(No Model.) 3 Sheets—Sheet 1.

H. W. PUDAN.

MACHINE FOR CUTTING SCREW THREADS ON BOLTS.

No. 473,640. Patented Apr. 26, 1892.

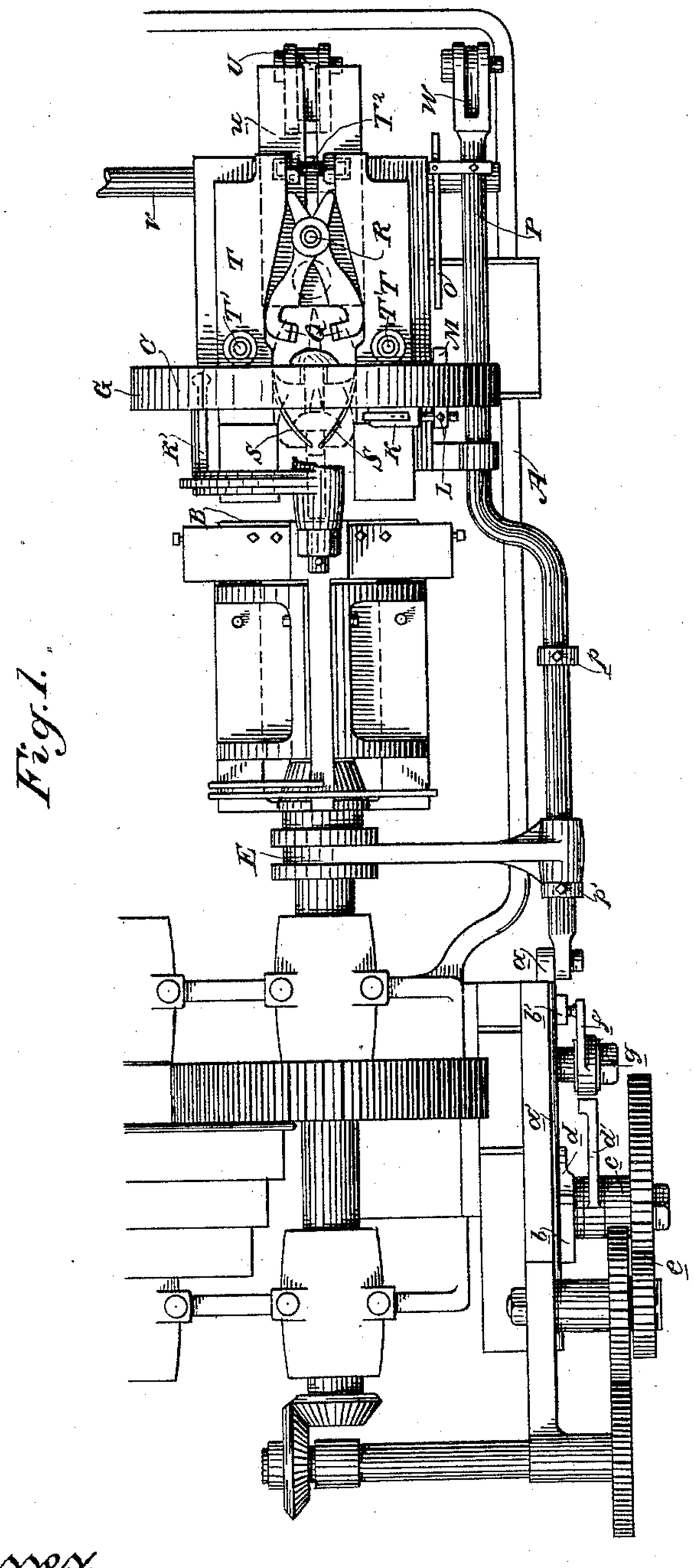

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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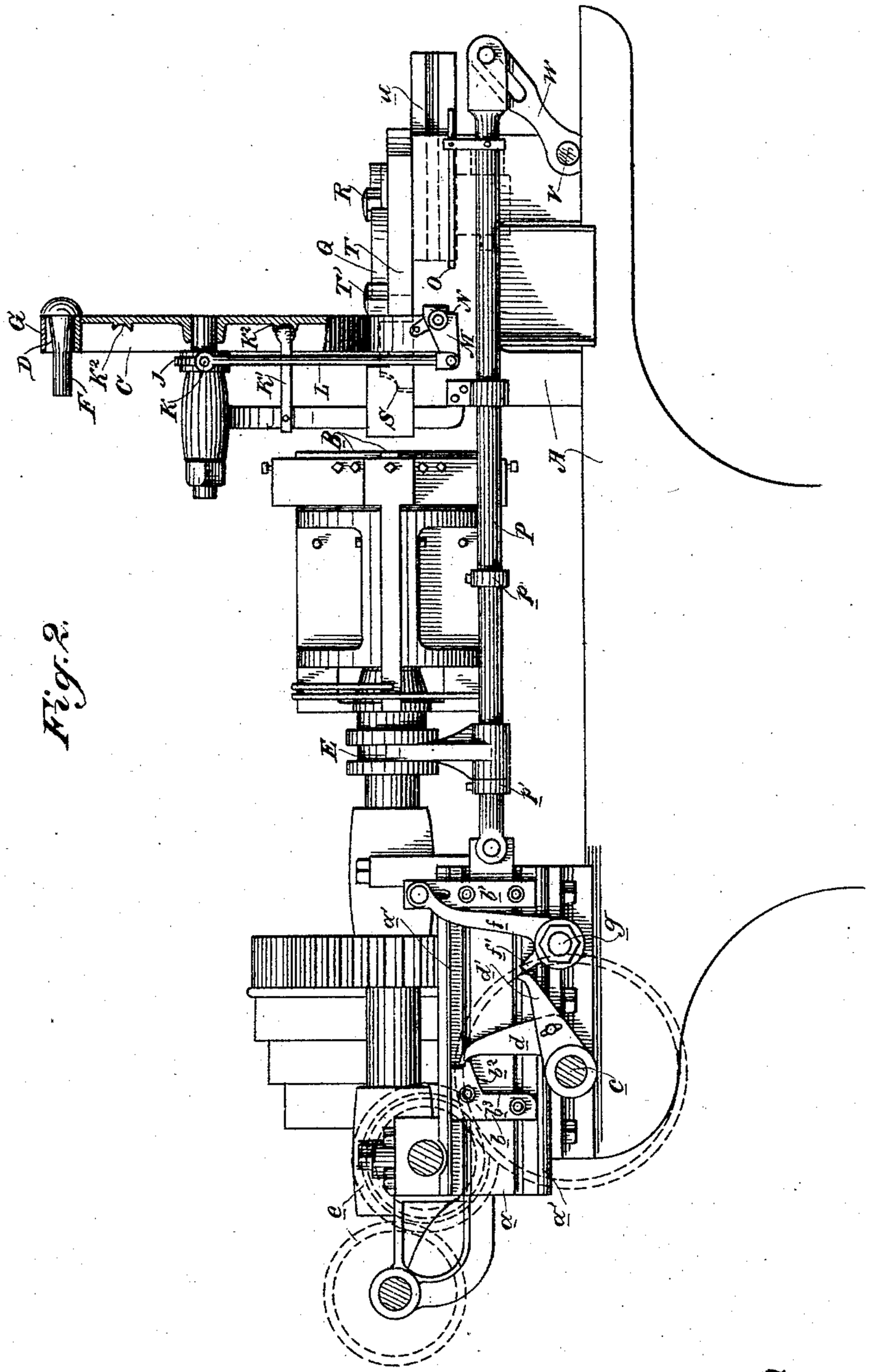

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

H. W. PUDAN.

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Fig. 3.

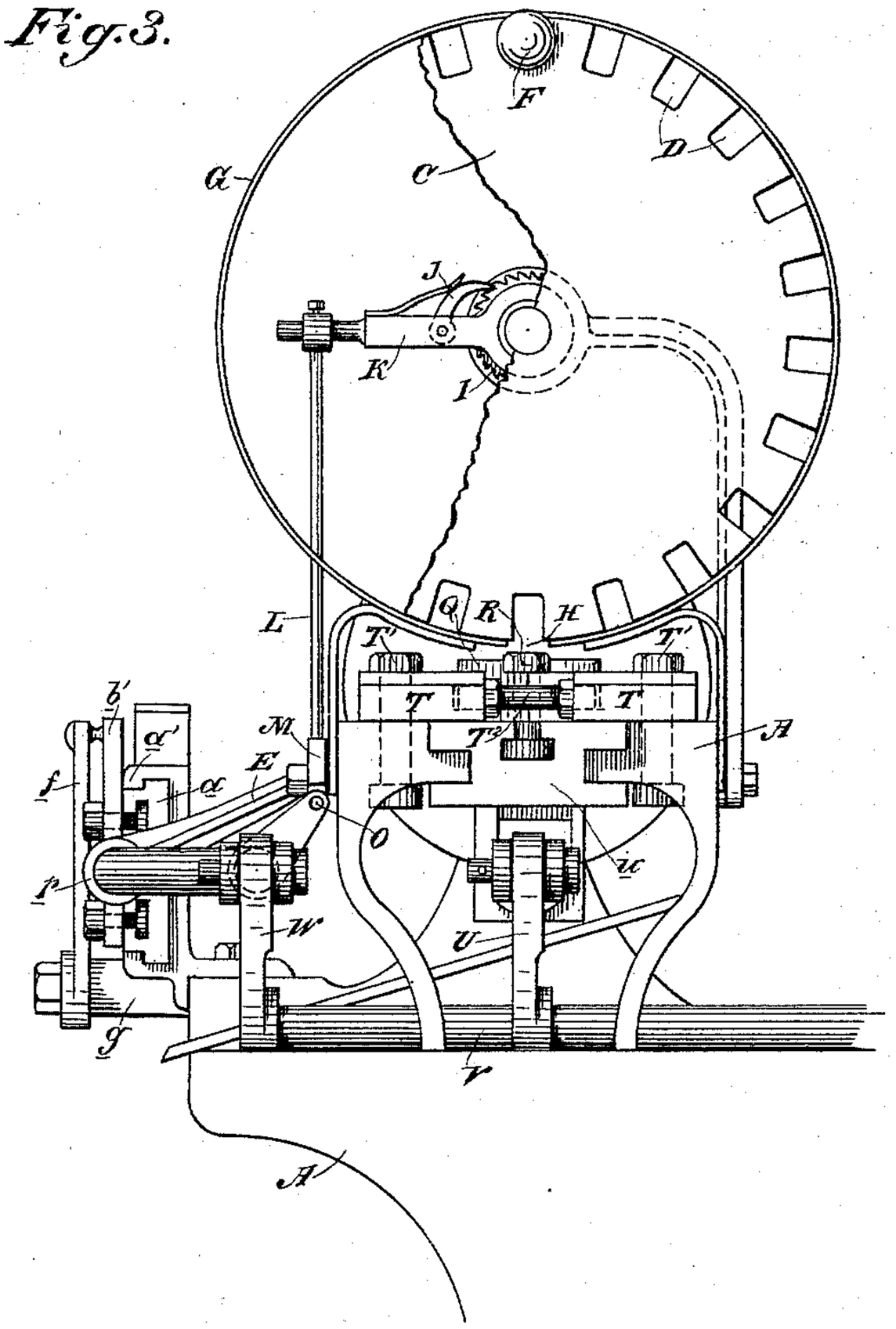
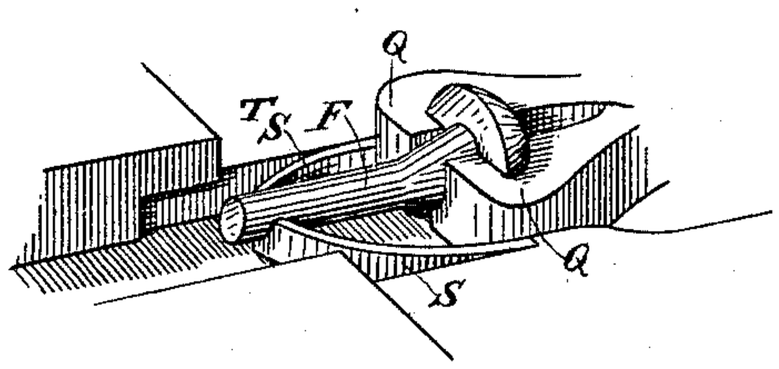


Fig. 4.



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Inventor,
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UNITED STATES PATENT OFFICE.

HERBERT W. PUDAN, OF SACRAMENTO, CALIFORNIA.

MACHINE FOR CUTTING SCREW-THREADS ON BOLTS.

SPECIFICATION forming part of Letters Patent No. 473,640, dated April 26, 1892.

Application filed November 16, 1891. Serial No. 412,085. (No model.)

To all whom it may concern:

Be it known that I, HERBERT W. PUDAN, a citizen of the United States, residing at Sacramento, Sacramento county, State of California, have invented an Improvement in Bolt-Cutting Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improvement in bolt-cutting machines whereby I am enabled to increase the output, while reducing the amount of labor necessary for the purpose.

My invention consists of certain attachments to bolt-cutters by which this result is produced, together with certain details of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view of my apparatus. Fig. 2 is a side elevation. Fig. 3 is a front elevation. Fig. 4 shows the bolt located in the clamp after having been dropped from the magazine.

My invention is designed to be applied to any bolt-cutting machinery. In the present case I have shown it adapted to what is known as the "National Bolt-Cutter," and it is designed to cut screw-threads upon three-quarter-inch track-bolts, which have a thread cut about two inches upon the end of the bolt and in which that portion of the shank adjacent to the head is made flattened or oval in section, so that the bolt may be held fast while the dies are cutting the thread upon its end.

A is the bed or frame upon which the parts of the apparatus are supported.

B are the dies by which the threads are cut upon the bolt, these dies being carried upon a head the sections of which may be approached toward each other, so that the dies will cut a thread upon the bolt, and may be separated from each other to allow the bolt to be withdrawn after the thread is cut.

The principal feature of my invention is an automatic feeding device by which the bolts are supplied one after the other without any further attention from the operator than to fill the magazine when it becomes empty. When the magazine is of sufficient capacity, one operator can thus attend to five or six machines and keep them all at work.

C is a magazine, which consists of a disk having radial slots D made in its periphery. These slots are of sufficient depth and width to receive the bolts, one of which is shown at F. The bolts are slipped into these slots, the width of which is sufficient to receive the narrowest portion of the oval or flattened part next the head of the bolt, while the major diameter of the oval lies in a radial position within the opening. A band or casing G surrounds this disk and prevents the bolts from falling out while the disk rotates until the openings reach the lowest point vertically beneath the axis upon which the disk turns. At this point the band or casing has a slot or opening H made in it of sufficient width to allow the bolt which is within the slot coinciding with the opening to fall through. It will be manifest that this disk may be made of any desired diameter and may have as many slots around its periphery as can be made without the heads of the bolts interfering with each other. The disk is rotated by means of a ratchet-wheel I and a pawl J, engaging this ractchet-wheel and pivoted to an arm K. This arm is actuated by a connecting-rod L and a crank-arm M. This crank-arm is pivoted upon a side of the frame and has a notch or lug, as shown at N, which is engaged by the rod O. This rod is fastened to the sliding bar P, so that it is moved with the latter, and when this bar is reciprocated, as will be hereinafter described, the rod O comes in contact with the crank-arm, partially rotating it upon its pivot pin or shaft, thus causing the pawl-and-ratchet mechanism to rotate the magazine-disk a distance equal to that between two of the bolt-carrying slots. As this takes place with each reciprocation of the carrying mechanism, it will be manifest that the bolts will be dropped from the slots of the magazine-disk successively until all are exhausted. The magazine-disk is held stationary at each point of rest by an elastic arm K′, having a rounded knob upon its end, and this knob drops into one of the depressions K^2 when either of the bolt-carrying slots is in position to deliver a bolt to the carrying-jaws. When these bolts fall from the magazine-disk, they are received between the jaws Q, which are chambered, as shown in Fig. 4, so as to receive the bolt which lies be-

tween these jaws with the major axis of its oval portion standing vertically. These jaws are adapted to close together transversely and thus clamp the minor axis of the bolt and hold it firmly while it is fed forward to the screw-cutting dies. These jaws are hinged together, as shown at R, and that portion of the bolt which projects beyond the jaws is supported upon two springs S, which center and hold the bolt in position to enter between the dies when the end reaches that point.

T are fixed curved guide-plates, the inner faces of which are curved so that when the jaws are in the position to receive a bolt from the magazine-disk they are separated sufficiently to allow the bolt to drop between them. As they are moved forward toward the dies they are closed together, so as to clamp the bolt tightly and prevent its turning during this operation. After the screw-thread has been cut upon the bolt, the dies separated, and the jaws drawn backward they reach a point between the guides which allows them to open sufficiently to allow the bolt to drop through into the chute, which delivers them at any desired point.

The guides T are pivoted upon bolts T′, and the rear ends of the guides are adjusted to or from each other by the stud T^2, having screw-threads with nuts near its opposite ends, which enter corresponding chambers in the adjacent faces of the rear ends of the guides, so that by turning the nuts in one direction or the other the guide-plates are adjusted to properly actuate the clamping-jaws. The reciprocating motion of these jaws is produced by a crank-arm U, which is connected with a horizontally-sliding plate *u*, and this plate has secured on its top the jaws Q at R. This arm is mounted upon a shaft V, which has a second crank-arm W upon its outer end. This crank-arm is connected by the sliding rod P, before mentioned, with a sliding plate *a*, which travels in guides *a′*. Upon this sliding plate are bolted two steel plates *b b′*, one of which serves for the forward and the other for the backward movement. These plates are adjusted upon the sliding plate *a* by bolts which pass through them, the heads of these bolts lying within parallel slots, which are formed in the plate *a*. The arm *d′* has a little slot, through which a set-screw from the underlying arm *d* projects, by which the relative position of the two arms can be regulated to produce the desired forward and backward movement of the connected parts.

d and *d′* are two arms fixed to a shaft *c*, which is rotated by a train of gearing at *e* and driven from the main central shaft, which rotates the cutter-head, as shown plainly in the plan view, Fig. 1. As the shaft *c* is rotated the arm *d* strikes the plate *b* upon the upper vertical portion and moves it backward, carrying with it the plate *a*, the connecting-rod P, and through the crank-arms the jaws, within which a bolt lies. Below the upper vertical part of the plate *b* against which this arm *d* strikes is an inclination, as shown at b^2. This inclination is at such a point that when by the movement of the arm *d* the parts have been moved backward to a certain distance, which in the case of bolts now being operated upon amounts to one and five-eighths inches, the point of the arm *d* will then follow this incline, which is about the same as the arc described by the end of the arm at this part of its movement, and while the arm is moving over this distance the parts operated by it will remain stationary. This pause occurs when the jaws which have been moved forward far enough to drop a bolt and which are now being retracted have reached a point beneath the magazine-disk, and while they thus remain stationary a bolt drops into the jaws. By the time this has taken place the jaws resume their motion, because the arm *d* will then have reached the second vertical portion b^3 of the plate *b*, and will thus continue to move the parts backward until the arm *d* has reached the bottom of the plate *b*, or when it has moved the parts back a distance equal to about four and three-fourth inches. At this point the dies will have commenced cutting the thread upon the end of the bolt and the farther advance of the bolt will be produced by the action of the dies cutting the thread. When the thread is completed, the collar *p* will strike the clutch E, and thus open the dies in the usual manner. On the return of the rod P the collar *p′* will act upon the clutch and close the dies in time to cut another thread. When the thread is completed, the die-heads will be opened in the manner usual to this apparatus, thus releasing the bolt. The arm *d′* will now have reached the point which will bring its end into contact with a projecting spur *f′* of the lever-arm *f*, which is mounted, as shown, upon the pin *g*. The upper end of the lever-arm *f* has a pin, which extends into a slot in the upper part of the plate *b′*, and by the action of the lever *d′* upon the lug *f′* the parts will be retracted and the slide-plate *a*, the connecting-rod P, and the jaws will be moved back the full length of the stroke, thus carrying the jaws to a point where they will open to their full width and allow the bolt to drop out. It will be seen that with this construction the only attention needed by the machine will be when the bolts in the magazine are nearly exhausted, when the operator can introduce new bolts into the empty slots and the machine will continue its operation.

As the feed and discharge of each of the machines is automatic, one operator can attend to a great number of machines and the output is very greatly increased.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a bolt-cutting machine having holding-jaws and screw-cutting dies, of a rotary disk having radial slots made

in its periphery adapted to receive the bolts and deliver them successively and automatically to holding-jaws to be carried to the screw-cutting dies, substantially as herein described.

2. The combination, with a bolt-cutting machine, of the rotary disk having radial slots made in the periphery, a stationary casing within which said disk rotates, having an opening in the bottom, through which the bolts drop from the carrying-slots when they reach this point, jaws situated beneath the disk, movable in horizontal guides, said jaws receiving the bolts from the feed-disk, and a mechanism by which the jaws are moved forward, so as to present the end of the bolt to the screw-cutting dies, substantially as herein described.

3. In a bolt-cutter, the screw-cutting dies and die-heads, a rotary disk having radial slots upon its periphery adapted to receive bolts, a stationary casing surrounding the disk, a slot in the lower portion of the casing, through which the bolts drop from each radial slot of the disk when it reaches this point, jaws reciprocating beneath the disk, adapted to receive the bolt as it is delivered from the feed-disk, springs by which the point of the bolt is supported, guided, and centered, so as to enter the cutting-dies when it reaches them, and guide-plates between which the jaws move and by which they are closed to clamp the rear end of the bolt when the jaws advance toward the dies and which open the jaws to release the bolt after the thread has been cut and the jaws have been retracted to the end of their rearward stroke, substantially as herein described.

4. In a bolt-cutting machine, the screw-cutting dies and die-head, a rotary disk having radial channels in its periphery, a stationary casing within which the disk revolves, by which the bolts contained in the channels are retained in place, a slot at the bottom of said casing through which the bolts from each channel are delivered, horizontally-moving jaws, a mechanism by which they are retracted and brought to a point beneath the disk to receive each bolt as it is delivered, a pawl-and-ratchet mechanism by which the disk is rotated, and an intermediate connecting-rod and arms, whereby the disk is rotated simultaneously with the movement of the jaws, substantially as herein described.

5. In a bolt-cutting machine, the rotary bolt carrying and feeding disk, a pawl-and-ratchet mechanism by which the disk is advanced the distance between two of the bolt-carrying slots at each movement, an elastic arm and stop mechanism by which the disk is retained at each position of rest, and a horizontally-moving clamping and carrying mechanism into which the bolts are delivered from the magazine-disk and by which they are presented to the screw-cutting dies of the machine, substantially as herein described.

6. In a bolt-cutting machine, the rotary feeding-disk, the jaws adapted to receive the bolts successively from said disk and carry them forward to the screw-cutting dies, a shaft with crank-arms, one of which connects with the carrier of the bolt-holding jaws and the other with a sliding plate, and arms d d', whereby said plate and the connected parts are reciprocated, substantially as herein described.

7. In a bolt-cutting machine, the bolt-feeding device reciprocating beneath the disk and adapted to receive the bolts successively from the feed-disk to carry them forward and present them to the screw-cutting dies, withdraw them, and deliver them into a delivery-chute, a mechanism by which the reciprocating motion of the jaws is produced, consisting of the sliding plate a, having the plates b b' secured thereto, an arm d, the mechanism whereby it is rotated so as to strike the plate b and move the slide and its connected parts in one direction, a lever-arm f, connected with the plate b', and a second arm d', adapted to engage the lever-arm and move the sliding plate in the opposite direction, substantially as herein described.

8. The sliding plate a, the plate b, secured thereto, having the two vertical faces and the inclined connecting-face b^2, the arm d' and gearing whereby it is rotated, so that the point is first brought in contact with the upper vertical edge of the plate b, then caused to traverse the inclined face b^2, and afterward to move in contact with the lower vertical edge of the plate, whereby the slide a is moved forward in two successive impulses with an intermediate pause, bolt-carrying jaws connected with this slide and actuated thereby, and a feeding-disk adapted to deliver bolts to said jaws during the time when the pause in their motion takes place, said jaws carrying the bolt thus received and presenting it to the screw-cutting dies with the completion of the movement, substantially as herein described.

In witness whereof I have hereunto set my hand.

HERBERT W. PUDAN.

Witnesses:
THOMAS A. PUDAN,
WM. W. WINN.

Correction in Letters Patent No. 473,640.

It is hereby certified that in Letters Patent No. 473,640, granted April 26, 189
upon the application of Herbert W. Pudan, of Sacramento, California, for an in
provement in "Machines for Cutting Screw Threads on Bolts," an error appears
the printed specification requiring correction, as follows: In line 3, page 1, the clau
"citizen of the United States," should read *subject of the Queen of Great Britain*; a
that the said Letters Patent should be read with this correction therein that the sa
may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 19th day of July, A. D. 1892.

GEO. CHANDLER,
First Assistant Secretary of the Interio

[SEAL.]

Countersigned:
N. L. FROTHINGHAM,
Acting Commissioner of Patents.