

Guages Insure Precision in Auto Manufacture

This is the third of a series of
articles telling how the modern au-
tomobile is made.

BY ISRAEL KLEIN
Science Editor, NEA Service

On proper guages depends the
exactness required in automobile
manufacture.

There are guages for every pur-
pose, for measuring internal di-
ameters, for measuring depth of
screw heads and sizes of threads,
for measuring sizes and angles of
gear teeth, and for making the
every day measurements of length,
breadth and thickness.

World's Standard

To make these guages abso-
lutely accurate there has to be a
standard guage for their measure-
ment. For this, Carl E. Johansson
of Sweden, a Swedish rifle mechanic,
has invented what is considered today
the most marvelous set of guages
ever devised.

They are called Johansson
guages, in his honor, and may be
found in every shop where pre-
cision work is to be done. They
are the standard of measurement
accepted the world over, and are
closely guarded against misuse or
flaws. In fact, an automobile
plant may have two or three sets
of "master guages," which are
never used except to check up on other
Johansson guages for accuracy.

The guages in use are always at
hand to set operating machines to
the required measurements and to
check up on other forms of guages.

These Johansson guages are
blocks of steel measuring from
as low as one-half of a ten-thous-
sandth of an inch to two feet. In
fact, there is one set of Johans-
son guages, the only one in the
world, which differs in steps of a
millionth of an inch. This is so
delicate that even the heat of the
user's body would influence its
length.

Attain True Parallel

The maintenance of accuracy of
these guages is Johansson's se-
cret, although Henry Ford has
taken over the rights of American
manufacture, and Johansson now
is doing this work for Ford. But
it is known that the guages go
through a seasoning process of
seven years before they are ap-
proved as standard.

What is most remarkable is the
fact that the opposite surfaces of
these guages are exactly flat and
mathematically parallel—one of
the greatest achievements in the
history of mechanics. So truly flat
are the surfaces that, although
non-magnetic, they will hold to-
gether against a pull of more than
200 pounds.

With these guages as the foun-
dation of precision, another form
of guage is turned out in the au-
tomotive plant, for the accurate
measurement of engine and other
parts. It is called a snap guage.

This is a steel block made in the
form of two C's back to back. The
jaws of the guage, which conform



Lapping a snap-gauge, shown here, is work requiring skill and ex-
treme care, for there's only one ten-thousandth of an inch difference
between the jaw widths. Inset shows a set of Johansson guages, the
standard of all.

with the edges of the C's, are
what take the required measure-
ment of parts. They are there-
fore made of a hard chromium
steel and are ground down par-
allel to each other and as smooth
as possible.

Ten-Thousandths of Inch Leeway
One set of jaws, one one side, is
"lapped" or rubbed down with the
use of a fine carborundum paste,
to the exact width between sur-
faces required of the part it is to
measure. On the other side, the
surfaces are spaced one ten-thous-
sandth of an inch closer together.

This affords the mechanic a le-
way of a ten-thousandth of an
inch in the manufacture of his
part, although it will be found
that the parts come out even close
to the exact requirement than
that.

The narrower jaw is called the
"Don't Go" side, and has the up-
per corners chamfered, or cut
off, so that the mechanic may re-
cognize it by the feel. When he
wants to check the measurement
of a piston, for instance, he ap-
plies it to the "Don't Go" side.
The piece must not go through
the jaws without being forced.

Then the same piece through the jaws that
are set to the required measure-
ment. If the piston goes through,

BIG OIL RUN MAY LOWER GAS PRICES

BY JOHN W. HILL

The American motoring public
should be able to take its joy rides
and its summer tours at a lower
cost this summer. There is every
prospect of cheaper gasoline prices.

It now seems probable that there
will be further huge over-produc-
tion of crude oil this year. This
means lower prices, from crude oil
to gasoline.

That prospect stands today in
the face of the greatest winter
consumption of gasoline ever
known. In January the country's
20,000,000 motor cars burned up
17 per cent more gas than was
used in January, 1926. February
consumption ran 30 per cent
ahead of one year ago.

But meanwhile production is
leaping ahead by great bounds.
The daily average output of crude
oil has reached approximately
2,500,000 barrels. Never before in
the history of the industry has that
figure been attained.

Two Reasons for Boost

Two factors are chiefly respon-
sible for this startling rise in pro-
duction.

One is the amazing output de-
veloped by the new Seminole field
in Oklahoma. The other is the
widely spreading use of improved
methods of accelerating the out-
put of wells. This improvement
in technology is known as the "gas
lift."

Of immediate significance is the
Seminole field. Early in February
this field had shown its ability to
produce 300,000 barrels of oil
daily. Such a huge output com-
pletely overtaxed pipe lines de-
signed to carry away the oil.

The full output for the field is
estimated at 350,000 barrels daily.
That is about 14 per cent of the
aggregate production of the coun-
try.

With such an enormous supply
of new oil pressing upon the mar-
ket something has got to give.
That something will be prices, say
oil officials.

Production is Hastened

Of even greater significance
than the Seminole developments is
the appearance of the new "gas
lift" equipment in the great oil
fields of the country. By the use
of the "gas lift," natural gas, a
by-product of oil wells, is intro-
duced into the oil sand. This
stimulates the flow of oil to the
top. After natural flow ceases
the small portion of recoverable
oil is left in the ground to be ob-
tained by pumping. Formerly a
large portion was left.

Of each 100 barrels of oil con-
tained in oil sand, it is possible
under present methods to recover
only about 35 barrels. The "gas
lift" is making it possible to speed
up greatly the production of oil
over a given period. Experts be-
lieve it may even increase the
total amount of oil that may be
recovered.

But the immediate unmistakable
effect of the new method is to in-
crease output. By the use of it
producers are getting from two to
three times as much oil a day as
formerly. This is having an in-
creasingly tremendous effect upon
total production and upon market
conditions.

CHICAGO—Your grandchild
should earn \$11,000 a year if he is
up to the average and present
tendencies continue. A survey by
the National Home Study Council
shows that the national income is
gaining at the rate of \$5,400,000,
000 a year.

NEW YORK—Peaches apparent-
ly are trying tin pan alley as a re-
venue producer. Anyhow, she is
credited with being the author of a
song, "When Flaming Youth Mar-
ries Old Age." It will be sung in
her vaudeville act. Tears, Years
and All, not to make money, she
says, but as an object lesson.

mum load that may be placed on
them and to keep them properly
inflated.

"Reasonable care and regular in-
spection of tires for minor injuries
and checking of the air pressure
will enable the motorist to get the
most in mileage and useful serv-
ice."

"The trouble is not with the
tires, but with the way they are
overloaded or underinflated. Noth-
ing—man, beast or mechanical de-
vice—can stand up under great
abuse. The remedy is to provide
tires large enough for the maxi-

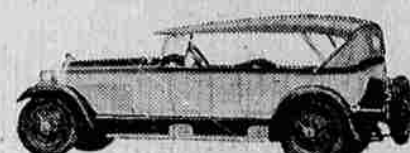
Nash Introduces New Cabriolet, Coupe, and Sport Touring Models



THE NEW SPECIAL SIX CABRIOLET
Equipped with Rumble Seat—Model 241



The New Advanced Six Coupe—Model 260



The New Nash Advanced Six Sport Touring—Model 271

Three brand new models—a Cabriolet, with
a rumble seat, on the Special Six chassis, a
Coupe, with rumble seat, on the Advanced
Six chassis, and a Sport Touring model on
the Advanced Six chassis—are announced
by The Nash Motors Company. The
Cabriolet being shipped to dealers now, is
priced at \$1,290 f. o. b. Milwaukee; the
Coupe lists at \$1,775 f. o. b. Kenosha, and

the Sport Touring is priced at \$1,540 f. o. b.
Kenosha. Shipments of the Sport Touring
car will begin before the end of the month
and of the Coupe about April 1. With the
addition of these new cars the Nash line
comprises twenty-six models, ranging in
price from \$865 to \$2,090 f. o. b. factory,
and all of them equipped with 7-bearing
crankshaft motors.

One-Sleeve Two-Cycle Car Due

By NEA Service

DETROIT, April 6.—Success of
experiments made in this country
and in Europe in recent years
points to the development and
adoption of the two-cycle, single
sleeve valve engine for the auto-
mobile.

This is nothing new in Europe,
where the three passenger car com-
panies and two motorcycle man-
ufacturers have been making use of
this type of motor. For America
it is an innovation.

First signs of this development
here was the purchase of the Ar-
gyll patents by Continental Mo-
tors about two years ago. These
are the original single sleeve
valve, two-cycle engine patents
based on inventions of two Scot-
tish engineers, Bart and McCollum.

Heretofore, American motordom
has been acquainted only with the
double sleeve valve engine of the
Knight type. In this case, two
cylindrical sleeves within the
cylinder work up and down, open-
ing and closing the intake and ex-
haust ports, as openings in the
sleeves meet others in the cylin-
der wall.

Twisting Cylinder.

In the Argyll engine, however,
only one sleeve is adjusted so that
it moves in a spiral, making a twist
of almost 50 degrees while moving
up or down along the cylinder wall
and opening or closing the intake
or exhaust ports by means of open-
ings at the top.

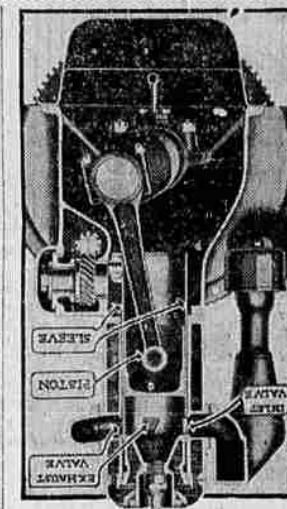
The engines in use in American
automobiles today are all of the
four-cycle type. Originally, these
were called "four-strokes-cycles" an-
guage, because the piston made
four strokes in each cycle of the
engine's operation. A cycle, in
this case, is the complete action
that takes place in each cylinder.

This consists of two upward and
two downward motions of the pis-
ton in the following order: 1—in-
take of gasoline when the piston
goes down; 2—compression as pis-
ton goes up; 3—power as piston
goes down; 4—exhaust of used gas
as piston goes up.

Power at Each Stroke.
Only the third stroke is effective
in propelling the car. The other
downward stroke is practically
waste. The two-cycle engine makes
every downward stroke a power
stroke.

In this case, the cycle consists
1—up, or compression, stroke; 2—
down, or power, stroke.

It is while the piston is on its
way down that both the exhaust
and intake valves are opened by the



Cross-section of one cylinder of the
Argyll single-sleeve engine.

the moving sleeve, permitting the
exhaust of the used gas and the
entrance of the new gas. The ex-
haust valve is opened slightly be-
fore the inlet, so that the cylinder
may be almost entirely cleared of
the used gas before the unused gas
comes in.

Longer life, less power to drive,
silence, less carbon deposit, greater
fuel efficiency are some of the
advantages claimed for this type
of engine. Tests have shown that
a small motor developing 30 horse-
power at 3000 revolutions a min-
ute, in an average small car, will
give 30 miles to a gallon of gaso-
line.

How's She Hittin'

By ISRAEL KLEIN

Science Editor, NEA Service

When the car develops a knock,
especially when laboring against a
grade or at starting, it is not al-
ways at fault.

This knock is called an "ignition
knock," and can be identified
by its hard, metallic sound. It is
not always due to any carbon in
the cylinder.

If the engine is in good shape,
however, and the knock occurs, it
is more than likely due to lack
of proper engineering on the part
and intake valves are opened by the

Many drivers forget that there
is a spark lever at their steering
wheels, to be manipulated at just
such emergencies.

When the engine is speeded up,
the spark must be advanced. But
when it slows down, as on labor-
ing up a hill or in starting, the
spark must be retarded so that the
ignition may be timed properly
with the compression of the fuel
in each cylinder.

Most power is obtained when
the spark ignites the compressed
gas while the piston is at the very
top of its stroke.

But when the engine is running
fast, the piston has a tendency to
be well on its downward stroke
before the gas has had time to ex-
plode. This is due not only to the
speed and momentum of the
piston and flywheel, but to the
fact that there is a slight delay in
the explosion of the gas, even af-
ter the spark has ignited it.

In other words, there is first
what engineers call a "flash point,"
when the gas is ignited, and then
comes the "fire point," when the
gas explodes.

There is loss of power if the
explosion takes place after the pis-
ton has started down. So the
remedy is to advance the spark so
that the flash will occur slightly
before the piston reaches the top,
and the fire will take place just
as the piston is ready to go down.

If the spark is advanced too far,
however, the fire, or explosion, oc-
curs before the piston arrives at
the top, making it necessary for
the other pistons and the flywheel
to force this one on its way up
against the force of the exploded
gas, thus causing the well-known
knock.

This occurs mostly when the en-
gine is slowed down, by the force
of its pull up hill, or against the
entire weight of the car on start-
ing. When this happens, the po-
sition of the spark that had been
proper now becomes too far ad-
vanced and the knock occurs.

The remedy is to retard the
spark, but only enough to over-
come the knock. Retarding the
spark too far causes loss of power.

Control of the spark, however,
should always follow the throttle
control. That is, the engine should
never be speeded up by advancing
the spark, or slowed down by re-
tarding it. The throttle should do
that.

Then, as the engine varies its
speed slower or faster, the spark
lever should be manipulated ac-
cordingly.

FRANCE'S ALOOFNESS NOT TO HALT ARMS CONFERENCE

WASHINGTON, April 5.—Presi-

dent Coolidge is disappointed that
France has decided not to partici-
pate in the naval limitation con-
ference between the United States,
Great Britain and Japan, but he
does not expect the refusal will in
any way impede the holding of the
conference.

Plans for the gathering of re-
presentatives of this country,
Great Britain and Japan around a
conference table at Geneva to limit
naval armament will go forward
despite France's declination, and
the president still is optimistic that
Italy, which declined to join in the
conference as an active participant
still may decide to send even an
unofficial observer. Italy has given
no indication of the course it will
take.

NEW YORK—Roger Wolfe
Kahn is trying to determine which
kind of jazz encourages indecent
dancing. He's on a committee of
orchestra leaders commissioned to
four night clubs to investigate.

NEW YORK JAIL AWAITS 22 FOR INDECENT PLAY

Producer of "Sex" and Her
Aides Found Guilty of
Corrupting Morals.

SENTENCE APRIL 19

Actors Sob as Verdict Is
Read—One Decorated
for Bravery in the
World War.

(Associated Press Local Wire.)

NEW YORK, April 6.—Max
West, author-star, and her twenty-
one associates in "Sex" raided
Broadway play, today faced jail
sentences.

The entire company, two man-
agers and the Morals Producing
company, the financing corpora-
tion, were convicted yesterday by
a jury for presenting a play tend-
ing to corrupt the morals of youth.

Jail was continued pending sen-
tence April 19. The law provides
penalties of not less than ten days
nor more than a year in jail, and
not less than \$50 or more than
\$1,000 fine, or both.

Sex, is the last of three raided
productions to be disposed of.
It has voluntarily closed on
March 19 after an eleven months
run, one month under protection
of an injunction after police had
served warrants on the cast and
the owners.

Sobs Displace Levity
The levity displayed by "Sex"
performers during the trial gave
way to dejection while they wait-
ed five and a half hours for a ver-
dict, and finally resulted in sobs
of actors and condemnation of the
prosecutor by women members of
the cast.

Miss West, blonde author-star
who admitted she knew "her
own" as an actress, buoyed up
her crestfallen company when the
verdict came.

Barrie O'Neal, who was de-
corated for bravery as a lieutenant
on a British mine sweeper during
the world war, and who played
the leading role of a hard bodied
lieutenant in the play, sobbed.

David Hughes, another player, also
cried. James F. Timoney, one of
the two managers, prayed.
Smiling, Miss West comforted
her fearful leading man. "We are
not through with this case yet,"
she said. "You've got to fight in
this world. I'm used to hard
knocks, but in this case my spirits
are good because I think the pub-
lic is on our side."

KING FERDINAND AT DEATH'S DOOR

(Associated Press Local Wire.)

**BUCHAREST, Rumania, April
6.**—King Ferdinand's condition
was extremely grave this morning
notwithstanding a slight rally
which revived the hopes of an an-
xious country.

VIENNA, April 6.—A Bucharest
dispatch to the Neue Freie Presse
this morning said King Ferdinand
had received the last rites of the
church and that his death was ex-
pected hourly.

The name correspondent says
the national peasant party is try-
ing to enforce a demand that the
king summon a crown council at
his bedside and revoke the exclu-
sion of former Crown Prince Carol
from succession to the throne. The
dispatch adds that nervousness
prevails throughout the country.

SPEED LIMIT GOES UP

The states of Washington and
Indiana have raised the legal max-
imum speed limit to 40 miles an
hour. This applies to the state
highways outside city limits.

STEEP TAXES ABROAD

Most parts of Europe look on the
automobile still as a luxury. In
fact, the ownership tax rises to as
high as 50 per cent of the car's
original cost.

WALKING STILL IS DANGEROUS

By NEA Service.

CHICAGO, April 6.—Peda-
rians made up 73 per cent of
the persons killed during
January in automobile ac-
cidents throughout the country,
reports the National Safety
Council.

Twenty-three per cent of
these were under 15 years old
34 per cent were 15 and
over, and 43 per cent were be-
tween these ages.

Only 12 per cent of the 1430
motor vehicle fatalities dur-
ing January were due to col-
lisions.

ALL REFINEMENTS IN NEW CHANDLER

The owner of a new Chandler
Royal Eight Sedan will find his car
equipped with all the comfort and
conveniences of home, points out
Stanley Bros., local Chandler re-
presentatives.

"On the instrument board there's
an electric clock which never
needs winding, and a cigar lighter
with an ingenious spot light at-
tachment, in addition to the usual
speedometer oil and gasoline
guages and ammeter.

"In the rear tonneau are arm
rest at either side of the wide
roomy seat with shaded reading
lights above; silken toggle grips to
assist in leaving the car; a bronze
robe rail with hand grips at either
end; an attractive, durable heater
set neatly into the lower portion
of the front seat back; a neat
smoking set and vanity case rigidly
set into the sides of body struc-
ture, and a comfortably padded

foot rest to comfort rear compart-
ment passengers.

"If the owner wishes to light a
cigar or cigarette, or Milady wishes
to touch up a bit, they will find
all the conveniences and comforts
of home in this completely-equi-
ped, luxurious new model," claims
Stanley Bros.

MILLIONS FOR ROADS

Virginia will spend nearly ten
million dollars for good roads this
year. The state highway commis-
sion has provided for an expendi-
ture of \$8,000,000 to improve the
main highways, and \$1,200,000 to
improve feeder roads.

CITROEN IS EXPANDING

Andre Citroen, the famous
French motor manufacturer, has
come into the American market to
buy several million dollars worth
of automotive machinery. He ex-
pects to expand his output from
100 to more than 1000 cars daily.

GARAGES INCREASE

Four out of five houses built last
year had a garage to accompany
it, reports the U. S. Department
of Labor. A large number of the
garages were of the multiple va-
riety, to go with apartments. They
cost an average of \$22 each.

PROPER INFLATION IMPORTANT POINT

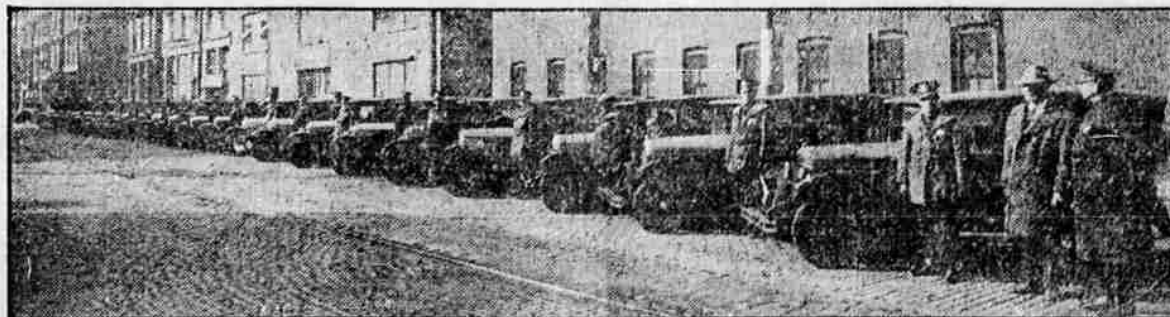
"Tire mileage, life and service
depend on several factors," accord-
ing to Earl Burch of the C. A.
Lockwood company, Firestone
dealer in Roseburg.

"These factors include the tire,
driver, car, roads, and last but not
least, on using tires large enough
for the heaviest load placed on
them at any time and keeping
them inflated to the correct pres-
sure.

"Nearly every day some one will
say to us, 'Why do some people
get 25,000 miles from their tires
when the best I ever get is around
10,000 miles?' How do you account
for that?"

"The trouble is not with the
tires, but with the way they are
overloaded or underinflated. Noth-
ing—man, beast or mechanical de-
vice—can stand up under great
abuse. The remedy is to provide
tires large enough for the maxi-

"HOT SHOT" SQUAD USES WHIPPETS



Here is a view of Kansas City's crack "hot shot" squad lined up with their speed cars—22 Whippets. This squad forms the backbone of the Missouri city's program against lawbreakers and its effectiveness is seen in a noticeable let-up in crime.

Kansas City police officials declare that the cost of operating and maintaining the squadron of Whippets is the most economical in the history of the city.

The Whippet was selected by the Kansas City police heads as the car best suited to the work that required speed, power and serviceability.

TOOT DE TOOT, TOOT

One of the famous letters to the London Times contains
the suggestion that motorists adopt the Morse code in signal-
ing to one another and avoiding accident.

Three short toots, meaning S, notifies others that the
tooting driver is going to stop. A short toot, followed by a
long and then a short, is code for R, and would mean a right
turn is intended. Similarly L for left turn would be a short
toot, a long and two short toots, as every Morse operator
knows.

Of course, we wouldn't have to know the entire Morse
code to fall in with this suggestion. These three letters would
be essential.

But it might be advisable to know the entire code,