

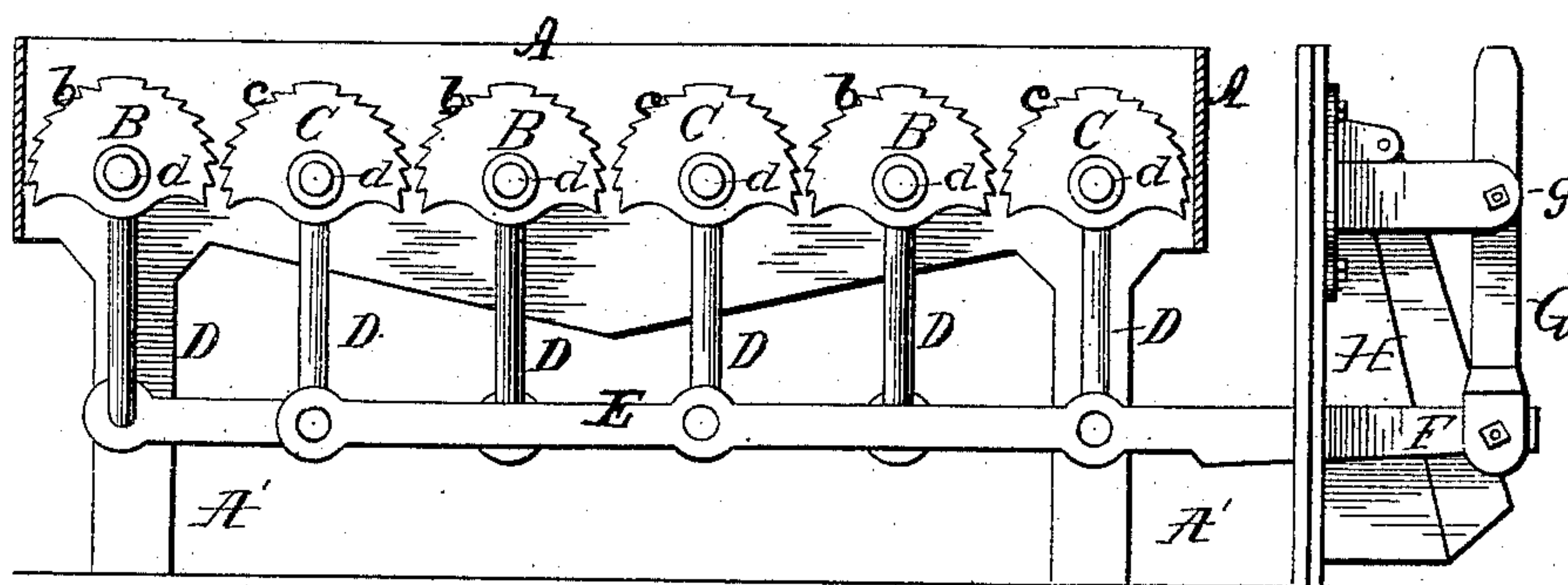
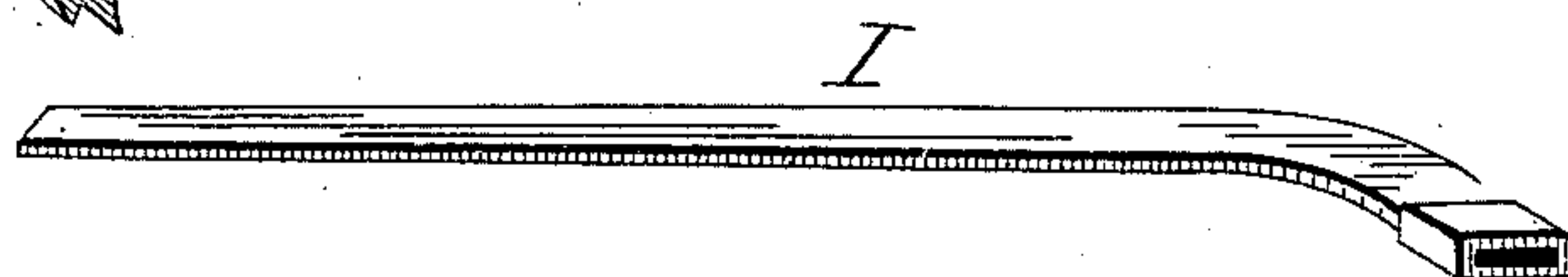
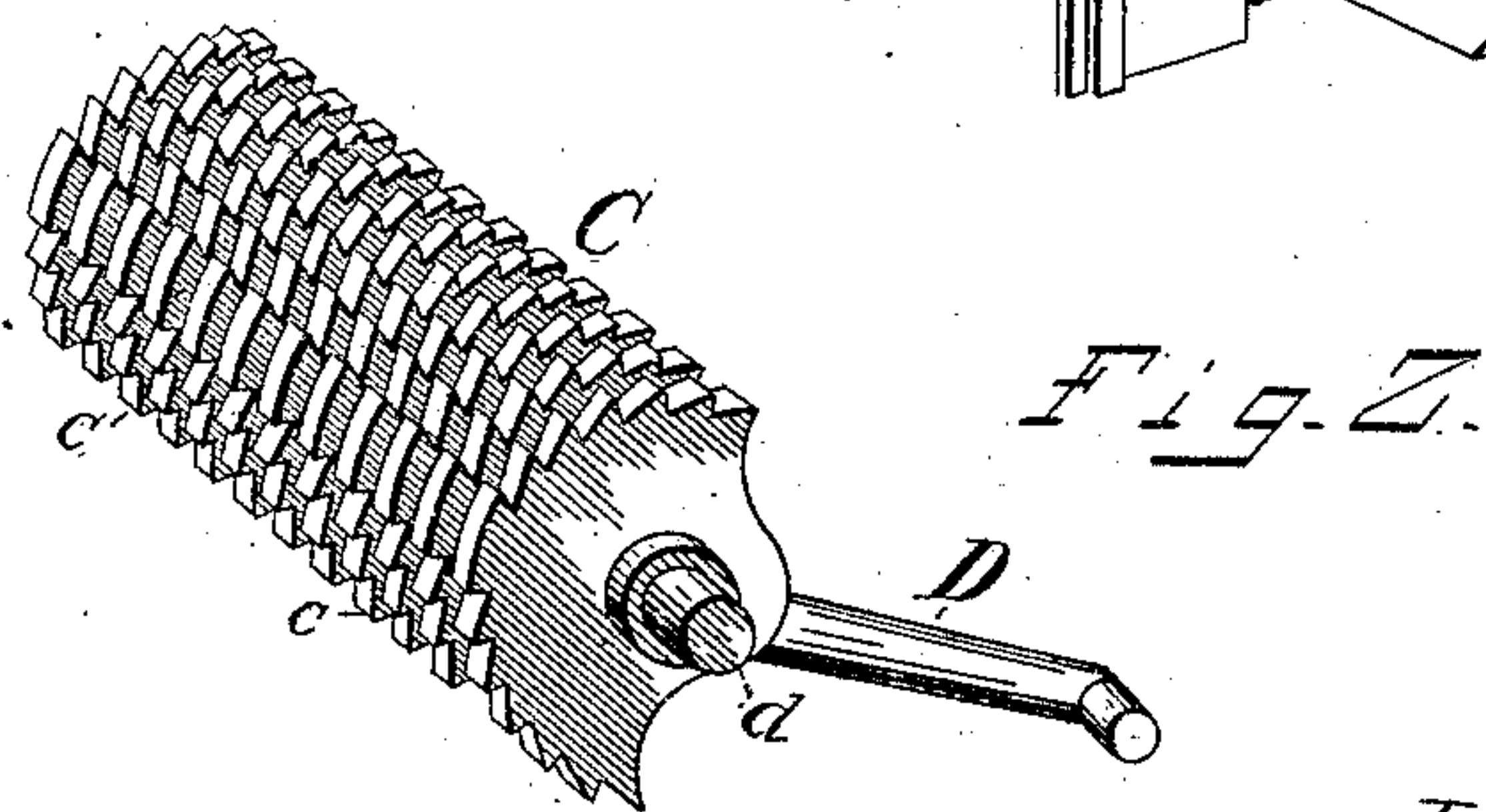
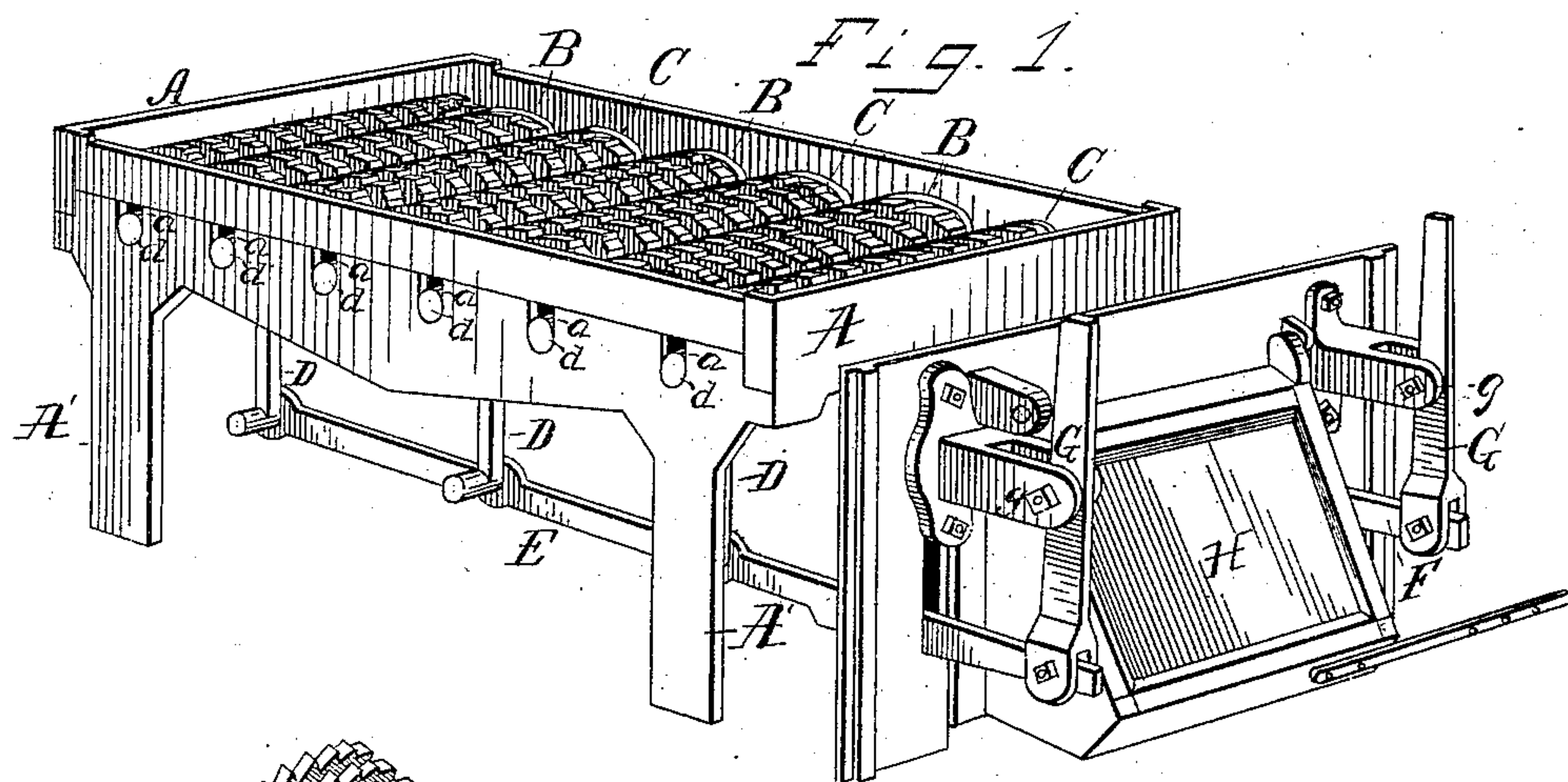
(No Model.)

J. R. REED.

ROCKING OR ROTATING GRATE FOR FURNACES, BOILERS, &c.

No. 354,230.

Patented Dec. 14, 1886.



WITNESSES  
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*By Wm. F. Drerickson* Attorney



# UNITED STATES PATENT OFFICE.

JOHN R. REED, OF WESTFIELD, MASSACHUSETTS.

## ROCKING OR ROTATING GRATE FOR FURNACES, BOILERS, &c.

SPECIFICATION forming part of Letters Patent No. 354,230, dated December 14, 1886.

Application filed February 16, 1886. Serial No. 192,134. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN R. REED, a citizen of the United States, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Rocking or Rotating Grates for Furnaces, &c.; 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 improvements in grates for furnaces, heating-boilers, &c., particularly that form known as the "rocking" or "rotating" grate; and my said invention consists of a grate composed of a rectangular frame having journal-bearings at each side thereof, a series of grate-bars, each having a short journal at each end and a depending rocker-arm at one side, the said bars being arranged alternately in said frame and formed with a curved toothed surface, the teeth being ratchet form and facing in opposite directions, and a connecting-bar extending at each side beneath the frame and connected with each of the rocker-arms upon that particular side, as and for the purposes as will presently appear, and be more particularly pointed out in the claims.

The object of my invention is to lessen the labor required to cleanse the grates of furnaces, heating-boilers, &c., and in addition to this, one set of bars whose surface is toothed acting upon a similarly-formed surface that is rigid and stationary, a better opportunity for the teeth of the bars to grasp and crush the cinders, &c., is obtained than were both bars operating at once, so that there is no value in the ashes that pass the grate, because of the complete combustion and reduction of all parts of the fuel; and, further, because of the curved and toothed surface of the grates, a greater amount of air-space is attained than is otherwise possible. All the oxygen possible is therefore supplied, and a complete combustion of all portions of the fuel is the result, and, as before stated, the toothed surface of every alternate bar acting against a rigid similarly-formed surface, a thorough cleaning of the grate is effected, and because of only one-half of the number of grate-bars being acted upon at once the labor necessary to operate a furnace-grate when con-

structed according to my invention is reduced one-half.

For a better understanding of the details of construction and arrangement of my invention, reference must now be had to the accompanying drawings, in which—

Figure 1 represents a view in perspective of an entire rotating or rocking grate for furnaces, &c., constructed according to my invention; and Fig. 2 is a similar view of one of the bars as removed from the frame, showing the construction of the same. Fig. 3 is a side elevation of the entire grate, showing one side of the case or frame as removed.

Within a suitable frame or case, A, supported upon legs A', is mounted a series of grate-bars, B and C, to form a grate for a furnace, steam-heating boiler, &c. These grate-bars B and C are similar in construction—that is, they resemble a section of a cylinder—and upon their outer surface a series of serrations or ratchet-shaped teeth is formed, as at *b* and *c*, the teeth upon one half of the surface of the cylinder facing one edge of the cylinder, while the teeth upon the opposite side thereof face in the opposite direction, but also toward the lower edge of the cylinder. Thus, when two or more bars are arranged parallel with each other, the teeth of each bar adjacent each other will point toward each other and downward toward the bottom of the grate. Centrally upon the heads or ends of these bars is formed a short journal, *d*, by which the grate is suspended within the bearings *a* in the frame, and one end of each grate is supplied with a depending rocker arm, D, by which the grate is rotated upon its axis.

When in position these grate-bars are arranged within the frame, so that their rocker-arms will alternate upon opposite sides of said frame with each other. If there be six grate-bars in the group, three rocker-arms will be upon one side of the frame and three upon the opposite side thereof, and each of these arms, upon each side, is connected to a bar or pitman, E and F, extending longitudinally beneath the frame, as shown in Fig. 1, and whose front end extends out beyond said frame, and has pivoted to it a short rocker-arm, G, which is in turn pivoted, as at *g*, to the front of the casing surrounding the grate adjacent the furnace-door H.



To operate or clean the grate when constructed in accordance with my invention, as hereinbefore described, a lever, as at I, is placed upon the top end of one of the rocker-arms G and moved back and forth, which, through the connection of the bar E or F and depending arms D, agitates one set of the grate-bars, while the remaining set remain idle. After this is accomplished, the lever is removed to the opposite position and the remaining set of grates operated. Thus an effectual cleaning of the entire grate-surface is the result, and with little expenditure of labor, and, the teeth of each grate facing each other, a thorough crushing of the cinders and their forced expulsion from the grate is effected.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent of the United States, is as follows, viz:

1. The grate-bars BC, formed with a toothed curved outer surface, the teeth being of ratchet

form and facing in opposite direction, as described and shown, for the purposes specified.

2. In a rotating or rocking grate, in combination with the frame having journal-bearings at each side thereof, the grate-bars having a short journal at each end and a depending rocker-arm at one side, and being arranged alternately in said frame, said grate-bars being formed with a toothed surface, the teeth being of ratchet form and facing in opposite directions, and a connecting-bar extending at each side beneath the frame and connected with each of the rocker-arms of the grate-bars upon that particular side, as described and shown, for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN R. REED.

Witnesses:

H. W. ASHLEY,  
A. B. CLARK.