Mechanical Logic

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History
• Charles Babbage’s Analytical Engine
• Mechanical decimal general purpose computer
• Steam engine, punchcards, gears
• CPU complete by death in 1871
• 1938 Konrad Zuse: the Z1
• First binary programmable computer, completely mechanical
• Punchcard input, processing implemented with metal plates
- 1963 Digi-Comp
- 3 bit mechanical computer, DIY kit
- Implemented with tubes, rods, elastics
Current / Our ideas
Full Adder
NOR logic

- not
- or
- and
- xor
• K’nex adding machine
• YouTube
• Fluidic Nor Logic

• Fluidic valves
Normally open (on or logic 1)
Pressure operated valve
Problem: requires too much pressure
Air XOR Gate
Air gate movie
- Fluidic Amplifier
- U.S. Patent #4,000,757
Fluidic Gramophone
Laser cut fluidic gates
• Paulo Blikstein’s Programmable Water
• Based on half adder units pictured above
Water Gates
Water Gates
Water Gates