(No Model.) 2 Sheets—Sheet 1.

W. GLEASON.

SAFETY ATTACHMENT FOR LATHES.

No. 447,607. Patented Mar. 3, 1891.

Fig. 1.

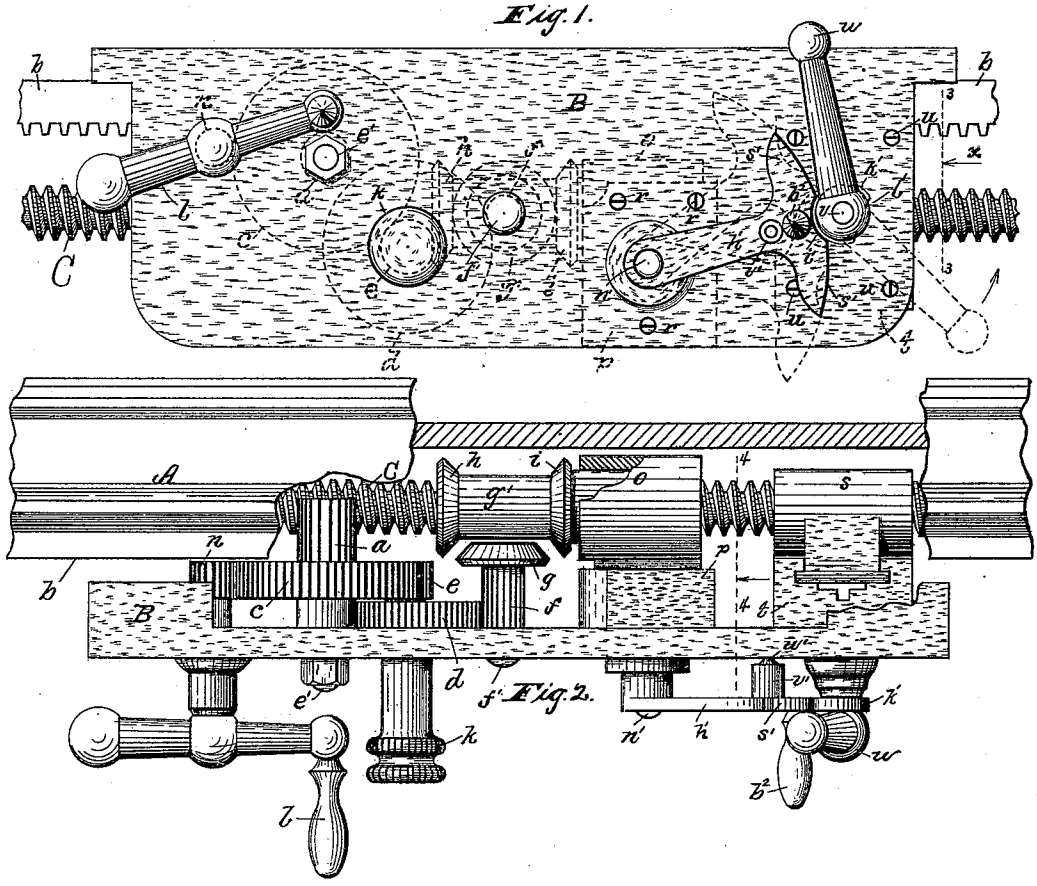


Fig. 2.

Fig. 3.

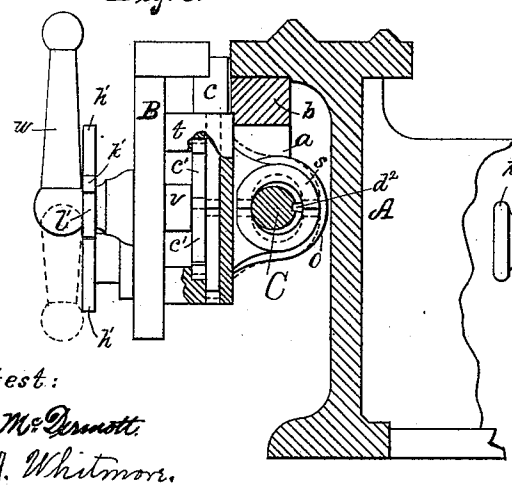
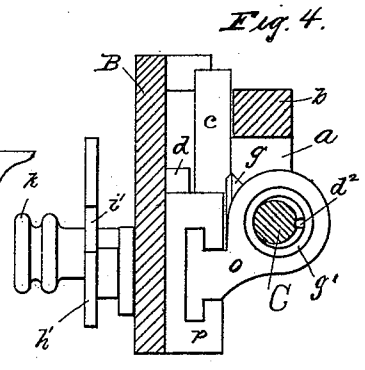


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

W. GLEASON.

SAFETY ATTACHMENT FOR LATHES.

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Fig. 5.

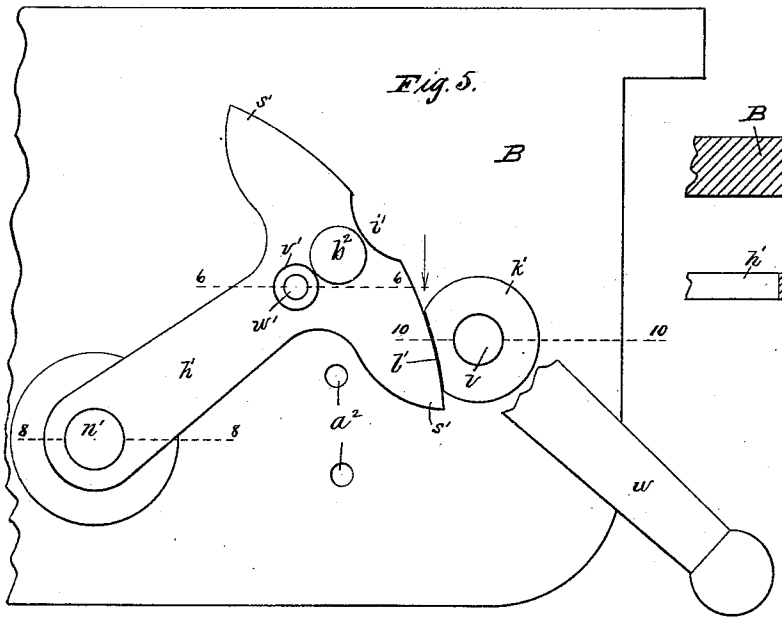


Fig. 6.

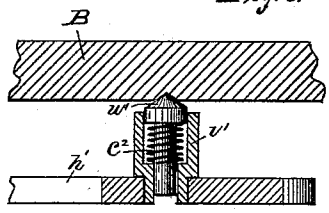


Fig. 7.

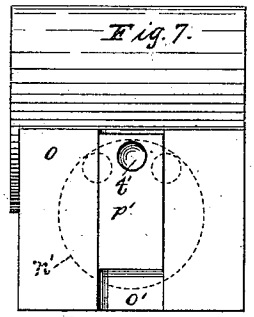


Fig. 9.

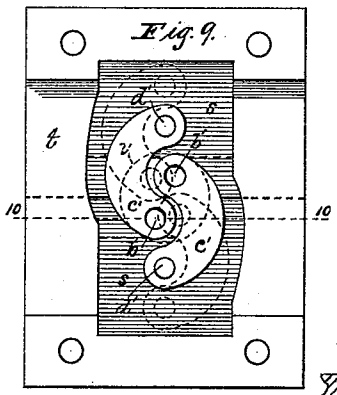


Fig. 10.

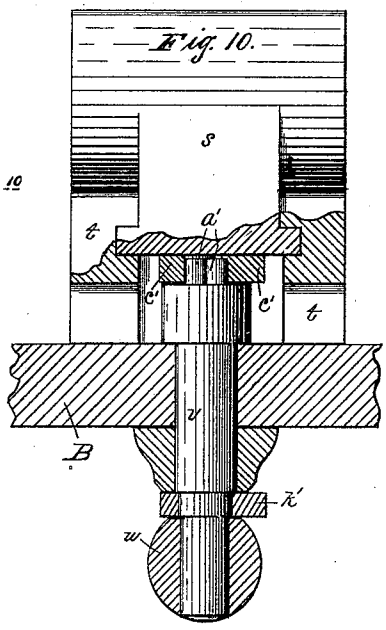
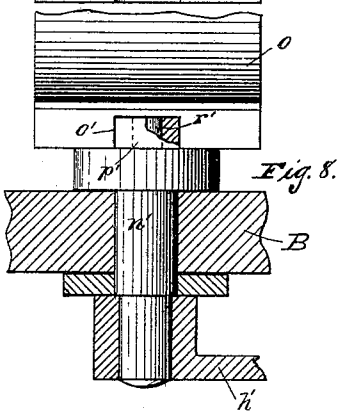


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM GLEASON, OF ROCHESTER, NEW YORK.

SAFETY ATTACHMENT FOR LATHES.

SPECIFICATION forming part of Letters Patent No. 447,607, dated March 3, 1891.

Application filed September 1, 1890. Serial No. 363,690. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GLEASON, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Safety Attachments for Lathes, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

Engine-lathes provided with lead mechanisms for cutting threads as commonly constructed are liable to be broken and seriously injured on account of the attendant inadvertently throwing the feed mechanism of the lathe into action or in position to act while the lead mechanism is operating or in position to operate, or by bringing the lead mechanism into action or in position to operate while the feed mechanism is in gear or operating. Either mechanism should act alone and while the other is inoperative, and if both are in action at the same time there is a clashing of the parts of the lathe, and a serious and costly break is liable to result therefrom.

The object of my invention is to provide a safety device or mechanism to connect the feed mechanism of the lathe with the lead mechanism and so construct and arrange the coacting parts of this safety mechanism that neither the feed nor the lead mechanism of the lathe can be brought into action until the other is first thrown out of action and rendered neutral or inoperative. This I effect by making a piece or part of this safety mechanism rigid with the feed mechanism and another piece or part of the safety mechanism rigid with the lead mechanism of the lathe, having these parts or pieces in position to alternately engage each other or interlock, so as to interfere with the motion of each other, to the end that only one of them can be moved at once. This safety device connecting the feed and lead mechanisms of the lathe is common to both of said mechanisms.

The invention is hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a front elevation of the apron of a lathe, showing my improved safety device in place, parts being shown in various positions by full and dotted lines; Fig. 2, a view of the same from on top, parts being broken away; Fig. 3, a view of the parts seen as indicated by arrow x in Fig. 1, the lead-screw being sectioned on the dotted line 3 3; Fig. 4, a transverse section on the dotted line 4 4 in Fig. 2, seen as indicated by the arrow pointed thereon. Fig. 5, drawn to a larger scale, shows more clearly the essential parts of my invention; Fig. 6, a longitudinal section of the detent for the feed-arm, taken on the dotted line 6 6 in Fig. 5. Fig. 7 shows a means for shifting parts of the feed mechanism; Fig. 8, a longitudinal section of the apron and other parts on the dotted line 8 8 in Fig. 5; Fig. 9, devices for operating the shear-nut; and Fig. 10, a horizontal longitudinal section of the apron and parts outside thereof, taken on the dotted line 10 10 in Fig. 5, parts within the apron being sectioned, as on the dotted line 10 10 in Fig. 9. The figures on Sheet 2 are all drawn to a scale twice that of the figures on Sheet 1.

Referring to the parts shown in the drawings, A is the frame or bed of an ordinary engine-lathe, B being the apron carrying the feed and lead mechanisms, and C the lead and feed screw, all substantially of common construction.

The feed mechanism shown herewith, which is substantially in common use on my lathes and not here claimed to be essentially new, is briefly as follows: A pinion a and gear c, Sheet 1, turn on a horizontal axis e', rigid with the apron, the pinion engaging a rack b on the lathe-frame. a and c, which are as one piece, are turned by a pinion e, engaging c. A gear d, having a common axis with e, but turning independently of the latter, is driven by pinion f on stud f'. e and d are provided with co-operating friction-surfaces, which, when drawn together by the clamping-nut k, turn as one piece. g is a miter-gear rigid with pinion f, and g' a sleeve formed with opposing miter-gears h and i, either one of which may be made to engage g. This sleeve is concentric with and slides freely over the lead-screw, and a spline in the sleeve fitting a longitudinal groove d^2 in the screw causes the latter and the sleeve to turn together. The sleeve rests in a bearing o, held to slide longitudinally in a block or slide p, made fast to the apron by clamping-screws r, Fig. 1. With this feed mechanism a handle l is provided to move the carriage along the

ways of the lathe, a pinion n being employed to engage the gear c, for the purpose as shown.

The lead mechanism shown herewith and in common use on my lathe consists of a shear-nut s for the lead-screw divided longitudinally, with the two halves held to slide vertically in a grooved block or slide t, secured to the apron by clamping-screws u, and means to move the halves of the shear-nut simultaneously toward or from the lead-screw. The means shown to operate the shear-nut consists of a horizontal shaft v, Figs. 5 and 10, resting in the apron and provided with a handle w to turn it. The inner end of the shaft is provided with longitudinal pins a', entering holes b' in the ends of curved links c', Figs. 9 and 3. The links are connected with the respective halves of the shear-nut by pins d'. Now by turning the handle w upward to the position shown in full lines in Figs. 1 and 2 the links will be drawn together and cause the halves of the nut to close upon the screw, as shown in Fig. 3. By turning the handle downward to the position shown in dotted lines in Figs. 1 and 3 the halves of the nut will be thrown apart and caused to release the screw.

In carrying out my invention I construct a mechanism to connect the feed mechanism of the lathe with the lead mechanism, consisting of an arm h' outside the apron, rigid with the feed mechanism, and a disk k', rigid with the lead mechanism, having said arm and disk in position to meet and engage each other. The arm is made rigid with a shaft n', resting in the apron in position to move the bearing o for the purpose of shifting the sleeve g'. The part of the bearing resting in the slide-block p is formed with a vertical groove or race o', Figs. 7 and 8, in which is fitted a sliding piece p'. The shaft n' is formed with a pin r', which enters a hole t' in the slide p'. Now by turning the arm h' to its upper position (shown in dotted lines in Fig. 1) the bearing will be carried to the left, causing the gear i, Fig. 2, to engage the gear g and causing the carriage to feed in one direction, and by turning the arm to the lowest position (also shown in dotted lines in Fig. 1) the gear h will be brought to engage the gear g, causing the lathe to feed in the other direction. By bringing the arm midway between these extreme positions, or to the positions shown in full lines in Fig. 1, the sleeve will be brought to its neutral position, as shown in Fig. 2, or in a position in which neither miter-gear h nor i will touch the gear g, thus rendering the feed mechanism inoperative.

The arm h' is laterally expanded at its outer end to form flukes $s's'$, Figs. 1 and 5. It is further formed with a peripheral recess i' at the middle of its outer end, and the outer edges of the flukes that meet or oppose the disk k' are concentric with the shaft n'. The arm is provided with a handle b^2 by means of which to operate it for the purpose of shifting the feed mechanism, as above described.

The disk k' is circular, concentric with the shaft v in a plane with the arm h', and formed with a peripheral recess l'. The disk k' and handle w are both rigid with the shaft v, so that said disk, handle, and shaft move together as one piece, the disk being virtually a part of the handle. The recess l' is circular, and when turned toward the shaft n' is concentric therewith and formed to make way for the flukes of the arm h', so the latter will just pass the disk freely when moved to operate the feed mechanism, as described; but it will be seen that when either fluke is presented to the disk and occupying the recess l' the lead mechanism is locked, so to speak, and cannot be brought into operation, for the disk cannot be turned on account of the arm h'. As the parts are constructed one or the other of the flukes of the arm h' will always be presented to the disk and occupy the recess l' therein when the feed mechanism is acting or in position to act. This positively prevents the handle w from being turned, as above described, to bring the lead mechanism into operation. For instance, when the arm h' is raised to its upper position by means of the handle b^2 to cause gear i to drive gear g for the purpose of feeding, the lower fluke will occupy recess l' of the disk and lock the lead mechanism by preventing the handle w being moved, and when the arm is depressed to join gears h and g the upper fluke will occupy recess l', and so lock the lead mechanism. It is only when the arm is brought to an intermediate position, (shown in full lines in Fig. 1,) bringing the recess i' opposite the disk, that the latter is released and the handle w allowed to turn to throw the lead mechanism into action, as described, and when the arm is in this position the gears h and i both clear the gear g, rendering the feed mechanism inoperative. Furthermore, when the arm h' is in the position last named and the handle w is turned up, as shown in Fig. 1, to close the shear-nut upon the lead-screw for cutting threads, the convex periphery of the disk will occupy the recess i' and prevent the arm being moved to bring the feed mechanism into use. Thus the arm and the disk by alternately engaging each other alternately lock the feed and the lead mechanisms, and in no case can the lead mechanism be brought into operation while the feed mechanism is acting, and in no case can the feed mechanism be brought into action while the shear-nut is closed upon the screw; but either mechanism may be brought into action at will.

The arm h' is provided with a stop or detent, Figs. 2 and 6, for holding it in its three positions—that is, in position to bring either of the gears h or i in contact with the gear g or in position to hold both said gears h and i away from the gear g. This stop consists of a cylinder or barrel v', secured in the arm h, holding a pointed bolt w', and a spring c^2 to press the bolt against the apron. Depressions a^2, Fig. 5, are formed in the face of the apron

in which to receive the point of the bolt when the arm is in any of the three positions named.

What I claim as my invention is—

1. In combination with the feed and the lead mechanisms of a lathe, an alternately-locking mechanism connecting said feed and lead mechanisms, adapted to prevent either of said feed or lead mechanisms being brought into action while the other is acting, substantially as described.

2. The feed mechanism and the lead mechanism of a lathe, in combination with a reciprocally-interlocking device or mechanism common to both said feed and lead mechanisms, whereby when either of said feed or lead mechanisms is held in position to act the other one is locked out, as and for the purpose specified.

3. In combination with the screw of a lathe, a sleeve on the screw, and a shear-nut for said screw, an arm to operate the sleeve and a handle to operate the shear-nut, said arm and handle engaging each other, whereby the arm serves to control the shear-nut and the handle serves to control the sleeve, substantially as described.

4. In combination with the feed and the lead mechanisms of a lathe, an alternately-locking mechanism connecting said feed and lead mechanisms, adapted to prevent either of said feed or lead mechanisms being brought into action while the other is acting, but permitting either to be brought into operation at pleasure, as set forth.

5. The feed mechanism and the lead mechanism of a lathe, in combination with a recessed arm for operating the feed mechanism and a disk connected with the lead mechanism in position to enter the recess in said arm to prevent the latter being turned, as and for the purpose specified.

6. In combination with the feed mechanism and the lead mechanism of a lathe, a recessed disk connected with the lead mechanism and an arm for operating the feed mechanism to occupy the recess in said disk to prevent the lead mechanism being moved, as and for the purpose specified.

7. In combination with the feed and lead mechanisms of a lathe, an arm for operating the feed mechanism and a handle for operating the lead mechanism, said arm and handle engaging each other, whereby either one locks the other, said arm having a detent to hold it in position, substantially as shown and described.

In witness whereof I have hereunto set my hand, this 28th day of August, 1890, in the presence of two subscribing witnesses.

WILLIAM GLEASON.

Witnesses:

E. B. WHITMORE,

M. L. MCDERMOTT.