A. FRENCH.

Chuck for Watch Makers' Lathes.

No. 237,105. **Patented Feb. 1, 1881.**

Fig. 1

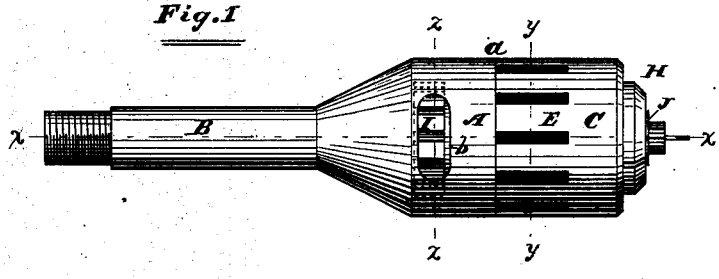


Fig. 2

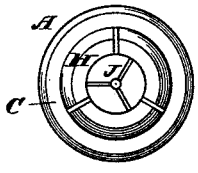


Fig. 3

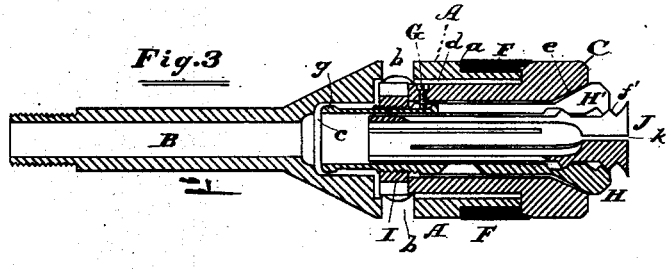


Fig. 4

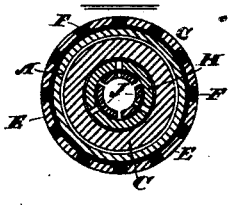


Fig. 6

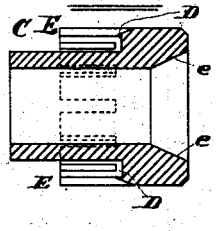


Fig. 7

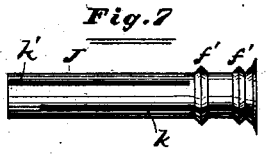


Fig. 5

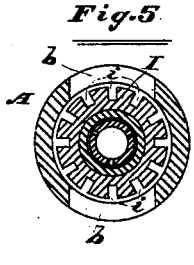
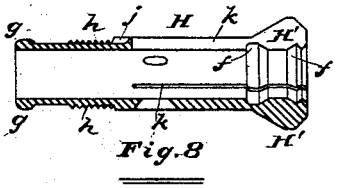


Fig. 8



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UNITED STATES PATENT OFFICE.

AUGUSTUS FRENCH, OF CHICAGO, ILLINOIS.

CHUCK FOR WATCH-MAKERS' LATHES.

SPECIFICATION forming part of Letters Patent No. 237,105, dated February 1, 1881.

Application filed January 27, 1880.

To all whom it may concern:

Be it known that I, AUGUSTUS FRENCH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Chucks for Watch-Maker's Lathes, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1 is a side elevation of a lathe-chuck embodying my invention; Fig. 2, an end view thereof; Fig. 3, a section in the plane of the line *x x* of Fig. 1; Fig. 4, a section in the plane of the line *y y* of Fig. 1; Fig. 5, a section in the plane of the line *z z* of Fig. 1; Fig. 6, a vertical central longitudinal section of the forward part of the case or shell of the chuck; Fig. 7, a side view of the inner or sub chuck, and Fig. 8 a vertical central longitudinal section of the outer spring-jaws.

Like letters of reference indicate like parts.

A represents the rear part of the shell or case of the chuck, and *a* is a shoulder near the forward end of this part of the shell. The part A is hollow, and *b b* are slots therein. A deep socket or recess, *c*, exists in the rear end of the part A.

B is a stem or spindle extending from the rear end of the part A.

C is the forward part of the shell or case of the chuck. The part C is also hollow or tubular, and is sufficiently slender to pass quite freely or loosely into the forward end of the part A, so as to leave a slight space between these two parts, as indicated at *d*, Fig. 3. The forward inner edge of the part C is chamfered, so that the outer end or mouth of the said part will be flaring, as shown at *e*. A collar or shoulder, D, is also made on the forward end of the part C.

E E are extensions projecting rearward from the shoulder D. When the parts A and C are arranged together the forward end of the part A nearly strikes the face of the shoulder D, and the rear ends of the extensions E E nearly strike the face of the shoulder *a*, and a considerable space exists between the part A and the under faces of the extensions E E, as indicated in Figs. 3 and 4. A considerable space also exists between the extensions E E. The parts A and C are connected by means of cement arranged underneath the extensions E E, as shown at F.

G is a screw or pin entering the part C.

H is a split-chuck, and *f f* are annular beveled grooves sunken in the inner faces of the jaws H′ H′ of the chuck H. The outer faces of these jaws are flaring, as usual, and the chuck is adapted to enter the part C of the shell or case, and is long enough to also enter the socket or recess *c* when the chuck is in position for work.

On the rear end of the cluck H is a rounded enlargement, *g*, made to nicely fit the socket *c*, or nicely enough to prevent the rear end of the chuck from being moved laterally in the said recess, but not fitting too closely to prevent a slight wabbling movement of the outer end of the chuck, and not preventing the easy insertion and removal of the chuck. I term the part *g* a "back-center," and the socket or recess *c* I term the "back-center bearing."

It will be observed that the chuck H may be moved back and forth in the socket or recess *c*, and that the enlargement or rib *g* will always have a bearing against the horizontal part of the wall inclosing the said recess. By this means the said chuck, wherever set, will have a back-center bearing which will admit of the centering of the outer end of the said chuck, it being remembered that this chuck will be drawn farther rearward when the object seized is small than when it is comparatively large. In other words, by employing what may be termed a "sliding back-center," objects of different sizes may be grasped and centered without freeing the cement.

On that part of the chuck H which passes out rearward through the part C, I make a screw-thread, *h*, and I is a nut run upon this screw-threaded part and having notches *i i* made in its perimeter. The chuck H may be secured to the part C by running the nut upon the screw-threaded part after passing the chuck through or into the part C. The chuck may then be either tightened or loosened so as to either contract or expand its jaws, by turning the nut in the proper direction, for the nut bears against the inner end of the part C, and when screwed toward that end tightens the chuck and contracts its jaws, which, however, will expand when the nut is turned in the opposite direction. To prevent the chuck from being turned with the nut, I sink a groove, *j*, longitudinally along the face

of the chuck, and into this groove the screw G enters. When the chuck and the part C thus connected are arranged in the part A, access may be had to the nut I through the slots *b b*, or either thereof. In other respects the chuck H, which I term the "outer chuck," may be constructed in the usual manner.

J is an inner or sub chuck, sufficiently slender to enter the chuck H. Near the outer end of the chuck J are the annular beveled ribs *f' f'*, arranged with relation to the grooves *f f*, as shown in Fig. 3. The chuck J is also a split chuck; but, in addition to the usual splits *k k*, I make the deep splits *k' k'*, entering the rear end of the chuck and extending much beyond the rear ends of the splits *k k*, as is clearly shown in Fig. 7. These splits I term "zigzag" splits. In other respects the chuck J may be made in the usual manner.

The manner of using these parts when they are made and arranged together in the way shown and described is as follows: The object to be operated upon is placed in the chuck J. The yielding jaws may be forced down upon and made to clamp the object tightly by turning the nut I in the proper direction. By making upon the chuck J the two ribs *f' f'*, that chuck has two bearings against the inner face of the chuck H, and hence the inner chuck, by being thus prevented from wabbling, will hold the object steadily or prevent it from wabbling. By making the bearing-faces inclined, in the manner shown and described, the chuck is especially well adapted to hold tapering objects firmly, for as the chuck J is compressed by the chuck H, the chuck J will be pushed forward, and as it moves forward the inner or most rearward rib, *f'*, will be pushed down, and hence the tapering or smaller part of the object will be more confined than if the forward end merely of the inner chuck should be contracted. Whether the object be either straight or tapering, it will be firmly seized and held, owing to either some or all of the provisions above described as intended for that purpose. After the object is thus firmly seized it may be easily centered by warming the cement cushion F until it is yielding by rotating the mandrel and by holding any suitable object steadily on the outer end of the object in the chuck. As soon as the object in the chuck is properly centered the cement should be allowed to become cold, when all the parts will be held firmly in their proper places, the back-center keeping its proper position always with relation to its bearing, and the remaining parts being sufficiently movable when the cement is yielding to allow the forward end of the object to be brought to a true central position. These results I attain to a great extent, for the reason that the inner chuck is made extremely flexible.

It will be perceived that it is immaterial whether the enlargement *g* be on the chuck H or projects from the recess or socket *c*.

It will also be perceived that the same result will follow if the relative positions of the grooves *f f* and ribs *f' f'* be changed.

It may also be here stated that it is not essential that all the bearing-surfaces between the inner and outer chucks should be inclined or beveled, for it is obvious that if the ribs *f' f'*, for example, be not inclined or beveled they will operate in the manner described in connection with grooves *f f*, having inclined sides, provided the said grooves be sufficiently wide for that purpose.

The spaces between the parts E E serve as slots or perforations to admit of the contraction and expansion of the cement.

What has been hereinbefore stated with reference to the forward movement of the chuck J in the chuck H when the former is compressed by the latter had reference only to the result following such compression when the smaller end of a tapering object was inserted in the chuck J. When such an object is so inserted, and the chuck J is compressed or contracted until it pinches the larger part of the object, the outer rib, *f'*, being over, or nearly over, such larger part, cannot be pressed farther toward the object. In other words, the outer end of the chuck J will be no longer yielding toward the object in it; but, as the object is tapering, and as its smaller end was first inserted, its smaller portion will not be pinched until after its larger part is. The inner rib, *f'*, therefore, may be pressed in toward the smaller part of the object until that part is pinched also by the chuck J. With this explanation, and by reference to Fig. 3, it will be perceived that the chuck J will be pushed slightly forward by tightening the chuck H upon it, owing to the form and arrangement of the ribs *f' f'*, and of the parts against which they are intended to bear, it being understood that the smaller end of a tapering object has been first inserted in the chuck J, and that the inner rib, *f'*, can therefore yield to the chuck H after the outer rib, *f'*, has ceased to yield toward the object. This forward movement of the chuck J will cause it to pinch the tapering end of the object as well as its larger part, and then the forward movement will cease, for it will be resisted by the inner rib, *f'*, which will no longer yield toward the object. Tapering objects may thus be very firmly held. The chuck J will be pushed in the reverse direction or inward if the larger end of a tapering object be first inserted in the chuck J; but if the object be not tapering the chuck J will not be moved longitudinally in the chuck H when the latter is tightened.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a chuck, of the yielding jaws H' H', having therein the recesses or grooves *f f* sunken in their inner faces, and of an inner split chuck having on its outer face the correspondingly-formed ribs *f' f'*, substantially as and for the purposes specified.

2. A chuck wherein two parts are adapted, substantially as described, to be temporarily united by means of a cushion of cement, and in the outer of which parts are the extensions E E, having spaces between and below them to admit of the contraction and expansion of the cement, substantially as and for the purposes specified.

3. The combination, in a chuck, of the deep socket, recess or back-center bearing *c*, and of the longitudinally-adjustable split chuck H, having on its rear end the annular rib or back center *g*, adapted to fit into the said socket or recess *c*, and bear against the wall thereof during the adjustment longitudinally of the chuck H, substantially as and for the purposes specified.

4. The combination, in a chuck, of the hollow cylindrical part A, having therein the slots *b b*, the hollow removable part C, the screw-threaded chuck H, having therein the groove *j*, the screw G, and the serrated nut I, substantially as and for the purposes specified.

5. The combination, in a chuck, of the hollow cylindrical part A and the hollow removable cylindrical part C, the latter adapted to enter the part A freely or loosely, and having thereon the rearward extension E E, forming a space between the parts A and C for the reception of cement, and keeping the cement from contact with the working parts of the chuck, substantially as and for the purposes specified.

AUGUSTUS FRENCH.

Witnesses:
F. F. WARNER,
W. S. BAKER.