

Torque-Arresting Tool

Anybody who does some hollowing on vessels and uses cutters (Fig.1) where the cutting tips are offset from the tool shaft knows the problem these offsets can cause with reference to the torque at the tool handle. The tools shown have a 3/4" dia. shaft length of 12 to 30 inches. A typical hollowing tool mounted in a Kelton tool handle is shown in Fig 2. Some tools such as the Monroe Hollower with an adjustable linkage are used for deep undercuts at the top of hollow vessels using only small diameter entry holes. The resulting torque for this tool and others can only be overcome by a tight fist grip on the tool handle



Fig.1



Fig.2

Many torque-arresting fixtures are on the market, which are trying to solve this problem and making the hollowing much easier and safer.

Among them the first ones I purchased is the "Stewart Tool" which came on the market about 25 years ago. The long tool handle has a padded armrest at the end (Fig.3) and also has a handle, which mounts on the shaft. Both the handle and the armrest can make the "steering" of this tool to which a variety of cutting tips can be added much easier. But in larger off-set tools tips this does not add to the safety factor, because a heavy catch at the tool tip end can create a very violent torsion force at the padded armrest. This easily can result in an injury at the elbow, the upper arm or shoulder joint. A simple bent tool handle as shown in Fig.4 somewhat eliminates this danger, but during a catch an injury in the wrist is still possible.

I bought one of these Stewart tools a long time ago, but it only took a very short time to put the armrest into permanent storage and I only use it to show other turners how dangerous it can be under certain circumstances. I kept the tool shafts and "steering" handle for later use.

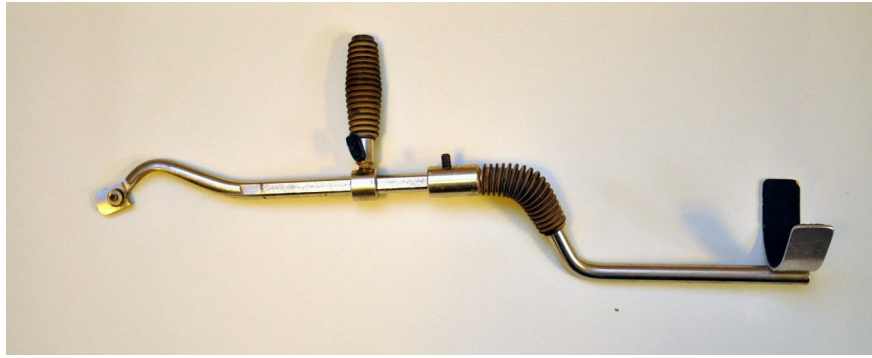


Fig. 3



Fig.4

Among other tools to make hollowing easier and safer was a gadget marketed in about 1980 (Fig. 5). It is made for small hollowing and a rotating front mechanism is attached to a 5/8 " dia shaft permanently welded to a cross bar (3/4" x 3/4" x 2 1/2" long).



Fig. 5



Fig. 6

This cross bar including the round bar and the tip mechanism suitable for a 1/4" square cutter is able to slide on the tool handle bar which also is 5/8" diameter mounted in a 18" long wooden handle (Fig. 6). The way it is constructed, the crossbar in some way arrested the torsion created by the overhanging tool tip when both round shafts are resting on the tool rest. It works great, but because of the general size and the large cutter head mounting mechanism it has its limitations and does not fit through small openings in hollow vessels.

I used this tool many times and this general configuration prompted me to make a larger adoption much more suitable for what I wanted to use it for (Fig. 7)

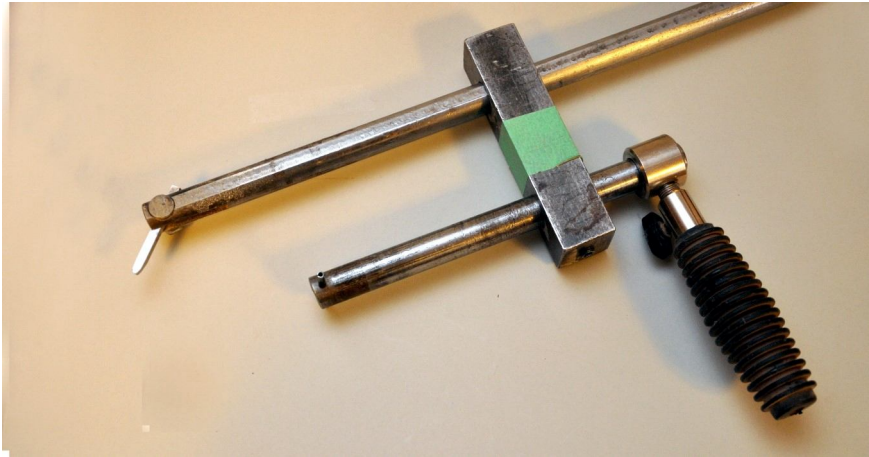


Fig. 7

It is made for $\frac{3}{4}$ " dia shank tools of various configurations. The one shown is made for an adjustable $\frac{1}{4}$ " square tip. It also can be used for all Kelton type hollowers and the old original curved cutter assembly, which came with the Stewart system. I also used the existing "steering" handle from the Stewart system for better maneuverability.

The parts needed are shown in Fig. 8. The cross bar is $1\frac{1}{4}$ " square x $5\frac{1}{2}$ " long cold rolled bar mild steel stock. The $\frac{3}{4}$ " dia holes are at 3" centers, centered on the square bar stock. The $\frac{3}{4}$ " dia cold rolled steel bar is 9" long with a $\frac{1}{8}$ " roll pin at the end to stop this bar falling off the tool rest during usage. Two Socket Head Set screws $\frac{3}{8}$ x 1" long at each end of the cross bar are for adjusting and locking the components to suit many different configurations. The long $\frac{3}{4}$ " bar with the tool tip can be used in a wooden handle or in any of the commercially available tool handles from Oneway, Kelton or others suitable for $\frac{3}{4}$ " dia tools. All materials required are readily available for your local Metal Supermarket. You might need the assistance of a machine shop if your drill press is not capable to drill the $\frac{3}{4}$ " diameter holes



Fig. 8

Above torque arrester is only suitable for $\frac{3}{4}$ " dia tool shanks. Because I also use smaller Kelton Hollowers, which are $\frac{5}{8}$ " dia I adopted the similar system as shown in Fig. 9 to suit this size.

The sizes are 1" x 1" x 4" for the cross bar with the $\frac{5}{8}$ " dia holes at $2\frac{1}{2}$ " centers. The Socket Head Set Screws are $\frac{3}{8}$ x $\frac{1}{2}$ " long. The $\frac{5}{8}$ " dia cold rolled steel support bar is 7" long (Fig. 10).



Fig. 9



Fig. 10

The weight of both torque-arresting systems is large enough to make usage safe and stable. Some sizes can be changed as required, but I found both attachments work well on a 12" long tool rest and very long overhangs can be achieved if very long and strong tool handles are used. I prefer the Kelton tool handles because their weight and adaptability to make longer handles by using various combination of shorter handles, but all Oneway handles work fine for me.

Fig. 11 shows a typical operation whilst hollowing a vessel using the heavy torque arresting system for $\frac{3}{4}$ " dia. tools.



Fig. 11

Fig. 12 shows the system mounted on a Kelton curved hollower mounted in a Kelton handle. The extra weight of the bar helps to counteract the downward force created by the cutting tip inside the vessel.



Fig.12

These torque arrester systems have been used in my shop for many years and proved to be invaluable in any small to medium sized hollowing operations. The up-movement as a reaction to the cutting action of the tool tip still has to be controlled by holding the tool handle firmly.

The tool handle control needed for heavy duty hollowing on large and deep vessels can only fully achieved by a heavy duty rigid boring bar system, which really works on the same principle but in a much larger heavy duty scale.

I have constructed such a system (Fig. 13) from my own plans. It is generally based on a system originally promoted and sold by Frank Sudol. These heavy duty systems are also manufactured by the Carter Products Co. Inc (carterproducts.com), Keith Clark (theokspindocter.com) and others. They are all based on a captured roller assembly at the end of a very large hollowing bar or frame.



Fig.13

Do not hesitate to contact me for additional information or if you have additional suggestions.

Please do not copy any of the information or photos without my permission

Eugen Schlaak

March 2015

E-Mail: goingwiththegrain@gmail.com