FABRICATION OF PLUMB BOBS

The first plumb bob to verify a vertical direction was produced by hanging a simple stone on a line. No great expense. As a travel-report of Dogan Basak shows, this method exists still in some countries. When the building is ready they throw the stone away. No chance for plumb bob collectors. The plumb bob was used as a weight to hold the line tight. Later on the bobs got tips to plumb down a point. In some countries we still find nowadays plumb bobs without a sharp tip. (In France the “truncated cone” and in the Netherlands the cylindrical “flat bottom”). Similar to the technical development in the world the shape, the material and the production method of the plumb bobs were adapted. The history of the plumb bobs is also the history of the technique.

1) FORGING or HAMMER

A very simple method to forge plumb bobs was using a hammer (and an anvil). We have good items of Ottoman bobs that were forged. (Picture right).

In 2007 a blacksmith made me a very nice plumb bob only by using a hammer. He did it during an antique market where I had my exhibition. The plumb bob is elegant und it works! Especially made for me! (Picture left)

The body of these plumb bobs was of one material only. At that time they did not have a hardened steel tip by another material or a combination of different materials. Unfortunately we don’t have pictures that show the production of plumb bobs in that time. The plumb bob was a tool that was not worth to show it in a picture. It was too simple! We know only pictures of forging swords by the blacksmith.
2) FOUNDING OR CASTING

Another method is to cast plumb bobs in moulds. The material of the moulds was a simple stone or clay, later copper, brass or steel. The material of the plumb bobs was plumb, because it melts already at 327 degrees Celsius. Later they used brass and iron.

A very good sample for an open mould you can see in the museum MAISON DE L’OUTIL in Troyes / France. I tried to produce my own French flat plumb bob with such a mould. Unfortunately the result was not really as expected, but I can use it. 😊 ☹️.

Very simple is the system with the three wires in the middle to fix the line.
Simple plumb bobs for the old levels were produced with such moulds:

The use of such a level in a picture of 1555.

This mould was offered by Hans Brunner, an antique dealer in Australia:

When you produce plumb bobs or other things from grey cast iron you have to work them after casting by turning on a lathe. Sample of a GREY CAST IRON plumb bob that was produced until 1970.

Some of the offered moulds are not used to produce „real“ plumb bobs. Some are for making so called “fishing sinkers”. The quality of these bobs must not be as high as for the plumb bobs for workers. They have a simple eye / loop to fix the line.

These fishing sinkers are usually not a part of our collection of plumb bobs from masons etc., but it is nice to know how they are looking.
I got the chance to take photos in a small factory where they produced since 1896 and still are producing plumb bobs. We will see the production of six-sided (cant roll) plumb bobs, the brass types in different shapes and the die cast method. You can follow the way from the raw material to the final product.

3) TURNING

You will see the fabrication of different types of plumb bobs, beginning with the raw material up to the final product.

Remark:
The photos are made not on the actually modern lathes, but on an older one to show better the different steps and not to show actual secrets of the factory.

- I got the permission to make photos inside of a factory
- I tried to tell no secrets of this factory
- This factory produces plumb bobs since 1896
- They make a lot of different types (see catalogue)

In the 1920s they produced on such a lathe.
These types are still produced nowadays (with some exceptions)

Catalogue from 1926.

- Most of the plumb bobs start as a rod
- Raw material from brass or iron
- Round or hexagonal

Raw materials
Information for plumb bob collectors

PRODUCTION TYPE 14:

- Plumb bob of brass
- Fine polished and varnished
- Brass knob unscrews
- With steel point
- (with steel plate / spacer)
- Weights of 125, 150, 200, 250, 300, 350, 400, 500 g

The material is turned in an approximate shape

Insert the piece into the lathe
Different steps of the six sided “can’t roll”

Drill a hole

Screw in steel Tip

Cut thread
On another lathe:
they copy the size and
finish the surface

Make a round shoulder

In the same steps and method are
also produced these CENTER
PLUMB BOBS and the ENGLISH
ONION SHAPE

Ready!
4) ZINC-DIE-CAST

Now we see a method that is used since 1970. DIE CAST with ZINC. It arrives in ingots.

This German Standard Plumb Bob has an integrated steel tip.
Information for plumb bob collectors

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input of ZINC

left side injection inside the machine

ZINC die cast machine. back

left side of the mould

right side of the mould
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Information for plumb bob collectors

Before shipping the plumb bobs get by hand a **client mark** with a marker and a hammer. Here are some of the marks. I made a photo directly from the marker and than I turned the photo left to right. So you can better see the mark.

The original look:

At the end of the production line the box gets a client label. This factory NEVER marked with its own name or label, but they sold also plumb bobs without marks!

A problem today with the increasing prices for the row material is that the factory can’t reduce the weight of the plumb bob. 12 oz plumb bob weight = 12 oz material. ☺

So the countries with high salaries have problems to produce and to sell any longer these products.

More moulds you can see on page 24 of “THE PLUMB LINE CONTINUUM” edited by Nelson Denny.

Remark:

If you have any comment, feedback or further information about the theme of this issue, please let me know. Thank you.

Wolfgang