

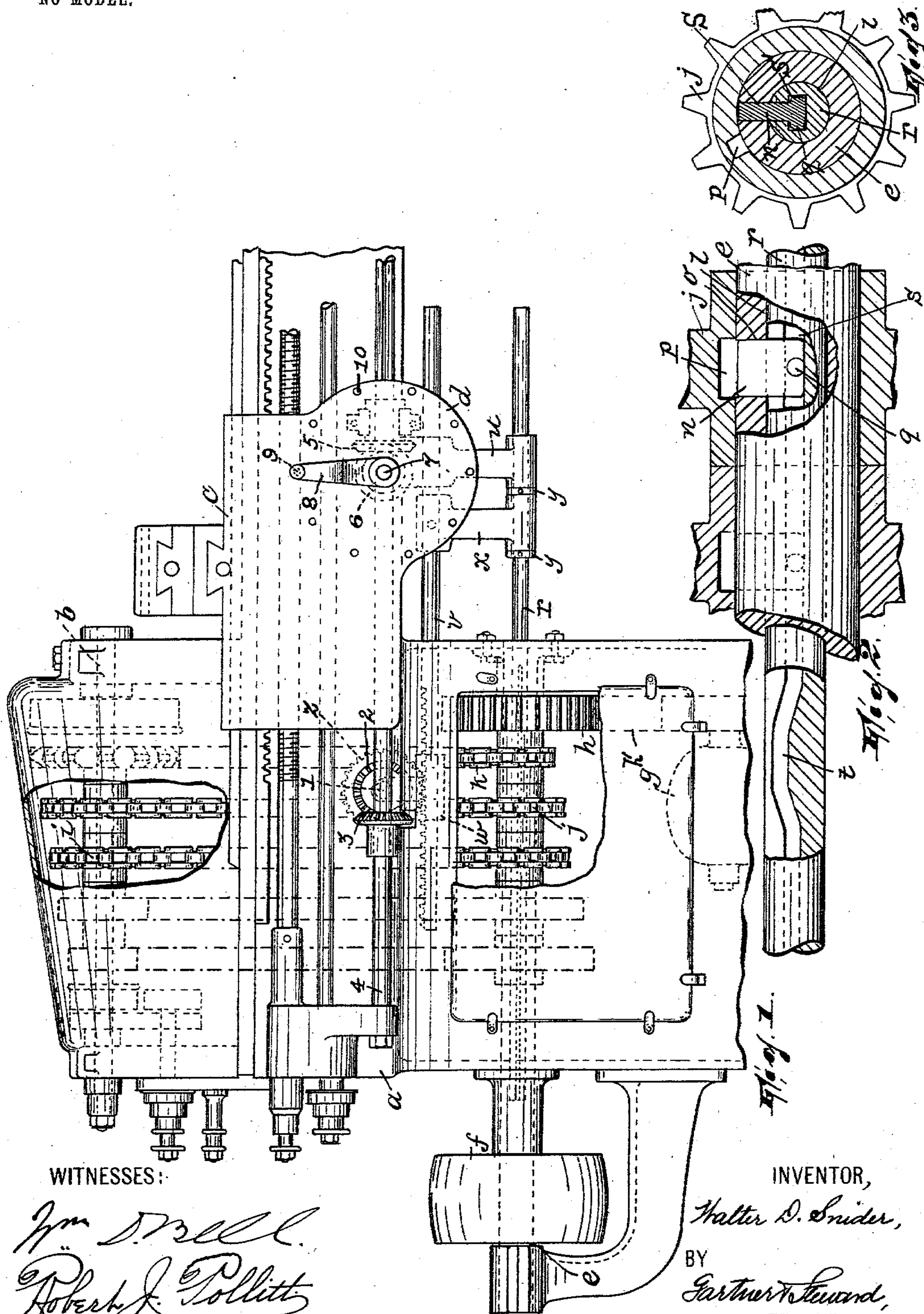
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W. D. SNIDER.
SPEED CHANGE MECHANISM FOR LATHES.

APPLICATION FILED MAR. 9, 1903.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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SPEED-CHANGE MECHANISM FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 752,007, dated February 9, 1904.

Application filed March 9, 1903. Serial No. 146,868. (No model.)

To all whom it may concern:

Be it known that I, WALTER D. SNIDER, a citizen of the United States, residing in Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Speed-Change 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, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to change-speed gearing; and it consists in an improved form of a mechanism of this nature applicable especially to lathes. It is contemplated in the case of the present invention not only to improve the change-speed gearing proper so as to insure the ready, easy, and positive operation of the parts thereof, but when a lathe or other like machine having a movable carriage or the like is the subject of the improvements to provide for operating the mechanism for convenience sake from said carriage.

My invention will be found fully illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation showing my invention applied to a lathe. Fig. 2 is a detail view partly in section and partly in elevation, and Fig. 3 a view showing the same detail illustrated in Fig. 2 from another view-point.

In said drawings, *a* designates the bed of the lathe; *b*, the mandrel journaled therein; *c*, the carriage, and *d* its apron.

e is a shaft which is journaled in the bed parallel to shaft *b* and below the plane of movement of the carriage, said shaft being the drive-shaft and being adapted to be rotated either by a pulley *f* carried by it or from a motor *g* through gearing *h h'* or in any other desired manner. On shaft *b* is fixed a series of graduated sprocket-wheels *i*, while on shaft *e* is arranged a reversely-graduated series of sprocket-wheels *j*, each of which is revolubly mounted on the shaft. The aligned

sprocket-wheels in the two series are connected by sprocket-chains *k*.

Shaft *e* is hollow, for a part of its length at least, from its inner end toward its outer end. Said shaft carries a series of keys *n*, corresponding in disposition and number to sprocket-wheels *j* and movable radially in openings *o* in the shaft into and out of recesses *p*, formed in the sprocket-wheels. If any key projects into the corresponding recess *p* in a sprocket-wheel *j*, it will be apparent that the shaft will drive the sprocket-wheel. Each key has its inner end formed with laterally-projecting pins *q*, so that a longitudinal section through the key in the plane of the pins gives the key a T-shaped contour. The keys are actuated so that any one of them may be made to interlock the corresponding sprocket-wheel with the shaft, and thus effect the rotation of the particular gearing of which said sprocket-wheel forms a member by a rod *r*, arranged to slide longitudinally in the bore *l* of the shaft and which is provided with a T-shaped groove comprising a slot *s*, receiving the keys, and camways *s'*, communicating with the slot and receiving the pins of the keys. This cam-groove is straight throughout the whole of its length except where, as at *t*, there is a slight deviation.

Rod *r* is journaled in a hanger *u*, suspended from a portion of the bed. It is actuated from a rack *v*, guided in hanger *u* and another part *w* of the frame through the medium of an arm *x*, projecting from the rack and penetrated by the rod which carries collars *y*, arranged on each side of the arm. Rack *v* is engaged by a spur-wheel *z*, secured on the inner end of a shaft 1, suitably journaled in the bed and carrying at its outer end a bevel-pinion 2, engaging another bevel-pinion 3, fixed on a shaft 4. Shaft 4 is journaled in the bed and extends substantially as far as at least the length of movement of the carriage *c*.

On shaft 4 is splined a bevel-pinion 5, which has bearings in the apron of the carriage and engages with another bevel-pinion 6 on a shaft 7, also journaled in the carriage. This shaft

carries a crank 8, having a pin 9 adapted to engage any of a circular series of notches 10 in the apron, the crank being preferably elastic, so as to permit the engagement and dis-
5 engagement of the pin with the notches.

The operation is as follows: On turning crank 8 it will be obvious that it will act through the gearing connecting it with rack *v* to shift the rack, and consequently the rod
10 *r*, which through arm *x* and collars *y* is made to move with said rack. Thus the deviation *t* in the cam-groove can be brought into coincidence with any one key, and so made to actuate it. In this way any one sprocket-wheel
15 is interlocked with the drive-shaft *e*, and so the mandrel *b* is made to take that speed of rotation which the particular gearing of which said sprocket-wheel forms a part effects.

Deviation *t* is preferably made not so long
20 but that it will stand clear between any two keys. Thus all of the gears may be unlocked from the shaft. Every other notch 10 may correspond to such "idle" positions of the parts, while the rest mark interlocked posi-
25 tions.

By mounting the prime actuating element 8 of my mechanism on the carriage I attain the advantage that the control of the mechanism is always in convenient reach of the oper-
30 ator.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a plurality of sets of gearing of different capacities, of a hollow
35 shaft carrying one member of each of said sets of gearing, keys arranged in the shaft and adapted to engage each of said members to interlock the same and the shaft and each
40 having a lateral projection, and a rod movable longitudinally in said shaft and having a longitudinal slot receiving the keys and a longitudinal camway opening into said slot and receiving the projections of said keys, sub-
stantially as described. 45

2. The combination, with a plurality of sets of gearing of different capacities, of a hollow
shaft carrying one member of each of said sets of gearing, keys arranged in the shaft and adapted to engage each of said members
50 to interlock the same and the shaft, each key being sectionally T-shaped, and a rod movable longitudinally in said shaft and having a T-shaped camway engaged by said keys, sub-
stantially as described. 55

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of March, 1903.

WALTER D. SNIDER.

Witnesses:

JOHN W. STEWARD,
WILBUR DUNN.