

2 Sheets, Sheet 1.

H. A. Harvey,

Shaving Screw-Blank Heads.

N<sup>o</sup> 44,723.

Patented Oct. 18, 1864.

Fig: 1.

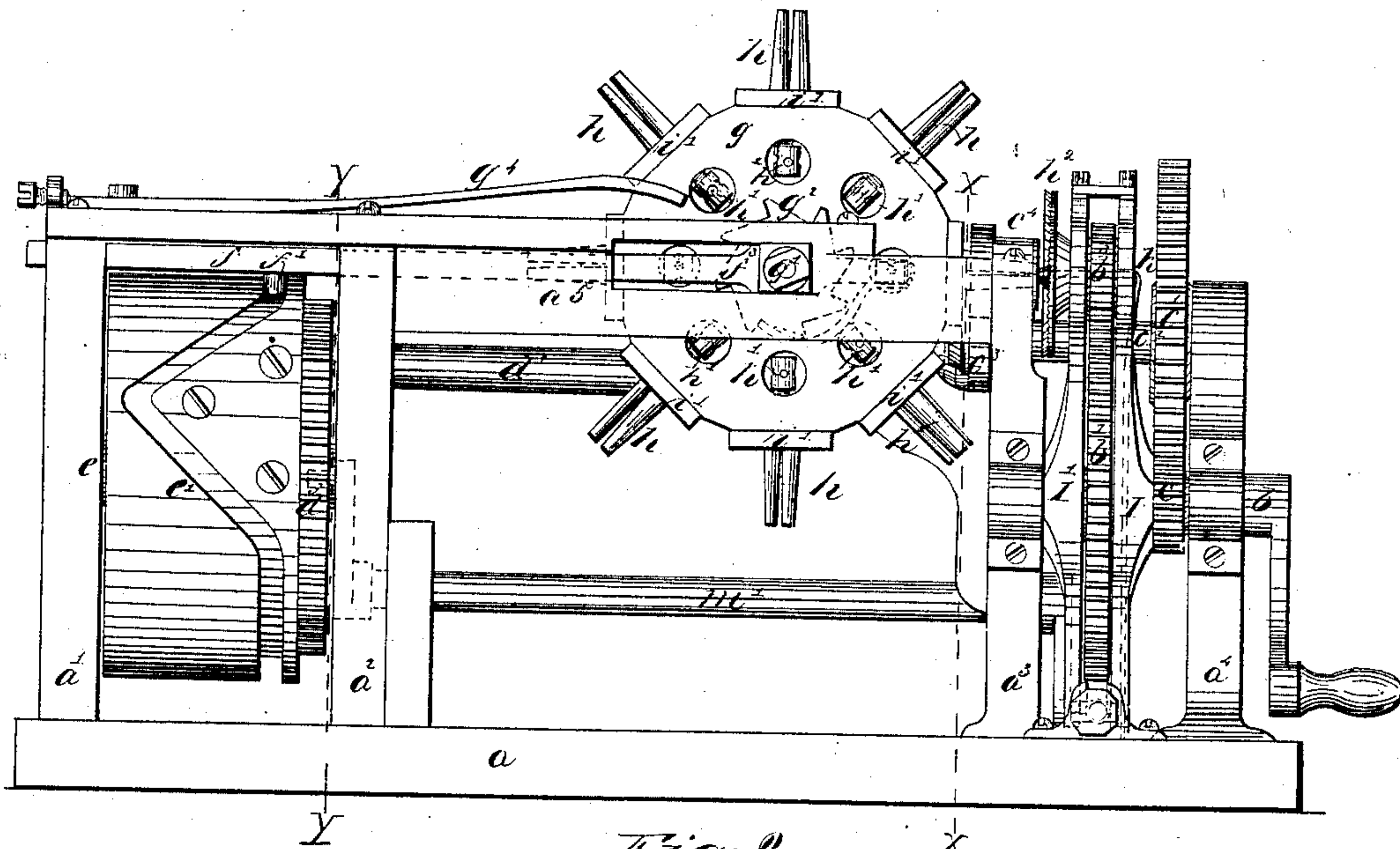


Fig: 2.

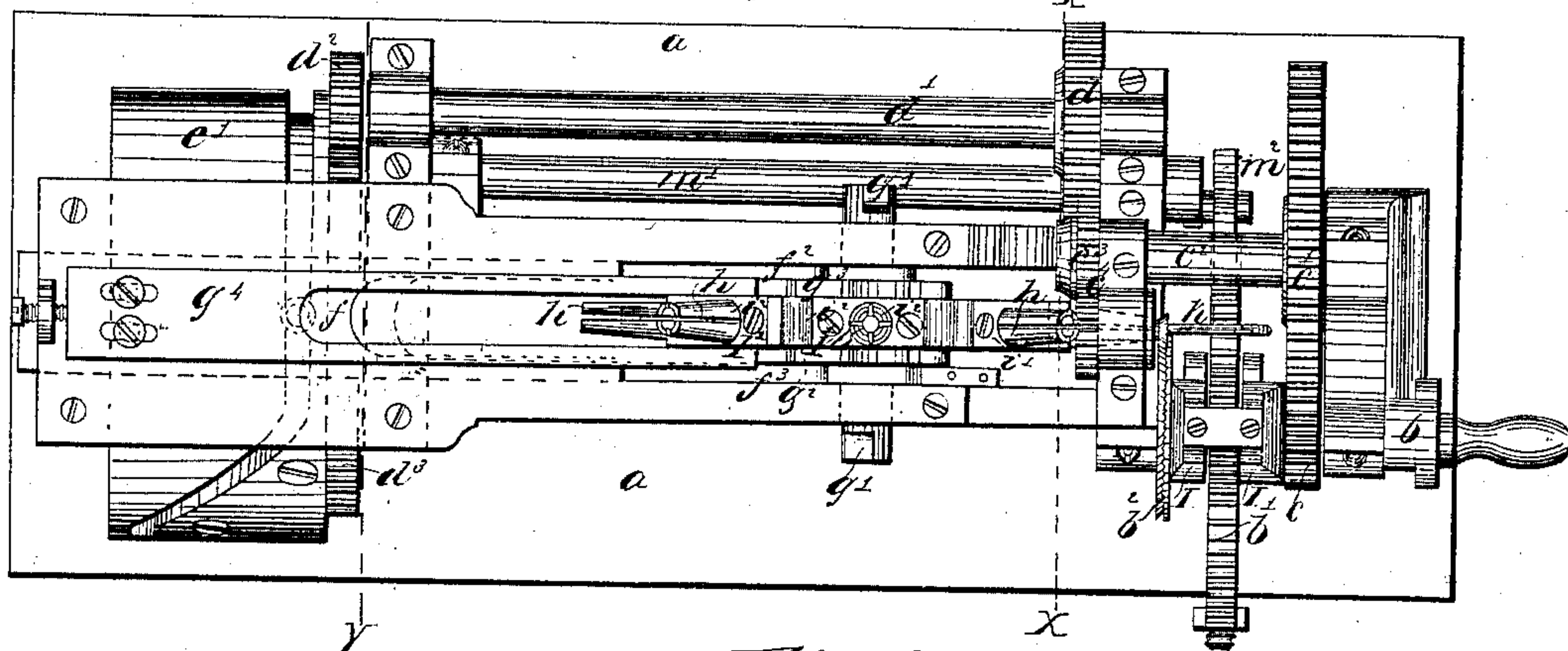
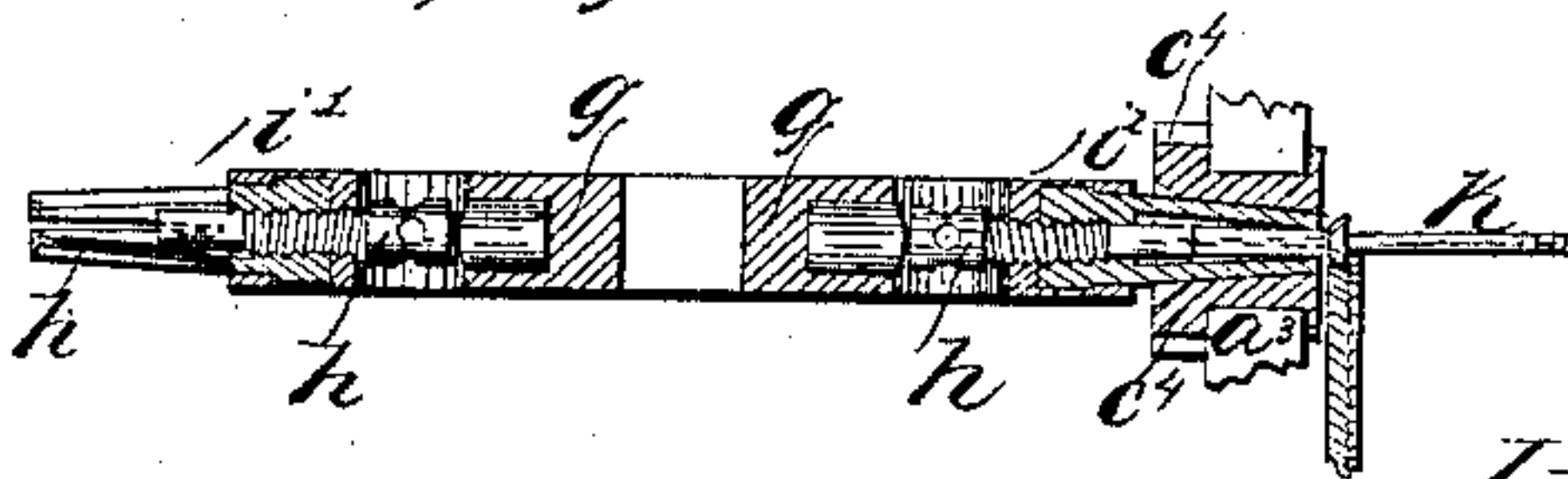


Fig: 3.



Witnesses:

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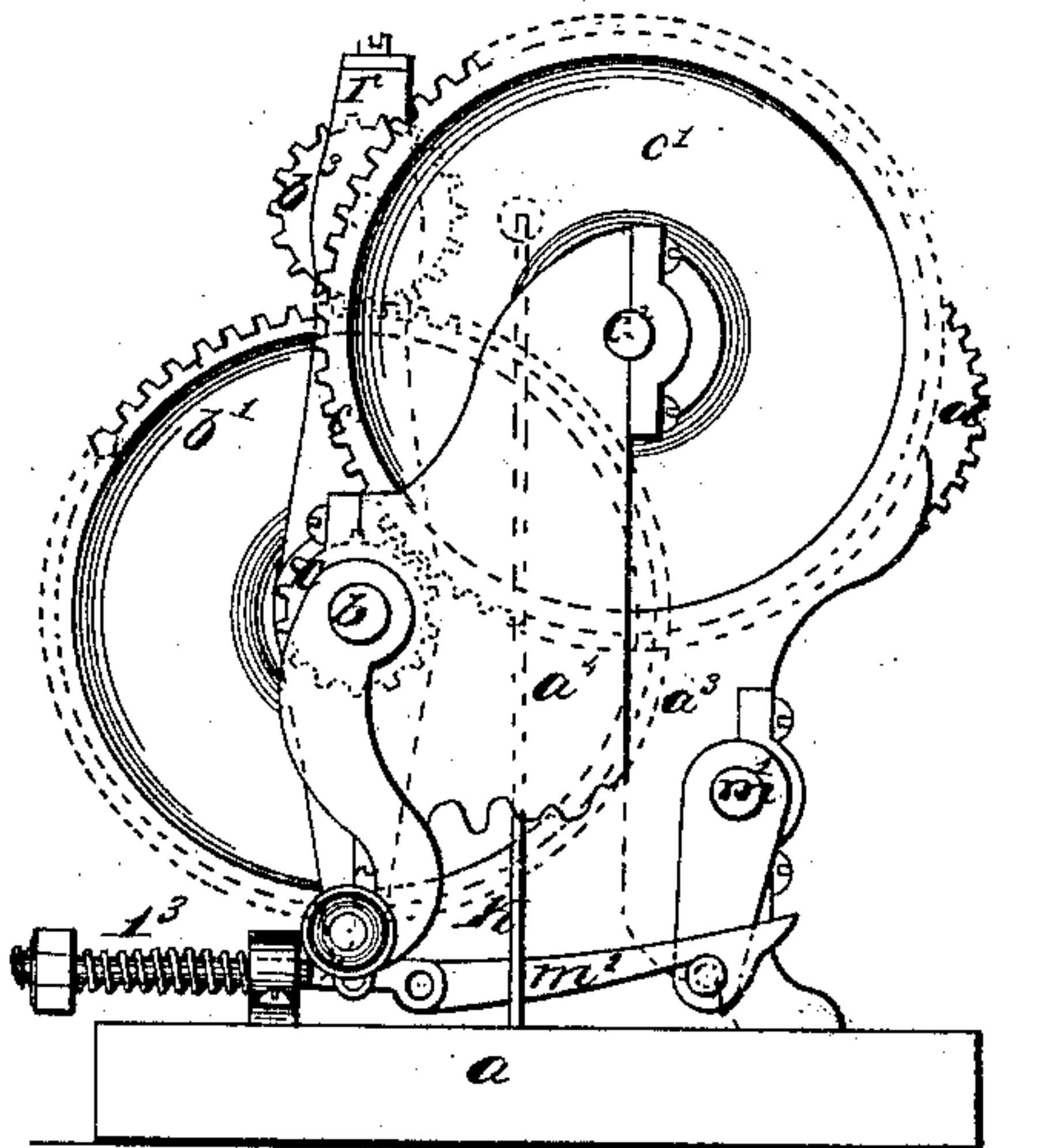
*H. A. Harvey,* 2 Sheets, Sheet 2.

*Shaving Screw-Blank Heads.*

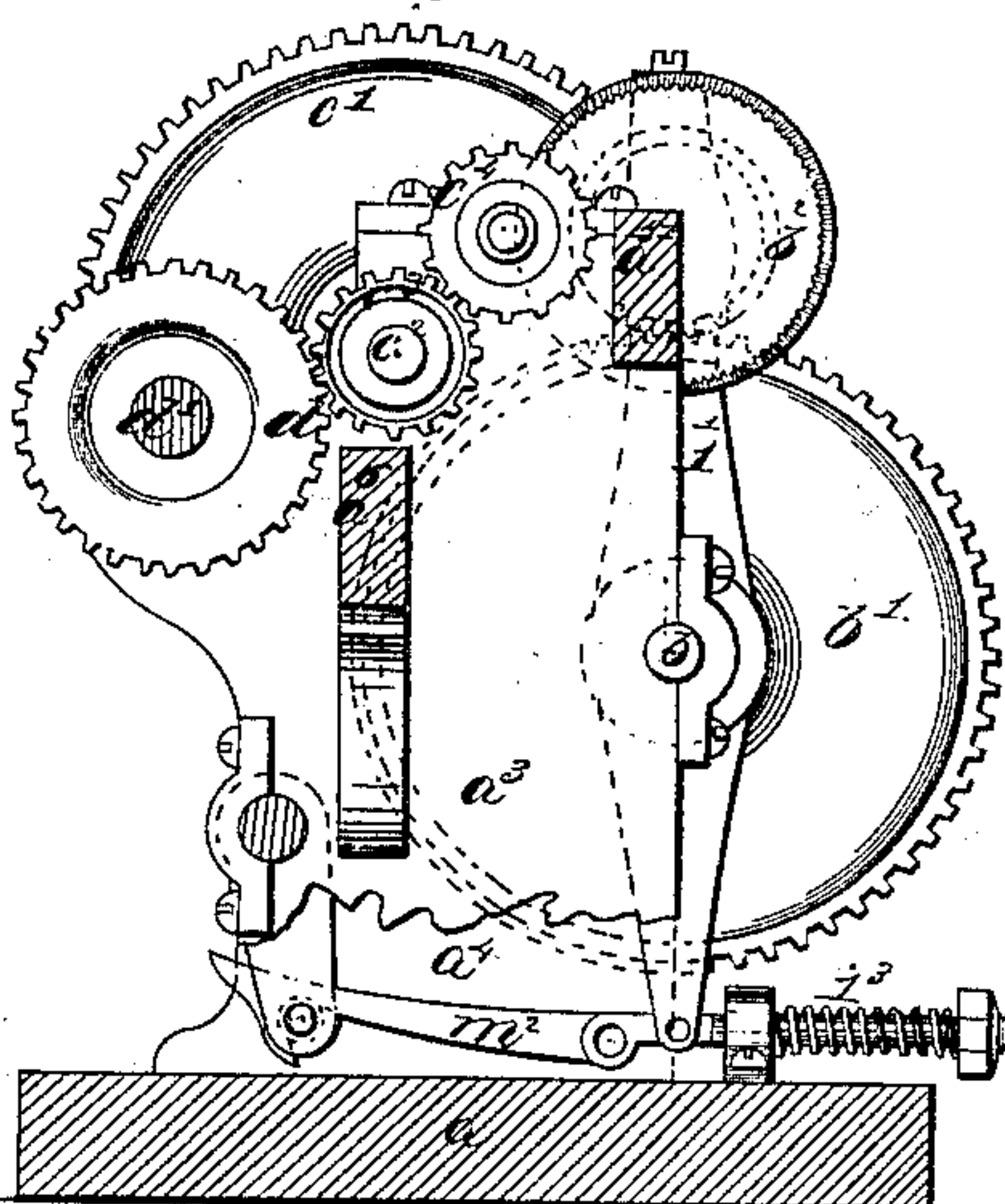
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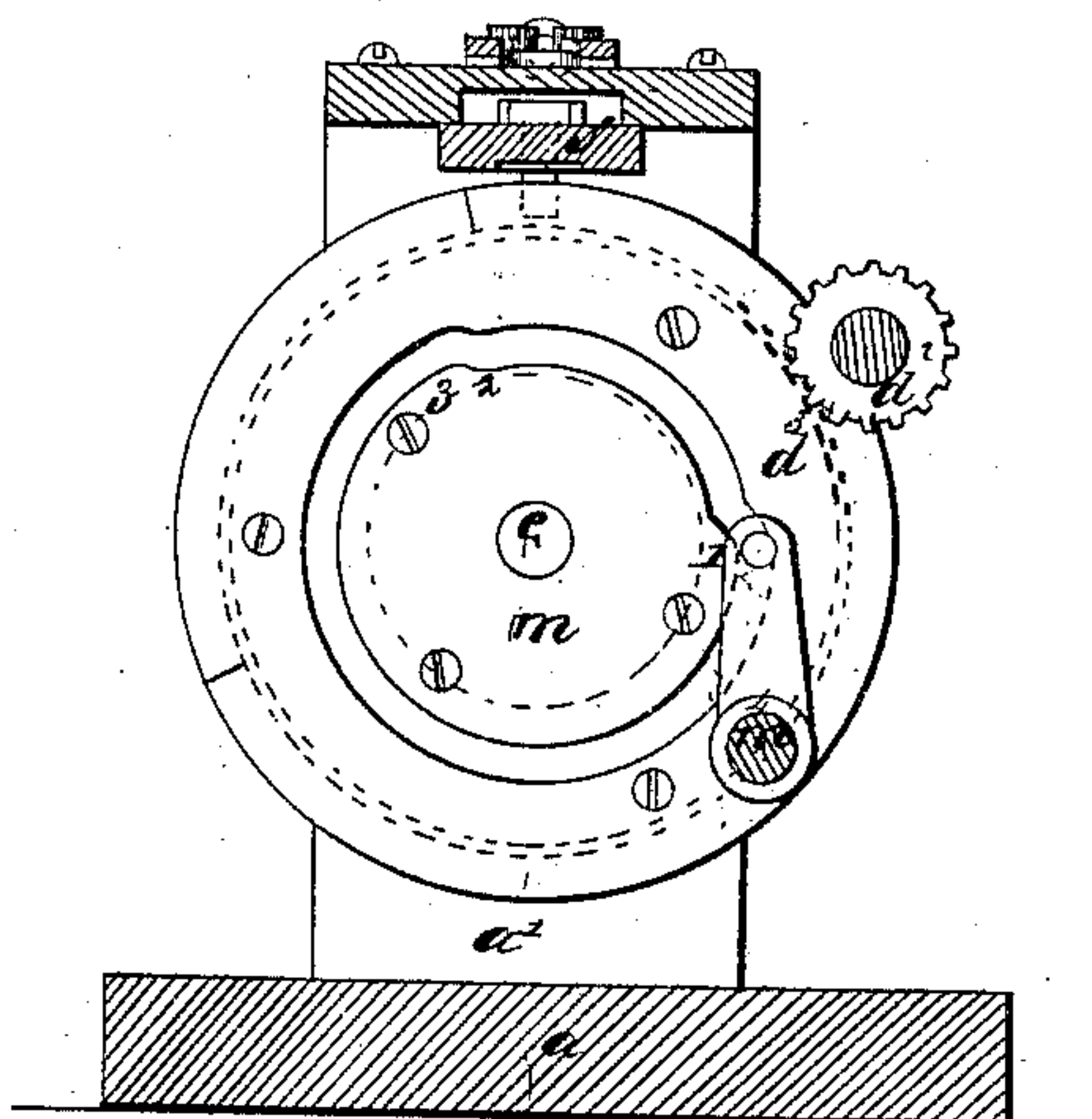
*Fig: 4.*



*Fig: 5.*



*Fig: 6.*



*Witnesses:*

*Chas. Blum  
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*Inventor:*

*H. A. Harvey*



# UNITED STATES PATENT OFFICE.

H. A. HARVEY, OF NEW YORK, N. Y.

## IMPROVEMENT IN SHAVING THE HEADS OF WOOD-SCREWS.

Specification forming part of Letters Patent No. 44,723, dated October 18, 1864.

*To all whom it may concern:*

Be it known that I, H. A. HARVEY, of New York, in the county and State of New York, have invented an Improved Machine for Shaving the Heads of Screw-Blanks, of which the following is a specification.

My invention consists of a machine for turning or shaving the heads of screw-blanks, and embraces the following features: First, an arrangement of mechanism whereby the screw-blank is revolved with more or less speed and submitted to the action of a circular cutter revolving at different rates of speed; and, secondly, the same mechanical arrangement for revolving the blank in connection with the ordinary V tool having a radial feed in the usual manner.

For the purpose of illustrating my invention it will be sufficient to describe one of its forms, from which the others will be readily understood. I have selected for this purpose the plan of cutting or shaving the head of the screw-blank while slowly turning upon the periphery of a swiftly-revolving circular cutter.

In this case the periphery of my cutter is provided with a groove, a cross-section of which corresponds to the outline of one-half of the head of a screw. The blank is presented and held in proper position for shaving in a spring-holder having the shape externally of a truncated cone, this holder bored out in the center and slit longitudinally into several parts, which are made to spring open, thereby enlarging the cavity so that it will easily receive the blank. The distance to which the head of the blank projects is regulated by a set-screw in the bottom of the holder, upon which the blank rests. The holder is contrived so that it can revolve around its longitudinal axis by the frictional influence of a constantly-revolving socket or collar, into which it is pushed with a sufficient degree of force to compress the several parts of the holder upon the blank. The aperture in the socket being tapering, in conformity to the conical shape assumed by the holder when gripping the blank, the friction of the socket upon the holder and the holder upon the blank causes the holder and blank to be revolved with the socket. While the blank is thus revolving, the circular cutter approaches and the teeth in its periphery cut away the

metal from the head of the blank until the desired size and shape is attained, when the cutter retires, and the holder, being withdrawn from the socket, springs open, so that the blank may drop or be taken out and another one be deposited therein, and so on.

The drawings accompanying and forming a part of this specification, embracing two sheets, represent a machine with a series of eight holders combined radially upon a center or hub, so that they may be successively and alternately projected into and withdrawn from the revolving socket just described.

This mode of arranging and combining the holders I have adopted in several machines for similar purposes, which have been the subject of patents heretofore. I therefore confine my description and claims in this application to the particular features of the machine to which I have alluded.

In Sheet No. 1, Figure 1 is a front elevation of my machine. Fig. 2 is a top view of the same. Fig. 3 is a transverse section of the wheel carrying the holders, and also of the revolving collar, showing the blank in position to be operated upon by the cutter. In Sheet No. 2 Fig. 4 is an end view of the machine. Fig. 5 is a cross section of the same through the line *x x*, Figs. 1 and 2; and Fig. 6 is a cross-section through the line *y y* on Figs. 1 and 2.

Similar letters of reference indicate corresponding parts in all the figures.

The frame of the machine consists of a bed-plate, *a*, from which arise four uprights, *a'*, *a''*, *a'''*, and *a''''*, the two inner uprights, *a''* and *a'''* being joined together by bridges *a<sup>5</sup>* and *a<sup>6</sup>*. The driving-shaft *b* carries a large spur-wheel, *b'*, which drives the cutter *b<sup>2</sup>* by the pinion *b<sup>3</sup>*, and a small spur-wheel, *c*, which meshes into the larger wheel, *c'*, upon the short counter-shaft *c<sup>2</sup>*. On the inner end of this shaft is another small spur-wheel, *c<sup>3</sup>*, which upon one side meshes into teeth upon the periphery of an annular wheel, *c<sup>4</sup>*, the latter being the revolving collar or socket to which I have alluded. On the other side the spur-wheel *c<sup>3</sup>* meshes into the wheel *d* upon the long counter shaft *d'*, which carries upon its opposite end a pinion, *d<sup>2</sup>*, meshing into the gear *d<sup>3</sup>* upon the cam-shaft *e*, which is speeded so as to make one revolution each time a blank is shaved. By the movement of the cam *e'* a backward and forward sliding motion is imparted at the proper



time to a carriage,  $f$ , by means of the cam-pin  $f'$ . This carriage, which rests upon the top of the uprights  $a'$  and  $a^2$ , and upon the bridges  $a^5$  and  $a^6$ , has two arms,  $f^2$  and  $f^3$ , which embrace the carrying-wheel  $g$  and support the shaft  $g'$ , upon which the carrying-wheel is mounted. On each side of the carrying-wheel are ratchet-wheels  $g^2$  and  $g^3$ , having the same number of teeth as there are holders upon the carrying-wheel. When the carriage is drawn partly back, these ratchets strike the stationary spring-dog  $g^4$ , and as the backward motion continues the carrying-wheel is thus made gradually to rotate upon its axis, so as to bring another holder in proper position to be forwarded to the revolving socket  $c^4$ . These holders  $h$  are merely short tubes tapered on the outside for a portion of their length, and slit longitudinally to give them elasticity, having set-screws  $h'$  inside, upon which the blank rests. Fig. 3 shows the manner of attaching them to the hub or carrier  $g$ . Thus, it will be perceived, the base of the holder, which is larger in diameter than the rest of it, drops into a cylindrical cavity,  $i$ , Fig. 3, in the hub, and a cap,  $i'$ , with a hole through it, is then slipped down upon the holder and fastened to the hub by the screws  $i^2$ , &c. This cap forms a shoulder, which bears upon the base of the holder and retains it in place without preventing its turning.

In order to prevent the possibility of the blanks projecting too far from the holder, I have a yielding spring-finger,  $k$ , which stands in the center of the socket so as to meet the blank in its forward motion and press it home upon the set-screw  $h$  before it is gripped.

The cutter-shaft is mounted upon levers  $l$  and  $l'$ , which rock on the driving-shaft  $b$ , and are operated from the eccentric cam  $m$  by means of the rocker-shaft  $m'$  and link  $m^2$ . For this purpose the cam  $m$ , Fig. 6, has sufficient throw to draw and hold the cutter completely back from the blank while the carrying-wheel is changing its position, which is effected by that portion of the cam from 1 to 2. From 2 to 3 the cutter is permitted to approach the blank

until at the proper distance to commence cutting, in obedience to the impulse imparted to the levers  $l$  and  $l'$  by the spiral spring  $l^3$ . From 3 to 1 the cutter is permitted to very gradually approach the blank as it removes the superfluous metal therefrom, when the cutter is again drawn back, and at the same time the cam  $e'$  moves the carriage  $f$  back and forth, partially rotating the carrying-wheel and presenting another holder to the socket, and so on.

The blanks may be deposited in the holders by hand, or by any suitable automatic contrivance.

It is obvious that by a simple change or reversal of the gearing the blank may be made to revolve swiftly and the cutter slowly, or the common V-tool may be attached to the upper end of the levers  $l$  and  $l'$ , in place of the revolving cutter, dispensing, of course, in the latter case with the gears  $b'$  and  $b^3$ .

What I claim, and desire to secure by Letters Patent, is—

1. The revolving collar or socket  $c^4$ , or its equivalent, when adapted to perform the double office of compressing the spring-holder to grip the screw-blank and communicating a rotary motion to the same, constructed and operating in the manner substantially as described.

2. The combination of such revolving socket with a holder,  $h$ , or a series of similar holders, substantially as described.

3. The combination of the revolving socket and holder described with a cutting-tool, whether revolving or otherwise, substantially as herein specified.

4. The combination of the revolving socket and holder described with a yielding pressure-finger, or its equivalent, for pressing the blank home in the holder and keeping it in that position until it can be gripped, substantially as described.

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Witnesses:

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