Dear Fellow Collector,
Dear reader of the PLUMB BOB NEWS,

Please, as always I am in search of new photos, catalogs, articles or personal stories about any aspect of PLUMB BOBS from you. Any help is appreciated.

If you have any information or pictures for these themes, please let me know.
Thank you, looking forward to hearing from you.

Wolf

THE PATENTED DEVIL LEVEL

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1. INTRODUCTION

When browsing through my pieces in the museum recently I found a small plastic instrument with the inscription "devil level".

When I looked at the "devil" in the device, I remembered the Bottle Imp (right) from my childhood, a small glass devil, which emerged in a glass bottle up and down. At that time we had only glass bottles and had to slip over a rubber cap for correct use. Today, you can also do this with a closed plastic bottle. I have seen that such a small “bottle devil” is offered for 10 €.

On YouTube you can also see the action on video: 
http://www.youtube.com/watch?v=sNOXFjJ4IDU
http://www.youtube.com/watch?v=4Wwz_BISA7w
http://www.youtube.com/watch?v=84f63FsqxK0

But with this “Bottle Imp” our “devil” in the angle measuring device - which I will describe today – has nothing to do. Only the shape and size are similar. Correctly the Bottle Imp is called "Cartesian Diver", as you can be read in Wikipedia:

http://en.wikipedia.org/wiki/Cartesian_diver

There you can also read that the devil is partially filled with water, but is not completely closed.

The "Cartesian Diver" responds to PRESSURE, whereas we for a plumb bob need the GRAVITY (or - BUOYANCY - in the opposite direction).

Coming back from my childhood and have a closer look on this in the USA patented "devil level", an angle and slope meter.

I will describe the devices in my museum and the patents.
2. THE MEASURING INSTRUMENT „DEVIL LEVEL“

The instrument is a plastic container 2 inch x 2 inch x 1 inch and is used as INCLINOMETER or LEVEL.

At the bottom the container is triangle shaped to put it on a pipe.

It is filled with a liquid, perhaps a kind of oil or anti freezing liquid. (In the patent description Glycerin is mentioned)

In most of the known Instruments we find not enough liquid so that the “devil” can’t swim and is not in a correct position. But you can refill some water by drilling a small hole in the top. After filling it correctly you can shut it with a drop of glue.

I found different labels / markings:

„PAT. PEND.“ = „patent pending“ shows that this instrument was produced before the patent was granted/published (1957 - 1960).

If a tool is marked “patent pending” you can’t be sure that a patent exist.

Without the name of the inventor or a date it is difficult to find the patent. I searched on different ways but could not find a matching patent.

Later I found a “devil level” marked “patented” and with two patent numbers. Now it was very easy to find the patents for this instrument.

What a surprise when I stored the files in my archive: I knew these patents already since 2007, but did not remember them. (I get older!).

More about the patents you find in chapter 3.

The scales on the front a back show different units and allow different measurements.

Front: „ELEVATION IN DEGREES“

The other side is marked: INCH RISE PER FOOT
Let’s look at the **central/main part** of this instrument, the “small devil”. It is a double cone from plastic that contains **AIR** in the upper part and **METAL** as weight in the lower part. In the tip is a ball (20) pressed in. The air lets swim the body so that the top points upside.

The weight holds the devil in the V-shaped bottom of the instrument.
The "Devil" (the plumb bob) sits with the round ball down in a defined position (central point) in the V-shaped recess.
The air-filled upper part having a tip is pointing to the surface of the liquid. If you now put the instrument not horizontally, but keeps it on a slope, the top still shows to the water surface above the central point. On the arc-shaped scale, the corresponding value can then be read.

Below: text and use of the instrument on a box

**THE DOUBLE CONE WORKS IN THIS INSTRUMENT LIKE A PLUMB BOB. IT IS THE GUARANTEE FOR THE VERTICALITY. IT IS A “FLOATING PLUMB BOB”**

For advertising some instruments are colored and/or printed with company names.

Maker is the company PICKETT in California. Pickett is also the owner of the patents.
I think the devil level was **produced between 1956 and 1975**, but this period is not sure.

Four of my six “devil levels”:
3. THE PATENTS

The history of the different patents: The first patent was US 2,841,880 granted to Christopher M. Golemon from Covina, California, in 1958 that was filed in 1954. Processing time more than 4 years!

Golemon got the rights for the basic principle of a display part:
- An elongate body
- Air chamber in the upper part
- Mercury as a weight below
- Tip ends of the top and bottom
- Floats in liquid

John W. Pickett from Altadena, California from Pickett Products Inc. seems to have heard (Unknown how) of the patent. Because he applied on May 13, 1957, (before the patent from Golemon was published) an own patent U.S. 2,939,221 that was accepted in June 1960 three years later.

In this patent he proposed some embodiments / implementations of the "water level". He also wrote extensively on the peak and the shape of the floating devil.
In both patents, we find a list with earlier patents that were considered in the assessment. Let's have a closer look to some of them.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td>807,992</td>
<td>Barclay</td>
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<td>Fielding</td>
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<tr>
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<td>1,541,455</td>
<td>White</td>
<td>June 9, 1925</td>
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<td>1,855,664</td>
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<td>2,092,179</td>
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<td>2,249,728</td>
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<tr>
<td>2,438,229</td>
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</tr>
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<td>2,653,389</td>
<td>Butterworth et al.</td>
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FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
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<tbody>
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<td>117,161</td>
<td>Great Britain</td>
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</tr>
<tr>
<td>182,540</td>
<td>Great Britain</td>
<td>June 30, 1922</td>
</tr>
</tbody>
</table>

SPENCER 1921 US1399090 describes a floating plumb bob for the use in an airplane.

WHITE 1925 U.S. 1,541,455 describes a water level with a pointer that is held in the center by an elongated hole:

McBRIDE 1931 US1836079 shows a floating pointer fixed by a hinge at the bottom:

VON ARX 1948 US2554135 invented a plumb bob integrated in a surveying rod (ranging pole). It shows the verticality of the rod.
The foreign patent from England GB7203 from 1903, Theodor Hillmer shows a floating plumb bob used in earth drilling equipment to show and register the inclination of the bore hole.

For this purpose a plate from the top was pressed against the tip of the floating plumb bob, and then later read the angle.

Theodor Hillmer was a German and lived in Aschersleben in Germany.

More about “Plumb bobs used in bore holes” you will find in my newsletter WOLF’S PLUMB BOB NEWS 2009-12.

In the information from the patent offices are not only found references to earlier patents that were included in the review, but there are also indications in which newer patents the patent to Pickett was taken as a reference base.

This is eg. the case with the patent of Marie Pierre Poitevin de Fontguyon from Paris, France. His idea about a floating (inversed) plumb bob (eg. for use in dams) was patented in 1967, U.S. Patent 3,348,315.

More about this kind of floating or inversed plumb bobs you will find in my newsletter 2010-12 PLUMB BOBS IN DAMS.

You should read this newsletter. 😊
THE DEVIL LEVEL IN THE WORLD WIDE WEB

In the www the devil level is hard to find. Documents are very rare.

The term “devil level” is also used in other areas like religion or music (where Rana presents a song called “devil level”).

JIM BEAM is advertising with the slogan: 😊

How sinister are you?

You must be of legal drinking age to use this application. Please drink responsibly.

In the literature, only some ads occur.

In the famous magazine Popular Mechanics we find in April 1956 this advertising:

In July 1959 it is offered in the Sarasota-Herald-Tribune for $1.95.

In February 1974 it is described in the newsletter THE CARPENTER as NEW and offered for $2.25.

In July 1974 the price rises to $2.75.
4. SOMETHING TO SMILE ABOUT

On eBay U.S.A. regularly is offered such a shoe with an integrated plumb bob. Another example of plumb bobs used by artists:

**JUST THE RIGHT SHOE CUSTOM MADE 25115 MINIATURE COLLECTABLES**

“This auction is for one #25115 Custom Made Shoe in the original box with paperwork and certificate of authenticity in excellent condition. Official JTRS sticker on the bottom of the sole. For those who like their fashion custom made, this clever shoe really measures up. Craftswomen of all kinds will appreciate the tape measure ankle strap fastened with a designer's triangle and golden screw. To keep things "on the level," a carpenter's plumb bob dangles from the heel. This shoe is from a smoke and pet free home. Just The Right Shoe miniature collectibles are known for brilliant design and authentic look. No other artist has captured the glamour and excitement of footwear fashion like Raine. Putting her best foot forward, award-winning artist Raine offers a delightful commentary on art, culture, and taste with her popular collection Just the Right Shoe. From earliest memory, Raine has always been passionate in the pursuit of her art. Expanding her love of art into three dimensions, she created large scale works for public spaces and showed limited edition bronzes in galleries before creating the miniature shoes that are now part of the successful Just the Right Shoe™ line. What wonderful collectable that are both topically interesting and intricate art as well. The unseen anatomy of the foot, with the creasing and wear on the shoe, creates the illusion of this tiny sculpture as having been worn by someone. The level of detail: satin, suede, rubber, cork, all executed in exquisite detail complete the realism, allowing collectors to enjoy an amazing shoe fantasy collection.”

5. REMARKS

Last but not least: GOOD NEWS:

NEXT YEAR I WILL CONTINUE WRITING AND PUBLISHING MY MONTHLY NEWSLETTER ABOUT PLUMB BOBS AND RELATED INSTRUMENTS.

DON’T FORGET THE NEXT MEETING IN JUNE 2014 IN PISA, ITALY!

I WISH YOU A MERRY CHRISTMAS AND A HAPPY NEW YEAR!

Wolf

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On subpage “download publications” or on page “WHAT’S NEW?”

Remarks and contact by email: plumbbobwolf@t-online.de

Enjoy it

Wolf

Ps. For the members of our group the whole world turns around the plumb bob as shown in our logo right. 😊