

Carburetion

By E. N. PERCY

MOST articles on carburetion either assume that the reader has a technical education; or else are of the purely descriptive character usually addressed to practical men.

However, it seems as though the physical principles of the process could be made clear to the non-technical man provided he is willing to "dig" a little.

There are two main elements that govern the process. One is the capacity of the air to absorb the fuel. The other is the amount of air necessary to burn the fuel. These two functions have nothing whatever to do with each other. In the case of fuels heavier than gasoline, it may happen that the air cannot absorb enough of them for proper combustion, and the mixture is "weak." In the case of very light fuels and improper combustion, it may happen that the air will absorb too much, and the mixture will be "too rich."

The capacity of air to absorb fuel is governed by what is known as the vapor pressure.

The vapor pressure depends upon the principle that liquids are evaporating all the time at all temperatures and pressures. When the temperature of a liquid raises to a point where the vapor pressure exceeds the air pressure, the vapor form bubbles and rises from the liquid and is said to "boil."

The vapor pressure of any liquid is 14.7 pounds per square inch when it boils at atmospheric pressure. The vapor pressure of water is about 14.7 pounds at 212 degrees F., but at 300 degrees F. it is over a hundred pounds pressure. The vapor pressure of gasoline is 14.7 pounds at about 80 degrees F. and continues all the way up to about 300 degrees F. because gasoline is a number of substances instead of one like water.

The laws of gases and vapors are such that they can mix according to their pressures. If the vapor pressure of gasoline is, say, 13 pounds at ordinary temperatures, a saturated mixture would contain 13 parts (by volume) of gasoline and 14.7 parts of air.

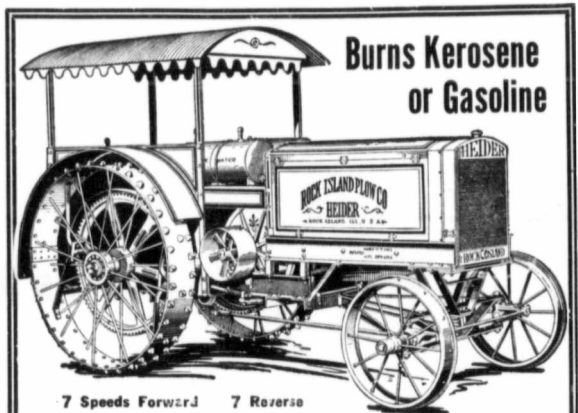
The actual vapor pressure of gasoline is about four pounds at ordinary temperatures of, say, 60 degrees F. This would give a possible mixture of four parts of gasoline-vapor and 14.7 parts of air, by volume. As air runs about twelve cubic feet to the pound and gasoline-vapor about four cubic feet, we have almost a pound of air for each pound of gasoline-vapor. These figures are very approximate, and must not be taken for scientific purposes.

A pound of gasoline-vapor requires about fifteen pounds of air for correct combustion or one hundred and eighty cubic feet. As fifteen pounds of air is capable of taking up nearly fifteen pounds of gasoline, it is evident that there is little trouble in making it take up the necessary amount for proper combustion.

On the other hand, in very cold weather, the vapor pressure of gasoline is so low that it is nearly impossible to get the air to take up enough for an explosive mixture.

The obvious remedy is to warm the air, or the gasoline, or both. If, however, one is attempting to carburet a heavy fuel, such as distillate or kerosene, the fuel vapor pressure may be so low that it is impossible to carburet it sufficiently to get an explosive mixture.

An explosive mixture must contain at least fifty per cent as much air as necessary, and not more than double the right amount, or the mixture will not explode. This is equivalent to saying that there must be not more than twice



7 Speeds Forward 7 Reverses

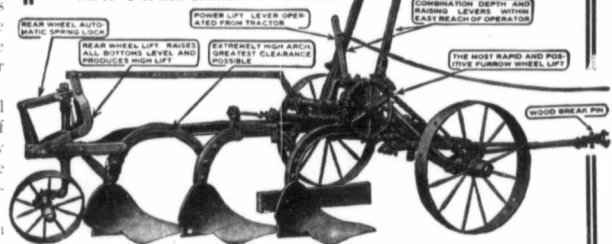
The HEIDER Tractor Is King of the Light Tractor Class

SIMPLE IN CONSTRUCTION—EASY TO HANDLE—ABUNDANT POWER—GREAT DURABILITY—ASTONISHING VALUE

ROCK ISLAND PLOWS Work Behind Any Tractor

Number Bottoms and Size	Wt.
No. 12—2 14-inch Bottoms.....	1009
No. 12—3 14-inch Bottoms.....	1225
No. 12—4 14-inch Bottoms.....	1415
No. 12—3d Bot. Att. extra.....	190
No. 12—4th Bot. Att. extra.....	190
No. 11—2 10-inch Bottoms.....	690
No. 11—2 12-inch Bottoms.....	695
No. 11—2 14-inch Bottoms.....	700
No. 11—2 16-inch Bottoms.....	705

2, 3 or 4
"CTX"
Bottoms



The power for the power lift is obtained from the wheel which is always running in the bottom of the furrow. This wheel is always on solid ground, and there is positively no chance of slipping when raising the plow.

The clearance, both fore and aft and under the beam, is much greater than the ordinary plow. No chance of clogging in trashy ground. An exceptionally high and level lift is made possible by our lifting device, giving a swing from high to low of fourteen inches. The clearance above ground is five inches. The bottoms are self-leveling and insure an even depth of plowing. Light draft is secured by distributing the weight evenly over all three wheels.

Write for complete Details and Specifications of this
UNIQUE POWER FARMING OUTFIT

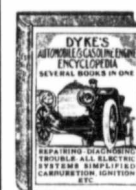
Waterloo Manufacturing Co. Limited

PORTAGE LA PRAIRIE, Man.

REGINA, Sask.



Transport Officer: "Confound it, man! What are you doing? Don't tease the animals!"



If You Own a Car

You Need

Dyke's

Automobile Encyclopedia

IT treats of everything about an automobile—all about repairing your car, with hundreds of splendid illustrations. It isn't what you would call an Encyclopedia in the true sense of the word—yet it is the most complete automobile reference book in the world to-day—any subject, trouble, remedy or repair you can possibly think of, can be found in the 6000 lines of index.

REMEMBER—Each and every subject is complete—there are many sub-headings not mentioned, and every subject fully illustrated and simplified. As a motor car owner you cannot do without it. **PRICE \$3.32 POSTPAID.**

Book Dept.

E. H. HEATH CO. LTD. Winnipeg, Man.