How computers work

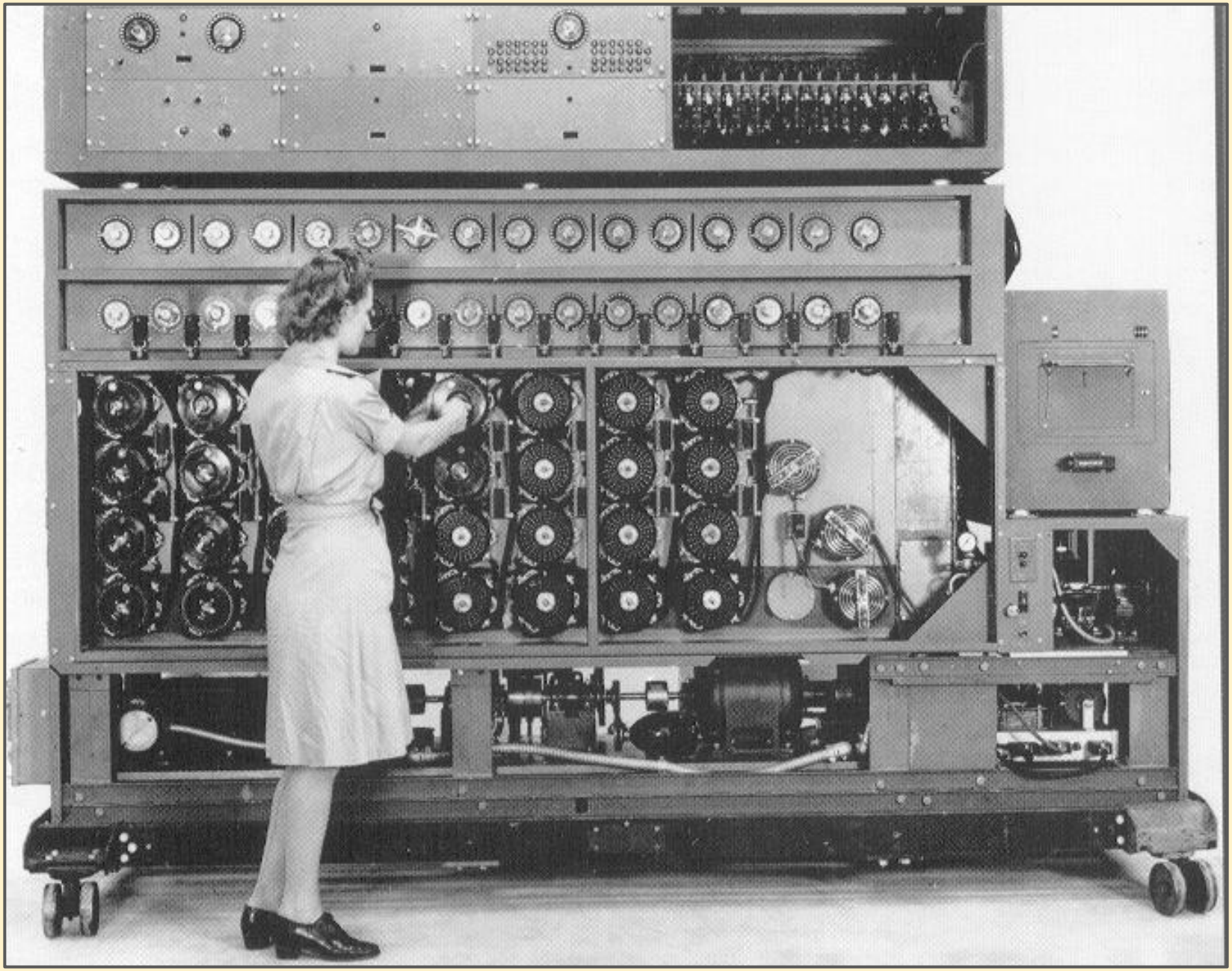
- Everything inside a computer has to be stored as numbers
- Computers use electricity
- The numbers can only be 0s or 1s
- Digits are combined to store bigger numbers
- This system is called binary numbers
- Data is stored by using **switches** which can be on or off

Transistors

The switches are called **transistors**

Transistors were invented in 1947 at Bell Labs in the USA. Without transistors we wouldn’t have any modern computers

This is because transistors are **very small**



A computer in 1942, before transistors were invented

Transistors

The CPU works by using transistors. The more it has, the more powerful the computer is

The first CPUs had about 2,000 transistors

Modern CPUs have more than 2,000,000,000

You could fit 3 million transistors on the end of a human hair

Transistors

The transistors in the CPU are used to **store** and **process** data

They are tiny, digital switches. If the switch is on, a 1 is stored. If it’s off, a 0 is stored

CPUs can do millions of processes a second. Each process changes a switch. This creates lots of heat, which is why computers get hot

Moore’s Law

Moore’s Law was thought up in 1965 by Gordan Moore, an American engineer

He noticed that the number of transistors on a CPU **doubles** every two years - because of technological advances

This means computers in two years time will be twice as quick and powerful as they are today

Moore’s Law

Moore’s Law has kept working since 1965 because we’ve been able to keep making things smaller

But things have become so small that some engineers think we might not continue to do this. This will break Moore’s Law