

(No Model.)

2 Sheets—Sheet 1.

H. C. HECKENDORN.
Lathe for Turning Ovals.

No. 233,753.

Patented Oct. 26, 1880.

Fig. 1.

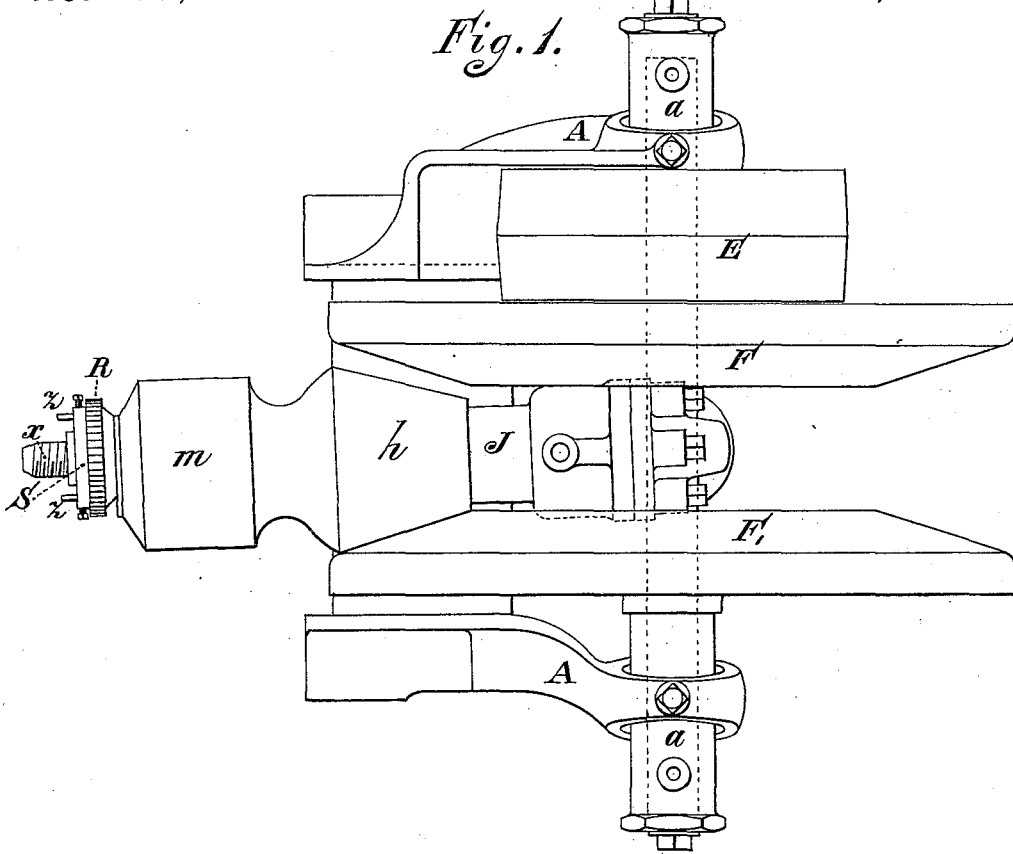
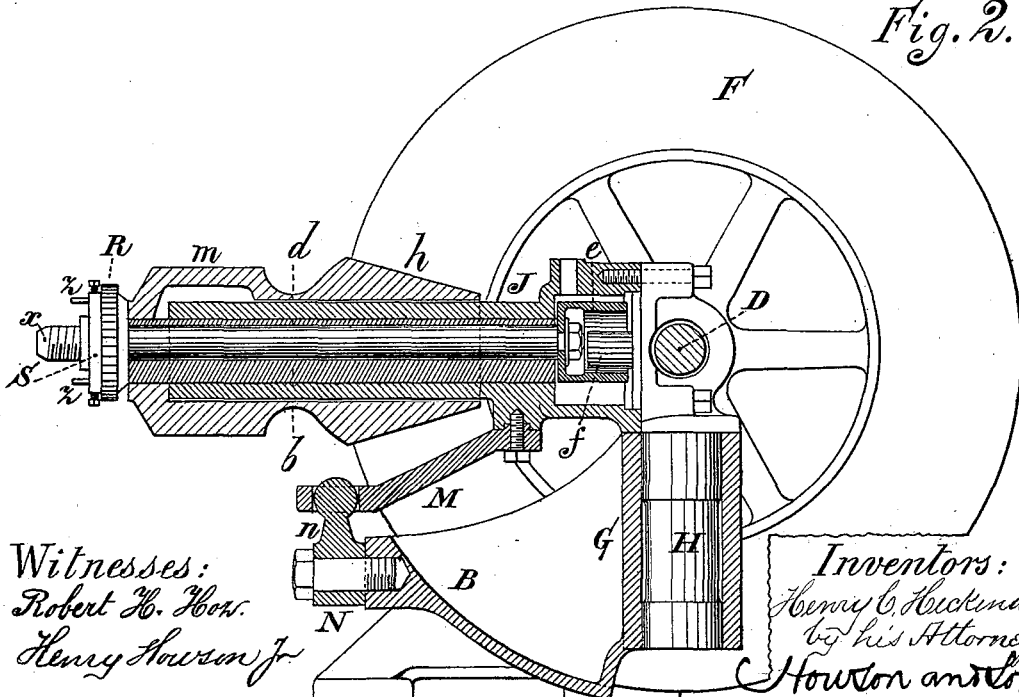


Fig. 2.



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Henry Lawson Jr.

Inventors:
Henry C. Heckendorn
by his Attorneys
Houston and Son

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

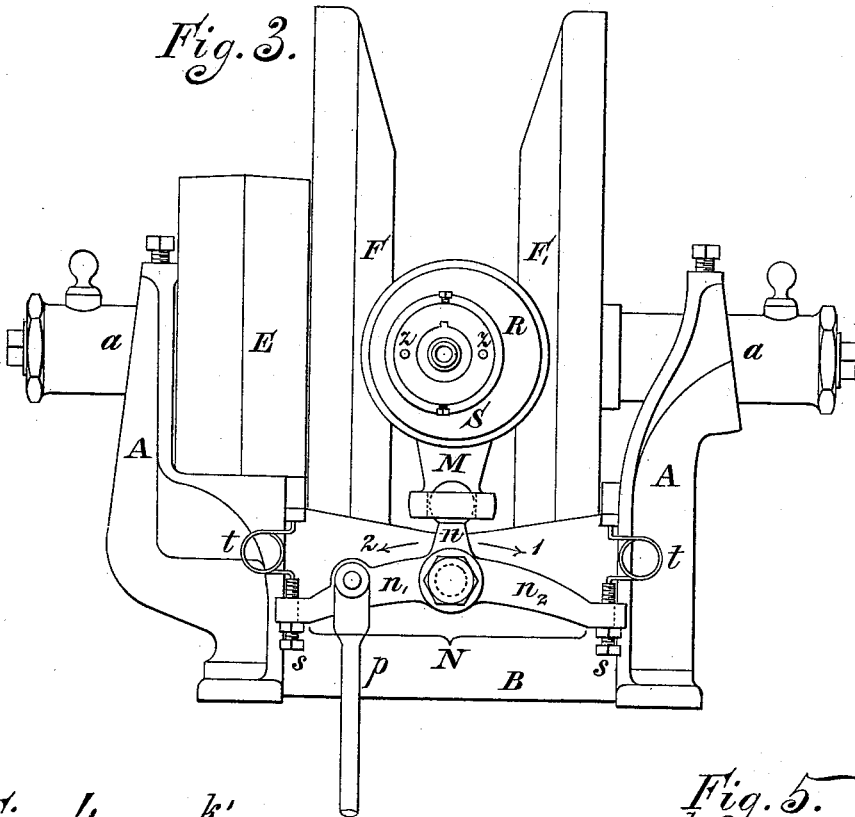


Fig. 4.

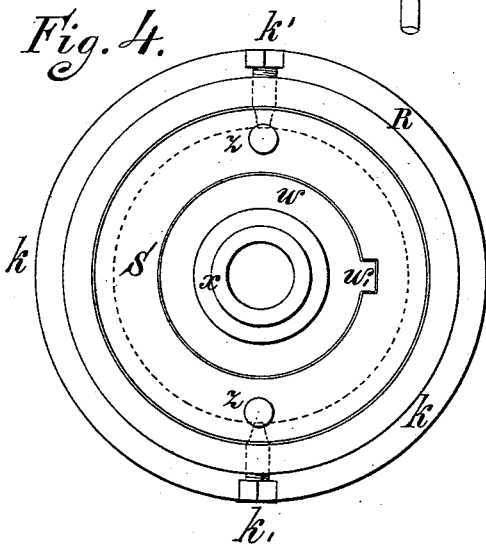
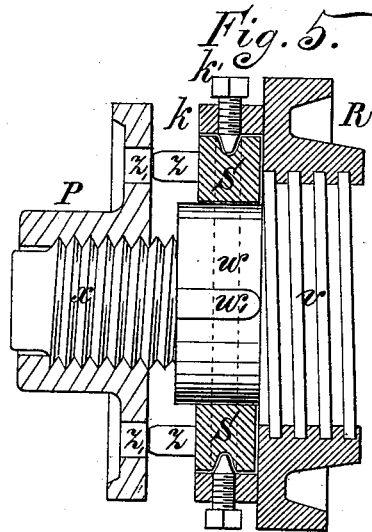


Fig. 5.



Witnesses:

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Inventors:

Henry C. Heckendorn
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Howson and Son

UNITED STATES PATENT OFFICE.

HENRY C. HECKENDORN, OF READING, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILLIAM H. WILHELM, OF SAME PLACE.

LATHE FOR TURNING OVALS.

SPECIFICATION forming part of Letters Patent No. 233,753, dated October 26, 1880.

Application filed August 9, 1880. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. HECKENDORN, a citizen of the United States, residing in Reading, in the county of Bucks, State of Pennsylvania, have invented certain Improvements in Lathes for Turning Ovals, of which the following is a specification.

My invention relates to certain improvements in that class of lathes in which the lathe-spindle has to be driven in both directions, the main object of my invention being to substitute for the usual arrangement of counter-shaft, pulleys, and straight and crossed belts a simple, compact, and convenient arrangement, whereby the direction of rotation of the lathe-spindle may be instantly reversed, a further object of my invention being to so connect the work-holding chuck to the lathe-spindle or shaft as to prevent the detaching of the same on the reversal of the movement of said spindle or shaft.

The principle of my invention is applicable to lathes generally, although I have designed it especially for oval-lathes, such as are used in the manufacture of hats, the rapid reversal of the direction of rotation of the work being considered advantageous in lathes of this class.

In the accompanying drawings, Figure 1, Sheet 1, is a plan view of my improved reversible lathe; Fig. 2, a longitudinal section of the same; Fig. 3, Sheet 2, a front view of the lathe, and Figs. 4 and 5 enlarged views of the device for securing the work-holding chuck to its shaft or spindle.

The frame of the machine comprises three parts, namely, the end frames, A A, and a transverse frame, B, the frames A being adapted to be bolted to a work-bench or other suitable support, and the frame B being firmly bolted to the frames A.

Each of the frames A carries a self-accommodating bearing, *a*, for the main or driving shaft D, to which are secured the driving-pulley E and two cone-wheels, F F', the cone-face of each of said wheels being preferably clothed with leather or similar material, so as to present a good frictional surface.

Forming part of the frame B is a vertical tubular bearing, G, which occupies a position centrally between the wheels F F' and directly beneath the shaft D, and is adapted for the

reception of a vertical spindle, H, the head of which has a transverse opening for the passage of the shaft D, and is bolted to the bearing J, carrying the lathe-spindle *b*.

As shown in the drawings, my invention is applied to an oval-lathe similar to that shown in Heckendorn's Patent No. 222,901, December 23, 1879, the spindle *b* carrying a shaft, *d*, which is arranged eccentrically in respect to the said spindle, and has at the front end the work-holding chuck and its securing devices, as described hereinafter, the shaft being provided at the rear end with a ring in which is formed an internal rack, *e*, adapted to the teeth of a pinion, *f*, secured to or forming part of the head of the spindle H. The pinion *f* and rack *e* are so proportioned that the shaft *d* will turn once on its own axis while it is being carried twice around the axis of the spindle *b*, the latter being provided with a conical driving-pulley, *h*, and a counter-balance, *m*, as described in the above-mentioned patent.

Secured to and projecting from the under side of the bearing J is an arm, M, in the front end of which is an opening adapted for the reception of a knob on one arm, *n*, of a lever, N, the latter being pivoted to the frame B, and having two other arms, *n'* and *n''*, which carry set-screws *s*, acted upon by springs *t*, the tendency of which is to maintain the lever N in the position shown in Fig. 3, the lever, when thus adjusted and acting on the bearing J through the medium of the arm M, serving to hold said bearing and the lathe-spindle *b*, carried thereby, in a position at right angles to the shaft D, so that the pulley *h* is free from contact with either of the driving-wheels F F'.

To the arm *n'* of the lever N is connected the upper end of a rod, *p*, the lower end of which is connected to a treadle suitably located, and by the operation of which the rod *p* may be either elevated or depressed, so as to move the lever N either in the direction of the arrow 1, Fig. 3, or in the opposite direction, as indicated by the arrow 2 in said figure. When the lever is moved in the direction of the arrow 1 the bearing J is caused to swing to the right, so as to bring the pulley *h* into contact with the cone-wheel F', the spindle H serving as the center of vibration for the bearing.

The lathe-spindle *b* is rotated by the fric-

tional contact of the pulley *h* with the cone-surface of the wheel *F'*, the speed of the spindle being, to some extent, governed by the pressure applied to the treadle and the consequent force with which the pulley is pressed against the wheel.

When it is desired to reverse the direction of rotation of the lathe-spindle, the treadle is operated so as to move the lever *N* in the direction of the arrow 2, the bearing *J* being thus thrown to the left, and the pulley *h* brought into contact with the wheel *F*, whereby an instant change in the direction of rotation is effected. When pressure is entirely removed from the treadle the springs *t* restore the lever *N* to the position of rest, as shown in Fig. 3, the pulley *h* being thereby freed from contact with either of the wheels *F F'*, and the rotation of the lathe-spindle *b* being discontinued.

In a lathe the shaft or spindle of which turns first in one direction and then in the other, it is important that the work-holding chuck, while readily detachable from said shaft or spindle, shall be rigidly secured thereto when the lathe is at work, so that it is not liable to be detached when the movement of the shaft or spindle is reversed. In order to attain this object I enlarge the front end of the work-operating shaft *d*, said enlarged end of the shaft comprising a threaded portion, *v*, a cylindrical projection, *w*, and a threaded stem, *x*. (See Fig. 5.) The chuck *P* is adapted to said threaded stem *x*, while to the threaded portion *v* is adapted a ring, *R*, having an annular flange, *k*, to threaded openings in which are adapted screws *k'*, the points of the latter entering an annular groove in a ring, *S*, adapted to the projection *w*, and having a key-seat for the reception of a feather, *w'*, thereon. From the face of the ring *S* project two pins, *z*, and in the chuck *P* are formed openings *z'*, adapted for the reception of said pins.

In applying the chuck the rings *R* and *S* are retracted to the position shown in Fig. 5, and the chuck *P* then screwed onto the threaded stem *x* until it reaches the position shown in said Fig. 5, the openings *z'* being in line with the pins *z* of the ring *S*. The ring *R* is then manipulated so as to cause it to move forward, carrying with it the ring *S*, which, owing to the feather *w'*, is prevented from turning, the pins *z* being thus caused to enter the openings *z'* of the chuck and prevent the unscrewing of the same from the stem *x*, the ring *S* abutting against the inner face of the chuck so as to provide a proper backing for the same. The chuck is released by reversing the above-described operation. If desired, the ring *S* may be independent of the ring *R*, the latter in this case being simply relied upon to hold the ring in its forward position.

Although I have shown my invention as applied to an oval-lathe of a certain character, it may be applied to other oval-lathes, such, for instance, as that shown in my Patent No.

201,781, dated March 26, 1878, or the invention may be applied to a cylindrical-lathe as well as to an oval-lathe.

As shown in the drawings, the lathe-spindle is arranged horizontally, but it may be placed vertically where such arrangement is desired, without necessitating any substantial change in the construction or arrangement of the parts.

I claim as my invention—

1. The combination of the driving-shaft *D*, having cone-wheels *F F'*, a bearing, *J*, pivoted centrally between said wheels, a lathe spindle or shaft adapted at its inner end to said pivoted bearing *J*, and having at the outer or projecting end the work-holding chuck, a cone-pulley, *h*, on said spindle or shaft, and means for adjusting the bearing *J*, whereby the pulley *h* is brought into frictional contact with either of the wheels *F F'*, all substantially as set forth.

2. An oval-lathe in which are combined the following elements, namely: a driving-shaft adapted to suitable bearings and having two friction driving-wheels, *F* and *F'*, a lathe spindle or shaft having a friction-pulley, *h*, a bearing for said spindle or shaft, a work-holding chuck, mechanism whereby, on the rotation of the lathe spindle or shaft, a combined rotating and reciprocating movement is imparted to said chuck, and means whereby the relation of the wheels *F F'* and pulley *h* may be changed, and the driving of the pulley by either wheel and the rotation of the lathe spindle or shaft in either direction thereby effected, as specified.

3. The combination of the shaft *D*, its bearings *a*, and wheels *F F'*, the lathe-spindle *b*, having cone-pulley *h*, the pivoted bearing *J*, having an arm, *M*, and the lever *N*, for operating said arm, as specified.

4. The combination of the shaft *D*, having wheels *F F'*, the lathe-spindle *b*, having a cone-pulley, *h*, the pivoted bearing *J*, having an arm, *M*, the three-armed lever *N*, and the equalizing-springs *t t*, as set forth.

5. The combination of the frames *A*, having bearings *a*, the shaft *D*, having wheels *F F'*, the frame *B*, having a tubular bearing, *G*, the spindle *H*, adapted to said bearing, and the bearing *J*, carrying the lathe-spindle, and secured to the head of the spindle *H*, as specified.

6. The combination of the work-operating shaft or spindle of a lathe and means for rotating the same in either direction, a chuck adapted to said shaft or spindle and having openings *z'*, a ring rotating with but capable of sliding on said shaft or spindle, and having pins *z*, and means for operating said ring, whereby its pins are caused to enter the openings in the chuck or are removed therefrom, as set forth.

7. The combination of the work-operating shaft *d*, having a threaded portion, *v*, a cylindrical projection, *w*, with feather *w'*, and a threaded stem, *x*, a chuck, *P*, adapted to said

stem x and having openings z' , a ring, S, adapted to the projection w , and its feather, and having an annular groove and pins, z ; and a ring, R, adapted to the threaded portion v of the shaft, and having a projection or flange, k , with set-screws k' , as set forth.

In testimony whereof I have signed my name

to this specification in the presence of two subscribing witnesses.

HENRY C. HECKENDORN.

Witnesses:

H. R. SHULTZ,

HENRY HOWSON, Jr.