April 4, 1944. E. DU B. LUKIS 2,345,613

LATHE ATTACHMENT

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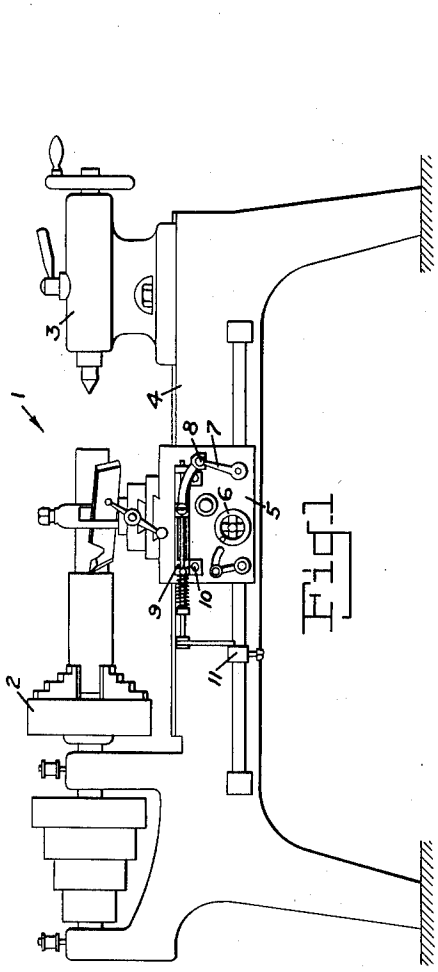


Fig-1

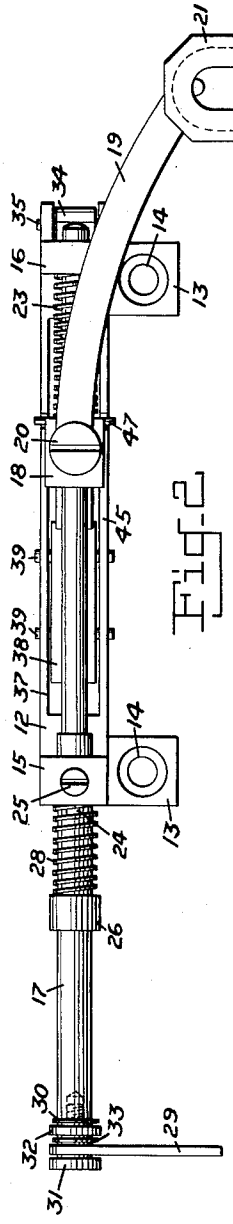


Fig-2

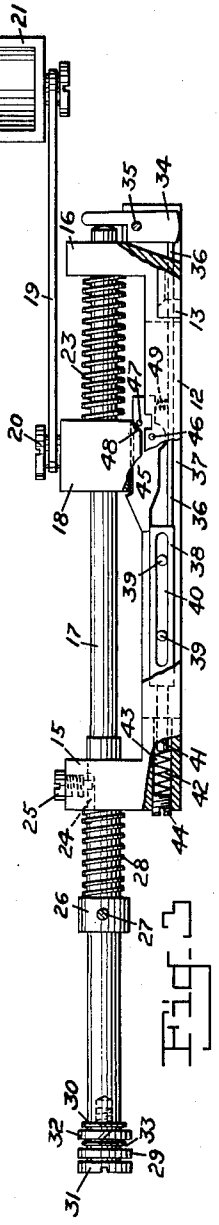


Fig-3

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LATHE ATTACHMENT

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Application August 7, 1942, Serial No. 453,926

8 Claims. (Cl. 82—21)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to an attachment for lathes and the like for automatically arresting carriage motion at a preselected point. The attachment may be adapted for use in machines other than lathes for accomplishing similar results.

In a conventional engine lathe provided with a lead screw a manually operated feed lever is provided on the carriage for manually engaging and disengaging a carriage mounted half-nut or split-nut with the lead screw. When the nut is engaged, the carriage is geared for automatic feeding; when disengaged, the carriage ceases to be automatically fed.

An object of this invention is to provide an attachment for such lathes and like devices which mechanically operates the feed lever. A further object of the invention is to provide an attachment which will disengage the carriage feed of a lathe at a preselected point with a high degree of accuracy and which will repeat this operation within narrow limits of tolerance. Another object is to provide means in such an attachment for resetting the mechanism before each use. Another object is to provide an attachment of the type referred to which is easily mounted upon a conventional lathe.

Further objects and advantages of the invention will be in part apparent and in part described in the following detailed description of a preferred embodiment as shown in the accompanying drawing in which:

Fig. 1 is a front elevational view of the attachment mounted on a lathe,

Fig. 2 is an enlarged front elevation of the attachment, and

Fig. 3 is a bottom view of the attachment shown in Fig. 2.

Referring now to Fig. 1 of the drawing, 1 represents a lathe having head-stock 2, tail-stock 3, and bed 4. A tool carriage is provided having an apron 5, hand wheel 6 and feed lever 7. As is conventional, the feed lever has a handle 8 by which it is manually thrown to the right to engage the half nut with the lead screw and to the left to disengage these members. The attachment, generally designated at 9, is shown assembled to the carriage apron to which it is attached by screws 10. The bed is provided with a longitudinally adjustable stop 11 for actuating the mechanism of the attachment to withdraw the feed lever from operating position as will be explained hereinafter.

Turning now to Figs. 2 and 3, showing the attachment in detail, 12 is a frame having depending ears 13 provided with bolt holes 14 for securing the attachment to the carriage apron. The frame is provided with two forwardly projecting bearing blocks 15 and 16 mounting a slider shaft 17. A slider 18 is mounted upon this shaft between the bearing blocks and carries a feed lever actuating arm 19. The actuating arm is pivotally mounted to the slider at 20 and carries on its free end a pivotally mounted hood 21 adapted to engage the upper end of the feed lever, as shown in Fig. 1. The hood has an aperture 22 through which the handle 8 projects. A compression spring 23 surrounding the shaft between bearing block 16 and the adjacent face of the slider urges the latter to the left.

The slider shaft is journalled in its bearing blocks for longitudinal movement therein limited by the extent of key-way 24 and cooperating key 25. A collar 26 is fixed about the shaft by set screw 27, and between this collar and bearing block 15 a shaft return spring 28 under compression is mounted about the shaft. This spring normally tends to maintain the shaft in its extreme left-hand position.

The slider shaft 17 not only serves to carry the slider 18, but also acts to trip the mechanism retaining the slider to the right permitting the slider to move rapidly to the left disengaging the feed lever. The left-hand end of the shaft is provided with release bar 29 mounted at right angles to the shaft between collar 30 and screw 31. To permit rotational positioning of the release bar a split washer 32 and plain washer 33 are included between the release bar and the collar 30, for frictionally engaging the release bar. The release bar engages the adjustable stop 11 (Fig. 1) when the carriage has reached the desired limit of its movement to the left, and the slider shaft is moved to the right relative to the frame 12 for tripping the release mechanism.

In the release mechanism, a rocker 34 is mounted on pivot 35 in the right-hand end of the frame. The top of the rocker contacts the end of the slider shaft and the bottom of the rocker contacts the end of lock push rod 36 journalled in the frame. The base of the frame is provided with an opening 37 which carries a sliding lock 38 mounted on pins 39 bridging the operture and passing through slot 40 in the lock body. On the left-hand end of the lock body a lock return pin 41 is located which bears against

locking spring 42 housed in recess 43, the end of which recess is closed by the retaining screw 44.

Sear 45 is mounted in the frame aperture on pivot 46 and is held in locked position by the lock as shown. A sear setting pin 47 passes through the sear near its right-hand end and is engaged by the cam surface 48 on the rear of the slider when the latter is cocked to move the sear into engagement with the slider and to permit relocking of the sear by the lock as impelled by the locking spring. A sear spring 49 is provided to yielding bias the sear to a position releasing the slider.

The description of the several parts of the device should give an understanding of its operation, but a brief description of its operation nevertheless will be given for the sake of clarity.

To set the device to stop carriage movement at a preselected point, the carriage is run up to the position representing the finish of the longitudinal cut and there is clamped in position by manually moving the feed lever to the right to engage the half-nut with the lead screw, the feed lever hood 21 being in engagement with the feed lever. In this position, the device is cocked, the sear securing the slider to the right. The adjustable stop 11 is moved into contact with the release bar of the adapter and pushed against the release bar until the tripping mechanism is actuated releasing the slider to move the feed lever to disengage the half-nut. The stop is then clamped in this position, the carriage is moved back to a position to start a cut, and the feed lever is thrown to the right to start automatic feed. This motion recocks the stop mechanism by dragging the slider to the right and allowing the sear to engage and be locked.

When the cut is finished, the release bar contacts the adjustable stop causing movement of the slider shaft to the right which rotates the rocker 34 clockwise forcing lock out of engagement with the sear. The sear spring releases the sear from engagement with the slider which is rapidly moved to the left by the slider spring to actuate the feed lever stopping the carriage movement. The position of stop may be hit repeatedly with the great accuracy, tolerances of =0.001" being not uncommon.

The principles of the invention may be applied in mechanism constituting a permanent part of a lathe. Also, the attachment according to the invention does not interfere with ordinary manual operation of the lathe which may be performed after disengaging the hood 21 from the end of the feed lever.

The preferred embodiment herein shown and described is merely illustrative of and not limitative of the invention defined in the following claims.

I claim:

1. An attachment for arresting the automatic feeding movement of lathe carriages and the like comprising an elongated frame fitting the lathe carriage, a slider mounted for longitudinal movement in said frame, spring means biasing said slider for longitudinal movement in said frame, a sear retaining said slider against longitudinal movement, an operating arm on the attachment and means including a lock member cooperative with the said sear for tripping the sear upon engagement of said operating arm with a stop on the lathe to permit said spring to effect longitudinal movement of said silder, said slider being linked to the feed lever of the lathe to retract said lever from feeding position upon actuation of the slider.

2. An attachment for arresting the automatic feeding movement of lathe carriages and the like comprising an elongated frame fitting the lathe carriage, a longitudinally reciprocable slider shaft mounted in said frame, a slider mounted for longitudinal movement upon said shaft, spring means biasing said slider for longitudinal movement upon said shaft, a sear retaining said slider against longitudinal movement, a longitudinally sliding lock engaging said sear to hold it in position to restrain said slider, a push-rod on said lock, a crank pivoted between one end of said shaft and one end of said rod, and means on said shaft for engaging a stop on the lathe to reciprocate said shaft transmitting motion through said crank to said push-rod to slide said lock releasing said sear and permitting said slider to move longitudinally upon said shaft as urged by said spring means, said slider having a linkage connecting it with the feed lever of the lathe to retract said lever from feeding position upon actuation of the slider.

3. An attachment for arresting the automatic feeding movement of lathe carriages and the like comprising an elongated frame fitting the lathe carriage, a longitudinally reciprocable slider shaft mounted in said frame, a slider mounted for longitudinal movement upon said shaft, spring means biasing said slider for longitudinal movement upon said shaft, a sear retaining said slider against longitudinal movement, a longitudinally sliding lock engaging said sear to hold it in position to restrain said slider, a push-rod on said lock and spring means normally tending to hold said lock in engagement with said sear, a crank pivoted between said shaft and said rod, and means on said shaft for engaging a stop on the lathe to reciprocate said shaft tarnsmitting motion through said crank to said push-rod to slide said lock releasing said sear and permitting said slider to move longitudinally upon said shaft as urged by said first mentioned spring means, said slider having a linkage connecting it with the feed lever of the lathe to retract said feed lever from feeding position upon actuation of the slider.

4. An attachment for arresting the automatic feeding movement of lathe carriages and the like comprising an elongated frame fitting the lathe carriage, a longitudinally reciprocable slider shaft mounted in said frame, and a spring and stop means on said frame for maintaining said shaft in said frame, a slider mounted for longitudinal movement upon said shaft, spring means biasing said slider for longitudinal movement upon said shaft, a sear retaining said slider against longitudinal movement, a longitudinally sliding lock engaging said sear to hold it in position to restrain said slider, a push-rod on said lock and spring means normally tending to hold said lock in engagement with said sear, a crank pivoted between said shaft and said rod, and means on said shaft for engaging a stop on the lathe to reciprocate said shaft transmitting motion through said crank to said push-rod to slide said lock releasing said sear and permitting said slider to move longitudinally upon said shaft.

5. An attachment for arresting the automatic feeding movement of lathe carriages and the like comprising an elongated frame fitting the lathe carriage, a longitudinally reciprocable slider mounted in said frame, a slider mounted for longitudinal movement upon said shaft, spring means biasing said slider for longitudinal move-

ment upon said shaft, a sear retaining said slider against longitudinal movement, a longitudinally sliding lock engaging said sear to hold it in position to restrain said slider, a push-rod on said lock and spring means normally tending to hold said lock in engagement with said sear, a crank pivoted between said shaft and said rod, and means on said shaft for engaging a stop on the lathe to reciprocate said shaft transmitting motion through said crank to said push-rod to slide said lock releasing said sear and permitting said slider to move longitudinally upon said shaft as urged by said first mentioned spring means, said slider having a linkage connecting it with the feed lever of the lathe to retract said feed lever from feeding position upon actuation of the slider, and complementary cam surface on said slider and on said sear for resetting said sear when said slider is moved into cocked position.

6. An attachment for arresting the automatic feeding movement of a lathe carriage by throwing its feed lever into disengaging position, in combination, a shaft mounted for a limited extent of longitudinal movement, a slide mounted on the said shaft and operatively connected to the said feed lever, a spring associated with the said slide and compressed thereby as the said feed lever is manually thrown into feeding position, the said compressed spring urging the slide in a direction to throw the feed lever into disengaging position, a pivotally mounted sear having a hook arm adapted to block the said slide against movement by the compressed spring in said disengaging-direction, a spring associated with the said sear adapted to turn the sear in a sense to free its said hook arm for blocking engagement with the slide, a lock mounted for a limited extent of axial movement, a spring associated with the said lock urging the lock in a direction to underlie the said hook arm of the sear to lock the sear in slide-blocking position, an adjustable stop on the frame of the lathe, an arm on the said shaft adapted to be contacted by the said stop, interconnecting means between the said shaft and the said lock whereby the movement of the shaft upon contact of its arm with the said stop is communicated to the said lock to withdraw it from sear-locking position to enable the said sear spring to turn the sear to withdraw its hook arm from slide-blocking position, the said compressed slide spring moving the slide in a direction to throw the feed lever into disengaging position, the said slide being provided with a cam surface and the said sear being provided with a pin cooperative with the said cam surface so that the movement of the slide in the said manual throwing of the feed lever to feeding position will turn the sear to enable the said lock to return to locking position underlying the said hook arm of the sear.

7. An attachment for arresting the automatic feeding movement of a lathe carriage by throwing its feed lever into disengaging position, in combination, a slide operatively connected to the said feed lever, a spring associated with the said slide and compressed thereby as the said feed lever is manually thrown into feeding position, the said compressed spring urging the slide in a direction to throw the feed lever into disengaging position, a pivotally mounted sear having a hook arm adapted to block the said slide against movement by the compressed spring in said disengaging-direction, a spring associated with the said sear adapted to turn the sear in a sense to free its said hook arm from blocking engagement with the slide, a lock mounted for a limited extent of axial movement, a spring associated with the said lock urging the lock in a direction to underlie the said hook arm of the sear to lock the sear in slide-blocking position, an adjustable stop on the frame of the lathe, means movable with the said lathe carriage and operative upon contacting the said stop to withdraw the said lock from sear-locking position to enable the said sear spring to turn the sear to withdraw its hook arm from slide-blocking position, the said compressed slide spring moving the slide in a direction to throw the feed lever into disengaging position, the said slide being provided with a cam surface and the said sear being provided with a pin cooperative with the said cam surface so that the movement of the slide in the said manual throwing of the feed lever to feeding position will turn the sear to enable the said lock to return to locking position underlying the said hook arm of the sear.

8. An attachment for arresting the automatic feeding movement of a lathe carriage by throwing its feed lever into disengaging position, in combination, a slide operatively connected to the said feed lever, a spring associated with the said slide and compressed thereby as the said feed lever is manually thrown into feeding position, the said compressed spring urging the slide in a direction to throw the feed lever into disengaging position, a pivotally mounted sear having a hook arm adapted to block the said slide against movement by the compressed spring in said disengaging-direction, a spring associated with the said sear adapted to turn the sear in a sense to free its said hook arm from blocking engagement with the slide, a lock mounted for a limited extent of axial movement, a spring associated with the said lock urging the lock in a direction to underlie the said hook arm of the sear to lock the sear in slide-blocking position, an adjustable stop on the frame of the lathe, and means movable with the said lathe carriage and operative upon contacting the said stop to withdraw the said lock from sear-locking position to enable the said sear spring to turn the sear to withdraw its hook arm from slide-blocking position, the said compressed slide spring moving the slide in a direction to throw the feed lever into disengaging position.

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