(No Model.) 2 Sheets—Sheet 1.

J. EMIG.

CHUCK.

No. 499,377. Patented June 13, 1893.

Fig. 1.

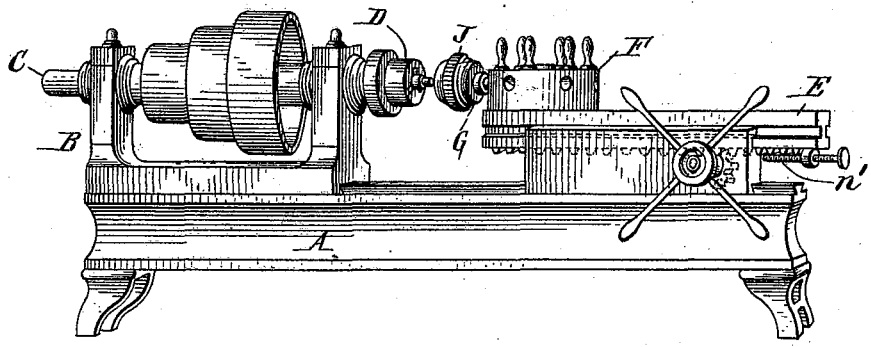


Fig. 2.

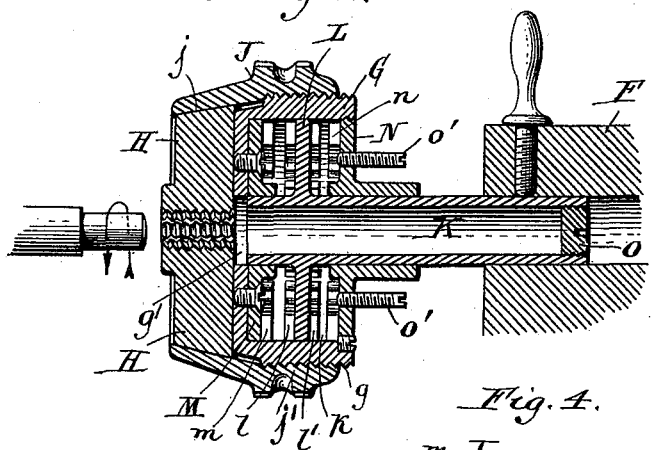


Fig. 3.

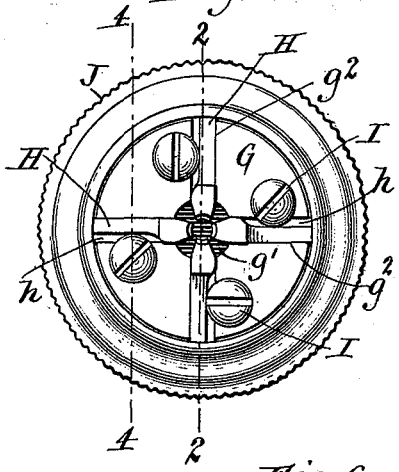


Fig. 4.

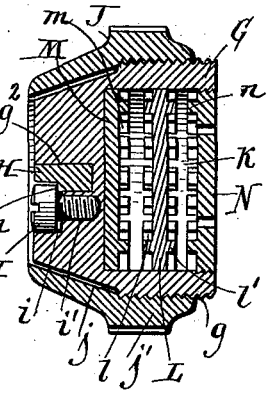


Fig. 5.

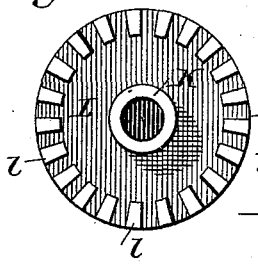


Fig. 6.

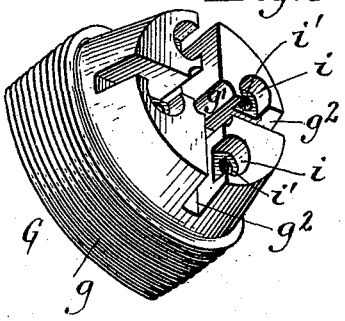
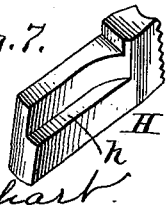


Fig. 7.



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(No Model.) 2 Sheets—Sheet 2

J. EMIG.

CHUCK.

No. 499,377. Patented June 13, 1893.

Fig. 8.

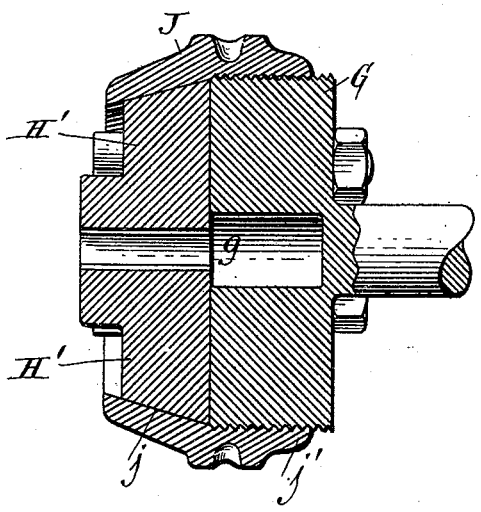


Fig. 9.

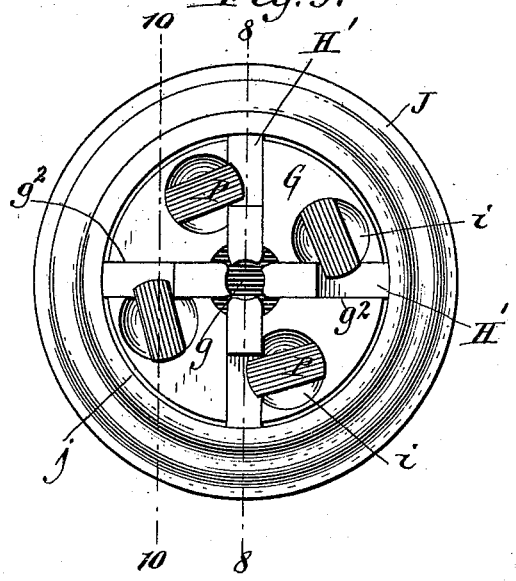


Fig. 10.

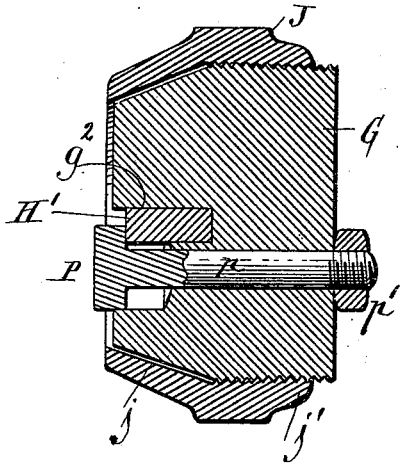
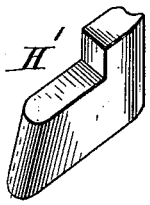


Fig. 11.



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UNITED STATES PATENT OFFICE.

JACOB EMIG, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO EMANUEL V. ABRAMS, OF SAME PLACE.

CHUCK.

SPECIFICATION forming part of Letters Patent No. 499,377, dated June 13, 1893.

Application filed December 15, 1892. Serial No. 455,283. (No model.)

To all whom it may concern:

Be it known that I, JACOB EMIG, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Chucks, of which the following is a specification.

This invention relates to a chuck for holding cutting tools, such as screw threading taps, dies and mills.

The objects of this invention are to improve the means for adjusting and holding the dies and to improve the construction of the clutch whereby the dies are held against rotation when in operation.

In the accompanying drawings consisting of two sheets: Figure 1 is a perspective view of a lathe provided with my improved tool holding chuck. Fig. 2 is a longitudinal section of the chuck and adjacent parts, the section being taken in line 2—2, Fig. 3. Fig. 3 is a front view of the chuck. Fig. 4 is a longitudinal section in line 4—4, Fig. 3. Fig. 5 is a face view of the intermediate clutch disk and its stem. Fig. 6 is a perspective view of the body of the tool chuck. Fig. 7 is a perspective view of one of the screw cutting dies which may be used in connection with my improved chuck. Fig. 8 is a longitudinal section showing a modification of the tool holding chuck, the section being taken in line 8—8, Fig. 9. Fig. 9 is a front view of the same. Fig. 10 is a longitudinal section in line 10—10, Fig. 9. Fig. 11 is a perspective view of a milling tool which may be used in connection with my improved chuck.

Like letters of reference refer to like parts in the several figures.

A represents the bed of a lathe, B the head stock, C the spindle journaled in the head stock and D the blank holding chuck secured to the spindle.

E represents the carriage sliding upon the bed and provided with the usual turret F.

G represents the body of the tool chuck, having the outer side of its front portion tapered forwardly, while its rear portion is cylindrical and provided with an external screw thread g. The body is provided in its face with a central opening g' and four radial ways or grooves g^2 extending from said opening to the outer side of the body.

H represents screw cutting dies arranged in the ways g^2 and having their inner cutting ends extending into the central opening of the body while their outer ends are beveled and extend beyond the outer side of the body. One of the outer longitudinal corners of each die is cut away to form an elongated shoulder h.

I represents clamping screws whereby the dies are secured to the body. The heads of these clamping screws are arranged in sockets i formed in the face of the body and intersecting the ways g^2, while their screw threaded shanks are arranged in threaded openings i' formed in the bottom of the sockets. The heads of the clamping screws overhang the dies and upon tightening the clamping screws their heads bear against the shoulders of the dies and hold the latter firmly in place. By forming elongated shoulders on the dies and sockets in the body it permits the heads of the clamping screws to be counter sunk in rear of the front ends of the dies.

J represents an adjusting sleeve whereby the dies are adjusted. This sleeve is provided at its front end with an internal conical portion j which surrounds the tapering portion of the body and a cylindrical rear portion j' provided with an internal screw thread which engages with the external screw thread of the body. Upon turning the adjusting sleeve, so that it moves rearwardly, the conical portion of the sleeve engages against the projecting outer ends of the dies and moves the latter inwardly toward the center of the body. When the dies are adjusted to the proper position they are secured in place by tightening the clamping screws. The conical sleeve performs only the function of adjusting the dies while the holding of the latter is effected solely by the clamping screws.

Instead of employing screw threading dies, a set of milling tools H′, may be used as represented in Figs. 8, 9, and 11, or if desired a set of gripping dies may be substituted for the screw threading dies for the purpose of holding a screw threading tap.

K represents a stem which supports the tool chuck, and upon which the body has a limited longitudinal movement. This stem is preferably hollow and secured with its rear end to the turret in the usual manner while its front end is arranged in a cavity *k* formed in the rear end of the body. The stem is provided inside of the cavity of the body with an intermediate clutch disk L having annular rows of teeth *l l'*, on its front and rear sides, respectively.

M represents a front clutch disk mounted loosely upon the front end of the stem, and secured to the body in front of the intermediate clutch disk. The front clutch disk is provided with an annular row of teeth *m* on its rear side which are adapted to engage with the front teeth *l* of the intermediate clutch disk upon sliding the body rearwardly on the stem.

N represents a rear clutch disk which is mounted loosely on the stem in rear of the intermediate clutch disk and secured to the rear end of the body. The front side of the rear clutch disk is provided with an annular row of teeth *n* which engage with the rear teeth *l'* of the intermediate clutch disk upon sliding the body forwardly on the stem.

In the inoperative position of the clutch the intermediate clutch disk is arranged midway between the front and rear clutch disks so that it engages with neither, as represented in Fig. 2, which permits the clutch body carrying the tools to revolve freely on the stem.

Upon rotating the blank, and moving the carriage forwardly by hand in the usual manner the carriage and the tool chuck travel forwardly together until the dies on the latter strike the end of the blank when the forward movement of the body and dies, for the time being is arrested and the dies are caused to revolve with the blank by frictional contact. During the continued forward movement of the carriage, the stem slides forwardly in the body and the front teeth of the intermediate clutch disk are engaged with the teeth of the front clutch disk whereby the dies are held against rotation and pressed against the end of the blank thereby causing them to begin cutting a thread upon the end of the blank. The forward feed of the carriage and tool chuck is continued until the thread upon the blank is nearly finished when the forward movement of the carriage is arrested by a stop *n'* commonly employed in lathes of this character. After the forward movement of the carriage has been stopped the cutting dies continue to move forwardly upon the blank owing to the partial thread which has been cut upon the blank, thereby automatically feeding the dies and body forwardly during the last portion of the cutting operation until the teeth of the front clutch disk become disengaged from the front teeth of the intermediate clutch disk when the dies, being no longer held, revolve freely with the blank and the cutting of the thread upon the same ceases. Upon reversing the motion of the finished screw and moving the carriage backwardly the rear teeth of the intermediate clutch disk are brought into engagement with the teeth of the rear clutch disk whereby the dies are held against rotation which causes the reversely rotating finished screw to unscrew itself from the dies. In order to permit both right and left hand screw threads to be cut with the chuck the shoulders on both sides of each tooth in the clutch disks are made abrupt so that the front and rear clutch disks will be held against rotary movement in both directions upon engaging with the teeth of the intermediate clutch disk. The hollow stem supporting the dies permits the finished end of the blank to pass through the chuck thereby enabling a blank of considerable length to be operated upon. The rear end of the hollow stem is preferably closed by a screw plug *o* so as to prevent any metal chips from passing through the stem into the turret and interfering with the operation of the latter.

O' represents set screws arranged in threaded openings formed in the rear clutch disk parallel with the stem. Upon turning these screws so that they bear against the intermediate clutch disk, the front clutch disk is drawn against the intermediate clutch disk so that their teeth interlock which causes the body to be held immovably on the stem and permits the chuck to be used for the purposes of a solid chuck having no clutch mechanism. By employing an intermediate clutch disk having teeth on opposite sides which are adapted to engage with clutch disks in front and in rear of the same a very strong and durable chuck is produced. The chuck is also very compact owing to the arrangement of the clutch mechanism in the cavity of the body.

In Figs. 8, 9, and 10, my improved means of holding the dies is shown applied to a chuck having no clutch mechanism. In this construction the dies are held in place by bolts P bearing with their heads against the dies and having their shanks *p* passing entirely through the body and secured in place by nuts *p'* bearing against the rear side of the body.

I claim as my invention—

1. The combination with the stem and the body of the chuck capable of lengthwise movement on the stem and provided with dies, of an intermediate clutch disk arranged on the stem and provided with teeth on its front and rear sides, a front clutch disk arranged on the body and provided with teeth adapted to engage with the front teeth of the intermediate clutch disk and a rear clutch disk arranged on the body and provided with teeth adapted to engage with the rear teeth of the intermediate clutch disk, substantially as set forth.

2. The combination with the stem and the body of the clutch capable of lengthwise movement on the stem and provided with dies, of an intermediate clutch disk arranged upon

the stem and provided with teeth on its front and rear sides, a front clutch disk secured to the body and provided with teeth adapted to engage with the front teeth of the intermediate clutch disk a rear clutch disk secured to the body and provided with teeth adapted to engage with the rear teeth of the intermediate clutch disk, and a set screw arranged in the rear clutch disk and adapted to bear against the intermediate clutch disk, substantially as set forth.

3. The combination with the hollow stem provided with a clutch disk, of a clutch body capable of lengthwise movement on the stem and provided with a clutch disk adapted to engage with the disk of the stem and with a central opening communicating with the front end of the hollow stem, and dies secured to the body and arranged with their cutting ends in said opening, substantially as set forth.

4. The combination with the body of the chuck provided with a central opening and the dies secured to the body and arranged with their cutting ends in said opening, of a hollow stem supporting the body and having its front end communicating with said opening, and a screw plug closing the rear end of the stem, substantially as set forth.

Witness my hand this 13th day of December, 1892.

JACOB EMIG.

Witnesses:
THEO. L. POPP,
EMANUEL V. ABRAMS.