

A. W. WHITCOMB.
TAIL STOCK CLAMPING MECHANISM.
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Patented Feb. 20, 1912.

2 SHEETS—SHEET 2.

1,018,222.

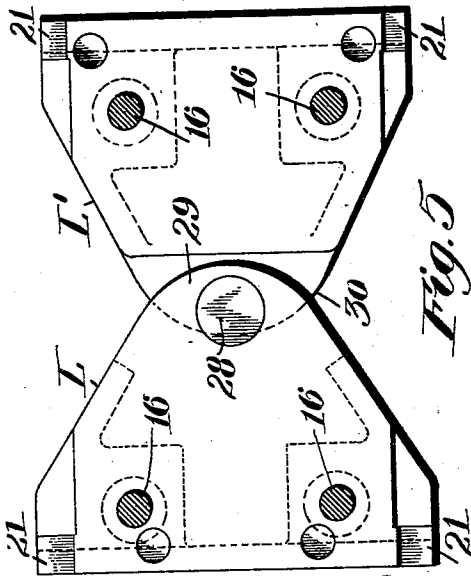


Fig. 5

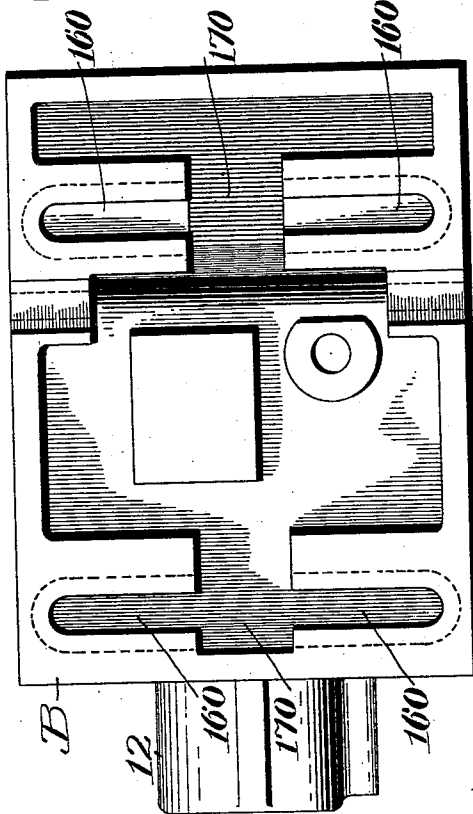


Fig. 3

Witnesses:
C. F. Mason.
W. E. Regan.

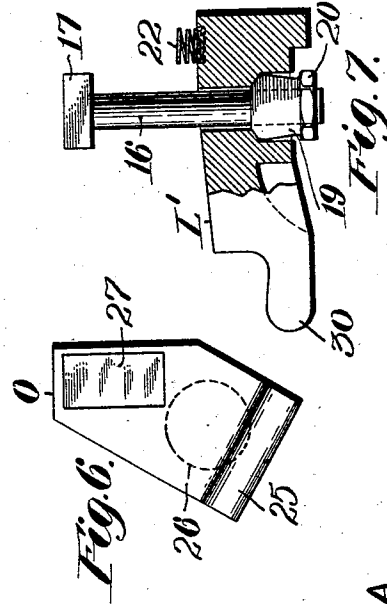


Fig. 6

Fig. 7

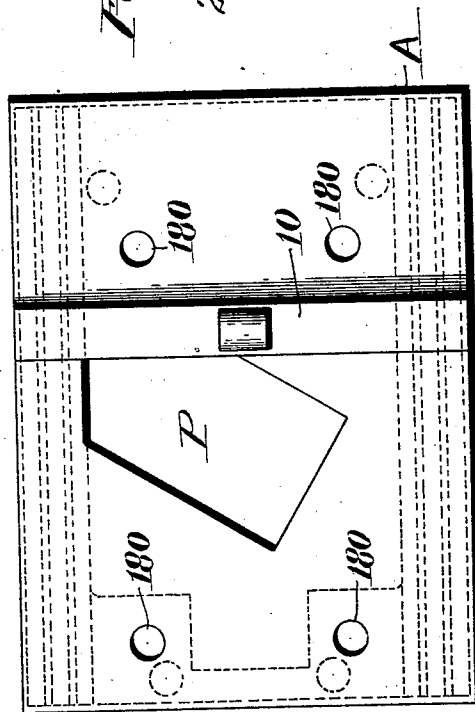


Fig. 4

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TAIL-STOCK-CLAMPING MECHANISM.

1,018,222.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALONZO W. WHITCOMB, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Tail-Stock-Clamping Mechanism, of which the following is a specification.

This invention relates to improved mechanism for clamping the tail-stock of a lathe to the shears or ways of a lathe bed.

One usual clamping mechanism employed for this purpose consists of a strap bearing against the under side of the inside lips of the shears or ways of the bed, which strap is carried by two bolts which project up through the tail-stock and which are provided with nuts which can be turned by means of a wrench to tighten one nut and then the other. This arrangement has the disadvantage that the clamp is applied at the middle of the tail-stock so that as the tail-stock receives the thrust from the tool (the resultant action of which gives an upward strain), the pressure is apt to lift or spring the front of the tail-stock upwardly and thus to distort the work on the centers. This common arrangement also has the disadvantage that one side of the clamp is tightened before the other and often with a different degree of pressure which may throw the tail-stock out of accurate position on the ways of the bed.

To overcome these objections, I have provided a new and improved tail-stock clamping mechanism which consists of a lever fulcrumed to the tail-stock and having engagement under the lathe bed and of means for applying pressure for operating said lever to lock the tail-stock to the bed. The engaging faces of the lever are preferably arranged under or near the front face of the tail-stock so as to clamp the same to the lathe bed at the most advantageous position to resist strain from the cutting tool.

In addition to providing a single locking lever, I usually provide another lever which is arranged to engage under the shears of the lathe bed near the rear face of the tail-stock and I arrange the operating mechanism so that the pressure is applied to lock the tail-stock to the ways at practically the four corners thereof. When two levers are em-

ployed, I arrange the ends thereof to bear on each other and apply the operating means directly or through a compounding lever thereto so that one hand-wheel or lever will operate all the locking faces at the same time. The locking levers are arranged with a certain amount of play or lost motion so that they can adapt themselves to their engagement whereby the same will yield so that the locking or clamping strain will be practically the same at all four corners of the tail-stock. Thus by manipulating one handle, the tail-stock can be rigidly locked to the bed at all four corners.

One form of mechanism by which the invention can be practiced is shown in the accompanying drawing in which,

Figure 1 is a side elevation of a tail-stock with my improved clamping mechanism applied thereto, the lathe bed being broken away to show the same, Fig. 2 is a cross sectional view taken on the line 2-2 of Fig. 1, Fig. 3 is a bottom plan view of the tail-stock block, Fig. 4 is a top plan view of the base, Fig. 5 is a plan of the locking levers, Fig. 6 is a plan of the operating lever, and Fig. 7 is a side elevation partly in section of one of the locking levers.

Referring to the drawing and in detail, A designates the base and B the block of a tail-stock. The base is provided with the usual rib or guide 10 which fits in grooves planed in the block B so that the block can be adjusted laterally on the base by suitable screws 11-11 which are tapped into the sides of the block and which engage a projection extending up from the base whereby the block can be adjusted laterally for turning taper work. The block has a barrel 12 fitted in which is the spindle 13 which carries the usual center and which spindle can be adjusted back and forth by a hand-wheel 14 which carries a screw engaging the rear of the spindle. A clamp 15 is provided for locking the spindle in its adjusted position in the barrel. These parts form an ordinary construction of tail-stock.

The base A has grooves cut in the bottom thereof which engage the usual ways or inverted V's formed on the lathe bed C so that the tail-stock can be moved forward and backward on the lathe bed for different lengths of work.

The improved clamping mechanism is arranged as follows: T-shaped slots 160—160 are planed in the bottom of the tail-stock block near each end thereof. These T-slots have an opening 170—170 in the middle thereof. Bolts 16—16 having heads 17—17 are entered through these openings and then slid outwardly into proper working position in the T-slots. After they are slid into this position the tail-stock block B is set on the base A, the bolts slipping through holes 180—180 provided for them in the base. Thus the bolts will be held in position laterally and the tail-stock block can be adjusted laterally on the base.

L designates a locking lever and the same is provided with two holes whereby it can be pushed up on the bolts after the same are placed in position, as previously described.

Nuts 19 are threaded on the ends of the bolts 16, which nuts have hexagon heads 20 to allow the application of a wrench adjustment. The faces of the nuts 19 are rounded or chamfered off where the same engage the locking lever and the holes in the lever are made slightly larger than the bolts so that the lever can turn or rock on the nuts 19 as a fulcrum. The lever L is provided with faces or ears 21—21 which engage under the inside lips of the lathe bed, which engagement comes practically under the front face of the tail-stock. Small springs 22—22 are inserted into the front face of the tail-stock to bear on the lever L so as normally to force the faces or ears 21—21 out of engagement with the lathe bed lips, the term "front face" of the tail-stock being used to designate the side thereof which is next to the work. On account of these springs the levers cannot interfere with the sliding of the tail-stock along the ways.

To operate the lever a screw 23 is threaded into the block, which screw is preferably extended up through a hub formed on the tail-stock barrel and which screw is provided with an operating handle or wheel 24 which is secured to the upper end thereof. Instead of having the end of this screw bear directly upon the locking lever L to operate it, which would accomplish part of these results, it is preferred to compound the motion by using an operating lever O which has a ball shaped bearing 25 engaging under the tail-stock block and a cylindrical ear 26 engaging the lever L. The operating lever O is placed in the opening P in the base so that its position is determined in this way. The lever O is formed so as to lie within the base as shown in Fig. 2 so as to allow for the lateral movement of the tail-stock block upon the base without interfering with the action of the screw 23 upon it, as the bearing surface of the block can slide on the ball shaped bearing 25 of the

lever O and the wearing surface of the lever O can slide on the end of the screw 23.

A wearing face 27, preferably made of hardened steel, is inserted in the lever O so that engagement of the end of the screw with the lever will not cause wear and another steel wearing face 28 is inserted in the lever L for the ear 26 on the lever O to engage to prevent wear. By this arrangement, when the screw is operated, the lever L will be rocked on its fulcrum to lock the tail-stock to the bed, and at the same time the tail-stock block B will be rigidly locked to the base A.

I preferably additionally employ a second lever L' for locking the tail-stock to the bed, which lever L' and its suspending mechanism is substantially the same in construction as the lever L except that its engaging faces are arranged to come practically under the rear face of the tail-stock so that the tail-stock will be clamped to the lathe bed at all four corners. The lever L is provided with a lip 29 at its rear face and the lever L' is provided with a lip 30 at its front face which lips bear on each other, as shown in Fig. 2, substantially under the rounded ear 26 or bearing point of the operating lever O whereby the levers are interlocked in such a way that the pressure from the operating lever causes them both to engage simultaneously with the lathe bed. A certain amount of lost motion is given to all of these parts so that the engagement at the four points will be substantially a yielding and compensating engagement. The action of the levers can be regulated by adjusting the nuts 19. By using the system of compound levers shown, a very powerful locking and clamping mechanism is provided and is so arranged that the tail-stock is locked at its four corners to the lathe bed by simply manipulating one handle or wheel which may form a part of the structure and at the same time the tail-stock block is clamped to the base. It also will be noticed that when the screw is released, that the tail-stock block can be adjusted laterally on the base A if desired without interfering with the proper action of the clamping mechanism.

The details and arrangements herein shown and described may be greatly varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

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

1. The combination of a tail-stock adapted to rest on a lathe bed, a lever having means for receiving pressure at one end and ears or clamping faces at the other end engaging under the lathe bed, a fulcrum member near the latter end and supported by

the tail-stock, and means carried by the tail-stock for exerting pressure on said fulcrum member for operating the same.

2. The combination of a tail-stock, and means for clamping the same to the lathe bed, comprising two levers having four ears or clamping faces arranged to engage the ways of the lathe substantially under each corner of the front and rear faces of the tail stock.

3. The combination of a tail-stock, and means for locking the same to the lathe bed, comprising two clamps each of which engages the lathe bed substantially under the two corners of the tail-stock on one end.

4. The combination of a tail-stock, and means for locking the same to the lathe bed comprising a plurality of separate clamps to engage the lathe bed substantially under the four corners of the tail-stock, and means for causing said clamps to operate simultaneously.

5. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising a lever fulcrumed to the tail-stock having two separated ears or clamping faces to engage under both of the lathe bed ways near one end of the tail-stock, and means for operating said lever.

6. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising two levers fulcrumed to the tail-stock and having ears or clamping faces engaging under the lathe bed ways and means for simultaneously operating both of said levers.

7. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising inter-engaging levers fulcrumed to the tail-stock, and each having ears or clamping faces engaging under both the lathe bed ways substantially under two corners of one end of the tail-stock, and means for operating said levers.

8. The combination of a tail-stock, and means for clamping the same to the lathe bed, having four separated ears or clamping faces arranged to engage the ways of the lathe substantially under each corner of the front and rear faces of the tail stock.

9. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising two inter-engaging levers fulcrumed to the tail-stock and having ears or clamping faces engaging under the lathe

bed ways, an operating lever bearing on the tail-stock and on the levers, and means for exerting pressure on the operating lever.

10. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising two inter-engaging levers fulcrumed to the tail-stock and having ears or clamping faces engaging under the lathe bed ways, an operating lever bearing on said levers at the point where they are inter-engaged, and a screw threaded into the tail-stock for exerting pressure on the operating lever.

11. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising levers secured by adjustable fulcrums to the tail-stock and having ears or clamping faces engaging under the lathe bed ways, and means for operating said levers.

12. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising bolts inserted and held in the tail-stock, locking levers held on said bolts by adjustable nuts and having ears or clamping faces engaging under the lathe bed ways, and means for operating said levers.

13. The combination in a tail-stock construction, of a base, a block mounted so as to be laterally adjustable thereon, T-shaped grooves formed in the bottom of the base, bolts having heads engaging in said grooves, a locking lever or levers carried by said bolts, and means for operating the same whereby a clamping mechanism is provided which does not interfere with the lateral adjustment of the block on the base.

14. The combination of a tail-stock, and means for clamping the same to the lathe bed comprising levers fulcrumed to the tail-stock and having ears or clamping faces to engage under the lathe bed ways, means for operating said levers comprising an operating lever, a screw, and wearing faces inserted in the operating lever under the screw and in the locking lever where the same is engaged by the operating lever.

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

ALONZO W. WHITCOMB.

Witnesses:

E. M. ALLEN,

C. F. WESSON.