(No Model.) 2 Sheets—Sheet 1.

E. A. ALPRESS.

UNIVERSAL FEED ATTACHMENT FOR ENGINE LATHES.

No. 386,177. Patented July 17, 1888.

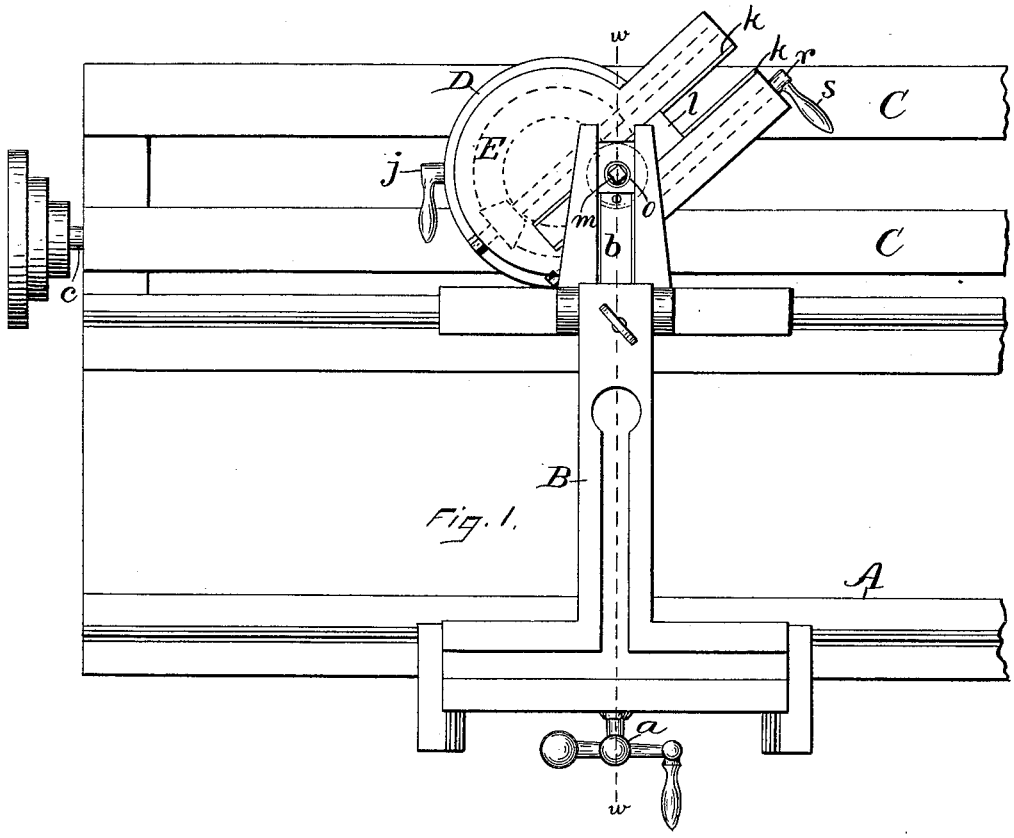
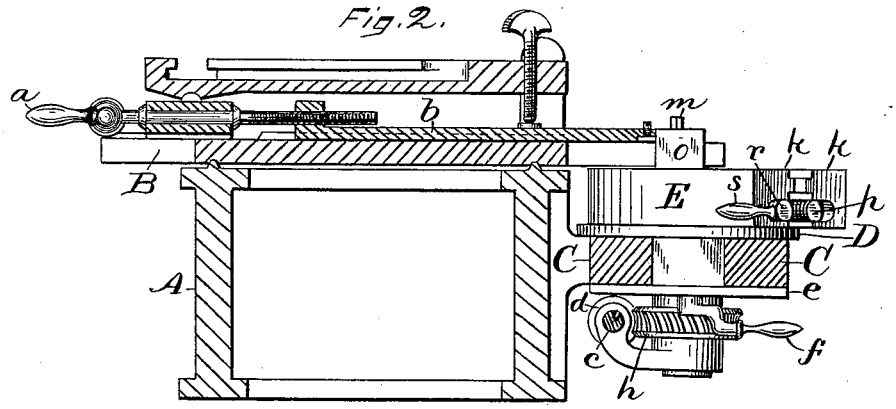


Fig. 1.

Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

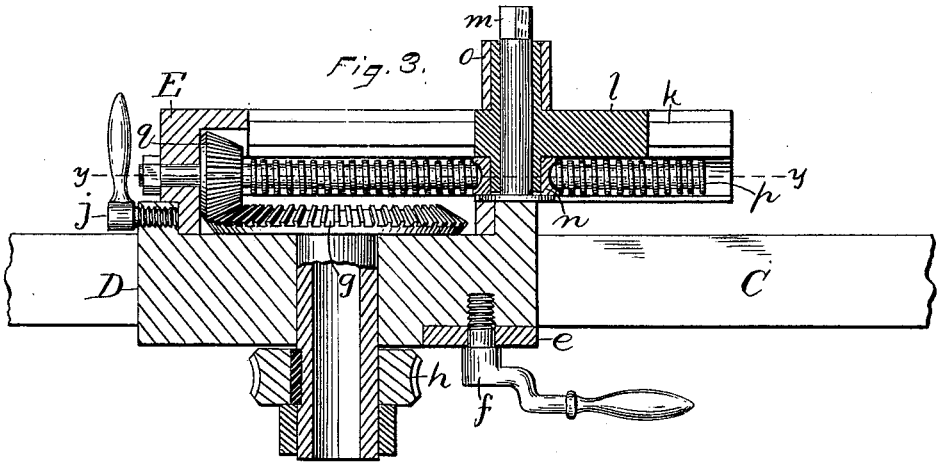


Fig. 4.

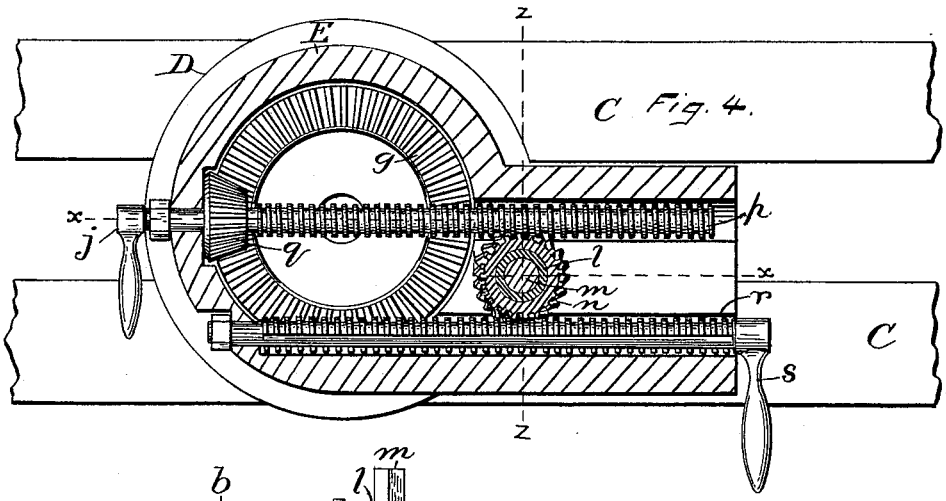
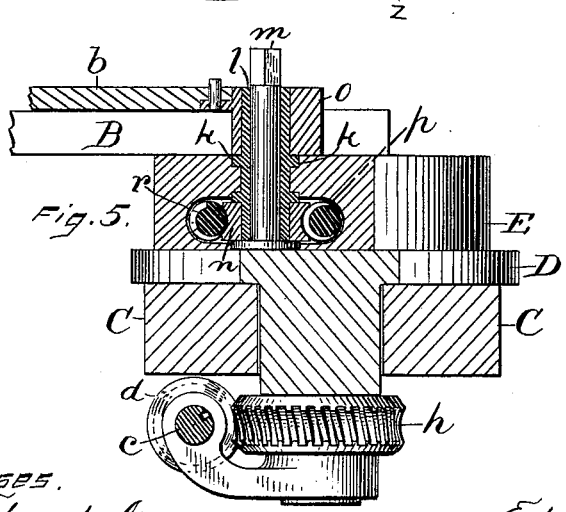


Fig. 5.



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UNIVERSAL FEED ATTACHMENT FOR ENGINE-LATHES.

SPECIFICATION forming part of Letters Patent No. 386,177, dated July 17, 1888.

Application filed August 3, 1887. Serial No. 246,003. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. ALPRESS, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Universal Feed Attachments for Engine-Lathes, of which the following is a specification.

My invention relates to improvements in feeding mechanism for engine-lathes, and the object of my improvement is to provide simple and effective means for feeding the tool at any desired angle to the length of the lathe-bed.

In the accompanying drawings, Figure 1 is a plan view of part of a lathe-bed and carriage with my universal feed applied thereto. Fig. 2 is a transverse vertical section of the same on line *w w* of Fig. 1, some of the parts being shown in side elevation. Fig. 3 is a vertical section, partly in elevation, of the main portion of my feed, the plane of section being indicated by the line *x x* of Fig. 4. Fig. 4 is a horizontal section, partly in elevation, of the same on line *y y* of Fig. 3; and Fig. 5 is a transverse section, partly in elevation, of the same on line *z z* of Fig. 4.

A designates an ordinary lathe bed, and B the lathe-carriage mounted thereon. Instead of making the nut for the screw *a* of the feed-carriage rigid with the lower part of the carriage, I form said nut on a slide, *b*, which is arranged to slide in proper ways in a line at right angles to the ways of the lathe-bed, substantially in accordance with Letters Patent No. 46,152, dated January 31, 1865. I also provide the lower part of the lathe-bed with a slotted rearward extension to better guide and support the rear end of the slide; but this is not essential, provided the slide be sufficiently rigid. At the rear of the lathe I provide a feed-shaft, *c*, and upon said shaft I secure the worm *d*, Figs. 2 and 5, the same being fitted to the shaft by means of a slot and spline, so that the worm may be revolved by the shaft, and at the same time be free to move longitudinally along the shaft in a well-known manner. I also arrange upon the rear of the lathe-bed two parallel bars, C C, which serve as a sort of table to support the feed attachment and as ways for it to slide upon.

My feed attachment has a lower bed or block, D, which is fitted to the bars C C, so as to slide thereon, and is loosened or fastened in place by means of a strap, *e*, and holding-screw *f*, or equivalent clamping mechanism, by the loosening of which the universal feed mechanism may be free to be moved along the bars C C, or by means of which it may be firmly fastened in any desired position to said bars. In the center of this lower bed, D, I arrange a vertical shaft having at its upper end a beveled gear, *g*, and at its lower end a worm-gear, *h*, which meshes into the worm *d* on the feed-shaft *c*, and is driven thereby. An upper bed or block, E, is pivotally mounted on the lower bed, D, by having a tenon which fits into a circular recess in the lower bed, D, so that the upper bed may be swiveled to any desired position thereon. I secure this upper bed in the adjusted position by means of the set-screw *j*. This upper bed, E, is also provided with ways *k k*, within which I arrange a sliding feed-block, *l*, which carries a vertical shaft, *m*, squared at its upper end, and having at its lower end a worm-gear, *n*. The block *l* is pivotally connected, by means of said shaft *m*, with a similar sliding block, *o*, which block *o* is connected to the rear end of the slide *b* and moves in a slot made to receive it in the rearward extension of the carriage B, said block *o* practically constituting a part of the slide *b*. Upon one side of the worm-gear *n*, and passing over the center of the beveled wheel *g*, is a feed-screw, *p*, having a pinion, *q*, which meshes into the gear *g*. Upon the opposite side of the worm-gear *n*, and capable of engagement therewith, is a similar screw, *r*, set parallel thereto and serving the purpose of a stationary rack. This screw *r* is, however, cut away or left threadless upon one side through the operative portion of its length, as shown in Figs. 4 and 5, and provided with a handle, *s*, by means of which said screw may be set with its threads in engagement with the pinion *n*, or it may be turned a partial revolution, so as to bring the threadless space or cut-away portion directly opposite the teeth of the worm-gear *n*, so as to throw said screw out of engagement with said worm-gear.

In using my feed attachment the screw *f* is loosened and the lathe-carriage and feed attachment moved longitudinally along the lathe-bed into the desired position for use. The

screw *f* is then tightened to fasten the lower bed, D, firmly in place. The upper bed is then adjusted so as to bring the ways *k k* into any desired angle to the ways of the lathe-bed, when it is secured in position upon the lower bed by the set-screw *j*. The screw *r* is set in the position shown, with its threads engaging the teeth of the worm-gear *n*. The ordinary feed for moving the lathe-carriage B laterally—that is, along the ways of the lathe-bed—is thrown out of gear and not used. Motion is communicated to the feed-shaft *c* by any suitable driving mechanism connected with the lathe-head. The tool-post and its tool are set in the desired position within the carriage B, as in other lathes. The feed-shaft *c* carries the worm *d*, thereby imparting motion to the worm-gear *h* and geared wheel *g*, which wheel, meshing into pinion *q*, drives the screw *p* and the engaged worm-gear *n*. The screw *r*, serving as a stationary rack, prevents the worm-wheel *n* from rotating about a stationary axis, and thereby necessitates in the movement of said gear *n* the movement of the sliding feed-block *l*, in which said wheel is mounted, along the ways *k k*. The sliding feed-block *l* being connected with a similar block, *o*, at the rear part of the slide *b*, acts as a driver and necessitates a movement of the upper part of the tool-carriage transversely to the lathe-bed. If the ways *k k* are set at right angles to the ways of the lathe-bed, the tool moves directly backward without giving any lateral movement to the carriage; but if the ways *k k* are set at an incline to the ways of the lathe-bed, as shown, the connections of the sliding feed-block *l* with the lower part of the carriage by means of the slide *b*, which moves in ways or guides within said lower part, necessitates a movement of the lathe-carriage bodily in the longitudinal direction of the lathe-bed, while its upper part, which carries the tool-post and tool, is moved backward, thereby, as the resultant motion, carrying the tool in a path which is parallel with the ways *k k*. In order to move the sliding feed-block *l* quickly back to the other end of the ways *k k* for setting the feed again, the screw *r* is turned over to bring its cut-away or threadless portion facing the teeth of the worm-gear *n*, and a crank is applied to the squared upper end of the shaft on which said gear is mounted, whereby the gear *n* can be rotated to carry the sliding feed-block *l* back on the ways *k k*. In so doing the screw *p* acts as a stationary rack and the gear *n* as a pinion engaging therewith and traveling with the block *l*.

I claim as my invention—

1. The combination of a lathe-bed, the lathe-carriage fitted to slide longitudinally on said bed, and the feeding device herein described, the latter consisting, principally, of the ways *k k*, the sliding feed-block fitted to said ways and pivoted to a slide on the lathe-carriage, and a feed-screw set parallel to said ways *k k* for driving said block along said ways and thereby feeding the lathe-carriage, substantially as described, and for the purpose specified.

2. In a feed attachment for lathes, the combination of a lathe-bed, a lathe-carriage fitted to slide longitudinally on said bed, the slide *b*, fitted to slide with the upper part of the lathe-carriage in a line at right angles to the main ways of said lathe-bed, the bars or ways C C, the lower bed or block of the feed attachment mounted on said bars or ways C C and adapted to be adjusted and secured at the desired position thereon, the upper bed or block of the feed attachment pivotally mounted on said lower bed and provided with ways *k k*, and the sliding feed-block within the ways of said pivotally-mounted upper bed and pivoted to the slide *b* on the aforesaid lathe-carriage, substantially as described, and for the purpose specified.

3. In a feed attachment for lathes, the combination of the lower bed or block adapted to be adjusted and secured in a stationary position by one side of the lathe-bed, the beveled wheel *g*, mounted within said lower bed, the upper bed or block pivotally mounted on said lower bed and having ways *k k*, the feed-screw *p*, mounted within said upper bed and provided with pinion *q*, which engages the wheel *g*, the sliding block for traveling on said ways *k k*, the worm-gear *n*, carried by said sliding block, the stationary screw or rack *r*, and mechanism for driving the wheel *g*, substantially as described, and for the purpose specified.

4. In a feed attachment for lathes, the combination of the upper bed or block having ways *k k*, the feed-screw *p*, attached to said bed, the sliding block for traveling on said ways, the worm-gear *n*, mounted on said sliding block, and the stationary screw or rack *r*, having a threadless portion and adapted to be partially rotated to engage and disengage its threads from said worm-gear, substantially as described, and for the purpose specified.

5. In a lathe, the combination of adjustable ways *k k*, the sliding feed-block fitted to said ways, a slide to which the sliding feed-block *l* is pivoted and by which said slide is driven, the lower part of the lathe-carriage having guides for said slide, which also necessitate the simultaneous movement of the lower part of the carriage with said sliding block in the longitudinal direction of the lathe-bed, and the upper part of the lathe-carriage connected to said sliding feed-block through the slide to which said sliding feed-block is pivoted and necessarily moving with said block transversely to the lathe-bed, substantially as described, and for the purpose specified.

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