April 3, 1928. 1,664,757

C. F. RANDOLPH

TAILSTOCK CLAMPING MECHANISM

Original Filed March 21, 1923 2 Sheets-Sheet 1

Fig. 1.

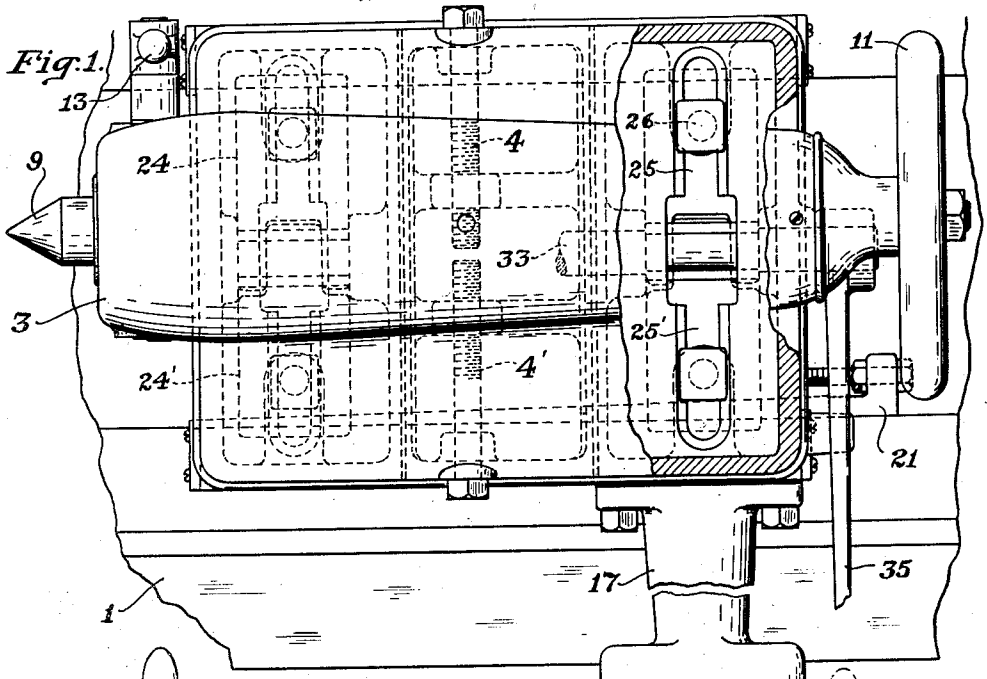

Fig. 2.

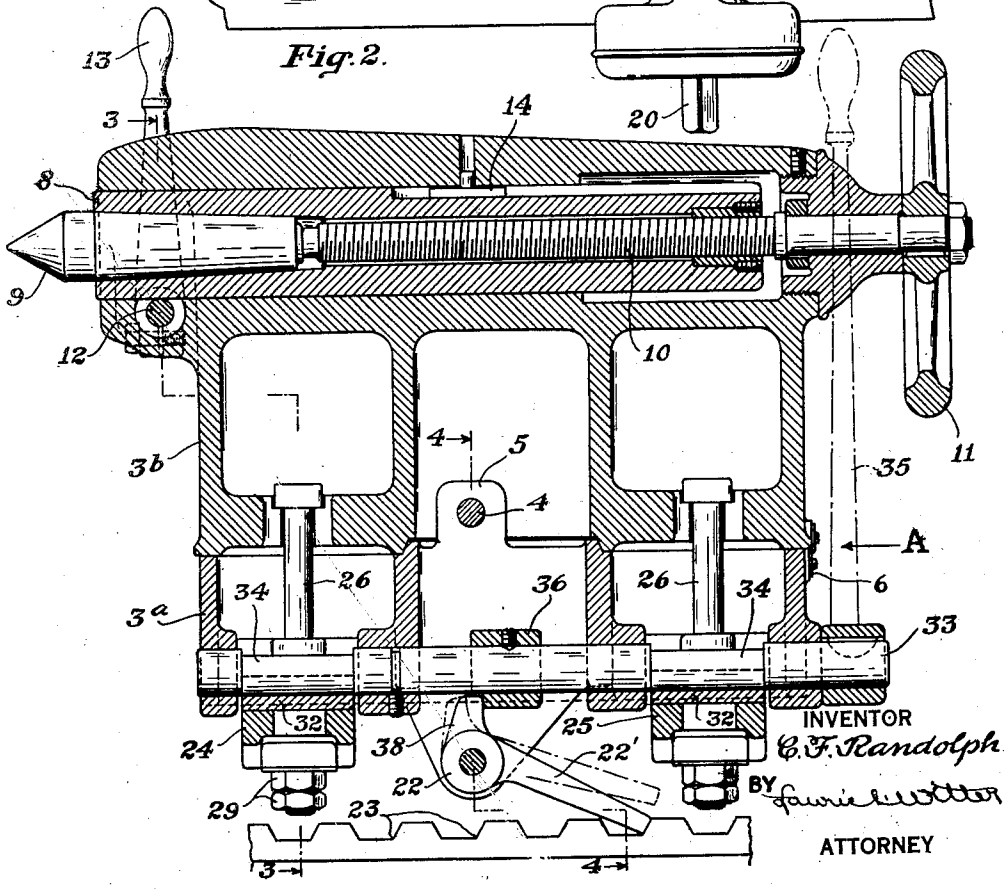

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Fig. 3.

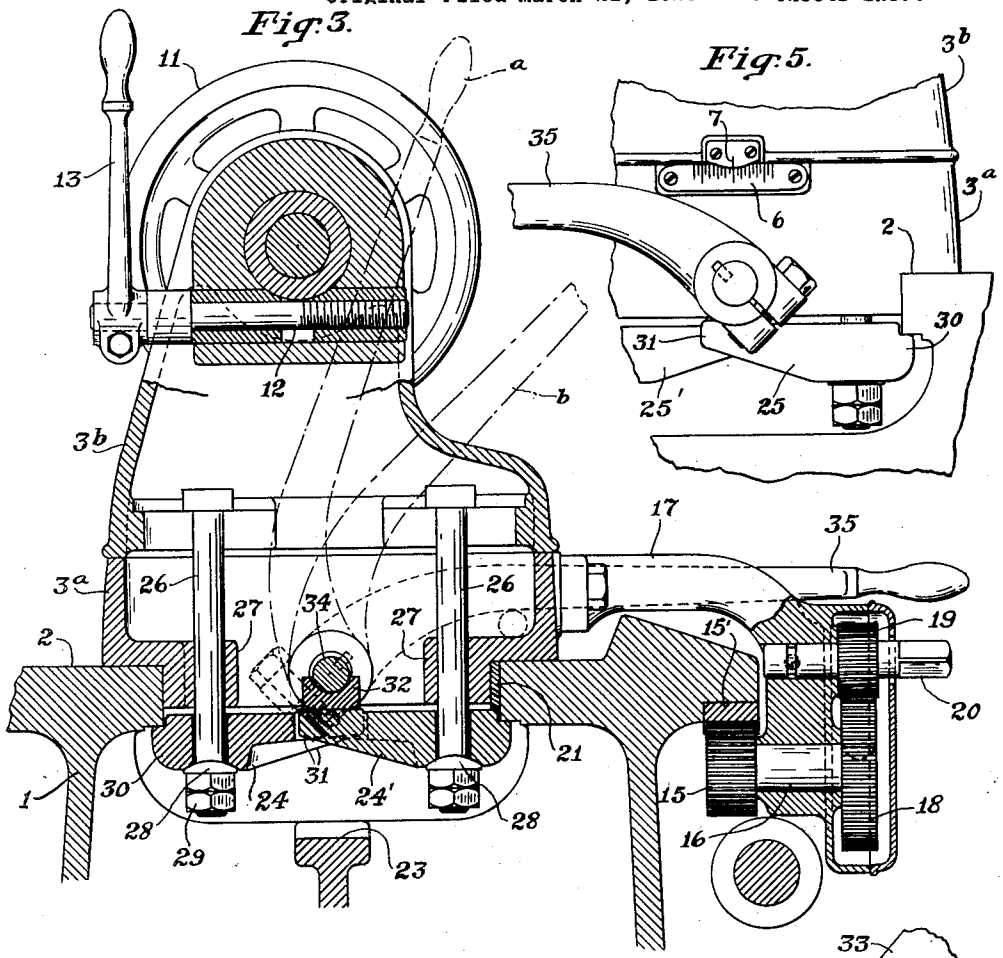


Fig. 5.

Fig. 4.

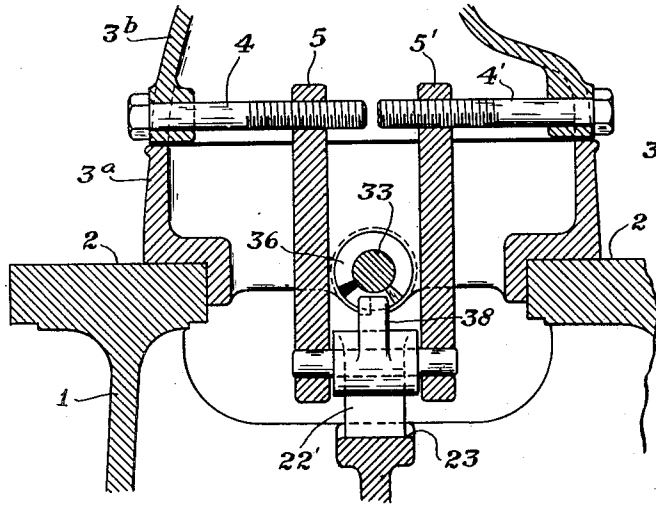
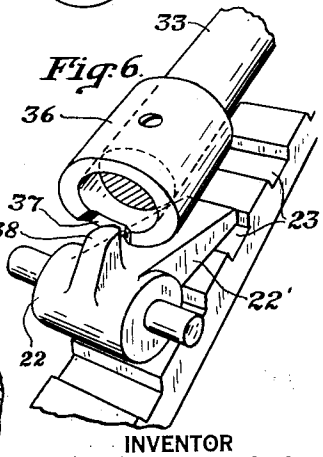


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TAILSTOCK CLAMPING MECHANISM.

Application filed March 21, 1923, Serial No. 626,584. Renewed September 13, 1927.

This invention relates to tailstocks for lathes and particularly to means for supporting a tailstock against movement on a lathe bed. In accordance with the invention, I provide a plurality of clamping elements secured to the tailstock and adapted to engage the lathe bed and an improved unitary means in connection therewith for clamping and unclamping the said elements. One object of my invention is to provide an improved mechanism of this type.

In addition to the clamping means above defined, I preferably pivotally mount a bracing element on the tailstock in a position to engage rack teeth on the lathe bed. In one position this element engages the rack teeth in a manner to brace the tailstock against longitudinal backward movement on the bed and in another position the element is disconnected from the rack teeth and the tailstock is free to move on the bed. Another object of my invention is to provide means for disengaging the element from the rack teeth simultaneously with the disengaging of the clamping means. Such means preferably comprise a cam on a clamp operating shaft extending longitudinally of the tailstock as illustrated in the accompanying drawings.

With the above and other objects in view, my invention consists in the features of construction and operation set forth in the following specification and illustrated in the accompanying drawings. In such drawings annexed hereto and forming a part of this specification, I have shown one embodiment of my invention, but it will be understood that the invention can be otherwise embodied and that the drawings are not to be construed as defining or limiting the scope of the invention, the claims appended to this specification being relied upon for that purpose.

Referring to the figures of the drawings:

Figure 1 is a plan view of my improved tailstock mechanism.

Fig. 2 is a central vertical longitudinal section therethrough.

Fig. 3 is a cross section taken on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary cross sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged fragmentary end elevation looking in the direction of arrow A in Fig. 2.

Fig. 6 is an enlarged fragmentary perspective view of the tailstock bracing means.

My invention contemplates improved clamping mechanism for securing the tailstock to the bed of a lathe and for releasing the same therefrom. The invention furthermore contemplates means for bracing the tail-stock against movement on the lathe bed and a single operating mechanism, including a hand operated lever, for operating both the clamping mechanism and bracing means. The entire mechanism is so arranged that by moving a single lever, the operator may release both the bracing means and clamping mechanism from engagement with the bed whereby the tailstock becomes freely adjustable thereabout. Conversely, by moving the lever in the opposite direction, the bracing means and clamping mechanism may be reengaged with the bed to secure the tailstock thereto in its adjusted position. The specific mechanism shown in the drawings for performing these functions will now be described.

Referring to the drawings by reference characters, 1 indicates the lathe bed on the ways 2 of which the tailstock 3 is slidably mounted. The tailstock comprises a lower section 3^a and an upper section 3^b transversely slidably mounted thereon. A pair of bolts 4 and 4′ mounted in the upper section 3^b threadedly engage lugs 5 and 5′ of the lower section 3^a, whereby the upper section may be adjusted transversely. A scale 6 is provided on the lower section for cooperating with a mark 7 on the upper section to accurately indicate the amount of such adjustment. The upper section carries a spindle 8 provided in one end with a work engaging center 9. A screw 10 and hand wheel 11 are provided for adjusting the spindle longitudinally. A screw clamp 12 operated by a lever 13 is provided for securing the spindle in its adjusted position. A key 14 prevents rotation of the spindle.

The tailstock may be moved along the bed by means of a pinion 15 engaging a rack 15′ secured to the bed. The pinion 15 is mounted on a shaft 16 journaled in a bracket 17 bolted to the tailstock. A gear 18 on the other end of shaft 16 is engaged by a pinion 19 on a shaft 20. The outer end of shaft 20 is squared to receive a suitable wrench or operating handle. A longitudinally adjustable taper gib 21 is provided for

accurately seating the tailstock on the ways 2.

Pivoted to lower extensions of the lugs 5, 5′ is a tailstock bracing member 22 having a relatively long arm 22′ adapted to engage within any one of a series of notches 23 formed in the lathe bed. It will be understood that this mechanism serves to brace the tailstock against backward movement on the lathe bed when the center 9 is engaged with a piece of work.

The tailstock clamping means comprises a pair of clamping elements 24 and 24′ at one end of the tailstock and another pair 25 and 25′ at the other end of the tailstock. Each clamping element is supported on a bolt 26 hung from the upper tailstock section 3^b. Each bolt extends downwardly through a projection 27 of the tailstock section 3^a and is provided with a washer 28 and check nuts 29 for supporting its clamping element, the upper surface of the washer being curved to permit pivotal movement of the elements thereon.

As shown most clearly in Fig. 3, each clamping element comprises a short arm 30 adapted to engage beneath a way of the bed and a relatively long arm 31 projecting past the center of the tailstock. The free ends of the long arms 31 of each pair of elements overlap in a manner to receive a block 32 thereon. Means is provided for forcing these blocks downwardly to engage the clamping elements with the ways whereby to secure the tailstock to the bed. This means is illustrated as comprising a shaft 33 rotatably mounted in the section 3^a and extending longitudinally thereof. The portions 34 of this shaft adjacent the blocks 32 are cam or eccentric shaped whereby to force the blocks 32 downwardly when the shaft is rotated. A handle 35 is mounted on the end of the shaft for rotating the same.

A collar 36 is secured to the shaft between the eccentric portions 34. The forward end of this collar is notched at 37. The bracing member 22 is provided with a short upwardly extending arm 38 adapted to engage against the forward end of the collar. When the arm is engaged within the notch 37, the end 22′ of member 22 is engaged within a notch 23 as shown in full lines in Fig. 2. By rotating the collar, the arm 38 is forced out of the notch whereby the arm 22′ is raised to the position shown in dot and dash lines in Fig. 2.

With the collar 36 secured to the shaft 33 in the proper position, the operation of the mechanism is as follows: With the handle 35 in the position shown in dot and dash lines *a* (Fig. 3), the tailstock is unclamped from the bed and the bracing member 22 is raised to the position shown in dot and dash lines in Fig. 2. With the parts so positioned, the tailstock may be freely adjusted along the ways 2. When the handle is moved downwardly to the position shown in dot and dash lines *b*, the tailstock still remains unclamped from the bed but the bracing member 22 is in the downward position shown in full lines in Fig. 2. With the parts so positioned, the tailstock may be moved backwardly to firmly engage the free end of arm 22′ of the bracing member against the shoulder of the adjacent notch 23. When the tailstock is so positioned, the handle 35 is pushed downwardly to the position shown in full lines in Fig. 3 whereby the tailstock is firmly clamped to the bed.

What I claim is:

1. A lathe tailstock comprising the combination of means for engaging the ways of a lathe bed, a pair of relatively movable clamping elements adjacent each end of the tailstock for engaging beneath the ways, and means including a shaft extending longitudinally of the tailstock for operating both pairs of clamping elements, the elements of each said pair being moved relatively in performing the clamping operation.

2. A lathe tailstock comprising the combination of means for engaging the ways of a lathe bed, a pair of relatively movable clamping elements adjacent each end of the tailstock for engaging beneath the ways, a cam engaging each pair of elements for moving the same into clamping engagement with the ways, and a unitary operating device for both cams, the elements of each said pair being moved relatively in performing the clamping operation.

3. A lathe tailstock comprising the combination, of means for engaging the ways of a lathe bed, a pair of clamping elements pivoted to the tailstock adjacent each end thereof for engagement beneath the ways, a shaft extending longitudinally of the tailstock, and means on the shaft for operating both pairs of clamping elements about their pivots into and out of clamping engagement with the ways.

4. A lathe tailstock comprising the combination of means for engaging the ways of a lathe bed, a pair of clamping levers pivoted to the tailstock adjacent each end thereof, one end of each lever engaging beneath a way and the other ends of each pair of levers being adjacent each other, a block mounted on the adjacent ends of each pair of levers, a shaft extending along the tailstock, and means on the shaft for operatively engaging each block to operate the levers about their pivots into clamping engagement with the ways.

5. A lathe tailstock comprising the combination of means for engaging the ways of a lathe bed, a pair of clamping levers pivoted to the tailstock adjacent each end thereof, each lever being movably connected to the tailstock by a bolt hung therefrom and ex-

tending downwardly through the lever, a shaft extending longitudinally of the tailstock, and means on the shaft for operating the levers about the bolts into and out of clamping engagement with the ways.

6. A lathe tailstock comprising the combination of means for engaging the ways of a lathe bed, clamping means for securing the tailstock to the bed, an element connected to the tailstock and adapted to engage rack teeth on the bed for bracing the tailstock, and unitary means operative to both disengage the clamping means and the bracing means from the bed.

7. A lathe tailstock comprising the combination of means for engaging the ways of a lathe bed, clamping means for securing the tailstock to the bed, a shaft for operating the clamping means, an element pivoted to the tailstock and adapted to engage rack teeth on the bed for bracing the tailstock, and means operated by the shaft for pivotally moving the element out of engagement with the rack teeth when disengaging the clamping means.

8. A lathe tailstock comprising the combination of means for engaging the ways of a lathe bed, clamping means for securing the tailstock to the bed, a shaft for operating the clamping means, an element pivoted to the tailstock and adapted to engage rack teeth on the bed for bracing the tailstock, and a cam on the shaft for pivotally moving the element out of engagement with the rack teeth when disengaging the clamping means.

In testimony whereof, I hereto affix my signature.

CLIFFORD F. RANDOLPH.