

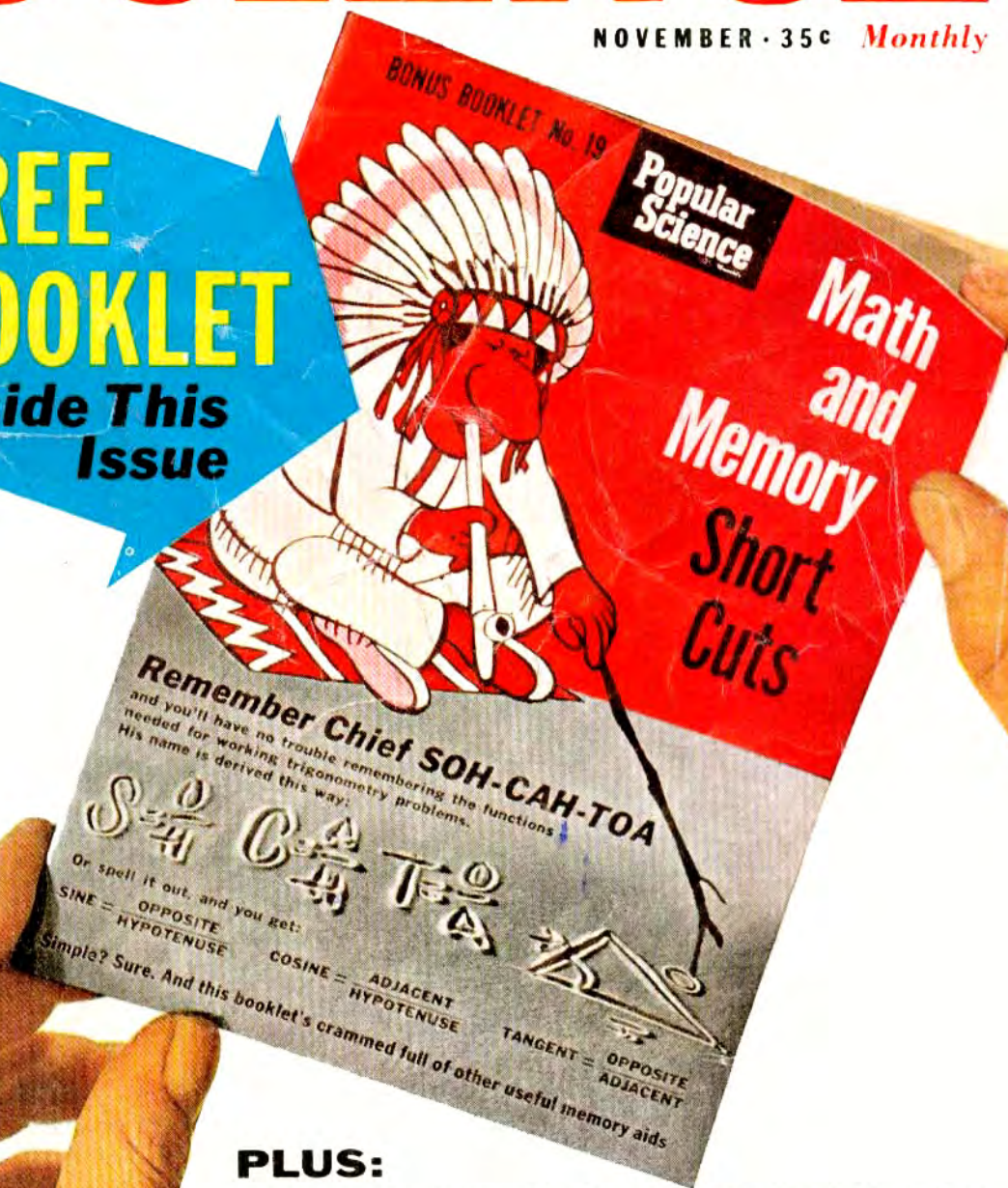
Big Winter Workshop Section—56 Pages

POPULAR SCIENCE

NOVEMBER • 35¢ *Monthly*

**FREE
BOOKLET**

**Inside This
Issue**



PLUS:

FORD'S NEW IN-BETWEEN CAR

Gus Goes to the Movies



By Martin Bunn

GUS Wilson rolled out from under a station wagon on the apron of the Model Garage. "Muffler and tailpipe are okay," he said. "Let's look inside."

Bill Ames moved over and Gus inspected the exhaust manifolds, crossover, and joints. Nowhere did the reddish surface show the sooty streaks of exhaust leaks.

"Everything's all right here, too," he reported. "What made you think of exhaust leaks?"

"My wife," answered Ames. "On long trips she rides in back to keep the kids under control. Gets a headache every time, even with the back window open."

Gus dropped the hood. "Try keeping that window shut, but one or two others at least part way open."

"She'll complain about drafts," said Ames. "The rear window ventilates but doesn't let in cold drafts."

"No, it lets in exhaust. These square-ended wagons have lots of suction drag. It pulls the exhaust along with you. An

open rear window makes a low-pressure area inside the car, so some gas gets in. It could cause your wife's headaches."

"It could? Well, now I know a busted muffler won't put me to sleep."

"Hold it!" warned Gus. "Safety isn't once-and-for-all. A rock could hole your muffler tomorrow, or open a joint. Any time the exhaust begins to bark, better check. And watch out for snowbanks."

"Snowbanks? Why?"

"Backing into one could plug that straight tailpipe solid," explained Gus. "That might stall your engine. But if it didn't, exhaust might seep into the car while you're spinning your wheels to get out of the drift."

"Okay," said Ames. "I'll watch out."

The brisk fall day wore on. At noon, Harry Towne, a sandy-haired young fireman, drove in his 1955 hardtop.

"Hey Stan," he called to Gus's young helper. "Check the points. Engine's getting sluggish."

Stan set to work and the young fireman watched. Everything checked out. "Nothing wrong with points, timing, valve clearances, and compression," said Stan.



With his flashlight, Gus trudged behind the last row of parked cars.

"Well, thanks," said Towne after a pause. "I've got to get back, but I wish you'd found something wrong because it sure isn't acting right."

"Leave it. I'll check the gas line and fuel pump," suggested Stan.

AS THE fireman left, the phone rang and Gus picked it up. He recognized the tense voice of Tom Hawley, the Model Garage's fussiest customer.

"Get over here fast, Gus," he said. "Something awful's happened."

Knowing this might mean no more

than a scratch on Hawley's beloved and pampered '39 Caddy, Gus asked for details.

"I broke a spark plug! In the engine. Can't get it out," spluttered Hawley. "I was cleaning plugs. When I tightened this one, it broke in two!"

Gus groaned. Hawley made a fetish of the sleek old sedan, bringing it to the shop only for lubrication. He did routine work on it himself.

"I'll send Stan over," said Gus.

The phone made strangled noises about hurrying. Gus could imagine Hawley.

He'd be almost in pain as long as that broken shell remained in the engine.

Stan grinned on hearing of Hawley's predicament. "He sure loves that crate."

"What's wrong with that?" asked Gus. "Anyway, go easy on it—and on him. I'll check Towne's car meanwhile."

GUS found both gas line and pump on the fireman's car were delivering gas well. Puzzled, he turned his light on the exhaust manifolds. At two block joints and the pipe coupling, black streaks darkened the red-burnt metal.

"Back pressure," thought Gus.

He put the car on a lift. The muffler was intact. The tailpipe looped up over the rear axle and straightened behind it. Its oblique end was bent down at the tip as if it had hit something, but not enough to constrict it.

Returning to the bend over the axle, Gus moved his finger up along it. At the top, the curve flattened into two side points. Whatever had bent down the tailpipe had creased the bend, narrowing the pipe there to a mere slit. As he stood staring at it, Stan drove in.

"Can't work for that guy, Boss," he reported. "I offered to let him use the extractor himself, but he was shaking too much. When I began twisting it, he turned green and stopped me. He's afraid chips will get into the cylinder."

"How about putting thick grease on the extractor to hold them?"

Stan shook his head. "I'm afraid he'd faint, Gus. Anyway, he wants you."

"Okay. Towne's trouble is back pressure from a kinked tailpipe. He should get a new one in right away."

STANDING regally in the driveway of Hawley's garage was the Cadillac, its front fenders protected with white cloths. It reminded Gus of the time he'd pushed the car a block—after Hawley rounded up four blankets to protect the Caddy's spotless bumper.

Hawley paced beside it, his spare figure bent as if burdened, droopy mustache quivering. "Thank heaven you've come. Your helper means well—but chips could

ruin the cylinder wall. There must be a better way."

Gus examined the stub in the plug hole. "No chips torn out, Mr. Hawley. But maybe there is another way."

From his kit Gus took an adjustable wrench, a hammer, and a big rasp. Knocking off the handle of the rasp, he inserted the thick tang in the broken plug shell. Beside him Hawley breathed noisily as Gus tapped the four-cornered tang tight.

Closing the wrench on the rasp near the shell, Gus applied turning force. A gasp made him look at Hawley. Under the mustache his lips twitched.

Gus increased torque. The tang's corners held, slowly

turning the shell. Soon he could screw it out by hand. Hawley exploded in a sigh of relief.

WHEN Gus returned to the garage, he saw that Towne's car was gone.

"He had some errands to do before his date tonight," explained Stan. "But he'll bring it back tomorrow for a new tailpipe. He remembers bumping that high curb at the firehouse, but thought it only bent the pipe end."

Gus grunted. "He'd better drive with a window open tonight."

Where'd it come from?



Plus and minus

The plus and minus signs are supposed to have been used first in Holland in the 15th century. They were a shorthand for marking down excess or short weight in bales of goods. Thus if a bale were supposed to weigh four centners (400 lb.) but was five pounds over, it would be marked 4 c. + 5. If it were under by the same amount, it would be marked 4 c. - 5. The signs were used in a similar sense in an arithmetic book published in Leipzig in 1489. About the middle of the next century they became recognized as formal signs of operation—i.e., as indications to perform addition or subtraction.

"Don't worry." Stan said, grinning. "He won't be driving much."

By closing time a damp chill hung in the air. Gus ate dinner, wondering why he felt uneasy. About Towne's car?

"I'm a soft-headed fool," thought Gus, and telephoned Stan.

"Why'd you say Towne won't be driving far?" asked Gus.

Stan chuckled. "He's taking his girl to the Town-Line Drive-In. It's the last show of the season. Getting too cold for outdoor movies."

As Gus hung up and switched on tele-

aged man and woman glared at him through the rain-flecked window.

Towne's car wasn't in the last row. Gus walked up the next as rapidly as he could pick out tailpipes. Another bent one was on a convertible. He started on the third row, oblivious to the gigantic picture at his side, to whispering speakers left on stanchions.

The twentieth car had a bent tailpipe, exhaust muttering. A hardtop. Without his light, Gus could make out a man and a woman inside, heads together, motionless behind the clicking wipers. He rapped on the glass. They paid no attention.

Gus turned the light on them. The man was Harry Towne, eyes closed, his face peaceful.

Yanking the door open, Gus noted a faint smell of exhaust inside. Towne didn't budge. Reaching over, Gus flung the other door wide, switched off the ignition, turned on headlights. Horns blared protest. He half dragged Towne out onto the ground, went back for the sleeping girl.

"THE hospital says they're doing fine," reported Stan next morning.

"But it was close. How could a smart apple be taken in that way?"

"Habit," said Gus. "He was used to idling the engine to keep the windshield clear and the car warm. Maybe he just forgot—or thought if he got dopey he'd have time to shut off the engine. But carbon monoxide's treacherous."

"Boss, you got a crystal ball?"

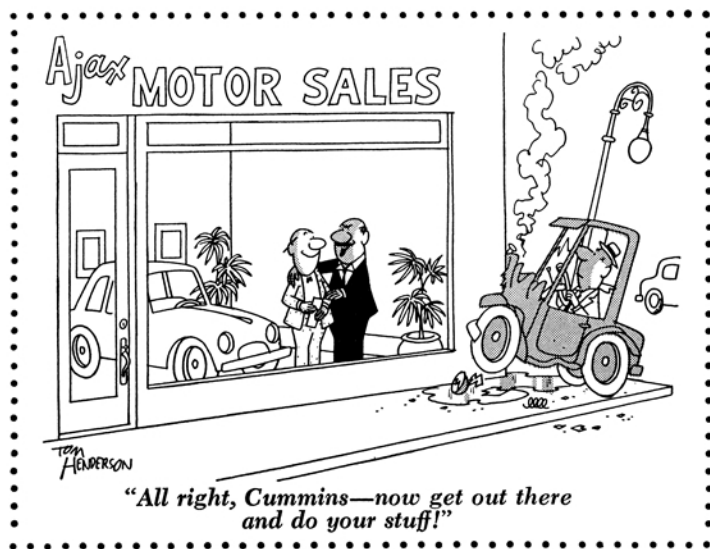
"It wasn't working," snorted Gus. "But the pattern bothered me—a cold, rainy night, the car parked, a girl to keep comfortable, back pressure bottled up in a leaking exhaust system. But it took a TV show to get me moving."

"I suppose it showed you the spot Harry was in," said Stan sarcastically.

"Sure. It began with a fight in a garage. Hero was knocked out and left with a car engine running. Darn!"

"What's the matter?"

"I'll never know how my pet private eye got out of that one alive!" ■ ■



vision, rain began drumming on the windows. The TV picture unfurled into violent action. But it was better, thought Gus, than seeing a movie through a windshield on a night like this.

Suddenly he stood up, stared at the TV screen, and switched it off. Putting on a raincoat, he went to his car.

THE great crescent of the drive-in lay under a curtain of rain. Gus paid, drove to the projection shack, knocked on the door until a man opened it.

He wasn't helpful. "We got 600 cars here. You want to look, go ahead. I can't put a notice on the screen until the picture's over, unless it's something official."

Gus trudged behind the last row of cars, aiming the beam of his flashlight at rear bumpers.

Then the light found a tailpipe with the tip bent down, exhaust burbling. Gus swung the beam into the car. A middle-