

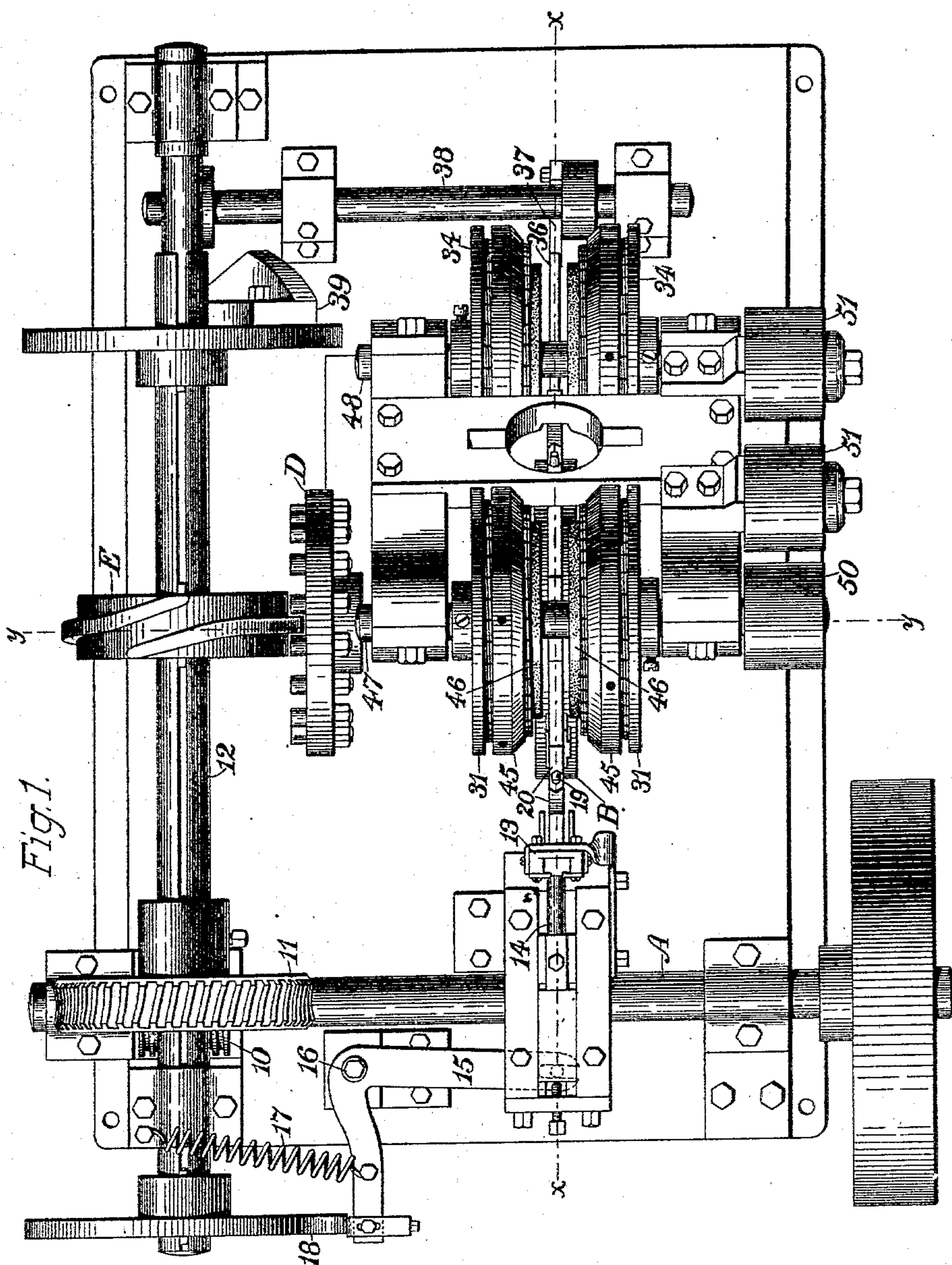
(No Model.)

5 Sheets—Sheet 1.

G. DUNHAM.
MACHINE FOR POLISHING OR EDGING NUTS.

No. 515,754.

Patented Mar. 6, 1894.



Witnesses:
John Edwards Jr.
Edward W. Bush.

Inventor:
George Dunham.
By James Shepard.
Atty.

(No Model.)

5 Sheets—Sheet 2.

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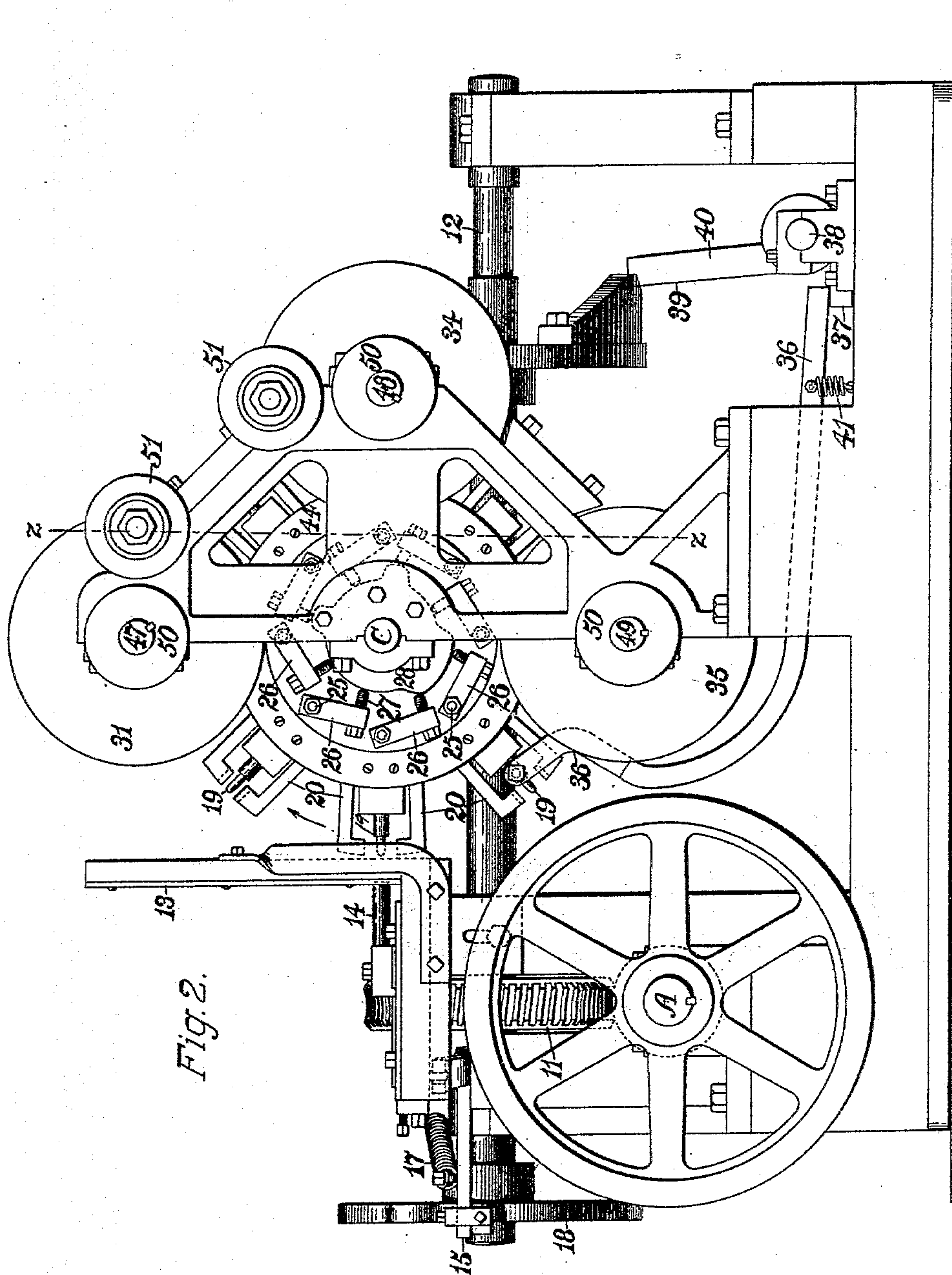


Fig. 2.

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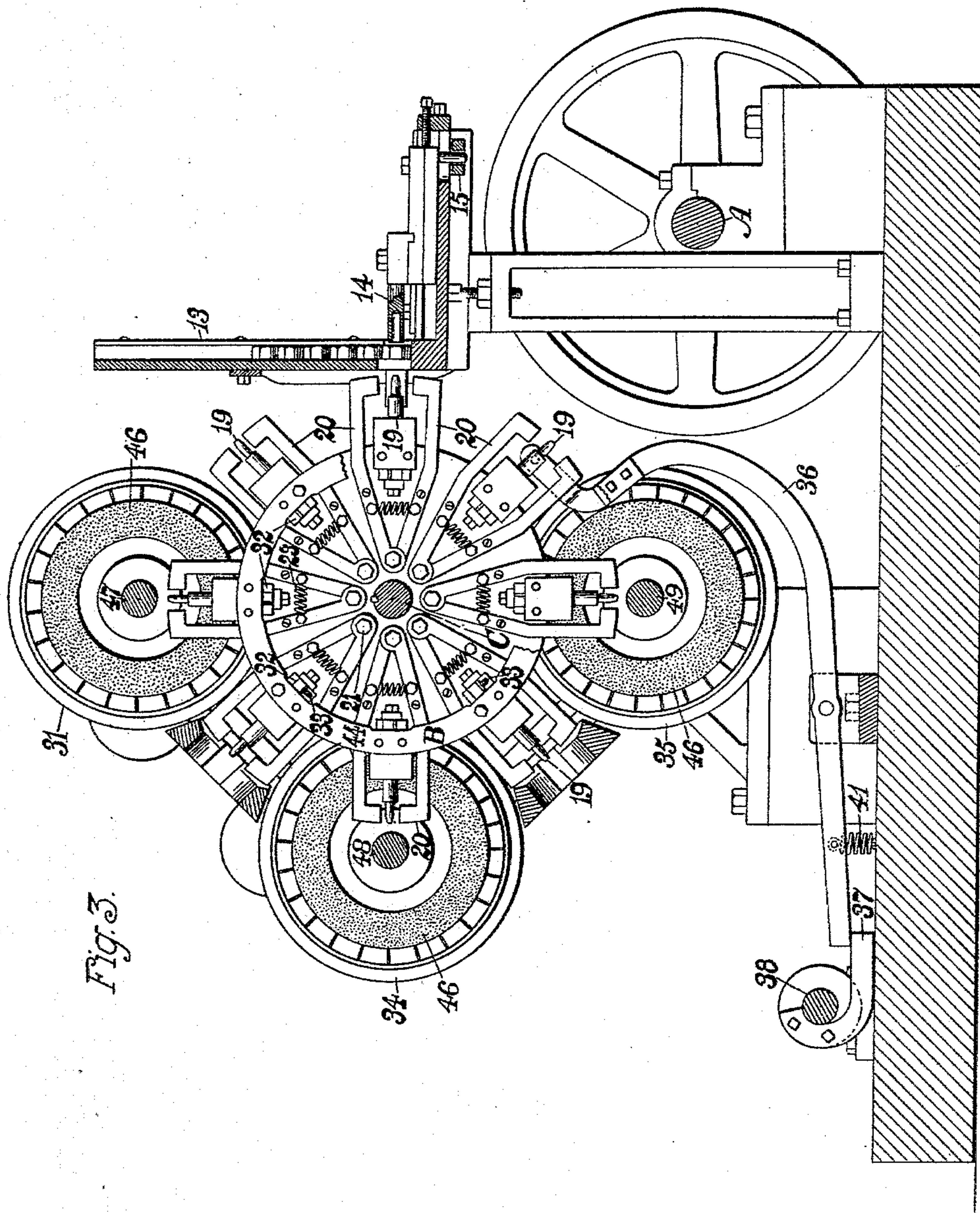


Fig. 3.

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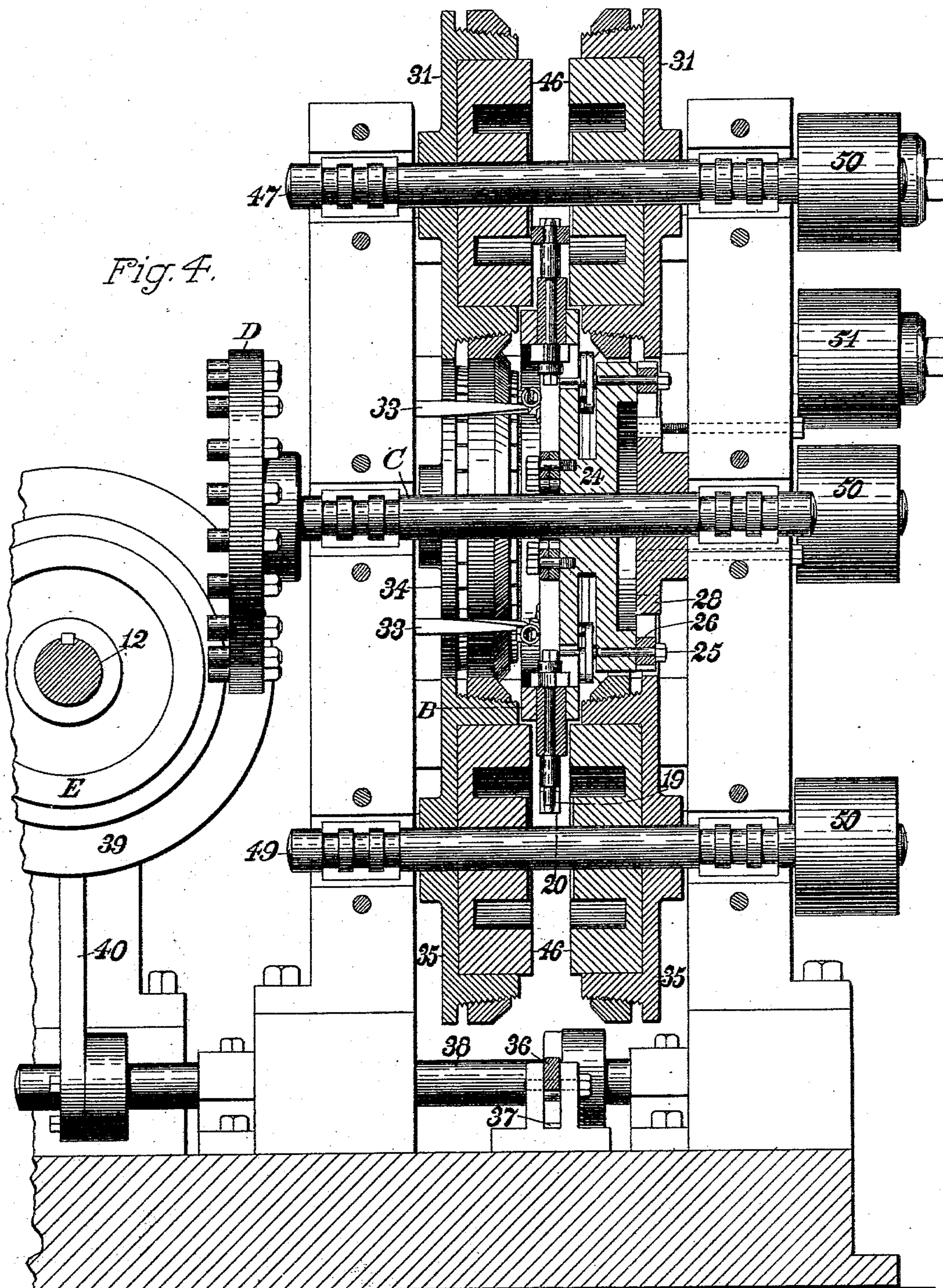
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Fig. 5.

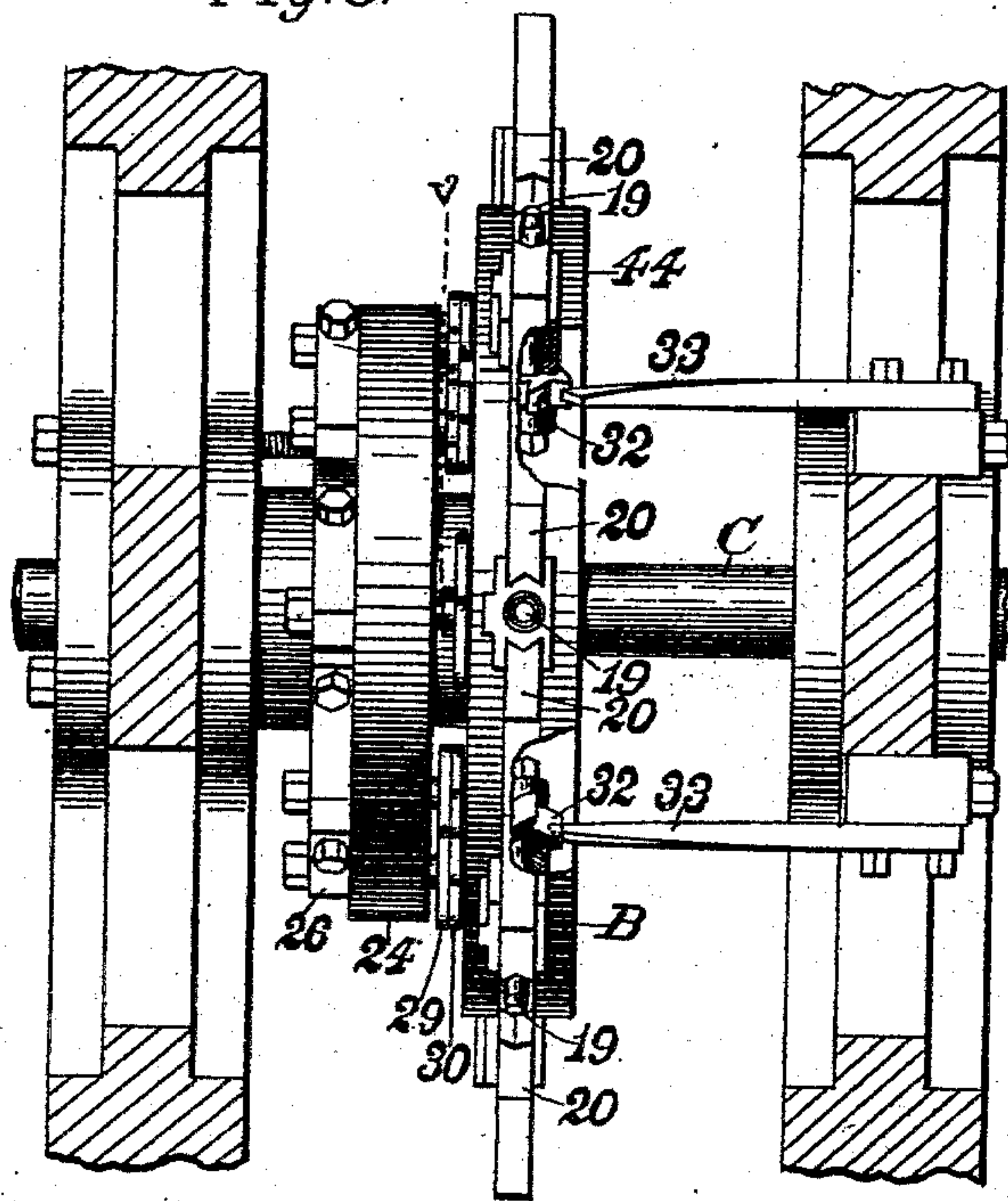


Fig. 6.

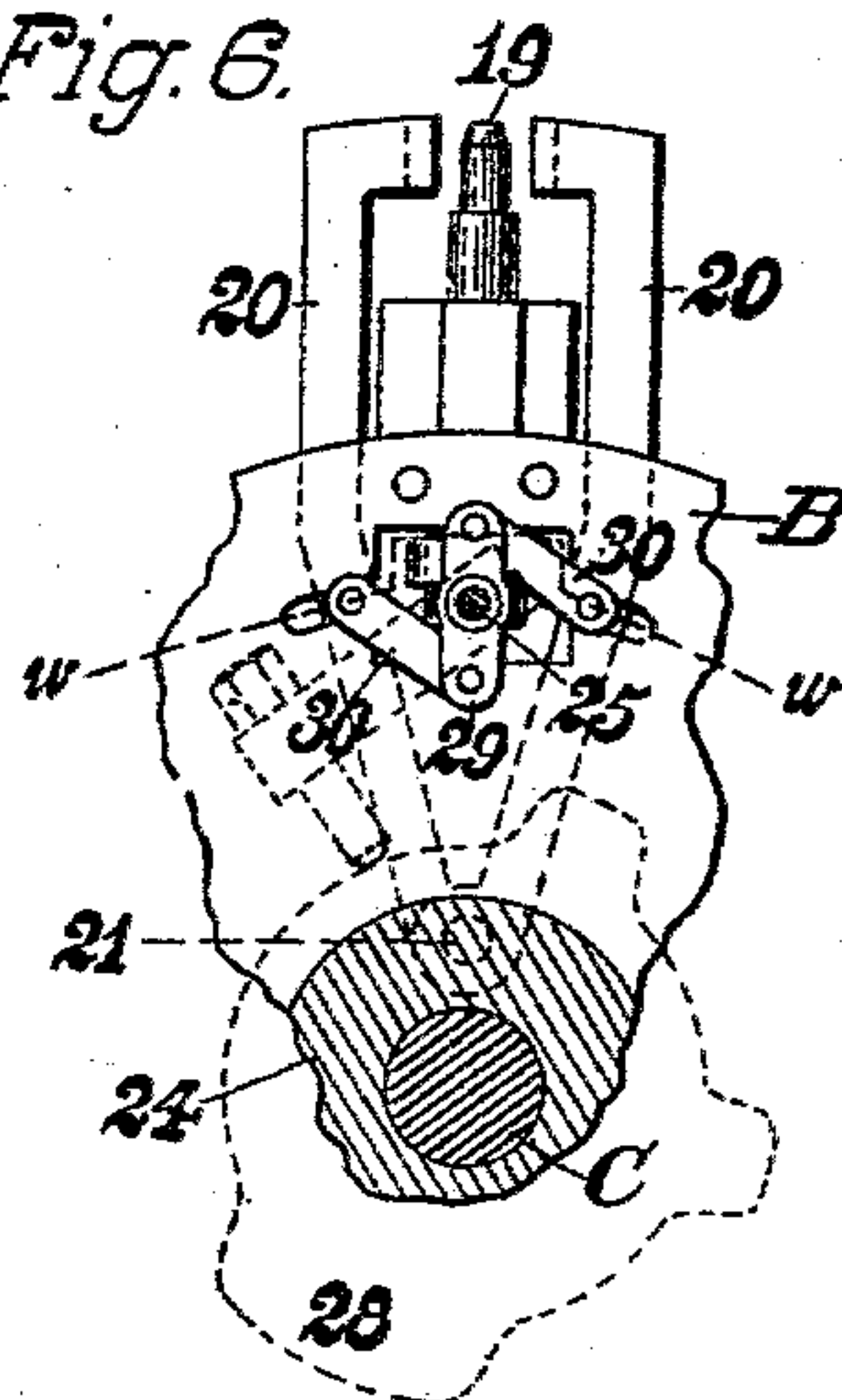


Fig. 7.

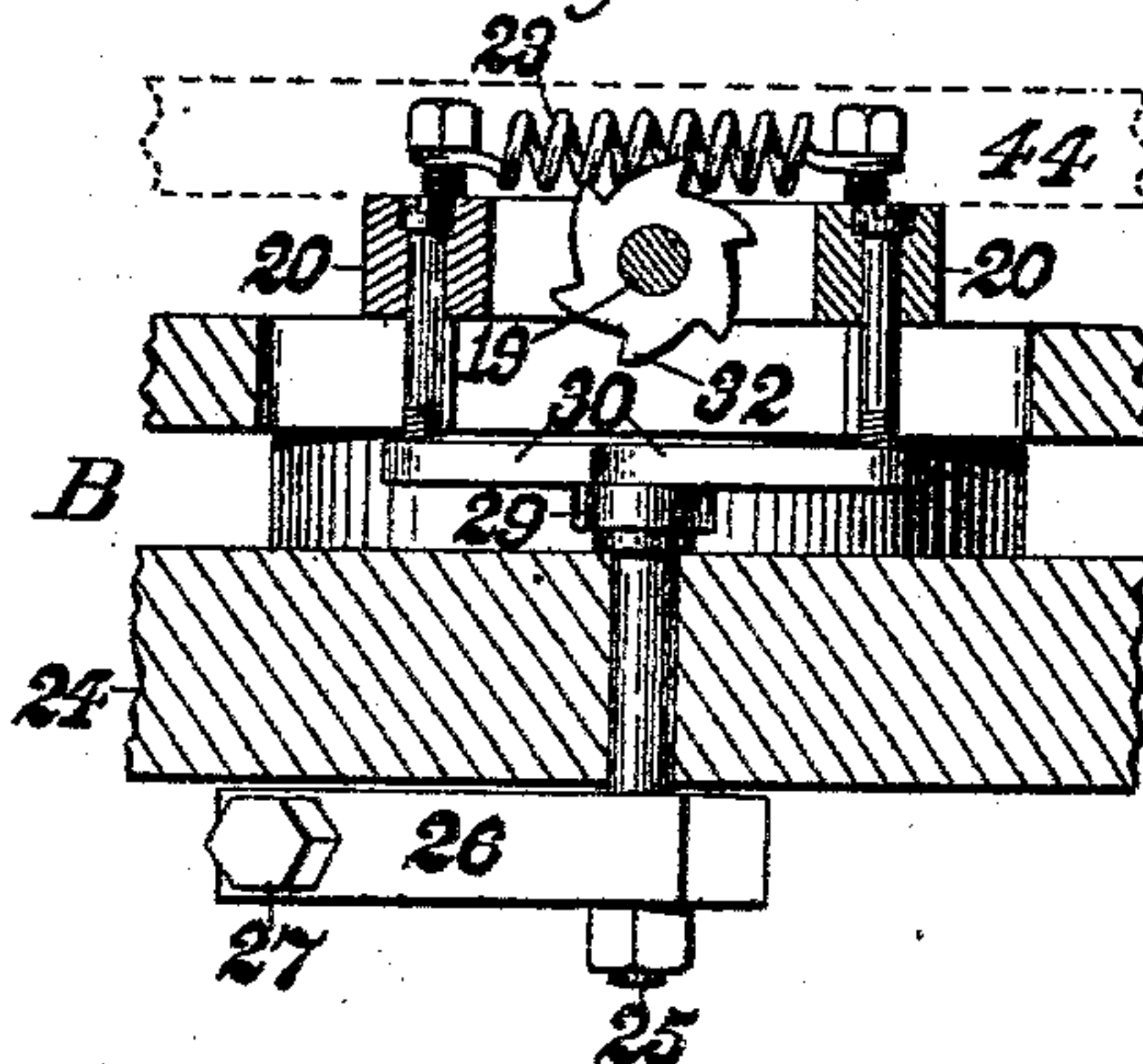


Fig. 8.

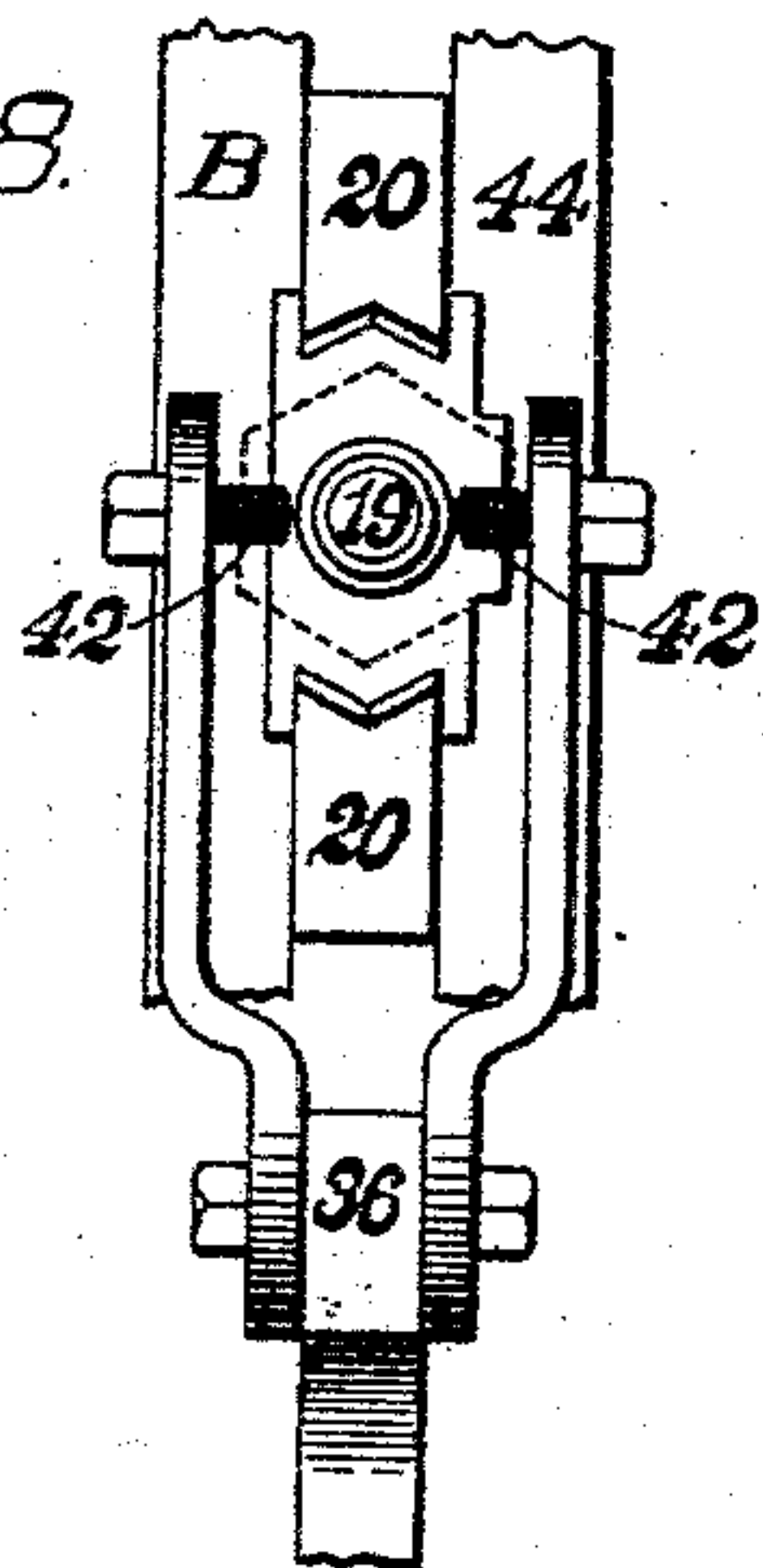
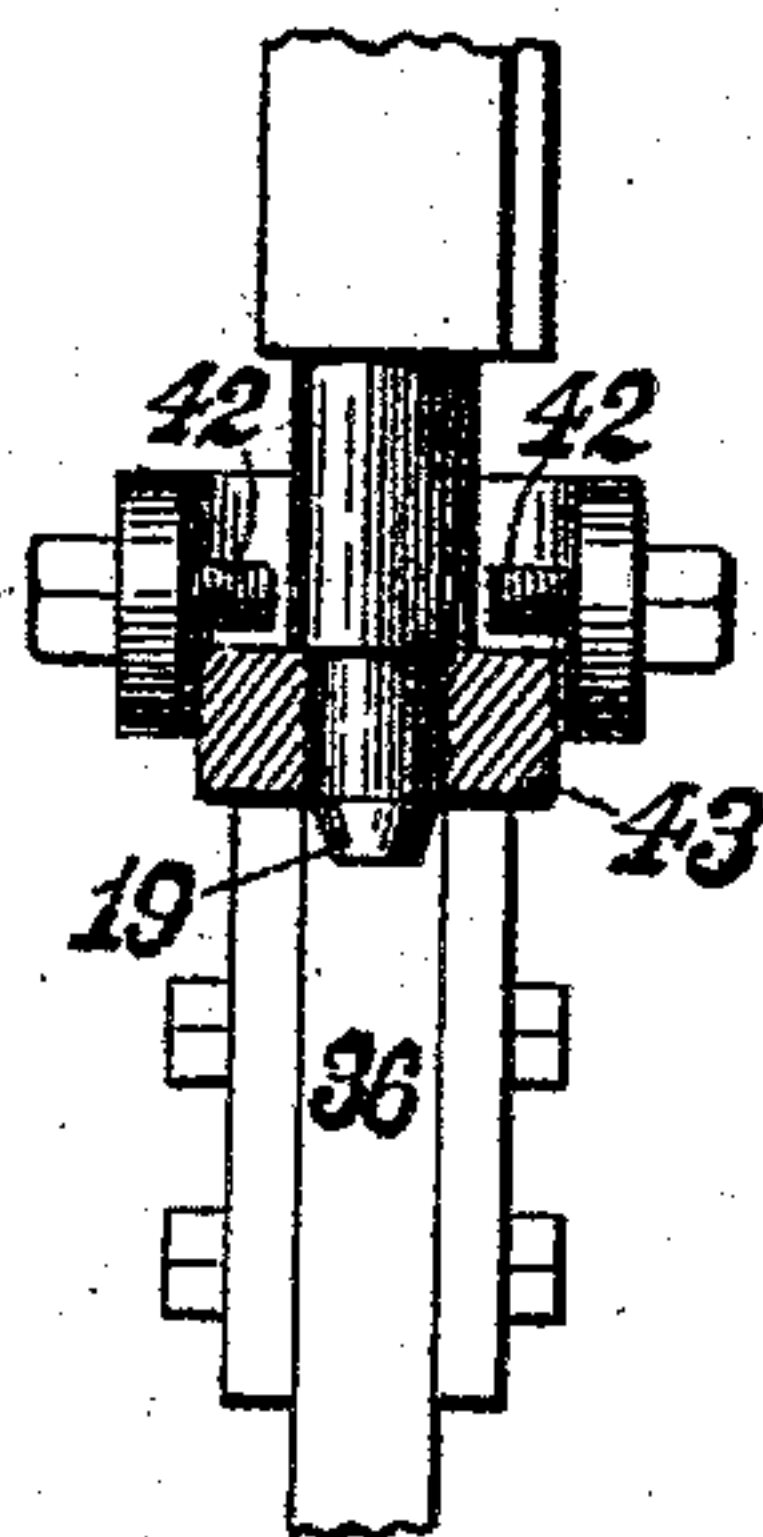


Fig. 9.



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UNITED STATES PATENT OFFICE.

GEORGE DUNHAM, OF UNIONVILLE, CONNECTICUT.

MACHINE FOR POLISHING OR EDGING NUTS.

SPECIFICATION forming part of Letters Patent No. 515,754, dated March 6, 1894.

Application filed April 5, 1893. Serial No. 469,155. (No model.)

To all whom it may concern:

Be it known that I, GEORGE DUNHAM, a citizen of the United States, residing at Unionville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Machines for Polishing or Edging Nuts, of which the following is a specification.

My invention relates to improvements in machines for polishing or dressing the edges of nuts or other articles of analogous shape, and the objects of my improvement are simplicity and cheapness of construction and general efficiency in operation, and more particularly to produce a machine for automatically carrying nuts to and from polishing or dressing wheels and turning the nut as it passes from one polishing device to the next.

In the accompanying drawings: Figure 1 is a plan view of my machine. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section on the line *x x* of Fig. 1. Fig. 4 is an enlarged vertical section on the line *y y* of Fig. 1. Fig. 5 is an enlarged section of the same on the line *z z* of Fig. 2 showing the intermittingly rotating head in elevation. Fig. 6 is a detached side elevation partly in section on the line *v v* of Fig. 5 showing one pair of holding jaws and one pilot together with their operating devices. Fig. 7 is a section on the line *w w* of Fig. 6 showing said operating devices. Fig. 8 is a face view of the knockout together with a portion of the intermittent head, and Fig. 9 is a plan view of the knockout together with a sectional view of a nut and elevation of the pilot.

A designates a driving shaft carrying a worm 10 for engaging the gear 11 of the cam shaft 12.

The nuts to be polished are hexagonal in form, as my machine is arranged, and are placed in stacks in the chute or hopper 13 with two of their side edges in a vertical position, while the angles formed by the other sides are at the top and bottom of the nuts.

At the lower end of the chute or hopper 13 is a space large enough to permit the bottom nut to pass out in a sidewise direction, and immediately opposite said space is a pusher or conveyer 14 arranged to slide in suitable guides and acted upon by the angle lever 15 which is connected thereto by a pin and slot

connection as shown by full lines in Fig. 3 and by broken lines in Fig. 1. This angle lever is pivoted to the frame of the machine at 16, Fig. 1, and is pulled in one direction by means of the spring 17, as shown in Figs. 1 and 2, while it is driven in the other direction by means of the cam 18 on the cam shaft 12. When the projection of this cam 18 acts to move the pusher or conveyer 14 against the bottom nut, it is pushed out of the hopper on the pointed pilot 19 which guides it into position between the jaws 20, said jaws being carried by an intermittingly rotating head B. This head B is carried on the shaft C, the end of which is provided with a pin wheel D that is engaged by the worm E on the cam shaft 12, the thread of said worm being inclined for a portion of its length to impart the necessary movement to the pin wheel and left straight on the remaining portion so as to hold the pin wheel against rotation, all in a well-known manner in mechanical movements.

The jaws 20 are pivoted to the head B at 21 as best shown in Figs. 3 and 6 and are drawn toward each other by means of springs 23. The confronting faces of these jaws are made V shape to fit the angular corners of a hexagonal nut as best shown by the end view of said jaws in Fig. 5.

In the disk or hub 24 of the head B, I arrange the rock shaft 25 for each pair of jaws, and on one end of said rock shaft is an arm 26 having a pin or projection 27 which rests upon the edge of the stationary cam 28, whereby as said arms are dragged past the projections of said cam the rock shafts are operated. The nut is received on the pilot between the jaws when the rock shaft arm 26 is held outwardly by the cam 28, thereby rocking the cross arm 29 and the links 30 that connect it with the jaws so as to force the jaws open and hold them in their open position until the intermittingly rotary head moves forward so as to release the arm 26 from the cam and permit the springs to draw the jaws together and hold the nut firmly thereon. At the first one-eighth revolution of the head from the point where the nut is received, no work is performed on the nut, but during the next one-eighth part of a revolution it is brought between the pair of grind-

ing or polishing wheels 31 and two of its opposite side edges polished or dressed off. At the next movement of the head, the rock shaft 25 is again thrown outwardly by the succeeding point on the cam 28 thereby holding the jaws open. The pilots are arranged to rotate in their mountings and provided with a ratchet wheel 32 at their inner ends. Stationary trips 33 are arranged on the frame with their ends in the path of these ratchet wheels so as to catch one of the teeth thereof and rotate the pilot one-sixth of a revolution at a time when the jaws are thus held open by the rock shaft and cam. The nuts are crowded on by the conveyor with sufficient force to make them turn with said pilots. As the head makes another movement, the jaws are released and the spring 23 draws them together again, this time taking upon different corners of the nut and bringing two other opposite sides into proper position to pass between the next pair of grinding or polishing wheels 34. The third projecting point of the cam 28 will next act to open the jaws and the ratchet wheel will be caught by the other one of the arms 33 to turn the pilot another one-sixth of a revolution and bring the two remaining sides of the nut in position for passing through the third pair of polishing or grinding wheels 35, thereby polishing the remaining two side edges of the six-sided nut. The first and largest point on the cam 28 now again operates to move the rock shaft and force the jaws open, and the knockout 36 is actuated by the arm 37 of the rock shaft 38 to force the nut off the pilot from between the jaws. The rock shaft 38 is forced in one direction by means of the cam 39 on the cam shaft 12 acting upon the arm 40 of said rock shaft, the spring 41 returning the knockout and rock shaft to their former position after the arm 40 is released by said cam. The knockout is in the form of a curved lever shown in side view in Fig. 2, the end nearest the pilot being forked and provided with fingers 42 for extending behind the nut 43 as shown in Figs. 8 and 9. The intermittingly rotating head B is supported on its shaft C by the hub 24, the jaws 20 being pivoted to the broad side of said hub or disk as best shown in Fig. 3. This hub or disk is also grooved as best shown in Figs. 5 and 7 to make room for the cross arms and links of the jaw opening rock shafts to work in. The pilots are mounted to rotate in blocks or supports secured to the broad side of the disk or hub of the head B and a ring 44 is secured to said blocks and over the jaws. A portion of this ring is broken away in Fig. 3.

The polishing wheels, mills, or dressers 31, 34 and 35 may be of any ordinary construction either rotary or reciprocating. I prefer, however, to employ chuck jaws to be compressed by the screw rings 45 to clamp within the chuck, the polishing, grinding or milling tools 46, and I prefer to make the working

faces thereof in the form of an annulus as shown. These wheels are mounted on the shafts 47, 48 and 49 carrying suitable driving pulleys 50 for the application of a driving belt, idle pulleys 51 being employed where desirable for giving the proper belt contact.

In order to avoid crowding, I have not in all cases duplicated the figures of reference where a number of like parts are shown in the same view.

In describing the operation of my machine I have followed only one nut or piece of work but it will of course be understood that so long as nuts are supplied to the hopper, one nut will be received on one of the pilots at every period of rest of the head B so that after one complete rotation of said head the various operations described will each be performed at their appropriate place on each of the several pilots.

While I have shown and described my machine as arranged for dressing or edging hexagonal nuts, I consider that there would be no departure from my invention by arranging it for dressing or edging four or eight-sided pieces. I have also described the best known means for imparting the movements to the various parts, but I do not wish to thereby waive any right to equivalents. For example, the pin wheel and worm are a known means for imparting an intermittent movement to a rotary device, and therefore I consider other means for giving a like movement to the head an equivalent therefor.

Some of the most important features of my machine are a conveyor to transfer the work from the hopper, a pilot to receive and guide the work into place on the head, the head carrying the work, dressing devices located in the path of the work and means for turning the work to present different edges to the different dressing devices.

I claim as my invention—

1. The combination of the intermittingly rotating head, the pilots mounted thereon for receiving the work and guiding it to its position on said head, the chute or hopper, and the conveyor for pushing the work from said hopper to the pilots on said head, substantially as described and for the purpose specified.

2. The combination of the head, the pilots mounted on said head and the conveyor for presenting the work to said pilot, substantially as described and for the purpose specified.

3. The combination of the head, the pilots and holding jaws mounted thereon and the conveyor for presenting the work to said pilots and jaws, substantially as described and for the purpose specified.

4. The combination of the jaws or holders and the pilot between said jaws, substantially as described and for the purpose specified.

5. The combination of the head, the pilots mounted thereon, dressing devices located in the path of the work on said head and means

for partially rotating said pilots when not in position for presenting the work to said dressing devices and for permitting them to remain non-rotative when said pilots are in position for presenting the work to said dressing devices, substantially as described and for the purpose specified.

6. The combination of the head, the pilot and jaws mounted thereon, means for opening and closing said jaws and means for partially rotating said pilot when said jaws are opened, substantially as described and for the purpose specified.

7. The combination of the head, the pilots mounted thereon, the ratchet mounted on said pilot and a trip acting to engage said ratchet and partially rotate said pilot within the head, substantially as described and for the purpose specified.

8. The combination of the head, the jaws pivoted thereon, the rock shaft also mounted on said head, the tripping arm of said shaft, devices for connecting said rock shaft with said jaws and the cam with which said rock shaft arm is engaged for moving said jaws, substantially as described and for the purpose specified.

9. The combination of the intermittingly moving head, dressing devices located in the path of the work as carried by said head, and means for holding the work against independent movement on said head when the work is

presented to said dressing device, substantially as described and for the purpose specified.

10. The combination of the intermittingly moving head, dressing devices located at different points in the path of the work as carried by said head, devices for holding the work in a fixed position with reference to said head when presented to said dressing devices and means for turning the work while passing from one dressing device to another to present different sides to the different dressing devices, substantially as described and for the purpose specified.

11. The combination of an intermittingly rotating head, a conveyer for presenting the work to said head, devices for holding the work thereon, dressing devices located in the path of the work as carried by said head, means for releasing the work-holding-devices, and a knock off for ejecting the work from the head, substantially as described and for the purpose specified.

12. The combination of the jaws or holders, the pilot between said jaws and the knock off, substantially as described and for the purpose specified.

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Witnesses:

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E. G. DUNHAM.