(No Model.)

F. H. CRAFTS.

DRIVING MECHANISM FOR LATHES.

No. 499,159. Patented June 6, 1893.

Fig. 1.

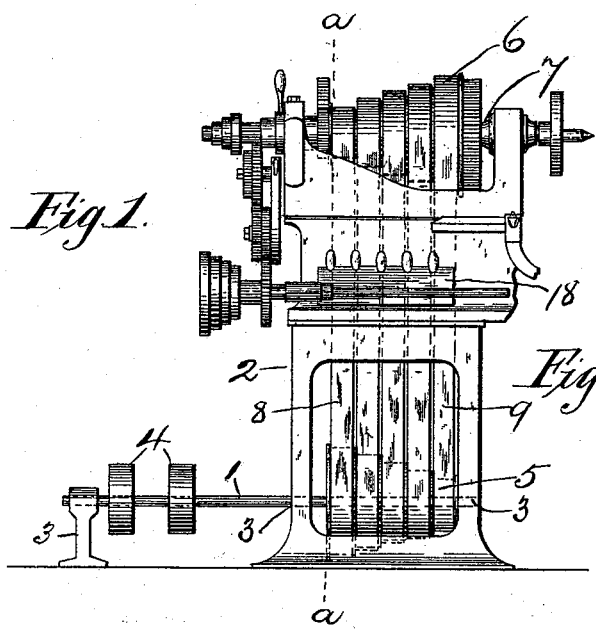


Fig. 2.

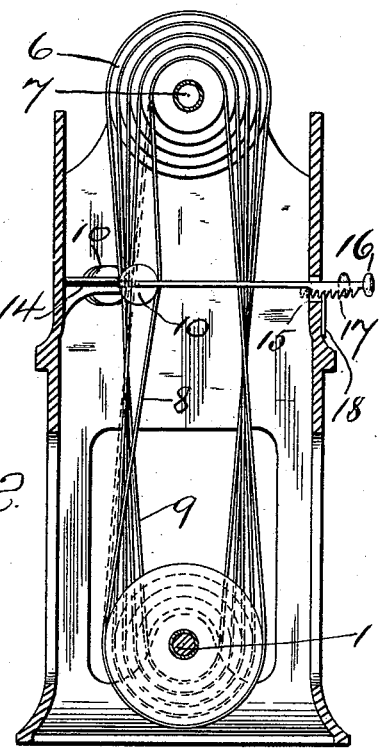
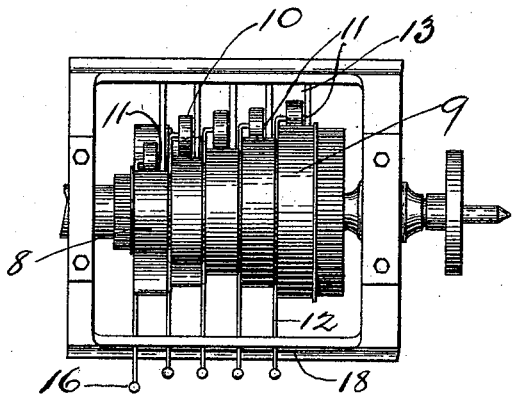


Fig. 3.



WITNESSES

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DRIVING MECHANISM FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 499,159, dated June 6, 1893.

Application filed September 21, 1892. Serial No. 446,438. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. CRAFTS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Driving Mechanism for Lathes; 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 improvements in driving mechanism for lathes, and consists in certain improvements, as hereinafter set forth, in the gearing whereby the speed of the lathe may be instantly changed without sidewise shifting of the power-transmitting belt.

In the accompanying drawings, Figure 1 represents a front elevation of a portion of a lathe frame having my improvements applied thereto. Fig. 2 represents a section thereof on the line *a*, *a*, of Fig. 1. Fig. 3 represents a top plan view of a portion of a lathe frame with my improvements thereon.

In my construction, instead of the countershaft, 1, being located above the lathe frame, 2, it is mounted in suitable bearings, 3, near the bottom of the lathe frame, and has band pulleys, 4, with which belt connection is had from the source of power.

5 represents a plural-stepped pulley keyed or otherwise secured upon said counter-shaft, 1; 6 represents a similar stepped pulley, reversely positioned as customary, and located upon the spindle-shaft, 7. The connection between these stepped pulleys is had by a series of belts or bands, 8, 9, corresponding in number with and seated upon each step thereof as shown. Ordinarily, where a plurality of pulleys, or stepped pulleys, are mounted on the respective shafts, a single belt has been employed which, as it is desired to change the speed of the machine, has been shifted from one pulley, or from one step of the pulley, to another. Manifest disadvantages, it is well known, result from the necessity of so shifting the belt, especially where considerable change in speed of the machine is desired, and the time employed in so shifting the belt is a material loss, and the belt is injured by frequent sidewise shifting. By the employment of a distinct belt for each step of the pulleys employed in connection with a belt-tightener, or tighteners, by which the individual belt, alone, may be placed in operative connection with the respective pulleys and the remaining belts allowed to run idle according to the speed at which it is desired to run the machine, a distinct advantage is secured in that a change of speed may be instantly effected without stopping the machine and without danger or risk to the operative. Such a belt-tightening arrangement as has been found most effective I have represented in the drawings. Corresponding in number with the number of steps in the cones and with the belts employed, are belt-tighteners consisting of balls or disks, 10, which may be of a width equal to the width of the respective belts; with said balls or disks 10 are engaged the inner angular ends, 11, of the operative rods, 12, said ends, 11, having slidable bearing within grooved boxes or brackets, 13, projecting inwardly from the rear of the frame of the lathe, the grooves, 14, in said boxes corresponding, or nearly so, in size with the size of the ends, 11, of the rods, 12, or disk journals so as to permit of the free reciprocal movement therealong of the inner ends of said rods 12 carrying said belt-tightener disks.

The belt-tightener-operating rods, 12, extend out beyond the front of the lathe frame, passing through a slot or opening, 15, therein as shown, and have at their outer ends suitable hand grasps or knobs, 16, by which they may be grasped by the operator to reciprocate said rods back and forth to bring into contact with or release from contact with either of the belts as desired the respective belt-tighteners.

Figs. 2 and 3 of the drawings clearly indicate, in full and dotted lines, the operation of the tighteners. The front ends of the rods, 12, are somewhat enlarged, as shown in Fig. 2, and have on their under edge a series of teeth or serrations, 17, which engage with the upper edge of a metal plate, 18, attached to the front of the lathe frame and extending somewhat above the lower edge of the slot, 15, in said frame. By slightly raising the front ends of the operative rods, 12, said teeth will be released from engagement with the top edge of said plate, 18, whereupon said rods may be either pushed inward to release the disks, 10, at the inner ends of said rods from

tightening contact with the belts, or said rods may be drawn forwardly to bring the respective disks, 10, into frictional and tightening contact with said belts as the case may be; the outer ends of said rods are then dropped to bring the teeth, 17, into engagement with the plate, 18, whereby said rods are securely held in their adjusted positions. The serrations or teeth, 17, and plate, 18, at all times securely hold the rods, 12, and belt-tightener disks, 10, in their positions of adjustment. It will readily be seen that by this arrangement the tension on all the belts can be readily and instantaneously regulated and maintained at any desired degree according to the character of the work being accomplished; when the tool is taking a light cut, the tension on the belt need be less than when a heavy cut is being taken, in which case the rod would be pushed in somewhat to release the tension on the belt of the tightener-disk, and, similarly, when the cut is heavier, the rod would be drawn forwardly to increase the tension of the disk on the belt; the speed of the rotation of the belts and lathe spindle can thus be very effectually and expeditiously regulated and maintained according to requirement.

By locating the counter-shaft below the spindle-shaft in contradistinction to the location of the counter-shaft above the spindle-shaft, and the employment of a single sidewise-shiftable belt, I avoid the disadvantages of the belt pulling up on the spindle and the consequent tendency of the lifting up of the tool, which results in an undue friction on the cap of the journal and the cutting of the box, which produces more or less lost motion.

Having thus described my invention, what I claim is—

In a driving mechanism for a lathe, the combination with the spindle-shaft, of a stepped pulley located thereon, a counter-shaft journaled in bearings parallel with said spindle-shaft and having suitable power connection, a stepped cone pulley located on said counter-shaft, a series of belts or bands corresponding in number with and connecting the respective steps of said cone pulleys, a vertically-disposed plate located adjacent an opening at the front of the lathe-frame, a series of belt-tighteners corresponding in number with the number of belts, and consisting of rods having inner angular ends with disks thereon, and said rods extending outwardly therefrom in a straight horizontal line to the front and through the opening in the lathe-frame and each having at its front end a notched or serrated under face and adapted to engage said plate, and a suitable hand-grasp, and a lathe having a series of grooved boxes to receive and guide said belt-tighteners in their reciprocal movements, substantially as and for the purpose set forth.

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

FRANCIS H. CRAFTS.

Witnesses:
C. J. HAMILTON,
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