

G. L. SCOTT.
APPARATUS FOR MOLDING PULLEYS.

No. 90,126.

Patented May 18, 1869.

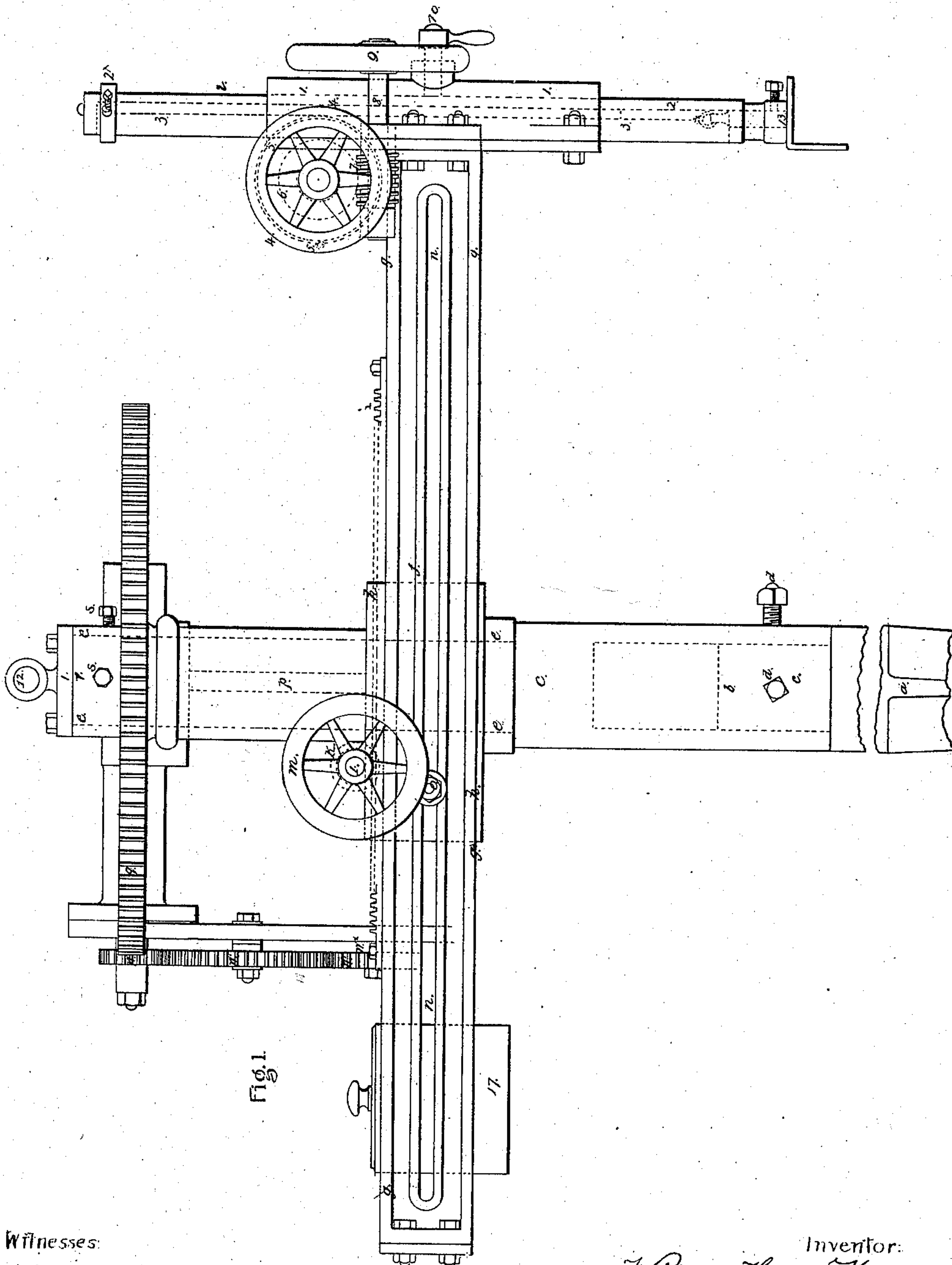


Fig. 1.

Witnesses:

E. F. Sartorius
J. L. Lutton

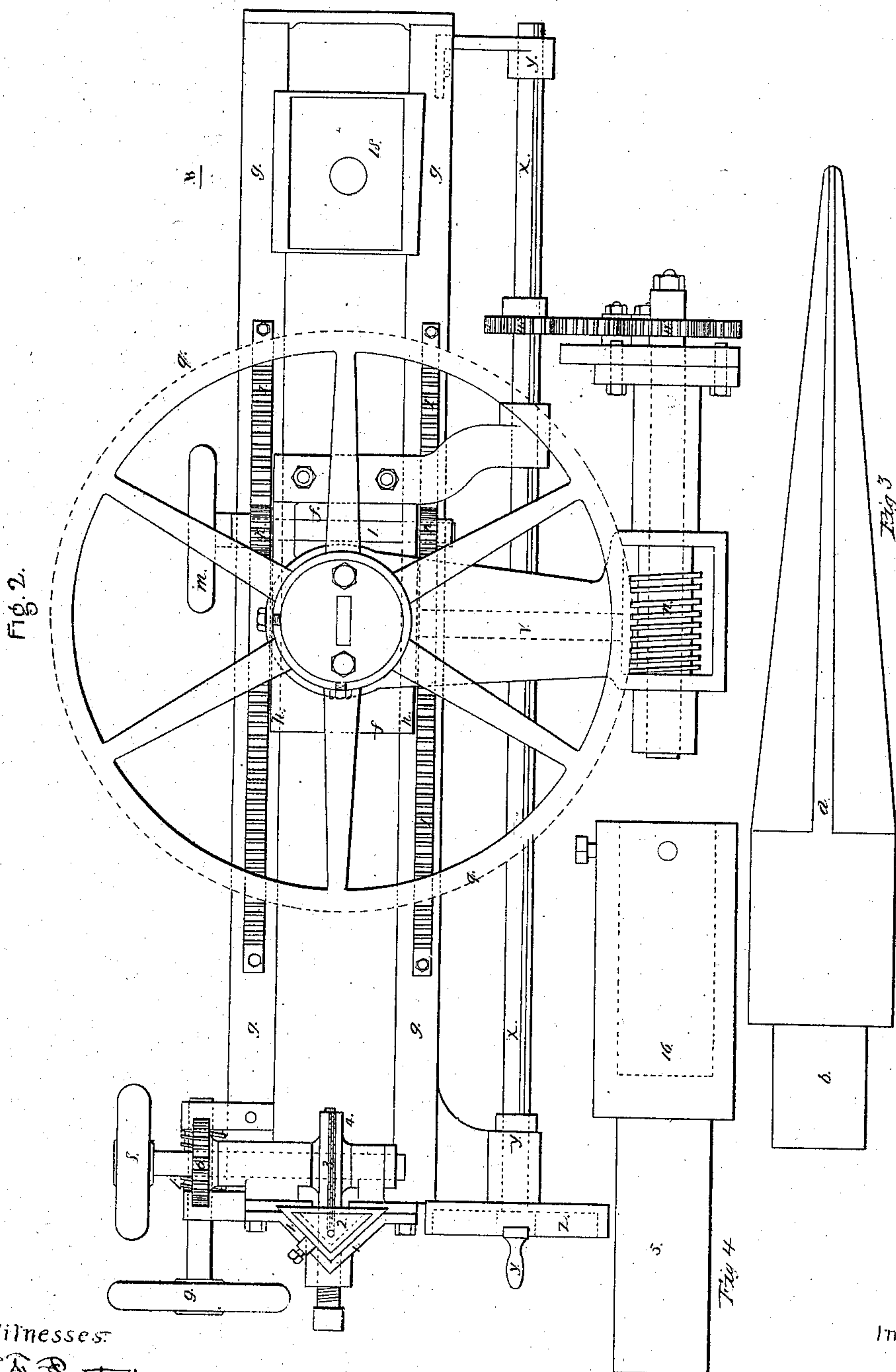
Inventor:

William Henry Thompson
Attorney of George Lamb Scott.

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APPARATUS FOR MOLDING PULLEYS.

No. 90,126.

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Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE LAMB SCOTT, OF MANCHESTER, ENGLAND.

IMPROVEMENT IN APPARATUS FOR MOLDING PULLEYS.

Specification forming part of Letters Patent No. 90,126, dated May 18, 1869.

To all whom it may concern:

Be it known that I, GEORGE LAMB SCOTT, of Manchester, in the county of Lancaster, England, a subject of Great Britain, have invented a new and useful Improvement in Apparatus for Molding Toothed or other Wheels or Pulleys, or Portions of Circles for Casting; and I do hereby declare that the following specification and the annexed drawings are a full and exact description of the same.

Figure I is a side elevation. Fig. II is a plan view of the machine; Fig. III, vertical section of the center post; Fig. IV, section of elevating-stud.

I will first state the general principle of the construction of the apparatus. There is a shaft, which may be bedded in the floor of the foundry, and which corresponds to the center of the wheel or other article to be cast. Upon this shaft is mounted a radial arm, the outward end of which carries the portion of pattern capable of being raised or lowered by a screw.

The radial arm and pattern are caused to move through the circle at intervals by a handle, connected by gearing to a worm-wheel upon the central shaft, and at these intervals the operation of molding is performed by the turning of the above-mentioned screw.

The pattern can be moved inward or outward on the radial arm for different diameters, and I adapt a dividing-plate to guide the workman in moving the pattern through the circle.

When bevel-wheels are to be molded, the radial arm which carries the pattern can be fixed at any angle. A trammel carries gearing, by which it may be caused to revolve, and it also carries a portion of the pattern, which may be lowered to admit of the sand being rammed around it, and may then be withdrawn and moved onward for another operation, and thus the toothed or other wheel or circular article is molded by the use of a pattern which represents a portion only of the article to be produced, such general principle of molding, however, being now in use and well understood.

In order to fix the apparatus in any desired part of the foundry, and to provide a center upon which it may turn, so as successively to present the segmental pattern to the sand, I

employ a post, *a*. (Shown detached at Fig. III.) This post is in the form of a spike provided with feathers, and is driven, or is otherwise forced or bedded, firmly in the floor of the foundry. Upon its upper end is formed a stud, *b*, and upon this, as a preparatory measure, is placed an ordinary plain trammel, which, by being turned, smooths the surface of the sand for the process of molding. This plain trammel having been removed, the molding apparatus, which I will now proceed to describe, is placed upon the stud *b*. At *c* is a boss, mounted upon the aforesaid stud *b*, and capable of being fixed thereon in any desired position by set-screws *d*, and which carries at its upper end a stud, *e*. Upon this stud *e* is formed a block, *f*, provided with a groove on each side, and within which are placed two bars, *g*, united at each end, and constituting a frame capable of sliding in the block *f*, the overhanging parts *h* thereof affording guides. Upon the bars *g* are toothed racks *i*, in gear with which are pinions *k*, mounted upon a shaft, *l*, carried by bearings which extend from the block *f*.

The shaft *l* is provided with a pulley-handle, *m*, by turning which the pinions *k* are caused to act upon the racks *i*, and thus slide the bars *g*, in the one direction or the other, within the guides formed in the block *f*, and when any desired position is effected it may be retained by a bolt, *o*, proceeding from the block *f* through a slot, *n*, in the bar *g*, and capable of being tightened by a nut. The upper part of the block *f* is provided with a boss, *p*, also capable of turning upon the stud *e*, and supporting a worm-wheel, *q*, the boss *r* of which is fixed to the stud *e* by set-screws *s s*, so as to be fast therewith.

At *t* is a cap-piece, attached to the stud *e* above the worm-wheel *q*, so that the said worm-wheel is confined thereto and cannot move upward. In gear with this wheel is a worm, *u*, carried by a bracket, *v*, which extends from the block *f*; and upon the axis of the said worm is a pinion, *w*, connected through a train of change-wheels, *w' w**, to a shaft, *x*, mounted in bearings *y y*, carried by one of the bars *g*. The pinion *w** of the train is mounted with a key, situated within a groove in the shaft, so as to permit the said shaft to slide through it.

Upon one end of the shaft *x* is a pulley, pro-

vided with a spring-handle, *y*, fitting into a notch of a disk, *z*, after the manner of an ordinary dividing-plate.

One end of the frame constituted by the bars *g* carries a V-formed guide, 1, within which is placed a sliding piece, 2. This sliding piece is formed hollow for the reception of a chain, (shown by the dotted line 3,) and which chain is made fast to each end of the said sliding piece. It also passes around a pulley, 4, to which it is made fast at 5. The axis of the pulley 4 is carried by brackets extending from the V-guide 1, and is provided with a worm-wheel, 6, in gear with a worm, 7, upon a shaft, 8, carried by bearings attached to one of the bars *g*, and furnished at its outward end with a pulley-handle, 9. At 10 is a screw, passing through the V-guide 1, and capable of being caused to act upon the sliding piece 2, so as to hold it firmly in any desired position.

The operation is as follows: The sand having been smoothed by the ordinary trammel, as before described, and the said trammel having been removed from the stud *b*, the boss *c* and its parts, above described, which are carried thereby, are placed, as shown in the drawing, upon the stud *b*. In order to facilitate this I form a ring, 12, upon the cap-piece *t*, to which ring a chain connected with a crane may be attached. This having been done, the boss *c* is tightened upon the stud *b* by the set-screws *d*, and the pulley-handle *m* is turned, so as to give motion to the pinions *k*, and through them cause the racks *i* and frame *g* to slide outward or inward until the pattern-holder 13 upon the bar 2 occupies the radius required. The pulley-handle 9 is then turned, by which means the worm 7 will cause the pulley 4 to revolve, and, through the medium of the chain 3, force downward the V sliding bar 2, and with it the segmental pattern, (not shown in the drawing, but attached to the part 13,) into the sand. Then the screw 10 is turned, so as to fix the bar 2 steadily, and the sand is rammed around the pattern, as usual, after which the pattern is raised by turning the pulley-handle 9 in the other direction, and one portion of the wheel is thus molded.

In order to mold a second portion, the handle *y* is turned one or more revolutions, according to the space the segmental pattern is to pass through, which revolutions are registered by the notch in the disk *z*. By this operation the train of wheels *w* will impart rotary motion to the worm *u*; and as the wheel *q*, with which it is in gear, is fixed, the whole apparatus will turn bodily upon the stud *b*, and move the seg-

mental pattern through the space required for another operation of molding, which is then performed as above described, and so on until the entire wheel is molded.

The gearing *w* is a train similar to ordinary change-wheels of lathes, and the numbers of teeth are arranged so as to move the pattern at each revolution of the shaft *x* through a space into which the wheel to be molded will divide.

The depth to which the pattern is to be forced into the sand is regulated by a stop, 2*, attached to the bar 2, which stop may be adjusted in any position, and arrives in contact with the top of the guide 1.

In molding light wheels or other circular articles the pattern may be moved comparatively quick, and I have therefore shown a pulley on the shaft of the wheel 6, which, if the said worm-wheel 6 be removed, may give direct motion to the pulley 4 and chain 3.

At Fig. IV is an additional stud, 15, the boss 16 of which may be placed upon the stud *b*, in order, when desirable, to elevate the whole apparatus. At 17 is a box placed upon the bars *g*, and in which any desired weight may be placed in order to balance the apparatus, according to the distance that the pattern is moved outward from its center of motion.

The toothed wheel or other circular article having been molded, as above described, by successive printings of the segmental pattern, the arms or other such parts may be added by the use of cores, as is well understood, and a top mold-box employed, as is usual.

Having thus described and ascertained the nature of my invention, and the manner in which the same is to be performed, I desire it to be understood that I do not limit myself to the precise arrangement of parts above described; but

I claim—

1. For the purpose herein set forth, the use of a trammel carrying gearing and other parts, substantially as described.

2. Also, the use of the movable center of motion *a b*, and constructing the molding apparatus so as to constitute a machine complete in itself, and capable of being adapted to any part of the foundry.

Signed and sealed at Manchester, England, this 28th day of May, 1868.

GEORGE LAMB SCOTT. [L. S.]

Witnesses:

THOS. MARTIN,

EDWD. SHUTTLEWORTH.