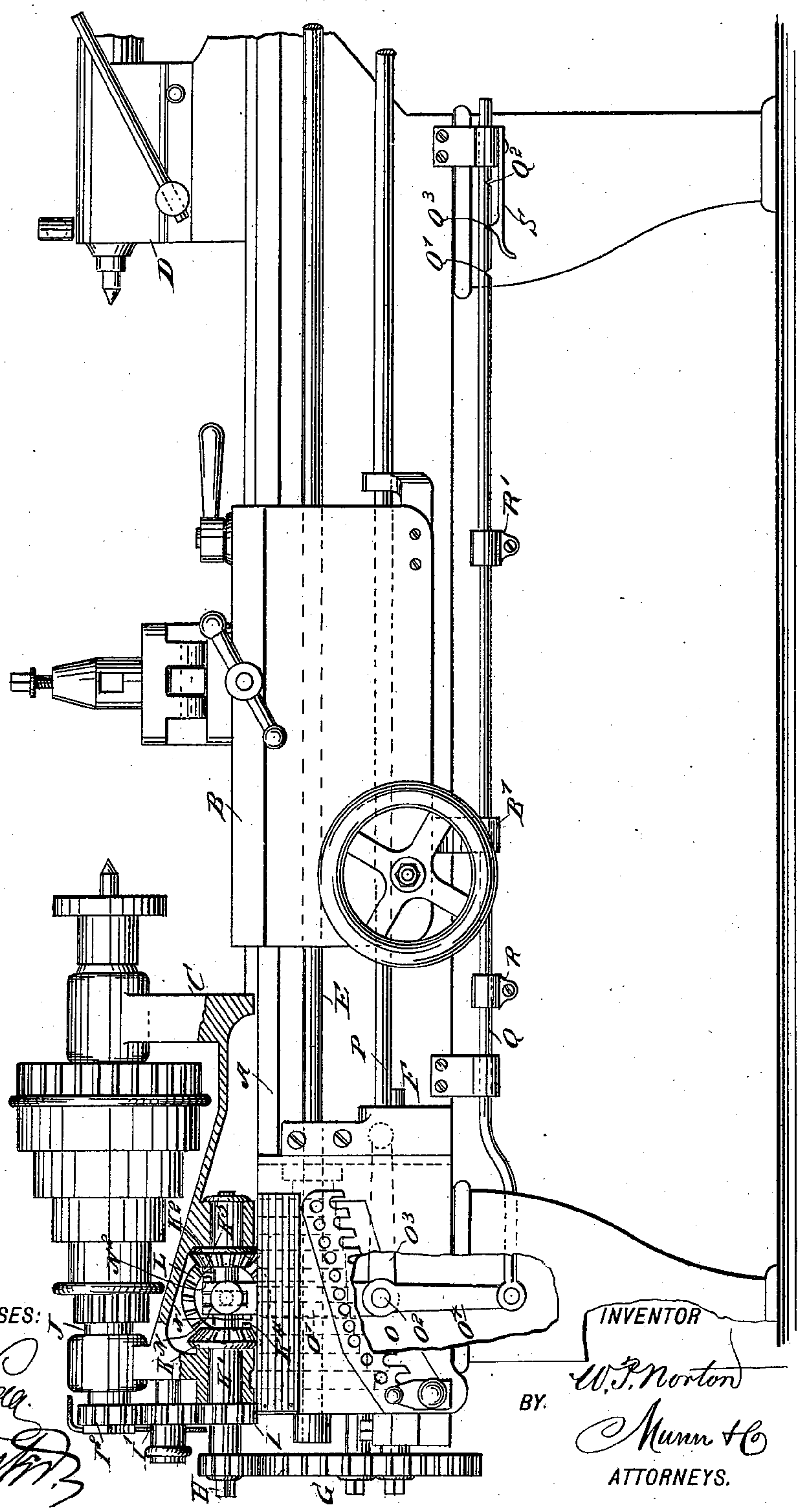
(No Model.)

W. P. NORTON.

SCREW CUTTING LATHE.

No. 549,006. Patented Oct. 29, 1895.



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SCREW-CUTTING LATHE.

SPECIFICATION forming part of Letters Patent No. 549,006, dated October 29, 1895.

Application filed January 25, 1895. Serial No. 536,271. (No model.)

To all whom it may concern:

Be it known that I, WENDELL PHILLIPS NORTON, of Torrington, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Screw-Cutting Lathes, of which the following is a full, clear, and exact description.

The invention relates to screw-cutting lathes such as shown and described in the Letters Patent of the United States Nos. 470,591 and 519,924, granted to me under dates of March 8, 1892, and May 15, 1894, respectively.

The object of the present invention is to provide certain new and useful improvements in screw-cutting machines whereby the movement of the carriage is automatically arrested.

The invention consists in the combination, with the reversing-rod under the control of the operator, of an auxiliary slidable rod provided with adjustable stop-collars adapted to be alternately engaged by the carriage, a lever connected with the said reversing-rod and auxiliary rod, and a clutch mechanism actuated by the said lever and adapted to be alternately connected by oppositely-driven reversing-gears with the driving-shaft.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a side elevation of the improvement with parts in section.

The screw-cutting lathe shown in the drawing is provided with the usual bed A, on which is mounted to slide longitudinally the carriage B, between the head-stock C and the tail-stock D. The feed screw-shaft E, connected in the usual manner with the carriage B, carries differential gears adapted to be driven from the driving-shaft F in the manner shown and described in the patents above referred to, so that further description of the same is deemed unnecessary.

The driving-shaft F is connected by the usual interchangeable gears G with the reversing-shaft H, carrying loosely the gear-wheel I, connected by the intermediate sliding gear-wheel I′ with the gear-wheel I^2, secured on the outer end of the live-spindle J of the lathe. The gear-wheel I is secured on one end of the hub K′ of a beveled gear-wheel K, mounted to rotate loosely on the reversing-shaft H and forming one of the bearings therefor, the said hub K′ being mounted to turn in the head-stock C. The beveled gear-wheel K is connected by a beveled gear-wheel L with a third beveled gear-wheel K^2, having its hub journaled in the head-stock C, the said hub forming a second bearing for the reversing-shaft H.

Now, by the arrangement described, it will be seen that the rotary motion of the live-spindle J is transmitted by the gear-wheels I^2, I′, and I to the beveled gear-wheel K, which latter, by the beveled gear-wheel L, drives the beveled gear-wheel K^2, but in an opposite direction to that in which the beveled gear-wheel K is rotated. The gear-wheels K and K^2 are adapted to be locked to the reversing-shaft H, so that the latter is rotated either in a forward or backward direction, according to which of the two gear-wheels K or K^2 is locked at the time the said shaft H is rotated.

Now, in order to lock or connect the gear-wheels K or K^2 alternately to the shaft H, I provide a double clutch N, mounted to slide on and turn with the shaft H, the said double clutch being provided on opposite sides with clutch-teeth N′ and N^2, adapted to engage corresponding teeth K^4 and K^5 on the beveled gear-wheels K and K^2, respectively. The double clutch N is held in the vertically-disposed arm O′ of a three-armed lever O, fulcrumed at O^2 on the bed A. The horizontally-disposed arm O^3 of the said lever O is connected with usual reversing-rod P in the manner described in detail in the Patent No. 519,924, above mentioned, so that further description of this part of the device is not deemed necessary.

The third arm O^4 of the three-armed lever O extends downwardly and is pivotally connected with one end of a second auxiliary reversing-rod Q, mounted to slide longitudinally in suitable bearings attached to the bed A. On this slidable rod Q are adapted to be fastened the stop-collars R and R′, adapted to be alternately engaged by a lug B′, projecting from the carriage B.

In the rod Q are arranged the notches Q′, Q^2, and Q^3, adapted to be engaged by a spring pawl or latch S, attached to one of the bear-

ings for the rod Q, as is plainly shown in the drawing, the said spring-pawl serving to hold the rod Q either in an outermost, innermost, or intermediate position. As shown in the drawing, the pawl S engages the notch Q^3, thus holding the rod Q in an intermediate position with the double clutch N out of mesh with the clutch-teeth K^4 and K^5 of the beveled gear-wheels K and K^2, so that the feed-screw shaft E is at a stand still.

Now when it is desired to impart a traveling motion to the carriage B, then the operator actuates the reversing-rod P to cause the three-armed lever O to move either of the clutch-teeth N′ or N^2 into engagement with the clutch-teeth K^4 or K^5 on the bevel gear-wheels K or K^2. The carriage B then travels either to the right or to the left, according to the movement given to the reversing-rod P. Now when the carriage B nears the ends of its desired travel, then the lug B′ strikes the corresponding stop-collar R or R′, so as to shift the auxiliary rod Q either to the right or to the left, according to the direction in which the carriage B is moving. In doing so the carriage moves the rod Q from either end position into an intermediate position, thereby causing the rod Q to move the three-armed lever O into the intermediate position shown in the drawing. Thus the corresponding beveled gear-wheel K or K^2 is unlocked from the shaft H, and consequently further motion of the feed screw-shaft E ceases, so that the carriage B comes to a stop. When it is desired to return the carriage, then the operator turns the reversing-rod P in a direction opposite to the one previously given, so that the three-armed lever O is shifted to move the double clutch N into engagement with the other gear-wheel K or K^2, so that the feed screw shaft E is turned in an opposite direction from the live-spindle J. The carriage B now travels in an opposite direction, and when nearing the end of its desired travel it moves its lug B′ in contact with the corresponding stop collar R or R′, so that the rod Q imparts a swinging motion to the three-armed lever O, thereby throwing the double clutch N out of mesh and into an intermediate position, as shown in the drawing.

It is understood that when the operator actuates the reversing-rod P to start the carriage B on its travel either to the right or to the left, then the three-armed lever O receives a swinging motion from the said rod P, whereby the arm O^4 of the said lever moves the rod Q from its normal intermediate position to an end position—that is, with the spring-pawl S in engagement with either notch Q′ or Q^2.

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

1. A screw cutting lathe or like machine, provided with a reversing mechanism, a three armed lever, an operative connection from one arm of the lever to the reversing mechanism, a movable rod arranged to be actuated by the carriage and operatively connected to the second arm of said lever, and a reversing rod under the control of the operator and operatively connected to the third arm of the lever, substantially as described.

2. A screw cutting lathe, provided with a reversing mechanism, a movable rod adapted to be actuated by the carriage and operatively connected to the reversing mechanism, and a reversing rod under the control of the operator and likewise connected to the reversing mechanism, substantially as described.

3. In a screw cutting lathe, the combination with a reversing shaft provided with reversible gear wheels, a clutch for connecting either of the reversible gear wheels with the shaft to rotate the latter in either direction, a three armed lever carrying the said clutch and connected by one of its arms with the ordinary reversing rod, and an auxiliary slidable rod connected with the third arm of the said three armed lever, the said auxiliary rod being provided with adjustable stop collars adapted to be alternately engaged by the carriage, substantially as shown and described.

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Witnesses:

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