Versatile Walking Stick: Camera Monopod and Stylish Walk-Along

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Abstract:

The Versatile Walking Stick (VWS) project extends the functionality of the collapsible wood walking stick by simply adding a 1/4-20 threaded barbed T-Nut to the top. The walking stick makes a good mount for a DSLR/SLR camera and when not toting a camera, it can sport hiking and self-defense aids or decorations.

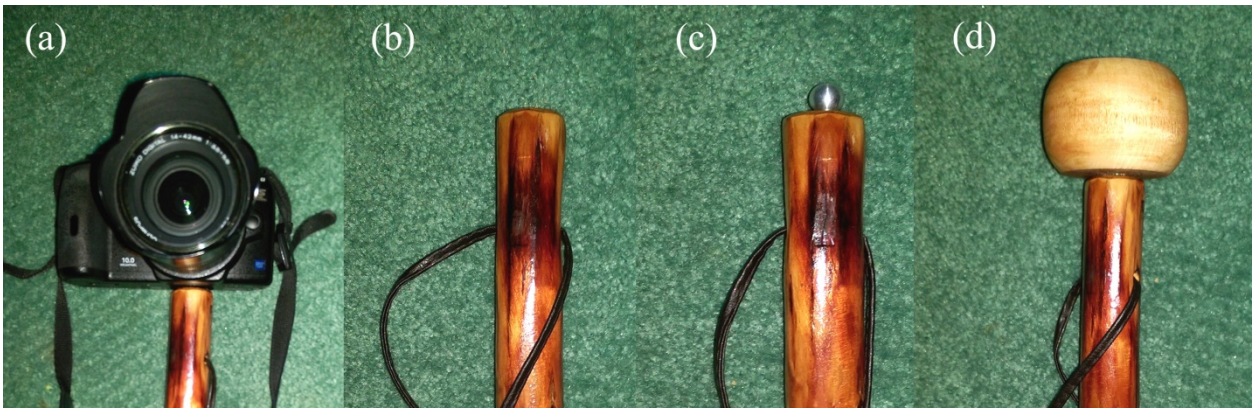

Figure 1: Several examples for the walking stick: (a) Camera mount, (b) plain top, (c) ½ inch aluminum ball and (d) large wood turning.

Introduction:

Recently, we visited the Tent Mountains just outside Santa Fe NM with several cameras and equipment in tow. Unfortunately, we forgot our camera tripod at home although we did bring a walking stick for steadying our old bones, whacking any nasty varmints that might cross our path and for moving brush. For picture taking, the long range lenses and camera assembly are easy enough to support at the crook/elbow of the arm to provide fairly good stability and maneuverability. Just the same, there are times when a photographer wishes for a tripod or even a monopod but not the extra weight and apparatus. We realized it would be a simple matter to modify our favorite walking sticks for the camera and add some useful decorations (Figure 1).

Commercial camera monopods can be found at camera shops such as bhphotovideo.com but they are not always very useful as a hiking stick or a whack-a-nasty. Some excellent instructuctables show camera monopods (see last section). However, the one shown in this instructable is about as simple as it gets.

Step 1: Find a walking stick and a barbed T-Nut

We use the collapsible walking stick with a carry pouch sold through amazon shown in Figure 2 (SE WS634-55P or search ‘3 section wood walking stick 55’). The 55 inch length proves to be about right for people having heights of 5’4” through over 6 feet. The stick is made of nice gnarled wood and can be parted into three sections. The bottom tip has a rubber cup that can be removed to expose a metal spike. The airlines don’t mind sending these sticks through baggage.

Figure 2: Left: The collapsed walking stick. Right: Barbed T-Nut

The barbed T-nut (our name for it, Figure 2b) can be found at Home Depot under the name ‘insert nut’ made by Everbilt #610169. These T-nuts are 13mm long (1/2”) and threaded for ¼-20 screws same as found on many camera mounts (threaded hole on the bottom side of the camera). This particular T-nut does not have a flange on top that would potentially ruin the look of the stick. After hammering the T-nut into a hole drilled during Step 3 below, the barbs grip the wood and prevent it from pulling out or moving. Notice that the barbs are sloped on one side and flat on the top. The sloped side must push into the hole in the wood while the flat side prevents the T-nut from being extracted (see Figure 5 for an example). The cited T-nut works OK with a 3/8” hole drilled into the wooden top surface of the stick. Check your camera for the proper screw thread and buy a suitable T-nut. Some barbed T-nuts might require a different diameter drill bit than the one we used.

Step 2: Clamp the walking stick

The top section of the walking stick will need to be held steady to drill a hole. We used a vise to hold the rod steady. Wrap a couple of paper towels around the stick prior to clamping it into the vise so that the clamping pressure won't damage the finish on the stick. Rather than a vise, it might be possible to use wood clamps to hold the stick against a table top and drill sideways or, being careful, hold the stick by hand and drilling. Unfortunately, we did not photograph the wrapped stick prior to drilling the hole but we did 're-enact' the scenario after hammering the T-nut into place (Figure 3). Do not hammer on the stick while clamped to prevent damage to the sides of the stick.

Figure 3: Stick wrapped in paper towel and clamped in a vise.

Step 3: Drill the 3/8" hole for the barbed T-nut

The hole can be easily drilled with a hand drill such as a battery powered one. The 1/4-20 barbed T-nut can be easily hammered into a 3/8 inch diameter hole. We used a regular metal drill bit (HSS, or Titanium or etc.) with a 3/8" diameter. On the bit, we placed a visible mark at about 7/8 inches from the tip; this marker will be used to set the hole depth. Just about any visible mark will work but sometimes it is easier to wrap a piece of tape around the bit as a marker. The 7/8 depth means that a 1" long socket screw will not enter the hole so far that it would require a tool to remove it. If your hole goes beyond 7/8", don't worry about it since everything works anyway.

The stick is roughly rounded on the top. Make an effort to drill the hole along the axis of the walking stick so that the camera will be level when the stick rests perpendicular to the ground. Again, this is not critical since the camera might need to be at various angles and the stick won't necessarily be perpendicular to the ground anyway.

Do keep in mind that once the hole has been created, there won't be any chance to change it. Drill the hole until the mark on the bit comes even with the top surface of the stick. Be careful not to enlarge the hole diameter by wobbling the drill around while drilling - the 3/8" is almost too large already.

Step 4: Hammer the T-nut into place

As previously mentioned, the T-nut **barbs** have flat tops and tapered sides as shown in Figure 2b. The end of the T-nut with the slanted barbs (the left side of the T-nut in Figure 2b) should be inserted into the wood and hammered into place (see for example Figure 5a). Position the T-nut in the hole and hammer away – gently of course – more like tapping. Just prior to the T-nut pushing all the way into the hole, some people will place a 3/8 diameter bolt on top of the T-nut and hammer on the bolt to push the nut further into the hole so as not to damage the surface of the stick. Figure 5 shows that we didn't

bother for one of the decorations. The top of the T-nut should sit flush with the surface of the stick (see Figures 3 and 5b).

Step 5: ¼-20 Socket Screw

If you can find a 1” long socket screw (i.e., grub screw) then hey! buy it and don’t worry about cutting a screw or threaded rod. Figure 4a shows an enlarged view of the socket screw. Notice the left side of the screw accepts an Allen key for turning. Home depot has a “1/4-20 socket screw 1” made by Everbuilt #756489 for about a dollar. Other socket screws can be found by searching for “1/4-20 Grub Screw 1" or “1/4-20 socket screw 1" on ebay. If you find a longer one say 1.5” then you will probably want the hole to be drilled to a depth of about 1 3/8”. You will also want a ¼-20 nut. It would be a good idea to get a hex key to fit the socket screw for later use.

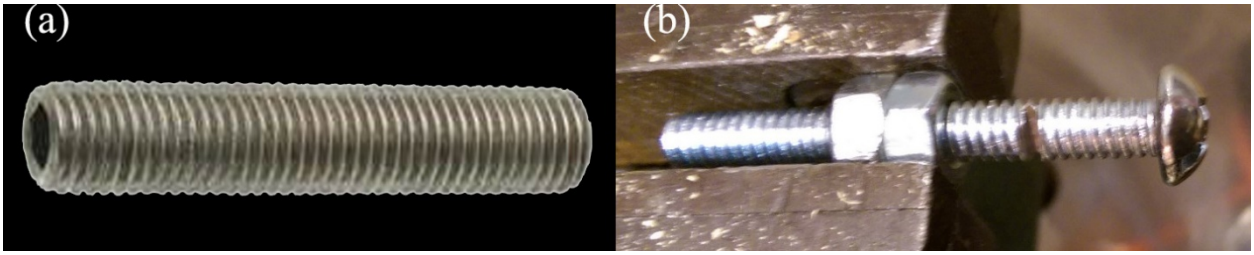

Figure 4: Left: Socket screw. Right: Cutting a screw

If you don’t find a suitable socket screw then it will be necessary to cut threaded rod or a round-head screw. Home depot sells threaded rod. It’s probably easier and less expensive to find a couple of ¼-20 round head screws having length over 1 inch. Aluminum will be easiest to cut. Make sure to have a couple of extra ¼-20 nuts to help secure the screw while cutting. Do not use a bruit-force bolt cutter for cutting the screws unless you plan to do a lot of filing and thread repair!

A Dremel tool with a metal cutoff wheel (Home Depot, EZ456) can be used to cut the screw (or threaded rod). Place two nuts on the threading, tightened them against each other and clamped them in a vise (Figure 4b). Make sure the nuts are quite tight against each other and tightly clamped in the vise. Be careful when cutting so as not to ruin the threads. And be sure to wear eye goggles! Often, removing the nuts through the cut threads will be sufficient to correct any slight mishaps. HarborFrieght.com has inexpensive tap and die sets if the threads need more persuasion. Sometimes a nice small jeweler’s triangular file can be used for thread cleanup if needed. Also, a metal file can be used to slightly round the cut end of the screw to provide a slight taper to help when starting the screw into a nut. It’s probably best to place the cut end into the stick to help prevent any damage to the camera threads. Use the dremel wheel to cut a notch across both ends of the screw so that a small screw driver can be used to extract the screw if necessary.

Basically the project has been completed at this point.

Step 6: Mounting the camera

There are a couple ways to mount the camera.

1. Twist the screw into the camera and then twist on to the rod. If the screw should push too low into the T-nut then use the Allen key or screw driver to back it out. Generally, the screw should not be left hanging out of the camera or the stick when not in use.
2. Place a ¼-20 nut on the threaded rod (or cut screw or socket screw) and leave about a ¼ inch of thread at one end. Screw the longer side of the rod in to the T-Nut. Tighten the ¼-20 nut against the T-nut. Place the camera on the shorter side. The ¼-20 nut prevents the screw from changing positions in the T-nut.

Step 7: Find a nice decoration

A decoration can be screwed into the end of the stick (Figure 1) when not used for the camera. Figure 1a shows the camera mounted on the stick. The stick can also be left without any decoration although the T-nut would fill with debris making it difficult, if not impossible, to attach the camera or decorations later. Figure 1c shows an example aluminum ball attached at the top. The aluminum ball can be 0.5" to 1.5" in diameter with a ¼-20 threaded hole; these Aluminum balls can be found on eBay by searching for "1/4-20 aluminum ball".

Figure 1d shows an example of a wood ball (from Home Depot manufactured by H&P Wood Turnings Inc. #236119, Artesian Small Bun Foot). This ball required a barbed T-nut to be inserted using the same technique as for the stick (Figure 5).

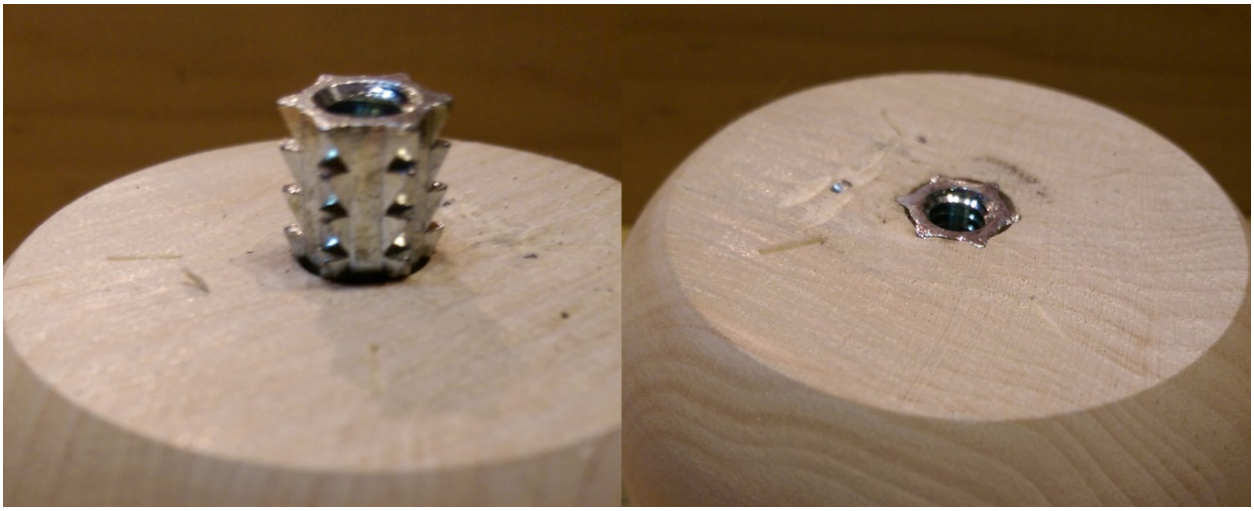

Figure 5: Barbed T-nut with wood ball. (a) tappered side pushes into the ball, (b) hammer the t-nut flush with the surface

Notice that the barbed T-nut has the side with the sloped edges of the barb inserted into the hole (Figure 5a). Some people will lightly hammer the t-nut until its top surface is about 1/8 from the wood surface. They then set a 3/8 inch diameter bolt on top of the T-nut and hammer the other end of the bolt so that the hammer does not make contact with the wood and mar it. Inspecting Figure 5b shows we did not take that precaution since the marks on this decoration would not be visible anyway. The wood ball and be painted/carved as desired and it has enough weight for use as a whack-a-nasty. Actually the larger aluminum balls would look nice and supply plenty of weight. A que ball or colored plastic ball might look nice up top too once the t-nut has been inserted. Wise old owl? Skull and cross bones?

Finally, for those people with an adventuresome spirit and extra walking sticks for experiments, consider adding a seat by using 10”x3”x1” hardwood or aluminum and drilling a hole through it. Insert an appropriate round head screw through the hole and tighten into the T-nut. We did not make this addition for fear of loosening the embedded t-nut while sitting on the attachment. Perhaps the hole in the stick could be drilled with a smaller diameter bit to increase the binding of the T-nut.

Parts and things

1. Walking stick 55 inches long with three sections: Amazon SE WS634-55P or search “3 section wood walking stick 55”

2. Barbed T-nut (1/4-20) can be found at HomeDepot.com under the name ‘Insert Nut’ made by Everbilt #610169. The ones from home depot are 13mm long (1/2 inch) and fit in 3/8 hole. Also look for Barbed Insert Nut and Wood Insert T-nut at other sources. The Home Depot package has 4 T-nuts that can be used with wood decorations.

3. Drill bit for metal with 3/8 inch diameter available at almost any hardware/tool store

4. Electric drill with chuck capable of holding 3/8 inch diameter bit.

5. Vise or clamp to secure the stick while drilling. Wear Goggles.

5. A couple paper towels to wrap the stick while drilling. A marker or tape to set bit depth.

6. Option 1: Much preferred: Socket Screw (i.e., grub screw): 1/4-20 and 1” long from Home Depot made by Everbuilt #756489. If this cannot be found anywhere then proceed to Option 2.

7. Option 2: Round head screw (1/4-20) having length over 1” - available at almost any hardware store. You will also need a Dremel tool and metal cutoff wheel (756489) available at Home Depot.

8. Several spare 1/4-20 nuts available at almost any hardware store.

9. Optional decoration examples: Aluminum balls (0.5” to 1.5” diameter with 1/4-20 threaded hole) found on ebay by searching for “1/4-20 aluminum ball”; Wood ball from Home Depot manufactured by H&P Wood Turnings Inc. #236119, Artesian Small Bun Foot.

Example Related Instructables

http://www.instructables.com/id/Multipurpose-Walking-Staff-Monopod-for-Cameras/ by Picture-Bandit
http://www.instructables.com/id/Easy-Bamboo-Monopod/ by SJosephson
http://www.instructables.com/id/Multi-Function-Walking-Stick-Converts-into-a-Cha/ by hpstoutarrow