(No Model.) 3 Sheets—Sheet 1.

H. M. DARLING.

FEEDING MECHANISM FOR LATHES.

No. 409,456. Patented Aug. 20, 1889.

Fig. 1.

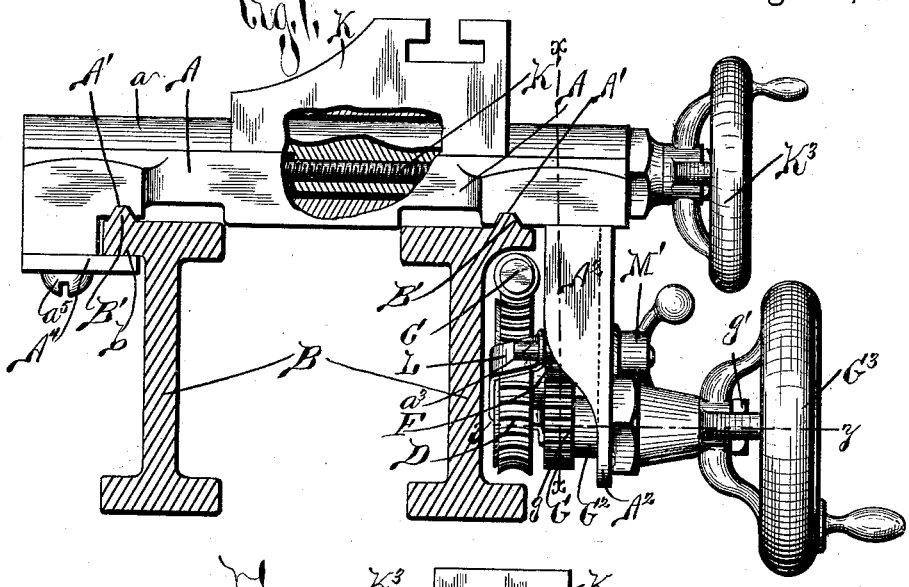


Fig. 2.

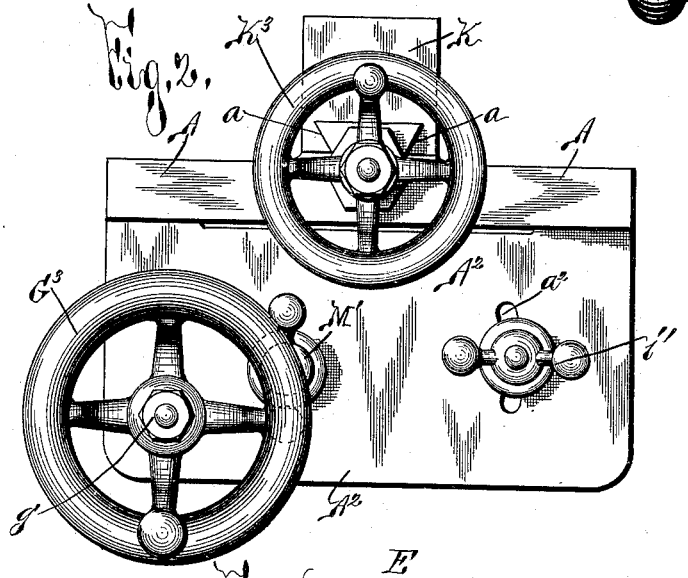
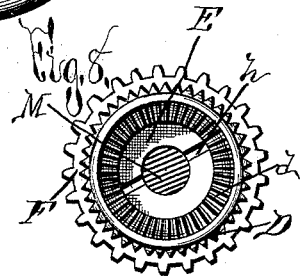


Fig. 3.



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(No Model.) 3 Sheets—Sheet 2.

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FEEDING MECHANISM FOR LATHES.

No. 409,456. Patented Aug. 20, 1889.

Fig. 3.

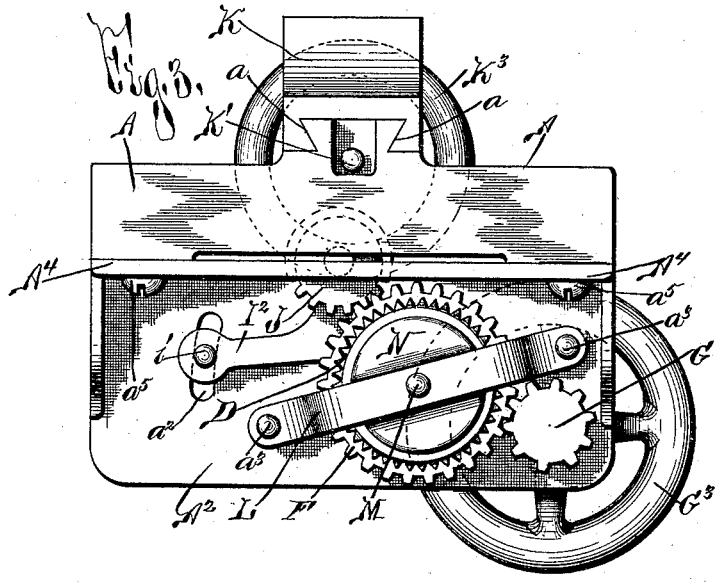


Fig. 4.

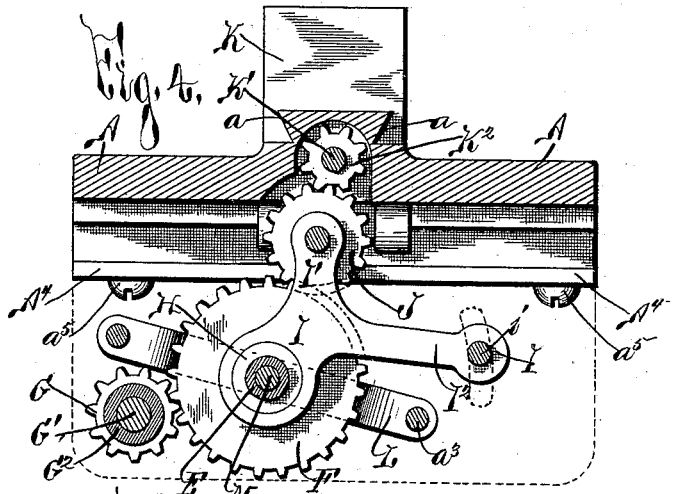
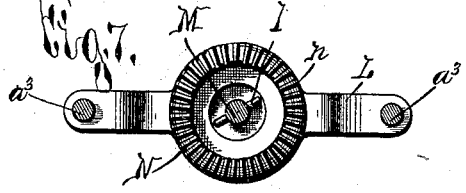


Fig. 7.



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FEEDING MECHANISM FOR LATHES.

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Fig. 5.

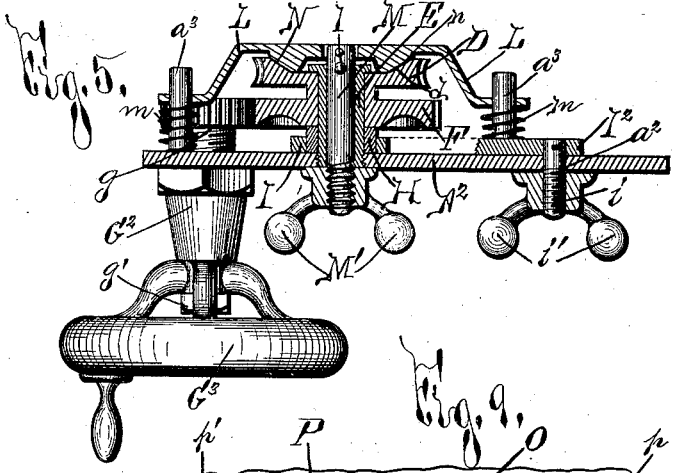


Fig. 9.

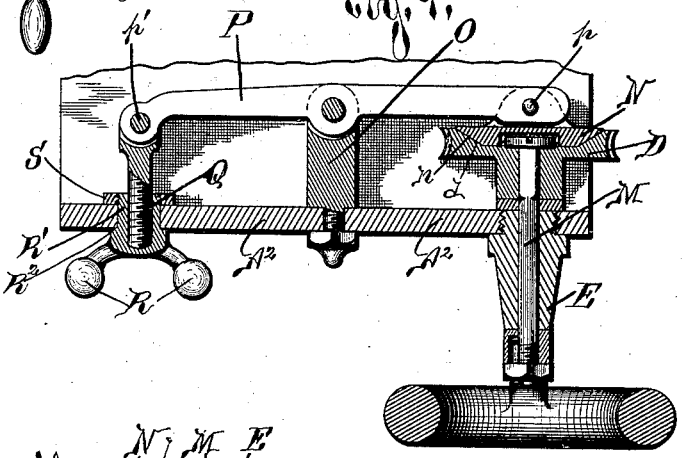
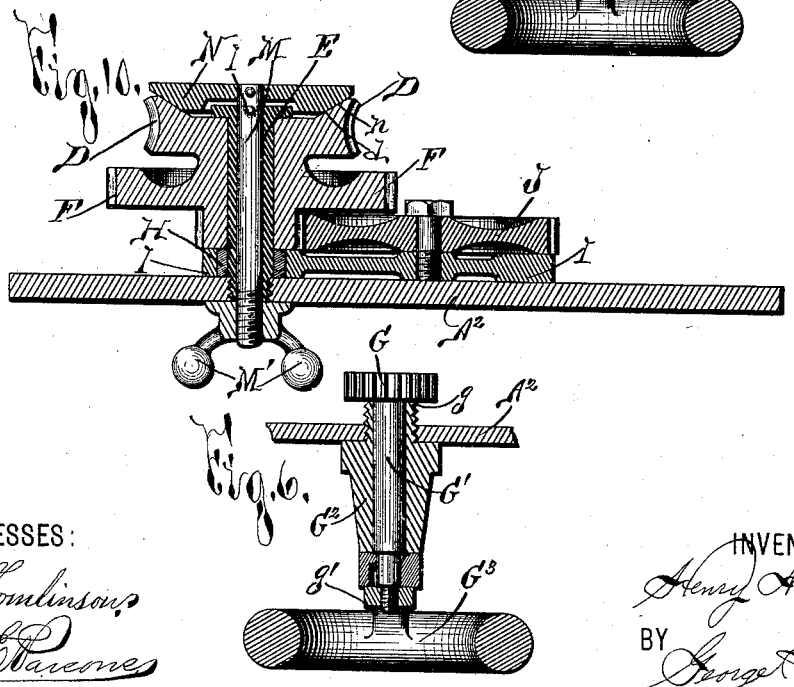


Fig. 10.



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UNITED STATES PATENT OFFICE.

HENRY M. DARLING, OF SENECA FALLS, NEW YORK, ASSIGNOR TO ADELBERT S. DAVIS, OF SAME PLACE.

FEEDING MECHANISM FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 409,456, dated August 20, 1889.

Application filed March 25, 1889. Serial No. 304,653. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. DARLING, of Seneca Falls, in the county of Seneca, in the State of New York, have invented new and useful Improvements in Feeding Devices for Lathes, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to an improved feeding device for lathes, and has for its object the production of a simple and effective device which may be used for moving the carriage lengthwise of the lathe-bed, or for operating the cross-feed of the carriage; and to this end it consists, essentially, in a worm-gear or other connection to the feeding mechanism of the lathe adapted to convey motion from the said feeding mechanism to the cross-feed of the carriage, or adapted to be locked to the carriage and cause the movement of the feeding mechanism of the lathe to move the carriage lengthwise of the bed.

It furthermore consists in the detail construction and arrangement of the parts, all as hereinafter more particularly described, and pointed out in the claims.

In describing my invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a side elevation, partly in section, of the lathe-carriage mounted in operative position upon a cross-section of the lathe-bed, illustrating the relative construction and arrangement of the lathe-carriage and my improved feeding device for conveying motion thereto. Fig. 2 is a front elevation of Fig. 1, showing the lathe-carriage as detached from the lathe-bed, and still further illustrating the relative construction and arrangement of the parts. Fig. 3 is a rear elevation of the detached carriage, to which my improved feeding device is secured in operative position, clearly illustrating the same. Fig. 4 is a sectional view taken on line $x\,x$, Fig. 1, illustrating the device for transmitting the motion to the cross-feed. Fig. 5 is a horizontal section taken on line $y\,y$, Fig. 1, illustrating my improved feeding device in section and clearly showing the relative construction and arrangement of the parts, which are here shown locked to the carriage for the purpose of moving the same lengthwise of the lathe-bed. Fig. 6 is a sectional view taken on line $y\,y$, Fig. 1, illustrating the detail construction of the device for transmitting motion to the carrier by hand. Fig. 7 is an elevation of the detached device for locking the carriage to the feeding-screw or other feeding device of the lathe, clearly illustrating the construction thereof. Fig. 8 is an elevation of the gearing to which the device illustrated in Fig. 7 is secured. Fig. 9 is a like sectional view to Fig. 5, illustrating a modified form of the construction for locking my improved feeding device to the carriage; and Fig. 10 is a like sectional view illustrating a still further modified construction of said device.

A represents my improved carriage, of suitable form and construction for the particular work for which it may be designed, mounted upon any desirable construction of lathe B, and guided thereon by any suitable guides B′, provided upon the lathe, engaging like guideways A′, provided upon the carriage.

Motion is transmitted to the carriage from a suitable lead-screw, feeding-rod, or other equivalent device C, which may be driven in the usual manner by a driving-shaft or other prime motor. Engaging the feeding device C is a suitable wheel D, and when the feeding device consists of a lead-screw, as illustrated, this wheel is a worm-wheel having suitable teeth meshing with the screw. Depending from the carriage A, and preferably on the outside of the lathe-bed, is the apron A^2, secured to which is the hollow stud E, upon which is journaled the worm-wheel D. Secured to the worm-wheel D, and preferably formed integral therewith, is the spur-gear F, which meshes with a gear G, formed or provided with its spindle G′, journaled in the stud G^2, secured to the apron A^2. The stud G^2 preferably passes through the apron A^2, and its inner face g abuts against the adjacent face of the gear, forming a bearing therefor. Secured to the opposite end of the spindle G′ by any well-known means is the hand-wheel G^3, which is further secured in position

by means of a nut g', screwed upon the extremity of the spindle G'.

It will be observed that the lathe-carriage may be moved along the bed by turning the hand-wheel G^3, rotating the gears G and F, and thus rotating the wheel D along the feeding device and moving the carriage lengthwise of the lathe.

Interposed between the inner face of the apron A^2 and the adjacent face of the gear F is the sleeve H, upon which is loosely mounted the bracket I. (Best shown in Figs. 4 and 5.) Mounted on the arm I' of the bracket I is the intermediary J, which is constantly in engagement with the gear F and is rotated thereby. The cross-feed K of the carriage A is guided on ways a, provided or formed upon the said carriage.

As shown in Fig. 1, the cross-feed K is operated by means of a screw K' running transversely of the carriage and provided with a gear K^2, which, when it is desired to operate the said cross-feed by the feeding device C of the lathe, is engaged by the intermediary J, thus transmitting motion from the gear F to the screw K'.

In order to allow the intermediary gear J to be readily engaged with the gear K^2, I provide upon the bracket I, and preferably upon the arm I^2 thereof, a stud i, which projects through a slot a^2, provided in the apron A^2. As shown in the detail view, Fig. 5, the free extremity of the stud i is threaded and engaged by a thumb-nut i', which, when turned down toward the apron, clamps the bracket I in the desired position after the intermediary gear J has been engaged with the gear K^2. When desired to disengage the said intermediary gear, the thumb-nut i' is loosened and the bracket readily oscillates or swings on the stud E as a pivot, thus allowing the intermediary gear to readily drop out of engagement with the gear K^2. This bracket and construction of gears form a feed of great advantage, since there is but little wear upon the gears from engagement and disengagement by reason of the gear J swinging in an arc concentric with the periphery of the gear F, and when it is desired to operate the cross-feed automatically, &c., by simply loosening the nut i' and forcing upward the bracket I the gear J is engaged with the gear K^2, and by tightening the nut the cross-feed is operated regularly by the feeding device C, forming a very simple and desirable connection between the cross-feed and the said feeding device C.

The cross-feed screw K' is provided at its forward extremity with the hand-wheel K^3, secured thereto, which may be operated, whenever desirable to move the cross-feed, by hand, instead of by means of the feeding mechanism, as previously described.

Projecting from the inner face of the apron A^2 are the dog-pins a^3, upon which is mounted the yoke or bracket L, secured upon the inner extremity of the rod M, passing through the hollow stud E. Upon the face of said yoke, adjacent to the apron A^2, is the raised projection N, which, although it may be of any suitable shape, is preferably of a disk shape, and is provided at its edge or periphery with a bevel or serrations n, adapted to engage a like bevel or serrations d, provided upon the adjacent face of the worm-gear.

Secured to the free end of the rod M is the thumb-nut M', operated to force said yoke and its projecting face N into and out of engagement with the bevel or serrations d of the worm-wheel D. By turning the nut M' and drawing the projection or disk N into engagement with the worm-gear D, as the said projection or disk is prevented from turning by means of the dog-pins a^3, the said gear will be unable to turn, and therefore the carriage will be fed lengthwise of the lathe. When the thumb M' is loosened, the lock N will readily disengage itself from the wheel D; but to render this disengagement more positive, I sometimes find it advisable to interpose a spring m between the yoke or bracket L and the apron A^2. This spring m is preferably of spiral form, and is wound around the dog-pins a^3 as a ready means of retaining the same in position; but it will be understood that other constructions of springs might be readily used for the same purpose.

To further facilitate the operation of the yoke L in locking the worm-gear from movement, I provide the pin l, secured to the rod M and projecting therefrom, which pin engages a slot h, provided in the adjacent face of the hollow stud E. This slot h thus serves the purpose of aiding the stoppage of said gear, and also allows a screw-driver to be inserted therein for the purpose of securing the stud E to the apron A^2. The securing of the worm-gear from movement also forms a feature of great advantage, since by simply turning up the thumb-nut M' the motion of the feeding device C is utilized to move the carriage lengthwise of the lathe, and by turning the thumb-nut in the opposite direction said movement of the carriage is checked, and, as described, the hand-wheel G^3 can then be used to move the carriage.

When operating the cross-feed by means of the feeding mechanism C, it is preferable to lock the rear of the carriage to the lathe, in order that the carriage may be firmly secured in its position during the operation of the cross-feed. Accordingly I provide the gib A^4, bearing on the underneath side of a way b of the lathe-bed. The gib A^4 is, by gib-screws a^5, secured to the lathe-carriage, and by turning up these screws the said gib A^4 is tightened against the way b of the lathe-bed, firmly securing the carriage in position.

At Fig. 9 I have shown a modified form of the device for stopping the movement of the worm-gear, in order to feed the carriage longitudinally on the lathe-bed. Secured on the interior of the apron A^2 is the stud or projection O, pivoted to which is the swinging

lever P, having the projecting face or disk N pivoted at one extremity at *p*. Pivoted to the opposite arm of the lever, at *p'*, is the rod Q. The free end of the rod Q is threaded and engages the thumb-nut R, having its hub R' passed through an opening in the apron A^2, and provided with a nut S, secured thereto on the inner side of the apron A^2, and drawing the shoulder R^2 of the thumb-nut tightly against the outside surface of the said hub. As the thumb-nut R is turned it will be seen that the same can be moved either in or out by means of the shoulder R^2 abutting against one side of the apron A^2 and the nut S abutting against the opposite side, and that as the said nut is turned the rod Q will be either forced in or out, according to the direction of turning of said nut, thus forming a positive mode of operating the said projection N and engaging or disengaging the same from the worm-wheel D, preventing the movement thereof.

The lock N (illustrated in the first nine figures of the drawings) is prevented from rotation by means of being secured in one case to the yoke L and in the other case to the lever P, which yoke and lever are prevented from rotary movement.

At Fig. 10 I have shown a still further modified form of the lock device for stopping the rotation of the worm-wheel, in which the lock N is not prevented from rotary movement. In this case the checking of the movement is derived entirely by means of impinging the said projection or disk N against the worm-wheel by tightly drawing together the said parts by means of a thumb-nut bearing against the outside of the apron A^2. This impingement of the lock N and the wheel D causes the rotation of the latter to be checked exactly as previously described, when the lock is prevented from rotary movement by the yoke L or lever P.

The operation of my invention will be readily perceived from the foregoing, and it will be understood that with a very simple construction and novel arrangement of parts I have obtained a device which may at will transfer the motion of the feeding device C either to the lathe-carriage, to move the same longitudinally, or to the cross-feed of the carriage, to move the same transversely of the lathe. It will also be understood that when the feeding device C does not consist of a screw the wheel D must be made to correspond therewith, and also that other changes may be made in the relative arrangement and detail construction of the parts without departing from the spirit of my invention.

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

1. The combination, with the main feeding mechanism of a lathe and a lathe-carriage provided with a cross-feed, of an auxiliary feeding device, substantially as described, for transferring motion from the main feeding device, and a lock for transferring the motion from the auxiliary feeding device to the cross-feed or to the lathe-carriage, substantially as and for the purpose specified.

2. The combination, with the main feeding mechanism of a lathe, the lathe-carriage, and a cross-feed provided thereon, of the wheel D, for transferring motion from the main feeding mechanism to the cross-feed, and a lock for preventing the rotation of said wheel to feed the carriage longitudinally, substantially as and for the purpose specified.

3. The combination of the main feeding mechanism C of a lathe, the wheel D, the hollow stud E, a lock for engaging the wheel D, and the rod M, connected to operate the lock, substantially as and for the purpose specified.

4. The combination, with the main feeding mechanism of a lathe, the hollow stud E, and the wheel D, journaled thereupon and provided with a beveled face, of the beveled lock N, for engaging said face of the wheel D to the rod M, substantially as and for the purpose specified.

5. The combination, with the main feeding mechanism of a lathe, of the hollow stud E, the wheel D, mounted thereupon and provided with serrations, the serrated lock N, for engaging the serrations of the wheel D, and the rod M, substantially as and for the purpose specified.

6. The combination of the main feeding mechanism of a lathe with the wheel D, connected to operate the lathe-carriage, the lock N, and means for engaging said lock with the wheel D, substantially as and for the purpose described.

7. The combination of the main feeding mechanism of a lathe with the wheel D, for conveying motion to the carriage thereof, the lock N, prevented from rotary movement, and means for engaging and disengaging said lock with said wheel, substantially as and for the purpose set forth.

8. The combination of the main feeding mechanism of a lathe, the lathe-carriage, the wheel D, for conveying motion to the carriage, the yoke L, provided with a projecting face N, and means for engaging said face with the wheel D, substantially as and for the purpose set forth.

9. The combination of the main feeding mechanism of a lathe, the carriage of a lathe, the wheel D, for conveying motion to the carriage, the yoke L, having the projecting face N for locking the wheel D, dog-pins *m*, for preventing movement of the yoke, and means for moving said yoke toward and away from the gear, substantially as set forth.

10. The combination of the main feeding mechanism of a lathe, the lathe-carriage, the wheel D, journaled on a spindle secured to the carriage, the yoke or bracket L, having the projecting face N for locking the wheel D, pins a^3, for guiding the yoke L, means for en-

gaging said yoke with the gear D, and springs for disengaging the said parts, substantially as and for the purpose set forth.

11. The combination of the main feeding mechanism of a lathe, the lathe-carriage, the projecting hollow stud E, the wheel D, journaled thereupon, the yoke L, guided on pins a^3, secured to the lathe-carriage, the rod M, secured to the yoke, and means for operating said rod, substantially as and for the purpose set forth.

12. The combination, with the main feeding mechanism of a lathe, of the lathe-carriage, the hollow stud secured thereto, the wheel D, mounted thereupon, the yoke L, having a projecting face N, a guide-pin *m* for the yoke, springs interposed between the yoke and the carriage, the rod M, and clamping device M′, for engaging said projecting face of the yoke L with the wheel D, substantially as and for the purpose specified.

13. The combination, with the main feeding mechanism of a lathe and the carriage of a lathe, of the stud E, secured to the carriage, the wheel D, mounted upon said stud, the lock N, for preventing the rotation of the wheel D, the rod M, for operating the lock, and the pin *l*, secured to said rod for engaging a slot in the adjacent face of the stud E, substantially as and for the purpose specified.

14. The combination, with the main feeding mechanism of a lathe, of the lathe-carriage, the stud E, secured to said carriage, the wheel D, mounted thereupon, the wheel F, secured to the wheel D, the hand-wheel G^3, and gearing between said hand-wheel and the wheel F, substantially as and for the purpose specified.

15. The combination, with the main feeding mechanism of a lathe, the carriage of a lathe, and a cross-feed provided on the carriage, of the wheel D, mounted on a support secured to the carriage, the wheel F, secured to said wheel, and an intermediary between the cross-feed and said wheel D, substantially as and for the purpose described.

16. The combination, with the main feeding mechanism of a lathe, the carriage of the lathe, and the cross-feed, of the wheel D, mounted on a support secured to the carriage, a spur-gear F, secured to the wheel D, an intermediary between the cross-feed and the wheel F, and a lock N, for stopping the rotation of the wheel D and the movement of the cross-feed, substantially as and for the purpose specified.

17. The combination, with the main feeding mechanism of a lathe, the carriage of the lathe, and the cross-feed, of a wheel D, journaled on a support secured to the carriage, a spur-gear F, secured to the wheel D, and an oscillating intermediary between the cross-feed and the said wheel F, for transferring motion to the cross-feed, substantially as and for the purpose set forth.

18. The combination, with the main feeding mechanism of a lathe, the carriage of a lathe, and the cross-feed, of the stud E, projecting from the carriage, the wheel D, journaled upon the stud E, the bracket I, pivoted upon the stud, and intermediary gearing mounted upon the bracket I and oscillating to connect the motion of the wheel D to the cross-feed, substantially as and for the purpose specified.

19. The combination, with the main feeding mechanism of a lathe, the carriage of a lathe, and the cross-feed, of a wheel D, for conveying motion from the feeding mechanism, the swinging bracket I, the intermediary J, interposed between the cross-feed and the wheel D, a stud provided upon said swinging bracket, and means for retaining said stud in its adjusted position, substantially as and for the purpose set forth.

20. The combination, with the main feeding mechanism of a lathe, the lathe-carriage, and the cross-feed, of the wheel D, journaled on a spindle secured to the carriage, the bracket I, pivoted to said spindle and provided with a stud guided in the apron of the lathe-carriage, a clamp for retaining the bracket in its adjusted position, intermediary gearing mounted upon said bracket for conveying motion from the wheel D to the cross-feed, and a lock for stopping the rotation of the wheel D and the feeding of the cross-feed, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Seneca Falls, in the county of Seneca, in the State of New York, this 19th day of March, 1889.

HENRY M. DARLING.

Witnesses:

WILLIAM HILLS,

N. M. PARHAM.