(No Model.)

W. BARKER.

LATHE CARRIAGE.

No. 430,612. Patented June 24, 1890.

FIG. 1.

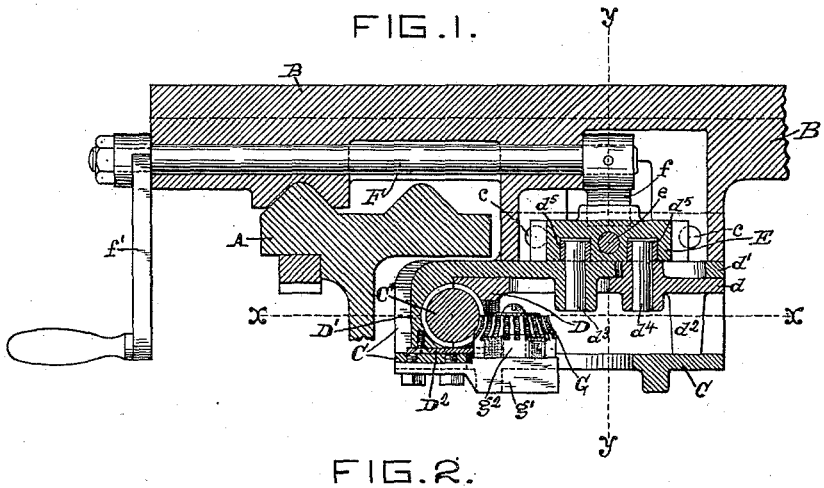


FIG. 2.

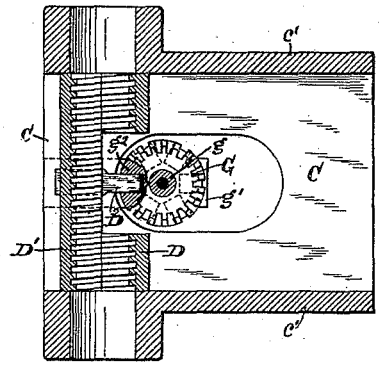


FIG. 3.

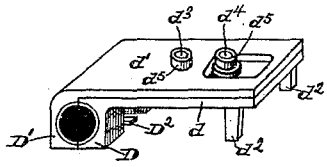


FIG. 4.

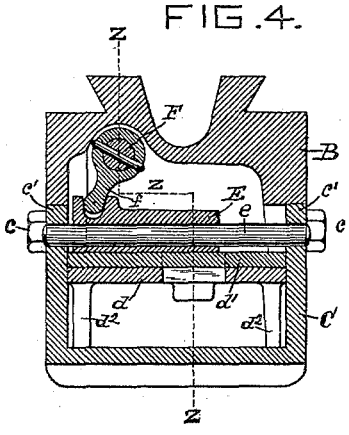
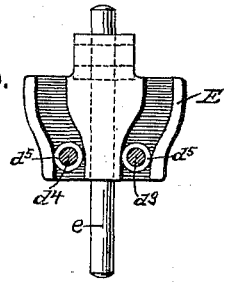


FIG. 5.



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UNITED STATES PATENT OFFICE.

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LATHE-CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 430,612, dated June 24, 1890.

Application filed September 7, 1889. Serial No. 323,261. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BARKER, a citizen of the United States, and a resident of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Lathe-Carriages, of which the following is a specification.

My invention relates to screw-cutting lathes, and is an improvement upon the device for which Letters Patent No. 396,700 were granted to William Lodge, January 22, 1889.

The object of my invention is to provide a means whereby the tool-carriage may be rapidly returned coupled to the lead-screw and the tool thrown into its proper working position as soon as the carriage is coupled to the lead-screw, or, more properly speaking, to prevent the coupling of the carriage to the lead-screw until the tool is in position to be thrown to its work.

Another object of the invention is to insure a rapid coupling of the carriage with the lead-screw without liability of injuring the threads upon the lead-screw and half-nuts.

The invention will be first fully described in connection with the accompanying drawings, and then the novel features will be particularly referred to, and pointed out in the claims.

Referring to the drawings, in which like parts are indicated by similar reference-letters wherever they occur throughout the various views, Figure 1 is a longitudinal section taken through different planes on line *z z* of Fig. 4. Fig. 2 is a sectional plan view taken through line *x x* of Fig. 1. Fig. 3 is a detail view in perspective of the half-nuts and their connections. Fig. 4 is a vertical transverse section taken through line *y y* of Fig. 1. Fig. 5 is an inverted plan view of the cam for separating and closing the half-nuts, the friction-rollers being shown in edge elevation, their journals in section, and the cam-guide rod in longitudinal elevation.

Referring to the parts, A represents the front ways of the lathe; B, the tool-carriage mounted to slide on the front and rear ways. (The latter not shown.)

C is a box secured to the under side of the carriage by bolts *c*. This box has tubular extensions upon each end, which are bored out to snugly fit the periphery of the lead-screw C′.

Within the box C are fitted the half-nuts D D′, which have wings *d d′* fitted one upon the other, so that the half-nuts when brought together engage the lead-screw C′, and when separated disengage the lead-screw and permit the carriage to slide upon its ways independent of it. The wing of half-nut D has legs d^2, extending down from it to slide upon the bottom of box C and keep the wing *d* in engagement with wing *d′* of the outer half-nut. The wings *d d′* of the half-nuts D D′ are each provided with upwardly-projecting stud-pins d^3 d^4, the pin d^4 projecting through a slot in the wing *d′*, so that the top of the stud-pins are in the same horizontal plane. These stud-pins are armed at their upper ends with friction-rollers d^5.

E, Fig. 5, is a grooved cam fitted to slide upon a rod *e*, secured in the upwardly-projecting flanges *c′* of the box C. The cam E has upon its upper face a curved depression to receive the rounded end of a crank-arm *f*, which is secured upon the inner end of a shaft F, and to the outer end of this shaft is secured a handle or crank-arm *f′*, by means of which the shaft is rocked to actuate the cam in either direction for the purpose of separating the half-nuts to disengage the lead-screw or to close them and engage it.

The devices, so far as above described, do not differ materially from the similar devices shown and described in the patent above referred to, and they are only referred to here for the purpose of clearly defining my present invention. Assuming that the said former invention is fully understood from the foregoing, I will now point out specifically my improvements, it being of course understood that in the former device it was necessary to "feel" before the tool could take a new "bite," unless the screw being chased had the same number of threads to the inch as the lead-screw, or the number of threads to the inch to be chased were a multiple of the number of threads to the inch on the lead-screw, and that any carelessness in attempt-

ing to close the half-nuts upon the lead-screw would be liable to injure the threads on both the lead-screw and the half-nuts. To obviate this defect, I have provided the worm-wheel G, which is mounted upon a stud g, which stud is secured to and projects upward from a bar g', which bar is rigidly secured to the forward end of the box C, the half-nut D being cut away centrally upon its lower part, so as to admit the introduction of the worm-wheel G and its supports. By this arrangement it will be seen that the worm-wheel is always in engagement with the lead-screw, whether the nuts be closed or separated. It will of course be seen that when the half-nuts are separated, and thus disengaged from the lead-screw, the worm-wheel G will run "idle," and that when the half-nuts are closed to engage the lead-screw then the worm-wheel is only a part of the half-nut, and, of course, the tool-carriage.

The upper part of the wheel G is provided with teeth to engage the thread of the lead-screw C'. The lower rim g^2 of this wheel is notched radially to receive a tongue or finger D^2, which is secured to the under edge of the half-nut D'. The teeth in wheel G and the notches around its rim are so arranged in relation to the pitch of the lead-screw that the threads upon the half-nuts will truly register with the spaces between the threads upon the lead-screw whenever the tongue D^2 enters any of the notches in rim g^2, and that the half-nuts cannot be closed upon the lead-screw until the tool is in a position to be thrown in to its work as soon as the carriage and lead-screw are coupled. In order to attain these ends, the number of teeth in the wheel G must be a multiple of the number of notches in rim g^2 and the number of threads to the inch on the lead-screw. Assuming, for instance, that the lead-screw has six threads to the inch and the wheel G thirty-six teeth, then there should be six notches in the rim g^2. If there be thirty teeth in the wheel, there should be five notches; if only eighteen teeth, then there should be three notches in the rim. The notches should of course be equally divided, and so arranged with relation to the teeth on the wheel G that the threads in the half-nuts and upon the lead-screw engage truly when the tongue D^2 enters any of the notches. It is evident that if only one notch be made in the rim the tool will always be in a position to register with the thread being chased; but it would take longer for the lead-screw to bring the wheel G in proper position than if there were more notches.

The device above described will chase any number of threads to the inch when they are whole numbers; but when the number of threads to the inch upon the screw to be chased is not a whole number—as four and one-half, five and three-fourths threads to the inch, and so forth—the wheel G and its rim g^2 must be correspondingly arranged, that change-wheels having the notches arranged in the rim, as above indicated, may be substituted. It will therefore be seen that the nuts cannot be jammed against the threads of the lead-screw, for if it be attempted to force the cam E to close the half-nuts the end of the tongue D^2 will strike the periphery of the rim g^2 of the wheel G, and prevent the closing of the nuts until by the action of the lead-screw the worm-wheel G is turned until one of its notches is in a position to receive the tongue D^2. When in such position, the tongue will enter the notch in wheel G, locking its further revolution and making it, in fact, part of the nut, and when in this position the half-nuts and lead-screw will interlock, the tool be in a position to register truly whenever thrown, and the carriage be carried by the lead-screw, and the tool held to its work until the half-nuts are again separated.

It is of course immaterial to which half of the half-nuts the locking-tongue is applied or whether it be connected in any manner to the cam-actuating mechanism. The object of my invention would be attained by connecting the tongue to any moving part of the feed mechanism whereby the half-nuts would be automatically and truly coupled with the lead-screw in the act of closing, and prevented from closing until the said screw and nut were in alignment and the half-nuts prevented from closing until the tool was in a position to register with the groove in the screw being chased whenever thrown to its work.

I have specifically described my invention and what I believe to be the best means of applying it; but I do not wish to be understood as limiting myself to the precise details of construction hereinbefore shown and described, as many obvious mechanical changes may be made without departing from the spirit and scope of my invention.

I claim—

1. The combination of the carriage, the lead-screw passing through it, the half-nuts D D', having wings d d' and carrying studs and friction-rollers, the worm-wheel G, having notched rim g^2, mounted in said carriage to engage the lead-screw, the teeth of the said wheel forming a part of one of the half-nuts when the nuts are in engagement with the screw, the tongue D^2, secured to one of the half-nuts and arranged to enter one of the notches in the rim g^2 when the teeth of the wheel and threads of the half-nuts are in the same spiral path, and to strike against the rim and prevent the closing of the half-nuts until the threads and teeth are in such position, and the cam E and its actuating mechanism to separate and close the half-nuts, substantially as shown and described.

2. The combination, in a feed mechanism

for screw-cutting lathes, of the lead-screw, the sliding half-nuts arranged to be brought into or out of engagement with the said screw, a worm-wheel journaled upon a stud rigidly secured to said carriage and interposed in one of the half-nuts to form a part of it when the half-nuts are closed and to revolve when the half-nuts are separated, and means such as shown to couple the worm-wheel with its half-nut when closed and uncouple it from said half-nut when the half-nuts are separated.

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