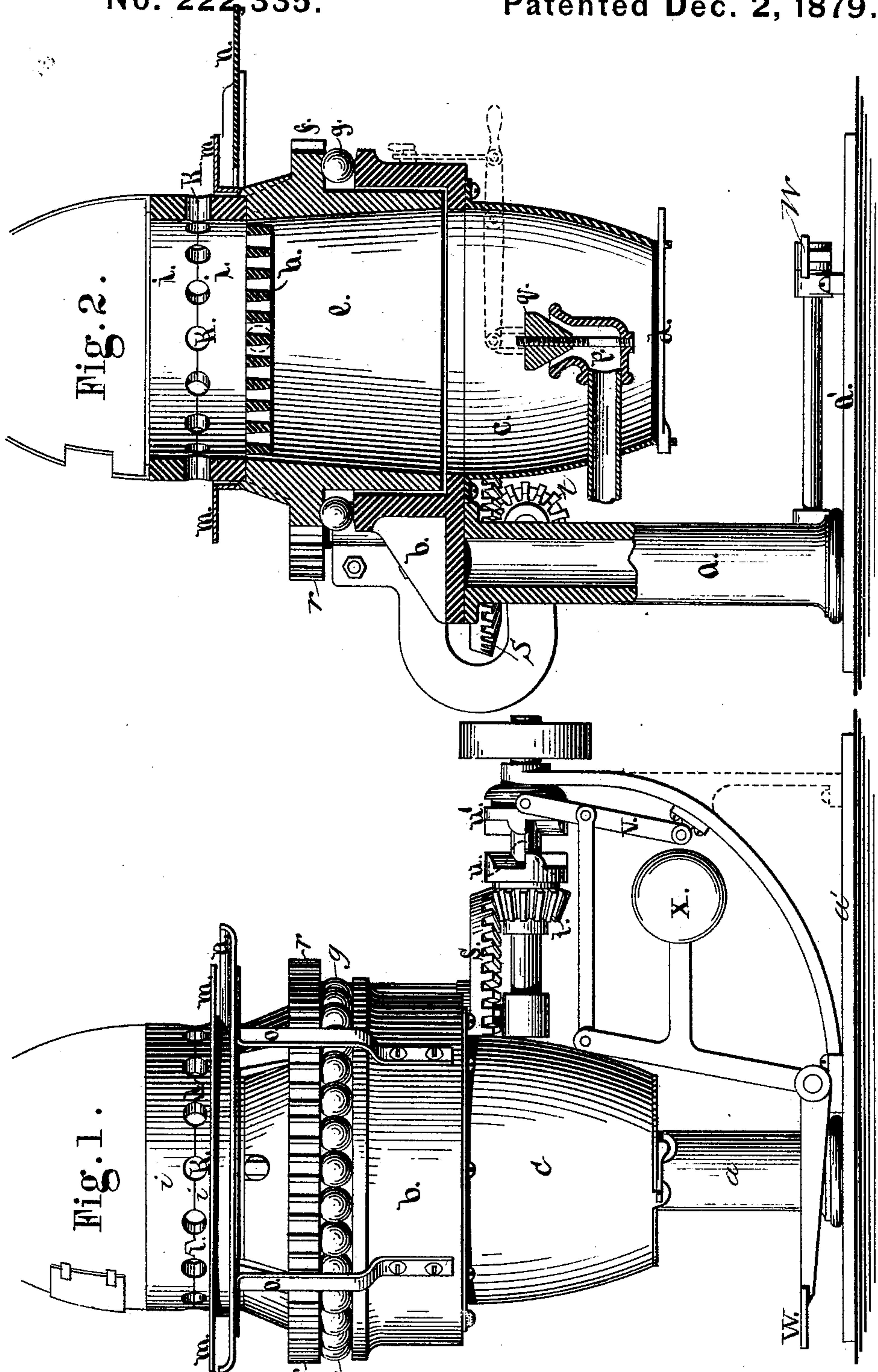


G. H. WEBB.
Furnace for Heating Blanks.

No. 222,335.

Patented Dec. 2, 1879.



WITNESSES:

Henry J. Miller
J. A. Miller Jr.

INVENTOR:

George H. Webb
by Jos A. Miller atty

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Fig. 3.

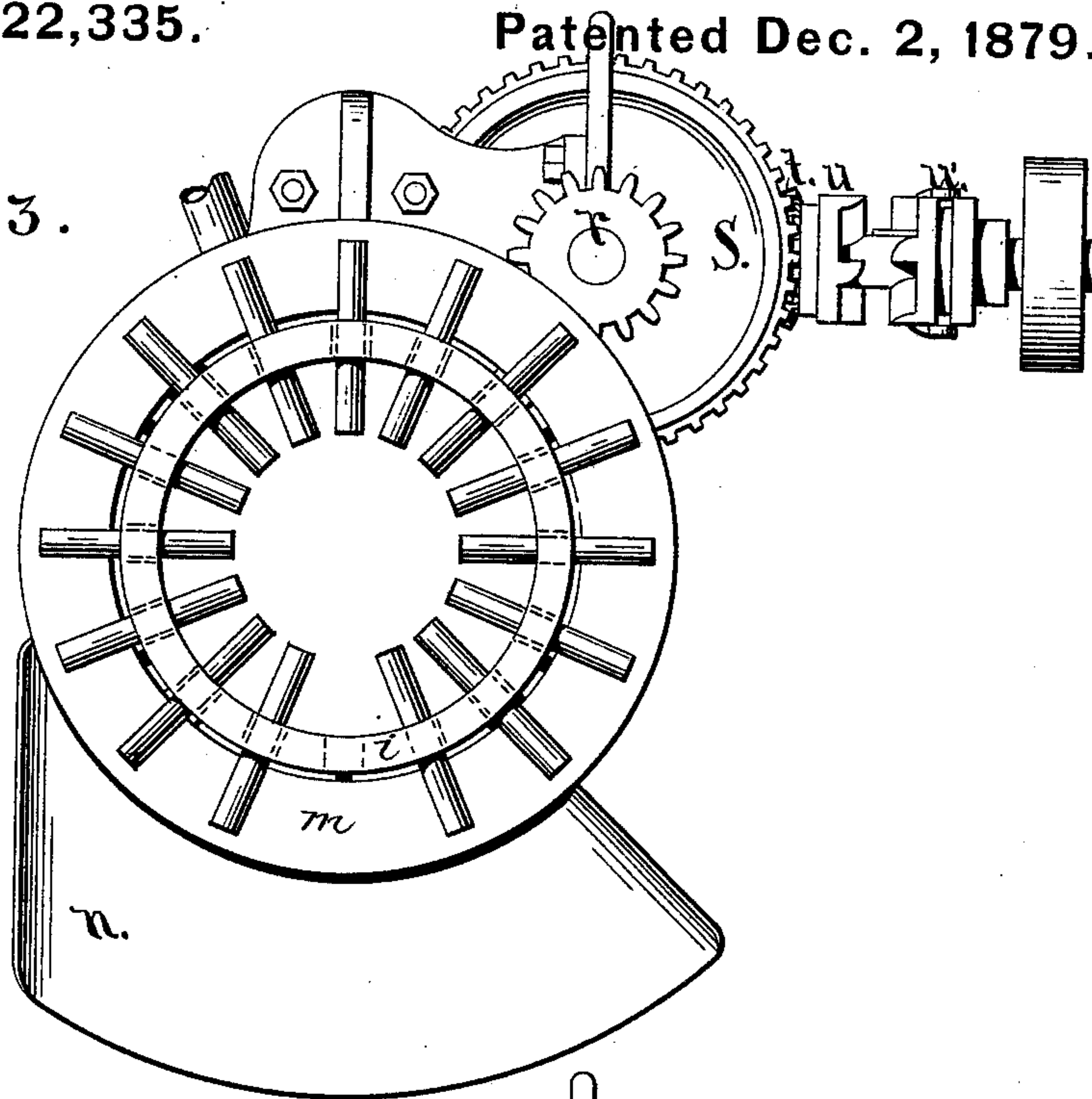
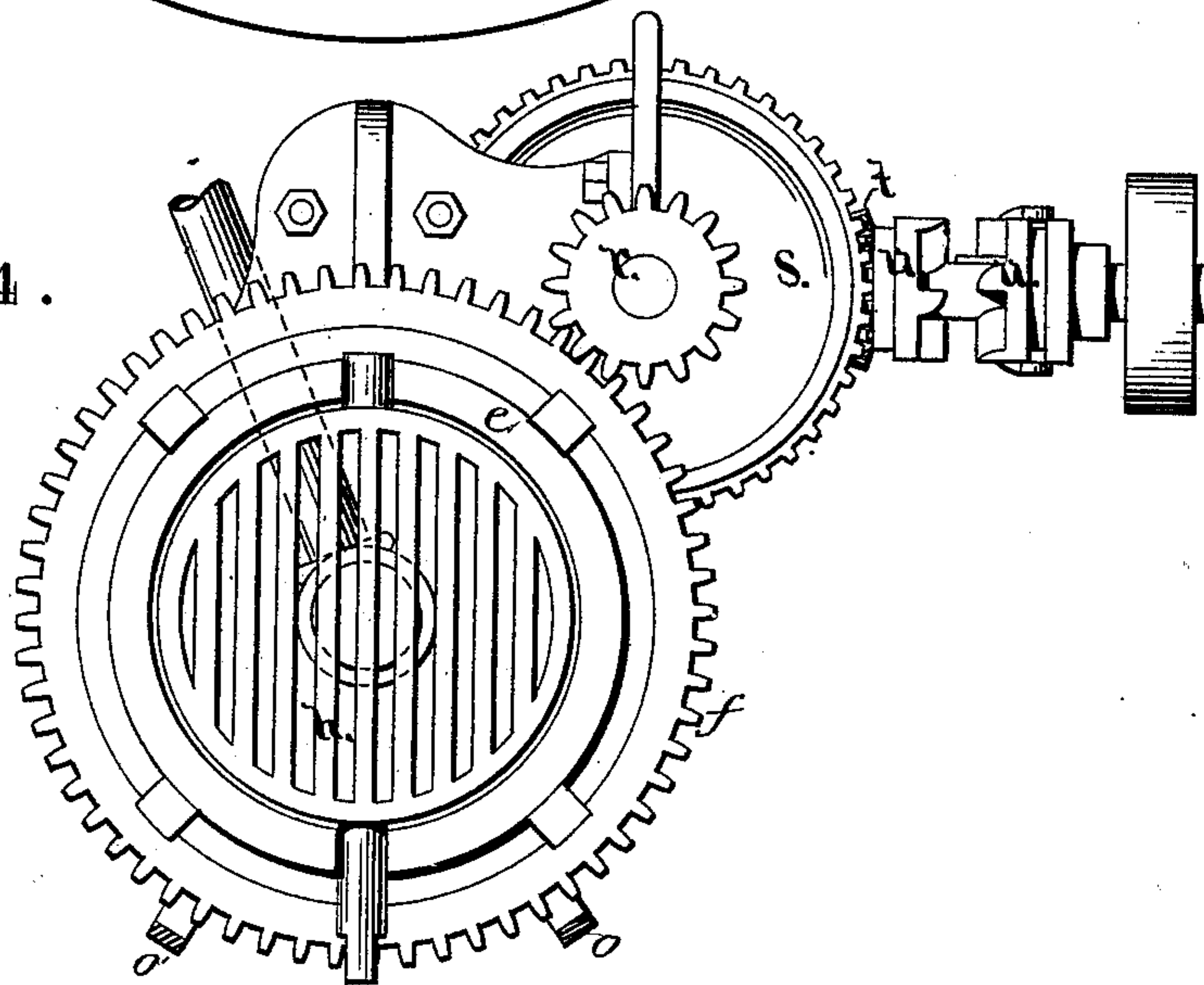


Fig. 4.



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GEORGE H. WEBB, OF PAWTUCKET, RHODE ISLAND.

IMPROVEMENT IN FURNACES FOR HEATING BLANKS.

Specification forming part of Letters Patent No. **222,335**, dated December 2, 1879; application filed June 12, 1879.

To all whom it may concern:

Be it known that I, GEORGE H. WEBB, of Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Furnaces for Heating Blanks; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a view of my improved forge-furnace adapted for the heating of bolt-blanks for a bolt-heading machine. Fig. 2 is a sectional view of the furnace, showing the air-blast device and the means for regulating the same, as also the fixed support on which the furnace proper is made to revolve, so that new blanks can be inserted and heated blanks withdrawn at a point convenient to the bolt-heading machine. Fig. 3 is a top view of the furnace, showing the bolt-blanks inserted. Fig. 4 is a top view, the rings forming the blank-holders being removed, as also the annular table, so as to show the dumping-grate and the means for rotating the furnace more fully.

Similar letters of reference indicate corresponding parts.

The object of my invention is to facilitate the heating of blanks for forging; and another object of this invention is to so arrange the grate and the blast-regulating device in a furnace that each of the blanks inserted shall be more thoroughly heated at the point which is to be upset in forming the head of a bolt or similar article than at other points.

A further object of this invention is to construct the portion forming the sides of the furnace near the fire, and through which the blanks are inserted, so that the same may be readily exchanged.

Another object of this invention is to support the furnace and arrange the same in such a manner that dust, ashes, or cinders will not prevent the free operation of the same.

My invention consists in the several details of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the drawings, *a* is a standard firmly secured to the bed-plate *a'*, or cast in one piece with the same. *b* is an annular ring, cast

in one piece with a bracket, by which it is secured to the standard *a*. *c* is a circular chamber secured to the annular ring *b*, which, extending downward, forms the ash-pit of the furnace, the bottom thereof being closed by the plate *d*, which is secured so as to be easily removed when the ash-pit is to be cleaned.

e is a cylinder, whose interior is preferably made wider at the bottom and tapers upward, as shown in Fig. 2. This cylinder *e* is provided with a rim and gear. The said cylinder sets loosely within the annular ring *b*, and is supported on a series of balls, *g*, which rest on the surface of the annular ring *b*. To insure the free rotation of the balls, no groove or indentation is made in the upper surface of the annular ring *b*; but this surface is preferably made so that ashes, dust, or cinders will not lie on the same and obstruct the rolling of the balls. To secure the balls and hold them in their proper positions, an annular groove is made in the lower face of the rim *f*, as shown in Fig. 2, and they are thereby made to rotate in a circle.

h is a dumping-grate supported on a central shaft in the cylinder *e*, so that the upper surface of the grate is on a level, or nearly so, with the upper edge of said cylinder. The grate is surrounded by the rings *i i*, resting on the cylinder *e*, and held in place by projections on the cylinder, as shown in Figs. 1 and 2. The rings *i i* are duplicates of each other, and are cast with the semicircular holes *K K* in each, and also with the dowels *l*, so that they fit into each other. Either of these rings may be used as the upper or lower ring, and they may be replaced by rings cast from the same pattern.

m is an annular shelf or table surrounding the lower ring, the surface of this table being on or nearly on a line with the holes *K*, so that blanks inserted may rest on the same as the said shelf or table *m* revolves with the furnace.

n is the stationary shelf, supported by the brackets *o o*, which are secured to the annular ring *b*. On this shelf a stock of blanks can be kept and the tongs supported, so that the blanks will be ready for insertion into the holes *K*.

The blast-pipe is placed so that the exit

thereof is central within the ash-pit *c*. *p* is the outlet-nozzle, provided with the conical plug *q*, which is made adjustable either by being supported on a central pin provided with a screw-thread, or by sliding on the central pin and being operated by a lever, so that it can be secured in any desired position, as shown in Fig. 2 by broken lines. When so arranged the plug *q* can be used as a valve to shut off or let on the air.

When the blanks to be heated are to be used for bolts on which the heads are to be formed by upsetting, it is desirable to heat the metal of each blank thoroughly a short distance from the end, preferably to a higher heat than the end. When the blank thus heated is presented to the heading-machine the metal will upset more readily and form a better head, being much stronger than when the end of the blank is the hottest and is turned over the rest of the blank. To heat, therefore, the blank thoroughly, I arrange the nozzle *p* and the plug *q* so that the main force of the blast will strike the grate at the distance from the outer edge of the fire where this portion of each blank is located, leaving the center of the fire but little affected by the blast.

The furnace is connected by a dome or funnel with a chimney or outlet arranged to carry off the products of combustion.

For light work the whole furnace may be made stationary, but circular in form, so that two or more forgers may have access to the holes *K* and insert new blanks into the holes from which heated ones have been withdrawn; but for the ordinary bolt-work I prefer to make the upper part of the furnace rotatable.

Various devices may be used to rotate the furnace proper—such, for example, as a worm gearing into the gear *f*. The manner I prefer is shown in the drawings, in which the pinion *r* gears into the gear *f*, and this pinion *r* is secured to a vertical shaft, to the lower end of which the bevel-gear *S* is also secured. This bevel-gear *S* gears into a bevel-gear, *t*, loose on a horizontal shaft, to which continuous motion is imparted. The bevel-gear *t* is provided with a clutch, *u*, and is driven by a clutch, *u'*, secured to the horizontal shaft by a spline. This clutch is operated by the lever *V*, actuated by the foot-treadle *W*, which is counter-balanced by the weight *X*, so that the clutches are disconnected in their normal condition, and are connected when the operative depresses the foot-treadle, the foot part of which is made and placed so that it can be readily operated by either foot of the forger.

The shelf *n* is of such length that usually three or four blanks can be removed and new blanks inserted before the furnace is to be rotated.

The operation of this furnace is as follows, viz: A fire being built on the grate *h*, the furnace is made to rotate slowly and the blanks are inserted to the proper distances, and when the first blank inserted is opposite the operative the same is withdrawn, another inserted, and the work continued.

This furnace is much more convenient than the ordinary forge-furnace. It is more accessible and more durable, and is readily repaired by substituting new rings *i i* for the old ones. It does not heat up the room as much as the old furnaces, takes less room, and produces more and better work with less fuel, and the heat can be applied to the portion of the blank requiring the same more uniformly.

Instead of the bottom plate, a box or receptacle can be secured, which, with the dumped ashes and coal, can be readily removed.

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

1. In a circular forge-furnace, the combination, with the cylinder and grate located therein, of a ring placed above the grate and provided with a series of holes, *K*, and an annular shelf, *m*, secured to the furnace, the shelf being located slightly below the holes *K*, substantially as set forth.

2. In a circular forge-furnace, the combination, with the cylinder and grate and ring placed above the grate, said ring provided with a series of holes, *K*, of a closed ash-pit and a blast-pipe provided with an adjustable air-deflector, whereby an annular blast of air may be forced against the bed of fuel on the grate, substantially as set forth.

3. In a circular forge-furnace, the combination, with the cylinder and grate located therein, of the interchangeable rings *i i*, provided with holes *K K*, substantially as set forth.

4. A circular forge-furnace provided with interchangeable rings *i i*, annular shelf *m*, and stationary shelf *n*, substantially as set forth.

5. In a circular forge-furnace, the combination, with the ring *b* and stationary chamber *c*, secured thereto, of the cylinder *e* and anti-friction rollers interposed between the upper edge of ring *b* and an annular flange projecting outwardly from the cylinder *e*, substantially as set forth.

6. In a circular forge-furnace, the combination, with cylinder *e*, provided with a gear, *f*, of the stationary ring *b*, inclosing the lower end of cylinder *e*, interposed anti-friction rollers, and driving mechanism for rotating cylinder *e*, substantially as set forth.

GEORGE H. WEBB.

Witnesses:

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