PYROMETER / BASIC LINEAR EXPANSION DEMONSTRATION APPARATUS

PRECAUTIONS. READ THIS FIRST:

1) It is not a toy and adult supervision / operation is required as the experiment is being performed with a flame.
2) The base where the candles are placed is wooden, tea-light candles with metal covers should only be used.
3) During or immediately after experiment do not touch any of the metal parts linked to the rod under experimentation as heat does get transferred and they will be extremely hot. Let it cool down and then touch the rod for changing to a different rod.
4) Use basic precautions as one would on using open flames.

This is an excellent basic instrument used to demonstrate expansion in metals and comparing their expansion in a given amount of time. The instrument has a reference scale which is used to observe the amount of expansion. The two great advantages of this instrument is that it can be assembled very quickly with positioning just one part and screwing in two screws, it does not require steam or high temperature burners. One tea-light or more(not supplied), depending on how fast you want to show expansion, will be enough to conduct the experiment.

PARTS & APPARATUS ASSEMBLY:

The unit when unpacked comes as follows:
Wooden Base A, comes with fixed parts:
B – Two pillars that are used for storage of the two extra rods which are not being used. Just slide them in and tighten screws.
C – Pillar with set screw and to hold end of rod which is being experimented on.
D – Pillar to hold end of rod which is being experimented on.
J – Two screws in pre-drilled holes to fix E.
E – Pillar having Pointer F, and Scale G.
H – Set of 3 rods, Aluminum, Brass and Steel.

With a screw driver (not supplied, but easily available in the lab) remove the two screws J and take E and match the pre-drilled holes on the base of E with J, taking care that the pointer / scale is facing the rod holder D / C. Screw in the screws. Figure on left.
Take the rod which you want to experiment on and insert it in the rod holding pillars D & C. Taking care that the pointed end is towards the pointer and the round recessed end towards the set screw I. Figure on right.
Insert the balance two rods in B for storage.

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The instrument is now ready for use.

Slide the rod, which is being experimented upon, by hand so as to touch the square part of the pointer. With the help of the set screw I slide the rod so that the pointer is at zero.

Take one or more **TEA-LIGHT CANDLES WITH METAL BASE**, (not supplied) depending how fast you want to conduct the experiment and put them below the experimental rod. Light the candle / Candles and record the time. As time passes the pointer will begin to move to the right as the rod is expanding and in turn pushing the pointer. Record the reading on the scale after a given time. **Wait for the instrument to cool down**, and change the rod to a different metal. Again repeat and the experiment and note the reading on the scale for the same amount of time. The difference in the expansion rate can then be seen in the same amount of time leading to finding out which metal expands the most in the same period of time.

If the flame of the candles is too low use some kind of an elevator on the base of the candles.

During heating of the rod carbon may get deposited on the place where the flame touches the rod, clean it after it cools down as when you experiment again and heat at the same place, heat will not get transferred as the carbon starts to act like an insulator.