

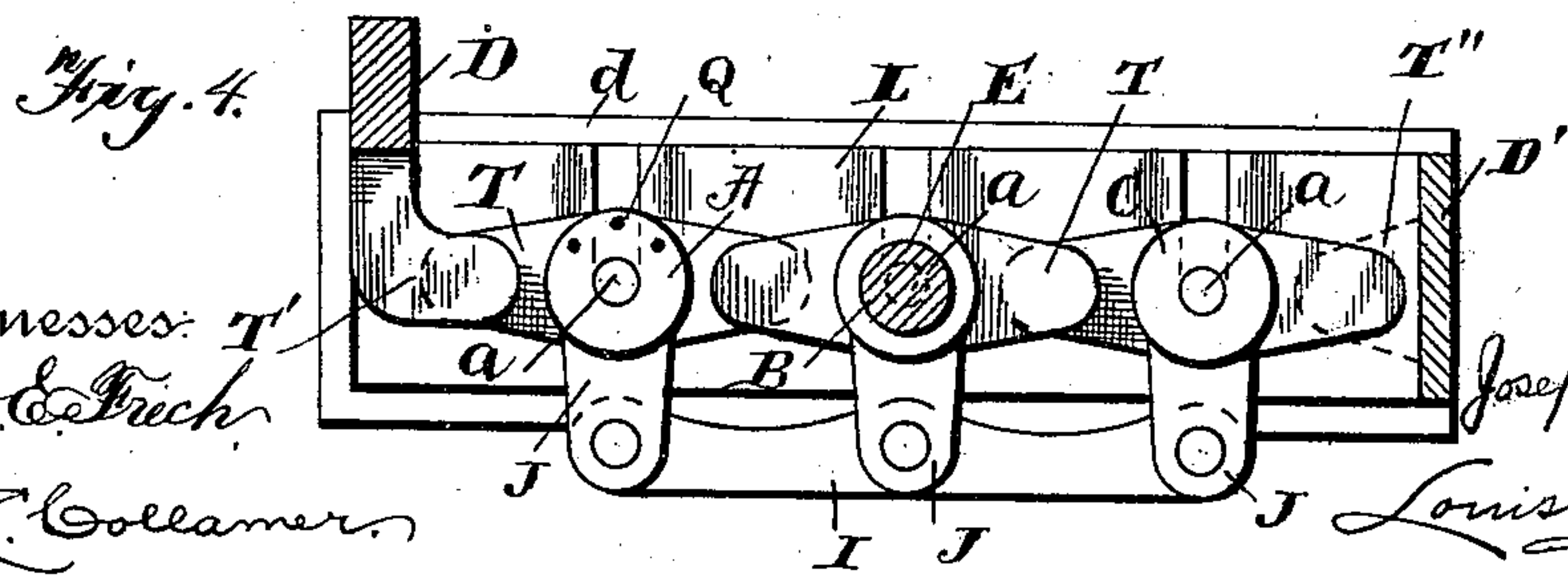
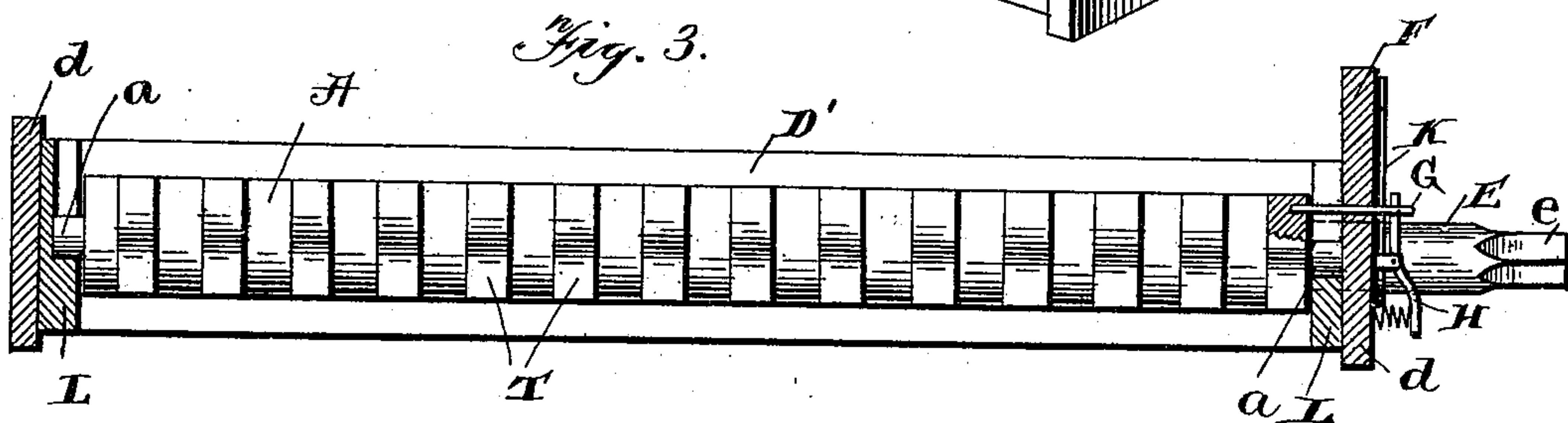
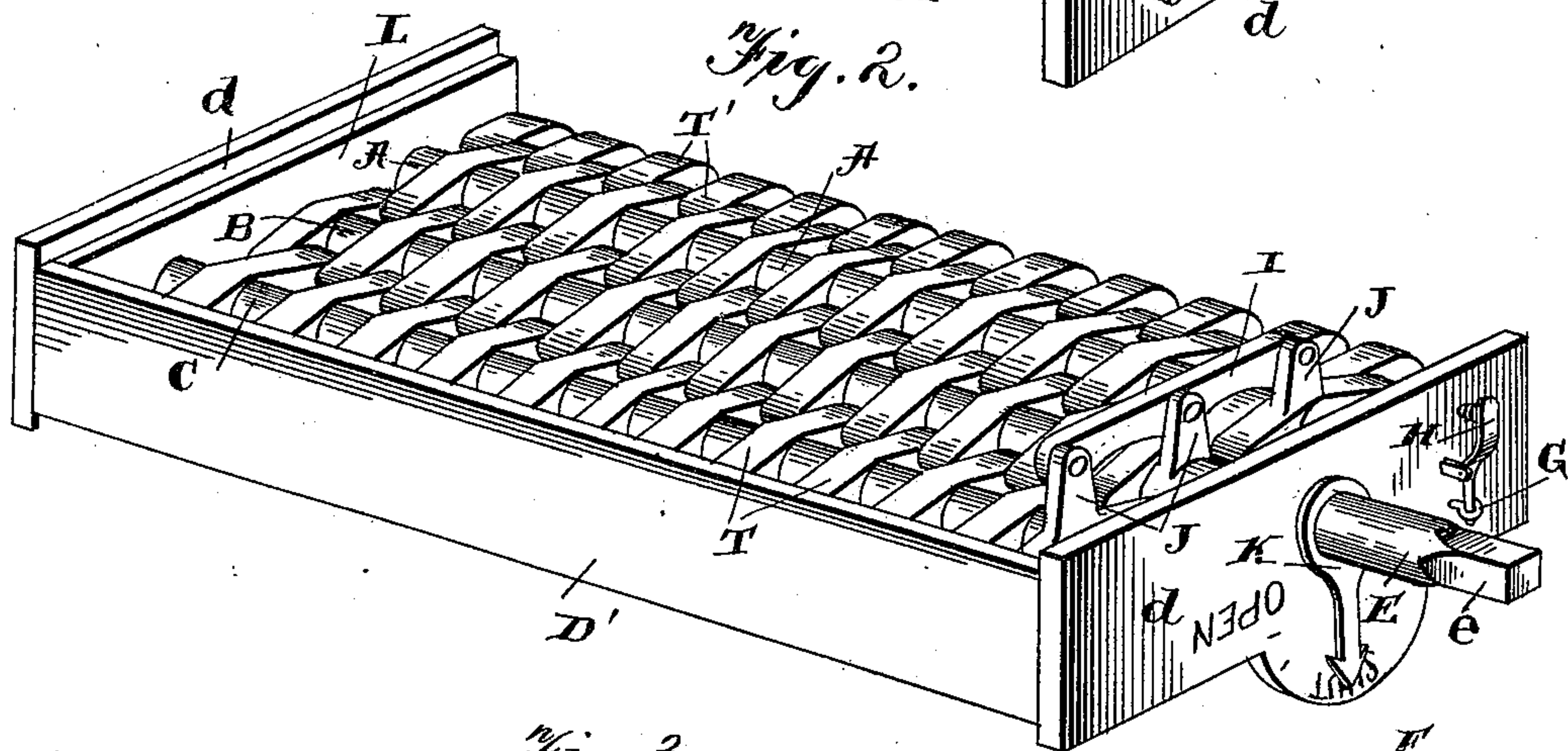
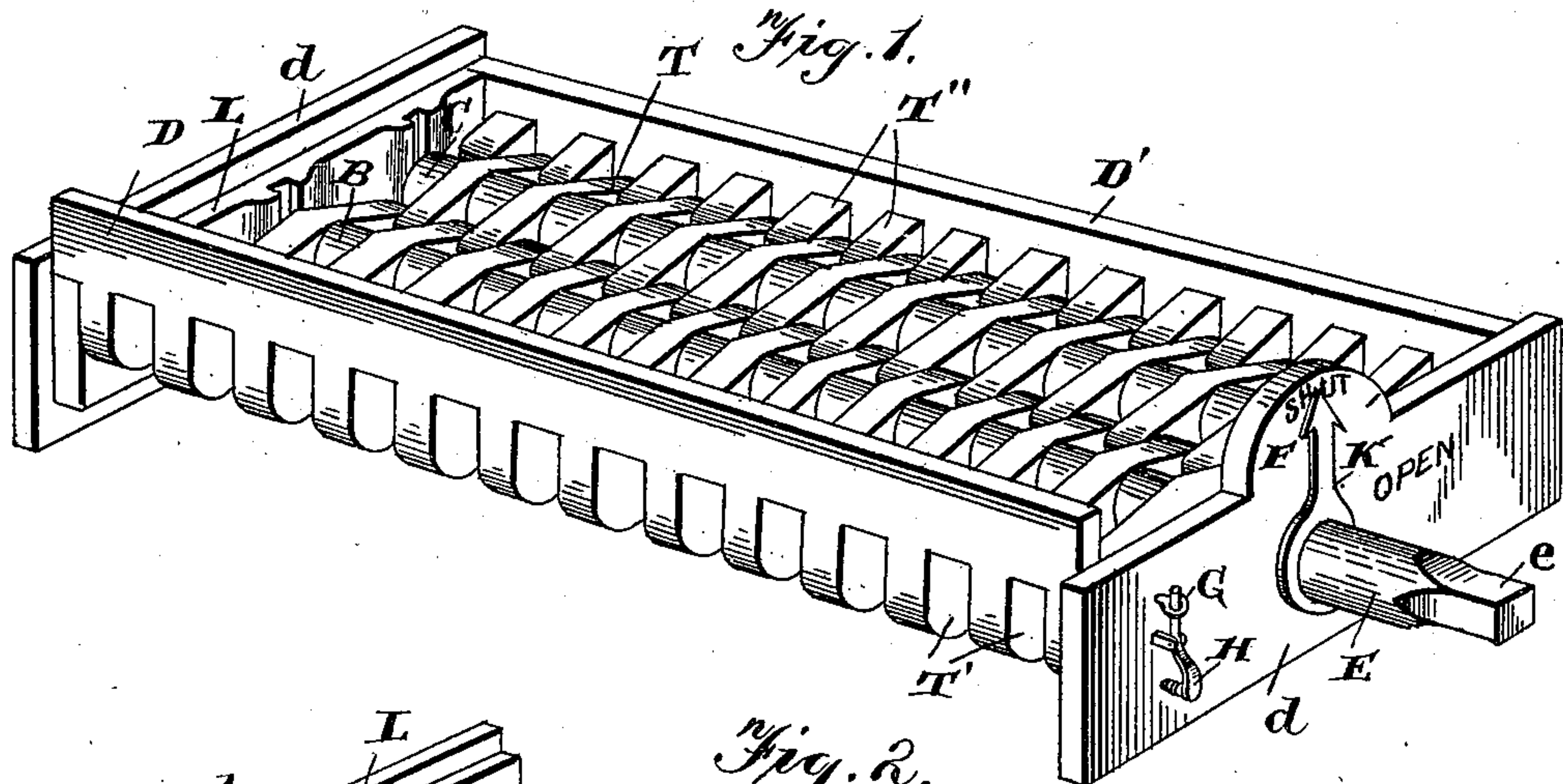
No. 652,823.

Patented July 3, 1900.

J. P. WEBER.  
GRATE.

(Application filed Dec. 10, 1897.)

(No Model.)



Witnesses: T'  
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# UNITED STATES PATENT OFFICE.

JOSEPH PETER WEBER, OF ST. PAUL, MINNESOTA.

## GRATE.

SPECIFICATION forming part of Letters Patent No. 652,823, dated July 3, 1900.

Application filed December 10, 1897. Serial No. 661,363. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH PETER WEBER, a citizen of the United States, residing at St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Grates, of which the following is a specification sufficiently full, clear, and exact to enable those skilled in the art to make and use the same.

10 This invention relates to stoves and furnaces, and more especially to the grates that are used therein; and the object of the same is to produce a grate adapted for use in a stove or furnace for burning wood, large or  
15 small coal, screenings, pea-coal, and other combustibles.

To this end the invention consists in a grate having teeth which are constructed as herein specified, and, further, embodying a construction of parts substantially as hereinafter more fully described and claimed, and as illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of this improved grate looking from the top and front.  
25 Fig. 2 is a similar view looking from the bottom and front. Fig. 3 is a longitudinal section through the frame, showing one grate-bar and the stub-shafts of the latter and the position and use of the locking-pin. Fig. 4  
30 is a cross-section taken just in rear of the front of the frame.

Referring to the said drawings, the letter D designates the front bar of a frame, of which D' is the rear, and  $d\ d$  are the ends, all  
35 inclosing the grate-bars proper. In the accompanying drawings this frame is shown of substantially rectangular contour; but it will be understood that by the use of properly-shaped plates, fire-bricks, and the like the  
40 whole could be readily adapted to a cylindrical or other-shaped fire-pot without departing from the spirit of my invention.

A, B, and C are the grate-bars, having trunnions  $a$  at their extremities which are journaled in open-topped bearings in plates L L,  
45 that stand just inside and are secured to the ends  $d\ d$  of the frame, and these grate-bars stand slightly remote from and parallel with each other throughout the length of the frame.  
50 On the grate-bars are intermeshing teeth T, and the lower edge of the front bar D of the frame (and the rear bar, too, if desired) may

have similar teeth T' and T'', spaced and located so as to intermesh with the teeth T on the adjacent grate-bar. The body of each grate-bar is a rod cylindric in cross-section and preferably of greater diameter than the trunnions  
55  $a$  at the extremities of its axis, and on this rod the teeth T may be cast or formed in any suitable manner. Each tooth is substantially diamond-shaped in contour with all angles rounded off, and its shortest diameter is coincident with that of the rod and normally vertical, while its longer diameter is therefore normally horizontal. The lateral ends  
60 of the tooth taper outwardly—that is to say, their upper and lower edges incline or converge outwardly from the rod on either side of the latter—and all edges are flattened, as shown. By this construction it will be clear  
65 that along the top of each grate-bar there is a straight horizontal line comprising the rounded-off upper angles of the teeth and the rounded upper sides of the rod where exposed between them, and this line forms a support for the fuel at all times, even when the  
70 grate is being agitated in the act of shaking. One of the front trunnions (preferably that on the central grate-bar) is continued through the end  $d$  in a shaft, as E, having a squared or angular extremity  $e$  for the reception of a properly-shaped shaker, and this shaft also preferably carries an index K, moving over a scale marked, as at F, on the end of the grate-frame. The index and scale are useful for  
75 the purpose of indicating when the teeth T on the grate-bars stand each truly and closely interlocked or intermeshed with the space between the two teeth next adjacent without the necessity for the operator looking into the stove or furnace to ascertain, and they also permit him from the exterior to know through  
80 how great an arc the teeth are turning during the operation of shaking. To this end one extreme of the scale may be marked with the word "open," as indicating that all the teeth T stand vertical, as in dumping, and the other extreme may bear the word "shut," as indicating that the teeth are all horizontal and as closely interlocked as possible, as when  
85 very fine coal or screenings are being burned.

Depending from each grate-bar, preferably near the rear end thereof, is a lug J, and I is a link pivotally connecting all these lugs, so



as to cause the bars to rotate or oscillate in unison. In the present instance I have shown but three bars; but it will be understood that a greater or smaller number could be employed.

In operation, the grate being placed within the stove or furnace and surrounded with fire-brick, if need be, the fuel is laid and lighted, the combustible material being wood, fine or coarse coal, coke, peat, screenings, pea-coal, or any desirable and suitable fuel, and when it is desired to shake the stove the shaker (not shown) is applied and oscillated. Care should be taken that the operation of shaking does not cause the teeth to open sufficiently far to permit the passage between them of the live coals or embers unless it is desired to dump the fire, and the index and scale will be found useful in keeping this check on the operator. As the teeth on one side of one grate-bar rise those on the opposite and adjacent side of the next bar descend, and hence there is caused an interlocking or intermeshing movement of one set of teeth through the other set and back as the shaker is reciprocated, which movement I have found to be highly useful and advantageous. When fine coal or screenings are used, this absence of any opening between the teeth of the grate other than that ever present by reason of their looseness is an advantage, because the unconsumed fuel is not lost. This construction has a further advantage in that the admission of air, and hence the draft, is not altered either during the process of shaking or afterward, and yet if it were desired to change the draft the grate-bars could be rocked to such an extent greater than usual and left standing with openings of considerable size through the grate.

It is often found desirable to lock the grate in some way in order to prevent it from moving so as to open or close the teeth with respect to each other to a greater or less degree, and any suitable device may be employed as such lock. However, I have shown herein a pin G, sliding longitudinally inward through an opening in one end *d* and its ad-

jacent plate L and adapted to engage one of a series of holes Q in the grate-bar opposite, so as to set and hold this bar, and hence all of them, in any desired position. This pin may be operated by a handle H, pivoted between its ends to the front of the frame, with one end connected with the pin and the other pressed outward by a spring for the purpose of holding it to its work, and when it is desired to shake or dump the handle is depressed, so as to withdraw the pin, and released after the operation is over.

What is claimed as new is—

1. In a grate, the combination with a frame, a series of grate-bars having their cylindric bodies journaled therein, and means for holding said bodies in adjusted position; of a series of single teeth within the frame and a series of double teeth on said grate-bar bodies, all intermeshing with each other, each tooth having its side faces flat and parallel and its upper and lower edges converging outwardly from said bodies and its rounded outer ends fitting closely into the space between the similar members next adjacent, all as and for the purpose set forth.

2. In a grate, the combination with the frame, a series of grate-bars having their cylindric bodies journaled therein, means for causing said bodies to oscillate in unison, and a locking device for removably holding the bars against such oscillation and in various adjusted positions; of a series of double teeth on said grate-bar bodies, all intermeshing with each other, each tooth having its side faces flat and parallel and its upper and lower edges converging outwardly from said bodies and its rounded outer ends fitting closely into the space between the similar members next adjacent, all as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH PETER WEBER.

Witnesses:

L. FEESER, Jr.,  
GEO. E. SCALES.