

Canada's Young Farmers and Future Leaders.

Using Land to Advantage.

Perhaps the most important fact about agriculture is its dependence upon land. This does not necessarily mean soil fertility or depth of soil but mainly land area—space. Assuming that the average wheat yield is in the neighborhood of twenty bushels per acre, the production of 1,000,000 bushels would require 50,000 acres of land. To convert this amount of wheat into flour, however, would require only a few acres, and here lies the striking difference between agriculture and manufacture as typified by urban industries. A tannery may cure the hides from cattle which thousands of acres had supported, and an acre or more may turn all the leather of the tannery into shoes or harness, but land area is the prime requisite of agriculture. Even farmers who should appreciate this fact more than others, too often regard land as cheap and fail to use it to best advantage. Because agriculture is in most countries of such fundamental importance and because it requires so much more land than any other industry, nations frequently find themselves short of land for agricultural purposes and may take steps to acquire more, which frequently lead to war. There are few strikingly effective ways of economizing on land for agriculture aside from reclamation or irrigation. There are, of course, effective ways of economizing land for urban industries, notable among which is the erection of tall buildings. Land cannot be arranged so as to grow crops in tiers, one above the other, like offices in a skyscraper. One acre of mining land may occupy the labor of many men, in fact as many as can find room to work at different levels below the surface, but agricultural work for the most part can be carried on at only one level, except for such rare exceptions as mushrooms and tomatoes for instance, grown in greenhouses.

It is, of course, quite true that yields per acre can be improved and very greatly increased by the greater expenditure of labor and seed. There is, however, a limit to the profitability of such increases and it is this limit which should be determined as closely as possible by every farmer. Some farms may be naturally fertile but require more labor to make them more productive, others may be well worked but needing greater quantities

of fertilizer, lime or manure. The owner alone must judge as to the amount of money he can afford to spend for manure or labor. Too great an economy of land may result in a real waste of energy and time and the proper degree of economy to bring about becomes, therefore, a nice problem in farm management, which will vary with each farm. Where intensive cultivation is practiced much greater capital is required per acre, and, even though it may be used at satisfactory rates of interest, lack of capital may prevent or make unwise the more intensive methods. Land being so fundamentally important it is therefore of the greatest importance that it be used wisely and with care.

The Agricultural Fair.

If one were to attempt, by any method or means for determining values of abstract things, to determine the value of the fairs and exhibitions which have been held in Canada to the agriculture of this country, he would, in all probability be astounded at the amount of good that has been accomplished in this manner. We are accustomed to reading the flaming posters and the large advertisements in display type inviting our attendance and our patronage of this large exhibition, or that country fair, without giving a great deal of thought to the reasons which may be behind the holding of them. Away back in the days of the early settlements in North America these fairs were not as they are to-day. They partook partly of the nature of thanksgiving festivals, stated times for which were duly appointed each year when the products of the year were gathered together in each community and the people given occasion to witness in a striking manner the reward of their labor. Later on, these occasions were also made to serve in the capacity of social gatherings and, gradually, the evolution of the modern fair or exhibition has given us the highly specialized and departmentized event to which so many of us look forward each year.

Someone has aptly said that the fall fair is the mirror or the photographic plate of the community, reflecting

the prosperity, the customs, occupations and other characteristics of the people. This is very true and one has only to observe carefully the classes of live stock, for instance, shown at a few fairs in different localities to realize to what extent these communities follow similar lines in the raising of live stock. Horses may be strong in one locality but beef cattle may be weak; trotting events may denote a live interest in light horses, or an absence of good types of horses on the surrounding farms. Holsteins may be more prominent in one section, Ayrshires in another, and Jerseys in still another. Certain sections may be exceptionally favorable for the growing of corn, while others may grow but little corn but most excellent cereals. All these will be reflected in the prize list for the fall fair and in the exhibits, and it should be the object of every citizen in the community to see that the best is represented. Many a stockman has been attracted to a certain district because a chance visit to a fall fair has shown splendid quality or large numbers of the particular kind of stock in which he was interested and it is only natural that he should endeavor to obtain further purchases from districts which he knows can supply his wants. The same thing holds true of seed grains and seed of all kinds. This is being realized to a greater extent all the time, and now we see for example, fruit exhibitions in certain parts of the country and corn shows in others.

From the standpoint of progressive agriculture and because of its possibilities in business, everyone should take an interest in the fall fair. A reputation for good farming should mean increased land values to the community and this naturally points toward increased prosperity. What has been said with regard to the local fair is no less true with respect to the larger exhibitions such as the Ontario Provincial Winter Fair, or a national or provincial exhibition. The smaller fair seeks to attract attention to a certain locality and the excellence of its products; the larger show or exhibition has broader aims and has a value less directly concerned with the individual but in a general sense does a very important work. Let us, therefore, do our best to support the local fair and the larger exhibitions by exhibiting our best.

Automobiles, Farm Machinery and Farm Motors.

Compression.

BY PROF. W. H. DAY.

Not only must the valves be timed correctly, they must be properly ground so that during the compression and power strokes, especially the former, there may be no leakage and consequent loss of power. To test the compression turn the engine over on the compression stroke. If it turns hard, and when the piston is once

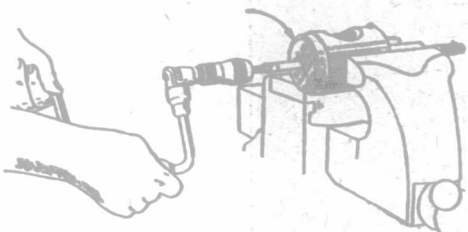


Fig. 1—Grinding Valve, When Contained in a Cage.

With acknowledgements to the I. H. C.

past centre the elasticity of the compressed air shoots the engine forward to the end of the stroke, the compression is good, but if it turns easy and is rather sluggish after the piston is past centre, then the compression is poor, and there is a leak somewhere. The exhaust valve is the most common place for leaks—sometimes it becomes warped by the intense heat, sometimes it becomes pitted by the continual action of the exhaust gases, and sometimes bits of carbon may lodge between the valve and the seat. The last two are the most common, and perhaps carbon is the initial cause of pitting. When warping or pitting occurs it is necessary to regrind the valves. The method of doing this varies with the design of the engine. If the valves are in cages, the latter may be removed and placed in a vice, as shown in figure 1, to admit of easy grinding. If they are in the head, this must be removed and turned upside down as shown in figure 2, to admit of access to the valves. The valve spring is removed and some of the grinding compound placed between the valve and the seat, and then the valve turned back and forth by means of a grinding tool like a screwdriver in an ordinary brace. The grinding should continue until both the valve and the seat show a smooth, even surface of contact all the way round. Frequently in L and T heads the valve seat is solid, with the engine body. In this case it becomes necessary to grind the valves right in the engine. Access to them may be had by removing the valve caps and the mechanic must place himself above the engine in order that the brace may be worked to advantage. The push rod must be shortened or removed so that the valve stem will not ride on it as the grinding proceeds. Care must be taken that none of the grinding compound drops over into the cylinder. To guard against this a small cloth may be used to close the opening between the cylinder and the valve chamber

or combustion chamber as it is usually called. And this chamber must be thoroughly cleaned before the cloth is again removed. After the grinding is finished and the valve and spring replaced the push rod must be properly adjusted.

The writer cannot refrain from observing that his experience has been that if a good carbon remover (and there is such on the market) is used regularly in the engine, the valves will last almost indefinitely without need of regrinding. I have used carbon remover in my automobile engine for 10,000 miles with entire satisfaction. At the end of 6,000 miles the pistons were removed for inspection and could not possibly have been in finer condition, there being no sign of scoring or undue wear, and there has not been a leaky valve in 10,000 miles.

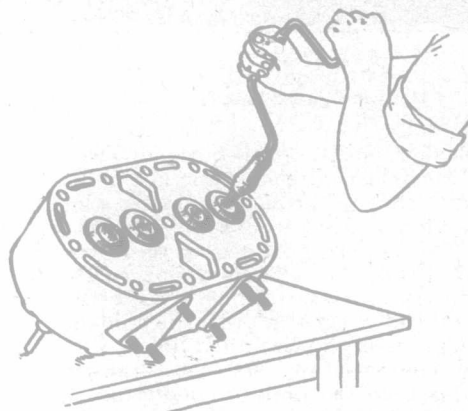


Fig. 2—Grinding Valves in Valve-in-head Type of Engine.

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If after the valves are in good condition the compression is still poor, then the leakage must take place past the piston rings. This may occur from insufficient lubrication, or from the rings or cylinder being worn or from the rings being gummed in the grooves by carbon. If the last is the trouble a treatment with a good carbon remover will loosen them and avoid a great deal of unnecessary work. If none is at hand, however, the piston must be taken out and the rings removed, and they and the grooves thoroughly cleaned. In doing this coal oil will be found helpful. Care must be taken that the rings are not broken in being removed or replaced. Three strips of tin will be found helpful, as shown in figure 3. If the rings are worn new ones may be put in, but if the leak is due to worn or scored cylinder, then it must be rebored and the piston fitted with new rings the proper size for the new bore.

Bearings.

Sometimes an engine develops a knock on account of a loose bearing. There are three places where this may occur:

1. At the wristpin.
2. At the connecting rod bearing on the crankshaft.
3. At the main bearings, i. e., where the crankshaft rests in the frame or base.

In any case the knock should be removed before it becomes really bad, else the bearings may be flattened by the pounding or the shaft worn out of true. When the crankshaft and connecting rod are accessible it is an easy matter to locate the loose bearing. To test the connecting rod turn the crankshaft till it is half way between inner and outer dead centre, then place one hand on the connecting rod and crankshaft to detect any play or lost motion as the flywheels are rocked back and forth with the other hand. The wristpin may be examined in a similar way. To ascertain if the main bearing is loose it is customary to place one end of a lever under the flywheel to raise and lower it, while as before the hand rests on the hub and bearing to detect any play. Care must be taken not to spring the crankshaft. If the base is enclosed as in automobiles, one may make a shrewd guess by certain symptoms or characteristics. A wristpin knock is erratic—sometimes present, sometimes absent, but most in evidence while the engine is idling. To a connecting rod knock there is no let-up, and it is worse when the engine is pulling heavy. The main bearing knock is most in evidence when the engine is exerting a moderate pull, e. g., when the power is partly shut off with the car going at a moderate rate of speed. A wristpin knock is not as serious as the others.

If either the connecting rod or main bearing is loose the cap must be taken off, some liners removed, the cap replaced, the bolts tightened and the bearing tested again. If still loose or if too tight another adjustment must be made. The bearing should have only a very slight play—about 5/1000 to 8/1000 of an inch in the bearing and 1/16 to 1/32 side play.

If the knock is at the wristpin then it is necessary to put in a new pin, and a bushing also, if the knock is

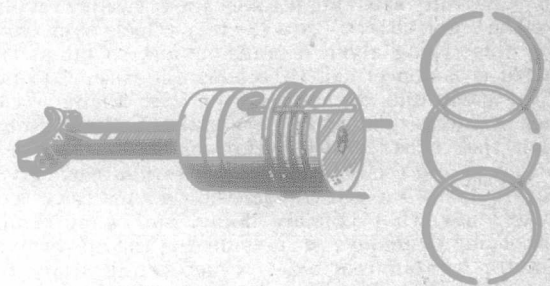


Fig. 3—Replacing Piston Rings.

Note strips of tin used for sliding rings to the grooves.