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1,935,645

STOP CHUCK

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FIG. 1

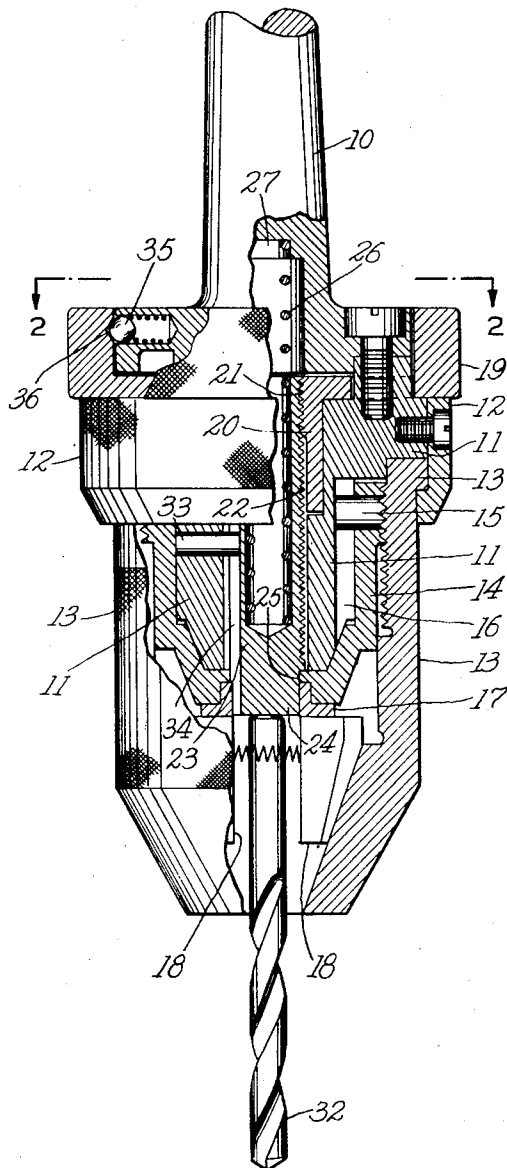


FIG. 2

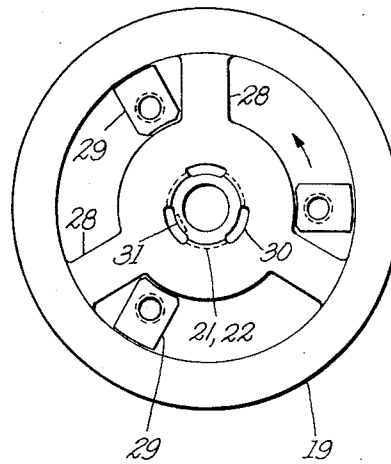
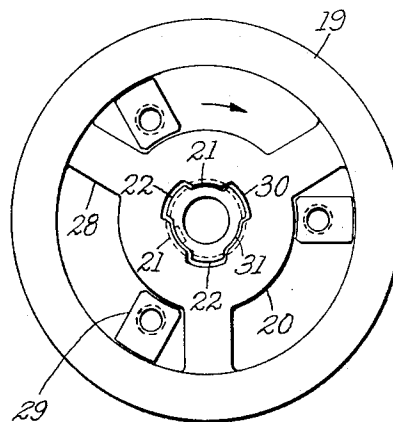


FIG. 3



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STOP CHUCK

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2 Claims. (Cl. 279—9)

This invention relates to an improved chuck of the type in which the tool is automatically locked at any position in the chuck, its main object being the production of a chuck having novel locking means. With this and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawing which forms a part of this specification, and in which like characters of reference indicate the same or like parts,

Fig. 1 is a sectional side elevation of the stop chuck;

Fig. 2 is a top view taken on the line 2—2 of Fig. 1 with the driving shank removed, showing the lock ring in its closed position; and

Fig. 3 is a similar view showing the lock ring in its open position.

In carrying the invention into effect there is provided, in combination, tool gripping jaws, means for closing the jaws to grip a tool inserted therebetween, and rotating them with the gripped tool, a stop pin yieldingly mounted in said means and arranged to engage the inner end surface of the tool to prevent inward movement of the tool while it is gripped by said jaws, and devices for locking said pin in any position to which it may be pushed while inserting the tool between said jaws. In the best forms of construction contemplated said devices include a circumferentially interrupted threaded portion on said pin, and a lock wheel having a hub rotatably mounted in said means and provided with a circumferentially interrupted threaded portion adapted to engage the threaded portion of the pin. These various means and parts may be widely varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of many possible concrete embodiments of the same. The invention, therefore, is not to be restricted to the specific construction shown and described.

Referring to the drawing, the shank 10 is attached to the upper end of the body 11 by screws and the grip ring 12 is also secured to the body by screws (see Fig. 1). The body 11 carries a hollow spindle 14 having external threads engaging with the threaded portion of the shell 13 which is supported by grip ring 12 and free to turn thereon. The spindle 14 has a key 15 which is slidably mounted in a keyway 16 of body 11. A plug 17 which is fitted into the lower end of

the spindle 14 engages the tool gripping jaws 18 mounted in the tapered socket of the shell and yieldingly held apart by interposed springs.

A lock wheel 19 surrounding the shank 10 has a hub 20 which is turnably mounted in an internal recess in the upper end of the bore of the body 11. A portion of the inner periphery of hub 20 has a fluted threaded section 21, engaging with fluted threaded sections 22 of lock pin 23. The tip 24 of the lock pin 23 is guided in a circular opening 25 in the lower end of the spindle 14. A compression spring 26 is seated in the longitudinal bore in lock pin 23, its other end bearing against the base of aperture 27 provided in the shank 10, thus yieldingly pressing shouldered tip 24 against the base of the spindle 14 when the lock wheel 19 is in its open position as shown in Fig. 3.

The lock wheel 19 (Figs. 2 and 3), has a number of spokes 28, spaced in reference to the stop lugs 29 on the body 11. Spokes 28 and lugs 29 are spaced in relation to each other and the threaded sections of the hub 20 and lock pin 23 respectively for a purpose hereinafter described. Longitudinal slots 30 are provided between the threaded portions 21 of hub 20, and similar slots 31 are provided between the threaded sections of lock pin 23. When the lock wheel is in its open position (Fig. 3), the sections 22 of lock pin 23 are opposite the slots 30 of hub 20, and the sections 21 of the hub 20 are opposite the slots 31 of lock pin 23. The lock pin 23 can now be pushed upward, thus permitting the tool 32 to be set at a desired point.

The operation of the chuck is as follows:

When the lock wheel is in open position the tool 32 is pushed against the lock pin 23 thus axially raising the same, until the tool protrudes a desired measured distance from the shell 13, corresponding to the depth of the hole to be drilled. The aperture in shank 10 receives the upper end of the pin. A key 33 carried by the body 11, engages a slot 34 of the pin 23, thereby guiding and preventing the same from turning. The tool 32 having been correctly set, the lock wheel 19 is turned (see Fig. 2), and the threaded sections 21 encounter and interlock with the threaded sections 22, thus the lock pin 23 is securely held at its desired setting. The turning of wheel 19 permits a spring-pressed ball 35 carried by the shank 10 to snap into engagement with a depression 36 provided in the wheel 19, thus locking the wheel in its closed position. The shell 13 is held by the operator while rotation of the driving shank 10 turns the spindle 14 and causes the relatively stationary threaded portion of the shell

13 to force the rotating spindle 14 downward along the keyway 16 of body 11. Thereupon the pressure applied to the plug 17 forces the jaws 18 downwardly in the tapered socket of the shell 13, thereby causing them to grip the tool 32 and shell, and rotate the same.

While the lock wheel might be turned manually to its closed or open positions, this result is preferably obtained automatically in the following manner. When the driving shank is rotated in a clockwise direction, as indicated in Fig. 3, the stop lugs 29 on body 11 are moved into engagement with the spokes 28 of the lock wheel, thereby turning the latter until the circumferentially interrupted threaded portions on the interior of its hub encounter the circumferentially interrupted threaded portions on the stop pin 23, whereupon the spring-pressed ball 35 on the driving shank snaps into the depression 36 in the wheel and locks the latter in its closed position. At the same time the operator grasps the shell 13 to hold it stationary relative to the rotating spindle 14 so that the interfitting threaded portions of these members will cause the spindle to move downwardly and push the plug 17 down against the tool gripping jaws to bring them into gripping relation with the tool and the interior of the socket in the lower end of the shell. The operator now releases the shell, and the gripped tool is fed into the work.

To remove the tool from the chuck the driving shank 10 is rotated in a counter-clockwise direction, as indicated in Fig. 2, and the shell 13 is grasped manually to hold it stationary relative to the spindle 14 so that the interfitting threaded portions of these two members will cause the spindle to move upwardly and release the tool gripping jaws, which then disengage the tool. Meanwhile the stop lugs 29 on the body 11 encounter the spokes 28 of the lock wheel and turn the latter to bring the circumferentially interrupted threaded portions on the interior of its hub out

of engagement with threaded portions of the stop pin 23, thereby permitting the spring 26 to seat the stop pin on the spindle 14.

What is claimed is:

1. In a chuck, the combination with tool gripping jaws, of means for closing the jaws to grip a tool inserted therebetween and rotating them with the gripped tool, a stop pin yieldingly mounted in said means and arranged to engage the inner end surface of the tool to prevent inward movement of the tool while it is gripped by said jaws, and devices for locking said pin in any position to which it may be pushed while inserting the tool between said jaws, said devices including a circumferentially interrupted threaded portion on said pin, and a lock wheel having a hub rotatably mounted in said means and provided with a circumferentially interrupted threaded portion adapted to engage the threaded portion of the pin.

2. In a chuck, the combination with a driving shank, of a hollow body attached to said shank, a hollow spindle surrounding said body and splined thereto, a grip ring secured to said body, a shell supported from said ring and free to turn thereon, said shell being provided with a socket in its lower end, tool gripping jaws mounted in said socket, a lock wheel having a hub turnably mounted in said body, a spring-pressed stop pin bearing against the lower end of said spindle, said pin and hub having circumferentially interrupted threaded portions adapted to be engaged when said wheel is turned into the proper position to lock said pin against axial movement, and said shell and spindle having interfitting threaded portions, whereby the rotation of said shank while said shell is manually held stationary will cause the spindle to push said jaws into gripping relation with a tool inserted therebetween and said shell.

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