

Know Many Kinds of Technical Subjects.

MANY OF THEM INVENTORS

Not a Few Individuals Granted Letters Patent on New Devices Perfected.

By S. W. Elston.

Time was when a civil engineer had to call himself a surveyor or the public didn't understand his profession, and when a mechanical engineer was thought to be just one degree removed from the man who wielded a hammer and cold chisel. Of late years there has been a more general understanding of the engineering professions, but even now the

has a mental picture of a man in overalls handling a switch engine.

The profession of automobile engineering probably is less understood than any of the other branches of engineering. In one of the largest motor car factories in the country they still laugh at the head of the engineering department who was mistaken for—but that is getting ahead of the story.

A party of ladies were being shown over the plant. At last they reached the engineering department, where the guide introduced them to the chief engineer. The ladies were quite interested.

"Automobile engineer?" politely inquired one of them.

"Yes, madam," replied the man of science.

"How fascinating!" said the visitor. "But do you know, I always thought they called them chauffeurs."

Profession Most Important.

All of which shows that an engineer is without honor save in his own profession.

As a matter of fact, the engineering department is one of the most important in any large automobile factory. To be of the engineers are the men who

acquired the most expert knowledge of a great many different subjects. He must have had a most thorough technical education—he may get this in college or out—but he must have it. He must know all about combustion engines; he must know how to design them, how to build them, how to refine them.

He must be a mechanician engineer and also a designing engineer. He must be a metallurgist; he must be a chemist, and of course he is a mathematician. An automobile engineer is not necessarily an inventor. However, there are few of the high-class men of the profession who have not been granted letters patent on some of their brilliant new devices.

Maintains Staff of Engineers.

The Chalmers Motor Company, for example, maintains a staff of about fifty engineers, designers, draftsmen and experimental automotive mechanics. Headed by George W. Dunham, this company has an automobile engineering house second to none in the country; a force of men continually employed with the designing and testing of new features, always studying to make better things already produced, ever advancing the science of motor car construction.

The first function of the engineering department is, of course, the designing of the automobile must be of the right proportions, suitable for use through a certain range of road conditions, and

models must be built, tested and designed to meet the requirements and win the approval of an ever fastidious public.

For this work the Chalmers Company has a force of six men, headed by an expert designing engineer. The designers themselves are of various nationalities—men who have studied the best automobile products of France, England, Germany, Italy and America. In designing any one model these men combine the best ideas of all countries, then add and improve through original features of their own to make the design suitable to the public which buys Chalmers cars.

Designs Are Done Over.

When a design has been decided upon it is submitted to the board of engineers. Its every detail is gone over, its advantages and disadvantages argued and its feasibility of manufacture thoroughly discussed.

Perhaps it is rejected as it stands; perhaps it is turned back to the designer to be remade and improved. When a design is finally accepted it finds the O. K. of at least fifteen men, every one of whom is an acknowledged authority on automobile construction.

To carry out this design in practical manufacture certain materials are, of course, needed. So when a design is approved, the chief engineer and his staff take the original plans and purchase the materials with which to build one car. These materials are worked up in the

are first tested. On machines designed for the purpose, steels, bearings, brakes, wheels and, in fact, all parts of the car are put through tests which result in eventual dislocation.

The point at which a bearing goes to pieces, the strain which a wheel stands before breaking, the tensile strength of a gear shaft, all of these things are carefully recorded. Meters, carburetors, magneto and so forth are worked to the limit of their endurance on running cars.

Steel Material Selected.

Then the very best of this mass of material is selected for the building of the experimental car, which is built under the direct supervision of the engineering force.

When completed this car is given at least one year of grueling work. The engineers try it out on all kinds of roads, in all kinds of weather, up all kinds of grades, from the Atlantic to the Pacific coast. If the machine shows even a minor weakness it is sent back to the engineering department and corrected. At the end of its test it must pass a standardization examination which admits of no defect. It is proved perfect by this examination; permanent plans are then made from the original drafts, requisition for materials are made out and the new model passes on to the factory to become an integer of the Chalmers output.

Even now, when the public is just

beginning to realize what constitutes a stock car, the stock chassis are more sharply drawn.

The manufacturer of 10,000 or more

cars can no longer fall behind the clause

of twenty-five special machines and thus

enter contests with his handicapped com-

petitor, who is unable to build that num-

ber, but he must now build a sufficient

percentage of his output on certain lines,

that dodging the stock chassis clause is

well-nigh impossible. Additional latitude

is given the manufacturer who desires to

build a racing car and still compete in

classes other than the free-for-all, in

which he has to contest with the monster

trucks with which he would have little or

no chance.

Division C of the racing rules alrea-

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arranged in classes of various piston

displacement, though with no limit on

their weight or stock parts.

ed to Reduce Wind Resist-
ance to Minimum.

WEIGHT ALSO BIG FEATURE

Car of Large Dimensions Will Not
Be Handicapped With Fric-
tion Removed.

By Howard Marmon.

The great increase in the number of contests over previous years and up to the close of 1909, with a further increase in contests for 1910, has caused the con-

cern board of the American manufacturers to give more than passing attention to the racing rules to govern contests for the season of 1910. While the general out-

line of the rules has been left very much

the same, the racing rules have

been rearranged, later to more firmly establish just what constitutes a stock car and stock chassis are more sharply drawn.

The manufacturer of 10,000 or more cars can no longer fall behind the clause of twenty-five special machines and thus enter contests with his handicapped competitor, who is unable to build that number, but he must now build a sufficient percentage of his output on certain lines, that dodging the stock chassis clause is well-nigh impossible. Additional latitude is given the manufacturer who desires to build a racing car and still compete in

classes other than the free-for-all, in

which he has to contest with the monster

trucks with which he would have little or

no chance.

Division C of the racing rules alrea-

dy makes this class of machines with the

arranged in classes of various piston

displacement, though with no limit on

their weight or stock parts.

Wind Resistance Is Problem.

We have built a special racing car for this class. It will race in class C. Displace-
ment, 100 cubic feet or from 40 to 60 inches
cylinder displacement. This six-cylinder
car will run at 2,200 pounds, but with
its pointed radiator and sharpened tail,
its speed is a matter of speculation
at this time.

I have always contended that it is not
as much a matter of weight to promote
speed as it is a matter of reducing wind
resistance. A motor properly turning up
at its highest speed will carry a few hun-
dred pounds over a road with or at
practically the same speed. It requires
more time to start a heavy car than a

light one, but once started and well under
way over a fine surface, such as is
furnished at the Speedway, a couple of
hundred pounds makes but little differ-
ence.

But against a wind surface, that is the
vital question. Under ordinary speed this
is not as important, but as the speed is
increased it takes additional horse power
to overcome the resistance, and as each
additional mile is added the power re-
quired increases at a phenomenal rate.

A car that with a given horse power
would travel at the rate of 100 miles an
hour (if it had much wind surface), might
require just double its horse power to
travel at the rate of 120 miles an hour, so
rapidly does the load from wind resistance
increase.

Experiments Give Results.

Scientific experiments have demon-
strated that the wind resistance at high
speed forms a sort of block against the
surface resisting it so that it absorbs
power at a phenomenal rate after a cer-
tain speed is attained. This was proved
at the Brooklands track.

The great Benz with a flat radiator was
run at the rate of 100 miles an hour and
seemed to be at the limit of its speed. A
pointed radiator was then made, the
starting crank was pointed as were the
axles and every wind-resisting surface,
while a pointed "tail" to overcome
suction in the rear was added. The car
that required all of that enormous 200
horse power to travel at the rate of 100
miles an hour, at once reached the re-
markable speed of 137 miles an hour
for a short distance, while

it may even do better than this
at Florida Beach. I have held this con-
tentation for years, but this has been the
first year in the history of automobile rac-
ing that the various types of cars have
been classified and with Division C of the

racing rules limiting displacement, but
placing no limit on the type of car, we
have made one of our machines to comply
with this rule and it now remains to be

seen whether or not my theory is ab-
solutely correct.

I expect this special machine, with wind
resistance reduced to the minimum,
to travel forty miles an hour faster than the
same car, of which we are making into a
stock model but with the regular wind
resisting radiator and construction such
as is found in stock chassis.

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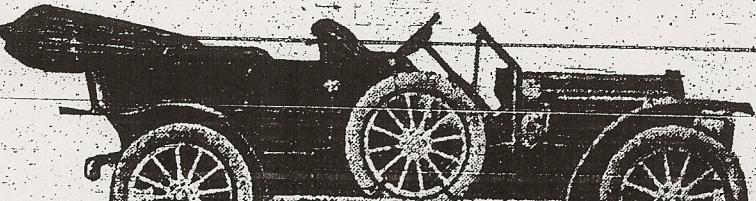
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THE NEW Rambler



The three-point-suspension of the buyer's judgment should be predicated upon efficiency, reliability and accessibility. The question of "efficiency" as between automobile engineers involves a mass of sines, cosines and designs as uninteresting as unintelligible, more capable of physical demonstration than mental.

"Reliability" is a matter of design, workmanship and materials. Largely dependent upon the skill of the manufacturer in combining experience with results.

The greatest of these is "accessibility." There are about as many degrees of accessibility as there are manufacturers. Partial accessibility means not only money, but exasperating delay—greasy inconvenience—petty oily annoyances—temper trying tasks without end. Rambler accessibility is complete from the fan to the brake shoe, end to end—from the gasoline tank indicator to the drain cock on the crank case, top to bottom. This get-at-ability is in many instances represents the difference between the curbstone adjustment by the owner and a costly shop job by the repairman.

The New Rambler, with straight line drive, off-set crank-shaft, exclusively Rambler spare-wheel, one piece crank case, automatic spark retarder, clutch release, safety lock and tank gauge, special equipment and carrying capacity, is the car of all-day-comfort.

We Invite Inspection and Cheerfully Demonstrate

Rambler Auto Co.

224-228 South Pennsylvania

Street,

Indianapolis, Ind.