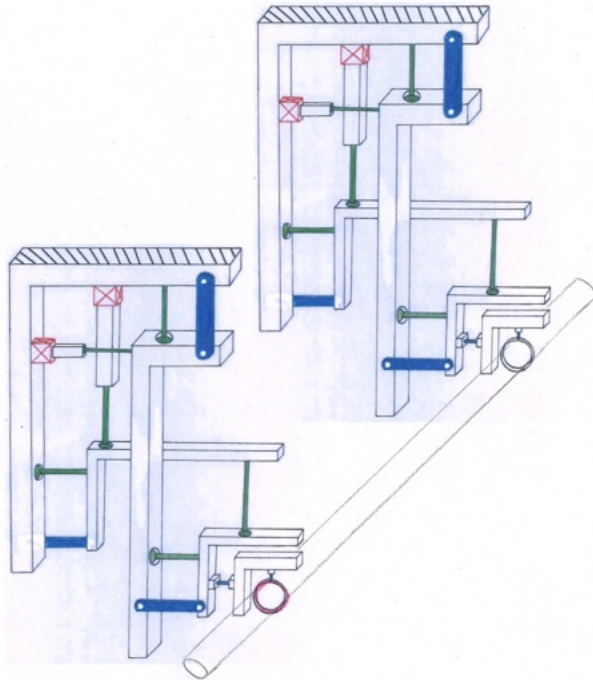


# Planche 1 : Translations en parallèle, cardans en anneaux

*Cinématique idéale*



Grübler 3d :

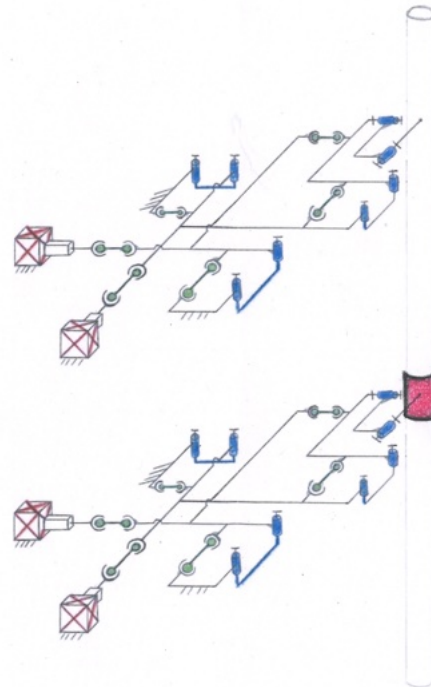
$$n = 33, k = 45, b = 13$$

$$M = \sum di - 6b = (20 \cdot 1 + 1 \cdot 2 + 24 \cdot 3) - 6 \cdot 13 = 16$$

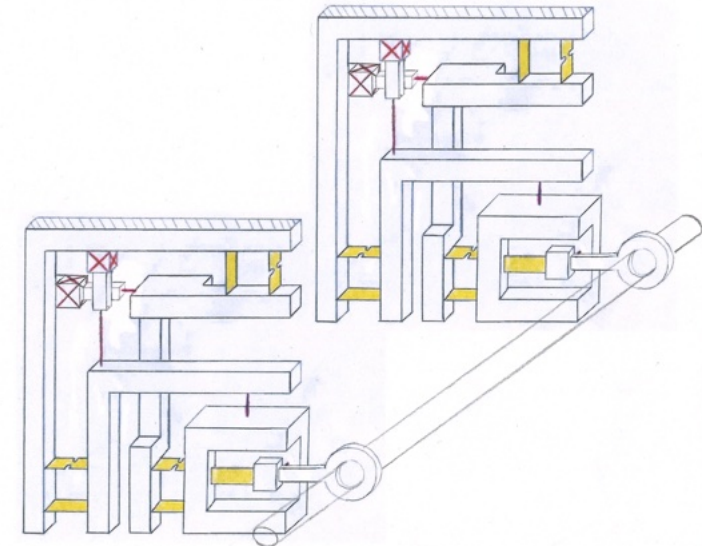
$$\text{DOF} = 16 \text{ (4 ext. + 12 int.)}$$

$$\text{DOH} = \text{DOF} - M = 0 \quad (\text{pas d'hyperstatismes})$$

*Représentation schématique*



*Cinématique flexible*



Grübler 3d :

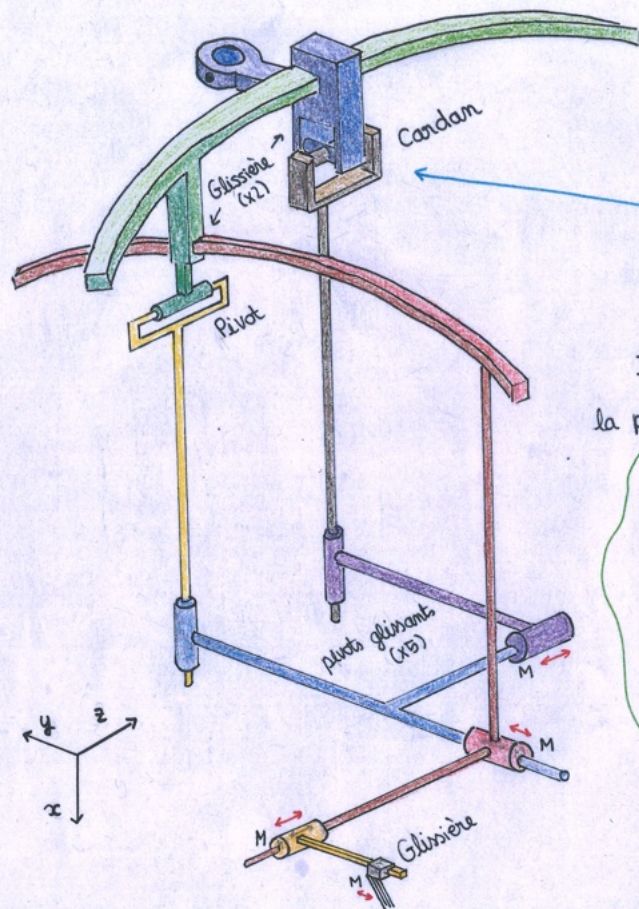
$$n = 13, k = 27, b = 15$$

$$M = \sum di - 6b = (4 \cdot 1 + 1 \cdot 2 + 8 \cdot 3 + 6 \cdot 4 + 8 \cdot 5) - 6 \cdot 15 = 4$$

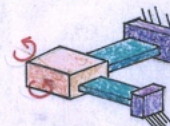
$$\text{DOF} = 4 \text{ (4 ext. + 0 int.)}$$

$$\text{DOH} = \text{DOF} - M = 0 \quad (\text{pas d'hyperstatismes})$$

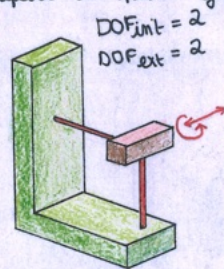
## Schéma Cinématique



Implémentation pour  
le cordon et la translation en x



Implémentation pour  
la plupart des pivots glissants



$DOF_{int} = 2$   
 $DOF_{ext} = 2$

Evaluation de Grubler  
(cinématique)

$$b = k - m + 1 = 10 - 9 + 1 = 2$$

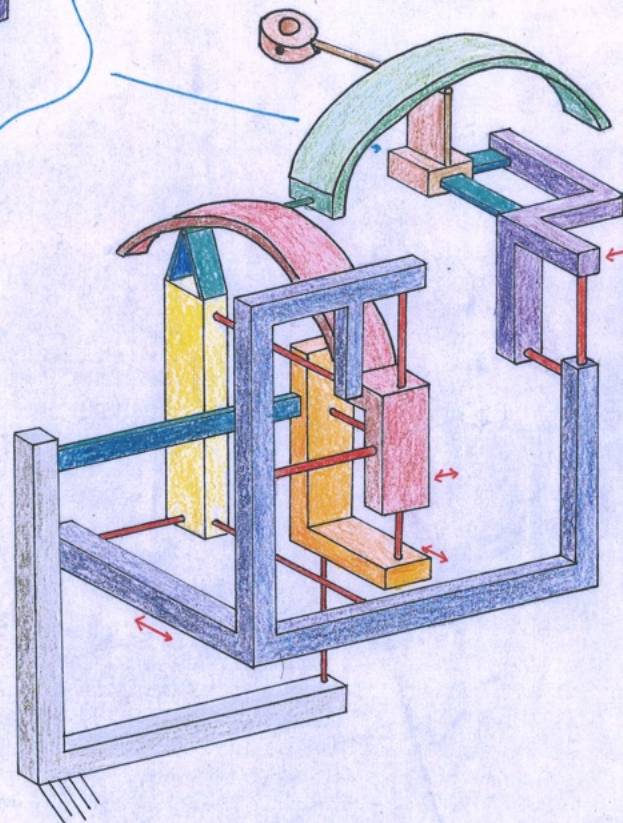
$$M = 3 \times 1 + 5 \times 2 + 3 \times 1 - 12 = 4$$

$$DOF_{ext} = 4 = 2 \text{ rotation} + 2 \text{ translation de l'anneau}$$

$$DOF_{int} = 0$$

$$DOH = 0 \quad \text{Aucun hyperstatisme}$$

## Implémentation Physique

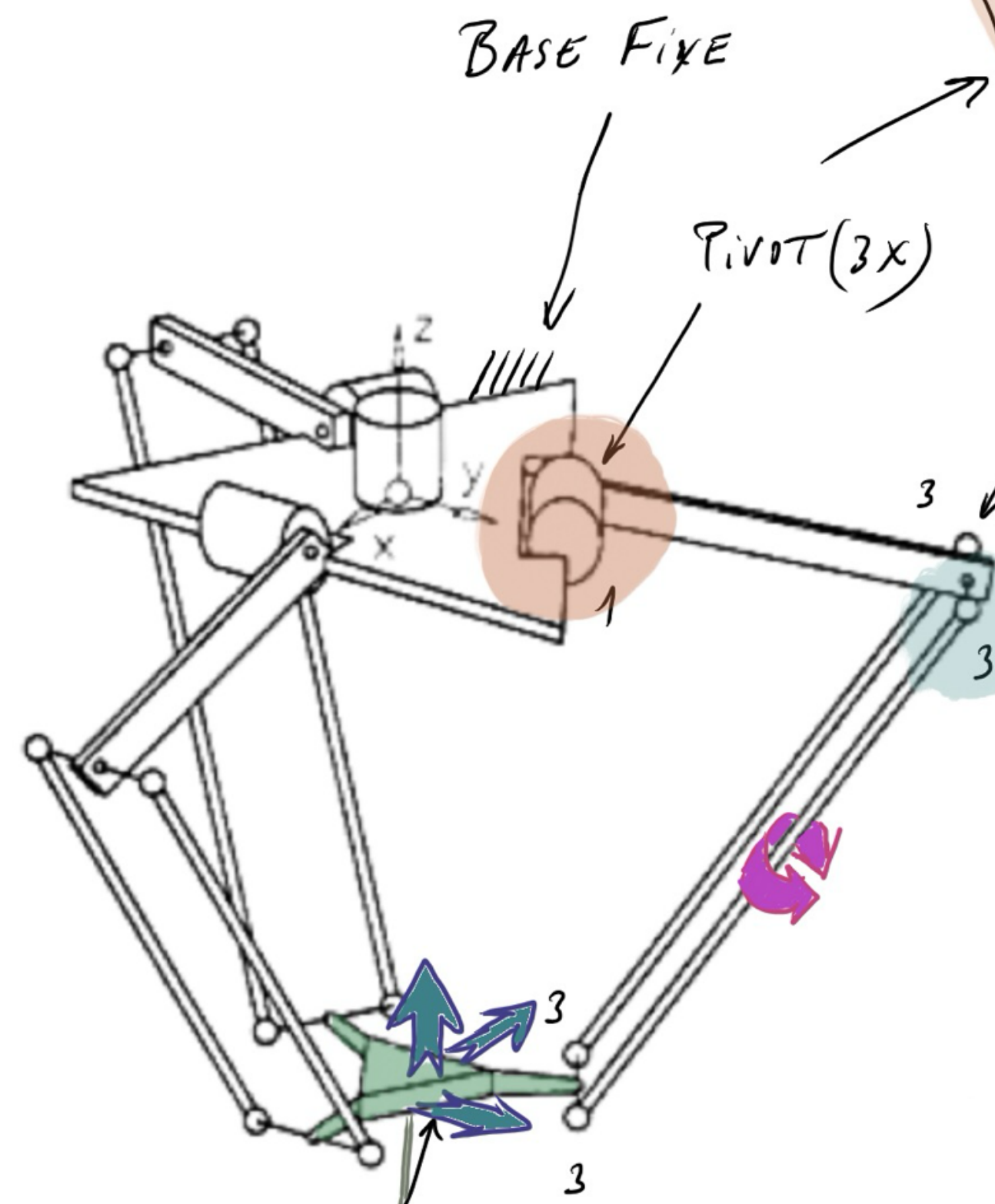


tiges

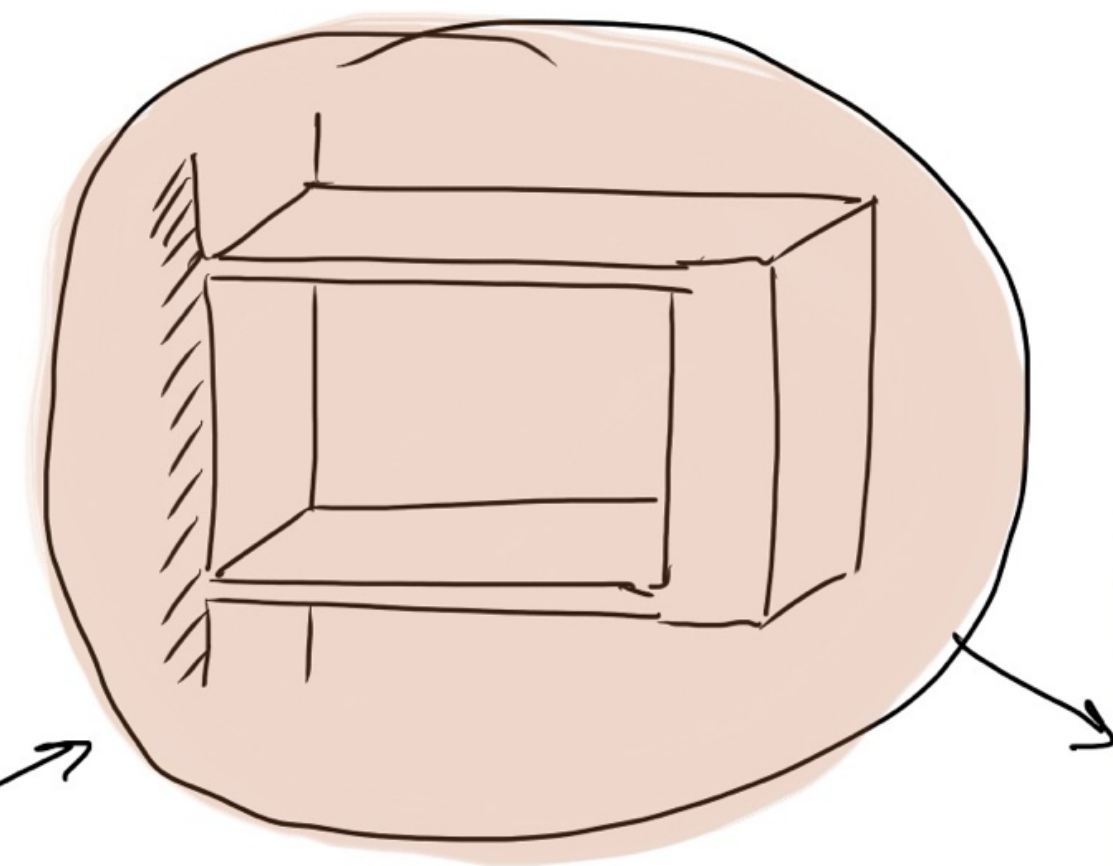
lames

# PLANCHE ROBOT DELTA

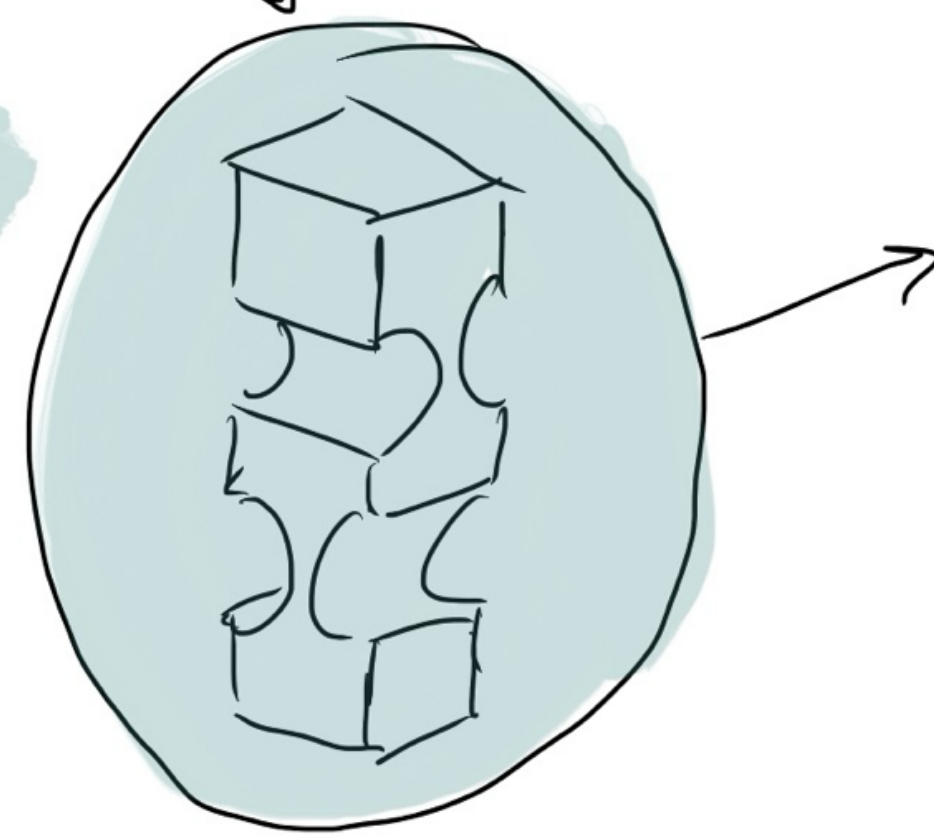
## SCHEMA CINEMATIQUE



PLATEFORME MOBILE  
 BOUCLES :  $b=5$   
 $M = 3 \times (3+3+3+3+1) - 5 \times 6 = 9$   
 DOF EXTERNES  $= 3 \rightarrow$  TRANSLATIONS PLATEFORME  
 DOF INTERNES  $= 6 \rightarrow$  ROTATION BARRES PARALLÈLES  
 $DOH = 9 - (6+3) = 0 \rightarrow$  AUCUN HYPERSTATISME

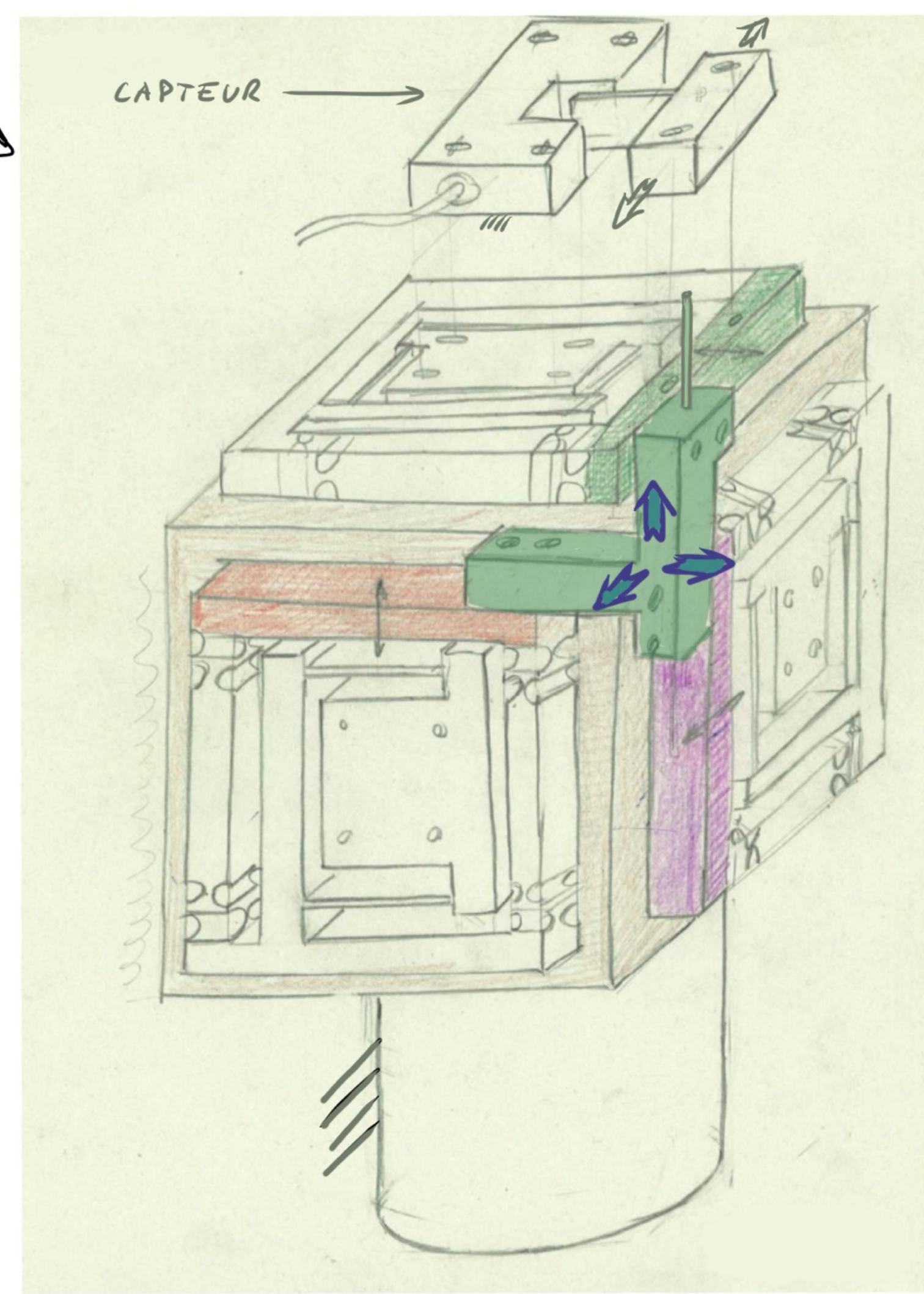


ROTVES (12x)



CHOIX DES GUIDAGES  
FLEXIBLES

## IMPLEMENTATION PHYSIQUE (VUE D'ARTISTE)



S. HEWEIN, 14.3.2017