

My First Clock

Thank you for purchasing “My First Clock”.

Before assembling “My First Clock”, please read this manual thoroughly, carefully and retain it for future reference. You can then easily assemble, configure and play “My First Clock” properly.

Introduction



My First Clock is an exciting new type of educational toy for all ages 6 yrs+. In the year 1350 the Italian scientist, E.Danti made the first mechanical clock. Based on the original design of E.Danti you can recreate this famous invention and make **My First Clock** yourself!

My First Clock ,consists of **33** pieces of different kinds of parts and operates mechanically using spring and gears, will keep good time with proper adjustments.

At the same time, you will become acquainted with some fundamental principles of physics.

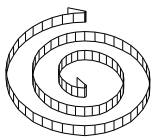
My First Clock will help you to understand the mechanics of the spring, pendulum and gears.

Surprise your family with a real working mechanical clock. Tell your teachers and classmates what you have learned. **My First Clock** is truly more than just a toy.

MORE THAN JUST A TOY!

Learn how the clock works. What do the gears do? Why is it necessary to have a pendulum?

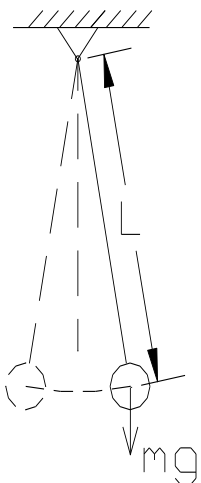
The Spring



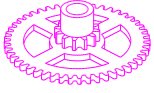
The spring supplies the energy that makes the clock run. When the spring is unwound up it will automatically want to release its energy and return to its unwound position. When it unwinds, it turns the Spring case (The red gear with the white cover) which in turn puts force on the next gear. If there were no brake or regulator the spring would unwind rapidly.

The Pendulum

The pendulum acts as the regulator that controls the speed of the clock and keeps it constant. The pendulum fork moves in the same direction and speed as the pendulum .The spacing of the fork assures the Escape wheel No. 17 moves at a constant speed. It also acts as a brake against the force exerted by the spring. The speed of the Escape wheel No. 17 is regulated by the length of the pendulum. The longer the pendulum shaft, the slower will be the Escape wheel No. 17; The shorter the pendulum shaft, the faster will be the Escape wheel No. 17. If the clock runs too fast, make the pendulum shaft longer. If the clock runs too slowly, make the pendulum shaft shorter.



The Gears



The Gear Nos. 16, 15, 14 (Red, Yellow and Blue gears) acts as transform one form energy into another. In this case they transform the rapid speed of the Escape wheel No. 17 into a slower so that the Spring Case will make one complete rotation every hour.

The Escape Wheel No. 17 slows the Gear No. 16 (Red Gear); The Gear No. 16 slows the Gear No. 15; Gear No. 15 slows the Gear No. 14 still further. The Gear No. 14 turns at just the right speed to make the Spring Case complete one full rotation every hour.

The Spring Case turns the Gear No. 24 (Black Gear) exactly one full rotation every hour. The Gear No. 24 ensures that the Minute Gear makes one complete rotation every hour carrying the Minute Hand with it. The Minute Gear slows the Gear No. 27 (Green Gear) down so that it turns the Ring Gear every hour. Every 15 minutes the Ring Gear releases the hammer and the bell rings. So that the Bell will ring on the quarter hour, you must pay attention to the position of the hands of the clock and the Ring Gear when you assemble the clock. You must position the hands of the clock at the 12:00. Then place the Ring Gear so that it just release the hammer. The Gear No. 27 also transforms the speed of the Gear No. 28 (Pink Gear) linked with hour hand by slowing it down to a complete rotation every 12 hours

Interesting facts

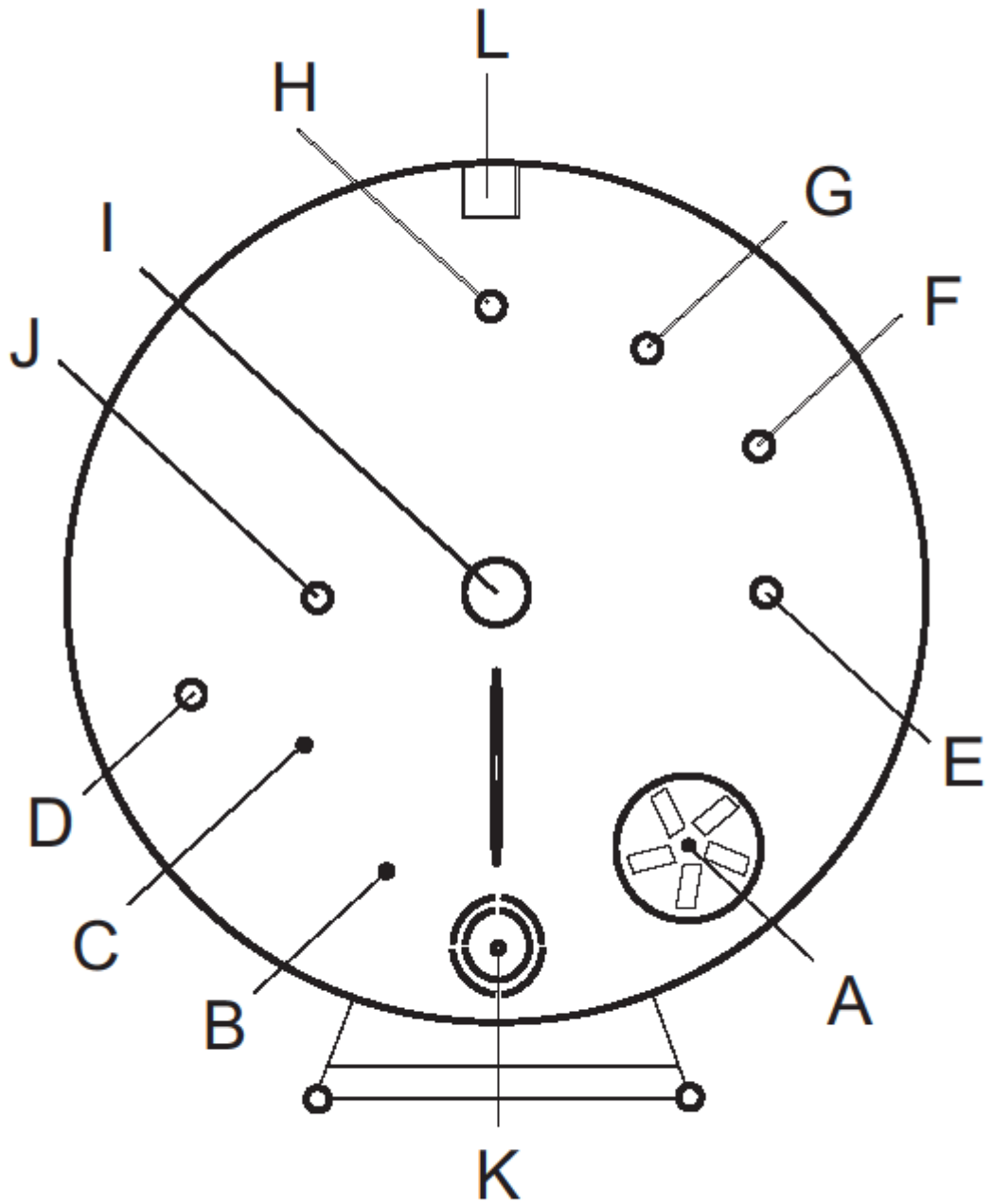
The Escape Wheel No. 17 makes a full rotation every 34 swings of the pendulum. Every hour the Escape Wheel No. 17 makes 148.59588 rotations. This means that the pendulum make 5052.26 swings every hour or 0.71255 second for every swing. Therefore the periodic motion of pendulum should keep period of every swing $T = 0.71255$ second if the clock runs correctly.

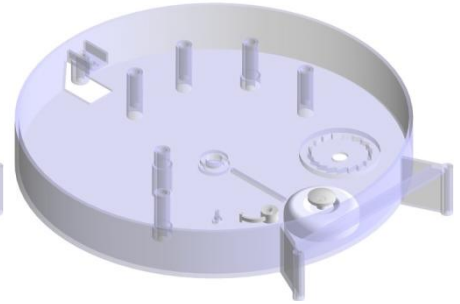
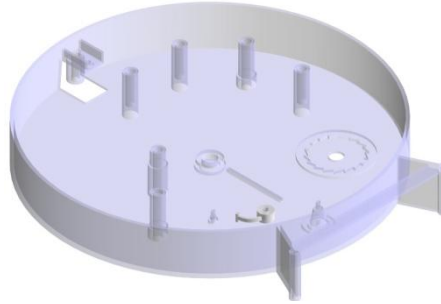
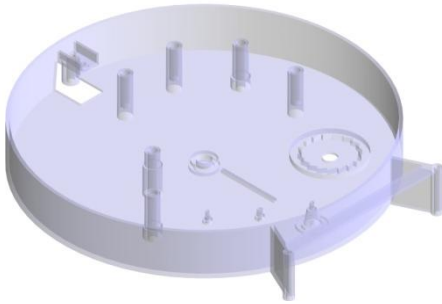
Because any interference with the pendulum will affect the proper running of the clock, it's necessary to keep the clock of a level surface, Do not place the clock in a strong draft or breeze, do not bump or knock the pendulum hanger out of the pendulum pole.

Years ago, before electric and digital clocks; pendulum clocks were enclosed in tall glass case. Every morning and evening they were opened and someone, usually grandfather, would wind the clock spring; hence, they were called grandfather clocks.

Finally, we hope that **My First Clock**, a truly ideal multi-purpose educational toy, can stimulate your curiosity and desire to learn, explore, improve your alertness and intelligence, and also provide good training for your mind and hands.

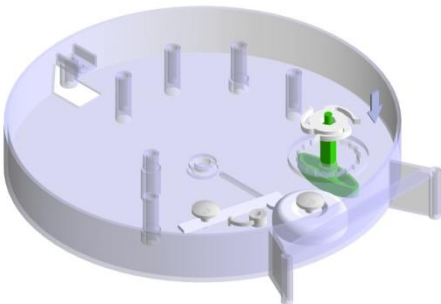
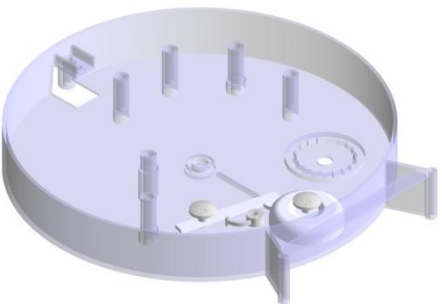
Rear Plate Structure





1. Place the **Hammer Spring** on the **stand B** of the rear plate

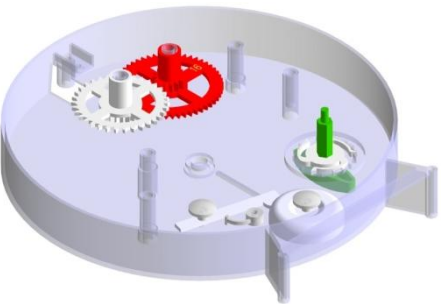
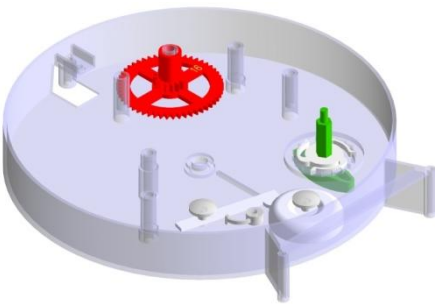
2. Place the **Bell** with the hollow side downwards on the **section K** of the rear plate
Attach the **Bell** with the **Bell Button**



3. Place the **Hammer** on the **stand C** of the rear plate, that the rounded end of the **Hammer** is facing the **Hammer Spring**
Attach the **Hammer** with the **Hammer Button**

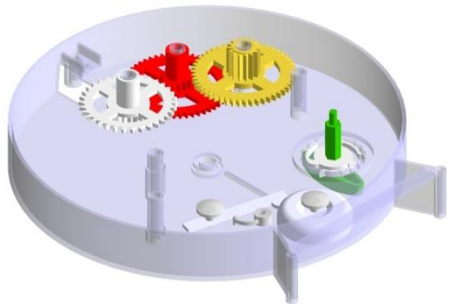
4. Insert the **Key** from below into the **section A** of the rear plate

5. Place the **Pawl** with the plain side upwards on the **section A** of the rear plate and insert the **Key** into the **Pawl**

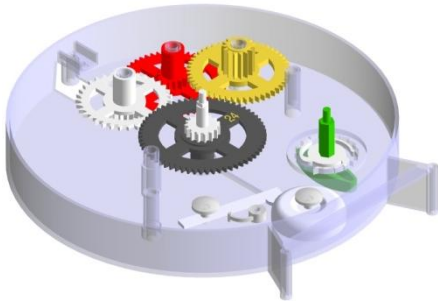


6. Place the **Gear No. 16** (red) with the big gearwheel side downwards on the **stand G** of the rear plate

7. Place the **Escape Wheel No. 17** (white) with the small gearwheel side downwards on the **stand H** of the rear plate

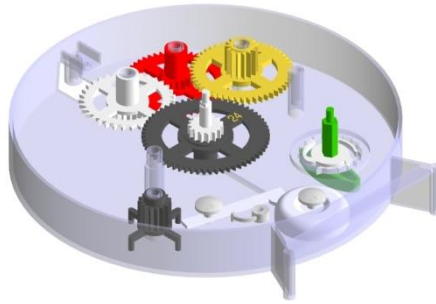


8. Place the **Gear No. 15** (yellow) with the big gearwheel side downwards on the **stand F** of the rear plate

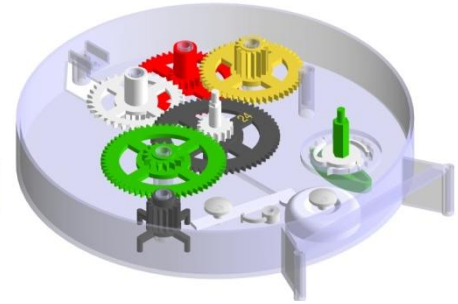


9. Insert the **Minute Gear** with the big end into the **Gear No. 24** (black). The labeled side of the black gear points to the **Minute Gear**

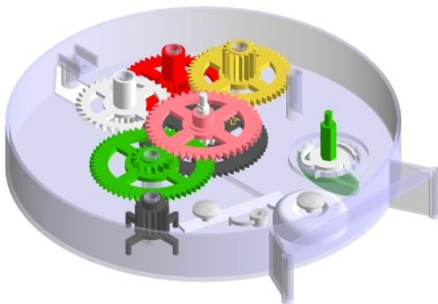
Insert the big end of the **Minute Gear** into the **Friction Plate**, that the hollow side of the **Friction Plate** finishes on the **Gear No. 24** and insert the big end of the **Minute Gear** in the **section I** of the rear plate



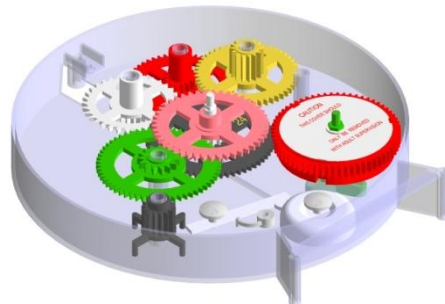
10. Place the **Ring Gear** with the gearwheel side upwards on the **stand D** of the rear plate



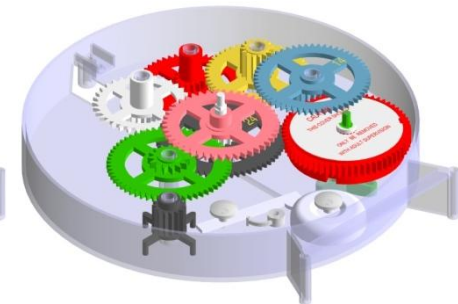
11. Place the **Gear No. 27** (green) with the big gearwheel side downwards on the **stand J** of the rear plate



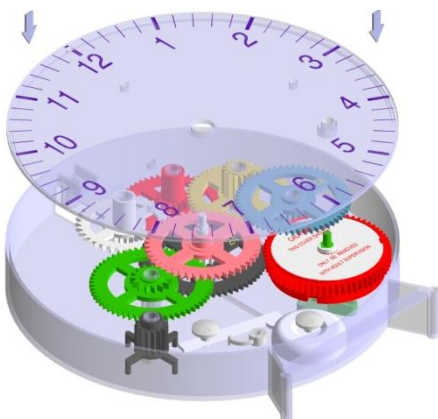
12. Place the **Gear No. 28** (pink) with the labeled side downwards on the small end of the **Minute Gear**



13. Place the **Spring Case** with the labeled side upwards on the **Pawl** and insert the **Key** into the **Spring Case**



14. Place the **Gear No. 14** (blue) with the big gearwheel side upwards on the **stand E** of the rear plate



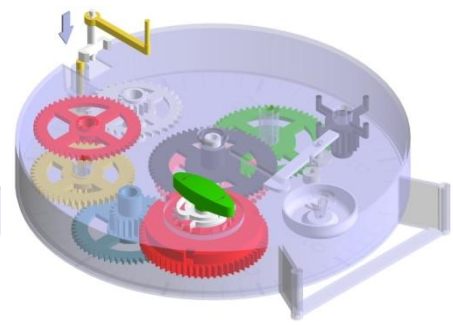
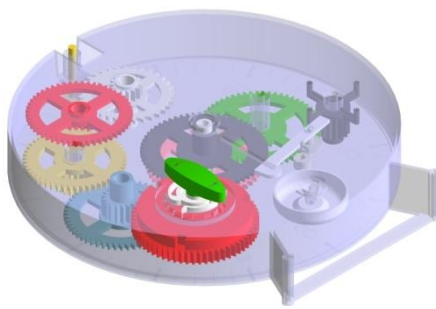
15. Apply the **Dial Plate** on top



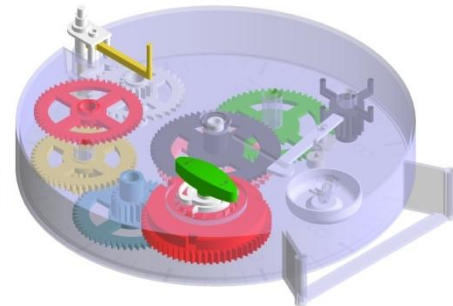
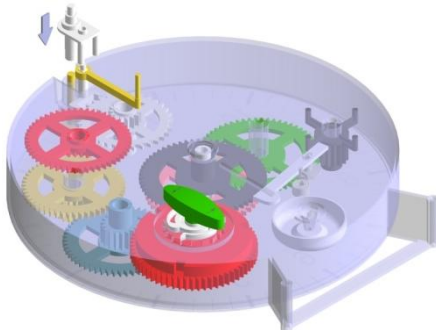
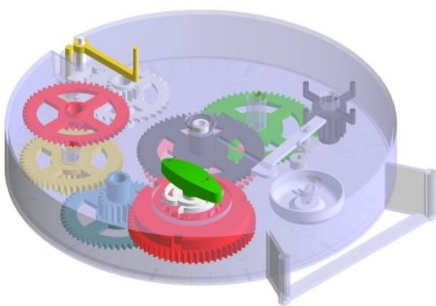
16. Insert the **Supporter Pin** into the hole of the **Dial Plate** and into the **Fork Supporter** of the **Pendulum Mount** the **Key** with the **Key Button**



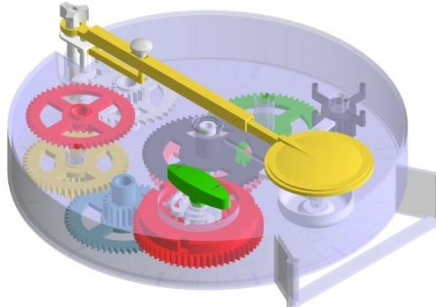
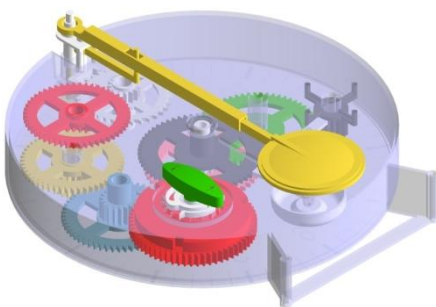
17. At first, place the **Hour Hand** on the middle of the **Dial Plate** and then place the **Minute Hand** on the middle of the **Dial Plate**. The plain side of the hands should point upwards
Attach the hands with the **Button for Hands**



18. Connect the anchor with the pendulum hanger and set the anchor on the anchor-wheel



19. Insert the anchor-bearing on the pendulum bolt and the pendulum hanger.



20. Connect pendulum and pendulum top and place it on the anchor bearing and the pendulum hanger

21. Attach the pendulum to the lock button of the pendulum and the lock button of the pendulum hanger

Parts and components



Gear Nr. 14



Gear Nr. 15



Gear Nr. 16



Gear Nr. 17



Gear Nr. 24



Gear Nr. 27



Gear Nr. 28



Spring Case



Ring Gear



Minute Gear



Pawl



Hammer Spring



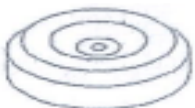
Hammer Button



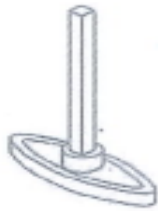
Hammer



Bell Button



Bell



Key



Minute Hand



Hour Hand



Button for Hands



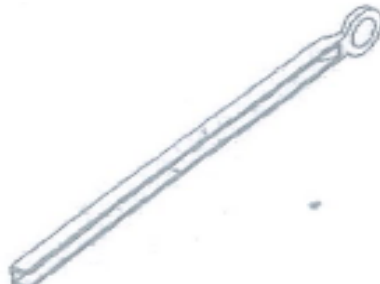
Pendulum Button



Pendulum Bolt



Pendulum Hanger



Pendulum Top



Pendulum



Key Button



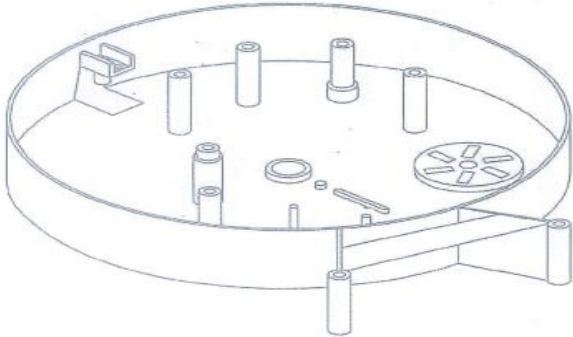
Anchor-Bearing



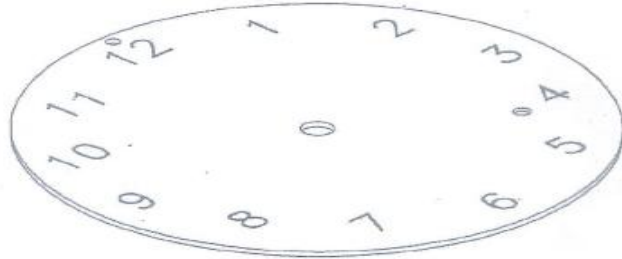
Anchor



Pendulum Button



Back Plate



Dial Plate

Caution :

When you wind the Spring of the clock and find the clock does not run or does not run properly after assembling by yourself, do not worry. Check every step in details and pay more attention to:

- 1) It is necessary to keep the clock on a level surface. Any interference with the pendulum will affect or even stop the proper running of the clock.
- 2) Do not press the Button for pendulum too tight in order to allow the pendulum to swing freely at the fork supporter.
- 3) Please turn pendulum supporter a little bit around supporter pin into a position that will make the clock work properly.

Please Read and Keep:

Toy not suitable for children under 3 years. Small parts might be swallowed or inhaled.