

# Fire Piston Demo:

## **My back-ground:**

Turning for several years

Involved with the Club Lib

I like to turn smaller stuff

## **History of the fire piston:**

Fire piston was invented in 1745 by Abbe Augustin Ruffo. The Fire Piston was patented in 1807 simultaneously in both England and France. Fire pistons, or fire syringes as they were called then, were popular household tools throughout Europe during the early nineteenth century until the [safety match](#) was invented in 1844.

## **Operation of the piston:**

Piston is quickly rammed into the cylinder causes the interior temperature to rise sharply to 260°C (500°F). Cotton fibers for example combust at 235 °C (455 °F) and will light in fire pistons.

The piston has a handle on the end to allow a firm grip to be applied to it, or a large enough surface area to strike it sharply without causing pain while the cylinder is braced against a hard surface, and it can be completely withdrawn from the cylinder. The piston shaft generally has a notch or recess on or in its face, into which a piece of tinder is placed.

Fire pistons have a [compression ratio](#) of about 25 to 1.

Easily combustible materials such as [char cloth](#) or [amadou](#) work well as tinder in the fire piston



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**I have two types Sample's:** ----- Commercial and Mine

**Define your options:**

Fire piston options: ----- Tinder holding cap and/or tie-ring

**Needed supplies:**

Cylinder wood

Piston shaft wood (Cocobolo)

"O" rings ( 5/16 X 3/16 X 1/16 )

Cork with glue backing

Petroleum Jelly

CA glue

Denatured Alcohol

**Construction:**

Layout "**plunger cap**" (ring?) and "**piston body**" on the cylinder.

Turn to finished exterior and cut of cap, ring and body

Cut off the cap

I drill the cap out on the drill press

If making a tinder holding cap do this section, turn step and cut off

When making the step allow for adding of cork for a snug seal

I drill the inside out on the drill press of this piece also now

Cut off the Lanyard ring if making one

(Drill this a little larger then plunger shaft so it will clear the "O"rings)

**Making the shaft:**

I use Cocobolo but any dense hardwood should work. Note this is a exotic wood.

I make the shaft a little larger and fit it onto the body. I want it to go on and off easy.

Next I cut the O-ring grove in the shaft. This will make the seal tight for the needed compression.

Do not Drill the tinder cup before you are done fitting the shaft and "O-Ring" Because

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you want to hold the shaft while cutting the “O-Ring” groove to keep an even depth of cut.

I next drill the cup in the shaft for the tinder. Eye ball it. It does not hold a lot of tinder (maybe 1/8" to 3/16").

I can usually remove and try the piston at this point.

**If the seal is not good enough.** If not I try adding a little Petroleum Jelly.

If I still have a problem I put the shaft back on the lathe and cut the o-ring groove slightly and add a second o-ring in the groove. You should get this to work.

Now with a working piston I remove the o-rings and measure the length to bottom out in the bottom of the body (*This is without the lanyard tie-ring if used*) add how deep into the cap it goes (plus a little sand and fitting room). Mark and cut off the shaft.

I recheck for a fit that will just bottom out. I will sand the shaft to fit.

I use Denatured alcohol to clean all oils off the shaft area and the cap area before using CA glue to glue the shaft into the cap. Take care to glue it in straight.

You can use whatever finish you are comfortable with.

Your Fire Piston is done.

### **Making the Tinder: “Char Cloth”**

#### **Needed supplies:**

Cotton cloth

Clean paint can with lid

Good old camp Fire

#### **Construction:**

I use “**Monks Cloth**” (from Wal-Mart) cut into 2 foot sections and shred to threads.

This cloth 100% cotton and has a loose large thick weave. Any cotton cloth will work.

Fill the paint can 3/4ths full and place the cover on. I put a 1/16<sup>th</sup> inch hole in the cover to let the gas escape. The can will be placed in the fire. Smoke and gas will pour out the hole. When the smoke stops the “char cloth” is done. Remove the can and allow cooling completely. It is important not to open when still hot or the char cloth will ignite and you may lose it all. Keep it dry and it is ready to use.