## THE CANADIAN THRESHERMAN AND FARMER

#### THE sense of hearing is a great aid to detecting irregularities in the running of a gas engine.

From the sound of the exhaust one can tell whether some of the charges taken into the cylinder are being expelled without having been exploded. Knocking or pounding is made evident entirely by the sense of hearing. A sharp knocking sound may be due to lost motion in the bearings of the connecting rod, either at the crank pin or piston pin end, or to side movement of a piston ring because of the groove having widened from wear; or, a loose key in the flywheel may be the cause of the trouble. Knocking sometimes is caused by wear of piston or cylinder. Sometimes a shoulder wears in the bore of the cylinder and striking this shoulder causes knocking if there is any play in the bearings. Foreign bodies may accidentally have been drawn into the cylinder and knocking results when the piston strikes them. In automobile engines knocking or pounding is sometimes due to the looseness and resulting rattling of some external part. Nuts work loose or bolts are too small for the holes to which they are applied. All of these causes are easily detected upon careful examination and when located the remedy is apparent.

Scored and leaky cylinders result when the ends of the piston pin or wrist pin protrude through the hole or bearing in the piston. Some pins have their bearing in the piston itself while others are tightly secured in the piston and have their bearing in the upper end of the connecting rod. If the scoring or marking in a cylinder consists of several parallel marks on the side where the inlet port is located in an engine of the two cycle type usually this trouble is the result of sand working in from the core formed when casting. If on the exhaust port side it is usually an indication of faulty lubrication. Scoring sometimes results from small pieces of porcelain breaking off the insulation of the spark plug.

Cylinders have been ruined as a result of the pin or nut which holds in place the spring on an inverted inlet valve dropping into the cylinder.

In an engine in which the inlet and exhaust valves are tight and the gasket does not leak it will be found that sometimes when compression is considerably reduced trouble is caused by leaks from scored or imperfect cylinders because the piston or piston rings have been worn considerably. In such case the remedy is to remove the piston and examine it for the possible trouble and correct it. If

# Troubles and Remedies in Farm Tractors

the cylinder is found out of round or marked it usually will require reboring and new piston and rings fitted

Sometimes piston rings stick in the slots or grooves in the piston. This is usually due to two causes: Water gets into the combustion chamber, causing the rings to rust; or, the sides of the slots are slightly tapered instead of parallel. Where tapered sides are found it is usually necessary to straighten them up in a lathe and use slightly wider rings to take up some of the play. Piston rings need renewing oftener than is common in general practice. Broken piston rings unless detected and at once replaced are often the cause of annoyance. Frequently considerable injury to the engine results from leaving them in place. Although piston rings do not break often, broken rings will cause loss in compression and this may be distinguished from leakage due to the rings being worn by the fact that the broken ring will make a distinct clicking sound at the end of every stroke. Piston rings are supposed to be held in position by small pins, one in each ring, so

that the joints of adjacent rings are diametrically opposite. If for any reason these pins break, a ring may slip around until its joint is in line with that of the next ring above or below. This will cause loss of compression, and may often be very difficult to locate

Joints between the cylinder head and the cylinder of stationary gas engines are usually kept tight by packings cut out of asbestos 1-32 of an inch thick. If the packing becomes damaged as a result of overheating or excessive pressure, water from the jacket leaks to the outside or into the cylinder. The latter is more serious since it interferes with the running of the engine by corroding the points of contact on the igniter and the valve seats and stems, and prevents proper lubrication of the piston and cylinder. As soon as the leak of water from the faulty packing develops the king should be renewed at the first opportunity. If the leak is toward the combustion chamber the engine will generally stop in a short time.



Leaky inlet and exhaust valves

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### July, '16

are the cause of frequent trouble. Usually the remedy for le-ky valves is to regrind them to their seats. This requires considerable skill to prevent injuring both valve and seat. Grinding is usually accomplished by emery and oil and finishing up the surface with powdered oil stone, ground gass or similar fine abrasive. Although there is not much danger of getting emery or other abrasive material into the cylinder when grinding exhaust valves, care should be taken to avoid doing so. The grinding of inlet valves is a very particular operation, for if any of the abrasive material is left behind and drawn into the cylinder it is likely to cause trouble.

Sometimes the inlet valve spring, especially where the valve is of the automatic variety, will weaken from becoming overheated. This is certain to occur sooner or later if the engine has been allowed to overheat from lack of water. In time a spring loaded too near the elastic limit of the steel will break as a result of the perpetual vibration and jarring to which it is subjected.

Unequal tension in the springs of automatic inlet valves permits one cylinder to take more gas than another. At high speeds part of the charge will be blown back through the valve having the weak springs so that the other cylinders will get stronger impulses. A quick way to test the uniformity of valve spring tension without taking out the valves is to run the engine slowly with the throttle almost closed. When this is done the cylinders in which springs are stiffer will receive scarcely any fuel while the cylinders having weak valve springs will do most of the work because being supplied with fuel. Whenever the tension of valve springs is suspected of being other than it should be, the valve should be taken out and the spring tested.

Owing to the heat to which it is constantly subjected the exhaust valve spring is more likely to weaken than that of the inlet valve. The symptoms are loss of power because of the valve hanging open at the end of the exhaust stroke and rattling when the valve closes.

To be continued in August Issue

A young fellow recently applied for a job as life saver at the municipal baths in Minneapelis

As he was about six feet six inches tall and very well built, the chief life saver gave him an application blank to fill out.

"By the way," said the chief life saver, "can you swim?"

"No," replied the applicant. "but I can wade like everything."



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