(No Model.) 3 Sheets—Sheet 1.

F. H. RICHARDS.

CLAMPING MECHANISM FOR TURRET LATHES.

No. 496,001. Patented Apr. 25, 1893.

Fig. 1

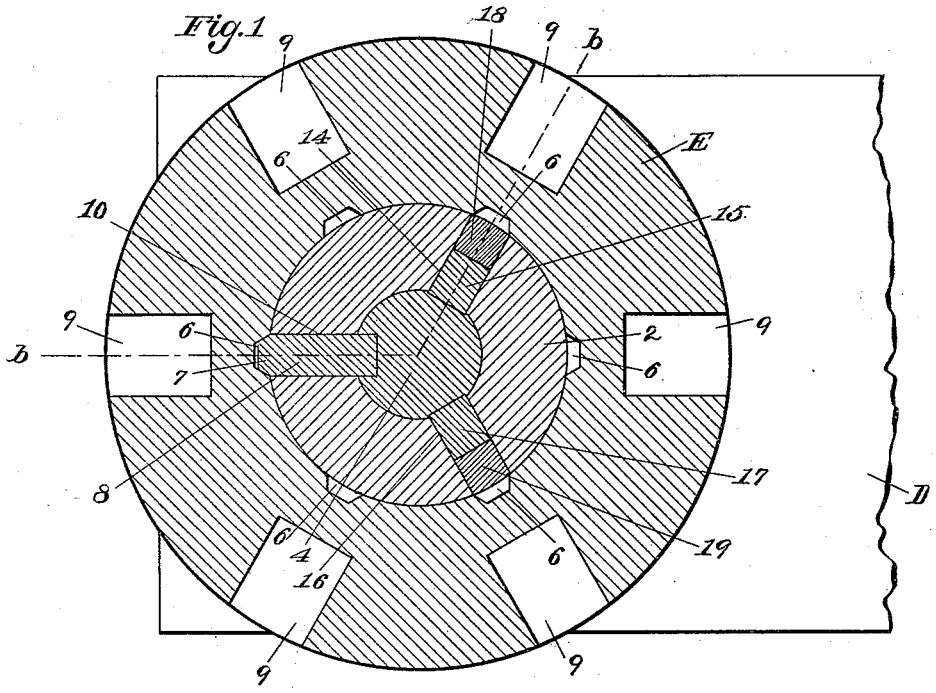
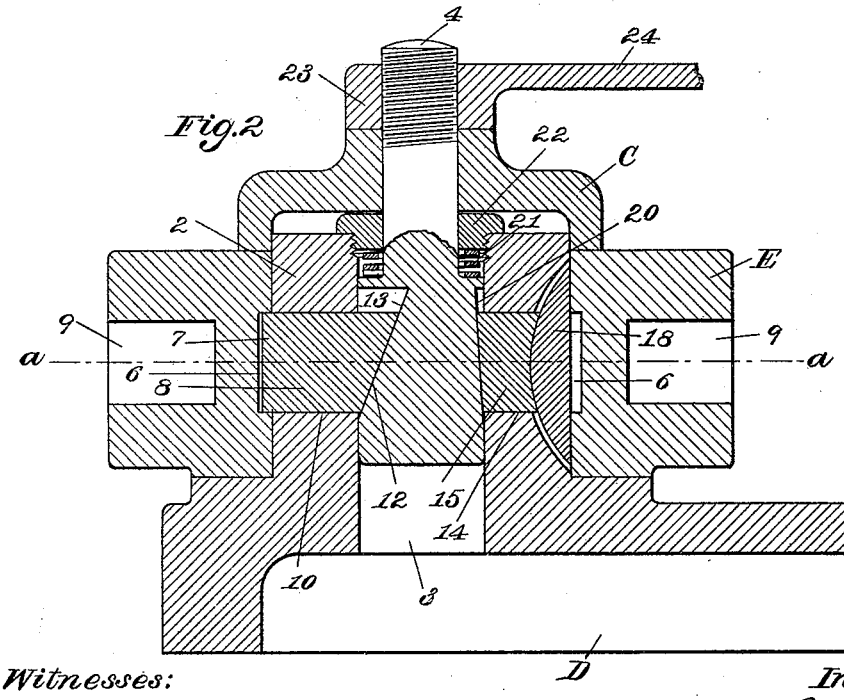


Fig. 2



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3

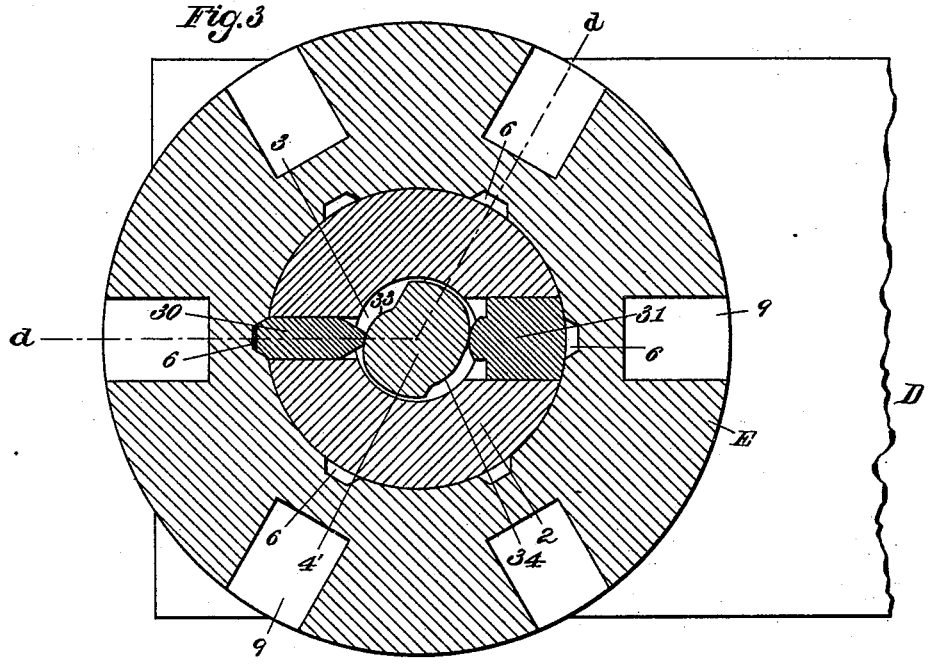
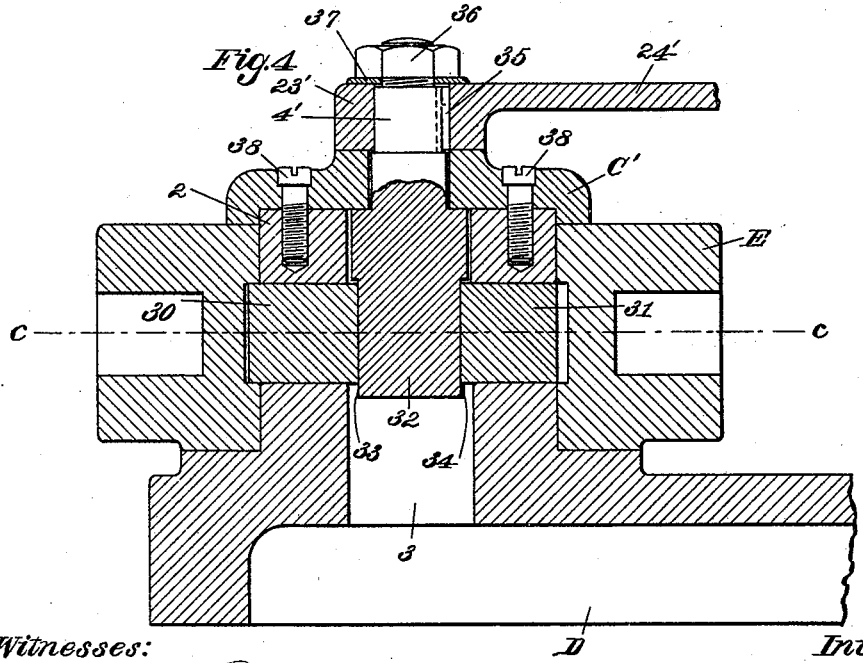


Fig. 4



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(No Model.) 3 Sheets—Sheet 3.

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CLAMPING MECHANISM FOR TURRET LATHES.

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Fig. 5

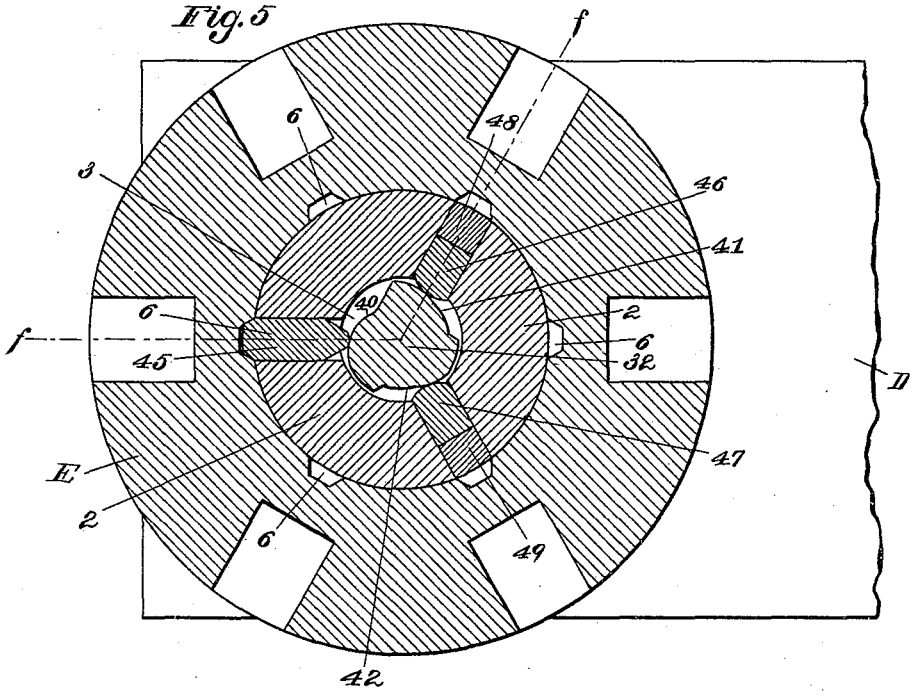
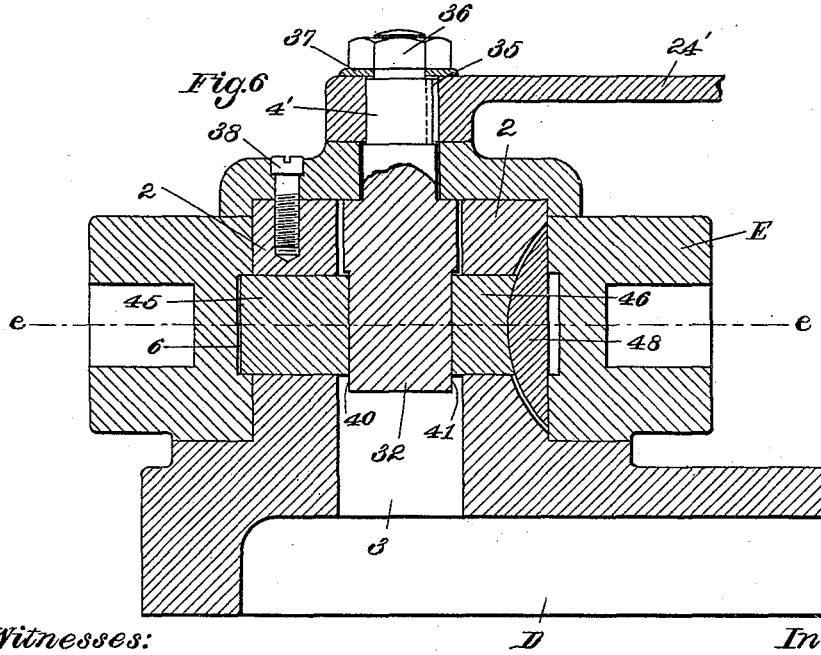


Fig. 6



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UNITED STATES PATENT OFFICE.

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CLAMPING MECHANISM FOR TURRET-LATHES.

SPECIFICATION forming part of Letters Patent No. 496,001, dated April 25, 1893.

Application filed March 29, 1892. Serial No. 426,950. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Clamping Mechanism for Turret-Lathes, of which the following is a specification.

This invention relates to clamping-mechanism for the turrets of turret-lathes; the object being to provide means for clamping the turret diametrically and longitudinally at the same time, and also for locking the turret against rotation.

In the drawings accompanying and forming a part of this specification, Figure 1 is a horizontal section (on line *a a*, Fig. 2) of the turret of a turret-lathe furnished with my present improvements; the turret being shown mounted on the usual turret-slide. Fig. 2 is a vertical section of the turret and slide, in line *b b* of Fig. 1. Fig. 3 is a view, similar to Fig. 1, of a modification of the mechanism, the view being taken in line *c c* of Fig. 4. Fig. 4 is a vertical section in line *d d* of Fig. 3. Fig. 5 is a view, similar to Figs. 1 and 3, of a further modification of the mechanism, this view being taken in line *e e* of Fig. 6. Fig. 6 is a vertical section of the same, in line *f f* of Fig. 5.

Similar characters designate like parts in all the figures.

In the drawings, the usual turret-slide D is shown provided with the hollow turret-carrying column 2, which is preferably formed integral with said slide, and is centrally bored at 3 to receive the bolt-actuating wedge or cam; which cam, in the present instance, is shown formed on the lower end of a bolt or shaft, 4, to whose upper end is secured the cam-actuating lever 24, by means of which the operator may lock the turret to the turret-carrying column, or unlock the same therefrom.

In the turret-clamping apparatus shown in Figs. 1 and 2, which is the preferred form thereof, the turret E is shown bored to fit closely and turn freely on the column 2 of the slide D, and has a series of detent-notches, 6, formed therein to receive the wedge-shaped end, 7, of the lock-bolt 8. Said notches 6 should correspond in number to the series of tool-holding sockets 9, which are in the present instance six in number. The column 2 is mortised at 10 to receive the said lock-bolt 8, which is fitted for longitudinal movement in said mortise. The inner end of the bolt 8 is shaped, at 12, Fig. 2, to bear against the wedge-shaped face 13 of the shaft 4. Said column 2 is also mortised at 14 and 16, to receive the turret-clamping slides 15 and 17, and the shoes, or bearing-blocks, 18 and 19, respectively; the inner ends of the said slides are inclined as shown in Fig. 2, to bear against the correspondingly-shaped faces, as 20, on said shaft 4. The upper end of the shaft 4 is threaded to receive the threaded hub, or nut, 23, which is provided with one or more arms, or levers, 24, for turning the same to draw said shaft upward and force outwardly the lock-bolt 8, and the slides 15 and 17 and their respective shoes.

For the purpose of retracting the shaft 4 when the nut 23 is unscrewed, a spring, 21, (shown in section in Fig. 2) is arranged to bear downwardly against a shoulder on said shaft, and to react against the nut 22, which is screwed into the upper end of the column 2.

When the cam-shaft is drawn up, the cam, or incline, 12, forces forward the lock-bolt 8 to engage in the turret-notch, while the cams 20—20 drive out the slides 15 and 17 to force the shoes 18 and 19, respectively, against the inner surface of the turret, as shown in Figs. 1 and 2. When the turret is to be turned, the shaft 4 is first retracted to relieve the clamp-slides and lock-bolt, when the turret may be revolved in the usual manner, either by hand or by means of a ratchet-mechanism not shown.

For the purpose of clamping the turret longitudinally thereof, the hub 23 is made to bear (or react) against a piece which is intermediate to said hub and the turret itself. As shown in Fig. 2, this intermediate part, or thrust-member, consists of the cap C, whose

outer edge rests on the turret E, and whose hub or upper end supports said lever-hub 23 against downward movement.

When the operator turns the lock-bolt actuator (consisting in the lever 24 and hub 23, or of some equivalent device) to draw up the shaft 4 as hereinbefore described, the power exerted (less the difference due to friction) reacts downwardly upon the upper surface of the turret to clamp this firmly upon the turret-slide. The result of this distribution of the force applied is, obviously, to simultaneously lock the turret to the column 2 and to draw the turret downwardly on said column against the turret-slide, thereby effectually locking and clamping the turret at the same time, by a single operation.

In the form of the mechanism illustrated in Figs. 3 and 4 of the drawings, the column 2 is mortised to receive a lock-bolt, 30, similar to the bolt 8 above described, and a slide, 31, which acts directly against the face of the bore of the turret E, as illustrated in said figures. The actuating means, in this instance, consists of a rotatable shaft, 4′, (otherwise similar to shaft 4 in Figs. 1 and 2,) whose enlarged lower end, 32, has formed thereon the cam-faces 33 and 34 for actuating the lock-bolt 30 and the slide 31, respectively. The hub 23′, having the arm, or lever, 24′, is shown fixed to the upper end of the shaft 4′ by means of a key, 35, a nut, 36, and washer, 37. The enlarged portion 32 of said shaft 4′ engages the under side of the cap C′, (similar to the cap C,) which cap fits the upper end of the column 2, to which it is secured by means of screws, as 38; the outer edge of the cap C′ extends over the turret E, and thus serves to hold said turret down onto the turret-slide D. By rotating the shaft 4′ in one or the other direction as the case may require, by means of the lever 24′ and the hub 23′, the lock-bolt and clamp are operated to lock the turret to the column 2 or to unlock it therefrom.

In the modification shown in Figs. 5 and 6, the several details are similar to those just described in connection with Figs. 3 and 4, except that the column 2 is provided with two clamp-slides instead of one, and that these two slides are similar to the slides 15 and 17 in Figs. 1 and 2, and are like those furnished with adjustable shoes located intermediate to the said slides and the turret E. In this instance, the lower end, 32, of the shaft 4′ has, of course, three cam-faces, 40, 41, and 42, to engage the inner ends of the lock-bolt 45 and the slides 46 and 47, respectively. The outer ends of the said slides 46 and 47 are concaved to engage the convex inner sides of the shoes 48 and 49, respectively; by this means said shoes are made self-adjusting and the pressure is distributed equally to both ends thereof, thus insuring the proper fit and operation of the parts, and overcoming the effect of any slight inequalities in the construction of the mechanism.

The mode of operation of the modification shown in Figs. 5 and 6 is similar to that of the device shown in Figs. 3 and 4. On rotating the shaft 4′, the lock-bolt 45 is forced outwardly into engagement with one of the detent-notches 6, and the slides 46 and 47 react against the bore of the turret through their respective shoes, thus simultaneously locking and clamping the turret against rotation.

Having thus described my invention, I claim—

1. In a turret-locking mechanism, the combination with the turret-carrying column and the turret revolubly mounted thereon, of a lock-bolt supported in said column, a clamp supported in the column opposite to the lock-bolt and bearing against the inner surface of the turret, and a bolt-and-clamp actuator intermediate to the lock-bolt and clamp for simultaneously operating the same to lock and clamp the turret, substantially as described.

2. In a turret-locking mechanism, the combination with the turret-carrying column and the turret revolubly mounted thereon, of a lock-bolt supported in said column to slide radially thereof, a pair of turret-clamps carried in said column opposite the lock-bolt, and a bolt-and-clamp actuator intermediate to the lock-bolt and the pair of clamps for simultaneously operating the same to lock and clamp the turret, substantially as described.

3. In a turret-locking mechanism, the combination with the turret-carrying column having the central opening, and with the turret revolubly mounted on said column, of a lock-bolt supported in the column and adapted to engage the turret, a clamp supported in the column opposite to the lock-bolt and bearing against the inner surface of the turret, a sliding bolt-and-clamp actuator in the turret-opening and engaging said bolt and clamp, and means for sliding said actuator longitudinally of said column, substantially as described.

4. In a turret-locking mechanism, the combination with the turret-carrying column and with the lock-bolt and clamp carried thereby, of the turret revolubly mounted on said column, a lock-bolt actuator substantially as described, a clamp set on the turret, and means for operating said actuator by reacting against said clamp, whereby the turret is simultaneously locked and clamped both diametrically and longitudinally of the turret-column, substantially as described.

5. In a turret-locking mechanism, the combination with the turret-carrying column and with the turret revolubly mounted thereon, of the clamp-slide supported in the column, and the shoe bearing against the inner side of the turret and fitting the end of the clamp-slide, and means for actuating said slide to force

the shoe against the turret, substantially as described.

6. In a turret-locking mechanism, the combination with the turret-carrying column and with the turret revolubly mounted thereon, of the sliding lock-bolt, the turret-clamps, the sliding actuator-shaft having cam-faces bearing against said bolt and clamps, means for operating said shaft to actuate the lock-bolt, and means for retracting said shaft, substantially as shown and described.

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Witnesses.
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HANS MALLNER.