

D. WEIR.
CHUCK.
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1,022,166.

Patented Apr. 2, 1912

Fig. 1

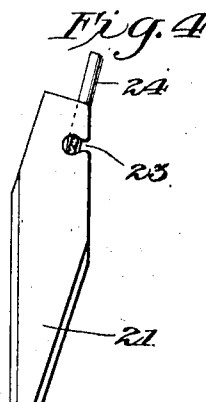
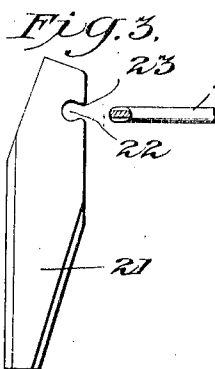
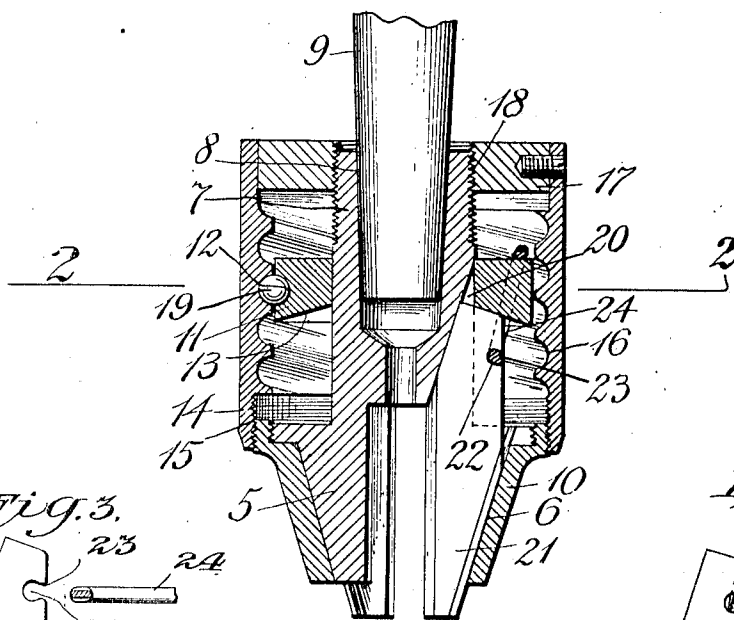
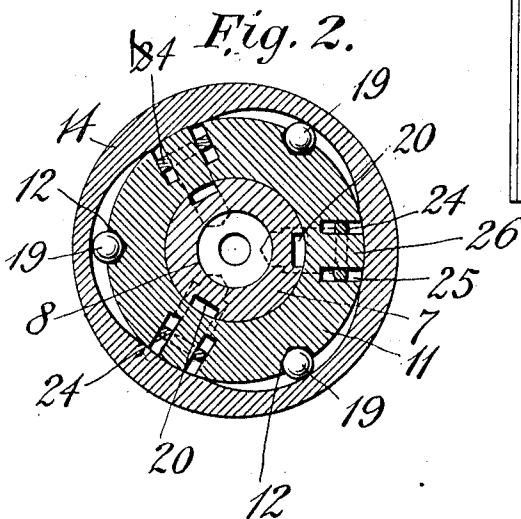


Fig. 2.



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CHUCK.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID WEIR, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented a new and Improved Chuck, of which the following is a specification.

My invention relates to the class of devices specified, and the object of the invention is to provide a device of this class having numerous novel features of advantage and utility.

A device in the use of which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a view in central longitudinal section of the device. Fig. 2 is a view in cross-section on the line 2—2 of Fig. 1. Fig. 3 is a detail view of one of the jaws and a portion of a link in position for engagement with the jaw. Fig. 4 is a like view but showing the link in its locked normal position.

In the accompanying drawings the numeral 5 denotes the body of the chuck having slots 6 at its outer end and a reduced portion or neck 7 at the opposite end, the latter of which has an opening 8 for the reception of a spindle 9. The spindle may be tapered as shown in the drawings to engage the tapered opening 8 as is usual in this form of device. A cap 10 is secured to the body in any suitable manner, inter-engaging screw threads on the two parts being employed in the structure shown herein. A carrier ring 11 is mounted to slide freely along the neck 7, this ring having in its outer surface recesses 12 and on its under surface a jaw seat 13. A sleeve 14 is mounted upon the body, being threaded as at 15 at its lower end to engage an intermeshing thread upon the cap 10. The sleeve is provided on its inner surface with a coarse thread or spiral 16. A collar 17 is secured within the end of the sleeve opposite the cap 10 and this collar is threaded on its inner surface to engage a thread 18 on the neck 7. Balls 19 are located in the recesses 12, projecting from the recesses in position to engage the threads or spirals 16.

The body 5 has lengthwise tapered grooves 20 within which jaws 21 move longitudinally. These jaws have openings 22 for the reception of links 24. Extending from the openings 22 to the edge of the jaws are

passages 23 slightly less in width than the diameter of the opening 22. The links 24 are preferably of frame form having side bars and end bars, each end bar engaging an opening 22 being of less dimension one way than it is the other so that in one position the end bar of the link may enter the passage 23 as shown in Fig. 3 and when turned to the position shown in Figs. 1 and 4 of the drawings the larger dimension of the end bar will be located across the passage 23, thus preventing disengagement of the parts. The ring 11 has slots 25 projecting inward from its edge, these slots being arranged in pairs providing lugs 26 over which the links 24 are hooked, these lugs being suitably located with reference to the jaws 21.

While the above is a description of the preferred form of construction of my improved chuck which is as shown herein, this construction may be departed from to a considerable extent and yet embody the invention as set forth in the appended claims. Among such changes it may be noted that the cap 10 may be secured to the body 5 in any suitable manner and the collar 17 may be secured to the sleeve 14 in any suitable manner or may in fact be an integral part thereof. The thread or spiral 16 may be of such number as may be desired and they may also be fine or coarse, that is there may be a greater or lesser number of threads to a unit of length. In any event this thread will be of such inclination as to provide for an extremely quick feeding movement of the jaws, a sufficiently quick feeding movement being obtained when the inclination of the thread is such as to be insufficient to resist the pressure ordinarily applied axially of the body in the normal operation of the chuck.

In the structure herein shown the spiral or coarse thread is a right hand thread while the threads upon the collar 17 and outer end of the sleeve 14 are left hand threads. The results herein gained however may be secured in any construction in which the threads upon the collar 17 and outer end of the sleeve 14 are different in character from the thread upon the interior of the sleeve, this difference in character being either in pitch or in the direction in which the thread extends.

While a ball 19 has been shown as the

interengaging medium between the carrier ring 11 and the coarse thread on the interior of the sleeve, yet any other means for interengaging these parts may be employed.

In the operation of the device the sleeve 5 being turned to the right, as is common in devices of this class, the right hand thread on the interior of the sleeve will cause the carrier ring 11 to be moved downward, the spindle 9, of course, being held against rotation. At the same time this rotation of 10 the sleeve will carry it downward upon the neck 7 and also upon the cap 10, the movement of the sleeve however being much slower than that of the ring. This movement of the carrier ring closes the jaws together, as upon the spindle of a drill or like tool, and when the jaws are seated against the shank of such tool a further turning 15 movement of the sleeve by reason of the interengaging fine threads upon the collar 17 and shank 7 and also upon the outer end of the sleeve and cap 10 enables a tighter grip to be obtained for the reason that the ring having been seated the rotation of 20 the sleeve now tends to carry the latter upward. A certain looseness between the parts enables the sleeve to be moved slightly upward, which movement, however, is opposed by the fine threads 15 and 18, which, 25 by reason of their slight inclination and increased power resulting therefrom enables the jaws to be tightly seated and held by said fine threads, thus locking the parts 30 firmly against a relative movement which would tend to loosen the drill. The coarse steep thread on the sleeve however will enable the latter to be turned easily in the opposite direction to disengage or loosen the 35 jaws. The function of the coarse thread being purely that of a feeding thread I have termed it a feeding thread, and the function of the fine thread 18 being purely that of a tightening and holding thread I 40 have applied such terms thereto.

I claim:—

1. A chuck body, a carrier ring mounted thereon, a sleeve mounted upon the body, an 45 interengaging feeding thread connecting said sleeve with one of said members and of a pitch insufficient to hold the parts against relative rotary movement by reason of ordinary pressure exerted longitudinally of the body in the operation of the 50 chuck, a locking thread connecting said sleeve with the other of said members and of a pitch sufficient to hold the parts against rotary movement by reason of pressure exerted lengthwise of the body, jaws carried 55 by the carrier ring and means engaging the jaws to close them together.

2. A chuck body, a carrier ring mounted thereon, jaws carried by said ring, a sleeve 60 mounted upon the body, a feeding thread connecting the carrier ring and sleeve, said

thread being of a pitch insufficient to hold the sleeve from rotary movement by reason of ordinary pressure exerted axially thereof in the operation of the chuck, a locking thread between the sleeve and body and of a pitch 70 sufficient to hold the parts against rotary movement by reason of pressure exerted axially of the structure, and means for closing the jaws together.

3. A body part, a carrier ring slidable 75 along the body part, jaws carried by said ring, a sleeve mounted upon the body part and having a coarse, quick feeding thread engaging said ring and of a pitch insufficient to prevent rotation of the sleeve by reason of ordinary pressure exerted axially thereof in the operation of the chuck, and a 80 locking thread upon the sleeve engaging a thread upon the body part and of a pitch sufficient to hold the sleeve against rotary movement by reason of pressure exerted 85 axially of the structure, and means engaging the jaws to separate and close them.

4. A body part, a carrier ring mounted thereon, jaws carried by said ring, a sleeve 90 mounted upon the body and having an interthread, jaws carried by said ring, a sleeve and carrier ring, said sleeve also having on its inner surface a tightening and holding thread to oppose the action of the feeding 95 thread, and means engaging the jaws to close them.

5. A body part, a carrier ring mounted thereon, jaws carried by said ring, a sleeve 100 mounted upon the body and entirely inclosing the upper portion thereof, said sleeve having on its inner surface a feeding thread connecting it with the carrier ring and said sleeve also carrying on its inner surface a 105 tightening and holding thread constructed to oppose the action of the feeding thread, and means engaging the jaws to close them.

6. A body part, a carrier ring slidable along the body part and having recesses in its edge, jaws carried by said ring, a sleeve 110 having a spirally arranged groove, a ball located in a recess in the ring and engaging said groove, a thread between the body part and sleeve, said thread being formed to cause a different rate of movement between 115 the sleeve and body part than is caused by said groove between the sleeve and ring, and means engaging the jaws to close them.

7. A body part, a carrier ring slidable along the body part, a sleeve mounted on the 120 body part and connected with said ring to impart a sliding movement thereto, jaws mounted to move longitudinally in the body part, and links to unite the jaws and ring, one of said parts having a recess with a narrow 125 entrance thereto and the other an engaging part narrower in one direction than in another, the narrow dimension being such as to permit passage through the narrow entrance, said links being constructed to en- 130

gage the jaws in one position and to be locked thereto when in engagement with said ring.

8. A body part, jaws mounted to move
5 longitudinally thereof and having link recesses with narrow entrances thereto, a carrier ring slidable longitudinally of the body part, links having an end bar of two dimensions one dimension permitting insertion of
10 the bar through said narrow entrance and the other dimension locking the bar against movement through said narrow entrance, said links connecting the jaws and ring, a sleeve mounted upon the body part to move

the carrier ring, and means engaging the 15 jaws to open or close them.

9. A body part, jaws mounted to move longitudinally thereof, a carrier ring slidable longitudinally of the body part, a sleeve mounted upon the body part and having a 20 feeding groove, a ball located in said groove and in a recess in said ring, and tightening and holding threads between the sleeve and body part.

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