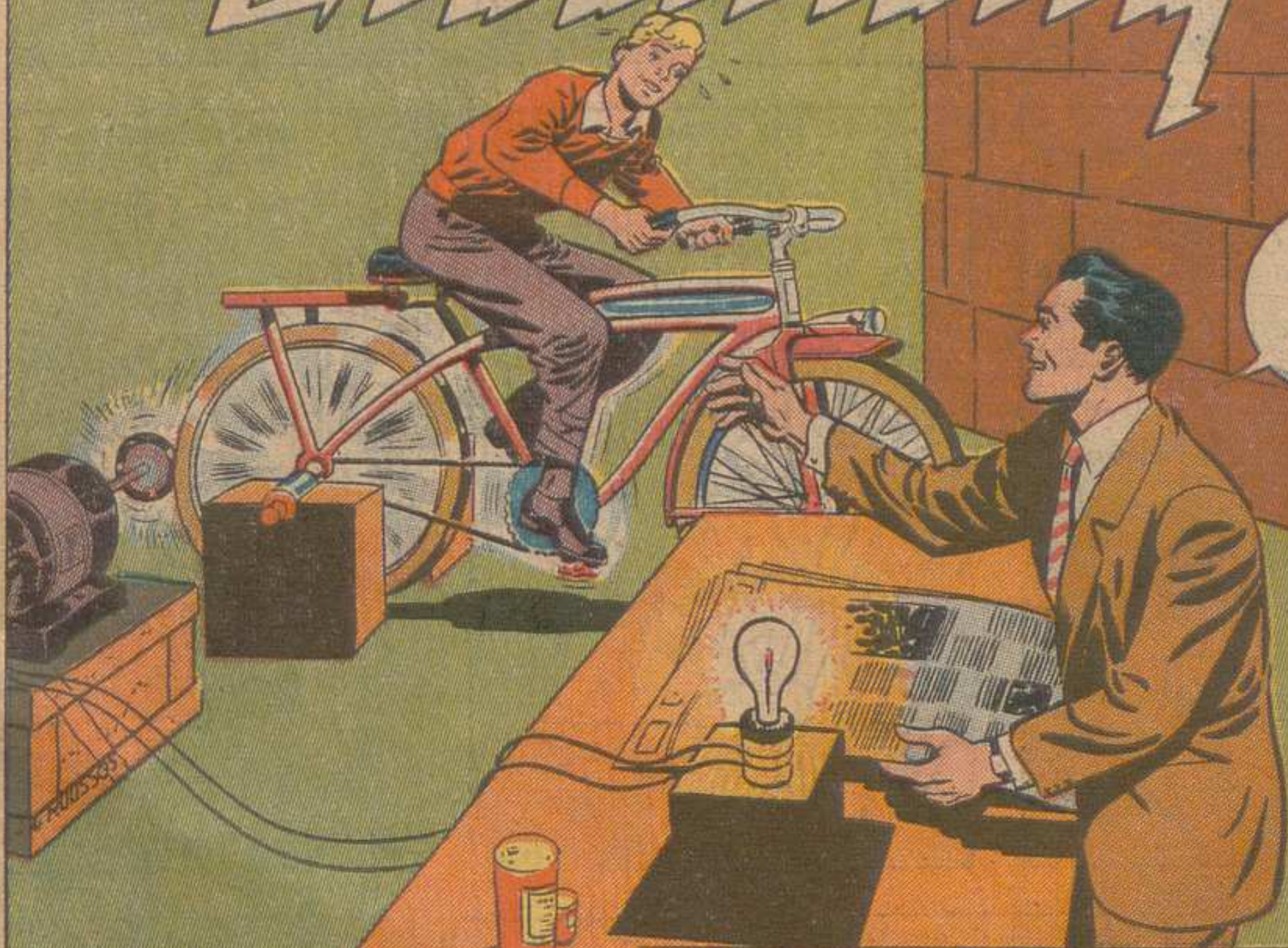


ADVENTURES *in* Electricity

NUMBER
ONE



ADVENTURE SERIES

Prepared for
GENERAL ELECTRIC COMPANY
By GENERAL COMICS, Inc.

SCIENTISTS HAVE LEARNED TO TAP THE STORED ENERGY OF THE SUN...TO FLASH IT THOUSANDS OF MILES IN A FRACTION OF A SECOND...AND TO PERFORM MODERN MIRACLES THAT PUT TO SHAME THE FABLED MAGIC OF THE ARABIAN NIGHTS. WHAT IS THIS STRANGE AND MARVELOUS FORCE? HOW DO WE CONTROL THE MONSTROUS POWER WE UNLOOSE? THE ANSWER'S IN THIS EXCITING TALE OF

“HOW MAGIC IS BORN
...AND HOW IT TRAVELS!”

THE GENERATION OF ELECTRICITY

Pam
 2017.0877

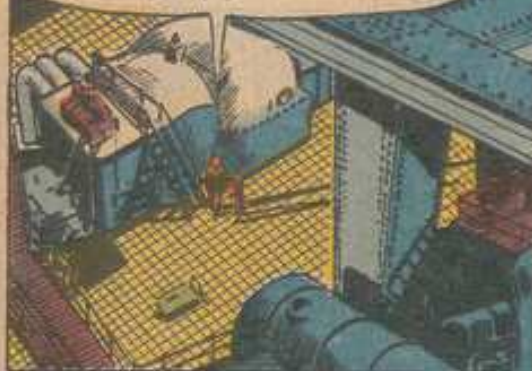





YES, SIMPLE AS... MUD? I DON'T UNDERSTAND A THING ABOUT IT.



BUT I STILL DON'T UNDERSTAND ONE THING. I'VE SEEN OTHER SHAFTS AND AXLES TURN... BUT I NEVER SAW THEM PRODUCE ANY ELECTRICITY. HOW DOES THIS ONE DO IT?



"JOHNNY, THAT'S A SECRET THAT'S BEEN WORTH BILLIONS OF DOLLARS TO THE HUMAN RACE... BUT, SINCE YOU'RE MY BROTHER, YOU CAN HAVE IT FREE."



HERE'S ALL YOU NEED TO PERFORM THE TRICK... A COIL OF WIRE, A MAGNET, AND A GALVANOMETER TO DETECT THE PRESENCE OF THE ELECTRICITY WE'LL PRODUCE.



I CONNECT THE COIL TO THE GALVANOMETER AND PUT THE COIL BETWEEN THE ENDS OF THE MAGNET...



NOW I TURN THE COIL SLOWLY...



THE NEEDLE... IT'S BEGINNING TO MOVE!



AND AS I ROTATE THE COIL FASTER...

THE NEEDLE'S MOVING MORE AND MORE!



NATURALLY--THE FASTER I TURN THE COIL, THE MORE ELECTRICITY GOES THROUGH THE WIRE.



GOSH, IS THAT ALL THERE IS TO MAKING ELECTRICITY? I THOUGHT IT WAS COMPLICATED!

IT IS COMPLICATED, JOHNNY, WHEN YOU TRY TO GET A CURRENT LARGE ENOUGH TO BE USEFUL. NO MATTER HOW FAST YOU TURN THAT COIL IN THE MAGNET, YOU'LL NEVER PRODUCE ENOUGH ELECTRICITY TO LIGHT EVEN A TINY BULB LIKE THIS.



"NEVERTHELESS, THE GENERATOR WORKS ON THE SAME PRINCIPLE AS OUR LITTLE EXPERIMENT. IT USES A STEAM TURBINE INSTEAD OF A HUMAN HAND TO PRODUCE MOTION... AND GIANT MAGNETS AND COILS INSTEAD OF OUR SMALL ONES..."



AND INSTEAD OF PRODUCING A TINY CURRENT LIKE THE ONE WE PRODUCED, GENERATORS MAKE ENOUGH ELECTRICITY TO LIGHT UP A GREAT CITY!"

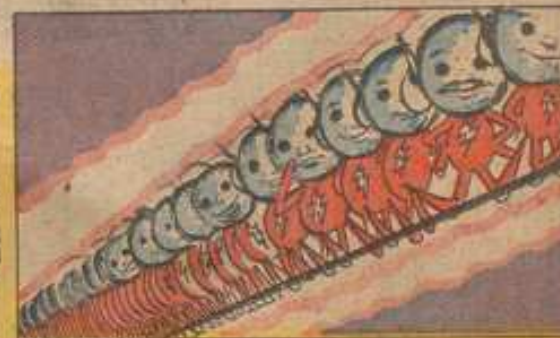


ALL DONE WITH A PIECE OF WIRE AND A MAGNET? IT'S SIMPLE... BUT IT'S SURE BAFFLING, TOO!



NOT SO BAFFLING AS IT SEEMS AT FIRST, JOHNNY!

"MAGNIFY THE WIRE A COUPLE OF BILLION TIMES AND YOU WON'T SEE THIS."



"ELECTRONS DON'T REALLY LOOK LIKE THIS, OF COURSE, BUT I'M DRAWING THEM MORE HUMAN HERE TO SHOW YOU WHAT HAPPENS. THEY'RE VERY TINY."

"MOST OF THE TIME, EVEN IF THEY MOVE AROUND A LITTLE THEY DON'T CONTRIBUTE TO THE CURRENT."



"BUT BRING A MAGNET NEAR THEM...AND THINGS HAPPEN."

"WATCH OUT, BOYS... HERE COMES A MAGNET!"

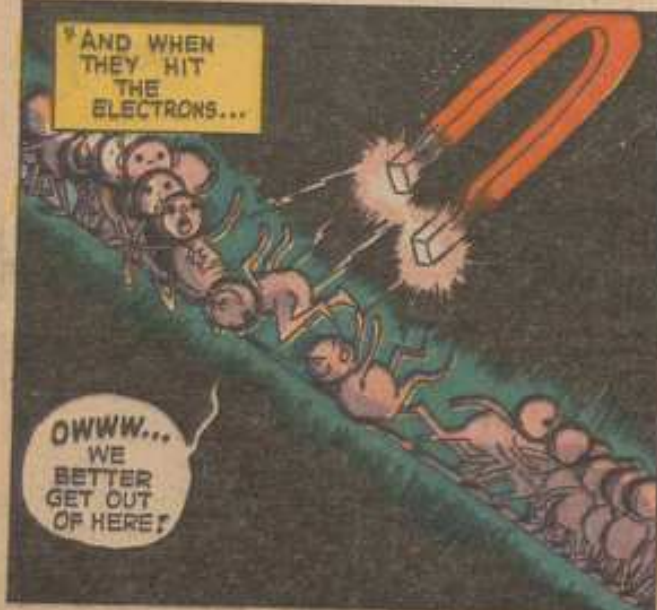
"HEY? WHAT?"



"WE CAN IMAGINE THE END OF THE MAGNET SURROUNDED WITH INVISIBLE LINES OF FORCE. ACTUALLY, THEY DON'T EXIST AS LINES, BUT THEY DO REPRESENT THE WAY THE MAGNET ACTS."



"AND WHEN THEY HIT THE ELECTRONS..."



"OWWW... WE BETTER GET OUT OF HERE!"

"BUT FOR THAT TO HAPPEN, THE MAGNET OR THE WIRE HAS TO BE KEPT MOVING. BECAUSE, IF NEITHER ONE MOVES, WE DON'T GET A CURRENT, EVEN THOUGH THE LINES OF FORCE ARE STILL THERE."

"HANG AROUND, FELLOWS... THIS THING'S DEAD AND IT WON'T HURT US!"



"IS THAT CLEAR, JOHNNY? YOU NEED BOTH A MAGNETIC FIELD AND MOTION TO PRODUCE A CURRENT."

BUT WHEN ALL THE ELECTRONS CHASE OFF DOWN THE WIRE... WHAT THEN? WHERE DOES THE ELECTRIC CURRENT COME FROM?

THAT'S IT, JOHNNY... AN ORDINARY ELECTRIC CURRENT IS NOTHING BUT A BUNCH OF MOVING ELECTRONS.



OF COURSE, ONCE THEY'RE MOVING WE CAN COAX THEM TO GO WHEREVER WE WANT...THUS TRANSMITTING CURRENT WHEREVER WE NEED IT. LET ME SHOW YOU HOW.



HERE'S A COPPER WIRE, AND HERE'S A GLASS ROD...GUESS I DON'T HAVE TO ASK YOU WHICH CONDUCTS ELECTRICITY?

IT'S THE COPPER... EVERY BODY KNOWS THAT.



YES, METALS IN GENERAL CONDUCT ELECTRICITY WELL, AND AMONG METALS, COPPER WORKS BETTER THAN ANYTHING ELSE WE KNOW OF EXCEPT SILVER...WHICH IS KIND OF EXPENSIVE.



THAT DOESN'T MEAN, OF COURSE, THAT WE CAN'T FIND SOME USE FOR GLASS OR RUBBER, OR OTHER MATERIALS THAT DON'T CONDUCT.



WHEN ELECTRIC CURRENTS START RUNNING WILD, THEY CAN BE MIGHTY DANGEROUS. SO WE USE FLEXIBLE RUBBER INSULATION FOR THE WIRE ITSELF, GLASS OR PORCELAIN FOR SUPPORTS.



I GET IT. THE CONDUCTOR TAKES THE ELECTRICITY WHERE YOU WANT IT TO GO...AND THE INSULATOR KEEPS IT AWAY FROM WHERE YOU DON'T WANT IT?

EXACTLY. NOW, LET'S SEE WHERE WE WANT IT TO GO.



LONG-DISTANCE TRAVELERS ARE STEPPED UP TO VERY HIGH VOLTAGES...AND THE HIGHER THE VOLTAGE, THE LESS CHANCE OF THEIR FALLING BY THE WAYSIDE...

THAT'S RIGHT MISTER!



LATER...

THIS LINE CARRIES POWER MANY MILES ACROSS THE COUNTRY...

GOSH, THEY'RE SO LITTLE—DON'T ANY OF THEM GET LOST?





THEY'RE BUILT TO TAKE ALL KINDS OF WEATHER, SON.





"INSTEAD OF ENDING UP WITH MORE WATER THAN YOU STARTED WITH... YOU FIND YOURSELF WITH LESS! THE EXTRA WATER HAS SPLASHED ONTO THE GROUND, AND IS LOST."



THAT'S THE KIND OF THING THAT HAPPENS WHEN LIGHTNING HITS A LINE THAT'S ALREADY LOADED.

GUESS YOU'RE RIGHT, MISTER. BUT THE RAIN'S STOPPING...



SO I'D BETTER SEE ABOUT GETTING BACK TO WORK. SO LONG.

SO LONG... AND THANKS FOR EXPLAINING THINGS.



COME TO THINK OF IT, THOUGH, HE LEFT OUT SOMETHING IMPORTANT... AND SO DID YOU. THESE HIGH-TENSION LINES ARE INTERESTING... BUT HOW ABOUT THE WIRES THAT CARRY THE CURRENT IN OUR HOUSES? WHAT ABOUT THEM?

THEY'RE PART OF THE SAME STORY, JOHNNY.

THESE SAME 100,000 VOLT LINES SUPPLY CURRENT TO OUR TOASTERS, AND RADIOS, AND ELECTRIC LIGHTS.

HUH? BUT THOSE TAKE JUST A LITTLE OVER A HUNDRED VOLTS, NOT 100,000?

SURE, BUT IT'S THE SAME ELECTRICITY. IT'S JUST BEEN STEPPED DOWN TO LOWER VOLTAGE.



"IT'S LIKE TRYING TO GET A PIECE OF CANDY FROM A MACHINE BY PUTTING A BIG BILL IN THE SLOT..."

HEY, MISTER! THAT SLOT TAKES JUST NICKELS!



"YOU HAVE TO GET THE BILL CHANGED INTO NICKELS. IT'S THE SAME WAY WITH ELECTRICITY... YOU CHANGE 100,000 VOLT CURRENT TO 120 VOLT, OR 240, OR WHATEVER YOU WANT. THE THING YOU DO IT WITH IS A SERIES OF TRANSFORMERS..."



"YOU CAN HAVE A GIANT TRANSFORMER, A MIDGET, OR ANYTHING IN BETWEEN, DEPENDING ON WHAT YOU NEED IT FOR..."



"BUT THEY ALL DO THE JOB EFFICIENTLY, WITH THE LOSS OF PRACTICALLY NO POWER."

GOSH, THAT LITTLE THING SURE DOES AN IMPORTANT JOB... BUT I'D NEVER THOUGHT IT.

YES, YOU CAN'T TELL FROM THE WAY A GADGET LOOKS JUST HOW IMPORTANT IT IS.



"TAKE AN ELECTRIC METER, FOR INSTANCE. LOOKS SIMPLE, DOESN'T IT? YET IT MEASURES CURRENT AND VOLTAGE AT THE SAME TIME, MULTIPLIES THEM TOGETHER, MULTIPLIES BY THE TIME THE CURRENT IS ON..."



"AND GIVES YOU THE ANSWER INSTANTLY IN TERMS OF KILOWATT-HOURS OF ENERGY USED."

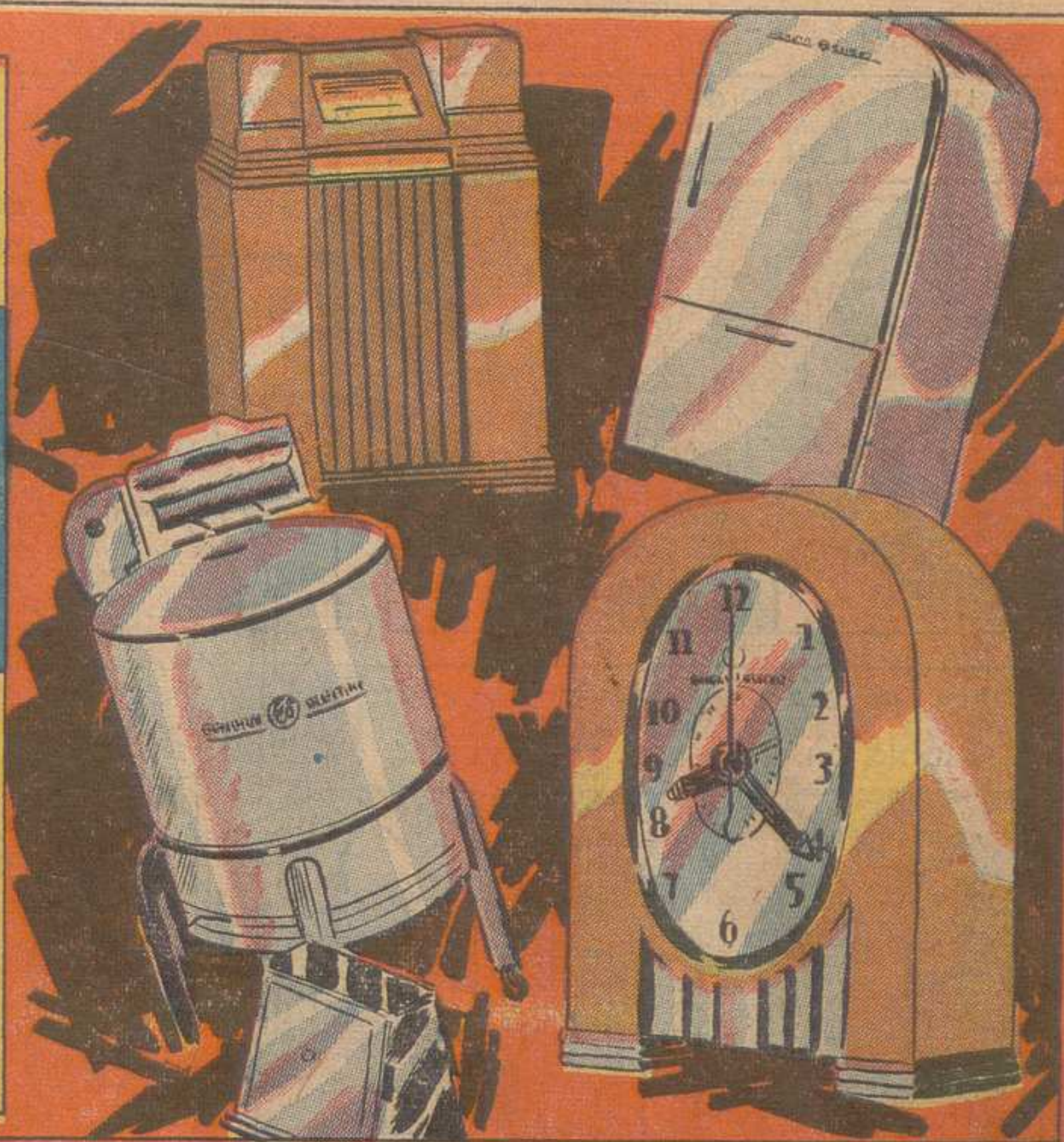
"OR TAKE AN ORDINARY FUSE. THAT LOOKS SIMPLE TOO... BUT IT DOES A SWELL JOB OF PROTECTING YOUR HOUSE AGAINST DAMAGE IF ANYTHING GOES WRONG WITH THE CIRCUIT..."



"SUPPOSE YOU HAVE A SHORT CIRCUIT, FOR INSTANCE. POP, GOES THE FUSE...AND POP GOES EVERY FUSE YOU PUT IN ITS PLACE, UNTIL THE TROUBLE IS CORRECTED."



"IT'S LITTLE GADGETS LIKE THAT, JOHNNY, THAT MAKE IT POSSIBLE FOR US TO USE ALL THE MARVELOUS THINGS THAT RUN BY MEANS OF ELECTRICITY... ELECTRIC EYES, LAMPS, CLOCKS, HEATERS, MOTORS, RADIOS, WASHING MACHINES, REFRIGERATORS..."



GEE, COME TO THINK OF IT, THEY ARE PRETTY WONDERFUL. I'M GLAD YOU TOLD ME ALL THIS, ED. I'VE ALWAYS WANTED TO KNOW ALL ABOUT ELECTRICITY.

ALL ABOUT IT? JOHNNY, YOU'VE LEARNED A LOT! BUT....

NO MAN KNOWS ALL ABOUT ELECTRICITY. THERE'S AN OCEAN OF UNKNOWN FACTS AHEAD OF US... AND WE'VE JUST ABOUT GOT OUR FEET WET IN THE WATER.

WELL, IT'S BEEN FUN ANYWAY... AND, THOUGH IT MAY NOT SEEM MUCH TO YOU, ED, I THINK I'VE LEARNED PLENTY!



GENERAL ELECTRIC
Schenectady, New York