

Witch 23

Chapter 23 New source of power

“Come on, try to join these two iron plates together,” Roland said.

Anna’s finger pressed on the iron seams. A flame was ejected from her finger, melting the interface at a speed visible to the eyes.

“Reduce the firepower and start again with the reverse side.”

Anna nodded her head and did it once more. The two iron plates were firmly welded together at a 90-degree angle.

Roland carefully examined the interface and found that the effect was just as he had imagined – a perfect weld without any flaws. With a little polishing, the fluid traces of molten iron could rub off. There was no difference with a modern welding technique.

“Very good, Miss Anna, simply excellent!” Roland excitedly exclaimed, “Next, we should also weld this two iron panels together.”

“What is it? An iron... bucket?”

“No, it is a cylinder,” corrected Roland.

“Cylinder?” repeated Anna, puzzled.

“Yes, the cylinder can be filled with air,” Roland pointed to another square piece of iron, “Do you see the small hole above it? The air can enter the cylinder through that small hole, and push the piston. Well, and since the piston diameter is slightly smaller than the cylinder’s diameter, it can move freely inside. “

Even the genius Anna, in front of so many unknown words, had question marks above her head, “these... cylinder, piston and so on, what do they do?”

“They are needed for the purpose of manufacturing a machine that can move automatically.”

The steam engine brought the first industrial revolution, it was the driving force behind human development, completely replacing humans and animals in the workforce.

It was a schematic diagram that each mechanic engineer was familiar with, to describe it in simple words, it was a larger version of a kettle. After boiling the water, the produced steam would be induced into the cylinder. There, it would push a piston that is connected to a pole. Like this, thermal energy was turned into mechanical energy.

The principle was very simple, but it did not mean that it was easy to manufacture. Its difficulty laid in the sealing of the cylinder and piston, as well as the production of the gas pipeline. Without proper metal processing skills and only relying on manual forging, manufacturing a usable cylinder would only be a dream.

However, with the help of Anna’s ability, he could make up for the lack of their manufacturing skills.

After much advance planning, Roland came up with a design using four iron plates of the same size, like this, so the smithy could easily grind it. Then the iron plates would be welded together at a 90-degree angle by Anna. Like this, it was possible to get a highly stiff square cylinder. With the help of Anna, he didn't need to use the traditional production process. They created first a tubular boring machine, and then post processed it to create a circular cylinder. The other big parts, too, could be divided into small pieces and then welded together. In this way, it was even possible to produce them in a small workshop. In this way, they were able to produce all of the components required for the steam engine.

In fact, prior to the invention of welding, people could only rely on connecting small pieces by bolting or riveting. Since the internal cylinder must be smooth, normal connection methods obviously couldn't do this.

The only problem was the gas pipeline. Its production process was nothing special, it needed to be heated up until it was red, and then the groove could be hammered into the right shape; this was also the method to produce a front-loading flintlock gun barrel. Later the barrel just needed straightening and counterbored rifling etc., nothing that was too complicated.

The problem was that it was impossible for Roland to call the blacksmith into the castle's back garden, since it was still not known that Anna hadn't been executed. Blacksmithing was not one of their strengths, but in a desperate attempt, they had to let the chief knight do it, under Roland's own command.

After waiting for three days, Roland finally had the first steam engine ever standing in his back garden.

"This is the powerful machine you were talking about?" Carter frowned while looking at the strange machine, but he had affirmed first hand that this machine had nothing to do with magic. Each of the iron plates were personally molded by himself, and to him, it only looked like a sealed furnace. It was impossible for the devil to have any interest in it.

But how could it move a pile of lump iron upwards? It looked very clumsy and had no feet, was it possible that it could fly?

But in Roland's eyes, this seemingly simple machine exuded the beauty of the modern industry. Standing on the shoulders of giants, he naturally did not need to invent the Newcomen steam engine — or the Watt steam engine, instead he built an improved steam engine. His first prototype was already a high-pressure steam engine with a dual connecting rod and a slide valve. To make it better than most of the original steam engines, the key laid in some of newer innovative ideas.

"Soon you will understand it."

Roland poured a bucket of water into the steam room and told Anna to ignite the firewood.

Ten minutes later, the water was at a rolling boil. Soon, a creaking sound could be heard from the cylinder. Roland knew it was the sound of the thermal expansion of the cylinder. The thin iron piston's expansion was far greater than the cylinder's and it would eventually press firmly against the cylinder wall.

"Isn't this a water boiler? I did not think it would really be a furnace," Carter muttered.

When the cylinder was full of steam, an excited scene appeared. The piston rod began to push outwards, and when the motion was at its apex, another rod would pull the slide valves, allowing the steam to push the piston inwards again. The wheel connected to the two poles would rotate very quickly through this motion, and with increased power, the speed very quickly reached its peak.

The machine made an ear-piercing humming sound, and white gas was ejected, producing a kind of unstoppable and imposing aura. "That's what you called... hidden forces in nature?" asked Anna, dumbfounded.

The chief knight's face was full of wonder, the great iron wheel that he needed to spend a good deal of strength to install, was now rotating like it was as light as a feather. Standing next to the wheel he could even feel a new breeze – this only showed the astounding power of the steam engine.

In his heart, a trace of anxiety gradually arose.

His Highness had said that it could replace the power of humans and animals, and it seemed he hadn't lied. When placed on a horse-drawn chariot, it would be very hard for 10 knights to resist its brute force.

Training a qualified knight needed fifteen years, but the manufacturing of such a machine only needed three days. If the blacksmith only worked part time, it would still only need a week.

It didn't require feeding and wasn't afraid of cold or hunger. It also wasn't afraid of arrows and swords. Just install a ram in front of it, and it could bring rampage on the battlefield.

As a traditional knight... was his existence still necessary?

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In the evening, when Roland returned to the bedroom, Nightingale was once again waiting for him.

This time, she did not wear her hood, and she was smiling and sitting at the table. Her hands fiddled with a few parchments, "It seems that the outside rumors really cannot be believed. They say the 4th Prince is ignorant and has a bad character, in fact, he shouldn't have any learning or skills. In fact, compared with a court great master he would not have time for civilities. This drawing on this paper, are these the plans for the steam stove? You call it... steam engine, right? "

Shoot! Can't I even get a little privacy? Coming and going like you want, do you think this is your home?! In his heart, Roland cursed her endlessly, but he still replied with a calm face, "Yes those are the plans, but without Anna's help, they would forever be drawings only."

"What can it do?"

"A lot, it can help with ore transportation, drainage, metal fabrication, forging, everywhere where strength is required it can play a role."

"Then I will take it," with this words Nightingale took the parchment and placed it in her robe, "the Witch Cooperation Association has witches with the power of fire too."

"Hey—"

She shook her head to stop Roland's protest, "Of course, I'm not only taking your stuff, take a look at this first before complaining." She put a small amount of white stuff on the table.

When Roland went over to the table, he found out that it was actually a roll of paper.

He gently expands the roll, and swept through its content, "This is..."

"A secret letter delivered by pigeons," Nightingale explained to him in a happy tone, "the recipient was your maid Tyre, tsk, it looks like your harem isn't loyal."

"I have not touched her," Roland frowned.

Tyre, he could remember that she seemed to follow him from a very early age, and the former 4th Prince appeared to be interested in her, but unfortunately he failed to succeed in conquering her, he could only lightly harass her several times. Here in Border Town, to prevent the long wait for his own personal maid, she got the room next door to him. He did not expect that this was actually an arrangement made by one of his siblings.

Although this letter was not signed, according to the content, he could judge, that it was sent by one of his siblings. In the letter it revealed that the author was very unhappy with the last failure, but the plans for the riot in Longsong Stronghold were not allowed to fail again.

Well, in fact, the first plan must have succeeded, he thought, or else he would have never become Roland Wimbledon.

It was unlikely that this letter was forged by Nightingale, because only the people who were involved in this conspiracy could have been aware of the first assassination plan. And if Nightingale wanted to kill him, it wouldn't be a problem for her.

"How could you steal this from her?"

"Your maid Tyre isn't stupid, her intention was to burn the letter after reading it. Unfortunately, she looked away when I was just behind her," She made an act of sweeping something, "So, how do you want to handle this? Do you need my help to 'deal' with her? "

Roland naturally understood what she meant by 'deal', so he hesitated for a moment, then he finally nodded, "I have to trouble you." He did not have the confidence to do this kind of thing himself, "if you can... ask her who the person in the dark is. "

"As you wish, Your Highness," Nightingale smiled while giving a salute, "Well, this will be the reward for the drawing of the steam engine."