S. T. Jackson.

Lathe Chuck.

No. 50,593. Patented Oct. 24, 1865.

Fig. 1.

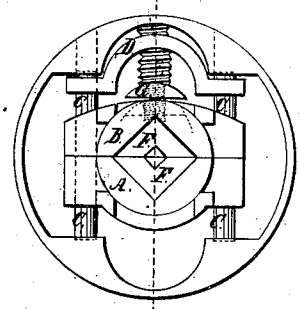


Fig. 2.

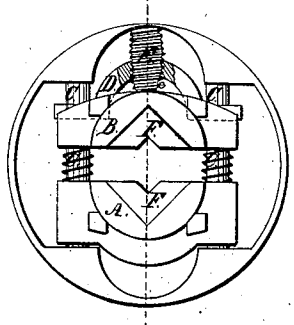


Fig. 5.

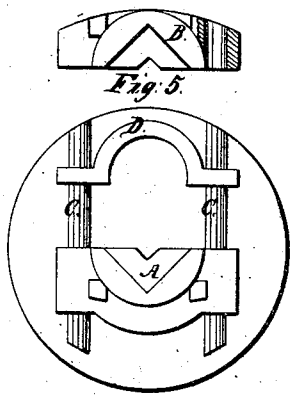


Fig. 3.

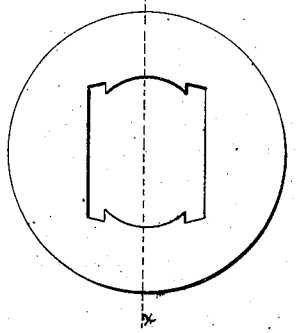
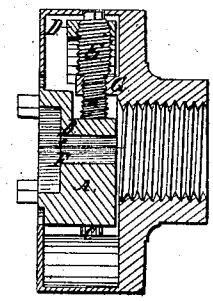


Fig. 4.



Witnesses:

Jas. S. Hallowell.

Robt. L. Brown.

Inventor:

S. T. Jackson

by R. D. O. Smith
atty.

UNITED STATES PATENT OFFICE.

SILAS T. JACKSON, OF SHEBOYGAN FALLS, WISCONSIN.

SELF-CENTERING CHUCK.

Specification forming part of Letters Patent No. **50,593**, dated October 24, 1865.

To all whom it may concern:

Be it known that I, SILAS T. JACKSON, of Sheboygan Falls, in the county of Sheboygan and State of Wisconsin, have invented a new and useful Improvement in Self-Centering Chucks; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my chuck, the front plate being removed, showing the jaws closed. Fig. 2 is a plan view of the same, showing the jaws open. Fig. 3 is the front plate, showing the opening therein. Fig. 4 is a vertical section on the line *x x*. Fig. 5 shows the jaws detached.

My invention belongs to that class of chucks which are constructed with screws for the purpose of operating the jaws; and its nature consists in such a construction as shall enable me with a double screw, the pitch of one being just half the pitch of the other, to operate the jaws simultaneously in opposite directions, so that they will approach or recede from the center at equal speeds, thereby forming a self-centering mechanism of very simple and inexpensive yet effective form.

That others may understand its construction and operation, I will particularly describe it.

A, Fig. 5, is the lower, and B is the upper, jaw. The lower jaw, A, is securely attached to the guide-rods C C, and these latter are inserted through proper holes in the jaw B, so that the latter jaw may have a free motion back and forth upon said rods. The yoke D then connects the upper ends of the rods C C, and it is by means of this yoke that the rods are drawn back and forth and communicate motion to the jaw A.

At the center of the yoke D a nut is formed for the screw E, which, passing through said nut, rests at its lower end upon the upper side of the upper jaw, B, so that it is evident, if the screw E be run through the nut in the yoke D, it will cause the jaw B to descend upon the jaw A, or they will be forcibly drawn together, clasping and holding firmly whatever happens to be inclosed between them.

Springs or equivalent devices should be placed between the jaws, so that when the pressure of the screw is relaxed they will move away from each other automatically. This function of the parts already described is too common and well known to require further setting forth here.

It is now required that I should describe the peculiar arrangement by which the jaws A and B should be retained always equidistant from a certain fixed point which is coincident with the axis of the mandrel to which the chuck is to be attached.

In order to accomplish the objects for which a chuck is designed, it is, of course, necessary that the working parts should be attached permanently to some rigid body, which, in turn, may be attached to the lathe or other engine. A suitable shell or frame-work is therefore provided having the requisite means of attachment to the turning-engine. This shell or frame is also provided with proper bearings for the guide-rods C C, so arranged that as the rods slip in their bearings the center points or notches, F, of the jaws will move always in a line passing over the axial point before spoken of. This is not difficult of execution. It now becomes necessary to cause the jaws to recede from or to approach this axial point through the operation of turning the single screw E. I therefore reduce somewhat the size of the bolt upon which the threads of the screw E are formed, and upon that reduced portion I form the threads of the screw *e*. The pitches of these two screws should be exactly as one to two, the pitch of E being just double the pitch of *e*. A nut, G, fitted to the screw *e*, is made, and is firmly and rigidly attached to the shell or frame of the chuck, and when the parts are in place, the jaws firmly screwed together and exactly central to the axial point before mentioned, the lower end of the rod upon which these two screws are formed should bear upon the upper side of the jaw, B, and the nut G should be up very near to the shoulder formed at the junction of the two screws, (see Figs. 1 and 4,) and there should be as much space below it for the jaw B to ascend as there is above it for the yoke D and jaw A to descend. It will now be perceived that if the screw E be turned backward the screw *e* will rise through the nut G and the jaw B will follow it. If, now, the screw E was in pitch exactly equal to the screw *e*, the yoke D and jaw A

would remain stationary; but the pitch of E is just double the pitch of *e*, and therefore, while during one revolution the screw *e* has traversed in its nut a certain distance, the yoke D has traversed on the screw E twice that distance, and has been obliged to descend while its screw rises. It is therefore apparent that the movement of the yoke D and jaw A upon its screw E is just double the movement of the jaw B; but it is also apparent that just one-half of said movement of the yoke D and jaw A is absorbed by the lateral movement of the screw E itself, so that the actual descent of the jaw A is exactly equal to the ascent of the jaw B. The reversion of the movement of the screw operates the jaws in the opposite direction, but does not change the character of their movement. The screw E may in practice be turned by a key, crank, or any other device suitable or convenient in view of the special construction or adaptation of my implement.

The proportions of the relative parts of my invention are not represented in the drawings with accuracy, though I think they clearly represent the peculiarities of its construction and the principle upon which it acts. The details of its construction may be greatly varied to adapt it to the various positions or kinds of work with which it is to be used, without altering the principle upon which it acts.

Among the advantages pertaining to this arrangement I may mention cheapness and simplicity of construction, facility of use, and adaptation to special purposes, the accuracy of manufacture without the use of the costly machinery sometimes necessary, and last, though not least, the open center, not possessed, I believe, by any other self-centering screw-chuck, thus allowing small work, as in turning the end of a slender rod to be inserted through the chuck and hollow mandrel of the lathe, so as to grasp the work near the point to be operated upon. The jaws are constructed so as to fit or grasp objects of various sizes.

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

In combination with the movable jaws of a chuck, a differential screw, operating substantially as described, so as to form a self-centering chuck, as set forth.

SILAS T. JACKSON.

Witnesses:

JAMES HANFORD,

CATHARINE M. HANFORD.