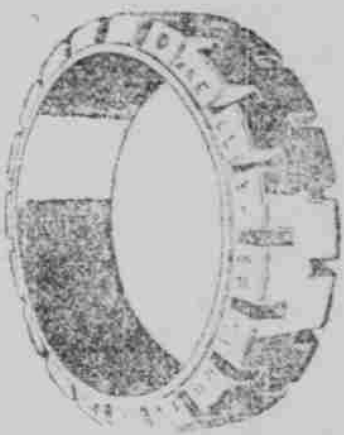


# Auto Quiz

Answers to Last Week's Questions  
1—Locating the various engine knock-  
is difficult without previous experience.



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Exact part not adjusted properly will give forth a sound different from that of any other part, and finding the particular sound is not easy without the use of listening devices or former training. To locate a main bearing knock run the engine on two cylinders at a time.

Operating one cylinder on each side of a bearing. The front bearing is usually the last to become loose. Play at those points will produce a hard bump, caused by end play in the crankshaft, loose, scored or burned bearings. Grooving of the motor when it is first turned over is created by the defect. A hollow, heavy sound or a sharp bump comes from a loose connecting rod. To locate the rod cut one cylinder at a time, or if very loose can be found by turning the engine over.



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by hand. A loose wrist pin in the piston will give a metallic knock. This looseness is caused by wear, a crooked or broken pin or from too tight a fit in the piston or connecting rod. Speed up the engine suddenly, then throttle down quickly to locate the knock. A loose crankshaft will give a third or a snap, and will cause the gears to rattle at times. It is caused by worn or burned bearings or end play in the shaft. A very heavy knock comes from the flywheel being loose which sound is produced regularly. A loose piston in the cylinder and loose valve rods often produce a similar sound, being a short slap or knock. When coming from the piston it means a piston too small for the bore of the cylinder. When from the valves it is caused by excessive space between valve stem and push rod, worn valve or rod guides, valve seat out of true or bent or sticking valve stem. Valve rod rollers or poor cams may also cause a knock.

2—Lubrication plugs will cause a motor on heavy pulling or high speed, and yet will not affect it in light pulling or slow speed. Cracked or porous condition of the porcelain in the plug

or leakage around the porcelain cause the trouble, allowing the high tension current to ground without crossing the spark gap.

3—Do not run a car on a dead battery. Although the generator is usually protected with a fuse which can be removed when the battery is not in use, to prevent excessive internal current from damaging the field and armature windings, it is wiser to play safe in attending to the battery at regular intervals, keeping it always in condition for use.

4—The total number of motor vehicles produced in the United States during 1919 was 1,974,015, including trucks.

5—Driving chains used on motor cars are usually in three forms, the silent chain, the roller chain and the block chain. The silent chain is commonly used to drive camshafts, rollers, generators and water pumps. Roller chains are made to drive the rear wheels on both automobiles and trucks of some makes, and in some cases drive the camshaft and transmit the cranking power from the starter to the motor. The block chain is rarely used for driving purposes on the machine at present.

6—There is a form of insurance which applies to a car owner or another person whose car has suffered damage in a collision. If an owner whose car smashes up another person's car has such insurance on the car, this insurance will cover the cost of the second as well as the first car. If only one car is damaged in a collision, no matter which car it is, the insurance covers the expense incurred.

7—It is possible for a motor to have too high compression, resulting in knocking and pre-ignition. The design of a motor may cause this, or in a case of the cylinder block being lowered to obtain a tighter fit between cylinders and crankcase or a faulty gasket being used the knocking will result. The only remedy is to elevate the cylinders slightly by placing a heavier gasket beneath them.

8—The throttle does not wholly control engine speed. The engine load, which increases when additional weight is placed in the car or when the car leaves a level road to climb a hill is also a factor. Thus when a car is loaded, or when going up grade, it will not attain

the speed with wide open throttle that it will attain when empty or on perfectly level road.

9—A chain of smoking when the car is driven at low speed is that on low throttle opening, used frequently in a city, the mixture, drawn into the cylinder does not completely fill the vacuum created in the explosion chamber by suction of the piston on a downward stroke, resulting in oil being drawn past the piston rings.

10—The same electrical machine can be used for either a motor or a generator, and is used for starting and generating in some systems. When it is driven by gears, shaft or chain or some means other than electricity, it creates current which may be used for battery charging and lighting. When it is driven by electricity, it is used as a starting motor for the car.

**This Week's Questions**

1—Does driving a car in second speed injure a motor if driven for any length of time? What rules should be followed if such driving is necessary?

2—What is a cause of a short circuit in a starting motor?

3—Is it necessary to signal before turning to the right, as is done when turning to the left?

4—What is a remedy for flooded cylinders resulting in hard starting?

5—What is the position of the spark when driving about 25 miles per hour?

6—Can distilled water be used after a considerable length of time?

7—When going down hill is it advisable to switch off the ignition?

8—What is the trouble with a car which will not stand on a hill with gears and clutch engaged, motor silent and emergency brakes set?

9—What is meant by the term "pumping oil"?

10—What percent of the gasoline produced in 1919 was consumed in that year?

## Harding's Forbears Pioneers of West

(INTERNATIONAL NEWS SERVICE)  
WILKES-BARRE, Pa.—The forbears of Senator Warren G. Harding, Republican Presidential nominee, were natives of Wyoming Valley. Two of his ancestors were scalped by the Indians during the Wyoming massacre and their names are inscribed on the famous Wyoming Monument.

## First Principles

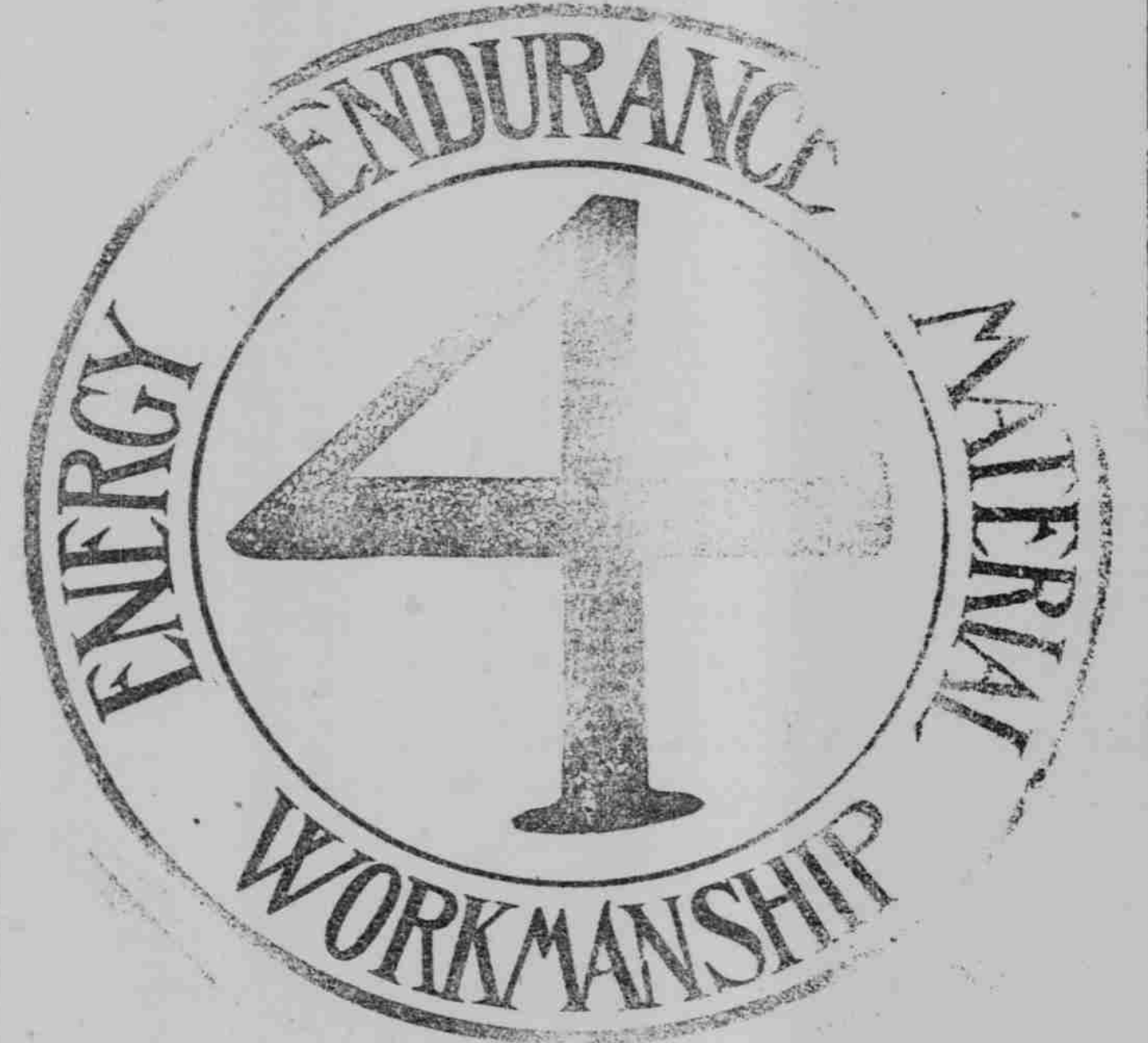
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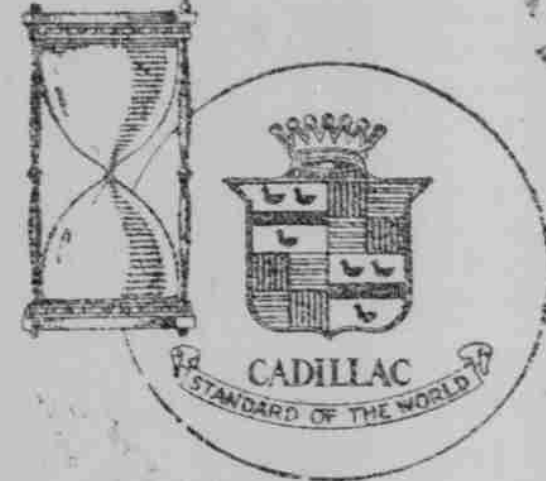
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