W. H. WARNER.

Grates for Furnaces, Stoves, &c.

No. 196,171. Patented Oct. 16, 1877.

Fig 1

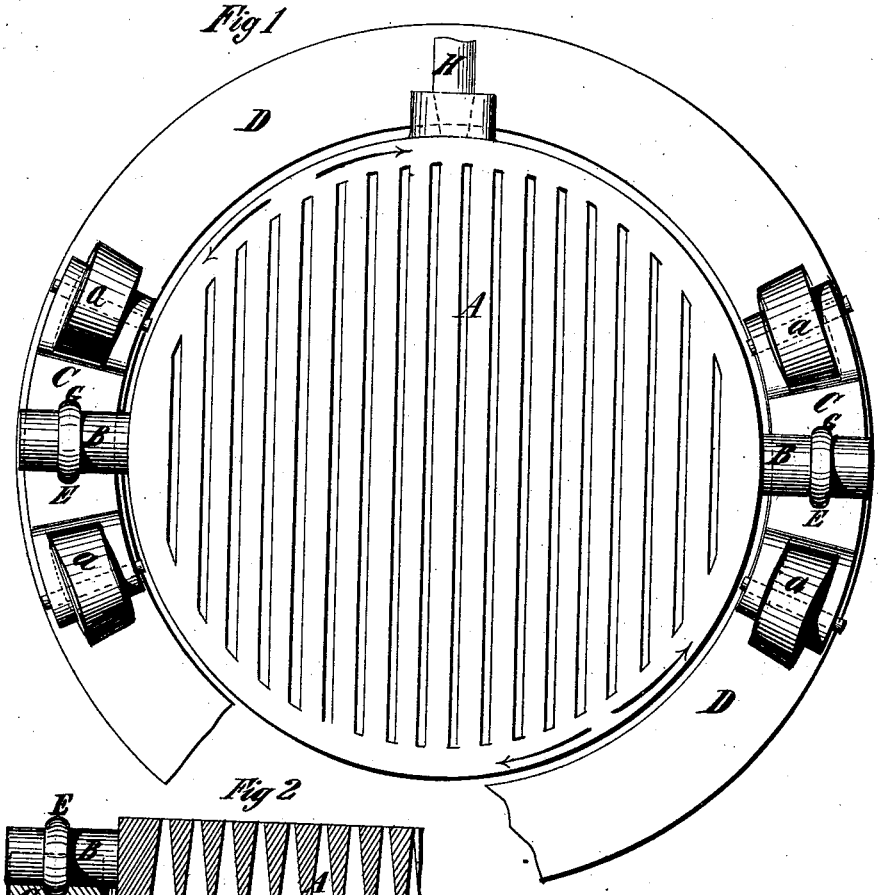


Fig 2

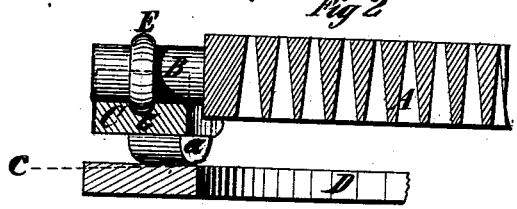
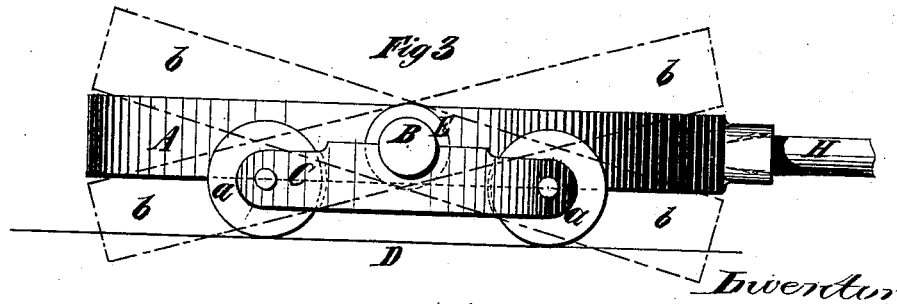


Fig 3



Witnesses.

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WYLLYS H. WARNER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN GRATES FOR FURNACES, STOVES, &c.

Specification forming part of Letters Patent No. **196,171**, dated October 16, 1877; application filed July 16, 1877.

To all whom it may concern:

Be it known that I, WYLLYS H. WARNER, of Brooklyn, Kings county, and State of New York, have invented certain new and useful Improvements in Grates for Furnaces, Stoves, and other Heat-Producing Apparatus, of which the following is a full, clear, and exact description:

The object of this invention is to facilitate rocking and oscillating grates of furnaces, stoves, and other heating apparatus, so that these operations may be performed more effectually and with less effort than hitherto.

One improvement consists in the combination, with a grate capable of oscillating to and fro in a horizontal plane, of carriages arranged at opposite parts entirely outside its circumference, whereby the grate is rendered less liable to come in contact with its support and its operation is facilitated.

Another improvement consists in the combination, with a grate capable of being rocked or tilted from a horizontal plane, of collars or bosses on its trunnions, and grooves or recesses in the bearings or supports of the trunnions, whereby the grate is more effectually precluded from moving laterally out of its proper position and coming in contact with any parts which would interfere with its free action.

Another improvement consists in a combination, with a grate and its support, of carriages for traveling on the said support, and provided with bearings for trunnions extending from the grate, whereby the grate may be oscillated to and fro in a horizontal plane, rocked or tilted from a horizontal plane, or both oscillated and rocked or tilted, and with such great facility as to be capable of operation by persons of even less than ordinary strength.

Another improvement consists in the combination, with a grate, its support, and carriages for the grate provided with bearings receiving the trunnions of the grate, of collars or bosses on the trunnions, and grooves or recesses in the carriages receiving the collars or bosses, whereby the carriages may be retained in position on their support, and the grate precluded from coming into contact with them, so as to be interfered with in rocking or tilting.

Another improvement consists in the combination, with a grate and its support, of segmental or arc-shaped carriages, provided with bearings receiving trunnions extending from the grate, and having wheels or rollers inclined in the direction of their travel, and made slightly conical in the direction of their axes, whereby the oscillation of the grate is facilitated, and it is effectually precluded from being worked or shifted laterally out of its proper position.

In the accompanying drawing, Figure 1 is a plan or top view of a grate and supports therefor embodying my invention. Fig. 2 is a section taken longitudinally through one of the trunnions of the grate, and transversely through the carriage therefor; and Fig. 3 is a side view of such a carriage, and end view of the trunnion of the grate fitting therein.

Similar letters of reference designate corresponding parts in all the figures.

A designates the grate. It may be of any suitable form, and is provided with arms B, extending at opposite points beyond its circumference into supports consisting, in this example of my invention, of segmental carriages C, arranged on a support, which, though represented as consisting of a path or track, D, circular in form, may be composed of short segmental or arc-shaped pieces.

The carriages are represented as provided with pairs of wheels *a*, inclined in the direction of their travel, and tapering conically from the outer to the inner edge, but may be provided with any other suitable rollers. The grate supported in this manner may be easily oscillated to and fro in a horizontal plane to clear the fire supported by it from ashes. Through the inclination of the wheels *a* its oscillation is facilitated, and, owing to the tapering conical form of the wheels, they have a tendency to travel in curved lines, and their outer edges are caused to bite into the supporting path or track, and preclude the grate from shifting laterally.

Other modes of engaging the carriage-wheels with their path or track may be adopted, such as inclining the path or track transversely to correspond to the taper of the wheels, as indicated by the dotted line *c*, Fig. 2.

It will be observed that the carriages for

supporting the grate are entirely outside its circumference. This is an important feature of my invention, and lessens the liability of the grate coming in contact with its supports, and, through friction, being impeded in its action.

The arms B, extending from the grate in this example of my invention, serve as trunnions, upon which the grate may be rocked or tilted out of a horizontal plane, as indicated by the dotted lines *b* in Fig. 3. E designate collars or bosses projecting from the arms or trunnions, and fitting in grooves or recesses G in its supports—in this example of my invention in the carriages C. Thus the grate is so secured in place as to be precluded from shifting laterally into contact with its supports, so as to be impeded by friction in rocking or tilting.

When my improvements are thus embodied together in a grate, provision is afforded for oscillating it to and fro in a horizontal plane, as indicated by the arrows in Fig. 1; also for tilting or rocking it out of a horizontal plane, as indicated by the dotted lines *b* in Fig. 3, and with such facility as to be within the power of persons possessing less than ordinary strength.

The collars or bosses E and grooves or recesses G, in this example of my invention, besides keeping the grate out of contact with its supports, keep the carriages in proper position on their path D, precluding them from contact with anything which might impede them in their action.

H designates a bar through which the grate may be operated. In lieu of this bar, however, one of its trunnions or arms B may be extended to serve as means for operating the grate.

The great facility afforded by my invention for operating a grate enables fires to be kept clear by even weak persons, and thus economy of fuel may be more generally attained than heretofore.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a grate capable of movement to and fro in a horizontal plane, of carriages arranged at opposite points entirely outside or beyond the circumference of the grate, substantially as and for the purpose set forth.

2. The combination, with a grate capable of being rocked or tilted out of a horizontal plane, of collars or bosses on its trunnions and grooves or recesses in the bearings or supports for the trunnions, substantially as set forth, whereby the grate is precluded from contact with its supports.

3. The combination, with a grate and its supports, of carriages for traveling on the said supports, and provided with bearings for trunnions extending from the grate, substantially as and for the purpose set forth.

4. The combination, with a grate, its supports, and carriages for the grate, provided with bearings receiving the trunnions of the grate, of collars or bosses on the trunnions and grooves or recesses in the carriages, receiving the collars or bosses, substantially as set forth, whereby the grate is precluded from contact with its carriages and the carriages with any object which could impede their action.

5. The combination, with a grate, carriages therefor, and a path or track for said carriages, of wheels or rollers in the latter inclined toward the direction of their travel.

6. The combination, with a grate and carriages therefor traveling on suitable supports, of wheels or rollers for said carriages, tapering conically in the direction of their axes, substantially as and for the purpose set forth.

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Witnesses:
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