A Geared-Up Screwdriver

By Clifford Fales; Photos by Nancy Allen

Offered here is information relating to an unusual screwdriver in the hope that other M-WTCA members have one in their collection and/or might have additional information such as manufacturer, marketing, or patent information. After first observing this screwdriver at a Rocky Mountain Tool Collectors meetiang when the owner was seeking information about it, I was subsequently able to purchase it.

In all my years of screwdriver collecting and research, I have never seen this model, nor any other screwdriver with a similar mechanical function. There is no evidence that there were any manufacturer's marks on this tool, and the original intention for the rotating handle cap and internal geared mechanism are not entirely obvious. My hope in writing this article is that a reader might recognize this tool and share some information so that we can clear up the mystery behind the origin of this screwdriver.

INTERNAL GEARED MECHANISM

The most interesting aspect of the tool is the geared mechanism which is enclosed within a cap on the upper end of the handle **(Figure 1)**. The cap can be rotated with one hand while holding the main body of the handle with the other. The wider steel ring, adjacent to the upper section of the handle, is pinned to this part of the handle and rotates with it. The inner circumference of this steel ring is a gear with twenty-four teeth.

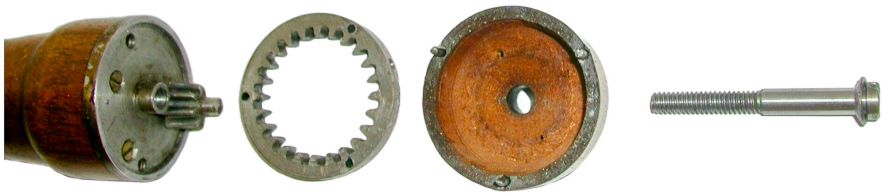

Figure 1: *Internal geared mechanism.*

The second steel ring, visible on the side of the handle, is the edge of a circular plate, attached with two flathead wood screws to the main part of the body. This plate includes a bearing for the upper end of the shaft, offset from the center. A small gear with eight teeth is mounted at the upper end of the shaft and engages with the geared ring **(Figure 2)**.

The shaft (offset from the center at this point) passes through and exits the lower end of the handle in the center to drive the chuck which accepts the blade. One rotation of the handle cap results in three rotations of the bit, and thus an increase in speed at a ratio of 1:3.

Figure 2: *Bearing plate and shaft gear engaged with rotating ring gear.*

I have not yet determined if the small gear may be removed from the shaft; this would be necessary to observe the shaft and any mechanism in the interior of the main body of the handle. I am uncertain if the shaft, being offset at the upper end and centered at the lower end might incorporate something like a universal joint where it joins the rear of the chuck to compensate for this misalignment. In its present state, the mechanism does not turn as freely as one would expect when being rotated. Without having disassembled this main portion of the body to observe its construction and operation, the reason for this failure to turn smoothly is unknown.

THE BIT AND THE CHUCK

The removable bit and the chuck are also a mystery **(Figure 3)**. The bit is certainly a user-made retrofit and not original to the tool. It is obviously not machined, but taper-ground by hand to fit the tapered chuck socket which appears to be the original, machined construction and not altered.

Figure 3: *Bit and chuck.*

Since the bit is a hand-ground retrofit, it is not totally surprising that it has no provisions at its lower end to prevent its turning in the chuck. However, it is surprising to observe that the interior of the chuck, which appears to be original and unaltered, has no notch, groove, flat side recess, or slot, as is commonly seen on the chucks of screwdrivers with removable bits. While it does seem to be a very tight friction-fit and may have been functioning to some degree, this is not a rational arrangement for a chuck and removable screwdriver bit.

Because the current bit's origins are suspect, the original mechanism of the connection between the chuck and bit is also uncertain. Was it a taper-fit similar to that on precision machine tools, or has the chuck been modified and lost whatever means it had originally to secure the bit and prevent it from rotating within the chuck?

THE HANDLE PIVOT SCREW

The head of this screw protrudes about ⅛" above the end of the handle. The original screw in this position would likely have been a countersunk screw. Also, the threaded portion of the screw appears to be considerably longer than needed for its purpose of holding the cap in place. Thus, this screw is probably not original.

FURTHER UNKNOWNS

There are two horizontal 6-32 threaded screw holes in the circumference of the geared ring. There are no screws in these threaded holes and the purpose of these is unknown.

There are also two vertical 10-24 threaded screw holes in the plate which houses the bearing for the shaft. There are no screws in these threaded holes and the purpose of these is also unknown.

WAS THERE A PATENT?

With neither manufacturer's markings nor a patent date marked on the tool—and never having seen another similar example—I have no information at all for either of these unknowns. Determining where this mechanism might fit in the U.S. Patent Office Classification System, or the Cooperative Patent Classification system might be a way to search for a matching patent or further information. Help would be appreciated in researching this item further. Anyone with some expertise in navigating these patent databases or who might have one of these screwdrivers or something similar in their collection is welcome to join me in working on this mystery.

Can you help identify the mystery screwdriver?

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Cliff Fales' Screwdriver Website

Read some of Cliff's previous articles from *The Gristmill* and *The Chronicle* (EAIA) on his website, which also hosts his database of U.S. patents for spiral screwdrivers at: **cfales.sos4net.com/index.htm**