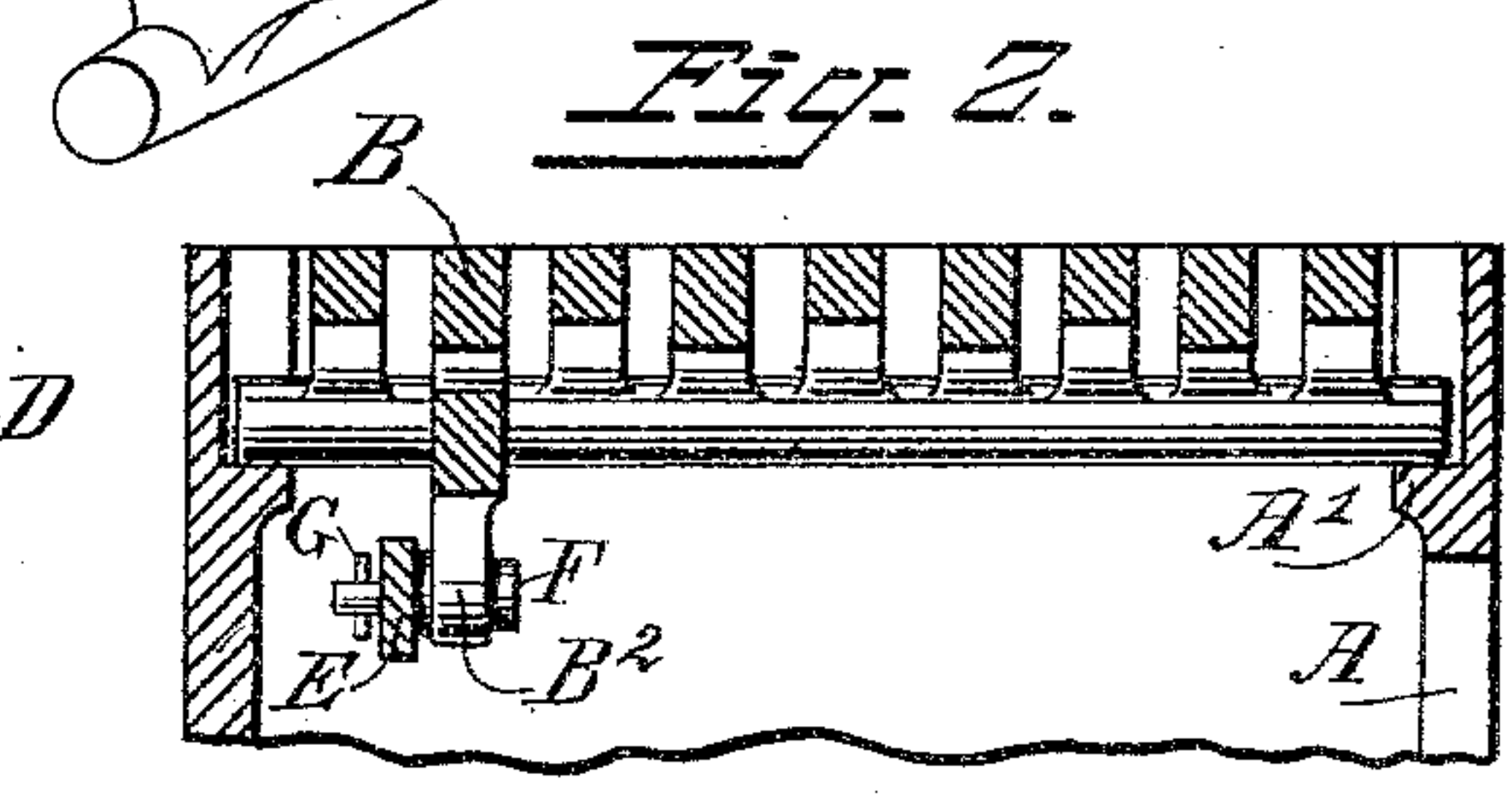
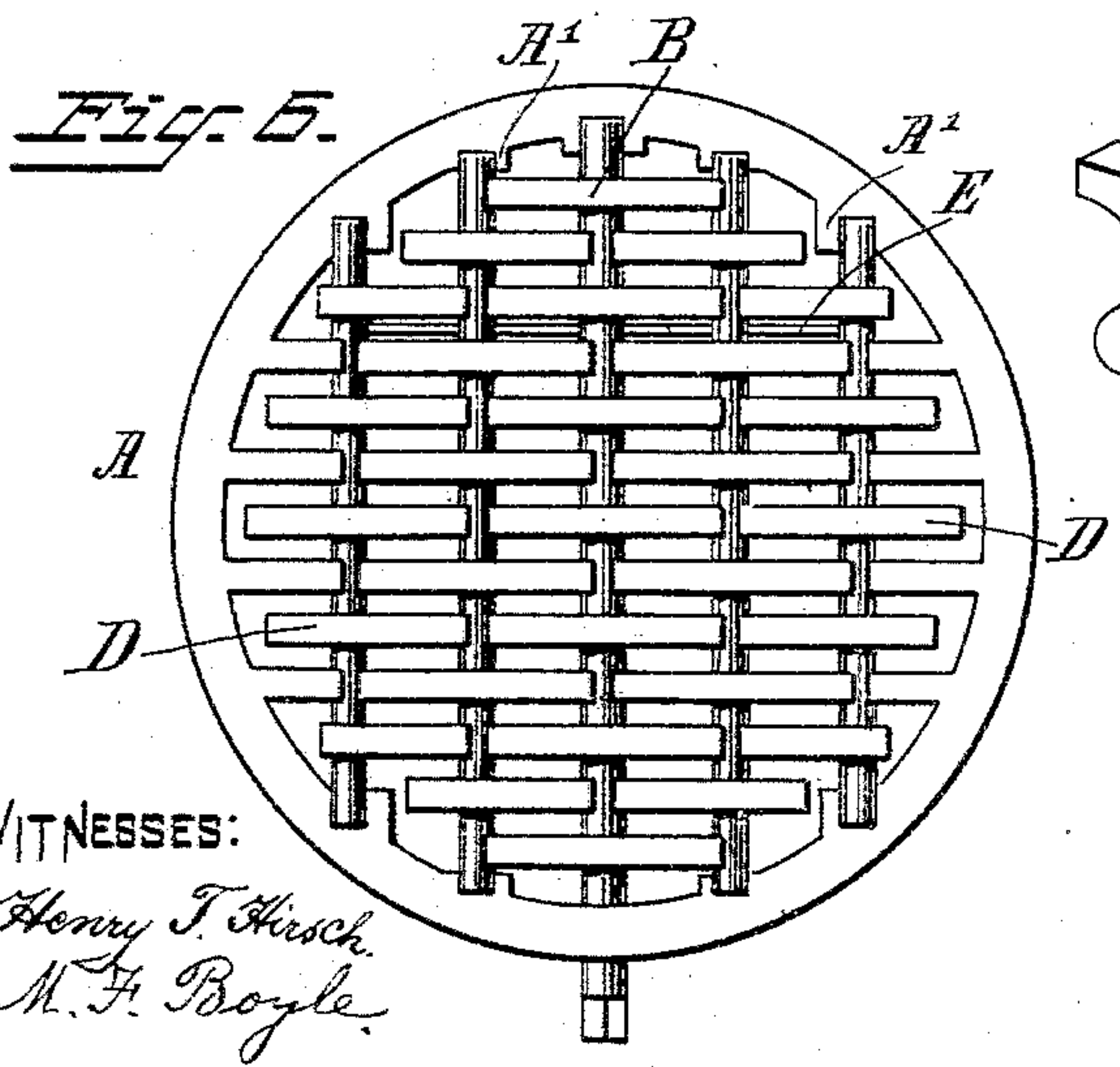
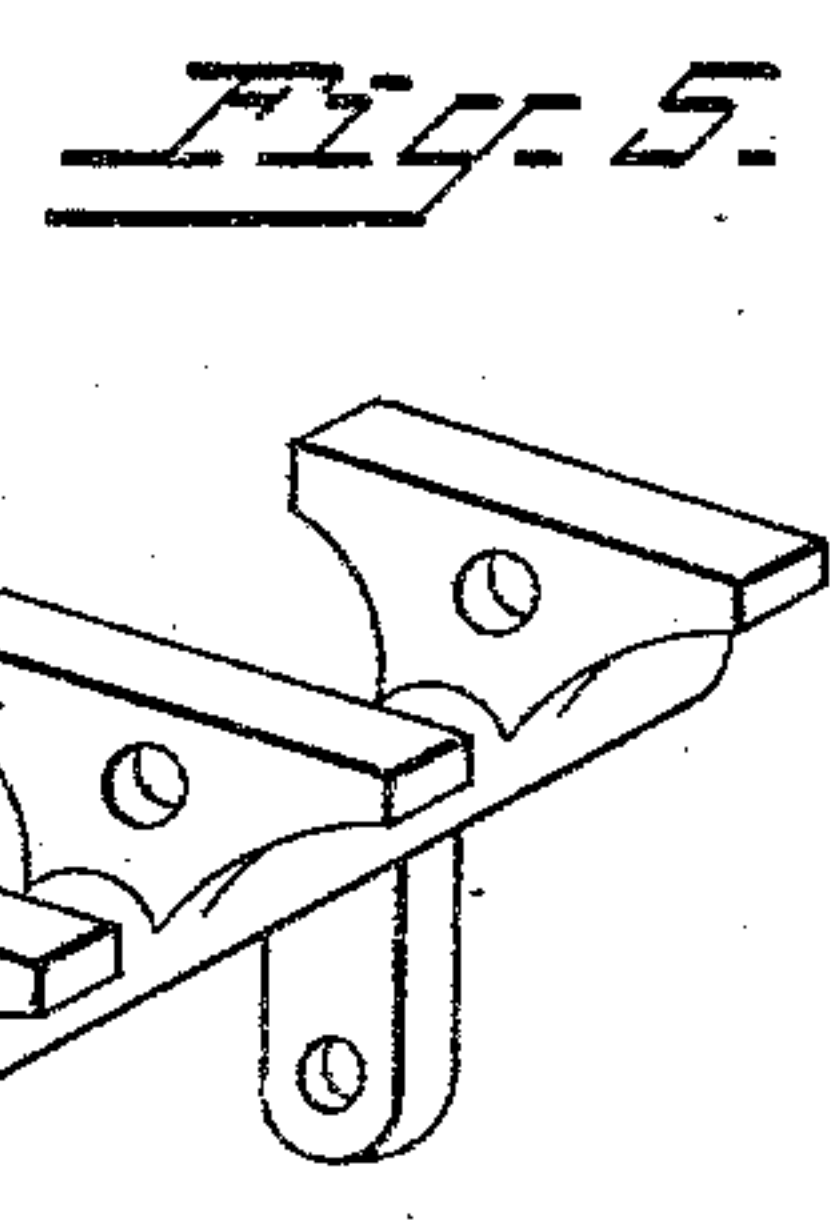
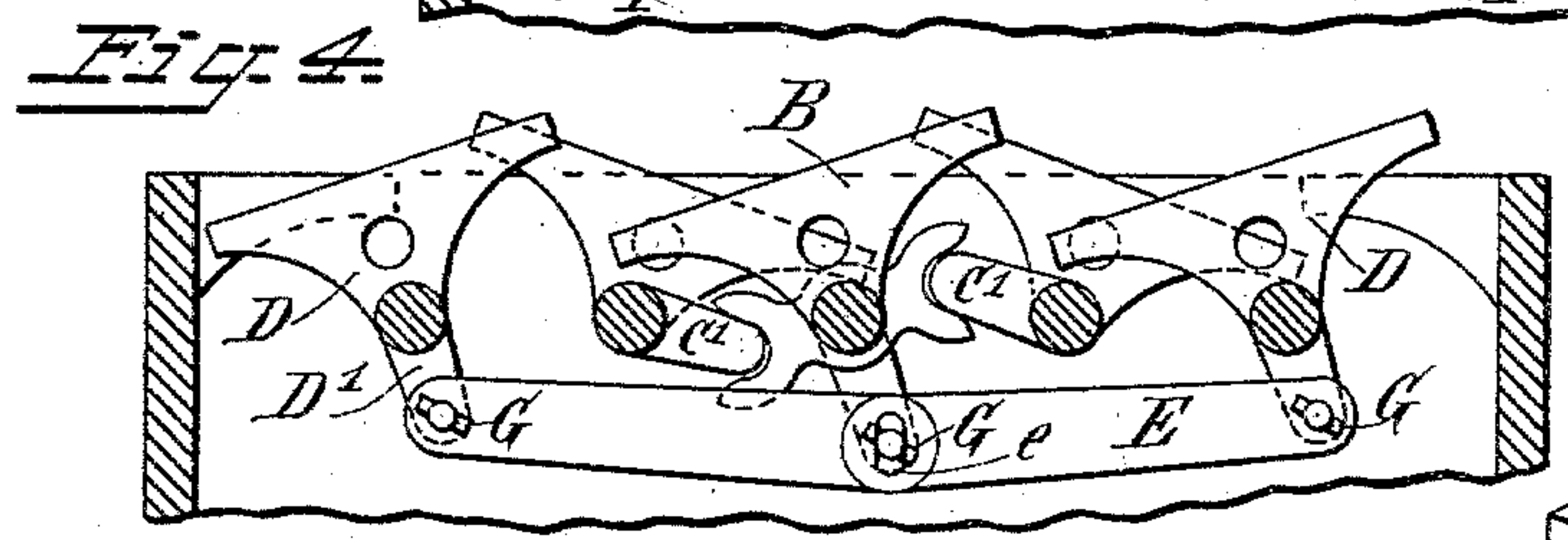
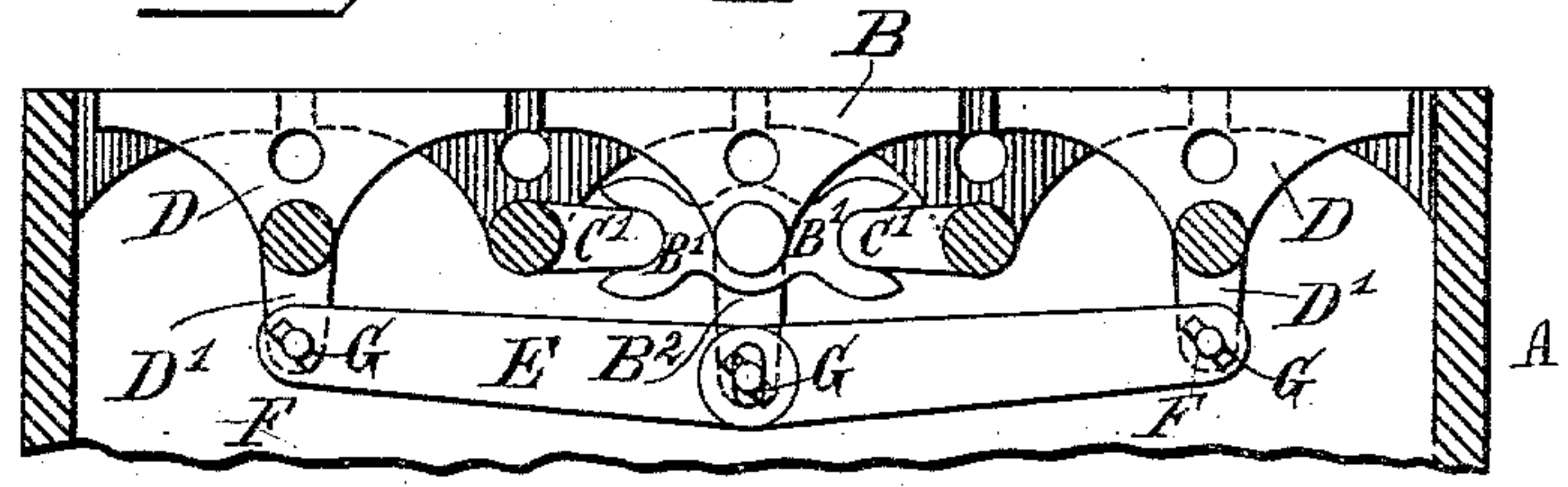
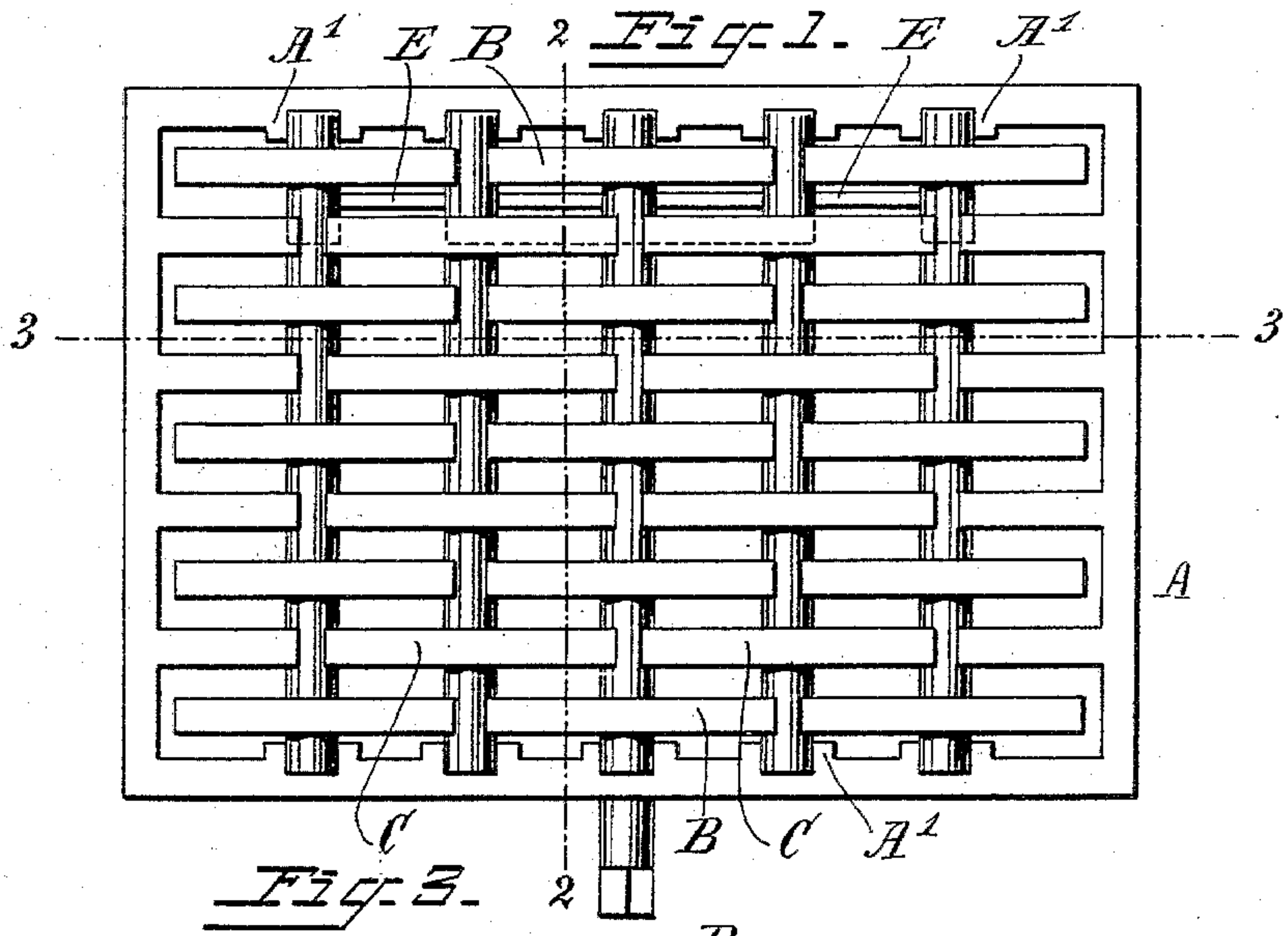


(No Model.)

C. YINGLING.
GRATE.

No. 556,795.

Patented Mar. 24, 1896.



WITNESSES:
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UNITED STATES PATENT OFFICE.

CHARLES YINGLING, OF METUCHEN, NEW JERSEY.

GRATE.

SPECIFICATION forming part of Letters Patent No. 556,795, dated March 24, 1896.

Application filed January 26, 1895. Serial No. 536,307. (No model.)

To all whom it may concern:

Be it known that I, CHARLES YINGLING, a citizen of the United States, residing at Metuchen, in the county of Middlesex and State of New Jersey, have invented a certain new and useful Improvement in Grates, of which the following is a specification.

The improvement pertains to that class of grates in which the grate area is composed of parallel sections which are arranged to rock each on a longitudinal axis properly supported. The edges of the sections are formed with fingers which intermesh with each other. The centers are arranged so low that in the rocking motion there is considerable lateral movement of the several sections. I make alternate sections rock in opposite directions. The sections are mechanically connected, so that the rocking of one communicates the proper rocking motion to the others. The motion may be imparted to any one of the sections, preferably the central one, by extending its shaft out beyond the inclosing frame and providing a properly-formed end, which may be engaged by a proper wrench or lever. The communication of the motion from one section to another is peculiar. I make the connections within the grate area, but preferably so far to one side of the center line as to offer little obstruction to the removal of the ashes and cinders by any ordinary means.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a plan view of my improved grate; Fig. 2, a sectional view on line 2 2 in Fig. 1; Fig. 3, a similar view on line 3 3 in Fig. 1; Fig. 4, a similar view to Fig. 3, the grate-bars being shown tilted; Fig. 5, a detail perspective view of one of the sections, and Fig. 6 a plan view showing the bars as applied to a circular grate.

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

A is an inclosing frame of cast-iron or other suitable material which is provided with bearings A', adapted to support the shafts or bodies of the several sections.

B is the central section. The shaft of this section is extended outward through a suit-

able hole in the frame A and is squared to receive a lever, (not shown,) by the aid of which the attendant may rock the sections strongly.

B' B' are segments of gear, and B² is an arm reaching down from the body B and provided with a pin F.

C C are the sections adjacent to the central section, B, one on each side. Each section C and C is provided with a segment of gear C', which engages with the corresponding segment B'. By this means the rocking motion is communicated from the central section to the two adjacent sections, the sections C C being rocked a little more than equally with the section B and in the opposite direction.

The sections D D are respectively at the extreme right and left of the grate, exterior to the sections C. They receive motion from the central section, B, through a link E and pins F. These pins are set firmly in the crank-arm D' and apply loosely in suitable holes in the link E. The arms D' are shorter than the arm B², the difference in the circular motion being allowed for by providing a slot instead of a round hole to receive the pin F of the central section, B. The pin F is set stiffly in the crank-arm B² and engages loosely in a vertical slot *e* in the link E.

There is, with the ordinary imperfections in mechanism of this character, some lost motion in the several connections, which tends to reduce the motion of the end sections, so that they shall rock to a less extent than the central section, that from which the motion is received. The tendency of ashes to accumulate against the sides of the interior of the furnace makes it important that the end sections, D D, shall rock as much as the central section, B, and somewhat more. The action in shaking the ashes down through the grate ought to be about equal at all points. The lost motion is more than compensated for—that is to say, the arm B² for the central section is so much longer than the arm D' on each of the end sections that there is a tendency from this cause to rock the end sections the most, and the toothed segments B' are of sufficiently greater radius than the segments C' to give a somewhat less excess of rocking of these intermediate sections.

I retain the connection of the link E with

the several pins F by means of split keys G inserted in the pins, as shown.

I attach importance to the open tops of the bearings A', because they make it easy to introduce and remove the several sections of grate as required.

I attach importance to the fact that the bearing points or axes of the several sections are far below the upper surfaces, which are the effective surfaces of the several sections, because it gives a considerable lateral movement to the several surfaces in opposite directions when the grate is rocked, and also prevents the heat of the furnace from acting injuriously on the shafts of the several sections and by the unequal contraction and expansion warping them. The cold air passing around the shafts at the low level at which I arrange them keeps them cool. The engagement of the ends of the fingers of the several sections allows the lateral movement. That movement together with the rocking movement is very effective in cleaning the fire, sifting the ashes down through the spaces in the grate, and retaining the unburned fuel.

While the details of construction shown in the drawings are the ones I prefer, they are subject to modifications which would not depart from the spirit of the invention and are

intended to be included by the claims. Instead of making the grate area rectangular, as shown, it can be circular, giving a proper corresponding form to the several sections of the grate.

Fig. 6 is a plan view of the invention applied to a circular grate.

I claim as my invention—

1. In a grate a series of sections adapted to rock connected by links so as to rock in the same direction, in combination with intermediate sections connected to such series by gears so as to rock in the opposite direction, arranged for joint operation.

2. In a grate a series of sections adapted to rock, connected by a link so as to rock in the same direction, in combination with intermediate sections connected to such series by gears so as to rock in the opposite direction, the parts being proportioned to increase the rocking motion of the outer sections relatively to the central sections, as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

CHARLES YINGLING.

Witnesses:

M. B. HARRIS,

M. F. BOYLE.