

POPULAR SCIENCE

MONTHLY

MECHANICS AND HANDICRAFT 

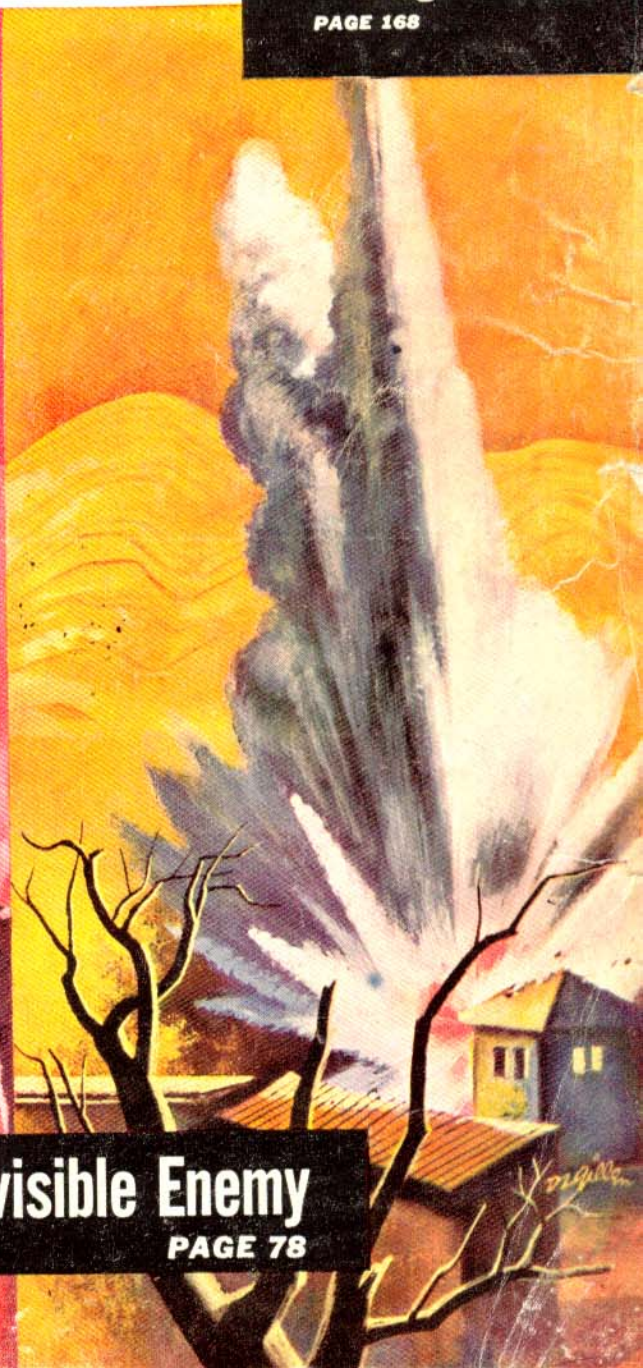
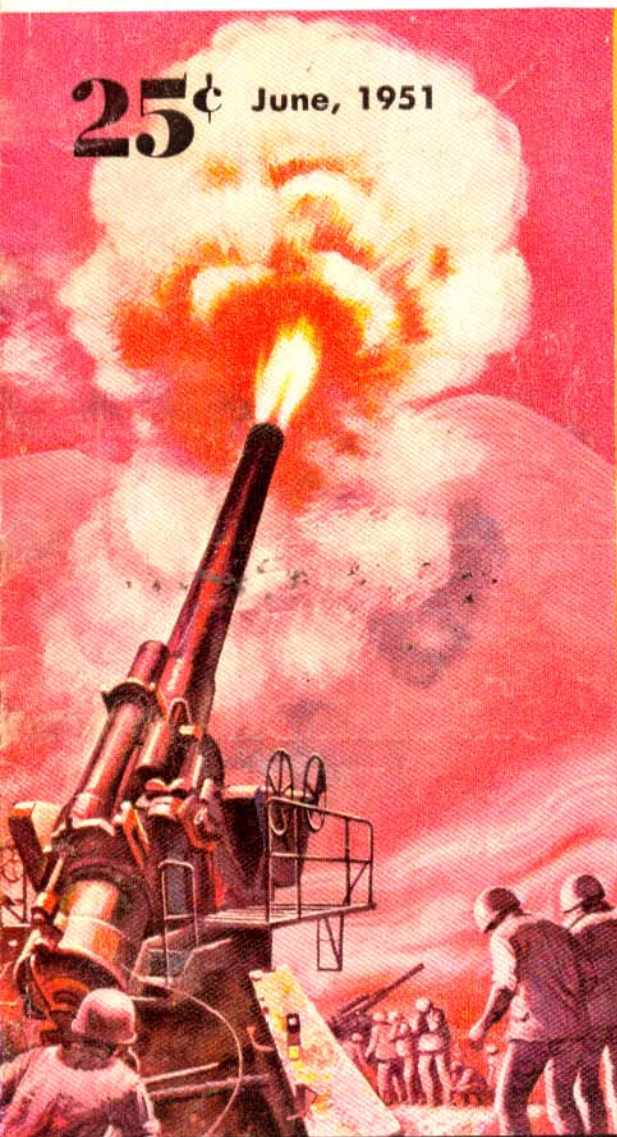
"How I Save Gas"



—By This Year's
Stingiest Driver

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25¢ June, 1951



How Gunners Hit an Invisible Enemy

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Gus Solves One for the Judge

With the Judge's car on trial for malfeasance, the Model Garage owner cross-examines and renders a decision.

By Martin Bunn

GUS WILSON never will understand why so many car owners always put off necessary car repairs until the last moment. Take the business of getting their cars ready for vacation trips. It's the same way every year. Come June, and the first hot spell, and the folks in our town descend on the Model Garage in droves and expect Gus to put their cars in shape overnight. Gus doesn't mind working late on an emergency job, but he hates like the devil to give up his eve-

nings doing work that could have been done weeks before.

This year has been no different. A few afternoons ago, after a particularly hectic morning spent dealing with customers who were in a hurry, Gus looked at the cars lined up on the repair-shop floor and groaned.

"There's more rush work stacked up here right now," he grumbled to Stan Hicks, "than we can handle in . . ."

Just then the jingle of the office phone interrupted.

"I'll get it," said Stan.

A few minutes later Stan came back out of the office.

"That was Judge Tate's wife," he explained to Gus, who had started to work on



one of the cars. "She's stuck down near the savings bank. Claims something exploded under the hood when she tried to start the car. She sounded scared and wants someone to come right down."

Gus didn't answer. He didn't even look up from the row of spark plugs he was cleaning and adjusting. After several moments of silence, Stan said, "Well, what do we do, boss?"

"Oh, go on down," Gus grumbled. "We're so far behind in our work now that one more car won't matter."

About 20 minutes later Gus heard the wrecker pull up and stop outside the shop doors. "Well, what was wrong with the Tate car?" he called as Stan entered the shop.

"Blamed if I know, but it's running okay now," Stan reported. "When I got there, I pushed the starter button and when nothing happened, I got out and opened the hood. The cap was completely off the distributor

and dangling by its wires. I snapped it back into place, tried the starter again, and the motor caught right away. That's all there was to it."

"What did you do then?" asked Gus.

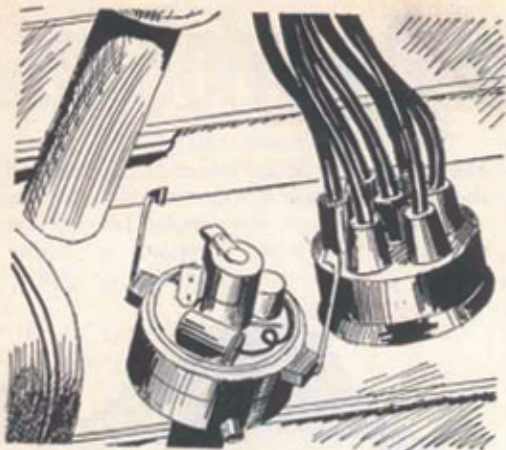
"What do you mean, what did I do then?" Stan asked, puzzled. "I told Mrs. Tate that the car was all right. What else?"

"But Stan, you know distributor caps just don't come loose of their own accord. Didn't

As Judge Tate got behind the wheel of his car, Gus Wilson raised the hood.

"Okay, now start her up," he called out.





you try to find out what made it come off in the first place?"

"Well, you see, boss," Stan explained, "I figured that the loud 'pop' she claimed she heard was probably some other car back-firing. You know how dames are when it comes to car noises. As for the distributor cap, I figured it had either jiggled loose or some wise kid had taken it off just to see the fun."

Gus looked at Stan and shook his head. Then he said, "Well, I'll bet you a buck against a broken wrist pin we'll be hearing from the Tates again."

For a time it looked as if Stan might win the bet. They hadn't heard a word from the Tates. Then, one evening, just as Gus was getting ready to close up shop for the day, a car pulled up in front of the garage. Old Judge Tate was at the wheel.

Stan Loses

"Good evening, Judge," Gus greeted the elderly man as he walked toward the car. "Something we can do for you?"

"I hope so," the Judge replied smiling. "I've been having trouble with this car, and this is the first chance I've had to bring it around. It all started about a week ago."

"That the time Mrs. Tate got stuck down near the bank?" Gus asked, expecting some sort of rebuke for Stan's failure to find out what actually was causing the trouble.

"Precisely, and your man was kind enough to come down and get the car started for Mrs. Tate," the old Judge replied mildly. "He found that the distributor cap had come loose."

Gus nodded.

"Well, oddly enough," the Judge went on, "it's happened to me several times since

when I've tried to start the car after it's been parked for a short time. Each time it's happened just after I've pushed the starter button. There's a loud 'pop,' and when I lift the hood I find that the distributor cap is off. Once I put it back, the engine starts easily."

"Have any trouble starting it first thing in the morning?" queried Gus.

"No, not particularly," replied the Judge.

"Well, let's drive her into the shop and have a look."

When the Judge had eased his sedan to a stop in the middle of the repair-shop floor, he set the hand brake, and turned off the ignition. As he opened the door, Gus motioned to him.

Trouble Won't Perform

"Stay right there, Judge. I want you to start and stop the engine for me a few times. Stan's gone for the day, so you'll have to pinch-hit."

As he talked, Gus walked around to the front of the car and raised the hood. "Okay, now start her up," he called to the Judge.

The engine started right up, and Gus didn't notice anything out of the ordinary as he peered under the hood.

"All right, now stop her, wait a moment or so, and start her up again," Gus directed.

The Judge did as Gus told him. There still were no signs of trouble, so Gus signaled for the ignition to be turned off.

"I guess you think I've been imagining things," Tate said, grinning, as he joined Gus at the side of the opened hood.

"Not at all," Gus assured him. "Automobiles are like kids and television sets—they won't do the right thing when you want them to show off."

As Judge Tate watched, Gus reached in and began removing the cap from the distributor. "These spring clips could be tighter," he said as he unlatched the cap and turned it bottom side up so he could see the contacts. "Had any work done on this distributor lately?"

Stan Takes a Kidding

The Judge thought for a moment. "Well, come to think of it," he said finally, "a mechanic where we spent our vacation last summer put in a new set of ignition wires for me and he made some comment about filing the distributor points."

"Judge, do you suppose you could leave the car here?" Gus asked. "I want to give

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Gus Solves One for the Judge

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that distributor a thorough going over and that's going to take time. I'll drive you home tonight and give you a ring in the morning after I've done a little checking."

The Judge agreed, and after Gus had locked up the office and the shop, the two men drove off in Gus's car.

When Gus got to the Model Garage the next morning, Stan was already there, and Gus noticed that Judge Tate's car had been moved to another position on the floor.

"Have any trouble getting that car started, Stan?" Gus asked, indicating the Tate car with a nod of his head.

"No, should I?"

Gus grinned. "Ever seen that car before?"

At that point, Stan did a double-take. "Why, it's the Tate's car," he groaned. "When was it brought in?"

"Last night, after you'd left. Old Judge Tate himself brought it in. Seems he has had the same sort of trouble Mrs. Tate had that time you fixed it." Gus chuckled.

"Okay, boss," said Stan good naturedly. "Rub it in. What do I do now?"

"First of all, let's check the distributor. Something's making that cap pop off under certain conditions. The two spring catches are a bit loose. Could be that the contact spring on the top of the rotor has been bent up enough to force them loose."

Gus reached in, unlatched the cap, and lifted the rotor off the shaft. "First, let's get a new rotor out of stock and replace this old one."

Lifetime Job

Gus replaced the old rotor and put the cap back in place. "Now," he told Stan, "your job is to sit in the driver's seat and start and stop this engine at about five-minute intervals until something happens."

"A fine way for a guy with ambition to earn a living," Stan joked as he slid in under the steering wheel. "I could be here doing this for days."

As Stan intermittently worked the starter button and the ignition switch on the Tate's car, Gus busied himself with another job. When nothing had happened after 40 minutes, Gus was about to tell Stan to quit when a hollow "pop" resounded through the shop. Gus dropped the pliers he'd been using and made it on the double over to the car. By the time he got there, Stan was

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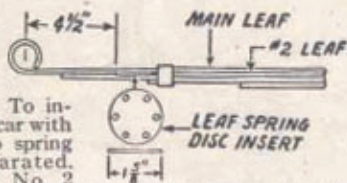


Care and Feeding of Engines

BY S. P. CORP

SLAP-HAPPY SPRINGS

Ever hear a slapping racket when you're driving over rough roads, especially in wet weather? Slap-happy springs! Lubrication won't fix it, but a plate-type disc inserted next to the main leaf of each rear spring will quiet it down. Most service stations sell these discs. To install, lift rear of car with bumper jack so spring leaves are separated. Pry main and No. 2 leaves apart with a screwdriver and insert discs with smooth side down. If springs are covered, cut a $2\frac{3}{4}$ " slot in side of cover, $4\frac{1}{2}$ " from each end of spring and insert discs. Thenpeen over the slot in the cover. This should remove cause of slapping.



MORE ABOUT TIRE CARE

Now that the air is full of rumblings about rubbershortage and synthetic tires, let's talk some more about making tires last longer. It's a good rule to stop at a service station at least once a week to have tire pressure checked.

While you're doing this, inspect the tire-wear pattern.



A tire that shows wear on the outside edges indicates underinflation. To avoid this, *never check a hot tire*. There is a normal build-up of 3 to 5 pounds over recommended tire pressures as the tire gets hot while being driven.

Never bleed a built-up tire pressure. This built-up pressure prevents excessive sidewall flexing, a cause of tire-damaging heat. A tire carrying 24 lbs. may get up to 27 lbs. under normal driving, or 29 lbs. at high speed. This is normal build-up. Such pressure should not be bled while tire is hot.

On the other hand, center tread wear means overinflation, and that, too, may shorten tire life. Keep pressures correct, and rotate tires every 2500 miles.

RE-RING FOR SUMMER

To get full enjoyment from your summer vacation trip, put in new Sealed Power Piston Rings now—save gas, save oil, and get the thrill of restored power! The Sealed Power MD-50 Steel Oil Ring is the best oil control ring ever built—the only ring with the Full-Flow Spring. Controls oil even in badly tapered and out-of-round bores.

Ask for free booklet, "7 Ways to Save Oil." A card will bring it—just address Sealed Power Corporation, Dept. H-6, Muskegon, Michigan. For triple wear, get Sealed Power Chrome-Faced Rings.

Gus Solves One for the Judge

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standing beside the open hood scratching his head. Everything that Judge Tate had said had been true. There was the distributor cap hanging loose at the end of the ignition wires.

Gus bent down to get a closer look at the distributor and cap. "What do you know? Knocked clean off. It couldn't have been the rotor. And that loud 'pop'."

"You know, Gus, that 'pop' sounded just like a carburetor backfire," Stan suggested. "You know, the kind you sometimes get when you try to start a motor on a real cold day with the mixture set too lean."

"Stan, I think you've got something," agreed Gus. "Hold the fort while I make a phone call."

As Gus disappeared through the office door, Stan shook his head. "Now how could a backfire in a carburetor knock the cap off a distributor?" he muttered to himself.

When Gus reappeared he was holding a short length of rubber tubing of the sort used with windshield wipers. And judging from the pleased look on his face, Stan felt certain that the boss was hot on the trail of some sort of clue.

"Just on a hunch, I'm going to check the vacuum spark-advance unit on that distributor," Gus explained. "Get a wrench and take off the vacuum line at the distributor."

Hunch Pays Off

As Stan went to work, Gus elaborated. Many distributors, he explained, are fitted with a diaphragm, operated by the vacuum generated in the intake manifold, that automatically retards the spark when the engine is pulling a heavy load, as in going up a hill.

When Stan had unscrewed the vacuum line at the distributor, Gus slipped one end of the rubber tube over the open fitting, put the other end in his mouth, and sucked in. Whatever he found, it seemed to please him.

"We're on the right track, Stan. Let's install a new vacuum unit and I think we'll have cured Judge Tate's exploding distributor."

In a few minutes the new vacuum unit was in place. Gus was standing near his bench stoking up his old pipe. Stan was rubbing his hands on a piece of waste.

"Let me in on a secret, will you?" Stan asked with a grin. "I still don't understand

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Gus Solves One for the Judge

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why that distributor cap kept popping off or why putting on a new spark-control unit is going to fix it."

"I don't wonder Stan," said Gus as he put a match to his pipe. "As a matter of fact, it's the first time I've run across this kind of trouble myself.

"You see," Gus continued, "that vacuum unit has a diaphragm in it that's operated by the suction of the intake manifold. When the diaphragm is pulled in by the suction, it operates a lever that rotates the breaker plate and automatically advances the spark. Well, the diaphragm in that old unit had a hole in it. I found that out when I slipped the tube on the fitting and sucked in."

"But why should that pop the distributor cap loose?"

"Well," Gus explained, "when the car was parked for a short time under certain conditions, enough gasoline vapors probably seeped back through that hole into the distributor to form a fairly explosive mixture. Then, when the starter button was pushed, there was enough arcing at the breaker points to touch the mixture off. Puff, a minor explosion, and the distributor cap was sprung loose from its catches."

Stan Turns Hero

"But what gave you the tip-off?" asked Stan.

"You did," said Gus. "Your crack about that 'pop' sounding like a carburetor backfire got me to thinking. Then I called the Judge to see how his car had been running. He cinched my hunch when he told me that the car seemed a little sluggish on the open road. That meant the spark wasn't being automatically advanced as it should under ordinary running speeds. And that could only mean that the diaphragm in the vacuum unit wasn't doing its job. By all odds that, in turn, meant a leaky diaphragm. And a diaphragm with a bad leak could let enough gas fumes seep back into the distributor to cause trouble now and then."

"Well," said Stan, "I'm glad we don't get a toughie like that one every day."

"But if it weren't for those toughies," said Gus, "the garage business wouldn't be much fun. I'd go nuts just pumpin' gas, fixin' flats, and drainin' out antifreeze. They're the cream in the coffee."

"Well, if that's the case, boss, I'll take mine black."

END