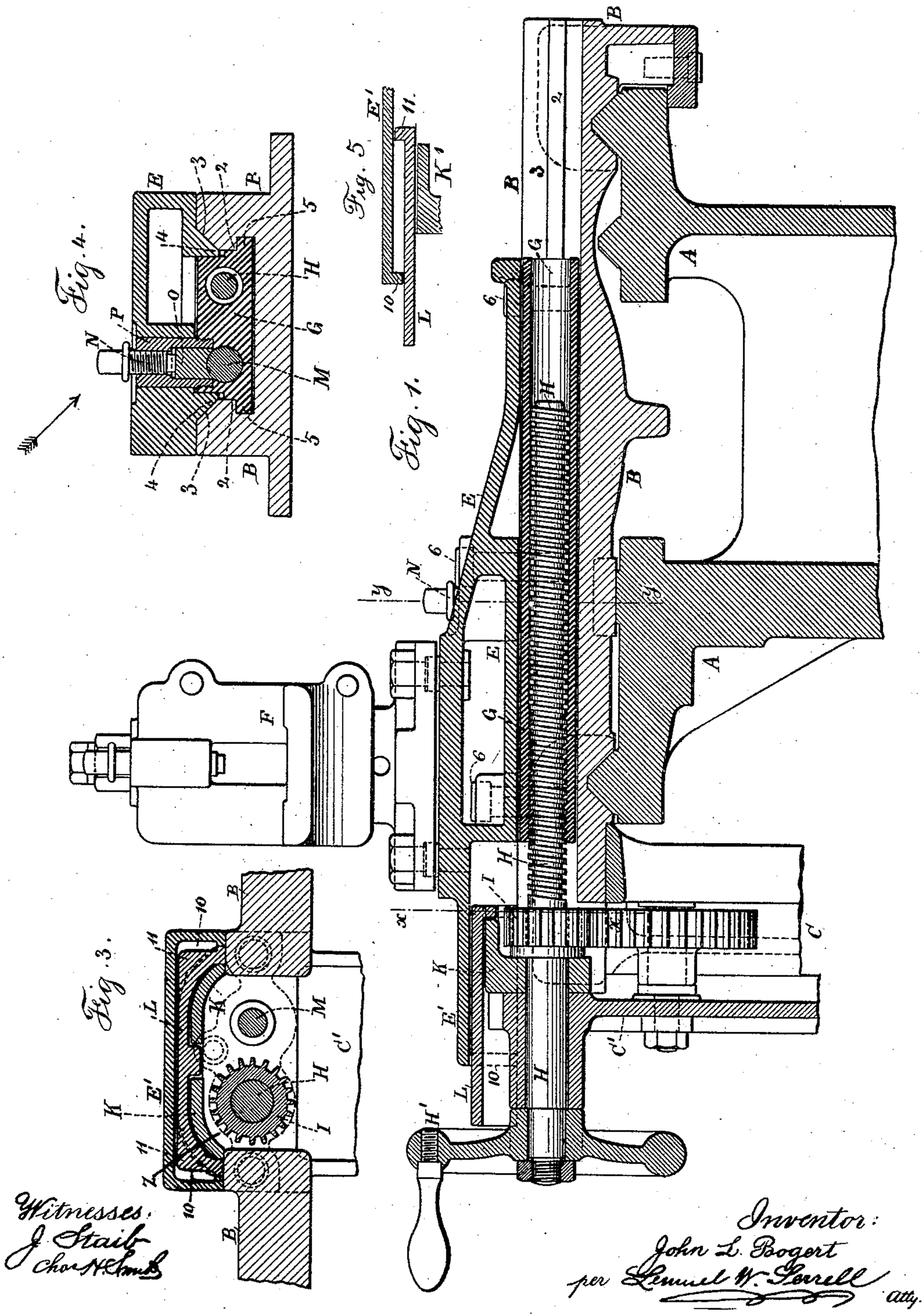
(No Model.) 2 Sheets—Sheet 1.

J. L. BOGERT.

LATHE.

No. 444,544. Patented Jan. 13, 1891.



(No Model.) 2 Sheets—Sheet 2.

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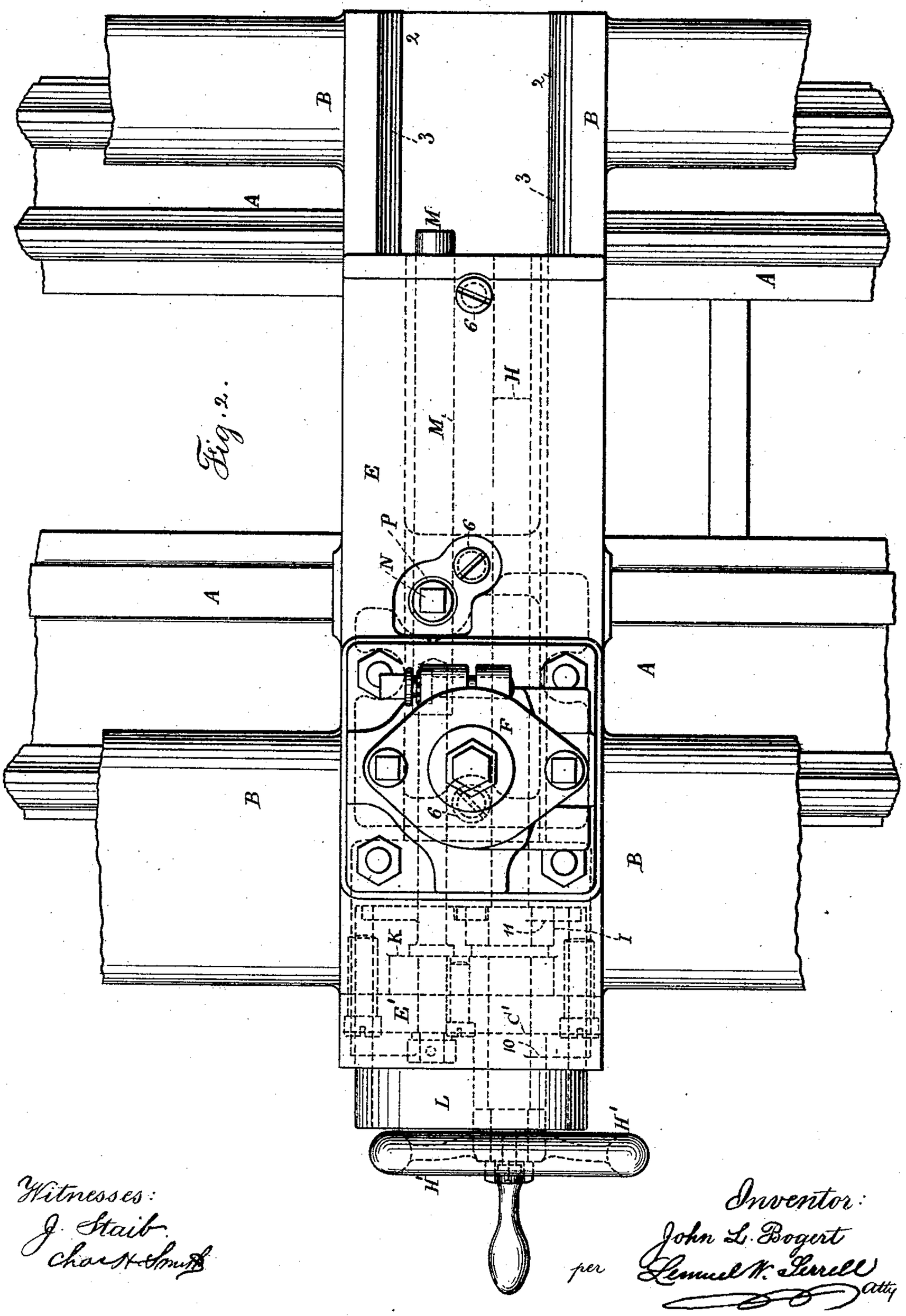

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN L. BOGERT, OF FLUSHING, NEW YORK.

LATHE.

SPECIFICATION forming part of Letters Patent No. 444,544, dated January 13, 1891.

Application filed February 24, 1890. Serial No. 341,397. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. BOGERT, a citizen of the United States, residing at Flushing, in the county of Queens and State of New York, have invented an Improvement in Lathes, of which the following is a specification.

In boring, screw-cutting, turning, and surfacing lathes it is customary to make use of a carriage or saddle resting upon the bed of the lathe and a cross-slide to support the tool-holder, which is moved by a feed-screw across the carriage. Heretofore in the majority of cases this feed-screw, which is usually known as the "cross-feed screw," has been left more or less exposed to the falling chips, resulting in its rapid destruction from abrasion. Where the cross-slide has been made of greater length than the width of the carriage this objection has been overcome; but the great length of the cross-slide causes it to project too far out from the front of the lathe when operating on work of large diameter. This difficulty I overcome by the sliding guard hereinafter described. Furthermore, in the ordinary lathe it is usual to employ a dovetailed upper surface to the carriage, and the lower surface of the cross-slide is constructed to fit this dovetailed portion of the carriage, and there is a gib or filling-piece that may be adjusted to compensate for wear. I find, however, that the direction of the resistance to the cutting action of the tool is such that the cross-slide tends to wedge or tighten at one side of the dovetail and loosen at the other. Freedom of movement under cutting strain is thus interfered with. I make the engaging surfaces of the carriage and cross-slide as hereinafter described, so that the pressure upon the cross-slide resulting from the cutting of the tool is resisted by surfaces approximately normal or perpendicular thereto. I also provide a "keep," that is connected to the cross-slide by screw-bolts and can be tightened from time to time to compensate for wear, and the parts are free to move with little or no wedge action resulting from the strain upon the tool.

In the drawings, Figure 1 represents the principal parts of the lathe by a cross-section. Fig. 2 is a plan view of the carriage and cross-slide. Fig. 3 is a section of the sliding guard at the line *x x*. Fig. 4 is a section of the cross-slide at the line *y y*, and Fig. 5 is a section at the line *z*, Fig. 3.

The lathe-bed A is of ordinary character, and the surface thereof is usually provided with V's, upon which the carriage B is supported and slides, and this carriage is usually provided with an apron C, that extends down at one side of the bed A, and upon this apron C is a cover C′ to the cross-feed gearing that is made use of in rotating the cross-feed screw H, from which the cross-slide E receives its motion. These parts are of ordinary construction, except in the particulars hereinafter named, and their mode of operation in giving motion to the tool-holder F and the tool carried by the same is not changed by my improvements.

Instead of the cross-slide E having a longitudinally-dovetailed lower surface fitting a corresponding dovetailed surface on the top of the carriage B and being held by the interlocking of said dovetailed surfaces, I make a channel through the upper surface of the carriage B and its cross-bar at right angles to a vertical plane through the centers of the lathe. This channel is constructed with inwardly-projecting longitudinal ribs 2, the upper surfaces 3 of which are inclined at about an angle of forty-five degrees to the horizontal surfaces. The lower surface of the cross-slide E is made with longitudinal downwardly-projecting ribs 4, corresponding to the inclined surfaces 3 of the ribs 2, so that the cross-slide E not only rests upon horizontal portions of the upper surface of the carriage B, but it also rests upon the inclined surfaces 3 of the ribs 2, and it will be observed by reference to Fig. 4 that the component of the pressure against the point of the cutting-tool upon the holder F during operation in a vertical plane parallel to the line of centers of the lathe is in the direction of the arrow, or nearly so, and hence at right angles, or nearly so, to one of the inclined surfaces 3, so that that surface supports the action of the tool without any tendency to wedge the under portion of the cross-slide into the carriage B, and this allows the cross-slide to be moved with but little friction.

In order to prevent the cross-slide E from rising, I make use of the keep G, which is in the form of a block having longitudinally-

projecting ribs 5 passing in beneath the ribs 2, and the keep passes up between the ribs 4 upon the under side of the cross-slide E. and this keep is connected with the cross-slide by screws 6, and it will be seen upon reference to Fig. 4 that when the lathe is first made the upper surface of the keep G does not come directly into contact with the under surface of the cross-slide E, and hence the screws 6 can be tightened from time to time to compensate for any wear that there may be upon the respective parts. This keep G forms a nut for the cross-feed screw H, such screw passing through such keep, and this screw is within the carriage B, and is fitted therein in the usual manner, or nearly so—that is to say, the screw portion is of sufficient length for the proper movement to be given to the cross-slide—and the back end of such screw H may or may not be received into a bearing upon the carriage B, and the front end of the screw is provided with a pinion I, that is driven by the gearing of the cross-feed that is between the apron and the cover, as usual in turning-lathes.

Upon the carriage B is a pinion-guard K in the form of an angle-plate, that is fastened upon the cover C′ and projects inwardly over the pinion I, and upon the cross-slide E there is a hood E′, either formed with or attached to the cross-slide and projecting toward and over the pinion I, and sufficiently above the same for the introduction of the sliding guard L, which intervenes between the pinion-guard K and the under side of the cross-slide hood E′, and at the end of the cross-slide hood is a curtain 10 in the form of a downwardly-projecting flange or plate, the under edge of which is arched or formed to correspond with the upper surface of the sliding guard L, and upon this sliding guard L are lugs 11 behind the curtain 10, and the length of the hood E′ and of the sliding guard L are sufficient to allow for the proper movement of the cross-slide without the screw H becoming uncovered—that is to say, when the cross-slide E E has been operated to draw the tool-holder and tool as far back from the axis of the lathe as possible the end of the hood E′ will be adjacent to the hand-wheel H′ upon the outer end of the cross-feed screw H, and the sliding guard L will be beneath the hood E′ and above the pinion-guard K. As the cross-feed screw H is revolved and the cross-slide E moved inwardly the hood E′ is moved backwardly over the sliding guard L until the curtain 10 comes into contact with the lugs 11, and thereafter the sliding guard is moved by and with the cross-slide E, and by the time the end of the sliding guard L reaches the inner edge of the pinion-guard K the cross-slide E has been moved to the extent of its inward motion across the lathe. Hence the hood E′ and the sliding guard L and the pinion-guard K will prevent any chips or turnings from passing into the cross-slide and coming in contact with the screw H or the cross-feed gearing; but if it is desired to obtain access to the screw H the guard L can be slid back beneath the hood E′, thus giving access to both the pinion and the screw, and the guard L can be slid out again from beneath the hood E′ to cover up the screw and the pinion-guard. When the cross-slide E is moved in the other direction, the sliding guard L remains stationary until the cross-slide comes in contact with its back end, and then the two parts move together to the extreme limit of outward motion, as before described.

In cases where the screw and cross-slide have both moved on the carriage the screw often projects inconveniently far from the lathe-bed, and where a hood has been used over the screw it has only served the purpose of keeping the chips and dirt from the screw.

In my improvement the edges of the hood resting upon the top surface of the carriage serve as additional support to the cross-slide against the thrust due to the pressure of the article being turned against the tool. Hence the cross-slide is more firmly supported than heretofore, and the support extends to the end of the hood.

It is usual to provide an adjustable stop-bar M, that is parallel with the screw H and held at its end within the carriage B, and this stop-bar passes through the keep G, and there is a clamp-screw with a block O at the end thereof, which is pressed against the side of the bar M by the action of the screw whenever it is desired to permanently clamp the cross-slide to the said bar M, and this clamp is usually brought into action at the time the carriage B is receiving a motion lengthwise of the lathe, and it is used for holding the cross-slide E more firmly to the carriage B; but in this construction of lathe, if the screw N were tapped into the cross-slide E, it would tend to press the keep G away from such cross-slide. I therefore provide a tubular hub P upon the keep G, either screwed permanently into it or cast with it, and this tubular hub passes up through a hole in the cross-slide E and receives into it the screw N and the block O, so that when such screw N is forced down to clamp the bar M there is no tendency to press the keep G away from the cross-slide E, because the tubular hub P for the screw N is a part of the keep G and receives the strain that is exerted in clamping the bar M. I remark that the cross-slide E at its inner portion is usually sufficiently long to cover up the screw-thread of the screw H, and the width of the lathe is sufficient to allow the back ends of the cross-slide to pass along upon the carriage to whatever distance is required in adjusting the cutting or turning tool upon the tool-holder. This tool-holder may be constructed in the manner represented in my patents, Nos. 368,749 and 373,878, or in any other desired way.

I claim as my invention—

1. The carriage and a feed-screw lying transversely of the carriage and occupying a

fixed position in relation to such carriage, a cross-slide resting upon the carriage and having a nut for engaging the screw, and a hood extending out from the end of the cross-slide over the feed-screw and resting at its edges upon the top surface of the carriage, substantially as and for the purpose set forth.

2. The combination, with the carriage, cross-slide, and its feed-screw, of a hood upon the cross-slide and a sliding guard upon the carriage over the cross-slide feed-screw and between the same and the hood of the cross-slide, substantially as set forth.

3. The carriage and cross-slide feed-screw, in combination with the cross-slide having a hood E′ and curtain 10, the sliding-guard L beneath the cross-slide hood and having at its inner end lugs 11, such sliding guard resting upon the carriage and covering the screw, substantially as set forth.

4. The carriage B and cross-slide feed-screw H and pinion I, in combination with the pinion-guard K, connected with the carriage and projecting inwardly over the pinion, the cross-slide E, resting upon the carriage, and the sliding guard L between the cross-slide and the pinion-guard, substantially as set forth.

5. The combination, with the lathe-bed, of a carriage having inwardly-projecting ribs 2, with upper inclined faces 3, the cross-slide E, having ribs 4 upon its under surface resting upon the inclined faces 3 of the ribs 2, the keep G, having sides that project under the ribs 2, and the screws to connect the keep and the cross-slide, substantially as set forth.

6. The combination, with the carriage and the cross-slide feed-screw, of the cross-slide resting upon the carriage, the keep G below the cross-slide and through which the screw passes, the adjustable stop-bar supported upon the carriage and passing through the keep, the tubular hub projecting upwardly from the keep and passing into an opening in the cross-slide, and a screw and clamp within the tubular hub for acting upon the adjustable stop-bar, substantially as set forth.

7. The combination, with the carriage, the cross-slide, and the cross-slide feed-screw, of a keep fitting into a recess on the under side of the cross-slide, forming a nut for the feed-screw, having edges that project beneath the ribs on the carriage, and means for connecting the keep and cross-slide, substantially as specified.

Signed by me this 20th day of February, 1890.

JOHN L. BOGERT.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.