A. E. NEWTON.

CALIPERING DEVICE FOR THE STOPPING MECHANISM OF MACHINE TOOLS.

APPLICATION FILED JULY 25, 1911.

1,098,751.

Patented June 2, 1914.

3 SHEETS—SHEET 1.

Fig. 1

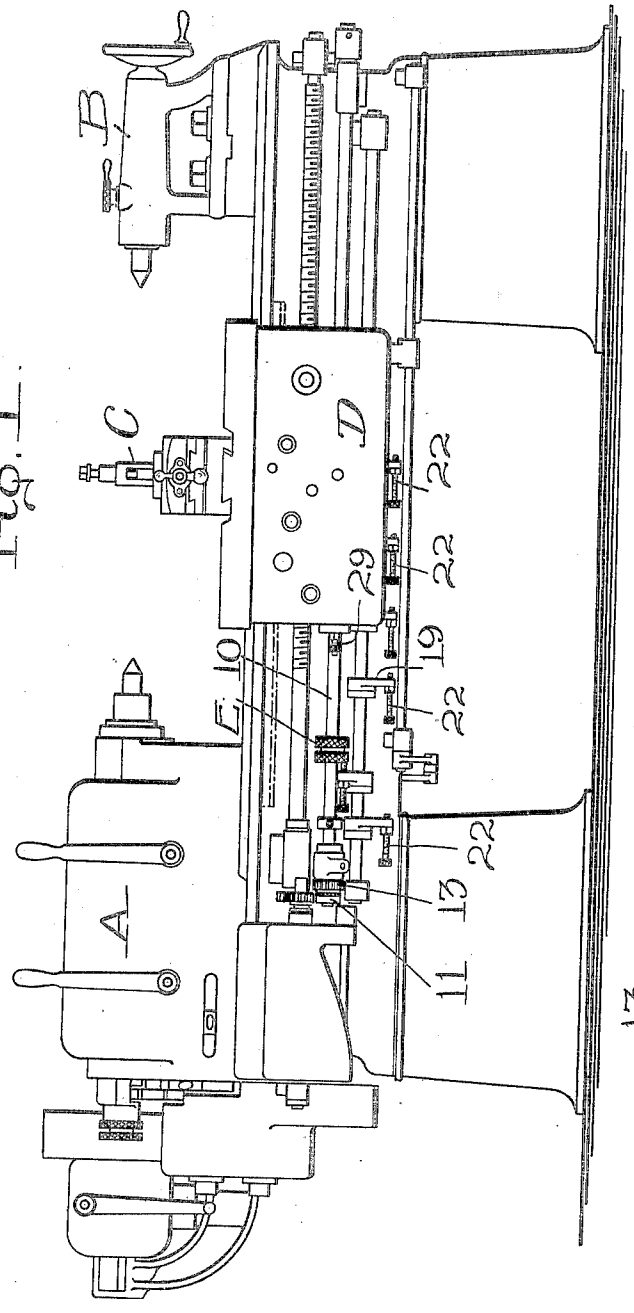
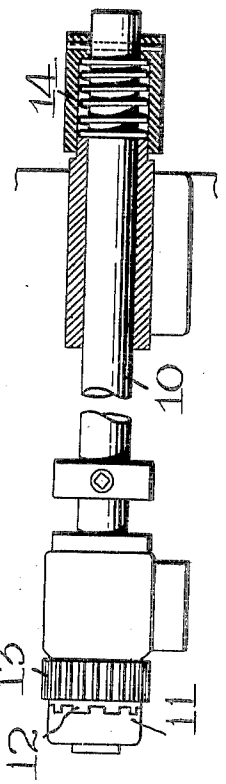


Fig. 2



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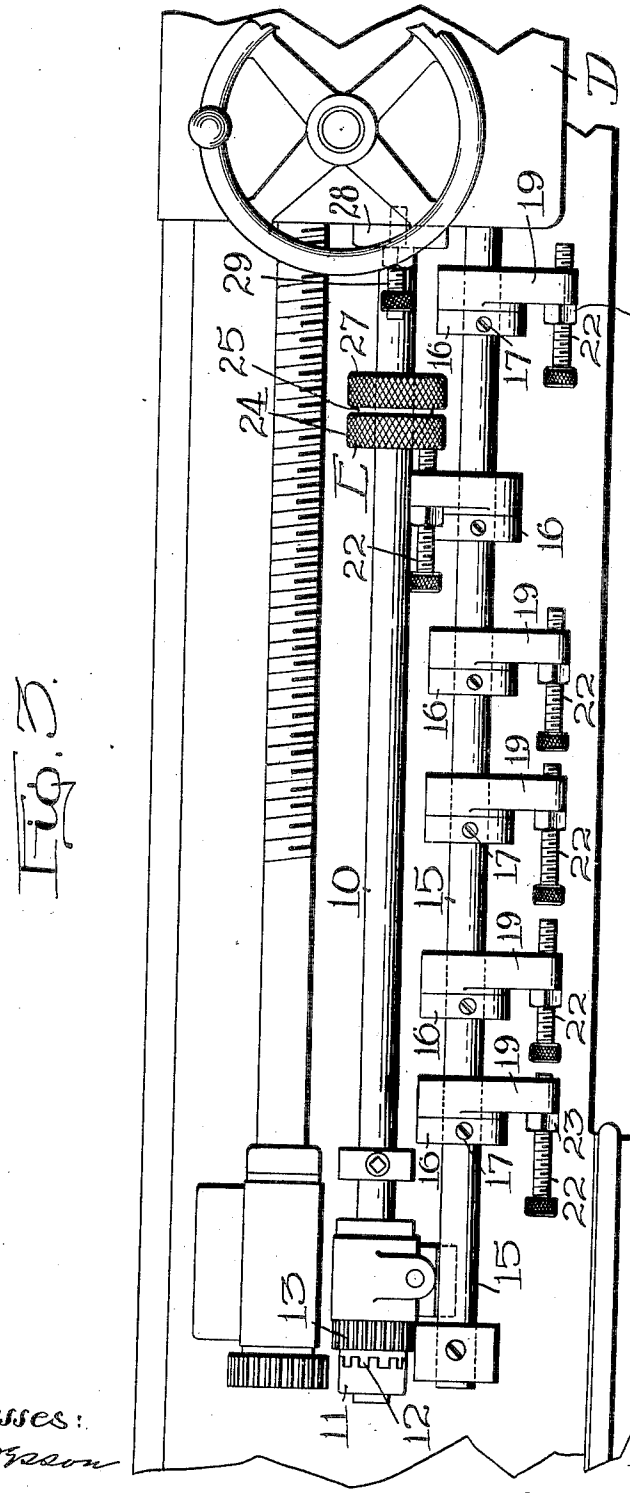


Fig. 5.

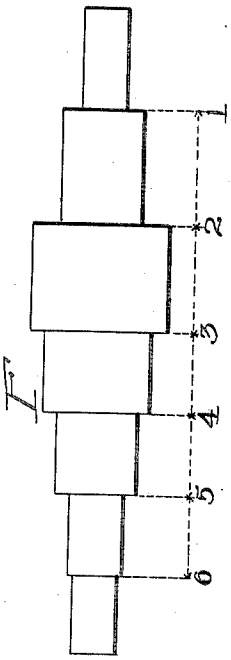


Fig. 7.

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3 SHEETS—SHEET 3.

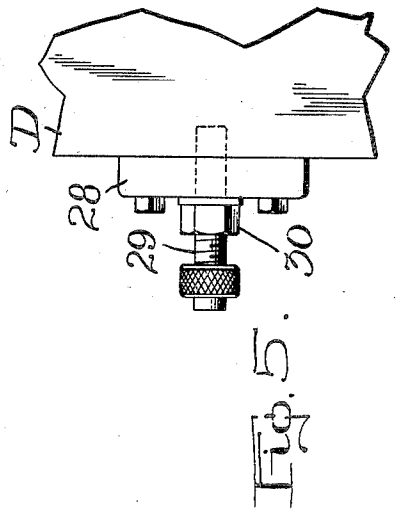


Fig. 5.

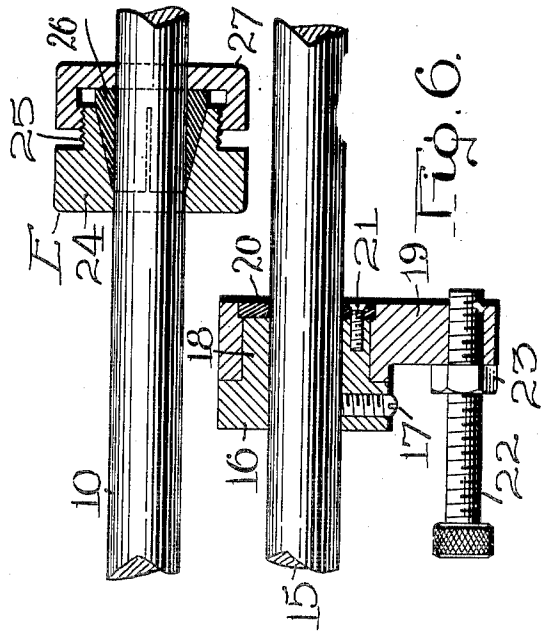


Fig. 6.

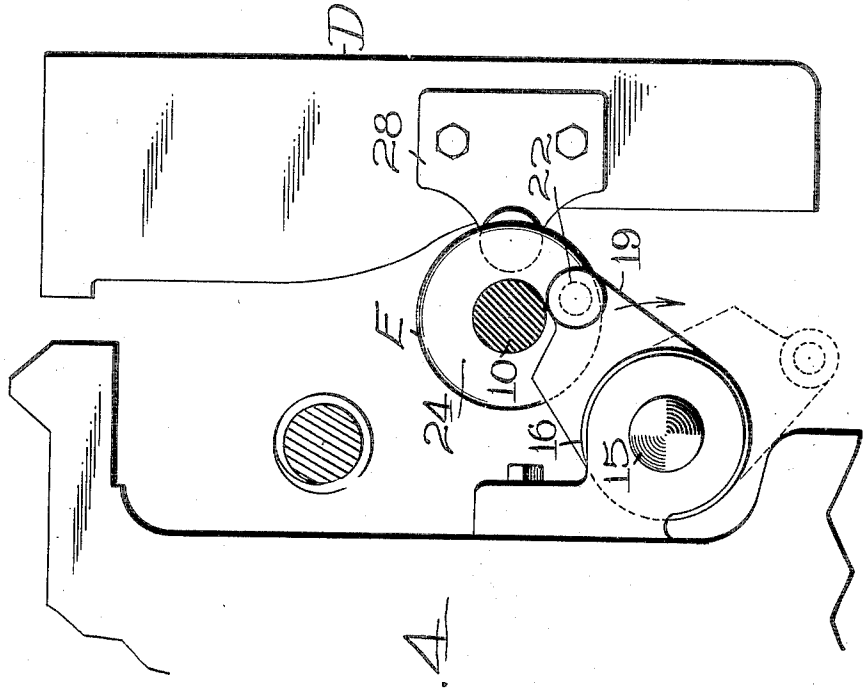


Fig. 4.

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UNITED STATES PATENT OFFICE.

ALBERT E. NEWTON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO REED-PRENTICE COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

CALIPERING DEVICE FOR THE STOPPING MECHANISM OF MACHINE-TOOLS.

1,098,751. Specification of Letters Patent. **Patented June 2, 1914.**

Application filed July 25, 1911. Serial No. 640,382.

To all whom it may concern:

Be it known that I, ALBERT E. NEWTON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Calipering Device for the Stopping Mechanism of Machine-Tools, of which the following is a specification.

The object of this invention is to provide a new and improved calipering device for the stopping mechanism of machine tools, particularly of engine lathes, so that the same can be employed to turn up a plurality of similar parts, such as multiple diameter shafts.

Engine lathes as now constructed some times have the feed rod which supplies power to move the tool carriage, operated through a normally engaged clutch, which feed rod carries an adjustable-collar, so that when the tool carriage reaches a determined position, it will engage said collar and disconnect said clutch and thereby stop the carriage at a determined point in its longitudinal travel.

The object of this invention is to adapt this old and common structure for use in connection with work, such as multiple diameter shafts, during which the tool carriage has to be stopped at a number of different points in its travel. To accomplish this, I provide a calipering device by which the adjustable collar can be accurately set in different positions on the feed rod for this purpose so that after the carriage has once stopped, the adjustable collar can be set at the next point at which it is desired to stop the feed, and this adjustment repeated as many times as is necessary for the particular work under process.

The invention further involves certain improved details of construction of this calipering device.

One way in which the invention can be practised is shown in the accompanying drawings in which,

Figure 1 is a front elevation of an engine lathe having my improvement applied thereto. Fig. 2 is a detail showing the spring which keeps the clutch which operates the feed rod normally in engagement. Fig. 3 is a front elevation on an enlarged scale showing the calipering device. Fig. 4 is a partial end elevation illustrating the arrangement and position of the calipering device. Fig. 5 is a front elevation illustrating the stop carried by the apron of the tool carriage. Fig. 6 is a sectional elevation illustrating in detail the stop collar and the calipering device, and Fig. 7 is a view illustrating a multiple diameter shaft which can be turned by the adjustments shown.

Referring to the drawings and in detail, it will be seen that in Fig. 1 I have illustrated an engine lathe having the usual head-stock A, tail-stock B, and tool carriage C, depending from which is the usual apron D. The tool carriage may be actuated by a feed rod 10 by any of the usual mechanisms. This feed rod 10 is provided at its end with a clutch 11 which engages a clutch 12 formed on the side of a driving pinion 13, which is journaled in a suitable bearing secured to the lathe bed at the head-stock end of the machine. The feed rod is normally forced to the right as shown in Fig. 1, by a spring 14 so as to keep said clutch in engagement.

A collar E is adjustably mounted on the feed rod 10 and the parts so far described are arranged so that when the tool carriage reaches a predetermined point in its travel, the apron will engage said collar E and release said clutch and stop the tool carriage at a point determined by the adjustment of said collar. To adapt this ordinary arrangement for use in work which requires a plurality of determined stops of the tool carriage, the following calipering arrangement is provided: A rod 15 is rigidly secured in bearings on the lathe bed. Fitted on this rod are a number of calipering devices or gages, six being shown in the present illustration. Each calipering device consists of a collar 16 fitted to swing on said rod, which collar can be set in proper position on the rod 15 by a screw 17. Hung on a hub 18 projecting from the collar 16 is a calipering arm or finger 19 which is held in place thereon by a collar 20 secured by screws 21 to the hub 18. The parts are arranged so that the finger 19 is loosely journaled on the hub 18 and normally hangs down in its lowest position out of the way. A setting screw 22 is threaded into the finger 19 and is provided with a locking nut 23. The stop collar E preferably consists of a hub 24 having a screw threaded projection 25 which has a conical opening fitting into which is a split

taper or conical bushing 26. Mounted on the projection 25 is a knurled clamping collar 27. By this arrangement, the collar E can be very quickly clamped to, or released from, the feed rod and set in any adjusted position. The apron D is preferably provided with an extension 28 arranged in which is a set screw 29 having a knurled head and provided with a locking nut 30.

In operation, the series of calipering arms are set so as to caliper the points at which it is necessary to stop the travel of the tool carriage for different diameters. For illustration, if a multiple diameter shaft F, such as illustrated in Fig. 7, is to be turned, the six calipering arms illustrated in the drawings are set to caliper the points 1, 2, 3, 4, 5, and 6, indicated in Fig. 7. A very accurate calipering can be obtained by setting the collars 16 in the desired position and by then adjusting the setting screws 22 and locking nuts 23 to obtain the exact positions necessary. In operation the right hand finger 19 first is swung up in position near the feed rod 10 and the collar E is loosened on the feed shaft and is moved into engagement with the end of the setting screw 22 and then is clamped in position on the feed rod. As soon as this adjustment is made the calipering arm drops down to normal position. The lathe is now started in operation to turn the right hand section of the shaft F and the longitudinal feed of the carriage will be automatically stopped when the tool reaches the point 1. Then the second finger 19 is swung up to position and the collar E is released and slid along the feed rod and set in position against the end of the screw 22 in the second finger 19, as illustrated in Fig. 3. Then this second finger or arm is allowed to drop to normal position. Then the lathe is started in operation to turn the second diameter of the shaft F. The adjustment is repeated with each calipering device, or as the exigencies of the particular work being turned demand. In this way, by once setting the calipering devices or gages, duplicate work can be produced at high speed. The calipering arms are normally out of the way and do not form stops in themselves. When the collar E is released from the feed rod, the stopping action is entirely disconnected. The screws 22 on the fingers are made of considerable length so that the points of stopping of the lathe on the shoulders of the work can come very close to each other. For very fine adjustments, the collar E can be set to the end of the screw 22 and then to the finger 19 of any one gage or calipering device. The setting screw 29 on the apron is provided so that in case the cutting tool should burn or break down and have to be removed for grinding, the operator will not have to reset any of the gages or calipering devices. After the operator sets the reground tool holder, a correct adjustment of the parts can be obtained by adjusting the set screw 29. Thus it will be noted that the plurality of stops required is obtained from the ordinary stopping mechanism on the regular feed rod and no tripping of the mechanism is necessary. The calipers or gages enable the particular work specified to be done in a very simple and convenient manner. The simplicity and minimum number of the parts enables the device to be economically manufactured.

The invention may be practised in many other ways and forms without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters-Patent is:—

1. In a device of the class described, the combination of a movable member, means for feeding said member along, a rod, a collar adjustably mounted on the rod in position to be moved by said member during the movement thereof, connections whereby when said collar is moved by said member the feed will be disconnected, and a calipering device arranged in connection with said adjustable collar so that the same can be accurately set in a determined position.

2. In a device of the class described, the combination of a reciprocable member adjustably mounted, means for feeding said member, means for disconnecting the feed of said member at a point determined by the adjustment of said means, and a plurality of calipering devices or gages arranged in connection with said adjustable means so that the same can be accurately set in different determined positions.

3. In an engine lathe, the combination of a tool carriage, a feed therefor, a rod, a collar adjustably mounted on said rod, connections whereby when said collar is engaged the feed will be stopped, and a calipering device arranged in connection with said adjustable collar so that the same can be accurately set in a determined position.

4. In an engine lathe, the combination of a tool carriage, a feed therefor, a rod, a collar adjustably mounted on said rod, connections whereby when said collar is engaged by the tool carriage the feed will be stopped, and a plurality of calipering devices arranged in connection with said adjustable collar so that the same can be accurately set in different determined positions.

5. In an engine lathe, the combination of a tool carriage, a feed therefor, a rod, a collar adjustably mounted on said rod, connections whereby when said collar is engaged by the tool carriage the feed will be stopped, a rod mounted on the lathe, and a plurality of adjustable calipering devices or gages mounted thereon so that said collar can be

accurately set in different determined positions.

6. In an engine lathe, the combination of a tool carriage, a feed therefor, a rod, a collar adjustably mounted on said rod, connections whereby when said collar is engaged by the tool carriage the feed will be stopped, a rod mounted on the lathe, a plurality of calipering devices or gages adjustably mounted on said rod, each gage consisting of a pivoted finger which can be swung up into position so that said adjustable collar can be accurately set in different positions.

7. In an engine lathe, the combination of a tool carriage, a feed therefor, a rod, a collar adjustably mounted on said rod, connections whereby when said collar is engaged by the tool carriage the feed will be stopped, a rod mounted on the lathe, a plurality of calipering devices or gages adjustably mounted on said rod, each gage consisting of a pivoted finger which can be swung up into position so that said adjustable collar can be accurately set in different positions, and a setting screw carried by the said pivoted finger.

8. In an engine lathe, the combination of a tool carriage, a rod, a collar adjustably mounted on said rod, and adapted to be engaged by the tool carriage, a rod mounted on the lathe, and a plurality of calipering devices or gages mounted on said rod, each consisting of a collar which can be adjustably secured to said rod, and a finger pivoted to said collar and arranged so that it can be swung into position so that the collar can be accurately set in different determined positions.

9. In an engine lathe, the combination of a tool carriage, a rod, a collar adjustably mounted on said rod, adapted to be engaged by the tool carriage, a rod mounted on the lathe, and a plurality of calipering devices or gages mounted on said rod, each consisting of a collar which can be adjustably secured to said rod, and a finger pivoted to said collar and arranged so that it can be swung into position so that the collar can be accurately set in different determined positions, and a set screw and nut carried by each finger.

10. In an engine lathe, the combination of a tool carriage, a rod, a collar adjustably mounted on said rod having a screw-threaded hub with a conical bore and split conical bushing therein, a clamping collar, and a plurality of calipering devices or gages arranged in connection with said adjustable collar so that said collar can be accurately set in different determined positions.

11. In an engine lathe, the combination of a tool carriage, a rod, a collar adjustably mounted on said rod, adjustable means on the tool carriage for engaging said collar, and a plurality of calipering devices or gages arranged in connection with said adjustable collar so that the same can be accurately set in different determined positions.

12. In an engine lathe, the combination of a tool carriage, a rod, a friction clamping collar mounted on said rod, an adjustable screw projecting from the tool carriage for engaging said collar, and a plurality of calipering devices or gages each comprising a pivoted finger which can be swung up into position so that said adjustable collar can be accurately set in different determined positions.

13. In a device of the class described, the combination of a reciprocable member, means for feeding said member, adjustable means for disconnecting the feed of said member at any predetermined point according to the adjustment of said means, a rod, and a plurality of adjustable calipering devices or gages mounted on said rod in position to be moved into the path of said means so that said means can be accurately set in different predetermined positions.

14. In a device of the class described, the combination of a reciprocable member, means for feeding said member, adjustable means for disconnecting the feeding means of said member at a predetermined point, a rod located adjacent to said reciprocable member, and a plurality of calipering devices or gages mounted on said rod, each comprising a collar which can be adjustably secured to said rod, and a finger pivoted on said collar and arranged so that it can be swung into position so that the collar can be accurately set in different predetermined positions.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

ALBERT E. NEWTON.

Witnesses:
ARTHUR B. COLVIN,
ALBERT E. FAY.