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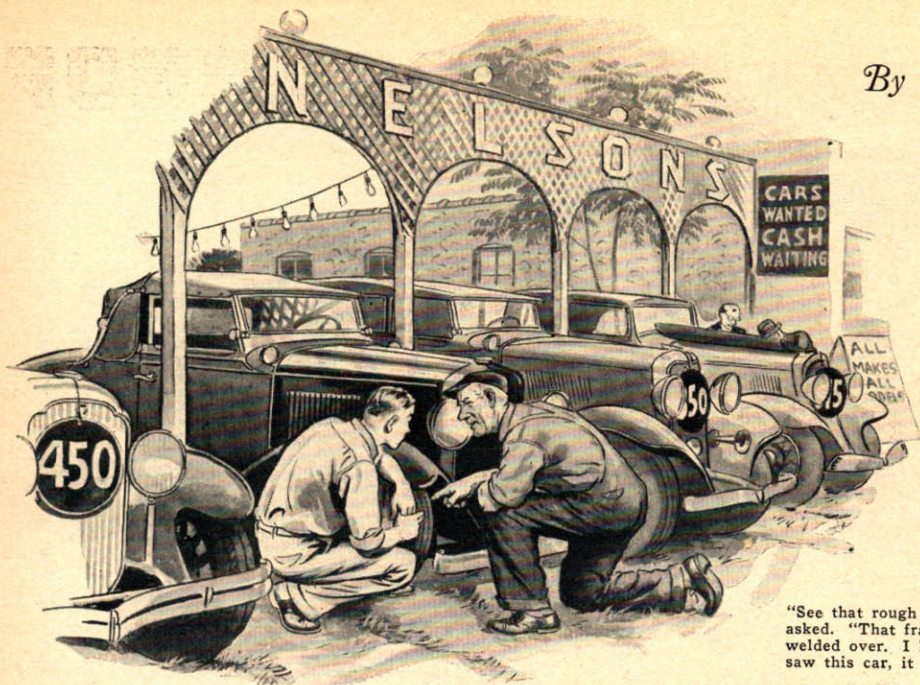
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POWER FROM THE SUN
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"See that rough spot on the frame?" Gus asked. "That frame has been cracked and welded over. I had a hunch, when I first saw this car, it had been in a smash-up"

GUS tells how to find evidence of a smash-up in rebuilt auto and how to look for signs of greater mileage than appears on speedometer which can be altered

TRAPS TO AVOID IN Buying a Used Car

WITH the summer rush about over, Gus Wilson and Joe Clark were taking it easy in front of the Model Garage when a young man turned into the driveway and walked toward them.

"Have you any used cars for sale?" he inquired timidly.

"Sorry, son," answered Gus, shaking his head. "Why don't you try Nelson's used car place over on Highland Road?"

"I had a hunch maybe I'd do better buying from a garage, but no one seems to have any so I guess I'll have to go there after all."

Something in the boy's manner pleased Gus. He lacked the usual cocksureness that made most youngsters of college age just a little painful.

"Tell you what I'll do," suggested Gus as the boy turned to go, "I've got to be in that part of town later today. Suppose you drop back and I'll drive you over."

"Gosh, Mr. Wilson, will you?" exclaimed the boy enthusiastically. "Gee, that'll be swell. You see, I know you—everyone here does—but you don't know me. I'm Fred Blaine, maybe you know my father."

"Sure do," said Gus. "And I'm glad to know you."

A few hours later, Gus and his new friend were headed toward Highland Road in the gray-haired mechanic's car.

"How much can you spend for a car?" asked Gus.

"I can't spend more than \$250," said Fred half apologetically. "I've only been working for two years and that's all I've been able to save. But Dad says he'll stake me to the license and the insurance."

"That'll be plenty," Gus assured him. "You're buying the car at the best time of the year. The summer fad of car driving is about over and the travel bugs who bought cars in the spring want to get rid of them. Even the dealers don't want to carry a raft of used cars over the winter. But I wouldn't spend the whole \$250 on the car, if I were you," added Gus. "If you're wise you'll leave a few dollars for extras."

"Extras? What extras?" asked Fred. "Remember, son, you're buying an old car not a new one. It isn't hard to spend at least \$25 on almost any car on the road to put it in half-way decent shape. You know batteries and tires don't last forever. Got any preference as to make?"

"I want one that won't break me," replied Fred with a grin. "So I guess that narrows it down to something small."

"Not necessarily," corrected Gus. "Sometimes a large car costs less to run than a small one. A medium-sized used car may cost you more for gas, but it's likely to be in better condition than a smaller one of the same age. Besides, even the gas isn't so much of an item. Say you drive a car 6,000 miles a year. On a small car that gives about eighteen miles to a gallon, that'll mean 333 gallons. With a larger car that only gives fourteen you'll use about 430 gallons. Figuring gas at eighteen a gallon, the larger car will only cost about \$17 more a year to run or about thirty cents a week. If a small car has been ridden hard you can spend that much in repairs."

"Never looked at it that way," Fred admitted. "But won't I get a better price on a small car?"

"Just the opposite," pointed out Gus. "Few people want a big car nowadays so small cars often bring a higher price than the larger ones."

A few moments later they were at Nelson's place and the two entered a large enclosure where more than fifty cars were neatly arranged in long rows. From the radiator cap of each fluttered a bright red price tag.

"Golly, look at this one," exclaimed Fred as he spied a trim blue touring car and poked his head under the top. "And it's only gone a little over 12,000 miles."

Gus walked around the car feeling the tires and poking his experienced hand under the chassis here and there. "Don't put too much faith in speedometers," he advised with a grunt. "It seems even some of the best dealers can't resist setting 'em back. Besides, there's a heap of other ways of telling how far a car has been driven. Take a squint at those tires, for instance."

"Why, they're not so bad," argued Fred, after a circuit of the car.

"Right," agreed Gus with a wink. "But they're all different makes and that's what tells the story. Tires that come with a car when it's new will last 20,000 to 25,000 miles if they're not abused. So when you see a car with low mileage and it has several different kinds of tires on it, look out. Either the speedometer's a liar or the car's been owned by a throttle hopper who's worn out the tires and probably the car's insides before their time."

"But look at the finish," said Fred, fondly stroking one of the fenders. "Looks almost new."

"Yeah, and (Continued on page 118)



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TRAPS TO AVOID IN BUYING A USED CAR

(Continued from page 68)

finishes can be just as misleading as speedometers," said Gus. "It's a sight cheaper to polish a car or slap on a thin finish than it is to overhaul a motor. You want something you can drive, not a piece of furniture."

As Gus talked, he ambled around to the driver's side of the car and, opening the door, pointed down at the accelerator.

"It took more than 18,000 miles of driving to wear those pedals that smooth. And look at the play in this steering wheel," he added twisting it first one way and then the other. "It shouldn't swing more than two inches without moving the front wheels."

"In other words," chimed in Fred with a chuckle, "it's no bargain at any price."
"Well, you can do better," answered Gus.

SOME five or six cars further on down the line, Gus paused beside an open roadster that looked to be in first class shape. Squatting down beside one front fender, he beckoned to Fred.

"See that rough spot on the frame?" he asked, rubbing his thumb over the metal. "Looks like rough paint, doesn't it? Well, it's not. That frame has been cracked and welded over. When I first looked at this car I had a hunch it had been in a smash-up."

Fred looked questioningly at the car and then at Gus.

"That's a brand new hood on there," pointed out Gus, "and when a car hits something hard enough to push a hood into a mess of wrinkles, I don't want it."

"Another place where a crash leaves its calling card," Gus continued, "is on the metal dash back of the motor where the stay rods for the top of the radiator are fastened. If it's dented and messed up or the rods are bent, it's a safe bet the radiator was so smashed and twisted it had to be replaced."

"If a car's been in a sideswipe or has skidded sideways into the curb, chances are the frame has been twisted. That'll show up in the tires. If they're pitted or worn in spots, it'll pay to have the frame checked."

"But how about prices?" interrupted Fred as he examined the tag on a small sedan. "How can you tell what a used car is worth? Isn't there some way of getting a peek at one of those rate books dealers have?"

"NO NEED TO," replied Gus. "It's pretty safe to figure that the value of a car goes down a little less than half the first year, a third more the second year, another quarter the third year, and still another tenth the fourth. That means a car that sold for \$800 in 1931 isn't worth more than a little over two hundred in 1934."

"Don't worry so much about the price but make sure you're getting your money's worth. Don't even consider a car before you've put it over the jumps up hills and on the level. Drive it slowly as well as fast. Listen for thumps and knocks and don't forget to give the brakes a good try."

"Then when you've finally decided that it's just the car you want, get a look at the bill of sale. If more than two people have owned the car, I'd think twice before I bought it. It may have been a lemon right from the start and four or five owners and several years of use won't improve matters."

"Gosh," exploded Gus as he pulled out his old-fashioned watch. "Look at the time. I was supposed to be over at the freight station half an hour ago."

"Well, now don't do anything rash," he added as he turned to go. "Take it easy and drive three or four of them before you decide. And by the way, if you want to, drop in at the Model Garage, I'll be glad to give them the once over for you."

TESTS EXPLAIN RAINBOW AND SUN'S GREEN FLASHES

(Continued from page 53)

color display that the sun paints is both more commonplace and more magnificent, particularly when the conditions are such that the beautiful secondary bow, with the colors reversed is formed outside the primary one.

As everybody knows, this lovely picture is painted by the sun only when it shines from behind the observer upon a curtain of falling raindrops. The sunlight falling upon each drop is bent upon entering the tiny liquid sphere above its center, is then reflected from its concave mirrorlike back and is bent again on issuing from the bottom of the drop as a band of color.

IT IS perfectly easy to see, through a simple experiment, just how this is done. Two flasks filled with water and held by an upright support, represent two greatly magnified raindrops. The sunlight, coming from behind the observer, falls upon the two flasks through a narrow slit in a cardboard screen. Through this same slit the observer looks. If you wish to try this experiment at night, a bright electric light can be substituted for the sunshine.

The diagram inset in *Figure 2* traces the course of several parallel rays of sunshine on their course through the raindrops. Rays A, B, C, D are scattered after leaving the drop and, multiplied by millions, cause the whitish semi-circular area you see inside the primary bow. Ray G, bent sharply inward across E and F, also contributes to this area of scattered white light. No light is thrown outside the bow; and that is why the sky always appears darker there than inside the bow.

Rays E and F emerge more nearly parallel than any of the others. It is these that, refracted slightly, according to their wave lengths, reach the eye as the rainbow's spectrum. The violet light, being refracted more, is thrown higher than the red, which is bent less and crosses to the eye lower.

At this point some good observer is going to object that the primary rainbow in nature has the red band outside and above, with the blue edge inside and below. This question caused me plenty of confusion when I was developing this equipment, until I remembered that the spectrum colors appearing along each spoke of the bow's wheel are not all contributed by a single drop. We can imagine how in nature each separate shade and tint in between the red and blue is furnished by a separate raindrop, their combined colors reaching the eye as a single spoke in the complete bow's wheel of prismatic color.

THE secondary bow is formed by a double internal reflection of rays entering the drop from below instead of above its center. This accounts for the reversal of colors in the secondary bow. You will hear some people explain this reversal by saying that the secondary is a reflection of the primary on the water drops farther out. This is wrong; each bow is formed separately.

There are several other interesting stunts you can do in unscrambling the rainbow. Perhaps the best is to allow the sunlight to fall upon one of the flasks through a hole in a piece of heavy paper, upon which the complete circular spectrum cast by each rain drop is painted by the rays passing through the drop in all directions. This experiment illustrates the whitish interior area of the bow. It also shows the darker area outside the bow.

An interesting point is that each person sees his own rainbow. Your companion, standing beside you to admire the lovely spectacle, really sees a bow formed by an entirely different set of millions of drops of rain. For that matter, your left eye can never see the same bow your right one does.