Silly & Useless Machines

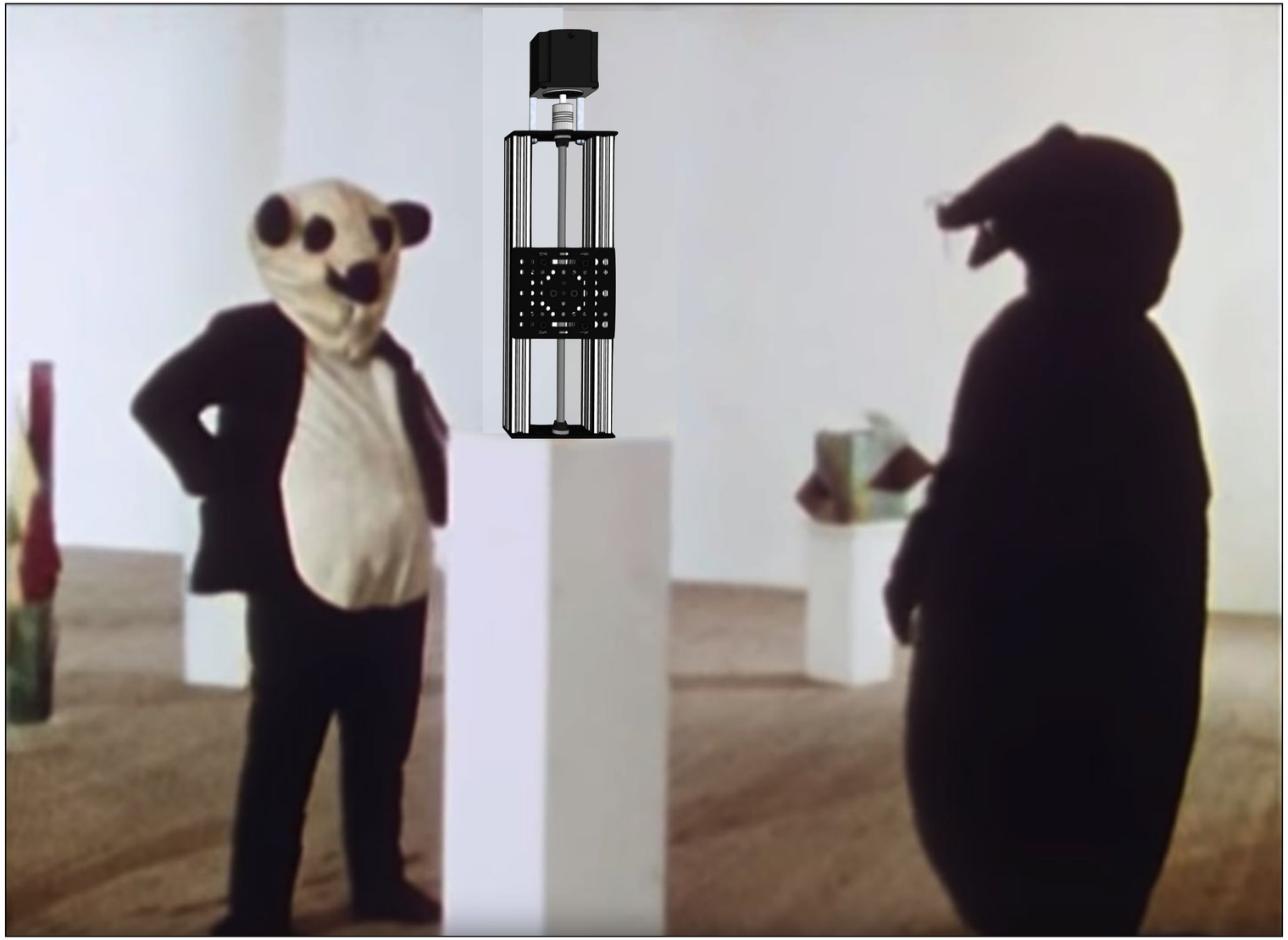
with connections to Kinetic Art

Doug L. James

Dave Cole, 2005, MASS MoCA

Dave Cole, 2005, MASS MoCA

But is it silly?



Adapted from Fischli and Weiss' THE POINT OF LEAST RESISTANCE, 1981
using a Maker Store linear actuator.

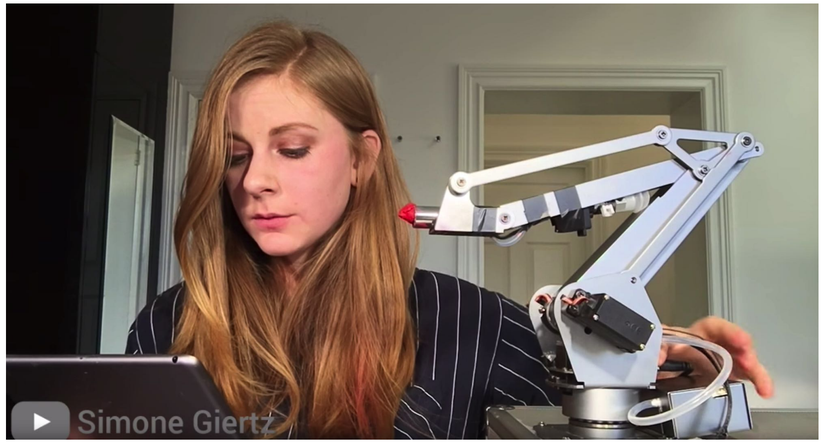
Smoking Machine

http://kristoffermyskja.com

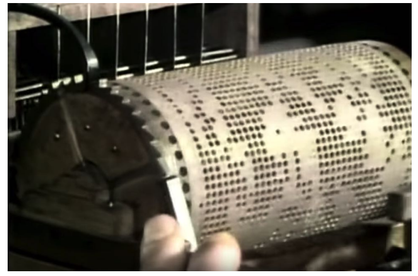
https://www.youtube.com/watch?v=VoBGau9623I

Sh*tty machines: Simone Giertz

https://www.youtube.com/channel/UC3KEoMzNz8eYnwBC34RaKCQ/featured



The Automata



Automated loom
1745

Metal-turning lathe
1751

Jacques de Vaucanson

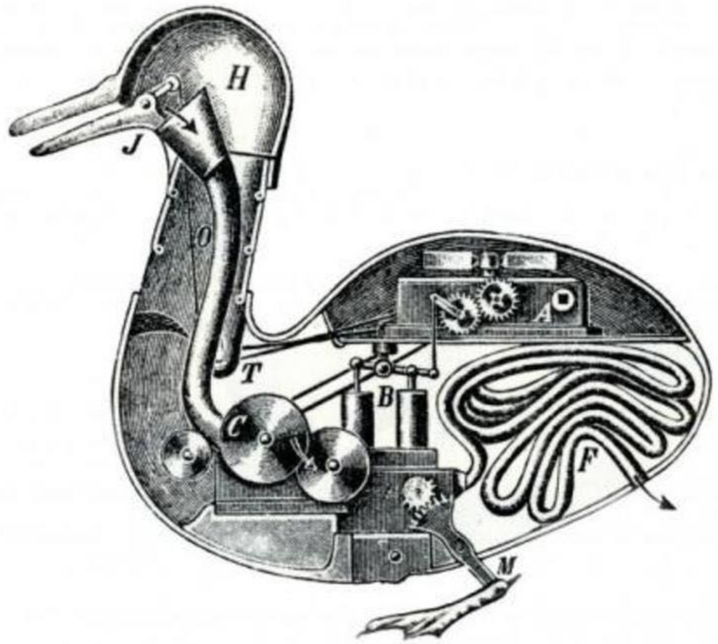
Le Mécanisme
1738

The Digesting Duck

https://en.wikipedia.org/wiki/Digesting_Duck

The duck had over 400 moving parts in each wing alone, and could flap its wings, drink water, digest grain, and defecate.

Poster, c.1739



An American artist's (mistaken) drawing of how the Digesting Duck may have worked

Voltaire wrote in 1741 that "sans la voix de la le Maure, & le canard de Vaucanson, vous n'auriez rien qui fit ressouvenir de la gloire de la France." ("**Without** the voice of le Maure and **Vaucanson's duck, you would have nothing to remind you of the glory of France.**")

Other ancient automata and early robots, including other birds

- Archytas of Tarentum (4th century BC)
- Hero of Alexandria (10-70 AD)

https://en.wikipedia.org/wiki/Robot#Early_beginnings

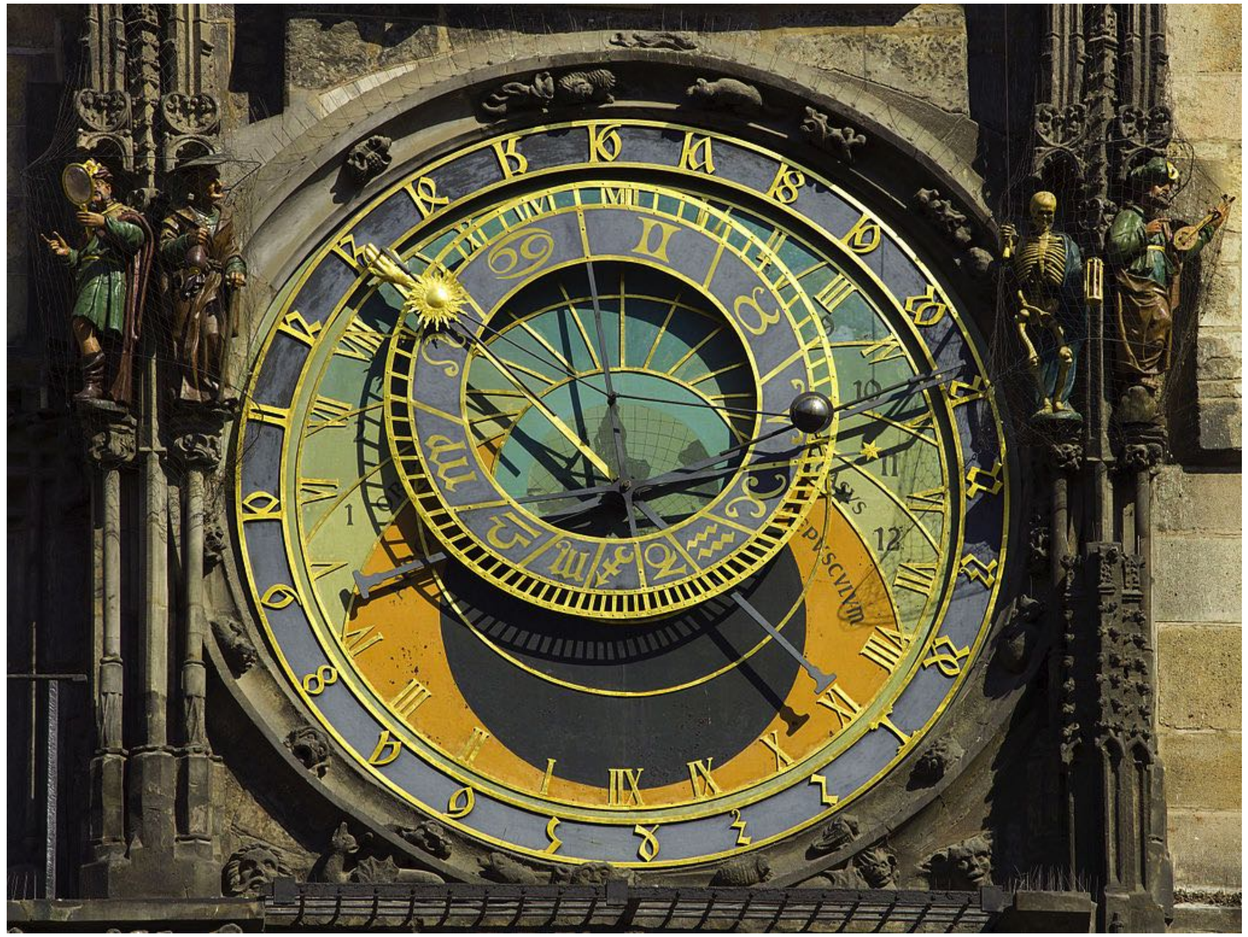
Villard de Honnecourt

https://en.wikipedia.org/wiki/Villard_de_Honnecourt

13th-century artist from Picardy in northern France. He is known to history only through a surviving portfolio or "sketchbook" containing about 250 drawings and designs of a wide variety of subjects.

1220 – 1240: The Portfolio of Villard de Honnecourt depicts an early escapement mechanism in a drawing titled *How to make an angel keep pointing his finger toward the Sun* and an automaton of a bird, with jointed wings which led to their design implementation in clocks.

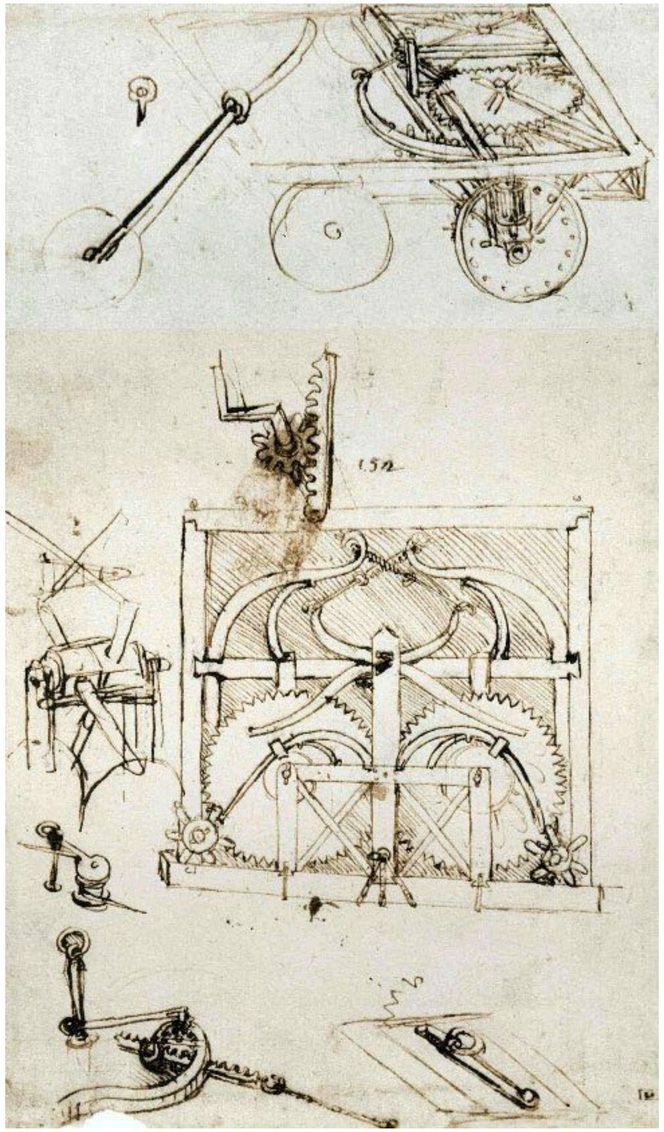
Because of their size and complexity, the majority of these clocks were built as public spectacles in the town centre. One of the earliest of these large clocks was the Strasbourg Clock, built in the fourteenth century which takes up the entire side of a cathedral wall. It contained an astronomical calendar, automata depicting animals, saints and the life of Christ. The clock still functions to this day but has undergone several restorations since its initial construction. The Prague astronomical clock was built in 1410, animated figures were added from the 17th century onwards.[24]



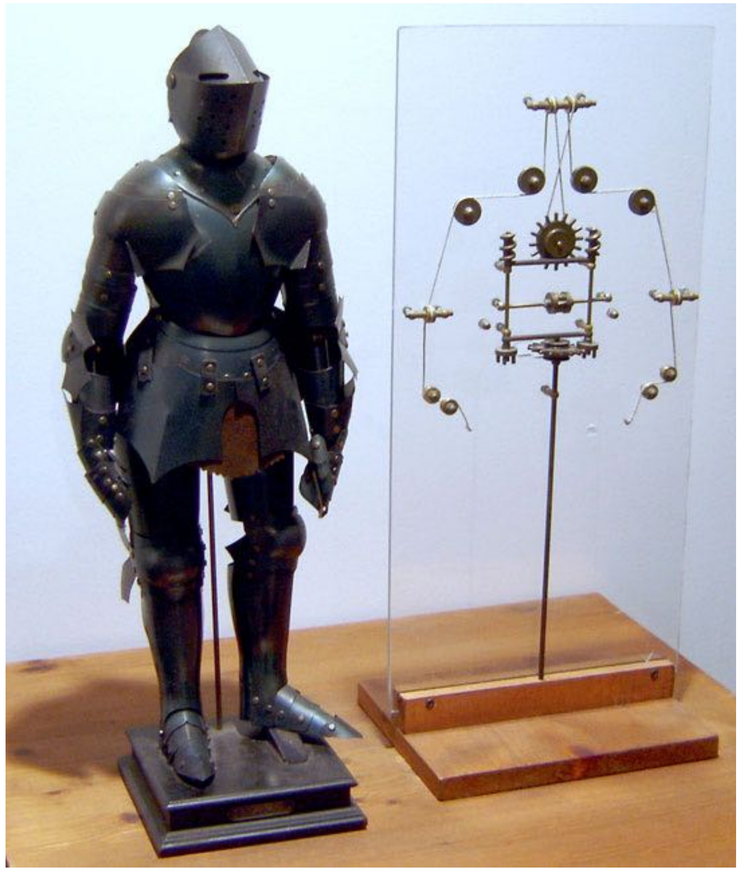
Face of the Astronomical Clock, in Old Town Square, Prague

Leonardo da Vinci

https://history-computer.com/Dreamers/LeonardoAutomata.html



Self-propelled cart, 1478-80



Mechanical knight (© Mark Rosheim)

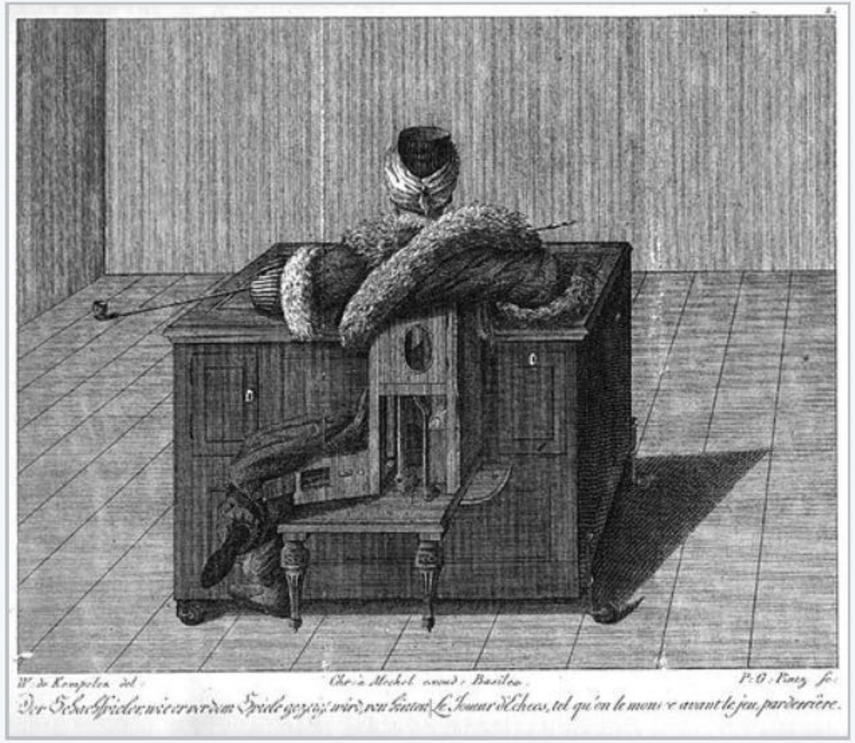
It is believed, that Leonardo demonstrated his "mechanical knight" in **1495** in Milano.

Leonardo's mechanical lion.
There are stories, telling that Leonardo made a mechanical lion, made with a wonderful artifice and able to walk forward and present flowers at the end of its performance, opening its chest to reveal a cluster of lilies. It is said that this machine was presented to the King of France Francis I as an amusement or as a diplomatic gesture during a banquet hosted by Florentine merchants and Giuliano de' Medici in Lyon in honor of Francis I on 12 July, **1515** (the Lion is the symbol of Florence, and lilies are the fleurs-de-lis of France. The bond between the two was also linked through marriage as Giuliano's wife, Philiberte of Savoy, was an aunt to the new King.) The mechanical lion perhaps was presented also during the peace talks between the French king and Pope Leo X in Bologna on December 19, 1515, where Leonardo was invited: "wherefore Leonardo being asked to devise some bizarre thing, made a lion which walked several steps and then opened its breast, showing it full of lilies". Later Leonardo took the lion when he moved to Château du Clos Lucé in France and the device was demonstrated and caused a great stir at the festival organized at Argentan in 1517.

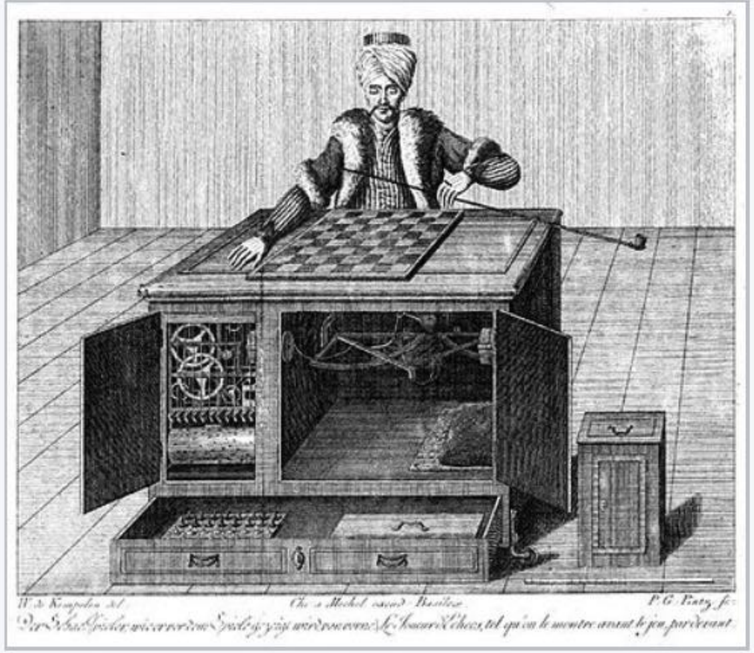
The Turk

https://en.wikipedia.org/wiki/The_Turk

The Turk, also known as the **Mechanical Turk** or **Automaton Chess Player** (German: *Schachtürke*, "chess Turk"; Hungarian: *A Török*), was a fake chess-playing machine constructed in the late 18th century. From 1770 until its destruction by fire in 1854 it was exhibited by various owners as an automaton, though it was eventually revealed to be an elaborate hoax.[1] Constructed and unveiled in 1770 by Wolfgang von Kempelen (Hungarian: Kempelen Farkas; 1734–1804) to impress the Empress Maria Theresa of Austria, the mechanism appeared to be able to play a strong game of chess against a human opponent, as well as perform the knight's tour, a puzzle that requires the player to move a knight to occupy every square of a chessboard exactly once.



An engraving of the Turk from Karl Gottlieb von Windisch's 1784 book *Inanimate Reason*



A copper engraving of the Turk, showing the open cabinets and working parts. A ruler at bottom right provides scale. Kempelen was a skilled engraver and may have produced this image himself.

Connections to kinetic art

Marcel Duchamp

https://en.wikipedia.org/wiki/Marcel_Duchamp

Marcel Duchamp. *Nude Descending a Staircase, No. 2* (1912). Oil on canvas. 57 7/8" x 35 1/8". Philadelphia Museum of Art.

Bicycle Wheel

Artist	Marcel Duchamp
Year	1916-17
Location	Original studio photograph. Shown to the left is the 2nd version of *Bicycle Wheel*, 1916-17. The original 1913 version and this 2nd version are lost. There are no known representations of the original 1913 *Bicycle Wheel and Stool*.[1]

"I enjoyed looking at it," he said. "Just as I enjoy looking at the flames dancing in the fireplace."

Kinetic works:

In 1920, with help from Man Ray, Duchamp built a motorized sculpture, Rotative plaques verre, optique de précision ("Rotary Glass Plates, Precision Optics"). The piece, **which he did not consider to be art**, involved a motor to spin pieces of rectangular glass on which were painted segments of a circle. When the apparatus spins, an optical illusion occurs, where the segments appear to be closed concentric circles. **Man Ray** set up equipment to photograph the initial experiment, but when they turned the machine for the second time, a belt broke, and caught a piece of the glass, which after glancing off Man Ray's head, shattered into bits.

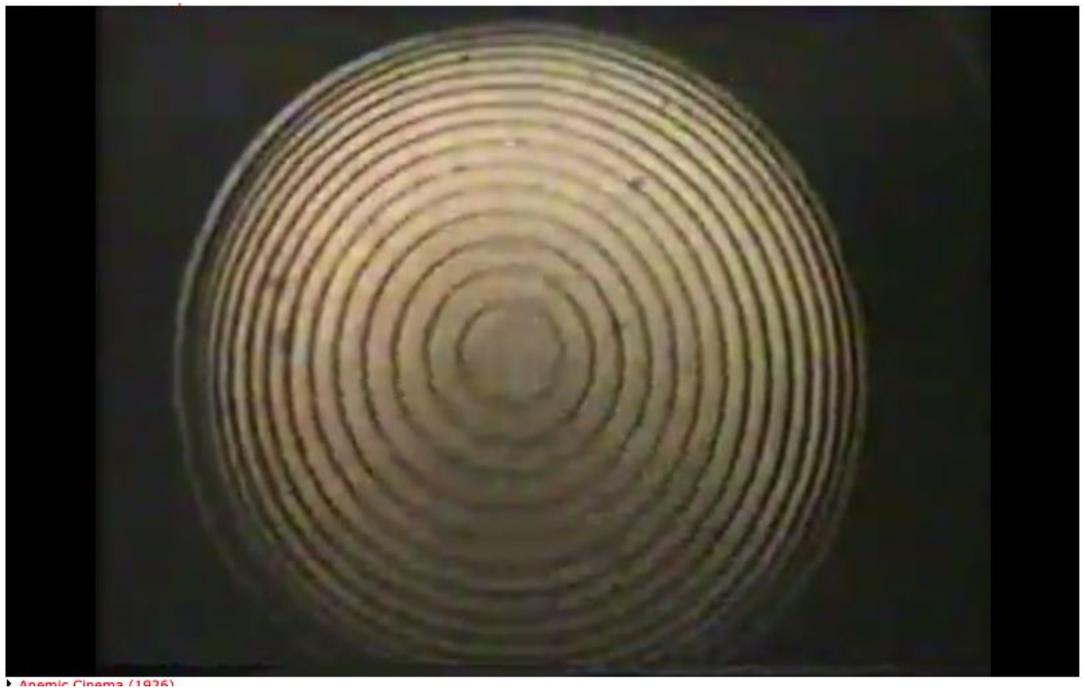
Marcel Duchamp

https://en.wikipedia.org/wiki/Marcel_Duchamp

Retroreliefs

To make the optical "play toys", he painted designs on flat cardboard circles and spun them on a phonographic turntable. When spinning, the flat disks appeared three-dimensional. He had a printer produce 500 sets of six of the designs, and set up a booth at a 1935 Paris inventors' show to sell them. The venture was a financial disaster, but some optical scientists thought they might be of use in restoring three-dimensional stereoscopic sight to people who have lost vision in one eye.[38]:301–303 In collaboration with Man Ray and Marc Allégret, Duchamp filmed early versions of the *Rotoreliefs* and they named the film, ***Anémic Cinéma*** (1926).

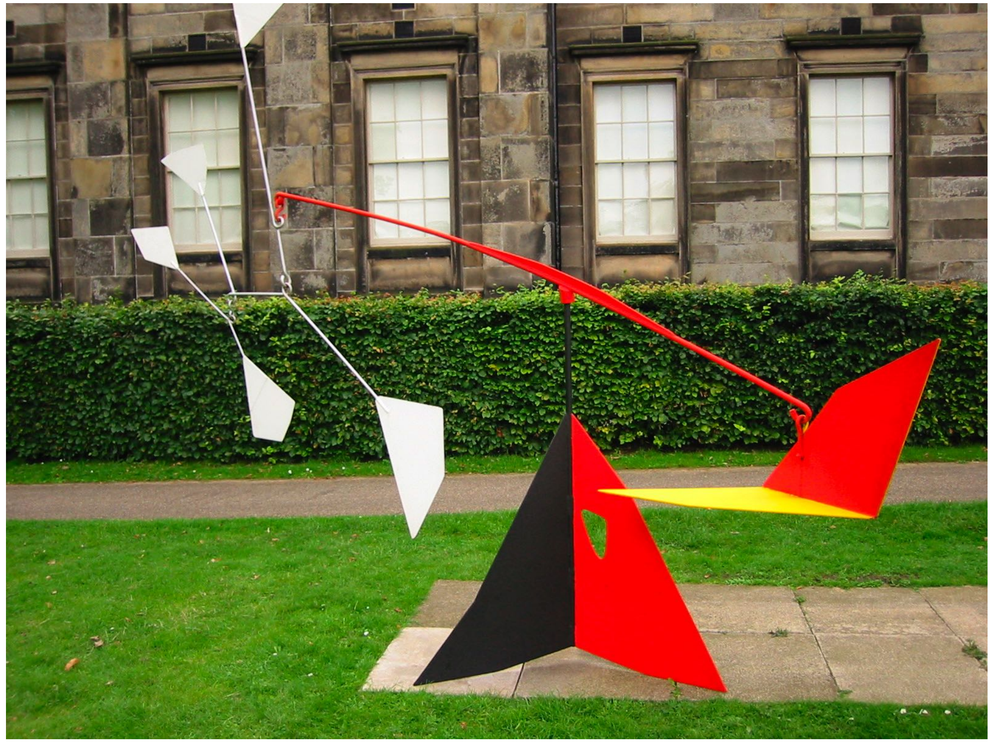
Later, in **Alexander Calder**'s studio in 1931, while looking at the sculptor's kinetic works, Duchamp suggested that these should be called "mobiles". Calder agreed to use this novel term in his upcoming show. To this day, sculptures of this type are called "mobiles".[38]:294



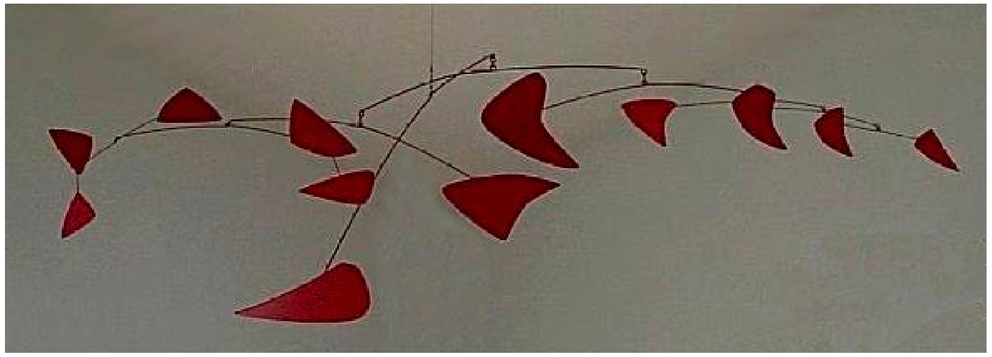
Anemic Cinema, c.1926

Alexander Calder

https://en.wikipedia.org/wiki/Alexander_Calder



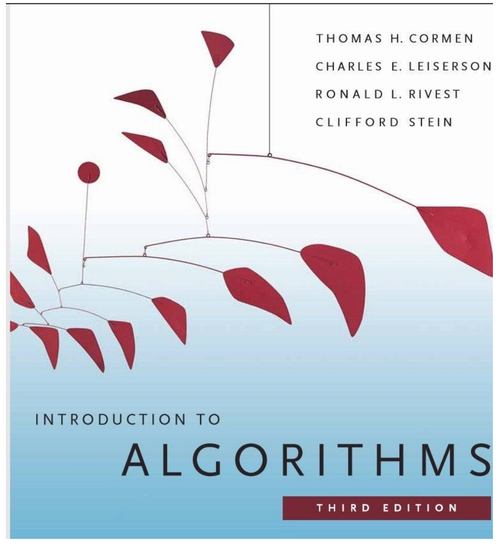
L'empennage, 1953



Red Mobile, 1956,
Painted sheet metal and metal rods, a signature work by Calder

An American sculptor who is best known for his innovative mobiles (kinetic sculptures powered by motors or air currents) that embrace chance in their aesthetic and his monumental public sculptures.

- first gained attention in Paris in the 1920s

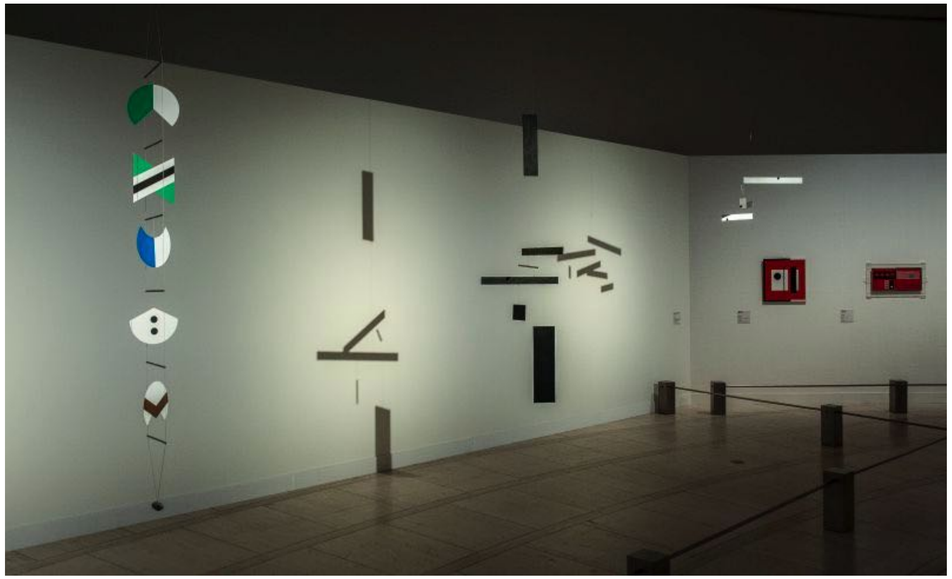


Bruno Mugari

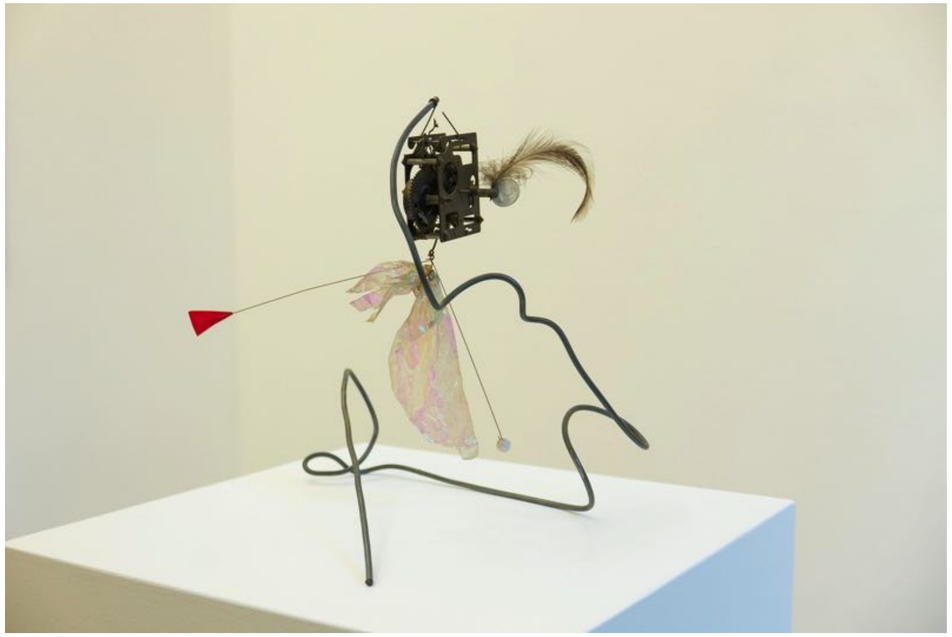
http://www.munart.org
https://en.wikipedia.org/wiki/Bruno_Munari

The Italian artist Bruno Munari began building "useless machines" (*macchine inutili*) in the 1930s. He was a "third generation" Futurist and did not share the first generation's boundless enthusiasm for technology, but sought to counter the threats of a world under machine rule by building machines that were artistic and unproductive.

In studio with Useless Machines 40s



Installation view *Useless Machines*

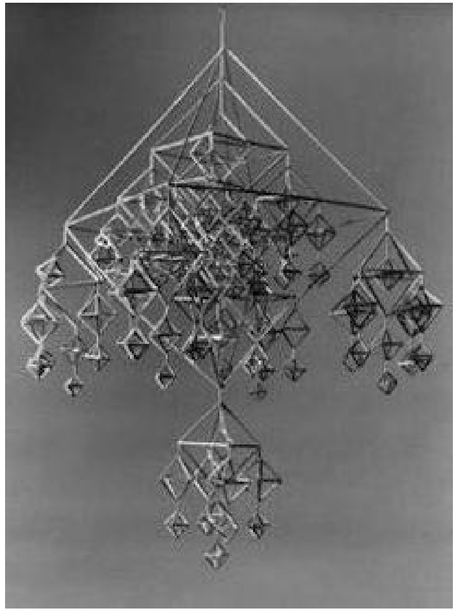


macchina aritmica 1951-1983

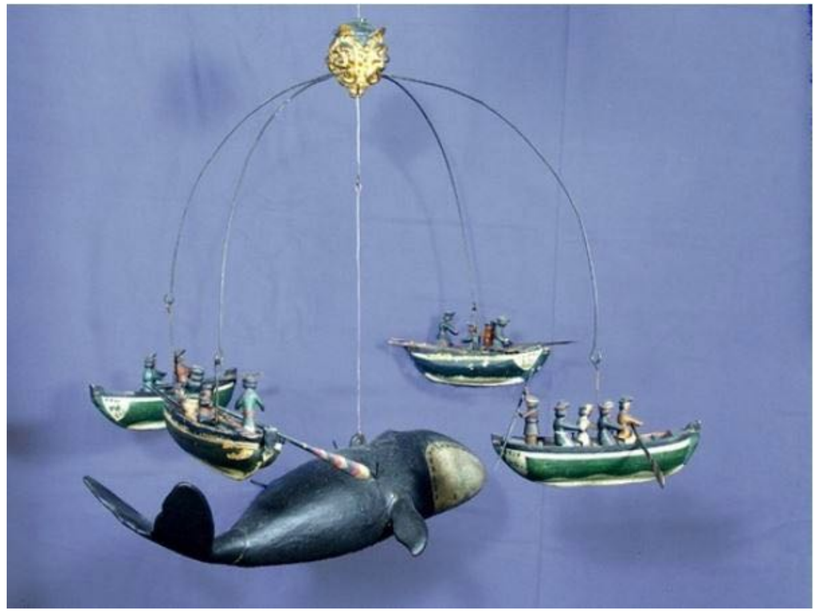
Hanging kinetic sculptures before Calder and Mugari

https://www.marcomahler.com/mobiles-before-calder-who-invented-mobiles-history

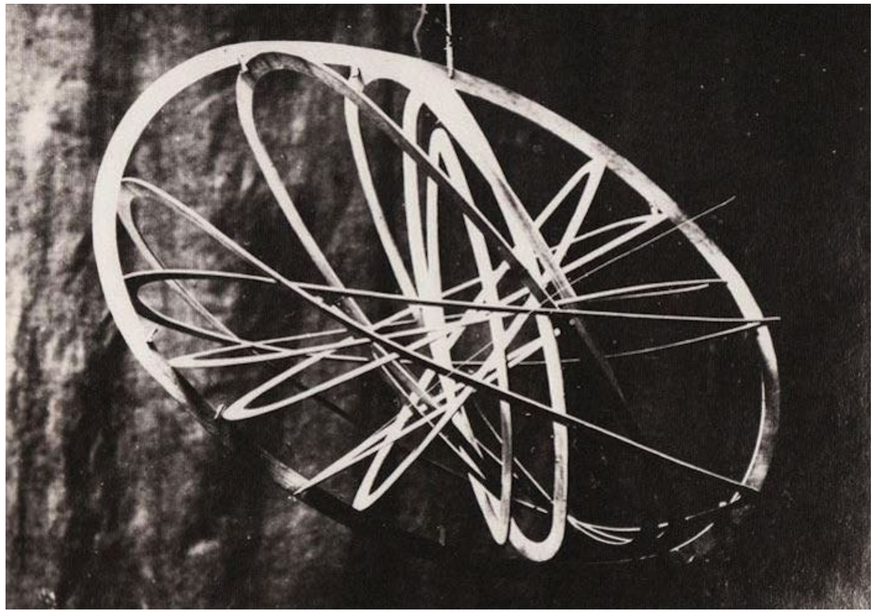
Wind chimes, 3000 BC, South East Asia



Himmeli, Finland



Netherlands, 1751

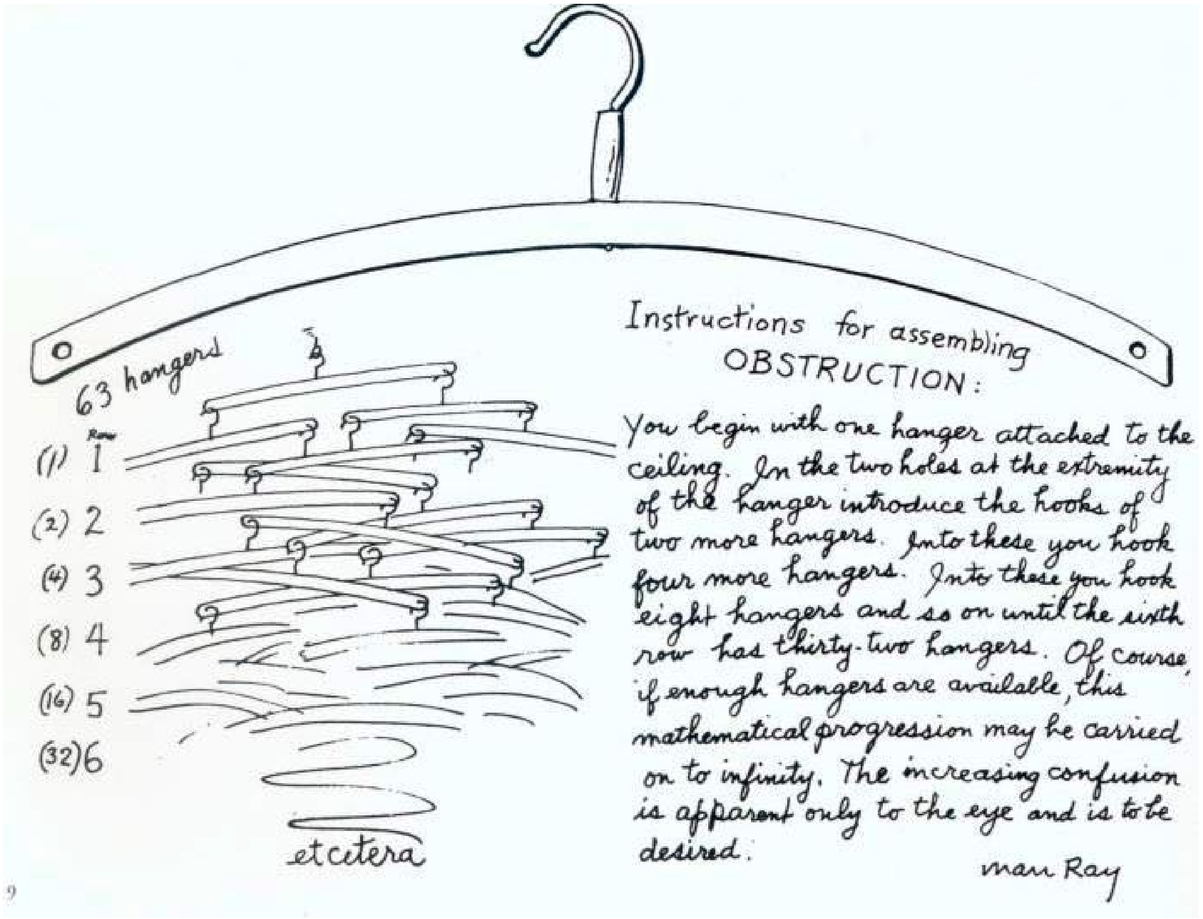


Naum Gabo, 1917, Russia

Hanging kinetic sculptures before Calder and Mugari

https://www.marcomahler.com/mobiles-before-calder-who-invented-mobiles-history

Man Ray's *Obstruction*, 1920



Man Ray’s instructions on how to assemble his mobile

Jean Tinguely

https://en.wikipedia.org/wiki/Jean_Tinguely

Jean Tinguely photographed by Lothar Wolleh, Milan, 1970

Jean Tinguely (1925-1991) was a Swiss sculptor. He is best known for his sculptural machines or kinetic art, in the Dada tradition; known officially as metamechanics. Tinguely's art satirized the mindless overproduction of material goods in advanced industrial society.

Early works: 1954-1963
- self-destructing machines
- drawing machines

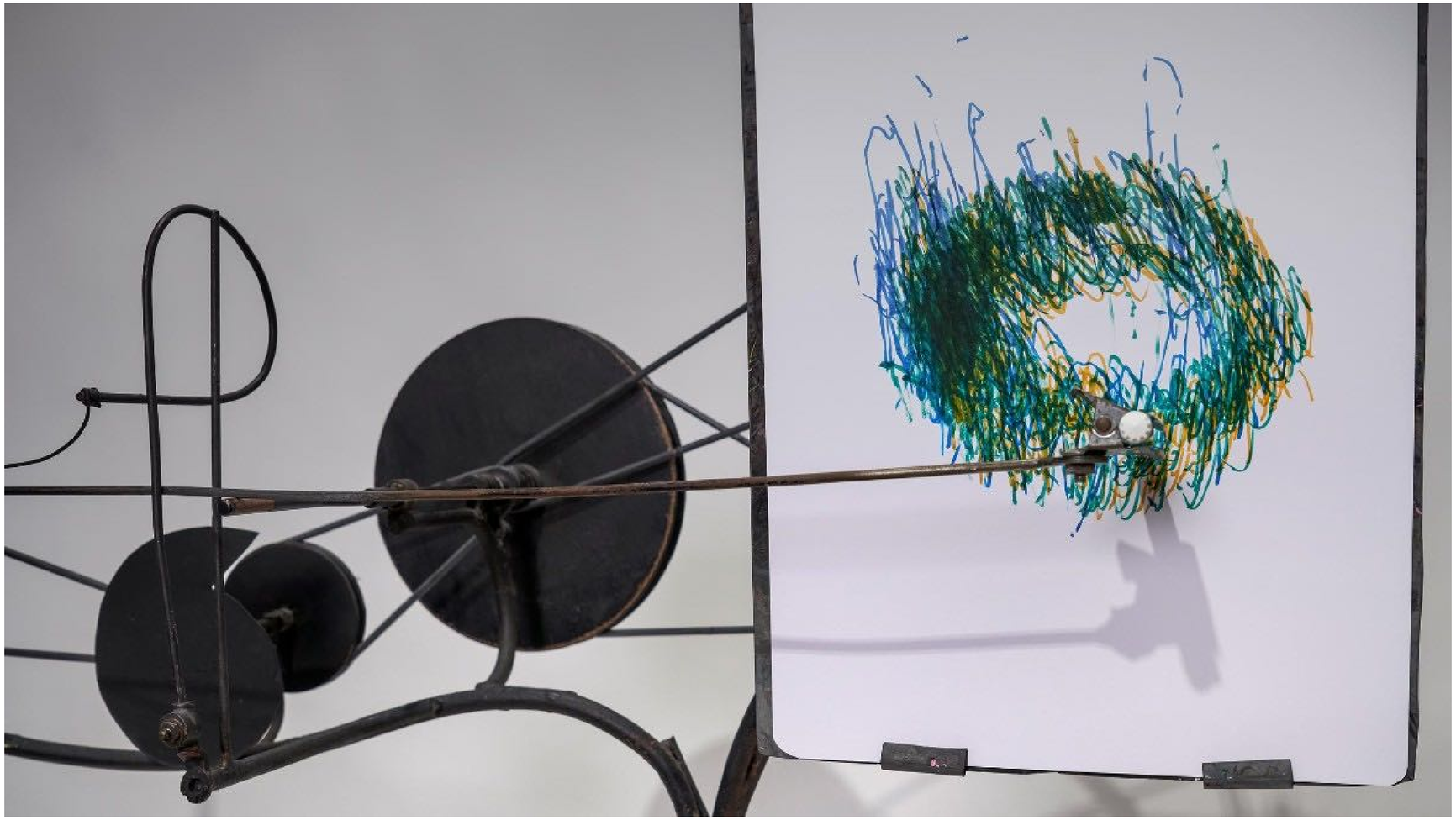
Jean Tinguely

https://en.wikipedia.org/wiki/Jean_Tinguely

His best-known work, a self-destroying sculpture titled *Homage to New York* (1960), only partially self-destructed at the Museum of Modern Art, New York City,[2] although his later work, *Study for an End of the World No. 2* (1962), detonated successfully in front of an audience gathered in the desert outside Las Vegas.

Jean Tinguely

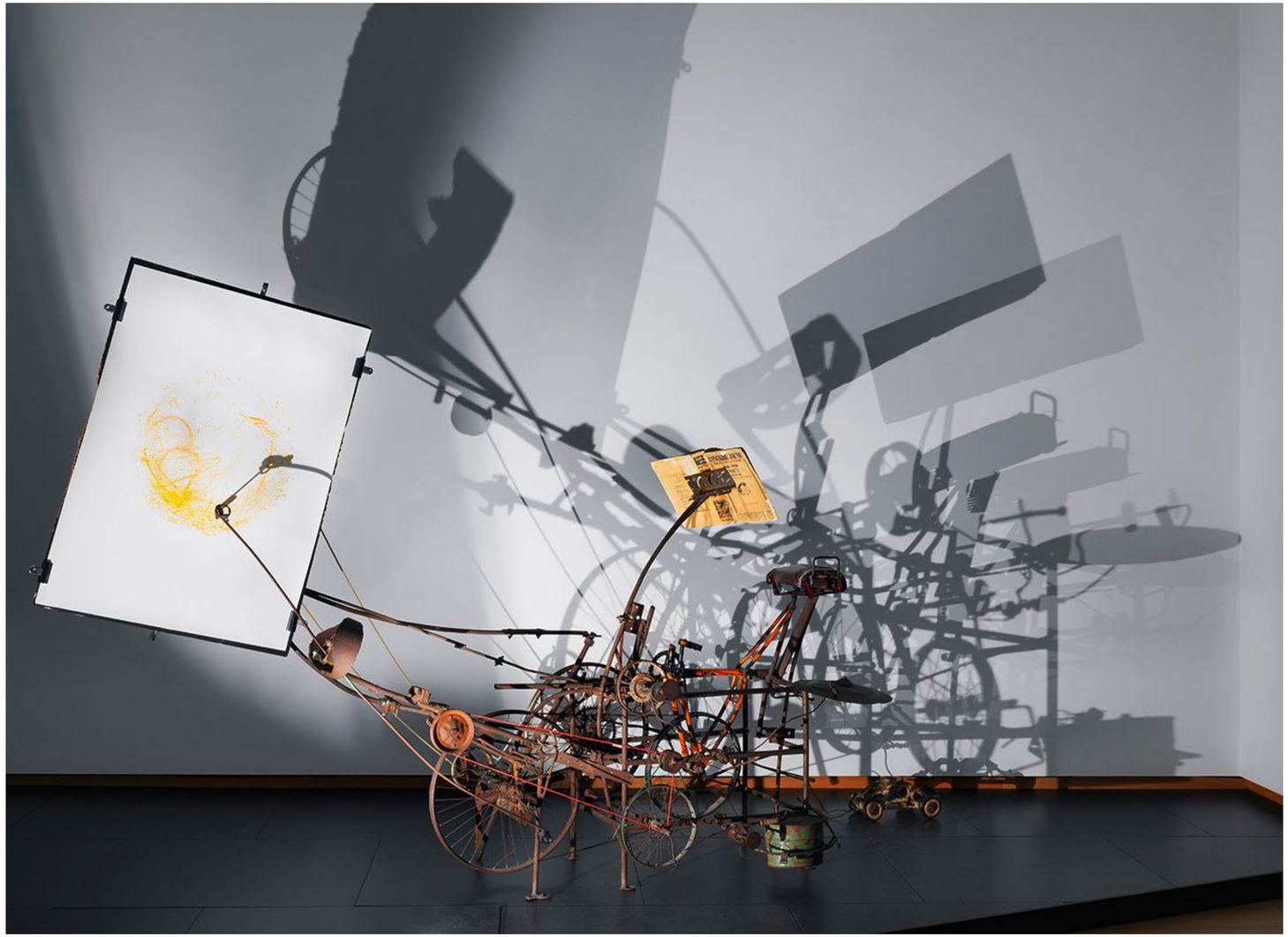
https://en.wikipedia.org/wiki/Jean_Tinguely



Jean Tinguely, Méta-Matic No. 10, 1959

Jean Tinguely

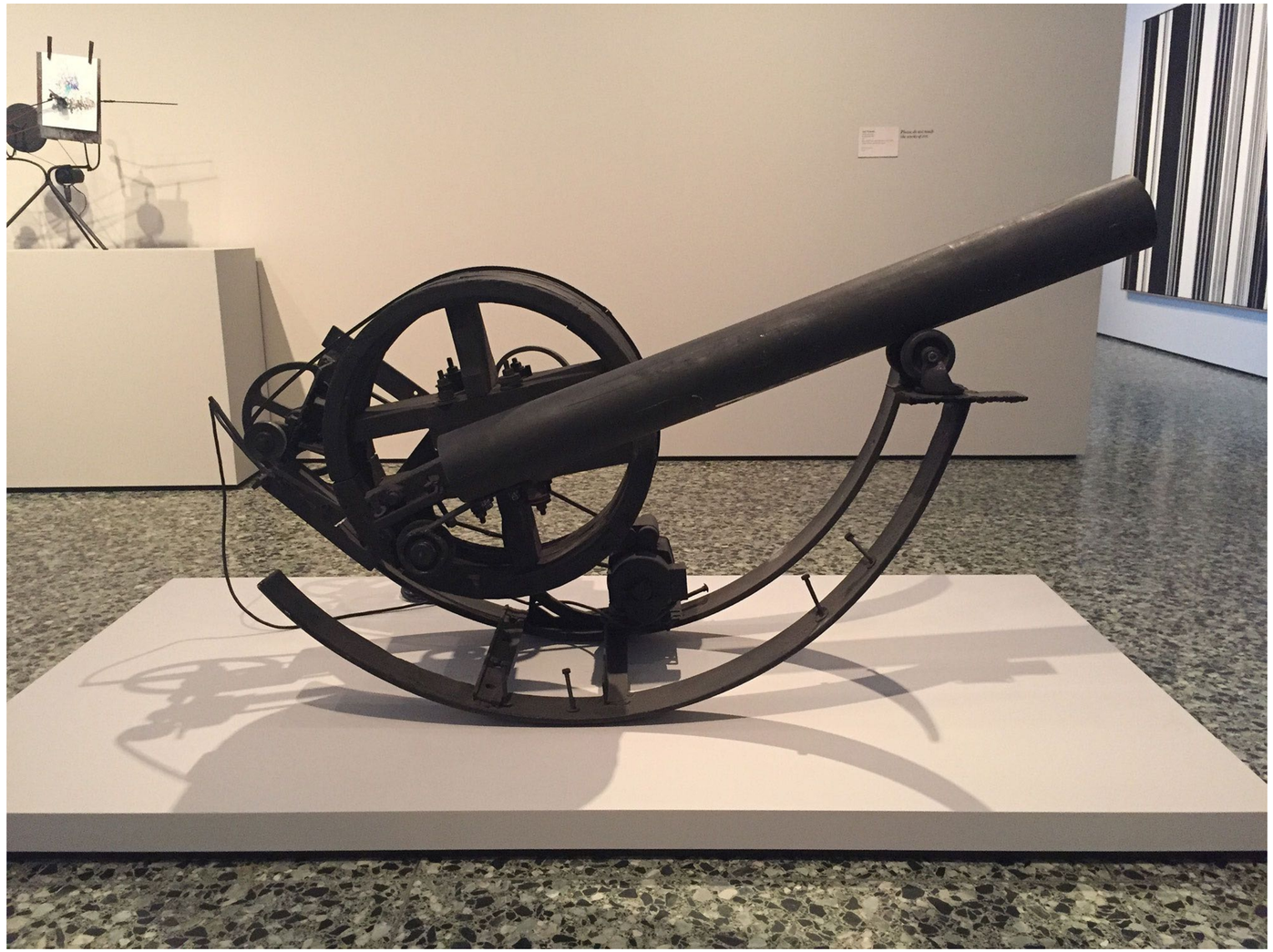
https://en.wikipedia.org/wiki/Jean_Tinguely



Jean Tinguely, Le Cyclograveur, 1960, coll. Kunsthaus Zurich. Photo by Gert

Jean Tinguely

https://en.wikipedia.org/wiki/Jean_Tinguely



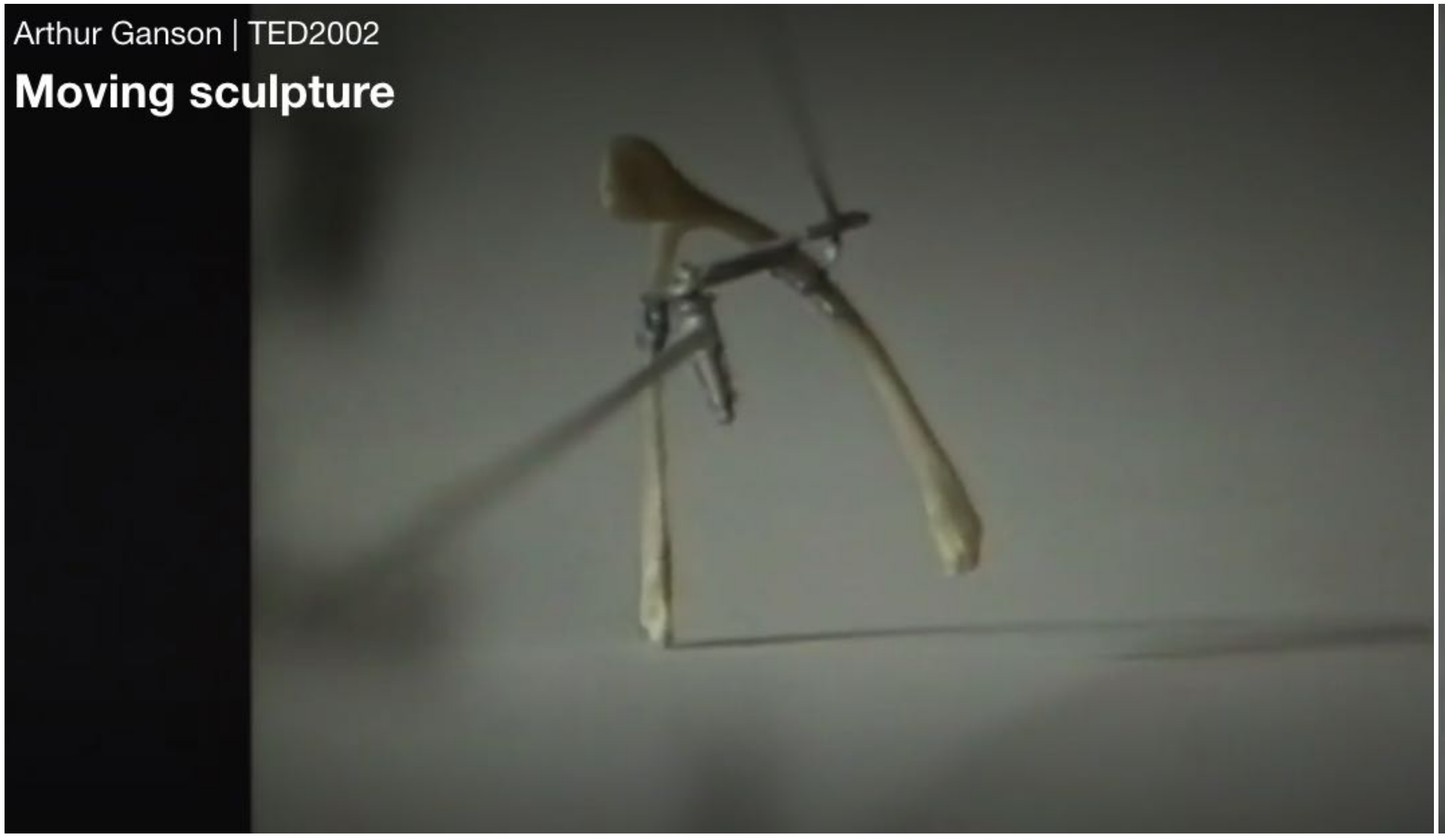
Jean Tinguely, La Bascule VII, 1967.

Jean Tinguely

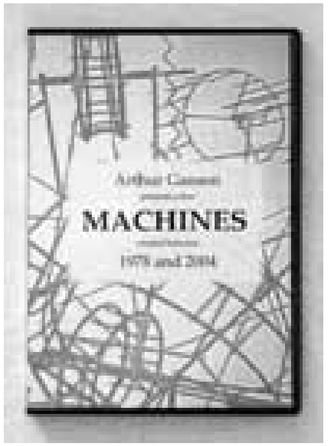
Arthur Ganson's Machines

https://en.wikipedia.org/wiki/Arthur_Ganson

"Ingenious but useless mechanical devices"



https://www.ted.com/talks/arthur_ganson_makes_moving_sculpture



Making wire gears...

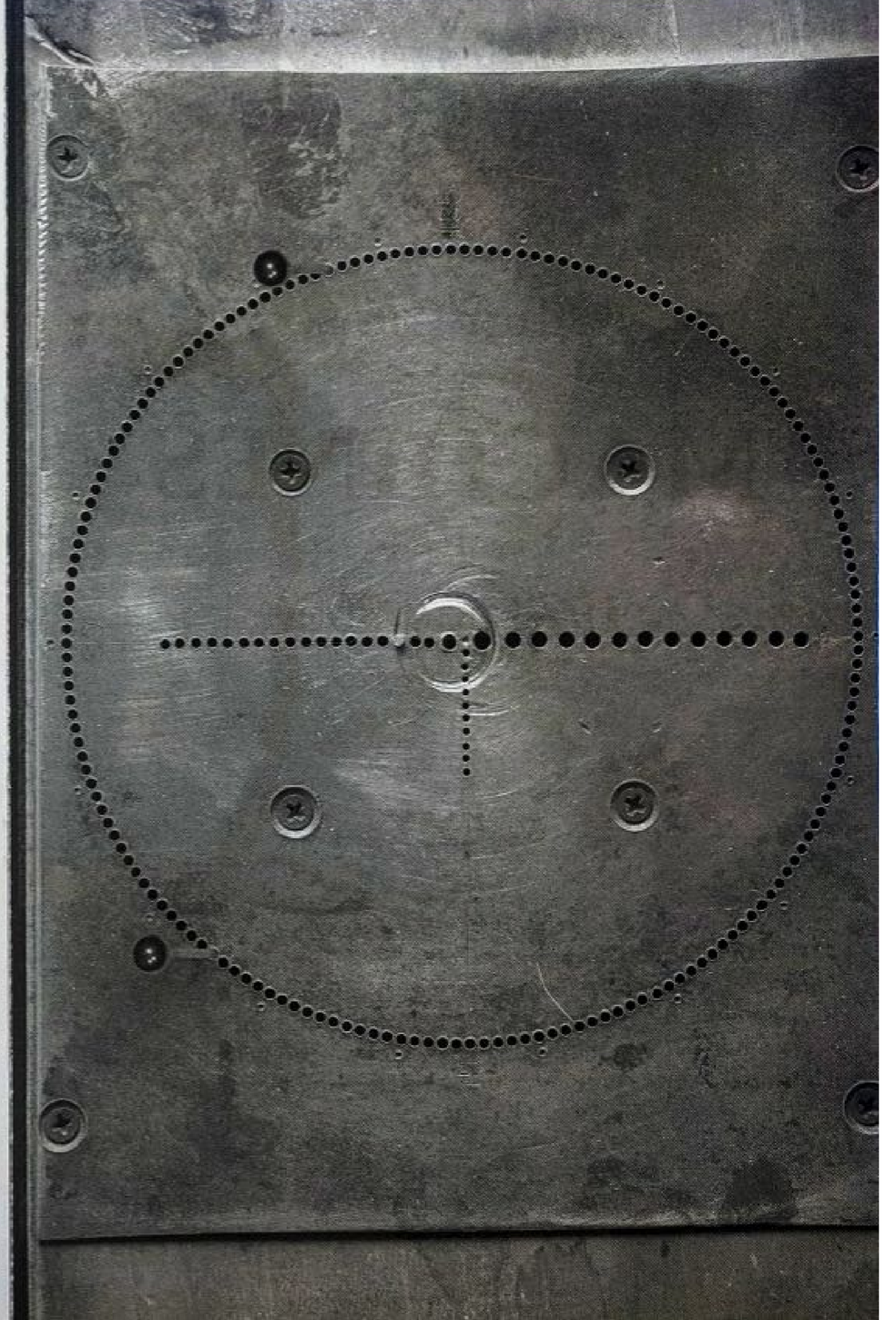
The making of tools and jigs is integral to my process of making sculpture. After many years of bending gear teeth freehand with a pair of needle-nose pliers, I devised these tools to 'standardize' the process.

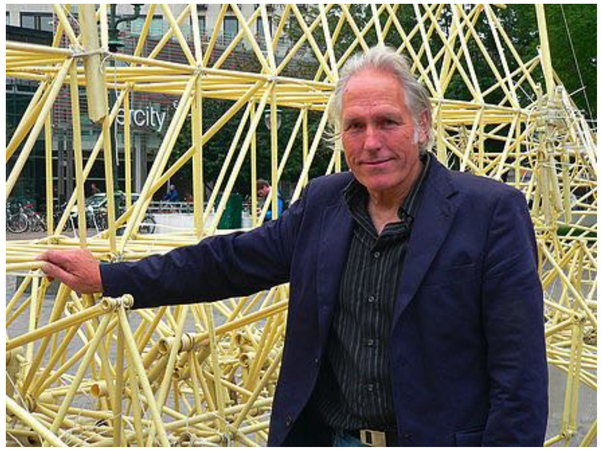
The plate to the right is the 'guide' and is used in conjunction with the hand tool to the left. The three linear arrays of holes on the plate are for different size bending pins and accommodate different gauges of wire. The two ball-end pins in the large circle of holes are adjustable 'stops' that determine the inside and outside bends of the teeth.

With this tool, many types of gears can be produced. Some situations require large diameter gears with great numbers of small teeth, while others require small gears with somewhat larger teeth. Once a new gear is developed, all pin settings are recorded for future re-use.

I thought that this tool would save me loads of time because it does allow me to make gears more efficiently. However, it has also (and probably not surprisingly) led to making machines with many more gears in them…

These tools are shown in operation in the chapter titled "making wire gears".





Theo Jansen

https://en.wikipedia.org/wiki/Theo_Jansen

"The walls between art and engineering exist only in our minds."

A *strandbeest*, exhibited by Jansen on the Linz city square during Ars Electronica, 2005

Theo Jansen's TED talk

My creations, a new form of life

Posted Sep 2007

Anthony Howe

https://en.wikipedia.org/wiki/Anthony_Howe_(sculptor)

Jacob Tonski

Balance from Within, 2010-2013

More Useless Machines

Useless machines

https://en.wikipedia.org/wiki/Useless_machine

A useless machine is a device which has a function but no direct purpose.

It may be intended to make a philosophical point, as an amusing engineering "hack", or as an intellectual joke.

Devices which have no function or which malfunction are not considered to be "useless machines".

PAT: A useless machine is a device which has a purpose but no function.

The Useless Machine

https://en.wikipedia.org/wiki/Useless_machine

Marvin Minsky discussing the Useless Machine
Originally he called it “The Ultimate Machine”

Arthur C. Clarke connection

http://frivolousengineering.com/history.htm

Later, Arthur C. Clarke, the British author of science and science fiction visited Bell Labs in the mid fifties and saw the prototype on Shannon's desk and was "haunted by it". He wrote about it at least twice: in Harper's Weekly, and in his book "Voice Across the Sea".

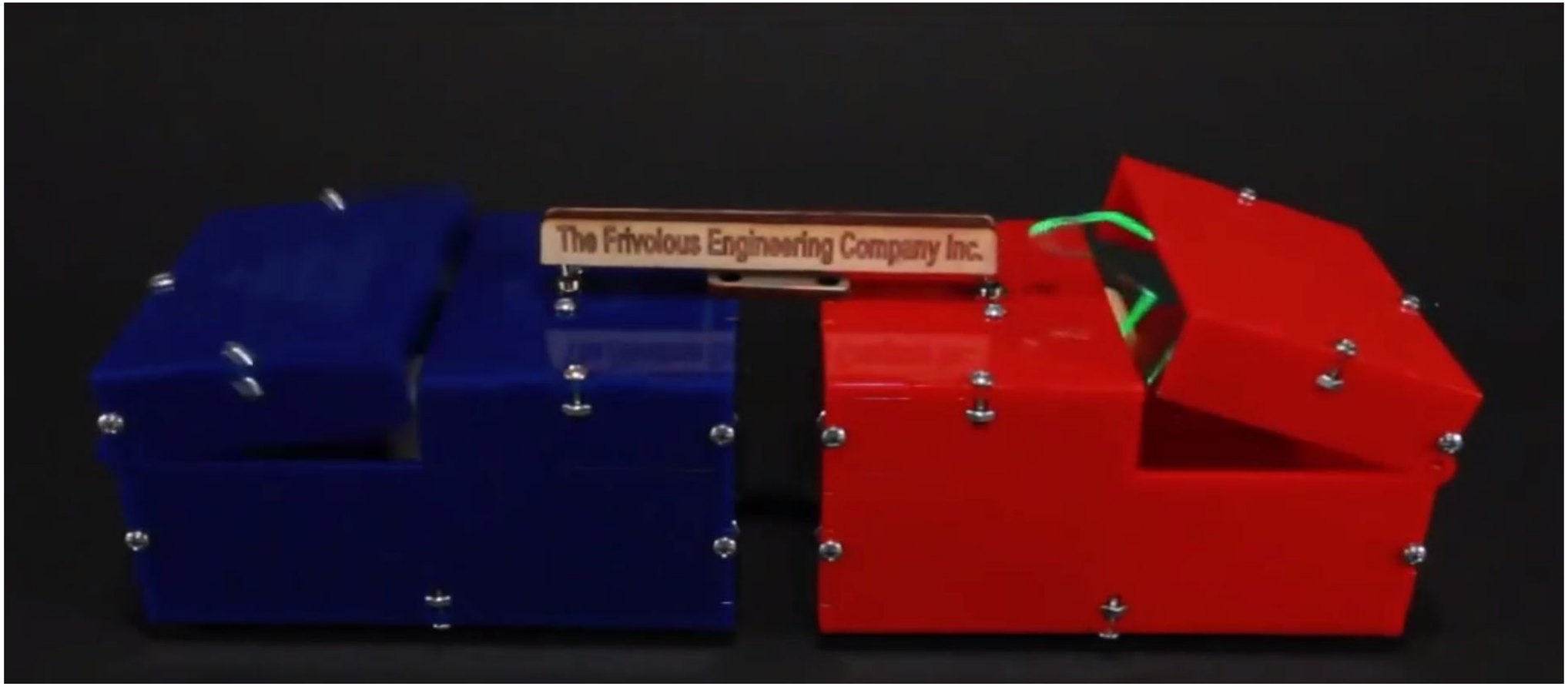
"I cannot leave Bell Labs without mentioning one more device which I saw there, and which haunts me as it haunts everyone else who has ever seen it in action. It is the Ultimate Machine–the End of the Line. Beyond it there is Nothing. It sits on Claude Shannon's desk driving' people mad. (Or sat, as Shannon is now at MIT.)

Nothing could look simpler. It is merely a small wooden casket the size and shape of a cigar-box, with a single switch on one face. When you throw the switch, there is an angry, purposeful buzzing. The lid slowly rises, and from beneath it emerges a hand. The hand reaches down, turns the switch off, and retreats into the box. With the finality of a closing coffin, the lid snaps shut, the buzzing ceases, and peace reigns once more.

The psychological effect, if you do not know what to expect, is devastating. **There is something unspeakably sinister about a machine that does nothing–absolutely nothing–except switch itself off.**"


HAL 9000: "I'm sorry Dave, I'm afraid I can't do that"

Why?



"Why?" is complicated

Go ahead, I dare you to ask Richard Feynman why we make useless machines

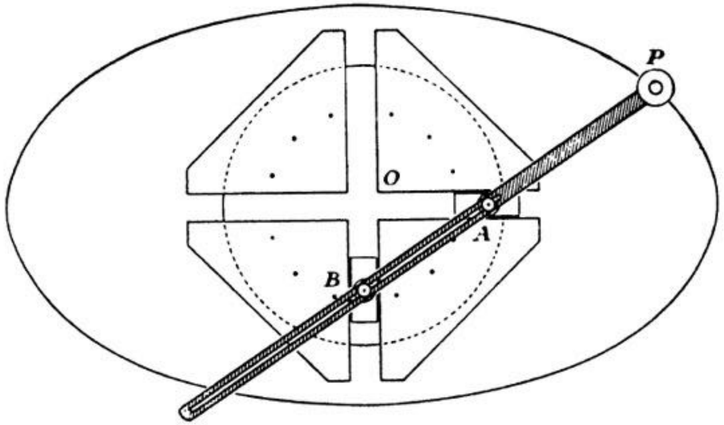
Trammel of Archimedes

https://en.wikipedia.org/wiki/Trammel_of_Archimedes

- **The ellipsograph**
  - **A four-bar linkage mechanism**
- **Archimedes of Syracuse (c. 287 – c. 212 BC)**

- **"Do nothing machine"**

- **Wooden toys: Kentucky do-nothings, nothing grinders, do nothing machines**, or **bullshit grinders**

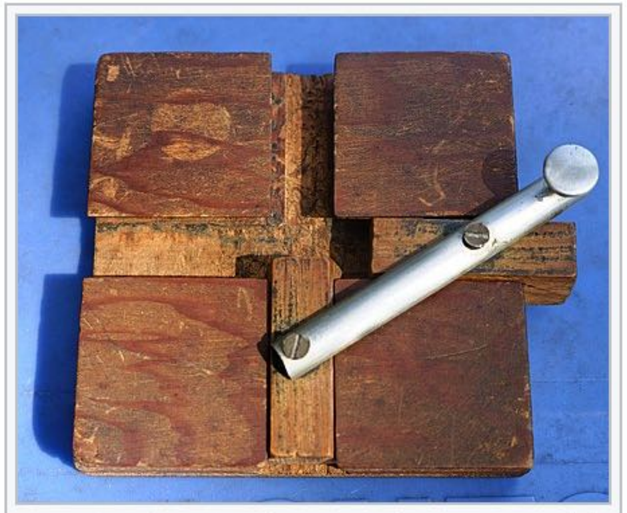


H.Martin Cundy and A.P. Rollet, 'Mathematical Models', Oxford University Press, Second Edition, 1961.

http://www.matematicasvisuales.com/english/html/geometry/elipses/trammel.html

https://www.youtube.com/watch?v=pid70tRkDJo

Wooden ellipsograph (ca. 1900) now at Smithsonian.

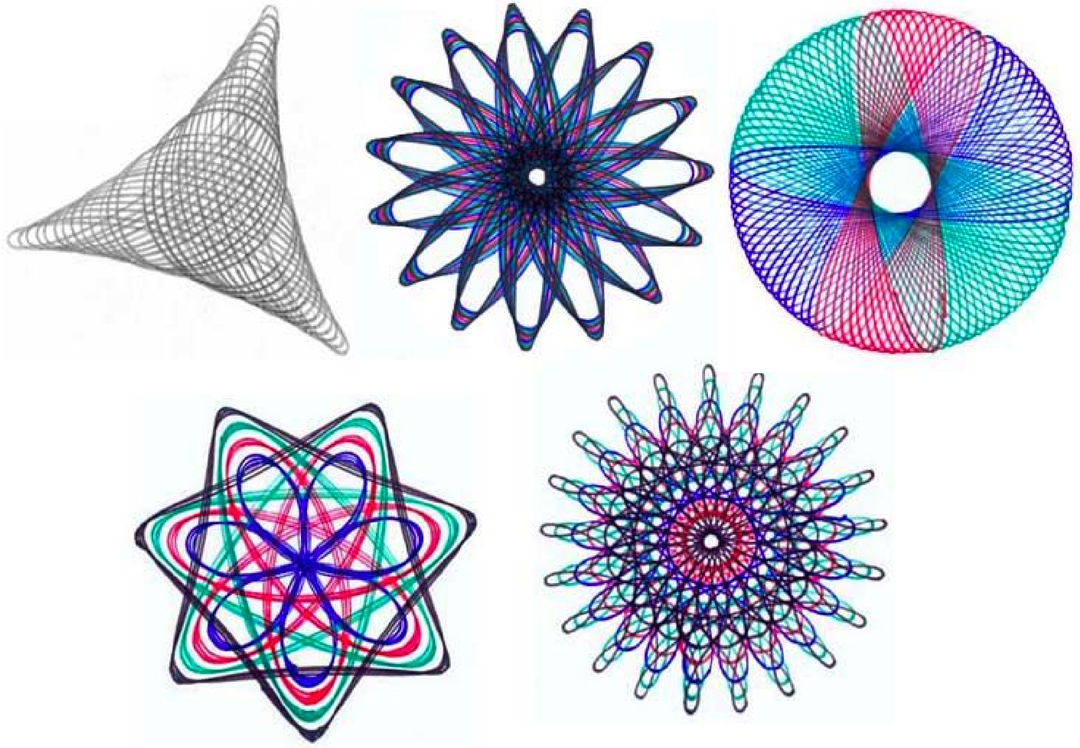


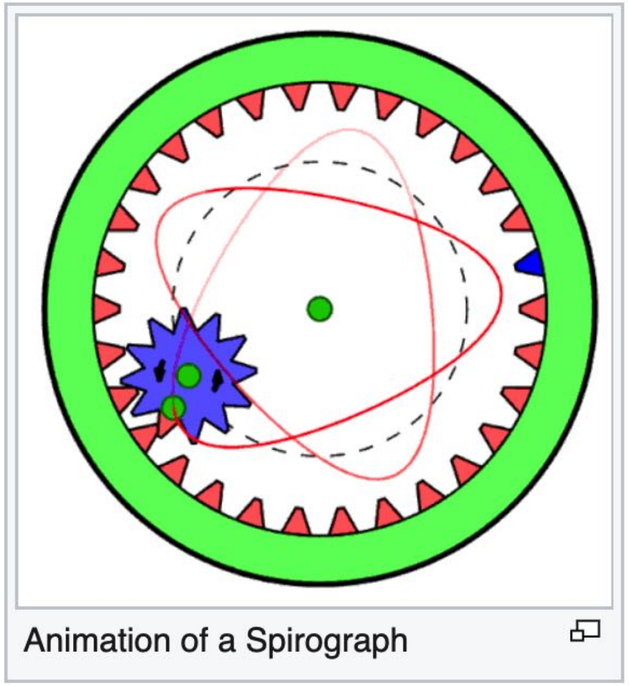
Bullshit Grinder (ca. 1960)

Spirograph

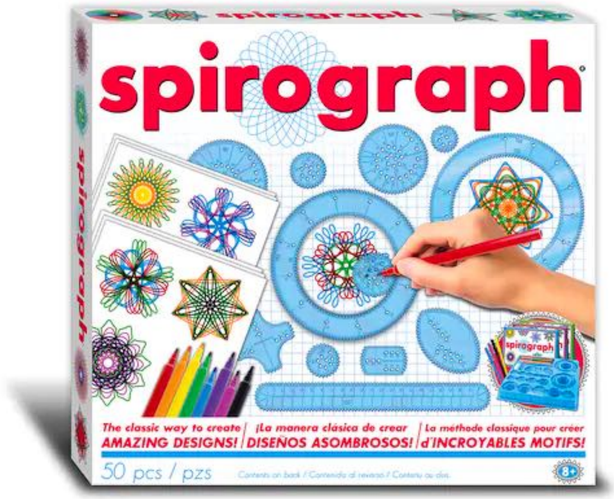
https://en.wikipedia.org/wiki/Spirograph

Geometric drawing toy that produces curves known as hypotrochoids and epitrochoids.





Animation of a Spirograph



Spirograph set (early 1980s UK version)

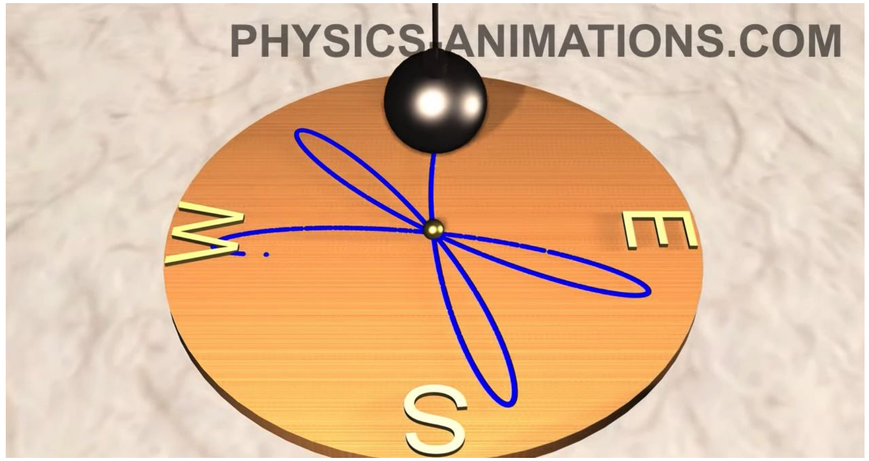
Inventor(s)	Denys Fisher
Company	Hasbro
Country	United Kingdom
Availability	1965–present
Materials	Plastic

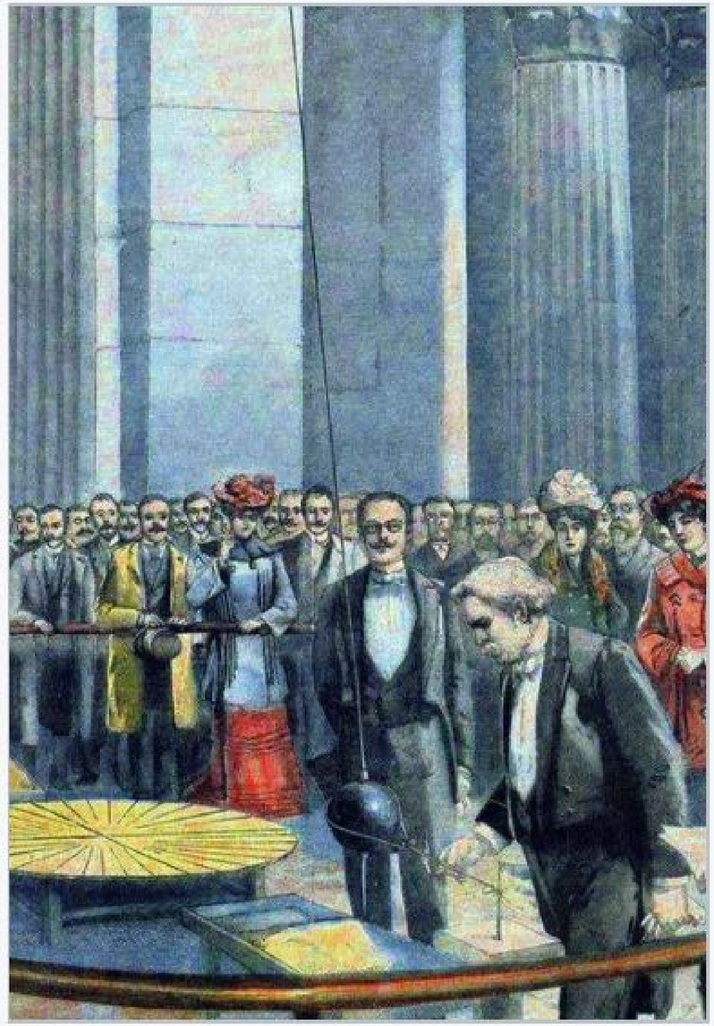
Official website

Foucault Pendulum

https://en.wikipedia.org/wiki/Foucault_pendulum

The Foucault pendulum at the California Academy of Sciences knocks over successive pegs as the Earth rotates



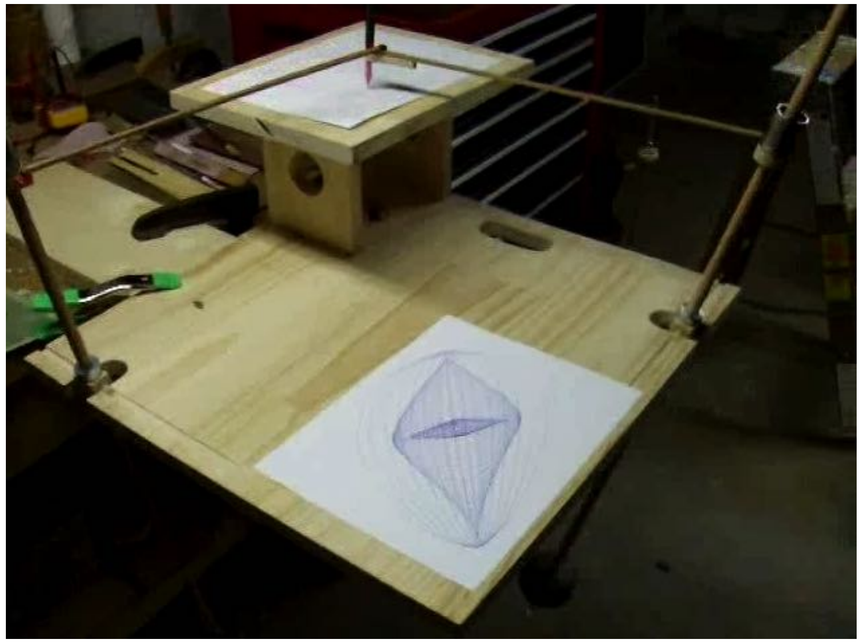


An excerpt from the illustrated supplement of the magazine *Le Petit Parisien* dated November 2, 1902, on the 50th anniversary of the experiment of Léon Foucault demonstrating the rotation of the earth.

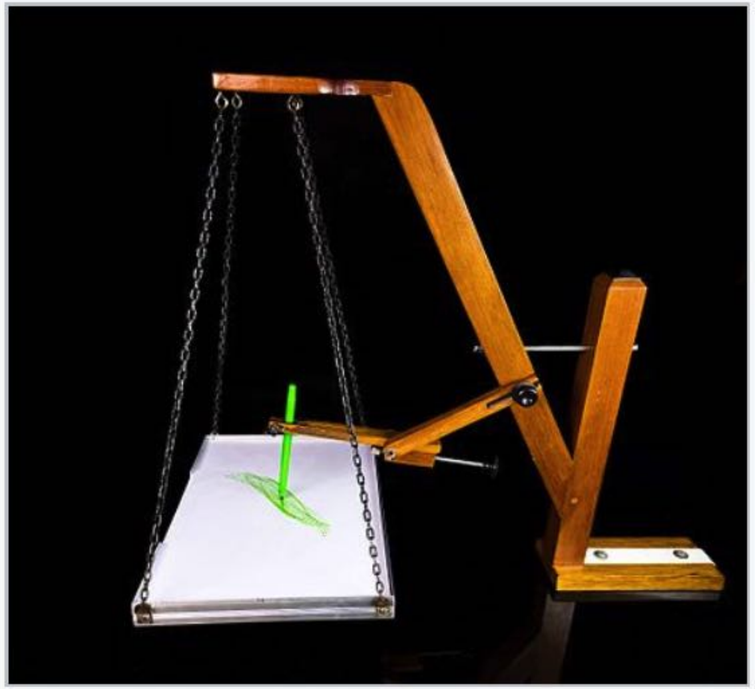
Harmonograph

https://en.wikipedia.org/wiki/Harmonograph

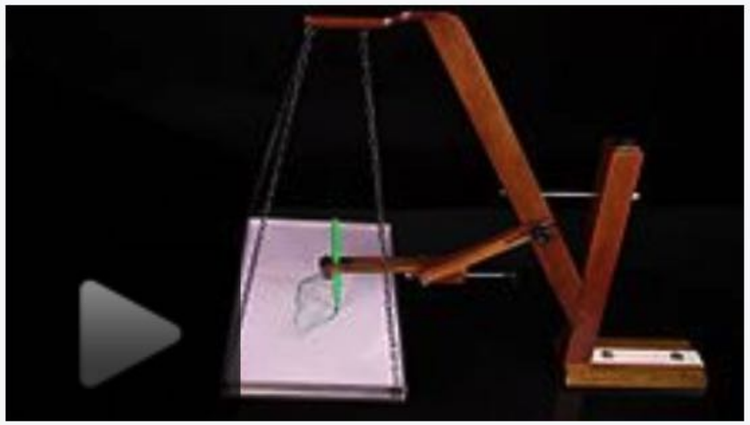
- A mechanical apparatus that employs pendulums to create a geometric image.
- The drawings created typically are **Lissajous curves**, or related drawings of greater complexity.
- The devices, which began to appear in the mid-19th century and peaked in popularity in the 1890s,
- Cannot be conclusively attributed to a single person, although Hugh Blackburn, a professor of mathematics at the University of Glasgow, is commonly believed to be the official inventor.



2-pendulum harmonograph



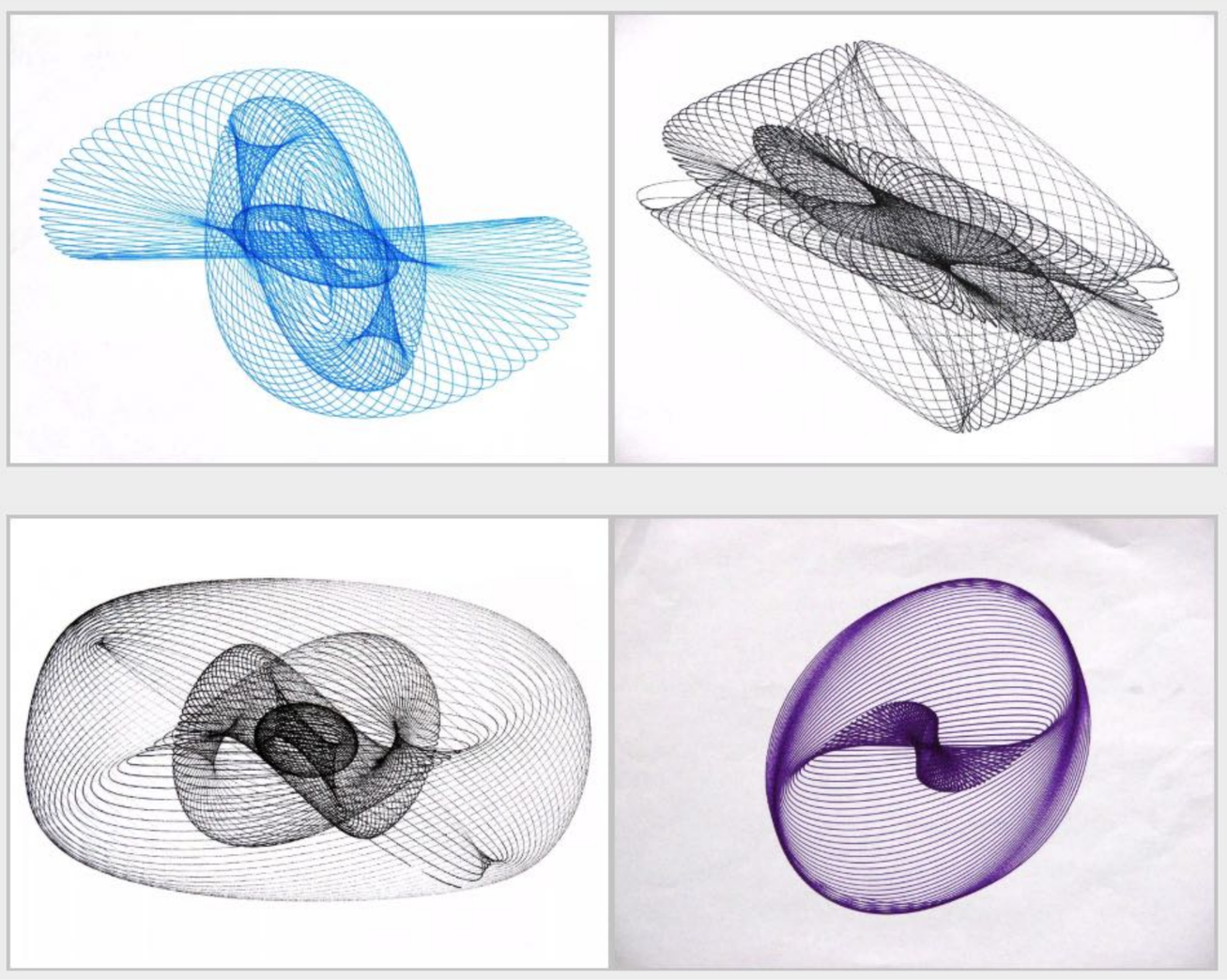
Harmonograph



A harmonograph

3-pendulum harmonograph
by Karl Sims

https://makezine.com/projects/build-swinging-art-table-uniquely-hypnotic-drawings/

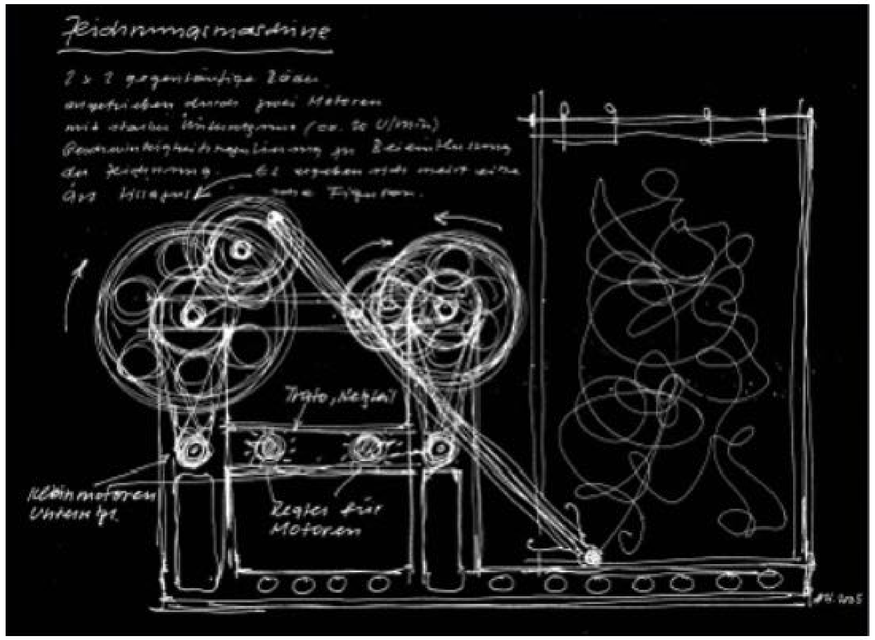


Alfred Hoehn

http://www.alfredhoehn.ch

art machines

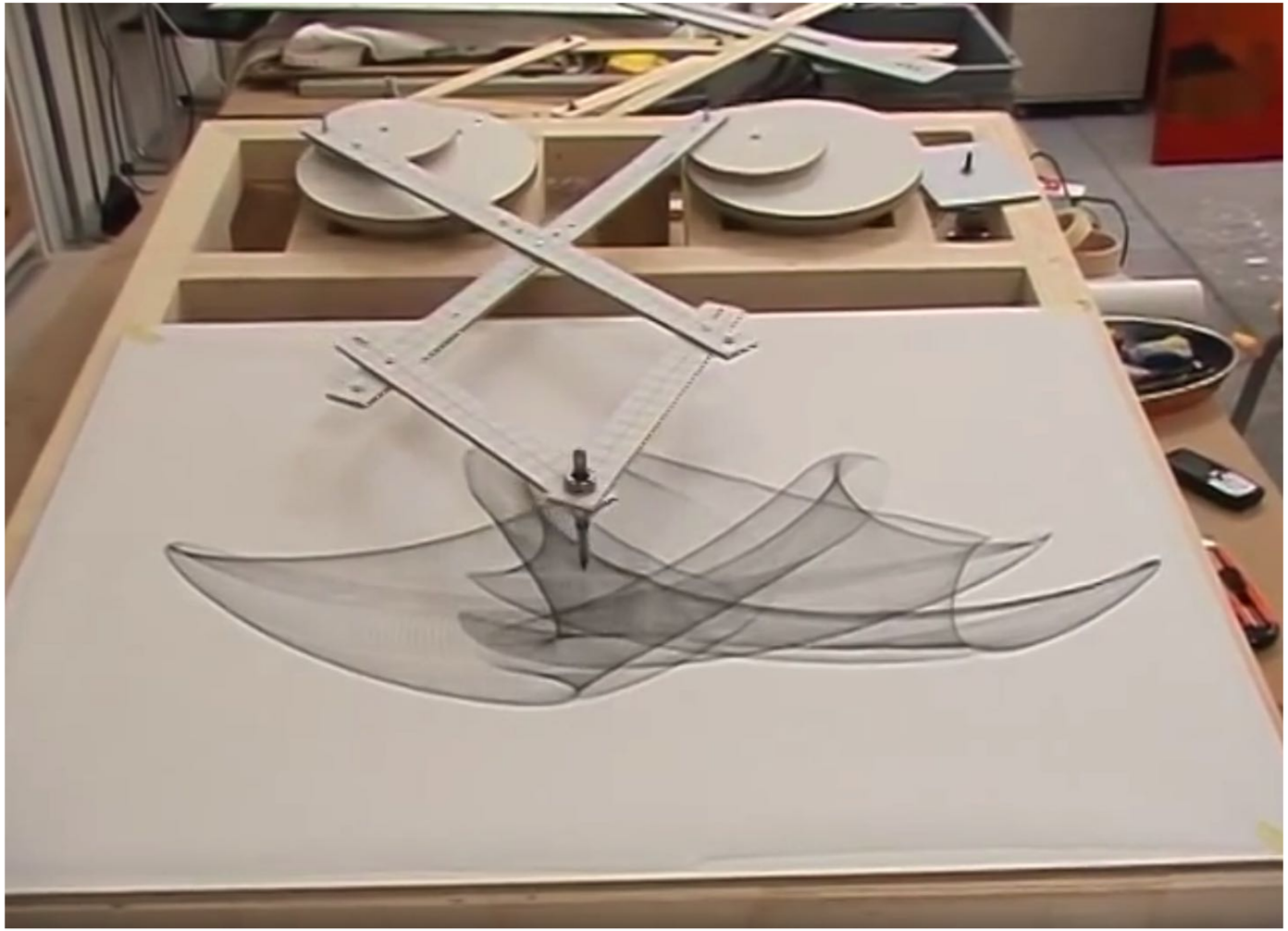
back home



For the construction of the "Machine Maios 1" in 2006, I was inspired for a long time by Jean Tinguely's drawing machine in the Tinguely Museum in Basel. Unlike Tinguely's machine, which operates at high speed and chaotically, the Maios machines are eye-catching figures with mathematical background. This was achieved by a system of counter-rotating wheels, which are connected by a kind of Pläuel and at the end of a pin is mounted. The system is based on the principle of so-called epicycles. These arise when, for example, "circles circle on circles". Anyone watching the planetary orbits will notice that some planets sometimesseem to run backwards, a phenomenon that results from the connection of two points on two nested circles. Klaudius Ptolemy (83 - 161 AD), who worked as a mathematician and astronomer in Alexandria, dealt in detail with the planetary orbits. In order to explain the retrograde nature of the planets he used, he used the so-called epicyclic theory, on whose principle the drawing machine "Maios 1" works. Lately, new and larger machines have been added with interchangeable drawing arms, some of which draw extremely interesting geometric shapes. In "Erlebnisland" of the technical museum in Dresden runs the "Maios 7", which draws the curves in sand.

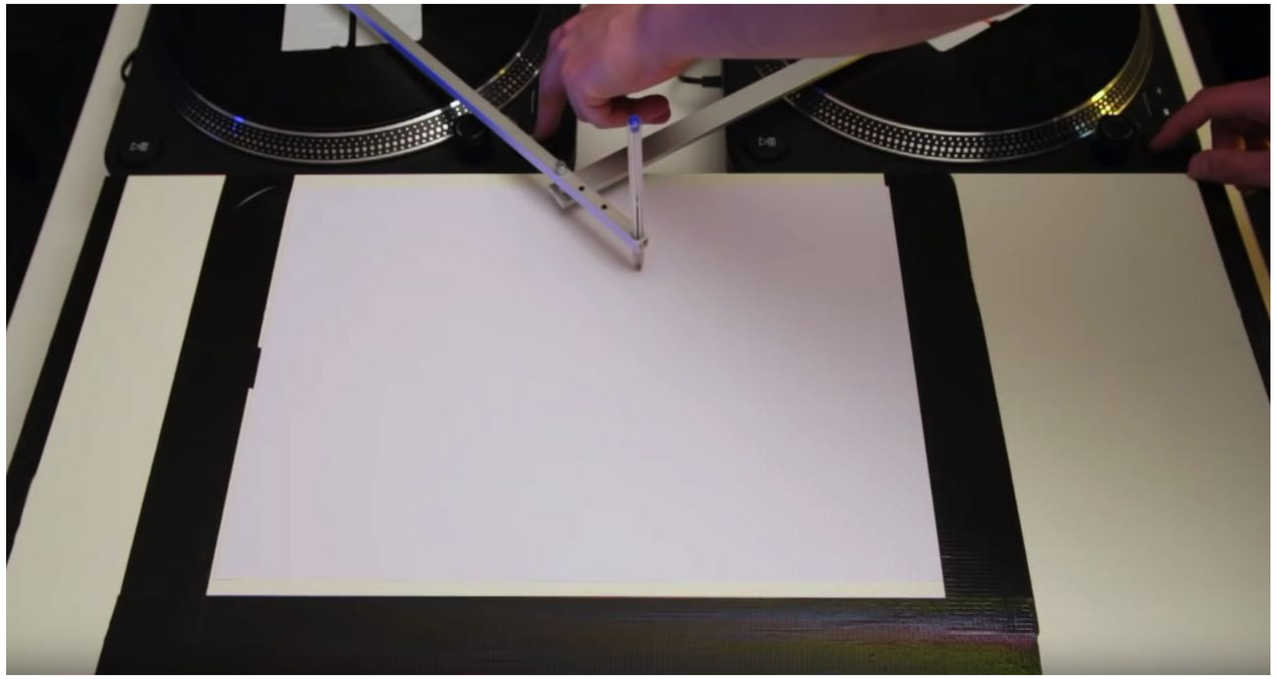
"Pintograph"

and other multi-wheeled drawing machines



https://www.youtube.com/user/alfredhoehn/videos

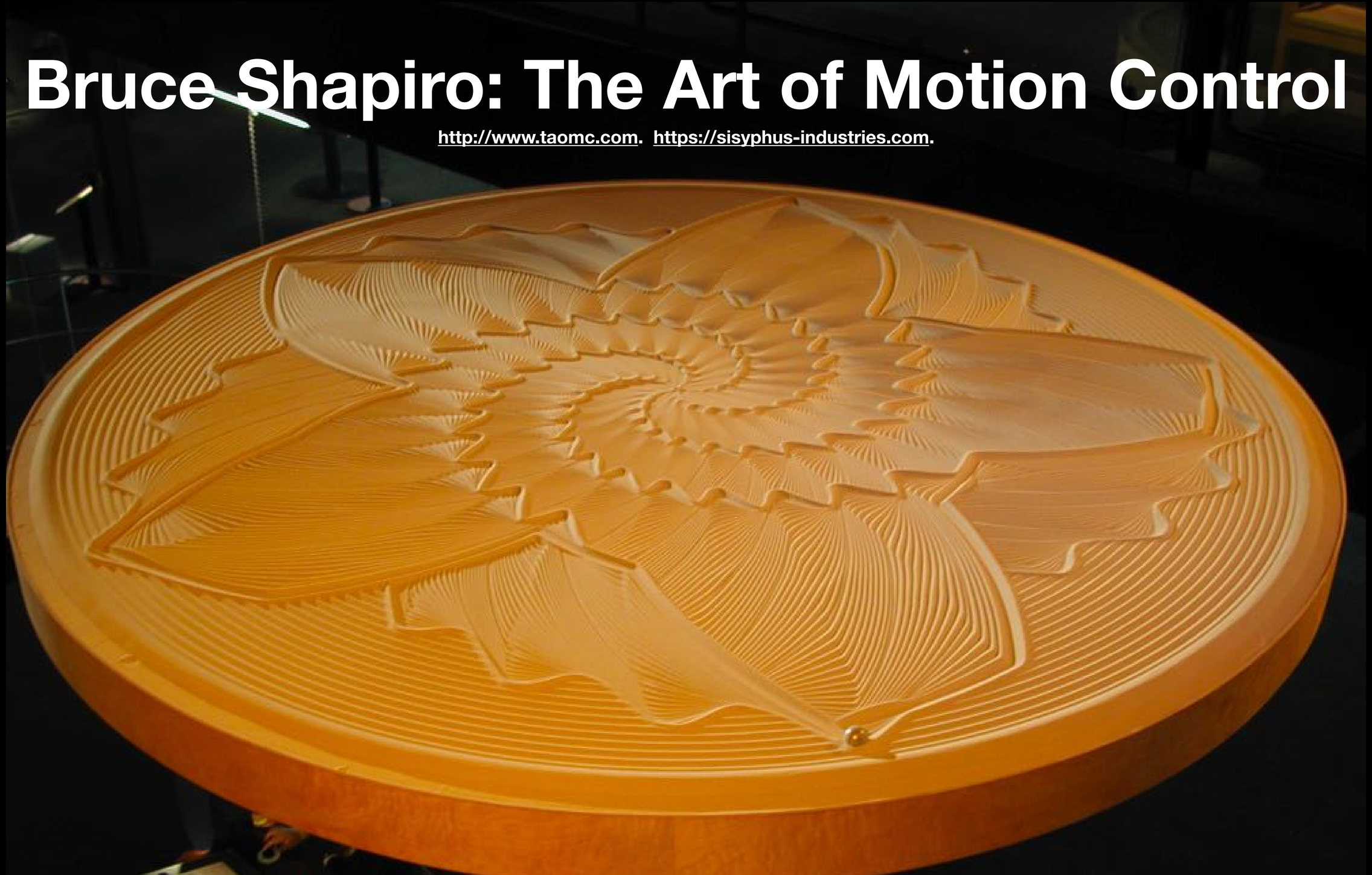
Using phonograph turntables...



https://www.youtube.com/watch?v=A32W7NfM8ws

Bruce Shapiro: The Art of Motion Control

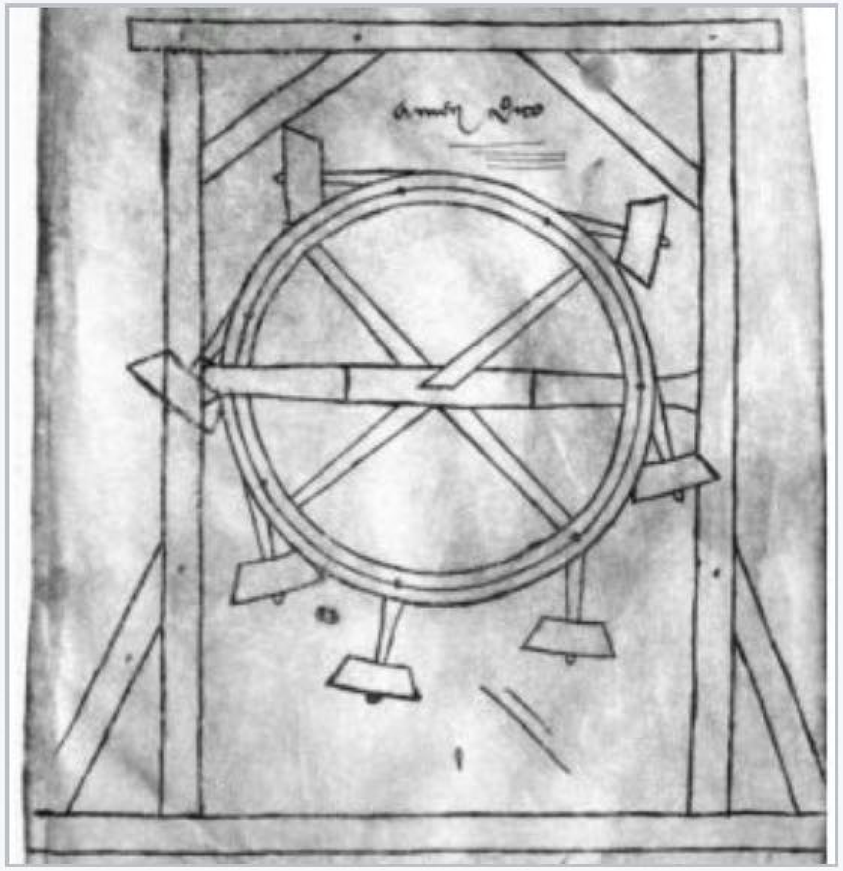
http://www.taomc.com. https://sisyphus-industries.com.



Patenting Silly and Useless Machines?

Villard de Honnecourt

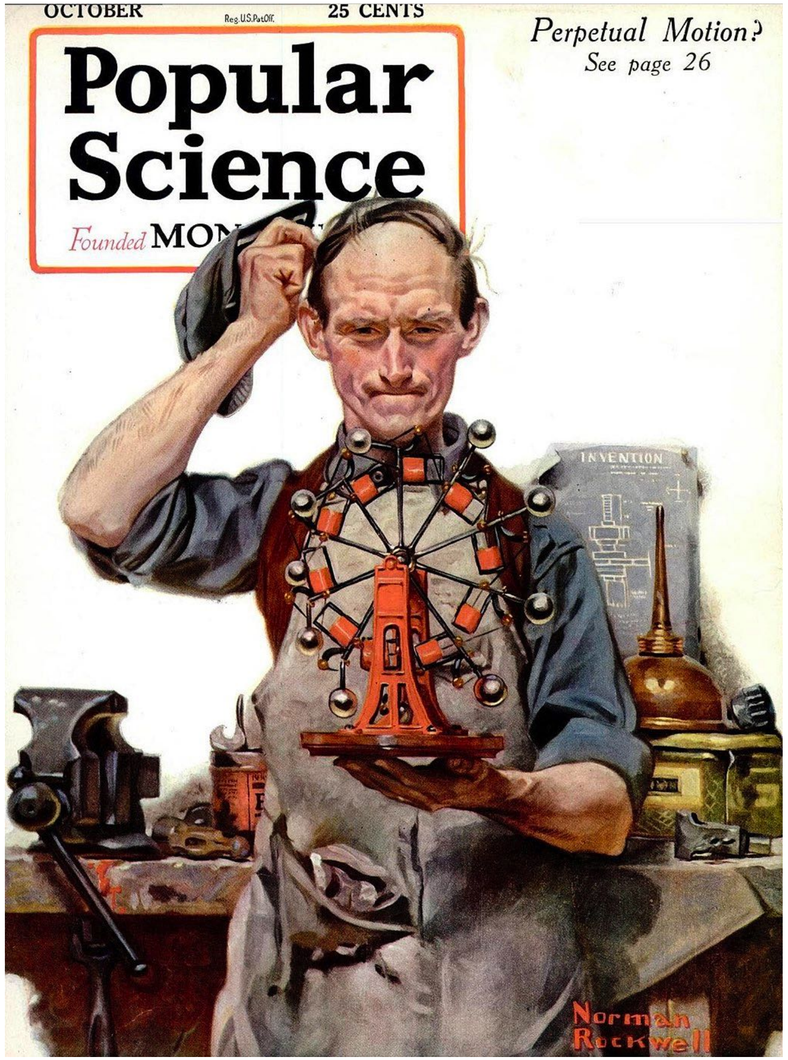
https://en.wikipedia.org/wiki/Villard_de_Honnecourt



Perpetuum Mobile of Villard de Honnecourt (about 1230)

Perpetual Motion Machines

https://en.wikipedia.org/wiki/Perpetual_motion



October 1920 issue of *Popular Science* magazine, on perpetual motion.

Oh ye seekers after perpetual motion, how many vain chimeras have you pursued? Go and take your place with the alchemists.

—Leonardo da Vinci, 1494

Re: Patents: See

https://en.wikipedia.org/wiki/Perpetual_motion#Patents

Are useless machines patentable?

"Minsky tried to get his bosses at IBM to patent the machine but for some reason they didn’t.

At least one company tried to sell them but as far as I can tell not very many. Back then, a machine that would turn itself off was disturbing to most people."

http://frivolousengineering.com/history.htm

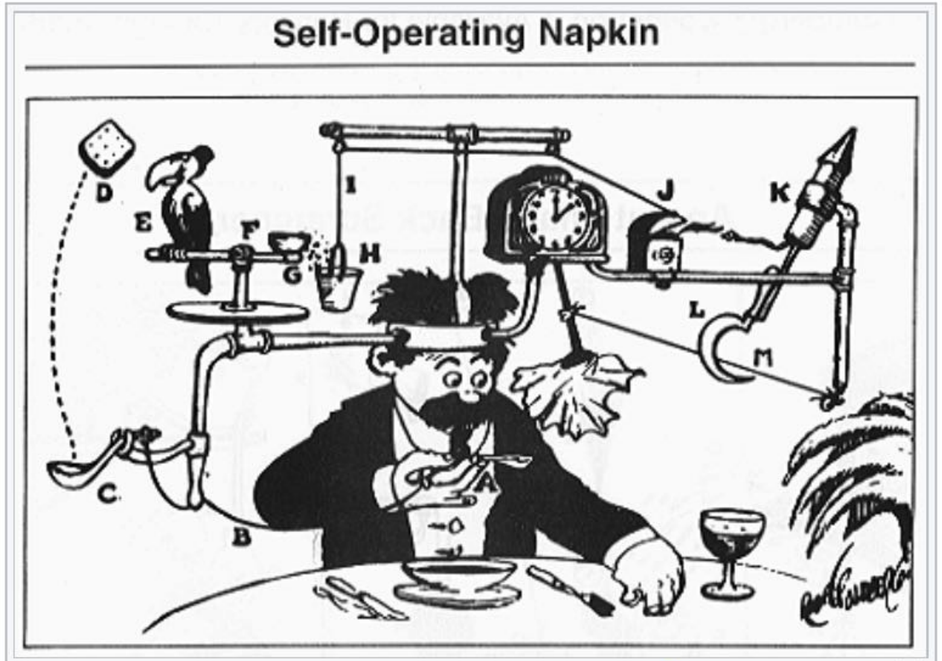
Are useless machines patentable?

- Relevant: **Incredible utility**
  - https://en.wikipedia.org/wiki/Incredible_utility
  - "In United States patent law, **incredible utility** is a concept according to which, in order for an invention to be patentable, it must have some credible useful function. If it does not have a credible useful function despite the assertions of the inventor, then the application for patent can be rejected as having "incredible utility". The invention does not have to work the way the inventor thinks it works, but it must do something useful."
  - See PAT's definition of useless machine.

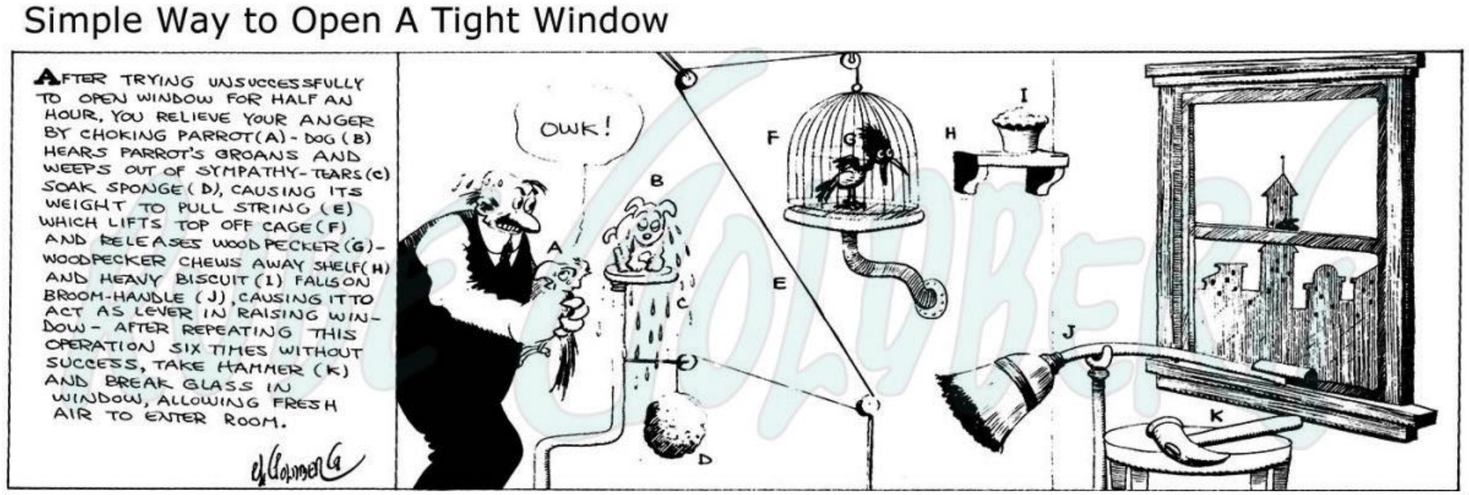
Rube Goldberg machines

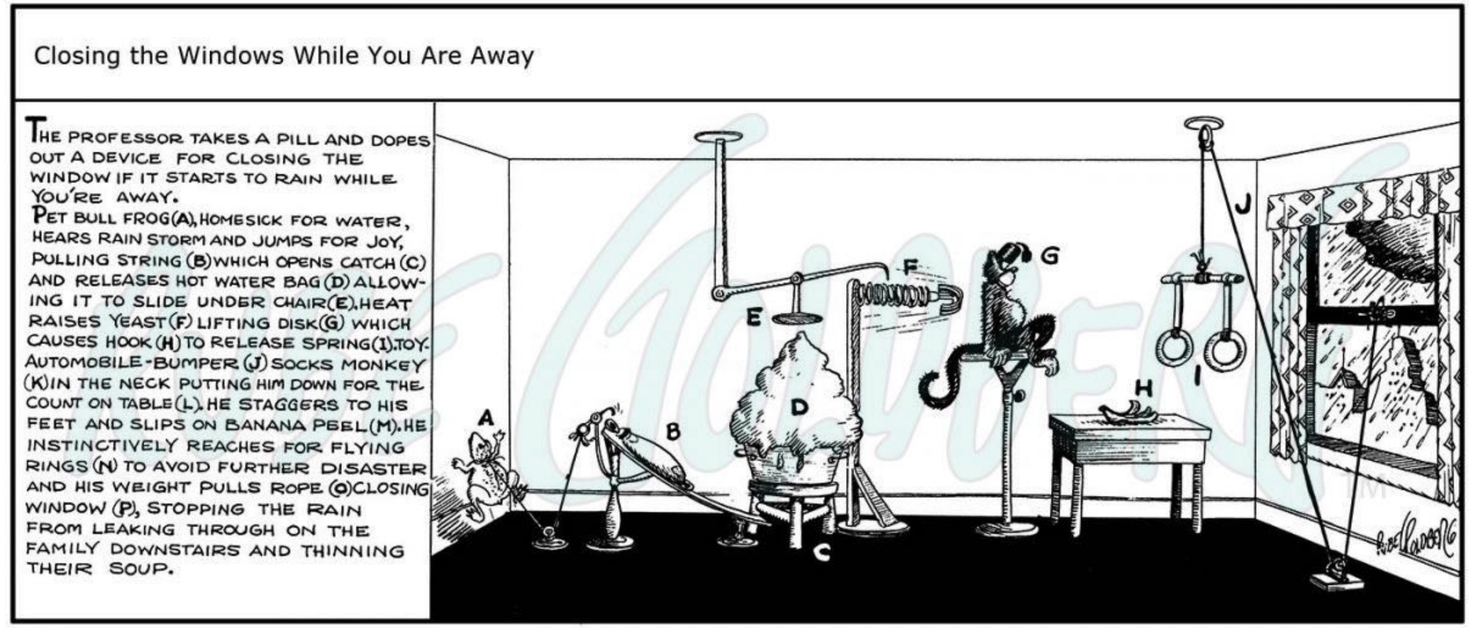
Rube Goldberg machine

https://en.wikipedia.org/wiki/Rube_Goldberg_machine



Professor Butts and the Self-Operating Napkin (1931). Soup spoon (A) is raised to mouth, pulling string (B) and thereby jerking ladle (C), which throws cracker (D) past tucan (E). Tucan jumps after cracker and perch (F) tilts, upsetting seeds (G) into pail (H). Extra weight in pail pulls cord (I), which opens and ignites lighter (J), setting off skyrocket (K), which causes sickle (L) to cut string (M), allowing pendulum with attached napkin to swing back and forth, thereby wiping chin.

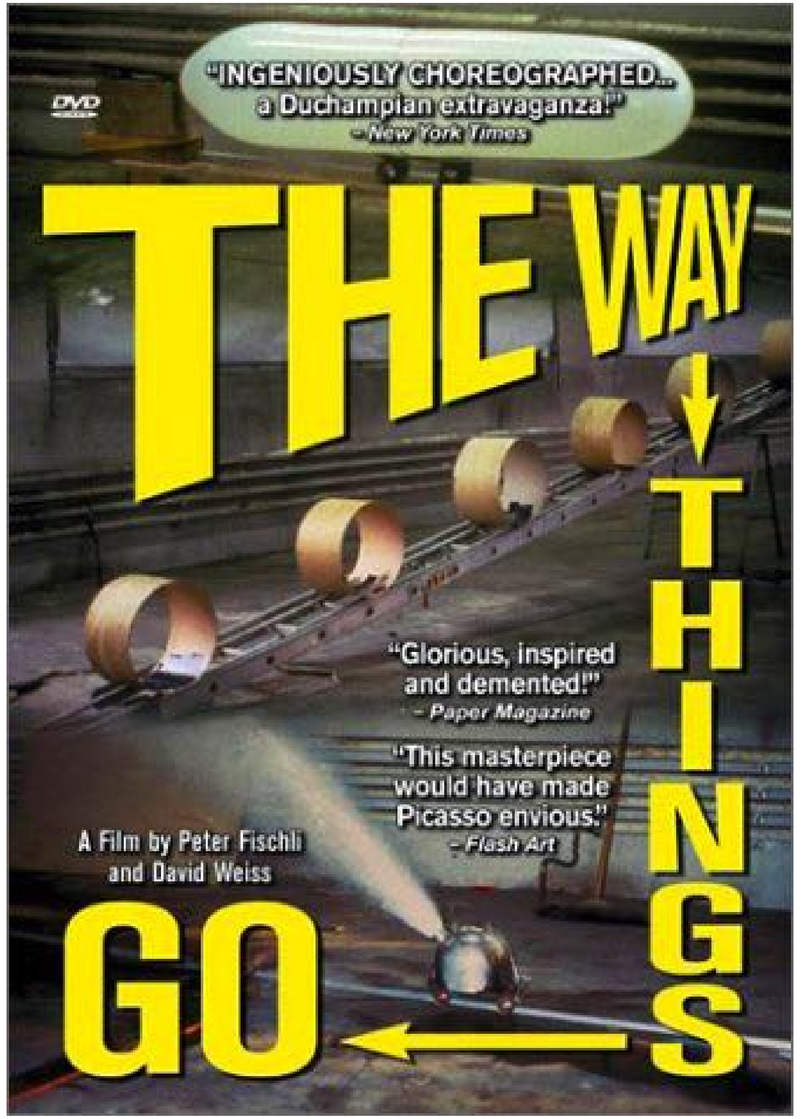




https://www.rubegoldberg.com/image-gallery-licensing

"The Way Things Go"

by Peter Fischli & David Weiss



Honda's "Cog" Commercial

"OK Go" Rube-Goldberg-like video

https://www.ted.com/talks/adam_sadowsky_engineers_a_viral_music_video#t-255396

Marble Machines

Audio-Kinetic Sculptures

George Rhoads

https://en.wikipedia.org/wiki/George_Rhoads
http://georgerhoads.com/

Ball machine sculptures

Wintergaartan's Marble Machine

Fountains

https://en.wikipedia.org/wiki/Fountain

Fountains & Automata

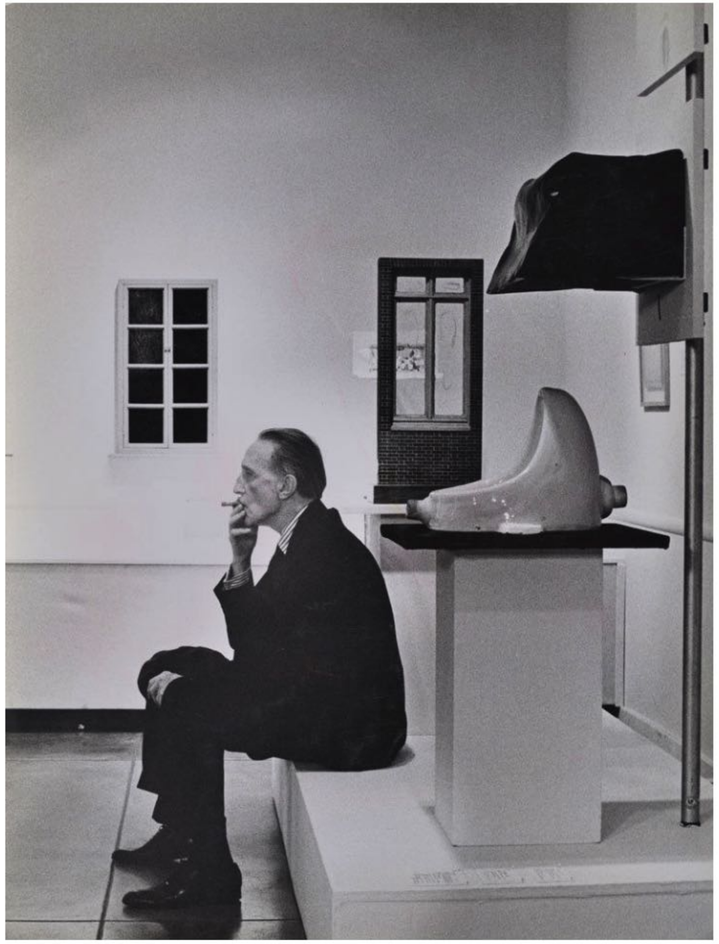
Hellbrunn Palace & Trick Fountains, c. 1615

https://www.salzburg.info/en/sights/top10/hellbrunn-palace-trick-fountains

"Hellbrunn Palace with its unique Trick Fountains and the spacious gardens was built between 1612 and 1615 by Prince archbishop Markus Sittikus. The whole area is a gem of mannerism and presents itself today in the same glory as it did 400 years ago."

https://www.youtube.com/watch?v=G0v-TbJJt58

Duchamp's Fountain



Julian Wasser

Duchamp smoking in front of Fountain, Duchamp Retrospective, Pasadena ...

Robert Berman Gallery

Image of Marcel Duchamp's *Fountain*, 1917, via Wikimedia Commons.

Tinguely's Fountains

https://www.youtube.com/watch?v=N4vK2L8ZUe0

Tinguely, one piece of Carneval Fountain, 1977;
location: in front of Museum Tinguely, Basel

'Tinguely, Jo Siffert Fountain, 1984; scrap metal components

The Isolator

By HUGO GERNSBACK

MEMBER AMERICAN PHYSICAL SOCIETY

The author at work in his private study aided by the Isolator. Outside noises being eliminated, the worker can concentrate with ease upon the subject at hand.

The Unuseless Machines

Chindogu

“One Stroke Brush”

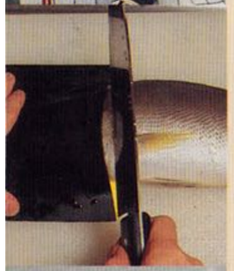
* For instant grooming

Reference:

Kenji Kawakami, **101 Unuseless Japanese Inventions: The Art of *Chindogu***, W. W. Norton & Company, NY, 1995.

“Toilet Roll Hat”

* For mobile comfort



The Ten Tenets of Chindogu

Every Chindogu is an almost useless object, but not every almost useless object is a Chindogu. In order to transcend the realms of the merely almost useless, and join the ranks of the *really* almost useless, certain vital criteria must be met. It is these criteria, a set of ten vital tenets, that define the gentle art and philosophy of Chindogu. Here they are:

1. A Chindogu cannot be for real use

It is fundamental to the spirit of Chindogu that inventions claiming Chindogu status must be, from a practical point of view, (almost) completely useless. If you invent something which turns out to be so handy that you use it all the time, then you have failed to make a Chindogu. Try the Patent Office.

2. A Chindogu must exist

You're not allowed to use a Chindogu, but it must be made. You have to be able to hold it in your hand and think 'I can actually imagine someone using this. Almost.' In order to be useless, it must first be.

3. Inherent in every Chindogu is the spirit of anarchy

Chindogu are man-made objects that have broken free from the chains of usefulness. They represent freedom of thought and action: the freedom to challenge the suffocating historical dominance of conservative utility; the freedom to be (almost) useless.

4. Chindogu are tools for everyday life

Chindogu are a form of nonverbal communication understandable to everyone, everywhere. Specialised or technical inventions, like a three-handled sprocket loosener for drainpipes centred between two under-the-sink cabinet doors (the uselessness of which will only be appreciated by plumbers), do not count.

5. Chindogu are not for sale

Chindogu are not tradable commodities. If you accept money for one you surrender your purity. They must not even be sold as a joke.

6. Humour must not be the sole reason for creating a Chindogu

The creation of Chindogu is fundamentally a problem-solving activity. Humour is simply the by-product of finding an elaborate or unconventional solution to a problem that may not have been that pressing to begin with.

7. Chindogu is not propaganda

Chindogu are innocent. They are made to be used, even though they cannot be used. They should not be created as a perverse or ironic comment on the sorry state of mankind.

8. Chindogu are never taboo

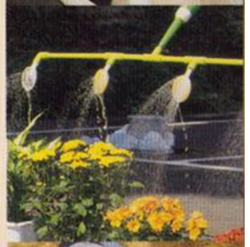
The International Chindogu Society has established certain standards of social decency. Cheap sexual innuendo, humour of a vulgar nature, and sick or cruel jokes that debase the sanctity of living things are not allowed.

9. Chindogu cannot be patented

Chindogu are offerings to the rest of the world – they are not therefore ideas to be copyrighted, patented, collected and owned. As they say in Spain, *mi Chindogu es tu Chindogu.*

10. Chindogu are without prejudice

Chindogu must never favour one race or religion over another. Young and old, male and female, rich and poor – all should have a free and equal chance to enjoy each and every Chindogu.



Final Thoughts