

# Assembly

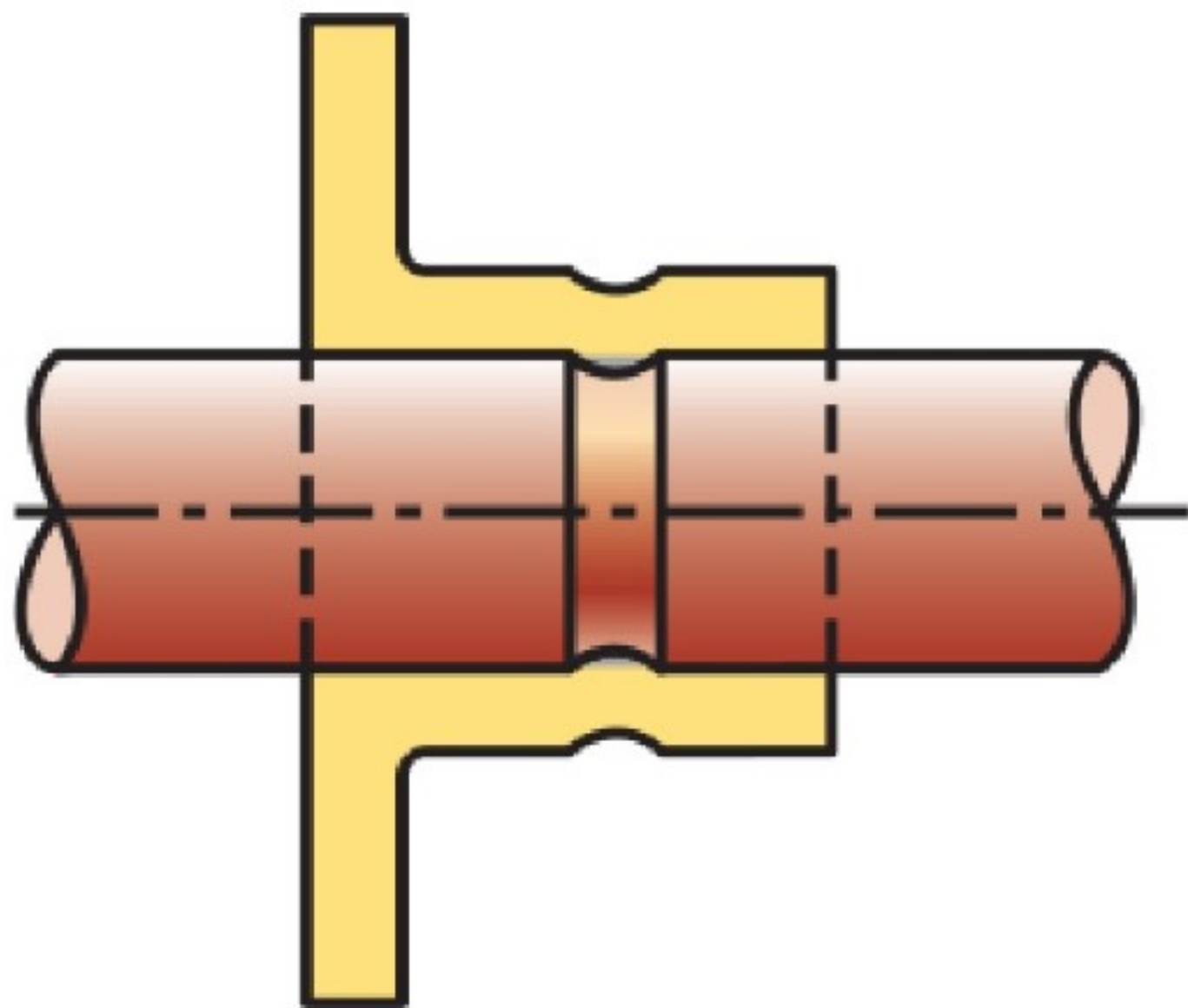
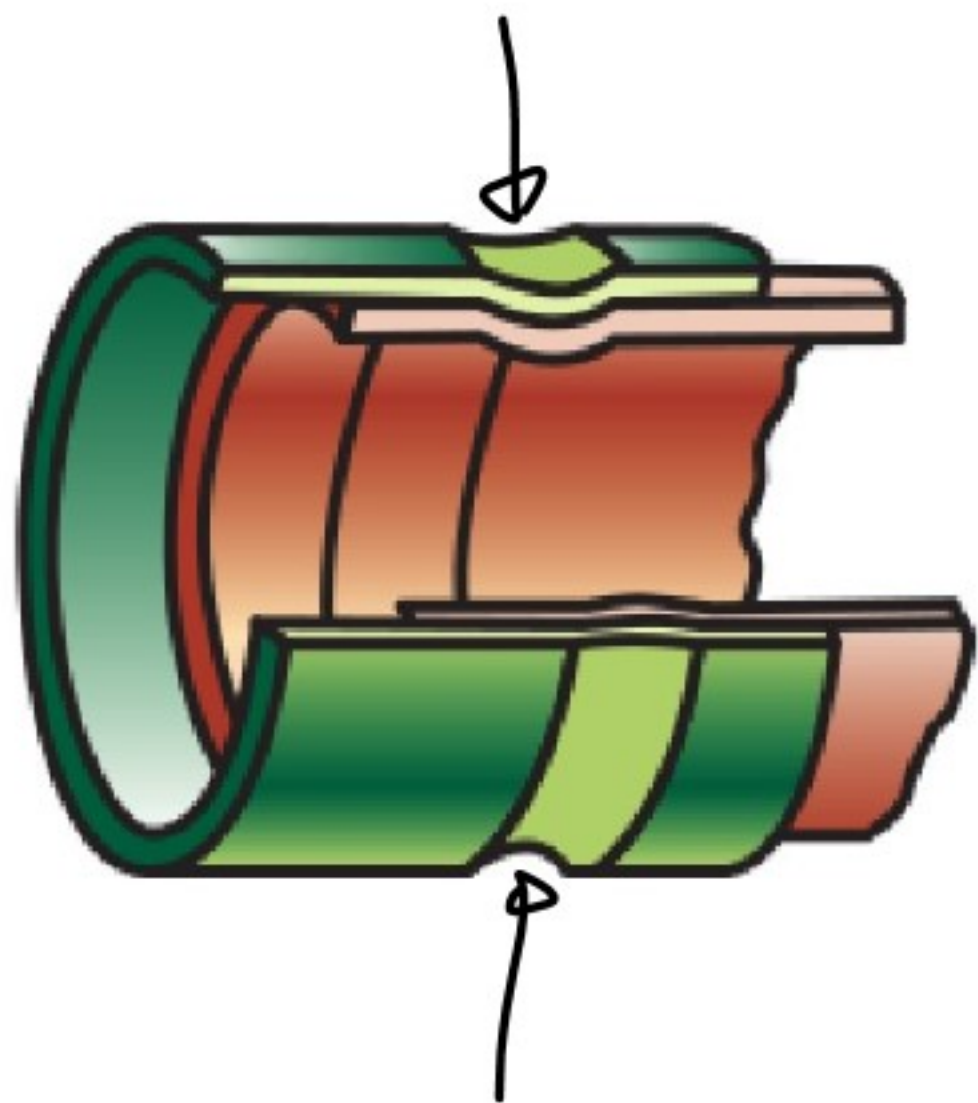
## Mechanical Fastening

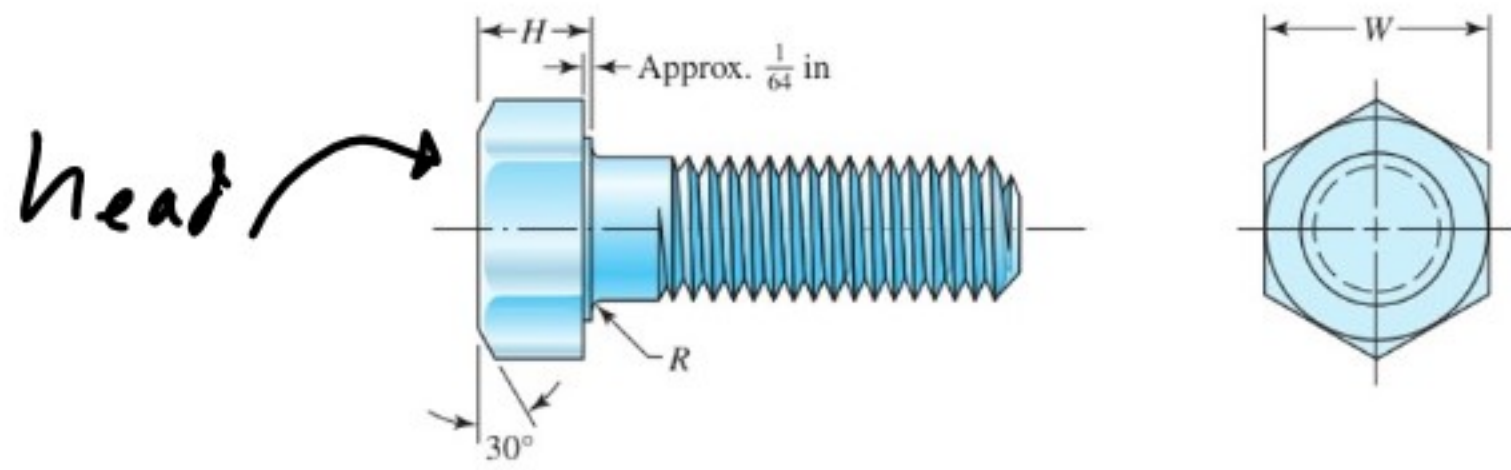
Press Fit

Crimping

Screws and Bolts

Clips

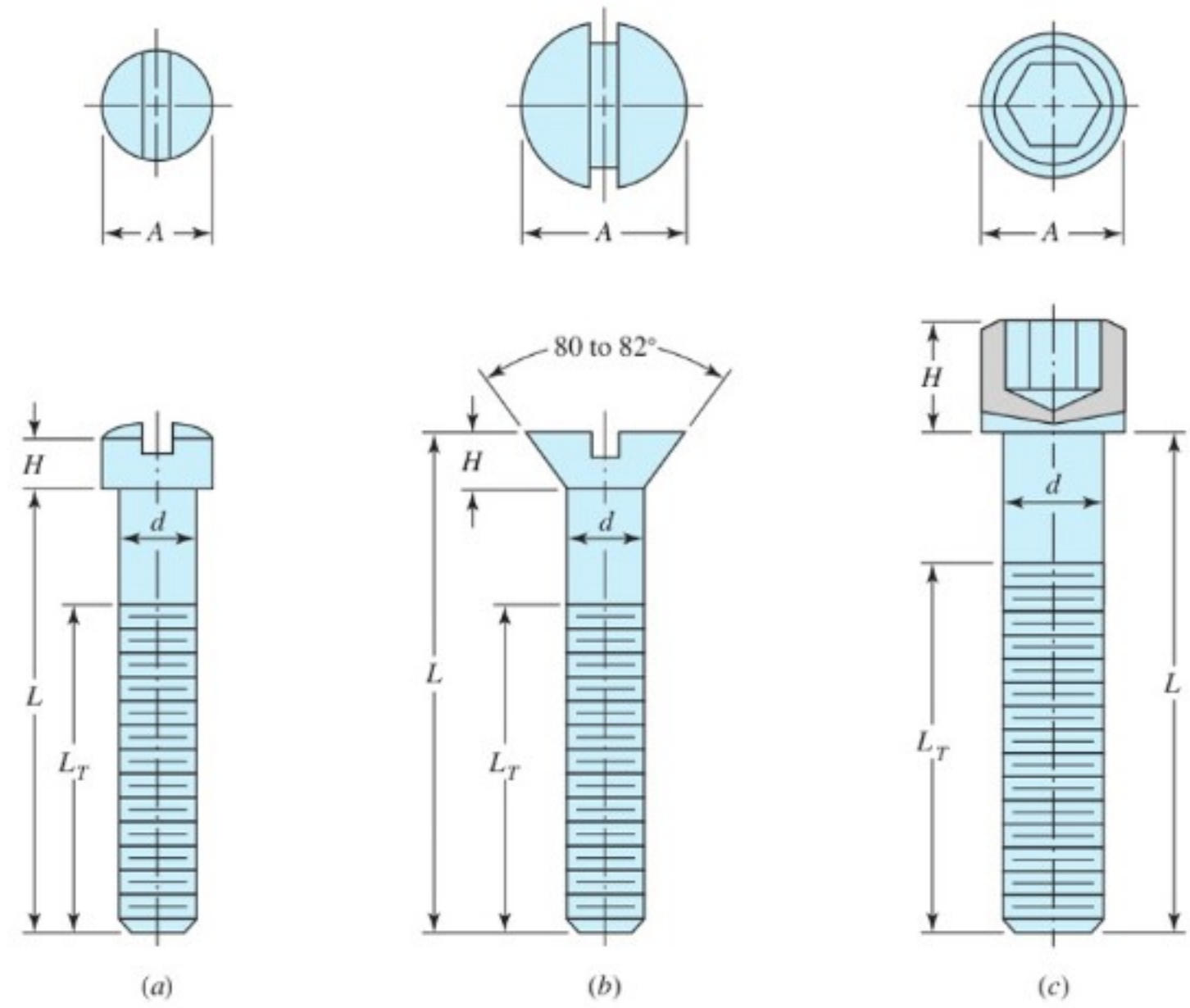


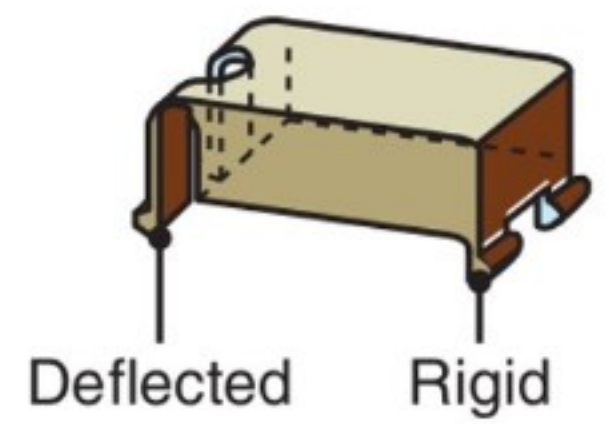
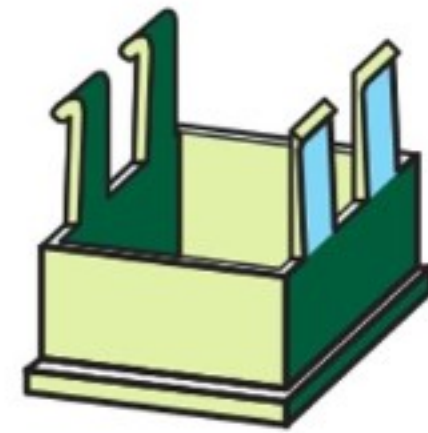
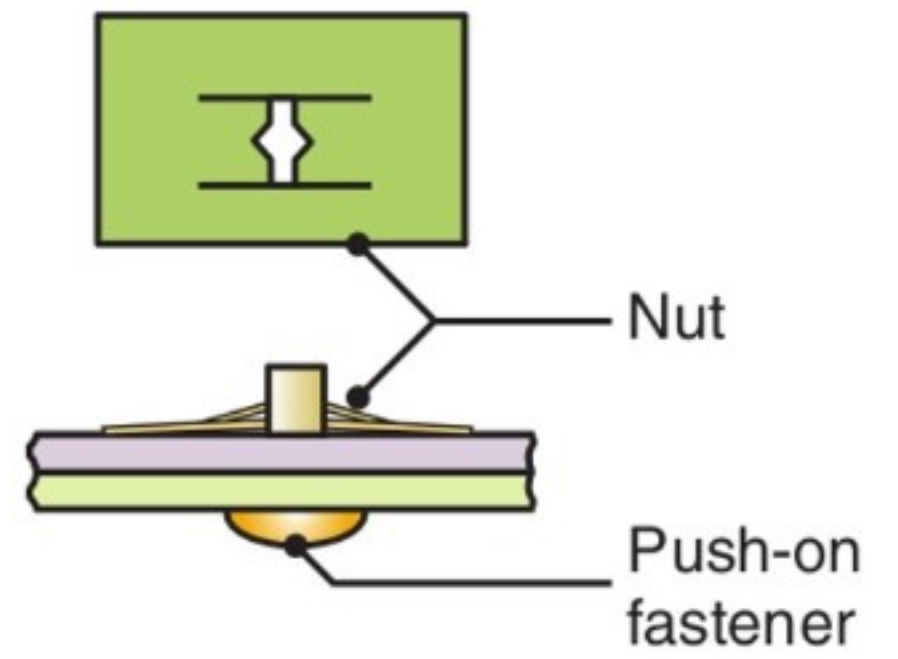
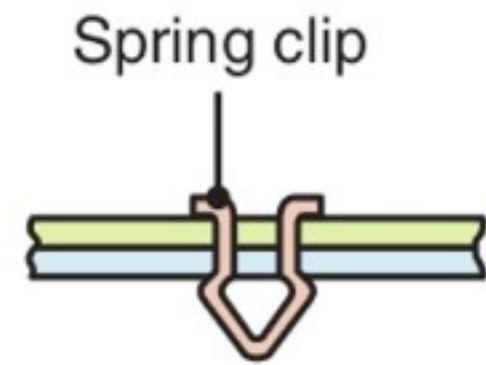


Head

Machine  
Screws

socket head





Vibratory  
feeder



Faster assembly

Power tools

Torque Limiter

Full automation

# Actuators

## Motors

Servo Motors

AC Motors

Synchronous

VFD

Variable Frequency Drive

Stepper

Pneumatics

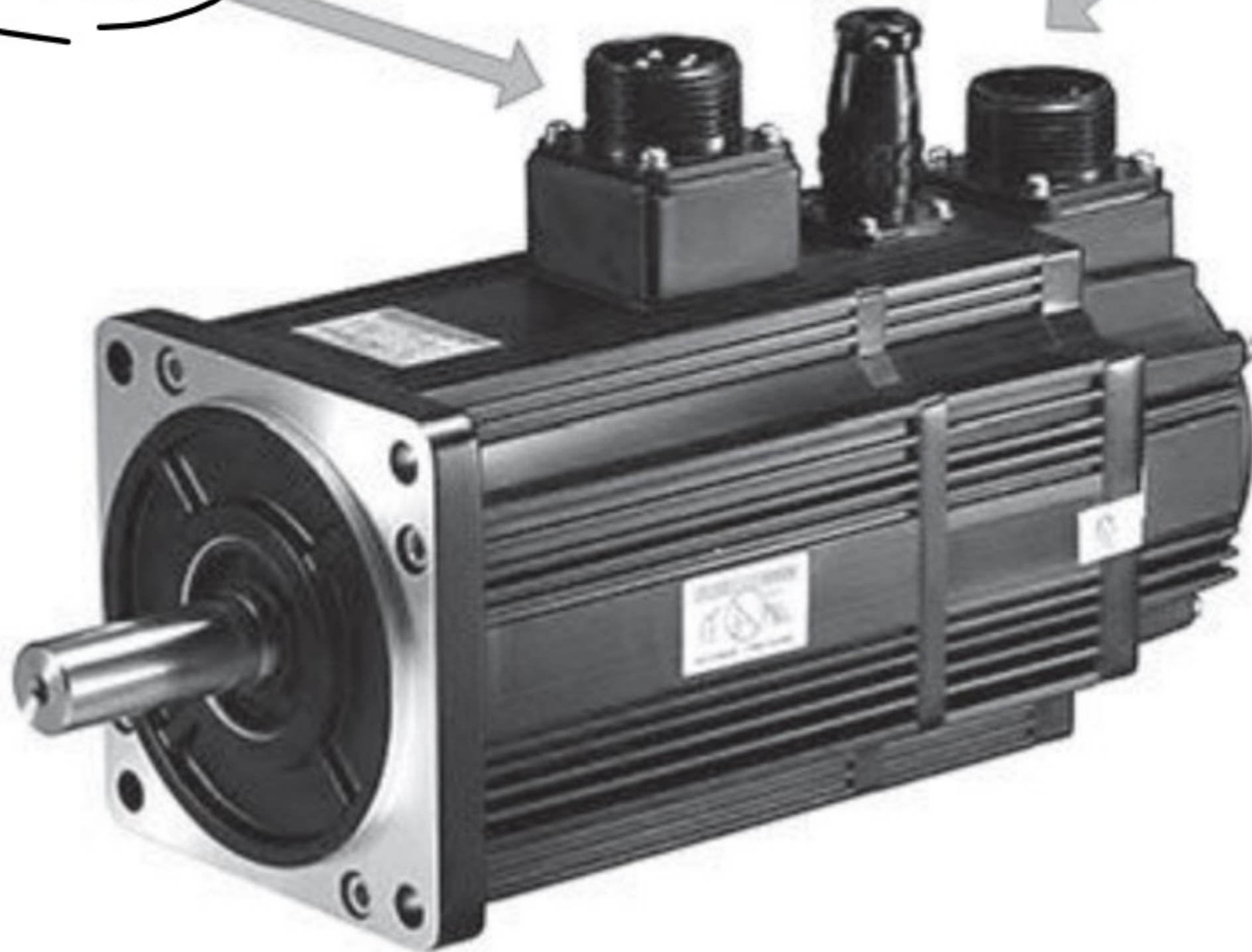
Hydraulics

Servo Motor

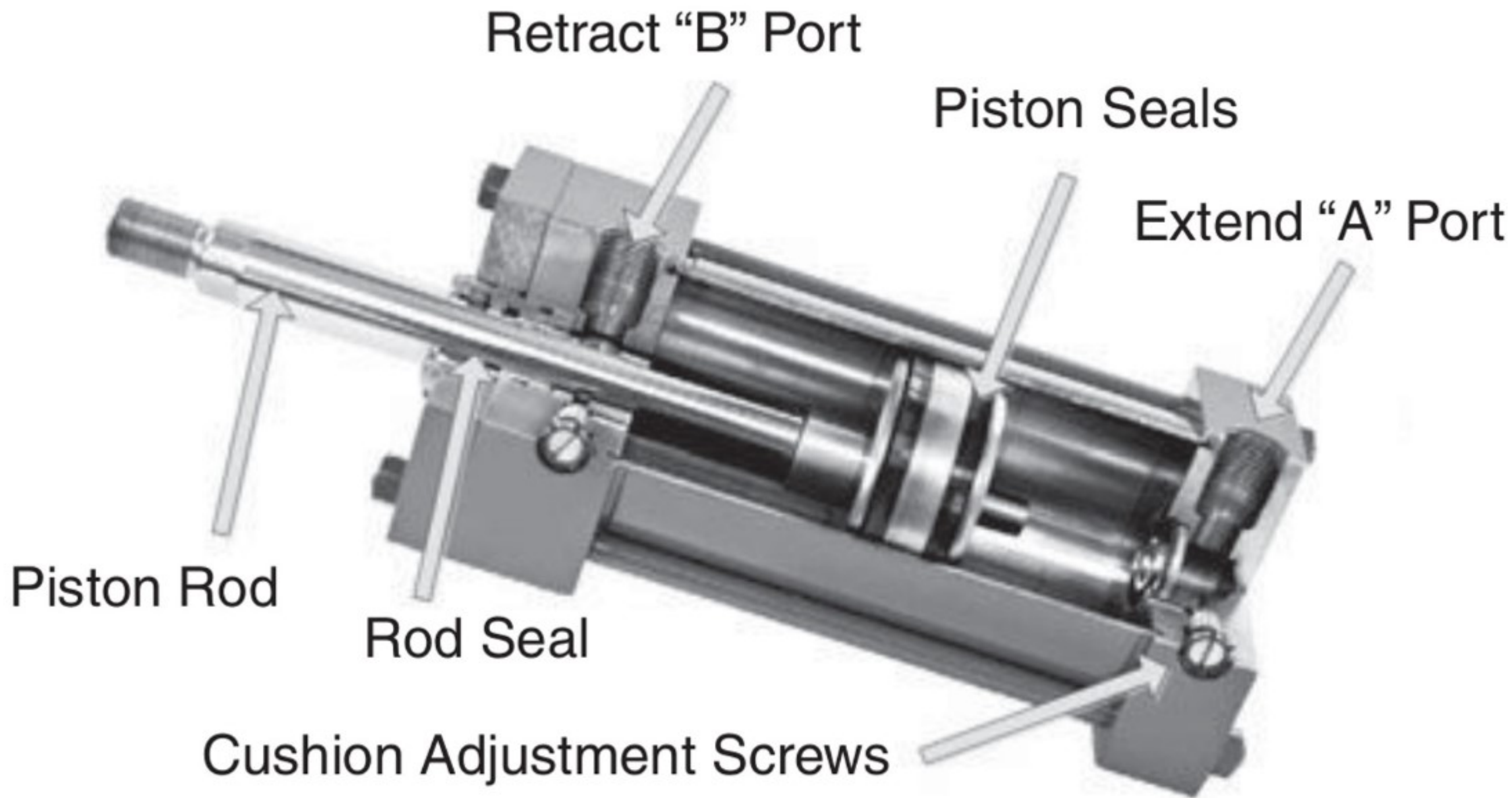
Power

Brake

Feedback  
Encoder







# Sensors

Inductive

Limit switches

Capacitive

Fluid level

Light

Color

Temperature

thermocouples

IR

non contact temperature measurement

Ultrasonic

Radar

non contact distance measurement

Speed

Cameras

Machine Vision

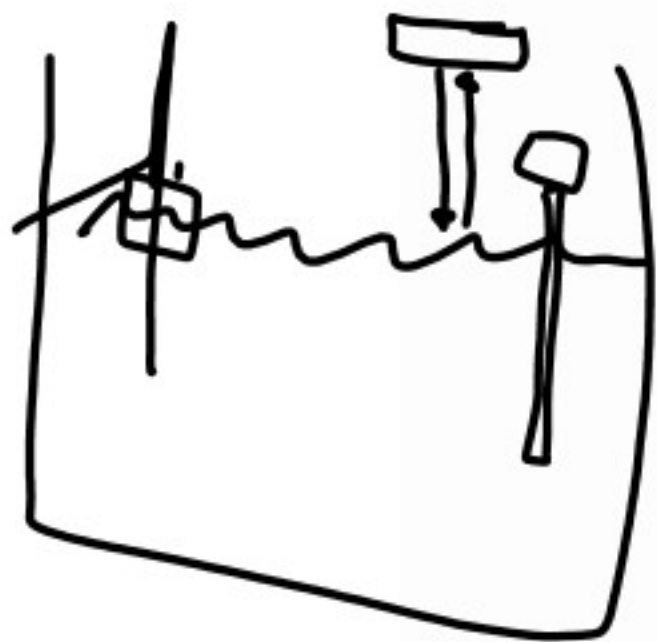
Scales

Inductive sensor

Keyence EZ-DM



Capacitive  
Fluid  
Level  
Sensor



Control

PLC

Programmable Logic Controller

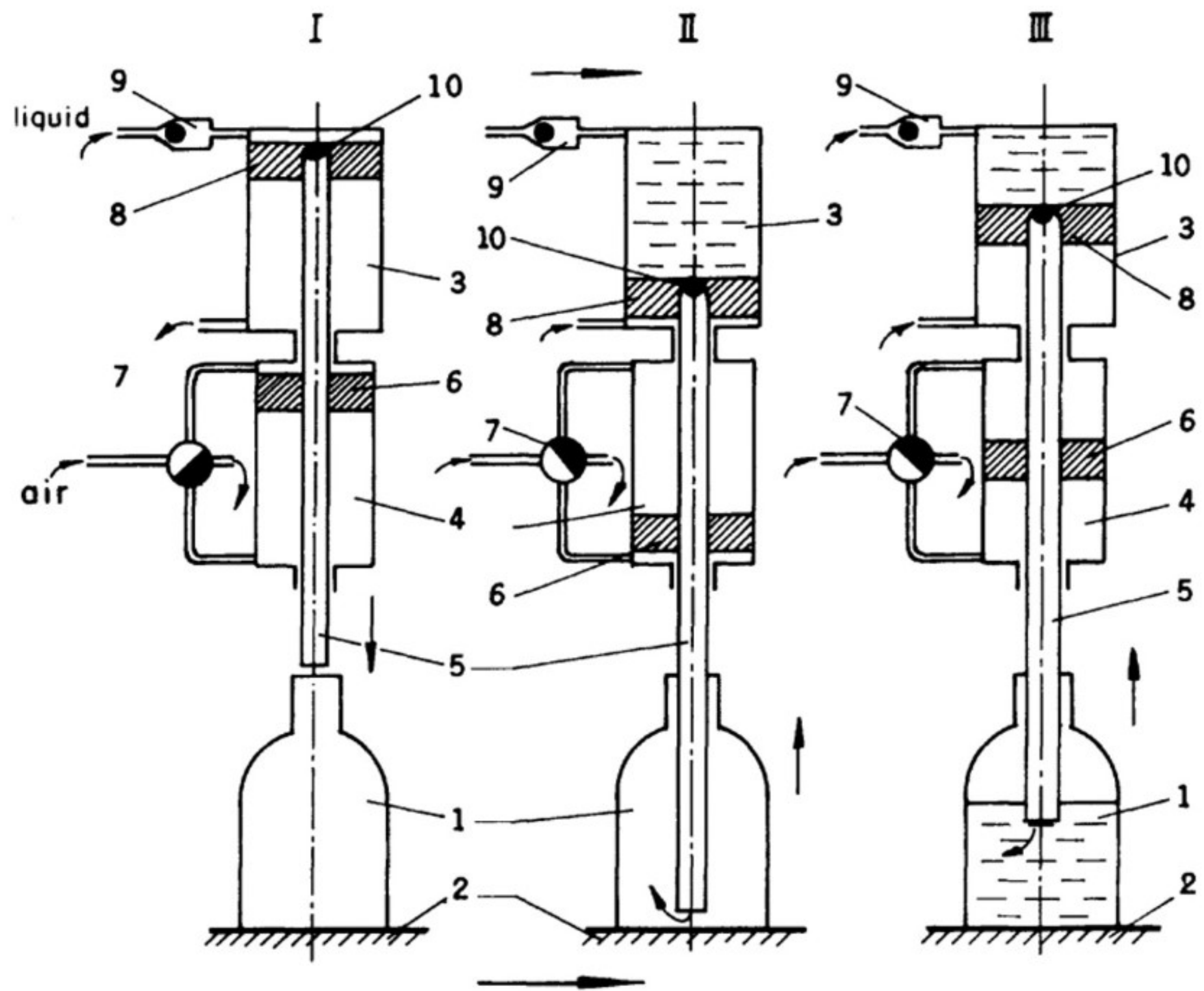
HMI

Human Machine Interface

HMI



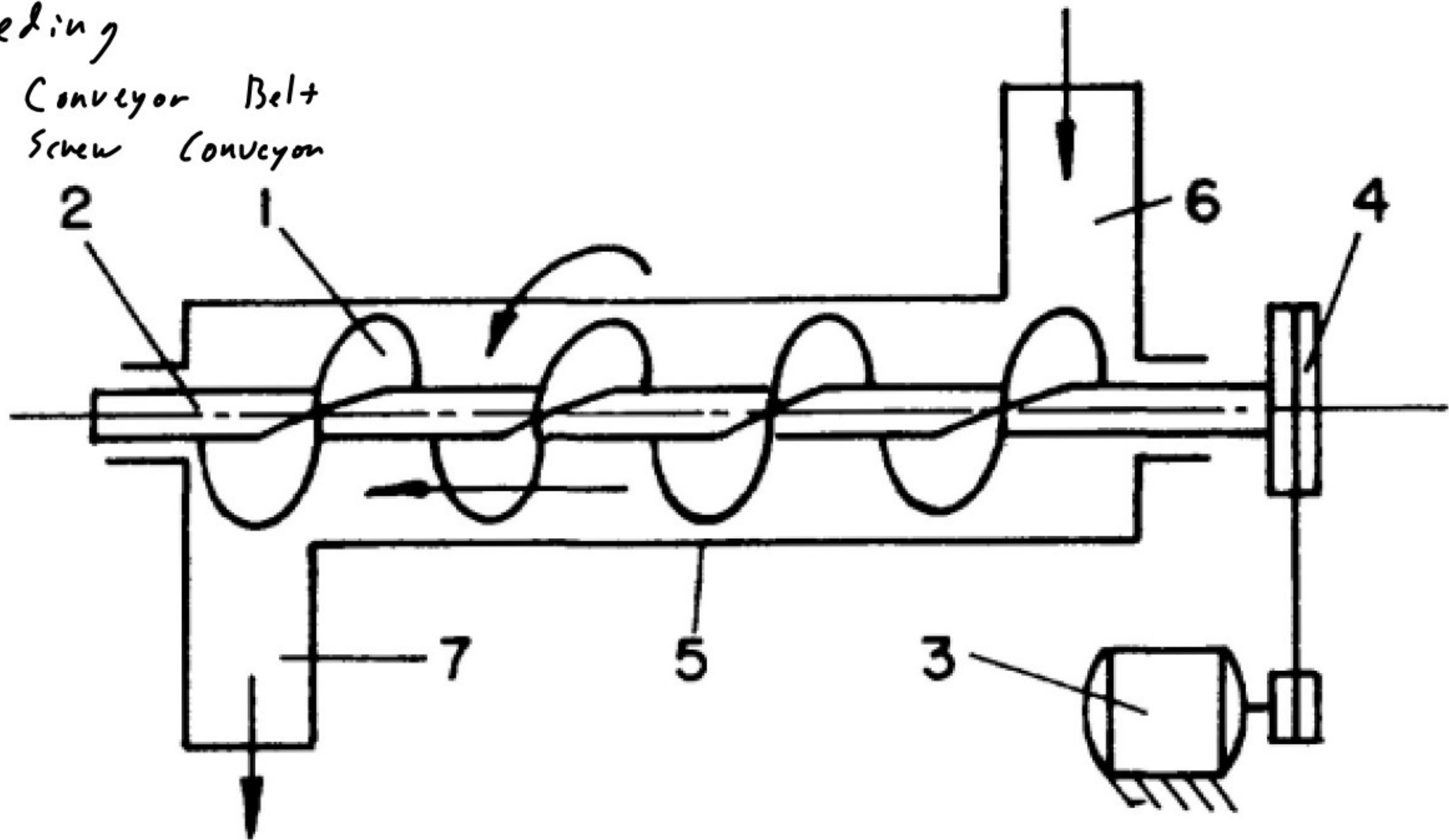


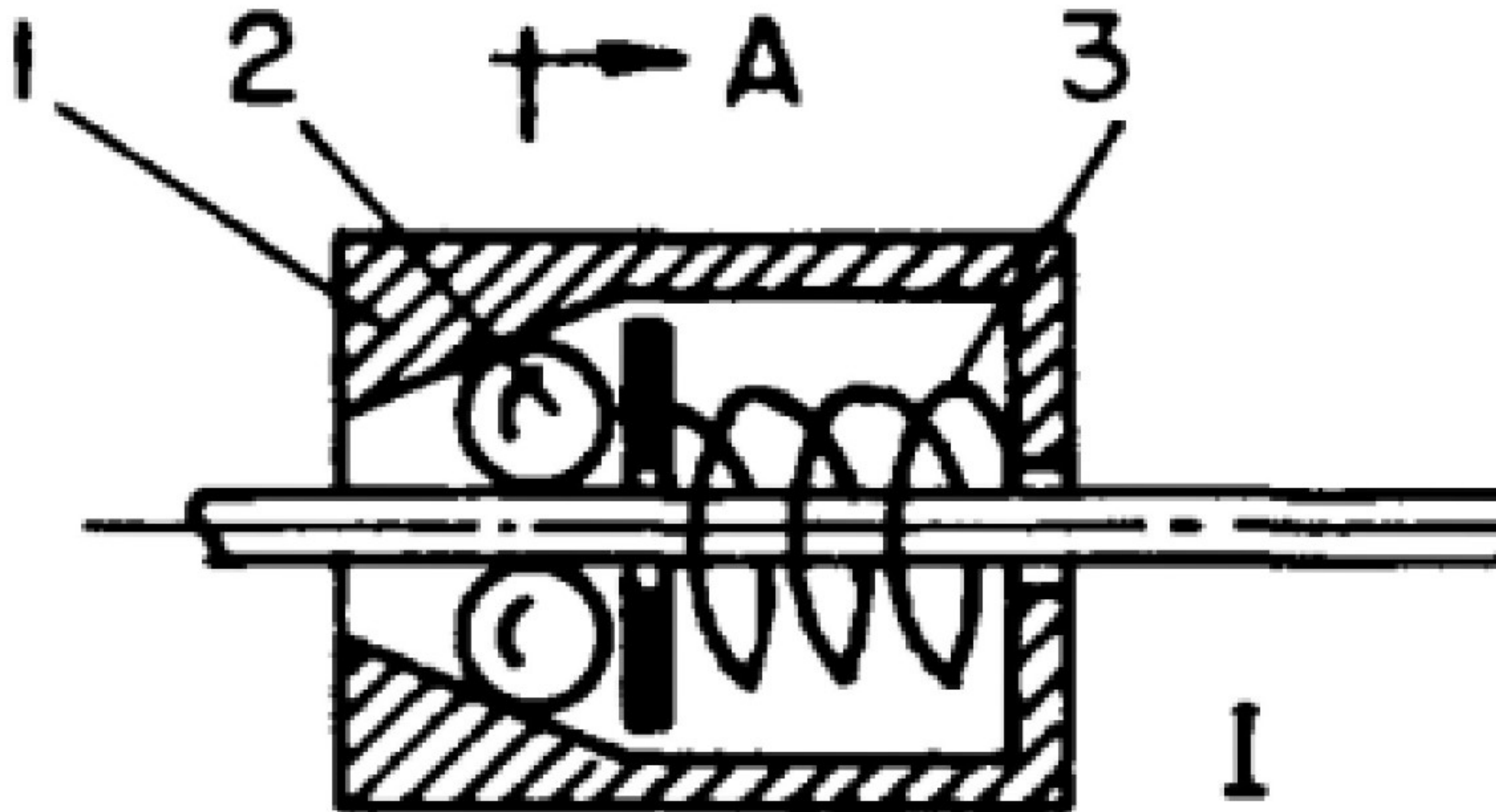




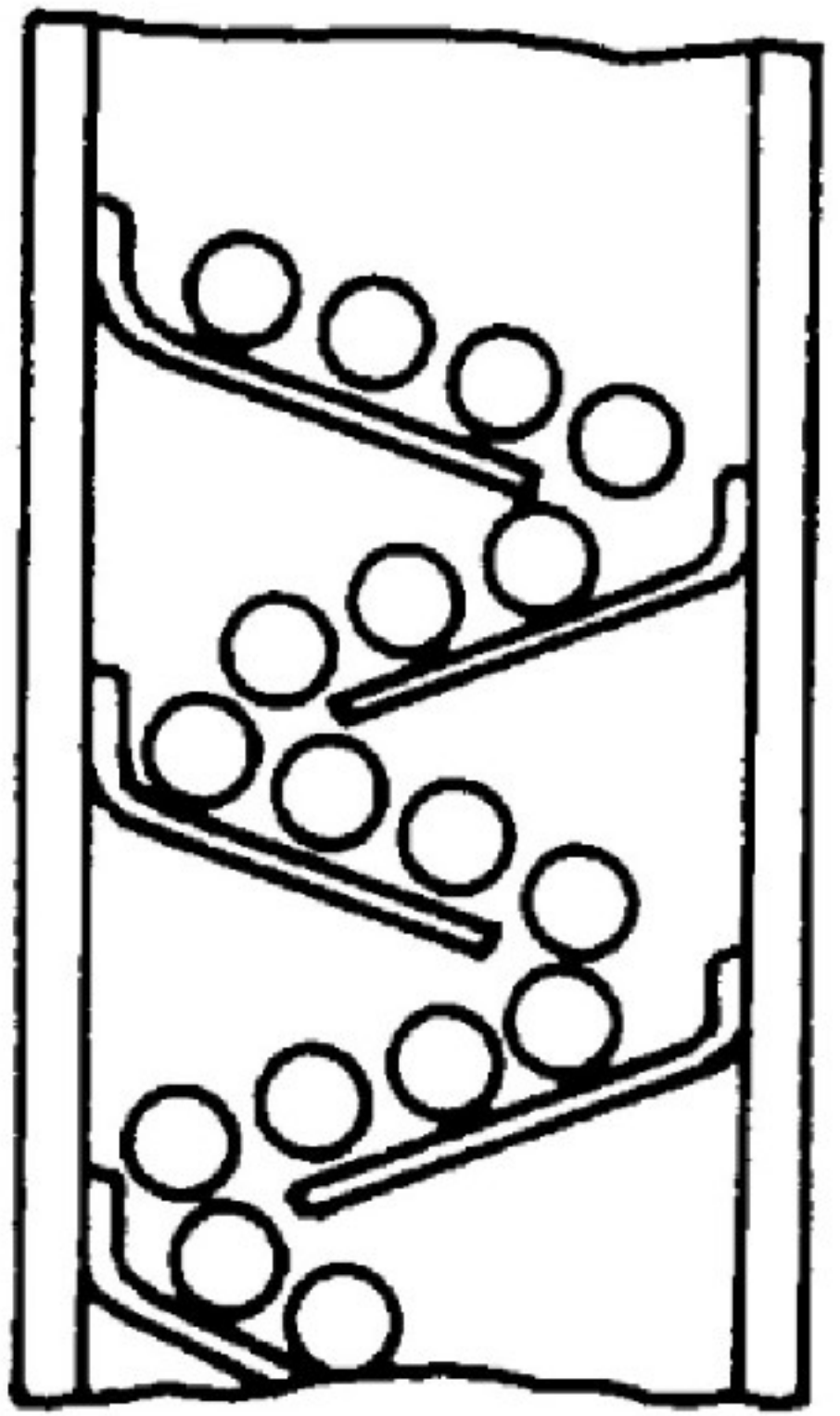
Feeding

Conveyor Belt  
Screw Conveyor

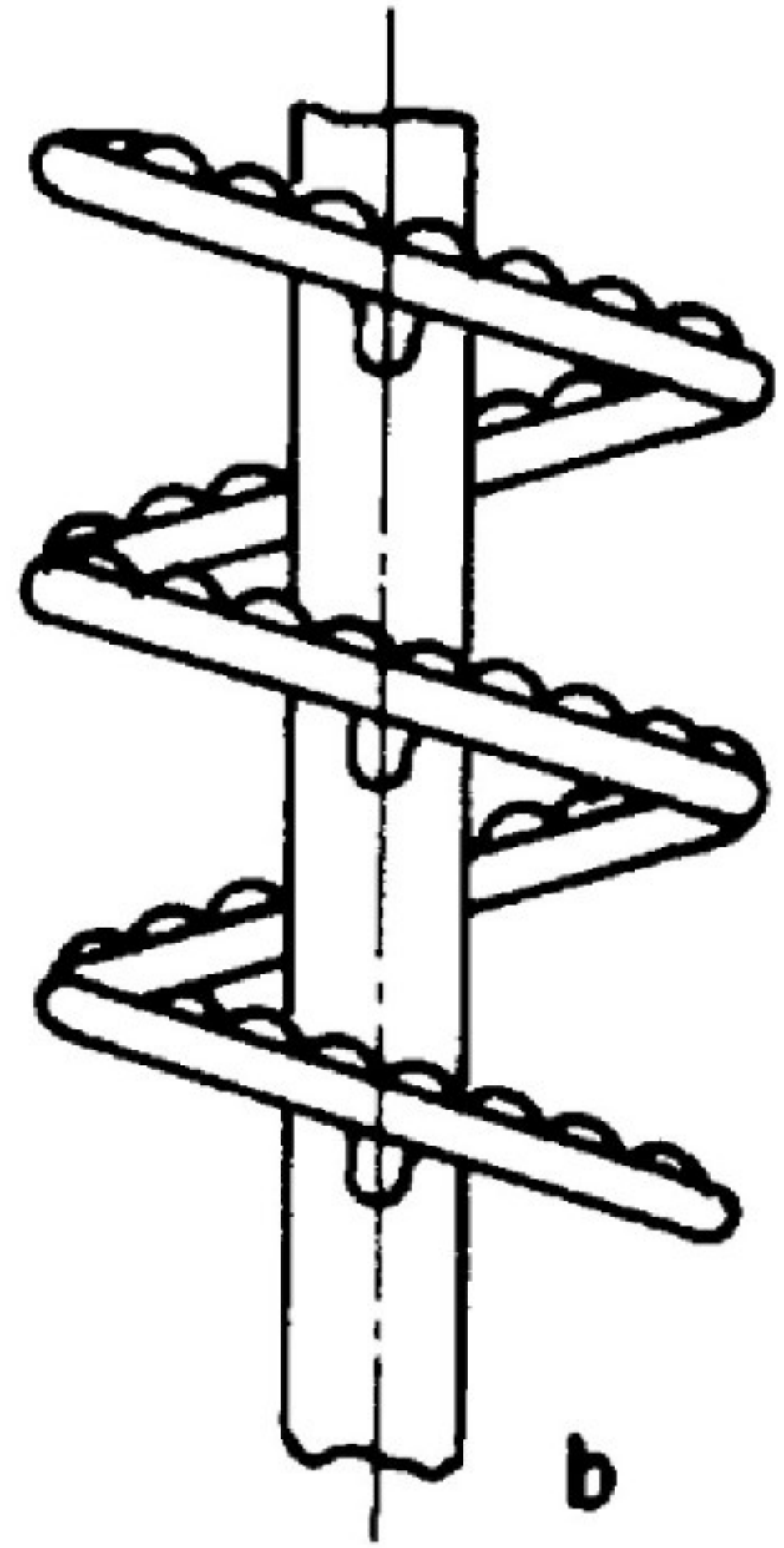




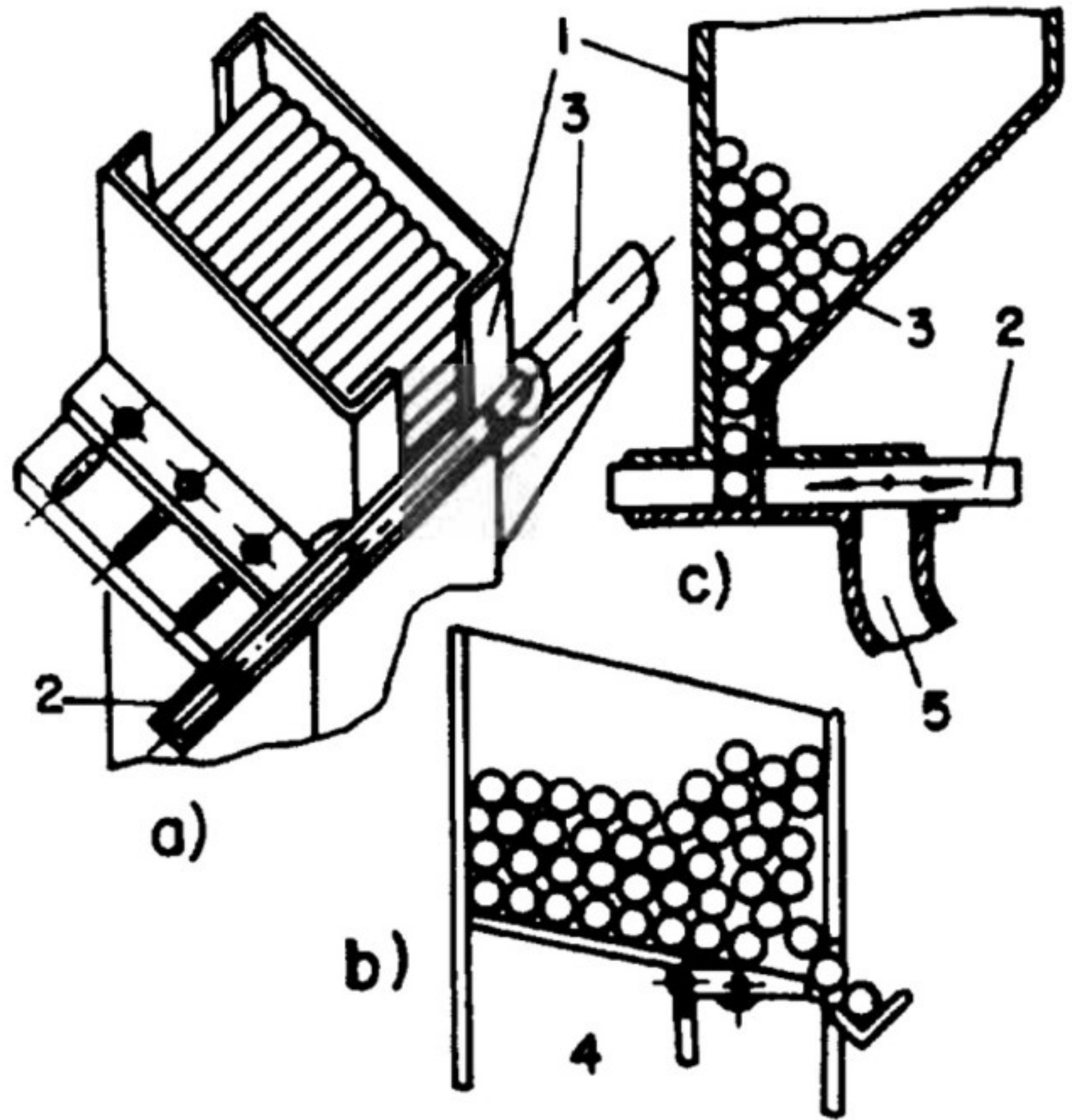
Hopper



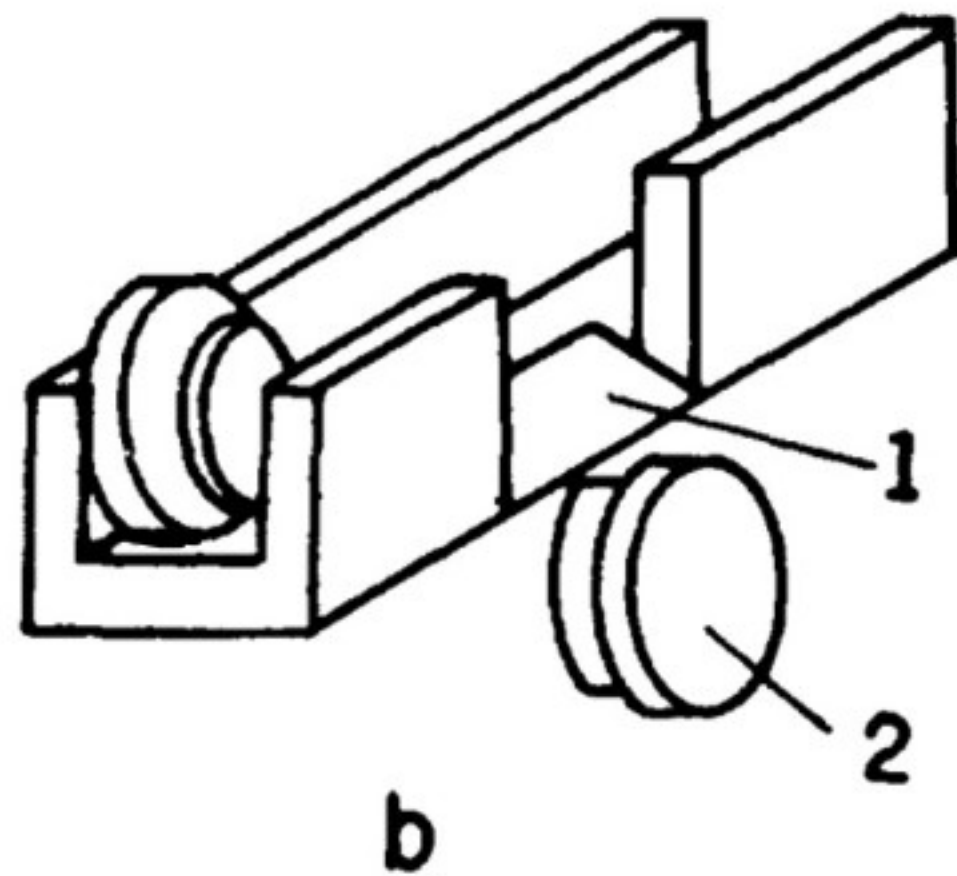
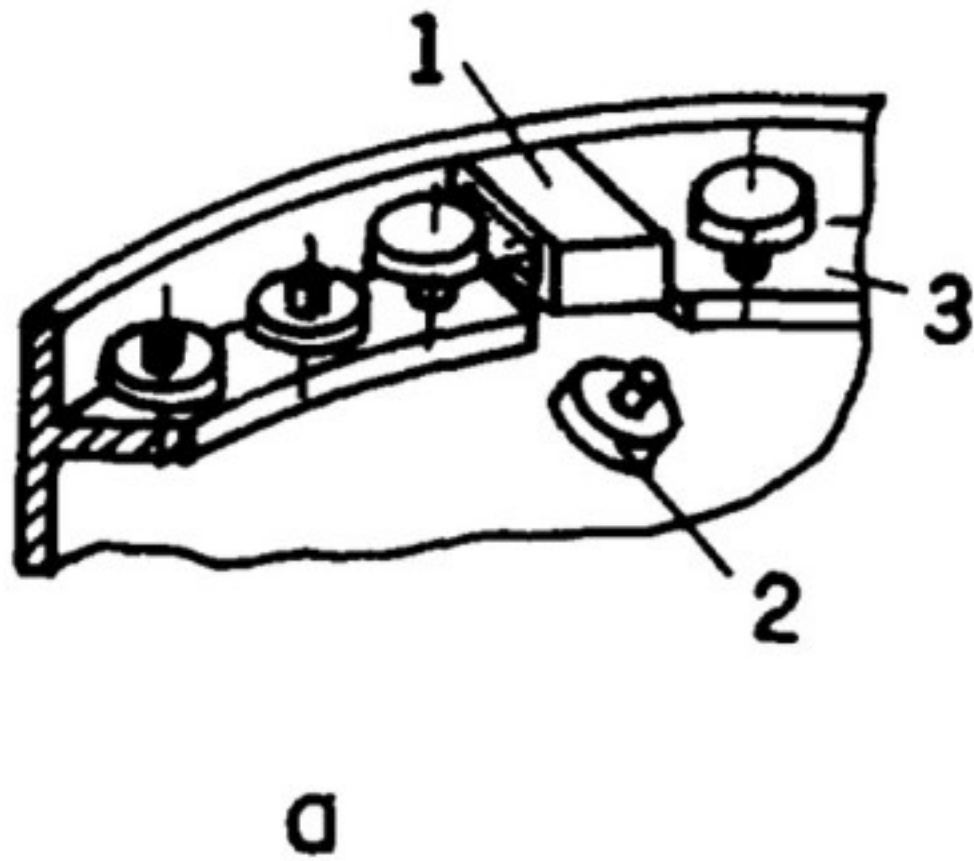
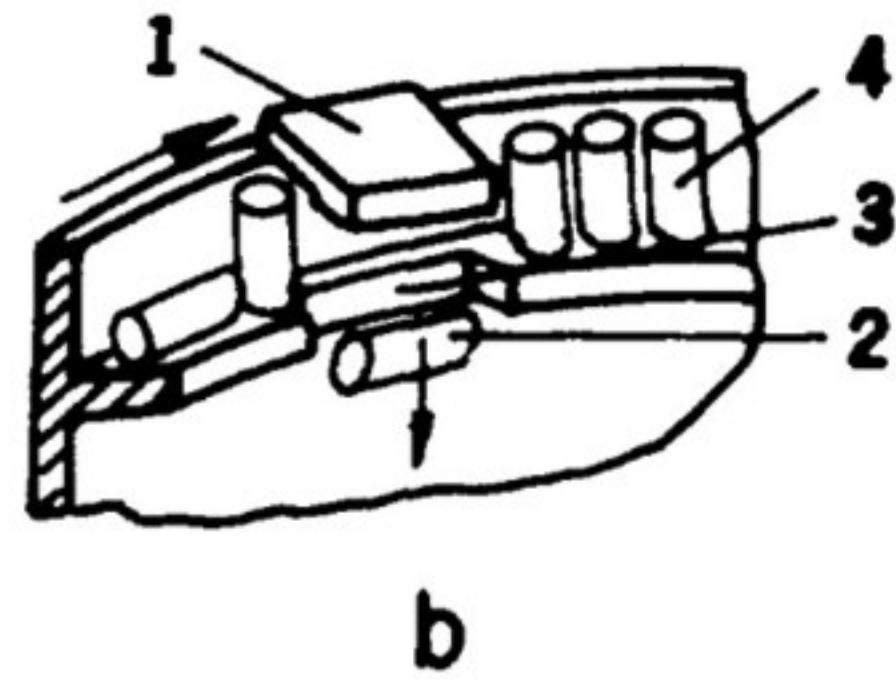
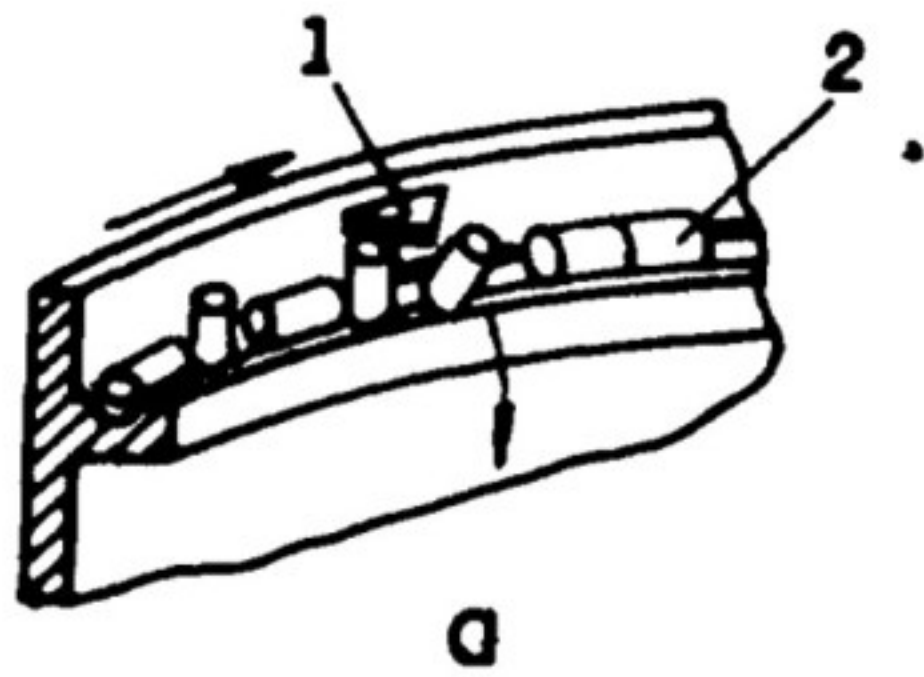
a

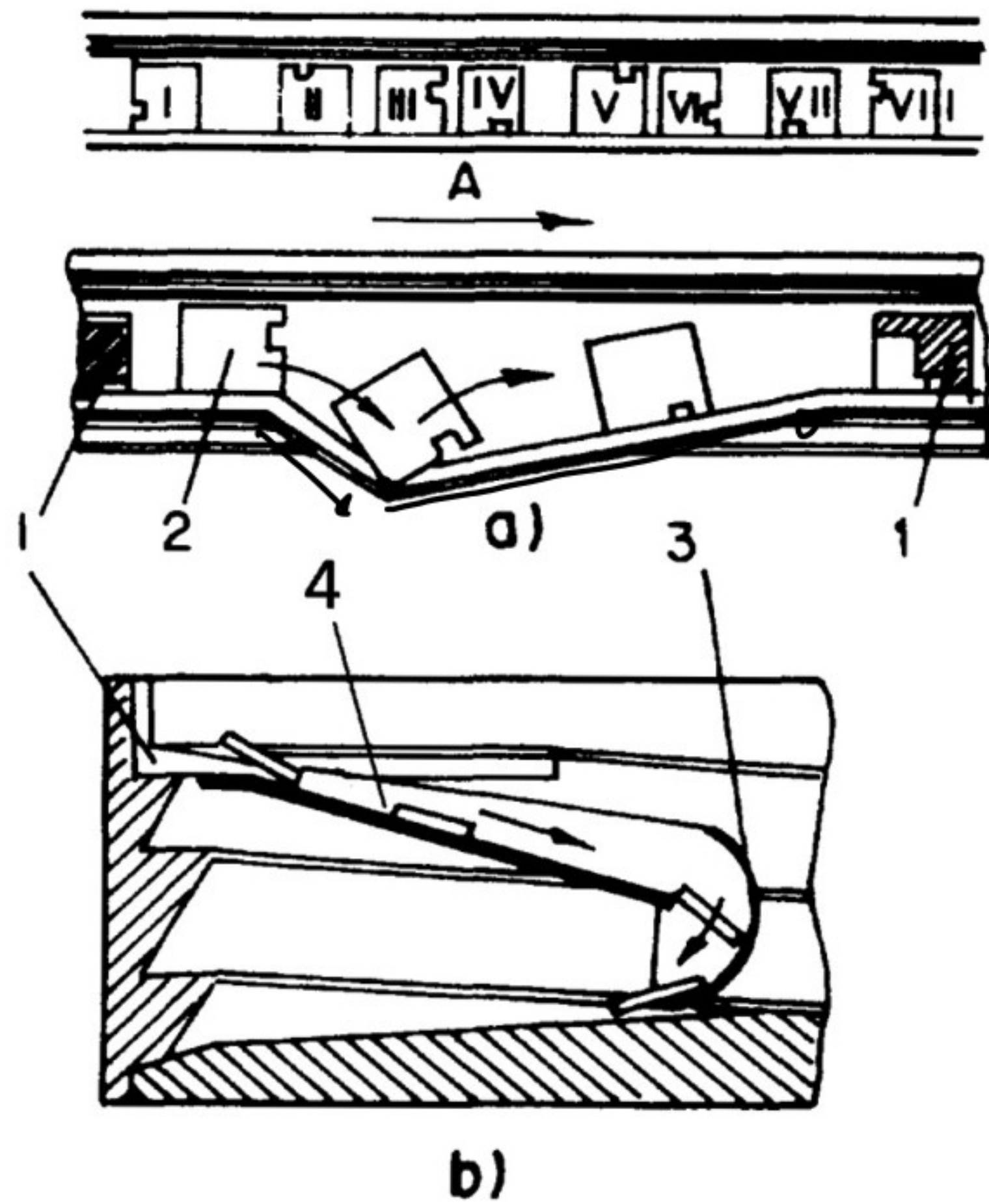


b

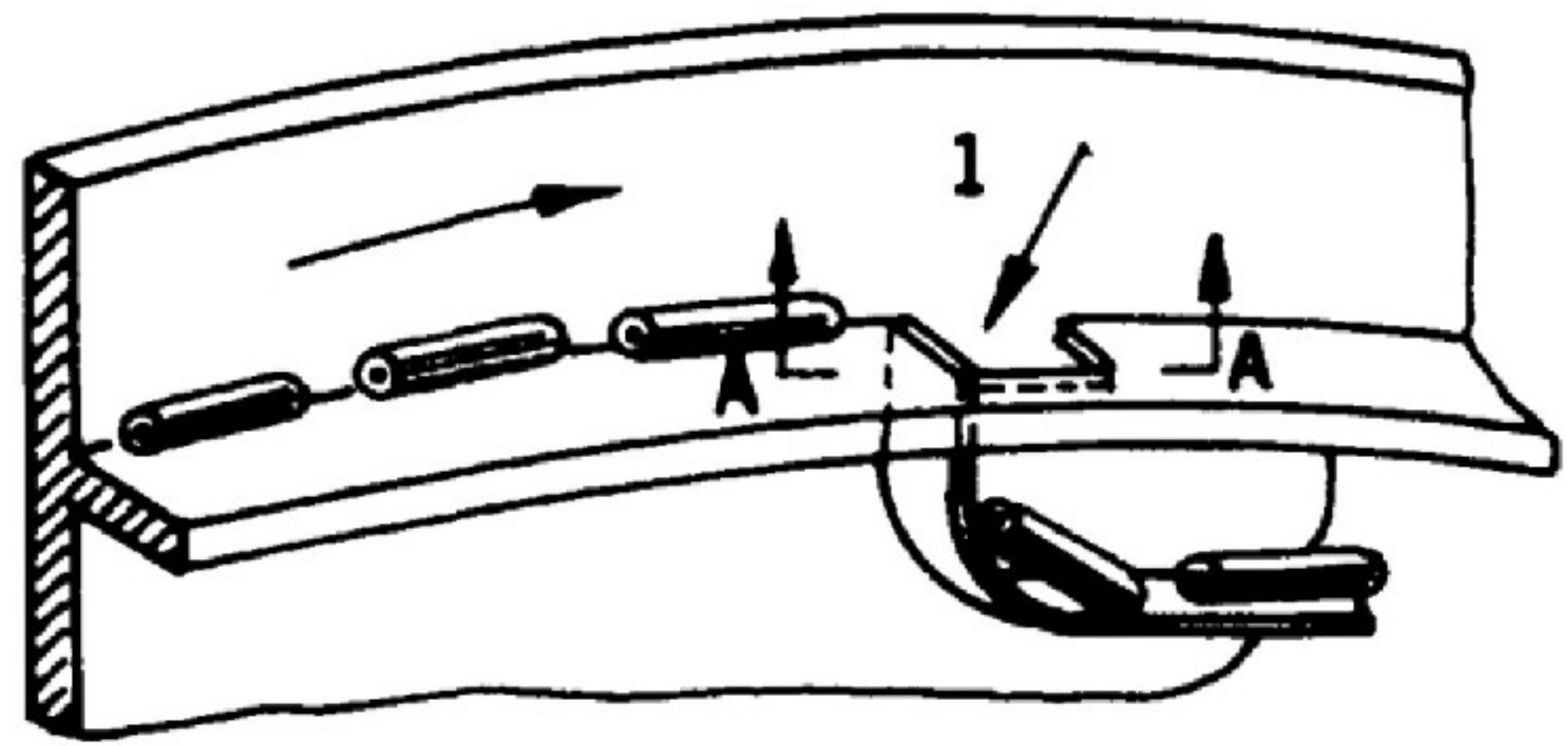


# Vibratory Feeders

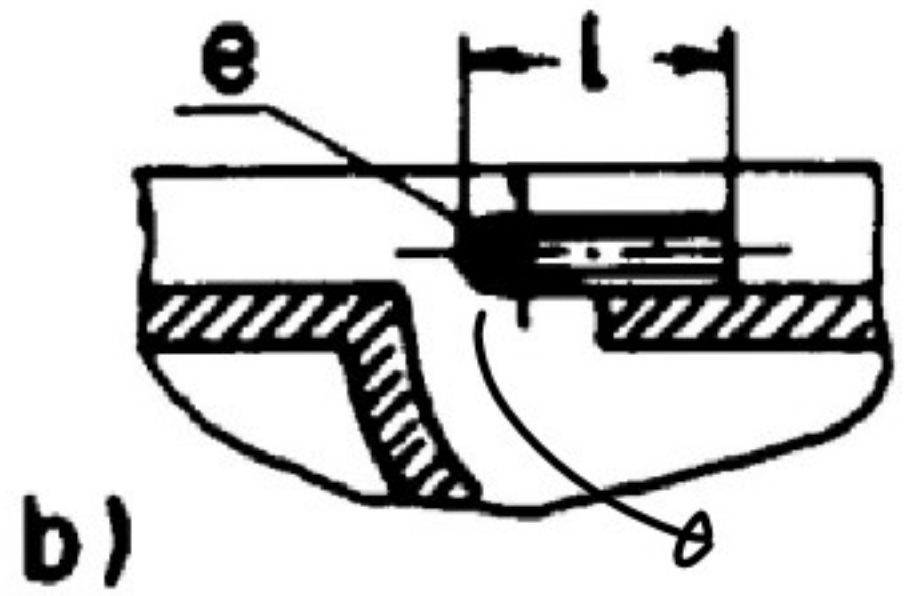
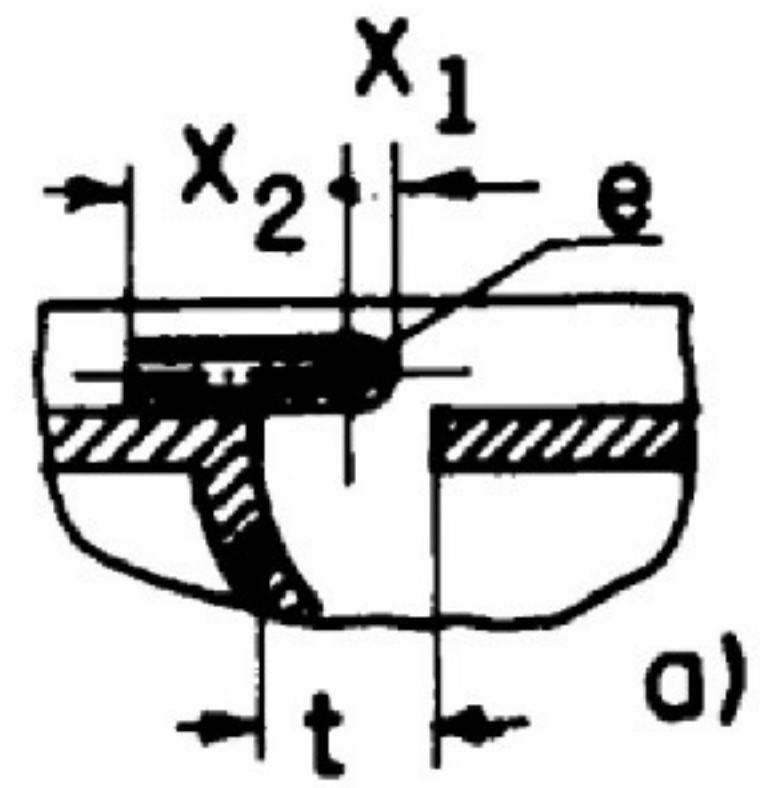


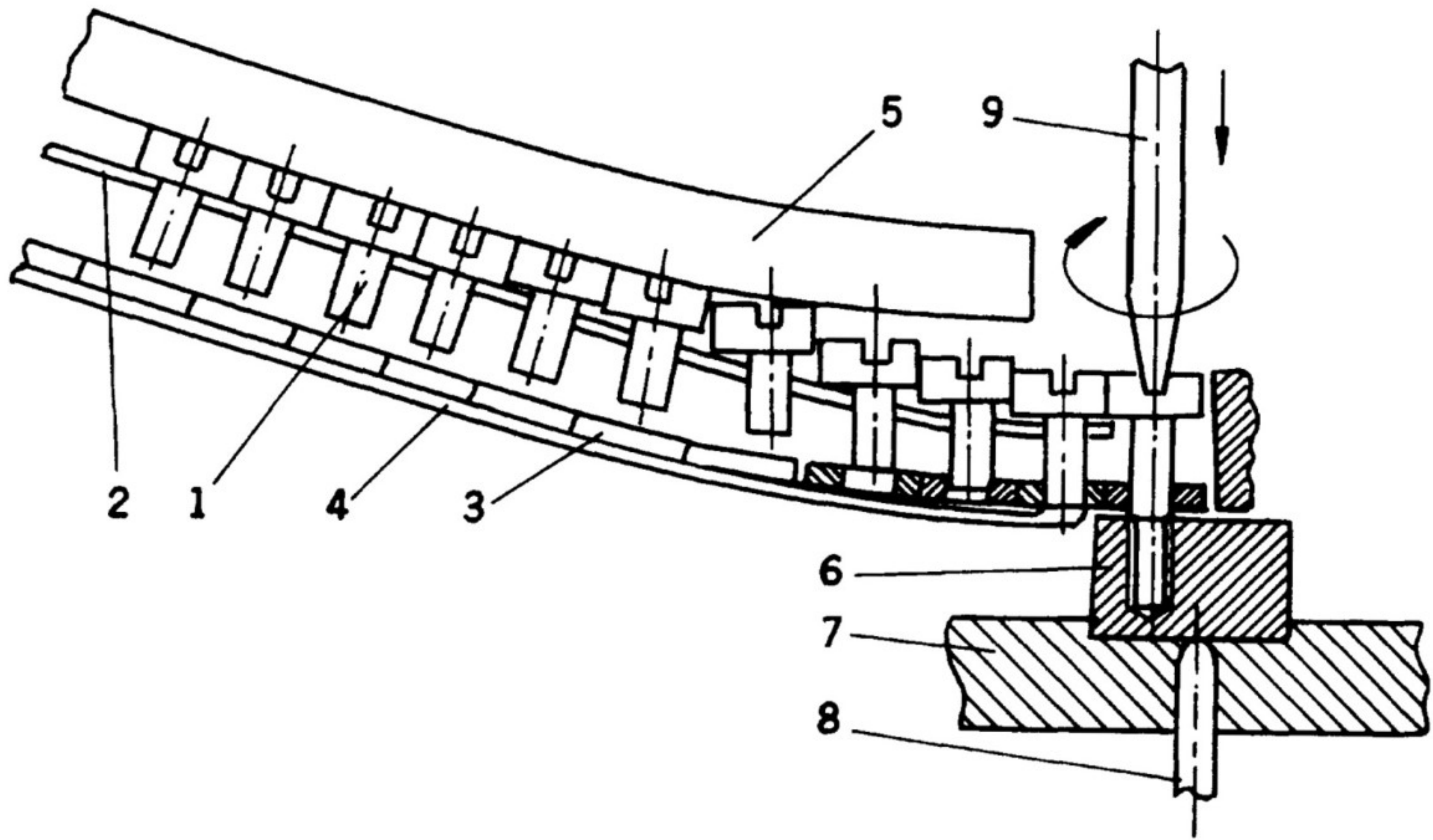


tighten  
heavies



A-A







Robotics: Designing the Mechanisms  
for Automated Machinery

Ben-Zion Sandler

- ▶ Vibratory Feeder ([https://youtu.be/\\_3envoV7l0Q](https://youtu.be/_3envoV7l0Q))
- ▶ Part Feeders (<https://youtu.be/ad4EqRxG-n8>)
- ▶ Rotary Part Feeder (<https://youtu.be/2hJ4fDah3ww>)
- ▶ Rotary Part Feeder (<https://youtu.be/4fwfum2RSAY>)
- ▶ Part Orientation  
(<https://www.tiktok.com/@4234machinee/video/7156596676797615406>)
- ▶ Hopper Feeder  
(<https://www.tiktok.com/@venaticsgear/video/7158082309227318533>)
- ▶ Pneumatics (<https://youtu.be/XIVeitmEAuE>)
- ▶ Pneumatics (<https://youtu.be/nhSQ9DxoBu4>)
- ▶ Assembly Automation (<https://youtu.be/ILb3oS-6NtQ>)
- ▶ 5 Axis Milling  
(<https://www.tiktok.com/@machinecutting/video/7144753400058596650>)