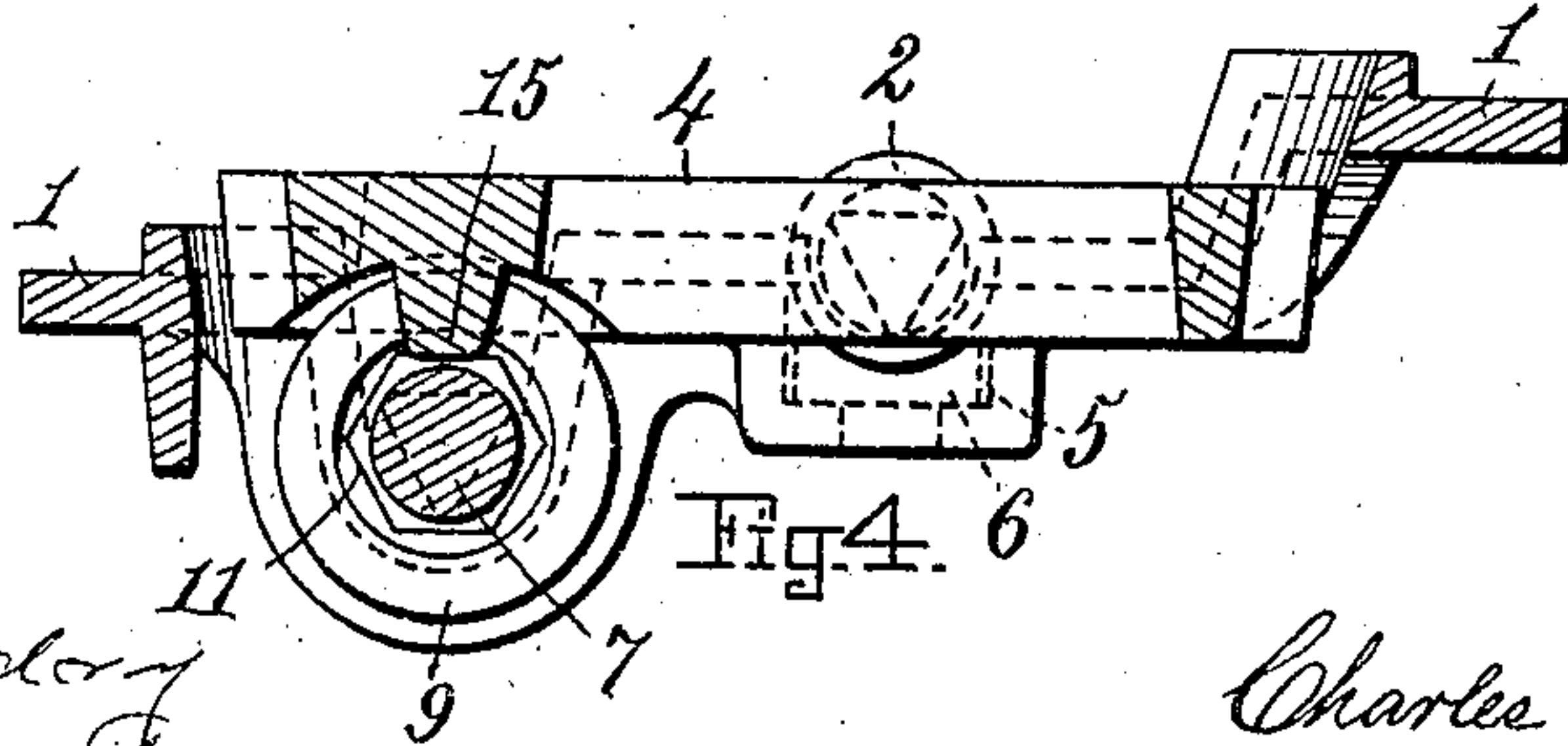
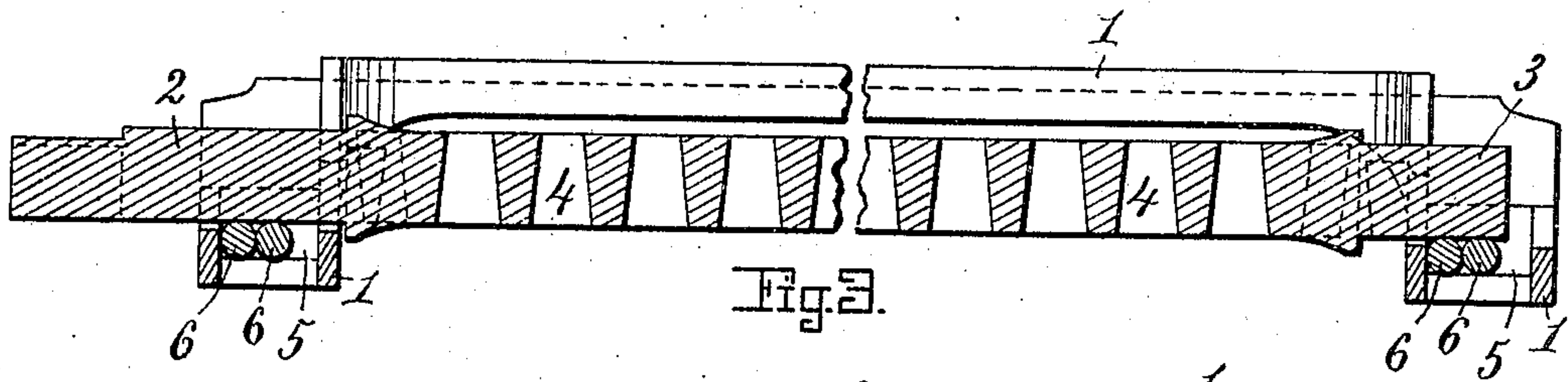
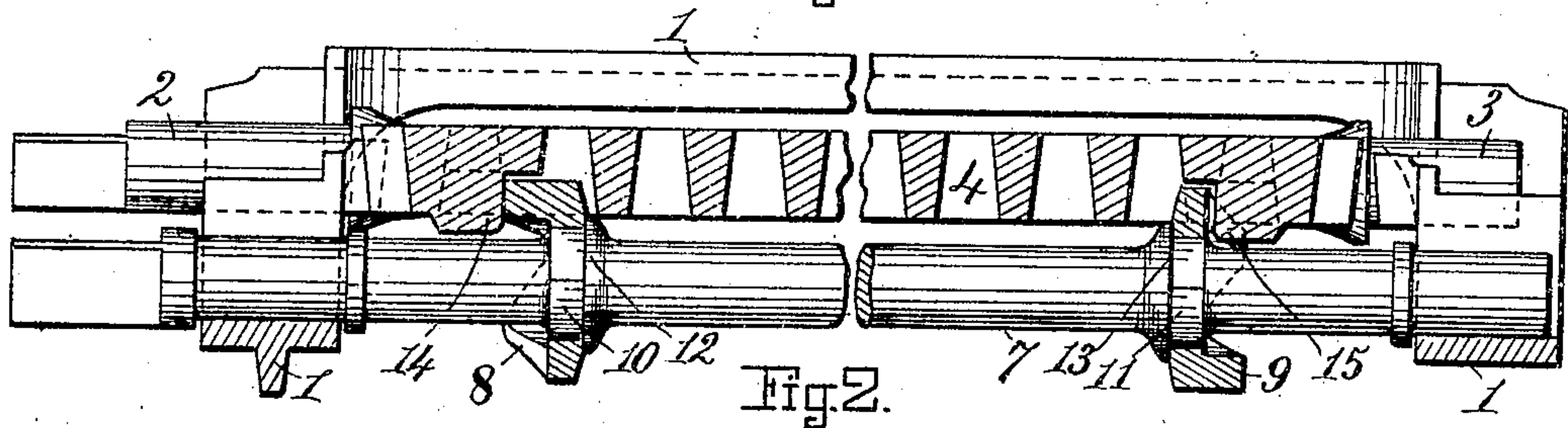
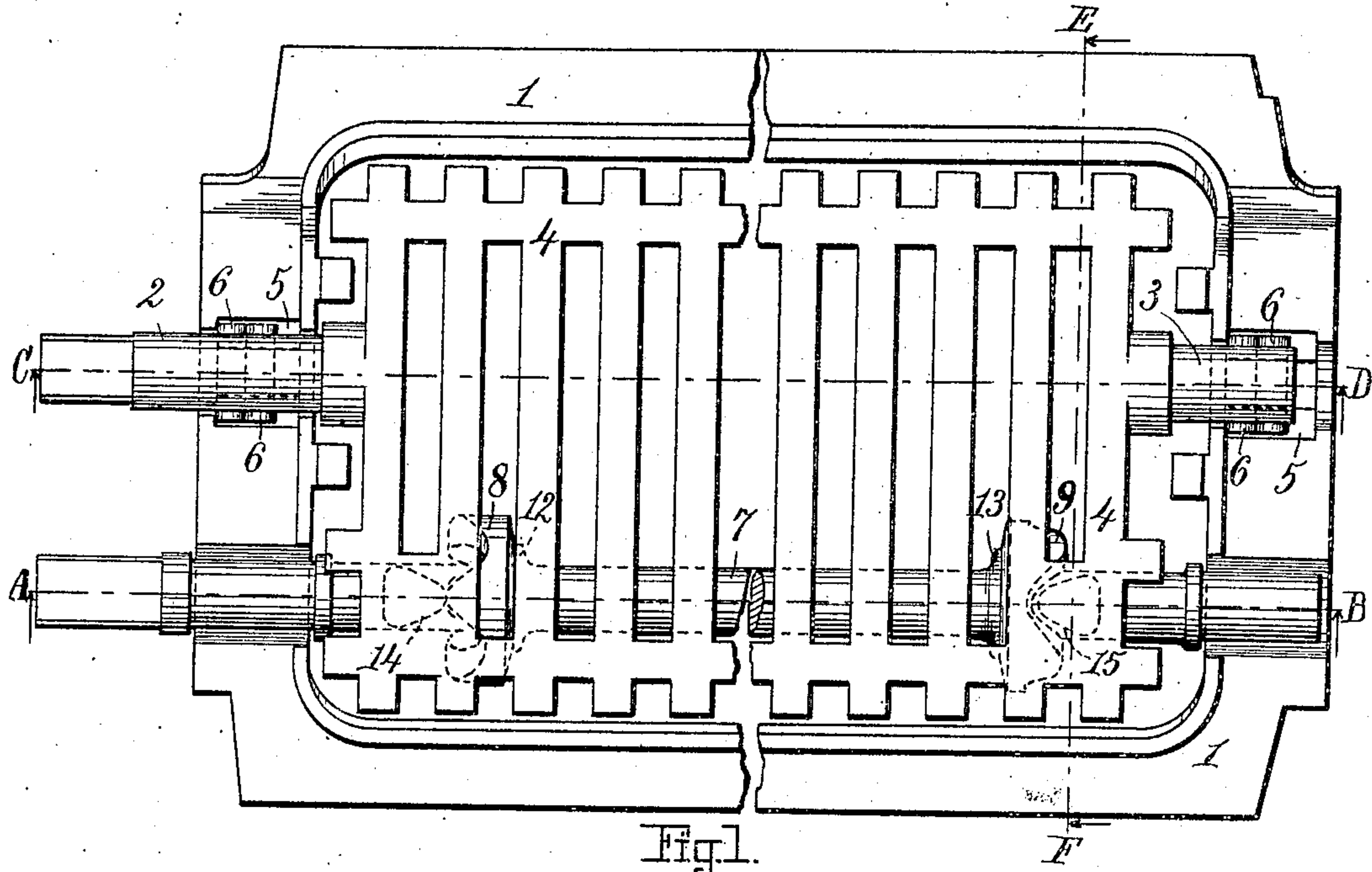


No. 843,952.

PATENTED FEB. 12, 1907.

C. H. LANGILL.  
SHAKING GRATE.  
APPLICATION FILED OCT. 3, 1906.



Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES H. LANGILL, OF BOSTON, MASSACHUSETTS.

## SHAKING-GRATE.

No. 843,952.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed October 3, 1906. Serial No. 337,307.

*To all whom it may concern:*

Be it known that I, CHARLES H. LANGILL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Shaking Grates, of which the following is a specification.

This invention relates to improvements in grate-shakers, and has for its object to provide novel means whereby the grate will be given a longitudinal reciprocating movement sufficient to cause ashes which have accumulated upon the top of the grate to become dislodged therefrom and to fall through the grate between the bars thereof and to the ash-pit below.

The invention consists of the novel constructions, arrangements, and combinations of parts fully described hereinafter and particularly set forth in the claims annexed hereto, and it is carried out substantially as illustrated on the accompanying drawings, which form an essential part of this specification, and whereon like characters of reference refer to like parts wherever they occur on the different parts of the drawings.

On the drawings, Figure 1 represents a plan view of my improved shaker, showing it applied to a grate mounted in the grate-frame. Fig. 2 represents a longitudinal section of the same on the line A B in Fig. 1. Fig. 3 represents a longitudinal section of the same on the line C D in Fig. 1. Fig. 4 represents a cross-section of the grate and its shaker on the line E F in Fig. 1.

Within bearings in the grate frame or bed 1 is pivotally mounted the trunnions 2 and 3 of the grate proper, 4, which trunnions project from the opposite ends of the grate substantially as usual; but they are preferably arranged to one side of the center of the width of the grate, so that the grate will be somewhat out of balance, for a purpose to be fully understood by the complete description of the device hereinafter contained. The length of the grate relative to the inside dimension of the grate-frame is such as to allow of a free reciprocation of the grate within the grate-frame in the direction of the axes of the trunnions 2 and 3 when so desired.

Recesses 5 are formed within the bearings for the trunnions in the grate-frame, and within these recesses are placed the rolls 6 in such a manner that the trunnions 2 and 3 will rest upon said rolls, and the rolls will act as an antifriction-bearing during the longi-

tudinal reciprocations of the grate, as above specified.

The outer end of the trunnion 2 is made of such a shape as to receive a suitable wrench by which the grate may be turned on its trunnions, and the end of the trunnion is preferably made triangular in cross-section, substantially as shown in dotted lines in Fig. 4.

Within bearings in the grate frame or bed 1 below the grate is rotatably mounted the shaft 7, having its axis of rotation parallel to the axis of rotation of the grate upon its trunnions, and this shaft is prevented from longitudinal movement in its bearing in the grate-bed in any of the common means now in use. The shaft 7 is located on the opposite side of the center of the width of the grate to that of the location of the trunnions 2 and 3, and consequently the shaft 7 acts as a support to prevent the grate from turning on its trunnions by the uneven balance of the grate, due to the location of the trunnions.

When the axis of rotation of a grate is substantially through the center of the grate, as in the stove-grates now in common use, great inconvenience often occurs when raking the fire from the top, due to the accidental tipping of the grate; but by my arrangement of the trunnions and the supporting-shaft all liability of accidentally tipping the grate is obviated and the grate is held firmly in a level position.

The shaft 7 is provided with two crown-cams 8 and 9, which have their cam-surfaces toward opposite ends of the shaft 7. The number of high and low portions of the cams correspond, and they are arranged so that the high portion of one cam will be in the same axial plane as the low portions of the other cam, and vice versa. For convenience in attaching the cams to the shaft and to add to the ease in replacing a defective or worn-out cam I make the shaft polygonal in cross-section where the cams are to be attached, and I make the surfaces of the polygonal portions of the shaft in line with each other, as shown at 10 and 11. I also provide the shaft with the collars 12 and 13, against which the cams press when in operation. The number of the faces on the polygonal portions of the shaft correspond to the number of the high and low portions of the cam which is to be placed upon that polygonal portion of the shaft. The perforations



through the cams are such as will fit closely upon the polygonal portions of the shaft. By this manner of attaching the cams to the shaft I am able to make the cams interchangeable, a cam of the same shape being applicable to either portion of the shaft.

The projecting end of the shaft 7 is preferably made the same shape and size as the projecting end of the trunnion of the grate, so that the same wrench may be used in turning the grate or rotating the shaft.

The under side of the grate is provided with the projections 14 and 15, which are engaged by the cams 8 and 9, respectively, when the shaft 7 is rotated. The action of the cams upon the projections on the grate is such that it causes the reciprocations of the grate within the grate frame or bed, and thereby the ashes which have accumulated upon the top of the grate are shaken through the grate between the grate-bars.

The operation of my improved grate-shaker is substantially as follows: If it is desired to tip the grate and allow the contents of the fire-pot to fall into the ash-pit below, it is only necessary to apply the wrench to the projecting end of the trunnion 2 and to turn the grate so that the projections on the under side of the grate will be raised from contact with the cams on the shaft 7 in a manner similar to the operation of tipping the grates now in common use. If it is desired to simply dislodge the accumulation of ashes upon the top of the grate, it is only necessary to apply the wrench to the projecting end of the shaft 7 and to rotate the shaft in its bearings in the grate-bed, thereby causing the cams to operate upon the projections on the under side of the grate and reciprocate the grate longitudinally within its bearings in the grate-bed more or less quickly, as desired.

My invention is very simple in its operation, is very strong and effective, not liable to get out of order, and if any of its parts are accidentally broken or worn out such parts

are very easily and cheaply repaired or substituted by other parts without the aid of a special mechanic to make the repairs.

Having thus fully described the nature, construction, and the operation of my invention, I wish to secure by Letters Patent and to claim—

1. A grate-frame, a grate within the frame trunnions on the grate having bearings within the grate-frame and within which the grate may be rotated and reciprocated, and two projections from the under side of the grate, combined with a rotary shaft below the grate, and two cams on the shaft having oppositely-disposed cam-surfaces which engage the projections on the grate.

2. A grate-frame, a grate within the frame, trunnions on the grate having bearings within the frame and within which the grate may be rotated and reciprocated, and projections on the under side of the grate, combined with a rotary shaft below the grate, and detachable cams on the shaft engaging said projections on the grate and held in engagement with the said projections.

3. A grate-frame, a grate within the frame, trunnions on the grate having bearings within the grate-frame and within which the grate may be rotated and reciprocated, and a plurality of projections from the under side of the grate, combined with a rotary shaft below the grate, collars on the shaft, polygonal portions on the shaft adjacent said collars but oppositely disposed in relation thereto, and crown-cams placed loosely upon the polygonal portions of the shaft engaging the projections on the grate to reciprocate the grate, said cams held in place upon the shaft by engagement with said projections.

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

CHARLES H. LANGILL.

Witnesses:

HENRY CHADBURN,  
CORA J. CHADBURN.