(No Model.) 2 Sheets—Sheet 1.

F. H. RICHARDS.

TURRET LATHE.

No. 515,365. Patented Feb. 27, 1894.

Fig. 1

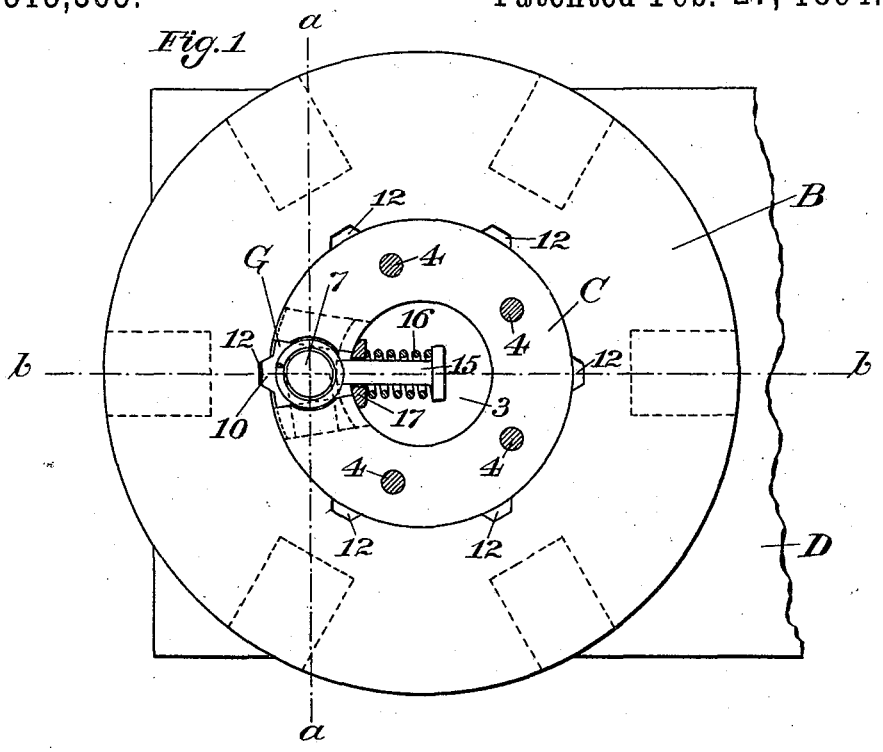
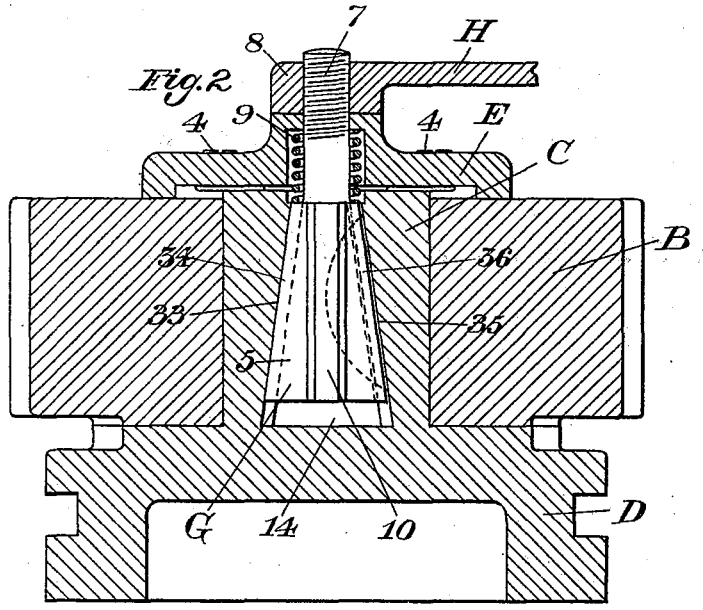


Fig. 2



Witnesses:

Henry L. Rickard.

H. Mallon.

Inventor:

F. H. Richards

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

F. H. RICHARDS.

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Fig. 3

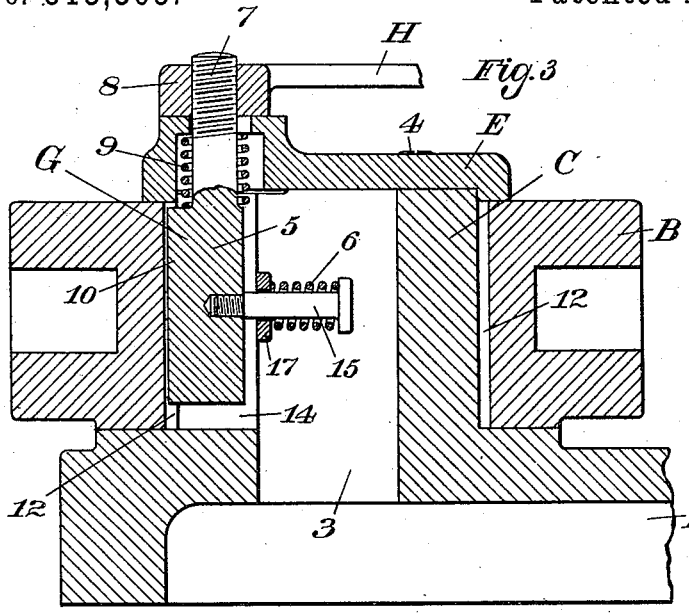


Fig. 5

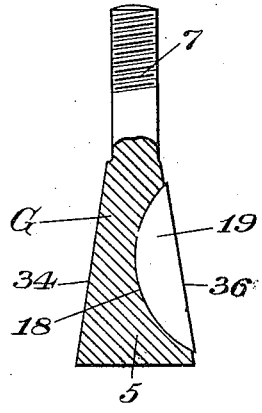
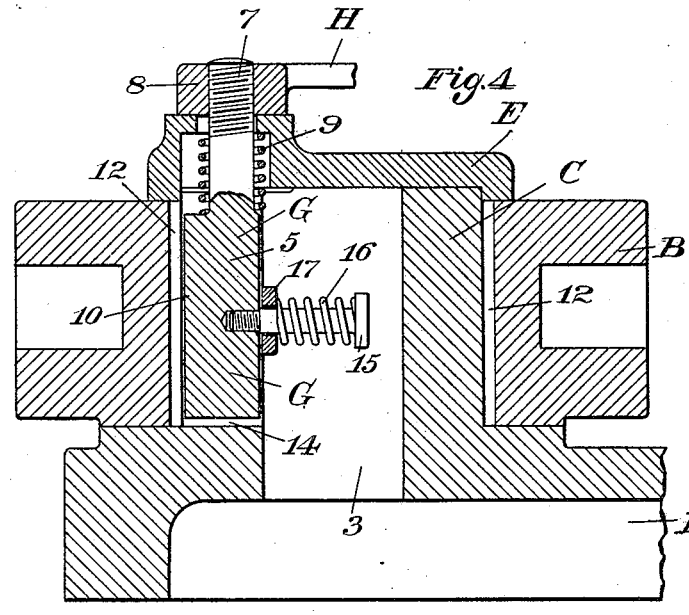


Fig. 4



Witnesses:

Henry L. Reckard.

H. Mallmer

Inventor:

F. H. Richards

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO WALTER WOOD, OF PHILADELPHIA, PENNSYLVANIA.

TURRET-LATHE.

SPECIFICATION forming part of Letters Patent No. 515,365, dated February 27, 1894.

Application filed December 7, 1893. Serial No. 493,065. (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-Lathes, of which the following is a specification.

This invention relates to locking and clamping devices for the turrets of turret-lathes and has special reference to that class of turret-locking and -clamping devices in which the turret is simultaneously locked against rotation on the turret-supporting column by means of a lock-bolt, and clamped thereon by expanding said column within the central bore of the turret.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view, with some parts removed, of a portion of the turret-slide of a turret-lathe, the supporting column thereon, and a turret mounted on said column and provided with my improved turret-locking and -clamping device. Fig. 2 is a vertical section of the same in line *a*—*a* of Fig. 1, as seen from the left-hand in said figure. Fig. 3 is a vertical longitudinal section in line *b*—*b* of Fig. 1. Fig. 4 is a view similar to Fig. 3, but showing the operative parts of the device in a different position. Fig. 5 is a detail view of the lock-bolt wedge shown partly in section.

Similar characters designate like parts in all the figures.

My improved turret-mechanism consists essentially of an expansible column, a turret revolubly mounted on said column and having notches whereby it may be locked in successive positions, and improved turret-locking means for simultaneously locking the turret and expanding the column within the same.

In the drawings, the turret, which is designated in a general way by B, is shown revolubly mounted upon a column, C, that is or may be formed integral with the usual turret-slide, designated in a general way by D, a portion only of the slide being shown in the drawings. The turret B is shown constructed for carrying six tools, (the more usual number,) and the turret-locking mechanism is shown constructed and arranged for locking the turret in each of its six successive positions to bring the tools successively into fixed alignment with the work-carrying spindle of the lathe. The turret is held in place on the column C by means of a cap, E, said cap being shown secured to the column by means of suitable screws, as 4.

The vertical column C, as shown in the drawings, is centrally bored at 3, and is slotted or mortised on one side of said bore, as at 14, to receive the wedge-shaped lock-bolt, G, shown in detail in Fig. 5. The wedge-portion or body, 5, of the lock-bolt, as shown in Figs. 1 and 5, is tapered in two directions; that is,— vertically and laterally so that on the drawing-up of said bolt to expand the column, it shall also be forced outwardly to lock the turret against rotation on said column. The mortise 14 of the column is formed on lines corresponding to the form of the bolt. The forwardly-projecting edge, 10, of said bolt is wedge-shaped cross-sectionally to fit the notches, 12, of the turret, which are correspondingly wedge-shaped, which construction insures the locking of the turret against rotation on the column C when the lock-bolt is drawn upward. The inclined faces, 34 and 36, of the bolt G engage the correspondingly inclined faces, 33 and 35, of the mortise 14 to advance the bolt and lock the turret against rotation, and at the same time act as wedges to expand the column C within the turret, on the raising of the bolt.

As a means for raising the lock-bolt, said bolt is shown provided with a stem, 7, threaded at its upper end to receive the nut, 8, which may be the hub of a lever, as H, by means of which said nut may be turned to raise the bolt, said nut bearing against the turret-cap E. A spring, 9, is provided coiled about the stem 7 of the bolt to force downward said bolt on the unscrewing of the nut 8, said spring acting in a well-known manner against the cap E and the bolt G. As a means for drawing back the said bolt at the same time to unlock the turret, I have provided a stud, 15, fixed in said bolt and carrying a spring, 16, which bears against the head of said stud and against a washer, 17, engaging the surface of

the bore 3 of the column. The inclination of the sides of the notches 12 is such, however, that said notch-sides act as wedges to force back the lock-bolt when the turret is turned and the bolt is lowered; said retracting device, therefore, is not indispensable.

To assure a perfect fit of the lock-bolt in the mortise 14 of the column, in some cases I make a milling cut, 18, Fig. 5, in one side of the bolt and place therein a shoe, as 19 which is fitted for free movement in said cut to permit the face 36 thereof to come into perfect engagement with the corresponding face 35 of the mortise 14 of the column, as illustrated in Fig. 2.

I have not shown any means for rotating the turret, but any one of the well-known turret-rotating devices may be employed to perform this work, or the turret may be turned by hand, after the manner now followed in the case of some turret-lathes already in use.

Having thus described my invention, I claim—

1. The improved turret-locking mechanism herein described, consisting of an expansible turret-carrying column divided or slotted transversely on diverging lines substantially as described, a turret revolubly supported upon said column and having a series of lock-notches formed in the inner face thereof, a column-expanding wedge or lock-bolt interposed between the adjacent ends of the slotted or divided column and having a portion or projection adapted for entering said notches in the turret, and means for imparting a longitudinal movement to said lock-bolt, substantially as and for the purpose described.

2. In a turret-mechanism, the combination of an expansible turret-carrying column divided or slotted transversely on radial lines and inclined width-wise at adjacent ends substantially as described, a turret revolubly supported upon said column and having a series of notches formed therein adjacent to said column, a locking-bolt or wedge of a cross-sectional shape coinciding, substantially, with the slot in the column and having a transversely projecting portion to fit a notch in the turret, a clamp or cap bearing upon the turret at each side of the column, and a lock-bolt actuator bearing against said clamp and adapted for imparting a longitudinal movement to said bolt and simultaneously moving said bolt transversely into engagement with one of the notches of the turret and expanding the column, substantially as and for the purpose described.

3. The turret-carrying column slotted longitudinally on one side thereof and having the adjacent faces of its ends oppositely inclined, in combination with a turret revolubly supported upon said column and having notches formed in its inner face adjacent to said column, a lock-bolt interposed between the adjacent ends of said column and adapted for longitudinal and transverse movement to simultaneously expand the column, and engage and lock the turret with relation thereto, a bolt-actuator, a cap interposed between the actuator and turret, and a spring interposed between said cap and lock-bolt, substantially as and for the purpose described.

4. The improved turret-locking mechanism herein described, consisting of a tubular turret-carrying column divided or mortised transversely on radial lines and oppositely inclined width-wise at adjacent ends, a turret revolubly supported upon said column and having a series of radially disposed notches formed in its inner face substantially as described, a wedge-shaped lock-bolt fitted for longitudinal and transverse movement between the ends of the turret-column and having a projecting stem screw-threaded at its outer end, a cap fixed to the column and bearing at its end upon the turret, a lock-bolt actuator engaging the stem of the bolt, and bearing upon said cap, and adapted for simultaneously moving the lock-bolt longitudinally to expand the wedge, and transversely to engage and lock the turret against rotary movement, and longitudinally and transversely retracting devices in direct connection with said lock-bolt, substantially as and for the purpose described.

5. The combination with the tubular turret-supporting column mortised or divided transversely with the adjacent faces of said mortise oppositely inclined, of a turret revolubly supported upon said column, a lock-bolt constructed to fit said mortise and adapted for longitudinal and transverse movement therein and having a binding shoe loosely supported in one side thereof substantially as described, a cap secured to said column and bearing upon the turret, a lock-bolt-actuator, a spring interposed between the cap and lock-bolt and adapted to impart a return movement to the bolt when the actuator is released, and a transversely retracting device consisting of a stud secured to the lock-bolt and having a head at its outer end, a washer bearing against the inner face of the turret-supporting column, and a spring interposed between said head and washer, all constructed substantially as and for the purpose set forth.

6. The combination with a tubular turret-carrying column, mortised or divided transversely on radial lines with its adjacent ends oppositely inclined width-wise or vertical, of a turret revolubly supported upon said column and having radially disposed notches upon its inner face, a wedge fitting said mortise and having its side-faces inclined to correspond to the inclination of the adjacent ends of the column and having a projecting screw-threaded stem and a transverse projection to fit the notches of the turret, a clamp or cap bearing upon the turret at each side the column, a wedge-actuator engaging the screw-threaded stem of the wedge and adapted to move said wedge longitudinally to expand the column, and at the same time force the said wedge outward

transversely into engagement with a notch of the turret, a spiral spring surrounding the stem of, and interposed between the wedge and cap for imparting a longitudinal retractive movement to said wedge, and means for unlocking the bolt with relation to the turret, consisting of a retracting spring mounted upon a stud fixed to one side of said bolt, and adapted for imparting a transverse movement to said bolt during its descent, substantially as and for the purpose described.

FRANCIS H. RICHARDS.

Witnesses:
JOHN L. EDWARDS, Jr.,
FRED. J. DOLE.