

UNITED STATES PATENT OFFICE.

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DRAWING-IN SPINDLE FOR HEAD-STOCKS.

SPECIFICATION forming part of Letters Patent No. 545,312, dated August 27, 1895.

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To all whom it may concern:

Be it known that I, EDWARD RIVETT, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Drawing-
5 In Spindles for Head-Stocks, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of a drawing-in spindle for lathe head-
10 stocks by means of which the chuck can be readily adjusted to the proper size to receive the article to be turned and maintained in adjustment, the chuck being opened or closed
15 by a suitable device during the running of the lathe.

By means of this invention the chuck can be adjusted to the article to be turned and each time the clutch will be opened to the
20 same extent, so that no time or labor is wasted in again closing the chuck nor in opening it too little or too much. When turning a series of similar articles, for all of which one setting of the chuck is sufficient, a very great
25 saving of time and labor is thus effected, particularly as the operator can open and close the chuck without altering the adjustment or stopping the lathe.

In accordance therewith my invention consists in the combination, with a tubular chuck-
30 spindle, a drawing-in spindle journaled therein, and a chuck connected and adjusted by rotation of the said drawing-in spindle, of independent means to positively lock the latter
35 from rotation in the chuck-spindle and devices to clamp and unclamp the chuck, substantially as will be described.

Other features of my invention will be hereinafter described, and particularly pointed
40 out in the claims.

Figure 1 represents a central longitudinal section of a lathe head-stock embodying my invention, and Fig. 2 is a similar detail view
45 taken on a horizontal plane through the drawing-in spindle to show the locking mechanism.

The head-stock A, having front and rear bearings A¹ and A², respectively, and containing tapering bearing-sleeves a¹ and a², the tubular chuck-spindle B, having the tapered
50 or conical forward end B¹ to enter the sleeve a¹, and the cone-pulley B², secured to the chuck-spindle by a suitable set-screw B^x, are

and may be substantially of usual and well-known construction.

The front end of the pulley B² is recessed 55 to receive therein a nut a³, threaded onto the chuck-spindle at a⁴ and bearing preferably against a loose collar or washer a⁵, interposed between it and the inner end of the tapering sleeve a¹. Rotation of the nut a³ to the left, 60 Fig. 1, forces the said sleeve into the bearing A¹ and takes up wear of the bearing parts from time to time, besides aiding to prevent longitudinal movement of the chuck-spindle B. 65

A tapering sleeve a² in the bearing A² surrounds the chuck-spindle, and is held in position and adjusted to take up wear by an adjusting-nut a⁶, threaded onto the end of the sleeve at a⁷ and resting against the inner side 70 of the bearing.

A slitted expansible chuck D, having the usual conical or tapering outer end d, adapted to fit in a correspondingly-shaped recess b in the forward end of the chuck-spindle B, is 75 prevented from rotation therein by a stop-pin b', extended through a hole in the tapering portion of the chuck-spindle and projecting in a longitudinal groove d' in the chuck, all as in the usual manner common to devices 80 of this class.

The inner end of the chuck is exteriorly threaded at d² to be engaged by the interiorly-threaded end of the tubular drawing-in spindle E, journaled in the chuck-spindle B, 85 for regulating the effective opening of the chuck D, rotation of the drawing-in spindle in one or the other direction by a hand-wheel E', secured to its rear end, moving the chuck in or out in its tapering recess in the chuck- 90 spindle.

A locking device is provided for maintaining the adjusted effective opening of the chuck when unclamped, said device consisting, essentially, of a collar f, surrounding the 95 drawing-in spindle between the hub e^x of the hand-wheel and the rear end of the chuck-spindle B. Ears e on the hub e^x have pivoted thereto levers e', cam-shaped at e² to bear against the hub and having toes e³ to 100 enter and bear against the inner ends of slots f' in the collar f. The levers e' are controlled by a cone-sleeve g, having an annular groove g', pins or projections h' (see dotted lines,

Fig. 1,) on an operating-lever *h* entering said groove to move the sleeve *g* into full or dotted line position, to thereby clamp or release the chuck D, the said lever *h* being pivoted at *h*² to a bracket *h*³ on the head-stock.

By referring to the drawings, Fig. 1, it will be seen that when the parts are in full-line position the levers *e'* will, through their cam portions *e*² and toes *e*³, act to force the drawing-in spindle E to the right, drawing in the chuck D and clamping it, the collar *f* bearing against the rear end of the chuck-spindle B. When the operating-handle *h* is moved into dotted-line position, the levers *e'* will permit the drawing-in spindle to be moved into the chuck-spindle, releasing the chuck.

To prevent the drawing-in spindle from rotating within the chuck-spindle and thereby altering the adjustment of the chuck D, I have devised means to lock the collar *f* to the chuck-spindle, and, as herein shown, I have provided the end of said spindle with a series of holes *b*⁵, Figs. 1 and 2, any one of which is adapted to be entered by a locking-pin *f*², longitudinally movable in a hole in the collar *f*, the collar being slotted at *f*³ to receive a spring *s*, acting against the inner end of the pin *f*² to normally project it. The pin is upturned at *f*⁴ to form a finger-piece, by which it can be withdrawn from engagement with the chuck-spindle B.

When the drawing-in spindle E has been turned to adjust the chuck D to the proper opening when unclamped, the locking-pin *f*² is permitted to enter one of the holes *b*⁵ in the chuck-spindle, so that it and the collar *f* must rotate together, and no movement of the operating-handle *h* to clamp or unclamp the chuck will release the locking-pin. When the work is clamped in the chuck, the locking-pin *f*² is relieved from shearing strain by the levers *e'*, which at such time rigidly clamp the collar *f'* between the end of the chuck-spindle and the hub of the hand-wheel E'.

So far as I am aware it is broadly new to provide means for locking the drawing-in spindle in adjusted position and to clamp and unclamp the chuck without interfering with or altering such adjustment; and my invention is therefore not restricted to the exact construction and arrangement herein shown

nor to the particular locking mechanism shown, for the same may be modified or rearranged without departing from the spirit and scope of my invention.

I claim—

1. The combination with a tubular chuck-spindle, a drawing-in spindle journaled therein, and a chuck connected to and adjusted by rotation of said drawing-in spindle, of independent means to positively lock the latter from rotation in the chuck-spindle, and devices to clamp and unclamp the chuck, substantially as described.

2. A tubular chuck-spindle, a drawing-in spindle journaled therein, and a chuck adjusted by rotation of the drawing-in spindle, combined with means to lock said spindles together and maintain the adjustment of the chuck, clamping devices carried by the chuck-spindle to open or close the chuck, and an actuator to control said clamping devices, substantially as described.

3. A tubular chuck-spindle, a drawing-in spindle journaled therein, and a chuck adjusted by rotation of the drawing-in spindle, combined with a collar on and rotatable with the drawing-in spindle adjacent the rear end of the chuck-spindle, a locking device to lock said collar and chuck-spindle together, and means to clamp the chuck and relieve the locking device from torsional strain, substantially as described.

4. A tubular chuck-spindle, a drawing-in spindle journaled therein, and a chuck connected to and adjusted by rotation of the drawing-in spindle, combined with a collar rotatable with said drawing-in spindle and adjacent the rear end of the chuck-spindle, and a locking pin on one to enter one of a series of holes in the other, to lock the collar and chuck-spindle together, to thereby prevent independent rotation of the drawing-in spindle, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD RIVETT.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.