

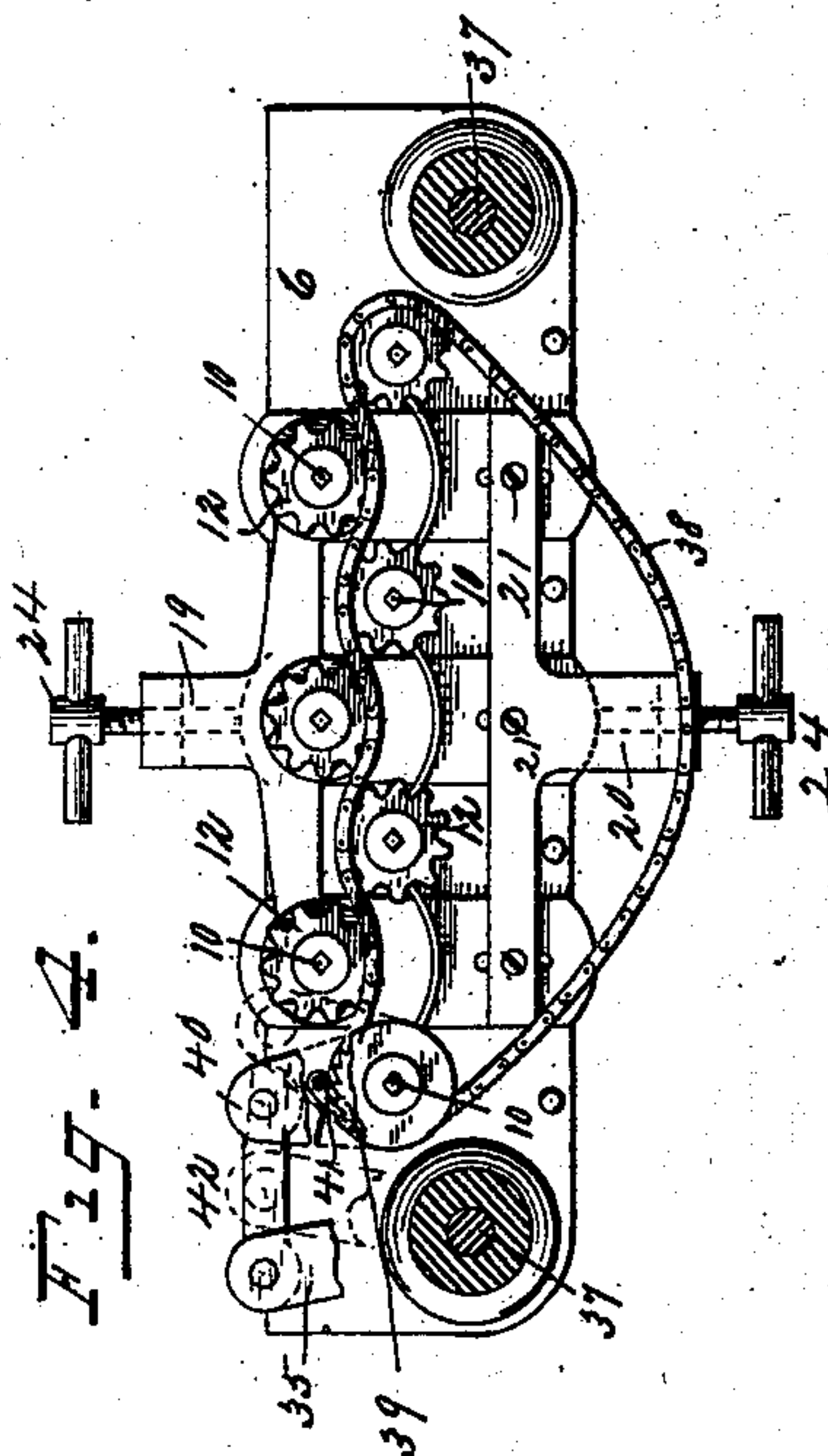
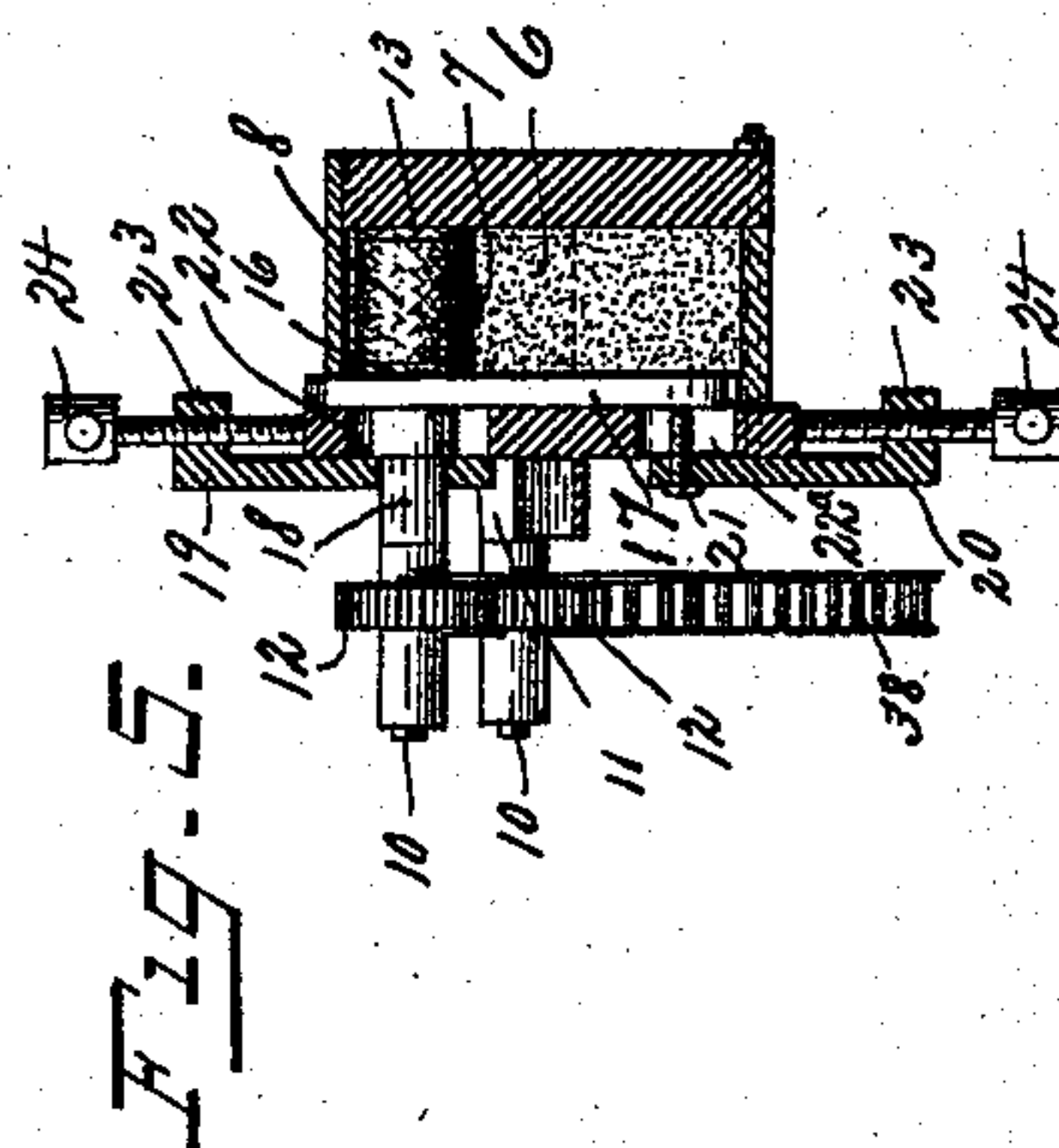
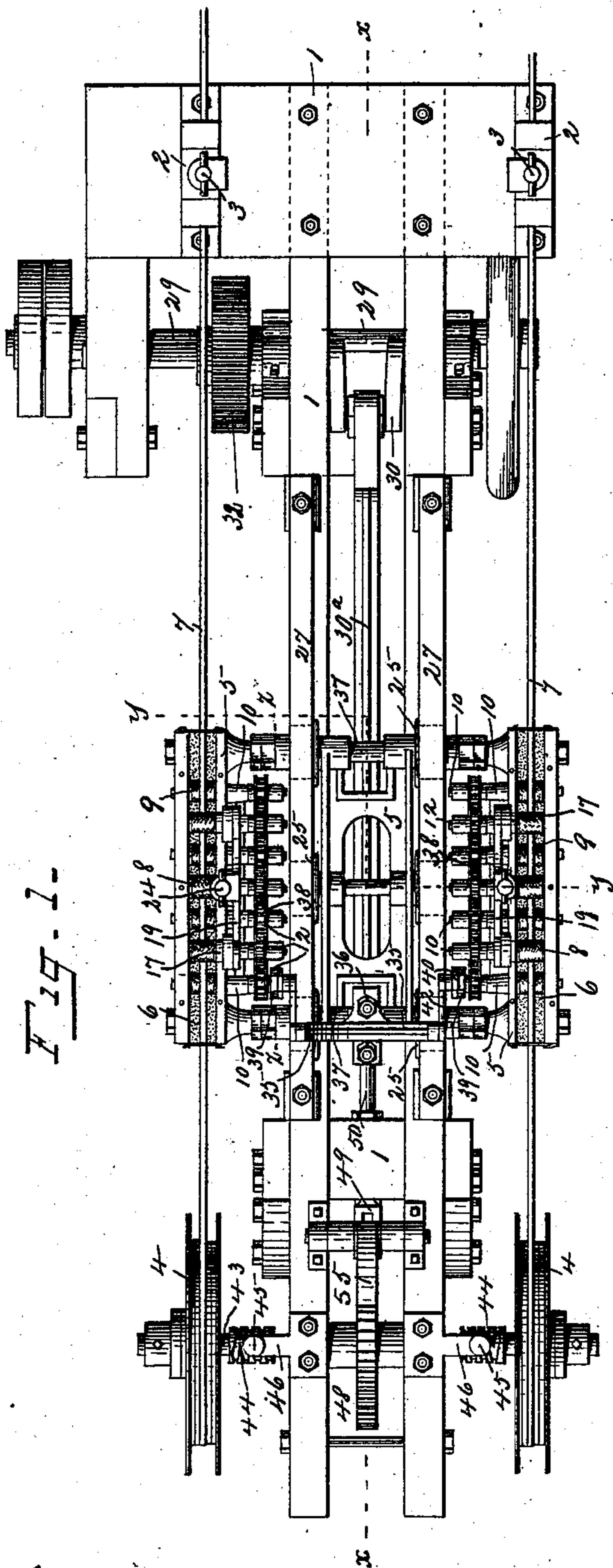
(No Model.)

3 Sheets—Sheet 1.

L. BAUMEISTER.
MACHINE FOR POLISHING WIRE.

No. 380,162.

Patented Mar. 27, 1888.



Witnesses—
E. D. Smith
C. E. Ruggles,

Inventor—
Leopold Baumeister
By
J. M. Wooster
att'y.

(No Model.)

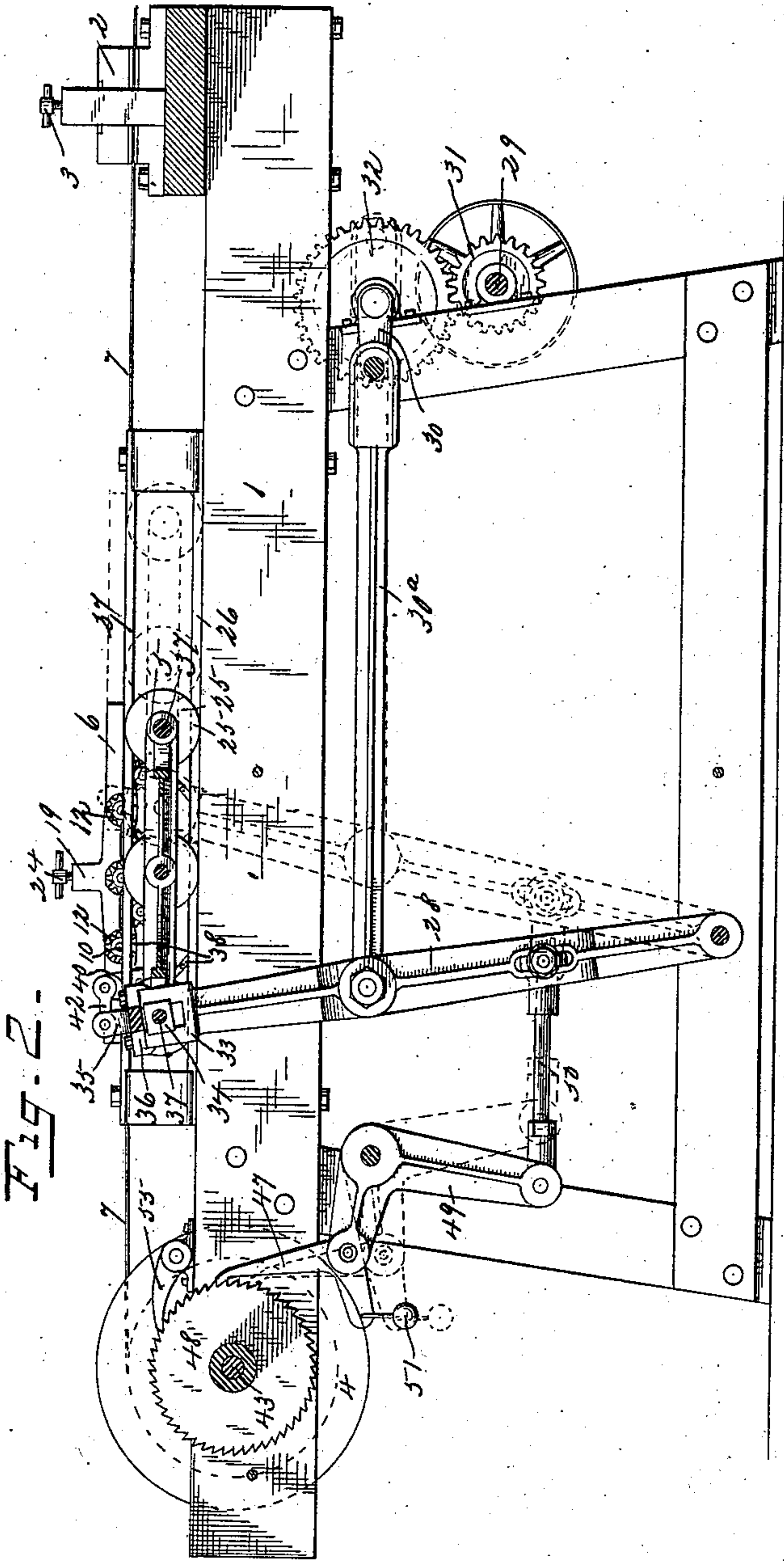
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L. BAUMEISTER.

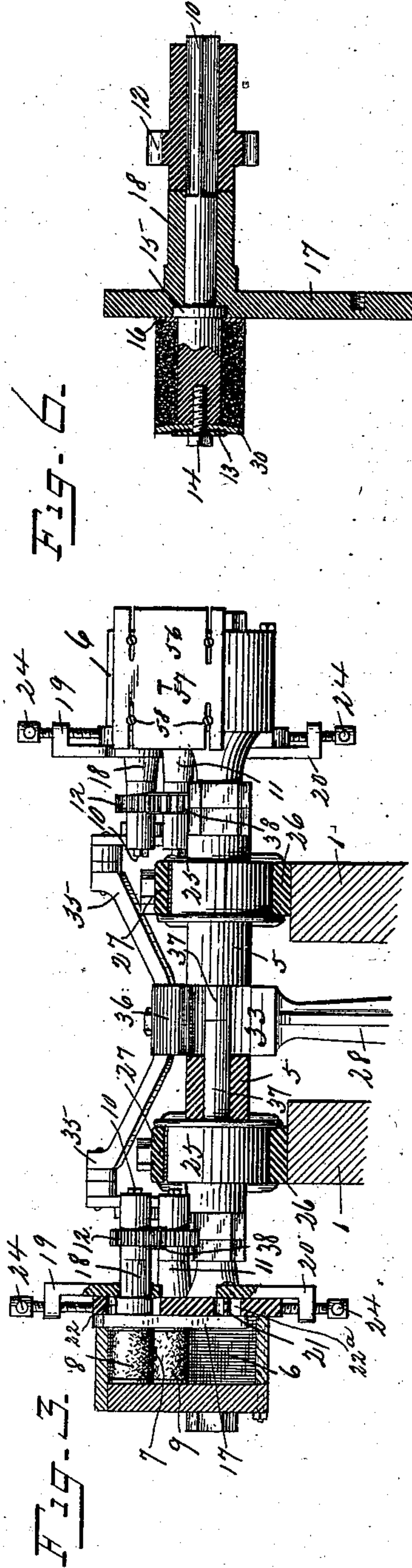
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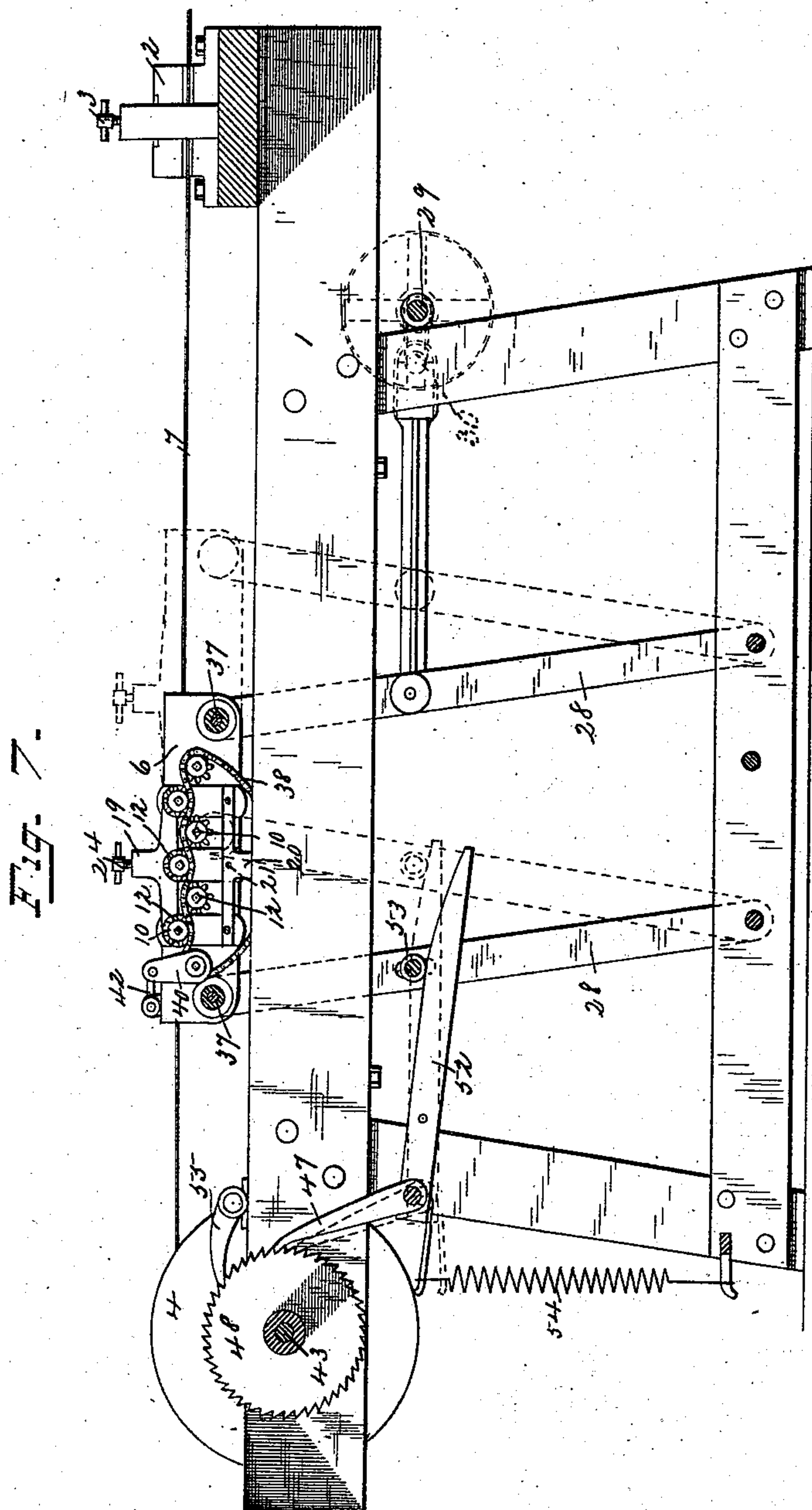
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Witnesses,
E. D. Smith
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UNITED STATES PATENT OFFICE.

LEOPOLD BAUMEISTER, OF BRIDGEPORT, CONNECTICUT.

MACHINE FOR POLISHING WIRE.

SPECIFICATION forming part of Letters Patent No. 380,162, dated March 27, 1888.

Application filed June 28, 1887. Serial No. 242,760. (No model.)

To all whom it may concern:

Be it known that I, LEOPOLD BAUMEISTER, a citizen of the Grand Duchy of Baden, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Polishing Wire; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its general object to produce a machine that will perfectly polish all qualities and shapes of wire, from the coarsest to the finest, either before or after it is tempered.

With these ends in view I have devised the simple and novel construction of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to denote the several parts.

Figure 1 is a plan view of the entire machine, the covers of the emery-boxes being removed; Fig. 2, a longitudinal section on the line *xx* in Fig. 1; Fig. 3, an enlarged cross-section on the line *yy* in Fig. 1, looking toward the left; Fig. 4, an enlarged cross-section on the line *zz* in Fig. 1; Fig. 5, an enlarged cross-section of one of the boxes; Fig. 6, a detail sectional view illustrating the construction of one of the upper polishing-rolls; and Fig. 7 is a longitudinal section corresponding with Fig. 2, showing the carriage arranged to swing instead of slide.

1 denotes the frame-work, which may be of any preferred construction; 2, tension devices at the front of the machine regulated by screws 3; 4, winding-drums at the rear of the machine, and 5 a reciprocating carriage at the central portion thereof. Upon each side of the carriage is an emery-box, 6, through which a strand of wire (denoted by 7) is passed to polish it. It will of course be apparent that any number of these boxes may be provided in each machine. In the present instance I have shown two, that being the number ordinarily used.

The construction and operation of the parts of the machine upon the carriage constitute an important part of my invention, which I will now proceed to describe in detail.

Each box is provided with upper and lower sets of polishing-rolls, (designated, respectively, as 8 and 9.) The rolls in either or both of the sets may be made adjustable. In practice I ordinarily make the lower set stationary and the upper set adjustable, and have so illustrated the construction in the drawings. The lower rolls are carried by shafts 10, which are journaled in the sides of the boxes, stumps 11 being cast upon the sides of the boxes to increase the bearing-surface and strengthen the machine. The outer ends of these shafts are squared, and gears 12 are placed upon the squared portions, as is clearly shown in Fig. 6, this portion of the arrangement of both upper and lower rolls being identical. These rolls may be made of any suitable material—for example, wood, leather, lead, or felt. For ordinary flat wire I preferably use a number of thicknesses of heavy felt, which are slipped over enlargements on shaft 10, and are held firmly in position by washers 13 and screws 14, engaging the inner ends of the shafts. In order to prevent emery in the boxes from working into the bearings of shafts 10, I provide collars 15 upon said shafts, which fit closely in corresponding recesses in the sides of the boxes, and leather washers 16 between the felt and the sides of the boxes. The screw and washer at the other end of the roller act to press the felt or other material firmly against the leather washer, which, in connection with the collar, prevents the entrance of any emery whatever into the bearings. The upper rollers are constructed in precisely the same manner, but the shafts 10 are journaled in slides 17, having stumps 18. These slides have vertical movement in corresponding grooves in the sides of the boxes. (See Fig. 1.) Any number of rolls may of course be used in each set. In the present instance I have shown four rolls in the under set and three in the upper set. The stumps and slides in which the shafts of the upper rolls are journaled all pass through slots 22 in the sides of the boxes, and are connected at the top to a supporting-piece, 19, in the present instance the stumps being passed through openings in said piece. At the bottom the slides are connected to supporting-pieces 20, by screws 21, passing through slots 22^a in the sides of the boxes. Both sup-

porting-pieces are provided with lugs 23, and set-screws 24, passing through these lugs, engage the top and bottom of the side of the emery-box, as clearly shown in Fig. 5. These 5 set-screws enable me to produce any desired amount of non-yielding pressure upon the wire that is being polished. Reciprocatory motion may be imparted to the carriage in any suitable manner.

10 In Figs. 1, 2, and 3 I have shown the carriage provided with rollers 25, which travel upon tracks 26, and are held in position by strips 27, said tracks and strips being fixed to the frame-work in any suitable manner; and 15 in Fig. 7 I have shown the carriage supported by oscillating levers 28.

29 denotes the main shaft of the machine, to which power is applied by a belt, (not shown,) and 30 denotes a crank, which may be upon 20 the main shaft, as in Fig. 7, or upon a secondary shaft, as in Figs. 1 and 2, in which the main shaft is shown as provided with a pinion, 31, and the secondary shaft with a gear-wheel, 32, meshing therewith.

25 30^a is a link connecting the crank with the oscillating lever.

In Figs. 1, 2, and 3 but a single oscillating lever is used, which is pivoted to the frame-work. At the upper end of this lever is a 30 yoke, 33, and 34 is a sliding block carried by the yoke. A cross-piece, 36, having arms 35, holds the block in position in the yoke.

37 denotes cross-bolts which extend through both emery-boxes and entirely across the carriage from side to side. One of these bolts 35 passes through sliding block 34, whereby the oscillations of lever 28 are caused to impart reciprocatory motion to the carriage.

In order to insure continuous change of the 40 polishing-surface of rolls 8 and 9 upon the wire, I cause a partial rotation to be imparted to each of the polishing-rolls at each reciprocation of the carriage. This may of course be accomplished in any suitable manner. In the 45 present instance I provide endless chains 38, which engage all of the gears 12 upon the shaft of the rolls in each emery-box, passing over and under alternate lower and upper gears. Upon one of the lower shafts in each 50 emery-box I provide a ratchet, 39, keyed thereto.

40 is a lever which turns on said shaft, and is provided with a pawl, 41, which engages the ratchet. A link, 42, connects each pawl-lever 55 with one of the arms 35, which project from cross-piece 36. It will be seen that each time the carriage moves toward the right pawls 41 are moved backward over one or two teeth on ratchets 39, and when the carriage is moved 60 toward the left this movement must carry the ratchets forward an equal distance, and, through their shafts and the endless chains which engage all of the gears 12 belonging to each emery-box, impart a corresponding rotary 65 movement to each of the polishing-rolls, so that a fresh polishing-surface comes in con-

tact with the wire at each reciprocation of the carriage.

It will of course be understood that the emery-boxes are covered, so that it is impossible for the contents to fly out, and, as already 70 described, I have so constructed the parts that it is impossible for emery to work into the bearings. Even if emery should fly out from the boxes it could not come in contact with 75 any of the operative parts of the machine, but would drop upon the floor. When it is necessary to put in new polishing-rolls, it is simply required to remove the outer sides (denoted by 6^a) of the emery-boxes and remove 80 gears 12 from shafts 10, when the latter may be readily drawn out and the rolls removed.

The tension devices (denoted by 2) at the front of the machine require no description, as any ordinary or preferred devices of this class 85 may be used.

The winding-drums are carried by a shaft, 43, at the opposite end of the machine. 44 denotes switch threads or worms mounted on this shaft, and 45 travelers mounted on arms 90 46, projecting from the frame-work. These travelers engage the switch-threads and cause longitudinally-reciprocating movement to the shaft, so that the wire is wound evenly upon the drums. The rotary movement of the 95 drums is imparted from lever 28 by means of a pawl, 47, which engages a ratchet, 48, on shaft 43. In Fig. 2 this pawl is carried by a bell-crank lever, 49, pivoted to the frame-work, and connected by an adjustable link, 50, to 100 oscillating lever 28.

51 is a weight acting to hold the pawl in engagement with the ratchet. It will be seen that each movement of the oscillating lever toward the right will draw the upper arm of 105 the bell-crank lever downward, and consequently draw the pawl backward over the ratchet, while the return movement of the oscillating lever will raise the upper arm of the bell-crank lever, and with it the pawl, forcing 110 the ratchet forward and imparting a rotary movement to the drums. In Fig. 7 the pawl is carried by a lever, 52, the opposite end of which is provided with an incline, which is engaged by a roller, 53, on one of the oscillat- 115 ing levers. A spring, 54, acts to draw the forward end of the lever downward and hold the pawl in engagement with the ratchet.

55, in both forms, is a pawl which engages the ratchet and acts to hold it against backward movement. The operation is the same as in the other form. It will of course be apparent that the slower the wire is wound upon the drums the more times the polishing-rolls will pass over its surface. The amount wound 125 at each reciprocation of the carriage may be readily adjusted by moving the point of attachment of link 50 to the oscillating lever up or down, in the form illustrated in Fig. 2, or by moving roller 53 up or down, in the 130 form illustrated in Fig. 7. In practice I usually wind about four inches of polished wire

at each reciprocation of the carriage. In order to reduce the wear upon the rolls to the minimum, I provide an adjustable guide, 56, at the front of each emery-box, having an aperture, 57, of suitable size and shape to permit the wire to pass through it freely, but at the same time to hold it against lateral movement. As the machine is shown as acting upon a flat wire, the guide illustrated is shown as provided with a corresponding aperture.

58 denotes set-screws passing through slots in the guide, whereby it is locked in any desired position.

Each time a new coil of wire is placed in the machine to be cleaned and polished guide 56 is moved so that the wire comes in contact with an unused portion of the surface of the polishing-rolls.

The operation of the entire machine has been so thoroughly described in detail as to require but a brief recapitulation. In starting the machine the strands of wire are passed through the tension devices, then through the emery-boxes between the upper and under sets of polishing-rolls, and the ends are attached to the winding-drums. The boxes are filled with emery, and the pressure of the polishing-rolls upon the wire is then adjusted, and the machine is ready for the application of power. In use the carriage reciprocates backward and forward, causing the wire to be thoroughly cleaned and polished by the action of the emery and the rolls between which it passes. The rolls have no movement, except as actuated in the manner described for the purpose of continually changing the surface that is acting upon the wire. The movement of the carriage is sufficient, so that several movements of the polishing-rolls take place over each portion of the surface of the wire.

The machine is adapted for all sizes, shapes, and qualities of wire, and is found in practice to perfectly remove a heavy oil-scale after tempering, and to impart to the wire a perfect polish.

It will of course be understood that the details of construction are subject to almost unlimited variation without departing from the principle of my invention.

I claim—

1. The carriage having emery-boxes, in combination with a set of rolls journaled in said boxes, another set of rolls journaled in slides in said boxes, supporting-pieces 19 and 20, connected to said slides, and screws at top and bottom, whereby said rolls may be adjusted.

2. The carriage having emery-boxes, in combination with a set of rolls whose shafts are journaled in said boxes, another set of rolls whose shafts are journaled in slides in said boxes, gears 12 on said shafts, and endless chains connecting all the gears belonging to each emery-box, whereby motion imparted to one of the shafts is transmitted to all of the others.

3. The combination, with the reciprocating

carriage, emery-boxes, polishing-rolls, shafts 10, and gears 12, of endless chains connecting all the gears belonging to each box, and mechanism—for example, a pawl and ratchet—for imparting rotary movement to the rolls.

4. The combination, with the reciprocating carriage, polishing-rolls, and gears 12, of an endless chain passing over and under alternate gears, whereby the movement of one of said gears is imparted to the others.

5. The emery-boxes having stumps 11, slides 17 in said boxes having stumps 18, shafts 10, and detachable gears 12, in combination with polishing-rolls carried by said shafts, an endless chain engaging the series of gears, and a pawl and ratchet and connecting mechanism for imparting rotary movement to one of said shafts.

6. The emery-boxes, a set of rolls journaled therein, slides 17 in said boxes, and another set of rolls journaled thereon, in combination with detachable gears 12, supporting-pieces 19 and 20, connected to the slides, and set-screws at top and bottom, whereby the rolls carried by the slides may be adjusted to give any desired pressure.

7. The combination, with shafts 10, carrying polishing-rolls and having collars 15, of the emery-boxes having recesses to receive said collars, and washers covering the collars and resting against the side of the box, whereby the emery in the boxes is prevented from entering the bearings.

8. Shafts 10, having collars 15, the emery-boxes having recesses to receive said collars, and washers 16, covering said collars and resting against the side of the box, in combination with polishing-rolls and gears 12, carried by said shafts.

9. The reciprocating carriage, emery-boxes on said carriage, and polishing-rolls in said boxes, in combination with tension and winding mechanism, and an adjustable guide through which the wire passes, as and for the purpose set forth.

10. The reciprocating carriage having emery-boxes and polishing-rolls, in combination with oscillating lever 28, connected to the carriage, and ratchet mechanism operated thereby, whereby a forward movement is imparted to the rolls at each reciprocation of the carriage.

11. The reciprocating carriage having emery-boxes and polishing-rolls, in combination with oscillating lever 28, connected to the carriage, a cross-piece upon said lever having arms 35, and ratchet mechanism operated by said arms, whereby a forward movement is imparted to the rolls at each reciprocation of the carriage.

12. The reciprocating carriage having emery-boxes and polishing-rolls, an oscillating lever, and a sliding block at the end of said lever, in combination with a cross-bolt, 37, passing through the carriage and sliding block, and ratchet mechanism, whereby a forward

movement is imparted to the rolls at each reciprocation of the carriage.

13. A reciprocating carriage having emery-boxes and polishing-rolls, and an oscillating
5 lever pivotally secured to the carriage, in combination with gears upon the roll-shafts, a ratchet secured to one of said shafts, a lever carrying a pawl journaled on said shaft, a link

connecting said lever with the oscillating lever, and an endless chain connecting the gears. 10

In testimony whereof I affix my signature in presence of two witnesses.

LEOPOLD BAUMEISTER.

Witnesses:

A. M. WOOSTER,

C. E. RUGGLES.