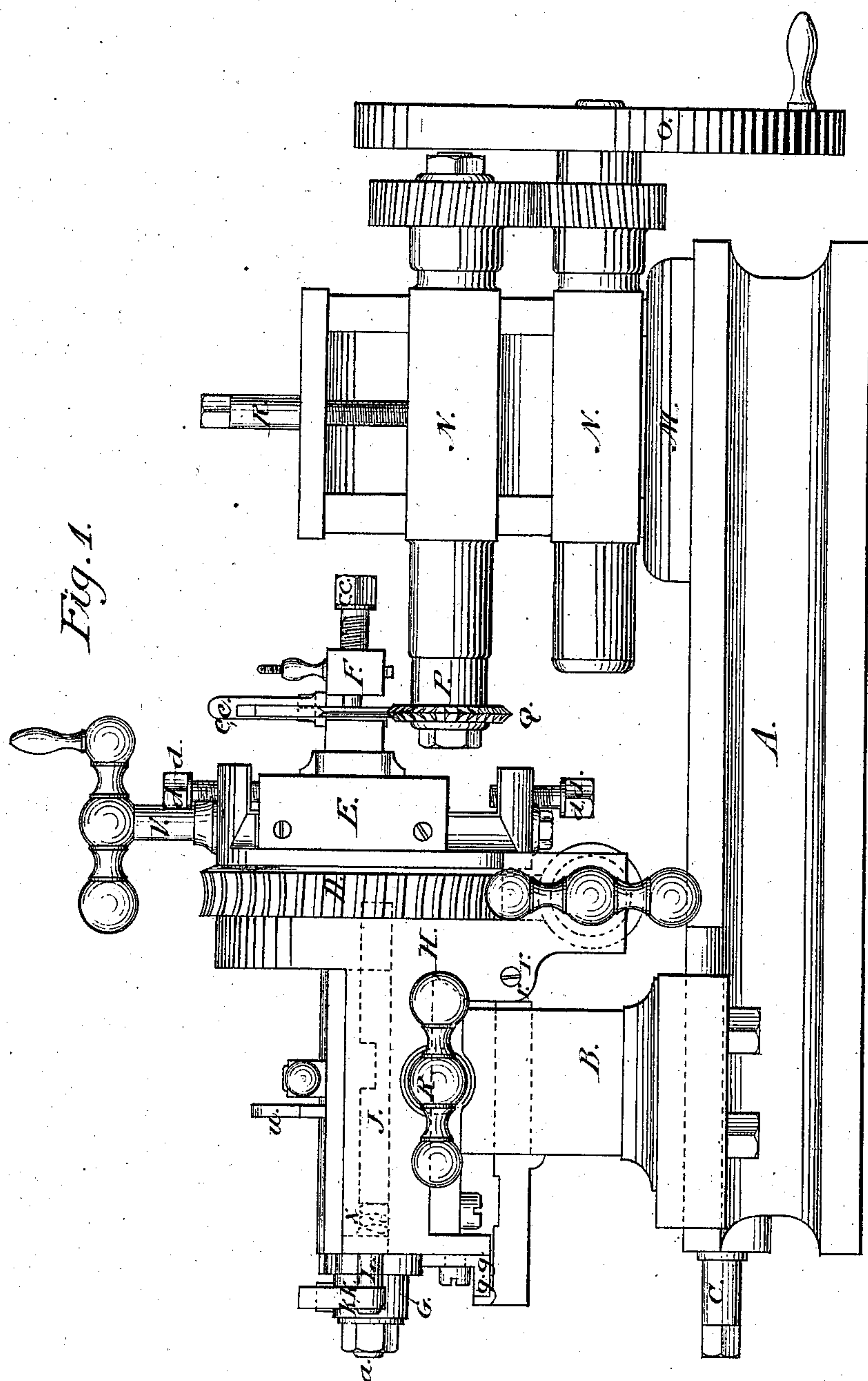


**W. HAWKINS.**  
**Machines for Milling Metal.**

No. 150,416.

Patented May 5, 1874.



*Witnesses.*

Wardwell.  
Edw. W. Down

*Inventor:*

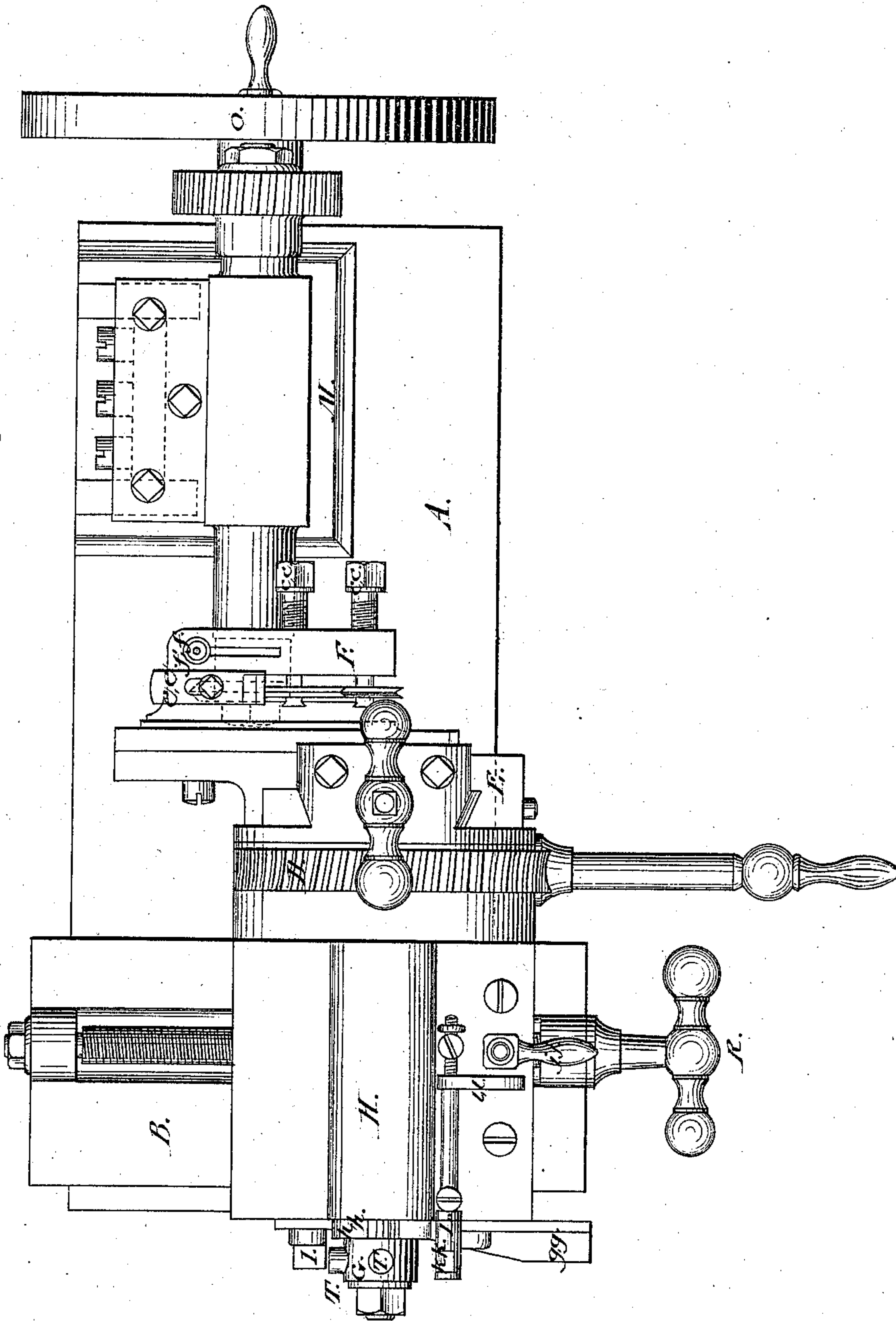
William Hawkins.  
per atty.  
A. H. & R. K. Evans.

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Fig. 2.



Witnesses.  
Alfred W. Down

Inventor.  
William Hawkins.  
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A. H. & R. H. Evans.





# UNITED STATES PATENT OFFICE.

WILLIAM HAWKINS, OF SAN FRANCISCO, CALIFORNIA.

## IMPROVEMENT IN MACHINES FOR MILLING METAL.

Specification forming part of Letters Patent No. **150,416**, dated May 5, 1874; application filed August 9, 1871.

*To all whom it may concern:*

Be it known that I, WILLIAM HAWKINS, of the city of San Francisco, in the State of California, have invented Improvements in Milling-Machines, of which the following is a specification:

The object of my invention is to provide a milling-machine so constructed as to cut grooves in saw-teeth or other metallic substances, straight, in circles, or on angles. It also relates to cutting straight and turning a curve or angle, at any desired point, at one operation, with the view of avoiding certain disadvantages in most milling-machines.

To more fully explain my invention, reference is had to the accompanying drawing, of which—

Figure 1 is a side elevation of the machine. Fig. 2 is a plan. Fig. 3 is an end view. Fig. 4 is a plan of eccentric and plate. Fig. 5 is a section of bolt, and view of screw-wheel, and section of movable head. Fig. 6 is a face view of screw-wheel, showing recesses with steel plates.

A indicates the frame or bed-plate, which should be substantially constructed to form a good foundation for the cutter-heads; B, the adjustable head, adjusted by means of the screw C. D is the screw-wheel, well secured to shaft *a*, and worked by screw-pinion *b b*. (See Fig. 3.) H is a movable head that is fitted to B, that can be moved both forward and backward. E is a movable plate, well fitted in ways to the face of the screw-wheel D, and is worked by the screw V. F is an open jaw or clamp that holds a saw-tooth, and is secured to plate E, and so arranged as to hold the tooth, and be freely revolved around cutter Q. The screws *c c* hold the saw-tooth in position in a firm manner in the jaw F. D D are adjusting-screws, to determine the position of plate E, in order to regulate the size of the circle or angle to be cut. *e e* is an adjustable gage, to regulate the position of the work or tooth to be cut; *f f*, an adjustable gage, to regulate the position of the work. G is a collar on the shaft *a* of the wheel D, and serves a double purpose—first, as a collar of shaft in

the movable head H; and, secondly, by its teeth *h h*, as gear, to work the sliding wedge *g g*. This sliding wedge moves the bolt I to release the head H, which is otherwise kept locked by that bolt through the medium of a spring.

At the commencement of cutting circles the bolt J is forced away from the wheel D by the eccentric *j j*, the movement being effected by the hand of the operator.

The bolt J is for the purpose of holding the wheel D firmly, the end thereof entering a socket or recess, *i i*, when the proper angle or shape of the saw-tooth or piece of metal to be grooved or milled is given. The bolt J is forced toward the wheel D by the spring K.

By Fig. 2 is shown a shaft, L, with lever *k k* and lever *l l*. The lever *k k* is moved by projection T on collar G. Such movement brings in action lever *l l*, which acts against the handle or lever of the eccentric *j j*, giving it an outward movement that allows the spring K to come into play, and force the bolt J toward the head D. *m m* (see Fig. 6) are steel plates, that come against bolt J, and hold wheel D firm and secure while cutting or milling. In Fig. 3 is shown a saw-tooth, S, held in the jaw F firm and secure by screws *c c*. M is the base of a standard secured to frame A. N are sliding-boxes, well fitted and secured to standard M. O is a band-wheel that carries movement to shaft P. Q is a cutter or milling tool. R is a screw to adjust the cutter-head or sliding boxes.

My improved machine is for cutting grooves or straight lines, and then turning a curve or circle or angle at any desired point, making a complete curve, and finishing a tooth or the work at one operation, and is found sufficient and well secured to resist all cutting pressure.

What I claim as my invention is—

1. The traveling head H, with its adjusting-screw R and bed B, in combination with the partially-rotating wheel D, adjustable plate E, with its clamp F, and adjusting-screw V, all constructed and arranged so as to allow a double adjustment of the

clamp without interfering with its rotation, as set forth.

2. The sliding bolt I, in combination with the head H, the wheel D, plate E, and clamp F, as and for the purpose set forth.

3. The combination of the collar G with its projections T, the rock-shaft L, having the levers *k k* and *l l*, the handle *j j*, and spring

*x*, for automatically releasing the bolt J, as described.

This specification signed this 10th day of June, 1871.

WILLIAM HAWKINS.

Witnesses:

A. B. CLASON,

J. H. BOONE.