L. A. CARTER.

CHUCK.

APPLICATION FILED NOV. 25, 1907.

919,536. Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

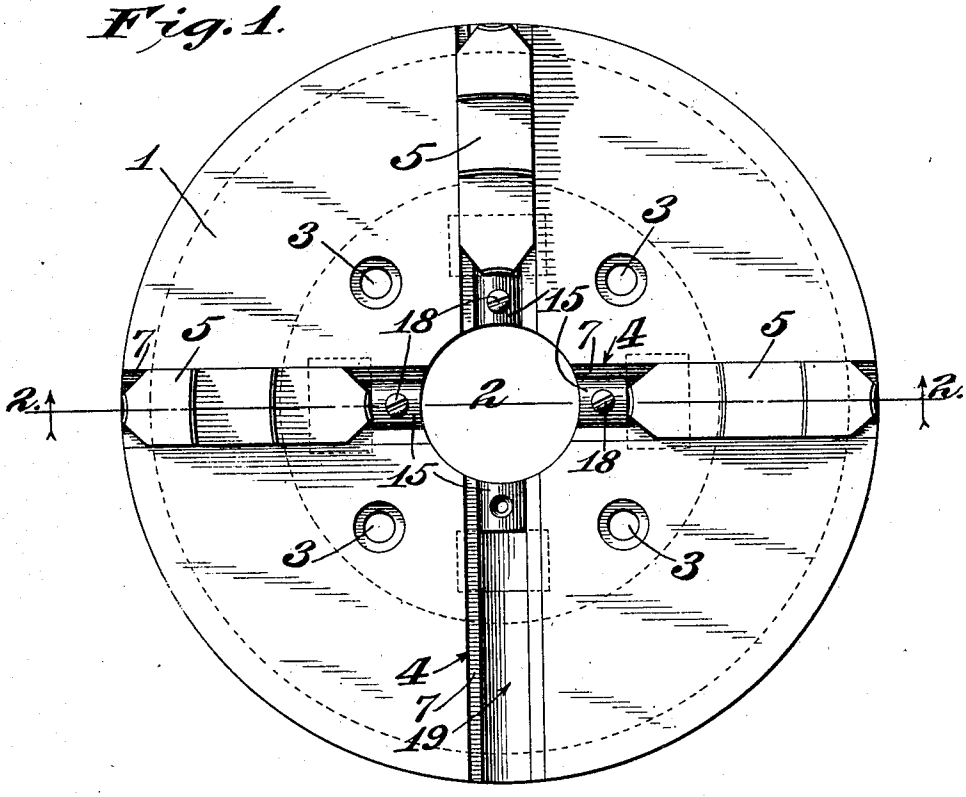
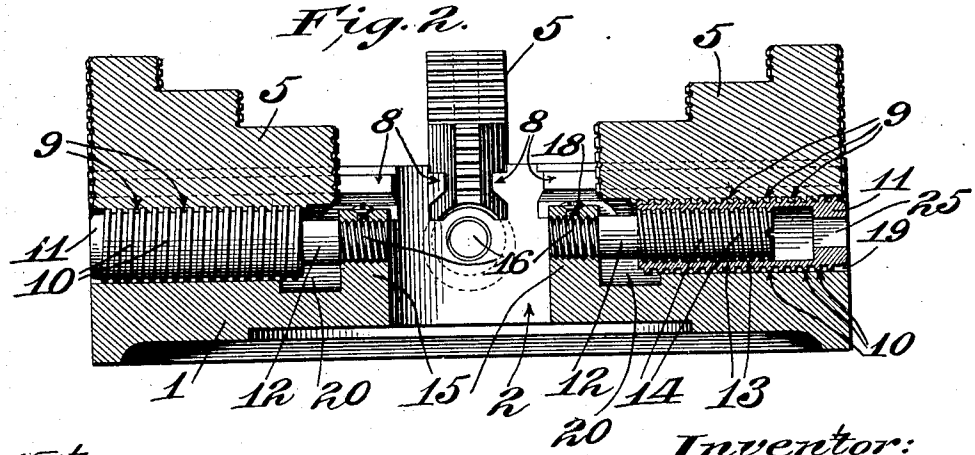


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

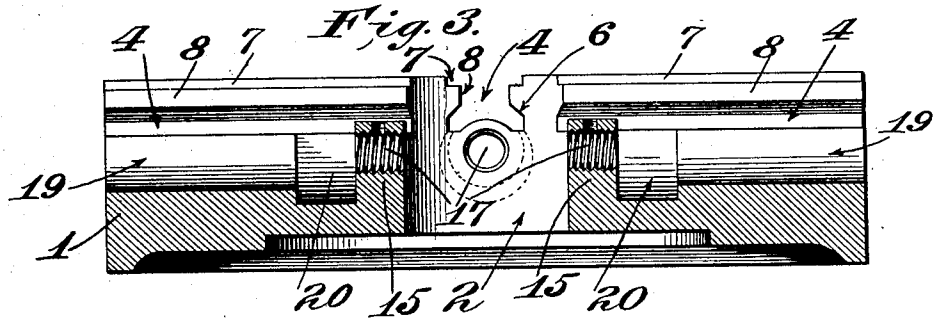


Fig. 4.

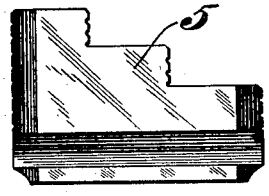


Fig. 5.

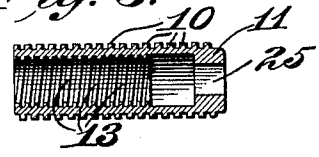


Fig. 6.

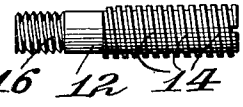


Fig. 7.

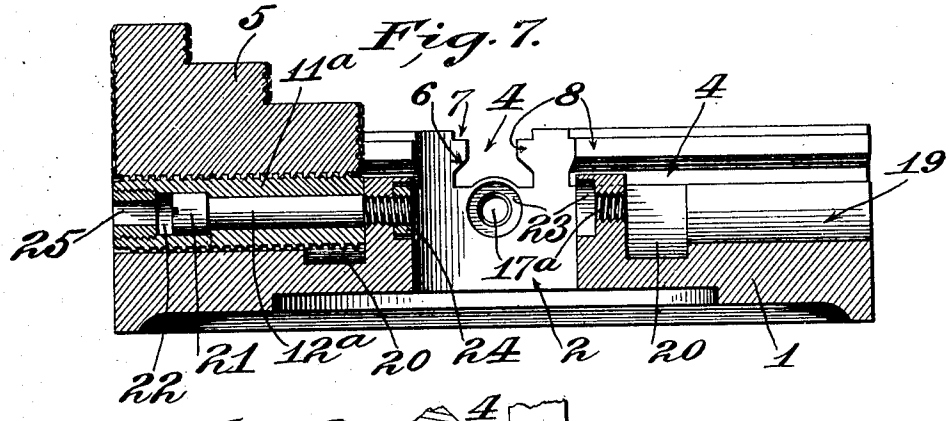
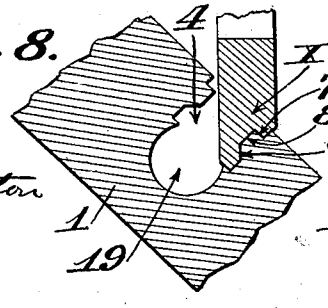


Fig. 8.



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UNITED STATES PATENT OFFICE.

LIONEL A. CARTER, OF ST. LOUIS, MISSOURI.

CHUCK.

No. 919,536. Specification of Letters Patent. Patented April 27, 1909.

Application filed November 25, 1907. Serial No. 403,689.

To all whom it may concern:

Be it known that I, LIONEL A. CARTER, a subject of the King of Great Britain, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Chucks, of which the following is a specification.

This invention relates to chucks and more particularly to lathe chucks.

It has for its principal objects to provide a protected and continuous thrust bearing of greater area for the driving screws; to provide for a greater and unbroken thread engagement between the jaws and their respective driving screws; to provide for an accelerated movement of the jaws; to facilitate the machine operations and economize in the manufacture of the device; to strengthen the structure; and to attain certain advantages hereinafter more fully appearing.

The invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a face view of a chuck embodying my invention, with one of the jaws and associated parts removed; Fig. 2 is a cross-section on the line 2—2 of Fig. 1; Fig. 3 is a cross-section of the body of the chuck, with the working parts removed; Fig. 4 is a side elevation of one of the jaws; Fig. 5 is a longitudinal section of the outer member of a compound driving screw; Fig. 6 is a detail view of the inner thrust member of the driving screw; Fig. 7 is a cross section of a modified construction, with some of the working parts removed; Fig. 8 is a detail sectional view of a part of the body portion showing the cutter in process of forming the side face of a slot.

The chuck comprises a body portion 1. This is preferably a flat circular casting and is provided with the usual central opening 2, and a series of counterbored holes 3 for the usual securing screws. In the outer face of the body 1 are a number of intersecting or radially arranged slots or slideways 4 in which jaws 5 are adapted to work. Preferably, the side faces of the slots are undercut on a bevel as shown at 6. The slots are also countergrooved as at 7, thereby forming longitudinal ribs 8 on each side face of the slots. By beveling the underside of the ribs 8 the same are widest at the base whereby the chuck body is materially strengthened to withstand thrust upon the jaws. This shape also facilitates the accurate cutting of the slots by a single cutter. That is, the slots may be roughly cored or shaped in the body 1 and the body mounted on a pivotal jig or holder on the traveling table of a milling machine at an angle to the vertical plane of the cutter, as diagrammatically shown in Fig. 8. A cut is made lengthwise of a slot 4 to form one side face thereof. The body 1 is then turned a quarter of a revolution and a cut made to form one side face of the next succeeding slot. In this way the body is turned intermittently and the operation of forming one side face of each of the slots is successively performed. For example, in a chuck provided with two intersecting or four radial slots, as shown in Fig. 1, the milling operations are completed upon three quarters of a complete revolution of the body relative to the cutter. A cutter X of the shape illustrated in Fig. 8, completely forms one side face of the slot and it may be resharpened without changing the form or sizes of its cutting faces. Thus a saving in the cost of manufacture of the device is made possible.

The jaws 5 are made with counterpart portions to slidingly fit the slots or slideways 4. The bottom faces of the jaws are continuously concaved crosswise and provided with screw threads 9 substantially the entire length thereof. This concaved threaded portion is adapted to mesh with the threads 10 of a driving screw. The driving screw is preferably a compound screw. The outside member 11 thereof will be hereinafter referred to as the jaw screw and the inside member 12 as the thrust screw. The outside threads 10 of the member 11 are preferably left hand square threads. In this case the inside threads 13 are right hand and preferably square and adapted to fit the right hand threads 14 on the thrust member or screw 12. The thrust screws 12 are secured to lugs 15 on the body at the inner ends of the slots 4. Preferably, the thrust screws 12 are threaded at their inner ends, as at 16, and adapted to be screwed tightly into threaded openings 17 in the lugs 15. The threaded end portions of the thrust screws are secured in position by set screws 18. It is obvious, however, that the thrust member may be attached to the lugs in other desirable ways.

The body portion 1 of the chuck is bored out below the slots 4, as at 19, parallel with

said slots and opening thereinto throughout the length thereof. The bored portions 19 are arranged to receive the jaw screws 11 which are adapted to work loosely therein. At the inner end of the bored portion 19 is a counterbored portion or enlarged pocket 20 adapted to receive chips or grit and prevent the same from working into the screw threads.

By providing a compound screw an accelerated movement of the jaws is accomplished. The spiral or thrust bearing screw 12 provides a continuous circular end thrust bearing of greater area for the jaw screw or driving screw proper 11. This is advantageous over the ordinary thrust bearings which only afford a bearing for a portion of the bearing face of the driving screw at the end or intermediate portion thereof. Furthermore, chips and grit work into the bearings when on the outside of the adjusting screw, and cause undue wear of the parts. In the present device this disadvantage is obviated.

In Fig. 7 a modified construction of the internal thrust bearing is illustrated. In this form the driving screw 11^a is bored axially to receive the thrust bearing stud 12^a. This stud is provided with a head 21 at one end which is adapted to fit in a counterbored seat 22 in the driving screw 11^a. The opposite end of the stud is preferably screw threaded similarly to the thrust screw 12. In this case, however, the set screw 18 is dispensed with, and in lieu thereof the threaded seat 17^a for the stud is counterbored as at 23 to receive a lock nut 24. The end thrusts of the driving screws are received by the lugs 15 and heads 21, and any wear of the parts may be readily taken up by adjusting the thrust bearing stud 12^a in its seat 17^a. Obviously, the driving screws are provided with squared sockets 25 at their outer ends to receive a counterpart portion of a manipulating key.

Obviously, the device may be modified and arranged in various ways without departing from the nature and principle of my invention, and, therefore, I do not wish to be limited to the exact construction and arrangement shown.

What I claim as my invention and desire to secure by Letters Patent is:

1. A chuck comprising a body member provided with radial slideways, jaws slidably mounted therein, the under sides of said jaws being screw threaded lengthwise thereof, an externally-threaded driving screw member mounted longitudinally of each of said slideways with its threads in engagement with the threads on its companion jaw, each of said driving screw members being bored axially and formed internally to coöperate with a thrust bearing member, and thrust bearing members fixedly secured at one end to said body member and each having a counterpart portion movably fitted in the axial bore of its coöperating driving screw member.

2. A chuck comprising a body member provided with radial slideways having cylindrically bored bottom portions, jaws slidably mounted in said slideways above said cylindrically bored portions and having their bottom sides screw-threaded, an externally threaded driving screw mounted in said cylindrically bored portion of each of said slideways in engagement with the threaded portion of the jaw therein, each of said driving screws being bored axially and formed internally to coöperate with a thrust bearing member, and thrust bearing members fixedly secured at one end to said body member and each having a counterpart portion movably fitted in the axial bore of its coöperating driving screw member.

3. A chuck comprising a body member, a jaw slidably mounted thereon, a driving screw arranged to actuate said jaw, said driving screw having an internally screw-threaded bore, and a thrust screw secured to said body member and fitted to the internally screw-threaded bore of said driving screw.

4. A chuck comprising a body member, a jaw slidably mounted thereon, said jaw having its underside screw threaded, a driving screw arranged to coöperate with said screw-threaded portion to actuate said jaw, said driving screw having an internally screw-threaded bore, and a screw-threaded thrust bearing secured to said body member and fitted to the internally screw-threaded bore of said driving screw, the internal screw-threads of said driving screw being reverse to the external threads.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 19th day of November, 1907, at St. Louis, Missouri.

LIONEL A. CARTER.

Witnesses:
G. A. PENNINGTON,
W. R. COLCORD.