No. 723,044. PATENTED MAR. 17, 1903.

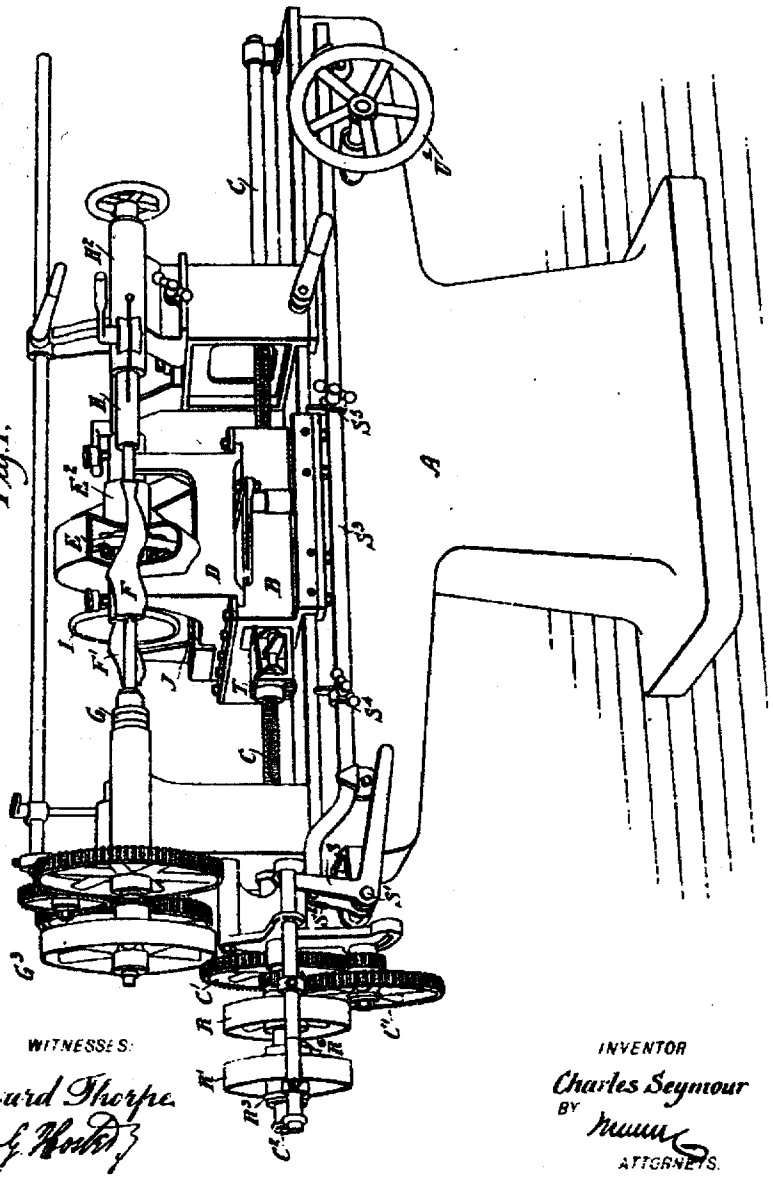
C. SEYMOUR.

COPYING LATHE.

APPLICATION FILED DEC. 8, 1902.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

Edward Thorpe.

Chas. F. Wood.

INVENTOR

Charles Seymour

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No. 723,044. PATENTED MAR. 17, 1903.

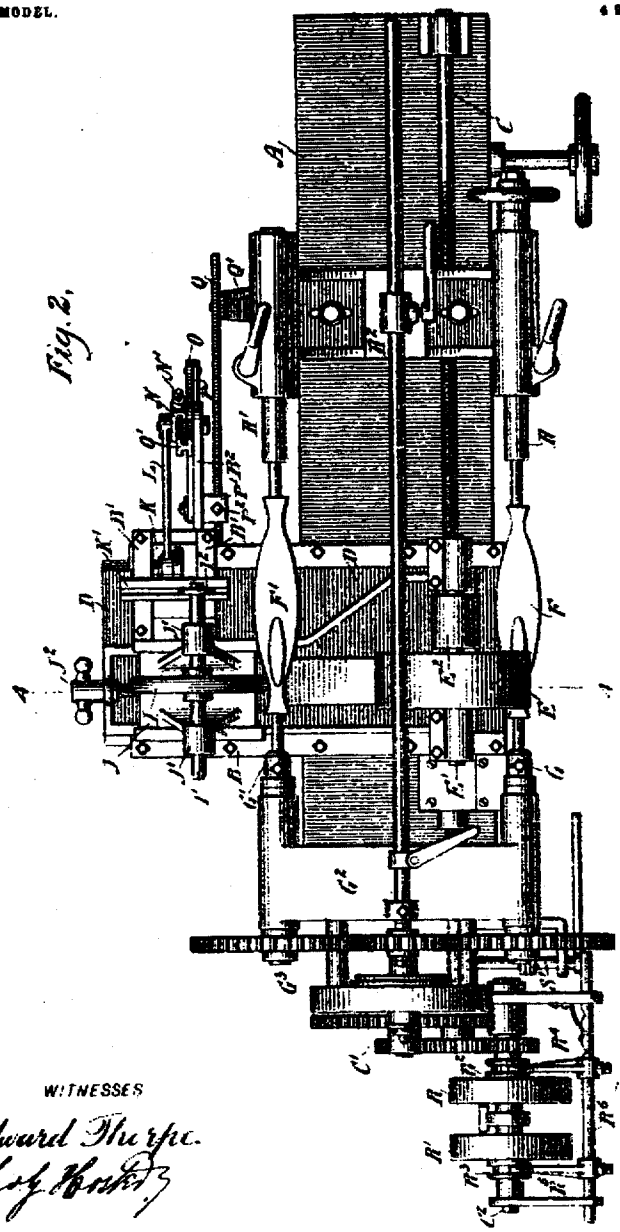
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APPLICATION FILED DEC. 2, 1901.

NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

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APPLICATION FILED DEC. 8, 1902.

NO MODEL. 4 SHEETS—SHEET 3.

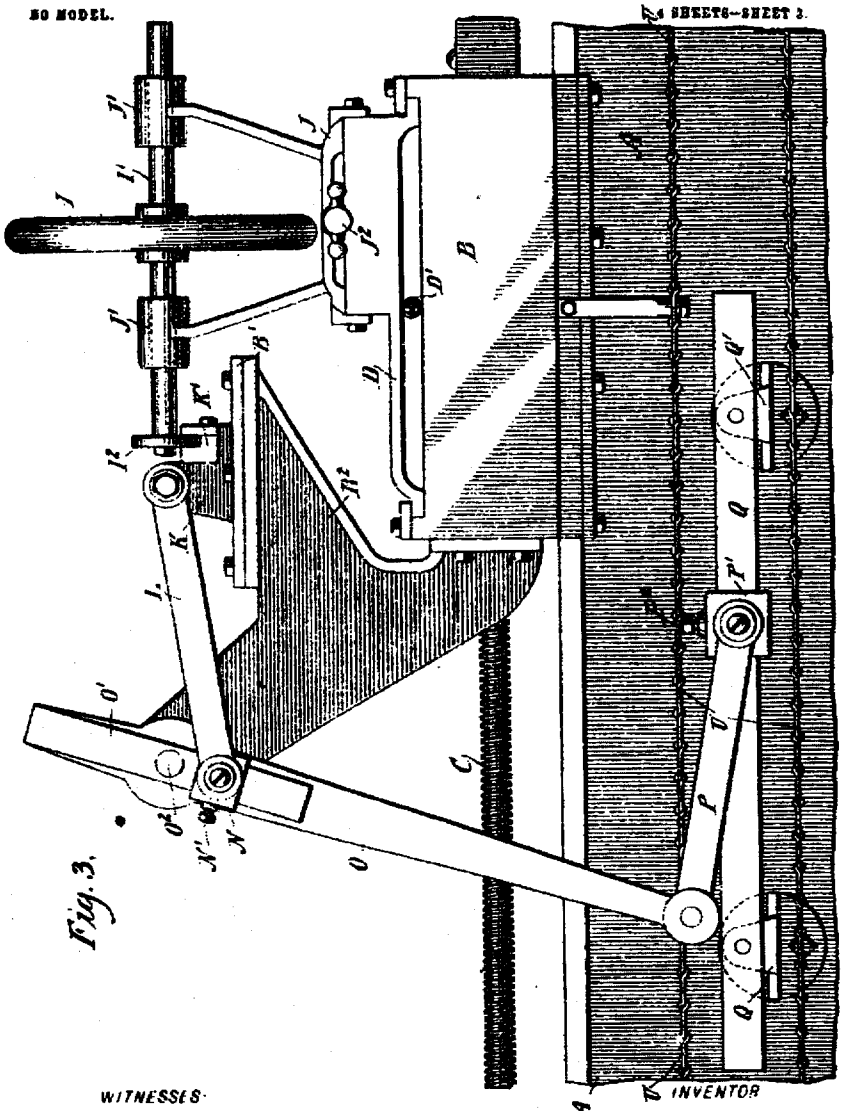


Fig. 3.

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No. 723,044. PATENTED MAR. 17, 1903.

C. SEYMOUR.

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APPLICATION FILED DEC. 2, 1902.

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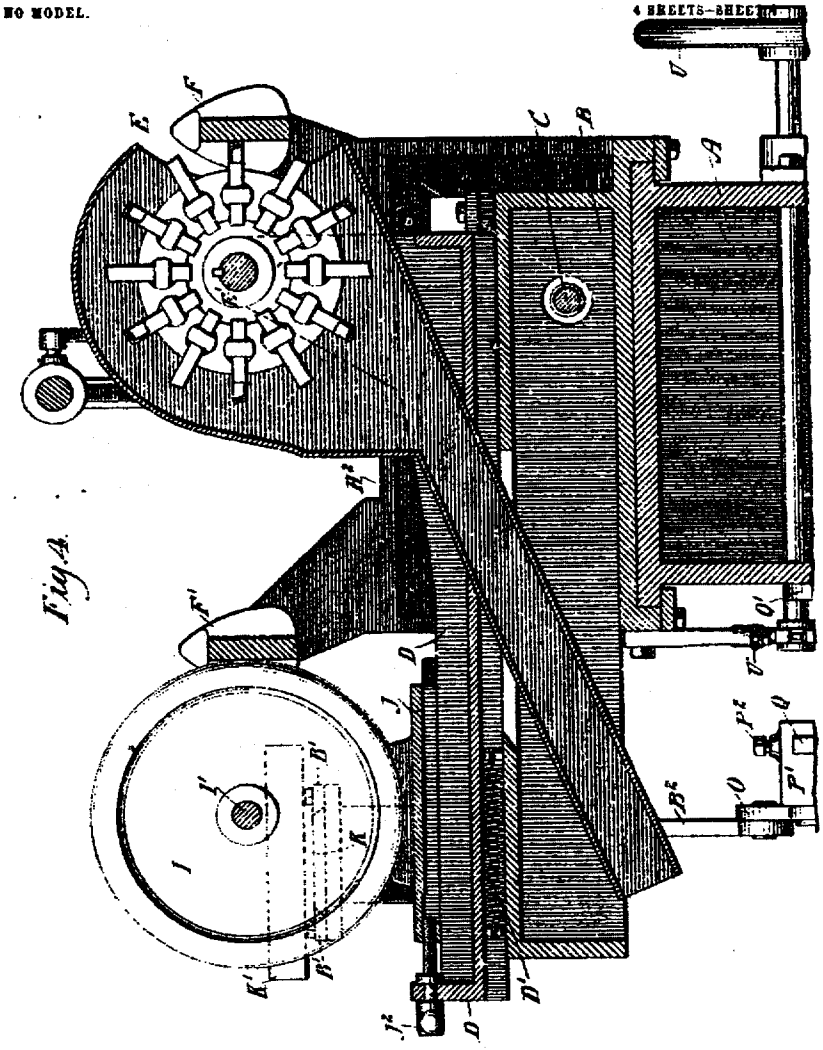


Fig. 4.

WITNESSES.

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723,044

March 17, 1903

page 1

723,044. COPYING-LATHE. Charles Seymour, Defiance, Ohio, assignor to Defiance Machine Works, Defiance, Ohio. Filed Dec. 2, 1902. Serial No. 133,560. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEYMOUR, a citizen of the United States, and a resident of Defiance, in the county of Defiance and State of Ohio, have invented a new and Improved Copying-Lathe, of which the following is a full, clear, and exact description.

The invention relates to woodworking machinery; and its object is to provide a new and improved copying-lathe for turning gun-stocks, shoe-lasts, and other articles of regular or irregular form and arranged to permit convenient adjustment for turning the arti-

cles of the same or of a proportionate larger or smaller size than the pattern.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a front perspective view of the improvement. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged rear elevation of part of the improvement, and Fig. 4 is an enlarged transverse section of the improvement on the line 4 4 of Fig. 2.

The improved copying-lathe is mounted on a suitably-constructed bed A, on which is held to slide longitudinally a carriage B, moved forward and backward by the usual feed-screw C, and on the said carriage is mounted to slide transversely a cross-head D, on which is journaled a cutter-head E, acting on the work F, held on the head-stock spindle G and a tail-stock center H, and the said cutter-head E moves with the cross-head D bodily in a transverse direction, according to the action of a pattern-contact I, in contact with a pattern F′, held on a head-stock spindle G′ and a tail-stock center H′, as plainly indicated in the drawings. The head-stock spindles G and G′ are journaled in suitable bearings in a head-stock G^2, and the said spindles are rotated in unison by a suitable driving device G^3. (Shown in the drawings, and of usual construction.) The two tail-stock centers H and H′ are mounted on a tail-stock H^2, held longitudinally adjustable on the bed A of the machine. The pattern-contact I is preferably in the shape of a wheel, the shaft I′ of which is journaled in suitable bearings J′, held on a bracket J, transversely adjustable by a screw J^2 in bearings on the cross-head D, as plainly indicated in Figs. 2 and 3. One end of the longitudinally-extending shaft I′ is provided with an annular flange I^2, engaging a transversely-extending groove or guideway K′, formed in a slide K, mounted to move longitudinally in bearings B′, formed on a bracket B^2, secured to the carriage B. The slide K is pivotally connected by a link L with a block N, adjustably secured by a set-screw N′ on a guideway O′, formed on a lever O, pivotally connected by a pivot O^2 with the bracket B^2 of the carriage B. The guideway O′ extends in opposite directions from the pivot O^2, so as to permit of moving the block N on the said guideway to either side of the said pivot O^2. When the block N is in the position shown in Fig. 3—that is, below the pivot O^2—then the work produced by the cutter E is less in size than the pattern F′, and when the block N is adjusted on the guideway O′ above the said pivot O^2 then the cutter E will form the work F to a size larger than the pattern F′. The lower end of the shaft O is fulcrumed on a link P, pivoted on a block P′, held lengthwise adjustable on a guideway Q, supported on brackets Q′, attached to the bed A at the rear side thereof, as plainly indicated in Figs. 2 and 3. The block P′ is secured in place on the guideway Q after the desired adjustment is made by a set-screw P^2.

In order to impart the desired forward-and-backward motion to the carriage B by the feed-screw C, it is necessary to rotate the latter alternately in opposite directions, and for this purpose the feed-screw C is connected by a suitable changeable gearing C′ with a driving-shaft C^2, carrying loose pulleys R and R′, connected by belts with suitable machinery for rotating the pulleys in opposite directions, and the said pulleys are adapted to be engaged by clutches R^2 and R^3, respectively, mounted to slide on and to rotate with the driving-shaft C^2. The clutches R^2 and R^3 are engaged by shifting arms R^4 and R^5, attached to a shifting rod R^6, mounted to slide longitudinally in suitable bearings attached to the bed A, and the said rod R^6 is pivotally connected by an arm S with a shaft S′, carrying an arm S^2, pivotally connected with a shifting rod S^3, supporting adjustable stops S^4 and S^5, adapted to be engaged by the sides of the carriage B, so that the latter moves alternately in contact with the stops S^4 and S^5 to shift the rods S^3 and R^6 to move one friction-clutch in engagement with the corresponding pulley R or R′ while the other friction-clutch is moved out of engagement, and vice versa. Thus the main driving-shaft C^2 is alternately rotated in opposite directions, and a similar movement is given to the feed-screw C to move the carriage B forward and backward on the bed A.

It is understood that the carriage B is provided with a sectional nut device T of usual construction for connecting the carriage with the feed-screw C or for disconnecting the carriage from the feed-screw whenever it is desired to run the carriage forward or backward by hand. When the carriage B is thus disconnected from the feed-screw C, a chain-gear device U is provided and controlled by the operator manipulating a hand-wheel U′ for moving the carriage B rapidly forward or backward independent of the feed-screw whenever it is desired to do so. As this mechanism, as well as the driving mechanism for the feed-screw C and that for the head-stock spindles G and G′, is of usual construction, further detailed description of the same is not deemed necessary.

The cross-head D is pressed on by a spring D′ to hold the pattern-contact I in contact at all times with the revolving pattern F′. The cutter-head E is provided on its shaft E′ with a pulley E^2, connected by belt with other machinery to impart a continuous rotary motion to the said cutter-head.

The operation is as follows: When the carriage B is traveling on the bed A, then it carries along the cutter-head E, as well as the pattern-contact I; but the latter has a supplementary bodily movement either in the direction in which the carriage is moving or in a reverse direction thereto, according to the position of the block N on the lever O. When the carriage moves on the bed A, then the pivot O^2 imparts a swinging motion to the lever O, fulcrumed on the link P, and this swinging motion of the lever O causes a pulling or pushing of the link L, so that the slide K is moved in its guideway B', and the shaft I', by the flange I^2 engaging the guideway K', is caused to slide in its bearings J' to give the supplementary movement to the pattern-contact I. Now when the block N is in the position shown in Fig. 3 and the carriage B moves either forward or backward then a swinging motion is given to the lever O, so as to shift the pattern-contact I in the inverse direction to which the carriage B is moving, and when the block N is shifted on the guideway O' above the pivot O^2 then a supplementary movement is given to the pattern-contact I in the same direction in which the carriage is moving. Thus in the one case the cutter-head E will shape the work F according to the pattern F', but in a proportionately larger size, and in the other case the work F will be proportionately diminished in size to that of the pattern F'. When the block N is moved into a central position—that is, centrally over the pivot O^2—then no movement is given to the slide K or the pattern-contact I, and consequently the latter simply moves with the carriage as the latter travels forward and backward on the bed A, and the produced work is an exact reproduction of the pattern.

From the foregoing it will be seen that by the arrangement described the pattern-contact I moves bodily with the carriage B and at the same time receives a supplementary motion either in the same direction as that in which the carriage moves or in a reverse direction to the movement of the carriage, according to the work desired to be cut—that is, whether the work is to be increased proportionately in size to the pattern F' or reduced correspondingly.

It is evident that when the pattern-contact moves in the direction in which the carriage travels it travels the length of the pattern before the cutter has traveled the same length, and hence the reproduced work is proportionately shorter than the pattern. When the pattern-contact travels in the reverse direction in which the carriage moves, then the carriage travels a longer distance in a given time than the pattern-contact, and hence when the latter has traveled the length of the pattern the cutter-head has traveled a longer distance on the work, and the latter is thus proportionately longer than the pattern.

By having the annular flange I^2 on the pattern-contact shaft I' engaging the transverse groove K' in the slide K the latter is always connected with the pattern-contact and the latter is free to travel transversely with the cross-head D, according to the shape of the pattern F', against which the pattern-contact I is held by the action of the spring D', connected with the cross-head.

It is understood that when the carriage B travels the cutter-head E is carried along to cut the surplus material from the wood block to form the article corresponding to the pattern F'.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A copying-lathe having a carriage mounted to travel longitudinally of the machine, a cross-head mounted to travel transversely of the machine on the said carriage, a cutter-head mounted to rotate on the said cross-head, a pattern-contact in contact with a revolving pattern and mounted to travel on the said cross-head longitudinally of the machine, and means controlled by the carriage for imparting a longitudinal movement to the said pattern-contact independent of its movement with the carriage as set forth.

2. A copying-lathe having a carriage mounted to travel longitudinally of the machine, a cross-head mounted to travel transversely of the machine on the said carriage, a cutter-head mounted to rotate on the said cross-head, a pattern-contact in contact with a revolving pattern and mounted to travel on the said cross-head longitudinally of the machine, and means controlled by the carriage for imparting a longitudinal movement to the said pattern-contact independent of its movement with the carriage, the said means having adjustable devices for moving the pattern-contact in the direction in which the carriage travels or in the reverse direction thereof, as set forth.

3. A copying-lathe comprising a head-stock having parallel head-stock spindles, a tail-stock having parallel tail-stock centers, the said spindles and centers being arranged in pairs, one for supporting and revolving the work and the other for supporting and revolving the pattern, a carriage mounted to travel longitudinally of the machine, a spring-pressed cross-head mounted to travel transversely of the machine on the said carriage, a cutter mounted to rotate on the said cross-head and arranged to act on the revolving work, a pattern-contact mounted to travel on the said cross-head longitudinally of the machine and in contact with the said pattern, and means controlled by the carriage for imparting movement to the pattern-contact in the same or in the reverse direction in which the carriage travels, as set forth.

4. A copying-lathe having a carriage mounted to travel longitudinally of the machine, a spring-pressed cross-head mounted to travel

transversely of the machine on the said carriage, a cutter-head mounted to rotate on the said cross-head and arranged to act on the revolving work, a pattern-contact in contact with a revolving pattern, a contact-shaft carrying the said pattern-contact and mounted to slide longitudinally in bearings on the said cross-head, a slide for shifting the contact-shaft in its bearings, and a lever fulcrumed at one end on the machine-frame and pivotally connected with the said carriage and the said slide, as set forth.

5. A copying-lathe provided with a carriage mounted to travel longitudinally of the machine, a spring-pressed cross-head mounted to travel transversely of the machine on the carriage, a cutter-head journaled on the said cross-head and arranged to act on the revolving work, a pattern-contact in the form of a wheel, in contact with the revolving pattern, a shaft for the pattern-contact, mounted to slide longitudinally on the said cross-head, a slide for shifting the contact-shaft in its bearings on the cross-head, a lever pivotally connected with the said carriage, a link held on a fixed block and forming the fulcrum for the said lever, and a link connecting the said lever with the said slide, as set forth.

6. A copying-lathe comprising a carriage, a cross-head mounted to slide transversely thereon and carrying a cutter-head and a pattern-contact, the latter being in the form of a wheel having its shaft slidably journaled on the cross-head in a longitudinal direction, a slide mounted to slide longitudinally on the carriage and having a transverse groove engaged by a flange on the contact-wheel shaft, and means controlled by the carriage for imparting motion to the said slide, as set forth.

7. A copying-lathe comprising a carriage, a cross-head mounted to slide transversely thereon and carrying a cutter-head and a pattern-contact, the latter being in the form of a wheel having its shaft slidably journaled on the cross-head in a longitudinal direction, a slide mounted to slide longitudinally on the carriage and having a transverse groove engaged by a flange on the contact-wheel shaft, and means controlled by the carriage for imparting motion to the said slide, the said means comprising a link, a lever pivotally connected with the carriage and having a guideway extending in opposite directions to its pivotal connection with the carriage, and a block adjustably secured on the guideway and pivotally connected with the said link, as set forth.

8. A copying-lathe comprising a carriage, a cross-head mounted to slide transversely thereon and carrying a cutter-head and a pattern-contact, the latter being in the form of a wheel having its shaft slidably journaled on the cross-head in a longitudinal direction, a slide mounted to slide longitudinally on the carriage and having a transverse groove engaged by a flange on the contact-wheel shaft, and means controlled by the carriage for imparting motion to the said slide, the said means comprising a link, a lever pivotally connected with the carriage and having a guideway extending in opposite directions to its pivotal connection with the carriage, a block adjustably secured on the guideway and pivotally connected with the said link, a fulcrum-link for the said lever to swing on, a pivoted block for the said fulcrum-link, and a longitudinally-extending rod on which the said pivot-block is held adjustable, as set forth.

9. A copying-lathe provided with a pattern-contact wheel, bearings in which the shaft of the wheel is mounted to slide longitudinally, a slide having a longitudinal movement and provided with a transverse groove engaging an annular flange on the shaft of the said pattern-contact wheel, and means for imparting movement to the said slide, to shift the pattern-contact wheel in a longitudinal direction, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES SEYMOUR.

Witnesses:

JAS. BAUER,

GEORGE W. DEATRICK.