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Innovators



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Table of Contents

Process of time	3
Challenges	4
Stem process	5
Steps	7
Designs	9
Fun Foto	13
Materials	14
Reflection	15
Bibliography	16

Process of Time

We started in December. Emma had done this before and wanted to do this again this year.

We began with the brainstorming process. One of the first ideas was a phone but we decided we wanted a hospital. Then we thought more about the human transfer and decided the phone concept would be more suitable.

Challenges

Cooperating, communicating, and deciding on ideas where everyone would be happy has been a challenge for us. Because we liked different things and we did a lot of things just on the way as we went. In the end we did a lot of teamwork and it all worked out.

STEM Process

ASK - Using the design process, we asked how to show the human to tech transfer theme into our machine.

Design - The first design we drew on the whiteboard was a hospital design. But our second design we changed it to be a phone timeline. And we decided our final design would be a phone timeline.

Build - After we designed the hospital we started building the hospital, but since we changed our final design to be a phone timeline we swapped the starting and ending places.

Test and Improved - One of the things we had to improve was Leo's chemical reaction and Chaley' s elevator. We changed Leo's chemical reaction to a more simple water step. And for Charley' s elevator we had to test a bunch of different magnets.

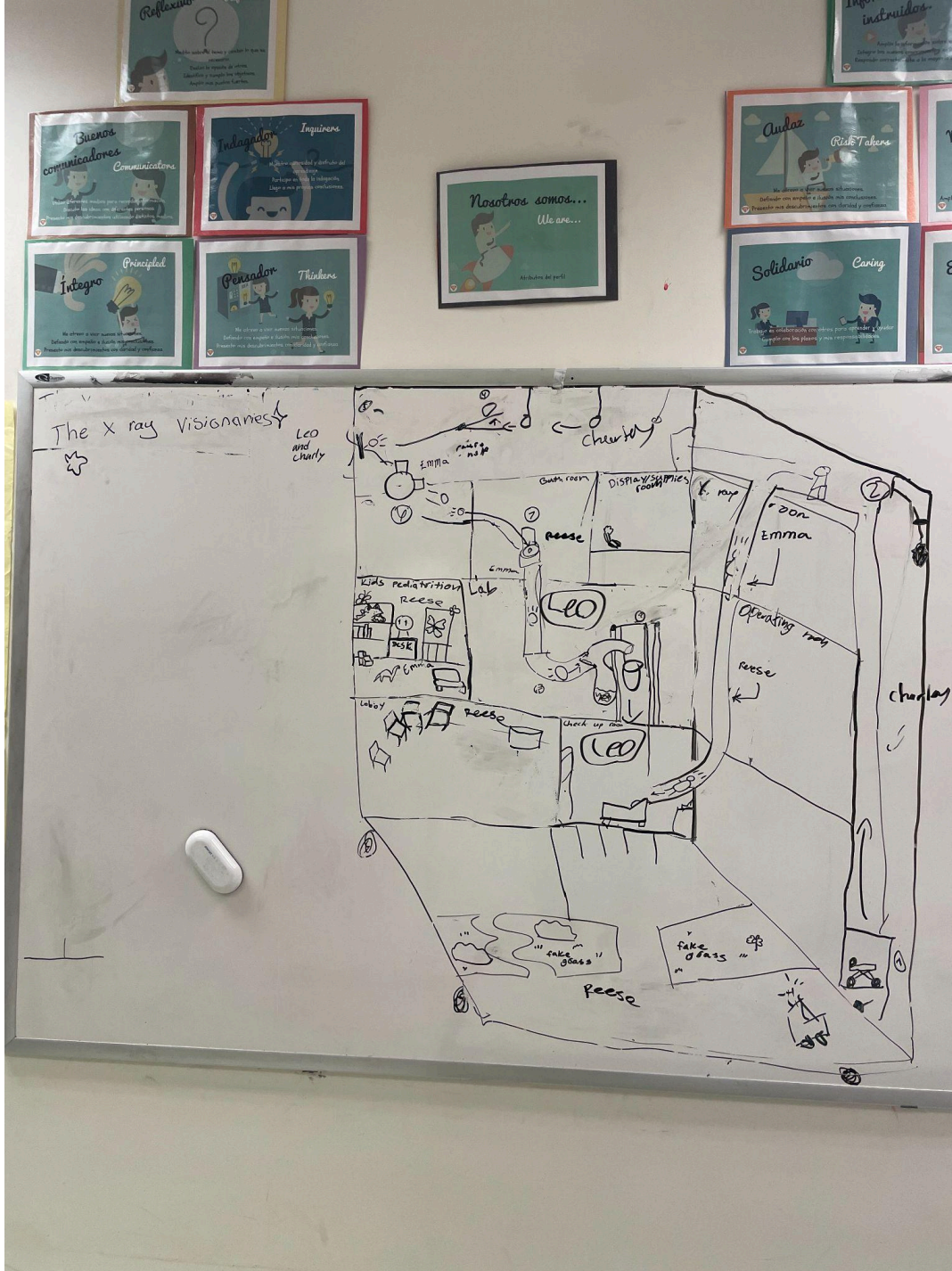
STEPS

1. The project begins with a marble rolling down an inclined plane
2. The marble drops to another inclined plane and switches directions
3. It goes off a ledge and down a slope
4. The marble falls into a cup, triggering a lever which releases a hotwheels car
5. That hotwheels car rolls down its track
6. The car hits a lever which releases a different car
7. That car rolls down its track
8. The other car collides with a cup of water pouring it into a funnel
9. The water pours into a cup which weighs down a pulley, triggering a marble into an inclined tube

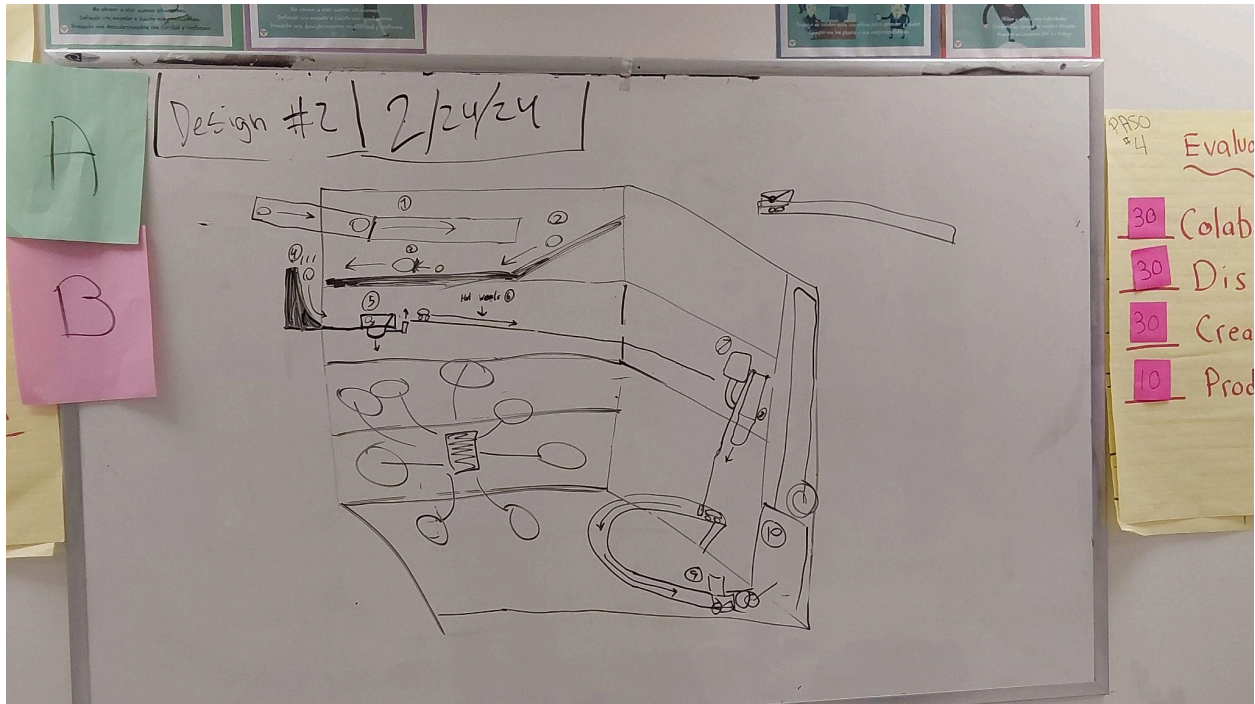
10. The marble rolls down a tube and onto a slope
11. The marble rolls down the slope and hits a domino chain
12. The domino chain ends and the magnet connected to a domino removes a weight on the elevator and it rises.

DESIGNS

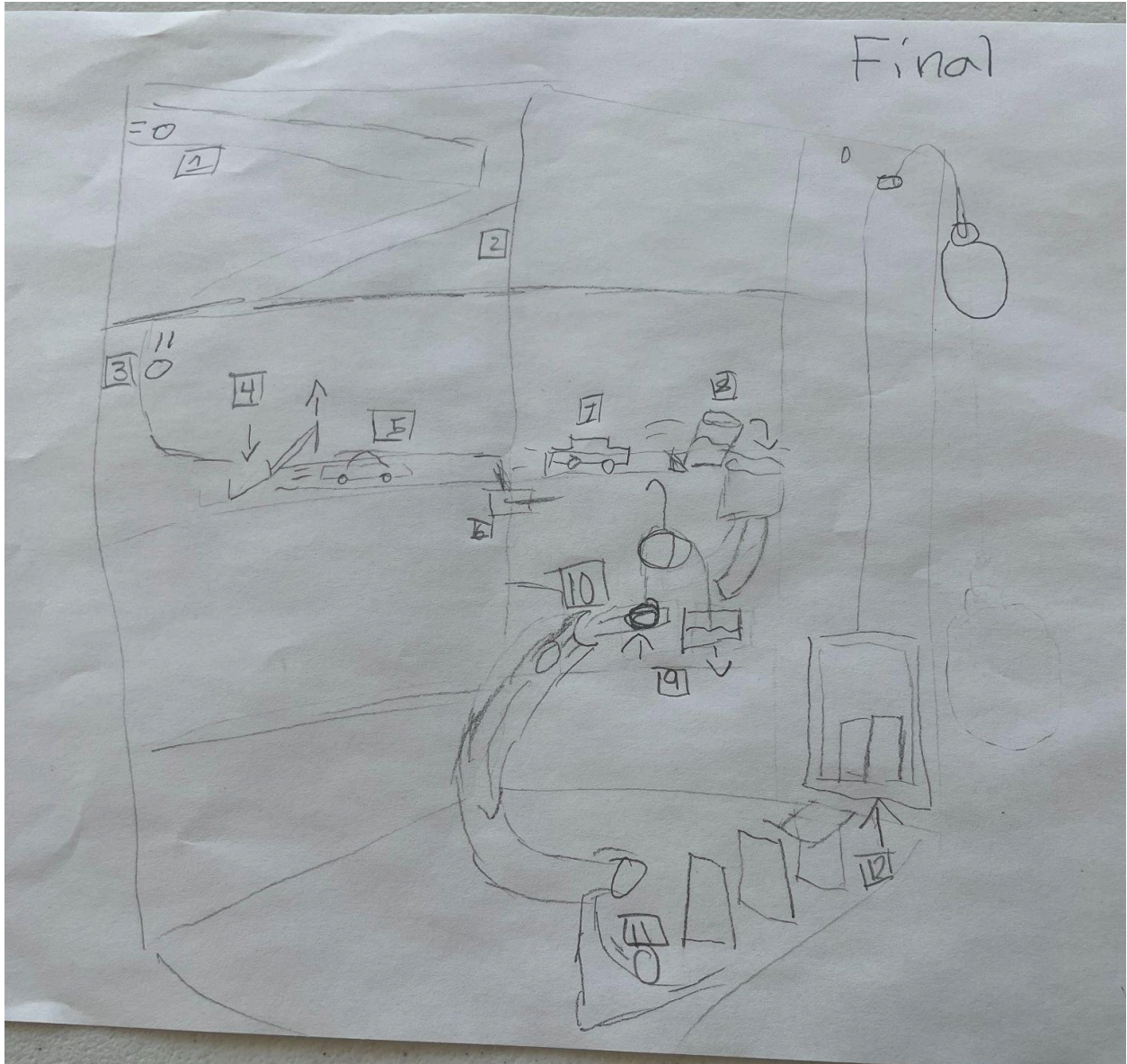
Design # 1



Design 2



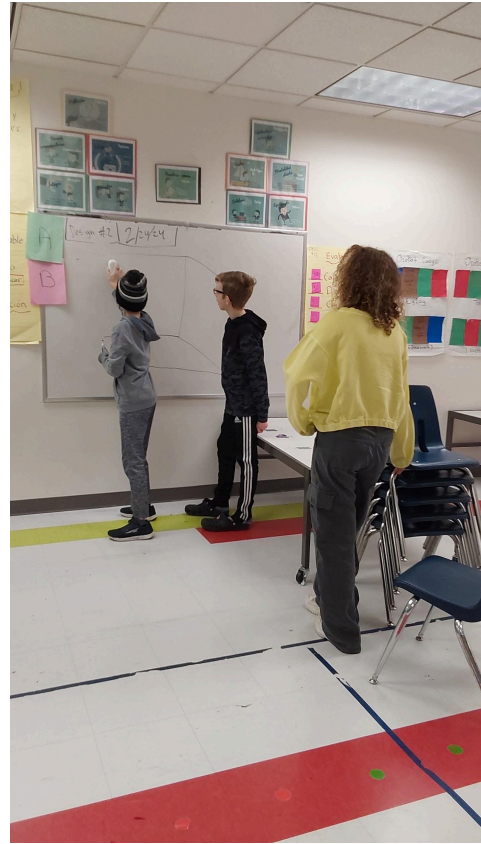
Final Design



Actual Machine



Fun Fotos



Materials

MATERIAL	COST/DONATION	RECYCLED?
1. Plywood	1. From Reese' s	1. No
2. MArbles	Dad	2. No
3. Paint	2. Found in school	3. No
4. Cardboard	3. Donated from	4. Yes
5. Black tube	Reese	5. Maybe
6. BAse	4. From school	6. yes
	5. From school	
	6. From last years rube	

Reflection

Leo - I think it's been hard figuring out the idea because like half way through the girls wanted to change the whole idea and it was very annoying but we got through it and I'm happy that we are done with the step. Another thing that I thought was hard was getting the girls to concentrate because everything had to be perfect and they would only think about how the project looked. I think that relatively nothing was easy but if I had to pick one thing that was easier was the first one to three steps. I learned that it can be hard to work with a group but it can also be really fun.

Charley - This was a very meaningful and fun project for me. In these months of working on this project I learned a lot, group work, engineering, problem solving, collaboration and more. Also I learned about energy transfer and how react objects react to one another. It was very difficult at times to understand each other and our individual ideas. Also it was sometimes difficult to choose which plan to use in our project, because we all had great ideas. We struggled at the beginning and we got super behind, but as a team we worked hard and accomplished our goal.

Emma - For me this was a very entertaining and an interesting project to do. I really enjoyed myself in this project and i learned a lot of things like teamwork, collaborating and of course engineering. The easiest things in my opinion were the decorations because I think that they were fun although some were difficult because they were very intricate such as the brick phone and the flip phone but overall the decor was simple. For me the hardest thing to do was agreeing on what to do especially for reese and I because we both wanted different things but in the end we problem solved and it all turned out great. Overall this experience has been awesome for me and i love our group because we all have our strengths. I really enjoyed myself and we worked really well and our project turned out great.

Reese - Rube has been a really fun experience for me, even though we started a bit late I think we have done a good job. There have been a few hard times like, when we completely changed our theme from hospital to a phone timeline. The only reason we decided to change to phones is cause we didn't feel like a hospital fit the theme. This project has helped me understand how working in a group can be so important, it has also helped me figure out how pulleys work (no i did not know how they worked before this). I don't always enjoy working in groups or necessarily with perfectionists, but even though Emma and Leo like everything to look good and work. But I've found ways to work peacefully with them. In conclusion i have leared a lot from this project and overall have enjoyed myself a lot.

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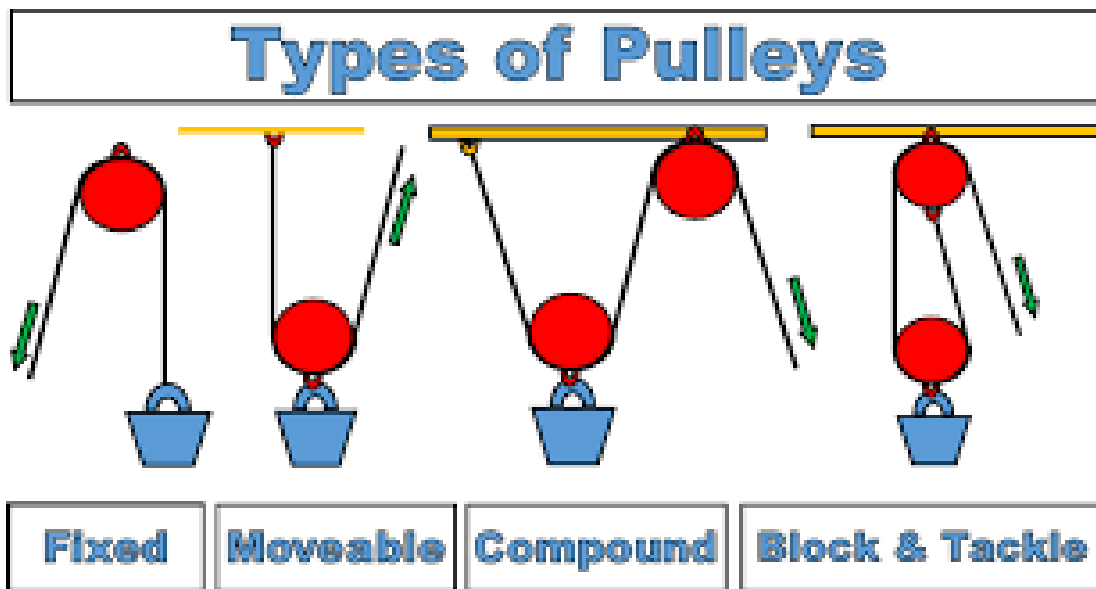
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"Pulleys - Simple Machines for Kids." *Inventors of Tomorrow*, Inventors of Tomorrow, 26 Sept. 2016, inventorsof tomorrow.com/2016/09/26/pulleys-2/.

A pulley is one of the simple machines. A basic pulley consists of a load, weight (or force, human, robot ... etc) wheel and a rope. There are many variations of pulley, the more wheels there are in the system, the easier it is to move the load, but you have to pull more distance. In this project we used a fixed pulley. It has a big weight on one end and an equal removable weight as the other load. Once the big removable weight has been removed, the opposite end, which is considerably heavier, drops, raising the other end which is acting as the elevator

Source: Previous knowledge, school project and [Inventors of tomorrow](#)

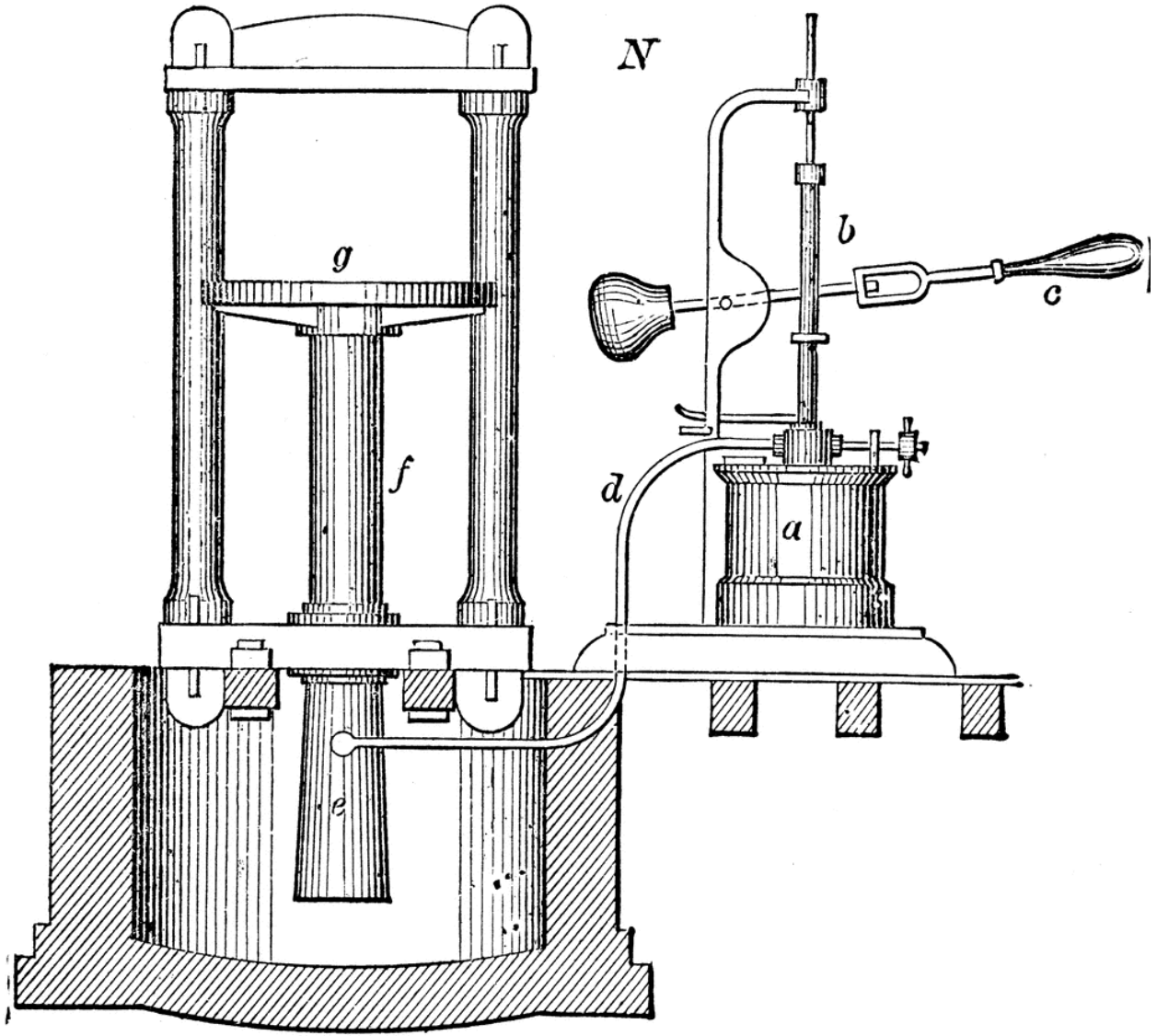


3/28/24 Leo. Info about Hydraulics

Hydraulics let the water flow through a tube and that pushes all the air out. Some hydraulics use gases instead of water but most hydraulics use water. Some hydraulics also power fans, gas turbines and pneumatic control systems. Joseph Bramah invented hydraulics in 1795, he made a hydraulic press, and that's how hydraulics were invented.

Joseph's hydraulic press

Resources, Britannica for the informacion and Google for the photos



Inclined planes

Simple machine consisting of a sloping surface, used for raising heavy bodies. The force required to move an object up the incline is less than the weight being raised, discounting friction. The steeper the slope, or incline, the more nearly the required force approaches the actual weight. Expressed mathematically, the force F required to move a block D up an inclined plane without friction is equal to its weight W times the sine of the angle the inclined plane makes with the horizontal. Referring to the Figure, $F = W \sin \theta$.

The principle of the inclined plane is used widely—for example, in screws and bolts, where a small force acting along a slope can produce a much larger force.