

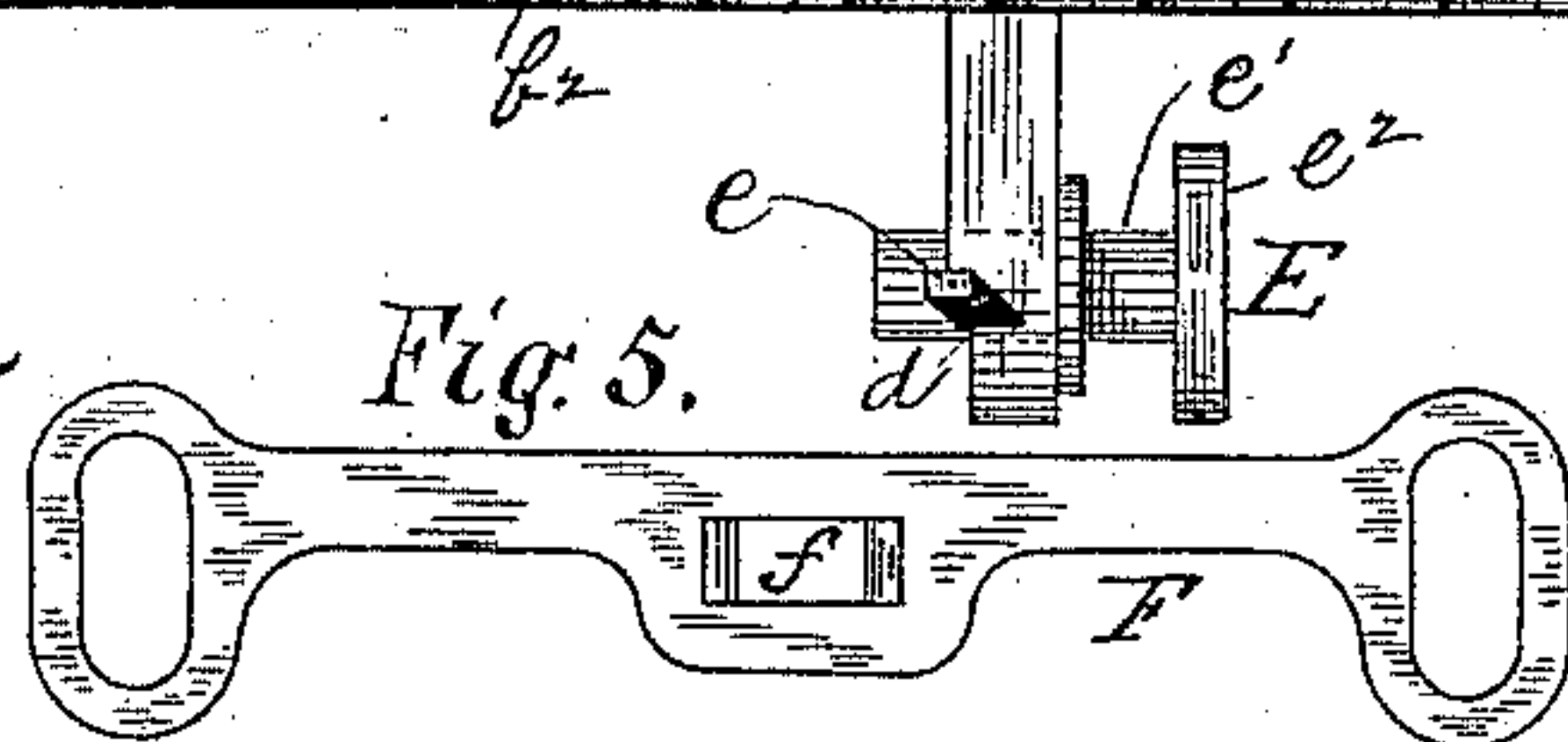
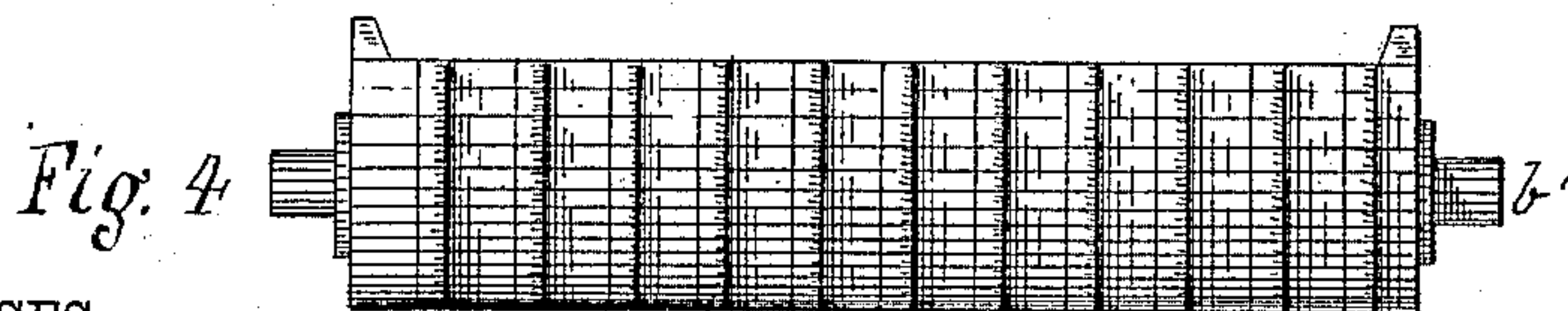
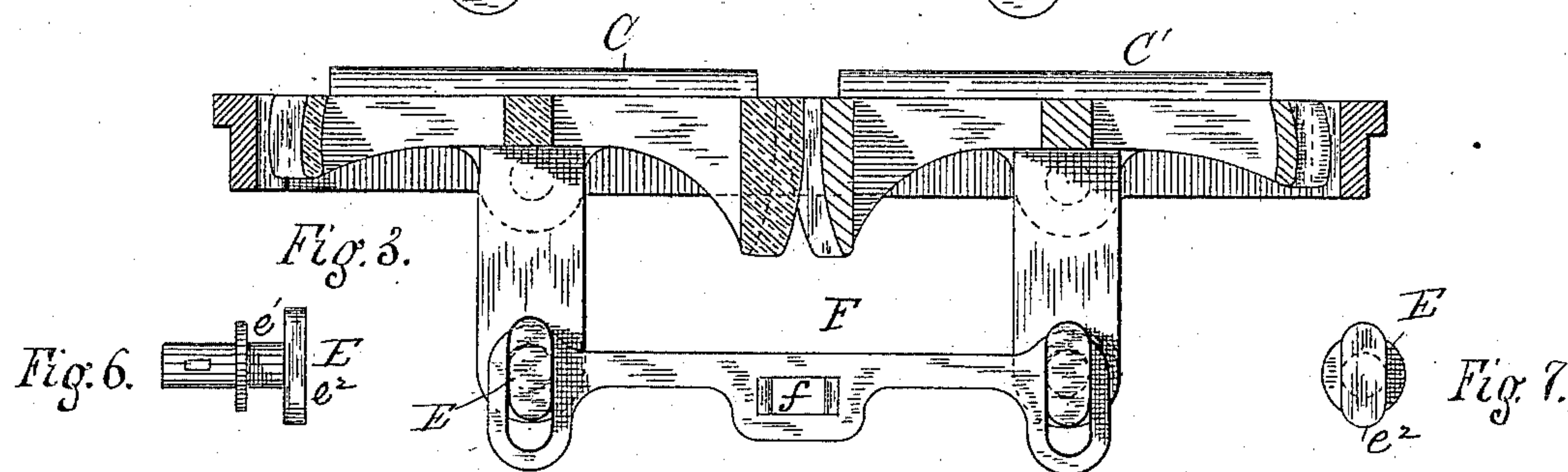
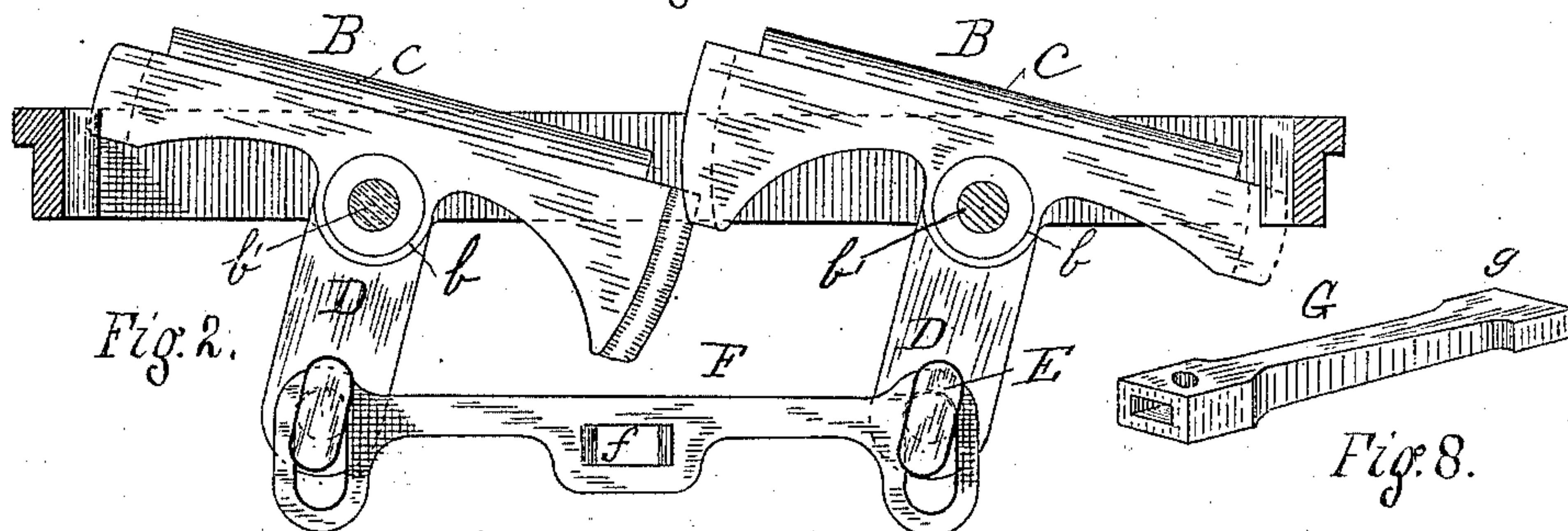
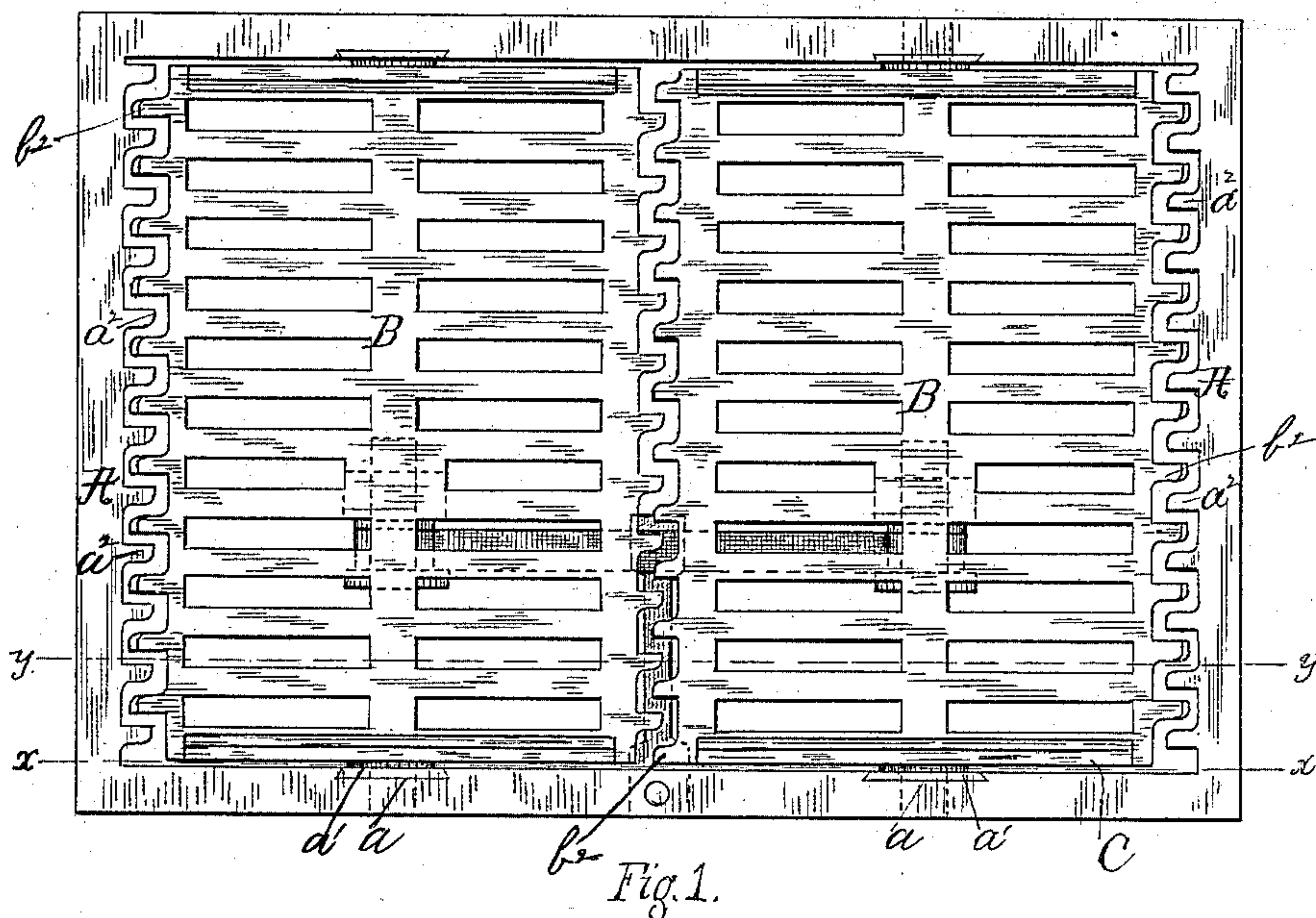
(No Model.)

J. L. L. KNOX.

GRATE.

No. 331,067.

Patented Nov. 24, 1885.



WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN L. L. KNOX, OF ALLEGHENY, PENNSYLVANIA.

GRATE.

SPECIFICATION forming part of Letters Patent No. 331,067, dated November 24, 1885.

Application filed January 31, 1885. Serial No. 154,582. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. L. KNOX, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Grates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement on the grate described in Letters Patent No. 229,319, issued to me and dated June 29, 1880, and entitled "grates for furnaces of steam-boilers."

The object of the present invention is to simplify the construction of the grate, render it less liable to fall out of repair, and decrease the cost of manufacture.

The invention consists in the hereinafter-described means for accomplishing said object.

Figure 1 is a top plan view of my invention; Fig. 2, a section on line $x x$ of Fig. 1; Fig. 3, a section on line $y y$ of Fig. 1; Fig. 4, an end elevation of one of the grate-sections; Fig. 5, a detail view of the coupling-bar; Fig. 6, a detail view of the bolt; Fig. 7, a face view of the head of the bolt; Fig. 8, a detail view of the shaker-socket and its tongue.

Similar letters of reference indicate corresponding parts throughout the different views.

A is the grate-frame, consisting of a quadrilateral rectangular cast-iron frame, provided with beveled recesses a , within which fit removable bearings a' .

B are the grate-sections provided upon either side with pendants b , having trunnions b' cast upon them. Said trunnions are situated in a horizontal plane some distance beneath the top of the grate and work in the removable bearings a' . By this construction, when the grate-sections are tilted a positive motion is imparted to that part of each section lying immediately above its axial line, and the accumulation of ashes at said part thereby prevented.

Each section of the grate is cast in a single solid piece, and is constructed as follows: The ends of the sections are provided with teeth b^2 , which mesh with each other and with teeth

a^2 , formed on the inside of the ends of frame A. Said teeth are curved on their outer faces in such manner as that when the sections are tilted in the act of shaking the teeth will at all times mesh. The object of this construction is to prevent any foreign substance from falling between the sections or the sections and the ends of frame A and preventing the further movement of the sections. The toothed ends of the grate-sections are extended downwardly some distance below the bottom of the body of the grate, and the ends which are juxtaposed are of about twice the facial length of those which mesh with the toothed frame ends. From the sides of each section extend upwardly and outwardly beveled flanges C, the object of which is to prevent the coal, ashes, &c., from falling between the sections and the front or back of frame A. From about the middle of each section extends a pendant, D, having a circular slot, d , drilled in its lower extremity. In this slot fits a bolt, E, which is secured by a pin, e , whose extremities rest against a shoulder formed on the pendant. Said bolt is provided with a cylindrical neck, e' , and has a vertically-elongated head, e^2 , for the purpose hereinafter set forth.

F is a coupling-bar provided with slots in either extremity, of configuration similar to the head of the bolt. The object of this construction is to allow the coupling-bar to be slipped over the heads and pressed downward upon the necks of the bolts, thus preventing accidental displacement of the bar while not interfering with the ready removal of same. The middle of the bar is provided with a slot, f , in which fits loosely a tongue, g , formed upon a socket-plate, G. Said socket-plate is pivoted to the front of the grate-frame, and has a socket in which an ordinary bar-shaker is designed to fit.

The grate is set in the following manner: The trunnions of the sections are slipped in the removable bearings a' , and the latter forced downwardly into the beveled recesses a . The coupling-bar F is then placed in position on the necks of the bolts E, and the tongue of the socket-plate pushed in the slot f , and the plate pivoted by a bolt to the front of frame A. The grate is then in condition for operation. When

the end of a shaking-bar is inserted in the socket and the bar laterally vibrated; the corresponding ends of each grate-section are alternately raised and depressed, and the
5 middle of each section given a lateral throw, thus thoroughly shaking up, separating, and freeing from ashes the coal. At the same time the toothed ends of the section overlapping each other and the teeth formed upon
10 the frame prevent cinders or any foreign substance from interfering with the operation of the sections.

It will be understood that any number of sections may be used and operated in the
15 manner described.

I do not desire to confine myself to the particular device shown for vibrating the grate-sections, as instead of the pivoted tongued socket-plate a number of well-known devices
20 may be employed, the character and construction of such device being dependent on the purpose for which the grate is intended, whether an open grate, a furnace-grate, &c.

The detachable bearings are fully shown and described in my former patent, No. 229,319, 25 and do not form any part of the present invention; but

What I do claim as new, and desire to protect by Letters Patent, is—

1. The combination of the frame A, the 30 grate-sections B, provided with pendants D, which have long-headed bolts E, and the bar F, having slots at each end for engaging the long-headed bolts in the pendants, substantially as shown and described. 35

2. The combination of a grate-frame and a pivoted grate-section having an open space between their ends, the grate-section being provided with beveled flanges extending upwardly from the sides thereof, as and for the 40 purpose specified.

JNO. L. L. KNOX.

Witnesses:

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J. A. KURTZ.