(No Model.) 3 Sheets—Sheet 1.

O. KROMER & F. RINKLEFF.

LATHE FOR TURNING IRREGULAR FORMS.

No. 278,025. Patented May 22, 1883.

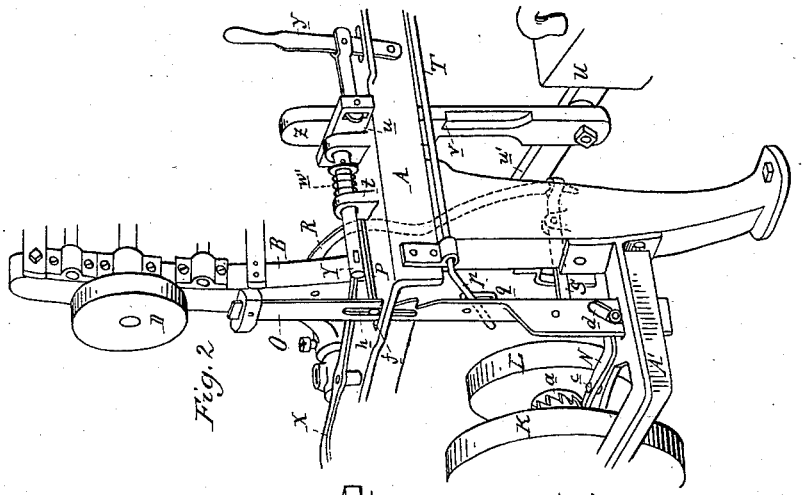

Fig. 2

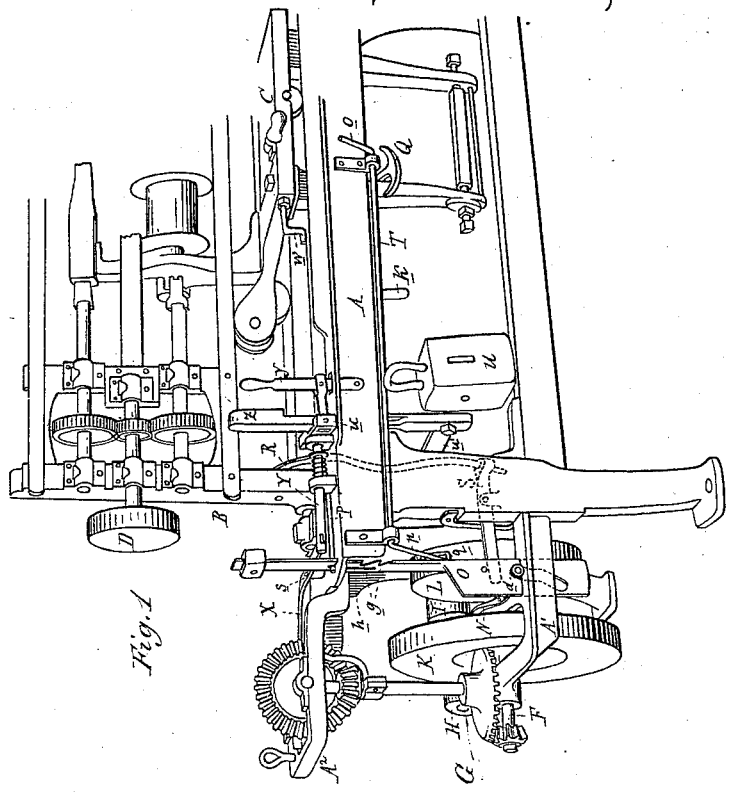

Fig. 1

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Fig. 4

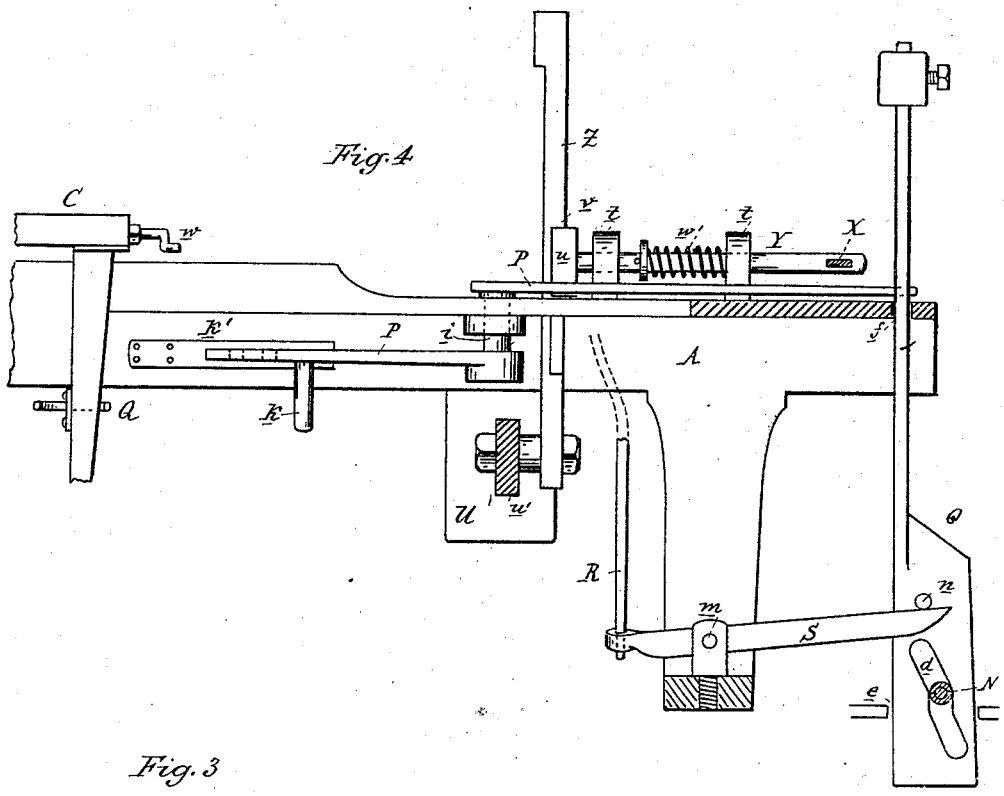

Fig. 3

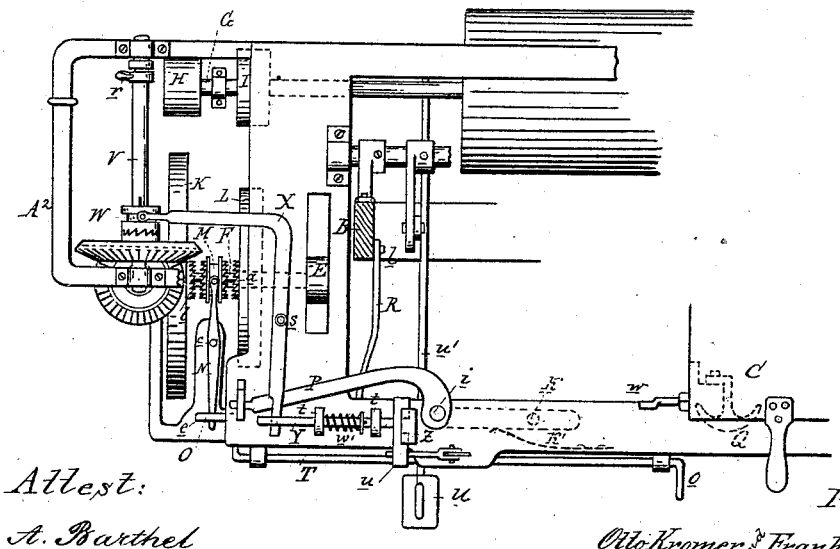

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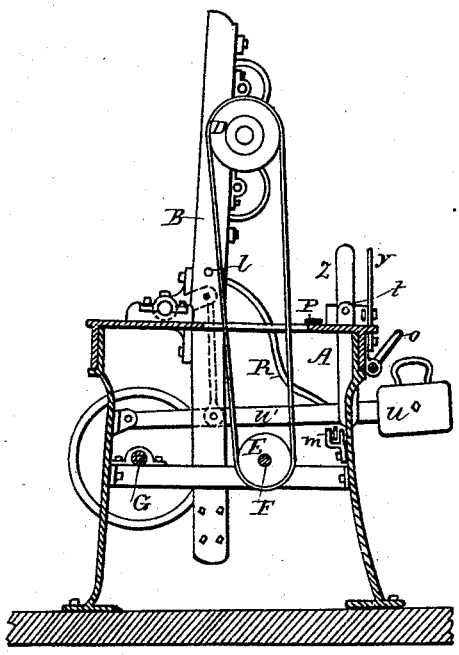
Fig 5.



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UNITED STATES PATENT OFFICE.

OTTO KROMER AND FRANK RINKLEFF, OF SANDUSKY, OHIO.

LATHE FOR TURNING IRREGULAR FORMS.

SPECIFICATION forming part of Letters Patent No. 278,025, dated May 22, 1883.

Application filed September 16, 1882. (No model.)

To all whom it may concern:

Be it known that we, OTTO KROMER and FRANK RINKLEFF, of Sandusky, in the county of Erie and State of Ohio, have invented new and useful Improvements in Lathes for Turning Irregular Surfaces; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

The nature of our invention relates to certain new and useful improvements in that class of lathes employed for turning irregular forms, our improvement being especially designed with reference to perfecting a more perfect device for turning wagon-spokes.

In the ordinary construction of spoke-lathes, wherein the spoke is placed between centers and is advanced to or drawn away from a cutter in conformity with the shape of a pattern, various devices are in use for automatically changing the velocity of the revolving spoke and pattern to a slower motion while cutting the shoulder of the spoke. The most improved arrangement is a belt-tightening device which automatically loosens the belt on the fast pulley and tightens it on the slow one; but this arrangement has two great defects. One is that the workman, in order to reset his belt-tightener after one spoke is finished, is required to lift quite a heavy weight, and the general objection to ever having a loose belt on the live pulleys when the machine is required to come to a dead stop after the spoke is finished. In our improved machine we keep tight belts on both the slow and fast pulleys all the time, and communicate the motion from either one by means of a clutch which is automatically thrown into or out of gear with either or both pulleys, as required for the performance of the work. We have also improved upon the devices for resetting the parts for each recurring operation, making them also handier by placing them in more convenient reach for the operator. The combination of the devices adopted by us greatly reduces the work of the attendant operator, as the machine works perfectly automatically and the resetting requires a less expenditure of time and strength.

Figure 1 is a perspective of our improved parts, showing them in connection with the rest of the machine. Fig. 2 is a similar view, the parts being shown as they stand at the end of an operation. Fig. 3 is a plan view of the same. Fig. 4 is an inside elevation of the front portion of our machine. Fig. 5 is a transverse section.

In the drawings, A is the upper front portion of the bed of the machine, being a part of the frame.

B is the swinging carriage.

C is the sliding carriage.

D is the pulley which rotates the pattern and spoke.

E is the pulley from which the pulley D derives its motion, being connected therewith by a belt.

F is the counter-shaft on which the pulley E revolves.

G is the main driving-shaft which rotates the pulleys H I. K and L are two other pulleys on the counter-shaft F. The pulleys K and H are connected by a belt, and give slow motion, while the pulleys I and L, also connected by a belt, give the fast motion to the counter-shaft F by the operation of the devices hereinafter described, and which contain the substance of our invention. The pulleys L and K revolve loosely upon the shaft F, and between these pulleys is placed the double clutch M, which is adapted to be shifted upon the shaft F on a spline, so as to engage either with the clutch-member *a* on the pulley L, or with the clutch-member *b* on the pulley K, or be out of engagement with either one.

N is a lever pivoted to the frame of the machine at *c*. Its inner end is forked and embraces the double clutch M without preventing its free rotation. The forward end of this lever engages in the oblique slot *d* of the vertical bar O. This bar O has a vertical play, and it passes at its lower end through a slot, *e*, in the part A′ of the frame, and near its upper end through a slot, *f*, in the part A of the frame. This bar O is also provided with two notches, *g*, by which the bar may be prevented from dropping through the slot *f*, as shown in Fig. 2, wherein the upper one of the two notches is shown to be engaged upon the edge of the slot *f*.

h is a vertical slot in the upper part of the bar O. Into this slot engages one end of the

lever P, which partly lies on top of the frame A and partly below, as shown in Fig. 4, having for a fulcrum the short shaft *i*, pivoted in the frame A.

k is a pin adjustably secured to the lever P.

Q is a cam-detent secured to the sliding carriage in such position as to impinge, in the forward motion of said carriage, against the pin *k*, and thereby impart a rocking movement to the lever P. Said movement actuating the bar O, will disengage its notch and allow it to drop the whole length of the slot *h*. R is a curved bar pivoted at its upper end at *l*, as shown in Fig. 3, to the swinging carriage. Its lower end is stepped into one end of the lever S, as shown in Fig. 4, pivoted at *m* to a convenient part of the frame. The free end of the lever S is adapted to engage with the pin *n*, near the lower end of the bar O, as shown in Fig. 4. The curved bar R comes into action whenever the swinging carriage falls forward, which it does whenever the spoke is finished. This movement depresses the curved bar and actuates the lever S, which, by reason of its engagement with the pin *n*, lifts the bar O.

T is a rock-shaft journaled to the frame A of the machine. It is provided at one end with the crank-lever *o*, which is put in the most convenient position for the operator, and at the other end with the crank-lever *p*, which engages into a loop, *q*, upon the side of the bar O. A spring, *k'*, is secured to the frame A, back of the lever P. Its tension forces the bar O, through the medium of the lever P, to keep its notches *g* in engagement with the slot *f*. The cam-detent Q impinges against the pin *k*, and thereby turns or swings the lever P around its pivot *i* and releases the bar O from engagement with its notch, and allows it to drop the full length of the oblique slot *d*, changing thereby the clutch M from the fast pulley K to the slow pulley L, which now transmits its motion until the operation of turning is finished, when the swinging frame B, being released in the usual manner, swings forward, and the bar R, following this movement, depresses the inner end of the lever S and forces the other end up, which, being engaged by the pin *n*, will also lift the bar O a certain distance up, which is so adjusted as to amount to one-half of the length of the slot *e*, thereby holding the lever N in proper position to hold the clutch M disengaged from either pulley. In other words, this brings the shaft F to a dead stop, thus allowing the operator to remove the finished spoke and put in a new one. Then the operator, by means of the crank-lever *o*, throws the bar O back to its elevated position, and work can be commenced on the new spoke as soon as the swinging frame B is pushed back into position, which, on the machine shown in the drawings, is done by the operator lifting the counter-weight U.

The feed is arranged as follows:

V is a shaft journaled across a suitable extension, A^2, of the frame.

r is a hook, to which the rope is attached, the winding up of which on the shaft draws the sliding carriage forward in the usual way.

W is a clutch, which, when closed, forces the shaft V to rotate, the movement being then transmitted to it by a train of gear-wheels, as shown in the drawings, from the shaft F. The clutch W, which slides on a spline on the shaft V, is embraced by the forked end of the lever X, pivoted on top of the frame A at *s*. Its other end engages in the end of the sliding bar Y, which is held and guided in proper journals *t t*, and its inner end is provided with the cross-head *u*.

Z is a vertical bar, with its lower end pivoted to the arm *w'*, which bears the counter-weight U. This bar Z is free to raise and fall with the counter-weight *u*, except when forcibly prevented therefrom by means of the engagement of its shoulder *v* on top of the cross-head *u*.

w is a detent attached to the forward end of the shifting carriage C.

In practice the parts are so adjusted that at the completion of the work the detent *w* impinges against the cross-head *u* and shoves it forward, releasing the shoulder *v* from its engagement thereon, and allowing the bar Z to drop, the latter being forced thereto by its connection with the arm U' of the counter-weight U, which is sufficiently heavy to counterbalance all the opposing weight and swing the carriage B forward in the usual manner. This same movement, by means of the connection described, parts the clutch W from its engagement, and the shaft V is now free to revolve in an opposite direction, being actuated thereto by the usual counter-weight, (not shown,) which retrogrades the sliding carriage. To bring the swinging carriage again into proper position for operation the counter-weight U must be raised until the shoulder *v* of the vertical bar Z engages again on top of the cross-head *u*, and to make this engagement positive a coil-spring, *w'*, is arranged upon the sliding bar Y. In order, when circumstances render such necessary, to suspend the operation of the machine instantly, a hand-lever, *y*, is pivoted to the frame A and connected to the cross-head *u*. By turning this lever forward it will disengage the cross-head from its engagement with the vertical bar Z, thereby allowing the carriage B to swing forward and away from the cutters. It will be seen that the action of the vertical bar Z has no further bearing upon the action of the feeding device than to make the operation of the clutch W perfectly positive.

What we claim as our invention is—

1. The double clutch M, wheels K L, and lever N, combined with the bar O, having inclined slot *d*, the lever P, fulcrumed at *i*, and the sliding carriage C, and means for operating said levers, as and for the purposes set forth.

2. In a lathe for turning irregular forms, and

in combination with the mechanical devices described for automatically operating the clutch M, the lever N, bar O, provided with notches *g*, lever P, provided with adjustable pin *k*, spring *k'*, and the sliding carriage C, having cam-detent Q, the parts being constructed, combined, and operating substantially as and for the purposes described.

3. In a lathe for turning irregular forms, the combination of the counter-shaft F and the two sets of pulleys I L and K H with the clutch M, sliding carriage C, and connections whereby the said carriage C, through its connections with said clutch, serves to automatically impart a slow or a fast motion, as occasion requires, substantially as set forth.

4. In a lathe for turning irregular forms, the rock-shaft T, attached at or near the front of the frame A, and provided with the crank-handle *o* and crank-lever *p*, and in combination therewith the vertical sliding bar O, lever N, and clutch M, whereby the operator may conveniently elevate the bar O after the new blank has been placed in the machine, and again automatically start the machine, substantially as and for the purposes specified.

5. In a lathe for turning irregular forms, the arm R, pivotally attached to the swinging frame, the lever S, and bar O, having pin *n*, combined with the clutch M and lever N, whereby the bar O is automatically thrown one-half its stroke to hold the clutch out of mesh with both pulleys L and K, substantially as set forth.

6. In combination with the carriage C, having detent *w*, the shaft V, and counter-weight clutch W, elbow-lever S, arm Y, spring *w'*, and cross-head *u*, whereby the carriage C, at the end of its traverse in one direction, throws the clutch W out of mesh, and the shaft V is automatically revolved in an opposite direction to retrograde said carriage, as set forth.

7. In a lathe for turning irregular forms, the vertical bar Z, provided with the notch *v*, the arm U', to which the counter-weight U is attached, and the cross-head *u*, combined for the purpose of swinging the carriage B the moment the feed-motion is stopped, substantially in the manner described.

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