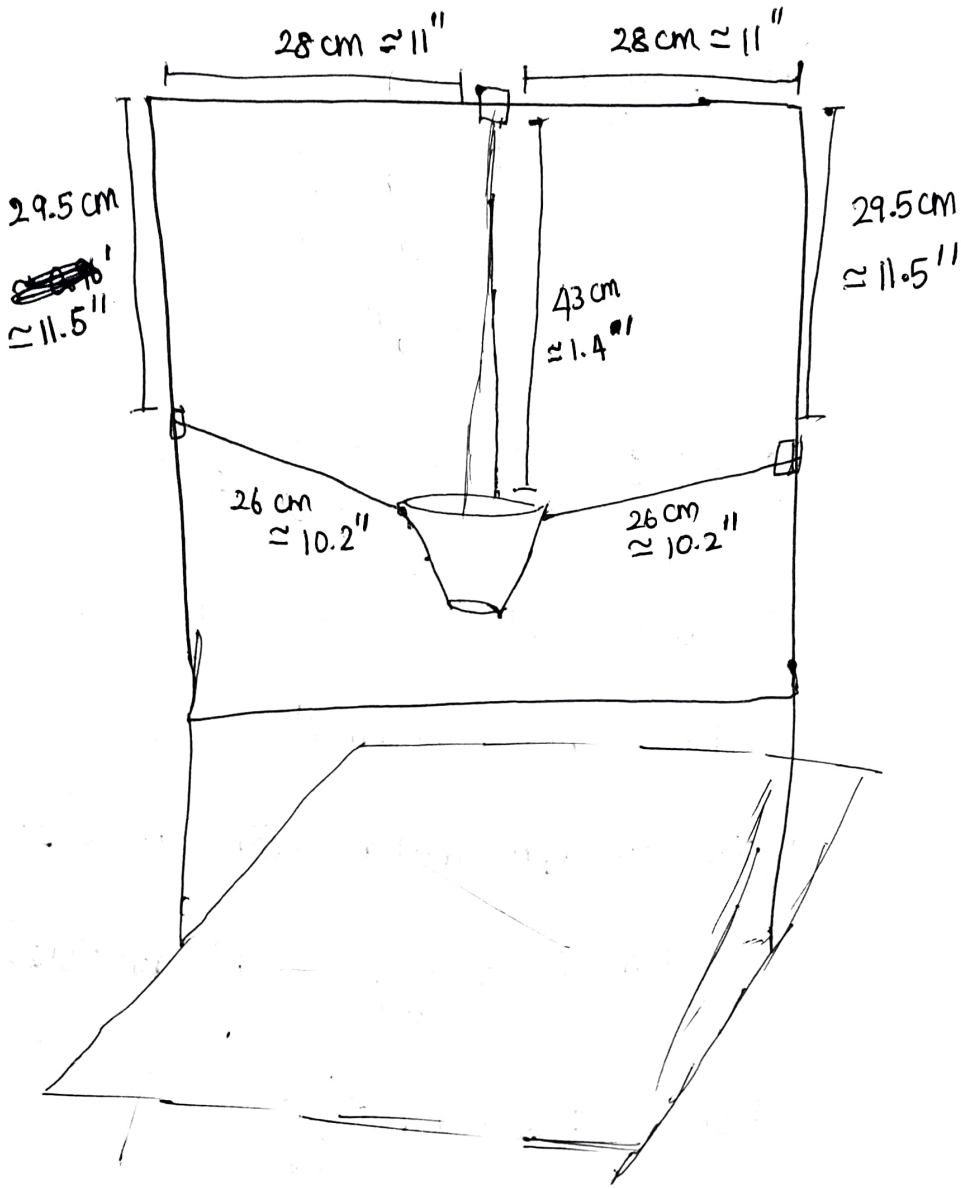

Inner Diameter → 13 cm Height
Outer " → 16 cm
Height → 11 cm.

Volume of Cradle $= \frac{1}{3}\pi h\left(R^2 + r^2 + Rr\right)$.

$\frac{1}{3} \times 3.14 \times 11\left(16^2 + 13^2 + 16 \times 13\right)$.

$11.51\left(256 + 169 + 208\right)$.

$11.51\,(633)$

$= 7285\,cm^3$

for 1°, it takes 0.3 inch

1s → 6°

So for 6° → 1.8 inches (Theoretical)

Theoretical Table:

delay	distance (Inch)
2.5s	4.5 ~~4.04~~
3.5s	6.3
7s	12.6
5s	~~10~~ 9

Circumference $= 2\pi r$

$= 2 \times \pi \times 1.4'$

$= 8.8'$

$\simeq 105.6''$

To swing $2.5'' \Rightarrow \frac{360^\circ}{105.6''} \times 2.5''$

8.5° left & 8.5° Right.

For 1 inch movement $\rightarrow 3.4^\circ$

With 100 rpm motor with Load $\simeq$ 80rpm

For 1S $\rightarrow \frac{80}{60} \Rightarrow 1.3$ rotations.

~~For one second, 5.94°~~

In 1S $\rightarrow$ ~~5.94°~~ 6° achieved in experiment.

In practical experiment case

~~1S = 4.43 cm~~

delay	Direction.	(Inch)
2.5 s	11.5 cm	4.042
3.5 s	15 cm	5.9
7 s	30 cm	11.8
5 s	20 cm	7.9

Averaging we get for 1S, it moves ~~4.43 cm~~ 4.43 cm from centre.