

No. 618,312.

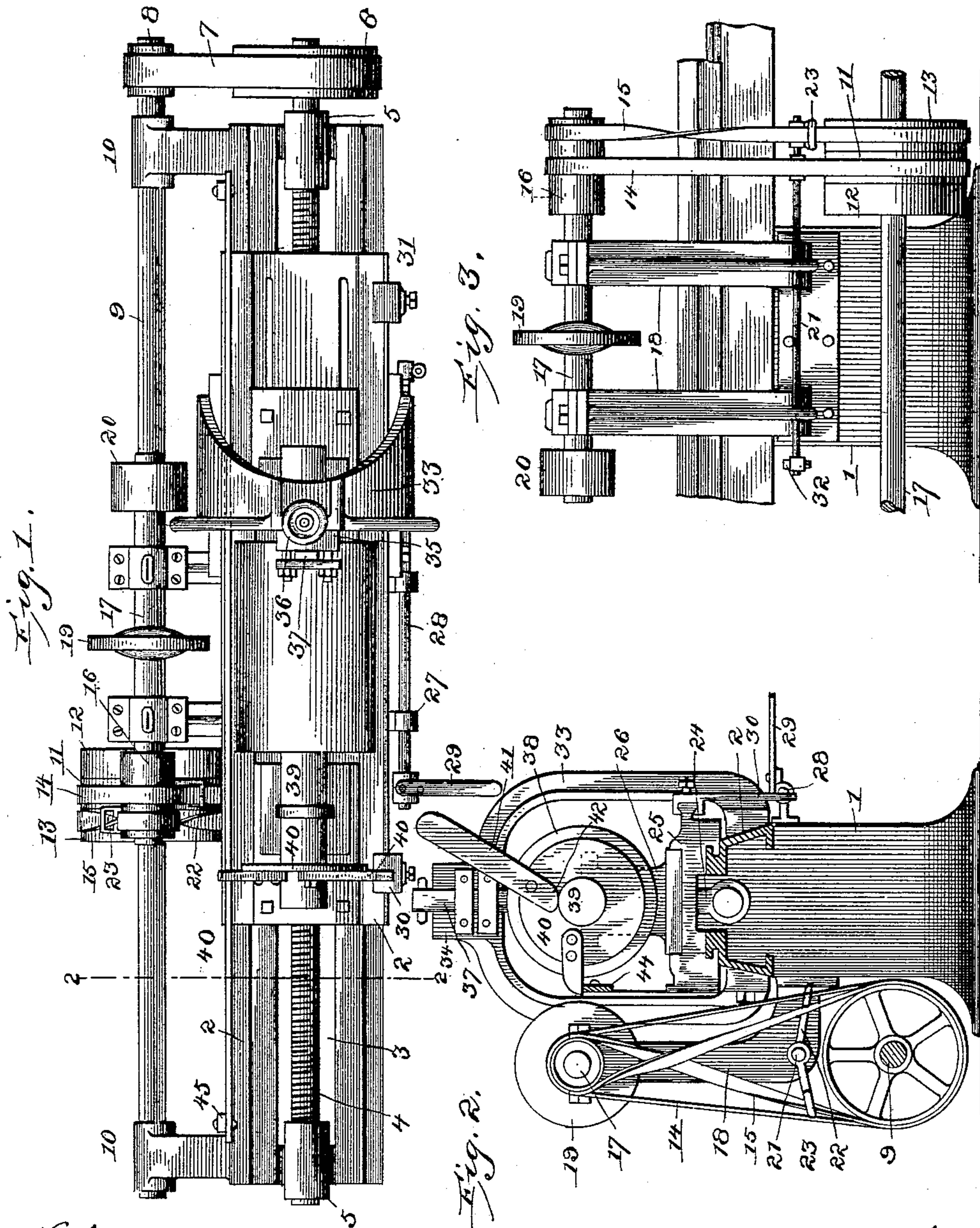
Patented Jan. 24, 1899.

F. W. WRIGHT.  
GRINDING OR CORRUGATING MACHINE.

(Application filed May 9, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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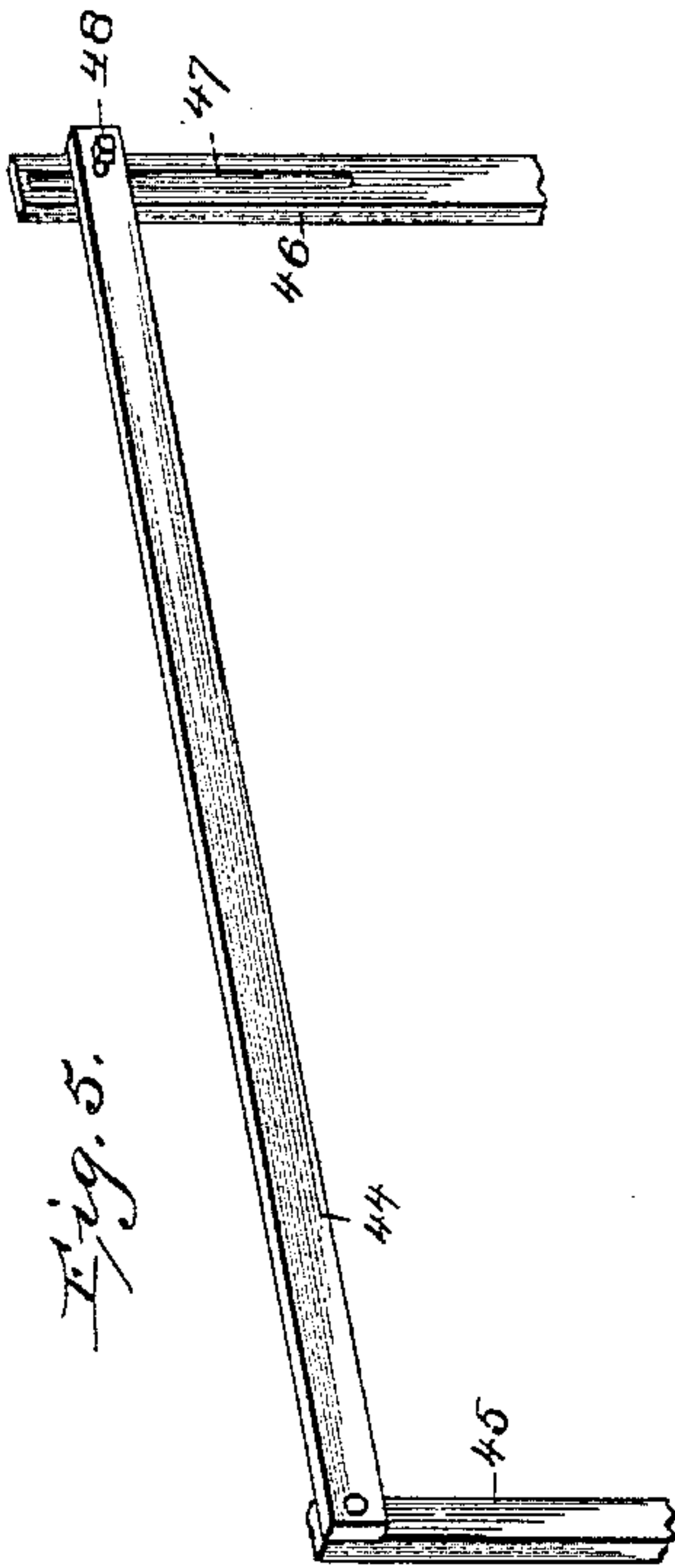


Fig. 6.

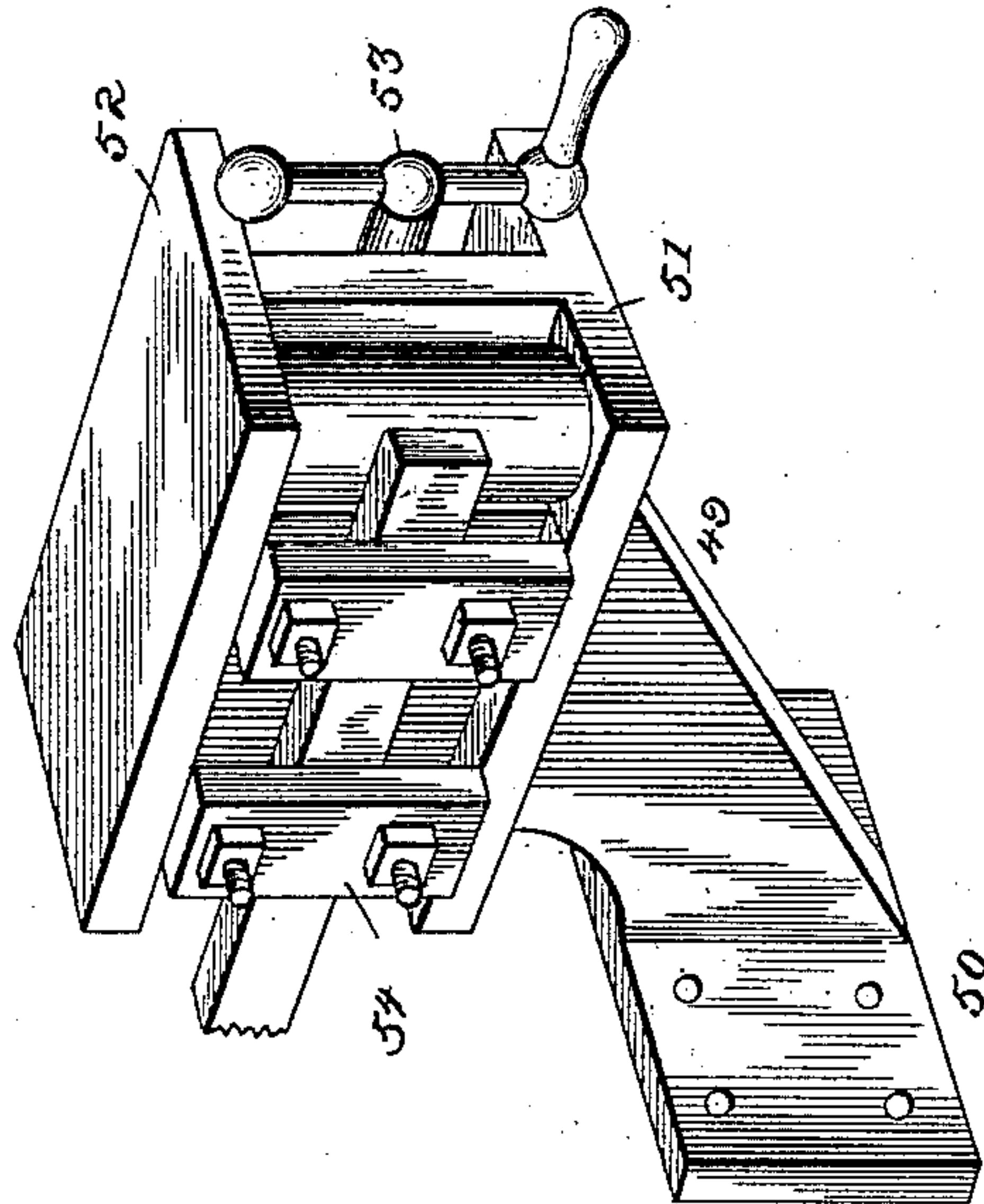
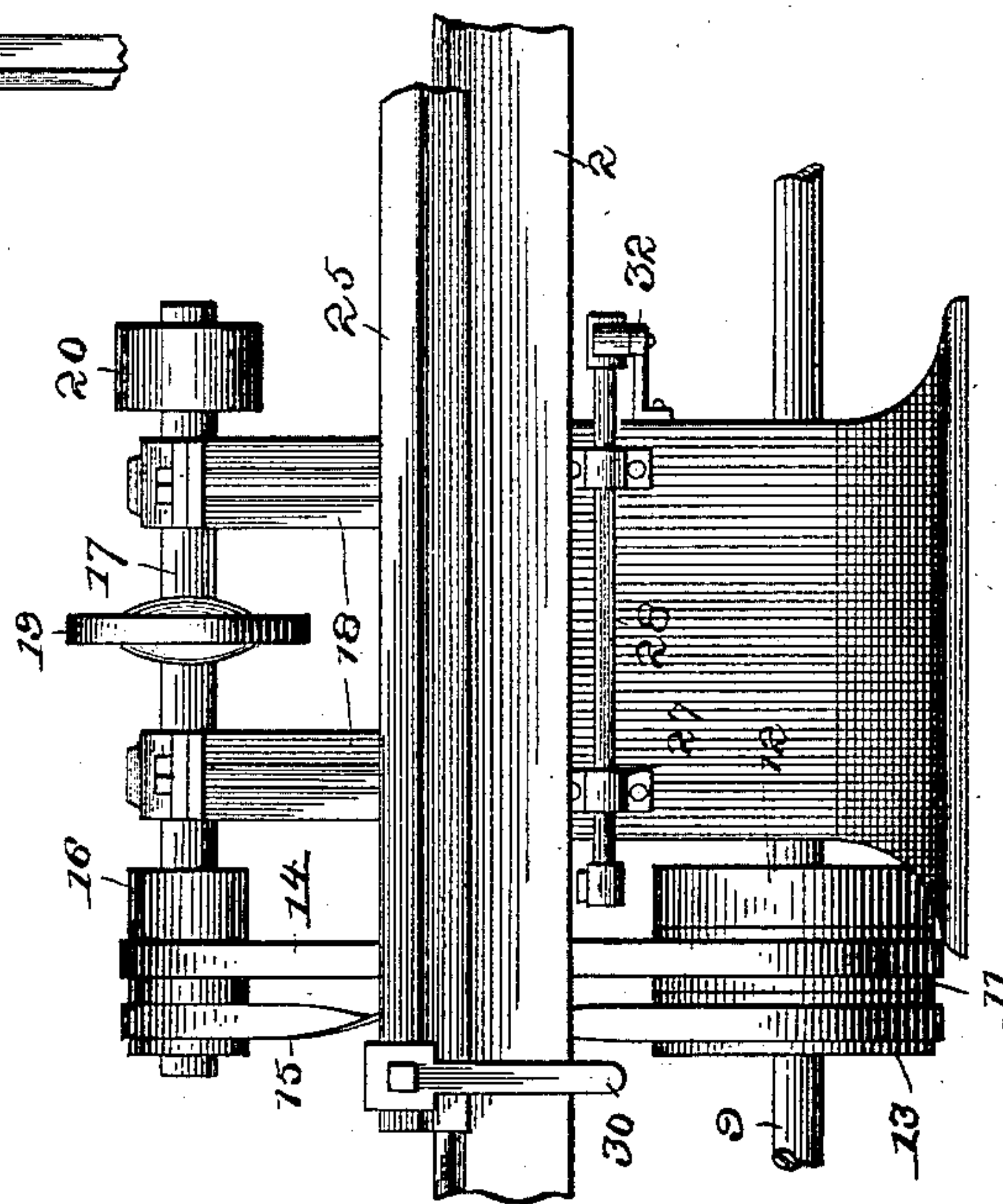


Fig. 4.



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# UNITED STATES PATENT OFFICE.

FRED W. WRIGHT, OF REED CITY, MICHIGAN.

## GRINDING OR CORRUGATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 618,312, dated January 24, 1899.

Original application filed July 8, 1897, Serial No. 643,902. Divided and this application filed May 9, 1898. Serial No. 680,184:  
(No model.)

*To all whom it may concern:*

Be it known that I, FRED W. WRIGHT, a citizen of the United States, residing at Reed City, in the county of Osceola and State of Michigan, having invented certain new and useful Improvements in Grinding or Corrugating Machines; 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.

This invention relates to a grinding or corrugating machine for treating the surfaces of rolls, and a part of its subject-matter is a division of a prior application filed by me on July 8, 1897, Serial No. 643,902.

The primary object of this invention is to provide means by which the surface of a roll or cylinder may be corrugated or grooved in lines parallel to its axis or pitched at a spiral inclination to the axis.

A further object of the invention is to provide means which may be easily adjusted and controlled to regulate the pitch of the inclination of the grooves to be produced in the roll-surface, and this adjusting means is readily accessible and efficient in service.

With these ends in view the invention primarily consists in the combination, with a traveling work-carriage, of a corrugating or grooving mechanism embracing a fixed support, a cutter-head movably mounted thereon, means for adjusting the cutter-head with relation to the work on the traveling carriage, and a corrugating or grooving tool fixed in the cutter-head.

The invention further consists in the combination, with a traveling carriage and a relatively stationary tool for grooving the work as it is presented thereto by the carriage, of means for giving to the work an intermittent rotary feed and a guide-track on which the roll-feed mechanism is adapted to travel and which regulates the position of the work with relation to the cutter; and the invention further consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the same in the accom-

panying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a grinding or corrugating machine embodying my invention. 55  
Fig. 2 is a vertical transverse section on the plane indicated by the dotted line 22 of Fig. 1.  
Fig. 3 is a front elevation of a part of the machine, showing the reversible driving-gear.  
Fig. 4 is a view in rear elevation of part of the machine. 60  
Fig. 5 is a detail view of the feed and guide device for the roll-shaft. Fig. 6 is a perspective view illustrating another embodiment of the corrugating mechanism, showing the same in operative relation to a part of the grinding-machine. 65

Like numerals denote like and corresponding parts in all the figures of the drawings.

1 designates the main frame of the machine, on which is carried the bed 2, which is divided or slotted centrally, as at 3, to accommodate a horizontal longitudinally-disposed feed worm-shaft 4, which is journaled at its ends in suitable bearings 5, that are rigidly secured to the bed. This feed-shaft is equipped at one end with a driving-pulley 6, around which passes a belt 7, that is operatively fitted to a pulley 8 on the counter-shaft 9. Said shaft 9 is arranged below the bed 2 and at one side of the machine-frame to be journaled in the bearings 10, and on this shaft are carried the fast pulley 11 and the two loose pulleys 12 13, the loose pulleys being fitted to the shaft on opposite sides of the fast pulley. To one of the loose pulleys, 12, is fitted a straight belt 14, while to the other loose pulley, 13, is fitted a crossed belt 15, and these straight and crossed belts are properly fitted to a pulley 16 on a shaft 17, which is journaled in bearings on a suitable upright supplementary frame 18 of the machine, so that this shaft 17 lies in a horizontal position above the bed 2. To the shaft 17 is rigidly secured an abrading-wheel 19, and on one end of the shaft is keyed or splined a driving-pulley 20, around which may pass a belt from an overhead line of shaft or other suitable source of power. 85 90 95

In the supplementary frame 18, at its lower part, is slidably fitted a shipper-rod 21, which is provided with two slotted arms 22 23, which lie in different vertical planes and are loosely fitted to the straight and crossed belts, re- 100



spectively, and as this shipper-rod and its arms are moved in one direction the arms serve to adjust the two belts simultaneously, whereby one belt may be moved from its loose pulley to the fast pulley at the same time that the other belt is moved from the fast pulley to its loose pulley to automatically reverse the rotation of the counter-shaft, which in turn drives the worm feed-shaft, that actuates the traveling nut 24 of the work-carriage 25. This traveling nut is properly fitted to the worm feed-shaft to be actuated thereby, and it is suitably secured to the work-carriage to impart a back-and-forth traveling movement to the latter, according as the feed-shaft is driven in one direction and then in the other direction. The carriage is slidably fitted to the bed 2, and it is provided with the uprights or posts 26, which carry journal-bearings adapted to receive the shaft of a roll or cylinder that is to be ground or corrugated in the machine.

On the rear side of the main frame are provided the bearings 27, in which is slidably fitted an actuating rod or bar 28, having an arm 29 rigidly secured thereto and projecting into the path of the detents 30 31, which are adjustably clamped to the work-carriage, and as the carriage reaches the limit of its motion in one direction the detent 30 strikes against the arm 29 to move the rod 28 in one direction, while on the completion of the travel of the carriage in the opposite direction the detent 31 strikes the arm 29 to move the rod endwise in the opposite direction. This actuating rod or bar 28 is operatively connected with the shipper-rod by a transverse lever 32, which is suitably hung below the machine-bed and has its respective ends loosely connected to the shipper and actuating rods, whereby the actuating-rod serves to control the shipper-rod.

Across the machine is fitted a substantial arch 33, which lies out of the path of the carriage and the work thereon and serves to sustain the cutter-tool in proper relation to the carriage. This arch is quite heavy and strong, and it is fashioned for application to the opposite sides of the bed 2, to which the arch is solidly bolted. The shape of the arch is such that the carriage may travel beneath and within the arch to move the work through the arch without coming in contact therewith. On the upper central part of the arch is rigidly bolted a tool-carrying head 34, having a bed-plate 35 firmly secured to the arch, and to which bed-plate the carrying-head 34 is slidably or adjustably fitted, so that its position to the work may be controlled by an adjustable screw 36. In this slidable tool-head is secured the vertically-disposed tool 37, the working end of which is presented to the surface of the roll which it is desired to treat or finish.

In the drawings, I have shown the work fitted to the bearings on the short posts of the traveling carriage; but it is to be under-

stood that while the work is shown in the drawings it forms no part of the machine. The roll or work is indicated at 38 and its shaft at 39. To one of the roll-shafts is fitted a loose face-plate 40, and on the face-plate is fulcrumed a lever 41, which is provided with a cam-shaped or eccentric gripping-head 42, that is adapted by moving the lever in one direction to bind firmly against the roll-shaft and thereby make the disk 40 fast with the roll-shaft. This face-plate is further provided with a finger that extends outwardly from the plate and is adapted to rest upon a track-bar 44, which is arranged alongside of the path of the traveling carriage. At one end of the machine-bed is erected a fixed post 45, to which is pivoted one end of the track-bar 44, and at a point adjacent to the vertical transverse arch is erected a similar post 46, the upper end of which is slotted vertically, as at 47. The inner end of the track-bar is lapped against this slotted part of the inner post, and the track-bar is fastened adjustably to the post 46 by a transverse bolt 48, which passes through the slot. I do not, however, desire to strictly limit myself to this particular means for adjustably clamping the inner end of the track-bar to the post, as I am aware that other devices may be substituted without departing from the invention.

In the operation of the machine as a grinder for truing the surface of a roll the cutter device is not used and the roll is mounted in the bearings of the traveling carriage, to be rotated thereon as the carriage travels. This carriage is adjusted to present the surface of the roll to the action of the abrading disk or wheel, and as the carriage completes its travel in one direction the shipper mechanism is actuated to reverse the rotation of the counter-shaft, thus impelling the carriage in the other direction, the reversal of the carriage being effected automatically. To use the machine as a corrugating attachment, the carriage is moved by the feed mechanism to travel beneath the arch, so as to present the roll to the cutter-tool on said arch. The roll is properly fitted to the bearings of the carriage, and the disk or face-plate is fitted to one of the roll-trunnions or shaft. After the track-bar has been properly adjusted the lever is moved to clamp the face-plate rigidly to the roll-shaft, and the finger of the disk is adjusted to the track-bar to travel thereon as the carriage moves along the bed. By arranging the track-bar in a perfectly horizontal position the carriage and work may be moved to cause the cutter-tool to form a series of straight grooves or corrugations in the surface of the roll; but by giving to the track-bar a slight inclination the finger is caused to turn the roll slightly in its bearings on the carriage, and thus a spiral groove may be cut in the roll to impart a spirally-corrugated appearance to the surface of the roll. By giving to the edge of the track-bar on which the finger rides a corrugated contour



the finger and bar may impart a rocking motion to the roll in its bearings on the carriage, and thus the surface of the cylinder may be fluted with angular or curved corrugations, as may be desired.

In the embodiment of the invention shown by Fig. 6 of the drawings the corrugating attachment has a bracket 49, which is formed with a face-plate 50, said face-plate being securely bolted in a detachable manner to the bed of the machine, so that the attachment may be applied or removed, according as it is desired to use it or not in treating the roll. This bracket carries a base-plate 51, on which is slidably mounted a head 52, which is arranged to be moved toward or from the work-carriage by an adjusting-screw 53. To this adjustable head is connected the tool-carrier 54, which is hinged, as at 55, to occupy a vertical position and enable the carrier to be swung in a horizontal plane and to bring the tool into or out of service. The tool has a serrated or toothed working edge, and it is securely confined in the carrier.

To use the corrugating attachment shown by Fig. 6, the roll to be treated is mounted in the carriage to travel therewith past the face of the tool, and as the roll and carriage travel endwise the tool cuts the groove in the face of the roll. After the roll has traversed its length past the tool the carriage reverses, the roll is turned, and the carriage again moved past the working end of the tool.

I am aware that changes and alterations in the form and proportion of parts and in the details of construction of the devices herein shown and described as the preferred embodiment of my invention may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such modifications as fairly fall within the scope of my invention.

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

1. In a corrugating-machine, the combination of a carriage and its actuating-shaft, a stationary tool-head, a work-shaft, a loose face-plate or disk arranged on said work-

shaft, a cam-lever pivoted to said face-plate and adapted to fix said face-plate with relation to said work-shaft, and a track-bar, together with means adapted to engage said track-bar and adjust and control the position of said work-shaft, with its work, through said face-plate, substantially as set forth.

2. In a corrugating-machine, the combination of a carriage and its actuating-shaft, a stationary tool-head, a work-shaft, a loose face-plate or disk arranged on said work-shaft, a cam-lever pivoted to said face-plate and adapted to fix said face-plate with relation to said work-shaft, a track-bar adapted to be shifted from the horizontal, to an inclined position, said face-plate having an arm or projection adapted to travel or rest on said track-bar, substantially as set forth.

3. In a corrugating-machine, the combination of a carriage and its actuating-shaft, a stationary tool-head, a work-shaft, a loose face-plate or disk arranged on said work-shaft, a cam-lever pivoted to said face-plate and adapted to engage said work-shaft, a track-bar having one end pivoted and its other end adjustable, and an arm or projection on said face-plate, adapted to engage said track-bar, substantially as set forth.

4. In a roll-corrugating machine, the combination with an elevated cutter, and a work-carriage arranged to travel beneath said cutter, of a track-bar inclined to the line of feed of said carriage and the work thereon, and work-holding devices mounted on said carriage and including a rocking disk having a tappet or finger arranged to ride upon the track-bar and a means for clamping said disk fast with the work, whereby the track-bar and the tappet coact to turn the disk and the work continuously in one direction as the work and carriage travel beneath the cutter and present the work thereto for cutting a continuous spiral in the work, substantially as set forth.

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

FRED W. WRIGHT.

Witnesses:

FRED BARGHOORN,  
R. C. LEAVENWORTH.