



## Mechanics and Machines, Lecture 8

Connections:

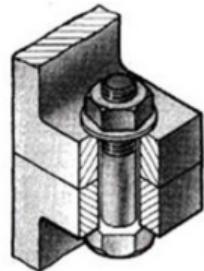
Detachable (Threaded, Keyed, Pin, Split pin)

Permanent (Riveting, Welding, Soldering, Glue)

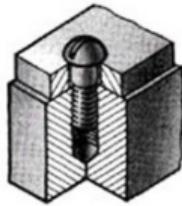


# Connections

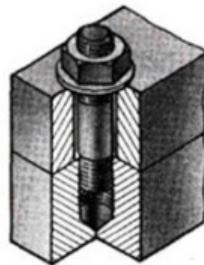
## Classification



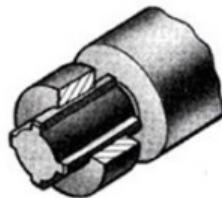
боловое



винтовое



шпилечное



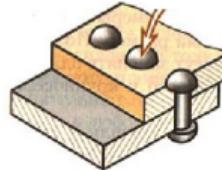
шлифтовое



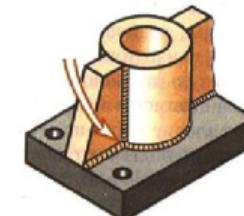
шпоночное



штифтовое



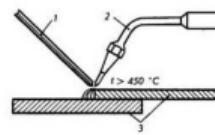
клепаное



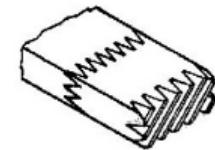
сварное



шивное



паяное



клеевое

Detachable (Разъемные)

Permanent (Неразъемные)



# Keyed (шпоночное) and Spline (шлифцевое)

They attach gears, pulleys, and cams on shafts to obtain machinery. In general, we call the assembly sections of these parts shafts hubs.

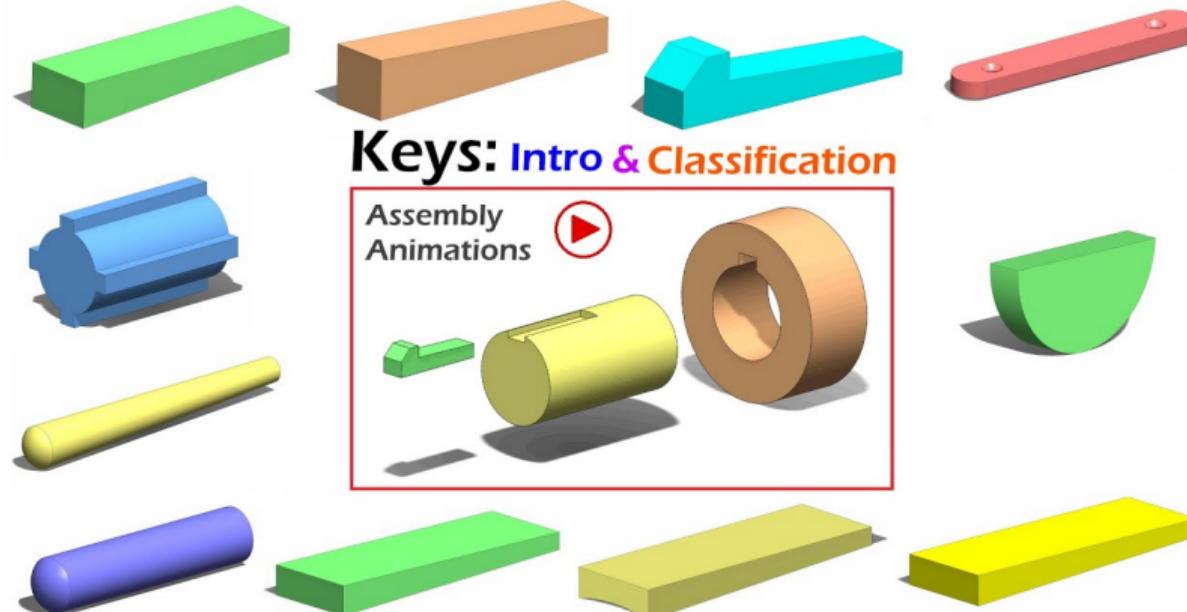
So, we use keys in the attachment of these elements to shafts.





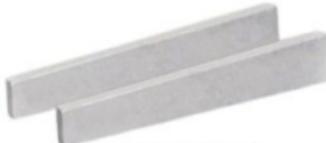
# Types of keys

Video





# Types of keys





# Keys and splines (rus)

Video

## ШПОНОЧНЫЕ И ШЛИЦЕВЫЕ СОЕДИНЕНИЯ



Эти соединения служат для окружной фиксации деталей на валах и осях и передачи вращающего момента.



# Keyed

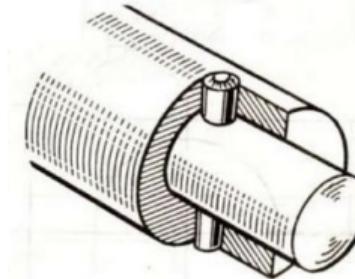
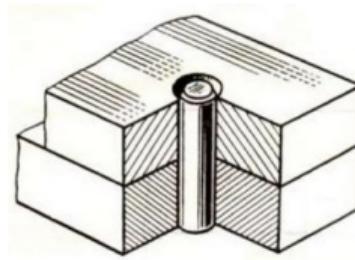
*Reference material*

- Shaft Keys and Keyways; Design, Explanation Applications



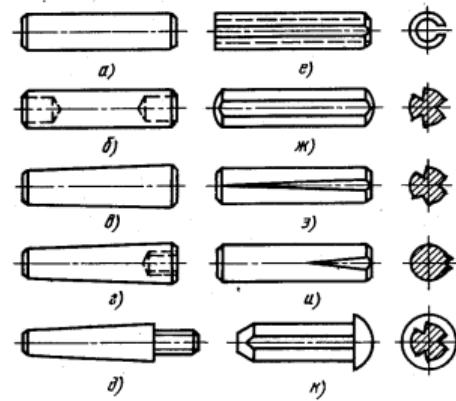
## Pin (Штифтовое)

It is a fastening element in the form of a cylindrical or tapered rod designed for a fixed connection. The pin is inserted tightly into the hole that runs through both parts, preventing their mutual displacement.





# Types of pin connections

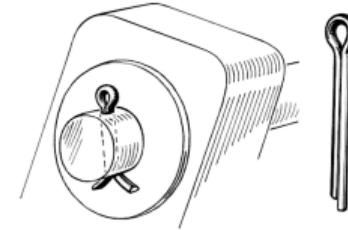




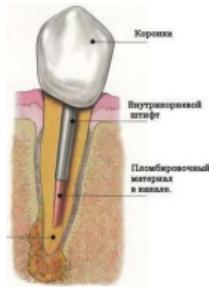
# Pin connection Applications



Common usage



Splint pin (шплинтовое)



Stomatology



Dowel (шкант)



# Pin types

Video





# Split Pin (шплинтовое)

Video

## ШПЛИНТОВОЕ КРЕПЛЕНИЕ:



о-шплинты  
круглогубцы



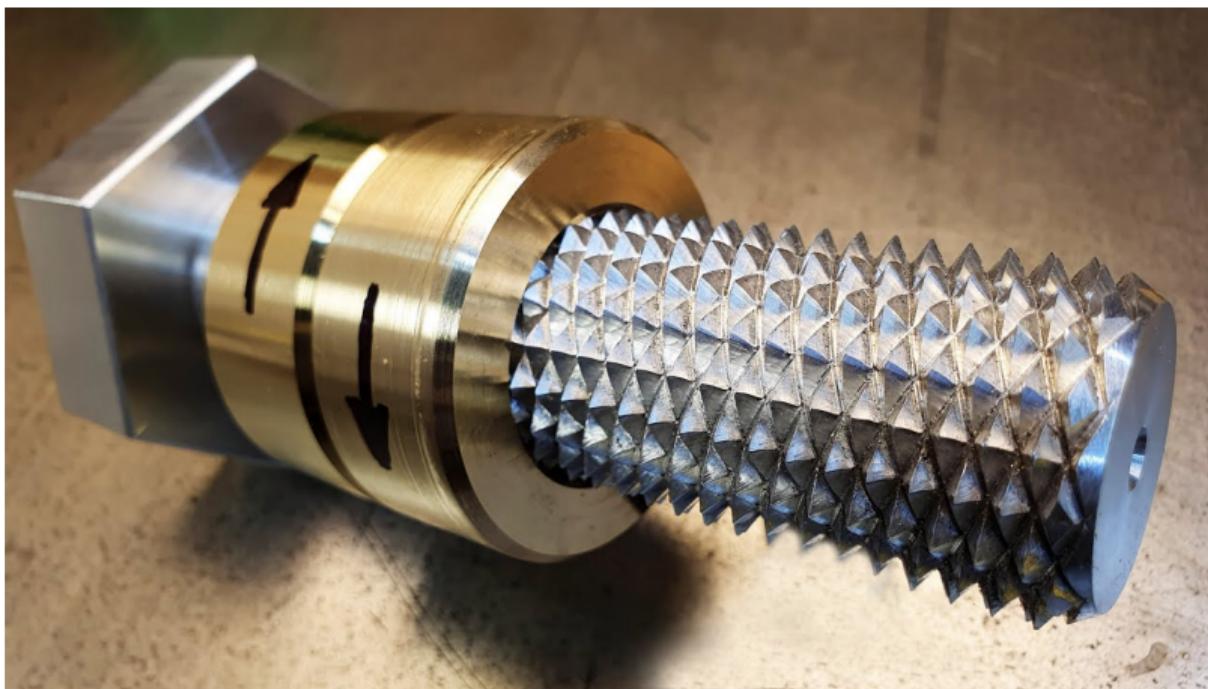


# Threaded



# Magic 2 sided screw

Video





# Threaded

*Reference material*

- Threaded connection (video, rus)



# Glued



# Riveting



# Riveting rus

Video



Неразъемные соединения



постройка Титаника



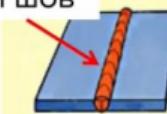


# Welding



### ВИДЫ СОЕДИНЕНИЙ И ШВОВ

стыковой шов



стыковое

угловой шов



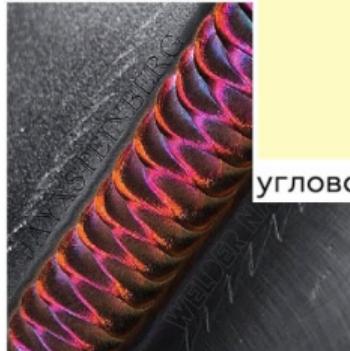
тавровое

нахлесточное



угловое

торцовое

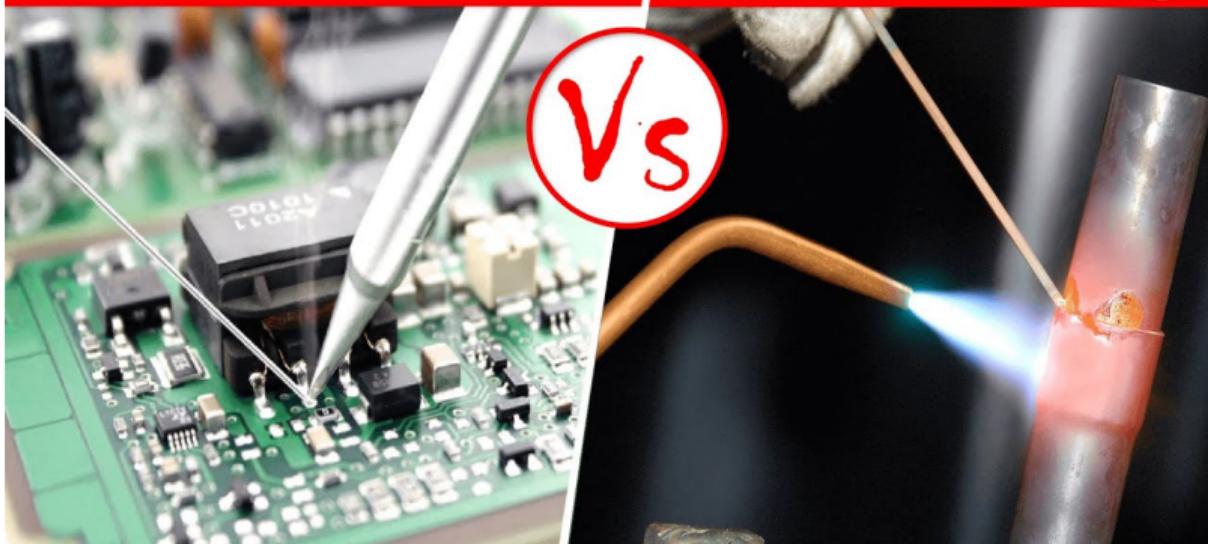




# Difference between Soldering and Brazing

Video

## Soldering/Brazing





# Soldering



# Reference material

1. Brazing soldering welding difference
2. Mott R. L., Vavrek E. M., Wang J. Machine Elements in Mechanical Design, Ed. — 2011
3. Avallone E. A., Baumeister III T., Sadegh A. Marks' standard handbook for mechanical engineers. — McGraw-Hill Education, 2007.
4. Budynas R. G. et al. Shigley's mechanical engineering design. — New York : McGraw-Hill, 2011.
5. Types of connection (rus, video)
6. A lot of engineering books in english

# Deserve “A” grade!

– Oleg Bulichev

✉ o.bulichev@innopolis.ru

↗ @Lupasic

🚪 Room 105 (Underground robotics lab)