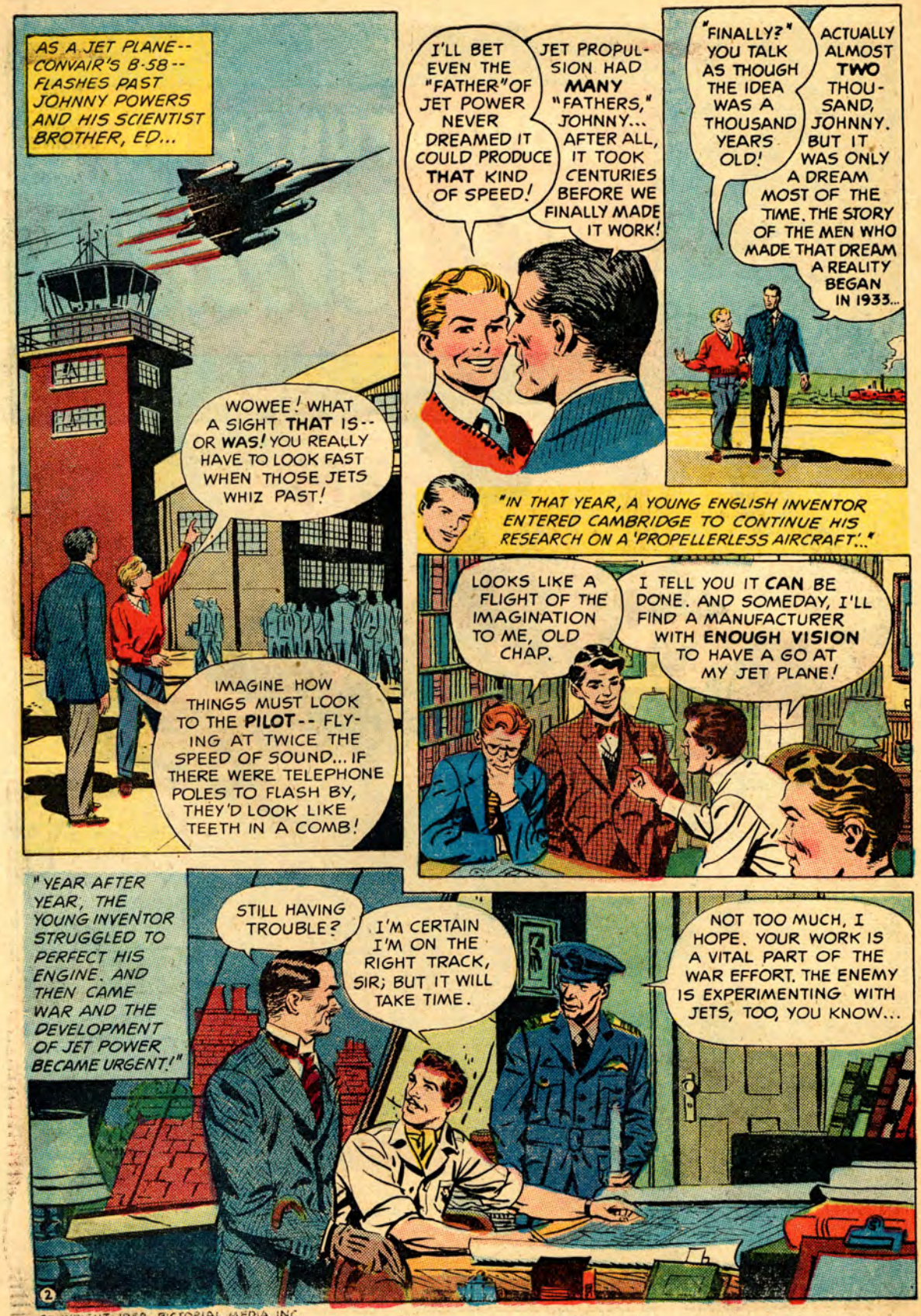
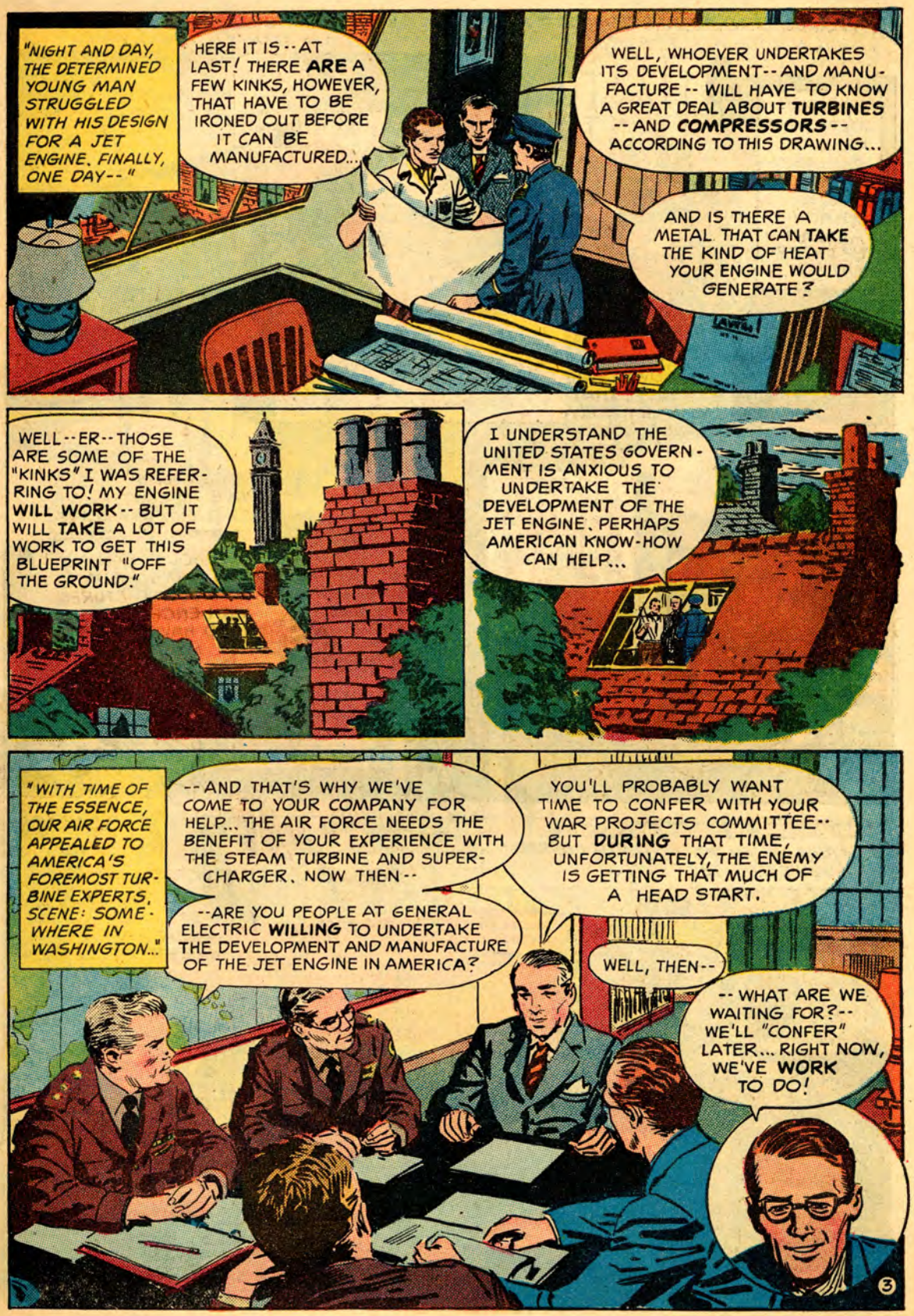
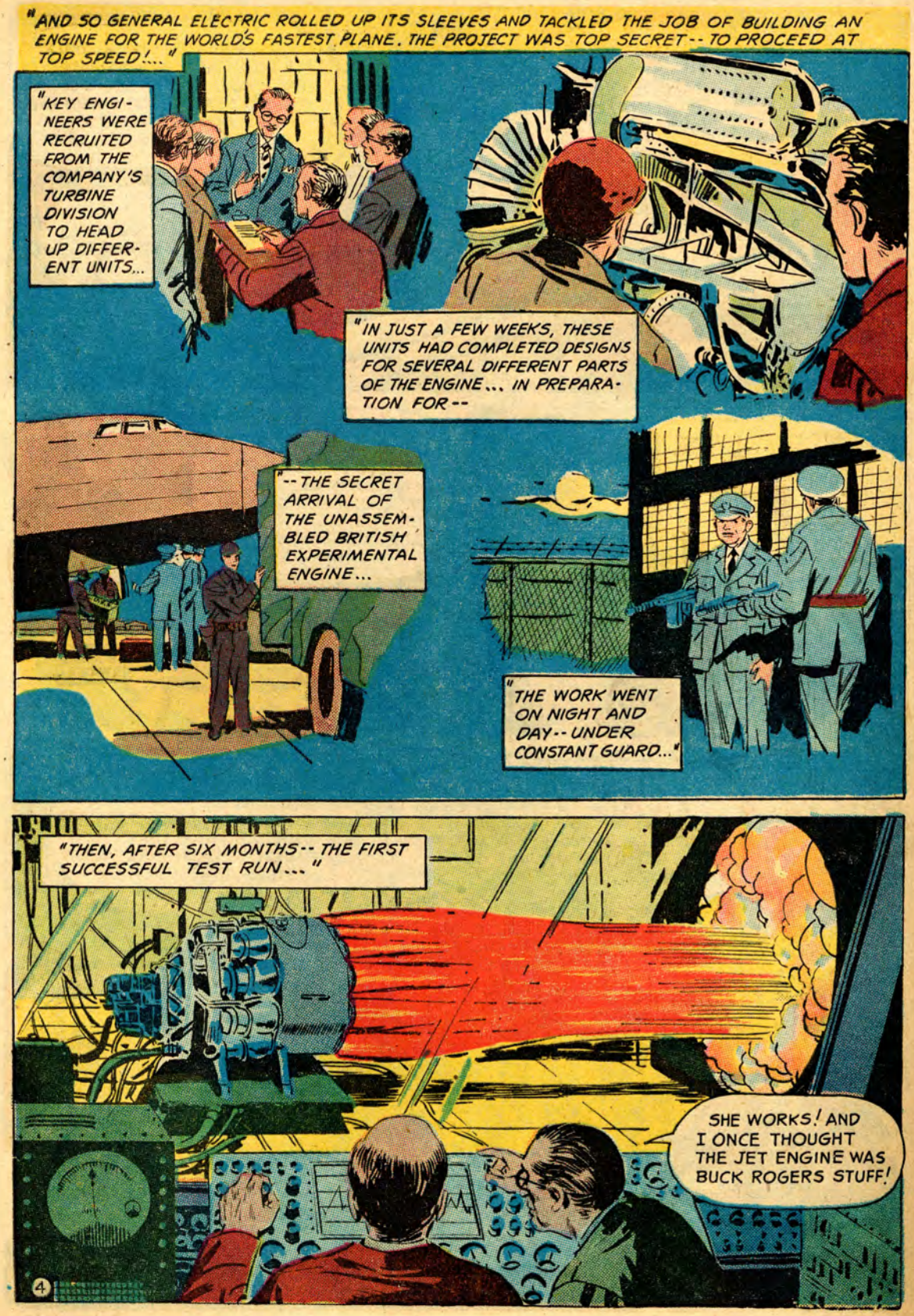

ADVENTURES IN
JET POWER
Convair B-58
U.S. AIR FORCE
ADVENTURES IN
SCIENCE SERIES
GENERAL ELECTRIC




"NIGHT AND DAY, THE DETERMINED YOUNG MAN STRUGGLED WITH HIS DESIGN FOR A JET ENGINE. FINALLY, ONE DAY--"
HERE IT IS--AT LAST! THERE ARE A FEW KINKS, HOWEVER, THAT HAVE TO BE IRONED OUT BEFORE IT CAN BE MANUFACTURED...
WELL, WHOEVER UNDERTAKES ITS DEVELOPMENT--AND MANUFACTURE--WILL HAVE TO KNOW A GREAT DEAL ABOUT TURBINES--AND COMPRESSORS--ACCORDING TO THIS DRAWING...
AND IS THERE A METAL THAT CAN TAKE THE KIND OF HEAT YOUR ENGINE WOULD GENERATE?
WELL--ER--THOSE ARE SOME OF THE "KINKS" I WAS REFERRING TO! MY ENGINE WILL WORK--BUT IT WILL TAKE A LOT OF WORK TO GET THIS BLUEPRINT "OFF THE GROUND."
I UNDERSTAND THE UNITED STATES GOVERNMENT IS ANXIOUS TO UNDERTAKE THE DEVELOPMENT OF THE JET ENGINE. PERHAPS AMERICAN KNOW-HOW CAN HELP...
"WITH TIME OF THE ESSENCE, OUR AIR FORCE APPEALED TO AMERICA'S FOREMOST TURBINE EXPERTS, SCENE: SOMEWHERE IN WASHINGTON..."
--AND THAT'S WHY WE'VE COME TO YOUR COMPANY FOR HELP... THE AIR FORCE NEEDS THE BENEFIT OF YOUR EXPERIENCE WITH THE STEAM TURBINE AND SUPERCHARGER. NOW THEN--
--ARE YOU PEOPLE AT GENERAL ELECTRIC WILLING TO UNDERTAKE THE DEVELOPMENT AND MANUFACTURE OF THE JET ENGINE IN AMERICA?
YOU'LL PROBABLY WANT TIME TO CONFER WITH YOUR WAR PROJECTS COMMITTEE--BUT DURING THAT TIME, UNFORTUNATELY, THE ENEMY IS GETTING THAT MUCH OF A HEAD START.
WELL, THEN--
--WHAT ARE WE WAITING FOR?--WE'LL "CONFER" LATER... RIGHT NOW, WE'VE WORK TO DO!
3


"AND SO GENERAL ELECTRIC ROLLED UP ITS SLEEVES AND TACKLED THE JOB OF BUILDING AN ENGINE FOR THE WORLD'S FASTEST PLANE. THE PROJECT WAS TOP SECRET -- TO PROCEED AT TOP SPEED!..."
"KEY ENGINEERS WERE RECRUITED FROM THE COMPANY'S TURBINE DIVISION TO HEAD UP DIFFERENT UNITS...
"IN JUST A FEW WEEKS, THESE UNITS HAD COMPLETED DESIGNS FOR SEVERAL DIFFERENT PARTS OF THE ENGINE... IN PREPARATION FOR --
"-- THE SECRET ARRIVAL OF THE UNASSEMBLED BRITISH EXPERIMENTAL ENGINE...
"THE WORK WENT ON NIGHT AND DAY -- UNDER CONSTANT GUARD..."
"THEN, AFTER SIX MONTHS -- THE FIRST SUCCESSFUL TEST RUN..."
SHE WORKS! AND I ONCE THOUGHT THE JET ENGINE WAS BUCK ROGERS STUFF!
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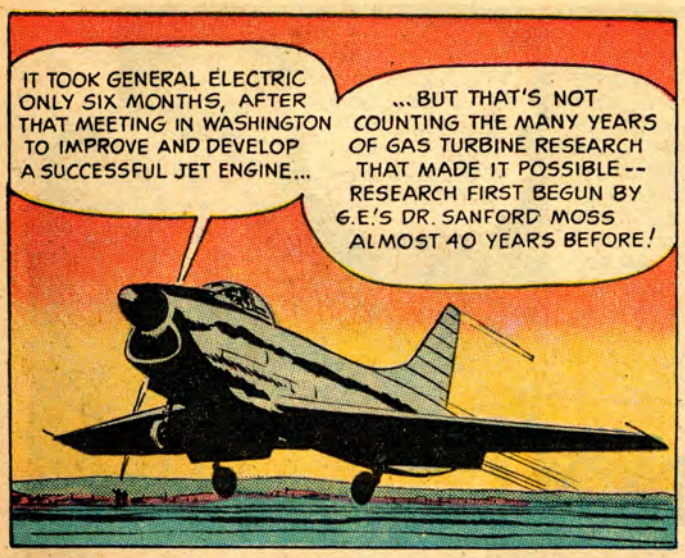
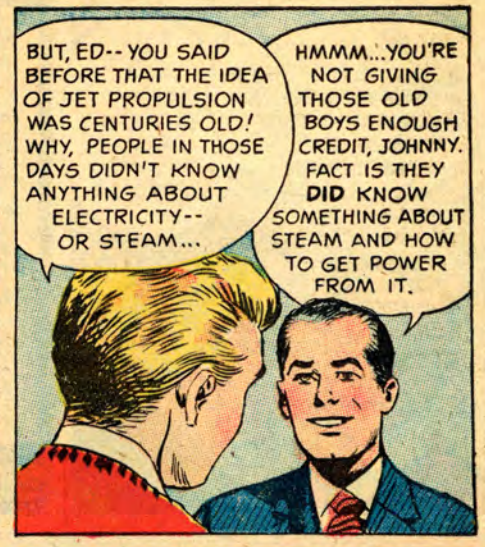
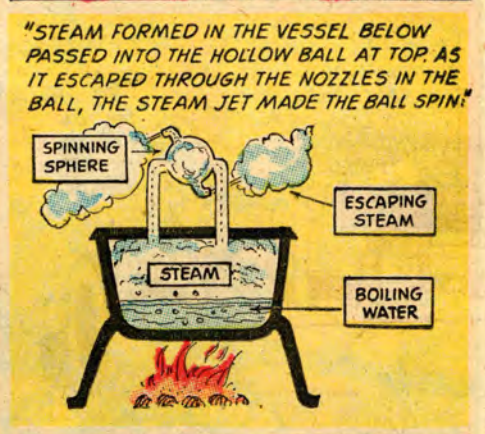
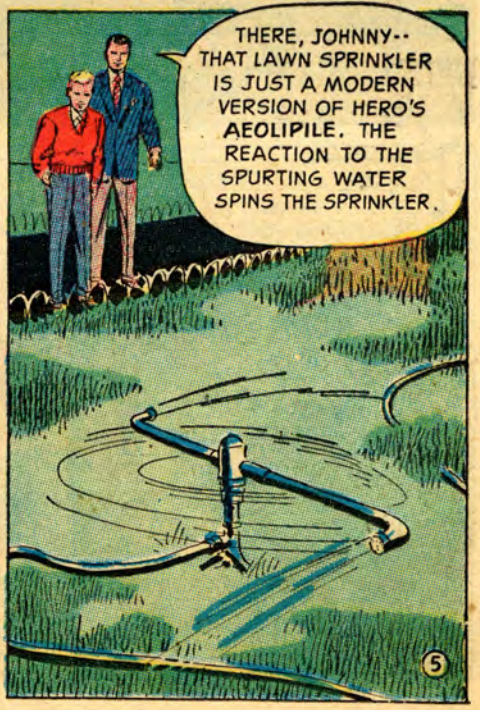

IT TOOK GENERAL ELECTRIC ONLY SIX MONTHS, AFTER THAT MEETING IN WASHINGTON TO IMPROVE AND DEVELOP A SUCCESSFUL JET ENGINE...
...BUT THAT'S NOT COUNTING THE MANY YEARS OF GAS TURBINE RESEARCH THAT MADE IT POSSIBLE -- RESEARCH FIRST BEGUN BY G.E.'S DR. SANFORD MOSS ALMOST 40 YEARS BEFORE!


BUT, ED-- YOU SAID BEFORE THAT THE IDEA OF JET PROPULSION WAS CENTURIES OLD! WHY, PEOPLE IN THOSE DAYS DIDN'T KNOW ANYTHING ABOUT ELECTRICITY-- OR STEAM...
HMMM...YOU'RE NOT GIVING THOSE OLD BOYS ENOUGH CREDIT, JOHNNY. FACT IS THEY **DID** KNOW SOMETHING ABOUT STEAM AND HOW TO GET POWER FROM IT.


"ABOUT 2,000 YEARS AGO, HERO OF ALEXANDRIA INVENTED THE FIRST STEAM TURBINE..."
IT SPINS BY ITSELF... 'TIS MAGIC!
AYE, THE MAGIC OF MY MIGHTY BRAIN!


"STEAM FORMED IN THE VESSEL BELOW PASSED INTO THE HOLLOW BALL AT TOP. AS IT ESCAPED THROUGH THE NOZZLES IN THE BALL, THE STEAM JET MADE THE BALL SPIN."
SPINNING SPHERE
ESCAPING STEAM
STEAM
BOILING WATER


THERE, JOHNNY-- THAT LAWN SPRINKLER IS JUST A MODERN VERSION OF HERO'S **AEOLIPILE**. THE REACTION TO THE SPURTING WATER SPINS THE SPRINKLER.


BUT THAT SPRINKLER DOESN'T GO ANY PLACE. THAT'S A LONG WAY FROM A JET PLANE THAT FLIES AT SUPER-SONIC SPEEDS!
THAT'S RIGHT, JOHNNY. BUT IT'S BASED ON THE SAME IDEA.
"ACTUALLY, IT WASN'T UNTIL 1620 THAT SOME-ONE HAD THE IDEA OF USING JET PROPUL-SION FOR FORWARD MOTION. REMEMBER SIR ISAAC NEWTON'S THIRD LAW OF MOTION?"
EVERY ACTION PRODUCES A REACTION, WHICH IS EQUAL IN FORCE AND OPPOSITE IN DIRECTION.
"THE IDEA'S SIMPLE, JOHNNY. BLOW UP A BALLOON LIKE THIS ONE... AND WHEN YOU LET IT GO..."
THE AIR SHOOTS OUT IN ONE DIRECTION THROUGH THE OPENING... AND THE REACTION PUSHES THE BALLOON IN THE OPPOSITE DIRECTION.
"OR TAKE A BOY STEPPING OUT OF A CANOE. AS HE THRUSTS HIS FOOT FORWARD, THE CANOE SHOOTS BACK."
"NEWTON PLANNED TO PUT HIS THIRD LAW TO WORK IN A JET PROPELLED HORSELESS CARRIAGE... BUT THE IDEA NEVER GOT BEYOND THE PLAN-NING STAGE."
"AND HERE'S A ROUGH IDEA OF WHAT ITS 'INSIDES' WOULD HAVE LOOKED LIKE..."
STEAM
BOILING WATER
FIRE
6

SURE I GET IT... BUT A MODERN JET ENGINE DOESN'T GET ITS POWER FROM STEAM PRESSURE, DOES IT?

NO, JOHNNY. TODAY, JETS GET THEIR POWER FROM THE HOT EXPANDING GASES PRODUCED BY THE CONTINUOUS BURNING OF FUEL. GET IT?

I-I GUESS SO... BUT...

HERE, JOHNNY-- IT'S ALL SPELLED OUT IN THIS LITTLE BOOK. I'LL SHOW YOU...

"(1) AIR IS SUCKED INTO THE ENGINE THROUGH THE ***INTAKE*** AND ON INTO THE--

(2) ***COMPRESSOR,*** WHICH — ACTING LIKE A LARGE FAN - COMPRESSES THE AIR FROM FIVE TO FIFTEEN TIMES ATMOSPHERIC PRESSURE AND FORCES IT THROUGH DUCTS TO THE--

(3) ***COMBUSTION CHAMBERS,*** WHERE--

1. INTAKE
2. COMPRESSOR
3. COMBUSTION CHAMBERS

"(4) ***FUEL*** IS SPRAYED INTO THE COMPRESSED AIR AND IGNITED. THE BURNING GASES EXPAND RAPIDLY AND BLAST THEIR WAY OUT THE REAR OF THE ENGINE. THIS JET BLAST GIVES THE ENGINE AND AIRPLANE ITS ENORMOUS FORWARD 'PUSH!'"

NOW TO SEE WHAT TURNS THE COMPRESSOR, IN THE FIRST PLACE...

4. FUEL INJECTORS
(BURNING GASES)

"AS THE HOT GASES RUSH OUT OF THE ENGINE, THEY PASS THROUGH A FAN-LIKE SET OF BLADES — THE

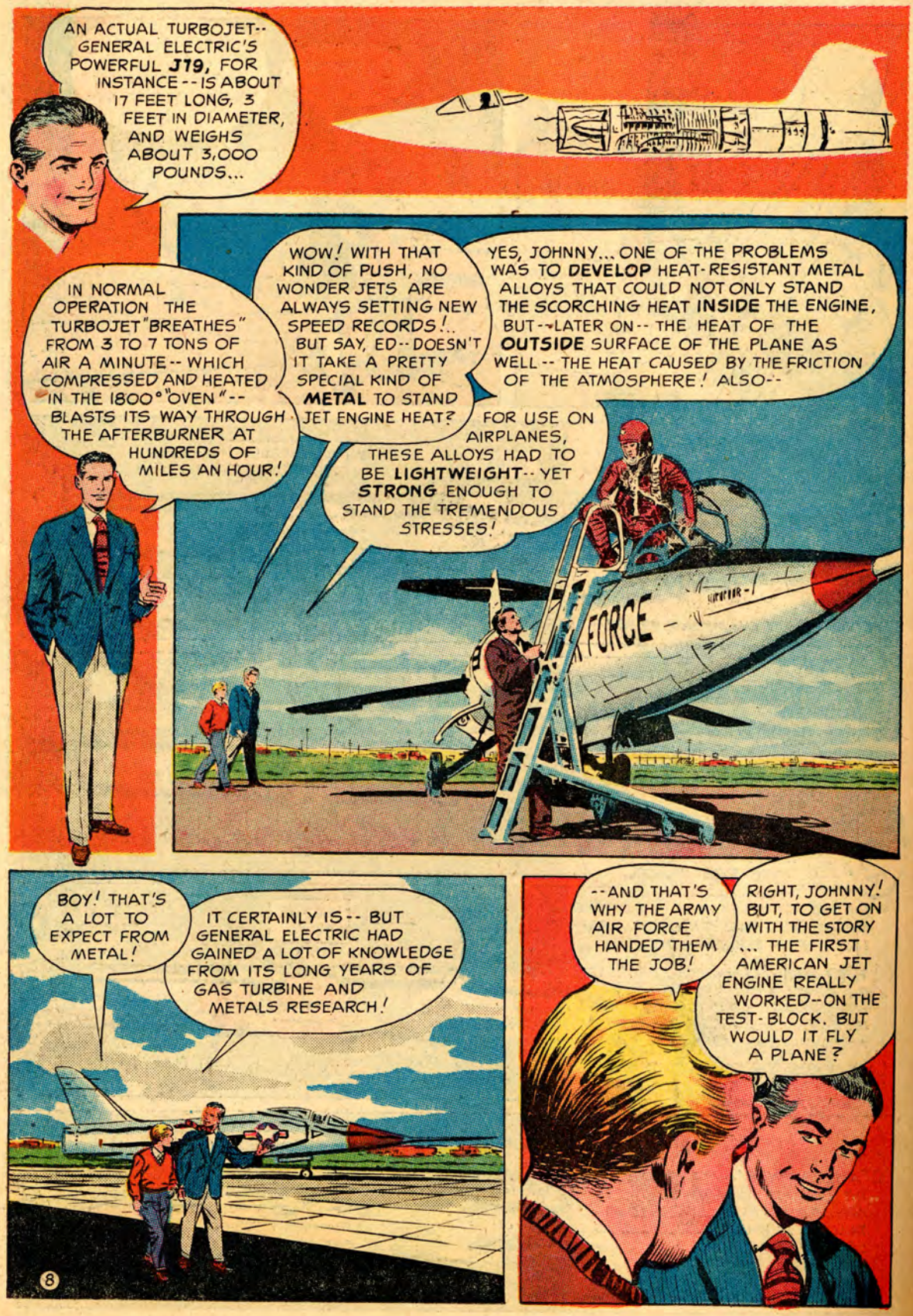
(5) ***TURBINE-WHEEL*** — WHICH REACTS LIKE A WINDMILL AND TURNS THE MAIN ENGINE SHAFT. (THIS TURNING POWER IS TRANSMITTED TO THE COMPRESSOR WHICH PACKS IN MORE FRESH AIR).

SOME ENGINES, DESIGNED TO GIVE EXTRA PUSHING POWER (CALLED '***THRUST***'), HAVE AN--

5. TURBINE WHEEL
(JET BLAST)

"(6) '***AFTERBURNER***' — ATTACHED TO THE REAR OF THE ENGINE. THE AFTERBURNER IS AN EXTRA-LONG TAILCONE IN WHICH MORE FUEL IS SPRAYED AND BURNED."

6. AFTERBURNER


AN ACTUAL TURBOJET-- GENERAL ELECTRIC'S POWERFUL J79, FOR INSTANCE -- IS ABOUT 17 FEET LONG, 3 FEET IN DIAMETER, AND WEIGHS ABOUT 3,000 POUNDS...
IN NORMAL OPERATION THE TURBOJET "BREATHES" FROM 3 TO 7 TONS OF AIR A MINUTE -- WHICH COMPRESSED AND HEATED IN THE 1800° "OVEN" -- BLASTS ITS WAY THROUGH THE AFTERBURNER AT HUNDREDS OF MILES AN HOUR!
WOW! WITH THAT KIND OF PUSH, NO WONDER JETS ARE ALWAYS SETTING NEW SPEED RECORDS!.. BUT SAY, ED -- DOESN'T IT TAKE A PRETTY SPECIAL KIND OF METAL TO STAND JET ENGINE HEAT?
YES, JOHNNY... ONE OF THE PROBLEMS WAS TO DEVELOP HEAT-RESISTANT METAL ALLOYS THAT COULD NOT ONLY STAND THE SCORCHING HEAT INSIDE THE ENGINE, BUT -- LATER ON -- THE HEAT OF THE OUTSIDE SURFACE OF THE PLANE AS WELL -- THE HEAT CAUSED BY THE FRICTION OF THE ATMOSPHERE! ALSO--
FOR USE ON AIRPLANES, THESE ALLOYS HAD TO BE LIGHTWEIGHT -- YET STRONG ENOUGH TO STAND THE TREMENDOUS STRESSES!
FORCE
BOY! THAT'S A LOT TO EXPECT FROM METAL!
IT CERTAINLY IS -- BUT GENERAL ELECTRIC HAD GAINED A LOT OF KNOWLEDGE FROM ITS LONG YEARS OF GAS TURBINE AND METALS RESEARCH!
--AND THAT'S WHY THE ARMY AIR FORCE HANDED THEM THE JOB!
RIGHT, JOHNNY! BUT, TO GET ON WITH THE STORY ... THE FIRST AMERICAN JET ENGINE REALLY WORKED -- ON THE TEST-BLOCK. BUT WOULD IT FLY A PLANE?
8

"THE ANSWER CAME IN OCTOBER, 1942, AT MUROC, CALIFORNIA. AN EXPERIMENTAL P-59 BELL AIRACOMET EQUIPPED WITH TWO GENERAL ELECTRIC JET ENGINES, WAS READY FOR ITS FLIGHT TESTS..."

THE ENGINES HAVE PASSED ALL THEIR GROUND TESTS... NOW, THE **BIG** ONE -- THE FINAL TEST -- IS IN YOUR HANDS! GOOD LUCK!

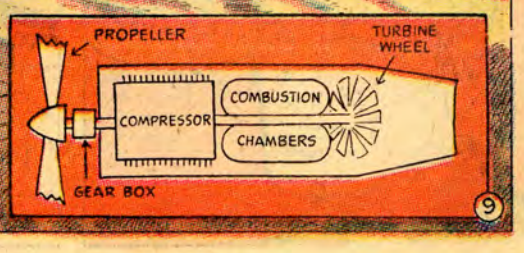
"THE DAREDEVIL PILOT TOOK A DEEP BREATH... STARTED THE ENGINES, AND -- OUR COUNTRY'S FIRST JET-PLANE TOOK TO THE SKIES!--

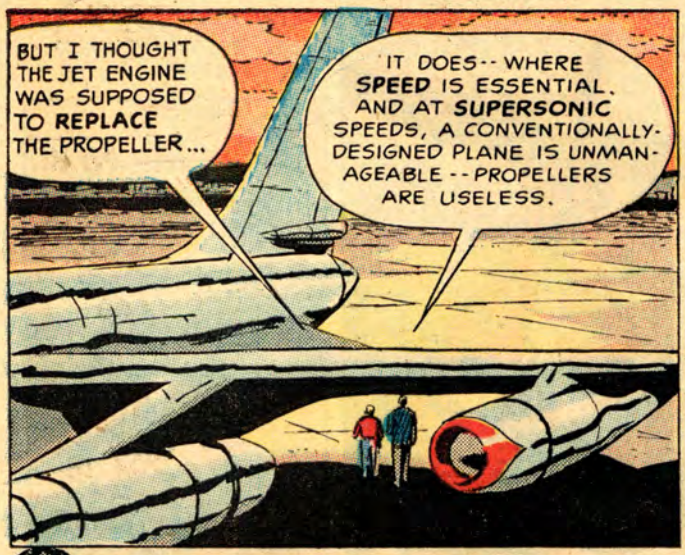
"--AND PASSED ITS TEST FLIGHT WITH 'FLYING COLORS'!..."

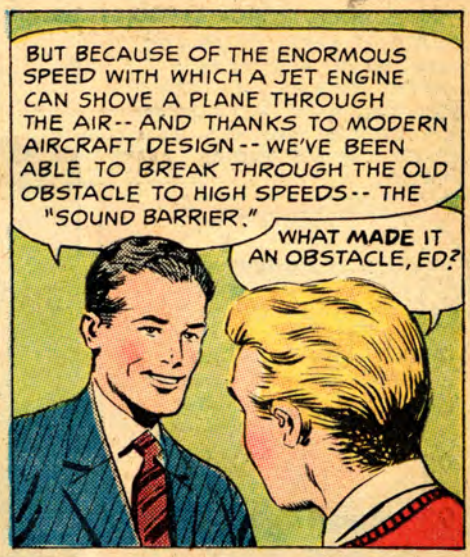
I TOOK HER UP TO 10,000 — AND NEVER KNEW FLYING COULD BE SO QUIET OR SMOOTH! -- NOT A SOUND OR A VIBRATION!

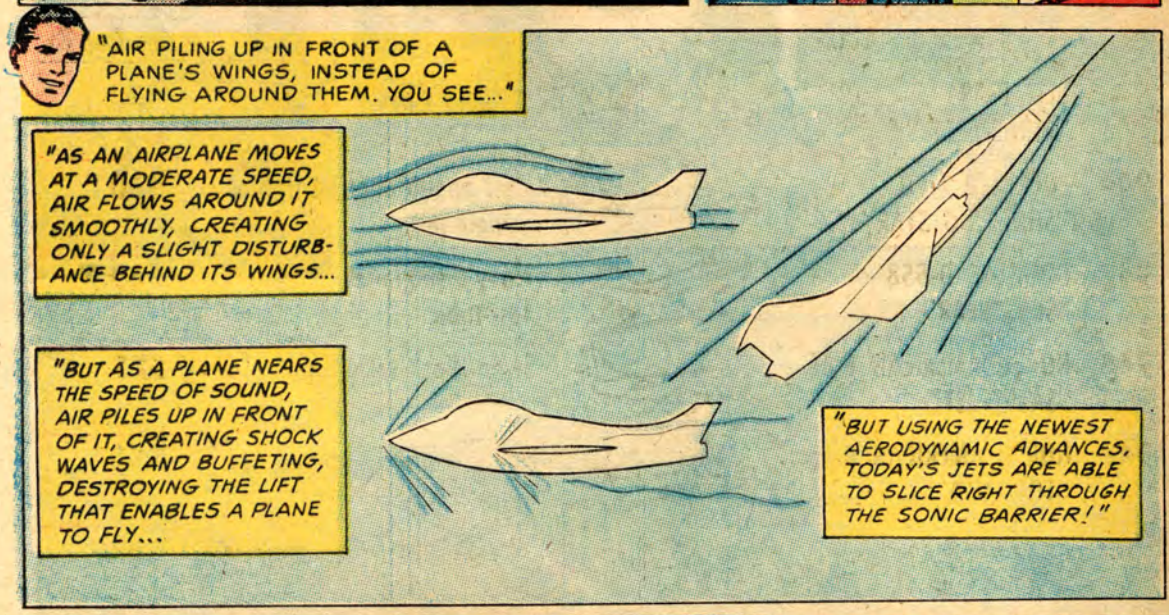
"SOON CAME OTHER TYPES -- FAST AND FURIOUS! -- THE LOCKHEED F-80 'SHOOTING STAR! WITH AN IMPROVED JET ENGINE! IT WAS OUR FIRST OPERATIONAL JET FIGHTER; IT SET RECORD AFTER RECORD -- COAST TO COAST IN 4½ HOURS... NEW YORK TO SCHENECTADY IN 17 MINUTES!"

"THEN THE **TURBOPROP** -- POWERING THE CONVAIR **XF-81** -- IN WHICH THE JET BLAST IS USED TO TURN THE BLADES OF A **PROPELLER**..."

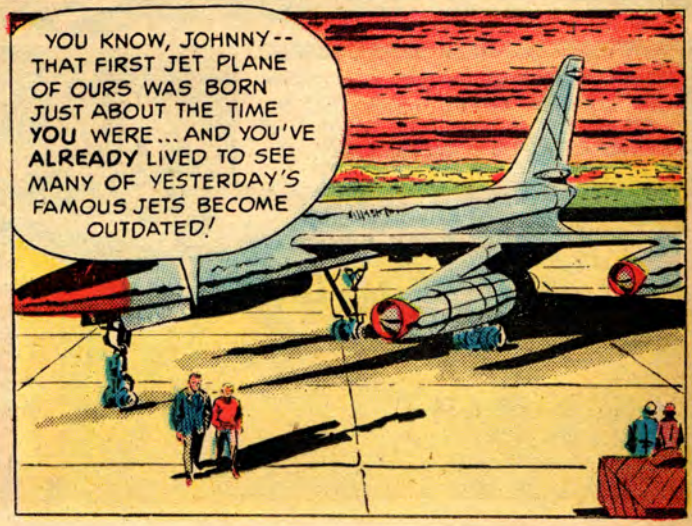



BUT I THOUGHT THE JET ENGINE WAS SUPPOSED TO **REPLACE** THE PROPELLER...
IT DOES -- WHERE **SPEED** IS ESSENTIAL. AND AT **SUPERSONIC** SPEEDS, A CONVENTIONALLY-DESIGNED PLANE IS UNMANAGEABLE -- PROPELLERS ARE USELESS.


BUT BECAUSE OF THE ENORMOUS SPEED WITH WHICH A JET ENGINE CAN SHOVE A PLANE THROUGH THE AIR -- AND THANKS TO MODERN AIRCRAFT DESIGN -- WE'VE BEEN ABLE TO BREAK THROUGH THE OLD OBSTACLE TO HIGH SPEEDS -- THE "SOUND BARRIER."
WHAT **MADE** IT AN OBSTACLE, ED?


"AIR PILING UP IN FRONT OF A PLANE'S WINGS, INSTEAD OF FLYING AROUND THEM. YOU SEE..."
"AS AN AIRPLANE MOVES AT A MODERATE SPEED, AIR FLOWS AROUND IT SMOOTHLY, CREATING ONLY A SLIGHT DISTURBANCE BEHIND ITS WINGS...
"BUT AS A PLANE NEARS THE SPEED OF SOUND, AIR PILES UP IN FRONT OF IT, CREATING SHOCK WAVES AND BUFFETING, DESTROYING THE LIFT THAT ENABLES A PLANE TO FLY...
"BUT USING THE NEWEST AERODYNAMIC ADVANCES, TODAY'S JETS ARE ABLE TO SLICE RIGHT THROUGH THE SONIC BARRIER!"


BECAUSE GREATER SPEED IS ESSENTIAL FOR MILITARY AND COMMERCIAL PLANES, OUR AERONAUTICAL ENGINEERS ARE CONTINUOUSLY AT WORK TO PRODUCE FASTER AND MORE ECONOMICAL JET PLANES...
10


YOU KNOW, JOHNNY -- THAT FIRST JET PLANE OF OURS WAS BORN JUST ABOUT THE TIME **YOU** WERE... AND YOU'VE **ALREADY** LIVED TO SEE MANY OF YESTERDAY'S FAMOUS JETS BECOME OUTDATED!

YES, IT TOOK US OVER **30** YEARS TO COME UP WITH A CONVENTIONAL PLANE THAT COULD TRAVEL AT ABOUT **HALF** THE SPEED OF SOUND... BUT WITH THE **JET**, WE HAVE **DOUBLED** THE SPEED OF SOUND -- IN LESS THAN **15** YEARS...

BIRTH OF AIR AGE IN AMERICA			Miles Per Hr.
1903	ORVILLE WRIGHT		120 ft. in 12 sec.
1904	WILBUR WRIGHT		50
1919	ARMY PLANES		106
1931	RUTH NICHOLS		210.65
1932	JIMMY DOOLITTLE		294.28
1935	HOWARD HUGHES		352.388

BIRTH OF JET AGE IN AMERICA				Miles Per Hr.
1942	BELL P-59 "AIRACOMET"		America's first jet plane	450
1944	LOCKHEED F-80 "SHOOTING STAR"		First operational jet-fighter (single-jet)	580
1947	DOUGLAS D-558 "SKYSTREAK"		Navy's single-jet test-tube	640.7
1948	NORTH AMERICAN F-86 "SABRE JET"		Swept-back-wing fighter	671
1948	NORTH AMERICAN B-45 "TORNADO"		First operational jet bomber (4 jets)	550
1949	CONVAIR B-36		World's largest and longest range bomber (4 jets plus 6 piston engines)	435
1951	BOEING B-47 "STRATOJET"		World's fastest bomber (6 jets)	600 plus
1953	NORTH AMERICAN F-86D "SABRE JET"		Interceptor, with after-burner	700
1954	NORTH AMERICAN F-86H		Tactical fighter-bomber	700
1956	LOCKHEED F-104A "STARFIGHTER"		Fastest U. S. fighter	Supersonic
1956	CONVAIR B-58 "HUSTLER"		America's first supersonic bomber	Over 1,100


OVER 1,100 MILES AN HOUR?! THAT'S NEARLY TWICE THE SPEED OF SOUND! THIS J79 ENGINE IS REALLY A POWERHOUSE!
NOT ONLY DOES IT DELIVER TWICE AS MUCH POWER AS THE G-E J47 THAT PRECEDED IT-- BUT IT'S SMALLER AND LIGHTER!
Convair B-58
GENERAL ELECTRIC'S J79 IS AMERICA'S MOST ADVANCED TURBOJET-- THE POWERPLANT OF OUR FASTEST NEW MILITARY AIRCRAFT...
"THE USAF CONVAIR B-58-'HUSTLER' -THE FIRST, AND WORLD'S FASTEST SUPERSONIC BOMBER... THE DELTA-WINGED B-58, POWERED BY FOUR J79'S, IS DESIGNED TO OPERATE AT ALTITUDES ABOVE 50,000 FEET-- CARRIES A THREE-MAN CREW...
"THE USN GRUMMAN F11F-1F - ONE OF THE FASTEST NAVY FIGHTERS YET TESTED...
U.S. NAVY
"THE USN CHANCE-VOUGHT 'REGULUS II' -- OUR NAVY'S SURFACE-TO-SURFACE MISSILE, WHICH WILL FLY FASTER THAN SOUND, AT ALTITUDES OF OVER 50,000 FEET. THE REGULUS II WILL BE LAUNCHED FROM SUBMARINES, SURFACE SHIPS, LAND BASES -- GUIDED WITH 'PIN-POINT' ACCURACY TO TARGETS HUNDREDS OF MILES AWAY...
"THE USAF LOCKHEED F-104A - THE 'STARFIGHTER' - OUR COUNTRY'S FASTEST FIGHTER... THIS SLIM STREAK OF FIGHTING POWER IS THE FASTEST-CLIMBING, HIGHEST-FLYING JET FIGHTER IN THE SKY -- ITS RAZOR-BLADE THIN WINGS SO SHARP THAT SHEATHS ARE FITTED ONTO THEIR EDGES TO PROTECT GROUND CREWMEN!"
U.S. AIR FORCE
52959

GEE, ED--HOW ABOUT JET-PROPELLED **PASSENGER** PLANES?

RIGHT **NOW**, GENERAL ELECTRIC IS FILLING AIRLINE ORDERS FOR ITS **COMMERCIAL** VERSION OF THE POWERFUL J79--THE ***CJ-805***, DESIGNED TO POWER MEDIUM-RANGE JETLINERS FOR DAILY PUBLIC USE...

"THE **CONVAIR 880**—POWERED BY FOUR G-E CJ-805'S--WILL OFFER SWIFT JET FLIGHT TO AMERICA'S AIR TRAVELLERS, WHETHER THEIR DESTINATION IS 200 OR 3000 MILES AWAY..."

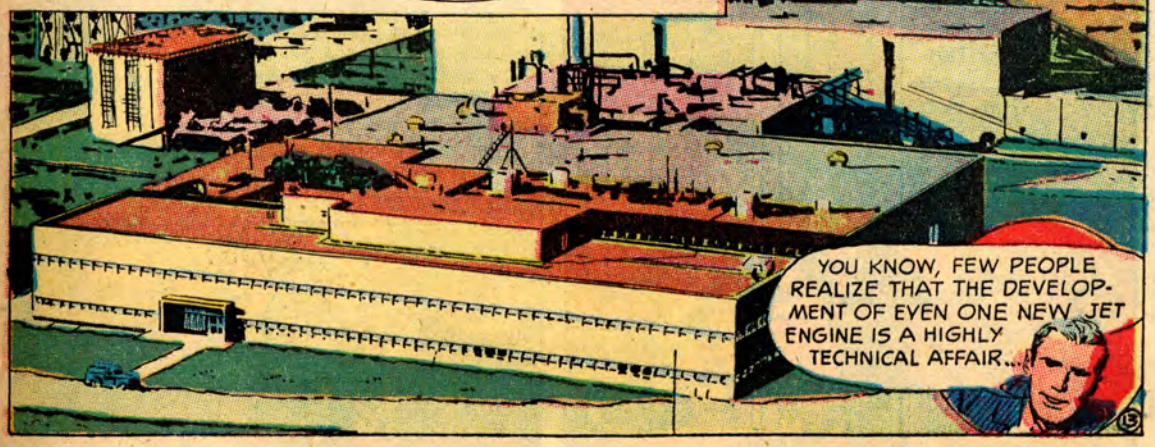
"THESE 88-TO-104 PASSENGER GIANT JET-LINERS, CRUISING AT OVER 600 MILES AN HOUR, WILL CUT CURRENT FLIGHT TIME BETWEEN CITIES UP TO 50%!"

AND THE FLYING WILL BE SO SMOOTH AND VIBRATIONLESS, YOU'LL BE ABLE TO BALANCE A QUARTER ON EDGE ON THE TABLE IN FRONT OF YOU!

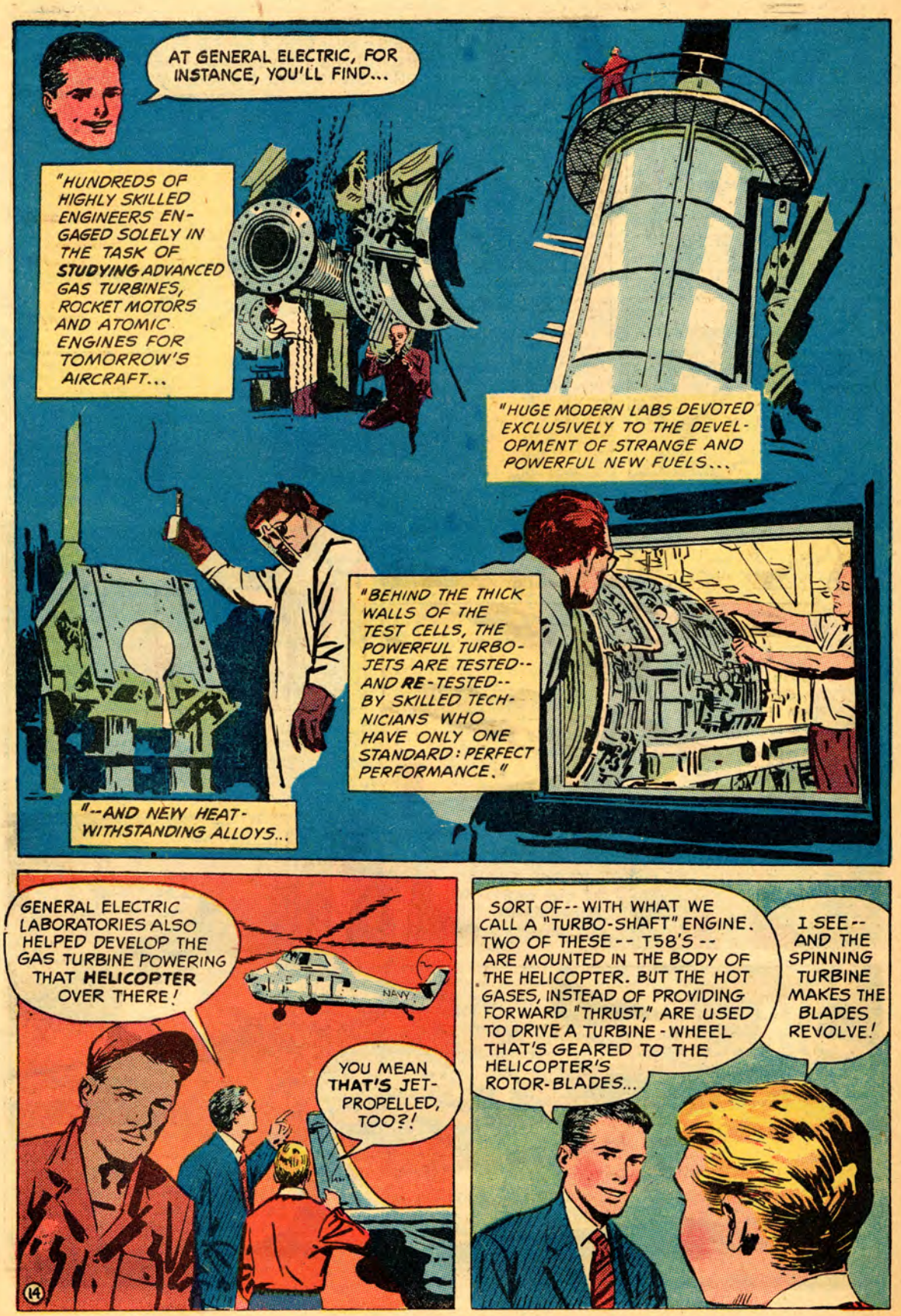
THAT KIND OF SPEED AND COMFORT IS WHAT I CALL **REAL LUXURY** TRAVELLING!

LUXURY FOR US PASSENGERS, YES. BUT AS FAR AS THE AIRLINES ARE CONCERNED, THE CJ-805 PROMISES TO BE THE MOST **ECONOMICAL** JET ENGINE IN THE WORLD TO OWN, OPERATE AND SERVICE!

"TO MEET AVIATION'S DEMAND FOR MORE EFFICIENT, MORE POWERFUL JET ENGINES, GENERAL ELECTRIC BUILT A MULTI-MILLION DOLLAR 'APPLIED RESEARCH' LABORATORY AT CINCINNATI..."



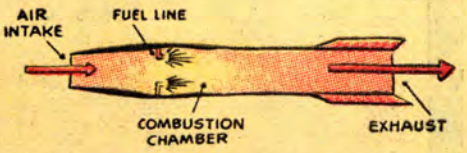
YOU KNOW, FEW PEOPLE REALIZE THAT THE DEVELOPMENT OF EVEN ONE NEW JET ENGINE IS A HIGHLY TECHNICAL AFFAIR...


AT GENERAL ELECTRIC, FOR INSTANCE, YOU'LL FIND...
"HUNDREDS OF HIGHLY SKILLED ENGINEERS ENGAGED SOLELY IN THE TASK OF STUDYING ADVANCED GAS TURBINES, ROCKET MOTORS AND ATOMIC ENGINES FOR TOMORROW'S AIRCRAFT...
"HUGE MODERN LABS DEVOTED EXCLUSIVELY TO THE DEVELOPMENT OF STRANGE AND POWERFUL NEW FUELS...
"--AND NEW HEAT-WITHSTANDING ALLOYS...
"BEHIND THE THICK WALLS OF THE TEST CELLS, THE POWERFUL TURBO-JETS ARE TESTED--AND RE-TESTED--BY SKILLED TECHNICIANS WHO HAVE ONLY ONE STANDARD: PERFECT PERFORMANCE."
GENERAL ELECTRIC LABORATORIES ALSO HELPED DEVELOP THE GAS TURBINE POWERING THAT HELICOPTER OVER THERE!
NAVY
YOU MEAN THAT'S JET-PROPELLED, TOO?!
SORT OF--WITH WHAT WE CALL A "TURBO-SHAFT" ENGINE. TWO OF THESE -- T58'S -- ARE MOUNTED IN THE BODY OF THE HELICOPTER. BUT THE HOT GASES, INSTEAD OF PROVIDING FORWARD "THRUST," ARE USED TO DRIVE A TURBINE-WHEEL THAT'S GEARED TO THE HELICOPTER'S ROTOR-BLADES...
I SEE--AND THE SPINNING TURBINE MAKES THE BLADES REVOLVE!
14

IN SOME EXPERIMENTAL HELICOPTERS, HOWEVER, JET POWER CAN BE USED ANOTHER WAY... VERY SMALL JET ENGINES – "**RAMJETS**" – ARE MOUNTED AT THE TIP OF EACH ROTOR BLADES TO DO THE TURNING!

ARE "RAMJETS" DIFFERENT FROM THE JET ENGINES WE'VE BEEN TALKING ABOUT?

THEY'RE THE SIMPLEST FORM OF JET ENGINE ... JUST AN **OPEN** TUBE, WITH NO AIR COMPRESSOR... IT GETS ITS NAME FROM THE FACT THAT AIR IS RAMMED THROUGH IT AND COMPRESSED BY THE SHEER SPEED OF ITS FLIGHT!

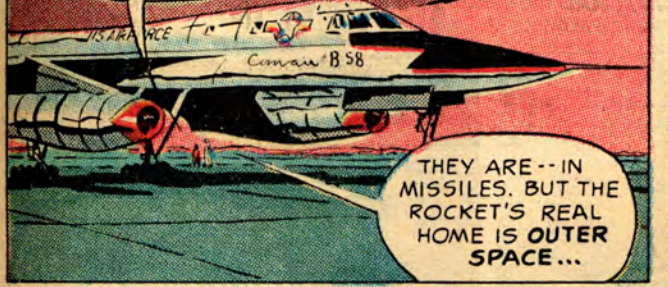


"– SORT OF A 'FIRE IN A FLYING STOVEPIPE'!"

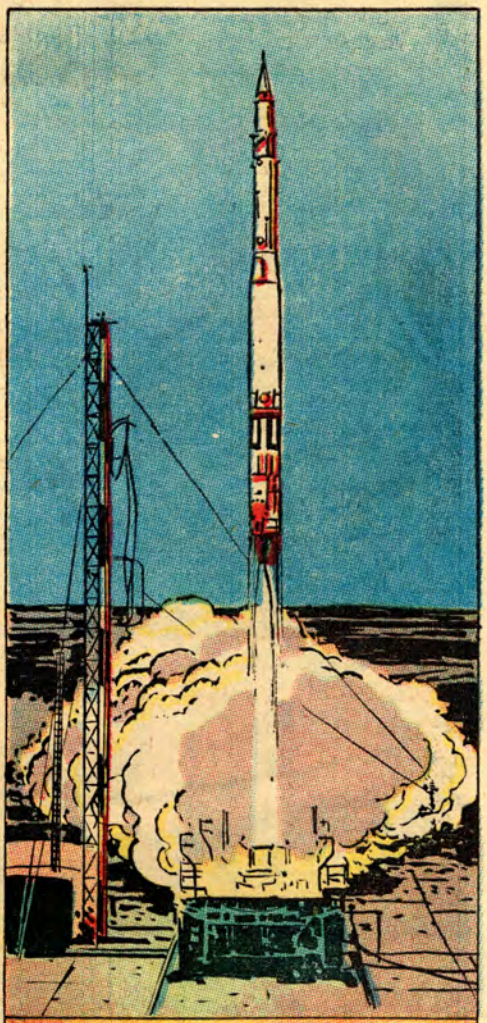
DOES THAT MEAN IT HAS TO BE MOVING PRETTY FAST BEFORE IT CAN WORK?

YES, RAMJETS DON'T BEGIN TO WORK WELL UNTIL THEY NEAR THE SPEED OF SOUND... SO THEY NEED TAKE-OFF ASSISTANCE. THAT'S WHY, IN PLANES OF THE FUTURE, THE **TURBOJET** MIGHT BE **TEAMED** WITH THE RAMJET -- WHICH COULD TAKE OVER AT HIGH SPEED.

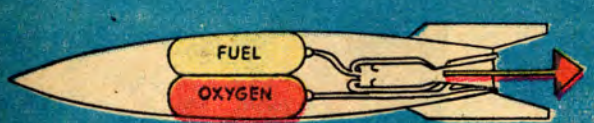
COULDN'T **ROCKET**-ENGINES BE USED TO GET THE RAMJET UP AND STARTED?



THEY ARE -- IN MISSILES. BUT THE ROCKET'S REAL HOME IS **OUTER SPACE**...



IT'S THE ONLY JET-PROPELLED DEVICE THAT CAN "BREATHE" OUTSIDE THE EARTH'S ATMOSPHERE, SINCE IT CARRIES ITS OWN OXYGEN TO BURN WITH THE FUEL ...



"IN G-E'S **X405** ROCKET ENGINE, THE FLAMING GASES BLAST OUT THE TAIL END AT 4500 MPH! -- A POWERFUL-ENOUGH BOOST TO SEND A 72-FOOT ROCKET ZOOMING **36 MILES** ABOVE THE EARTH -- AT A SPEED OF **4,000 MILES AN HOUR!**