

(No Model.)

Z. F. BRYANT.

FURNACE GRATE.

No. 389,833.

Patented Sept. 18, 1888.

Fig. 2.

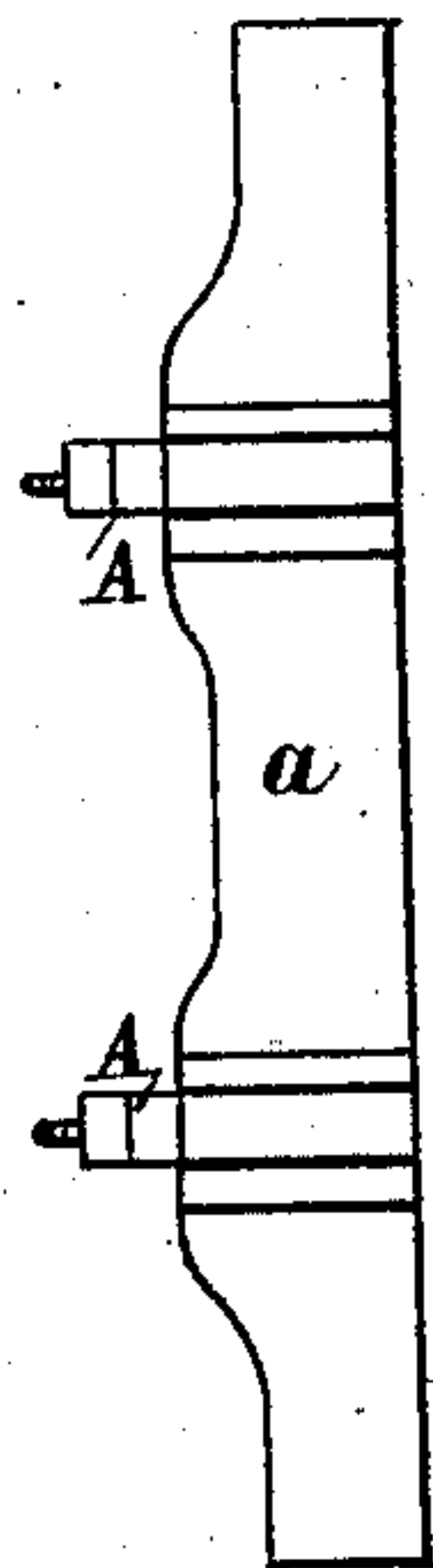


Fig. 1.

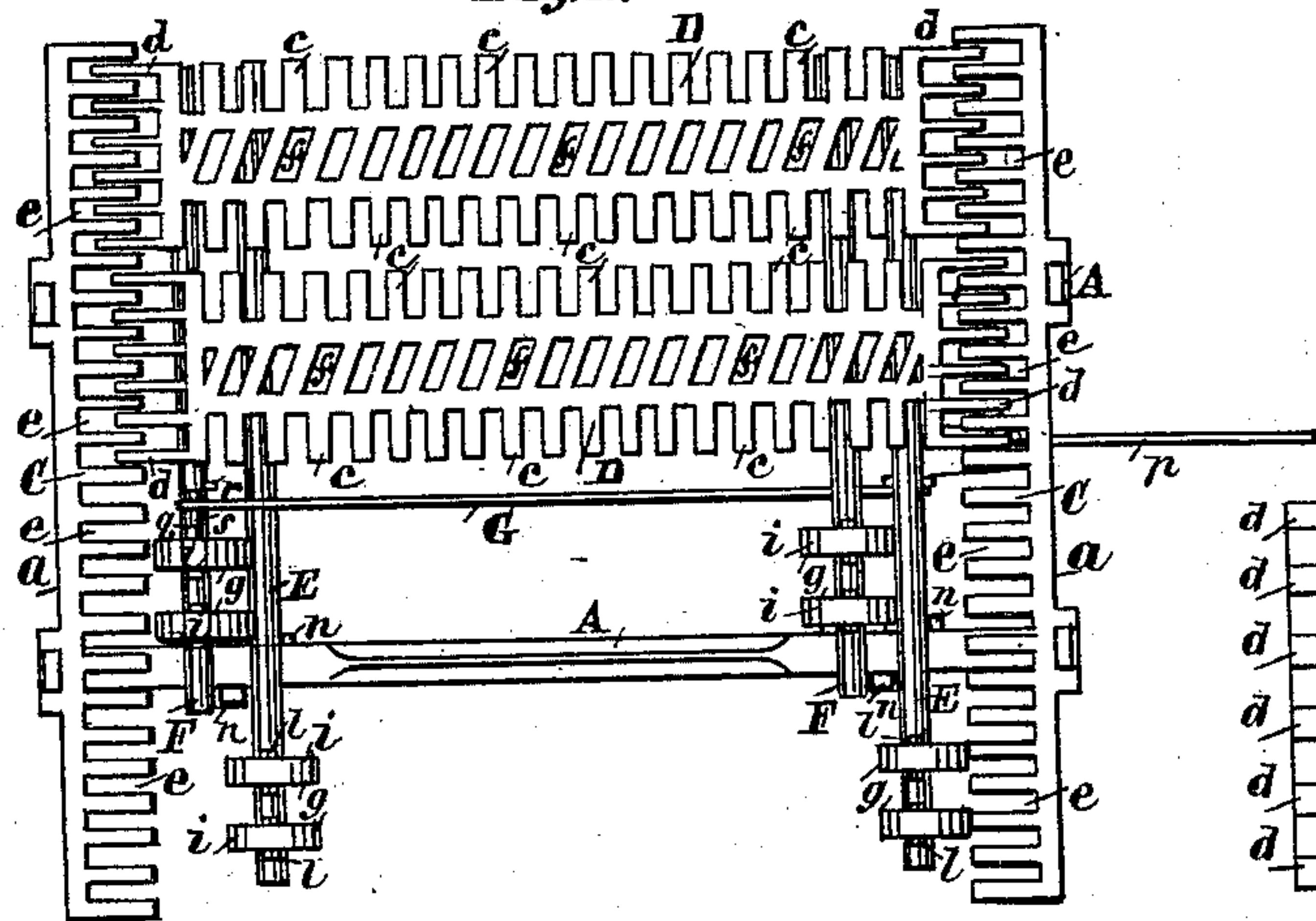


Fig. 3.

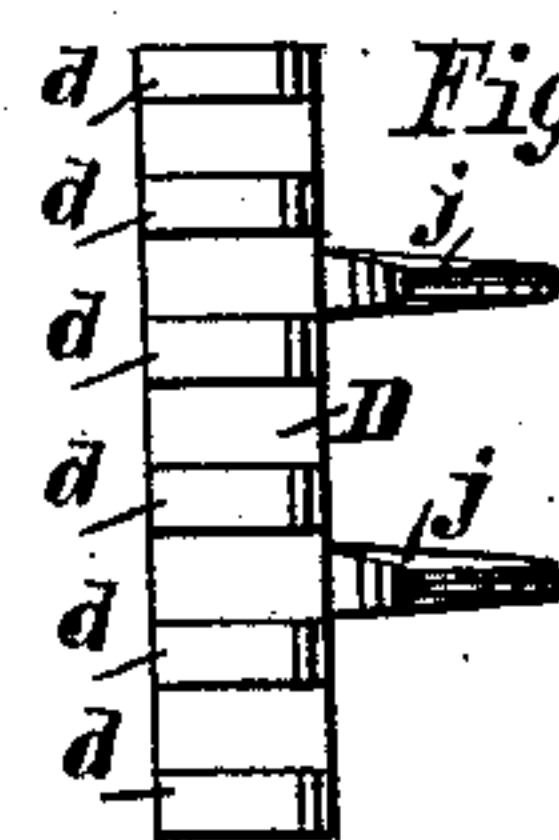


Fig. 4.

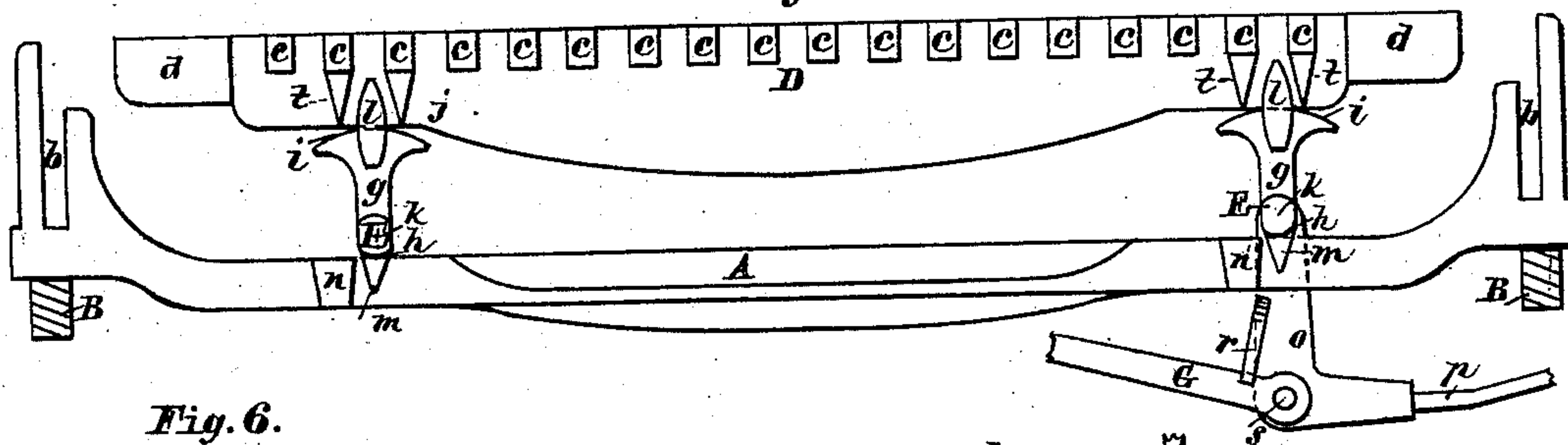


Fig. 6.

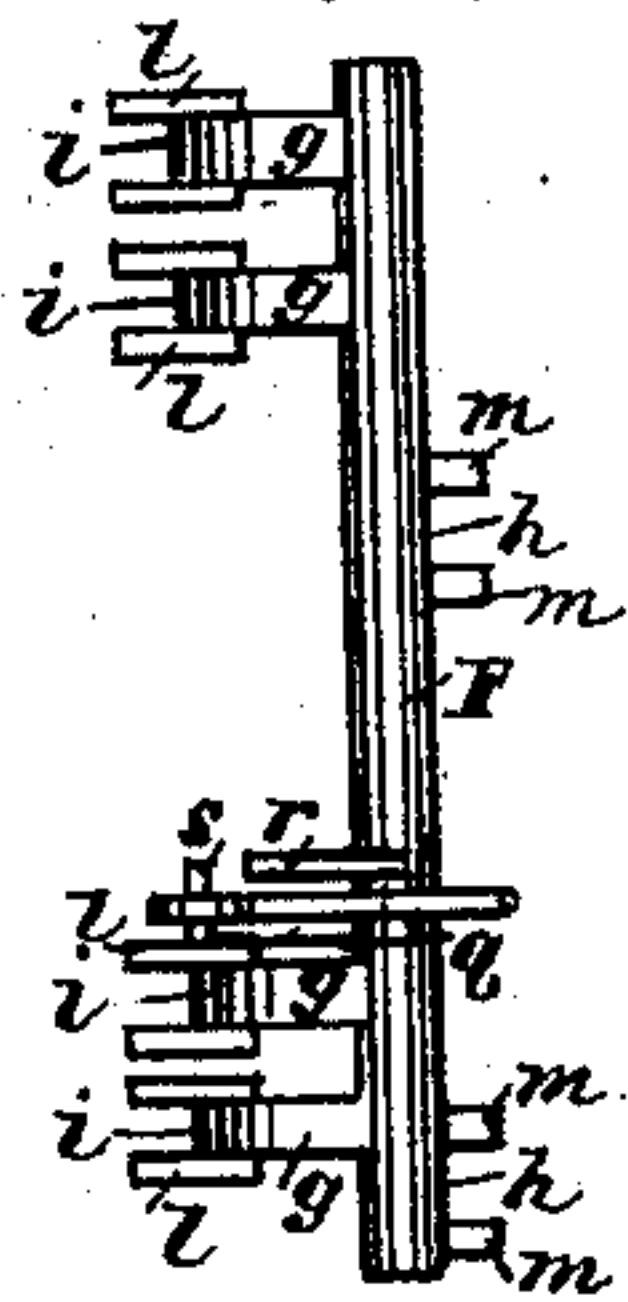


Fig. 5.

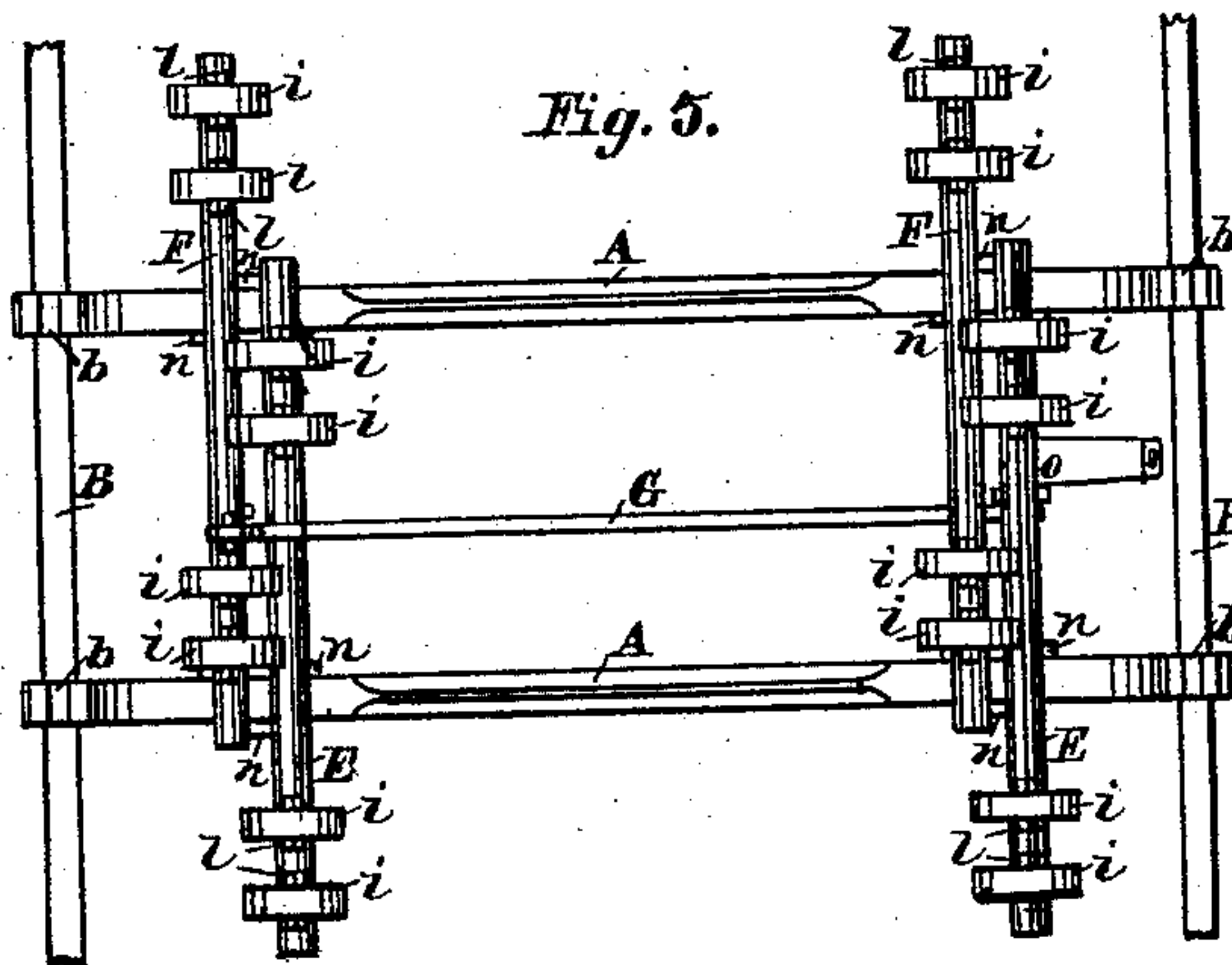
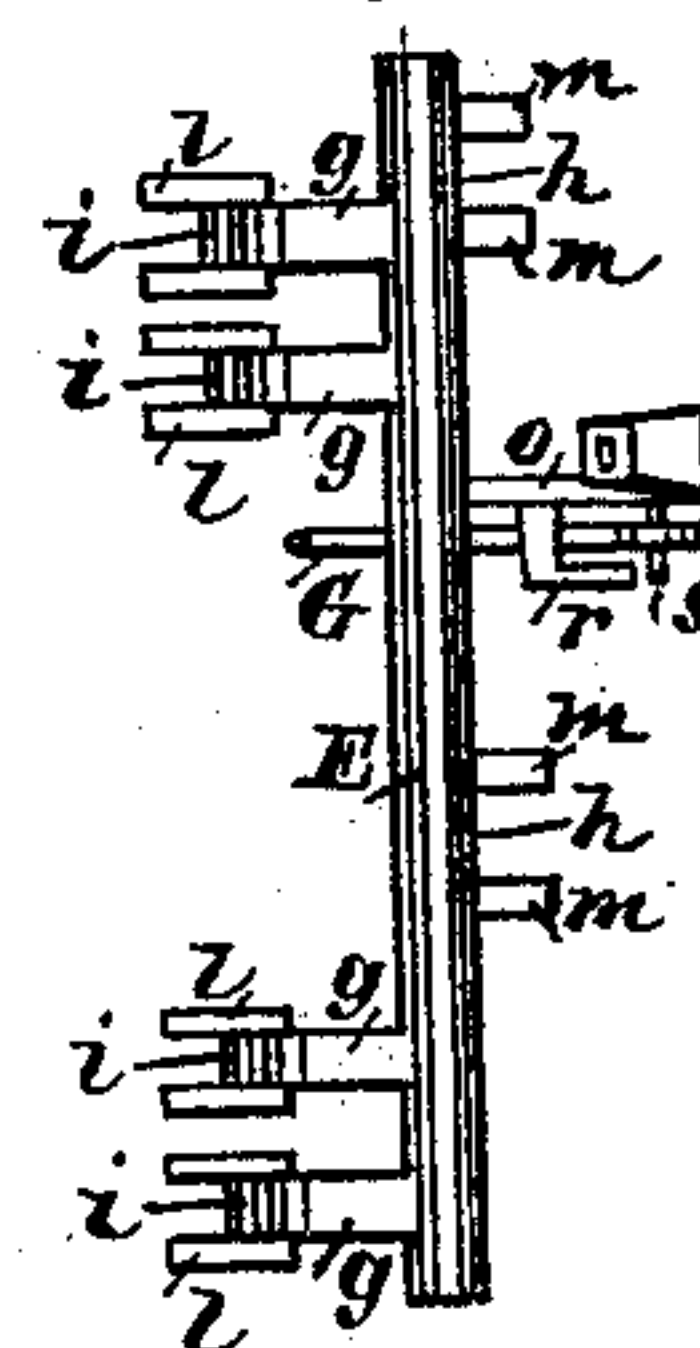


Fig. 7.



Attest;

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UNITED STATES PATENT OFFICE.

ZENAS F. BRYANT, OF MALDEN, ASSIGNOR OF ONE-HALF TO ALBERT H. CUSHING, OF BROOKLINE, MASSACHUSETTS.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 389,833, dated September 18, 1888.

Application filed February 10, 1888. Serial No. 263,651. (No model.)

To all whom it may concern:

Be it known that I, ZENAS F. BRYANT, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Furnace-Grates, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to that class of furnace-grates in which the grate-bars are moved longitudinally and alternate bars in opposite directions for the purpose of sifting the ashes through the grate.

The objects of my invention are to provide for sifting throughout the whole grate-surface, to prevent the movement of the bars from being impeded by the coal, and to cause the bars to move easily and uniformly in one and the same plane.

The invention consists in the novel devices and novel combinations of devices hereinafter described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a plan of a grate of four bars embodying my invention, two only of the bars being shown. Fig. 2 is an end view of the grate. Fig. 3 is an end view of one of the bars. Fig. 4 shows a side view of one of the bars and parts of the rocking mechanism. Fig. 5 shows a plan of the rocking mechanism. Figs. 6 and 7 show two of the rocking rods. Figs. 3 and 4 are drawn on a larger scale than the other figures.

Two longitudinal truss-supports, A A, are to rest at their ends on the usual transverse supports, B B, fixed in the furnace. On the supports A A rest the end plates, C C, the vertical flanges *a* of which are inserted in sockets *b*, provided by these supports. I prefer that the upper surface of each grate-bar D be smooth and be wholly in one and the same plane. At each side of each bar is a series of projections, *c*, presenting a rectangular surface. I form projections *d* at the ends of each bar, and also a series of recesses, *e*, in the end plates, C C. The surfaces of the end projections on the bars and the surfaces of the end plates all lie in the same plane, these projections and the recesses in plates being of such relative width that the projections may move freely in the recesses.

When the grate-bars are wide and openings *f* through the central portion of each bar are required, I prefer to form them so that they will be diagonally located at the surface of the bar, as shown.

Bearing on the supports A A are four transverse rods, E E and F F. Each of these rods is provided with arms *g*, preferably two for the grate-bar to be supported thereby when the grate-bar is wide, as shown. The under surface, *h*, of each of these rods, where it bears on a support, A, and the upper surface, *i*, of each arm *g*, on which a rib, *j*, of a grate-bar bears, are of such curvature that when the rod is rocked the surface *h* will roll on the support A, and the surface *i* will roll against the rib *j*. Thus the bar will move endwise horizontally, and will not have any vertical motion. The curvature of each arm has a much longer radius than that of the rod, so that while the bar moves a considerable distance on the arms the rod moves but a slight distance on its support. I prefer to strike these curves from the same center—as, for instance, the center *k* of the rod. Lips *l* are formed on each arm *g*, which, entering a recess at the sides of a rib, *j*, will insure the movement of the bar. These recesses at the sides of a rib may be formed by projections *t*, (shown in Fig. 4,) which may fill the angles between the under side of projection *c* and the rib *j*. Projections *m* on the rods E F and projections *n* on the supports A A will prevent the rods from slipping out of place on these supports.

The two rods E E support one-half of the grate-bars, and the two rods F F the other half, the bars supported by one set of rods alternating with those supported by the other set. To one of the rods E is fixed an arm, *o*, projecting downward, in which there is a socket for a lever, *p*, and to which is pivoted a connecting-rod, G. The other end of this connecting-rod is pivoted to an arm, *q*, projecting upward and fixed to a rod, F. Thus by swinging the lever *p* two rods, E and F, at opposite ends of alternate bars, are rocked in opposite directions, these bars causing the other two rods E and F to rock in like manner.

Lips *r*, which are fixed to the rods and may

be cast therewith, prevent the connecting-rod from slipping off the pivot-pins *s*, and thus the usual bolts or screws for this purpose are dispensed with.

5 The rolling movement of the rods and arms against the supports and bars, made possible by the form which I give to the surfaces *h* and *i*, results in a perfectly horizontal movement of the grate bars, and there is no lifting of the
10 bars and load thereon. The labor required to move the bars the desired distance is also much lessened by making the curvature at *i* of much larger radius than that at *h*.

I claim as my invention—

15 1. In a grate, the combination of truss supports A, rods E F, adapted to roll thereon and provided with curved surfaces *h i*, the surfaces at *i* being of longer radius than those at *h*, and also provided with lips *l*, grate-bars D, resting
20 on the curved surfaces *i*, and provided with ribs *j*, having recesses at their sides, in which the lips operate, substantially as described.

2. In a grate, the combination of truss-supports A, rods E F, adapted to roll thereon and provided with curved surfaces *h i*, the surfaces
25 at *i* being of longer radius than those at *h*, and grate-bars D, resting on the curved surfaces *i* and operated by means of the rods E F, substantially as and for the purpose set forth.

3. In a grate, the combination of bars D, 30 truss-supports A, rods E F, provided with curved surfaces, whereby they are adapted to roll against the under surfaces of the bars and on the truss-supports, and a connecting-rod, G, pivoted to an arm projecting downward 35 from a rod, E, and to an arm projecting upward from a rod, F, whereby the rods E F, carrying the bars, are moved in opposite directions, substantially as specified.

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Witnesses:

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A. H. CUSHING.