A. F. CUSHMAN.

Lathe-Chuck.

No. 200,261 Patented Feb. 12, 1878.

Fig. 1.

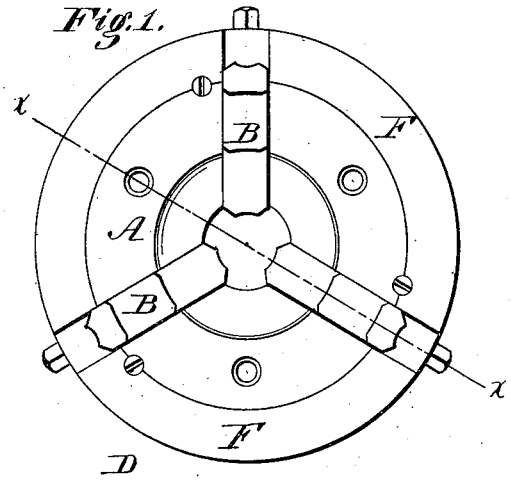


Fig. 2.

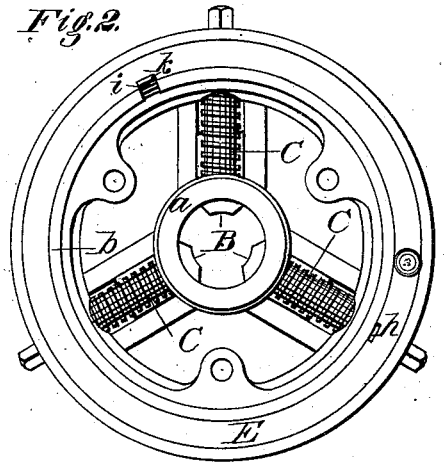


Fig. 3.

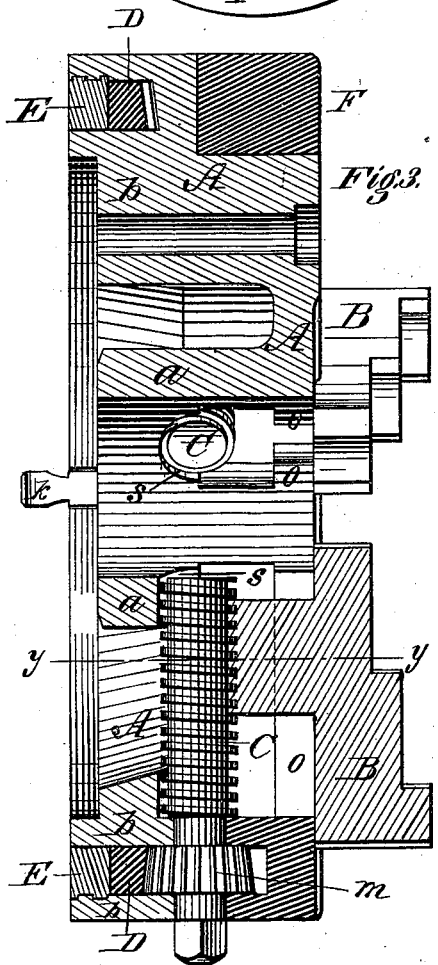


Fig. 4.

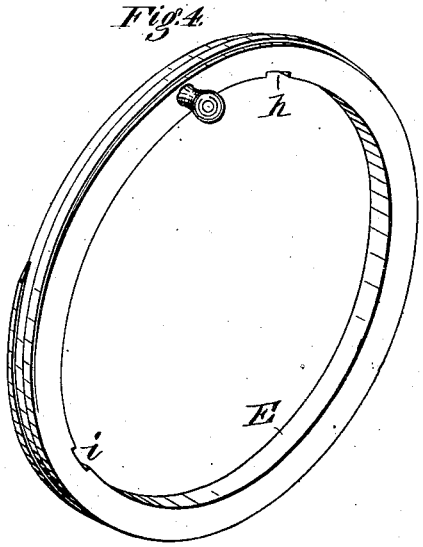
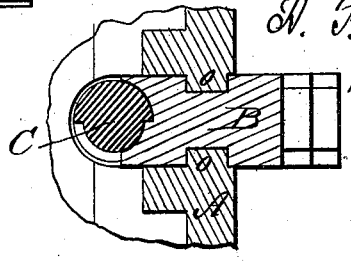


Fig. 5.



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AUSTIN F. CUSHMAN, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN LATHE-CHUCKS.

Specification forming part of Letters Patent No. **200,261**, dated February 12, 1878; application filed July 24, 1877.

To all whom it may concern:

Be it known that I, A. F. CUSHMAN, of Hartford, in the county of Hartford and State of Connecticut, have invented certain Improvements in Lathe-Chucks, of which the following is a specification:

This invention relates to that class of chucks in which sliding jaws are mounted in a radially-slotted body and moved by screws, which latter are provided with pinions and driven by a ring-gear; and the improvement consists in the peculiar construction of the body as a whole, and in minor details thereof, in the construction and arrangement of the screws, and in the manner of locking the ring-gear, as hereinafter fully described.

In the drawings, Figure 1 represents a face view of my improved device; Fig. 2, a rear view of the same; Fig. 3, a section on the line *x x* of Fig. 1; Fig. 4, a perspective view of the follower-ring which throws and holds the ring-gear up against the pinions of the jaw-screws; and Fig. 5, a cross-section on the line *y y* of Fig. 3.

In constructing my improved chuck, I cast a strong metal body, A, which is hollowed out or recessed on the back, as represented in Figs. 2 and 3, thus forming two concentric portions, *a* and *b*, joined on their front face, as shown in Fig. 3.

As represented in Figs. 1 and 3, the body A is reduced in diameter from about midway between its front and rear faces forward, the reduced portion being provided with slots or passages to receive and guide the sliding jaws B, and the rear portion having an annular groove or recess formed in its rear face to receive the ring-gear D and its controlling-ring E, which will be described further on. Directly in rear of each of the sliding jaws B, of which there are usually three, I place a large screw, C, which, engaging with threads on the rear of the jaws, serves to move the same in or out as the screws are turned. Each screw C is provided near its outer end with a pinion, *m*, each placed so as to extend back into the groove or recess which contains the ring-gear D, the body A being cut through at these points for that purpose.

The screws C have their shanks slightly reduced each side of the pinions *m*, and fitted in semicircular bearings in the outer portion *b* of the body A, their inner ends being supported in semicircular notches or seats *s* in the central portion *a* of the same, as shown in Fig. 3.

It will be observed, however, that the inner ends of the screws C are not reduced, but that the thread extends clear to the end of the shank in each, and that they bear with their threads against the seat or bearing *s* at this point.

The screws with their pinions *m* being placed as described, ring F is placed on the reduced portion of the body A, as shown in Figs. 1 and 3, said ring being provided with recesses, into which the pinions *m* extend, and with semicircular notches opposite each screw C, which, fitting over the shanks of the same, complete their bearings.

It will be seen that when thus arranged the screws C are held firmly against end movement, but are free to turn in their bearings.

The jaws B are made of the form shown in Fig. 3, the portion which extends into the body of the chuck, and which is provided with threads to engage with those of the operating-screws C, being shorter than their outer or face portion, and sufficiently short to be dropped into the central opening of the chuck, one at a time, until the grooves with which the sides of the jaws are provided, as usual, come in line with their guiding ribs or ways *o*. As each jaw is placed in this position, its controlling-screw C is turned, drawing the jaw back into its slot. The jaws are thus brought to their proper positions one at a time, and may be adjusted back and forth independently by turning their operating or controlling screws.

As previously stated, the pinions *m* extend a short distance into the groove or recess which contains the ring-gear D, so that when the latter is pressed forward and its teeth caused to mesh with those of the pinions *m*, the turning of one of the screws C, with its pinion *m*, will cause the others to turn simultaneously through the action of the ring-gear D.

In order to allow the chuck to be used either as a universal or an independent jaw-chuck, it is necessary to provide means for throwing the ring-gear D into and out of gear

with the pinions *m*. For this purpose I provide a follower or controlling-ring, E, which is placed in the groove or recess directly in rear of the ring-gear D, as shown in Fig. 3, and is provided on its periphery with a screw-thread, as represented more clearly in Fig. 4. This thread engages with a corresponding thread formed in the body of the chuck, in the wall of the recess, in which the ring E is placed, as shown in Fig. 3, so that by turning the ring E to the right or left it is thrown in or out. When thrown in, its front face, coming against the rear face of the ring-gear D, crowds the latter forward, causing its teeth to mesh with those of the pinions *m*, when, as before stated, the turning of any one of the operating-screws C will cause the simultaneous movement of the others, and consequently the simultaneous and uniform movement of all the jaws.

When the ring E is turned back, the ring-gear D will be thrown back out of gear with the pinions *m* by the turning of any of the screws C, thus leaving the jaws free to be adjusted independently.

For the purpose of retaining the controlling or follower ring D in either position to which it may be adjusted, it is furnished on its interior with two notches, *h* and *i*, into one of which a spring-arm, *k*, engages at the end of either movement, thus locking it in the position to which it is turned.

When it is desired to move or turn the ring E, the spring-arm K is drawn back out of the notch, when the ring is free to turn.

It is apparent that, if desired, the ring-gear D may be connected with the controlling ring or follower E, in such manner that it shall be drawn back therewith; but this is not deemed important.

For the purpose of better supporting the sliding jaws B, and preventing the breakage of the same at the narrow grooved portion between the ribs or ways *o*, the face of the chuck is slightly recessed to receive the same, as represented in Figs. 1 and 5, thus leaving solid shoulders, against which the sides of the jaw bear, thus greatly assisting the jaws in overcoming the strain brought upon them in heavy work; and for the purpose of guiding the jaws in placing them in the body A, the face of the chuck is recessed for a short distance, all around the central opening, as shown in Fig. 1, to the same depth as at the points just mentioned, so that when the threaded extension of the jaw is dropped into the central opening the ends of the jaw shall lap over onto the opposite sides of said opening, and thus regulate the depth to which they drop. By this arrangement the jaws may be quickly brought to their proper places. The jaws B are made reversible, end for end, as represented in Fig. 3, so as to utilize the different series of short shoulders on one face for flat and thin work, or the long bearing afforded by the opposite end for cylindrical work.

The exterior ring F limits the movement of the jaws B from the center, thus avoiding the chance of running them beyond the ends of the screws, the short threaded portion allowing them to move a long distance back, however, before coming in contact with the same.

The jaws can only be removed one at a time, as when moved toward the center together they meet and can move no farther; hence there is no danger of the jaws moving too far in that direction. When it is desired to remove the jaws, they are thrown out from the center, and then, one at a time, moved toward the center and removed.

The jaws B, bearing upon the screws C, prevent the inner ends of the same from rising up out of their seats or bearings.

In use, the chuck is secured to a face-plate by means of bolts or screws, which closes up the back of the chuck, leaving no place at which chips or dirt can enter.

Having thus described my invention, what I claim is—

1. In combination with the threaded ring E, applied and operating as shown, the spring *k*.

2. The chuck-body A, with the jaw-guides and the screw-bearings in its front, the whole made in one piece, as shown, in combination with the ring F, applied in the manner and for the purpose shown and described.

3. In a lathe-chuck having sliding jaws, the radial screws C, mounted in bearings at their outer ends, and having their inner threaded ends seated in open bearings, in combination with the jaws provided with the threaded necks, substantially as and for the purpose described.

4. In combination with the sliding jaws, provided with the short threaded neck on the back, the slotted body A, having its face recessed to form shoulders at the sides of the jaws, and also recessed around the central opening, as and for the purpose described.

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