

(No Model.)

C. HOPKINS & C. E. VAN NORMAN.

LATHE CHUCK.

No. 301,466.

Patented July 1, 1884.

Fig. 1.

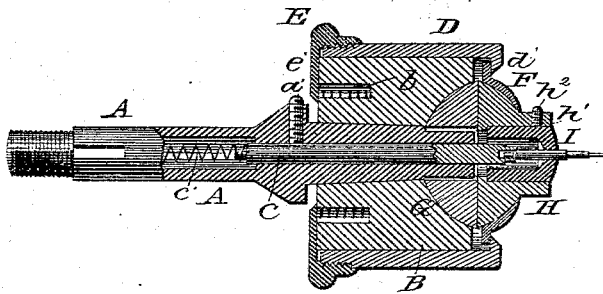


Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Witnesses:

Owen W. Page  
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Inventor:

Caleb Hopkins  
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# UNITED STATES PATENT OFFICE.

CALEB HOPKINS AND CHARLES E. VAN NORMAN, OF WALTHAM, MASS.

## LATHE-CHUCK.

SPECIFICATION forming part of Letters Patent No. 301,466, dated July 1, 1884.

Application filed March 8, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, CALEB HOPKINS and CHARLES E. VAN NORMAN, citizens of the United States, residing at Waltham, in the county of Middlesex and State of Massachusetts, have jointly invented new and useful Improvements in Lathe-Chucks, of which the following is a specification.

Our invention relates to improvements in lathe-chucks for holding work to accurate center in turning-lathes; and the objects of our invention are, first, to provide means for a combination rocking and sliding movement sufficiently sensitive to adapt it in its operation to the most delicate watch-work, and, second, to provide means by which work in the chuck can be readily and accurately centered at both ends by a single operation, and then be fastened rigidly to place by a single nut at the back of the chuck. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of the several parts in combination as when in use. Fig. 2 represents a segment of a ball with a hole through its center. Fig. 3 represents a segment of a ball corresponding to Fig. 2, but with a cylindrical projection rising from its highest part, with a longitudinal hole through its center. Fig. 4 is a perspective view of a longitudinally-slotted supplementary chuck. Fig. 5 is a back or under side view of a concavo-convex cap with a hole through its center and a flat level rim extending around its periphery.

Similar letters refer to similar parts throughout the several views.

The plug-chuck A and the body B, fitted to it, constitute the foundation parts of our invention, and to these all the other parts are attached.

In detail, the several parts are constructed and combined as follows: The plug-chuck A, with elongated forward end to receive and hold the chuck-head B, and to be used like the ordinary split chuck in a hollow-spindle lathe, is made with a longitudinal bore through its center, to which is fitted the pump-center rod C, which is acted upon and thrown forward by a spiral spring,  $c'$ , but may be fastened

rigidly to desired position by means of a set-screw. In the central part of the face of the body B is formed a concave recess of size and depth to receive the segment of ball G, the depth of the recess being so graduated as not to allow the flat face of the segment of ball G to sink quite as low as the face of the body B, and the hole through the center of the segment of ball G being sufficiently large to allow of requisite rocking movement of the part G without it coming in contact with the forward end of the plug-chuck or of the pump-center rod. Over the outside of the body B is placed a sleeve, D, with inner flange,  $d'$ , at its forward end, and with a nut, E, with broad inner flange,  $e'$ , screwed onto its back end, and within a recess,  $b'$ , in the back of the body B is placed a spiral spring, which, pressing outward against the flange  $e'$  of the nut E, creates a continuous backward draw upon the sleeve D. The segment of ball H, with hollow cylindrical projection  $h'$ , is placed face to face on the segment of ball G, in which position it is held by the cap F, the flat level rim of which, somewhat smaller in diameter than the diameter of the body B, extends under the flange  $d'$  of the sleeve D, the backward draw of the sleeve D serving to keep the cap F pressed down on the segment H, but allowing freedom of lateral movement within circumscribed limits, both of the cap F and the segment H. The segment H slides on the face of the segment G, and carries the cap F with it, the flat rim of which slides under the flange  $d'$  of the sleeve D, but not touching the face of the body B. Thus it will be seen that while the segment H and the cap F slide together laterally in unison the segment G does not slide laterally at all, but does rock in unison with any rocking movement of the segment H, and in this way we secure the desired combination rocking and sliding movements of sufficient sensitiveness of movement to adapt them to even the most delicate watch-work, and yet of sufficient strength and rigidity when the parts are bound together by tightening the nut E to meet all the requirements of heavier work.

The supplementary chuck I (represented more clearly in Fig. 4) is a cylindrical piece with longitudinal hole through its center, and

slitted longitudinally from end to end, the slit extending inward from one side through the center hole, and sufficiently past it to allow of the two parts thus nearly bisected being readily compressed by external pressure, and thus made to grip and hold firmly any thing of proper size placed within the center hole. The place for this supplementary chuck is within the bore in the cylindrical part *h'* of the segment H, as shown in the section view, Fig. 1, the screw *h'* serving both to fasten the supplementary chuck in its place, and also to compress its parts when tightening work in it. To adapt it to short pieces of work, the back end of the supplementary chuck I may be counterbored from the back, as represented in section view, Fig. 1, to allow of the pump-center C entering it far enough to reach the back end of the work to be operated upon, and to adapt them to work of different sizes any desired number of these supplementary chucks may be furnished with each chuck.

In use, the first step is to loosen the set-screw *a'*, so as to give freedom to the pump center C and allow it to be thrown forward into the counterbore in the back end of supplementary chuck I. The work to be operated upon is then placed in the supplementary chuck I, with its back end resting in the end of the pump-center C, which has been suitably countersunk for this purpose, and fastened there by tightening the set-screw *h'*. The nut E having been previously loosened, the work is then spun to center at its outer end, the combination rocking and sliding movements of the parts G, H, and F readily admitting of this, while at the same time the back end is held steadily to center by the countersink in the end of the pump-center, and thus, as will be seen, the work may be accurately centered at both ends by a single operation, and then by tightening the set-screw *a'* and the nut E all the parts of the chuck may be bound rigidly together, and the work thus retained firmly in centered position.

We are aware that previous to our inven-

tion adjustable chucks have been made that embodied in part the principles embraced in our present invention, a patent for such a chuck having been granted to Caleb Hopkins, one of the present applicants for a patent, October 10, 1880; but in our present invention we not only employ different means for securing the combination rocking and sliding movements covered by the patented invention above referred to, but add a third and important combination—namely, that of a back spring-center; and while we prefer to use these three combinations in the way described in this specification, we do not wish to limit ourselves thereto, inasmuch as a spring-center such as herein described may be successfully used in combination with the form of sliding jaws and knuckle-joint described in the patent to Caleb Hopkins, before referred to, and possibly in other forms of combination sliding jaws and knuckle or ball-and-socket joint. Therefore,

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a lathe-chuck, of the spring-center C with the plug-chuck A, the chuck-body B, the sleeve D, and the binding-nut E, substantially as described.

2. The combination, in a lathe-chuck, of the segments of ball G and H with the body B, the cap F, the sleeve D, and the nut E, substantially as described.

3. The lathe-chuck herein described, consisting of the following-named parts in combination: the plug-chuck A, with set-screw *a'*, the pump or spring center C, the body B, the segments G and H, with set-screw *h'* in part *h'* of the segment H, the supplementary chuck I, the cap F, the sleeve D, the nut E, and the spiral spring C', or its equivalent, all substantially as described.

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Witnesses:

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