

THE AUTOMOBILE

BEARINGS ARE SUPPORTS FOR MOVING PARTS.

What is a bearing? Well, it is a support for a moving part, made so as to minimize friction, stand wear and achieve fine adjustment. It would not be a bad idea if more humans had the characteristics of a bearing.

There are hundreds of these things in an automobile, so one could hardly be blamed for losing just a few. But the loss of only a few might raise merry havoc with the machine, and put it in the drydock of the automobile world—the repair shop.

There are many types of bearings, some in which the metals are selected with the idea of obtaining strength rather than non-friction qualities; others have strong metal shells lined with a comparatively soft non-friction metal. In these bearings moving members slide over each other.

In addition to this we have the so-called anti-friction bearings, in which balls, or straight, taper, or helical rollers are used, giving a rolling rather than sliding contact.

On the engines alone there are more than one hundred bearings. This is figured on the average six-cylinder motor; some of them have more than double the number. There are, for instance, the following:

Six cylinders, six wrist-pin bearings, six crank-pin bearings, four main, three cam-shaft, twelve main, twelve push rod, twelve valve stem, two fan, two water pump, eight ignition, six spark control, six carburetor control, six carburetor, three oil pump, four self-starter, and four self-starter linkage bearings, total 102.

The first named cylinder and piston, not generally termed bearings, are usually of cast iron, which gives comparatively long wear and in which the friction is not great if well lubricated. When wear does occur at this point it is necessary to rebore and have larger pistons fitted.

When Wear Occurs.

The wrist-pin bearings usually are in the form of a bronze shell, called a bushing, surrounding the wrist pin; when wear occurs it is necessary to drive out the bushing and replace with a new one which fits. In some cases it is necessary to replace the wrist pin also.

The crank-pin bearings are usually in halves, the metal babbitt or bronze, surrounded by a steel strap or casing, when wear occurs, the adjustment is made by taking out thin sheets of metal, called shims, which allow the halves to be brought closer together. The main crank-shaft bearings are of the same type.

The cam-shaft bearings are usually in bushing form, or of ball type, which must be replaced with new ones when they become worn. The cam-follower bearings may be just flat plates resting directly upon the cam, or rollers running on a pin in the valve push rod. Wear in these parts would usually be compensated for by adjusting screws on the valve push-rods.

The push-rod guides are sometimes made of cast iron or other metal, with babbitt or bronze shell in bushing form, and would require replacement when worn.

The oil pump bearings consist of a plunger working in a small cylinder, with one end bearing against a cam or a pair of gears driven from the cam shaft. These bearings, being

perfectly lubricated, seldom or never require adjustment.

All of the bearings considered so far are cared for by the lubricating system of the engine, which starts when the engine starts to run, and as long as oil is kept in the engine they are quite certain to be taken care of, barring accidental stoppage of the oil lead.

Fan Also on Bearings.

The fan usually runs on ball bearings, which are lubricated with a squirt can, being usually of the cup and cone type, that are adjusted by tightening the cone. The water pump bearings are lubricated by compression grease cups; when the bearings become badly worn it is necessary to drive out the bushings and replace them; generally the shaft also will need replacing. When this shaft becomes worn out of round no amount of tightening of the stuffing box will prevent water from leaking out.

The valve stem guides are sometimes bushings, but more usually are holes bored through the cylinder casting. In the former case, when wear occurs the bushing may be driven out and a new one, with new valve, installed; in the latter case, the holes must be reamed true and larger, and valves with larger stems be inserted.

In the ignition system ball bearings usually are employed with or without means of adjustment. These are lubricated with an oil can or packed in grease. There is one bearing of the ignition system which is unique in that some manufacturers advise keeping it free from lubrication substances of any kind. This is the rocker arm of the interrupter on certain makes of magnetos. Other forms of interrupters are so constructed that lubrication is advisable.

The carburetor air-valve bearing operates better if not lubricated, but does wear and need replacing at times. The throttle bearings may be lubricated and would certainly wear longer if this were done. When they do wear air is admitted which is noticeable at low engine speed, causing skipping and irregular running. Then the holes in the casting must be enlarged and a larger shaft inserted.

Pins Usually Not Adjustable.

The throttle and spark-control linkage have a number of bearings, which may be of the steel ball and socket type or a wire bent to fit in an eye. These pins should be frequently lubricated with a squirt can. Usually they are not adjustable, so that parts must be replaced when they become badly worn.

The self-starter motor and generator are usually equipped with ball bearings and are lubricated with a squirt can. Both the motor and generator have a copper commutator on which carbon brushes bear. These are not bearings, strictly speaking, but they do require a very slight trace of oil. The commutator becomes worn occasionally and must be smoothed up with fine sand paper, or, if badly worn, must be removed and trued in a lathe.

The other principal bearings throughout the car are usually of ball or roller type, which may or may not be adjustable. Usually the directions for the care and replacement are given in the manufacturer's instruction book.

—and the worst is yet to come



Fishes That Climb Trees.

It seems something of a miracle that a fish should be able to indulge in occasional tree-climbing.

On certain parts of the coasts of Asia and Africa, when the tide goes out, a fish known to the natives as the bonni is left behind. Instead of finding dry land uncongenial, this fish enjoys it thoroughly and makes hunting expeditions among the pools. Its breast fins are like elbow-joints, and by means of these it skips and jumps about the shore.

Observation of the antics of this queer specimen has shown that it is apt to retire speedily to a little pool and dip its tail in the water. This is because it has a supplementary breathing apparatus in its tail.

This fish has been known to climb a tree in the course of its wanderings. There are quite a number of species which can live out of water without experiencing any inconvenience. In India certain species of fish can live out of water for a day or two and on a hot summer's day they may be seen strolling rather clumsily across the fields.

Again, in Africa, there is a fish which has two lungs in addition to gills. For about six months of the year it lives entirely out of water. It gorges itself on food, as during the summer it buries itself in mud swamps and lives on its fat.

A Brazilian fish, which spends the summer in the same way, walks about on its fins. When kept in an aquarium, it has been known to approach a keeper and feed out of his hand.

Giving Her a Tip.

"Bridget, I don't want you to have so much company. Why, you have more callers in a day than I have in a week."

"Well, mum, perhaps if you'd try to be a little more agreeable, you'd have as many callers as I have."

Bank of England to be Rebuilt.

The famous Bank of England Building, called the Old Lady of Threadneedle Street, will soon be entirely rebuilt, made several stories higher and renovated so radically as to cause a change inside and out, says a London despatch. In the many years of its activities the bank as it grew necessitated taking premises for branch work outside the old Threadneedle area. Now it is planned to bring all the work together under one roof. Efforts will be made to preserve as much as possible the original features of the building, but some of the gardens on the four acre plot probably will disappear.

Despite its cold financial pursuit, the old building is full of romance. During the Gordon riots in 1780 the clerks were armed, instigated were melted into bullets, and the rioters were beaten off.

Where Girls Propose.

A curious custom prevails in Himia, one of the little islands of the Greek Archipelago.

The girls of this tiny isle exercise the right to propose to the men! The inhabitants of Himia are engaged almost entirely in sponge fishing. When a girl desires to marry, she waits until she has obtained the number of sponges from the sea that corresponds with the number of years she has lived.

These she places in a silk net, which she presents to the man of her choice. Should he refuse, his chances of obtaining another bride are remote, as usually the Himian maidens shun him as a punishment.

With wings nearly a foot in width extended, the Great Atlas Moth, of India, is the largest moth or butterfly in the world.

Raccoon Ranching in Canada

The raising of wild animals for their pelts in Canada, which may be said to have had its inception in the cult of the silver fox in Prince Edward Island, has spread all over the Dominion and come to include within the scope of its activities practically all fur-bearers of any value. One which has been somewhat slow in finding favor in the Dominion, but which has risen to greater popularity with the increased value of its skin, is the raccoon. The initial successes achieved in Canada in the domestication of this little animal has thrown light upon the industry and the profits to be secured from its following and has encouraged many to enter upon this interesting pursuit. Now raccoon ranches are to be found all over the eastern and occasionally in the western provinces.

Canada holds out particular advantages to those inclined to follow the farming of these profitable little fur-bearers. The climate and topography of the Canadian provinces are conducive to the production of richer and glossier furs of all kinds than other countries. This is true of both the wild and domesticated animals and the raccoon is no exception. Coons found wild or raised on ranches in Canada are stated to be in every way superior to those in existence across the border.

Easily Domesticated.

Authorities are of the opinion that raccoons are the most easily domesticated of all the denizens of the wild, after a short time in confinement losing all inclination to stray from their new homes and becoming as home-loving as kittens. If permitted to stray from their pens they will invariably return. They are less delicate in the rearing than foxes and it is almost impossible to kill them through exposure or neglect. They are both meat and vegetable feeders, which simplifies the proposition of dieting.

Their food in the wilds consists largely of frogs, honey and birds' eggs; domesticated they thrive exceedingly on butchers' scraps cooked and boiled corn. Gloss is put on the fur by periodical administrations of castor oil.

Not only is this animal a fur-bearer but valuable in his products from three points of view. Besides his pelt, which of recent years has greatly increased in value, from twenty-five to forty pounds of palatable meat, as fine as lamb, is taken from his carcass as well as about a gallon of oil.

Generous Profits Obtained.

The raccoon is prolific, producing at a birth from two to nine of a litter, so that a substantial ranch can be built up in a very short time and the proposition put on a profitable basis. Possessed of a home-loving instinct as these animals are, a ranch may successfully be conducted within a very limited area. A very successful one, in fact, is conducted within the confines of the city of Montreal, where a breeder, after experimenting all his life with other species of fur-bearers, decided upon the raccoon as offering generally the greater profits, and has run his ranch for six years. The foundation stock he obtained from animals caught by farmers and from other domesticated stock.

There is a great future for the domestic rearing of fur-bearers in Canada, and each year the industry is attaining more important proportions. Settlement is gradually curtailing the natural haunts of these animals, and on the other hand national fur markets at Montreal and Winnipeg are becoming important as world fur centres. As the richest producer of wild furs in the past, Canada is determined to maintain her prestige in the future, against the inevitable diminution of the catch, by extensive establishment of domestic ranches, providing profitable openings for many followers.

Affirmation.

"I am one with the all good." This is a splendid thing to keep in your mind constantly. Say it every day of your life, "I am one with the all good, one with the infinite life, one with omniscience, one with omnipresence—and if I am, I partake of all these qualities. I am perfect and immortal because I am created by perfection, by immortality."

"I am love because I am the product of love's creation."

Here and There in Canada.

In the whole of Canada there are 1,065 million board measurement feet of standing timber, according to the federal government. Of this, 360 billion feet are located in British Columbia and 200 billion feet in the prairie provinces.

The total value of 6,128,880 acres of land assessed under the Wild Lands Tax in Saskatchewan is \$79,791,607, according to the report of the Wild Lands Tax Commissioner, published in the annual report of the Department of Municipal Affairs.

Brick and tile to the value of \$300,000, manufactured in Saskatchewan, were used in buildings that were erected in 1920, in connection with which materials to the value of \$8,379,774 were used. While Saskatchewan contains some of the largest and most valuable clay deposits on the continent, they are as yet practically undeveloped. A wonderful market in Western Canada where last year it is estimated more than \$28,000,000 worth of clay products were used, awaits the development of the ceramic industry in this province.

Exports of lumber and manufactures of lumber to the United States through the port of St. John for the three months ending September, 1921, aggregated \$753,492. Exports of laths amounted to \$75,171; lumber, \$384,081; pine boards, \$23,807; pulpwood, \$75,470; shingles, \$2,595; and wood pulp, \$192,385.

A company has been incorporated with provincial charter to operate a large lumber mill and carry on lumber operations at St. Francis, near Edmonton, N.B. It is understood that Boston and Maine capital is behind the new company.

Erection of a paper mill, near Fort George, B.C., to cost approximately \$6,000,000, will be undertaken immediately, provided negotiations with the provincial government for leases on timber limits are successful, it was announced by Robert Tyhurst, of the Fraser timber syndicate.

Discovery of a large deposit of fuller's earth at Northern, British Columbia, is reported by Ralph O. Jessup, of New York. Mr. Jessup has left for New York, where he will endeavor to interest capital to exploit his find.

As an indication of the growth of automobile ownership in the province of New Brunswick, figures obtained from the provincial government show for the year 1921 up to the middle of October, against the whole of last year. The number of licenses issued were 13,576 and 11,216 respectively.

Thirty-five boxes of McIntosh red apples were packed from one tree in an orchard at Vernon, B.C., in addition to eight bags of windfalls. The tree is fourteen years old, and from one hundred trees in the same orchard 1,700 boxes of apples were picked.

Banquet Without the Hostess.

A procession of thirty-six elephants, painted green and red, met the Prince of Wales when he entered the territory of the only Mohammedan woman ruler in the world the Begum of Bhopal.

The Begum is a highly-educated, cultured woman who speaks English fluently. She is fond of music and painting, and has written one or two books, notably an account of her pilgrimage to Mecca.

Robbers attacked her caravan, but the Begum, personally leading her bodyguard, routed them.

This ruler was not present at her banquet to the Prince, for she is not permitted to take food in public.

Natural Question.

"I remember," said grandma reminiscently, "that when I was a girl we used to make our bread with soda." "And did you use ice cream soda when you made cake?" asked her little granddaughter.

Luck is ever waiting for something to turn up. Labor, with keen eyes and strong purpose, will turn up something. Luck lies in bed and wishes the postman would bring him the news of a legacy. Labor turns out at six o'clock and with busy pen or ringing hammer lays the foundation of a competence. Luck whines. Labor whistles. Luck relies upon chance; labor upon capital.—Coben.

THE CORN BELT IS TRAVELLING NORTH

WILL OCCUPY REGION OF WHEAT BELT.

And in the Near Future Will Become a Staple Crop of the Canadian West.

A striking feature of the 1921 harvest in the Canadian Western provinces is the quantity of corn to be seen on every hand, adding a novel touch to the western landscape of a few years ago. The traveller through the countryside encountered on all sides splendid sturdy stands of the growing crop, and later met plots and fields of the tall ripened sheaves ready for the silo and the winter's feed bin. The stalwart growth and excellent yields of the corn of the Prairie Provinces have occasioned exclamations of amazement and admiration from visitors across the line who, dwelling in what are known as the "Corn States," are in the best position to appreciate the wonderful production of Western Canadian soil. In ingrained belief that their territory alone on the continent possessed the properties for successful corn production, their astonishment and marvel can be imagined.

It is not so very many years ago since sceptics said that wheat could never be grown profitably in Canada, and gradually the growth and extension of Western Canadian cultivation saw the wheat belt travel northward in its wake, until now it is generally acknowledged to lie well within the Canadian West, a situation attested by a decade's uninterrupted successes in winning international honors for this crop. Indications would now tend to the assumption that the corn belt is undergoing something of the same process of shifting, and that, in the near future, corn will be a staple crop of the Canadian West, and the Prairie Provinces vie with the corn states across the border in their annual yields. Certainly the excellent crops to be seen all over this territory, and the increasingly large areas devoted to the culture, would demonstrate there is nothing in soil or climate to hinder such circumstances coming to pass.

Amazed at Growth of Corn.

The realization of this fact will undoubtedly have a great effect on their attitude towards Canada of United States farmers in whose agricultural activities corn enters as such a large factor, and Canadian agricultural land should be regarded with yet greater favor. Recently, a party of United States farmers visited the Canadian West to look over farm lands with the intention of purchasing and settling if satisfied. They were shown various sections where values ranged from \$25 per acre to \$50 per acre. In the course of their inspection they were amazed and delighted to see the excellent stands of corn as fine, on their own acknowledgment, as they could produce on the highly held lands farther south. Learning the price of the land they exclaimed, "These farms are worth at least \$75 per acre when you can raise corn like this." They were corn farmers and reckoned in terms of corn production. Needless to say they decided in favor of Canada and are now preparing to raise corn north of the line.

Other United States farmers will probably be just as amazed to learn that the Canadian West can raise corn to evoke the admiration of corn belt experts. The fact that corn is only becoming really popular in the West is due to several causes, one being that devotion to the cult of wheat and other cereals has tended to practically exclude more crops and another that before the more intensive farming which is becoming the order in the larger portions of the provinces, the wide ranges provided the necessities of pasturage and winter feed.

Certain it is that in the West corn can be grown successfully, and the increasing favor it is finding with farmers augurs the future location of the corn belt much in the same region where the wheat belt is to-day.

Gun That Saves Life.

Many things can be shot out of guns besides bullets and shells. An inventor has just produced a gun from which a stout line can, from the shoulder, be shot a distance of one hundred and ten yards.

The apparatus is particularly useful to ships, yachts, or lifeboats, when they require assistance, or for sending a line on to a quay or over a wreck. Its use to fire brigades, it is believed, will be invaluable also.

The mechanism is of a simple character. The gun is fitted with a stand, and when placed on this the distance to which the line can be sent is even greater.

Milk-Pudding Don'ts.

Don't drink milk with your meals! So said Sir James Cantlie, the eminent surgeon, in a lecture recently.

Milk clots upon meat or fish, and the gastric juices cannot get to work. This curd gets harder and becomes like cream cheese, thereby impeding the digestion of the meat.

By drinking milk with meat you lose the benefit of both and cause great trouble to the stomach. Milk puddings should not be taken with meat, fish or game.

Man was made for action. The mind must be employed, and when it is employed normally it gives a great sense of satisfaction, and increases health. The individual feels the exhilaration of constant growth, and there is no stimulant like that. It gives an uplift to the entire nature. There is no tonic, no stimulant, like that of the successful pursuit of one's highest ambition.

The Only Way.

Tommy had been very troublesome at school. The teacher had instituted a new form of punishment. She kept a roll of those children who made themselves conspicuous by their bad behaviour, and each month a list of the "awful examples" was posted up.

This afternoon, when she thought she'd stood about enough, she suddenly stopped the classwork, and exclaimed sternly:

"Now, listen to me, Tommy! If you don't stop misbehaving I shall have to take your name."

"Well, teacher," replied the small boy, "you'll have to marry me first."

Moral Hens.

A young married woman who moved into the country considered the keeping of hens a pleasant and profitable undertaking. As she grew more absorbed in the pursuit her enthusiasm increased. During one of her animated descriptions of her success a friend inquired: "Are your hens good laying eggs?"

"Oh, yes," she replied, in a delighted tone; "they haven't laid a bad egg yet!"

\$15,000 to Light a Fire.

The news that Britain's blast-furnaces are being rekindled is encouraging, says a London paper. For months they have been cold owing to the prohibitive cost of setting them going.

The blast furnace, which looks like a gigantic beehive, is used for smelting iron. Its roaring crown of flames is a familiar sight in the Midlands.

Few people realize what it costs to set one going. Many tons of wood are needed, and once this has ignited, load after load of coke is poured into the furnace. The heat is now intense, but it is not nearly sufficient to smelt iron ore.

For three weeks the furnace must roar night and day to bring the clay lining to a temperature great enough for the purpose. All this time the furnace is producing nothing whilst it consumes coke worth £3,000.

As there are about 300 of these miniature volcanoes in that country, the cost of setting all of them going runs into something like £1,000,000.

Equal to the Occasion.

A man overtaking two friends heard his own name mentioned and asked what it was they were saying about him.

"Well," assured one, "to tell the truth, we were disputing as to whether you are a fool or a rogue."

Taking an arm of each he said: "I think I can best settle that—I am something between the two."

More Also.

Roger had just returned from the birthday party.

"And did you remember to wish Maudie many happy returns of the day?" asked his mother.

"Yes, and I wished her many happy returns of the cake, too," replied the young hopeful.