

(No Model.)

W. J. OWENS.  
GRATE.

No. 411,391.

Patented Sept. 17, 1889.

Fig. 1.

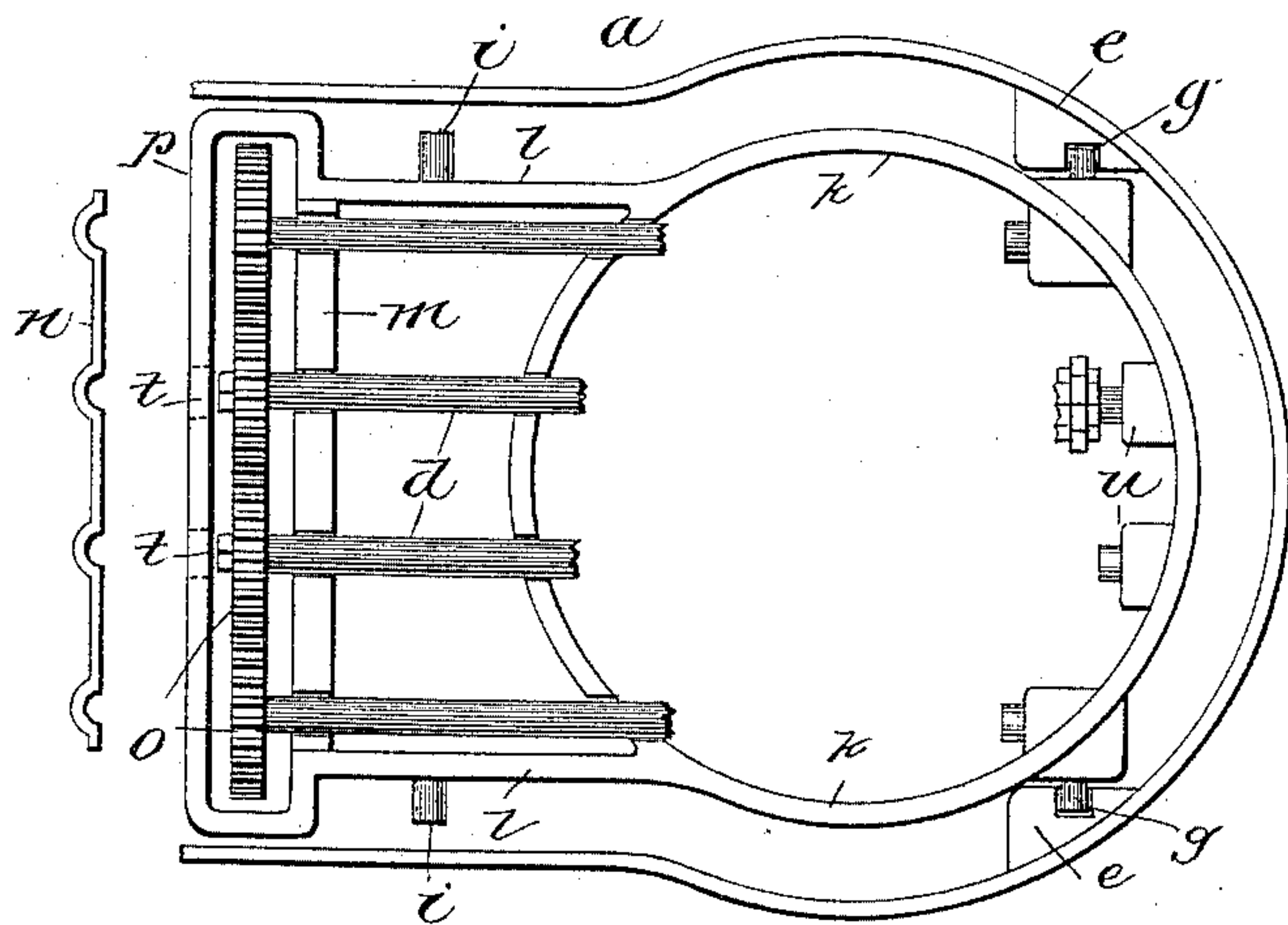


Fig. 2.

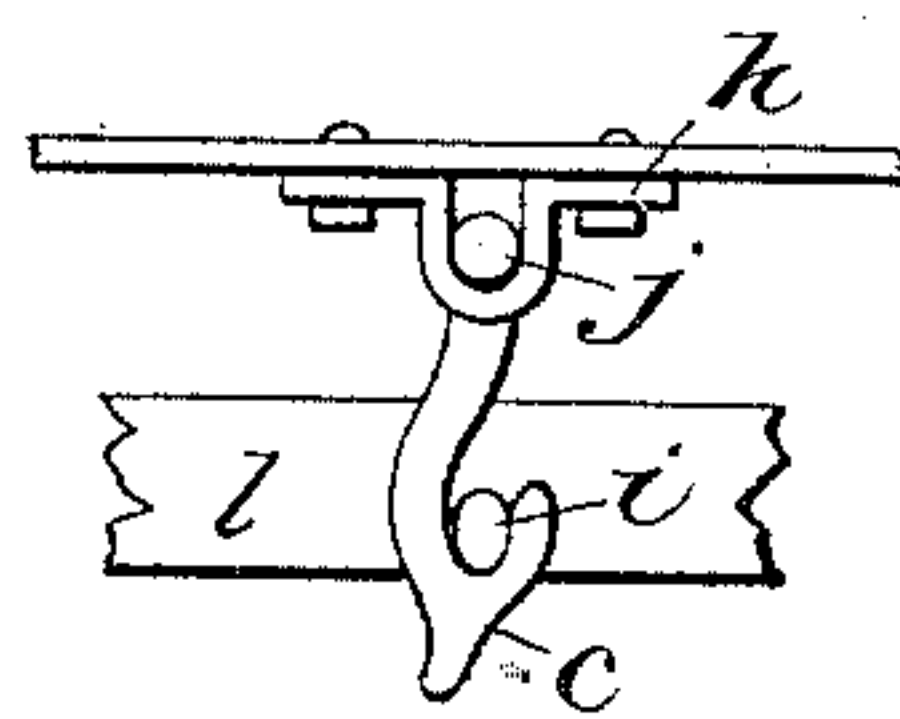


Fig. 3.

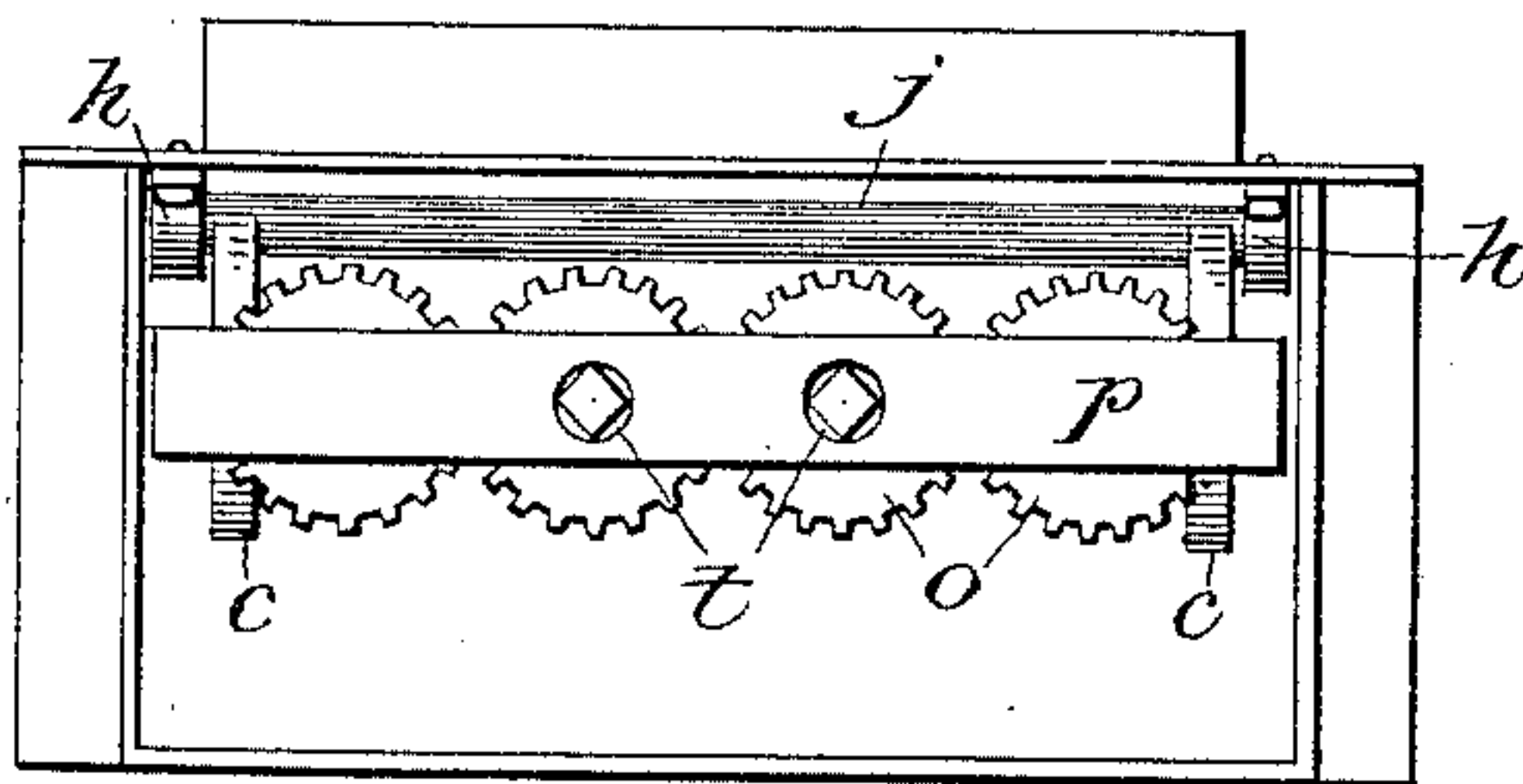


Fig. 4.

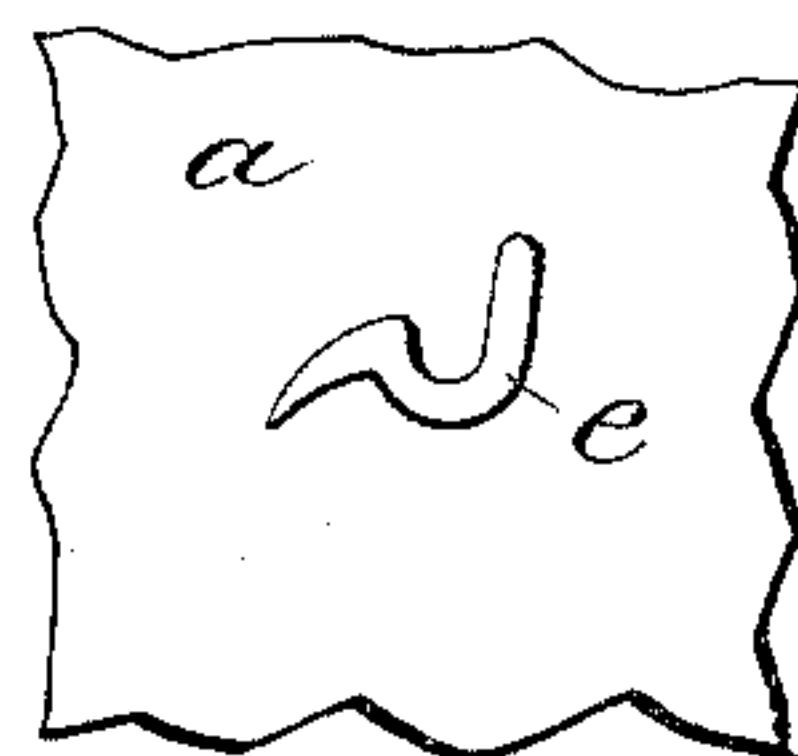


Fig. 8.

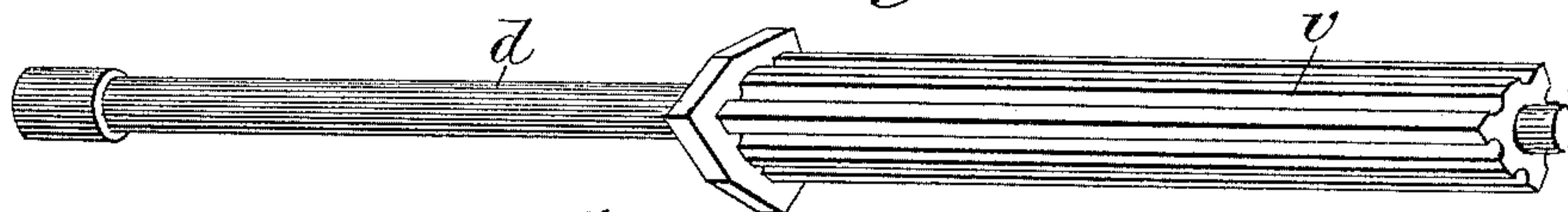


Fig. 5.

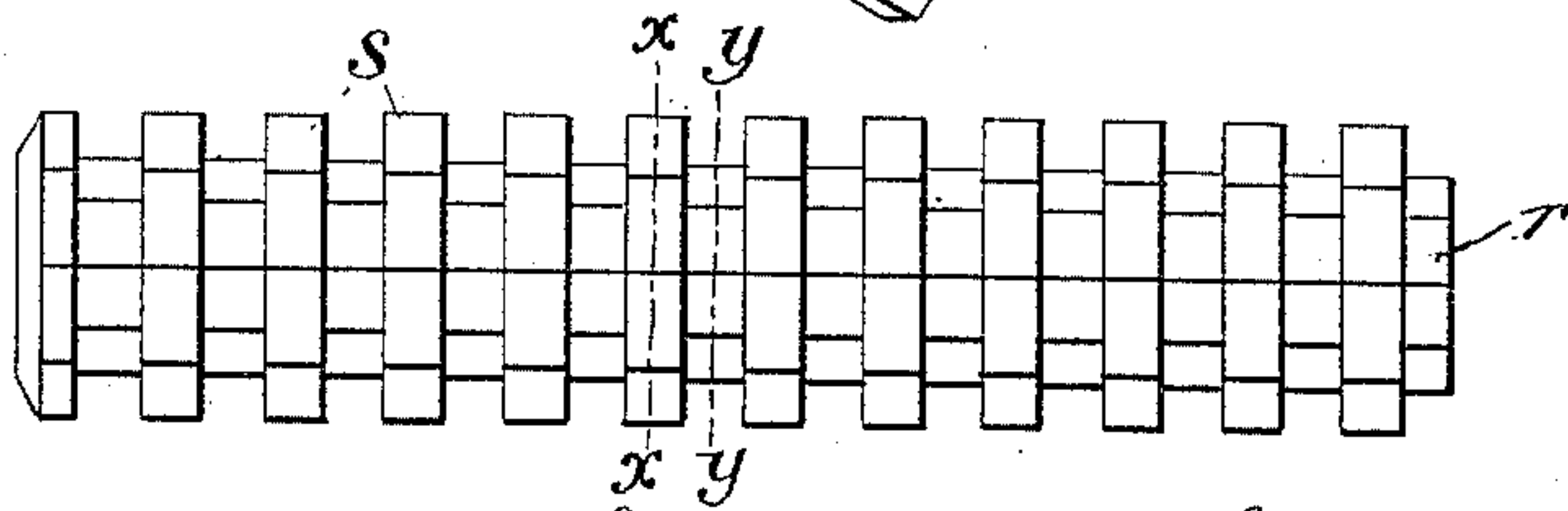


Fig. 6.

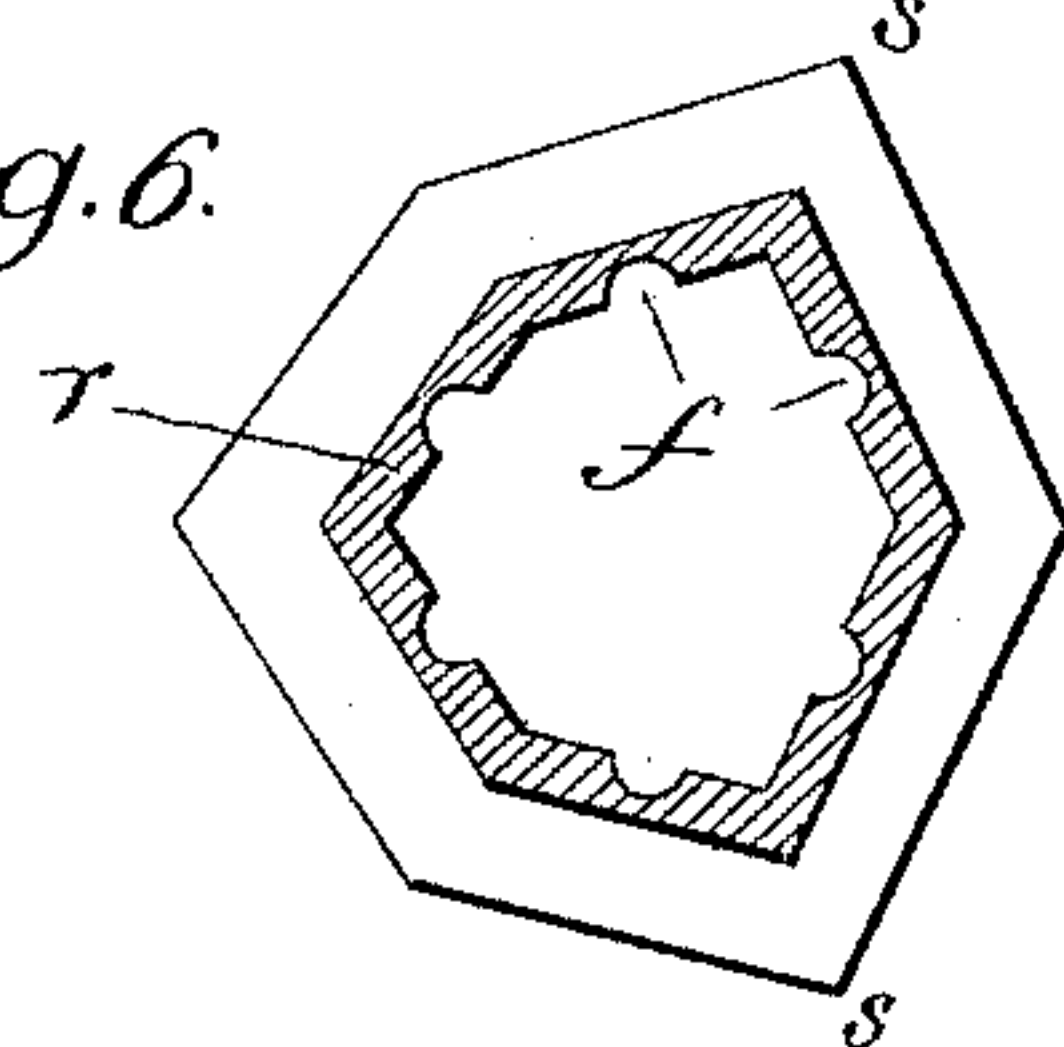
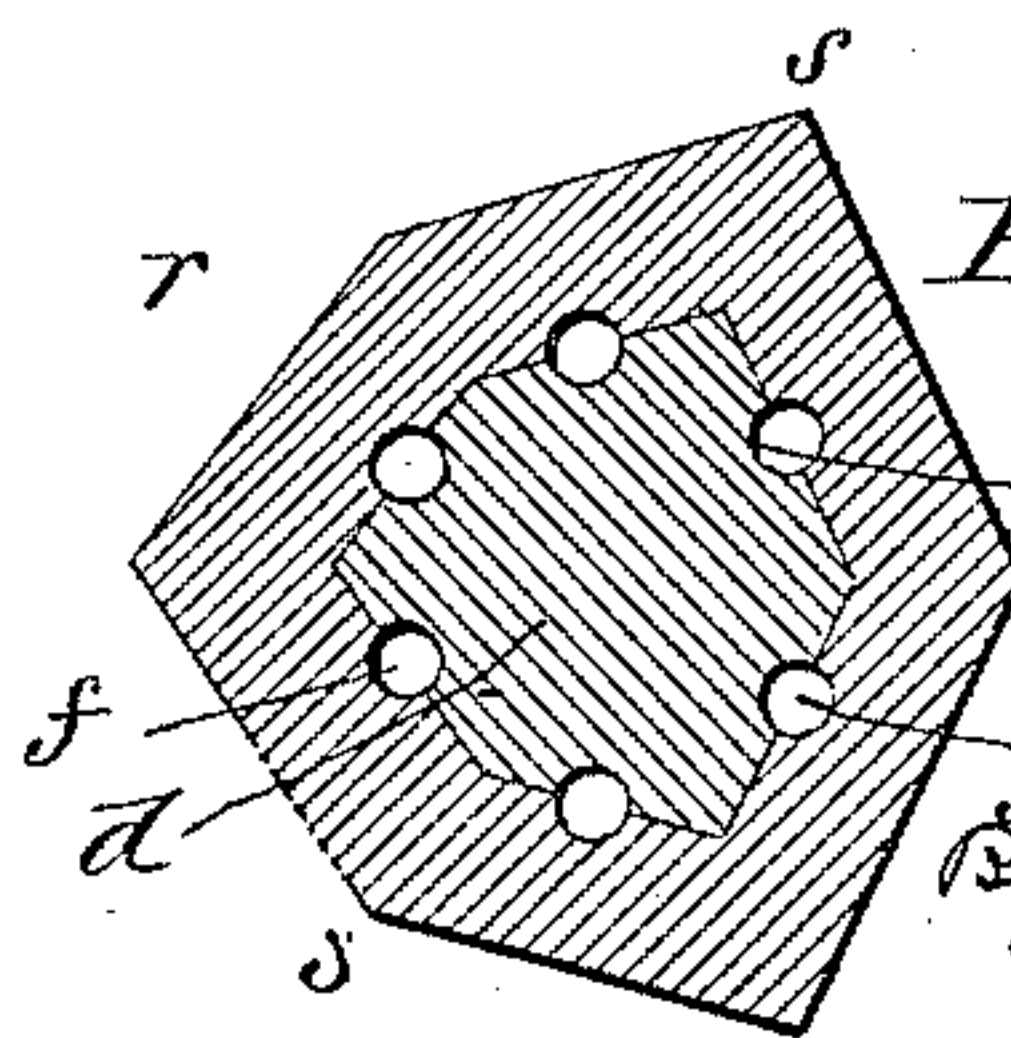


Fig. 7.



Witnesses:

Nathan Barney  
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Inventor.

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# UNITED STATES PATENT OFFICE.

WILLIAM J. OWENS, OF UTICA, NEW YORK.

## GRATE.

SPECIFICATION forming part of Letters Patent No. 411,391, dated September 17, 1889.

Application filed May 8, 1888. Serial No. 273,259. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. OWENS, of Utica, in the county of Oneida and State of New York, have invented a new and useful Improvement in Grates, of which the following is a specification.

This invention relates to the construction of furnace-grates and the means of dumping or removing the same from the furnace.

The object of my invention is to provide a grate that can be readily inserted or removed from its position in the base of the furnace; and my invention consists in the construction and combination of parts, as hereinafter described and claimed.

In the drawings which accompany and form a part of this specification, Figure 1 is a plan view of the grate as it rests in the furnace-base, the enlarged and sleeved portions of the bars being broken away, the supports and hangers for the lugs *i* being omitted, and the cap-strip *n* being removed from position. Fig. 2 is a detail side elevation of the hanger and means for supporting the forward portion of the grate. Fig. 3 is a face or front view of the grate and base. Fig. 4 is a detail side view of one of the saddles for supporting the rear trunnions of the grate, a portion of the base being also shown. Fig. 5 is a side view of one of the toothed sleeves. Fig. 6 is a section of the same on line *y y* of Fig. 5. Fig. 7 is a section of the same on line *x x* of Fig. 5, showing the hexagonal portion of a bar *d* therein; and Fig. 8 is a perspective view of one of the bars *d* complete, its toothed sleeve being omitted.

The furnace-base casting *a* is provided near its rear portion with two saddles *e*, to receive the trunnions *g*, which project from the circular portion *k* of the grate-frame. Cleats or bearings *h* are secured to the crown portion of the base-casting, and these receive the ends of a bar *j*, having hangers *c*, as shown in Figs. 2 and 3. These parts are omitted from Fig. 1, as hereinbefore described, to more clearly show the construction of the grate proper.

The hangers *c* receive and support lugs *i*, projecting from the front portion *l* of the grate-frame. This front portion has a front bar *p* and just behind it a cross-bar *m*, the former having holes *t* to allow access of a crank

or other turning-tool to the ends of bars *d*, and the bar *m* being grooved to form bearings for the round portions of bars *d*. A cap-strip *n* may be screwed to bar *m* over the bars *d* to complete the bearings. The rear ends of bars *d* are received by bearings *u* at the rear of the circular frame *k*, and near the front ends of said bars are secured gear-wheels *o*, which mesh with each other. The portions of bars *d* lying within circular frame *k* are made hexagonal and provided with longitudinal grooves or channels *v*, while similar grooves *f* are provided in the interior of the sleeves *r*, which have projections or teeth *s*. Said sleeves are adapted to fit the hexagonal portions of bars *d*, so that grooves *f* and *v* will form air-channels, as shown at *f'* in Fig. 7.

In putting the grate together the toothed sleeve is slipped onto the hexagonal portion of bar *d*, the rear end of said bar is inserted in its place in bearing *u*, and the round portion of the bar is then dropped to its bearing in cross-bar *m*. All the bars *d* are so placed and with their gear-wheels *o* meshing, and the cap-strip *n* is secured in place. Then the grate-frame is passed into the open front of the furnace-base and its trunnions *g* lifted into their seats in saddles *e* by means of a hook or other suitable means. The front portion of the frame is then lifted, and as this is done the lugs *i* strike the lower portions of hangers *c*, push them to one side until the lugs have been lifted sufficiently so the hangers *c* can swing back to vertical position, when the frame can be lowered until its lugs *i* rest in their seats in the hangers, as shown in Fig. 2. The grate can be removed by the reverse of this operation, it being understood that in removing the front portion of the frame is first lifted and the hangers swung out of the way by any suitable means.

When the frame is removed, any of the parts can be repaired or renewed. For example, a new toothed sleeve can be supplied to a customer at any time and can be inserted without taking the furnace apart.

It may sometimes be desirable to have the front ends of bars *d* project beyond the front bar *p* to render them more accessible for turning. In this case I prefer to provide the front bar *p* with depressions instead of holes

*t*, so the bars *d* can be readily removed by first lifting their front ends.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination with a furnace-base, a grate suitably supported at its rear end and having a lug *i* on each side of its front portion, and a rocking bar *j*, having hangers *c c* to receive and support the lugs *i*, substantially as described.

2. In combination with a furnace-base having saddles *e e* at its rear, a grate having

trunnions *g* to fit said saddles and lugs *i* on each side of its front portion, and a rocking bar *j*, having hangers *c c* to receive and support the lugs *i*, substantially as described.

In testimony that I claim the foregoing improvement in grates, as above described, I have hereunto set my hand this 1st day of July, 1887.

WILLIAM J. OWENS.

Witnesses:

EDWARD HURLBURT,  
GEO. W. EMDIN.