(No Model.) 2 Sheets—Sheet 1.

F. H. RICHARDS.

TURRET CLAMPING MECHANISM.

No. 496,064. Patented Apr. 25, 1893.

Fig. 1

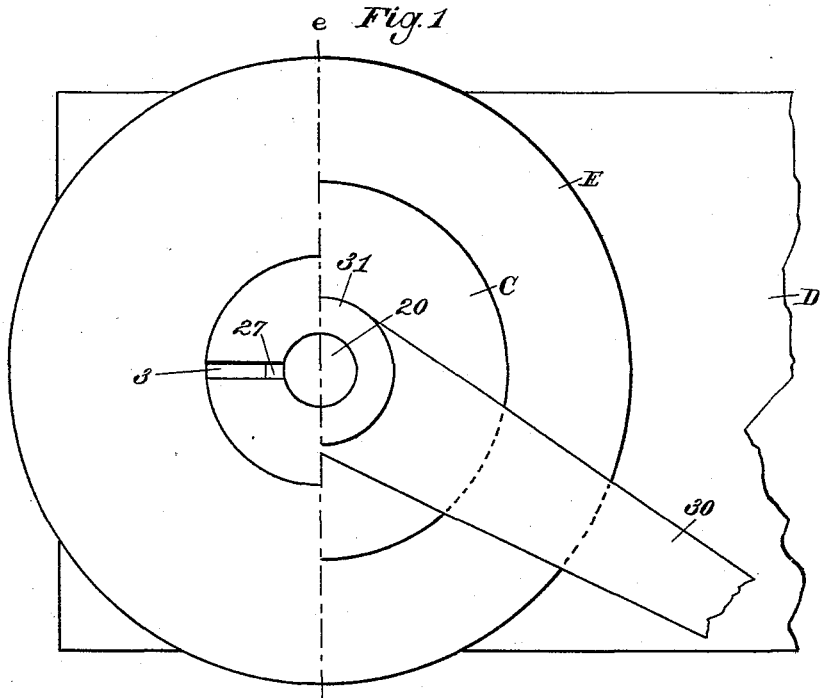
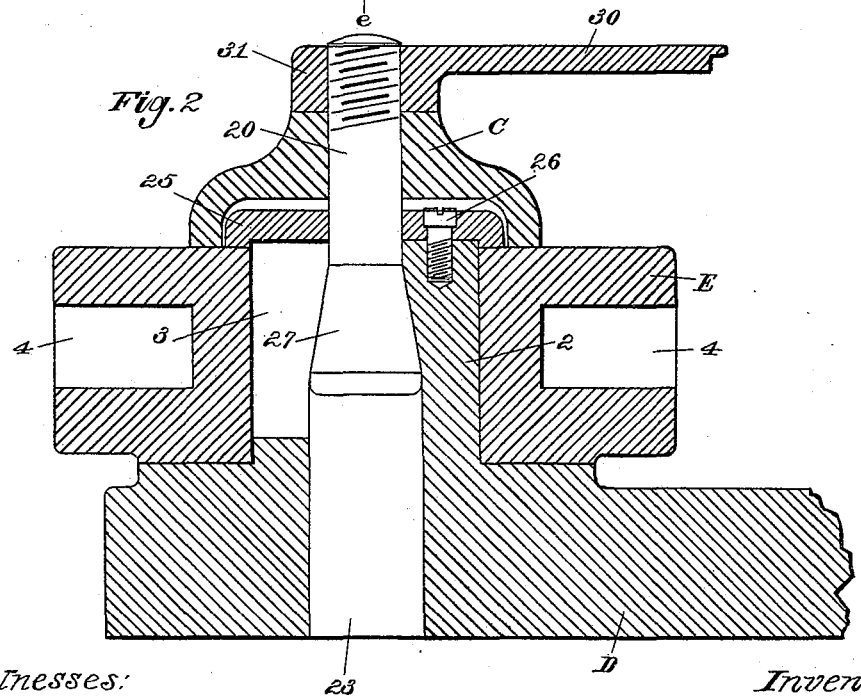


Fig. 2



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(No Model.) 2 Sheets—Sheet 2.

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TURRET CLAMPING MECHANISM.

No. 496,064. Patented Apr. 25, 1893.

Fig. 3.

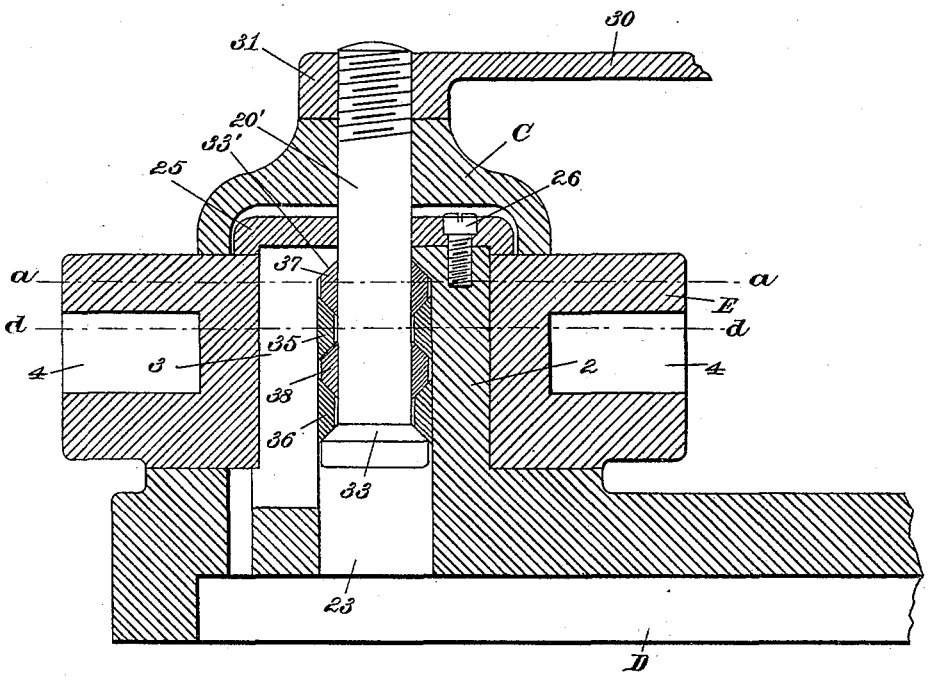


Fig. 4.

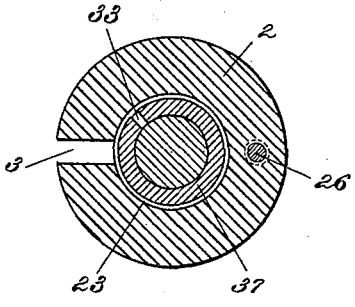
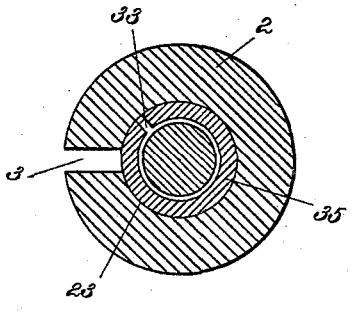


Fig. 5.



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UNITED STATES PATENT OFFICE.

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TURRET-CLAMPING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 496,064, dated April 25, 1893.

Application filed March 21, 1892. Serial No. 425,669. (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 Turret-Clamping Mechanism, 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.

My present invention is in the nature of an improvement on the turret-clamping mechanism described and claimed in Letters Patent No. 480,962, granted to me August 16, 1892.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view (with some details broken away on, and at the left-hand side of, the line *e e*) of the turret-slide of an ordinary turret-lathe, with the turret revolubly mounted thereon and furnished with my improved turret-clamping apparatus. Fig. 2 is a vertical longitudinal section of the parts shown in Fig. 1. Fig. 3 is a view similar to Fig. 2, showing a modification of the apparatus. Fig. 4 is a horizontal section of the column and contained parts, in line *a a* of Fig. 3. Fig. 5 is a similar view, in line *d d* of Fig. 3.

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 split on one side thereof, as at 3, to permit of the required expansion thereof within the central bore of the turret E. Said turret is shown having the usual series of tool-holding sockets, 4, formed in the periphery thereof.

The method of clamping the turret is by expanding within its central opening the aforesaid expansible column 2, on which the turret is fitted to normally turn closely yet freely. For this purpose, as hereinbefore stated, the column should be split or slotted on one side thereof, and means are provided for expanding and releasing the column. The means for effecting the expansion aforesaid consists of a suitable column-expander (in this instance, a wedge) fitting within a correspondingly-shaped portion of the column, and operated by devices which are actuated by the hand-lever 30. In the drawings, one form of column-expanding wedge is shown in Figs. 1 and 2, while a second and more elaborate form of the column-expander is shown in Figs. 3, 4 and 5.

In the turret-clamping apparatus shown in Figs. 1 and 2, the upper end of the column 2 is bored tapering to receive the conical wedge 27, which is, in this case, the lower end of the bolt or shaft 20, on whose threaded upper end is fitted the threaded hub, 31, of the aforesaid hand-lever 30. A suitable cap, as 25, fitted on the upper end of the column 2 and extending outwardly over the turret E, serves to hold down the turret, said cap being secured to the column by suitable screws, as 26, or other equivalent means. By means of the handle 30, the operator turns the hub, or nut, 31, to forcibly draw up the conical wedge 27 into the upper end of the column 2, thereby spreading or expanding said column within the central bore of the turret E, with a force due to the combined power of the wedge, the nut and the lever; which aggregate power, it will be obvious, is very great, being, in practice, sufficient to clamp the turret in place diametrically with extreme rigidity; as also described in my aforesaid application.

For the purpose of simultaneously clamping the turret longitudinally thereof, the lever-hub 31 is resisted in operative movement by a piece intermediate to said hub and the turret. As shown in the drawings, this intermediate or thrust-member consists of a cap, C, whose outer edge rests on the turret E, and whose hub or upper end supports the said lever-hub 31 against downward movement.

When the operator turns the expander-actuator (consisting in the handle 30 and hub 31, or equivalent device) to draw up the bolt 20 as hereinbefore described, the power exerted is applied equally (less the differences due to friction) downwardly upon the upper surface of the turret and upwardly upon the column-expander. The effect of this distribution of the force is, obviously, to simultaneously expand the column by means of the

wedge 27, and to draw the turret downwardly in the column 2 against the turret-slide D, thereby effectually clamping the turret in two directions at the same time; since, when the wedge-actuator is operated, said actuator reacts through said clamp against the turret in a direction longitudinally of the column.

In Figs. 3, 4 and 5, I have shown a modification of, and improvement on, the column-expander shown in Figs. 1 and 2. In this modification, the shaft 20′ (corresponding to the shaft 20 of Figs. 1 and 2) is enlarged at its lower end and has the inclined face, or wedge, 33, formed thereon; and the bore 23 of the column 2 is correspondingly tapered at its upper end, at 33′. A series of split wedge-rings, in the present instance four in number, is placed over the shaft 20′ and within the column 2, intermediate to said wedges 33 and 33′. Said rings are reversely constructed and arranged, two of them, 35 and 36, being fitted to the bore 23 and formed internally conical; while the other two rings, 37 and 38, fit the shaft 20′ and are externally conical.

When the operator, by means of the lever 30 and the nut 31, draws up the shaft 20′, this operates to force all of said conical rings one against the other and thereby expands the rings 35 and 36 against the sides of the bore 23, and compresses the rings 37 and 38 upon the said rod 20′; the result is that the column is expanded at several points along its length, and it fits equally firmly throughout its length within the turret.

Having thus described my invention, I claim—

1. The combination with an expansible turret-carrying column, and with the turret revolubly mounted on said column, of a column-expander, a clamp bearing on the turret lengthwise of the column, and an expander-actuator bearing against said clamp, whereby the expander and the clamp are simultaneously actuated for clamping the turret diametrically and longitudinally, substantially as described.

2. The combination with the expansible column and with the turret revolubly mounted on said column, of a column-expanding wedge, a wedge-actuator, and a turret-clamp intermediate to said actuator and the turret, whereby the operation of the wedge-actuator reacts through said clamp against the turret, substantially as described.

3. The combination with the column conically bored and slotted substantially as set forth, and with the turret revolubly mounted on said column, of the conical wedge 27 fitting said bore, the clamp C resting on the turret, and a screw and nut intermediate to said wedge and clamp for the simultaneous operation thereof, substantially as shown and described.

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