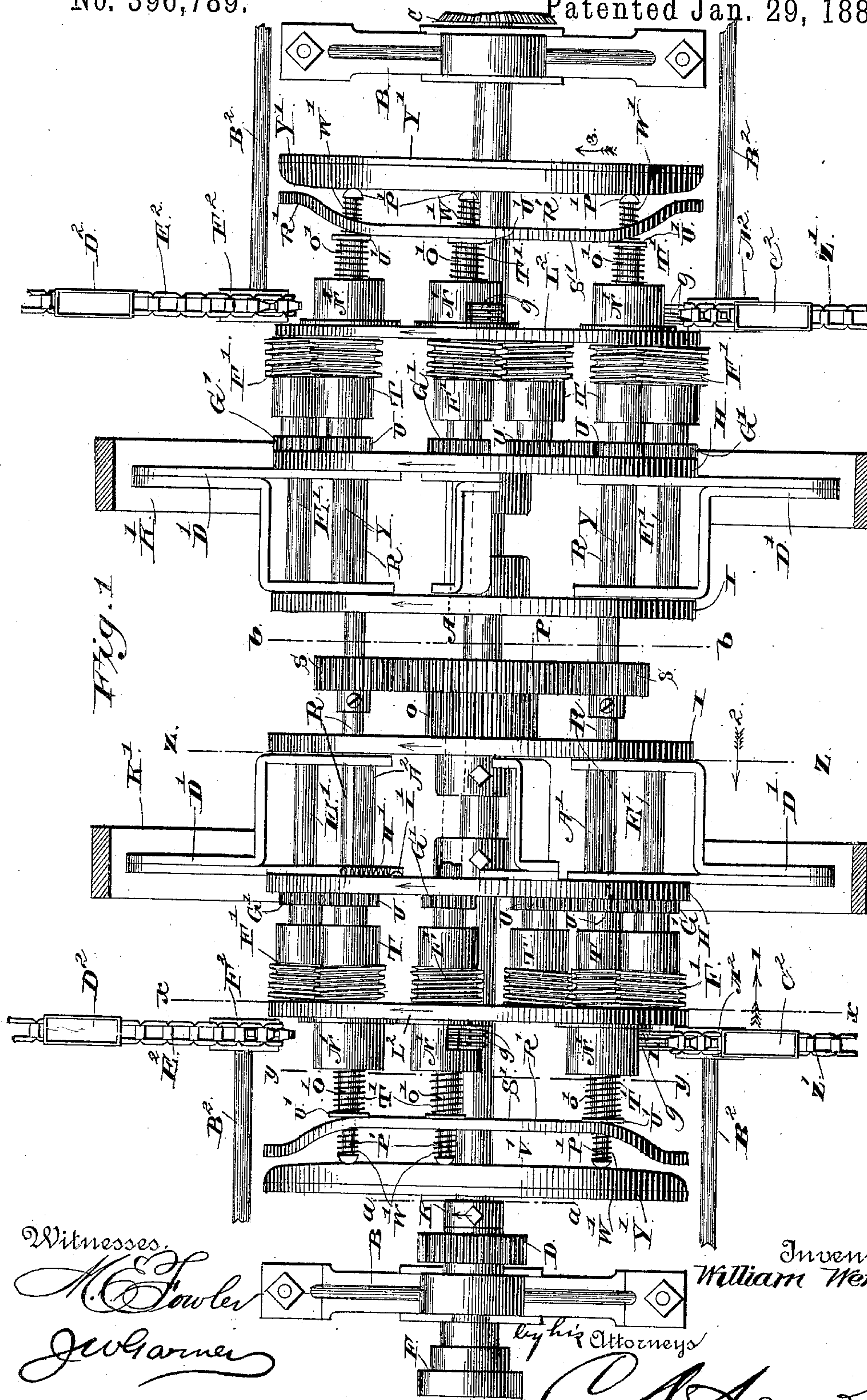


6 Sheets—Sheet 1.

# MACHINE FOR THREADING SHEET METAL RINGS.

No. 396,789.

Patented Jan. 29, 1889.



N. FETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

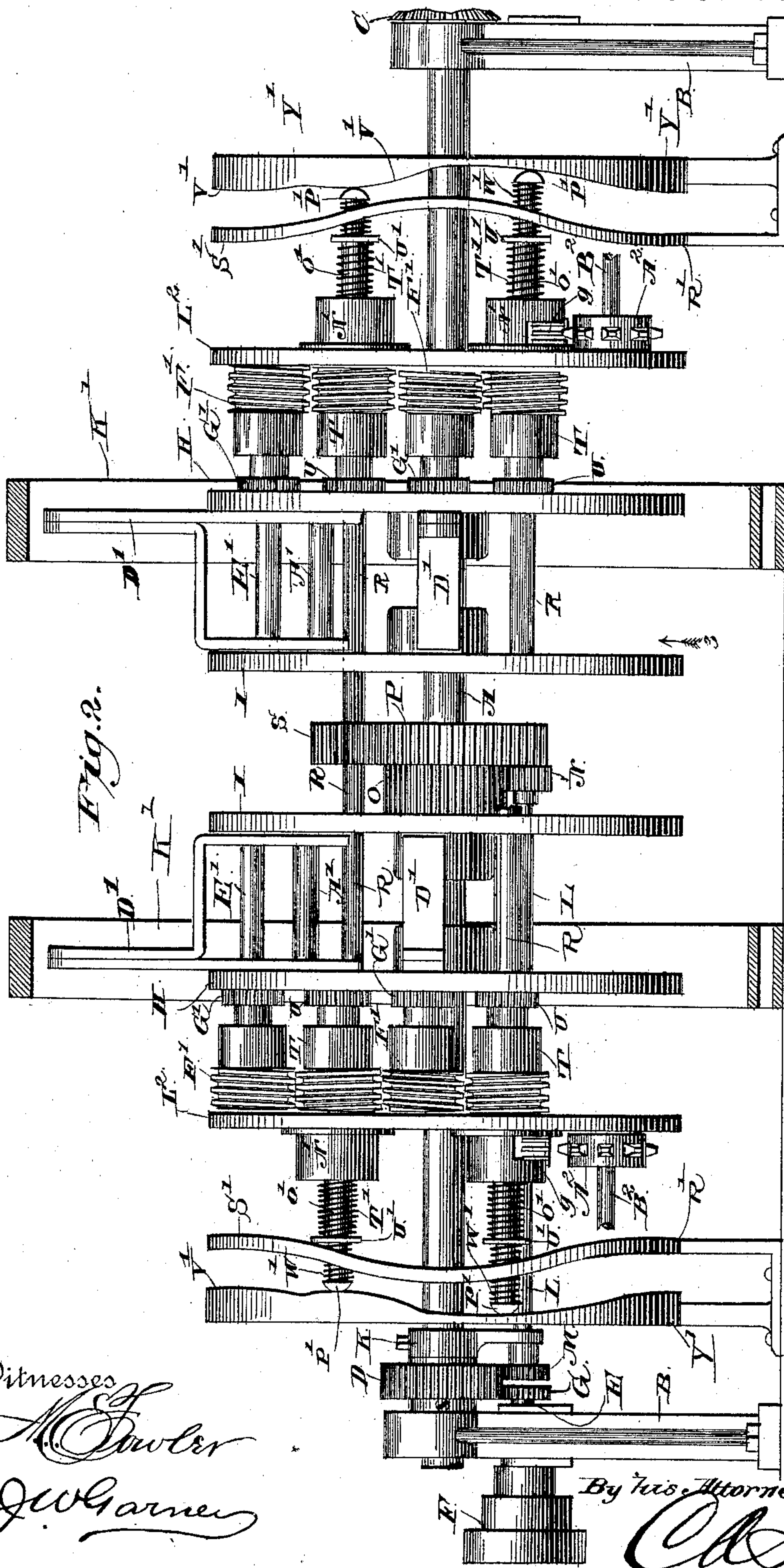
6 Sheets—Sheet 2.

W. WERTS.

MACHINE FOR THREADING SHEET METAL RINGS.

No. 396,789.

Patented Jan. 29, 1889.



Witnesses  
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*William Werts.*

By *his* Attorneys

*C. A. Snow*



(No Model.)

6 Sheets—Sheet 3.

W. WERTS.

MACHINE FOR THREADING SHEET METAL RINGS.

No. 396,789.

Patented Jan. 29, 1889.

Fig. 3.

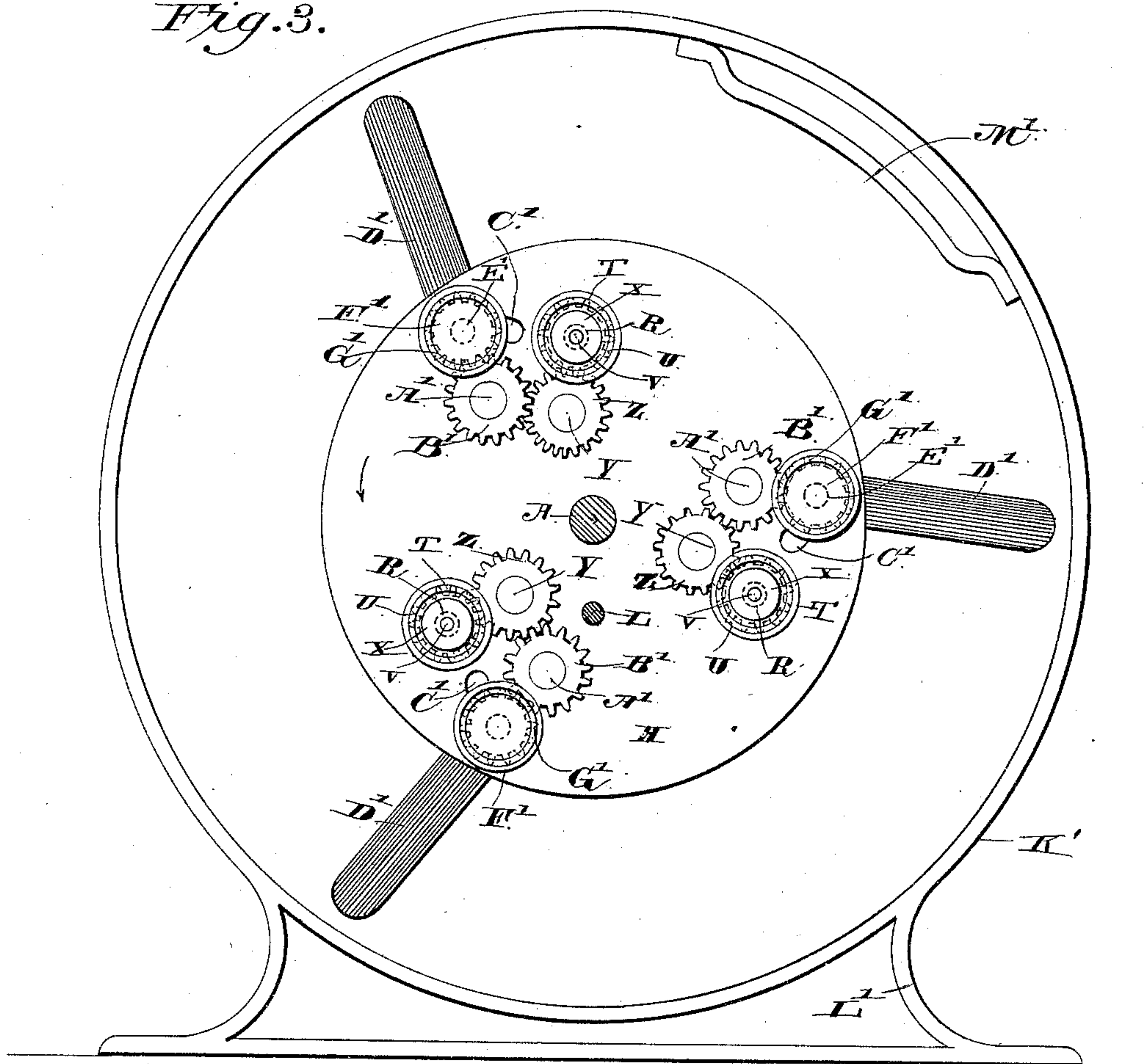
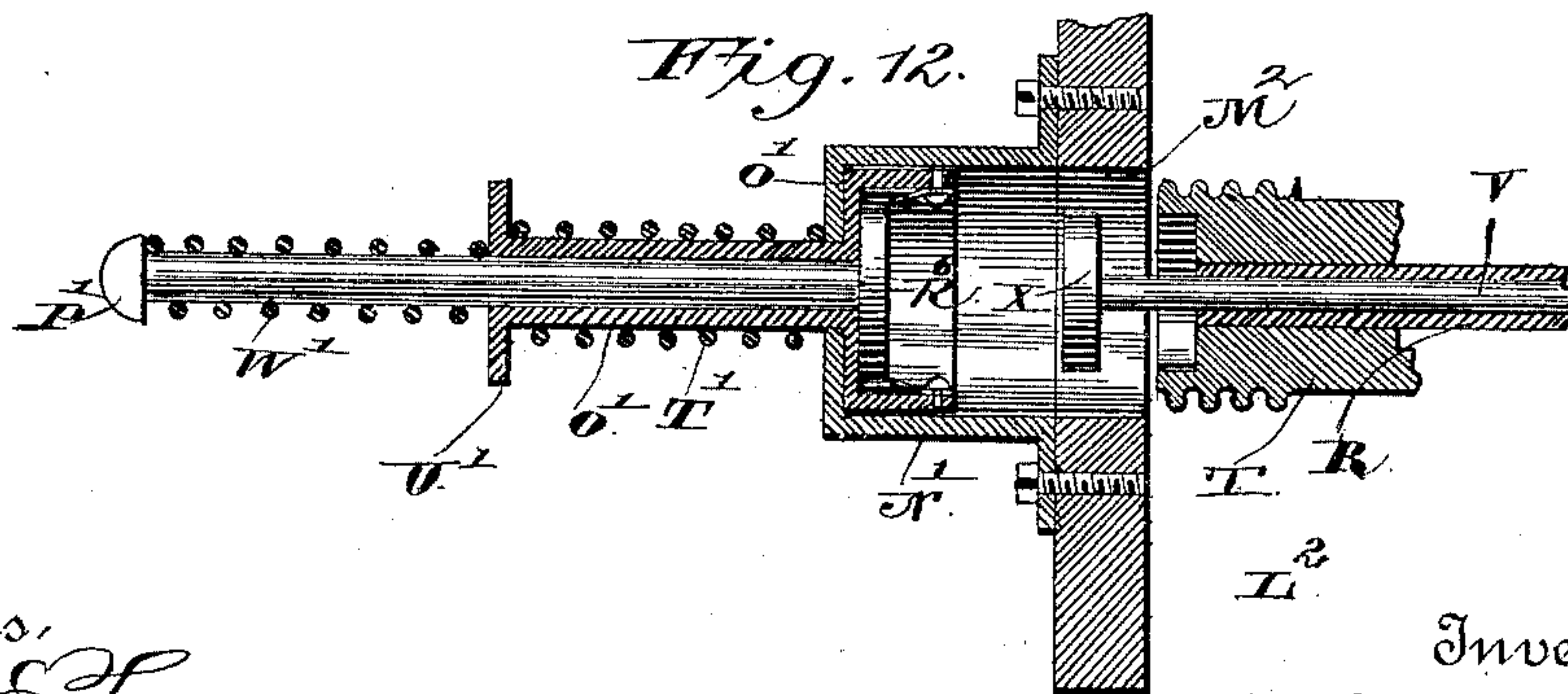


Fig. 12.



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(No Model.)

6 Sheets—Sheet 4.

W. WERTS.

MACHINE FOR THREADING SHEET METAL RINGS.

No. 396,789.

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Fig. 4.

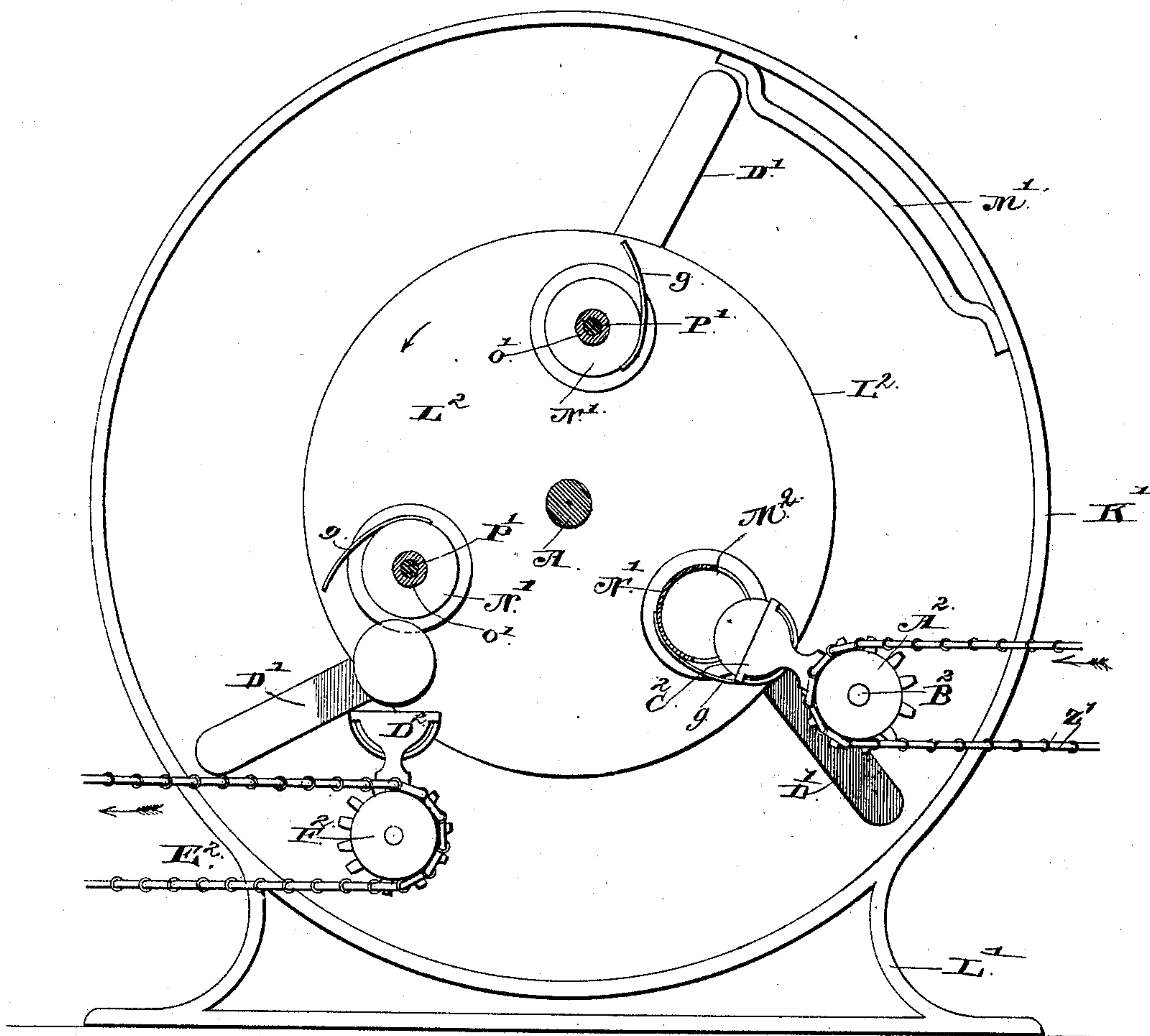
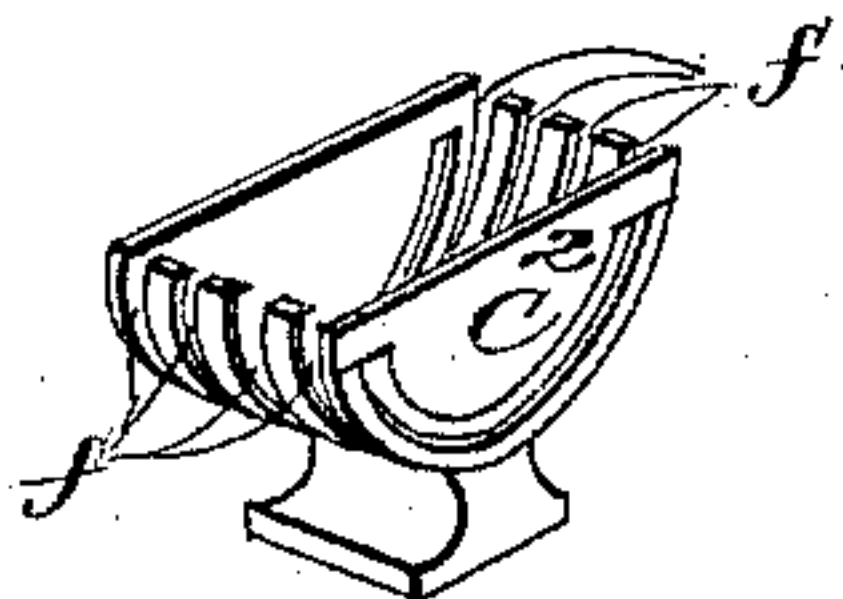


Fig. 13.



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(No Model.)

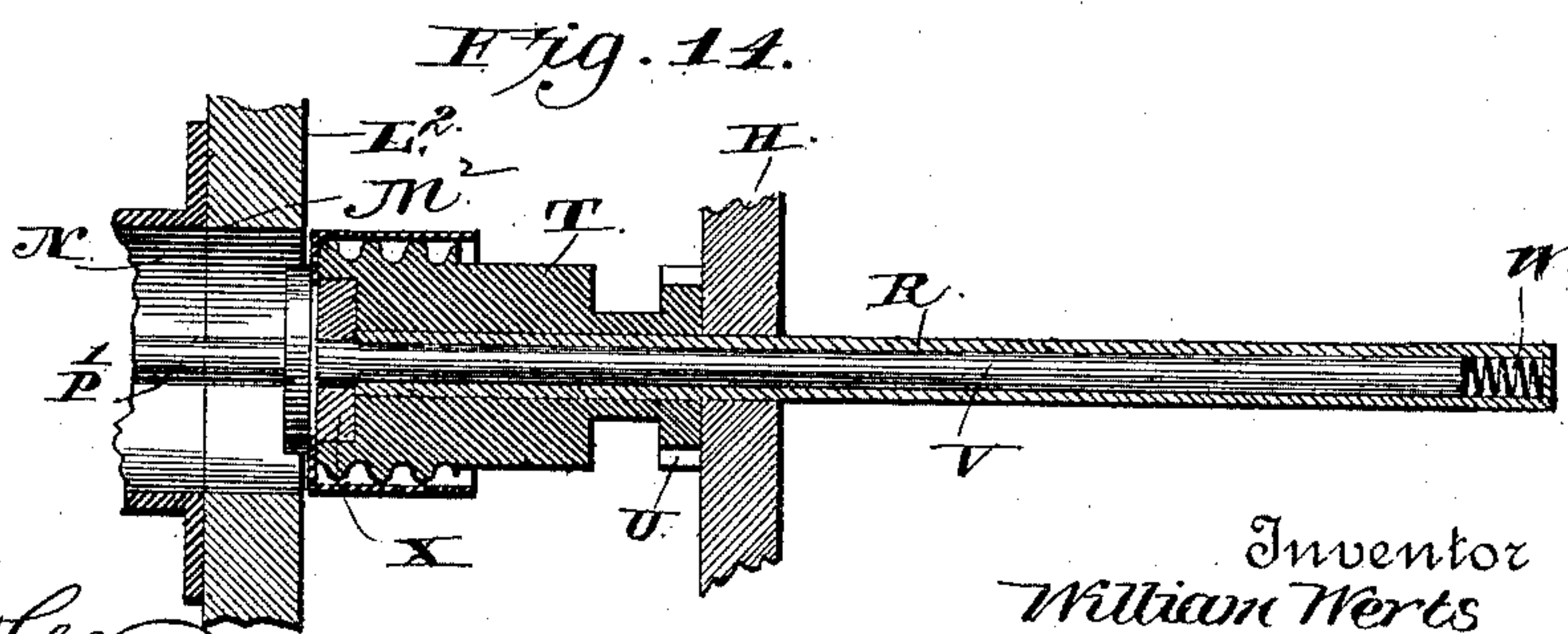
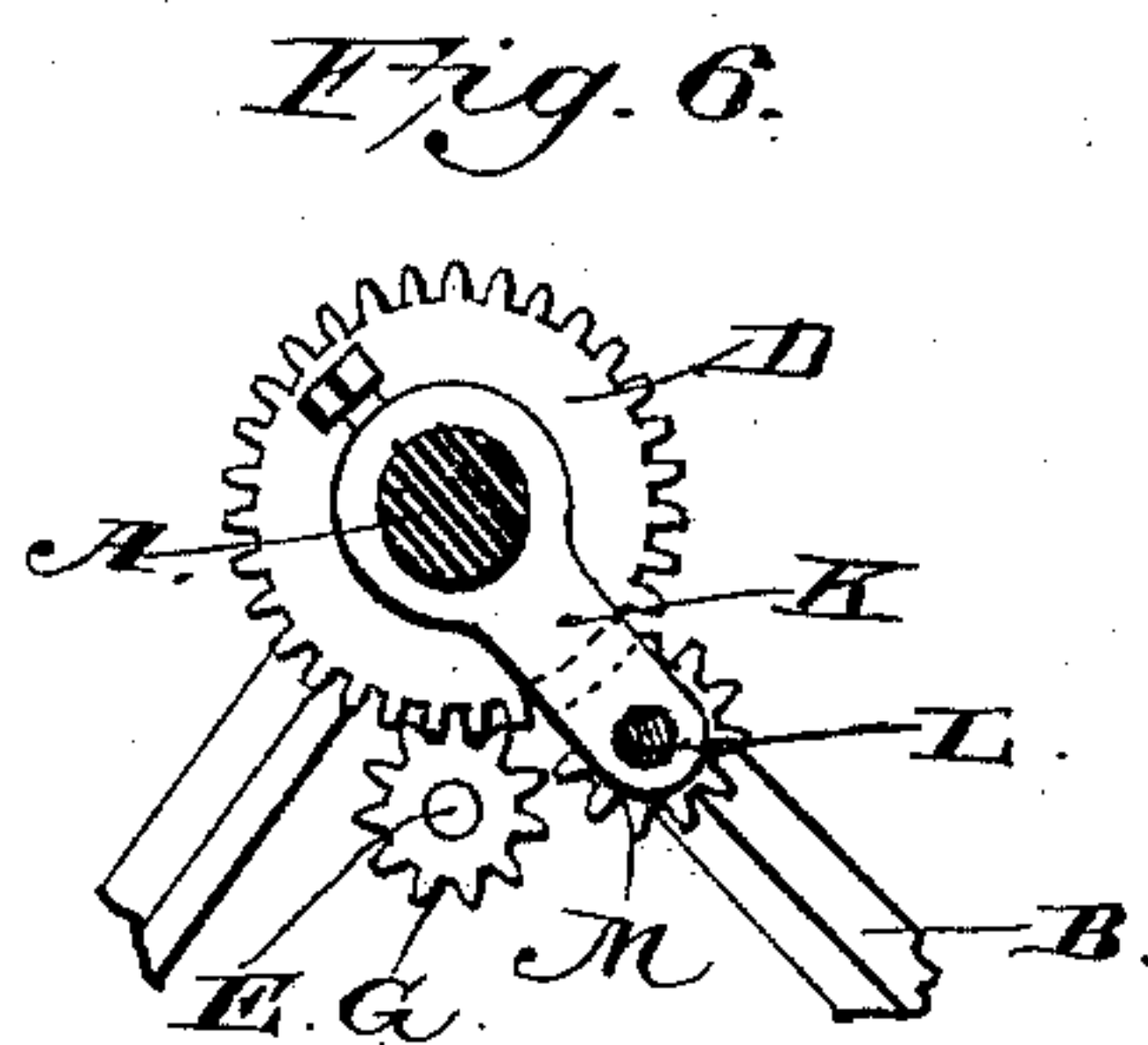
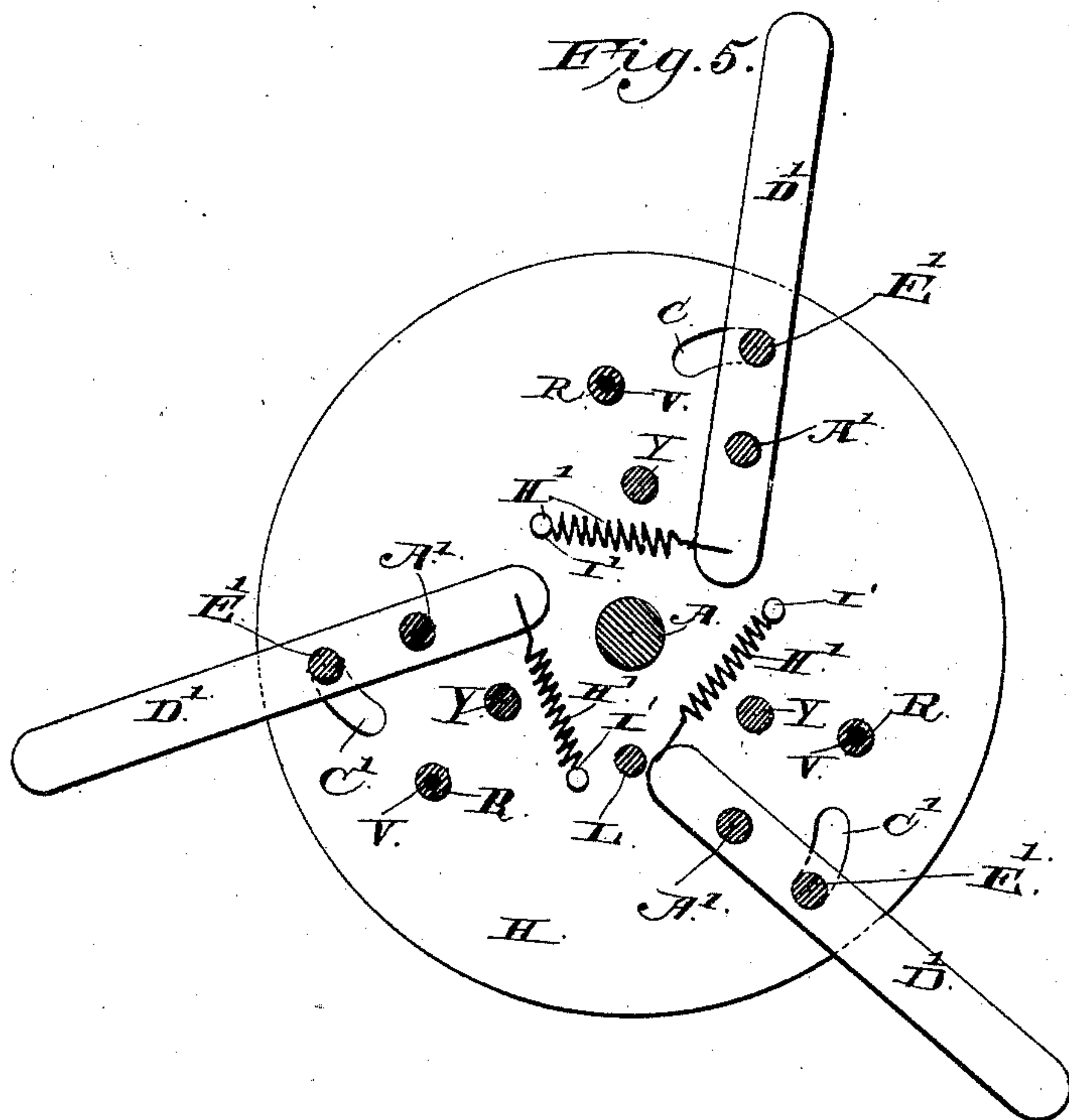
6 Sheets—Sheet 5.

W. WERTS.

MACHINE FOR THREADING SHEET METAL RINGS.

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(No Model.)

6 Sheets—Sheet 6.

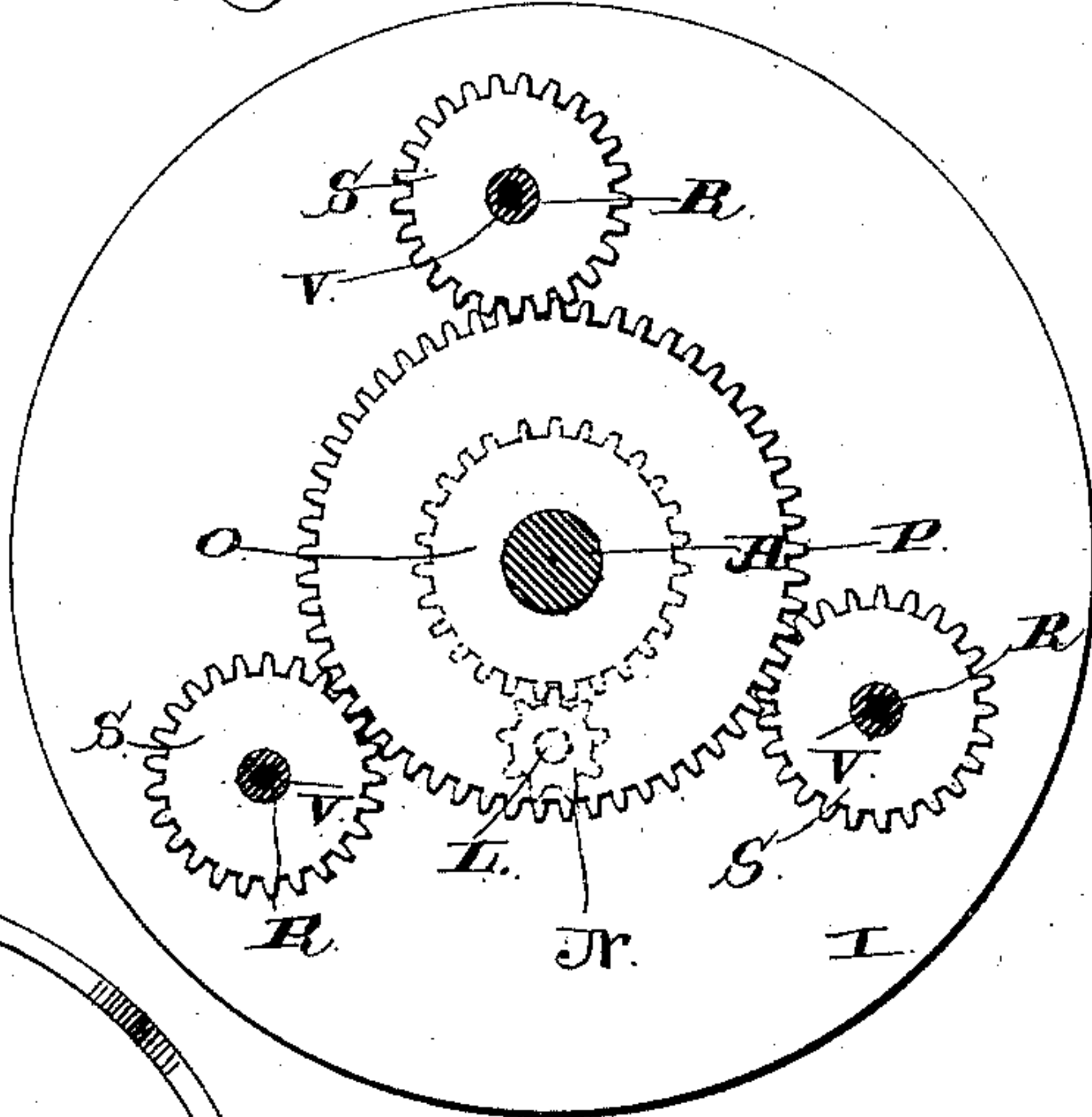
W. WERTS.

MACHINE FOR THREADING SHEET METAL RINGS.

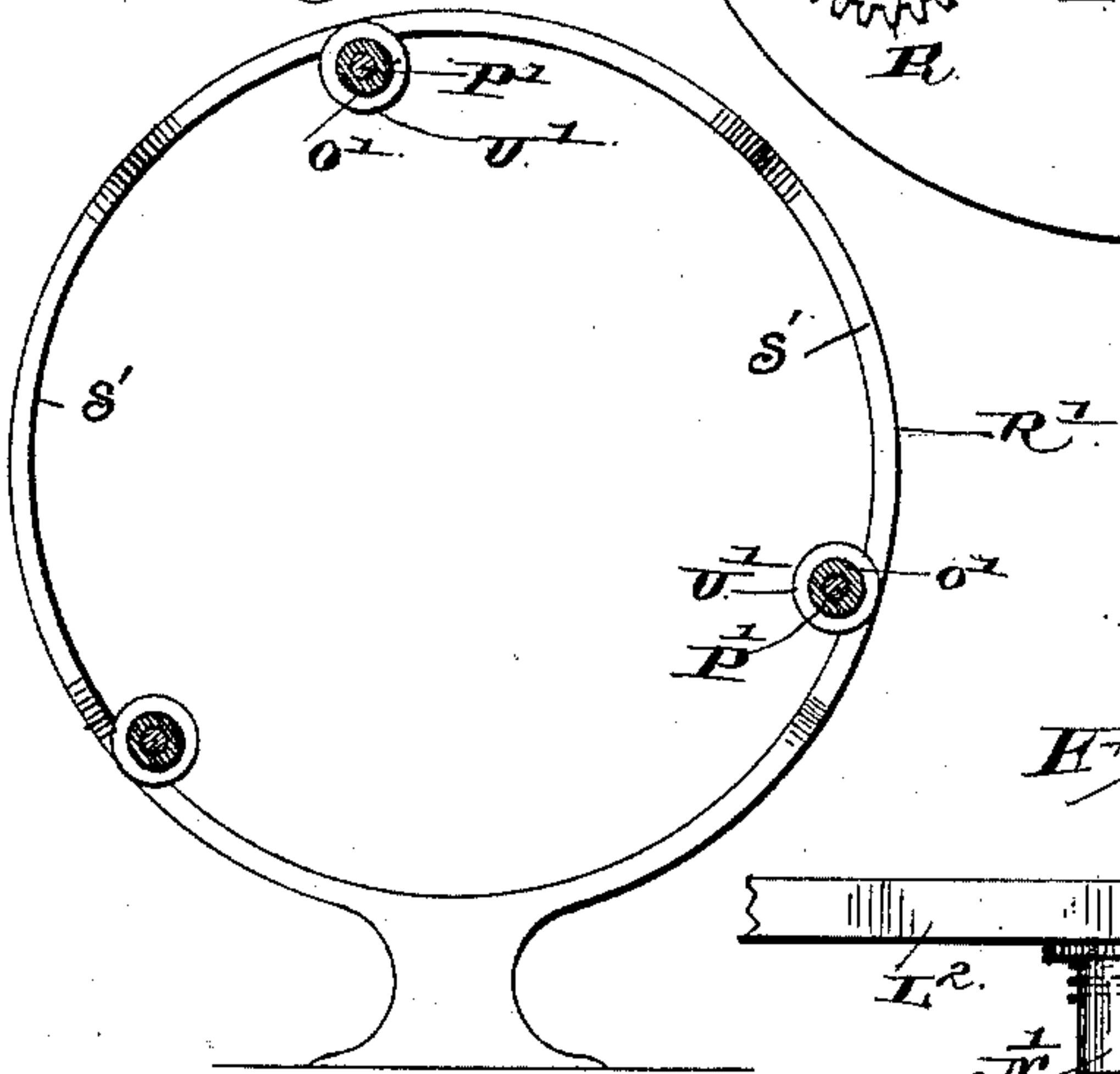
No. 396,789.

Patented Jan. 29, 1889.

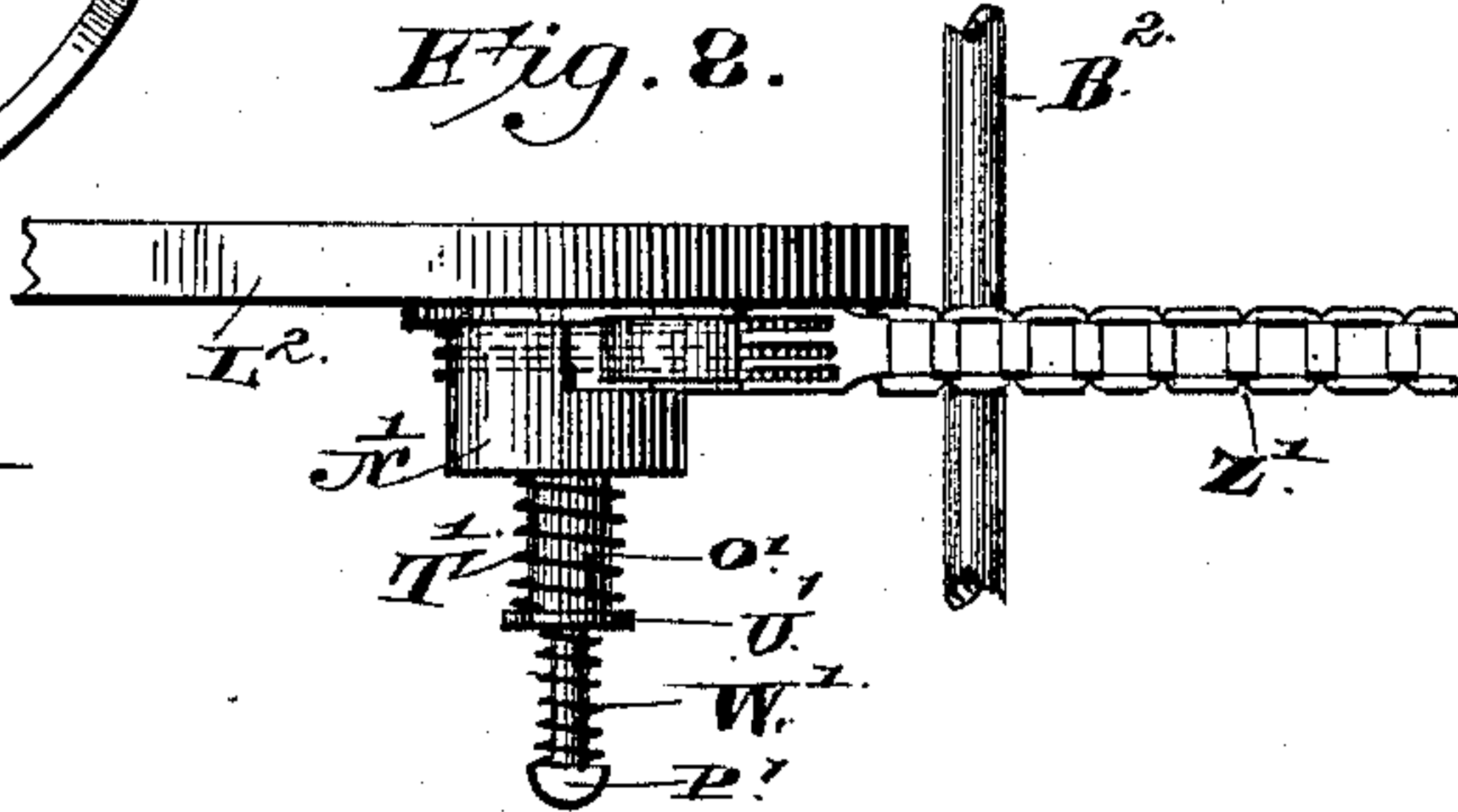
*Fig. 7.*



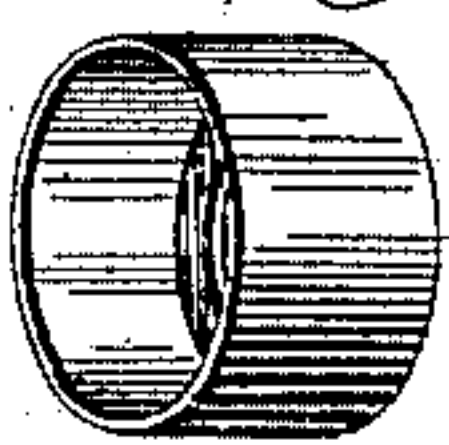
*Fig. 15.*



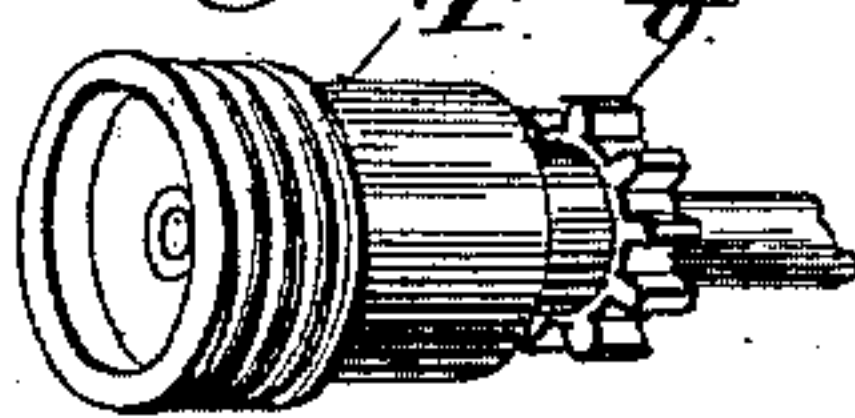
*Fig. 8.*



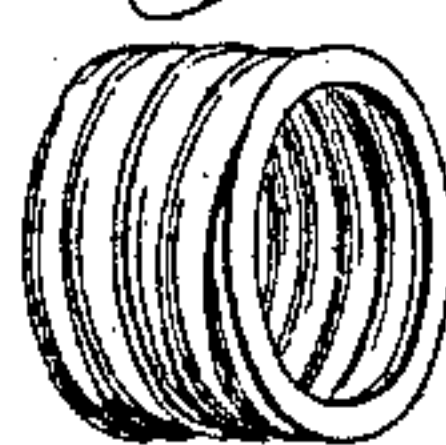
*Fig. 10.*



*Fig. 9.*



*Fig. 11.*



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# UNITED STATES PATENT OFFICE.

WILLIAM WERTS, OF CAMDEN, NEW JERSEY.

## MACHINE FOR THREADING SHEET-METAL RINGS.

SPECIFICATION forming part of Letters Patent No. 396,789, dated January 29, 1889.

Application filed September 25, 1888. Serial No. 286,363. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM WERTS, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented a new and useful Improvement in Machines for Threading Sheet-Metal Rings, of which the following is a specification.

My invention relates to an improvement in machines for threading sheet-metal rings; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

This invention is an improvement on the machine for which Letters Patent of the United States No. 291,656 were granted to me January 8, 1884, and the object of my present improvement is to simplify the construction of the machine, and thereby enable the same to be more readily operated and to be manufactured at a reduced cost.

In the accompanying drawings, Figure 1 is a plan view of my improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical transverse sectional view taken on the line  $xx$  of Fig. 1. Fig. 4 is a similar view taken on the line  $yy$  of Fig. 1, and looking in the direction indicated by the arrow 1 in said figure. Fig. 5 is a similar view taken on the line  $zz$  of Fig. 1, and looking in the direction indicated by the arrow 2. Fig. 6 is a detail transverse sectional view taken on the line  $aa$  of Fig. 1. Fig. 7 is a transverse sectional view taken on the line  $bb$  of Fig. 1. Fig. 8 is a detail plan view of one of the face-plates, a hopper, and the endless carrier to feed the blanks. Fig. 9 is a detail perspective view of one of the threaded chucks. Fig. 10 is a similar view of a sheet-metal blank. Fig. 11 is a similar view of a finished cap. Fig. 12 is a longitudinal sectional view illustrating a portion of the face-plate, the hopper thereon, the plungers in the hopper, and one of the chucks and the stripper therein. Fig. 13 is a detail perspective view of one of the buckets of one of the endless carriers. Fig. 14 is a view of the parts shown in Fig. 12, and representing the same in another position. Fig. 15 is a side elevation of one of the cam-arches.

A represents the main shaft, which is jour-

naled in standards B. To one end of this shaft is secured a gear-wheel, C, which meshes with a similar gear-wheel on a counter-shaft, (not shown,) and rotates the shaft A in the direction indicated by the arrow 3. Near one end of the shaft A is a gear-wheel, D, which is loosely mounted on the said shaft and is adapted to rotate independently thereof.

Journaled in one of the standards B is a shaft, E, which has a cone-pulley, F, on its outer end, and is provided at its inner end with a pinion, G, which engages the wheel D. The said cone-pulley is driven by an endless belt from a suitable counter-shaft. (Not shown.)

H represents a pair of circular face-plates of suitable size, which are rigidly secured to the shaft A, and are arranged at a suitable distance apart.

I represents a pair of disks of the same diameter as the face-plates, arranged at suitable distances from the inner sides of the face-plates, and likewise secured rigidly to the shaft A.

K represents an arm, which is rigidly secured to the shaft A near one end thereof. In the said arm and in the proximate disks H I is journaled a shaft, L, which has a pinion, M, at one end that engages the wheel D, and is provided at its opposite end with a pinion, N.

A pair of gear-wheels, O P, of different diameters are rigidly secured together and loosely mounted on the center of shaft A, and the smaller of these wheels engages the pinion N. In each pair of disks H I are journaled a series of shafts, R, which are arranged concentrically with the shaft A. Any suitable number of these shafts R may be employed, according to the size and the desired capacity of the machine; but I here illustrate only three of the said shafts in each pair of disks. Rigidly secured to the shafts R are pinions S, which engage the wheel P. The outer ends of the shafts R project from the disks H and are provided each with a right-hand threaded chuck, T, and with a pinion, U. Said shafts R are further provided with longitudinal bores or sockets, in which are fitted rods V. Springs W are inserted in the inner ends of said bores or sockets and bear outwardly against the inner ends of the said rods V.



To the outer end of the rods V are secured strippers or disks X, which are circular in form and are fitted in countersunk recesses in the outer ends of the chucks T.

5 Journaled in the disks H I at a suitable distance from the shafts R are shafts Y, which are each provided with a pinion, Z, that engages the proximate pinion U. Shafts A' are also journaled in the said disks at a suitable  
10 distance from the shafts Y, and are provided with pinions B', which engage the pinions Z. Each disk H is provided with a series of segmental slots, C', which are concentric with the shafts A'.  
15 D' represents a series of lever-arms which have their inner ends forked or bifurcated, and are fulcrumed at a suitable distance from their ends on the shafts A'. Journaled in the said lever-arms are shafts E', which extend  
20 through and are adapted to work in the slots C'. To the outer end of each shaft E' is secured a left-hand threaded chuck, F', and a pinion, G'. The pinions G' engage the pinions B' at all times, and by swinging the lever-arms D', which carry the shafts E', the chucks  
25 F' may be caused to engage the chucks T or to move from the same, as will be readily understood. By thus adapting the shafts E', which carry the chucks F', to move concentrically  
30 with the shafts A', and by providing the gearing which connects the shaft E' to the shaft A' and the latter to the shaft R, I am enabled to dispense with the complicated and costly universal joints and eccentric gears described  
35 in my before-mentioned Letters Patent, and thereby effect a very material economy in the construction of the machine and greatly simplify the working parts.

40 Springs H' are secured to pegs or pins I', that project from the inner sides of the disks H, and the free ends of the said springs are secured to the inner ends of the lever-arms D' and serve to normally turn the latter on the shafts A' in such a position as to normally  
45 withdraw the chucks F' from the chucks T, and hence adapt the sheet-metal blanks to be fed to or removed from the latter.

K' represents a pair of rings of suitable diameter, which are arranged concentrically  
50 with the shaft A and in line with the projecting outer ends of lever-arms D'. The said rings K' have supports or standards L' at their lower sides, and are each provided on their inner sides with a cam, M'. The said  
55 cams are arranged within the paths of the lever-arms D', so that when the machine is in motion and the disks H I and shaft A in rotation in the direction indicated by the arrow in Fig. 3 the outer ends of the lever-arms  
60 D' are caused to engage the cams, and thereby the said levers close the chucks F' against the chucks T, so that the threads thereof intermesh during a portion of each revolution of the disks.

65 It will be understood from the description of the gearings which connect the chuck-shafts together and to the shafts L that the

said chucks are also in constant rotation in opposite direction, so that when the chucks are closed together their threads are caused  
70 to impinge on the blanks and form threads therein, as fully set forth in my before-mentioned Letters Patent.

It will be understood that the rings K' are stationary and are rigidly secured to the  
75 table or floor or other object on which the machine is mounted.

L<sup>2</sup> represents a pair of circular plates, which are rigidly secured to the shaft A, and are arranged at suitable distances from the outer  
80 sides of the disks H. The outer ends of the pairs of chucks T F' are almost in contact with the plates L<sup>2</sup>, and the latter have circular openings M<sup>2</sup>, which are directly opposite the chucks T, and through which the blanks  
85 are pushed upon the latter. Hoppers N' are secured to the outer sides of the plates L<sup>2</sup> and in line with the openings M<sup>2</sup>, and said hoppers are provided with plungers O' P', the former being of tubular form and the latter  
90 having longitudinal movement therein.

Arches R' are arranged concentrically with the shaft A and at suitable distances from the outer sides of the plates L', and are provided each with a cam, S', for giving a forward  
95 movement to the plungers P' in order to hold the blanks while the plungers O' are withdrawn previously to the threading of the blanks. The plungers O' are withdrawn by means of the springs T', which surround them  
100 between the hoppers and the collars U'. As the rear ends of the plungers P' slide over the receding cams V' on the arches Y', they are withdrawn by means of the springs W' between the heads on their rear ends and the  
105 collars U' as the ends of the plungers O' slide against the receding cams S'. The strippers X, previously described, discharge the threaded caps as the plungers O' are withdrawn, the said strippers being forced forward  
110 by means of the springs W.

Arranged at a suitable distance beyond the arches R' are arches Y', which are provided with cams for giving a forward movement to the plungers P' in order to push the blanks  
115 from the hoppers upon the chucks T in position to be threaded.

Z' represents endless chains, which pass over sprocket-wheel A<sup>2</sup> on the shaft B<sup>2</sup> and over a shaft provided with a pulley, which  
120 shaft and pulley are not seen in the drawings. The chains are provided with buckets C<sup>2</sup> for conveying blanks to the hoppers on the plates L<sup>2</sup>. The lower sides of the said buckets have slots f, through which the fingers g  
125 of the hoppers pass and draw the blanks from the buckets into the hoppers, the mechanism being so timed that one of the buckets on the endless chain reaches one of the hoppers on the plate L<sup>2</sup> just before the lever-arms D' be-  
130 come engaged by the cams M' of rings K'.

The operation of the machine is as follows: The central shaft, A, which carries the plates L<sup>2</sup> and the disks H I and connecting devices,



being revolved, as described, the blanks placed in the buckets of the endless chains Z' are brought in succession to the hoppers N', and from the latter are forced by the plungers O' onto the chucks T, and, at the same time the cams on the arches Y' force the plungers P' forward, which hold the blanks in position while the plunger O' is withdrawn out of the way, and the chucks being closed upon the blanks and revolving in opposite directions, as before described, serve to crimp the blanks between them and form threads on the same, and convert the blanks into caps such as are employed for securing the covers on preserving-jars. The chucks F' are withdrawn from the threaded caps by the springs H' as soon as the lever-arms D' pass the cams M', and said caps are discharged from the chucks T by means of the strippers X, the springs W serving to push the strippers forward and the springs W' of the plungers P' yielding as the ends of the plunger-rods P' pass along the receding portions of the cams V'. The caps are thus held between the strippers X and the plungers P' in their outward movement, and are thereby caused to pass gently from the chucks T into the hoppers N'. As the said caps, having been pushed back into the hoppers N', drop from the said threaded hoppers in succession, they fall into buckets D<sup>2</sup>, similar to those previously described, and are mounted on endless chains E<sup>2</sup>, which are driven by a suitable counter-shaft (not shown) and passed over sprocket-wheels F<sup>2</sup>. The said endless carriers E<sup>2</sup> serve to deliver the caps from the threading-machine.

By reference to Figs. 1 and 2 it will be understood that my present improved threading-machine is double ended—that is to say, it has two sets of the revolving disks, plates, pairs of chucks, mechanism for operating them, and plungers, and cam-arches—thereby very greatly increasing the capacity of the machine.

Having thus described my invention, I claim—

1. In a threading-machine, the combination of the revolving disks H I, the threaded chucks T, journaled therein, the lever-arms pivoted to the disks, the threaded chucks F', journaled in the lever-arms and adapted to close against the chucks T, the cams to operate the lever-

arms, and means for positively rotating the chucks T, substantially as described. 55

2. In a threading-machine, the combination of the revolving disks H I, the threaded chucks T, journaled therein and having the gears U, the lever-arms pivoted to the disks, the threaded chucks F', journaled in the lever-arms and having the gears G', the gears Z, engaging gears U, the gears B', engaging gears Z and G', and cams for moving the lever-arms, substantially as described. 60

3. The combination of the revolving shaft 65 having the disks H I, the threaded chucks T, journaled in the disks and having the pinions S, the threaded chucks F', mounted so as to move relatively to chucks T, and the gear P, loose on the shaft and engaging said pinions S, and means, substantially as set forth, to rotate the gear P. 70

4. The combination of the revolving shaft having the disks, two sets of chucks supported by the disks, one set of chucks being movable 75 relatively to the other set, the gears S, the gears O P, loose on the shaft and secured together, said gear P engaging the gears S, the gear D, loose on the shaft, the driving-shaft having the gear G, engaging gear D, the shaft 80 L, journaled in the disks and having the gear M, engaging gear D, and the gear N, engaging gear O, substantially as described.

5. In a threading-machine, the combination of the revolving shaft having the disks H I, 85 the gear P, loose on said shaft, the shafts R, journaled in the disks and having the chucks T, the gears U and gears S, the latter engaging the gear P, the shafts Y, journaled in the disks and having the gears Z, engaging gear 90 U, the shafts A', journaled in the disks and having the gears B', engaging gears Z, the lever-arms fulcrumed on the shafts A', the cams to operate said arms, the shafts E', journaled in the lever-arms and having the chucks F' 95 and gears G', the latter being at all times in engagement with the gears B', and mechanism, substantially as described, to rotate the gear P.

In testimony that I claim the foregoing as 100 my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM WERTS.

Witnesses:

J. H. SIGGERS,  
R. J. MARSHALL.