

The Great Company Adventures • Book 21 of 50

BOSCH THE SPARK IN EVERY MACHINE

A curious girl, three wise mentors, and the tiny plug of ceramic and metal that lit the age of engines.

"Discovering the businesses that built the modern world"

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THE GREAT COMPANY ADVENTURES

Discovering the businesses that built the modern world.

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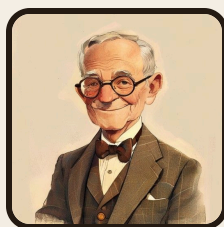
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MEET THE CHARACTERS



SIRI



BEN



WARREN



CHARLIE



CLARA

A curious girl named Siri, a wise old teacher named Ben, and his student Warren with Warren's partner Charlie — together discovering the businesses that built the modern world, one adventure at a time.

THE GLOBAL 50

One great company per volume · Fifty adventures, one modern world

SPACE & EXPLORATION

1. SpaceX — *“The Fire That Comes Back”*

MANUFACTURING & ENGINEERING

2. Toyota — *“The River That Builds Cars”*
3. Siemens — *“The Factory That Builds Factories”*
4. Caterpillar — *“The Machines That Move Mountains”*
5. Boeing — *“The Bird With Six Million Pieces”*
6. Airbus — *“The Plane Four Countries Built”*

ENERGY & INDUSTRY

7. Shell — *“The Sunlight Buried at Sea”*
8. ExxonMobil — *“The Ancient Sunlight Machine”*
9. GE Vernova — *“The Wheel That Makes Lightning”*

COMMUNICATION

10. AT&T — *“The Voice Inside the Wire”*
11. Qualcomm — *“The Whisper in the Air”*
12. Ericsson — *“The Towers That Talk”*

TRANSPORTATION

13. Tesla — *“The Car With No Engine”*
14. John Deere — *“The Machine That Feeds the World”*
15. UPS — *“The Promise in a Brown Truck”*

INFRASTRUCTURE

16. ABB — *“The Arms That Never Tire”*
17. Schneider Electric — *“The Guardian of the Grid”*

MATERIALS

18. Corning — *“The Thread of Light”*
19. DuPont — *“The Inventors of Almost Everything”*

SCIENCE & TOOLS

20. 3M — *“The Factory of Ten Thousand Ideas”*
21. Bosch — *“The Spark in Every Machine”*
22. Honeywell — *“The Dial That Tames the Weather”*

MEDICINE & BIOTECHNOLOGY

23. Pfizer — *“The Shield in a Tiny Vial”*
24. Roche — *“The Detectives of the Blood”*

25. Novo Nordisk — *“The Key to a Billion Locks”*

26. Johnson & Johnson — *“The Little Bandage That Grew”*

FOOD & AGRICULTURE

27. Nestlé — *“The Cup That Wakes the World”*
28. Cargill — *“The Invisible Harvest”*

FINANCE & COMMERCE

29. Visa — *“The Handshake Inside the Card”*
30. Mastercard — *“The Two-Second Trust Machine”*
31. Walmart — *“The Store That Never Runs Out”*
32. Costco — *“The Treasure Warehouse”*
33. FedEx — *“The Race Against the Sun”*

CONSUMER INNOVATION

34. Disney — *“The Factory of Dreams”*
35. LEGO — *“The Brick That Builds Anything”*
36. Sony — *“The Pocket Full of Music”*
37. Coca-Cola — *“The Secret in the Red Can”*
38. Nike — *“The Shoe That Learned to Fly”*

LUXURY & CRAFTSMANSHIP

39. Rolex — *“The Heartbeat on Your Wrist”*
40. LVMH — *“The Suitcase That Conquered the World”*

COMPUTING & DIGITAL CIVILIZATION

41. Apple — *“The Glass That Thinks”*
42. Microsoft — *“The Invisible Machine”*
43. Google — *“The Library With No Walls”*
44. Amazon — *“The Box That Crossed the World”*
45. NVIDIA — *“The Brain Made of Sand”*
46. Intel — *“The First Thinking Chip”*
47. TSMC — *“The Invisible City”*
48. ASML — *“The Machine That Prints With Light”*
49. OpenAI — *“The Machine That Learned to Talk”*

THE FINAL DISCOVERY

50. The Company Yet to Be Built — *“The Adventure You Will Build”*

THE TINY THING THAT SPARKED AT MIDNIGHT

Midnight. Homework: unfinished. And Grandpa Ben's old brass compass? Spinning like crazy.

SPIN

The needle stopped. Pointing at... a little spark plug from the garage. White, metal, boring. Dad's spare.

YOU? You're just a bolt with a hat!

The magic diary flipped open by itself. Fresh ink. Grandpa's handwriting.

It's never done THIS before...

"Time to meet the businesses that built the modern world. Start with the spark in every machine."

★ WORTH REMEMBERING

Hold a spark plug. It's smaller than your thumb — half ceramic, half steel. Inside it, a tiny bolt of **lightning** fires a thousand times a minute. That little flash lit every car, tractor and mower for a century. So... **who put lightning in a bottle?**

The plug flashed. A whirlpool of blue light grabbed her.

WHOOSH



Here we GOOO!

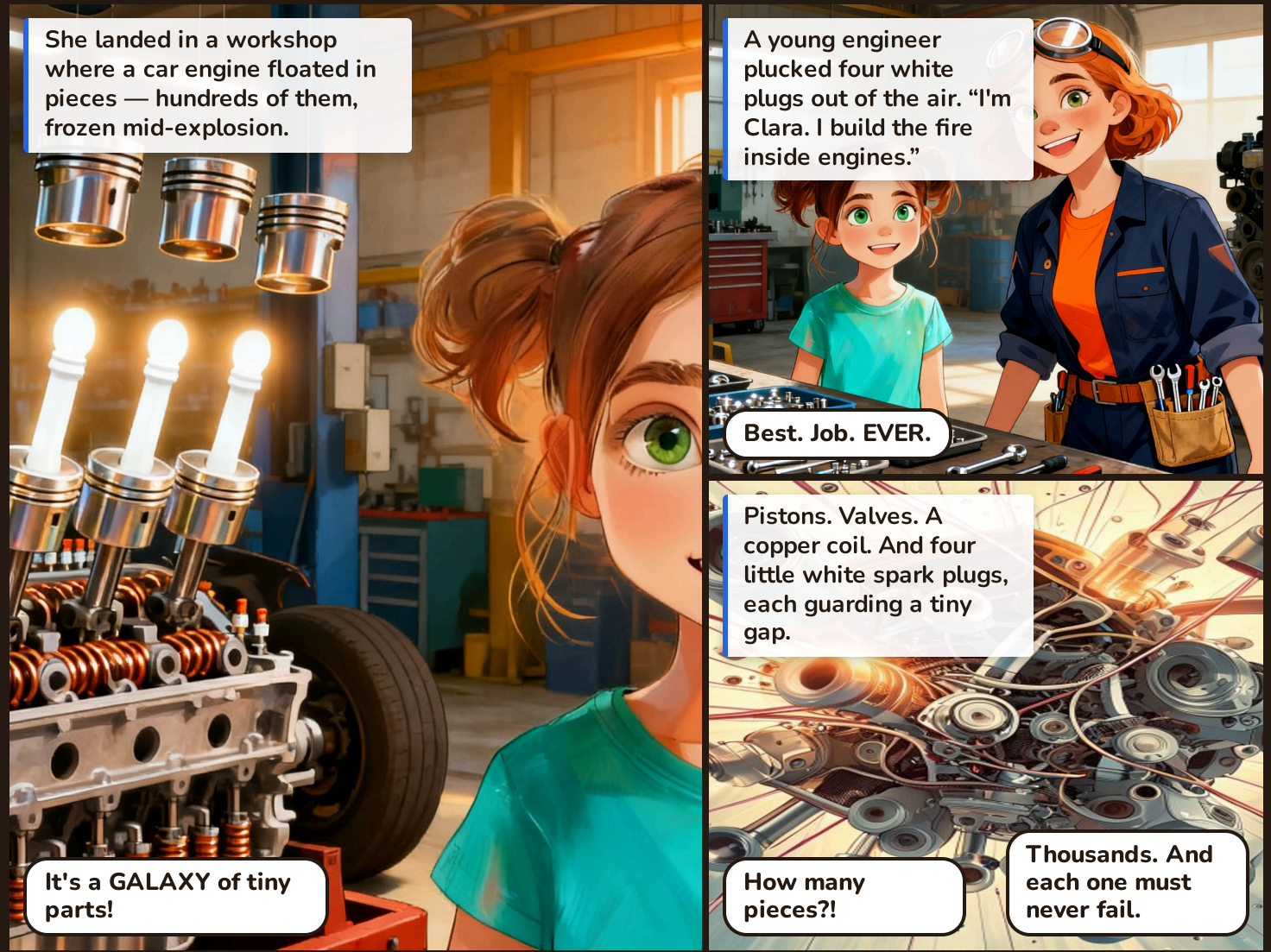


SIRI'S SECRET NOTEBOOK

New mystery! ⚡

- ① How does this thumb-sized thing make a BOLT OF LIGHTNING on demand?
- ② Grandpa says it built one of the world's greatest companies. A spark plug?! Prove it.

THE PUZZLE OF A THOUSAND PIECES



★ WORTH REMEMBERING

An engine is not one big bang — it's **thousands of tiny explosions a minute**, in perfect order. Each one needs a match. The spark plug is that match: the only part that fires **real lightning** on command.

📖 SIRI'S SECRET NOTEBOOK

An engine = thousands of tiny explosions/min. 🔍 The spark plug is the match that lights each one. First mystery: how do you make lightning small enough to fit in my hand?

CAGED LIGHTNING

3a The bolt: a storm you can hold

Clara dimmed the lights.
Between two metal points
— CRACK — a blue spark
leapt the gap.



That's real
LIGHTNING in
there!

"Air won't carry electricity.
It's a wall. So we PUSH —
twenty thousand volts —
till the air itself rips apart."



The air just...
shatters into
sparks!

★ WORTH REMEMBERING

A spark is baby lightning. Air is an **insulator** — normally it blocks electricity cold. But shove hard enough and the air tears into charged bits that suddenly conduct — an avalanche. That flash is 20,000°C. Hotter than the Sun's face. ⚡

"Fire below, lightning inside, a squeeze like the deep sea. One material survives it all: this white ceramic."

"It's alumina — a cousin of sapphire. It holds the lightning IN and keeps the fire OUT. Never leaks, never melts."

It's like a tiny knight's armor!

So the white part is the real hero?

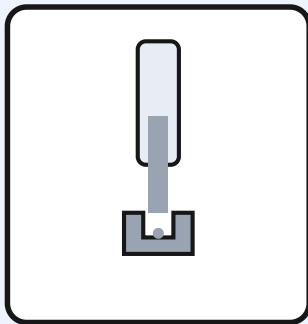
Ceramic is the unsung champion.

★ WORTH REMEMBERING

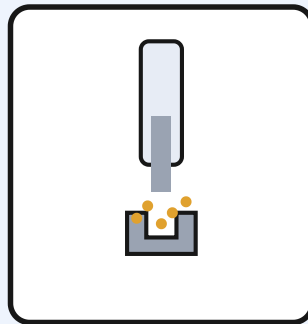
The white sleeve does three impossible jobs at once: bottles 20,000 volts, laughs at 2,000°C flame, and takes a squeeze like the ocean floor — **every single flash, for years**. Steel would melt; plastic would burn; glass would crack. Ceramic just smiles. 🛡️



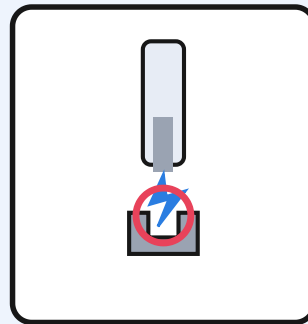
HOW A SPARK LEAPS THE GAP



THE GAP
air blocks it



20,000 VOLTS
air rips apart



THE SPARK
fuel catches fire



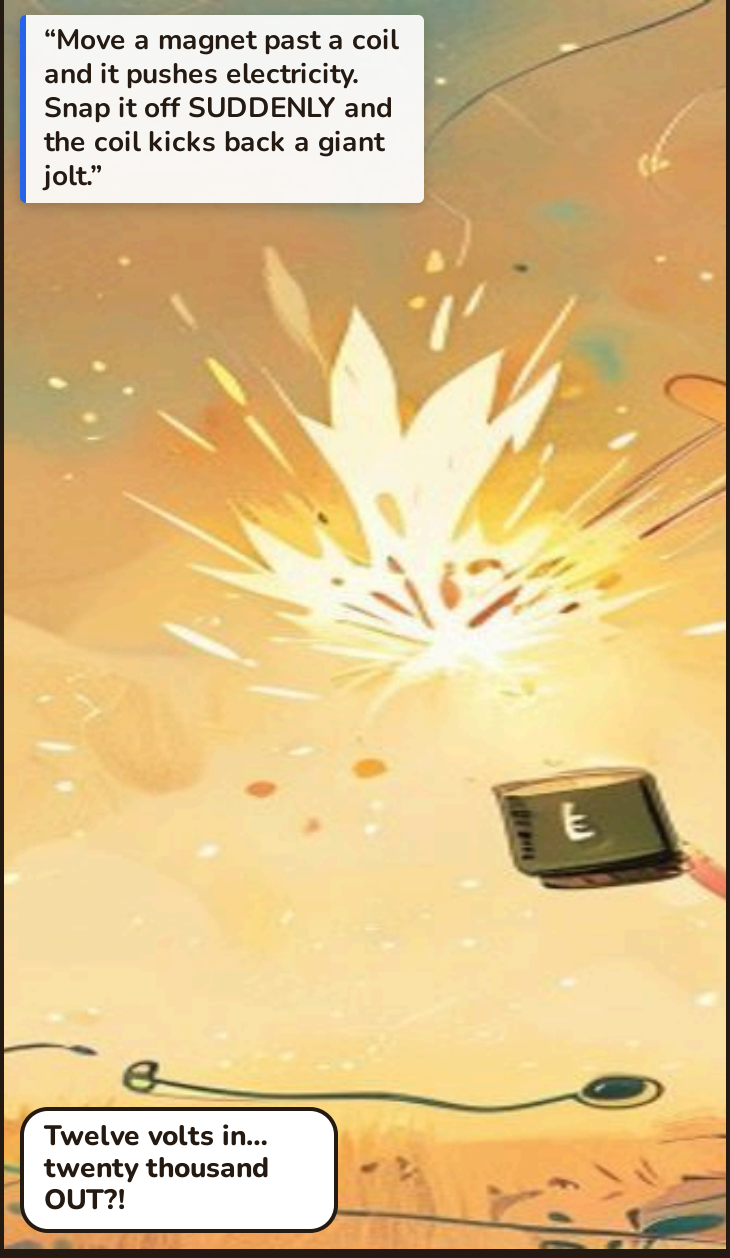
SIRI'S SECRET NOTEBOOK

- ① Spark = baby lightning; air is a wall until 20,000 volts rip it open ⚡
- ② The white ceramic bottles the lightning AND blocks the fire. Alumina = sapphire's tough cousin. 🛡️

LIGHTNING FROM A LITTLE BATTERY



Next: a coil of copper wire, thousands of turns, and a spinning magnet. "Here's where the lightning is BORN."



"Move a magnet past a coil and it pushes electricity. Snap it off **SUDDENLY** and the coil kicks back a giant jolt."

How? The battery's only twelve volts!

Twelve volts in... twenty thousand OUT?!

★ WORTH REMEMBERING

It's called **induction**. A collapsing magnetic field slings the voltage sky-high, like a stretched slingshot let go. A little coil turns a weak battery into a lightning cannon. No new energy — just squeezed into one tiny, mighty instant. 

“Now watch WHERE it fires.” A piston squeezed fuel-mist into a tiny pocket — the spark hit — BOOM — the piston flew down.



The spark lights the explosion that MOVES the car!

“And it must fire at the perfect instant. Thousands of times a minute. Every cylinder, in turn, forever.”



Like a drumline that NEVER misses a beat!

★ WORTH REMEMBERING

Here's the whole secret of an engine: squeeze fuel and air, fire the spark at **exactly** the right blink, catch the push. Too early or too late and it coughs. Get it perfect, four times a beat, a hundred times a second — and metal comes alive. 🥁

📖 SIRI'S SECRET NOTEBOOK

Battery 12V → coil + magnet → SNAP → 20,000V lightning. The spark lights a squeezed fuel-mist = one tiny explosion = one push. Thousands a minute, perfectly timed. My car runs on caged storms. ⚡

THE PART THAT MUST NEVER FAIL

Clara opened a window onto the world. Everywhere — cars, tractors, boats, mowers — the same tiny spark, glowing.

The whole PLANET runs on little sparks!

Then a door opened — onto a hall that stretched to the horizon. People and robots, making millions.

How perfect does ONE plug have to be?

Fire ten billion sparks. Miss none.

“Each white core is baked hotter than lava, ground smoother than a mirror, checked closer than a diamond.”

So much fuss for one little part!

Machines fired plugs millions of times, over and over, hunting for the one that might someday quit.

You test them to DEATH?!

★ WORTH REMEMBERING

Think about the job: buried in fire, flashing lightning millions of times, for years, while your life maybe depends on it. A spark plug that fails once is a car stuck on a highway. **Reliability isn't a feature here. It's the whole product.**

📖 SIRI'S SECRET NOTEBOOK

Baked, ground, tested to death — for a part you never see. 🌍 Billions of sparks, zero misses allowed. Grandpa's rule forming: the boring part that NEVER fails is worth a fortune.

WHY EVERY MACHINE SAYS YES

A museum of engines: motorcycle, chainsaw, snow blower, boat, generator, old airplane. "ALL of them need a spark."

"And look — cars from a dozen rival brands, all racing down one road. The same trusted spark inside every one."

The rivals all use the **SAME** secret ingredient!

"A carmaker bets its whole name on parts it didn't make. So it picks the maker it can **TRUST**. That trust is worth billions."

The invisible part is the most important one!

One little idea hides inside **ALL** of them!

★ WORTH REMEMBERING

Why would anyone build this? ❶ A part that never fails saves whole machines — huge **value**. ❷ Once a carmaker trusts you and designs you in, swapping you out risks everything. Trust, earned over a century, is a wall no newcomer can climb overnight. 🐾

📖 SIRI'S SECRET NOTEBOOK

People don't pay for the **OBJECT** — they pay for peace of mind. The spark maker is invisible but everywhere. Grandpa's rule: find the trusted part everyone would be scared to replace.

THE WORKSHOP THAT LIT THE WORLD



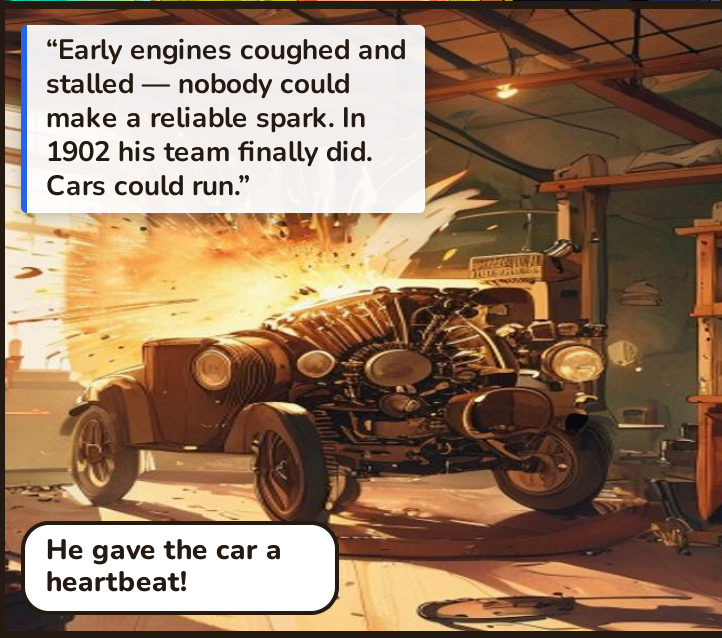
Over the green hills: a campus of gleaming workshops. Clara pointed to the name on the gate. Siri gasped.

BOSCH! The spark in every machine!



"It began in 1886. One young engineer in a tiny workshop, obsessed with precision electrical work."

A whole world...
from one
WORKSHOP?



"Early engines coughed and stalled — nobody could make a reliable spark. In 1902 his team finally did. Cars could run."

He gave the car a heartbeat!



"From that one spark grew everything: drills, fridges, sensors, brakes. Anything that needs precision and trust."

The spark plug was just the **FIRST** seed!

★ WORTH REMEMBERING

The founder's rule shocked everyone: **"I would rather lose money than trust."** He built for the long run and gave most of his company away to a foundation — so it would answer to its promise, never to a crowd chasing quick money. 💛



THE STORY IN TIME

1886

A young engineer opens a tiny precision workshop.

1897

He fits his ignition to a motor vehicle — one of the first.

1902

The reliable high-voltage magneto + spark plug.
Cars can finally be trusted.

1920s

Bosch spreads worldwide: lights, horns, injectors, tools.

1933

The first Bosch power tools and appliances.

1964

Robert Bosch's shares pass to a charitable foundation.

1978

Bosch pioneers anti-lock brakes (ABS) — safety for millions.

Today

Bosch parts hum inside billions of machines. ⚡



SIRI'S SECRET NOTEBOOK

BOSCH! 1886 workshop → 1902 reliable spark

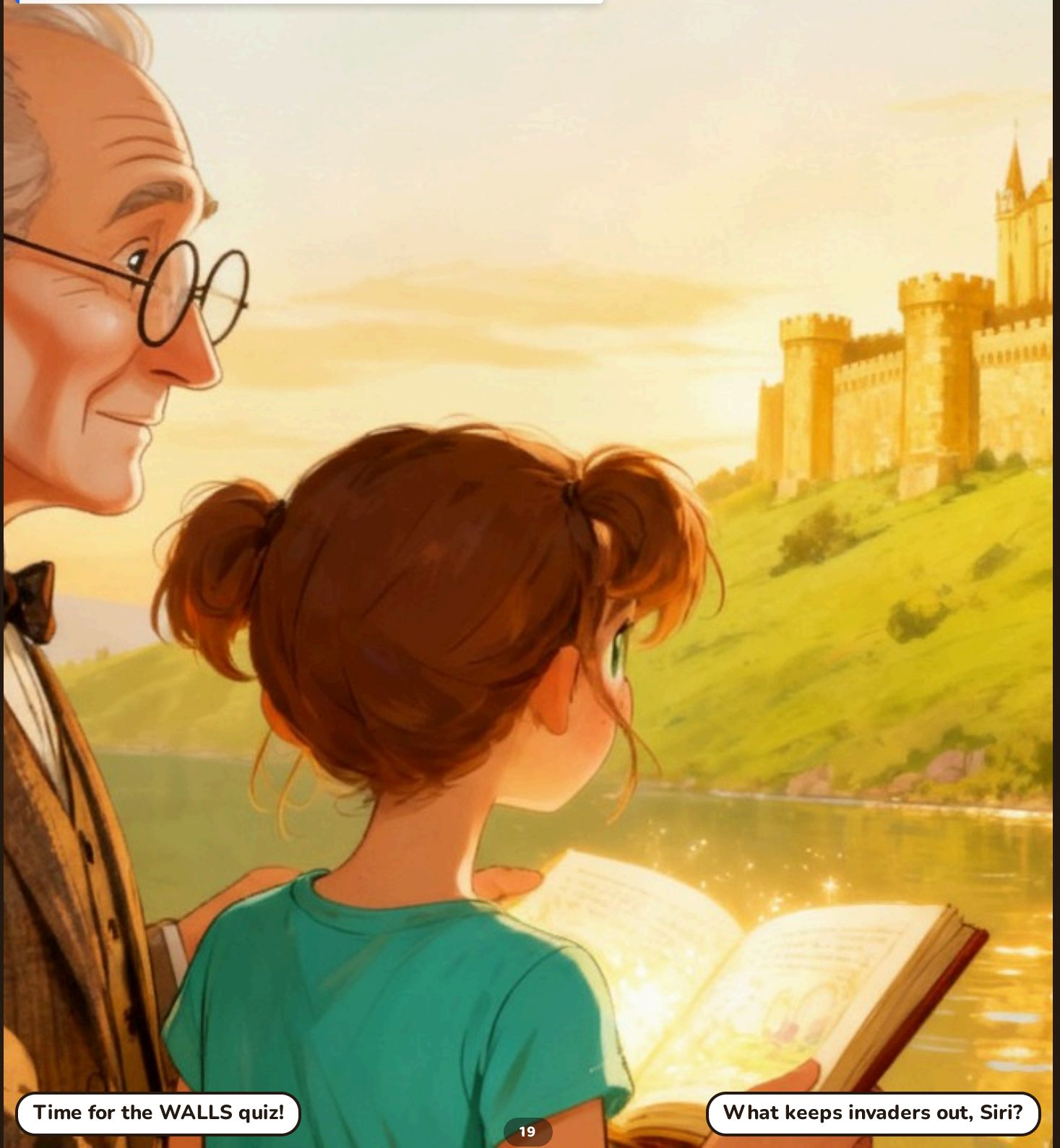
→ cars work → drills, fridges, brakes, sensors.

Founder's creed: rather lose money than trust.

He gave the company **AWAY** so it could think in decades. 🤖

THE CASTLE OF PRECISION

A warm glow. A smell of cherry cola. Warren and Charlie, the partners from Omaha, stood before a shining castle.



Time for the WALLS quiz!

What keeps invaders out, Siri?



THE CASTLE WALLS • WHY RIVALS CAN'T COPY IT



Wall One: A Century of Trust

'If it's Bosch, it works' — earned over 130+ years. Carmakers bet their name on it. Copying a part takes a year. Copying a reputation takes a lifetime.



Wall Two: Designed Right In

Bosch parts are built into thousands of machines from the blueprint up. Ripping one out means redesigning the whole machine. Most never do.



Wall Three: Deep Engineering

Billions poured into research every year, plus a mountain of patents and know-how. A newcomer would need decades just to catch up.



Wall Four: The Patient Owner

A charitable foundation owns most of it — so Bosch can invest for thirty years while rivals chase three months. Patience is a wall money can't buy.



The Cracks in the Wall

Electric cars need no spark plugs — the classic product could fade. It leans on the car world's ups and downs. And cheaper rivals nip at simple parts. Even great castles must keep reinventing.

Charlie tapped his glasses. “My trick: don't ask how to WIN. Ask what would DESTROY it. Then don't do that. **Invert, always invert.**”



Find the ways to lose... then don't!

★ WORTH REMEMBERING

Charlie's checklist for ruining Bosch: ship one bad part and break the trust. Fall asleep while the world goes electric. Stop reinventing. Now — just never do those. Worry, turned into a to-do list.

Warren raised his cola. "A business the world quietly relies on — and I could never buy it. It answers to no crowd, only to its own promise. That's rarer than any share."



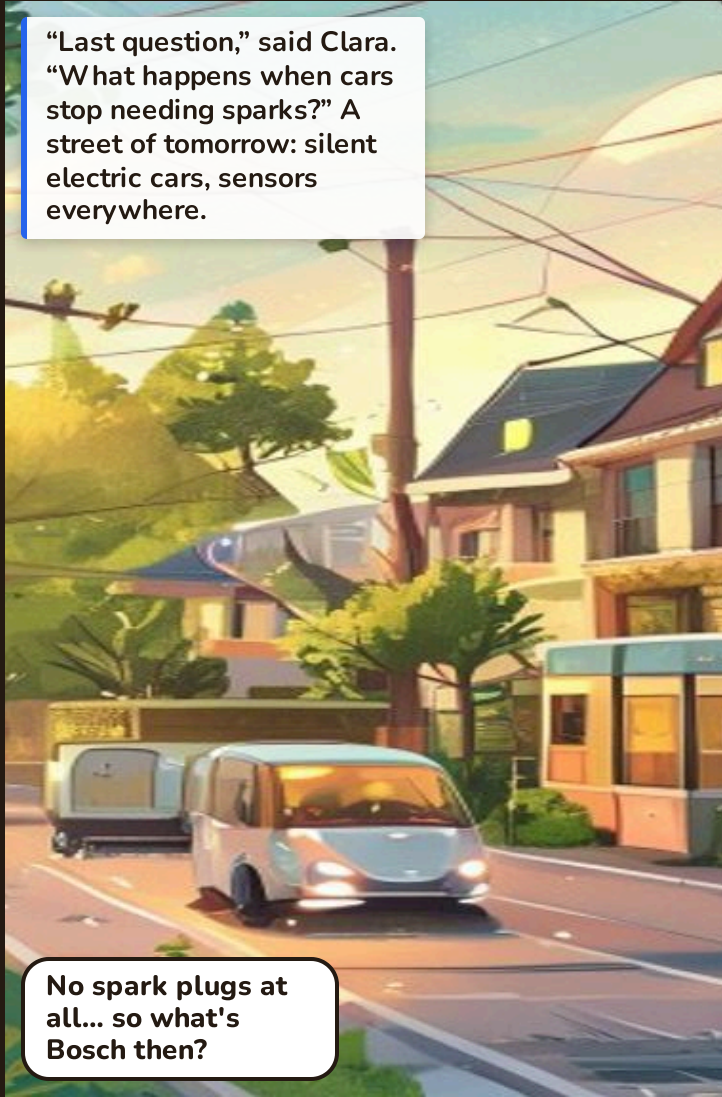
So the treasure isn't the spark. It's the TRUST.

SIRI'S SECRET NOTEBOOK

Walls: century of trust 🤝 + designed-in 🌐 + deep engineering 🧠 + patient owner 🏛️. Cracks: electric cars, car-world swings, cheap rivals. Charlie: INVERT. Warren: trust is rarer than any share. 🏰

THE NEXT THIRTY YEARS

"Last question," said Clara. "What happens when cars stop needing sparks?" A street of tomorrow: silent electric cars, sensors everywhere.



No spark plugs at all... so what's Bosch then?

On a rooftop at dusk, Siri thought it through the way Grandpa taught her.



Don't bet on the PART. Bet on the SKILL behind it.

★ WORTH REMEMBERING

The deep currents: electric motors and batteries instead of sparks. Sensors that let cars see. Heat pumps warming homes. The spark plug may fade — but Bosch's real gift was never the plug. It was **precision you can trust**, and that fits any future. 🧠

📖 SIRI'S SECRET NOTEBOOK

2056 watchlist: electric motors, self-driving sensors, heat pumps, hydrogen. Rule: bet on the SKILL, not the part. (The spark taught Bosch to make anything trustworthy.)

COMING HOME

Her own bed. Morning. The compass: quiet. The house: somehow different.

Was it real? It FELT real...

One fresh line dried on the diary's glowing page.

"The modern world is not magic. It is millions of ordinary people doing small hard things, together, for a long time."

In the garage: the old mower, the spare car. Caged lightning. White armor. A part that never fails.

You're a tiny hero I never even noticed.

She hugged the diary tight. Somewhere far away, a workshop of sparks caught the morning sun.

Show me the next one, Grandpa. ♡

★ WORTH REMEMBERING

Next time an engine starts, feel it: a weak battery slung into lightning, bottled in sapphire's tough cousin, fired at the perfect blink a hundred times a second. A spark plug is no longer just a spark plug. **Nothing, from now on, is just anything.**



SIRI'S SECRET NOTEBOOK · WHAT I LEARNED

- ① A spark is baby lightning — air ripped open by 20,000 volts.
- ② A coil slings a weak battery into that lightning.
- ③ White ceramic bottles fire, force and lightning at once.
- ④ Reliability IS the product — miss none of a billion sparks.
- ⑤ Trust → designed-in → deep skill → patient castle.
- ⑥ Bet on the skill, not the part. 💛



OUR PHILOSOPHY

We believe the greatest gift we can give a child is the ability to think.

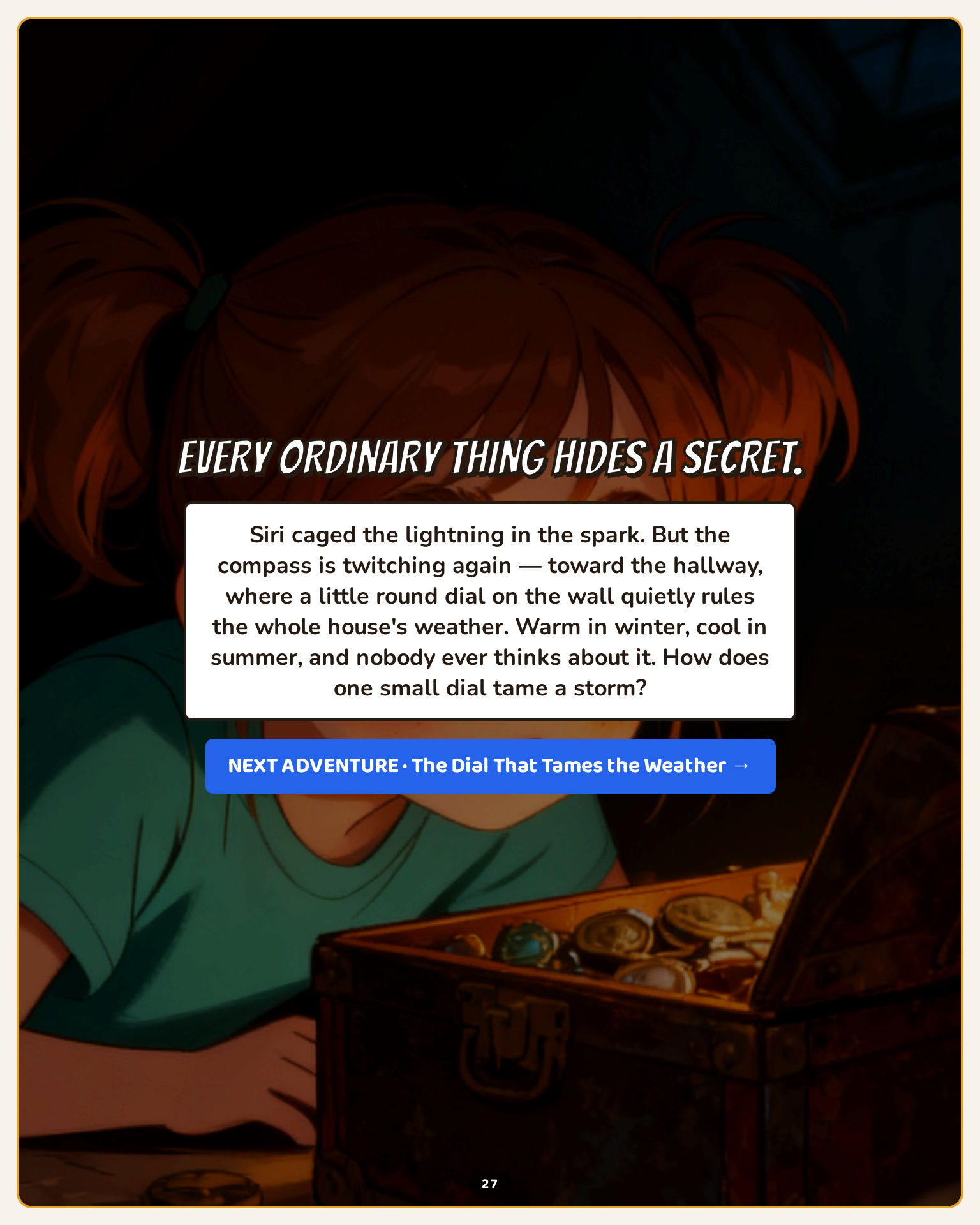
Inspired by the multidisciplinary thinking of [Charlie Munger](#) and the rational, long-term philosophy of [Warren Buffett](#), our comics connect science, technology, business, history, and human behavior to show how the real world works.

Every story begins with a scientific idea and follows its journey into innovation, industry, and the businesses that create value for society. Along the way, children learn that great companies are built on curiosity, experimentation, integrity, and long-term thinking.

Our goal is not to teach children how to invest, but to help them build the mental models needed to understand the world, ask better questions, and think independently.

The companies featured in *The Great Company Adventures* are educational case studies—not investment recommendations. They show how knowledge, innovation, and perseverance turn ideas into products, services, and enduring businesses.

LEARN THE SCIENCE. • UNDERSTAND THE BUSINESS. • THINK FOR LIFE.

A girl with red hair in pigtails, wearing a green shirt, is looking into an open wooden treasure chest filled with gold coins and jewels. The scene is dimly lit, with a warm, orange glow from the chest's contents.

EVERY ORDINARY THING HIDES A SECRET.

Siri caged the lightning in the spark. But the compass is twitching again — toward the hallway, where a little round dial on the wall quietly rules the whole house's weather. Warm in winter, cool in summer, and nobody ever thinks about it. How does one small dial tame a storm?

NEXT ADVENTURE • The Dial That Tames the Weather →