PIPE ORGANS

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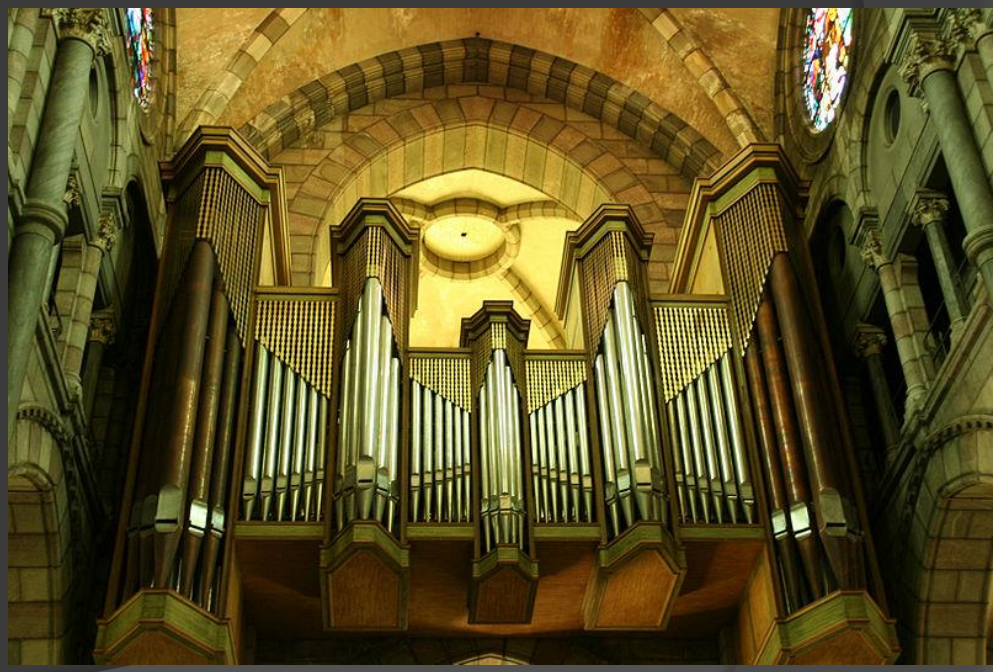
PHYS 150

Introduction

- Pipe organ- musical instrument commonly used in churches or cathedrals that work by driving wind through pipes.
- Uses 3 musical staves, one for right hand, left hand, and one for feet.



Introduction

- Pipe organs are matched by no other instrument in terms of loudness, range of tones, and size.

History

- The pipe organ has existed in many forms, with the hydraulis coming first.

•An early type of pipe organ that worked by converting dynamic energy of water into air pressure to drive the pipes.

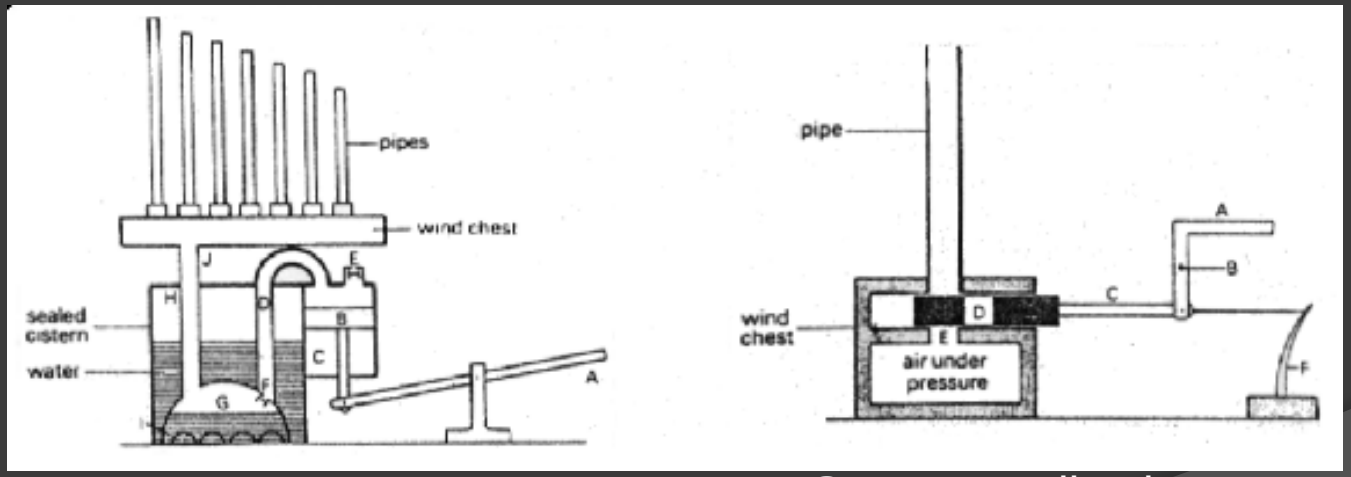
Source: www.csa.com

History (Hydraulis)

1st century BC hydraulis at the Archaeological Museum of Dion, in Greece.

History (Hydraulis)

- Ctesibius of Alexandria, Egypt, invented the hydraulis around 200 B.C.
- He was a musician and engineer.



Source: realize.be

Hyrdaulis Video

- https://www.youtube.com/watch?v=atT7Tjpn5js

Parts of the pipe organ

- Console- contains keyboards, couplers, expression pedals, and stops.

Parts of the pipe organ

- Keyboards- divided into manuals and pedal boards
- Manuals- keyboards played by hand
- Pedal boards- below manuals played by feet.

Parts of the pipe organ

- Divisions- sections that the pipes are grouped into. These are all named and controlled individually by different manuals.
- Most common divisions are swell, great, and choir.
- Pedal boards are only equipped with one division.

Parts of the pipe organ

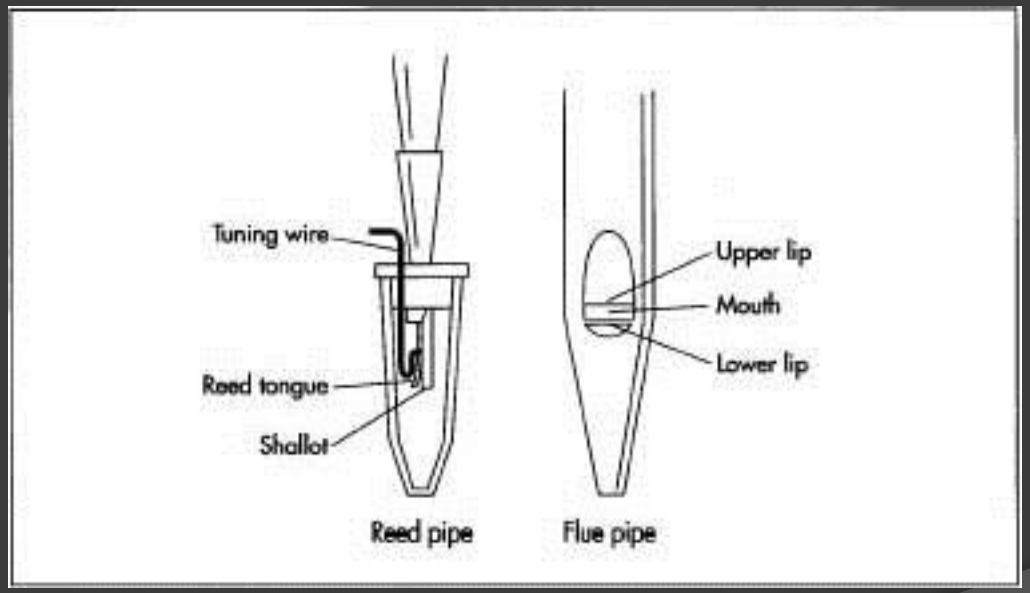
- Stops- divides keys on the manuals into ranks by tone color
- Rank- a set of pipes sharing a certain tone color named by their stop.

Parts of the pipe organ

- Pipes- made of metal, wood or glass.
- One pipe for each note, so many pipes required for the full musical scale.

Parts of the pipe organ

- Pipes are made in two typical styles: flue and reed.



Parts of the pipe organ

- Expression pedals- Balanced swell, crescendo.
- Balanced swell –opens shades to let more sound out (swell division)
- Crescendo- cumulatively pulls each consecutively louder stop when depressed

Pipe action

- Mechanical- The key is connected to trackers which eventually connect to the valves that open to admit air from the wind chest into the pipe.
- Electric – Pressing a key closes an electric circuit causing an electromagnet to open and close the air valves.

How a mechanical pipe organ works

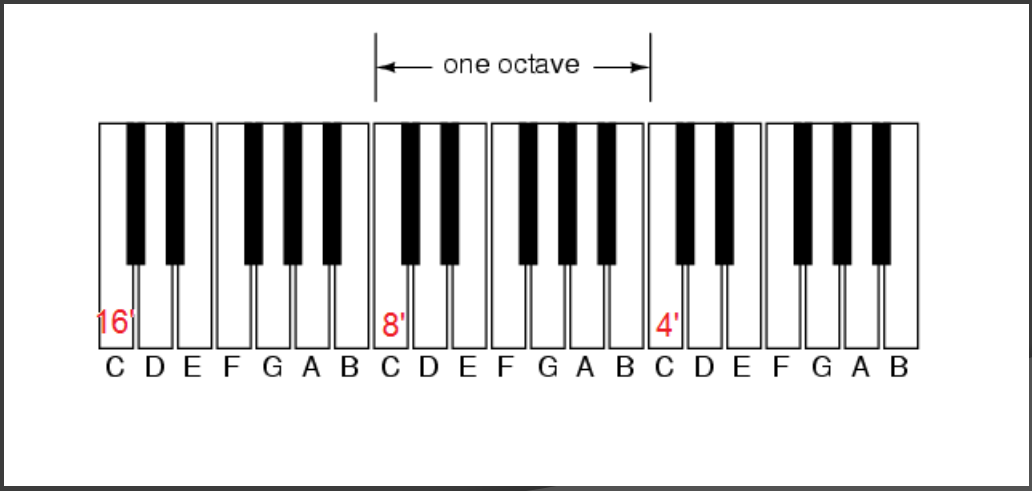
- http://pipedreams.publicradio.org/articles/how_a_pipe_organ_works/images/how_a_pipe_organ_works.jpg
- http://youtu.be/rhakZPMjPKE?t=1m10s

Tone Colors of Pipe Organs

- https://www.youtube.com/watch?v=U2GFPM-pwB8

Physics of pipes

- Resonant frequency/pitch of pipes correlates with length of pipes
- Flue and reed pipes
- Follows physics of closed-end pipes.



Carol Williams: Flight of the Bumblebee

- https://www.youtube.com/watch?v=hHZvMAJUN5g

Works Cited

- http://www.csa.com/discoveryguides/organs/review.php
- http://realize.be/ancient/orgele.html
- https://www.youtube.com/watch?v=atT7Tjpn5js