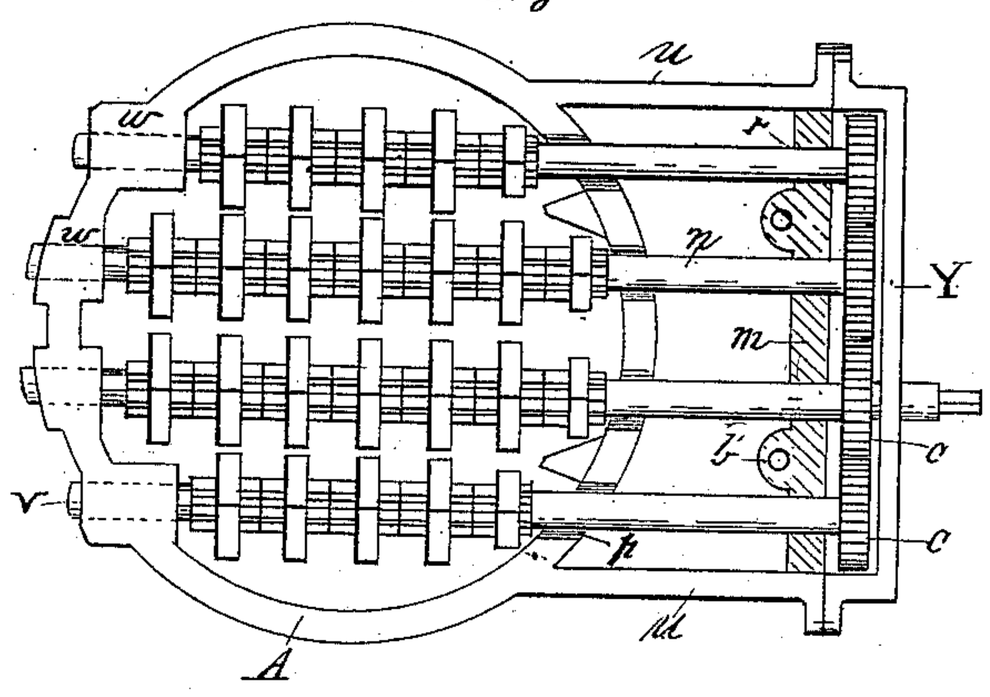
(No Model.)

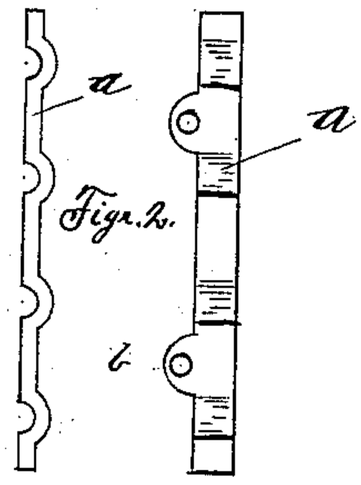
W. J. OWENS.

GRATE.

No. 387,566. Patented Aug. 7, 1888.

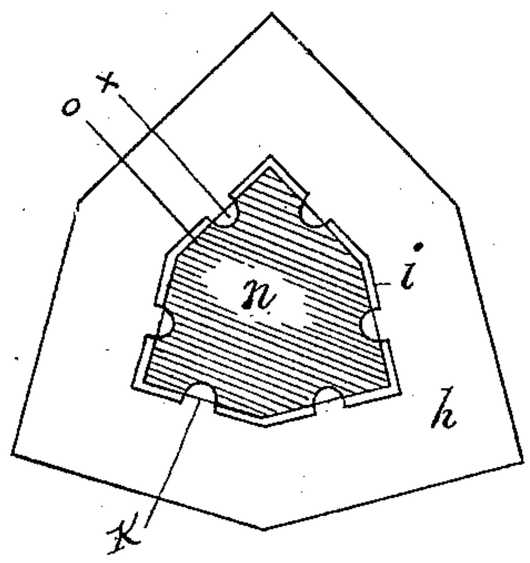
Figr.1.



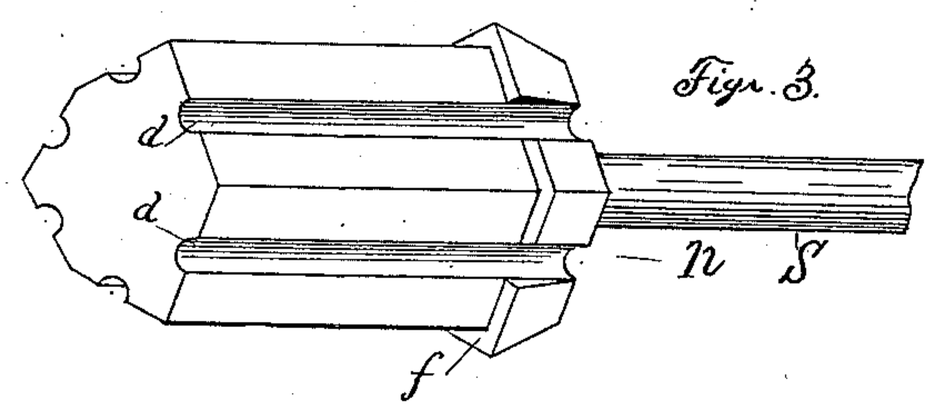


Figr.2.

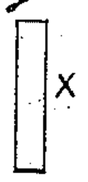
Figr.4.



Figr.3.



Figr.6.



Figr.5.

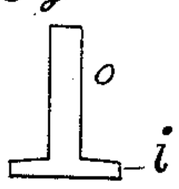
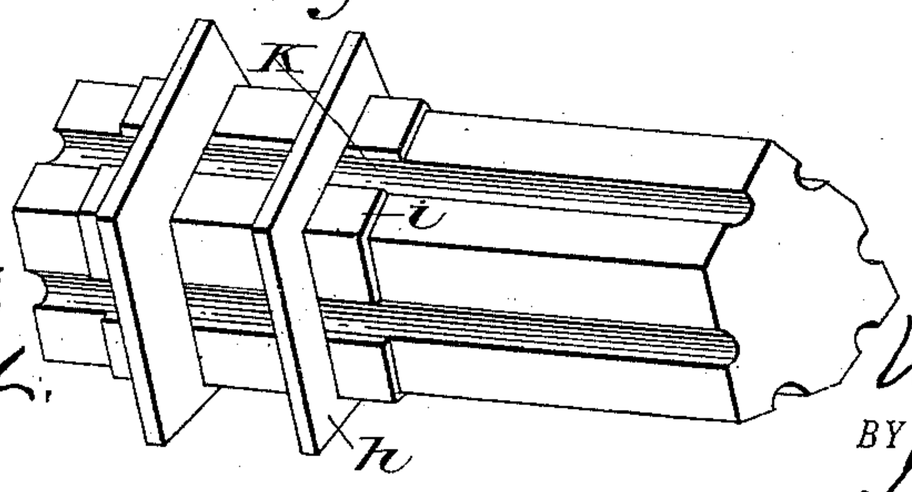


Fig.7.



WITNESSES:

C. Priebles.

R. Kirk Jr.

INVENTOR.

William J. Owens;

BY

S. S. McClellan —

ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM J. OWENS, OF UTICA, NEW YORK.

GRATE.

SPECIFICATION forming part of Letters Patent No. 387,566, dated August 7, 1888.

Application filed April 26, 1886. Serial No. 200,172. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. OWENS, of Utica, in the county of Oneida and State of New York, have invented an Improved Grate, of which the following is a specification.

This invention relates to rocking or rotating grates. It has for its object to provide a grate the bars of which are made hexagonal in shape, and provided with teeth which are also hexagonal in shape, all the bars arranged to be rotated at once by means of cog-gearing, the said bars being provided with air spaces or channels which correspond with air-passages in the teeth, which are adjusted to the said bars by being slid on over the ends of the same, all as will be hereinafter explained.

In the accompanying drawings, which form part of this specification, my invention is fully illustrated, with similar letters of reference indicating corresponding parts.

Figure 1 represents a plan or top view, showing the bars with the teeth attached in position in the frame, and showing the manner in which the gear-wheels *c* of each of the bars *n* mesh together, also the guard *y*, which protects the gear-wheels *c*. The clamp or strap *a* is left off in order to show the manner of inserting the bars in the frame. Fig. 2 illustrates side and top views of the clamp or strap *a*, showing the lugs *b*, which correspond with the lugs *b'* of the "rest" portion of the frame A, and which are provided with openings, so that a bolt or screw can be inserted in the said lugs *b* and *b'* to hold the clamp or strap *a* in place over the bars. Fig. 3 represents an enlarged detailed portion of the bar *n*, showing the hexagonal shape which receives the teeth, and which is provided with the air-channels *d*. It is also provided with a stop, *f*, which forms an abutting surface for the flange *i* of the teeth *h* to rest against. Fig. 4 represents a face view of one of the teeth *h*, showing its hexagonal shape, also the hexagonal shape of the bar *n* in cross-section in position with the tooth and the manner in which the air-channel *d* of the bar communicates with the space *k* in the flange *i* of the tooth. Fig. 5 represents a cross-section of the tooth *h* through the line *o*, Fig. 4, showing the flange *i*. Fig. 6 represents a similar cross-section through the line *x*, Fig. 4, where the flange is omitted to create the air-space in the tooth; and Fig. 7 represents a perspective view of the tooth *h*, showing the air-space *k* in the flanges *i*, and also the manner in which the flanges of each corresponding tooth abut against each other when in place on the hexagonal portion of the bar *n* and form the air-passage between them, which communicates with the air-channel *d* of the bar.

The frame A is made with its body portion circular to conform to the ash-base of a furnace, and is provided with two extending parallel arms, *u*, Fig. 1, across the ends of which is a bar-rest, *m*. The back end of the circular portion of the frame A is provided with enlarged square portions, as *w*, which have holes either cast or drilled through them longitudinally to receive the round end or trunnion *v* of the grate-bars. At the front circular side the said frame is provided with depressions or grooves, as shown at *p*, for the purpose of receiving the round portion of the grate-bar, as illustrated. The bar-rest *m* across the front of the frame is provided with corresponding semicircular grooves, as shown at *r*, to receive the ends of the bars *n*.

Outside of the bar-rest *m* is a guard-piece, Y, which extends across the face of the cog-wheels *c* to protect the same. This bar can be cast with the grate-frame A and form part thereof, or it may be made separate in the form of a cover and attached after the grate-bars are in position, its form being such as will leave a space between it and the bar-rest *m* sufficient for the free movement of the cog-wheels *c*.

The grate-bar *n* is constructed as heretofore described, its hexagonal portion being provided with the air-channels *d* and abutting stops *f*, the extended round portion *s* being provided on its end with a gear-wheel, the teeth of which are arranged to mesh with the corresponding gear-wheel of the adjoining bar.

To construct my improved grate, I first cast the frame A in the form illustrated, and heretofore described. I then construct the bars *n*, and after the teeth are cast to fit the same I slide them on the hexagonal portion until the requisite number of teeth are in position on the bar, the first tooth abutting against the stop *f*, and each following tooth abutting against its neighbor, the last tooth being properly secured, either by a pin through the bar

n, bolt, nut, or any suitable means. I next place the bars in position in the frame A, with their round ends or trunnion portions *v* inserted in the holes formed in the square parts *w* of the frame, and with their opposite ends containing the gear-wheels lying in the bar-rest *m* in such a manner as will cause the gear-wheels of each bar to mesh with its neighbor. I then put the strap *a* in place, with its lugs *b* directly over the lugs *b'* of the bar-rest. A bolt is then inserted through the lugs *b* and *b'*, and the bars are thus secured in position with sufficient freedom to rotate easily. If the guard Y is made separate from the grate-frame, I secure it in position after the gear-wheels are in place.

On either of the center bars the round portion *s* is extended beyond the gear-wheels, and may pass either through, over, or under the guard-piece Y. This extended portion *s* is provided with a square or suitably-formed end adapted to receive a crank, by means of which the bars can be rotated at will, it being understood that one third of a revolution will expose a new surface of the grate; also, that when a tooth becomes broken it can be detached and a new one inserted in its place.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. The hexagonal bar *n*, formed with the longitudinal grooves or air-channels *d*, and suitable abutting stops, as *f*, in combination with tooth-rings, as *h*, for the purpose specified.

2. In a grate-bar, the hexagonal tooth-rings *h*, formed with the flanges *i* and air-space *k*, in combination with a rotatable bar, as *n*, formed with the air-channels *d*, the said air-spaces registering with each other, as set forth and specified.

3. In combination with the frame A, constructed as described, the hexagonal-shaped bars *n*, provided with the air-channels *d*, in combination with the hexagonal-shaped teeth containing air-spaces between them, as set forth, which register with the air-channels in the bars, the said bars *n* being provided with gear-wheels on their front ends, arranged to mesh with each other, whereby all the bars can be rotated simultaneously by the rotation of one of the bars *n*, as described.

In testimony that I claim the foregoing improved grate, as above described, I have hereunto set my hand this 3d day of April, 1886.

WILLIAM J. OWENS.

Witnesses:
HERBERT D. PITCHER,
LESLIE R. GROVES.