



ŠTĚPÁNKA SEKANINOVÁ & JAKUB CENKL

INVENTIONS GREAT AND SMALL

THE STORIES OF



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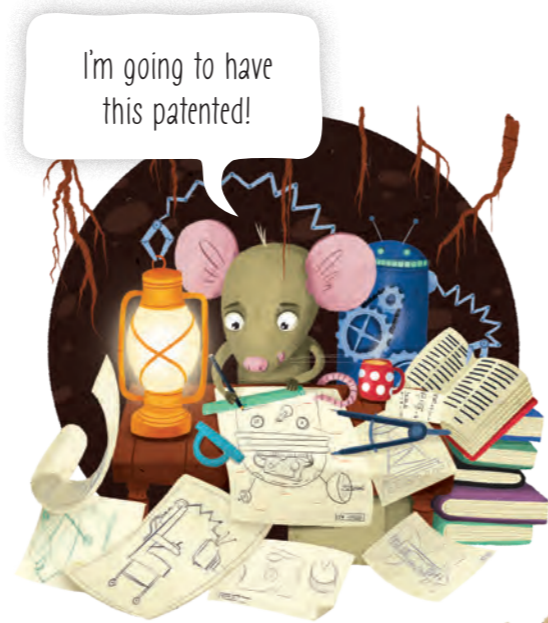
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INTRODUCTION

On the edge of the forest, in a large den made by Felix the fox, lived a mouse called Alfred, a clever little grey creature with keen eyes. Alfred was forever racking his clever brains. More than anything, he longed to come up with an invention that would go down in mousy history. Wouldn't you say, children, that his very name, Alfred, predestined him for this?



GREAT IDEAS

Alfred's spacious apartment was packed with things for use in all kinds of incredible experiments. Shoes that walked on their own, a story-reading armchair, a big pot, a wardrobe to choose the right clothes for the weather – all had their place in Alfred's den. The problem was, none of them worked.



ALFRED'S INHERITANCE

Alfred so wanted to show the world his talent! Not least since Alfred Snr., his grandfather, had invented a vehicle that ran on rabbit droppings which could overcome any obstacle and was never short of fuel.

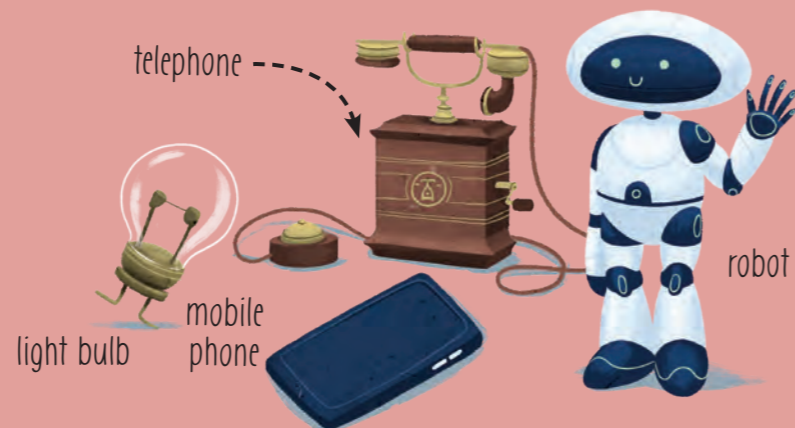
THE JOURNEY BEGAN

A wise owl called Justine lived in this forest too. Having watched Alfred's daily struggles from her perch until she could watch no more, she swooped down with an offer: how about they make a journey of discovery? One through the centuries, not one around the world. Alfred thought this such a great idea that he started packing.



WHAT IS AN INVENTION?

An invention is a new thing or technology that makes easier and maybe improves the lives of humans or mice. It may even make possible something that was impossible before. Before this thing or technology was invented, no one knew anything about it. It is the first of its kind.



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WHEEL MESOPOTAMIA

4000-3500 BCE

So heavy was the sated mouse that Justine's wings struggled to flap. She would need a vehicle with good wheels. 'Wheels!' she cooed. What a brilliant invention! Without warning, and with great relief, she set her course downwards, landing between two Asian rivers, the Euphrates and the Tigris.

WHERE DOES IT TURN?

The first people for whom the wheel was intended were potters – to make it easier for them to shape their vessels. That's right: the world's first wheel was a potter's wheel!



BRILLIANT IDEA!

Look around you. Do you see any wheels in the natural world? No. There's no such thing as a natural wheel. Rather than look to nature for inspiration, as was usually the case, the inventors of the wheel imagined it out of nothing! This ingenious invention was made around 3500 BCE. People were smart even then!

Haven't you got too many wheels?



SMART MESOPOTAMIANS

It happened in ancient Mesopotamia. What, you ask? The invention of the wheel, of course! We will never find out the names of the people who came up with this revolutionary idea. All we know about them is that they were from the Sumer and Assyrian civilizations.

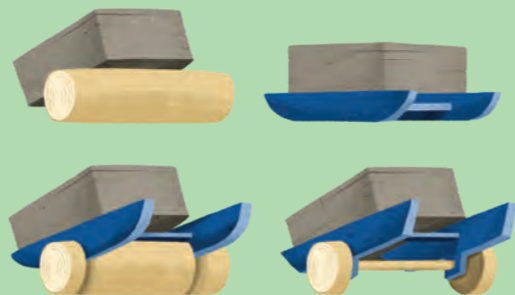
CONNECTING PLACES

With the coming of the wheel, again the world became a little easier to live in. Now that people no longer had to carry heavy loads on their backs, they found it easier to build and travel. Towns sprang up like mushrooms, connected by dense networks of roads that were good to drive on.



OLDEST WHEEL

This was very simple, cut from logs from felled trees. It can't have been anything special, can it? Carts with such wheels were certainly no Formula One racers. They were dreadfully heavy and could be driven only on firm, specially prepared roads. But driven they were! The amazing wheel originated out of logs the ancients put under loads that needed moving.



BYE, BYE, WHEEL!

Justine had rested on one of the heavy carts, gathering strength for the next leg of the journey. 'Get on, Alfred!' she called. Alfred was sorry to part from the Sumerian inventors. 'Time is pressing, we must go...' she hooted. And off they flew!

! DON'T IMAGINE THAT AFTER THE SUMERIANS INVENTED IT, THE WHEEL SPREAD RAPIDLY ALL OVER THE WORLD! THE INDIGENOUS PEOPLES OF THE AMERICAN CONTINENT AND AUSTRALIA MANAGED QUITE WELL WITHOUT IT UNTIL THE MODERN AGE.

CONCRETE

ROMA

3RD CENTURY BCE

WORLD'S HARDEST!

It led them to a certain building in ancient Rome, there to acquaint them with a certain Roman invention. This is Roman concrete – a building material that can last millennia!

RECIPE FOR CONCRETE

Toss in some burnt lime, a few pinches of volcanic ash, a little volcanic rock, and, if you can lay your hands on them, a few bricks. Add animal fat, milk and blood for zest. Put all this into formwork, add seawater and pack it down. Before long, you'll have rock-hard concrete. We don't know which Romans invented this recipe or when.

WONDERFUL SEAWATER

The sea is amazing! The combination of seawater and volcanic elements produces an extraordinarily resilient material by a special chemical reaction. This is the secret of Roman concrete's extreme durability. Many ancient Roman structures, such as dams, piers and bridge abutments, are constantly reinforced by seawater.

I like it here! Before we leave, I'm writing down how to make Roman concrete.

! THE ROMANS WERE VERY CRAFTY. THE MAGIC INGREDIENT IN THEIR CONCRETE WAS **VOLCANIC ASH** LEFT BEHIND BY A VOLCANIC ERUPTION AROUND 450,000 YEARS EARLIER. THE ROMANS WOULD FETCH IT FROM **POZZUOLI** IN THE GULF OF NAPLES. SUCH MATERIALS WERE KNOWN AS **POZZOLANS**.

EYEGLASSES

ITALY

13TH CENTURY

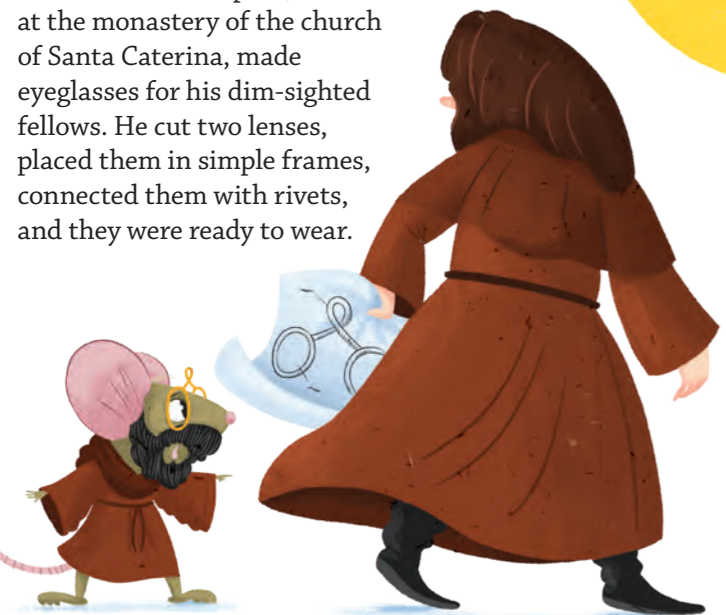
Our two friends went on their way. The owl kept her peepers wide open, to be sure of steering clear of trees and other obstacles. Alfred looked down and admired the big, wide, wonderful world. 'How lucky I am, to be able to see the countryside and read letters. My grandpa needed glasses. I wonder who invented them?'

WE NEED TO READ!

We're in the 13th century, in an Italian monastery at the church of Santa Caterina. The local monks are forever studying and reading books. A problem arises when they can't see to read. And so the reading stone – a semicircular lens cut from crystal or the mineral beryl – came about. When you put this over the text of a book, you can read absolutely everything!

HELP FOR THE EYES

Alessandro della Spina, a monk at the monastery of the church of Santa Caterina, made eyeglasses for his dim-sighted fellows. He cut two lenses, placed them in simple frames, connected them with rivets, and they were ready to wear.



GLASSES HAD TO WAIT A LONG TIME FOR ARMS – **TILL THE 18TH CENTURY**, IN FACT. BEFORE THAT, THEY WERE ATTACHED TO A HAT OR THE HEAD, OR CLIPPED TO THE NOSE.

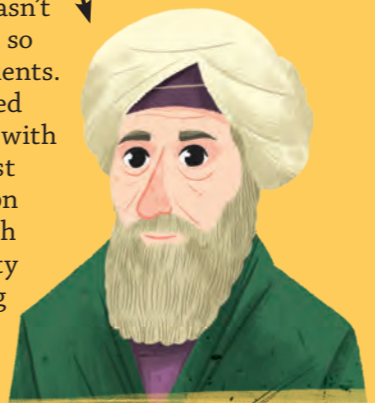
BUT I DIDN'T INVENT THEM!

Although Alessandro della Spina is considered the inventor of eyeglasses, who can say if this is true? He may have been inspired by an unknown inventor who wished to keep the idea secret. If so, he didn't succeed. Even closely guarded secrets will leak out.

AROUND THE WORLD THROUGH READING

A means for enlarging text wasn't invented till the Middle Ages, so it wasn't available to the ancients. The philosopher Seneca helped his eyesight by filling a glass with water and placing this against his book. The Arab scholar Ibn al-Haytham spoke in the 10th century of the amazing ability of glass hemispheres to bring objects apparently nearer.

SCHOLAR
IBN AL
HEITAM



THANKS FOR MY GLASSES!

'I couldn't read a single book without glasses,' said Justine, as she flapped her wings for take-off. 'Their inventor has my thanks, whoever he was.' Our two friends have a lot of centuries still to visit.

PRINTING

GERMANY

15TH CENTURY

Alfred the mouse loved seeing the world from on high. He had a good view of things at last, and it was giving him inspiration. 'Flying is the best!' he thought. But then a mighty storm came on, which proved too much even for Justine. Our travellers were forced to land, not knowing where they were. It didn't take them long to figure it out.



JOHANNES

Gutenberg was born in the German city of Mainz. He was trained as a goldsmith and gem cutter. It seems that these professions' use of stamps for impression of hallmarks gave him the idea of creating individual, movable letters. Nothing in life happens by chance.

'GET MOVING, LETTERS!'

Said Johannes Gutenberg, as he began casting individual letters in tin, lead and antimony. Such characters lasted a long time. After casting, they were set in a frame, coated with ink, and printed on paper or parchment.

'WELCOME TO MY WORKSHOP.'

The storm swept them into the 15th century, to the very feet of Johannes Gutenberg, who has gone down in history for perfecting the printing press! Although he didn't invent it, as some claim, he improved and simplified it to allow super-rapid printing, resulting in the spread of education at lightning speed. A method of printing was used in China long before Gutenberg.

'GOODBYE!'

Smearred with printer's ink, our two adventurers set out again. Alfred took along Johannes's first printed book, the Gutenberg Bible from 1455.

IN LEONARDO'S WORKSHOP

ITALY

15TH - 16TH CENTURY

To complete their journey, Justine carried Alfred back to the Renaissance. She would have been sorry not to see inside the workshop of Leonardo da Vinci: painter, sculptor, astronomer, architect, musician, natural scientist, writer, designer and – brilliant inventor!

HEADING HOME

Leonardo guided the amazed Alfred around his workshop all day. The mouse absorbed all the great Renaissance Man could show and tell him. By evening, Alfred's head was buzzing with new ideas. But all good things must come to an end. The two inventors parted and Alfred climbed onto the owl's back. Within a few flaps of Justine's wings, the beautiful Renaissance scene was gone. The journey was finally over.

Like you, Alfred, I'm a keen inventor. Look at all the things I've come up with.

FLYING MACHINE

MONA LISA

MECHANICAL KNIGHT

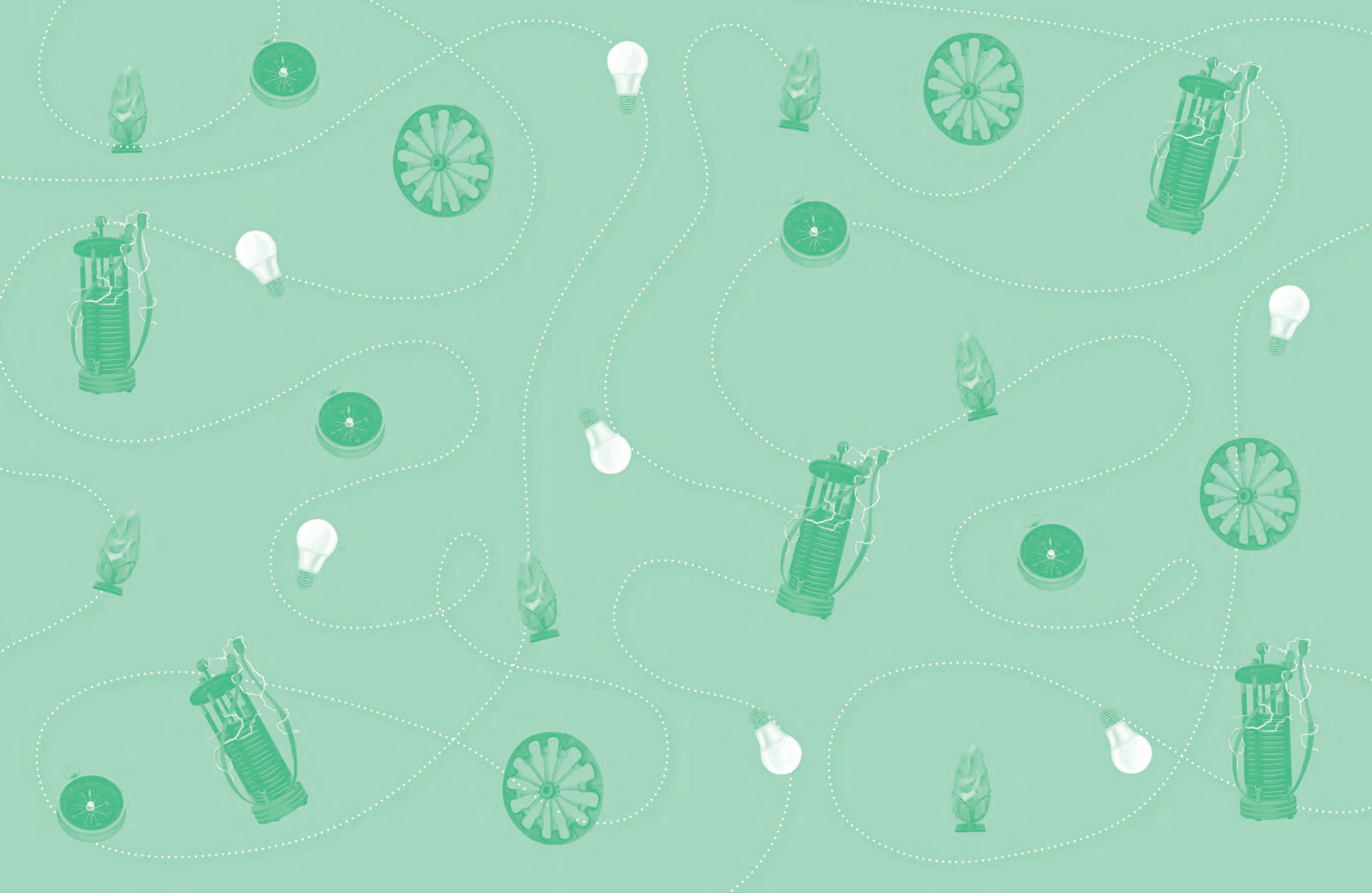
DIVING SUIT

HELICOPTER

PORTABLE BRIDGE

'TORTOISE-SHELL' TANK

MACHINE GUN



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Having a famous inventor for a great-grandfather burdens a person with a lot of responsibility – and this counts double for Alfred the mouse. Inquisitive Alfred so longs to invent something that would outdo his ancestor, but how can he go about it? How did certain inventions – some large, some small, but all super-important for our lives today – come to be? If you would like to know, join Alfred and his wise friend Justine the owl on a great journey of discovery through the centuries and find out how things were with these inventions and their inventors. But massage your muscles first, because the journey will be a long, long one – from prehistoric times to the 20th century!

JOIN US
ON A JOURNEY
TO INTERESTING
INVENTIONS



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