POWELL LEVERAGE PRINCIPLE

New Principle of Gasoline Engine Construction

By H. C. PERSONS

LIGHTER, more powerful and more economical gasoline engines, long-sought by automotive engineers may now be possible as a result of successful tests on a new principle in motor construction, known as the Powell Leverage Principle.

In dynamometer tests at the Quapaw, (Okla.) plant of the A. L. Powell Power Company, of Oklahoma, a 3x4 engine with a Powell Leverage unit in each of its four-cylinders, developed 41.2 brake horse-power at 1750 revolutions per minute with a fuel consumption of better than .6 lbs. per brake horse-power hours.

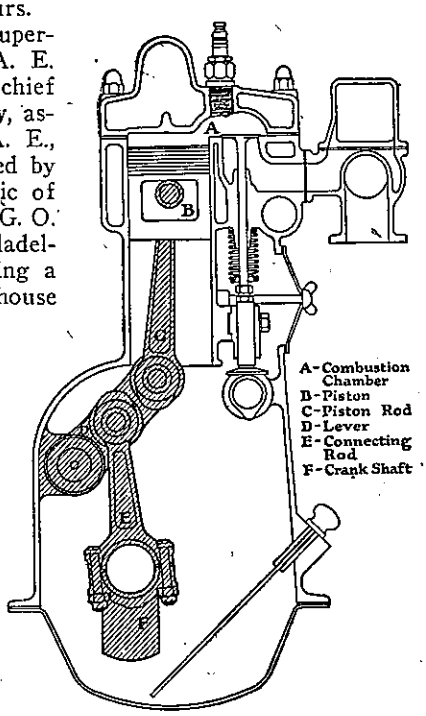
The tests were run under the supervision of V. J. Swanson, S. A. E. and A. S. M. E., of Cleveland, chief engineer of the Powell Company, assisted by S. F. Donohue, S. A. E., of Cleveland, and were witnessed by Fred Lindquist, master mechanic of the Empire District Electric Co., G. O. Spaur, technical engineer of Philadelphia, now in Oklahoma installing a power plant for the Westinghouse Company, and a group of officers and directors of the Powell Company.

In detail the result of these tests was tabulated as follows:

Engine Tested — 3-inch bore, 8-inch stroke, 226 cu. in. displacement; Crank circle diameter, 4 inches. Heavy duty truck type and low speed.

R.P.M.	B.H.P.	Fuel Consumption
*250	4.0	Fuel test was
450	10.0	made only on last
850	22.3	four tests and
1000	27.3	averaged .6 lbs.
1200	38.3	per B. H. P. Hrs.
1750	41.2	and better.

All tests were of 5 to 30 minutes duration.



The Powell Leverage Principle converts the engine into a compound instead of a simple lever with a piston stroke twice the diameter of the crank circle. The travel of the piston being doubled, the Powell engine should deliver greater power than the conventional engine of the same bore and same crank throw, and do it with a much smaller consumption of fuel.

In the ordinary type of engine of four-inch stroke the crank travel is practically 12½ inches while the piston makes a complete stroke, or travels 8 inches. In the Powell engine the piston makes a complete stroke or travels 16 inches in the same time. This longer stroke in the same period of time and with the same charge of fuel, gives twice the expansion to the gas.

But the claim of the inventor is based on further points of superiority. In the conventional engine the power is ineffective for approximately 7½ degrees either side of the dead center, and the momentum of the fly-wheel must carry the load over dead center. This means a waste of fuel and a reduction in horse-power. In the Powell engine the lever stands at approximately a 45-degree angle in its relation to the connecting rod from the crank to the lever so that the engine is practically never on a dead center, and is ready to deliver its full power the instant the explosion occurs in the cylinder.

In the usual type of engine the burned charge of gasoline is discharged from the cylinders under approximately 70 pounds pressure and upwards, causing loss of power and engine heating.

In the Powell engine, owing to the longer piston stroke in the same period of time and with the same amount of gasoline, there is more perfect combustion, and the burned fuel is discharged from the cylinder at about 20 pounds, or nearly atmospheric pressure.

The new principle, according to Mr. Powell, its inventor, can be applied to any form of internal combustion engine or to steam engines. Applied to automobile engines or aeroplane motors, the inventor declares it solves both the problem of fuel economy and of the need for lighter construction.

The tremendous annual waste in fuel through the imperfection of present-day gasoline engines is regarded by Mr. Powell as a serious economic menace. He believes that its solution will have to come through improvements in existing gasoline motors rather than through the discovery of some cheap substitute for gasoline.

He believes his leverage principle is a long stride toward the solution of this fuel conservation problem because when it is installed in any existing gasoline engine it will develop as much power as the same engine developed without it, with half the consumption of gasoline or twice as much power with the same fuel consumption.

Manufacturers of existing motors will be licensed to use the Powell patents.