Nov. 24, 1931. E. F. BATTERMAN ET AL 1,833,602

TAIL STOCK

Filed May 10, 1930 5 Sheets-Sheet 1

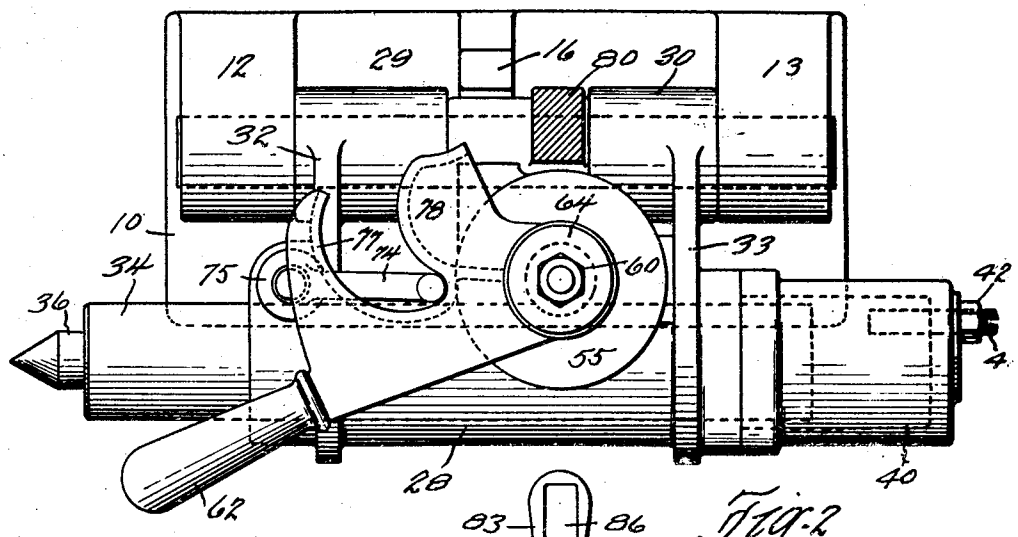


Fig. 2

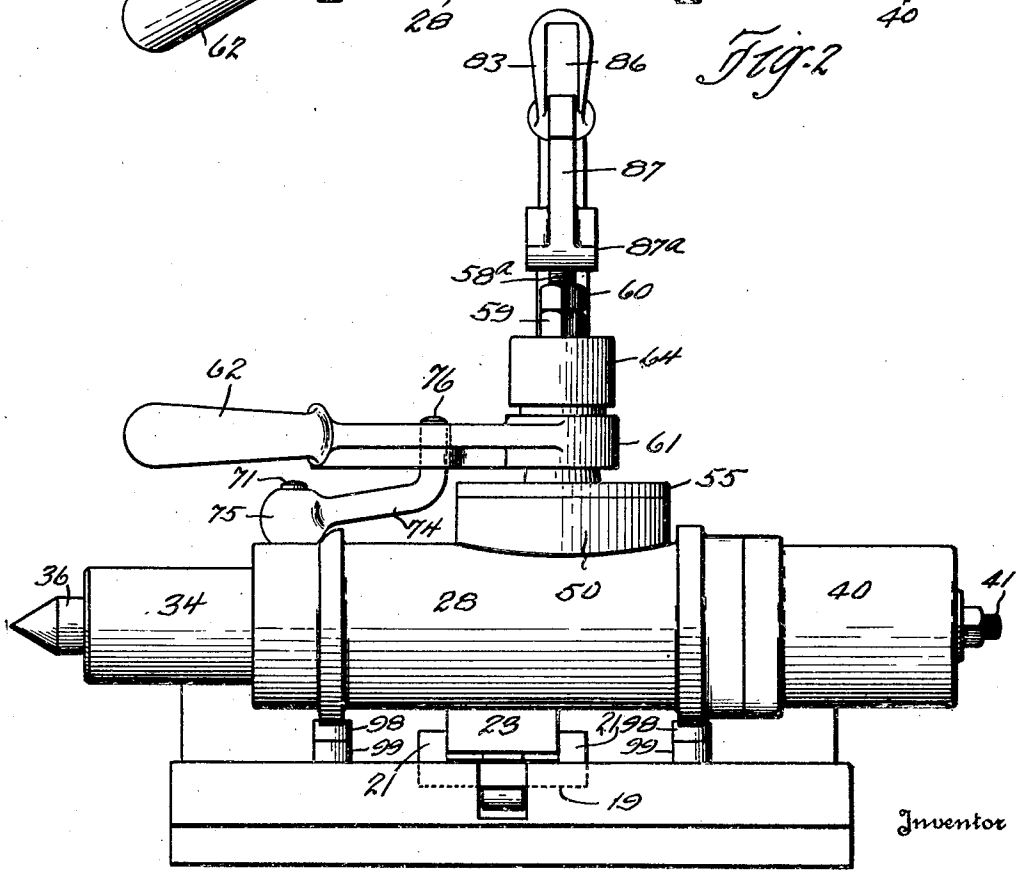


Fig. 1

Inventor

Elmer F Batterman
Joseph Verderber
Hudd Brock & Wheat

By

Attorney

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TAIL STOCK

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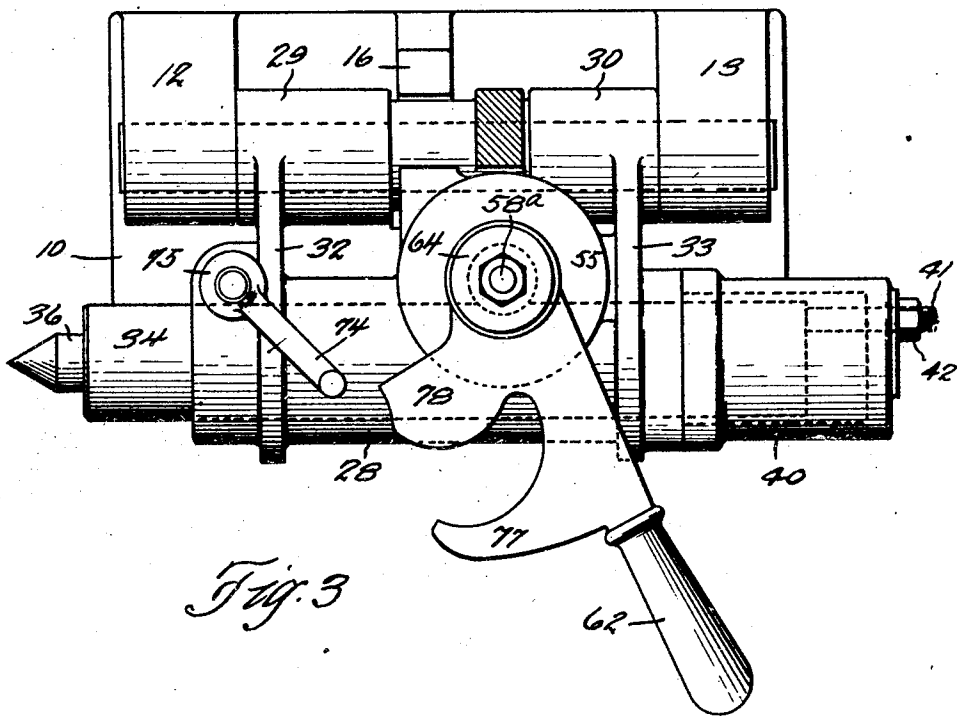


Fig. 3

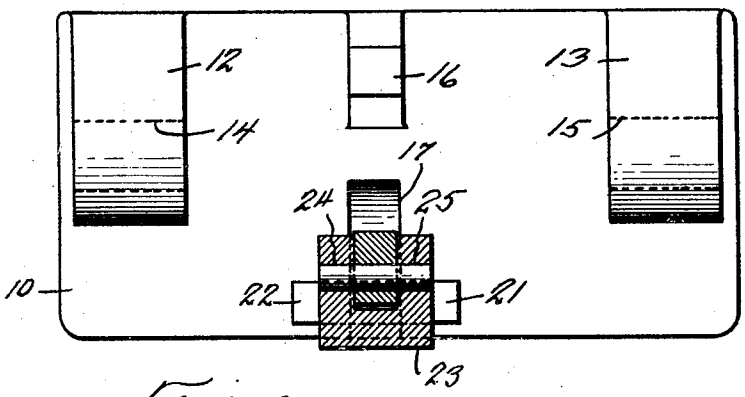


Fig. 4

Inventor

Elmer F. Batterman
Joseph Vanderlan

By Hull Brockhurst

Attorney

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TAIL STOCK

Filed May 10, 1930 5 Sheets-Sheet 3

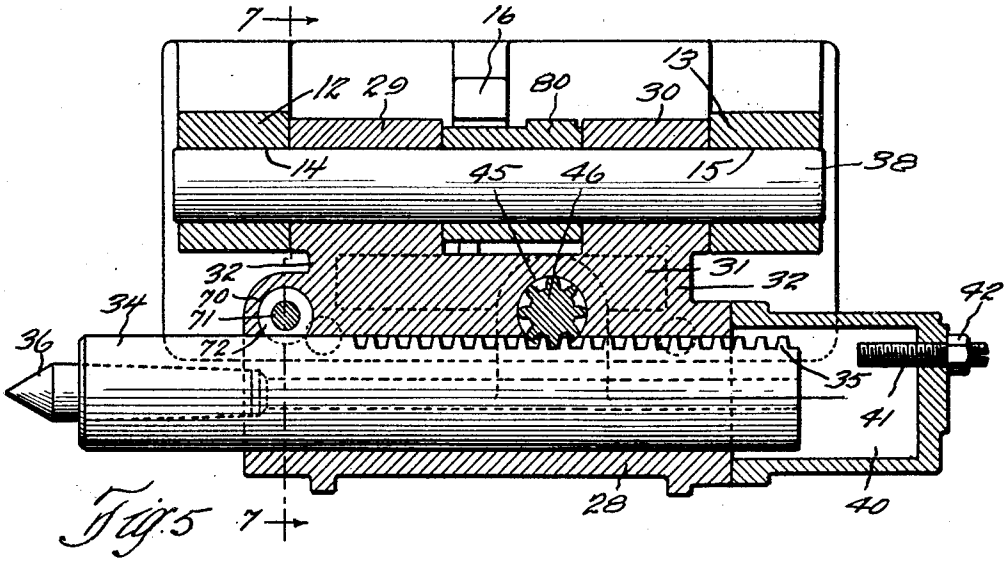


Fig. 5

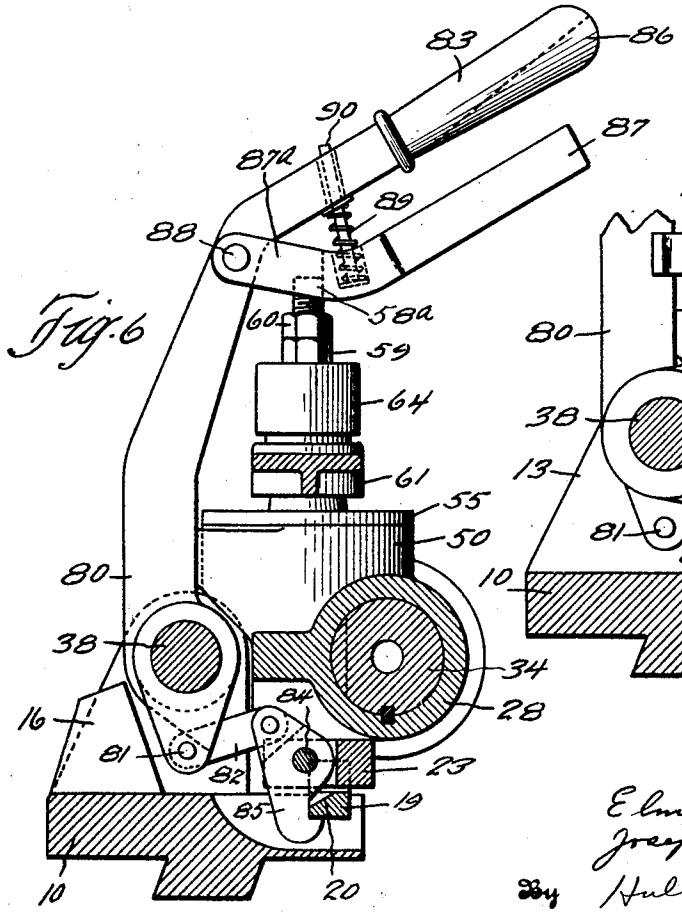


Fig. 6

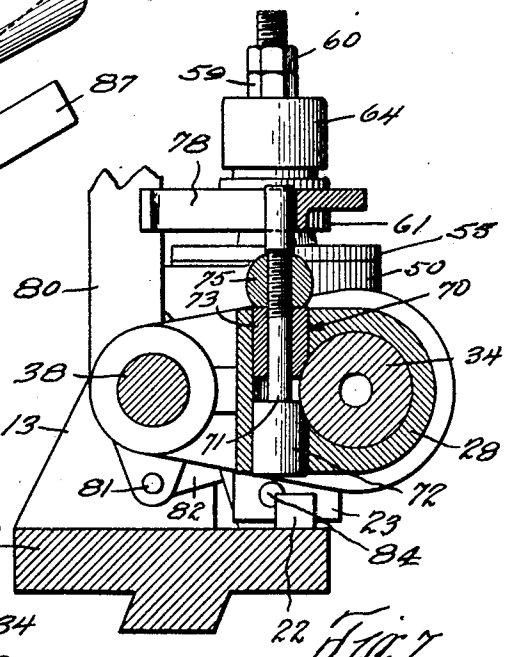


Fig. 7

Inventor

Elmer F. Batterman
Joseph Vanderbeek

By Hull Brock & Swearingen

Attorney

Nov. 24, 1931. E. F. BATTERMAN ET AL 1,833,602

TAIL STOCK

Filed May 10, 1930 5 Sheets-Sheet 4

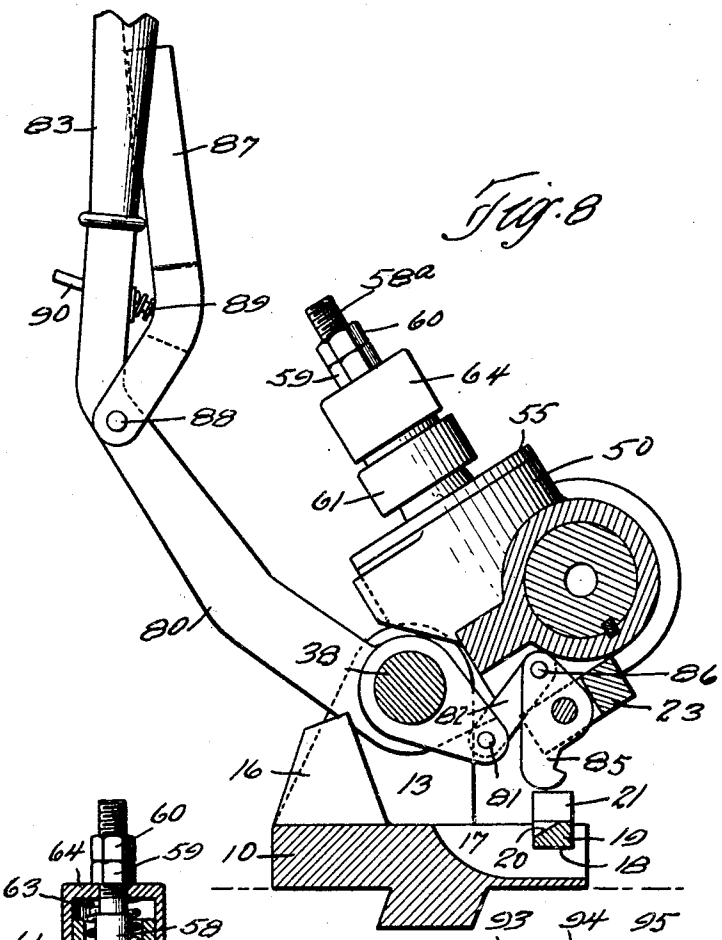


Fig. 8

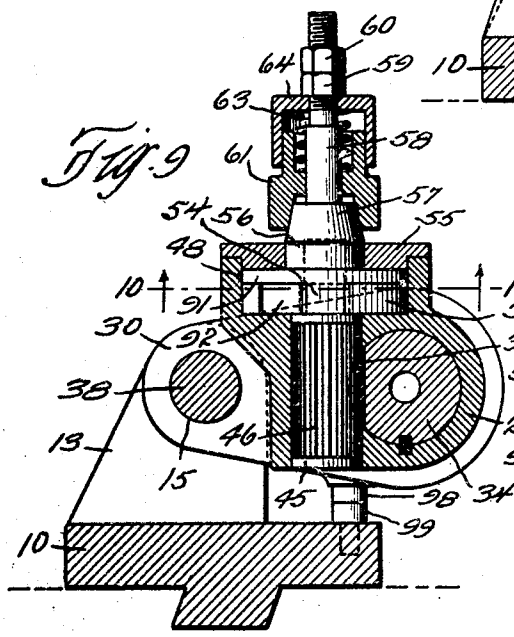


Fig. 9

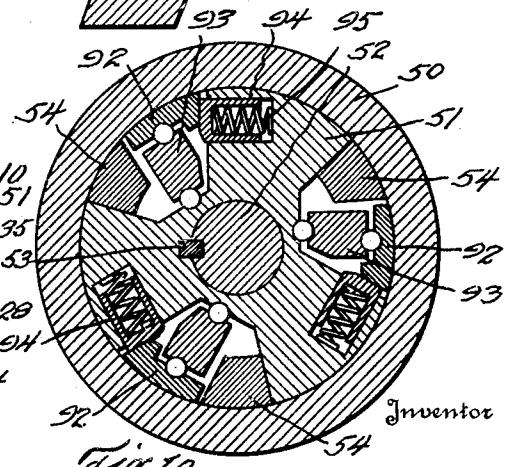


Fig. 10

Inventor

Elmer F Batterman
Joseph Verderber
Hull Brock & West

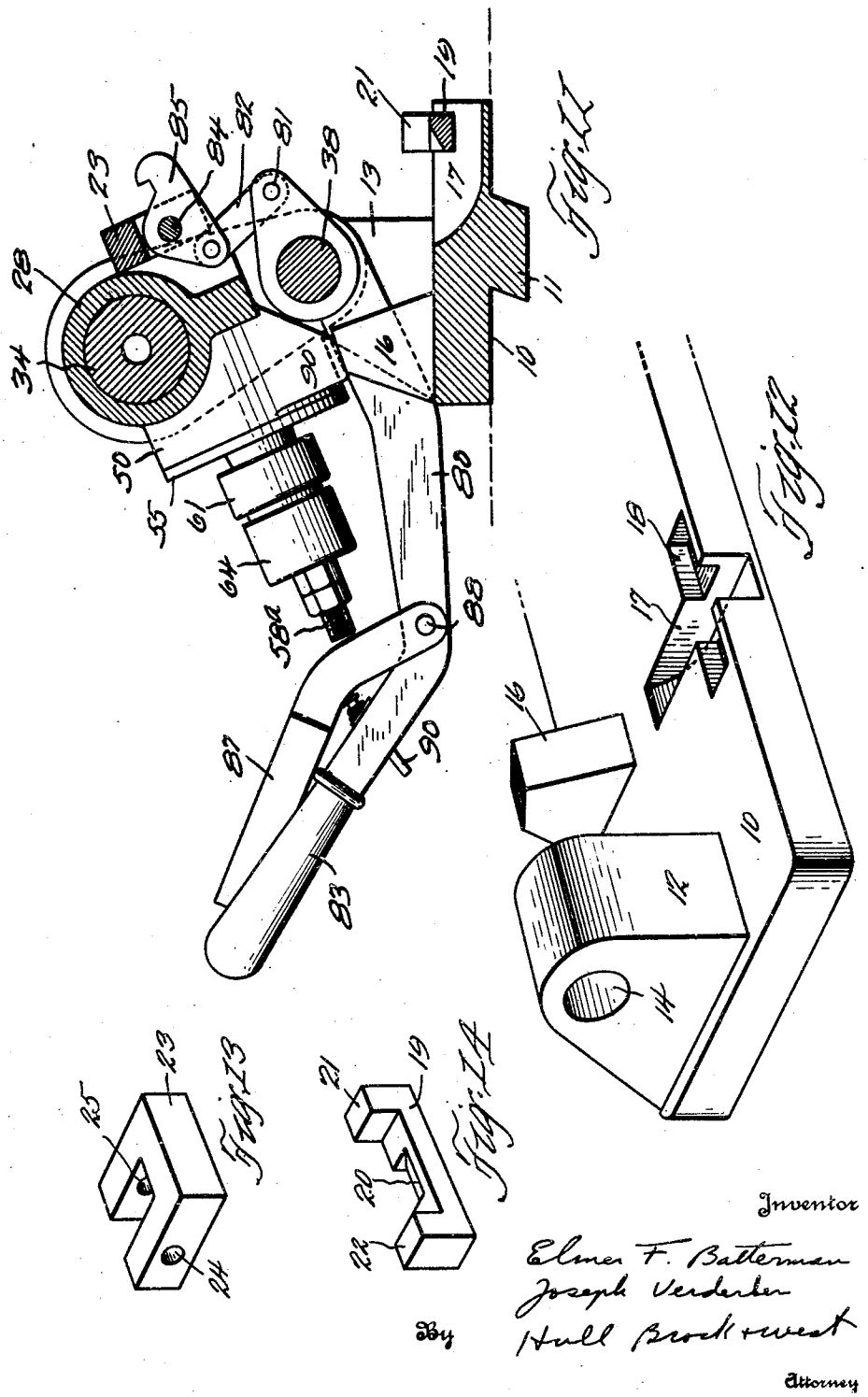
By

Attorney

Nov. 24, 1931. E. F. BATTERMAN ET AL 1,833,602

TAIL STOCK

Filed May 10, 1930 5 Sheets-Sheet 5



Inventor

Elmer F. Batterman

Joseph Verderber

By Hull Brock + West

Attorney

Patented Nov. 24, 1931 1,833,602

UNITED STATES PATENT OFFICE

ELMER F. BATTERMAN, OF EAST CLEVELAND, AND JOSEPH VERDERBER, OF CLEVELAND, OHIO, ASSIGNORS TO THE CLEVELAND UNIVERSAL JIG COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

TAIL STOCK

Application filed May 10, 1930. Serial No. 451,228.

This invention relates to an improved construction of tail stock for use in connection with a lathe of the type disclosed in our prior application Serial No. 406,783, filed November 13, 1929. In this construction it is desirable that the tail stock center be pivotally mounted so that the same can be moved out of the way for inserting the work.

The principal object of the invention is to provide such a tail stock assembly which shall be simple and efficient, give long wear and hold the tail stock center exactly in proper working position.

A further object is to provide such an assembly which shall embody several features making for convenience in use.

Other and more specific objects will appear from the following description and from the drawings. Referring to the accompanying drawings, Fig. 1 is a side elevation of our improved tail stock assembly; Fig. 2 is a top plan view showing one of the control levers in section; Fig. 3 is a top plan view like Fig. 2 but showing one of the operating handles in a different working position; Fig. 4 is a plan view of the base plate showing the pivot mounting for the casting which carries the tail stock center in section through the pivot; Fig. 5 is a horizontal sectional view taken centrally of the tail stock center; Fig. 6 is a vertical section showing certain of the locking means in locked position; Fig. 7 is a view showing another of the locking means in section; Fig. 8 is a sectional view similar to Fig. 6 but showing the tail stock center in unlocked position partially rotated about the pivot point; Fig. 9 is a vertical sectional view through the pinion which operates the tail stock center; Fig. 10 is a horizontal section showing a locking means which allows movement of the pinion in both directions by an operating handle but in only one direction by force applied through said pinion; Fig. 11 is a view similar to Fig. 8 but showing the pivotal portion in unlocked position completely rotated through its pivotal arc; Fig. 12 is a perspective view of a portion of the base member showing the pivot bearings, the means for locking the pivotal portion in position and the stop which limits the pivotal movement thereof; Fig. 13 is a perspective view of a block upon which one of the latch members is mounted; and Fig. 14 is a perspective view showing a portion of the locking means adapted to be attached in the longitudinal recess shown in Fig. 12.

As stated, this tail stock assembly is adapted to be used in connection with a complete lathe such as that shown in our above-mentioned co-pending application. The centering mechanism and parts carried thereby are mounted on a base plate 10 which has on the bottom thereof a rib or guide portion 11 adapted to cooperate with a complementary groove in the lathe bed and be secured against removal by any suitable means such as a gib (not shown). This base member carries upstanding bearing members or lugs 12 and 13 provided with suitable holes 14 and 15 drilled therein to receive a suitable pin. A stop 16 is also carried by the base and adapted to cooperate with a portion of the pivotal part of the assembly to limit movement thereof in a manner to be hereinafter described. The base is provided with a cut-away or depressed portion or groove 17 (best seen in Figs. 11 and 12) and a second depressed portion or groove 18 perpendicular thereto in which may be secured in any suitable manner a member 19 (see Fig. 14) which cooperates with the groove 17 to provide an abutment under which a locking latch may engage in a manner hereinafter to appear. The member 19 is provided with a beveled central portion 20 adapted to guide a locking latch into engaging position, and upstanding portions 21, 22 adapted to prevent endwise movement of the pivotal portion by reason of engagement with the forward portion of the U-shaped member 23 which is secured to the pivotal portion and provided with suitable holes 24 and 25 in the legs of the U to receive a pin upon which the latch member referred to is pivotally mounted.

The pivotal portion referred to includes a main casting or barrel 28 which carries bearing lugs 29 and 30 connected to the barrel portion by means of a web 31 which is provided with reinforcing portions 32 and 33 also connecting the portions 29 and 30 to the

barrel portion 28. The barrel portion is accurately drilled to receive a cylindrical tail stock center 34 which is provided with rack teeth 35 and carries a centering pin 36 in the usual manner as indicated in Fig. 5. Passing through the openings 14 and 15 and also through openings in the bearing portions 29 and 30 is a pivot pin 38 which is the main pivotal mounting for the movable portion of the tail stock assembly. Mounted on the rear end of the barrel portion 28 is a cap 40 secured thereto in any suitable manner and adapted to enclose the portion of the tail stock center 34 which may project rearwardly through said barrel and has a screw 41 threaded through the end thereof, secured in position by lock nut 42 and adapted to form a stop to prevent the member 34 from being moved too far rearwardly when the same is disengaged from the work. The barrel member 28 is also provided with an opening 45 drilled therethrough and adapted to receive a pinion 46 the teeth of which mesh with the teeth 35 of the rack for advancing and withdrawing the centering pin 36. The drilled portion 45 communicates with an enlarged cylindrical opening 48 also formed in the casting or barrel 28, which contains a ratchet or locking mechanism indicated generally by the numeral 50 and best seen in Fig. 10. The movable portion 51 of said ratchet member is keyed to the pinion shaft 52 by means of a key 53 and rigidly held to rotate therewith. The upper portion 56 of the ratchet or locking means which includes the members 54 (seen in Fig. 10) extends through an opening formed centrally in a cover plate 55 which is secured in rabbeted engagement with the walls defining the opening 48. This portion is provided with a frusto-conical face 57 above which extends a shank 58 having a threaded upper end adapted to receive nut 59 and lock nut 60. (The specific structure and operation of the ratchet member shown in Fig. 10 will be hereinafter described.) Bearing frictionally upon the frusto-conical surface 57 is a member 61 which is integral with the handle 62 and is provided with a frusto-conical depression adapted to cooperate with the frusto-conical portion to provide a friction clutch. A spring 63 is urged downward against the member 61 by means of a cap 64 held in spring pressing position by the nut 59. It will be seen from the foregoing that rotary motion of the handle 62 will result in driving the pinion 46 through a friction clutch and that this motion is further controlled by the ratchet or locking means 50 to permit movement in either direction by the handle 62 and to prevent movement rearwardly of the member 34 and to allow forward movement thereof by pressure applied on the rack 35.

As will be seen by reference to Fig. 7 especially, the barrel portion has a bore near the front end thereof 70 which intersects slightly with the bore in which the tail stock center 34 is received. A bolt 71 having an enlarged head 72 and an elongated washer 73 are received in the bore 70 for the purpose of locking the centering means 34. As shown, the head 72 and the washer 73 have wedging faces adapted to grip the member 34 when they are pressed tightly together. Threaded on the shank portion of the bolt 71 is a lever 74 provided with an enlarged nut portion 75 at one end thereof for the purpose of forcing the washer 73 and the head 72 into gripping contact with the member 34. As best seen in Fig. 1, the lever 74 is provided with an upturned portion 76 which cooperates with cams on the handle 62 for the purpose of locking and unlocking the tailstock centering member which carries the teeth 35. Referring to Fig. 2 and Fig. 3, it will be seen that when the handle 62 is rotated clockwise, the cam portions 77 and 78 thereof will operate to rotate the lever 74 counter-clockwise, that is, into locking position. Clockwise movement of the handle 62 results in moving the center member 34 to work holding position, and since the handle is connected to the pinion 46 through a friction clutch, it is only necessary to proportion the parts so that the centering pin 36 comes into work holding position before the handle 62 is moved to the limit of its throw in a clockwise direction. As soon as the centering pin comes thus into work holding position, the handle will slip on the friction clutch and may be further rotated to bring the lever 74 into complete locking position. When the handle 62 is moved in the opposite direction, that is, counter-clockwise, the first operation will be to loosen the nut 75 to a sufficient extent that the member 34 can slip past the bolt head and washer 72 and 73, after which the friction in the clutch will be sufficient to cause withdrawal of the member 34. When the member 34 abuts the screw 41 its motion will be stopped and if the handle is further rotated, the only result will be slipping of the faces of the friction clutch against each other.

Also mounted on the pin 38 is a lever member 80 which is provided with a pivoting means 81 at the lower end thereof adapted to connect with the link 82 and which extends upwardly and forwardly when in locked position and terminates in a handle 83. Pivoted on a pin 84 which is received in the holes 24 and 25 in the member 23 (hereinbefore described) is a latching member 85 which cooperates with the member 19 in the cam face 20 thereof to latch the pivotal portion of the lathe assembly in position. This latching member is connected by the link 82 with the lever 80 in a manner best seen in Figs. 6, 8 and 11. The handle 83 has a groove 86

formed in the underside thereof and adapted to receive the extreme end of a locking handle 87. The handle 87 is pivoted at 88 to the lever 80 and comprises a bifurcated portion 87a extending on the two sides of the lever 80 and adapted to hook over the upper end 58a of the bolt 58. A spring 89 guided by a rod 90 which passes through the lever 80 and bears against the member 87 constrains the members 83 and 87 to remain in separated position except when grasped and the member 87 pushed into contact with the member 83 against the resistance of the spring 89. This locking mechanism serves to hold the pivotal portion in locked position until purposely unlocked by the operator.

When it is desired to pivot the tail stock assembly to its inoperative position, the handles 83 and 87 are grasped, squeezed together and pushed rearwardly. This motion is transmitted by the link 82 to the latch member 85 which results in pivoting the same out of latching engagement with the member 19 and to a point at which the link 82 abuts the surface of the barrel 28 (best seen in Fig. 8). After this point is reached, the entire pivotal portion of the tail stock assembly rotates about the pin 38 as the lever 80 is pushed rearwardly. When pushed to the extreme rearward position, an abutment 90 on the barrel or casting 28 comes into abutting relation with the stop 16 and prevents further rotation of the barrel. When the lever 80 is returned to locking position, the cam 20 cooperates with the latch to guide the same into latching position.

Referring to Figs. 9 and 10, the member 56 which carries the conical clutch face 57 has attached to the bottom thereof a disk-like plate 91 which carries downwardly projecting portions 54. The pinion 46 has integral therewith at the upper end a disk-like member 51 having a cross section shown in Fig. 10. Freely carried in the space between the member 54 and the member 51 are brake shoes 92. Positioned between the brake shoes 92 and the member 51 are toggle links 93 pivotally connected to the member 51 and the brake shoe 92, respectively, by ball or roller bearings, as clearly shown in Fig. 10. These bearings are positioned at different distances from the center of the pin 52 and are angularly spaced apart whereby motion in a clockwise direction imparted through the shaft 52 will tend to press the brake shoes 92 against the portion 50 of the casting 28. Set in suitable depressions in the members 51 are cups 94 pressed by springs 95 toward the brake shoes 92. It will thus be seen that rotation of the shaft 52 in both directions by the handle 62 which drives the members 54 is possible without causing the brake shoes to come into locking engagement with the wall 51, but that rotation of the pinions 46 in a counter-clockwise direction (see Fig. 5) will result in tightening of the brake shoes against the wall 50. It is thought unnecessary to go more deeply into the specific construction and operation of the clutch member of Fig. 10 since the same forms the subject matter of the co-pending application of Joseph Verderber, Serial No. 301,191, and per se forms no part of this invention. The above description together with the showing in the drawings is thought a sufficient disclosure of this mechanism.

Carried on the lower side of the barrel 28 are suitable lugs 98 which may be cast integral with or threaded into the barrel 28 and which cooperate with similar lugs 99 on the base 10 to vertically position the barrel member. It is preferred that these lugs be threaded into the barrel and base portion so that they can be removed to compensate for wear.

While we have described the preferred embodiment of our invention we wish it understood that the same is merely illustrative and that the invention may be carried into effect in numerous variant forms within the scope of the appended claims.

Having thus described our invention, what we claim is:—

1. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting.

2. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a casting pivotally carried by said base, a tailstock center adjustably carried by said casting, means for releasably latching said casting in centering position and a single means for first releasing said last means and then rotating said casting about its pivotal mounting.

3. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a casting pivotally carried by said base, a tailstock center adjustably carried by said casting, means for locking said casting in centering position and a single means for first releasing said last means and then rotating said casting about its pivotal mounting.

4. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting, said tailstock center including a rack member received in said barrel, and a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center.

5. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle and a frictional driving connection between said handle and said pinion.

6. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle having a driving connection with said pinion and a locking means controlling said pinion shaft and allowing movement in both directions by force applied to said handle but preventing movement of said rack member in a direction to withdraw said tailstock center except by force applied through said handle.

7. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle having a frictional driving connection with said pinion and a locking means controlling said pinion shaft and allowing movement in both directions by force applied to said handle but preventing movement of said rack member in a direction to withdraw said tailstock center except by force applied through said handle.

8. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting, said tailstock center including a rack member received in said barrel, and a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position.

9. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle and a frictional driving connection between said handle and said pinion, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position.

10. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle having a driving connection with said pinion and a locking means controlling said pinion shaft and allowing movement in both directions by force applied to said handle but preventing movement of said rack member in a direction to withdraw said tailstock center except by force applied through said handle, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position.

11. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for first releasing said last means and then rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle having a frictional driving connection with said pinion and

a locking means controlling said pinion shaft and allowing movement in both directions by force applied to said handle but preventing movement of said rack member in a direction to withdraw said tailstock center except by force applied through said handle, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position.

12. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for releasing said last means and rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle and a frictional driving connection between said handle and said pinion, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position, said tailstock including means whereby said handle operates said lever to lock and unlock said gripping means when it is actuated to operate said pinion.

13. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for releasing said last means and rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle having a driving connection with said pinion and a locking means controlling said pinion shaft and allowing movement in both directions by force applied to said handle but preventing movement of said rack member in a direction to withdraw said tailstock center except by force applied through said handle, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position, said tailstock including means whereby said handle operates said lever to lock and unlock said gripping means when it is actuated to operate said pinion.

14. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for releasing said last means and rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle having a frictional driving connection with said pinion and a locking means controlling said pinion shaft and allowing movement in both directions by force applied to said handle but preventing movement of said rack member in a direction to withdraw said tailstock center except by force applied through said handle, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position, said tailstock including means whereby said handle operates said lever to lock and unlock said gripping means when it is actuated to operate said pinion.

15. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for releasing said last means and rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle and a frictional driving connection between said handle and said pinion, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position, said tailstock including means whereby said handle operates said lever to lock and unlock said gripping means when it is actuated to operate said pinion, said last means including a cam carried by said handle.

16. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a casting pivotally carried by said base, a tailstock center adjustably carried by said casting, means for locking said casting in centering position, a single means for first releasing said last means and then rotating said casting about its pivotal mounting, an upstanding member on said casting, said single means including a lever and said lever having mounted thereon means cooperating with said member carried by said casting to lock said single means in its casting locking position.

17. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for releasing said last means and rotating said barrel about its pivotal mounting, said

tailstock center including a rack member received in said barrel, and a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position, said gripping means including a bolt having a wedging head, a wedging washer on said bolt, and said lever having a nut portion at one end threaded on said bolt.

18. A tailstock for a lathe including a base adapted for attachment to a lathe bed, a barrel pivotally carried by said base, a tailstock center adjustably carried in said barrel, means for releasably latching said barrel in centering position and a single means for releasing said last means and rotating said barrel about its pivotal mounting, said tail stock center including a rack member received in said barrel, a pinion carried by said barrel and meshing with said rack member for adjustment of said tailstock center, and means for rotating said pinion, said last means including a handle and a frictional driving connection between said handle and said pinion, said barrel carrying a gripping means and a lever for actuating same to lock said rack member in position, said gripping means including a bolt having a wedging head, a wedging washer on said bolt, and said lever having a nut portion at one end threaded on said bolt.

In testimony whereof, we hereunto affix our signatures.

E. F. BATTERMAN.
JOS. VERDERBER.