R. K. LE BLOND & W. F. GROENE.

LATHE.

APPLICATION FILED JUNE 1, 1909.

980,971.

Patented Jan. 10, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

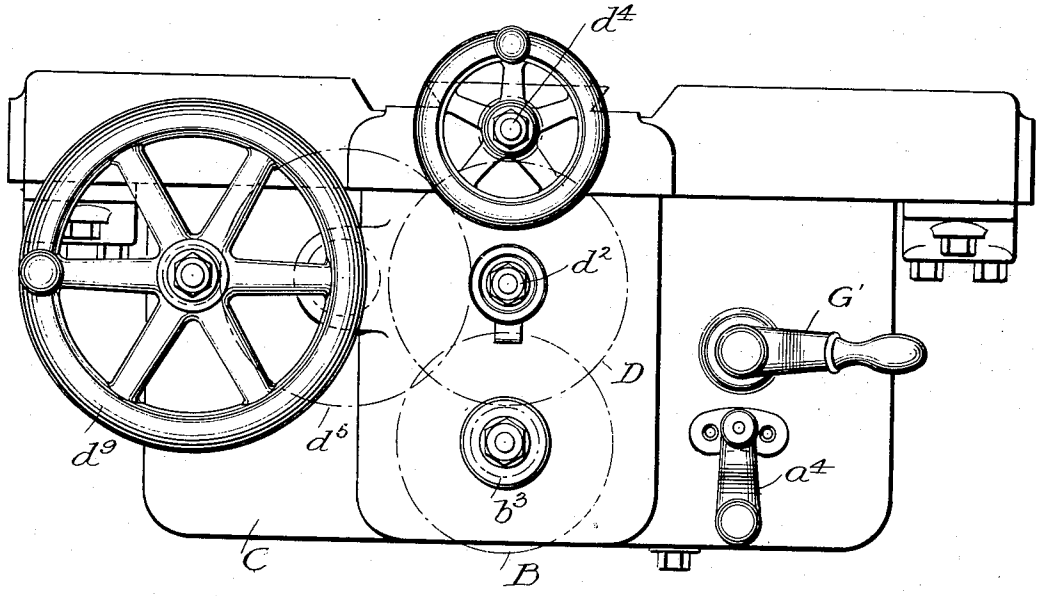
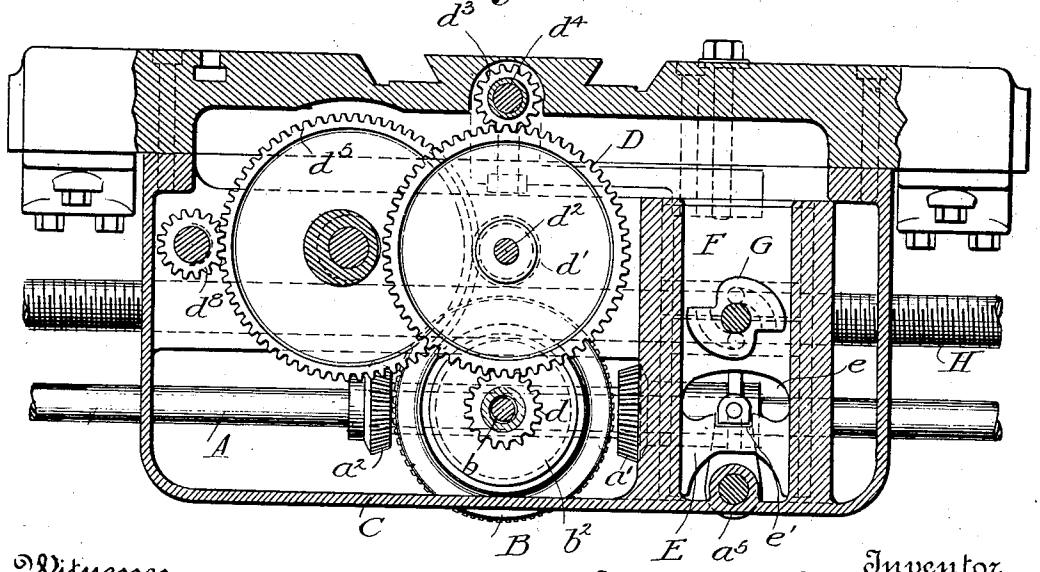


Fig. 2.



Witnesses

Raymond F. Barnes

M. H. Gale

Inventor

Richard K. LeBlond and

William F. Groene

By Robt. P. Harris

Attorney

R. K. LE BLOND & W. F. GROENE.

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3 SHEETS—SHEET 2.

Fig. 3.

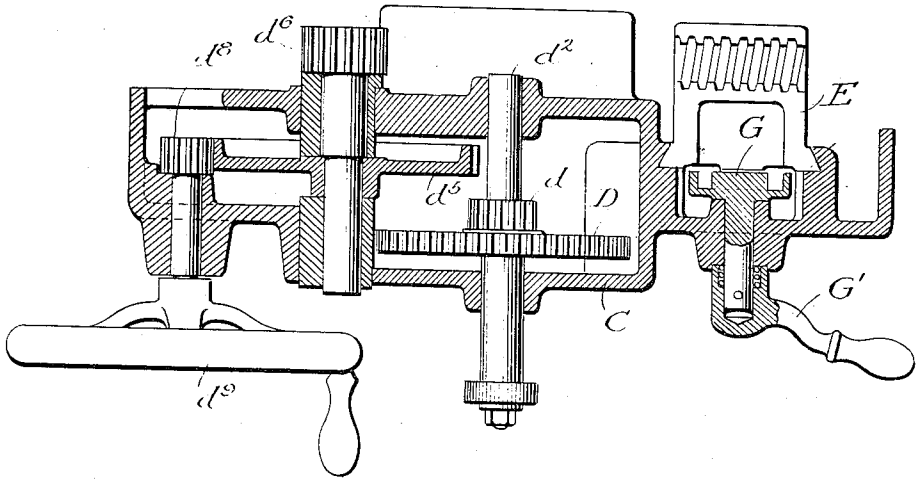
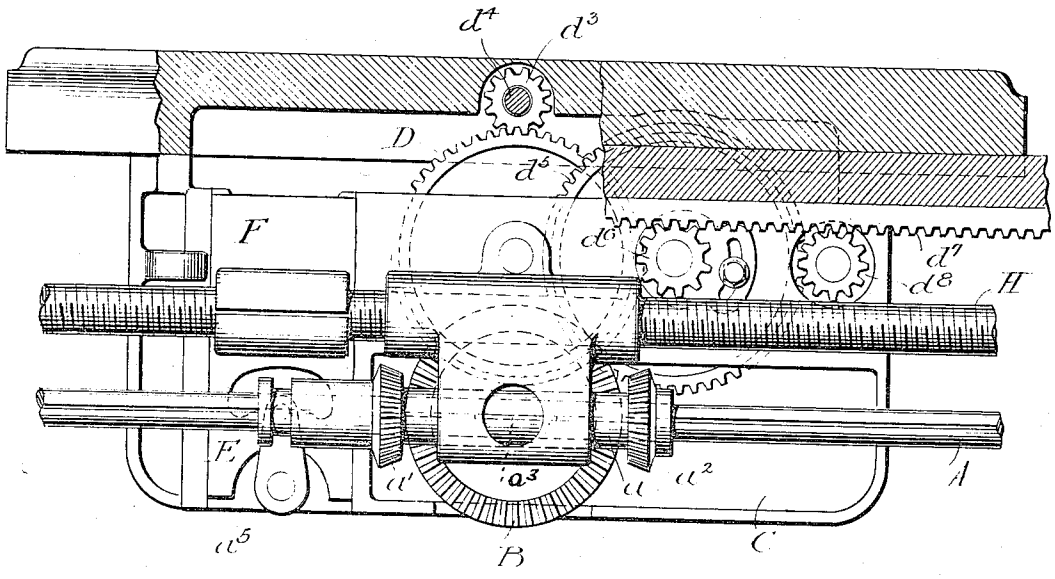


Fig. 4.



Witnesses
Raymond F. Barnes.
M. H. Galiher.

Inventor
Richard K. LeBlond and
William F. Groene
By Robt. P. Harris
Attorney

R. K. LE BLOND & W. F. GROENE.

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3 SHEETS—SHEET 3.

Fig. 5.

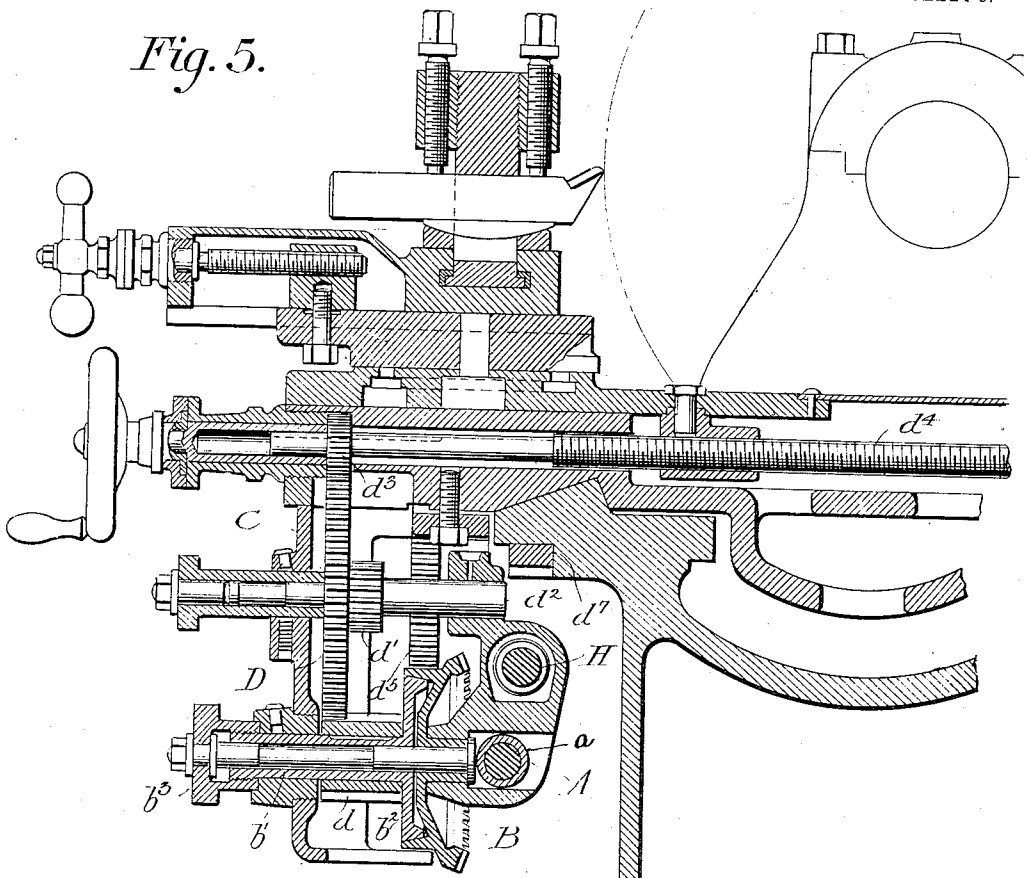


Fig. 6.

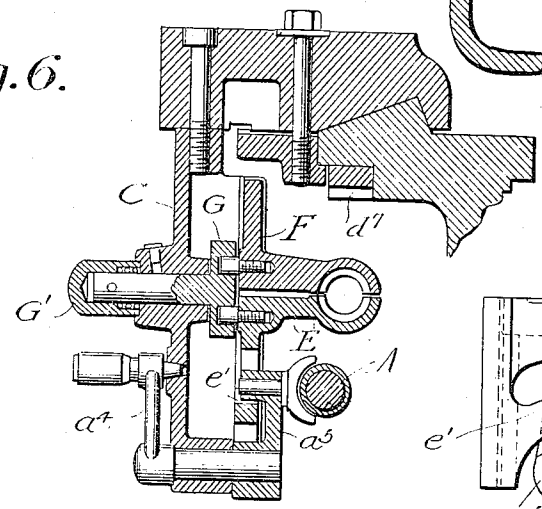
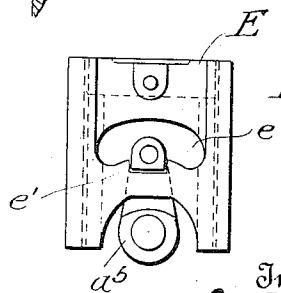


Fig. 7.



Witnesses

Raymond T. Barnes.

M. H. Gates

Inventors

Richard K. LeBlond and

William F. Groene

by Robt. P. Harris

Attorney

UNITED STATES PATENT OFFICE.

RICHARD K. LE BLOND AND WILLIAM F. GROENE, OF CINCINNATI, OHIO, ASSIGNORS TO R. K. LE BLOND MACHINE TOOL CO., OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

LATHE.

980,971. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed June 1, 1909. Serial No. 499,540.

To all whom it may concern:

Be it known that we, RICHARD K. LE BLOND and WILLIAM F. GROENE, of Cincinnati, county of Hamilton, and State of Ohio, have invented a new and useful Improvement in Lathes, of which the following is a specification.

This invention pertains to certain new and useful improvements in machine tools, and relates more particularly to the apron or gear mechanism which carries the feed gears and controls the automatic feeds.

One object of the invention is the production of means for obtaining automatic feeds, both longitudinally and across the machine.

A further object is to provide a single friction device for controlling both the longitudinal and cross feeds.

A further object is to provide improved means for connecting the friction device with the operative parts.

Another object is to provide an improved form of box apron.

In carrying out our invention, the various feeds are obtained through a suitable drive pinion which is rotated in either direction by any suitable means. Said drive pinion is loosely mounted on its shaft and may be connected up with a suitable power transmitting pinion by means of a friction device. The power transmitting pinion is adapted to engage a gear carrying a small pinion, both being mounted upon a slip stud, so that said gear may be thrown into and out of mesh with a suitable pinion adapted to drive the cross feed screw. When said gear is disengaged from the cross feed screw, the small pinion is thrown into mesh with a rack wheel which is adapted to move the carriage of the machine in any suitable manner.

In the accompanying drawings:—Figure 1 is a front elevation illustrating our improved apron. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a horizontal sectional view. Fig. 4 is a rear view, partly in section. Fig. 5 is a partial section of the bed and carriage, illustrating the apron in position. Figs. 6 and 7 are details.

Referring to the drawings:—A designates a feed rod having mounted thereon a sleeve a, provided at each end with a beveled pinion a', a^2. Said sleeve is driven by a key a^3 and can be shifted by means of a handle a^4 connected to said sleeve in any suitable manner. The pinions a', a^2 are arranged to mesh with a large bevel gear B loosely mounted on a shaft b, supported near the bottom of the casing C. On said shaft is mounted a sleeve b' provided with a friction disk b^2 adapted to engage the rear face of the gear B, said sleeve being shifted longitudinally upon shaft b by means of a friction knob b^3.

Keyed or otherwise secured to the shaft b is an elongated pinion d which meshes with a gear wheel D carrying a pinion d' and mounted on a slip stud or shaft d^2. The gear D is adapted to mesh with a pinion d^3 on the cross feed screw d^4. When the stud or shaft d^2 is shifted the gear D is disengaged from pinion d^3 and the pinion d' is caused to mesh with the rack wheel d^5, carrying and driving a rack pinion d^6, which in turn meshes with the rack d^7 on the bed. The rack pinion d^5 also meshes with a stud pinion d^8 actuated by a hand wheel d^9, whereby the carriage may be shifted by hand.

In doing regular work, requiring cross feeding, the friction knob b^3 is turned, engaging the friction disk with the bevel gear B. This drives the elongated pinion d, which in turn drives the gear D, and the latter drives the cross feed pinion d^3, thus revolving the cross feed screw and imparting an automatic cross feed to the tool. This feed may be engaged and disengaged by the friction knob b^3. If the length feed is required, the gear D is disengaged from the cross feed pinion d^3, bringing the pinion d' into mesh with the rack wheel d^5. This in turn drives the rack pinion d^6 meshing with the rack d^7, giving the length feeds, which are also controlled by the friction knob b^3. It will be understood that the various feeds are reversed by means of handle a^4, whereby sleeve a is shifted to bring either one of the pinions a', a^2 into engagement with the gear B. When said handle is moved to the right, it brings pinion a' into engagement with said gear, and when moved to the left, the pinion a^2 is brought into mesh, thus reversing the entire movement of the apron.

It will be noted that the casing C is cast in one integral piece with the bearings for the feed rod and lead screw. In ordinary practice, box aprons are bolted together, and composed of two or more pieces, using a third element to carry the bearings for the

feed rod and lead screw. By making the parts in one single bearing we greatly simplify the construction and reduce the expense of manufacture.

In order to prevent connection with the feed shaft and the feed screw at the same time, the shifting lever a^4 which moves the sliding sleeve is locked in the intermediate position by the movement of the slide E carrying the split nut F which connects with feed screw H. Said slide is provided with a recess e' which engages lever a^5 in such manner that movement of said lever is impossible when the feed screw is connected, and connection with the feed screw is impossible when the feed rod A is operating. The split nut is operated by a member G connected to a handle G'.

Having thus fully described our invention, what we claim and desire to secure by Letters Patent of the United States, is:—

1. An apron for machine tools, comprising a drive gear, means for imparting power thereto, a single power transmitting pinion mounted on the shaft of said drive gear, a clutch for connecting said gear and pinion, cross feed mechanism, length feed mechanism, and means for transmitting power from said pinion to said feed mechanisms.

2. An apron for machine tools, comprising a drive gear, a shaft upon which the same is mounted, a sleeve mounted on said shaft and provided with a friction disk adapted to engage said gear, a single power transmitting pinion mounted on said sleeve, cross feed mechanism, length feed mechanism, and means for transmitting power from said pinion to said feed mechanisms.

3. An apron for machine tools, comprising a drive gear, means for imparting power thereto, means for reversing the same, a single power transmitting pinion mounted on the shaft of said drive gear, a clutch for connecting said gear and pinion, cross feed mechanism, length feed mechanism, and means for transmitting power from said pinion to said feed mechanisms.

4. An apron for machine tools, comprising a feed gear having a pinion connected therewith, a cross feed pinion adapted to mesh with said gear, a rack wheel adapted to mesh with said pinion when said gear is disengaged from said cross feed, said gear and pinion being manually shiftable, a power transmission gear for driving said feed gear, and means for controlling the application of power to said transmission gear.

5. An apron for machine tools, comprising a feed gear having a pinion connected therewith, a cross feed pinion adapted to mesh with said gear, a rack wheel adapted to mesh with said pinion when said gear is disengaged from said cross feed, said gear and pinion being manually shiftable, a drive gear, an elongated power transmitting pinion supported by the shaft of said drive gear and meshing with said feed gear, and means for connecting and disconnecting said power gear and transmitting pinion.

6. An apron for machine tools, comprising a feed gear having a pinion connected therewith, a cross feed pinion adapted to mesh with said gear, a rack wheel adapted to mesh with said pinion when said gear is disengaged from said cross feed, said gear and pinion being manually shiftable, a drive gear, a shaft on which said gear is mounted, a sleeve mounted on said shaft and provided with a friction disk adapted to engage said gear, a pinion carried by said sleeve and meshing with said feed gear, and means for shifting said sleeve.

7. An apron for machine tools comprising a feed gear having a pinion connected therewith, a slip stud or shaft on which said gear is mounted, a cross feed pinion adapted to mesh with said gear, a rack wheel adapted to mesh with said pinion when said gear is disengaged from said cross feed, said gear and pinion being manually shiftable, a power transmission gear for driving said feed gear, and means for controlling the application of power to said transmission gear.

8. An apron for machine tools, comprising a cross feed mechanism, a length feed mechanism, a drive gear, a single power transmitting pinion for imparting power to either feed mechanism, and a single friction member for connecting said drive gear and pinion.

In testimony whereof we hereunto set our hands this 29 day of May 1909, in the presence of two attesting witnesses.

RICHARD K. LE BLOND.
WILLIAM F. GROENE.

Witnesses:
FRED. LE BLOND,
JOHN A. LE BLOND.