2 Sheets—Sheet 1.

J. H. FELTHOUSEN.

Apparatus for Forming Molds for Gear-Wheels.

No. 199,526. **Patented Jan. 22, 1878.**

Fig. 1.

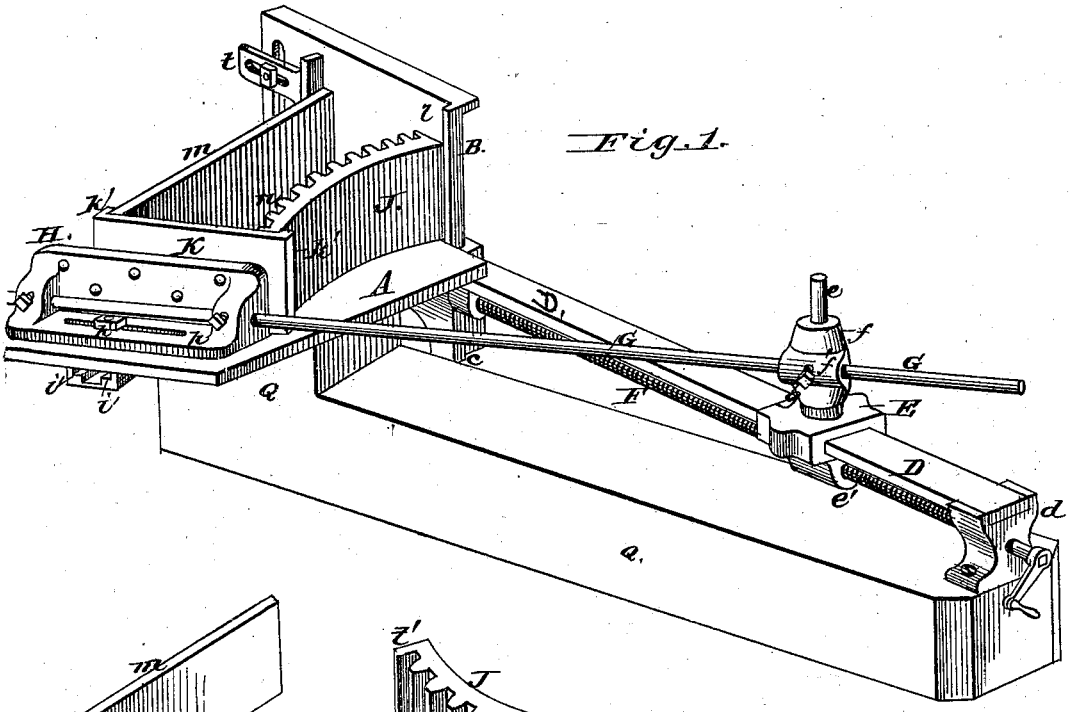


Fig. 7.

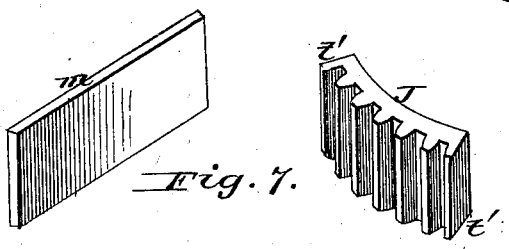
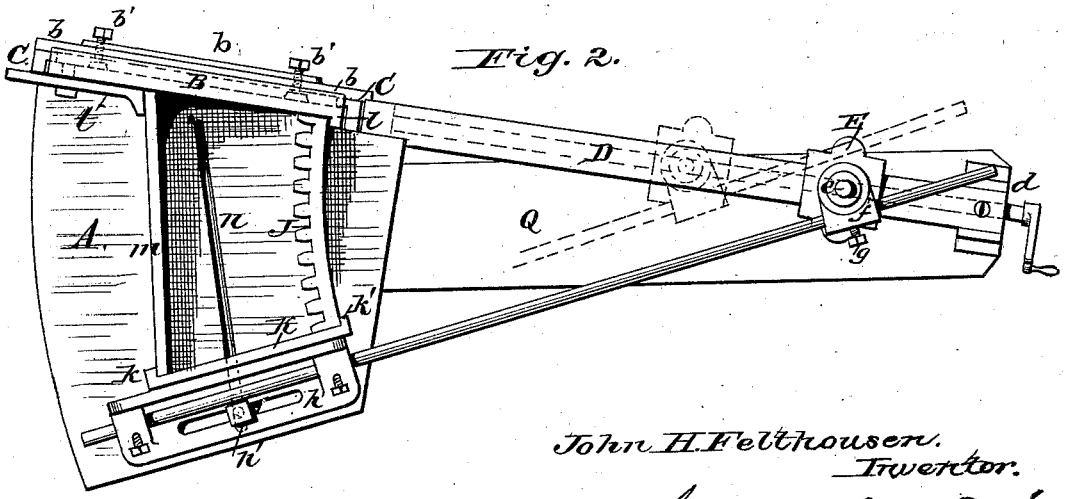


Fig. 2.



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J. H. FELTHOUSEN.

Apparatus for Forming Molds for Gear-Wheels.

No. 199,526. **Patented Jan. 22, 1878.**

Fig. 4.

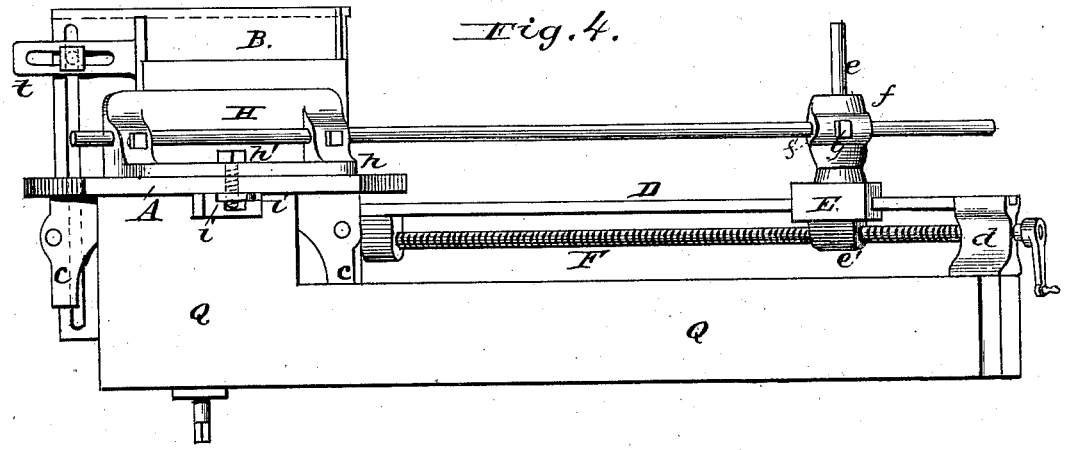


Fig. 3.

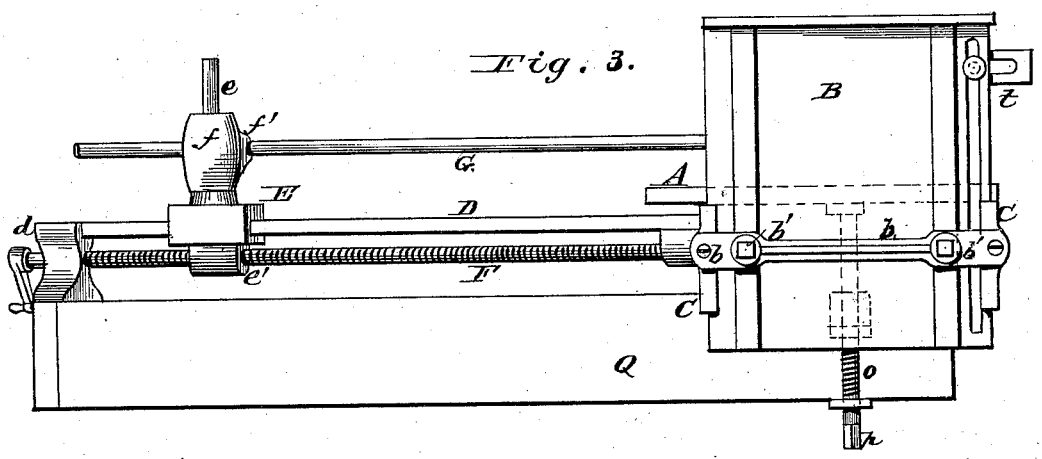
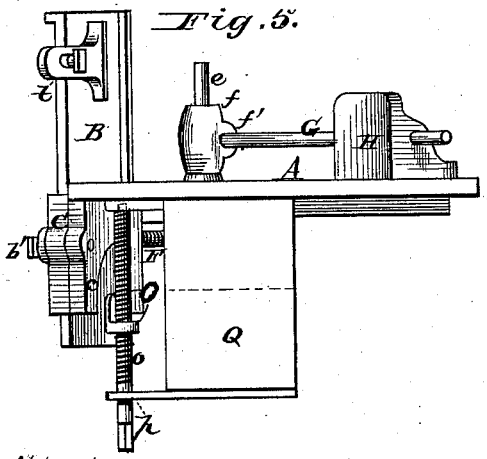


Fig. 5.



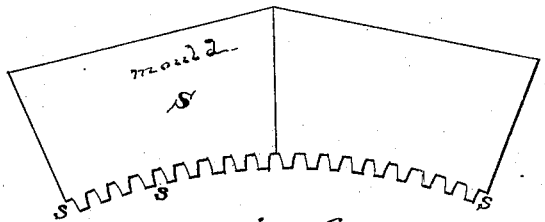


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN H. FELTHOUSEN, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN APPARATUS FOR FORMING MOLDS FOR GEAR-WHEELS.

Specification forming part of Letters Patent No. **199,526**, dated January 22, 1878; application filed January 5, 1878.

To all whom it may concern:

Be it known that I, JOHN H. FELTHOUSEN, of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Apparatus for Forming Molds for Gear-Wheels and other similar articles, of which the following is a specification:

My invention relates to an improved adjustable apparatus for forming the molds for casting gear-wheels and other circular bodies.

It consists in, first, a mold-former having one of its sides adjustable on the arcs of circles having varying diameters, in order to receive segmental patterns for wheels of different sizes; second, in the combination, in a mold-former, of a stationary bottom or table, a vertically-adjustable side or abutment, and a side adjustable on varying arcs, said sides being adapted to receive between them replaceable walls for the molds and segmental patterns of varying arcs; third, in the combination, with the circumferentially-adjustable side of the former, of a radius-rod having an adjustable center-point, whereby the former may be adapted to receive patterns formed with different arcs.

In the accompanying drawings, Figure 1 represents a perspective view of my invention. Fig. 2 is a plan view. Fig. 3 is a side view, showing the vertically-adjustable side of the former; and Fig. 4 is a view from the opposite side. Fig. 5 is an end view. Fig. 6 is a plan view of the mold. Fig. 7 is a view of the pattern and back-board.

The letter A represents the bottom or table of the mold-former. This table is firmly arranged upon any suitable foundation or base, Q, giving it a sufficient elevation to permit full vertical adjustment of the side B, which moves in edge-guides C attached to a flange, *c*, projecting downward from the table. Behind this adjustable side is a permanent bar, *b*, provided with set-screws *b'*, for holding the side in place. On the front or inner face of this adjustable side is arranged an adjustable lug or abutment, *t*, for supporting the outer replaceable sides of the former. From the inner edge of this adjustable side and the corner of the table extends an arm, D, having its inner end secured to one end of the flange of the table, and its outer end supported on a standard, *d*, of proper height to support the arm in a level position. Upon this arm D is arranged a traveling block, E, having a pin, *e*, projecting upward therefrom, and a lug, *e'*, projecting downward. Beneath the arm D, and parallel therewith, is a screw-rod, F, having its end journaled in suitable bearings, and said screw-rod passes through a threaded aperture in the lug *e'*, so that when said screw-rod is rotated the block E is caused to move in either direction desired upon the arm D.

Upon the upright pin *e* is swiveled a sleeve, *f*, having a lug, *f'*, projecting from one side, and provided with a horizontal aperture, through which passes the adjustable radius-rod G, which may be held in position by a set-screw, *g*. This radius-rod extends outward across the table A, and through lugs attached to the back of the circumferentially-adjustable side H, which has a base, *h*, resting upon the table, and this base has a longitudinal slot, through which passes a thumb-screw, *h'*, provided with lips *i i*, which fit in the dovetail grooves *i' i'* in the table, and serve to hold the adjustable side H in any desired position.

Now, when it is desired to form a mold for casting a certain segment of the rim of a wheel, the segmental pattern is placed upon its edge upon the table, as shown at J, Fig. 1, with one of its ends level against the vertically-adjustable side B, and its inner corner against a lip, *l*, on the edge of said side. Against the other end of the pattern is placed a facing-board, K, having a length equal to the desired thickness of the rim of the mold, and provided with a lip, *k'*, for holding said pattern upright, and then the adjustable side H, the center about which it moves, having been previously fixed, is moved up against the back of the facing-board, against which it is firmly secured by tightening the thumb-screw *h'*.

The adjustable stop *t* on the inner side of vertically-adjustable side B is then fixed at a distance from the pattern equal to the length of the facing-board, and then a back-board, *m*, is placed edgewise across the table, one end supported by the adjustable stop *t*, and the other end supported by an outer lip or flange, *k'*, on the facing-board, and thus is formed the mold-forming inclosure, as at *n*, Fig. 2, into

which is rammed the sand for composing the mold. A pattern of any desired width of face may be used, and the back and facing boards and vertically-adjustable side must correspond therewith.

A lug, O, extends inwardly from the lower part of the vertically-adjustable side, and through this lug passes a screw-rod, *o*, having its top journaled to the bottom of the table and its lower end journaled in suitable bearing *p*, fixed to the foundation or base Q. The projecting end of this screw-rod is formed to receive a crank or wrench, by which it may be turned for adjusting the side, and the same crank may be used for turning the screw-rod which adjusts the movable center of the radius-rod.

The segmental patterns which I use in connection with my mold-forming apparatus may be formed on any arc of any width, and for wheels with plain rims, such as fly and belt wheels, or for gear-wheels having either external or internal teeth, and in the case of toothed wheels the segmental patterns terminate at each end in a half-tooth—that is, instead of having at its ends complete patterns of teeth, it has patterns of longitudinal halves of teeth, as shown at *t'*, Fig. 7, so that the segmental molds terminate in spaces for metal, as shown at *s*, Fig. 6, in which S is the mold, instead of ending in sand half-teeth, which are extremely liable to be broken in handling the molds.

After the sand has been properly rammed in the former, the adjustable side H is lowered and moved away from the mold, and the pattern, facing-board K, and the back-board also removed, when the mold may be set aside, and others formed in a similar manner until enough are made for the rim of the wheel, when the segmental molds are arranged end to end in a suitable flask, and form the complete mold for the said rim; and in the case of a gear-wheel the mold for a tooth is formed by the junction of the half-tooth spaces at the adjacent ends of two of the segmental molds.

When it is desired to change the adjustment of the former, so as to adapt it to form a segmental mold of a different arc, or formed on an arc struck from a different center from that for which it has been used, the screw-rod F must be rotated to adjust the block E either toward or from the table, as the case may be, so that the pin *e* will form the center of a circle having a diameter equal to that of the wheel proposed to be made, supposing the outer face of the pattern, when properly placed, to represent the periphery of the said wheel.

The segmental molds formed by my apparatus are to be used according to the processes usual in the art of molding, as will be readily understood by those familiar with said art.

What I claim is—

1. The mold-former having one of its sides adjustable in the arc of a circle, substantially as described, and for the purpose set forth.

2. A mold-former having one of its sides adjustable in the arcs of circles of varying diameters, in order to receive segmental patterns for wheels of different sizes, substantially as described.

3. The combination, in a mold-former, of a stationary bottom or table, a vertically-adjustable side or abutment, and a side piece adjustable on varying arcs, said sides being adapted to receive between them replaceable walls for the mold-chamber and segmental patterns formed on different arcs.

4. The combination, with the adjustable side H, of the radius-rod G and adjustable center-pin *e*, substantially as described, whereby the former may be adjusted to receive patterns of different sizes and arcs.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

JOHN H. FELTHOUSEN.

Witnesses:

ALBERT H. NORRIS,

J. A. RUTHERFORD.