(No Model.) 2 Sheets—Sheet 1.

H. JOHNSON.

LATHE.

No. 539,584. Patented May 21, 1895.

Fig. 1.

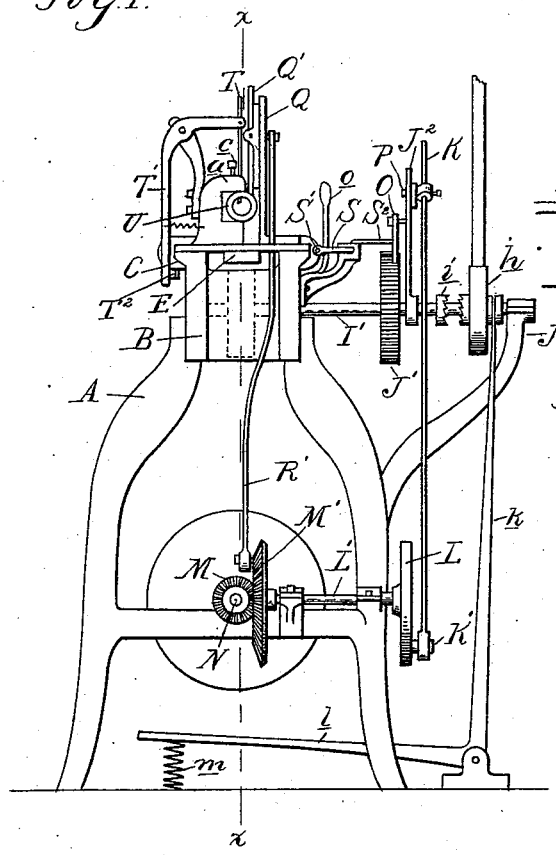


Fig. 4.

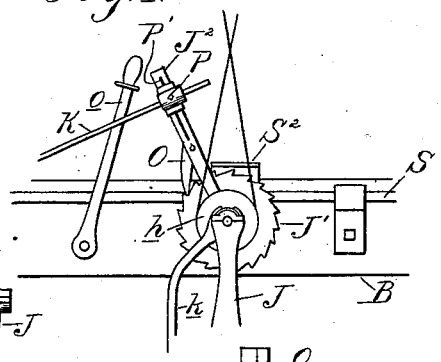


Fig. 6.

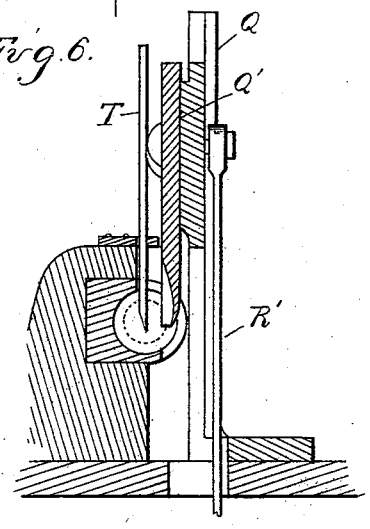
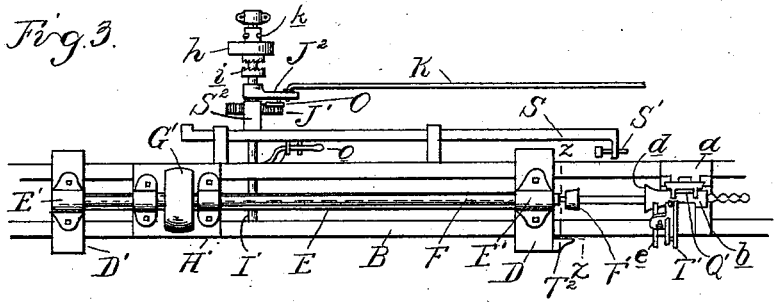


Fig. 3.



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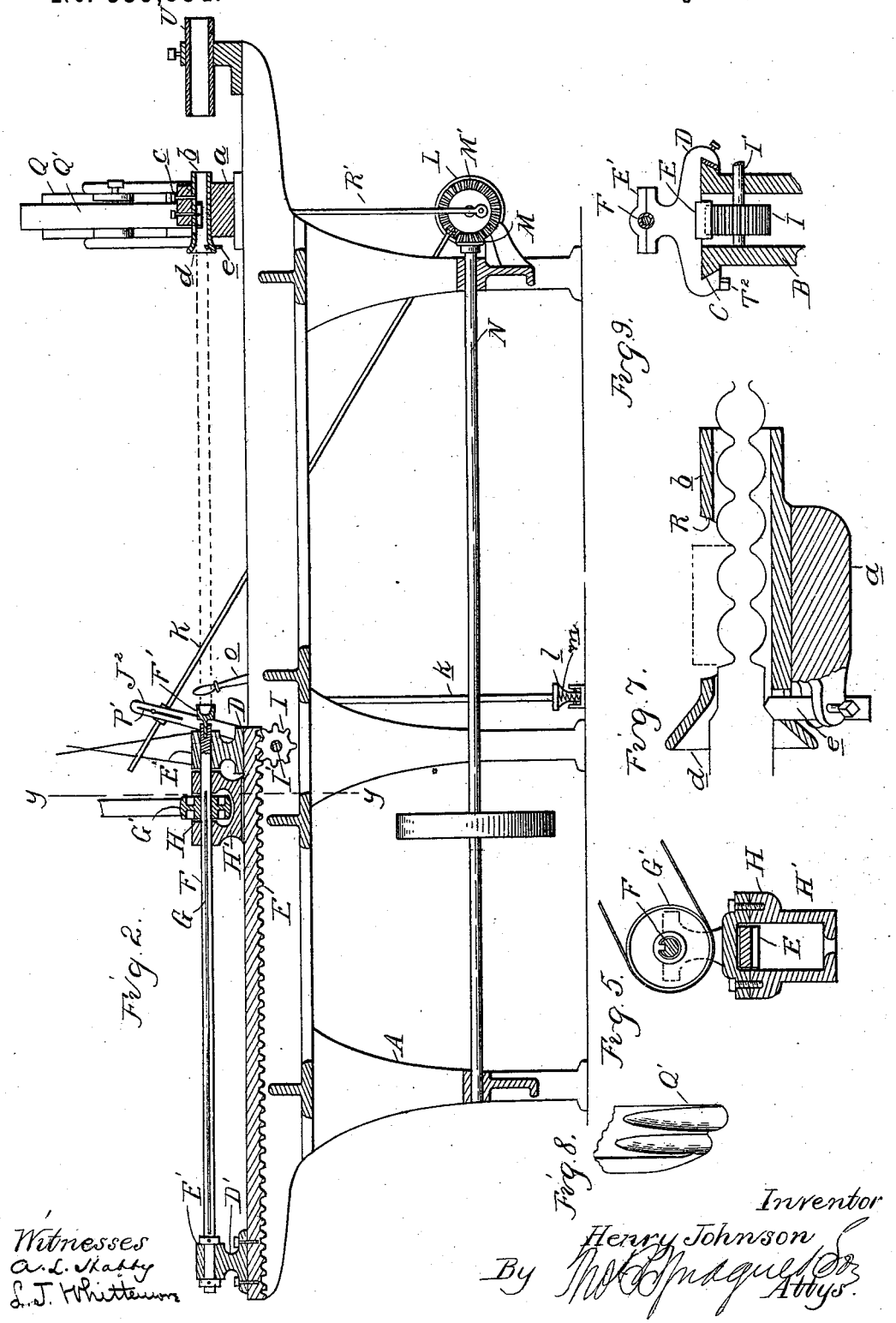
(No Model.) 2 Sheets—Sheet 2.

H. JOHNSON.

LATHE.

No. 539,584. Patented May 21, 1895.



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UNITED STATES PATENT OFFICE.

HENRY JOHNSON, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO THE WOLVERINE MANUFACTURING COMPANY, OF SAME PLACE.

LATHE.

SPECIFICATION forming part of Letters Patent No. 539,584, dated May 21, 1895.

Application filed September 24, 1894. Serial No. 523,936. (No model.)

To all whom it may concern:

Be it known that I, HENRY JOHNSON, a subject of the King of Denmark, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Lathes, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the peculiar construction of a lathe particularly designed for cutting spindles or rounds of symmetrical or regular configuration or shape.

The invention particularly consists in the peculiar construction of a work holding mandrel intermittently fed, a stationary guide for the free end of the work, a reciprocating cutter adapted to be moved to and from the work between the feed intervals of the mandrel so as to shape the blank at regular distances to produce the desired form.

The invention further consists in the particular construction, arrangement and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is an end elevation of my improved machine. Fig. 2 is a vertical central longitudinal section thereof on line *x x*, Fig. 1. Fig. 3 is a top plan view. Fig. 4 is a detail elevation illustrating the construction of the feed mechanism for the mandrel. Fig. 5 is a cross-section on line *y y*, Fig. 2. Fig. 6 is a vertical section through the cutter. Fig. 7 is an enlarged horizontal section through the stationary guide. Fig. 8 is a detached perspective view of the lower end of the cutter. Fig. 9 is a vertical section on line *z z*, Fig. 3.

A is the frame of the machine on the top of which is a table B preferably formed of two separate connecting bars or rails, having guide ways C thereon, upon which the sliding heads D D′ engage. These heads are connected on the under side by means of the rack bar E and in suitable bearings E′ on their upper face is journaled the mandrel F.

F′ is a chuck at the forward end thereof.

G is a longitudinal key-way in the shaft.

G′ is a drive pulley having a key engaging said key way and driven from any suitable source of power, being supported between the arms H of a cross-head H′ secured centrally of the frame. The arms H have suitable bearings for the shaft F.

The rack bar and heads carrying the mandrel form a feed carriage for the work which is intermittently fed forward by means of the pinion I engaging the rack bar E and secured to the transverse shaft I′ journaled in bearings in the frame. The outer end of this shaft is supported on the arm J. Secured to the shaft and beside the frame is the ratchet wheel J′.

J^2 is a lever sleeved on the shaft beside the ratchet wheel. This lever is oscillated by means of the connecting rod K secured to a crank pin K′ on a face plate or disk L and a transverse shaft L′ which is geared by means of the gear wheels M M′ to the drive shaft N, which may be driven from any suitable source of power.

The lever J^2 is provided with a suitable pawl O, resting on the ratchet wheel J′ and adapted to rotate the same a particular distance in its forward movement.

In order to adjust the movement of the ratchet wheel and thereby adjust the movement of the carriage I secure the connecting rod K, adjustably to the lever J^2 by means of the clamping bolt P engaging in the slot P′ in the lever.

a is a cross-bar at the forward end of the machine, supporting the tubular guide bearing *b* which is adjustable and detachable by means of the set screw *c*. This bearing has the flaring or bell shaped mouth *d* at its forward end to which is adjustably secured the roughing-out knife *e*. Shown in Fig. 7.

Q is a vertical standard beside the cross-head *a* in which slidingly engages the shaping cutter Q′. Shown in detail in Fig. 8. This is adapted to be moved to and from the work in a cut away portion R of the head *b*. This cutter is actuated by the connecting rod R′ connected at opposite ends to wrist pins on the gear wheel M′, and the cutter respectively, the parts being so combined that the shaping cutter will be in the work between the feed movements of the carriage, and be withdrawn as the carriage is fed forward. At the end of the feed movement I automatically stop the carriage through the sliding bar S on the frame, having an adjusting screw S′ at its forward end, against which the cross head D is adapted to engage near the end of its movement, causing the finger S^2 to strike the pawl O, and lift it from the ratchet wheel, thereby

stopping the feed movement of the carriage. As that portion of the blank at this point in the operation which remains unoperated upon by the roughing-out knife is larger than the guide bar *b*, it is desirable to cut off the blank and even if this were not the case it would be necessary to cut off the blank and make a finished end. I therefore provide a cutting off knife, which is automatically brought into operation by the carriage. I have shown a vertically reciprocating knife T sliding in bearings in the top of the cross-head *a* and supported at its upper end by the bell-crank lever T′, the lower end of which projects down beside the table and into the path of the inclined lug T^2 on the forward end of the cross-head D, all so arranged that as the cross-head reaches the forward end of its movement the lug will strike the bell crank lever and rock it, carrying down the cutting-off knife into the position shown in Fig. 6, where it will operate upon the blank. The carriage may now be returned to its initial position by the following mechanism:

h is a clutch pulley sleeved on the outer end of the shaft I′ and driven from any suitable source of power. *i* is a clutch collar on that shaft and *k* is a bell crank lever engaging a collar on the pulley *h* and having a treadle *l* so that the operator by pressing downward with his foot thereon, will rock the bell-crank lever and throw the pulley *h* into engagement with the collar *i* thereby rotating the shaft I′ in the opposite direction, and through the pinion I and rack bar E return the carriage to its initial position. As soon as the operator removes his foot from the treadle, the spring *m* will rock the bell crank lever and throw the clutch pulley *h* out of engagement with the collar *i*. To again throw the mechanism into operation, the finger S^2 may be withdrawn from beneath the pawl O by means of a rocking lever *o* pivoted on the side of the machine and engaging a suitable bearing on the shifting bar S, by means of which it may be moved to effect this result.

It will be observed from the description and operation of the parts that the blank will first be trimmed into a cylindrical shape, so that it will enter the tubular guide bearing and that it will be intermittently fed forward, constantly revolving, while the shaping cutter will be brought to the work at such intervals between the feed movement as to give it the desired shape.

The shaping cutter I have shown is designed to form a spindle composed of a series of connected balls but any other desired shape may be obtained by inserting a shaping cutter of desired construction.

U is a tubular support for the work after it leaves the tubular guide bearing *b*.

What I claim as my invention is—

1. In a lathe, the combination with a supporting frame, of a carriage on the frame, a mandrel and its chuck on the carriage, feed mechanism for the carriage, a stationary guide for the work, a cutter, means for actuating the cutter, a bar slidingly secured on the frame, a projection on the bar arranged in the path of the carriage, and means on the bar adapted to interrupt the feed mechanism upon the movement of the bar, substantially as described.

2. In a lathe, the combination with a supporting frame, of a carriage on the frame, a mandrel and its chuck on the carriage, feed mechanism for the carriage, a stationary guide for the work, a cutter, means for actuating the cutter, a bar slidingly secured on the frame, an adjustable projection on the bar arranged in the path of the carriage, and means on the bar adapted to interrupt the feed mechanism upon the movement of the bar, substantially as described.

3. In a lathe of the kind described, the combination of the constantly revolving mandrel and its chuck, of a feed carriage upon which it is supported, a feed mechanism therefor comprising a pinion engaging a rack bar thereon, an actuating mechanism for said pinion, means for automatically cutting off said feed mechanism at the end of the movement of the carriage and the reverse mechanism for said carriage, comprising the clutch pulley *h* sleeved on the shaft carrying said pinion, a stationary collar on said shaft with which said pulley is adapted to engage, and a spring controlled lever for engaging and disengaging said clutch pulley with the collar, substantially as described.

4. In a lathe, the combination with a supporting frame, of a carriage on the frame, a mandrel and its chuck on the carriage, feed mechanism for the carriage, a stationary guide for the work, a cutter, means for actuating the cutter, an inclined lug on the carriage, a reciprocating cutting-off knife, and a bell crank lever pivoted on the supporting frame having one end pivoted to the cutting-off knife and its opposite end arranged in the path of the lug on the carriage, substantially as described.

5. In a lathe of the kind described, the combination of the constantly revolving mandrel and its chuck, an intermittent feed mechanism therefor, comprising a rack bar on the carriage, a pinion on the shaft adapted to engage therewith, a ratchet wheel secured to the shaft, a rack lever carrying a pawl journaled on the shaft and adapted to actuate the ratchet wheel, a crank in the drive mechanism for rocking said lever, a sliding bar on the frame having a finger adapted to actuate said pawl and a projection on said bar adapted to be struck by the carriage near the end of its movement, substantially as described.

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

HENRY JOHNSON.

Witnesses:
M. B. O'DOGHERTY,
L. J. WHITTEMORE.