing or meshed only in pairs, as shown in Fig. 1. On the outer end of the journal of each alternate grate-section is secured an additional gear-wheel, through which motion is to be communicated to the several pairs of sections. These additional gears may consist simply of spur-wheels E, adapted to all engage with a reciprocating operating rack-bar, F, as shown in the left-hand series, Fig. 1, or they may consist of bevel-pinions G, adapted to engage with corresponding pinions on a longitudinal shaft extending along the whole series, as shown in the right-hand series, Fig. 1. Whether one or the other of these arrangements is employed the result is substantially the same—namely, the effecting of the simultaneous operation of the several pairs of sections in the whole series. Where the spur-gears and sliding rack are employed we usually arrange the rack upon rising and falling supports G G, which enable it to be thrown into and out of mesh with the spur-wheels at will, as shown in Fig. 2. We preferably, however, employ the longitudinal shaft with the bevel-pinions for operating the sections, as such arrangement is more positive in its action and is not so likely to get out of order.

To operate our improved grate, the rack-bar F is put in mesh and then moved longitudinally, or the longitudinal shaft is rotated, as the case may be, so as to cause each pair of grate-sections to open downward at the center.




This discharges the ashes and other refuse at the bottom of the fire into the ash-pit below, while the outer edges of the grate-sections rise and move inward to cut off the ashes, &c., from the fire above, and, coming together at the center, form a grate-surface like that turned down. By this means every reversal of the grate-sections cuts off the fire and supplies a grate-surface of the same form for the fire above.


10 In order to effect a more perfect operation of the several pairs of grate-sections, a separating-bar or short partition, H, is interposed between each pair of sections. These separating-bars act measurably to support the fire while the grate-sections are being turned or reversed, and prevent any portion of the contents escap-  
15 ing except that positively withdrawn by the action of the grate-sections.

Where the sliding rack-bar is used a thrust in one direction may indicate the entire reversal of the grate-sections, and where the rotary operating-shaft is employed a complete rotation of the shaft may indicate a like movement of the grate-sections.

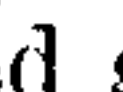
25 The bevel-pinions on the rotating shaft may be made larger than the co-operating additional pinions on the journals of the sections, as shown in Fig. 4, in which case a quarter, half, or other portion of a revolution of the shaft will indicate a complete reversal of the grate-sections.

We claim as our invention—

1. A furnace-grate composed of a series of pairs of revolving -shaped grate-sections connected together by continuous gearing so as to operate simultaneously, each pair operating at each half-revolution to cut out positively the lower portion of the mass which they support and discharge it into the ash-pit below and present a new upper supporting-surface similar to the one turned down, substantially as described.

2. A furnace-grate composed of a series of pairs of revolving -shaped grate-sections connected together by continuous gearing so as to operate simultaneously, each pair operating to cut out the lower part of the mass

which they support at each half-revolution and present a new supporting-surface similar to the one turned down, and having a separating-  
50 bar or short partition between each pair, substantially as described, for the purposes specified.

3. In a furnace-grate, a double series of revolving -shaped grate-sections geared together in pairs and journaled at their inner  
55 ends in a central supporting-bar and at their outer ends in a suitable supporting-frame, and having the operating-gearing applied to their outer ends, and a separating-bar or short partition between each pair of sections, substantially as described.

4. In a furnace-grate, the combination of a series of revolving sections connected together by continuous gearing and acting to cut away  
65 ashes and refuse in pairs, and having an additional gear-wheel applied to the journal of one of the sections of each pair, with a longitudinally-moving rack-bar for operating upon said additional gear-wheel, whereby to turn all the sections simultaneously, substantially as de-  
70 scribed.

5. In a furnace-grate, the combination of a series of revolving sections geared together in pairs, and having an additional gear-wheel applied to the journal of one of the sections of  
75 each pair, with a longitudinally-moving rack-bar adapted to engage with said additional gear-wheel, and means for throwing said rack-bar into or out of engagement, substantially as described.

6. In a furnace-grate, the combination of a series of revolving grate-sections geared together and having an additional beveled-gear wheel applied to the journal of each alternate  
85 grate-section, with a longitudinal bar having beveled-gear wheels for operating upon said beveled-gear wheels on grate-sections, whereby all the sections may be turned simultaneously, substantially as described.

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J. A. PRICE.

Witnesses:

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B. G. MORGAN.