

J. M. Carpenter.

Screw Cutting.

N^o 87,632.

Patented Mar. 9, 1869.

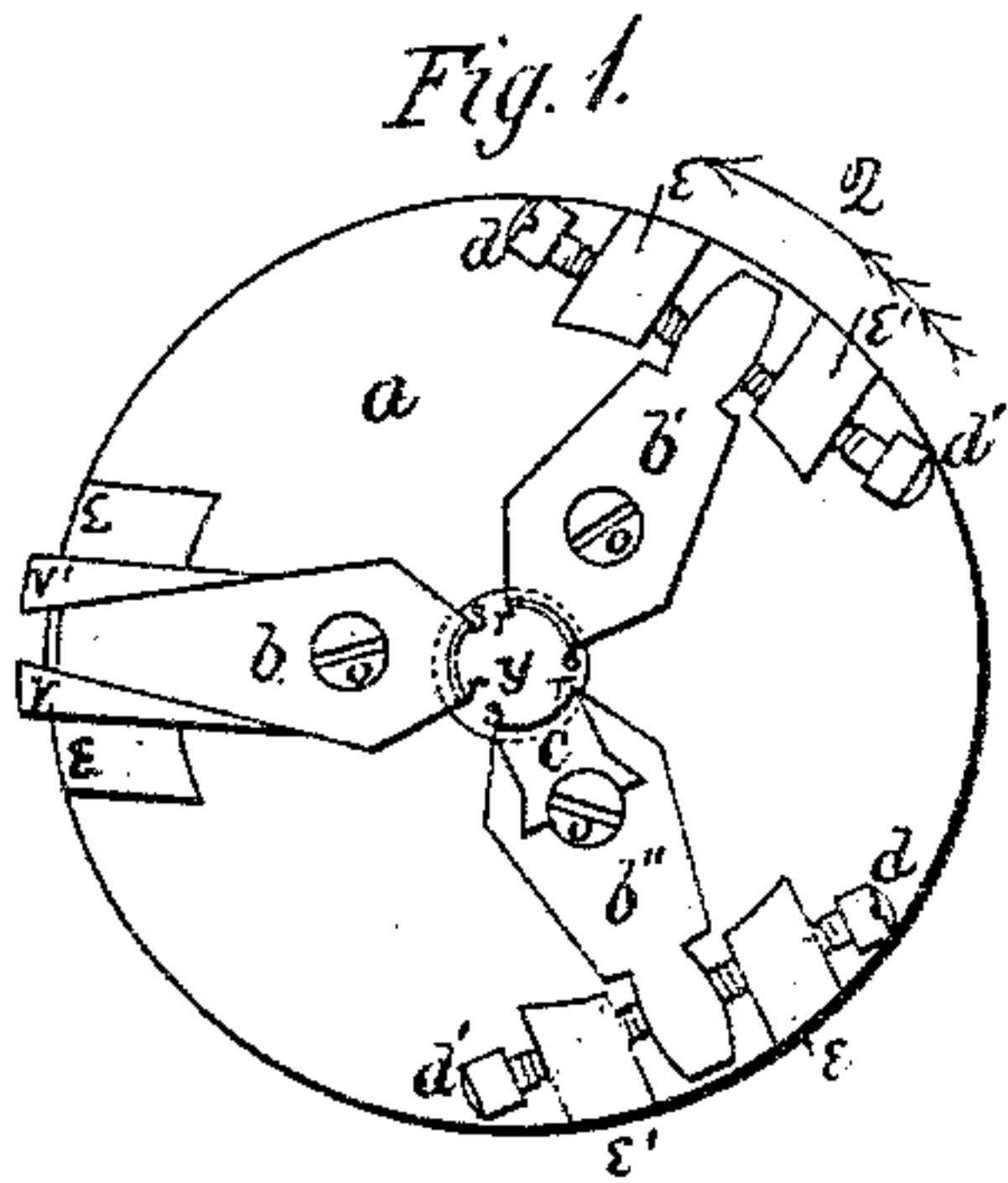


Fig. 1.

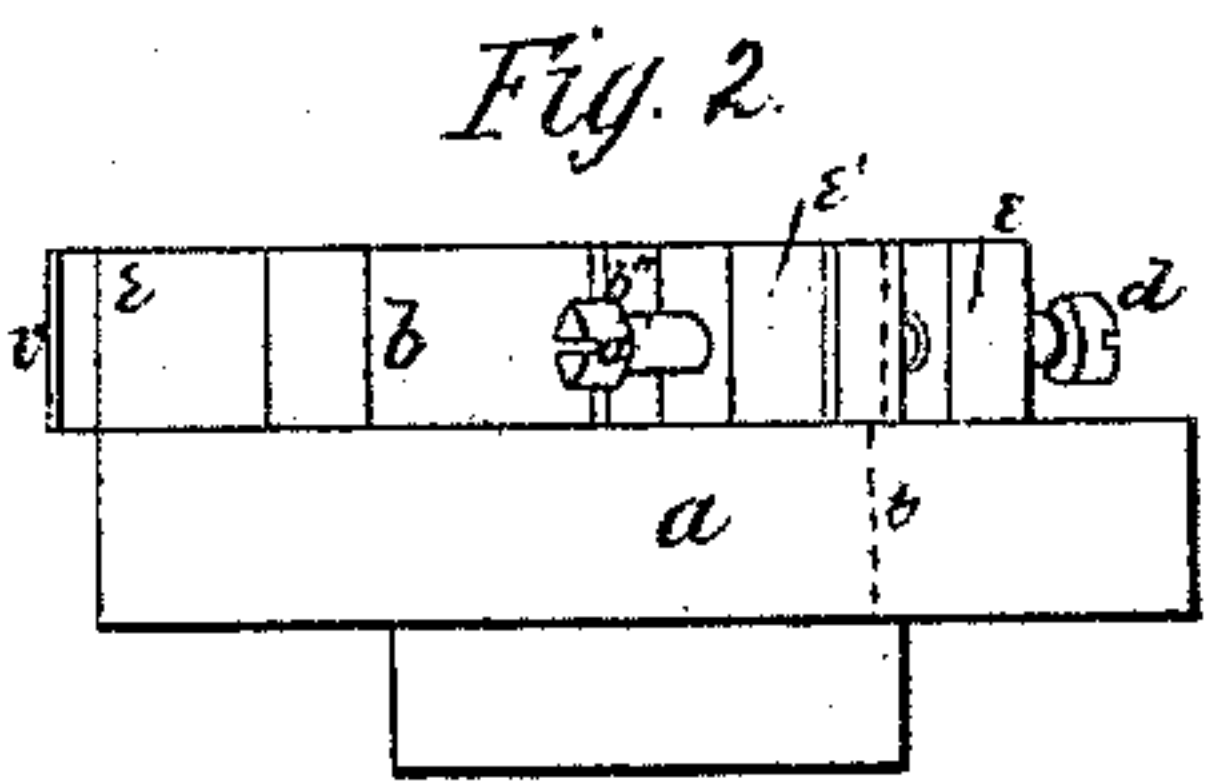


Fig. 2.

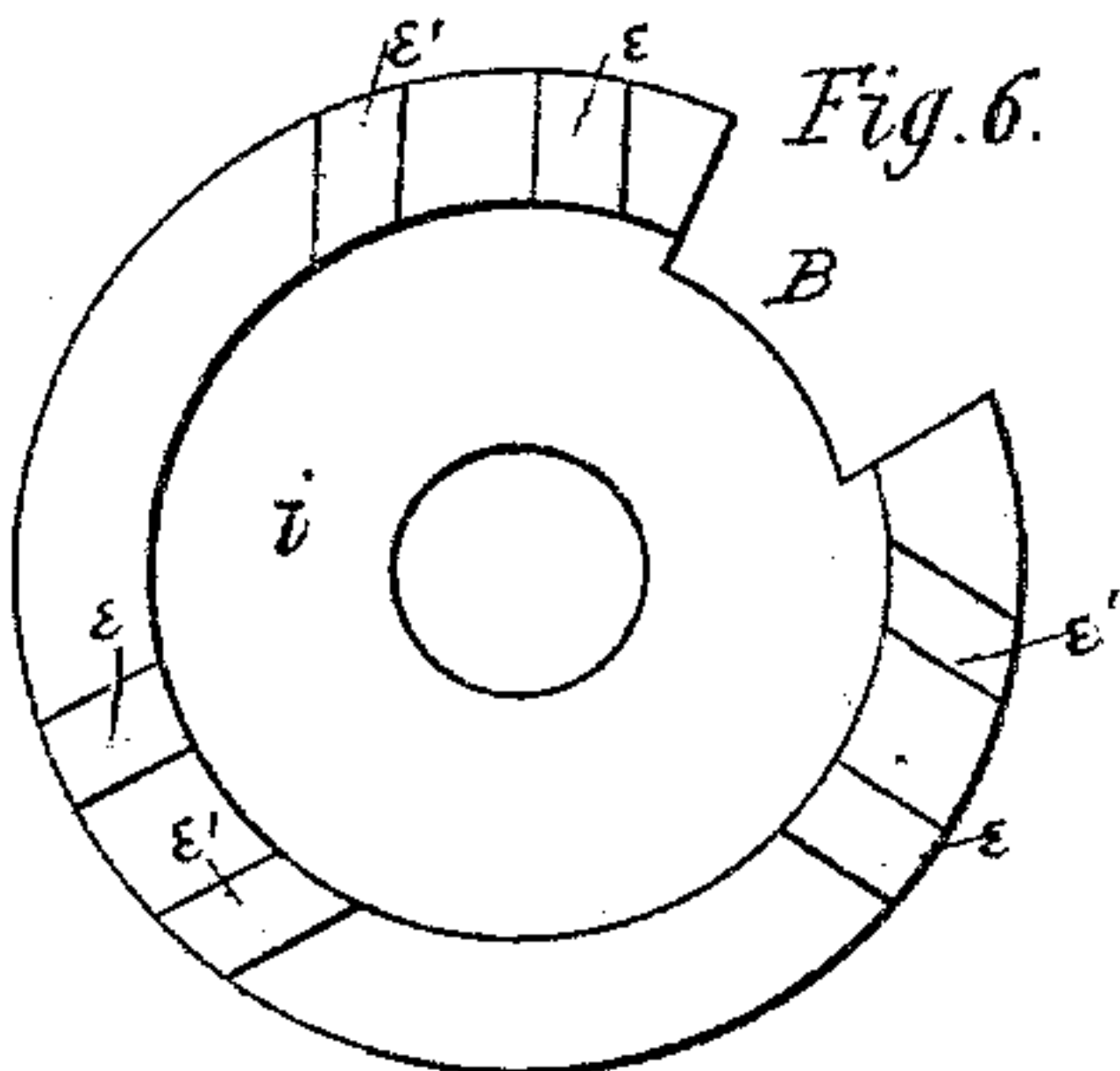


Fig. 6.

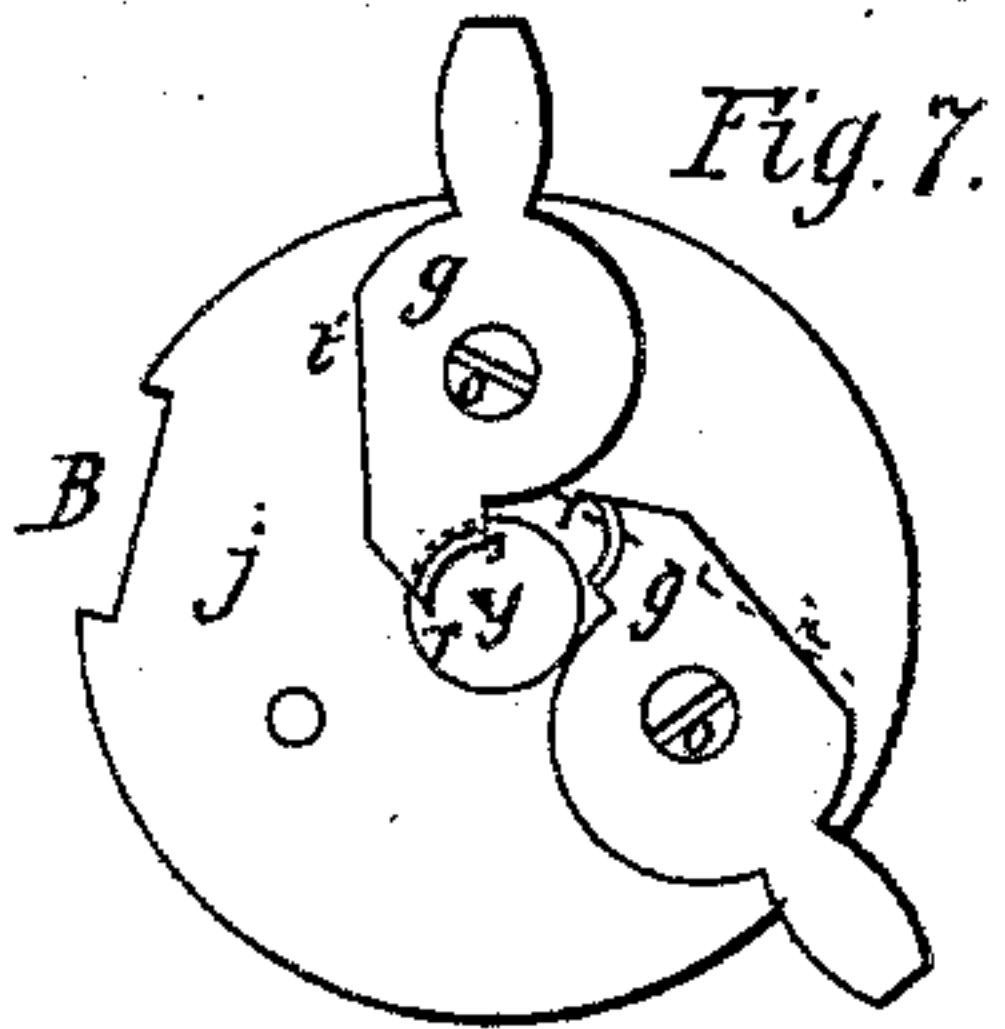


Fig. 7.

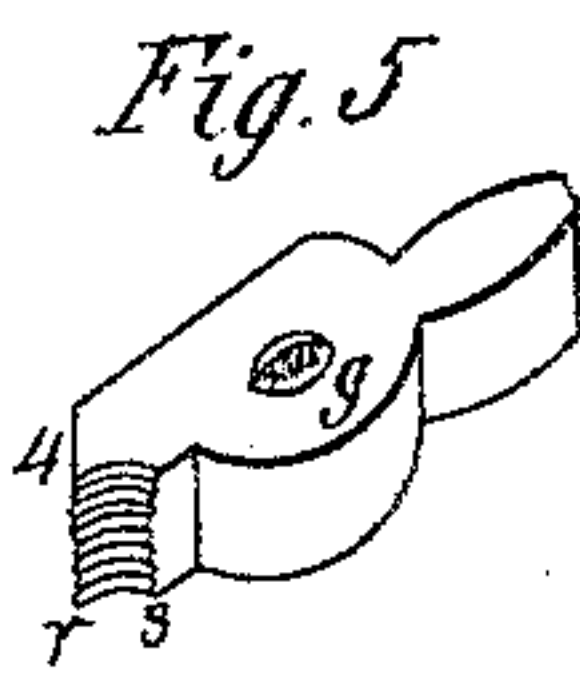


Fig. 5.

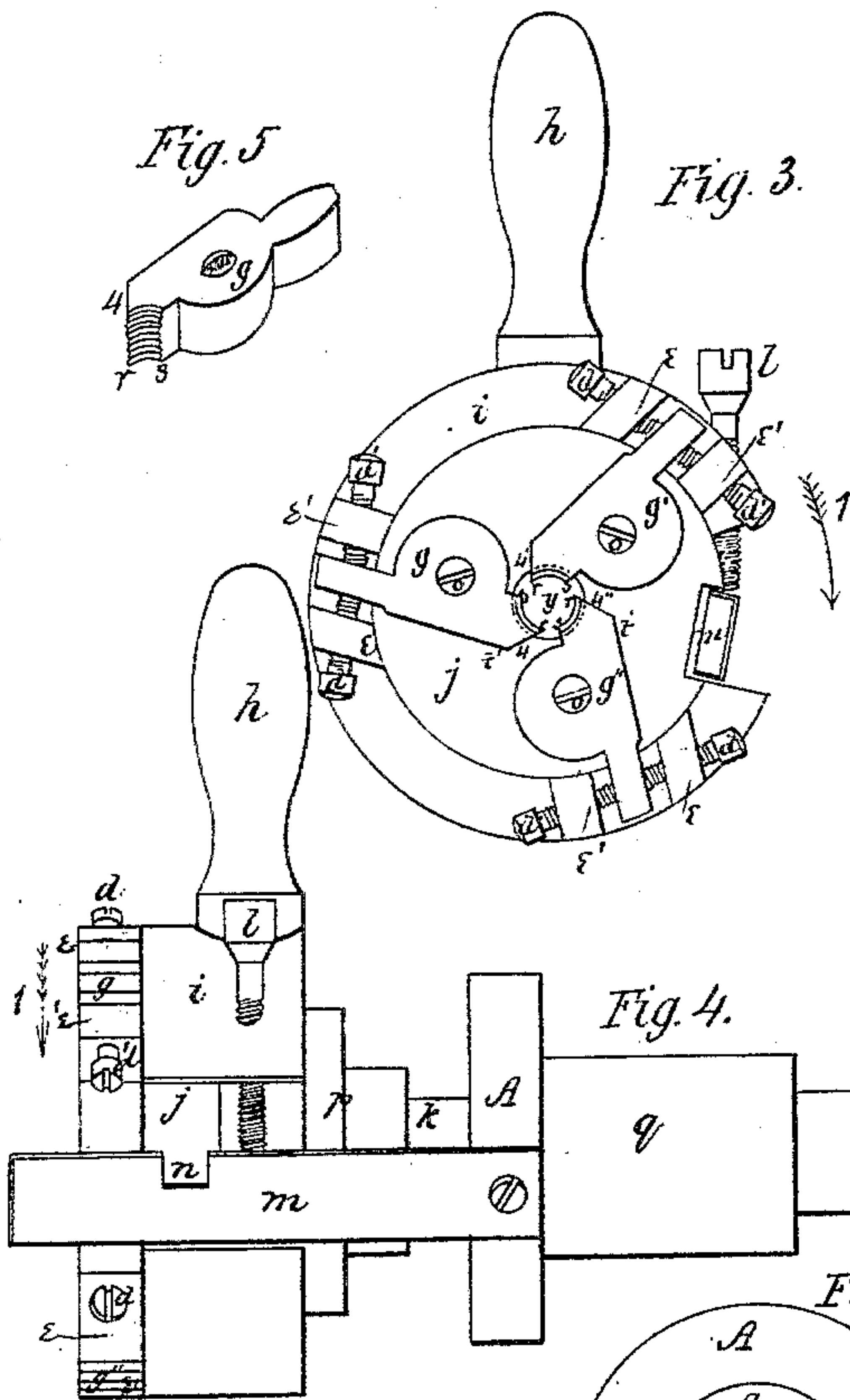


Fig. 3.

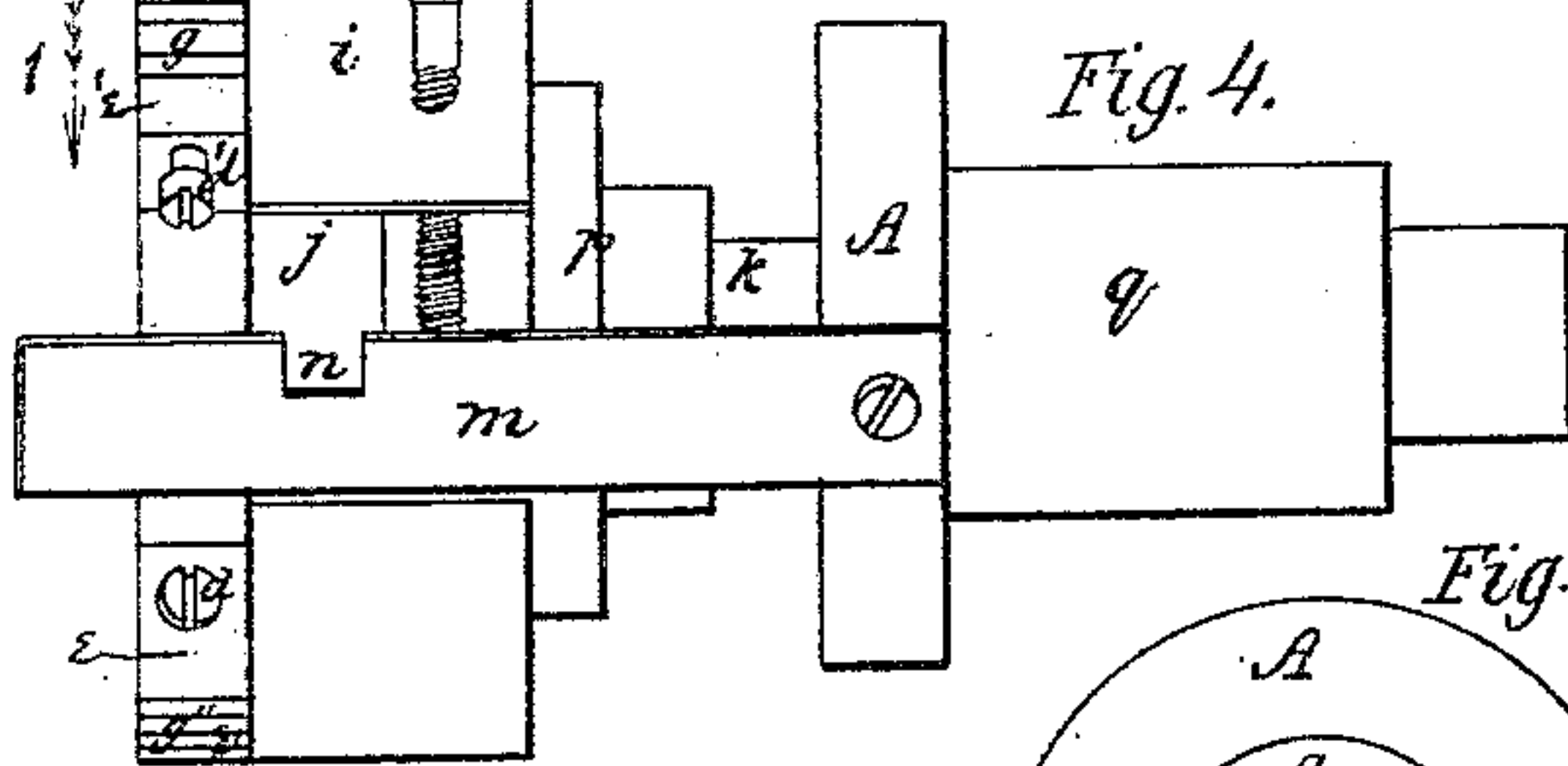


Fig. 4.

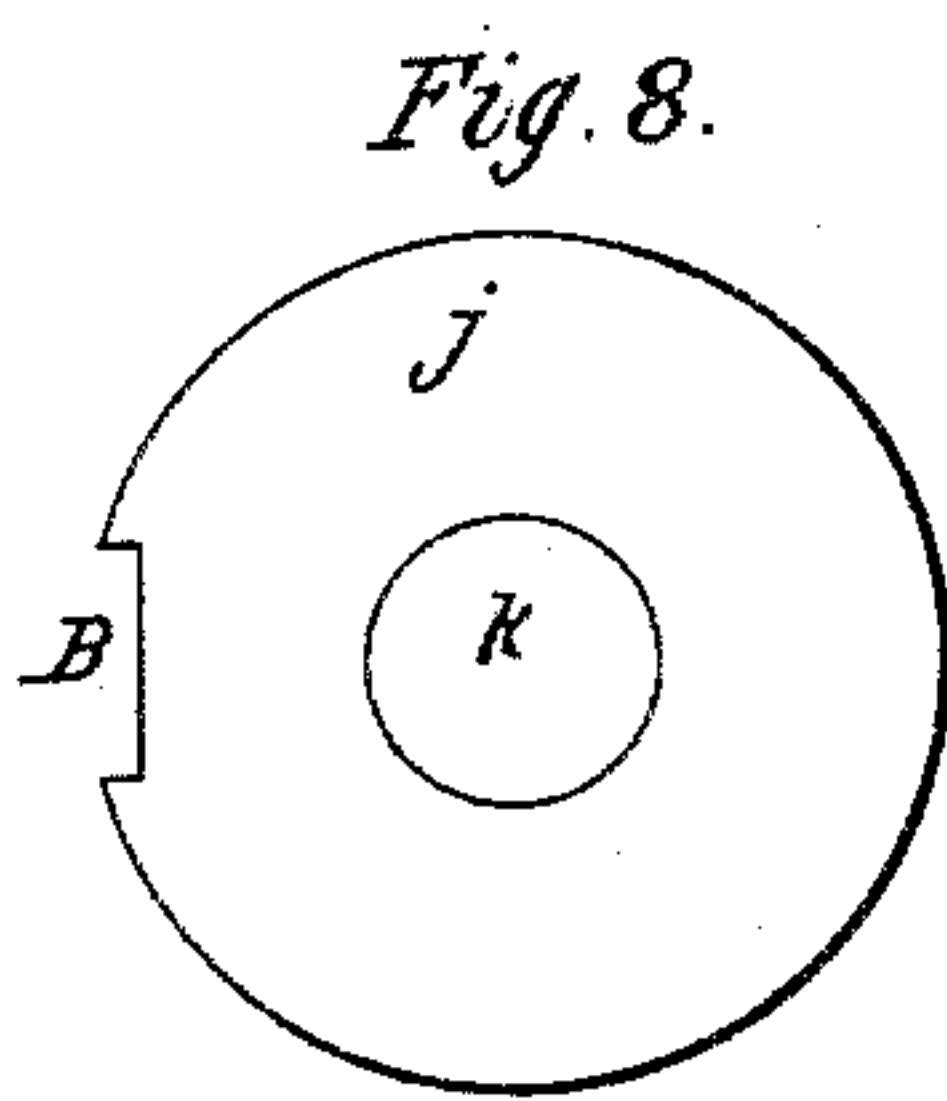


Fig. 8.

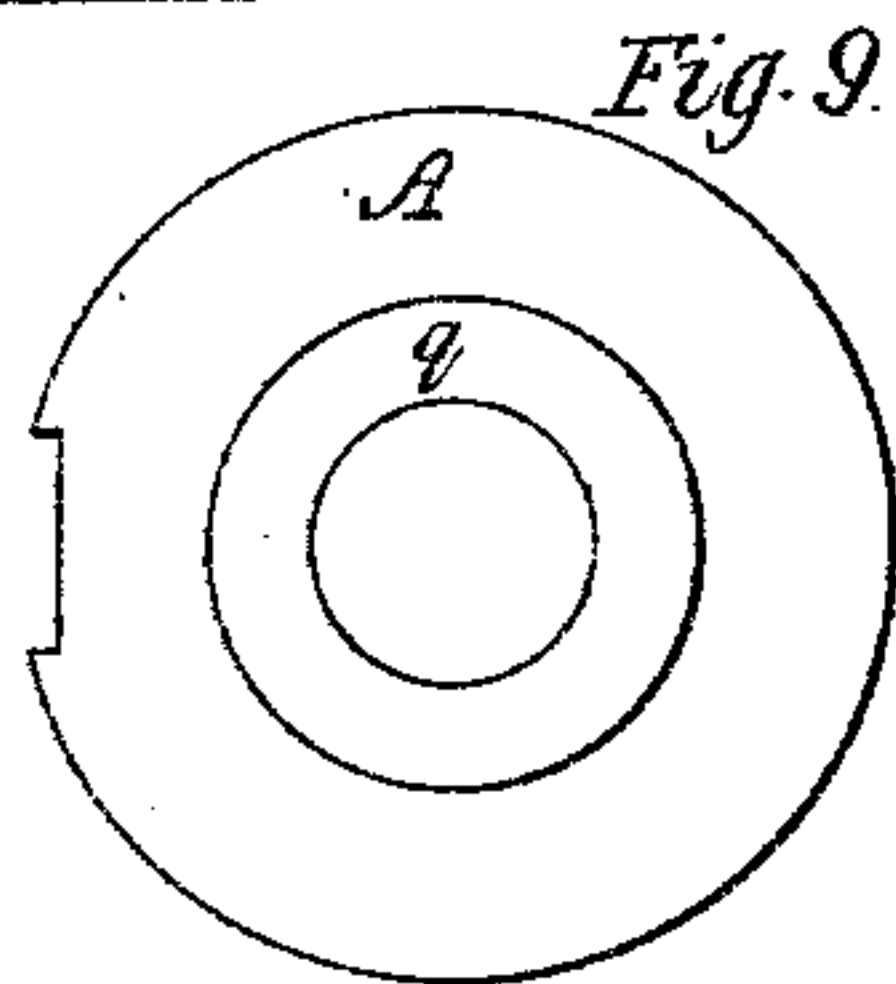


Fig. 9.

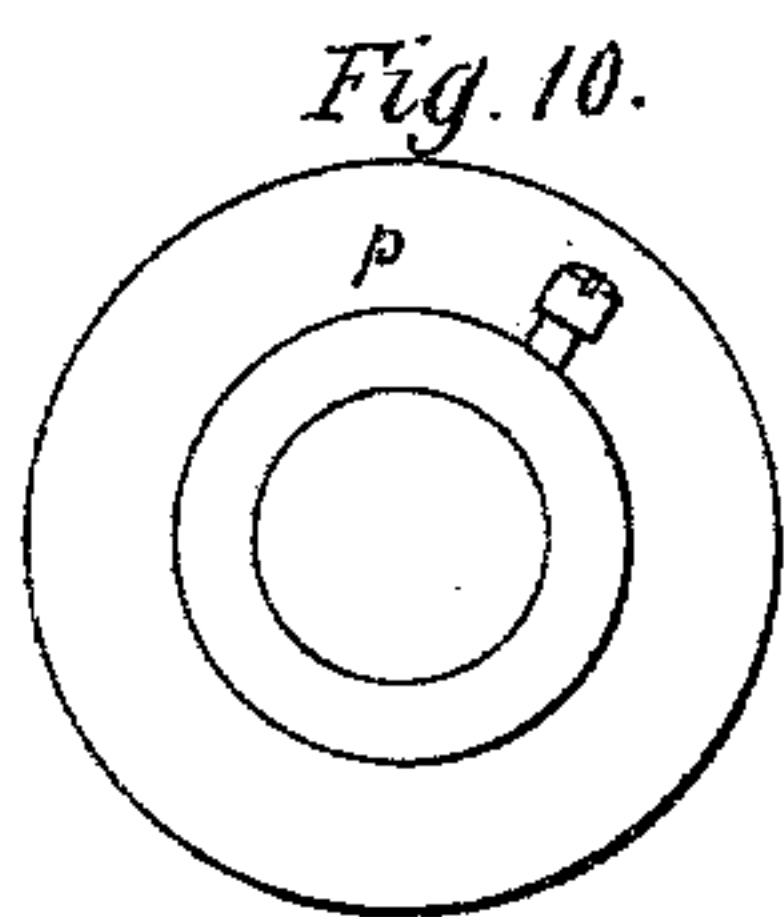


Fig. 10.

Witnesses.
John A. Hall
Lewis Hall

Inventor.
James M. Carpenter
By his atty *Liebnay Sanders.*

United States Patent Office.

JAMES M. CARPENTER, OF FLORENCE, MASSACHUSETTS.

Letters Patent No. 87,632, dated March 9, 1869.

IMPROVEMENT IN CUTTING THREADS ON PIPES, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, JAMES M. CARPENTER, of Florence, in the county of Hampshire, and State of Massachusetts, have made and invented certain new and useful Improvements in Machinery for Cutting Threads on Screws and the like; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which like letters mark like parts, and whereof—

Figure 1 is an end elevation, showing the segmental dies *b b'*, arranged on a single solid plate, *a*, such dies not being designed to "open" for withdrawal of the screw after the thread on the same is cut;

Figure 2, a side or edge elevation of the same;

Figure 3, an end elevation, showing the oscillating ring *i* surrounding the sliding head *j*, whereon are arranged the segmental dies *g g'*, designed to open for the withdrawal of the screw, after the thread thereon is cut;

Figure 4, a side elevation of the same, showing the bar *m*;

Figure 5, a perspective view of a detached segmental die, *g*;

Figure 6, an end elevation of ring *i*, detached from head *j*;

Figure 7, an end or face view of the sliding head *j*, whereon one segmental die, *g*, is in cutting-position, one, *g'*, is open or thrown back, as for removal of a screw, and all other parts detached;

Figure 8, an elevation of the opposite end of head *j*, all other parts being detached;

Figure 9, an end elevation of the stationary shell *q*; and

Figure 10, an end elevation of the collar *p*, which holds ring *i* in place.

My invention has for its object the more easy and perfect threading of screws, pipes, and the like; and

It consists in combining, with a head or holder, four pieces, more or less, of metal, having threads upon their inner ends, by means of screws or pivots, in such manner that they may be turned on their centres for the purpose of obtaining an adjustment of the forward, or cutting-edges of the cutters, and also of effecting, by the same movement, a clearance of the rear, or non-cutting edges thereof.

Heretofore sets of cutters composing a die have been used, arranged to slide radially in ways or grooves, for the purpose of opening the die, to release the screw, and they are efficient for this purpose. They have also been made with a curvature of the arc of a given circle, so that when slid inward radially, to act on a bolt, of a circumference less than that circle, they would give a proportionate clearance, which increased as the cutter approached the centre.

To enable others skilled in the art to practise my invention, I describe the same as follows:

In the accompanying drawings, the part marked *a* represents a single solid plate, to which are attached, by pivot-screws *o o o*, the segmental dies *b b'*, in the nature of equidistant radii, the outer ends of which are secured and controlled by screws *d d'*, or wedges *v v'*, in combination with the projections *e e'* which form a part of plate *a*.

Having thus secured blank dies in a proper position, I proceed to "tap out" the same, and having previously made a continuous straight line, *t*, across the end and side of die and plate, that I may always determine the exact position of each segment when "tapped out," I then loosen screws *d* or wedge *v* slightly, and tighten screw *d'* or wedge *v'* correspondingly, thus moving the outer ends of dies *b b'* in the direction indicated by arrow 2, whereby it is obvious that the forward, or cutting-edge *r*, of each segmental die, is moved toward the centre, *y*, of plate *a*, while the rear, or non-cutting edge *s*, recedes therefrom. But this variation of the cutting and non-cutting edges of the dies should be very slight, for instance, the half of a thousandth of an inch, or just enough to obtain what I term a "clearance," whereby the friction incident to cutting screw-threads is greatly reduced.

If the threads in the dies become worn, the edge *r* is easily sharpened by grinding-faces *4 4' 4''*, and then the cutting-edge *r* may be advanced by turning the die-lever on its centre for the purpose of adjusting it to its former position.

Segment *b'* is designed to represent a "holder," the inner end of which is provided with a dovetail slot, wherein is arranged a removable die, *c'*, and the die *c* may vary in length from pivot *o*, and in thickness of "thread," thus affording the means of cutting large or small screws by simply changing the part *c*.

My invention is designed to be used in connection with a "Brown & Sharp" screw-machine, or other similar machines, in which the blank, whereon a thread is to be cut, is made to revolve in a "chuck," while the thread-cutting dies have no revolving motion; but after cutting a thread by the above-described device, the screw must be removed therefrom by a reverse motion of the "chuck," which takes time, and often injures or destroys the thread. And to obviate these objections, I have made and invented an "opening"-die or device, in which segmental dies *g g'* are attached, by pivot-screws *o o o*, to the sliding head *j*.

Surrounding head *j* is an oscillating ring, *i*, provided with projections *e e'*, &c., through which pass the screws *d d'*, &c., whereby are held and controlled the outer ends of dies *g g'*, and these dies, held fast on head *j*, are "tapped out," as above described, and their position, when so "tapped out," may always be determined by the line *t*, marked against the straight sides thereof, on the face of head *j*.

The ring *i*, fitting shank *k*, is held in proximity to head *j* by the collar *p*, surrounding such shank, and whereon it is made fast by a common set-screw.

q is a shell surrounding shank *k*, and made fast in the "screw-head," so called, of a screw-machine.

To the flange A of shell *q*, I make fast a straight bar, *m*, wherein is a notch, *n*.

The bar *m* passes through a slot, B, on one side of ring *i* and head *j*, whereby they are prevented from rolling, while shank *k* slides freely in and out of shell *q*.

Entering slot B of ring *i*, is a large screw, *l*, by which is regulated the length of the thread to be cut, and the distance which ring *i* shall be allowed to oscillate.

h is a handle for operating ring *i*.

While a screw is being threaded, the blank is made to revolve in a "chuck," the "thread" in the die serving as a "feed," and drawing the thread-cutting apparatus nearer such chuck, till the large screw *l*, which rests on and slides along bar *m*, reaches notch *n*, when the ring *i* is oscillated in the direction indicated by arrow 1, whereby the dies *g g' g''* are opened or thrown into position of die *g'*, fig. 7, and the screw is then removed, without loss of time or injury of thread. Ring *i* is now oscillated in the opposite direction, bringing dies *g g' g''* again into cutting-position. Shank *k* is slid back into shell *q*, and the process repeated.

In forming "opening" segmental dies *g g'*, &c., the thread-cutting parts thereof must be less than a semi-circle, and made wholly on one side of a straight line, passing through the centres of head *j*, and any pivot-screw *o*; otherwise, it is obvious, such dies could not be opened.

I prefer three segmental dies, as herein shown, but one, two, or more, may be used.

The tooth of the "opening"-dies, or that part between the screws *d d'*, should be made curved on opposite sides, and the ends of such screws, a little rounded,

in order that the dies may open freely, and still be without "play."

The various forms and methods of application, herein shown, I consider one and the same in principle, and all equally of my invention.

I am aware that screw-threaders, having a portion of their inner ends cut away, for clearance, have been swung on centres, and have been provided with means for adjustment on such centres. Such a threader, I do not claim; but having thus described the construction and operation of my improved device for cutting threads on screws and the like,

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

1. As my improvement of screw-threading dies, conjointly, the attachment of said dies, by pivots, to the die-stock, a series of longitudinally-concave cutting-threads, of equal height throughout their entire length, and terminated at any angle to the curvature of said threads, in the plane of the straight-bevelled surface of the die-block, substantially as represented by fig. 4, and mechanism for adjusting said dies, to give clearance, and to retain them firmly in position when so adjusted, substantially as set forth.

2. Also, in combination with the dies, made and pivoted to the head-stock, as described, the oscillating ring and the adjusting set-screws, or their equivalent, the wedges, substantially as described.

3. The notched arm *m*, in combination with the shell *q*, ring *i*, and head *j*, substantially as and for the purpose described.

JAMES M. CARPENTER.

Witnesses:

ROBT. H. ALDRICH,
A. PERRY PECK.