

Experiment No. 141. Aim:-

To prepare a 5 kg test weight by Borda's method.

2. Apparatus used:-

- 1) 5 kg working standard balance.
- 2) 5 kg working standard weight
- 3) Dummy weight (C.I. weight)
- 4) Lead pieces.

3. Theory and formula used:-

Test weight is the commercial weight adjusted to the high accuracy possible to represent equivalent working standard weight faithfully respect to accuracy only.

To avoid error due to inequality of arms Borda's method is followed. If an working standard weight = w is keeping at right pan equipoised by keeping dummy load = m , at left pan, then it can be said.

$$w \times b = m \times a \quad \text{--- (I)}$$

$\therefore b =$ effort arm, $a =$ load arm

Now keeping dummy as it is C.I weight under precaution for test weight. At equilibrium position, it can be said.

$$w_1 \times b = m \times a \quad \text{--- (II)}$$

Then from eq^s (I) & (II), we get $w_1 = w$

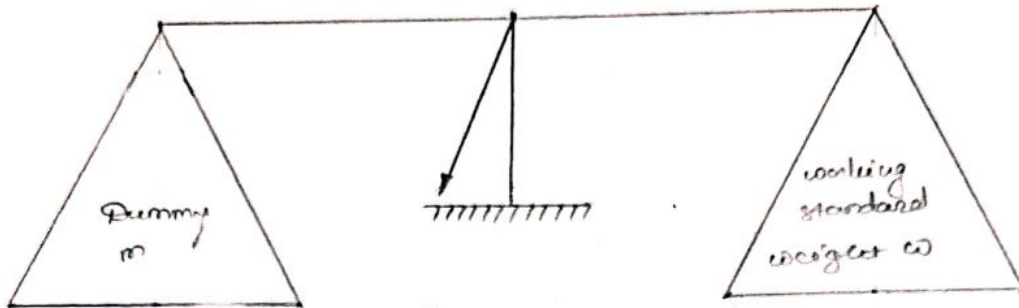


fig. 1

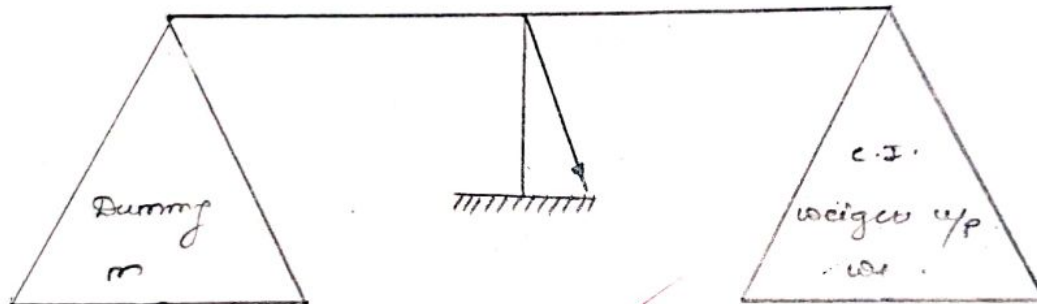


fig. 2

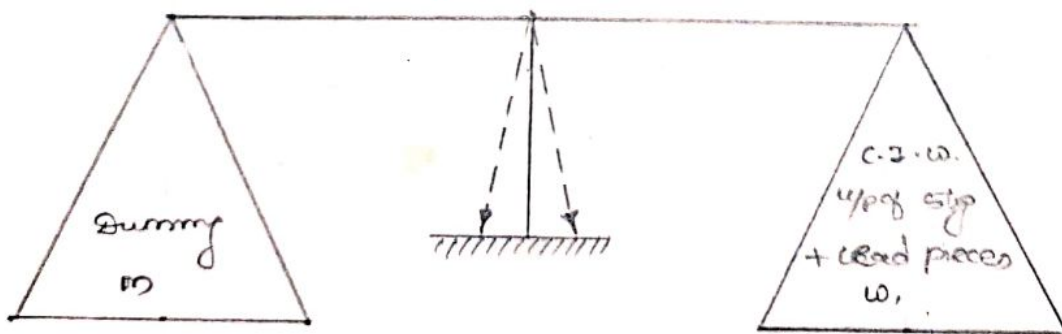


fig. 3

Table

Preparation of 5 kg Test weight

Borda's method

Sr No.	Load on Pan		Position of Pointer	Remarks
	Left	Right		
1	0	0	The pointer deflects same divisions both the side.	Equipped
2	Dummy	5 kg c.o.s. weight	Pointer appears to deflect towards dummy from its mean position	Dummy was lighter hence dummy was adjusted.
3	Dummy	C.I. weight to be prepared of 5 kg	The pointer appears to deflect towards C.I. weight	C.I. weight is lighter than dummy. It was adjusted.
4	Dummy	C.I. weight of 5 kg + lead pieces	Pointer appears to deflect same divisions both the sides	5 kg Test weight was prepared.

i.e. weight of C.I. weight = weight of working standard weight.

In this way test weight is prepared.

4. Physical observation:-

- | | | |
|-----------------|---|-----------|
| 1) Denomination | - | 5 kg |
| 2) Material | - | Cast iron |
| 3) Type | - | Hexagonal |
| 4) Trademark | - | SWPI |
| 5) Colour | - | Black |

5. Procedure:-

- 1) A working standard balance of 5 kg capacity having correct sensitivity was selected.
- 2) The balance was levelled & equipoised.
- 3) Placing a 5 kg working standard weight at right pan & dummy at left pan the balance was equipoised.
- 4) Now, a 5 kg working standard is replaced by a C.I. weight of 5 kg under preparation at right pan and dummy at ~~right~~ ^{left} pan as it is, the balance was equipoised by adjusting the C.I. weight only.
- 5) Then C.I. weight at right pan is prepared as 5 kg test weight. The result is given in table.

6. Result :-

A 5 kg test weight is prepared using Borda's method, which confirms to the standards established.

7. Precautions :-

- 1) Working standard balance was cleaned and levelled carefully.
- 2) Sensitivity of working standard balance has been checked.
- 3) Working standard balance & weights were handled carefully.
- 4) Loading & unloading were done at rest position of the balance.

Bhargava
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