

(No Model.)

C. W. DOTEN.  
Fire Grate.

No. 238,219.

Patented March 1, 1881.

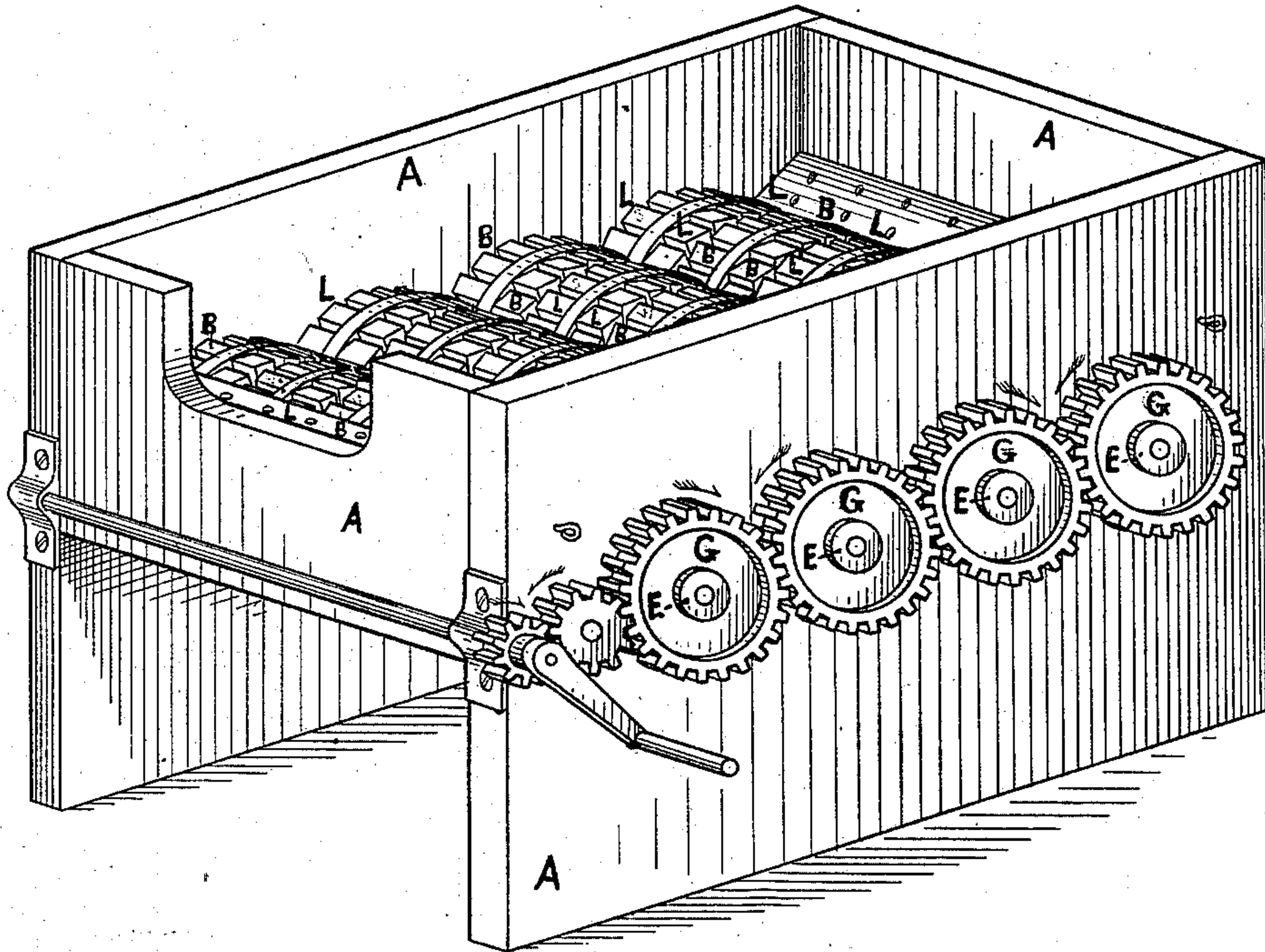


Fig. 1.

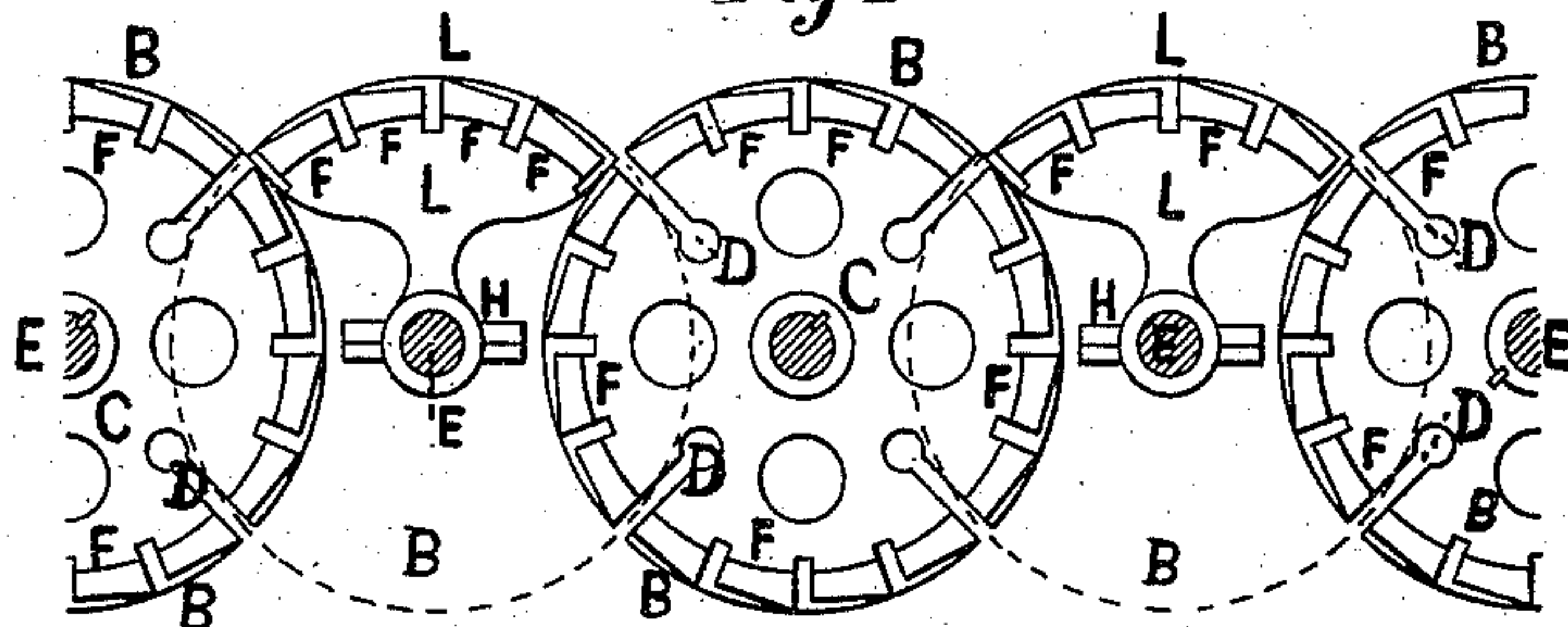


Fig. 2.

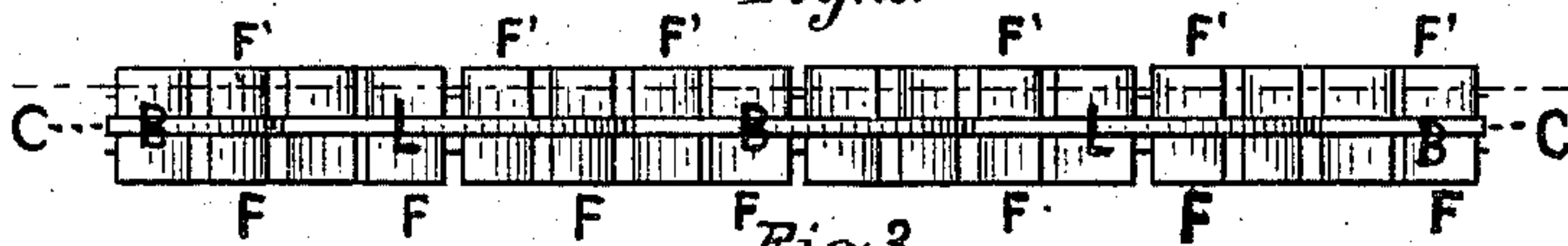


Fig. 3.

Witnesses.

Inventor.

H. S. Talbot

W. R. Marble

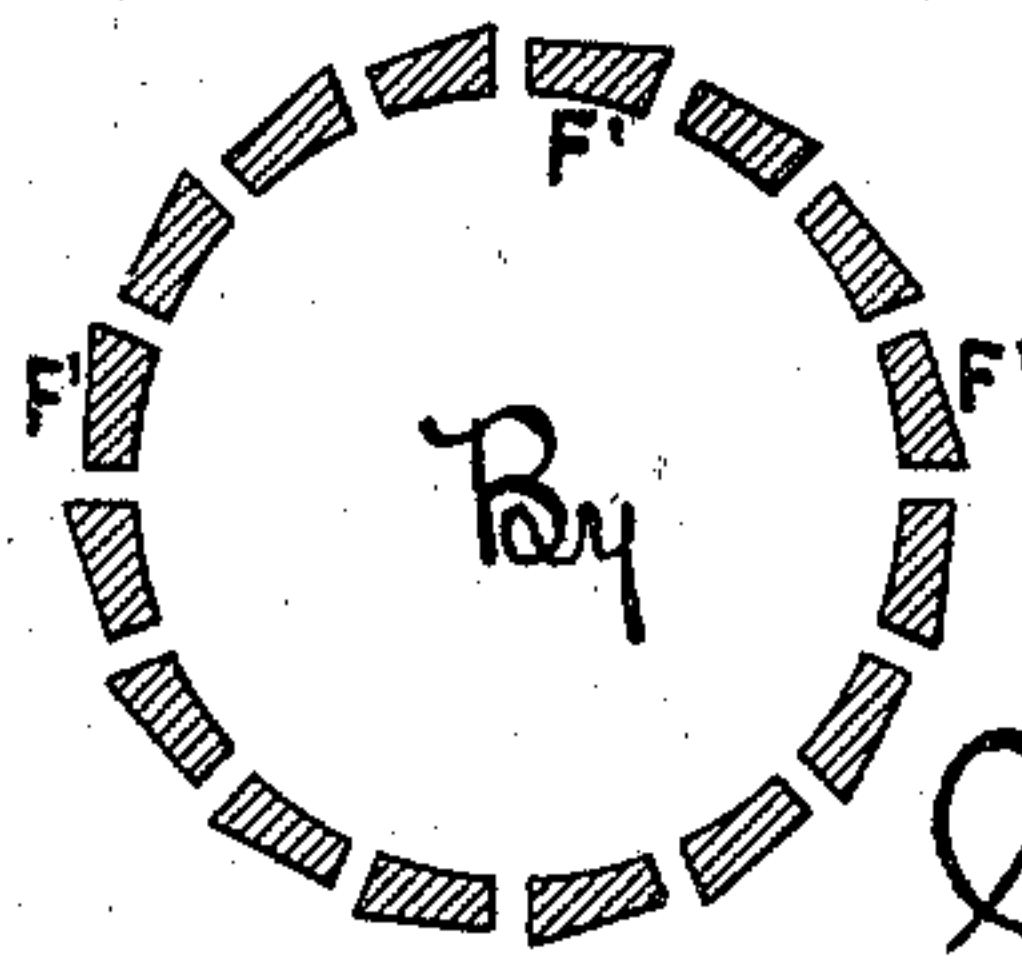


Fig. 4.

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# UNITED STATES PATENT OFFICE.

CLARK W. DOTEN, OF EAST BOSTON, ASSIGNOR TO DOTEN ROTARY FIRE GRATE COMPANY, OF BOSTON, MASSACHUSETTS.

## FIRE-GRATE.

SPECIFICATION forming part of Letters Patent No. 238,219, dated March 1, 1881.

Application filed October 2, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, CLARK W. DOTEN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Revolving Grate-Bars, of which the following is a specification.

The objects of my invention are to provide a grate-bar which may be rotated or revolved so as to break up the clinkers and sift the ashes entirely from the fire; and a further object is to loosen up and level the entire body of burning coal so it shall be brought into uniform action, leaving the air-spaces constantly clear and free, thereby admitting a free and full supply of oxygen continuously to the entire fire-surface; and a further object obtained is that by revolving the grate-bar the overheated surface thereof may be left in a position so as to cool off before being brought in contact with the burning coals again, thereby preventing warping, and other details of construction to allow for unequal expansion and contraction, as hereinafter more fully explained; and it consists in the construction, combination, and arrangement of a series of toothed wheels and toothed segments of wheels arranged alternately upon a shaft or journal, and which are interlocked with other similar series mounted in like manner, so as to form a rotative fire-grate surface. By means of suitable gear mechanism the several series of toothed wheels and journals are adapted to be rotated simultaneously in either direction by any suitable power applied thereto, and as hereinafter more fully described and set forth.

Figure 1 represents a perspective view of my invention as applied to a suitable brick-work frame for supporting the grate and boiler. Fig. 2 is a vertical section through the grate-bar, showing the wheels and segments. Fig. 3 represents a plan of the peripheral surface of the toothed wheels and segments. Fig. 4 represents a sectional view of one of the wheels, showing the cutting-surface or angle of the face of the teeth to the periphery of the said wheels through the broken line of Fig. 3.

A represents a suitable brick foundation or frame for supporting the boiler, and into which may be placed a suitable bearing or frame for supporting the fire-grate, in which B B B rep-

resent partially-slotted wheels, the periphery of each wheel having a central supporting rib or web, C, divided by several slots, D, equidistant apart, and converging toward the center or hub, which is provided with a hole to permit said wheel to be keyed or fastened to the shaft E. The periphery of these wheels B is provided with a series of lugs or teeth, F F', projecting horizontally from the opposite sides of the central supporting web or rib, C, those upon one side of said web-support having their peripheral faces formed on an incline in one direction, while those upon the opposite side have their corresponding faces formed with an incline in the opposite direction, so as to form cutters when revolved in either direction, in connection with a similar series attached to the next shaft, which are caused to revolve in the opposite direction to the former and simultaneously therewith by suitable gearing G, or in any other desirable manner.

It will be particularly observed that the said several series of wheels upon each shaft E are so arranged upon said shafts as to interlock with each other, as shown by dotted lines, representing their peripheries in Fig. 2, and that upon each shaft E is arranged a series of bearings or boxes, H, which support a series of toothed segments, L, which fill the spaces between the said toothed wheels, and their faces or upper surfaces are provided with similar angle-faced teeth, N; or, if desired, their faces may be an exact counterpart of one-fourth part of the said wheels, as shown in Fig. 2. By this construction and arrangement of the toothed wheels and segments thereof, which interlock with each other, a comparatively level fire-surface is obtained, and by means of the cutters or angle-faced teeth any clinkers formed from the burning coals are easily cut or broken in pieces, so as to pass through the air-spaces of same.

It will be obvious that the central rib, C, of the wheels and segments may be dispensed with, and that the cutters or teeth F may extend across the face of the periphery of the wheels on the same angle, or be left on their faces segmental to correspond to the diameter of the wheels, or that each tooth or cutter may be concaved, so that the same tooth shall pre-



sent a cutting-edge to the clinkers when the wheels of the grate are revolved in either direction.

5 It will be observed that when the wheels are rotated the segments remain stationary, they being fitted with boxes within which the shaft or journals upon which said wheels are keyed have a bearing and rotate.

10 Having thus described my invention, what I claim is—

1. A revolving grate-bar consisting of a series of slotted or toothed wheels secured to a shaft or journal and interlocking with other similar series of toothed wheels, the intervening spaces between the peripheries of said  
15 wheels being provided with similar toothed stationary segments, substantially as described, all constructed and arranged as and for the purposes set forth.

20 2. A revolving grate-bar consisting of sev-

eral series of interlocking wheels secured to journals, the intervening spaces between the peripheries of said wheels being provided with a corresponding series of stationary segments, said wheels and segments being provided with  
25 reverse angle-faced cutters or teeth, substantially as described, all constructed and arranged as and for the purposes set forth.

3. A revolving grate-bar composed of several series of interlocking toothed wheels and  
30 toothed segments of wheels mounted upon a series of journals, which are geared or connected together in such manner as to permit said wheels to be rotated simultaneously, all constructed and arranged as and for the purposes  
35 set forth.

CLARK W. DOTEN.

Witnesses:

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WILLIAM H. FLANIGAN.