

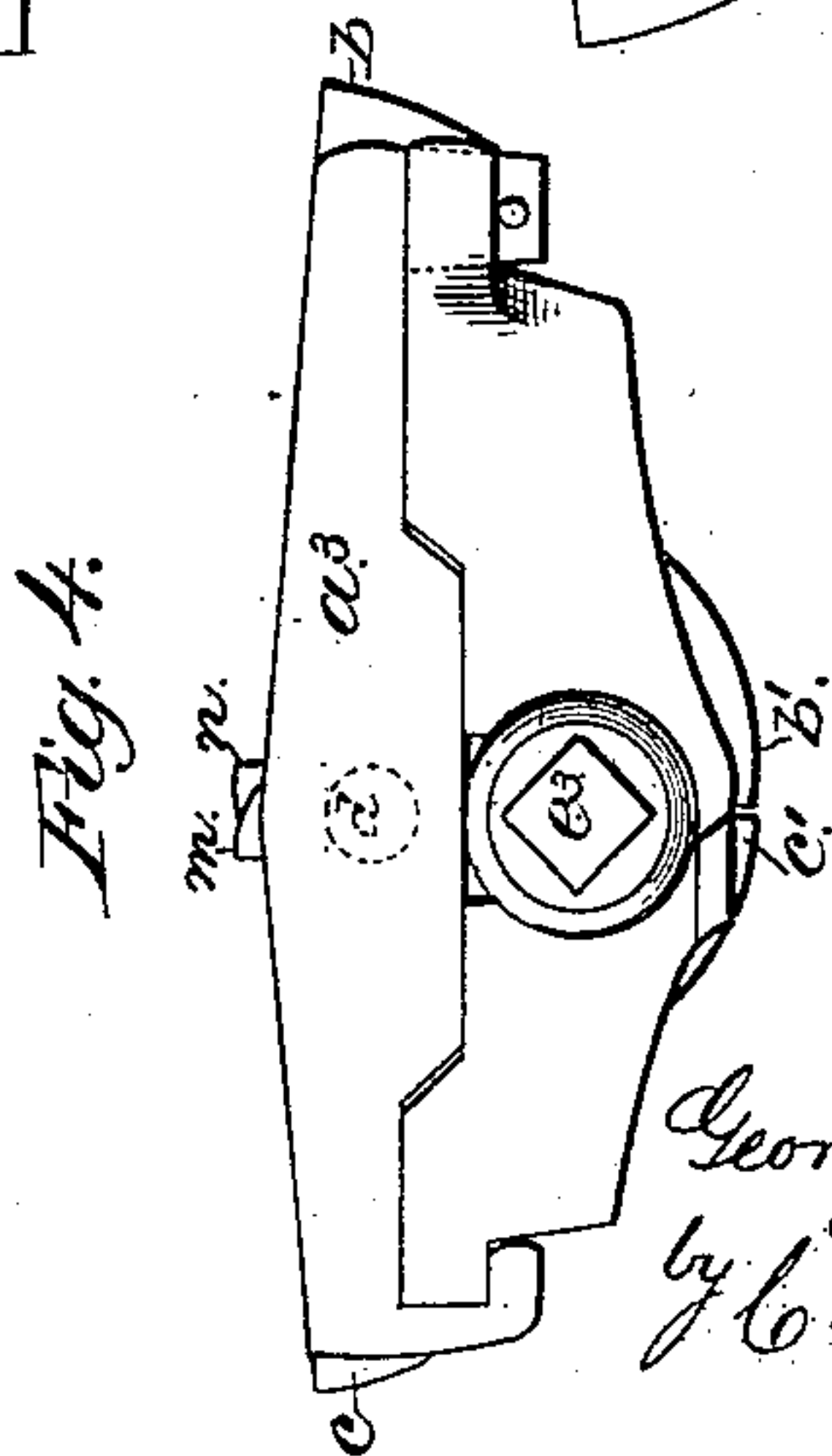
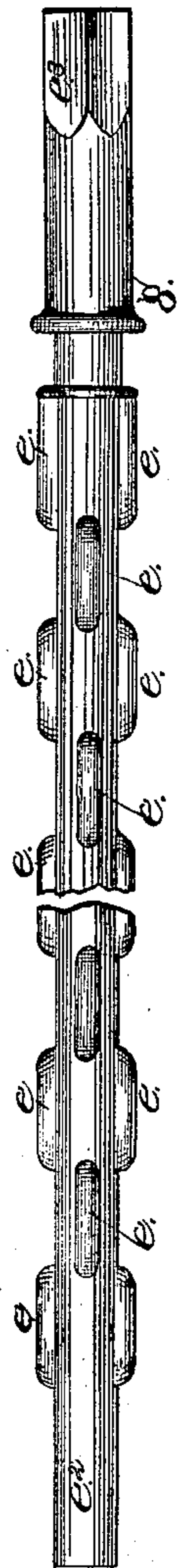
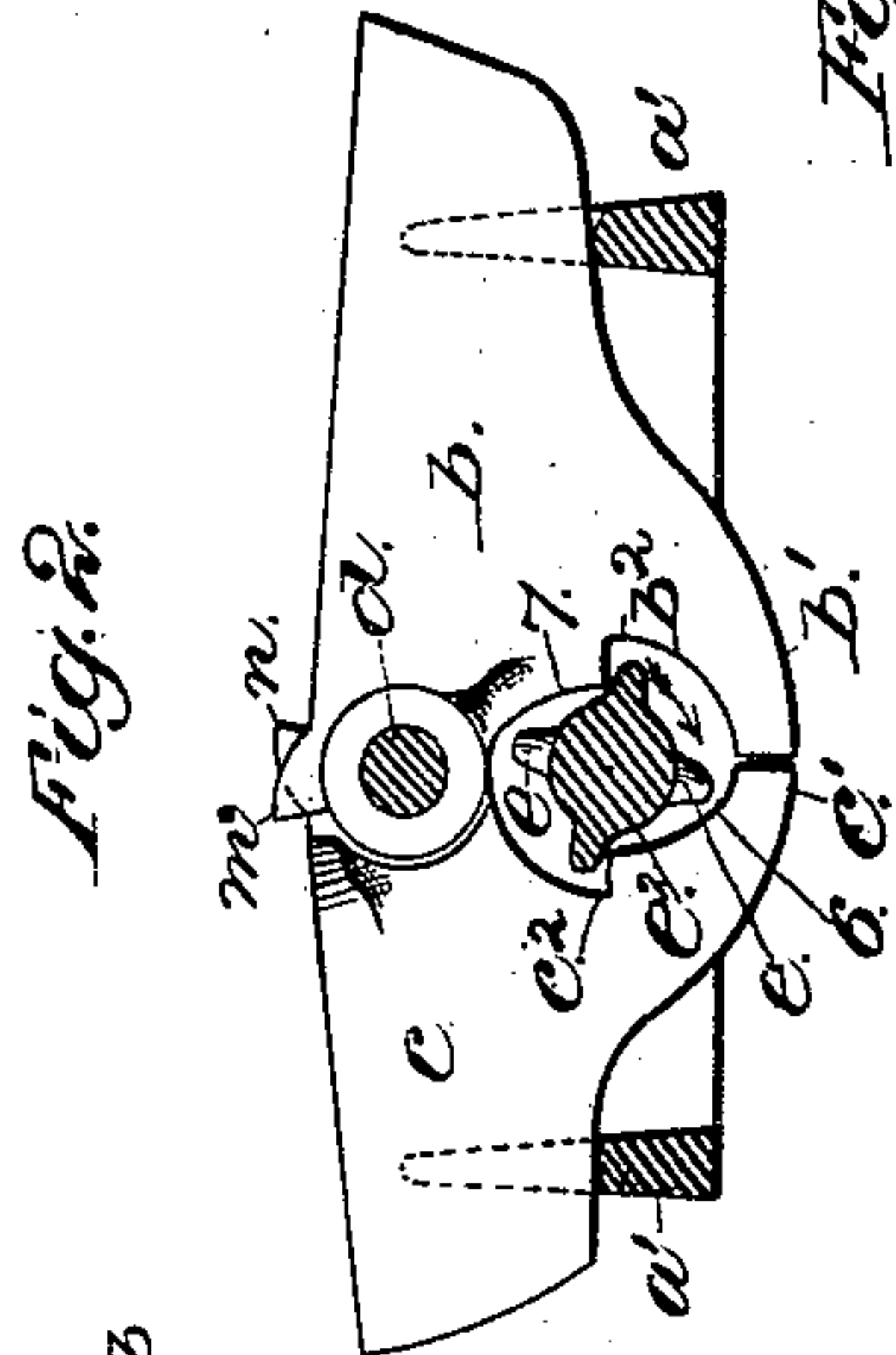
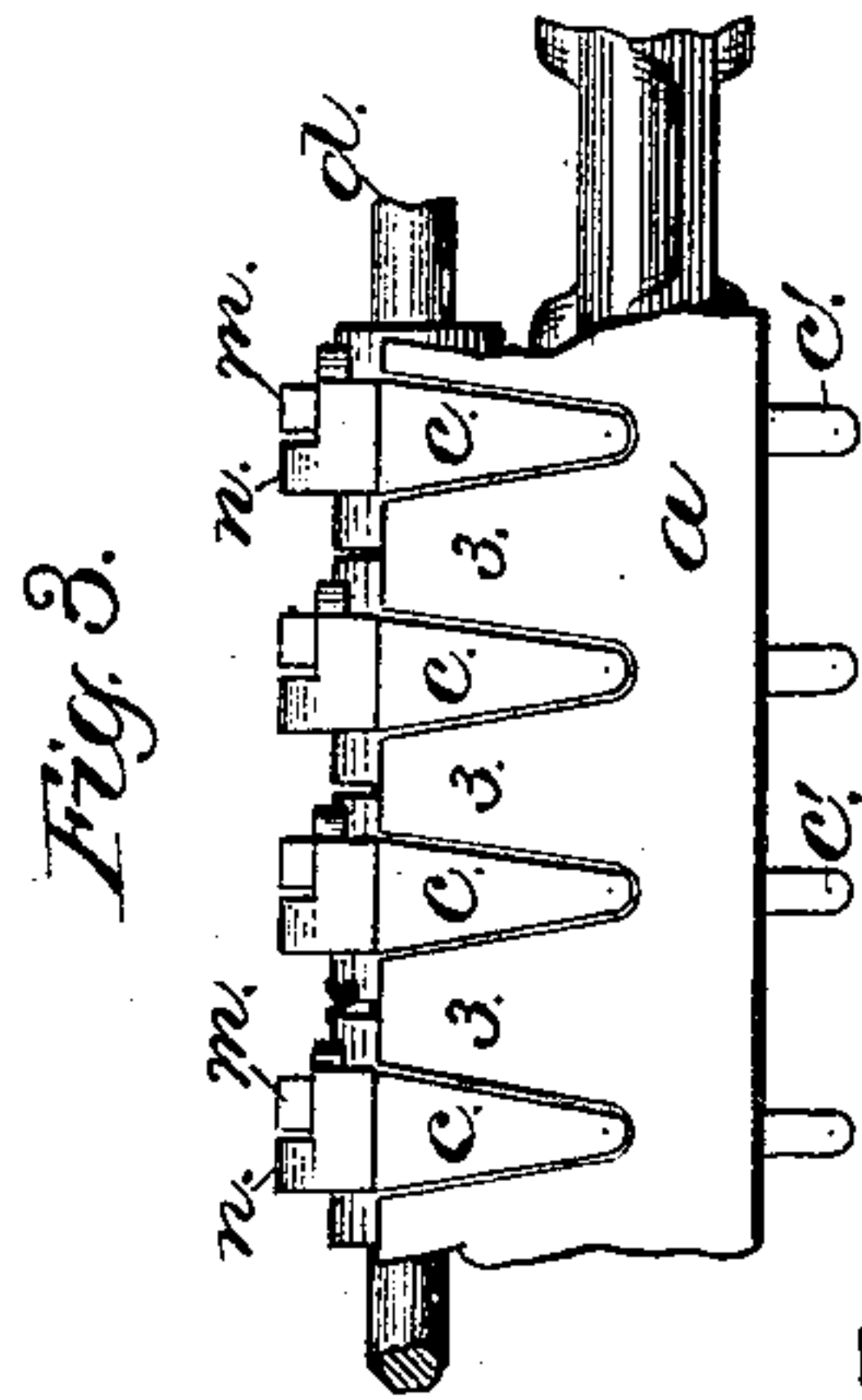
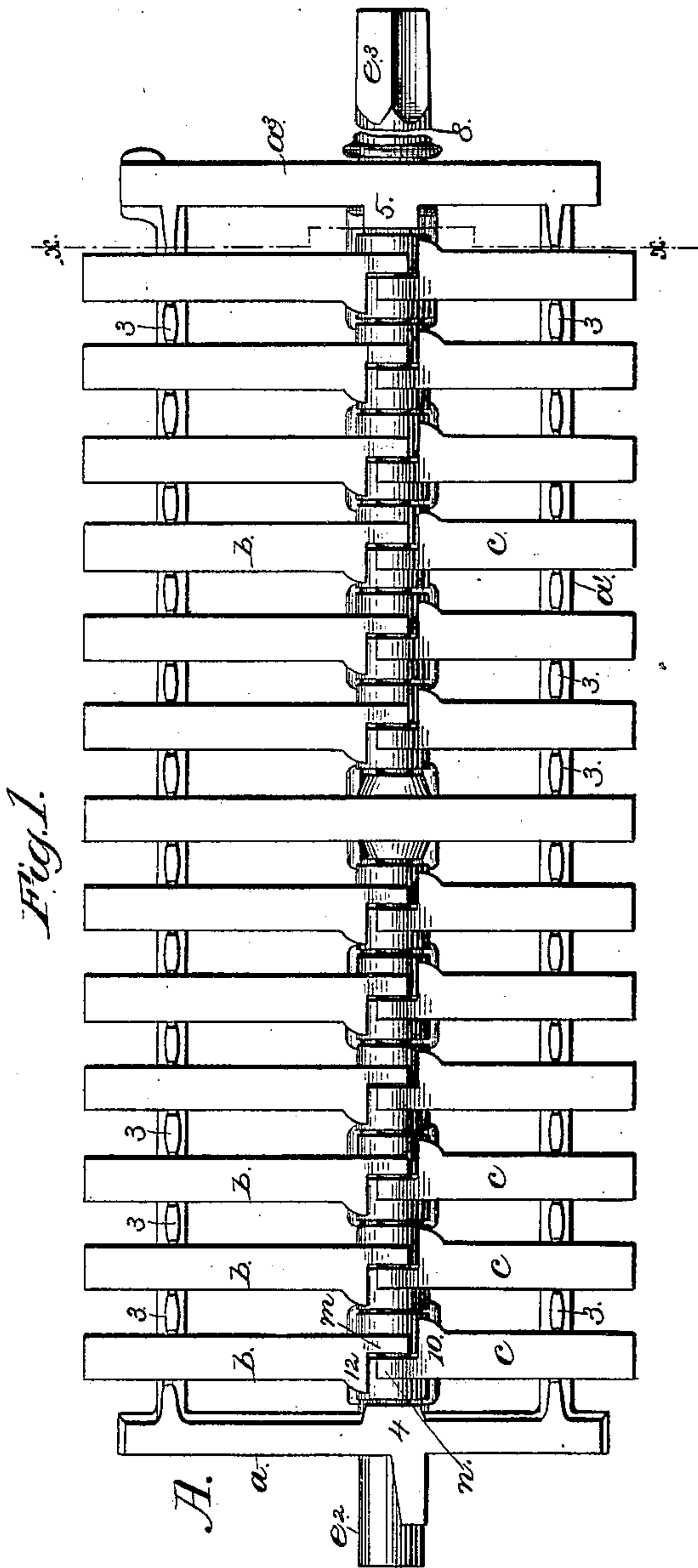
(No Model.)

G. W. WALKER.

GRATE BAR.

No. 246,645.

Patented Sept. 6, 1881.



Witnesses.  
L. F. Connor.  
Chas. Hayes.

Inventor.  
George W. Walker,  
by Crosby Gregory  
Atty.



# UNITED STATES PATENT OFFICE.

GEORGE W. WALKER, OF MALDEN, MASSACHUSETTS.

## GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 246,645, dated September 6, 1881.

Application filed June 6, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, GEO. W. WALKER, of Malden, county of Middlesex, and State of Massachusetts, have invented a new and useful Improvement in Grate-Bars, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to grate-bars, and is shown embodied in a dumping-grate.

The object of my invention is the production of a grate all the grates of which may be vibrated independently by cams, the said grate-bars being pivoted upon a rod supported in the dumping-frame at or near its center. Each grate-bar at its outer or movable end is guided by suitable combs or teeth forming part of the dumping-frame. The shaft which carries the cams for operating the grate-bars serves also as a supporting and trunnion shaft for the dumping-frame, thus making my improved grate-bar applicable to any furnace, in place of the usual grate-bar of substantially the same shape. Each of my improved grate-bars is extended only a part of the way across the dumping-frame, and is pivoted at its inner end, so that when a downward projection of the grate-bar is acted upon by a cam the outer end of the grate-bar will be raised and lowered rapidly. Adjacent grate-bars are provided with projections and shoulders to prevent the grate-bars leaving the notches or combs of the dumping-frame when the latter is turned over.

Figure 1 represents, in top view, a grate and dumping-frame embodying my invention; Fig. 2, a section on the dotted line  $xx$ , Fig. 1. Fig. 3 is a partial side elevation of the dumping-frame. Fig. 4 is a front end elevation of the dumping-frame, and Fig. 5 is a side elevation of the cam-shaft.

In the drawings, A represents the dumping-frame, it being oblong, the sides  $a'$  of the frame being provided with a series of upright combs or fingers, 3, in the notches between which the series of grate-bars  $b$   $c$ , near their ends, are entered and guided. The grate-bars are each provided with a suitable hole to fit a rod,  $d$ , the end of which has suitable bearings in the end  $a$  of the dumping-frame, and at one end is covered by a cap,  $a^3$ , secured to the front end of the dumping-frame, the projection 4 5 (see Fig. 1) extending over the said rod  $d$  near

its ends. The grate-bar  $b$  has a downwardly-projecting finger or arm,  $b'$ , and the shoulder  $b^2$ , and each grate-bar  $c$  has a corresponding downwardly-projecting arm or finger,  $c'$ , and the reversely-placed notch or shoulder  $c^2$ , these arms  $b'$  and  $c'$ , below the pivotal point  $d$  of the grate-bars, being suitably shaped to present proper cam-surfaces to be acted upon by short cam-projections  $e$ , more or less in number, and arranged, as shown in Fig. 5, on the shaft  $e^2$ , the front end of which is squared, as at  $e^3$ , to receive the usual wrench or handle with which to rotate the said shaft  $e^2$ , to vibrate the grate-bars, and also to turn over the dumping-frame. As the shaft  $e^2$  is rotated in the direction of the arrow, &c., Fig. 2, the cam-projections will strike against the portions 6 of the grate-bars  $c$ , and the portions 7 of the grate-bars  $b$  will move them so as to elevate the outer ends of the grate-bars, and as the cams pass the shoulders  $b^2$   $c^2$  the grate-bars, by their own gravity and the weight of the fuel upon them, will drop.

The left-hand end of the shaft  $e^2$  serves as the journal for the dumping-frame, and the neck 8 of the right-hand end of the said shaft, (see Fig. 1,) which in practice will be from two to three inches in length, serves as a journal to fit a proper bearing to sustain the front part of the dumping-frame. When it is desired to tip over the dumping-frame the shaft  $e^2$  will be turned in the direction opposite the arrow, Fig. 2, when the cam-projections  $e$  will strike squarely against the shoulders  $c^2$  and  $b^2$ , and will turn the dumping-frame over toward the left, as herein shown, the frame being capable of being turned over only in that direction. As described, it will be understood that this shaft  $e^2$  serves the purpose of the journal for the dumping-frame, and is provided with cams by which to vibrate the grate-bars when the shaft is turned in one direction, and the grate-bars are so shaped that when the said shaft is turned in the opposite direction the cams thereon, operating against the shoulders of the grate-bars, will turn the dumping-frame over.

Each grate-bar  $b$  has a projection,  $m$ , to strike against a shoulder, 10, of the grate-bar  $c$  in line with it, and each grate-bar  $c$  has a similar projection,  $n$ , to engage a shoulder, 12, of the grate-bar  $b$  in line with it, so that when the



dumping-frame is turned over the said projections meet the said shoulders and prevent the grate-bars turning so far upon the rod *c* as to permit the ends of the grate-bars to leave the notches between the fingers or projections 3 of the dumping-frame A.

The cap *a*<sup>3</sup> at the front end of the dumping-frame serves as a cover to retain the shaft *e*<sup>2</sup> in its bearing in the dumping-frame. This cap *a*<sup>3</sup>, as shown in Fig. 4, is hooked at one end to engage a lug, *f*, of the dumping-frame, and at its other end the cap has a leg to enter a socket of the dumping-frame, the leg being secured in the said socket by means of a pin, *o*, extended therethrough, as shown in the said figure.

These grate-bars, fixed at their inner ends substantially at or near the longitudinal center of the dumping-frame, are vibrated up and down at their outer ends, moving only at the said outer ends.

I do not broadly claim a grate-bar mounted loosely in a dumping-frame so that each end of the grate-bar may be moved up and down by means of cams on an independent shaft other than that which serves as the journals for the dumping-frame.

I claim—

1. The combination, with the frame, of grate-bars *b c*, pivoted at their inner ends, and a cam-shaft to operate upon downwardly-extended portions of and vibrate the said grate-bars

about their pivotal point, substantially as described.

2. The pivoted grate-bar provided with a downwardly-projecting arm, shouldered as described, combined with a dumping-frame and with a cam-shaft which, turned in one direction, will vibrate the said grate-bar, and in the other direction will turn over the dumping-frame, substantially as described.

3. The dumping-frame provided with the fingers or projections 3 to receive the grate-bars, combined with the independent grate-bars *b c*, having their inner ends pivoted substantially at the center of the dumping-frame, as set forth.

4. The frame, its rod *d*, and the series of grate-bars *b c*, the bars *b* being substantially in line with the series of grate-bars *c*, one grate-bar *b* being at one side of the frame, while a grate-bar *c* is at the opposite side of the frame, in line with it, substantially as described.

5. The dumping-frame, its cam-shaft, and rod *d*, combined with the series of grate-bars *b c*, provided with projections *m n* and shoulders 12 10, to operate substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. W. WALKER.

Witnesses:

G. W. GREGORY,  
BERNICE J. NOYES.