# Twist Drill Grinding Attachment

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# Twist Drill Grinding Attachment

Part 1: About the tool
Part 2: Mounting the tool
Part 3: Using the tool

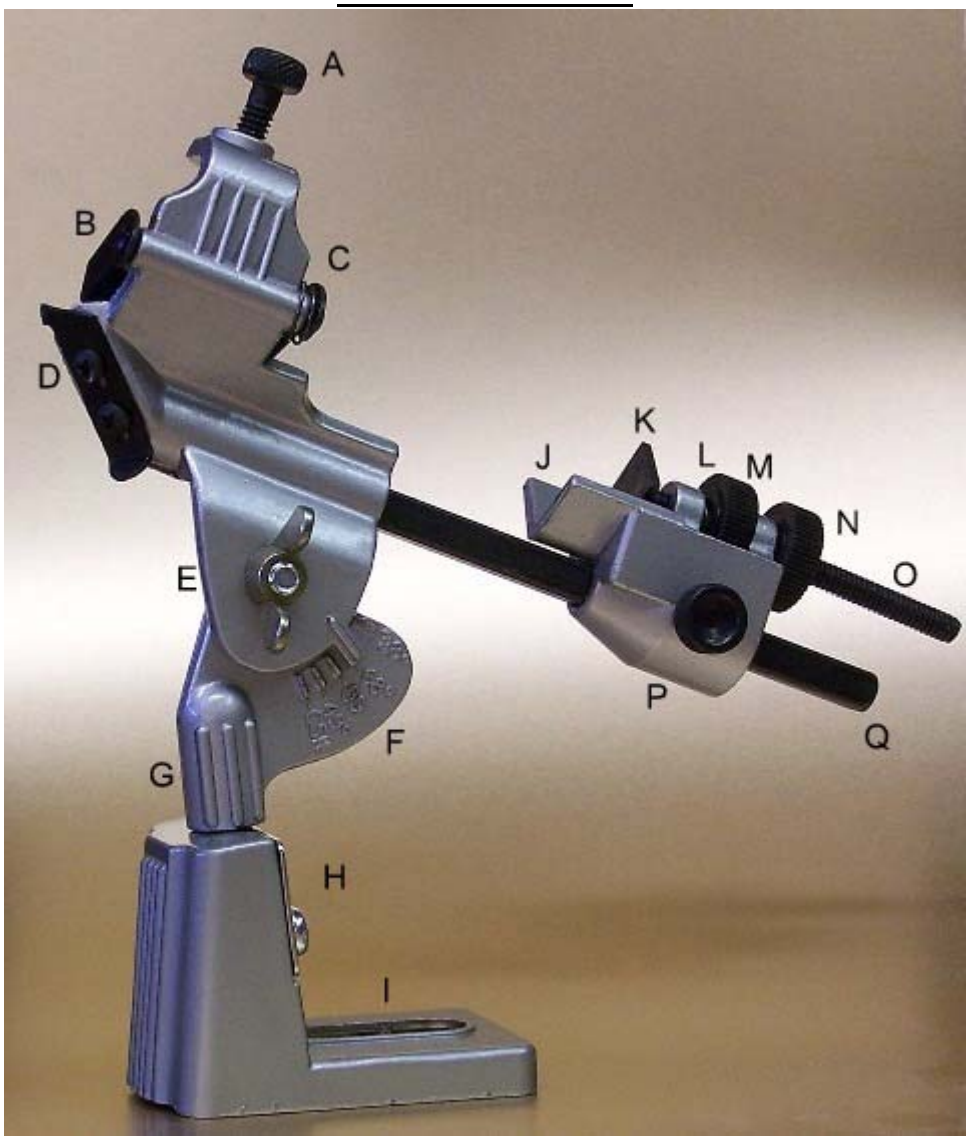
By Skiprat

## Part 1 About the tool

This little gadget while not a precision device is great for those that struggle to sharpen Twist Drills by hand.
Using it is fairly straight forward but there are several features that once understood, will make using and owning one a pleasure. There are many variants but they are pretty generic in their design. The box that this one came in did not show the country of origin and the instructions are basic at best. They are very cheap; this one cost less than £12 (around $18)
I've split this into 3 parts in an attempt to clearly describe how to get the most out of this clever and well thought out drill sharpening attachment.

I'll add the disclaimers and safety warnings of using grinding machines in Part 3.

# The Main Parts



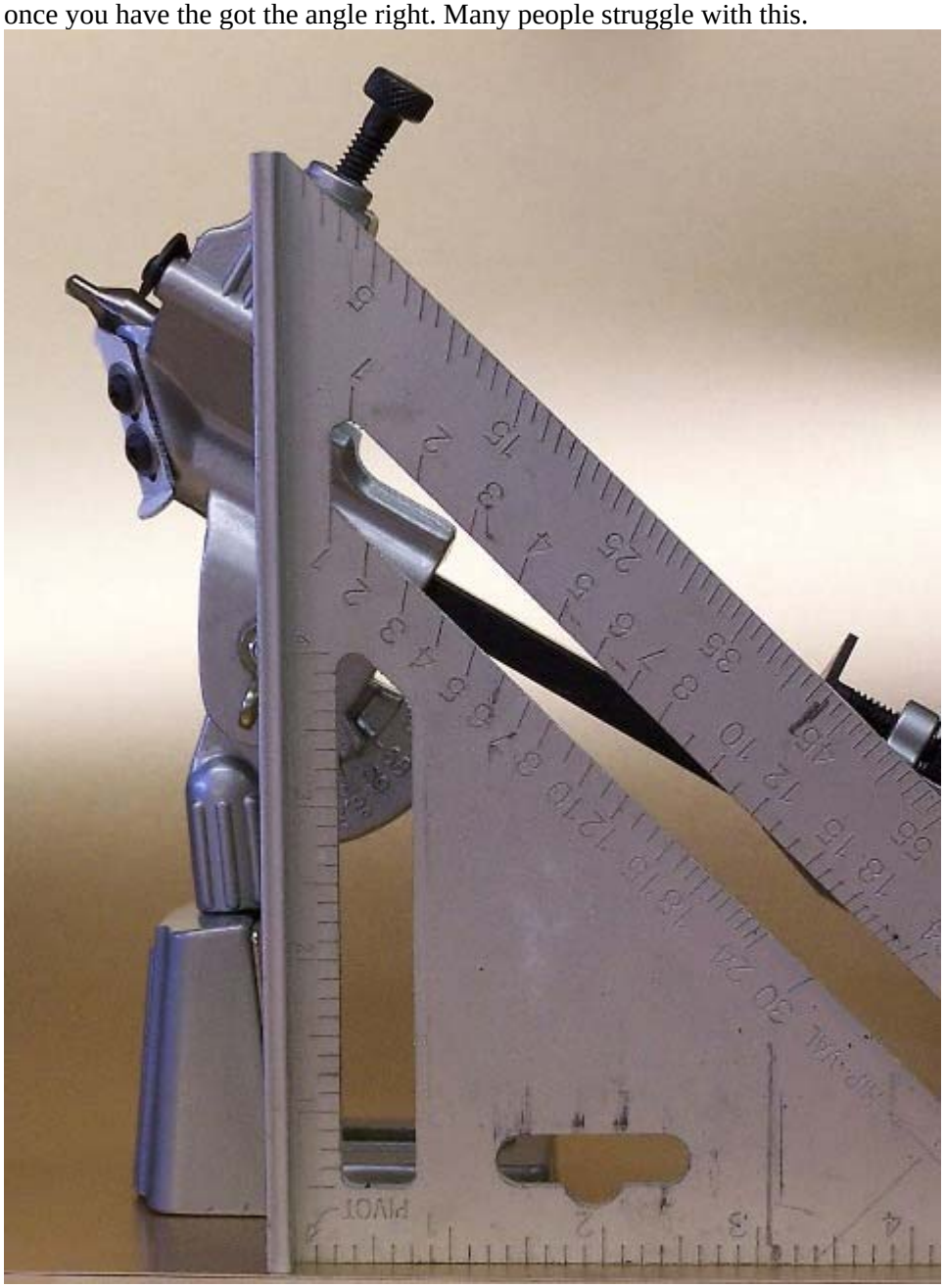

**A.** Knurled clamping screw
**B.** Clamping plate
**C.** Clamping plate return spring
**D.** Drill flute indexing tip
**E.** Drill Angle selector wing-nut
**F.** Drill Angle graduation indents
**G.** Tilted pivot point
**H.** Pivot point tension plate
**I.** Slotted mounting hole
**J.** V channel
**K.** Drill bit end stop
**L.** Adjustment anti-backlash spring
**M.** Fine adjustment wheel
**N.** Fine adjustment locking wheel
**O.** End stop thread
**P.** Coarse adjustment clamping screw
**Q.** Square adjustment shaft

## OK, so how does it work?

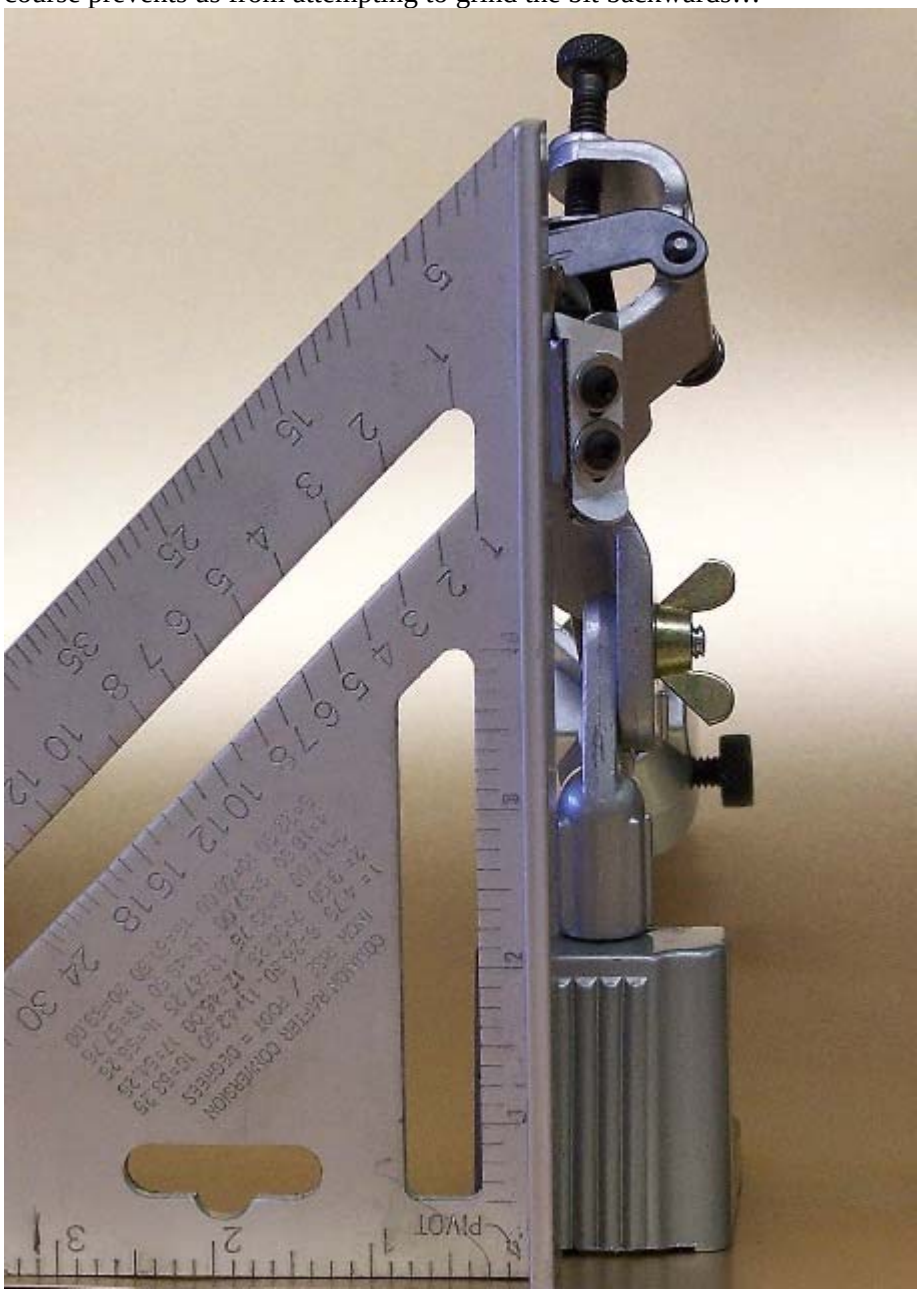
Once rigidly bench-mounted adjacent to the side of your grinder wheel, the drill is clamped in the attachment and then the device is pivoted by hand so the point of the drill is swept across the side of the grinder stone. Without changing any settings, the drill is removed and replaced to index the other flute which is then sharpened. Job done.

## Ok, so what's so clever about its design?

Several things. The first is the fact that the pivot point leans forward towards the grinder. See next picture. (Just ignore the centre drill in the device.) This in conjunction with the next feature produces the cutting edge relief. But all this really means is that the drill is sharpened in such a manner that only the actual cutting edges are in contact with the material being drilled. When drills are sharpened by hand, this relief is done by a practiced twist of the wrist once you have the got the angle right. Many people struggle with this.



The next clever bit that I like is the design feature that makes it dummy proof.  As seen in the next picture, the drill is clamped in the device off centre (to the left when viewed face on) to the pivot centre line. When the device is pivoted counter-clockwise (looking from above) the drill bit is swept into the grinder surface and thus sharpened correctly. But if pivoted clockwise (looking from above) then the drill bit is moved away from the grinder. This of course prevents us from attempting to grind the bit backwards!!!




The next design feature is the slotted hole in the base. This has two purposes. First should be obvious, when the angle is altered (different material, different angle) the device will either have to be moved closer or away from the grinder to maintain the correct shape of the ground point. You can't simply leave the clamp behind and extend the drill closer.
The other perhaps not so obvious purpose is that different style bits need to have slightly different geometry on the cutting edges and as the flute indexing point is fixed; this is achieved by moving the base. This really shouldn't concern us though, because if we were so pedantic about these special angles then we would probably have an all-singing-all-dancing machine to do the job in the first place.

## OK, so what is wrong with it?

So far just one small quality issue, one design snag and one design claim lie.

The quality issue was simple to fix. In the next picture you can see two screws that hold the flute indexing pointer at the correct height. These screws are little self tappers and the lower one would not tighten up. I suppose I could have exchanged it but hardly worth the fuel or bother. I just put a small washer under the screw. In some pics, this indexer is white. I just painted it for photographic clarity.

The design claim 'lie' is about this indexer too. The makers claim that it can handle drills from 3mm to 19mm. But the indexer won't lower enough to accommodate smaller than 4.5mm. I could and probably will file the adjustment slots in the thing but shouldn't have had to.

The design 'snag' will be dealt with more in Part 2. But the issue is the overall height of the thing. I reckon this device is aimed at the home workshop enthusiast, not industrial workshops. It should be mounted so that the grinding is done at grinder spindle height, as it is, it will barely touch the top of my 6 inch bench grinder wheels!! The 'instructions' say that either the device or the grinder may need to be mounted on riser blocks, but I don't think it would have been too difficult to design it so that only the device may be need to rise.

All in all, I'm happy with it. For the money, I expected loads of plastic but it is made from sturdy cast aluminium and steel.

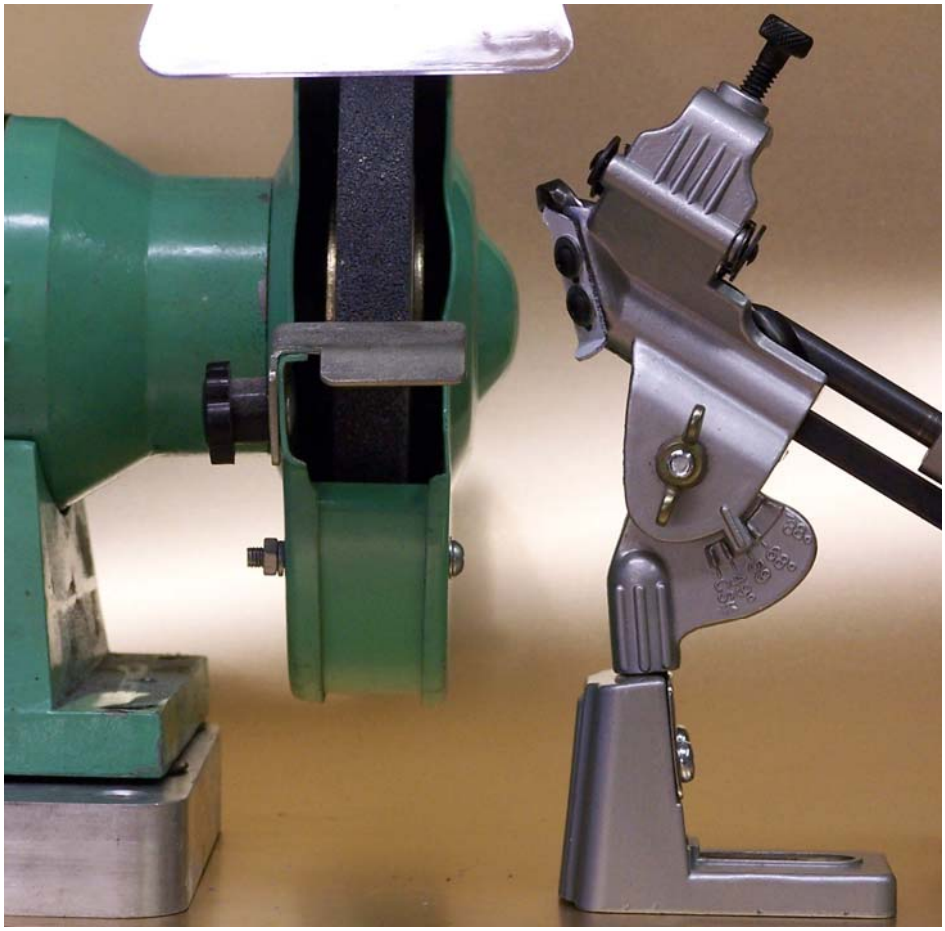
Ok, enough of the really boring bits ….(get it?) Let's mount up and see this little baby work.

# Part 2 Mounting

First the disclaimer…… I'm not responsible for your safety. But at least unplug the grinder until you want to actually do some grinding. You should also check to see if the stone you use permits using the side. But I think most modern stones can easily cope with the light passes.

Now you have to promise not to laugh when you see my super-dooper bench grinder!!! But if the attachment can be made to work on mine, then it should easily work on any other.

The instructions say that best results will be obtained by mounting the device so that the tip of the drill is about the same as the grinder spindle height. The first pic shows the grinder and the device without any riser blocks. The following pic shows it at almost as suggested, but the last pic is what I'm settling for, for now. I think I understand why they suggest this height and if I get poor results then I'll change it. I chose this height because I didn't want the swivelling of the device to foul the guard on the grinder. The guard is there for a reason and I don't really want to hack it to bits.

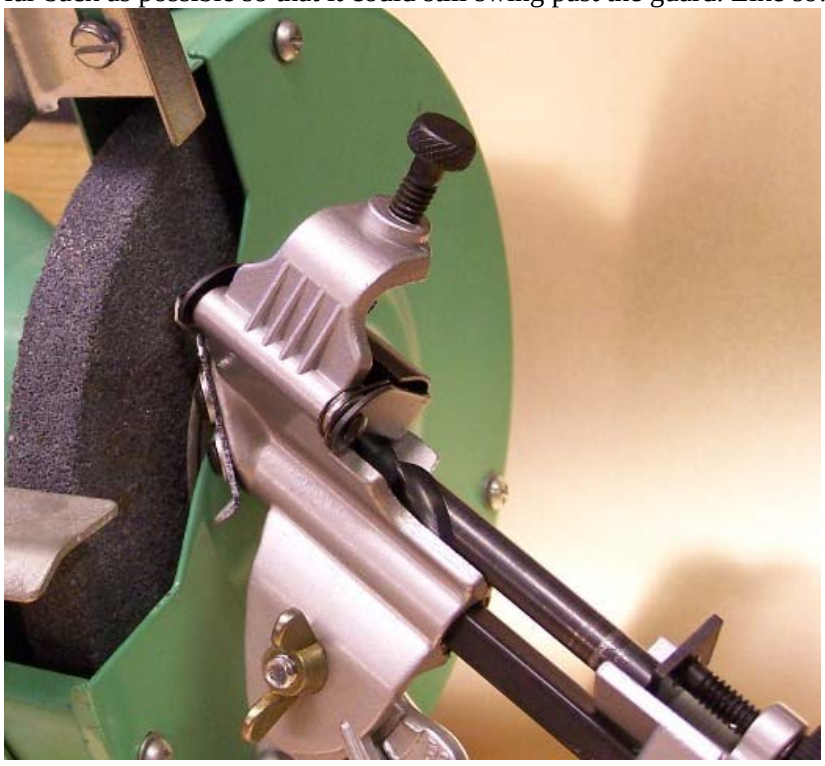


Before mounting, I fitted an average sized drill bit that I use. 8mm. The bit is supposed to protrude from the front of the device by approx its own diameter. So about 8mm in this case. I didn't know if they meant the very tip of the drill or the cutting edges. So I chose the edges and mounted it like this…..

The instructions call for the device to mounted approximately 2 ¼ inches from the surface of the stone. I assume that this means the middle of the slot in the base. Let's see…..

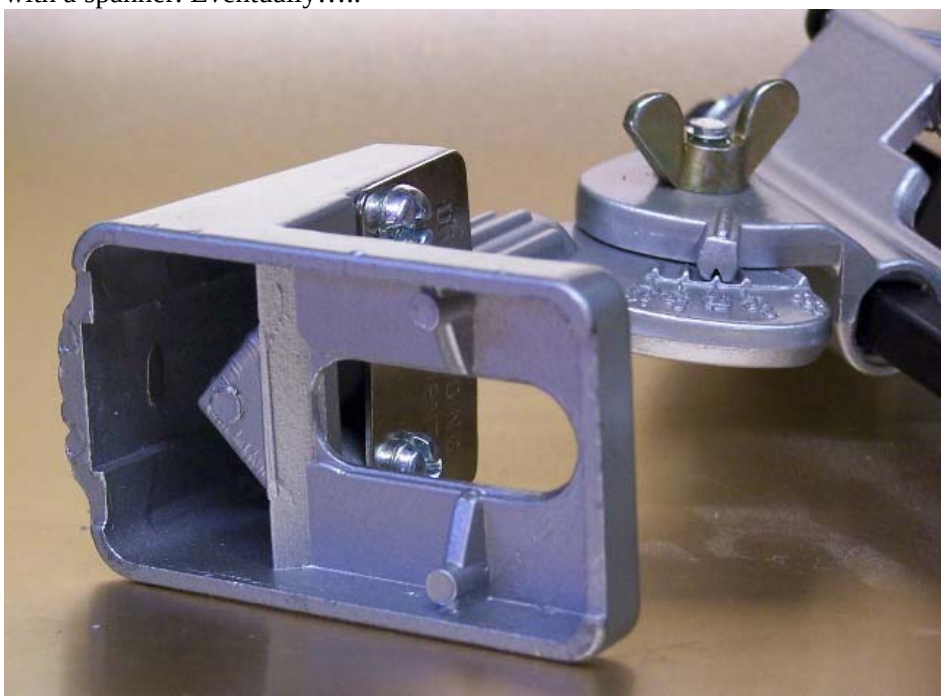
With the angle set at the most common position, this looks to be spot on.

It doesn’t mention exactly how far from the front or spindle to mount it, but by now we have figured out that as long as we get full swing then it really shouldn’t matter. I mounted mine as far back as possible so that it could still swing past the guard. Like so….

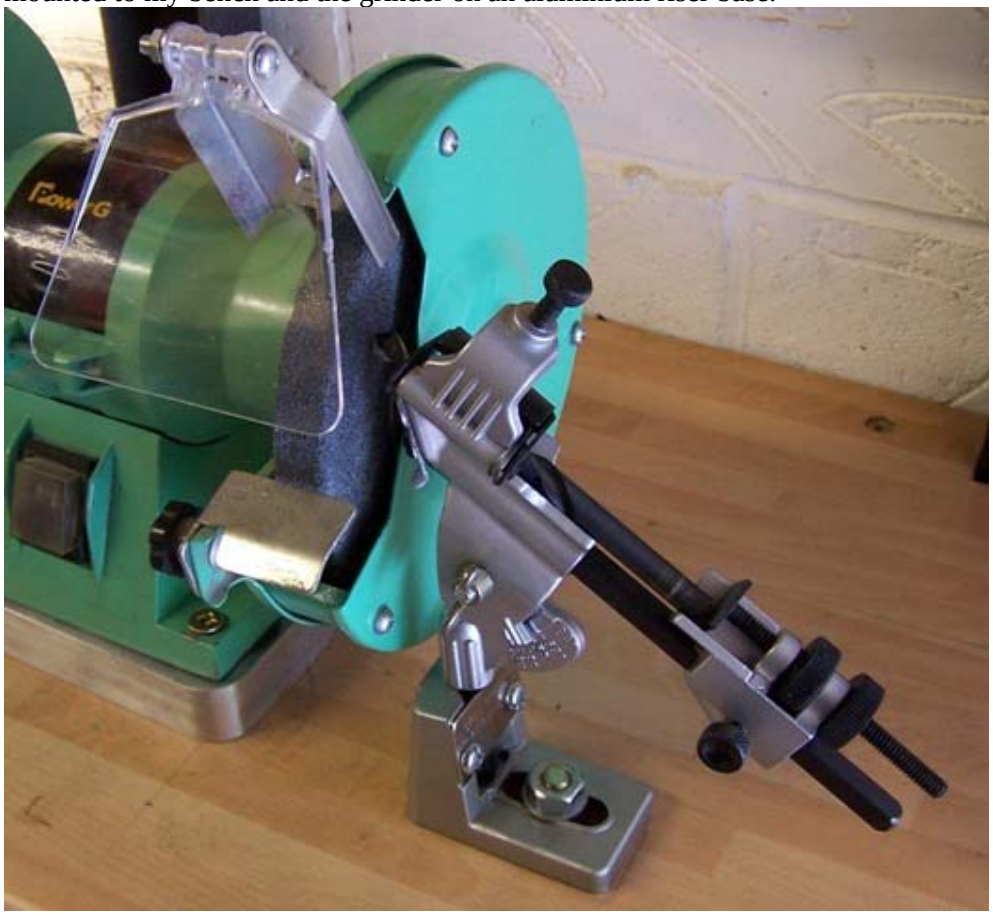


I might re-drill the mounting hole to bring it closer to the front of the stone. My theory being that the higher speed will give a smoother finish.

The next pic shows the base with the slotted mounting hole. (the angle setting indents are also pretty clear in this pic) I think I would like to have seen this a lot thicker as I’m a bit heavy handed when it comes to tightening bolts. I will get a wing-nut so I don’t over tighten the nut with a spanner. Eventually…..



Right, before we get stuck into eventually doing some sharpening, the final pic show mine mounted to my bench and the grinder on an aluminium riser base.



# Part 3 Using the tool

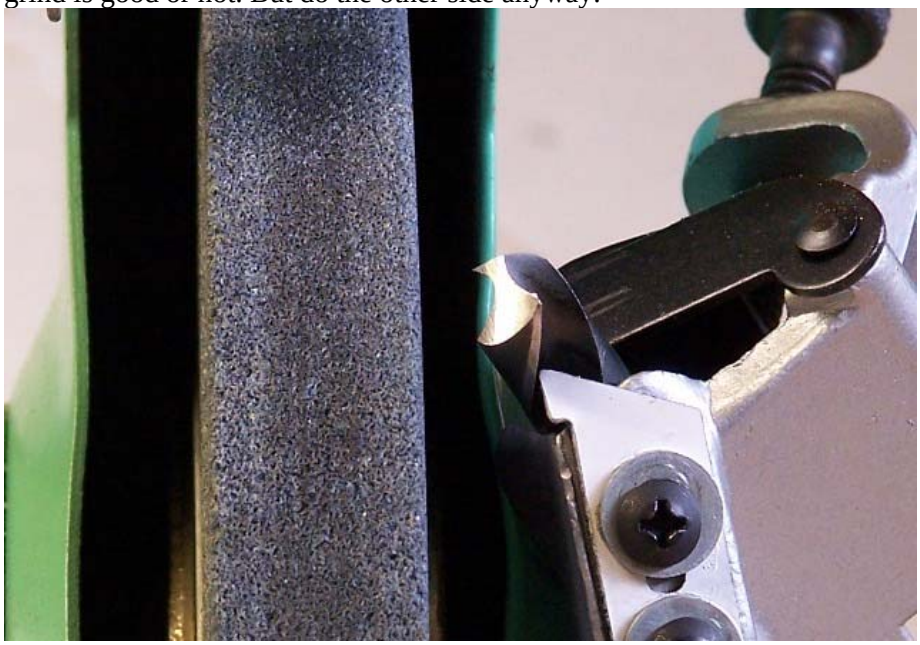
This is probably the easiest part.
First of all, start the grinder and stick you knuckle onto the stone……..
Ok don't then, but take it from me that it hurts like mad and from that moment on you will always unplug it when setting up.

Select the angle that you want. If you don't know what it should be either compare it to the angle already on the drill bit or choose the mid setting. My mid setting says 58deg so the included (total) angle is of course 116deg. This is a good general purpose angle. You can play around with the other angles later.

Swivel the device away from the stone and load a drill bit in it. You need two hands for this. First lock the coarse adjustment screw so that the drill sticks out of the end by approx its own diameter. Set the index point so that it is just inside the drill flute. With one hand turn the drill so that the drill stays in contact with the index point and tighten the clamping screw with your other hand. .

Now move the device closer to the stone so that the drill just touches it. Tighten to base bolt.
Swivel the device clockwise away from the stone and start the grinder.
Slowly and gently swivel the device so that the drill sweeps over the stone.
Switch off the grinder and without removing the drill; inspect the surface you have just ground. It will probably need more, so slightly loosen the drill clamp (A) also the locking wheel (N). Turn the wheel (M) so that it advances the drill just a little. Lock the locking wheel and tighten the drill clamp, remembering to keep the drill flute against the index point. Take another pass on the grinder.
Do that till you are happy with the result. Now without changing any settings, just rotate the drill and do the other side. Remember that the drill has been advanced. I just took several 'touches' on the second side to prevent heat build up until the drill was completely done.

The next pic shows the first side done. While in the device it is a little difficult to decide if the grind is good or not. But do the other side anyway.



……and the second side…..

Let’s have a look and see what we did…….

Not good !!!!!  But actually this shape is similar to what I prefer for plastic.

Ok, it isn’t rocket science to see that our swivel radius is too large. So let’s move the base closer and have another go……..

Much better. Some will prefer the relief angle to be a bit more, but I think that as long as the trailing corner is lower than the leading corner, then it is fine.

….and finally. I seem to use up a lot of centre drills and for these to work properly; they need to be ground accurately. Here is one that has just been ground. It looks ok, but I have yet to try it on a tough bit of stainless steel in my lathe. Instead of trying to get the end stop up close, I just cut a short piece of aluminium square rod to make a spacer.

I hope that this can be of use to someone and that some of the mystery of this little gadget has been cleared up.

Have fun and may all your drill bits be sharp !!!!

Skiprat
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