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Tool Tip... **Page 1**

Maltese Comet Pump

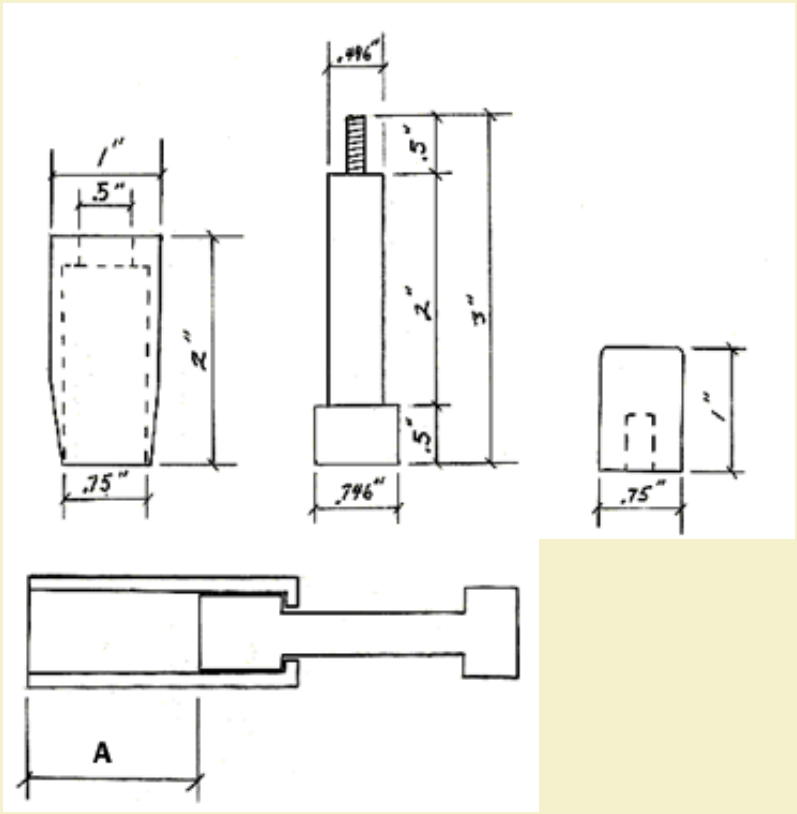
Figure 1: A Maltese comet pump.

Figure 2: Components of the pump include sleeve, piston and pounding nub.

Figure 3: Turning the piston from a piece of 3/4" brass rod.

Introduction:
In October of 2002 Benny Faruggia and Paul Schembri visited the Florida Pyrotechnic Arts Guild, bringing with them many ideas and techniques from Malta. One of the tools they shared with us is this simple comet pump, which allows damp composition to be quickly loaded and ejected without the need for trimming to maintain size consistency. With a little practice this is a very fast way to pump stars. I'm told once it's mastered you can pump 5 kilos (11 pounds) in an hour and a half or better.

For this article I will describe a ¾" diameter pump. The description and pictures below should give enough insight for anyone with a lathe to be able to make this type of pump.



The design of this pump is totally different from what we are use to. The sleeve is made from a solid piece of 1" dia. brass bar stock 2" long. It is rough bored with a series of drill bits to a depth of 1-3/4". Then using a boring bar the finish cuts are made for a smooth inside surface. Next a ½" dia. hole is bored through the final ¼" of the bar stock.

The ram is made in 2 parts. The first part is what I refer to as the piston and

Figure 4: Turning a taper on the brass sleeve allows easier insertion into dense comp.

Figure 5: Completed components ready for assembly.

the second part is the pounding nub. The piston is made from a piece of ¾" dia. brass bar stock 3" long. It is turned as shown in the picture below. The threaded end does not need to be made in one piece as shown in the diagram. The bar stock for the piston can be cut ½" shorter, drilled and then taped to accept a piece of ¼" - 20 all thread.

The final piece is the pounding nub. It is made from a piece of ¾' dia. by 1" long brass bar stock. It has the edge of one end slightly rounded and the opposite end is drilled and taped for the ¼" – 20 stud on the piston.

All three parts should have any rough edges removed and be polished. To assemble the pump the threaded end of the piston is slid through the ¾" end of the sleeve and out the ½" hole in the opposite end. Then the pounding nub is screwed onto the piston. The pump is now ready to use.

When using the pump simply slide the piston all the way against the back end of the sleeve and fill with dampened star comp. The sleeve is not rammed into a pile of damp comp. as typically done, rather the comp. is pressed into the sleeve using your fingers. This eliminates the density inconsistency that occurs when loading comet pumps by ramming them into a pile of damp comp.

Once loaded, press the comp. using a mallet or a press. At first it will take a little practice to load the pump to the same density each time so the stars will all come out the same length. I played with 500 grams of wet star comp and had the hang of it in about 45 minutes.

The pump described in this article has a cavity dimension (A) of 1-1/4". In my tests the stars pumped were 7/8" tall. To make the stars shorter the sleeve can be turned down to a shorter length or a washer like spacer can be made. The spacer should be placed on ½" diameter of the piston shaft before the pump is assembled. The intent of the spacer is to allow less travel in the piston. This allows less volume in the cavity, which in turn makes a shorter star.

Special Thanks to Benny Faruggia for sharing his paten with us.