

EXPERTS EXPLAIN CAUSES AND CURE OF ENGINE KNOCK

Standard Oil Board of Lubricating Engineers Diagnose Characteristic Knocks in Engine.

Determination of the exact cause of knocks heard in the engine is frequently a difficult matter, unless the engine can be taken down and a careful examination made of its mechanical condition. Very similar knocks may occur from different causes, and for this reason merely listening to the knock during operation of the engine may fail to reveal its definite location. There are, however, several characteristic knocks which may develop, and diagnosis of the trouble is greatly assisted by varying the operating conditions of the engine.

The following are the most frequent causes of engine knocks, according to the board of lubricating engineers of the Standard Oil company of California:

1. The spark knock is a clear, sharp rap, something like the sound of a small hammer striking a steel anvil. It is more noticeable when the engine is under heavy load, as when climbing grades, pulling heavy sand, or whenever laboring in high gear. If under these conditions the knock disappears when the spark is retarded it is almost certain that you have a spark knock.

2. The knock due to excessive carbon in the engine has exactly the same sound as the spark knock and occurs under the same conditions. Retarding the spark does not, however, eliminate the knock. If the engine is hot and continues to fire for a few seconds after the ignition has been cut out, this indicates the presence of excessive carbon deposit, as particles of carbon become incandescent and continue ignition of the mixture.

3. The knock caused by a loose wrist-pin bearing has about the same sound as spark and carbon knocks, and will be more pronounced under the same conditions. It may also appear in the engine, when running idle, is suddenly accelerated and then immediately slowed down.

4. If the knock is caused by a loose

TEMPTING OFFERINGS AT PORTLAND'S MOTOR CAR EXPOSITION



S. S. M. C. Rules of the Road

Adopted by the Society for the Suppression of the Motor Car.

- 1.—No automobile shall be driven at a speed to exceed four miles per hour.

- 2.—On meeting a team on a country road, if notified that horses are scary, tear down car and hide the pieces in the grass until team has passed.

- 3.—After 5 o'clock p. m. all cars must be provided with 1000 c. p. searchlights, siren whistle, bell, horn and skyrockets, one of which (the skyrockets) must be sent up every 200 feet.

- 4.—On entering a strange town, leave your car at city limits and walk through town, to observe locations of all school houses and hospitals, so that no unnecessary noise will be made when passing them in your car, then return and drive at speed limit of 2 1/2 miles per hour so as to avoid striking all "hound dogs" asleep in the street.

- 5.—Place attar-of-rose in your gasoline so that smell from exhaust will not offend the nostrils of the fair sex who live in said strange town.

- 6.—Report to justice of the peace upon arrival and deposit \$100 with him, to be used for paying fines at his discretion.

- 7.—The bridges are not built for heavy traffic so all streams must be forded.

- 8.—If a pedestrian crosses the street in the middle of the block, stop your car and remove your hat until he has reached the opposite curb.

- 9.—If a bicycle runs into your car from the rear, apologize to the rider for blocking the street and pay him \$50 to repair damage to a \$1.98 tire.

- 10.—When snow is on the ground place your car on snow shoes to prevent skidding.

- 11.—Speak kindly to all traffic officers. Their powers are arbitrary.

lower connecting-rod bearing, the sound

will be similar to previously mentioned

knocks, but not so sharp and clear—

more like a hammer striking on a heavy

piece of cast iron. It occurs under

the same conditions as the wrist-pin

knock.

5. The knock from a loose piston, or

piston slap, as it is generally called,

may be noticed at all times, but is more

pronounced when the engine is under

load. Sudden acceleration of the engine

when running idle will produce an un-

mistakable rattle which will usually

identify this condition.

6. Loose crankshaft main-bearing

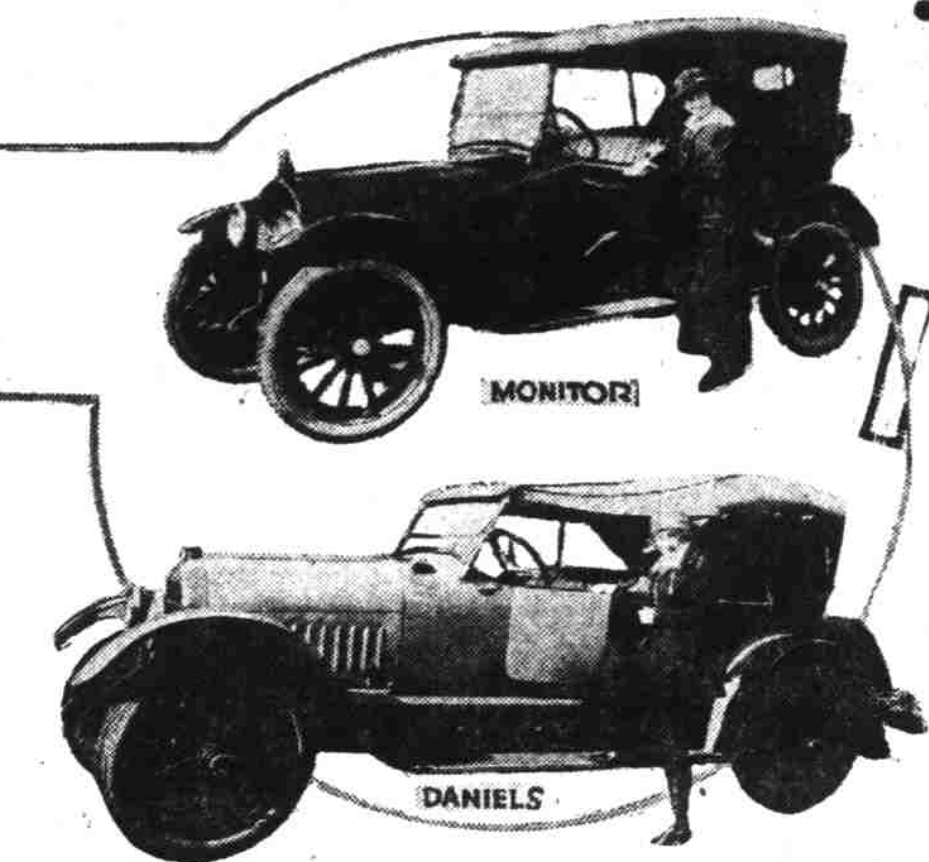
knocks are easily distinguished from

other knocks, as they occur in the form

of very deep, dull thuds, becoming

louder when the engine is pulling heavily

at low speed.



55 Employees With Company 15 Years

Of the 4400 employees of the Franklin Automobile company, 55 have been employed at the big Syracuse factory for 15 years continuously. Of this number three saw the first Franklin car turned

out in 1902, and one of these three men is William Dunk, production manager, who, like many other managers of America's well known industries, worked up from the ranks. Three of the present executive officers, including President H. H. Franklin, have been with the company since its inception. Fifteen of the 38 general foremen have completed 10 years of unbroken service.

GOES 7000 MILES USING SAME TIRES

Ralph H. Schaffer Covers Trip to Salt Lake Over Deserts Without Any Tire Trouble.

In the early days of automobiles, tires were the source of more annoyance than defects in mechanism. Sunday supplements and magazines were full of cartoons showing the humorous side of automobilism—the tires always being the source of trouble. Now the pneumatics have caught up and surpassed mechanical excellence.

A few years ago no motorist would have had the temerity to start on a 4000 mile trip, including 500 miles of blistering desert, with only one spare as utility to a set that had already delivered 7000 miles.

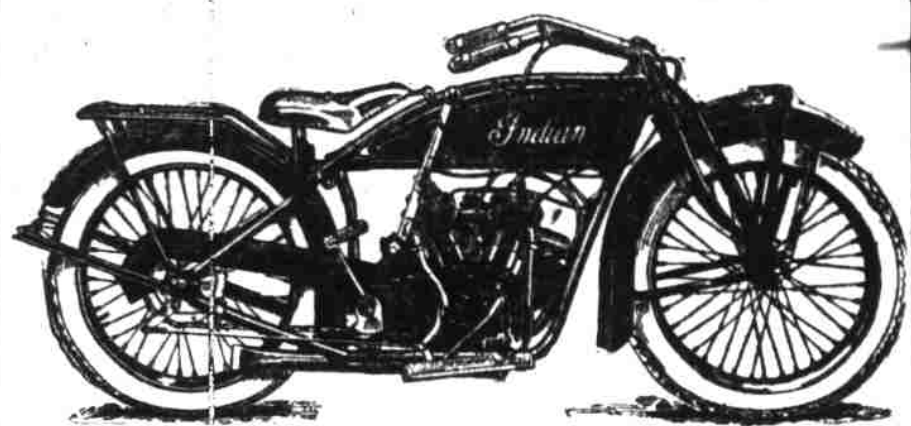
This is just what Ralph H. Schaffer of Tacoma, Wash., did recently when he drove from Tacoma to Salt Lake City and Los Angeles, returning by way of San Francisco. His cord tires carried him through hot desert sands and over rough roads in the Sierras and Cascade mountains without any trouble. Such performances graphically illustrate the confidence of motorists in these tires and the reliability characteristic of present day pneumatics, as well as stimulating long distance tours.

Industrial scientists have found that well lighted factories have a 12 per cent increase in production and a 25 per cent decrease in accidents.

Amount of Gasoline Used Is Registered

From Popular Mechanics
A dash instrument which records information regarding the gasoline consumption of a motor car is being manufactured in a southern state. In appearance, the device resembles an odometer, but, instead of registering mileage, it indicates the amount of fuel used during a season or on a trip, and the quantity in the tank, besides giving warning if the vacuum system is not functioning properly. The latter is accomplished by colored signals which appear in an aperture in the face of the meter. Provision is made for resetting the contrivance at the end of a trip or at the close of a season. Metal tubing connects this extremely useful instrument with the vacuum tank, through which it is operated.

Increased Output Planned
Some factories have announced production figures for 1920 including the Overland, which has set 200,000 as the mark; Hupp, 24,000; Columbia, 15,000; Hudson, 30,000; Essex, 40,000; Saxon, 12,000.



The Indian Scout

The first motorcycle to reach the top of Multnomah Falls. The first to Government Camp in 1920. The last word in motorcycle construction.

ON DISPLAY AT

INDIAN MOTORCYCLE & BICYCLE CO.
204-6 Third St. Main 6139



The Success of the New Mitchell

At the national shows will
be repeated here next week

WIDESPREAD was the interest at the National Shows in the New Mitchell. It afforded the one style offering that attracted the crowds. It brought to all these great shows an interest which the public expected to find more general.

The New Mitchell brings to motordom the next great step in the evolution of design. It brings a co-relation of lines that had to come. It combines with style a detail of finish seen only in cars priced much higher.

Next week at our own Show the Mitchell will be further welcomed by the representative throngs of interested motorists. And again people will agree that it has been the privilege of Mitchell designers to bring about a new type car which sets style standards.

No picture can do justice to this New Mitchell—hence, this pictureless announcement. You must see the Mitchell

yourself and note how its designers have departed from old-time crudities.

You must see the Mitchell to note the fineness of detail in finish and all the comfort features. Only after you have seen the Mitchell with your own eyes will you realize how it brings new distinction into motordom. And then, also, you will marvel at its price.

Please do not think that Mitchell has brought out something freakish or extreme. This is not the fact. You will accept Mitchell design just as you accepted the change from a perpendicular windshield to a slanting wind-shield. You will see how Mitchell designers express motion to the utmost.

The New Mitchell will mean to you the only new style idea at the show. You will see changes and refinements in many cars but only in the Mitchell will you see the design of tomorrow—as conceded by experts at the National Shows.

Only one word—Elegance—
can describe this new
CHALMERS

EVERYTHING in this Chalmers is new except the chassis. It has a new bonnet line, new coach line, new windshield, new top, new seat and seat springs.

They catch your eye, those lines, though they are marked by a reserve of rare good taste.

But in those multitudes of little details the real elegance is expressed—door handles, square doors, low sitting position, deep tilt of the cushions, the rug on the tonneau floor.



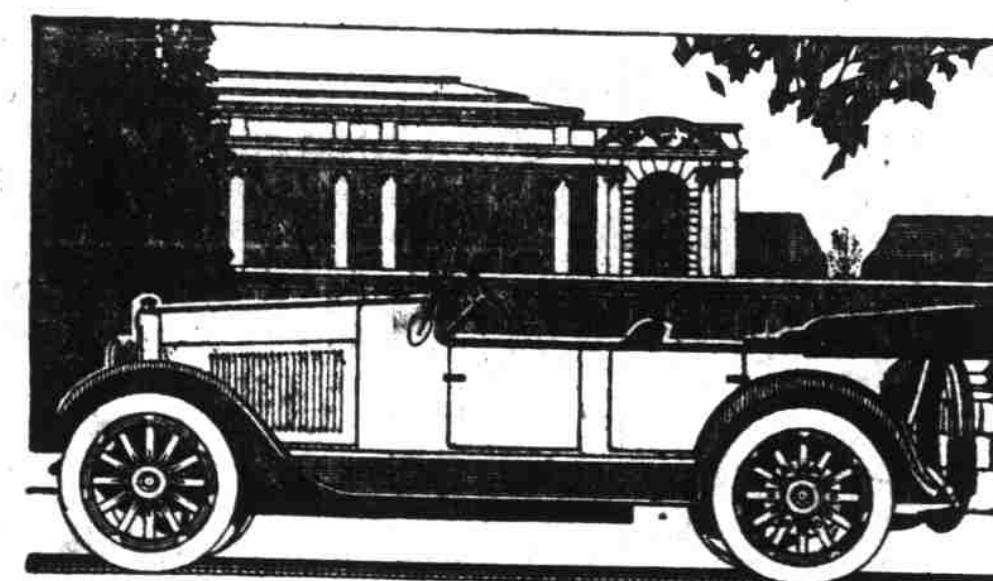
Quality First

A volume easily may be written about them, and any one of them may alone tempt you to ownership.

Then when you've had your first ride, when you've felt the influence that Hot Spot and Ram's-horn have on the action of its master engine, when you've noted the utter silence, easy starting, the ready response, the easy effort "up underneath the bonnet" you, too, will say Chalmers is one of the few great cars of the world.

C. L. Boss Automobile Co.

615-617 Washington Street, Portland



5-Passenger Touring Car
3-Passenger Roadster

5-Passenger Sedan
4-Passenger Coupe

Salesrooms:
BROADWAY AT OAK
Across from Benson Hotel
Out-of-town Visitors Invited to make
business headquarters with us.



DISTRIBUTORS FOR
THE PACIFIC NORTHWEST
Dealers Will Find our 1920 Mitchell
Selling Franchise Valuable