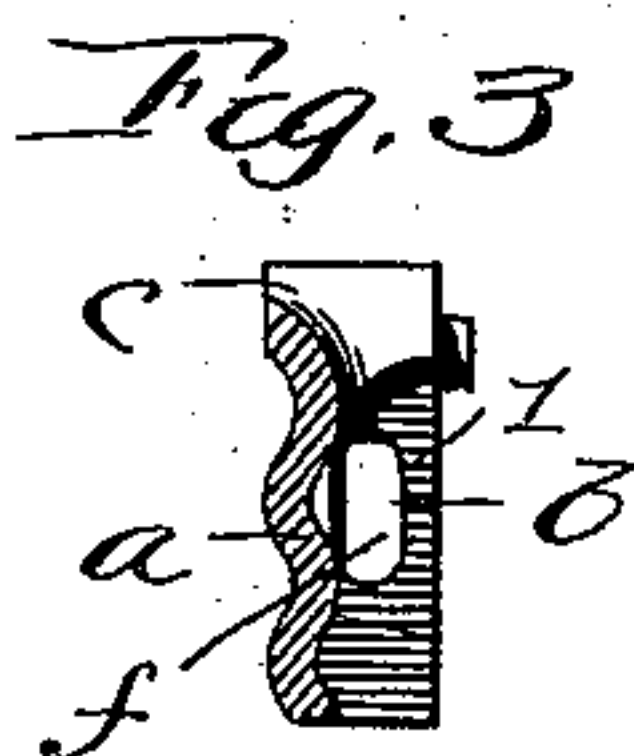
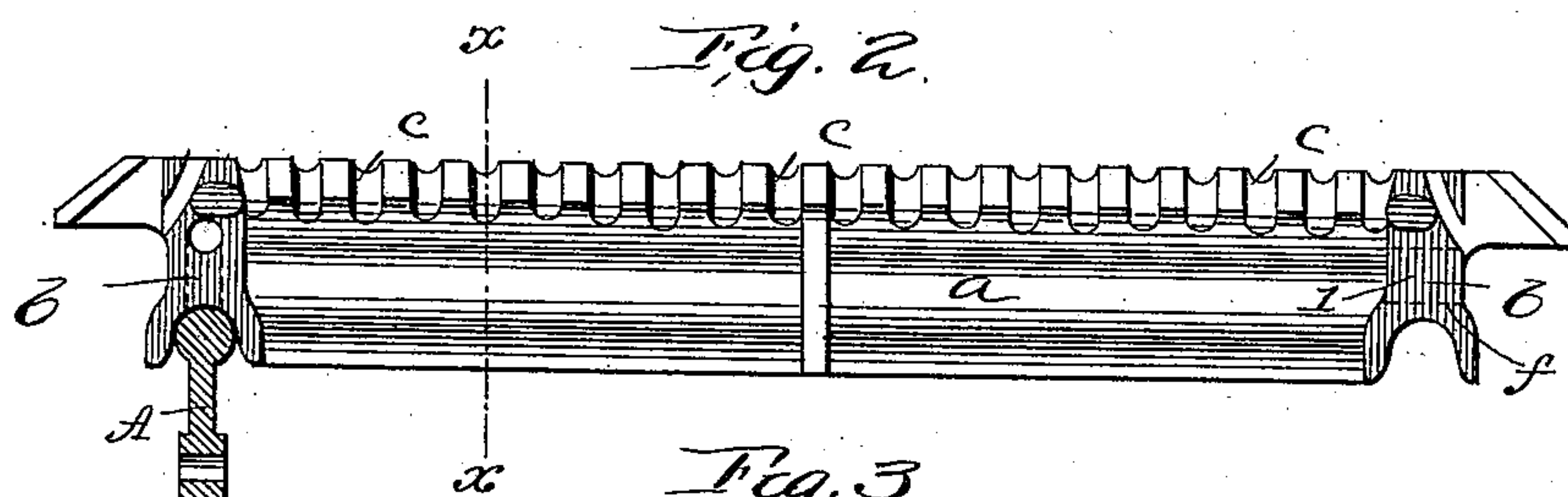
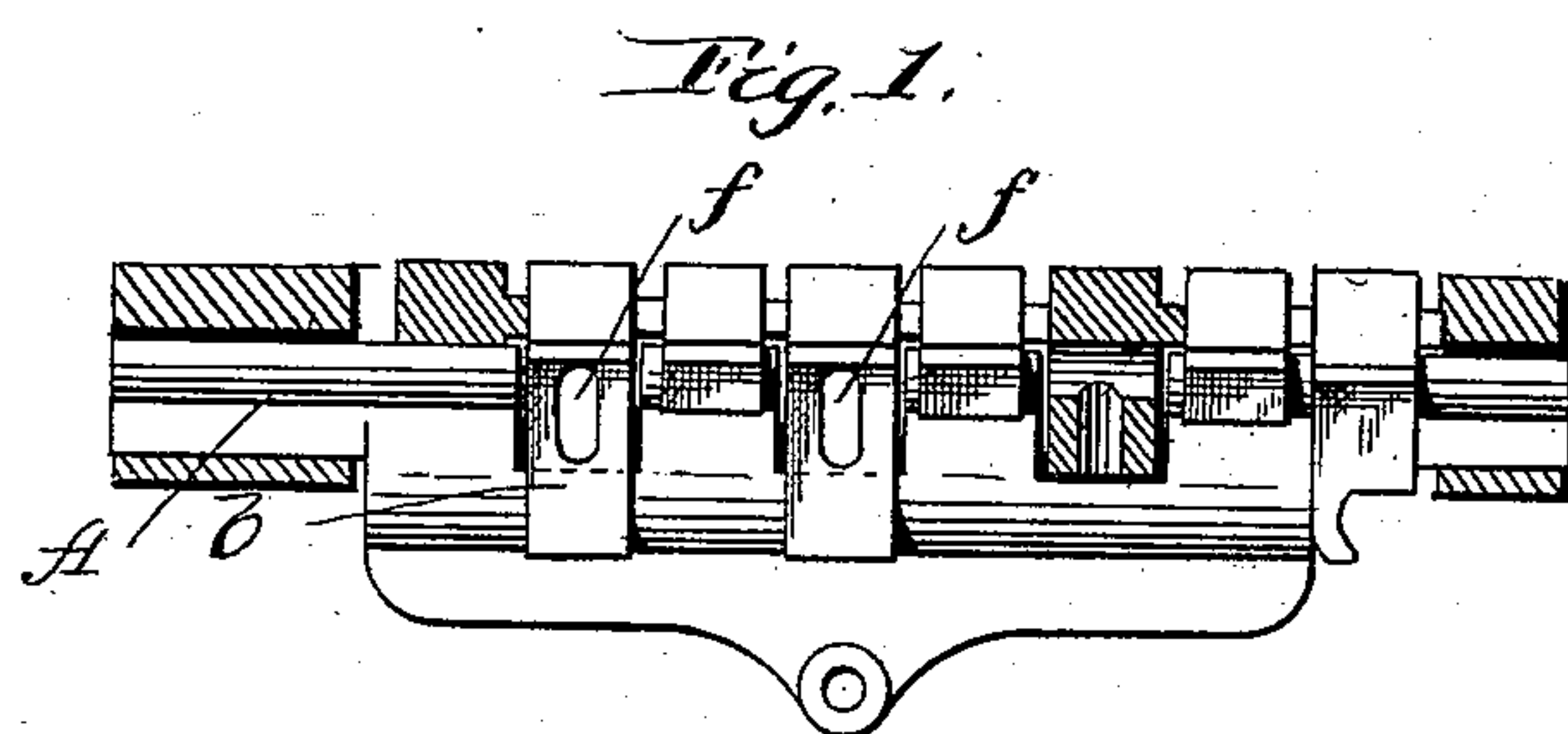


(No Model.)

E. GIBSON.
GRATE.

No. 464,185.

Patented Dec. 1, 1891.



Witnesses
W. F. Keene,
J. L. Middleton

Inventor,
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JES

UNITED STATES PATENT OFFICE.

EDWARD GIBSON, OF JERSEY CITY, NEW JERSEY.

GRATE.

SPECIFICATION forming part of Letters Patent No. 464,185, dated December 1, 1891.

Application filed April 11, 1890. Serial No. 347,470. (No model.)

To all whom it may concern:

Be it known that I, EDWARD GIBSON, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Grates; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to grates of that class in which two series of bars are supported on rocking shafts, and are reciprocated longitudinally in opposite directions thereby; and the invention relates particularly to the construction of the grate-bars.

In the accompanying drawings, Figure 1 is a front view, partly in section. Fig. 2 is a side elevation of one of the bars in place upon the crank-shaft. Fig. 3 is a section on line *x x* of Fig. 2.

Similar letters of reference indicate like parts in all the figures where they appear.

Each crank-shaft *A* is notched to provide upper and lower bearings for the two sets of bars which rest thereon. Each bar has a notched upper surface and a depending longitudinal flange or web *a*, extending from end to end. This flange is corrugated longitudinally, and, as shown in Fig. 3, it is located at one side of the bar, and the teeth *c* of the bar thus overhang on one side. These corrugations strengthen the bar and prevent warping under the action of the heat, and in order to secure the greatest strength from this construction the corrugations extend to near the upper surface of the bar, the curve being continued between the teeth, as in Fig. 3.

In order to get the full effect of the corrugated bar, it is essential that the bar be of uniform thickness in its depth, and in order to secure this uniformity at the upper part of the bar I arrange the teeth to one side of the center of the bar, so that no additional thickness is added to the bar proper at this point, as would be the case if the teeth were in the center.

I give the lower series of bars, which fit the notches of the crank-shaft lateral bearing-surfaces on both sides in order to prevent displacement, and thus avoid enlarged openings between the bars, and at the same time I secure good circulation of the air among the grate-bars and ash-pit. With these objects in view the ends of the lower series of grate-

bars, or those which fit in the notches of the crank-shaft, have enlarged ends or abutments *b*, extending laterally from the corrugated web. These abutments have a plain vertical bearing-face at each side and are fitted to the notch in the crank-shaft, so that a positive bearing is provided on each side and all lateral movement or play prevented. For the purpose of aiding the circulation these abutments are perforated longitudinally at the edge of the opening, being in line with the inner face of the corrugated web. Through this opening the air is free to circulate to and fro under the grate.

The longitudinal corrugations in the thin web *a* give great strength to resist warping by heat. I attach importance to the location of the web *a* at one side instead of in the center of each grate-bar, because it better allows for the longitudinal perforations *f* in the abutments. These perforations make the abutments about equal in thickness and heat-conducting power to the other portions of the bar and allow air to circulate freely to and fro along the grate-bar when the ash-pit is stopped at one point while another is open, as is frequently the case from accumulations of ashes and cinder.

The abutments *b* by presenting plane faces to match against the adjacent surfaces effectually avoid or greatly reduce the chance of the bars becoming locked together in case of warping.

I claim as my invention—

1. In a grate, the bars having an overhanging toothed upper part, and a corrugated web extending longitudinally along one side of the bar, the corrugations extending between the overhanging teeth, substantially as described.

2. In combination, the crank-shafts, and the grate-bars consisting of the webs at one side of the bars, the overhanging toothed portion, and the lateral abutments at the ends perforated longitudinally, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD GIBSON.

Witnesses:

CHARLES G. STEELE,
JNO. B. BARTLETT.