

V. J. WAHLSTROM.
CHUCK.
APPLICATION FILED JUNE 5, 1911.

1,026,187.

Patented May 14, 1912.

Fig 1.

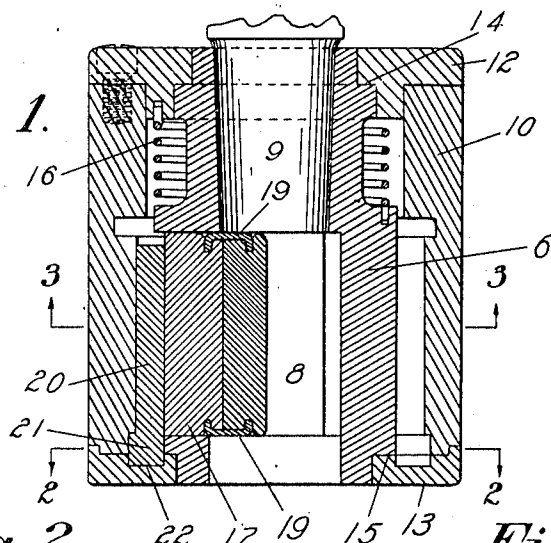


Fig 2.

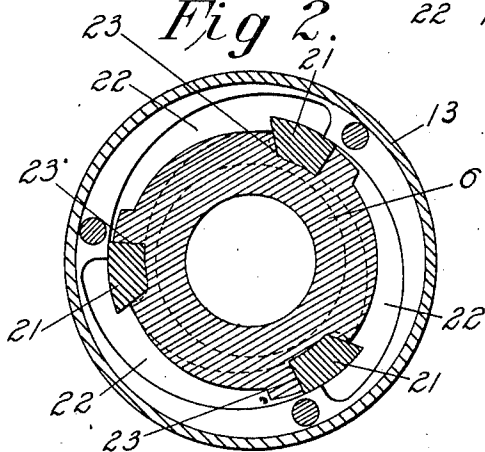


Fig 3.

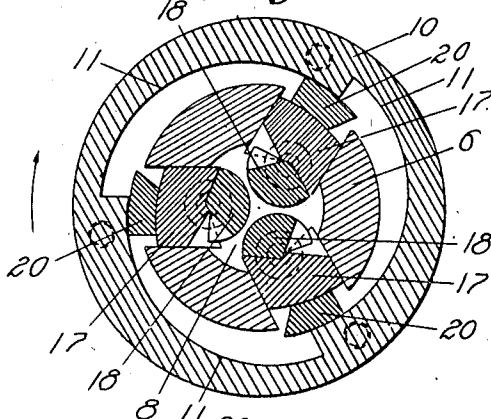


Fig 4.

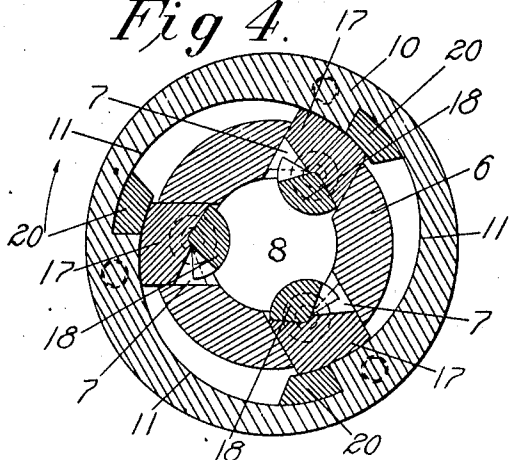
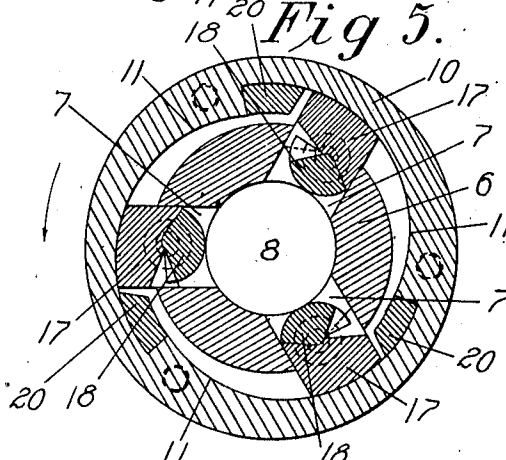


Fig 5.



Attest

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CHUCK.

1,026,187.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, VERNER J. WAHLSTROM, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Chucks, of which the following is a specification.

This invention relates to an improvement in chucks, and has for its main object the production of a device of this character capable of acting in connection with a greater number of different sized drills or other tools than has been heretofore possible.

Another object of the present invention is the production of a chuck having jaws movable toward its axis, cam surfaces for producing a movement of the jaw, means interposed between the jaws and cam surfaces to space the jaws from the surfaces, and means for moving the spacing means from between the jaws and cam surfaces to permit the surfaces to act directly upon the jaws, whereby a wide range of jaw movement is effected without increasing the eccentricity of the cam surfaces.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like characters of reference indicate the same or like parts, Figure 1 is a central sectional view of a device constructed in accordance with the invention, Fig. 2 is a sectional view taken on the line 2—2 in Fig. 1, and Figs. 3, 4 and 5 are sectional views taken on the line 3—3 in Fig. 1 and showing the parts in different positions.

In the device selected to illustrate the invention, there is provided a body 6 having three radial slots 7 cut through its walls and opening into a central aperture 8 adapted to receive a tool shank. The body is further provided with a shank 9, driven or otherwise fastened therein, for the purpose of attaching the device to a drill press or other machine tool. The device is further provided with an annular shell 10 surrounding the body, and rotatable thereon. This shell is provided with three internal cam surfaces 11, and is held in position by means

of two caps 12 and 13, screwed or otherwise fastened to the shell 10. These caps 12 and 13 engage respectively rabbets 14 and 15 formed on the body 6 and prevent a relative longitudinal movement of the shell and body. A spring 16 is coiled around the body within the shell, one end being fast to the body and the other to the shell, as indicated in Fig. 1.

For the purpose of clamping a tool in the central aperture 8, there are provided a plurality of jaws 17 working in the slots 7. Each of the jaws 17 carries a rocking gripper 18 which is pivotally mounted on the inner side of the jaw and held in position by means of annular caps 19. The outer end of each jaw has substantially the same curvature as the internal cam faces 11 before referred to.

That portion of the device so far described is old and well known in the art, and a more detailed description of its construction is deemed unnecessary to a full understanding of the present invention, and is therefore omitted in the interest of brevity.

It is very desirable that a chuck be adapted to accommodate as many different sizes of drills or other tools as possible. In chucks of the type shown herein, it is not advisable to increase the eccentricity of the internal cam surfaces 11, because if this is done there is danger of the jaw slipping and failing to operate effectively. In the present invention, there is employed what may be termed spacing means, this means serving the purpose of spacing the jaws 17 from the cam surfaces 11 during a part of the rotating movement of the shell 10. This part of the movement of the shell 10 is sufficient to permit a movement of the jaws equal to the eccentricity of the cam surfaces. It has been found that, by removing the spacing means from between the jaws and cam surfaces at the end of the partial movement above referred to, a further throw of the jaws can be obtained by bringing the jaws and surfaces into direct contact during the second part of the rotating movement of the shell. To this end, there are provided a plurality of spacing blocks 20 normally lying between the jaws 17 and the internal cam surfaces 11. Each of these blocks is provided with an enlarged head 21 tracking in a groove or channel

22 formed in the cap 13 and corresponding in eccentricity to the internal cam surfaces 11. While not essential in all constructions; as shown, the inner and outer faces of the spacing blocks 20 have substantially the same curvature as the cam surfaces 11, so that a wide bearing surface is provided. Means are provided for retaining the blocks in line with the jaws during the first part of the rotating movement of the shell 10. As shown, this means consists of a series of recesses 23 formed in the body 6.

The normal position of the jaws and blocks is shown in Fig. 3. When the shell is rotated in the direction of the arrow, the jaws are free to move to the position shown in Fig. 4. During this movement the blocks 20 are moved outwardly by the eccentricity of the channels 22 engaging the heads 21 of the blocks, but the blocks are retained in line with the jaws by engagement with the walls of the recesses 23. When the jaws and blocks are in the position shown in Fig. 4, the blocks are free from the recesses and consequently free from the body of the chuck. A further movement of the shell in the direction of the arrow, Fig. 4, permits the jaws to move to the position shown in Fig. 5. During this movement the blocks are removed from between the jaws and cam surfaces and the jaws are in direct contact with said surfaces. A reverse movement of the shell, in the direction of the arrow, Fig. 5, will first bring the parts back to the position shown in Fig. 4. A further movement in the same direction will cause the wide walls of the recesses 23 to pick up or engage the blocks and carry them along in line with the jaws to the position shown in Fig. 3.

Changes and variations may be made in the structure by means of which the invention is carried into effect. The invention, therefore, is not to be restricted to the precise details of the construction of the structure shown and described.

What is claimed is:

1. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, of a plurality of jaws movable within the slots, a shell rotatably mounted on the body and having a plurality of internal cam surfaces, spacing means normally interposed between the jaws and surfaces, and means for moving the spacing means from between the jaws and surfaces.

2. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, of a plurality of jaws movable within the slots, a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, and means

for moving the blocks from between the jaws and surfaces.

3. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, a plurality of jaws movable within the slots, a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, each of the blocks being provided with an enlarged head, and means engaging the heads of the blocks to move them from between the jaws and surfaces.

4. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, a plurality of jaws movable within the slots, a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, means engaging the blocks for retaining the same in line with the jaws during a part of the rotating movement of the shell, and means for moving the blocks out of line with the jaws during another part of the movement of the shell.

5. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, a plurality of jaws movable within the slots, a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, means carried by the body for retaining the blocks in line with the jaws during a part of the movement of the shell, and means for moving the blocks out of line with the jaws during another part of the movement of the shell.

6. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, a plurality of jaws movable within the slots, a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, a plurality of recesses formed in the body and engaging the blocks to retain them in line with the jaws during a part of the movement of the shell, and means for moving the blocks out of line with the jaws during another part of the movement of the shell.

7. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, of a plurality of jaws movable within the slots, a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, means carried by the body for retaining the

blocks in line with the jaws during a part of the movement of the shell, and means carried by the shell for moving the blocks out of line with the jaws during another

5 part of the movement of the shell.

8. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, a plurality of jaws movable within the slots, 10 a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, means carried by the body for retaining the blocks 15 in line with the jaws during a part of the movement of the shell, and a plurality of channels carried by the shell in engagement with the blocks for moving the blocks out of line with the jaws during another part 20 of the movement of the shell.

9. In a chuck, the combination with a body having a central aperture and a plurality of slots opening into the aperture, of a plurality of jaws movable within the slots, 25 a shell rotatably mounted on the body and having a plurality of internal cam surfaces, a plurality of spacing blocks normally lying between the jaws and surfaces, means carried by the body for retaining the blocks 30 in line with the jaws during a part of the movement of the shell, a cap carried by the shell and provided with a plurality of cam channels engaging the blocks to move them out of line with the jaws during another 35 part of the movement of the shell.

10. In a chuck, the combination with a

body having a central aperture and a plurality of slots opening into the aperture, of a plurality of jaws movable within the slots, means for simultaneously moving the jaws, 40 interposed means for normally spacing the jaws from the jaw moving means, and means for moving the spacing means from between the jaws and jaw moving means.

11. In a chuck, the combination with a 45 body having a central aperture and a plurality of slots opening into the aperture, of a plurality of jaws movable within the slots, means for simultaneously moving the jaws, a plurality of spacing blocks normally ly- 50 ing between the jaws and the jaw moving means, and means for moving the blocks from between the jaws and jaw moving means.

12. In a chuck, the combination with a 55 moving member, of a movable member, a spacing member normally lying between the moving and movable members by means of which motion is transmitted from the moving member to the movable member, and 60 means for moving the spacing member from between the moving and movable members to permit the moving member to act directly upon the movable member.

In testimony whereof, I have signed my 65 name to this specification in the presence of two subscribing witnesses.

VERNER J. WAHLSTROM.

Witnesses:

BERNHARD THEODORE BURCHARDI,
J. D. H. BERGEN.