



ROYAL RUBY

MOTOR
CYCLES



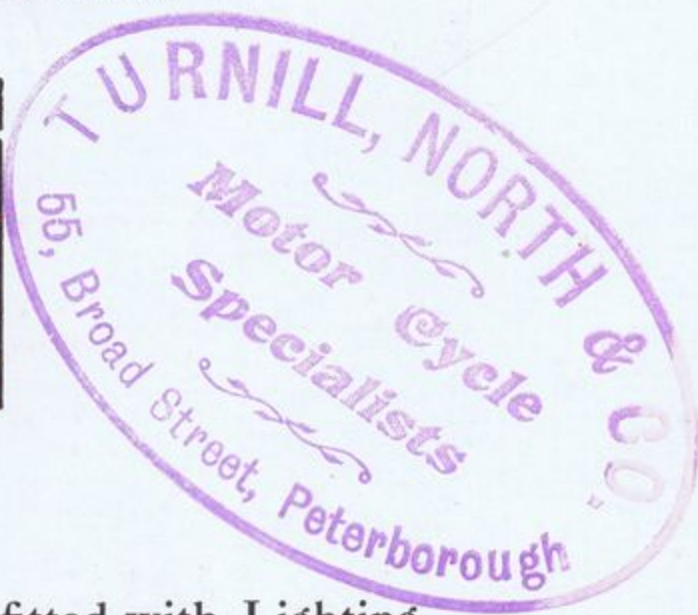
Season 1922.

67 667

ROYAL RUBY

MOTOR CYCLES

"The Keystone of Perfection"



All "Royal Ruby" Motor Cycles are fitted with Lighting Set, Horn, and Licence Holder over front number-plate.

THE RUBY CYCLE CO. LTD.

Managing Director:
GEO. E. RIGBY

Directors:
W. C. BACON
R. RIGBY
J. D. WILLIAMS
W. H. BACON

Royal Ruby Works
ALTRINCHAM
near Manchester

Showrooms and Service Depot:—
162, Deansgate, Manchester

Telephones:
CENTRAL 6636

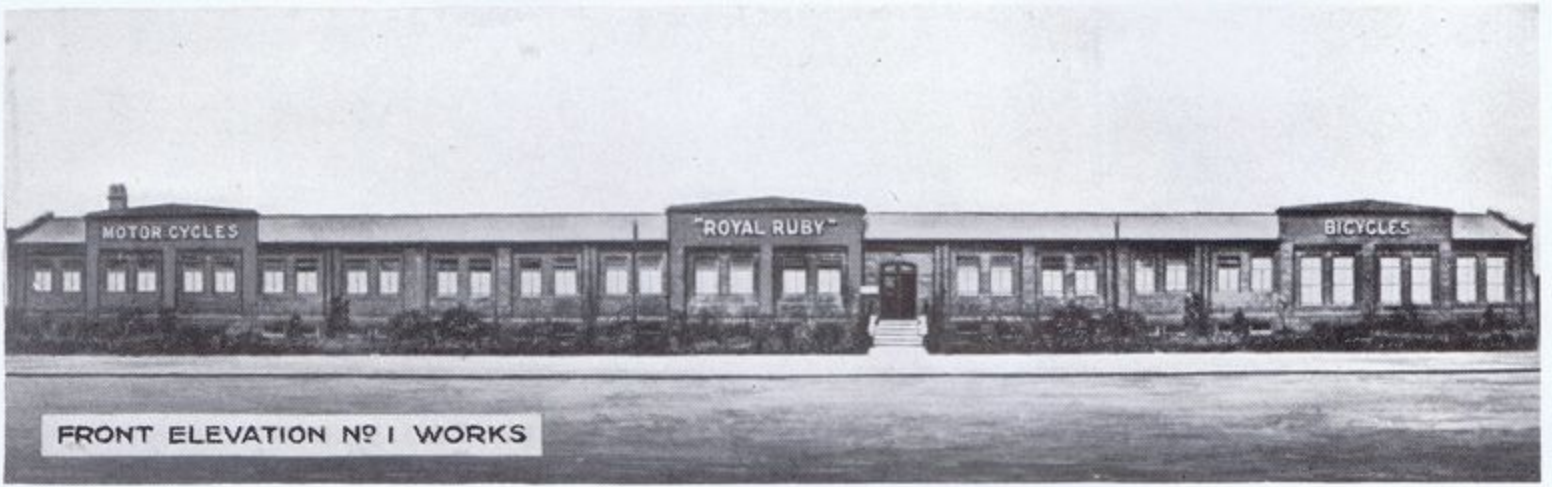
Telegrams:
"MACHINES, MANCHESTER"

Telephones:
ALTRINCHAM 655
(4 LINES)

Telegrams:
"MACHINES,
ALTRINCHAM"
ABC CODE
(5TH EDITION)

We reserve the right to modify or deviate from the specification in minor details, or make any improvements we find desirable.

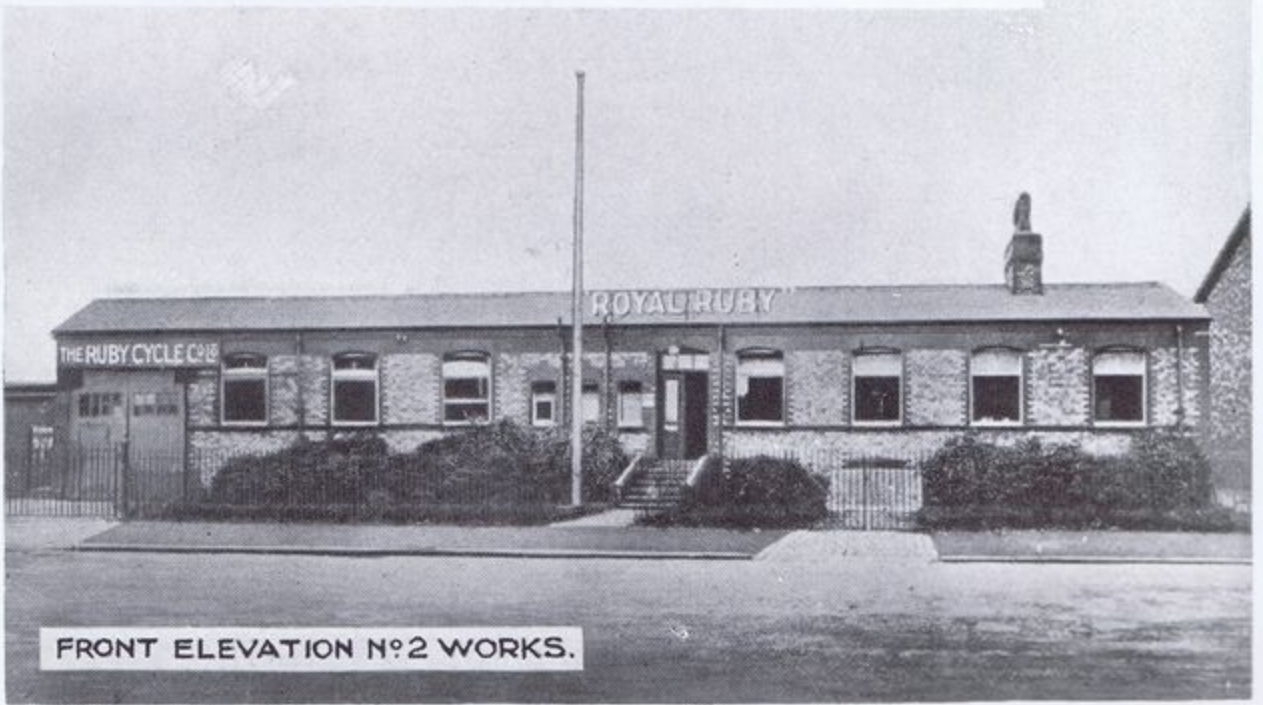
BARNSTORMERS.CO.NZ



FRONT ELEVATION N° 1 WORKS



GENERAL VIEW N° 1 WORKS,
SHOWING BUILDING, BRAZING,
ASSEMBLING, & FINISHING DEPTS.



FRONT ELEVATION N° 2 WORKS.



GENERAL VIEW N° 2 WORKS
SHOWING MACHINING DEPT.

Where "Royal Ruby" Cycles are made.

The illustrations on the opposite page and the pages following are intended to emphasise the assurance we give to all motor cyclists who are considering the purchase of a machine, that in buying a "Royal Ruby" they are acquiring the product of one of the best laid out and equipped factories in the country.

Coventry and Birmingham have by no means the monopoly of mechanical skill in the manufacture of motor cycles. The same qualities of foresight, ingenuity, and thoroughness that characterise the supremely successful Manchester business man in producing the intricate and efficient machinery utilised in the staple trade of the district, have been applied to the production of "Royal Ruby" Motor Cycles, which are unsurpassed for excellence of design, speed, comfort, and durability.

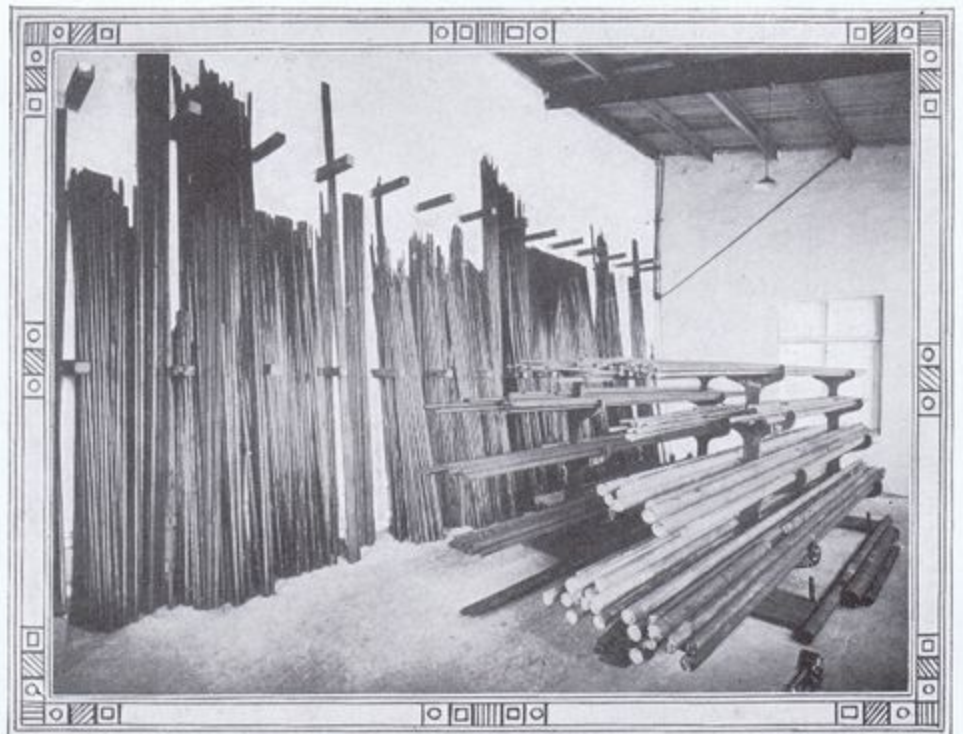
The "Royal Ruby" factory at Altrincham, eight miles out of Manchester, is laid out for the speedy handling of each class of material used in the manufacture of the complete machine.

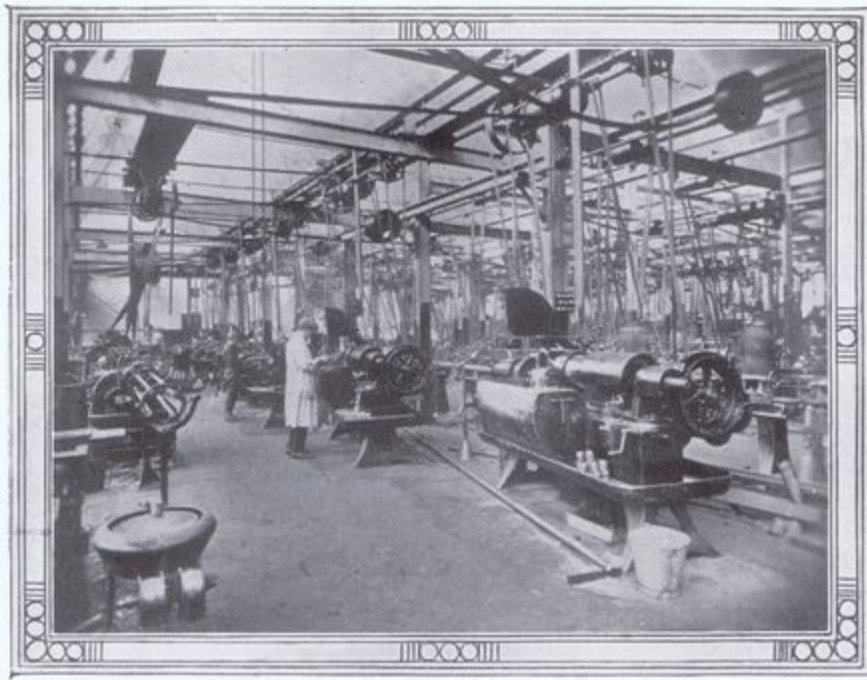
In the most modern of works, completed in 1920, spacious, scientifically lighted, heated, and ventilated, with everything on one floor, "Royal Ruby" cycles are constructed stage by stage, operation succeeding operation in carefully planned out sequence, until from the raw material is evolved the finished article, gauged, tested, faultless, so far as human skill can make it.

Our intention is to convey to the prospective buyer the manner in which a "Royal Ruby" machine is made, and with this idea in view, we will go through the various departments, giving an account of the operations necessary to make a machine from the raw material to the machine as turned out ready to take the rider where and when he wills.

STEEL STORES.

Starting from the Offices on our tour of inspection, we arrive at the Steel Stores. Here is kept a large stock of raw material ready to be issued to the Machine Shop. The Machine Shop is comprised of several departments, among which are the following:—





AUTOMATIC DEPARTMENT.

THE AUTOMATIC DEPARTMENT,

which, as its name implies, contains machines that, providing they are fed with the necessary bar material, can turn out parts indefinitely to any pattern fixed upon.

THE CAPSTAN DEPARTMENT

contains lathes which are set up to do certain operations at one setting of the part being operated upon.

THE HOBBING DEPARTMENT.

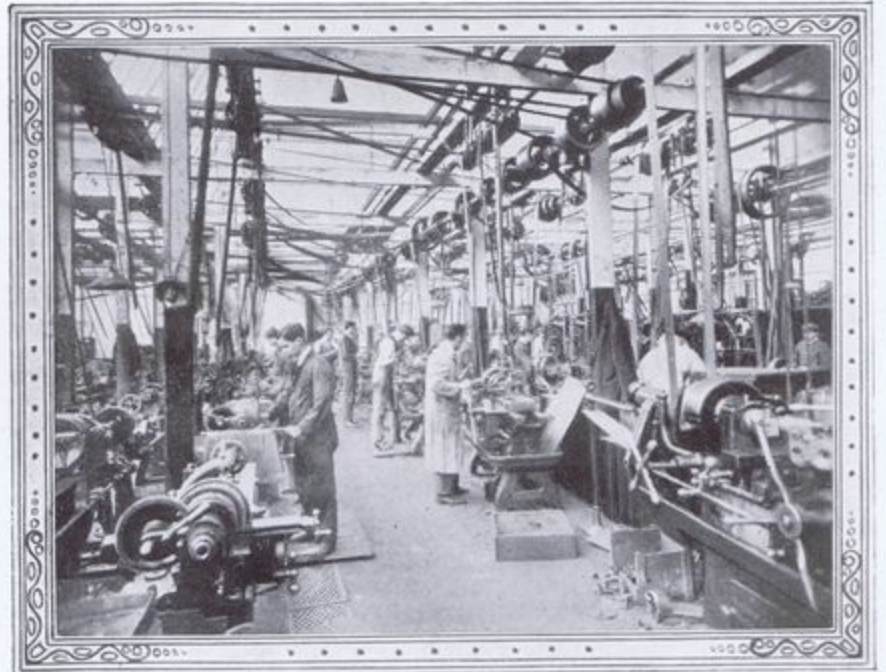
Here the cutting of gears and chain wheels is done.

THE TOOL ROOM.—This department is engaged on the making of tools, jigs, and fixtures necessary for the rapid and accurate production of machined parts.

THE HARDENING SHOP.

Here certain parts undergo the heat-treating process to enable them to stand up to the work imposed under running conditions.

While the various parts are going through the required operations, it is most essential that a rigid inspection is made to eliminate any faulty material or bad workmanship. To make sure of this, every part after each operation must go through the Inspection Department and be passed before any subsequent operation is carried out. Here the parts are inspected and then sent to their respective departments through the Main Stores, when further work upon them is carried out.



CAPSTAN DEPARTMENT.



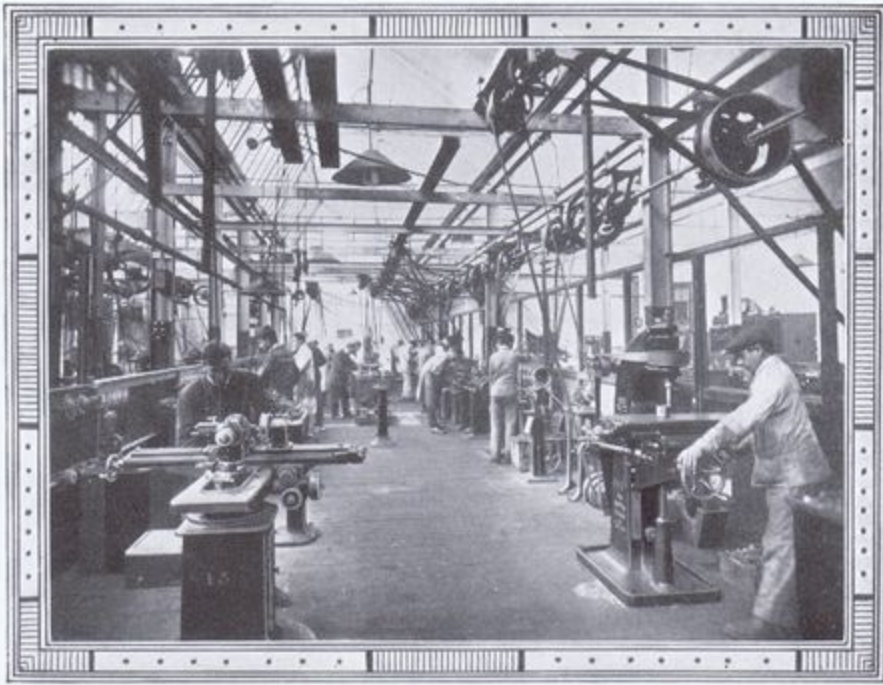
HOBBING DEPARTMENT.

FRAME BUILDING.

The "Royal Ruby" frame is built only of the best Malleable Castings and Weldless Steel Tube. Jigs designed and made in our own works are used throughout.

BRAZING SHOP.

In this section of the building the various portions of the frames are subjected to an intense heat from a special gas which is made on the premises.



TOOL ROOM.

they lie on the floor in a heap, they give the appearance of sand. The effect of this process is to clean away the roughness left by the brazing, and doing a great deal of work which formerly would have had to be done by hand. Everything, as you will note, in this modern motor-cycle building factory, is time and labour saving, resulting in better goods at less cost to the purchaser.

FILING DEPARTMENT.

Now, of course, the parts which have been brazed have to be filed and polished so as to give them the highly finished appearance associated with all "Royal Ruby" products. They are therefore taken to

THE POLISHING SHOP,

where men, taking part after part, manipulate them and grind them with emery-wheels in such fashion as to polish them and give them a perfectly smooth surface, removing all trace of the brazing and sand-blasting operations and making them ready for the process of nickel-plating or for enamelling, as the case may be.



INSPECTION DEPARTMENT

Brazing Shop—continued.

The strength and rigidity of the frames depend upon the thoroughness with which this work is carried out, as it is easy to imagine what would happen to a motor cycle going any speed up to 50 miles an hour or so if the frame broke away, so special care is taken to see that this operation is carefully and skilfully carried out.

From the Brazing Shop the parts are then taken to the

SAND-BLAST APPARATUS.

While in this chamber the parts are subjected to abrasion from uncountable little shots, so small that, as



HARDENING SHOP.

they lie on the floor in a heap, they give the appearance of sand. The effect of this process is to clean away the roughness left by the brazing, and doing a great deal of work which formerly would have had to be done by hand. Everything, as you will note, in this modern motor-cycle building factory, is time and labour saving, resulting in better goods at less cost to the purchaser.

THE NICKEL-PLATING SHOP.

The object of nickel-plating the parts is, of course, twofold. One object is for appearance, but the more important is for the prevention of rust. The process, briefly, is that the article to be plated, after being thoroughly cleaned, is placed in a dilute solution of pure zinc chloride, to which a solution of nickel sulphate is added, until the liquid is of a greenish colour, which is then raised to boiling-point.

Nickel-plating Shop—*continued.*

Electricity is run through the bath at the same time, with the result that the solution deposits on the articles a brilliant white layer, which, on being dried, takes a fine silvery polish.

Now here is a very important point. Nickel-plating, as we have said, serves two purposes—one of appearance and one of rust prevention.

The ordinary length of time with other makes for immersion in the nickel bath is 30 minutes, but, like every operation in connection with the



FRAME BUILDING.

making of a "Royal Ruby" Motor Cycle or Cycle, the length of time given is the maximum necessary to produce the very best result, so that parts of these machines which have to be nickel-plated are not left in for 30 minutes, but more often for 120, and even 180 minutes, if considered necessary, and it is this thoroughness and attention to details which make the "Royal Ruby" Motor Cycles the popular machines they are.

THE WHEEL BUILDING DEPARTMENT.

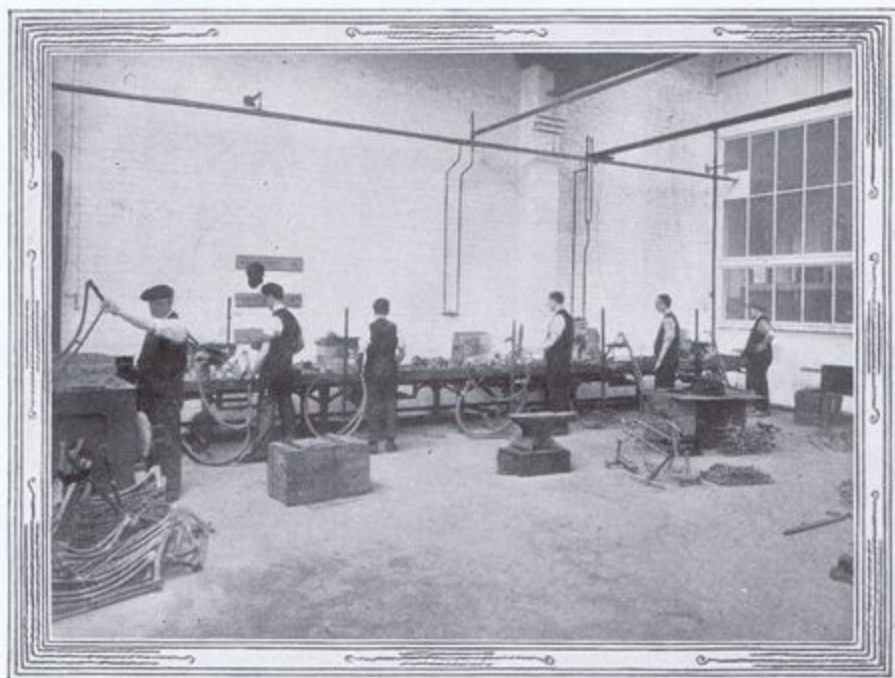
Here all Cycle and Motor Cycle wheels are built and trued up.

THE ENAMELLING SHOP.

In this department the parts which have to be enamelled, such as the frames, mudguards, and so on, are subjected to four operations, resulting in a total time elapsing of eleven hours before the whole are completed, and sometimes longer than that.



FRAME FILING.



BRAZING SHOP.

1.—The article receives a bath of linseed oil. It is then put into a gas-heated oven and heated to a definite degree for about two hours.

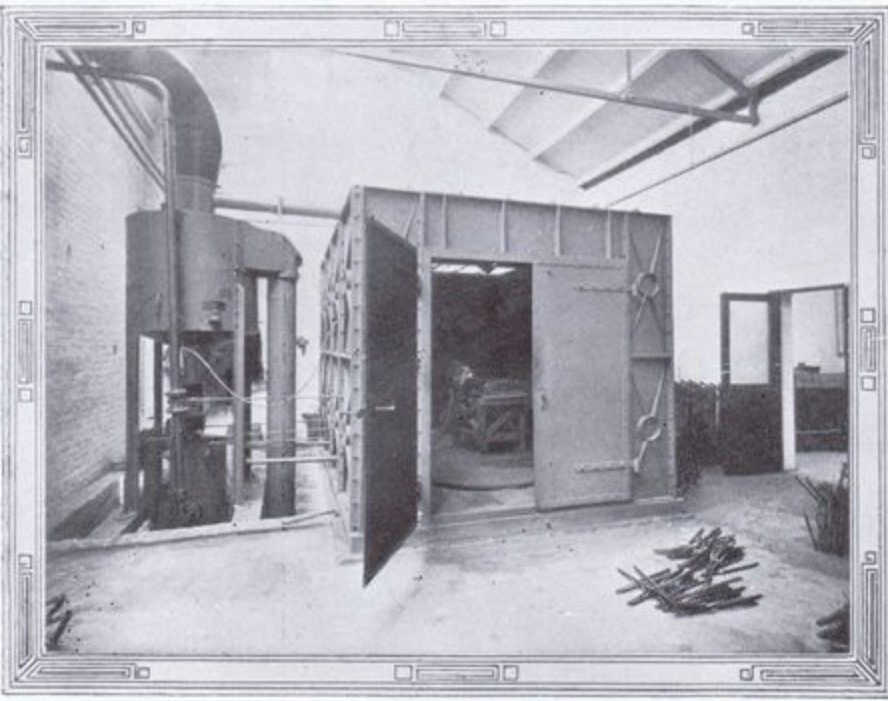
2.—After this heating has been satisfactorily accomplished, the article is then immersed in a bath of liquid rubber and again heated for three hours.

3.—After this second bath, another immersion is given in the enamelling bath, and the article is then put into another gas-heated oven and heated for **three** hours, after which it arrives

Enamelling Shop—*continued.*

4.—Which is another bath of enamelling and another heating for three or four hours, at the end of which the highly glazed enamel seen on a "Royal Ruby" machine is secured.

Sometimes, however, the article is heated even longer than eleven hours, because, if the enamelling is not sufficiently good to pass a critical inspection, it goes through the last process again, so that it may possibly have fourteen hours' treatment.

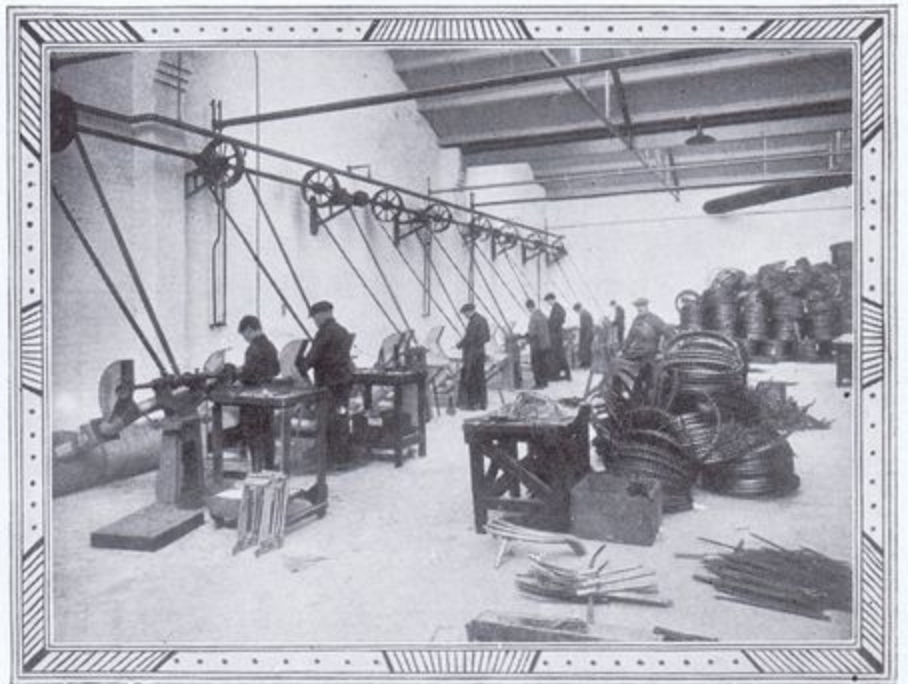


SAND-BLAST DEPARTMENT.

This department is connected with the Enamelling Shop, and is where the final touches are given.

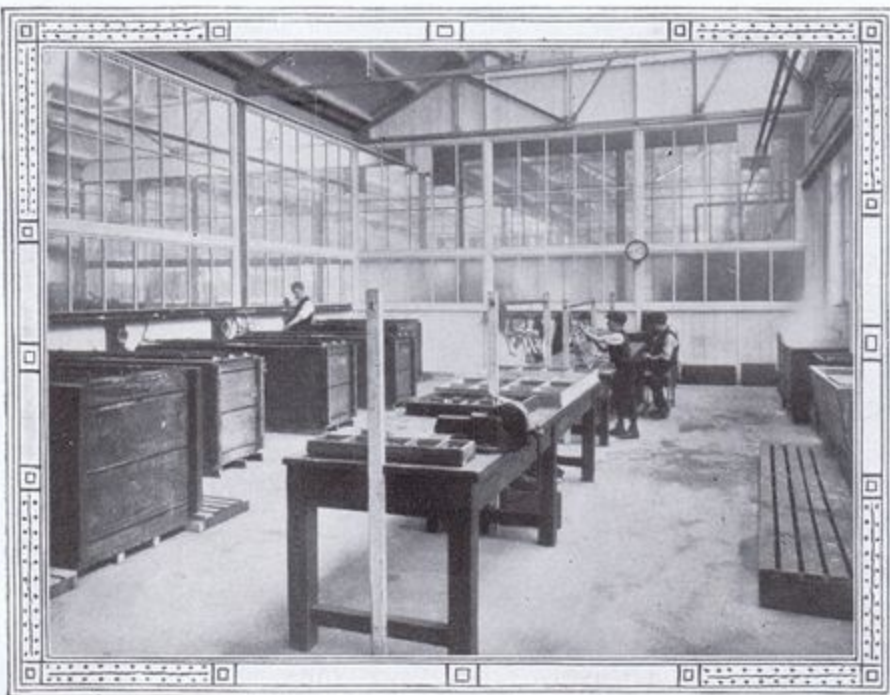
After this, of course, the various parts are assembled into the finished machine and taken out on the road for testing.

After many experiments, we have come to the conclusion that there is only one effective test, and that is to find the roughest road we can and run the machine over it for a distance of 20 to 30 miles, so that the purchaser eventually will know that his machine had been tested and passed under such conditions as he might be called upon to face at any time.



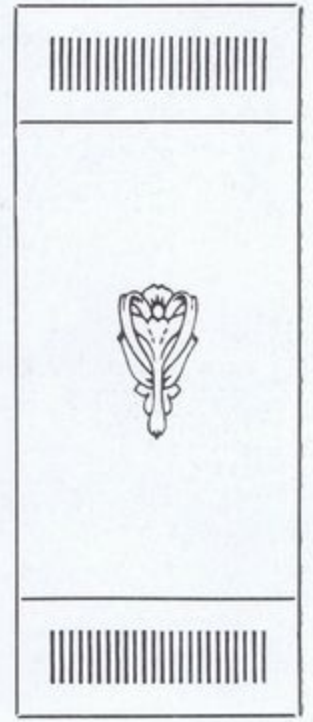
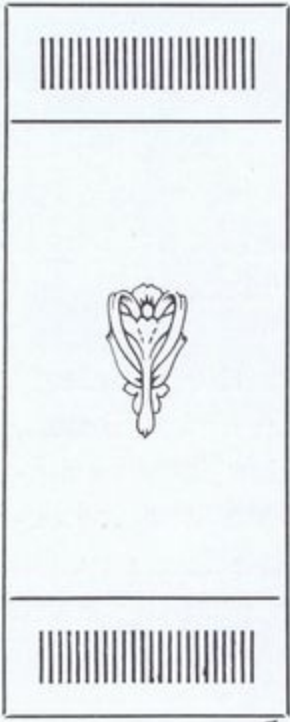
POLISHING SHOP.

The roughest roads are selected so as to give an adequate spring test, while for hill-climbing, the machines are run up a hill with a gradient of 1 in 5, which is a fairly severe test.



NICKEL PLATING SHOP.

We now come to a point of more than usual interest in connection with the "Royal Ruby" Motor Cycles. A great deal of necessary information dealing with the machines will be found in the specifications given with each model of machine, but some details about our Patented System of Spring Suspension will not be out of place, and will convince you that the "Royal Ruby" Motor Cycle is the machine you want, and, if you will carefully read the following, we think you will speedily agree with us.



WHEEL BUILDING.

WHERE THE STRENGTH OF THE "ROYAL RUBY" LIES.

In the perfect spring frame lies the secret of real motor cycle comfort. In the "Royal Ruby" spring frame lies the result of years of experimenting and the expenditure of unlimited energy, thought, and money.

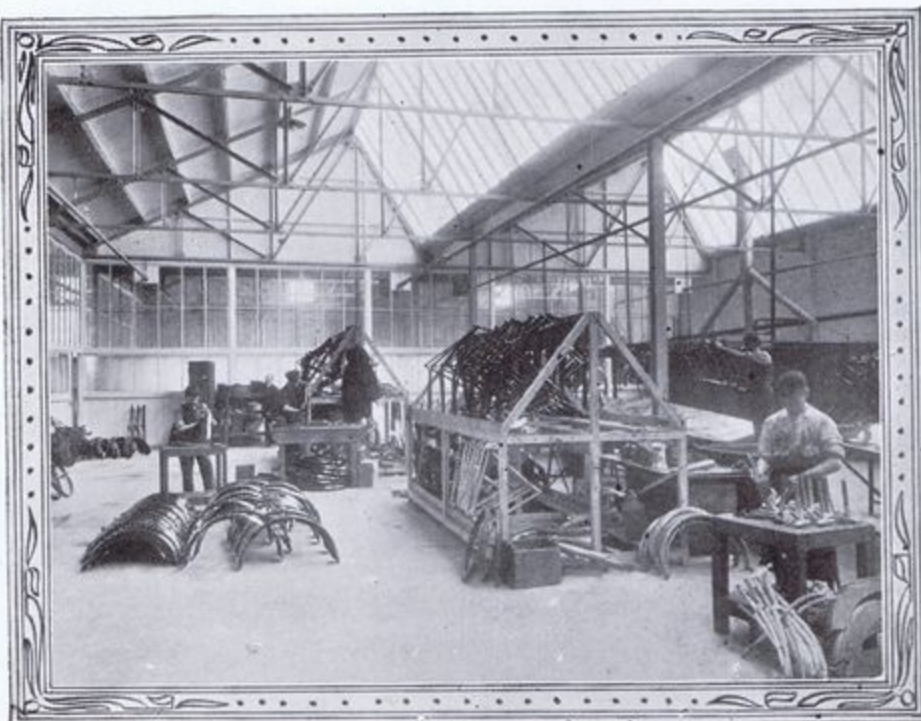
When we realise that, within a period of about one year, some 119 types of spring frames had either been patented or mentioned in the Motor Cycle Press, it can be understood what importance is attached to the production of a reliable spring frame.

The "Ruby" Cycle Company, Ltd., realised this at an early stage and set out to produce a spring frame that would so far outdistance all other attempts that there should be no question about the efficiency of the frame.



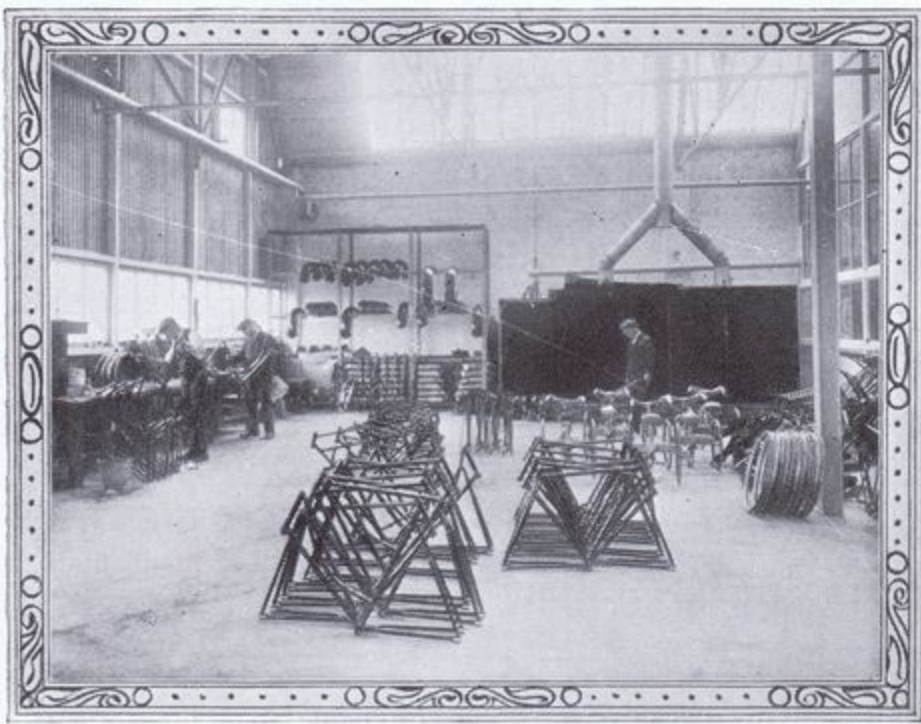
ENAMELLING DEPARTMENT (1).

In order to accomplish this, we set out a portion of the factory for the purpose of experimenting, and, as design after design was brought out, tested and patented, so gradually we began to see exactly what was necessary and how to secure it.



The first of these new spring frames were subjected to drastic tests in London, Hendon, and France among other places, and numerous parties of wounded soldiers were taken out over the torn and damaged roads for fresh air and change, and were but little inconvenienced owing to the existence of the spring frame.

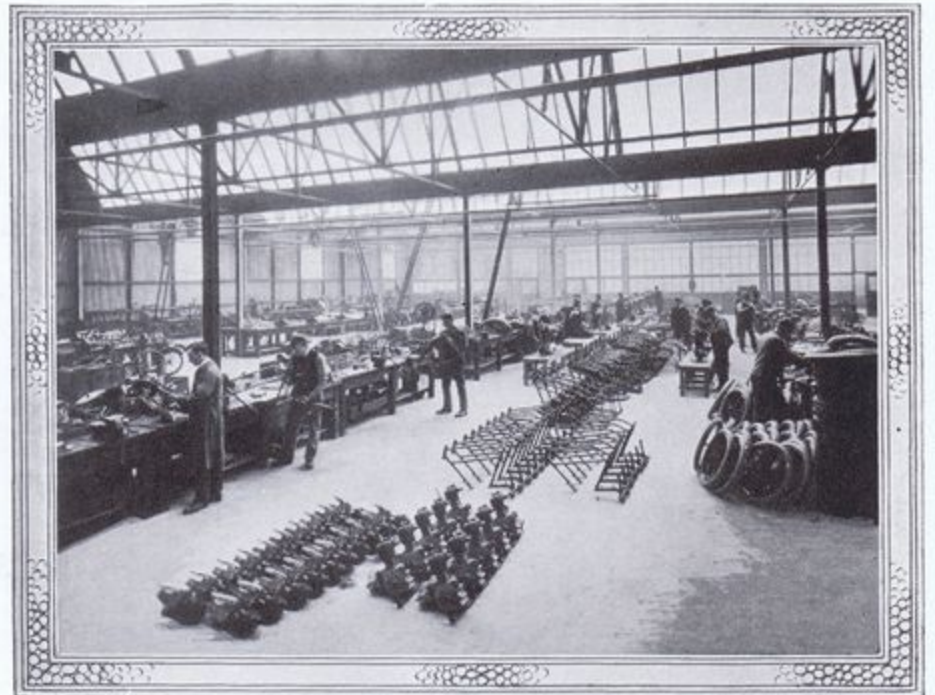
Finally, after years of ceaseless work, the expenditure of considerable thought, time and money, after countless tests and the ruthless scrapping



LINING SHOP.

striving, still greater efficiency was secured. Determined that the "Royal Ruby" should be foremost in giving a maximum of comfort with a minimum of weight, and that no model would be released until near perfection was obtained, it is but now that we are able to say that the 1922 model is, without exception, the finest and most reliable Motor Cycle ever turned out of a factory.

This is not quite the place to give the detailed specification of any of the "Royal Ruby" models, as these are given in their own pages in detail, but a word might be said here in asking your careful consideration of the claims of the "Royal Ruby" when making your decision which machine to buy.



ASSEMBLING DEPARTMENT.

THE ENGINE BUILDING AND GEAR-BOX DEPARTMENT.



ENGINE BUILDING AND ASSEMBLING

of every frame which did not reach the standard we had set, there was evolved a spring frame which, at the Motor Cycle Show of 1919, was eagerly inspected by thousands of interested people.

This spring frame was declared by experts, Press, and competitors alike to be a wonderful piece of craftsmanship, and the last word in spring frames. Hundreds of orders were taken, but the 8-h.p. machine was again ordered to be put into the Experimental Department by our Managing Director.

It was thought by many that this was an attempt to achieve the impossible, but nevertheless, by constant

The heart of the Motor Cycle is the engine, because without it the machine would be useless, consequently the work of the engineers in this department is of special importance, and the most detailed care is taken to see that every engine turned out from this shop is as near perfection as high-grade materials and workmanship can make them, and no motor cycle is allowed to go to a dealer until the testers are quite satisfied that the engine is right.

The Choice of a Motor Cycle.

The reasons prompting the choice of any particular motor cycle are various, and sometimes curious. One buyer will choose a machine for its cheapness or low price, another for its notoriety—someone has broken a record on that particular make of machine; another for its looks—big engine, extra long exhaust pipe, etc.; another for its noise; another for its quietness, and so on. Apart from mere personal predilection, however, it is not easy to make a choice between the many makes of machines similar in design, power, and price that are offered by one hundred and twenty leading makers (vide *Cycle Trader*, December 30th, 1921) to-day.

Each manufacturer's catalogue gives plenty of good reasons why you should buy his make. The agent is usually prepared with any number of arguments in favour of any machine he wishes to sell, but

THESE REASONS ARE NOT CONVINCING.

They come from people who have an axe to grind.

On this account, therefore, we propose to adopt a somewhat unusual course in submitting "Royal Ruby" Motor Cycles to the consideration of the reader of this catalogue, and to

LET OTHERS SPEAK FOR US.

The following extracts are from some of the leading journals devoted to motor cycling interests. They are independently written, and may be relied upon as wholly genuine:—

"We had no idea that the Company had such extensive establishments as these, nor the really fine system they have of getting the work through. Their big machine shop at the old works is **one of the most extensive and complete we have seen anywhere, and the workmanship equal to the best in Birmingham and Coventry.**"—*Bicycling News & Motor Review*, March 16th, 1921.

"There is now in the Manchester area one of the largest and most complete cycle and motor cycle factories at present in the country."—*Motor Cycle & Cycle Trader*, March 4th, 1921.

"In the company were Trade and Press representatives who had visited similar works in the Midlands, and who declared that the 'Ruby' factory was **far in advance of anything they had seen.**"—*Southport Visitor*, February 17th, 1921.

"The attention to finish, both seen and unseen, was remarkable. . . . In a word, 'Royal Ruby' work is made conscientiously, and in all respects dependable."—*Bicycling News & Motor Review*, March 16th, 1921.

“ We witnessed a demonstration of the springing of the ‘ Ruby ’ Motor Cycles. One of the machines was ridden at varying speeds over a series of baulks of timber like railway sleepers laid at intervals of a few yards along the road . . . the full force of the impact was apparently completely absorbed by the excellent springing system.”
—*Irish Cyclist*, February 23rd, 1921.

“ The viewing and testing are first class, and it would seem impossible for anything, under ordinary, or even extraordinary strain, to go wrong on any of the machines turned out.”—*Bicycling News & Motor Review*, March 16th, 1921.

“ We shall be doing our readers in all parts of the world a service by drawing their attention to the exceptional qualifications of the ‘ Royal Ruby ’ for service where conditions call for extreme strength and serviceability without the sacrifice of handiness and comfort.”—*British Export Gazette*, March 5th, 1921.

“ The principal impression left on our minds by this brief inspection was that the very perfect organisation and equipment of this factory was directed rather towards producing goods of the **highest possible quality and finish** than goods at the highest possible speed and minimum price.”—*Irish Cyclist*, February 23rd, 1921.

“ Every man undertakes and carries through his job with an interest and seeming pleasure that certainly make for fine and lasting workmanship in the goods produced. We have not been in any establishment where the conditions were more favourable for efficiency, nor where the men in all departments took a keener interest in the things they had in hand.”—*Bicycling News & Motor Review*, March 16th, 1921.

“ With so much put into them, we have no hesitation in saying that ‘ Royal Ruby ’ Cycles and Motor Cycles commend themselves to every market in the world.”—*British Export Gazette*, March 5th, 1921.

“ After witnessing the whole series of operations involved in the production of the ‘ Royal Ruby,’ we can vouch for the fact that the machine is built throughout with meticulous care and attention to detail. It is one of which its owner can be proud, not only for its looks, but also for its excellent workmanship.”—*Motor Cycling*, March 2nd, 1921.

“ Their motor cycles are splendid examples of the art.”—*Bicycling News & Motor Review*, March 16th, 1921.

We also give a few extracts from some of the many unsolicited testimonials received or published, showing the high estimation in which “ Royal Ruby ” Motor Cycles are held by their fortunate owners :—

TESTIMONIALS.

Copy of Testimonial.

SOUTH SHIELDS,
February 27th, 1922.

DEAR SIRS,

It is only right that I should let you know how delighted I am with the $2\frac{3}{4}$ h.p. “ Royal Ruby ” Motor Cycle I bought last September.

I rode it very little at first, as the weather and roads were so bad, and as I was new to the art of driving, thought it better to wait.

I have now confidence, and have used the machine every day for some weeks, on the worst of roads, and under the most unfavourable conditions, but it has never once failed me, and I consider it a perfect little gem.

BARNSTORMERS.CO.NZ

N. S.

TESTIMONIALS—continued.

Copy of Testimonial.

THE TAN-SAD WORKS,
FREEMAN STREET, BIRMINGHAM,
October 31st, 1921.

Messrs. The Royal Ruby Cycle Co.,
Moss Lane, Altrincham.

DEAR SIRs,

I purchased, five weeks ago, from Messrs. Frank Whitworth, New Street, Birmingham, one of your 8 h.p. Combinations, complete with Dynamo Lighting, and after having run some 600 miles, I should like to express my entire satisfaction with your Spring Frame.

I may say that I have ridden nearly all the well-known makes of Motor Cycle Combinations on the market, and have never ridden such a comfortable machine as the "Royal Ruby."

My riding being largely for business, consequently takes me out in all weathers, and your mudguard and leg shield arrangements are entirely satisfactory.

Yours faithfully,

For and on behalf of F. H. HEADLEY,
H. B. HEADLEY,
Works Manager.

Copy of Testimonial.

147, CATHERINE STREET,
HYDE PARK, DONCASTER.

DEAR SIRs,

In June, 1920, I purchased from your agent, W. E. Clark, one of your 3 h.p. Spring Frame Models, and thought you would like to hear my opinion of same.

I think it is a fine machine. I have used it every day for business purposes, and it has proved a no-trouble mount.

All my friends tell me it is the best machine for miles around. I never have trouble in starting up; usually the first kick-over is sufficient to start up.

I think it is very economical on fuel. I can get about 120 miles to the gallon, and two of us up nearly all the time.

Excepting for a slight accident which I had a while ago, the machine, including the engine, has only cost me 10d., and that was for a new inlet valve spring. I think this speaks for itself in regard to the workmanship of the machine, and proves that the initial cost is the cheapest in the end. I have run about 7,000 miles on it.

Now, I should be glad if you would send me any book or books about the machine, also one of the Magneto; the latter especially, as just lately I have had occasional mis-firing. This I have traced to the rocker arm sticking.

I also should be glad of your advice on the following:—Do you think it would be wise to attach a light side-car? This would only be used during the winter months, and would only be loaded lightly.

Thanking you in anticipation,

I am,

A Satisfied Rider,
CHAS. CARR.

Copy of Testimonial.

RICE BROS.,
56 & 57, CLIFFE, HIGH STREET, LEWES,
October 22nd, 1921.

The Ruby Cycle Co.

DEAR SIRs,

In the Eastbourne and District M.C.C. Penalty Run, held on the 16th inst., our Mr. E. Jenner was awarded the special prize. The machine used was our 2½ h.p. Sports Model.

We are,

Yours faithfully,

RICE BROS.

Copy of Testimonial.

NORTH LONDON MOTOR CYCLING CLUB,
4, THIRLMERE ROAD, MUSWELL HILL, N.10,
June 18th, 1921.

DEAR SIRs,

I purchased a 2½ h.p. 1921 Sports Model "Royal Ruby" from Messrs. Wauchope's, London, on April 16th, 1921, and having completed the first 1,000 miles (per Watford Speedometer) on same, and kept an accurate record, I thought the following might interest you:—

DATA .. Miles completed, 1,000. Petrol m.p.g., 131. Oil m.p.g., just over 500. Total expenses, including carbide, paraffin for cleaning, axle lubricant, etc., petrol and oil, 45d. per mile.

ENGINE .. The machine has given absolutely no trouble to date, and pulls well, climbing all main roads easily at 23 m.p.h. on top gear, so has not decarbonised yet.

I left my machine at a garage last Monday whilst attending the Club committee meeting. When returning for same, the garage proprietor said that he had been looking at the machine, and thought it was the soundest piece of work he had seen.

You may use this letter as a testimonial should you desire, as I can recommend the machine to anyone.

Yours faithfully,

BARNSTORMERS.CO.NZ FORBES ROBERTSON.

TESTIMONIALS—continued.

Copy of Testimonial.

RICE BROS.,

56 & 57, CLIFFE, HIGH STREET, LEWES,

October 23rd, 1921.

The Ruby Cycle Co., Ltd.

DEAR SIRS,

We beg to advise you that our Mr. E. Jenner was successful to-day in the Lewes and District M.C.C. Hill Climb, as follows:—

Class 350 c.c.—1st winning special prize, given by Messrs. J. B. Brooks & Co.,

Class 600 c.c.—3rd prize,

on a 2½ h.p. Sports Model.

We thought you would like to have these results. The events were run off in a downpour of rain.

We are,

Yours faithfully,

RICE BROS.

Copy of Testimonial.

October, 10th, 1921.

GENTLEMEN,

Nine weeks ago I took delivery of a "Royal Ruby" 8 h.p. Combination, and in this period have run it between 4,000 and 5,000 miles, fully loaded, for business purposes.

To say that I am "pleased" with this splendid programme is putting the matter as lightly as I possibly could, for, having had absolutely no trouble with it, I could hardly put it in a milder form.

It is important to notice that this mileage has been covered without any reference to the condition of roads, and that it embraces practically all points of the compass from my centre—I have not been able to "choose my path" at all, simply had to "get there" by a given time, whatever the conditions were; and the sterling qualities of the machine over the most wicked roads in England and Wales are worthy of record.

I cannot think that any machine ever had a more severe test than this, and it stands to her credit that, after a terrific week's work with it, I yesterday sat in the saddle from 7.30 a.m. to 7.30 p.m., and arrived home fresh enough to run my family to the theatre and to enjoy the performance myself.

If this is not a complete answer to the silly critics who ask, "Where are the Spring Frames?" I can supply others of a type which will silence them, for, after trying my machine under every conceivable set of circumstances—bad weather, wicked roads, terrific mountains, dangerous gradients, congested traffic—day after day, either crawling or at speed, I give it as my opinion (and no man can do more than give his honest thought) that

THE SPRINGING IS PERFECT.

Having driven at speed over roads that are unmentionable, having seen—often and often—others labouring their way, "wading," as it were, around pot-holes I have dared to ignore, my opinion is not arrived at without good cause.

Let me, here and now, say that I have never experienced the "side-slip-jelly" movement so often complained about in spring frames; indeed, on one occasion, picking up a passenger "miles from nowhere," and perched upon the top of an already heavy load of business tackle, this disinterested witness commented: "My word, how well sprung she is; it was like running on velvet."

The springing is undoubtedly splendid, but her strength, stability, reliability, her fine appearance and all-round excellence, have been so often dinned in my ears by strangers that, coinciding with the past, I have proved her to be able to hold her own with anything. I have grown to be fond of her—and why not? for with Shakespeare as adviser, I can say, "The friends thou hast and their adoption tried, grapple them to thine heart with hoops of steel."

Messrs Clarke & Bowyer inform me that you are showing at the Olympia, and in wishing you a successful time, I would like to say that you are at perfect liberty to use this in any way you choose, and further, you may refer anyone you care to me, and lastly, assure them that my machine is absolutely standard down to the last nut, and that I have no connection whatever with your firm other than that of a thoroughly satisfied client, who has given one of your machines such a gruelling test as few machines are called upon to stand throughout their lifetime.

I remain,

Yours respectfully,

W. B.

16, Crown Terrace,

Handforth, Cheshire.

If the foregoing testimony and the illustrations and brief descriptions of the different departments and processes at our works, and the special features of the machines as detailed in the specification pages of the catalogue, are studied, we think the only conclusion to be drawn from the whole will be that "Royal Ruby" productions are of superlative merit, and that intending purchasers need look no further if they require, firstly, complete efficiency in their machines; and, secondly, maximum value for the money they spend.

There are lower-priced motor cycles, we know, similar in power and specification. Outwardly they may appear the same in all essentials; but there is a good deal more than the eye can see in the manufacture of a motor cycle, and the expenditure of a little more money is the truest economy when it carries with it a guarantee of sound workmanship, correct design, and maximum service. These are the essential features provided in the "Royal Ruby," summed up in the one word, "QUALITY."

Recent "Royal Ruby" Successes.

The following are some of the successes gained in Competitions and Trials by various models of the "Royal Ruby." We have not made a great point of entering for competitions—not the most convincing demonstration of a motor cycle's capabilities—because success is so often a matter of an expert rider's skill or luck. We prefer the more solid testimony of the average user of a standard machine, not specially prepared for competition with all sorts of freak fitments not found on the standard article. Again, the expense of the various Trials and Competitions is very heavy, and has to be paid for eventually by the buyer through the enhanced price of the machine. We prefer to spend the money in giving full value.

Still, that "Royal Ruby" machines are capable of holding their own in Competitions and Trials may be seen from the following particulars:—

GREAT BRITAIN.

3 Cups.

- 1.—On an 8 h.p., Mr. H. Gibson tied for Horsman Cup in Liverpool-Edinburgh Trial.
- 2.—On an 8 h.p., Mr. Wright won Silver Cup in Biggleswade & District Trials.
- 3.—On an 8 h.p., Mr. H. Gibson won "200 Deansgate" Cup in North Western Centre Championship Trials.

9 Gold Medals.

- 1.—On an 8 h.p., Mr. Dale in London-Exeter Trial.
- 2.—On an 8 h.p., Mr. Gibson in Liverpool-Edinburgh Trial.
- 3.—On an 8 h.p., Mr. Gibson in London-Land's End.
- 4.—On an 8 h.p., Mr. Apsey in London-Land's End.
- 5.—On a $2\frac{3}{4}$ h.p., Mr. Gibson in London-Edinburgh.
- 6.—On a 3 h.p., Mr. S. Eastwood in London-Edinburgh.
- 7.—On an 8 h.p., Mr. Wright in Biggleswade & District.
- 8.—On an 8 h.p., Mr. Gibson in North Western Centre.
- 9.—On a $2\frac{3}{4}$ h.p., Mr. Gibson in Scottish Six Days'.

4 Silver Medals.

- 1.—On an 8 h.p., Mr. Kay, London-Edinburgh Trial.
- 2.—On an 8 h.p., Mr. Callaghan, Leinster Novices' Trial.
- 3.—On a $2\frac{3}{4}$ h.p., Mr. Jenner, Lewes & District Reliability.
- 4.—On an 8 h.p., Mr. F. Pownall, London-Exeter.

GREAT BRITAIN—*continued.*

8 First Prizes.

- 1.—On a $2\frac{3}{4}$ h.p., Mr. Moffat, for fastest time in Darlington Hill Climb.
- 2.—On a $2\frac{3}{4}$ h.p., Mr. Jenner, for fastest time in Lewes Hill Climb.
- 3.—On a $2\frac{3}{4}$ h.p., Mr. Stacey (350 c.c.), for fastest time (Amateur), Brighton Hill Climb.
- 4.—On a $2\frac{3}{4}$ h.p., Mr. Dunford (350 c.c.), for fastest time (General) Brighton Hill Climb.
- 5.—On a $2\frac{3}{4}$ h.p., Mr. Stacey (unlimited) (Amateur) Brighton Hill Climb.
- 6.—On an 8 h.p., Mr. Gibson, best performance of Side-cars over 450 c.c. in North Western Centre Trials.
- 7.—On a $2\frac{3}{4}$ h.p., Mr. Eastwood, best performance of machines in Classes 1 and 2 up to 350 c.c., in North Western Centre Trials.
- 8.—On a $2\frac{3}{4}$ h.p. Combination, Mr. H. Gordon Dear, Private Owner's Special Prize, and First Class Award for smallest power Side-car outfit, Western M.C.C. (Glasgow) Point-to-Point Run.

1 Second Prize.

On a $2\frac{3}{4}$ h.p., Mr. Jenner, second best time of open 350 c.c. class in Brighton Hill Climb.

HOLLAND.

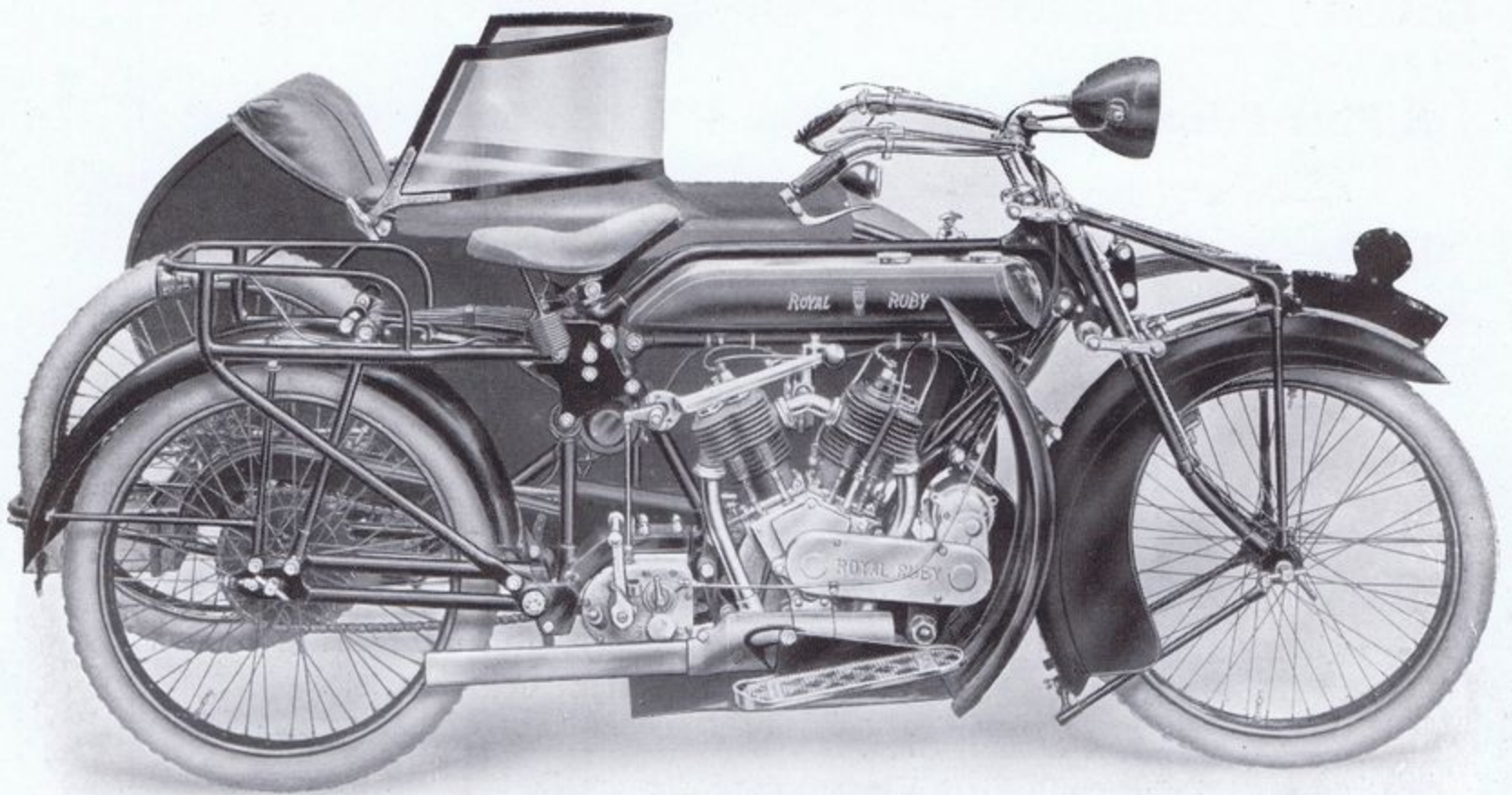
**All prizes won by Messrs. F. A. Witlich Hoek on 3 h.p.
Spring Frames.**

- One Silver Cup.
- Three 1st Prizes.
- Two 2nd Prizes.
- One 3rd Prize.

NEW ZEALAND.

**All the following won by Mr. Frank Sykes on a $3\frac{1}{2}$ h.p.
(in one season):—**

- Two Silver Cups.
- Three Gold Medals.
- Eight 1st Prizes.
- Eight 2nd Prizes.
- Three 3rd Prizes.



8 h.p. Twin "Royal Ruby" Combination, with Patent Adjustable Spring Frame and Side-car Wheel.

SPECIFICATION.

FRAME AND FORK—New design, fitted with our patented system of a spring suspension, which is the result of many years' experience and research. You will see from the illustration the whole machine is suspended fore and aft on a pair of laminated springs, which are centrally disposed, and can be adjusted to comply with the weight of the rider or the roughness of the roads. The middle section is fitted with our patented safety stays, which support the front down tube and connect the steering head to the engine lug and plates. This triangular construction is capable of withstanding all side strains, thus preventing fatigue of the frame members.

ENGINE—J.A.P. 8 h.p. twin cylinder with M.O. side valves 85.5 m.m. × 85 m.m. 980 c.c.

SILENCER—Special design.

GEAR—Sturmey-Archer three-speed countershaft, with our patented adjustment.

TRANSMISSION—All chain drive, with Hans Renold $\frac{3}{8}$ in. × $\frac{3}{8}$ in. extra strong chain.

CHAIN COVERS—Metal as shown, very strong.

LEG SHIELDS—Metal as shown, dome section.

MAGNETO SHIELD—Specially large, going right under the engine to protect the whole unit.

BRAKES—Special design, front, with inverted lever. Rear, very strong internal expanding band brake, fitted to rear wheel.

CARBURETTOR—A.M.A.C. or B. & B.

MAGNETO—B.T.H.

SADDLE—Brooks' B170, pan seat, padded top.

CARRIER—Very large, special design as shown.

TANK—Registered design, holding two gallons petrol and five pints lubricating oil; large filler caps, and fastened on two supports brazed to frame. Enamelled in black, ruby colour panels, and lined in real gold leaf.

LUBRICATION—Best & Lloyd's semi-automatic sight drip feed with pump and through duplicate pipes to engine.

CONTROL—Ignition and carburettor by levers on handlebar, valve lifter by inverted lever on handlebar, clutch by lever on handlebar, front brake by inverted lever on handlebar, rear brake by foot pedal on left-hand side of machine.

HANDLEBAR—Extra strong upturned.

MUDGUARDS—Specially wide, for both front and rear wheels.

STANDS—Fitted to front wheel, very strong, jack included in tool kit for rear wheel.

FOOTBOARDS—Royal Ruby patent adjustable.

WHEELS—28 in. × 3 in. B.E. Wedgewood rims, specially strong, fitted with best quality hubs, interchangeable.

TYRES—28 in. × 3 in. Dunlop extra heavy rubber studded B.E.

TOOLS—Fully-equipped tool roll, including jack.

INFLATOR—Good quality, with foot attachment.

SIDE-CAR.

CHASSIS—Extra strong, special design, fitted with Royal Ruby patent adjustable spring wheel, with laminated spring. It is of the very best quality throughout, having four couplings to motor cycle, and once coupled up, is as strong as one unit. The wheel is fitted with the best quality hub and is interchangeable with motor cycle; the mudguard is specially strong and wide, and can be quickly removed. The chassis is fitted with a luggage carrier and special attachment for carrying the spare wheel. A stand is fitted to raise the chassis from the ground, also carrier to hold one tin of petrol.

BODY—Large size, coach-built and coach-painted, covered with weather-proof "Atholeather," richly upholstered and specially well finished throughout, and is fitted with wind-screen.

PRICE.

Motor Cycle Combination, with Wind-screen, Horn and
Lighting Set, and Spare Wheel

£185 All on.

Lucas Electric Lighting Set, extra

£18

BARNSTORMERS.CO.NZ

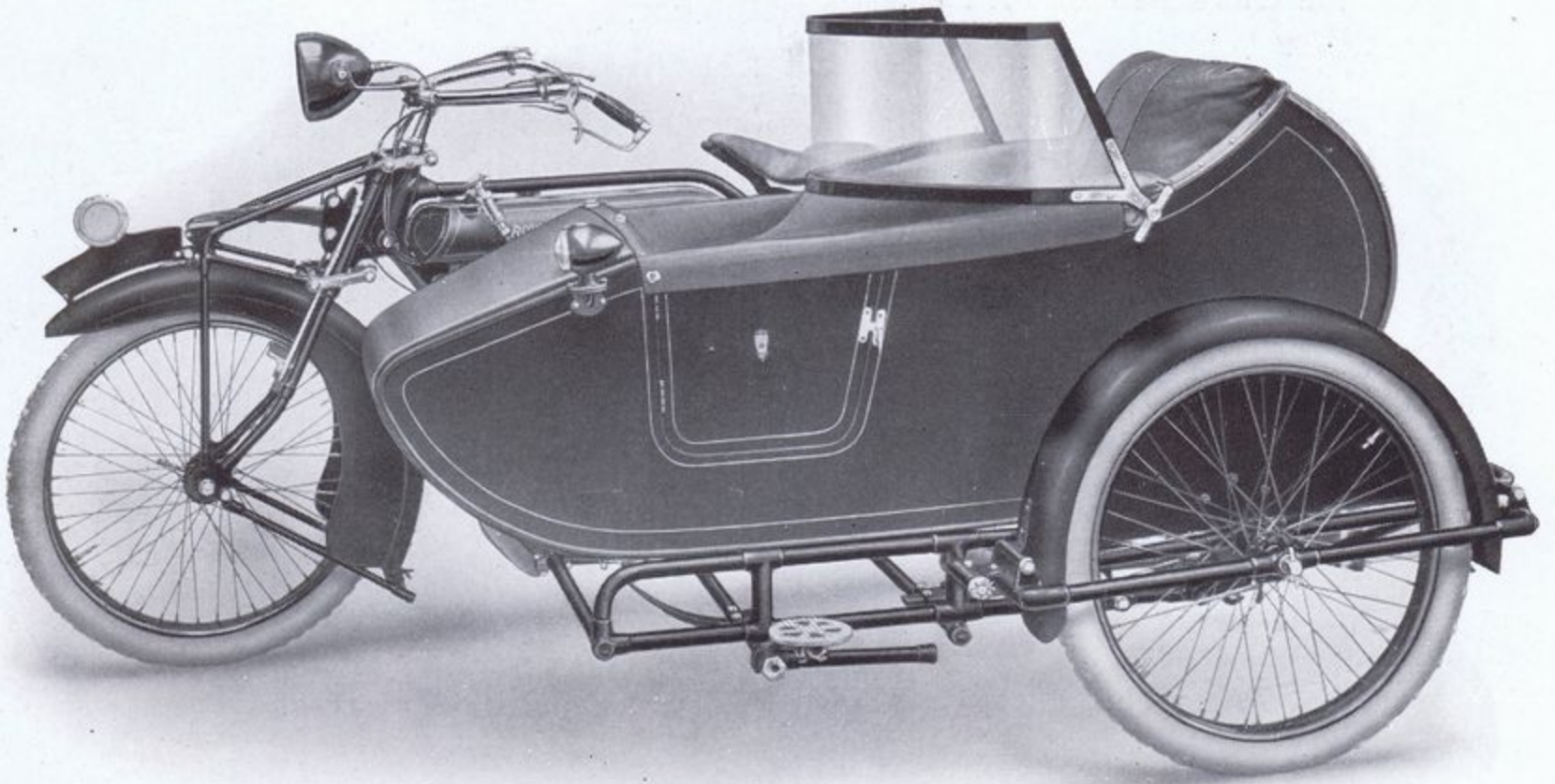
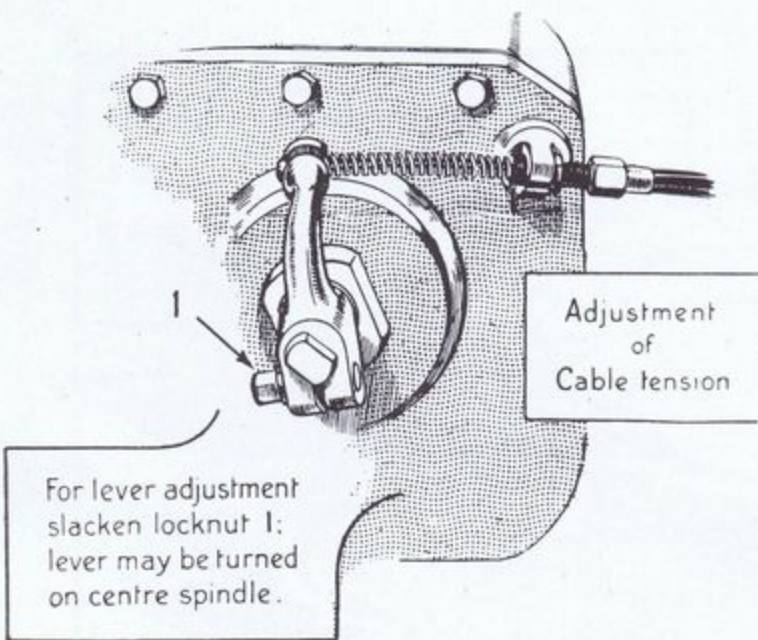
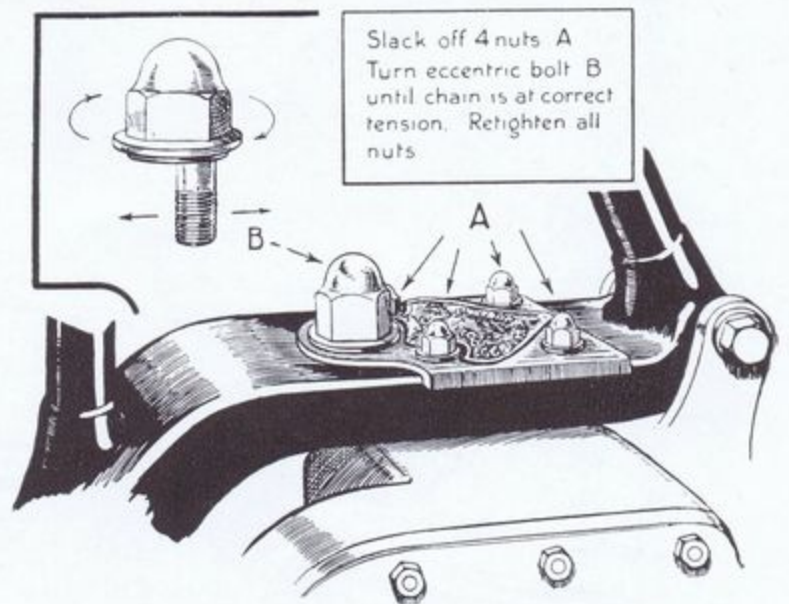


Illustration of new Side Car with bulbous back and screen, having Locker behind back cushion, Luggage Grid and Petrol Carrier.

Look carefully through the following pages for full detail drawings of this handsome Combination.



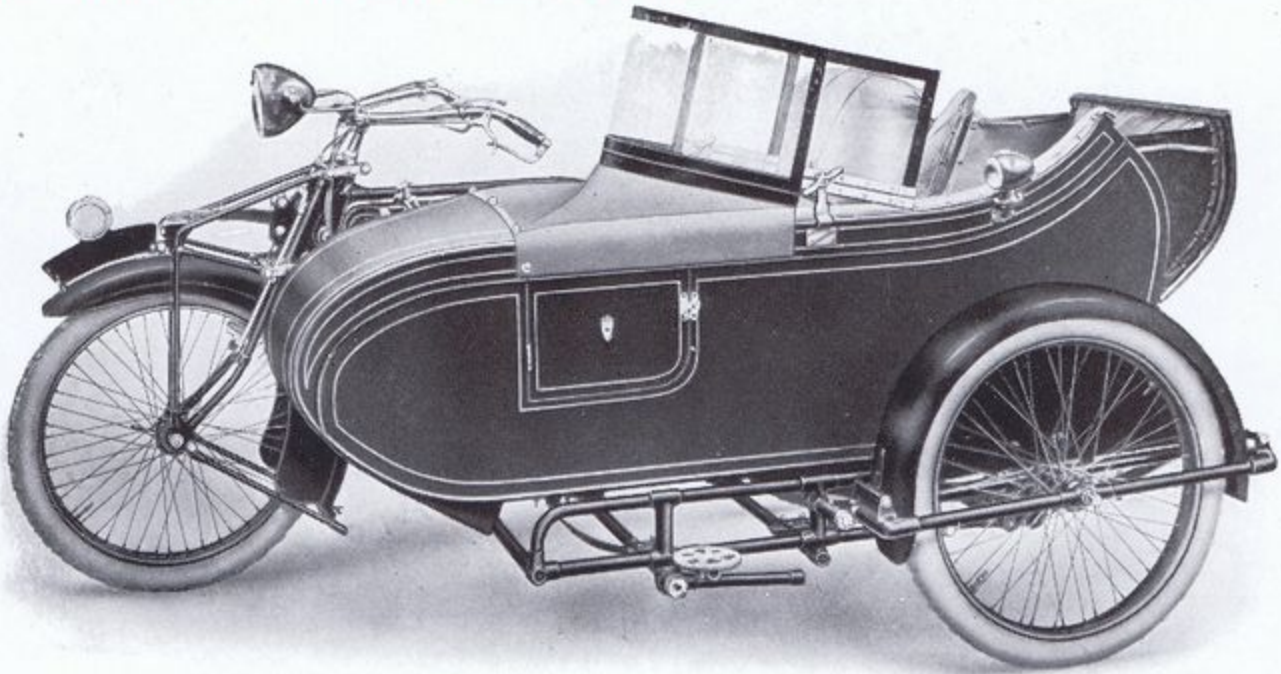
Clutch Cable Adjustment for Sturmey-Archer Gear.



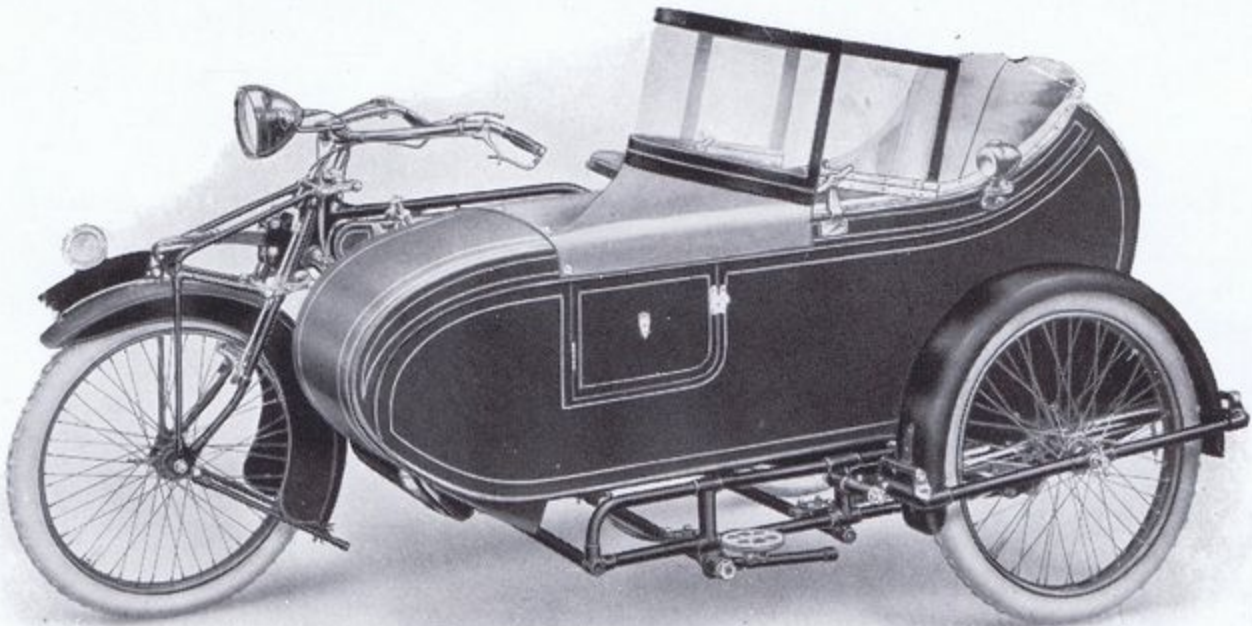
**Front Chain Adjustment (Patented).
Rear Chain Adjustment by drawbolts on rear wheel spindle.**

The new 8 h.p. machines are fitted with coach-built bodies of the bulbous back touring type, manufactured from finest quality three-ply material, with ample locker space in back and under the seat. They are comfortably upholstered in Atholeather. The body is covered with special material, which renders the woodwork immune from the ravages of sun and water, and always keeps its fresh polished appearance.

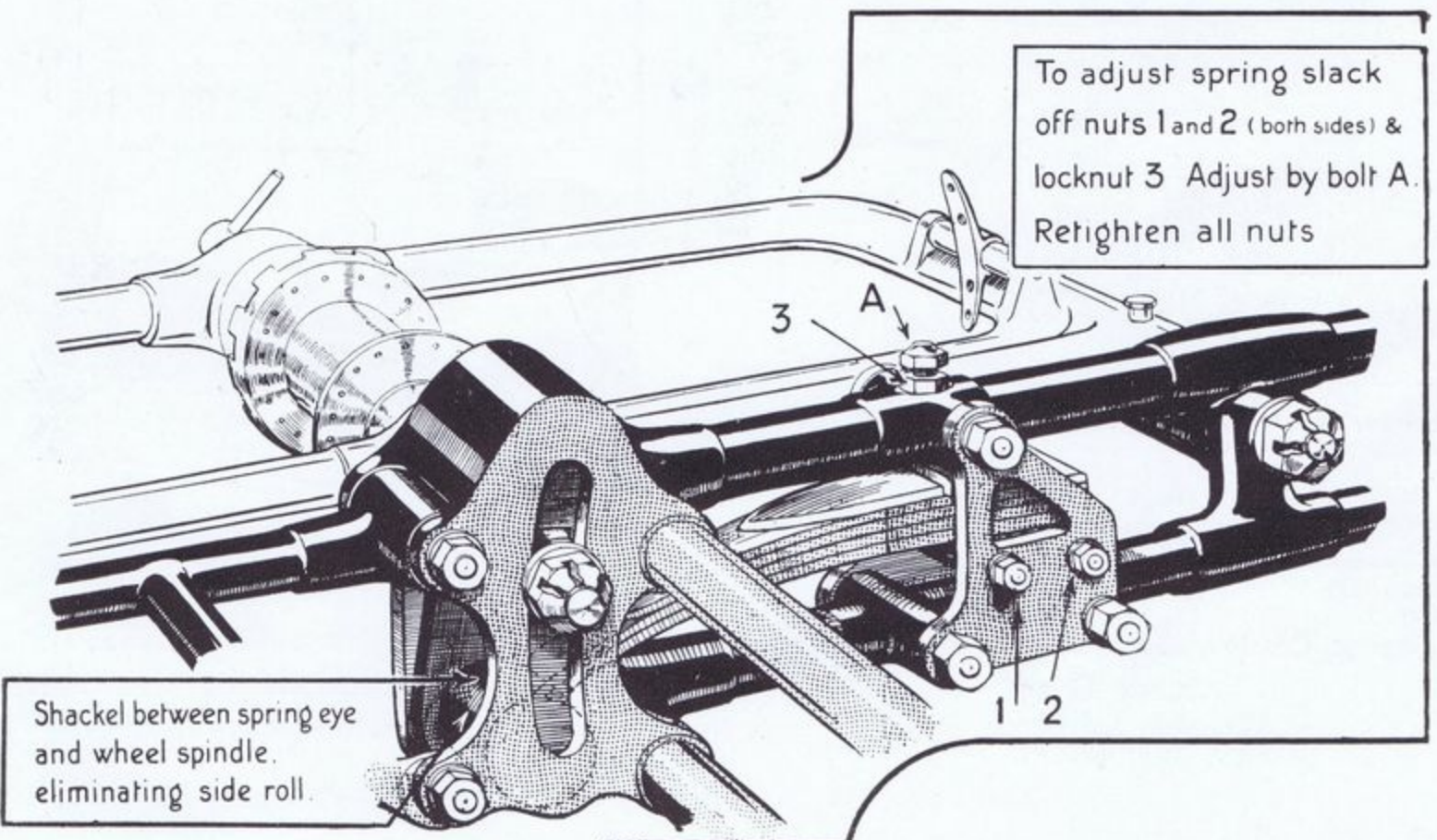
The tandem or touring side-car accommodates one or two adults as required. In use as a single seater, this body is very little longer than the standard bulbous body. By moving forward the seat and back, and opening out the locker-back, ample seating room for two adults is provided, the rear seat being as comfortably upholstered as the front. This side-car will seat two six-foot passengers.



Tandem side-car for 8 h.p. "Royal Ruby," designed for two adult passengers, with special wind-screen and apron. The whole is readily convertible to suit single passenger (see illustration below).



Tandem side-car body as arranged for single passenger.
Extra price of tandem side-car body, £12



Method of suspension of side-car wheel. The eye end of the spring is anchored in a shackle which is held sideways (but free to move vertically), preventing any side roll when cornering.

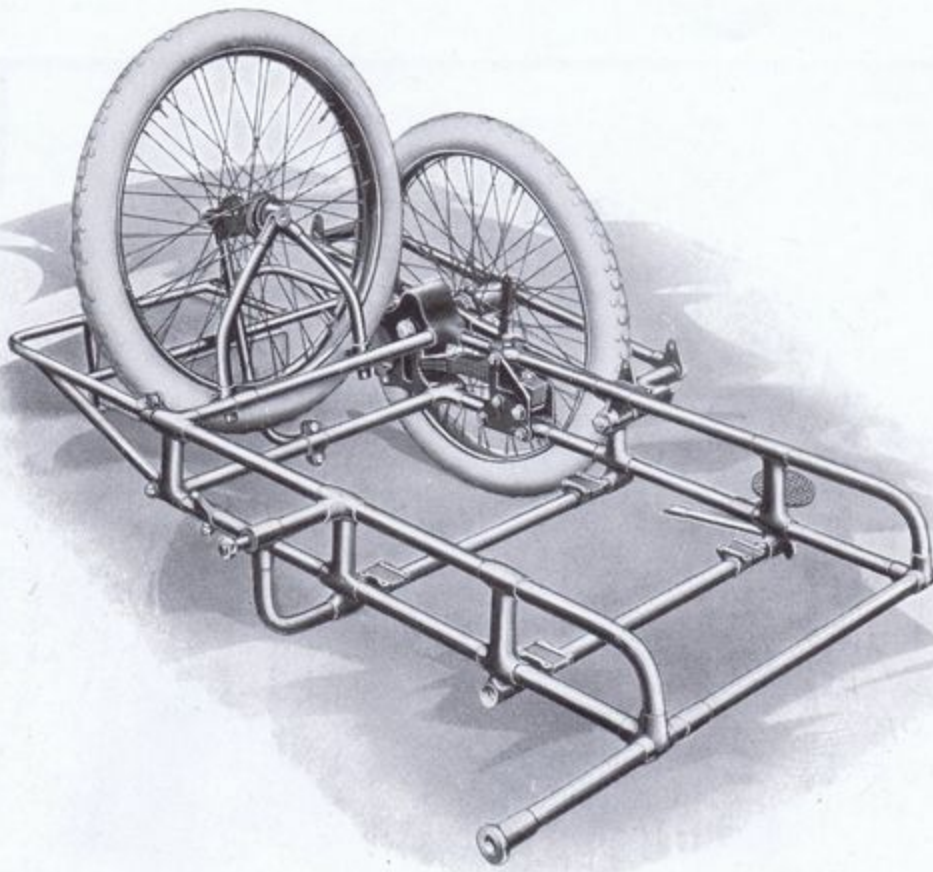
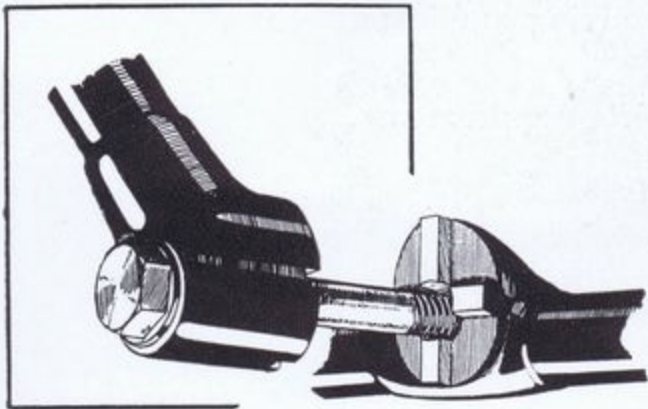
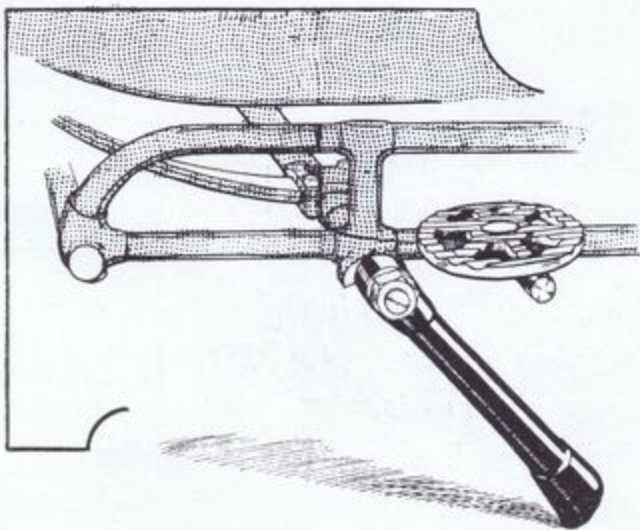
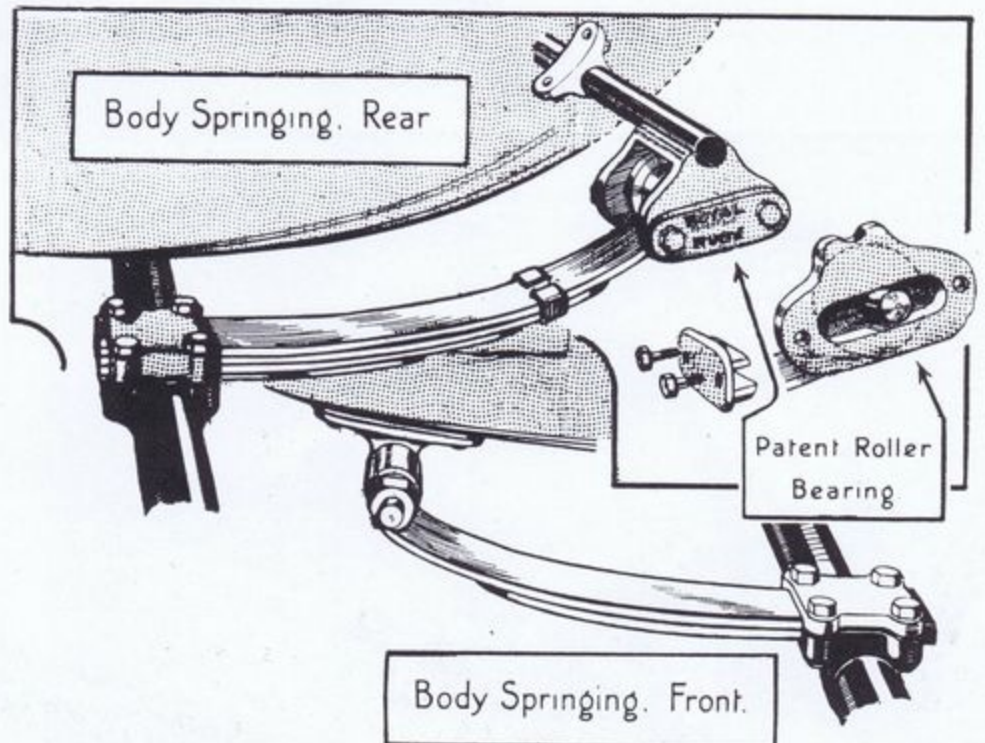


Illustration of Chassis of "Royal Ruby" Combination. The great strength of the chassis will be apparent from the drawing. The method of suspension of the side-car wheel is shown clearly.

The Spare Wheel is now carried as shown on page 16.

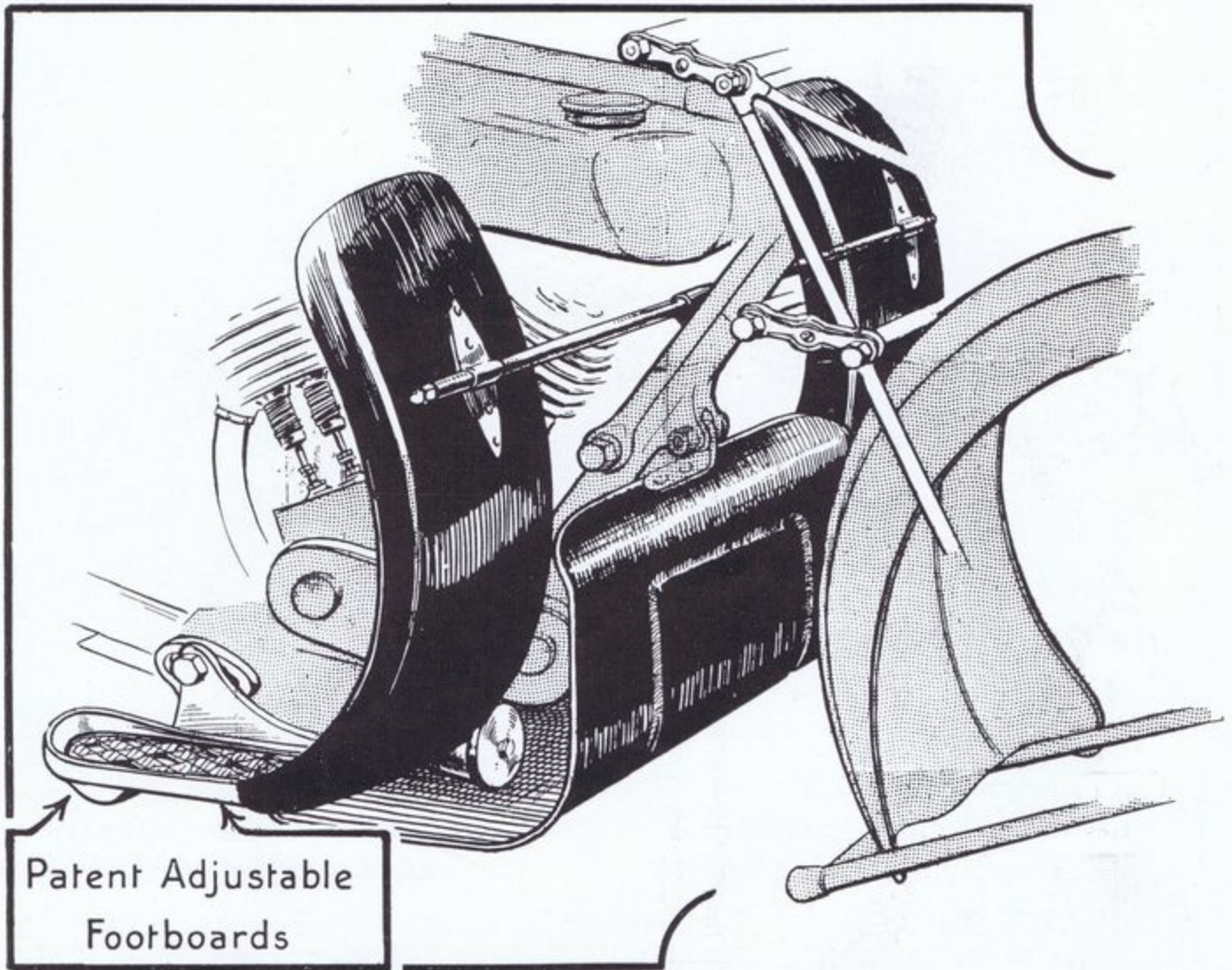


Chassis connection of frame, giving rigidity.



Chassis Stand and Footstep. A spring stop keeps stand out of way when not in use.

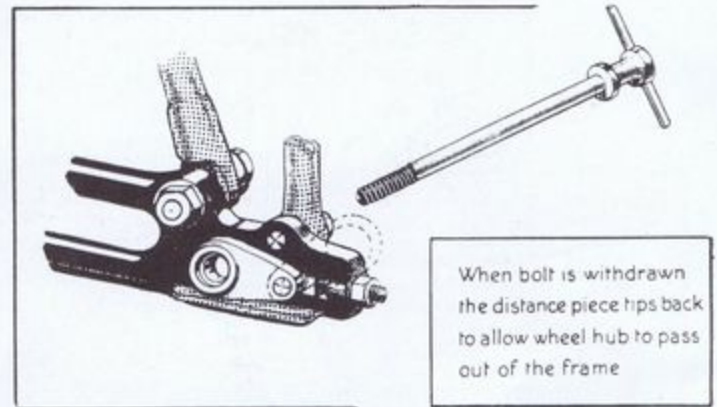
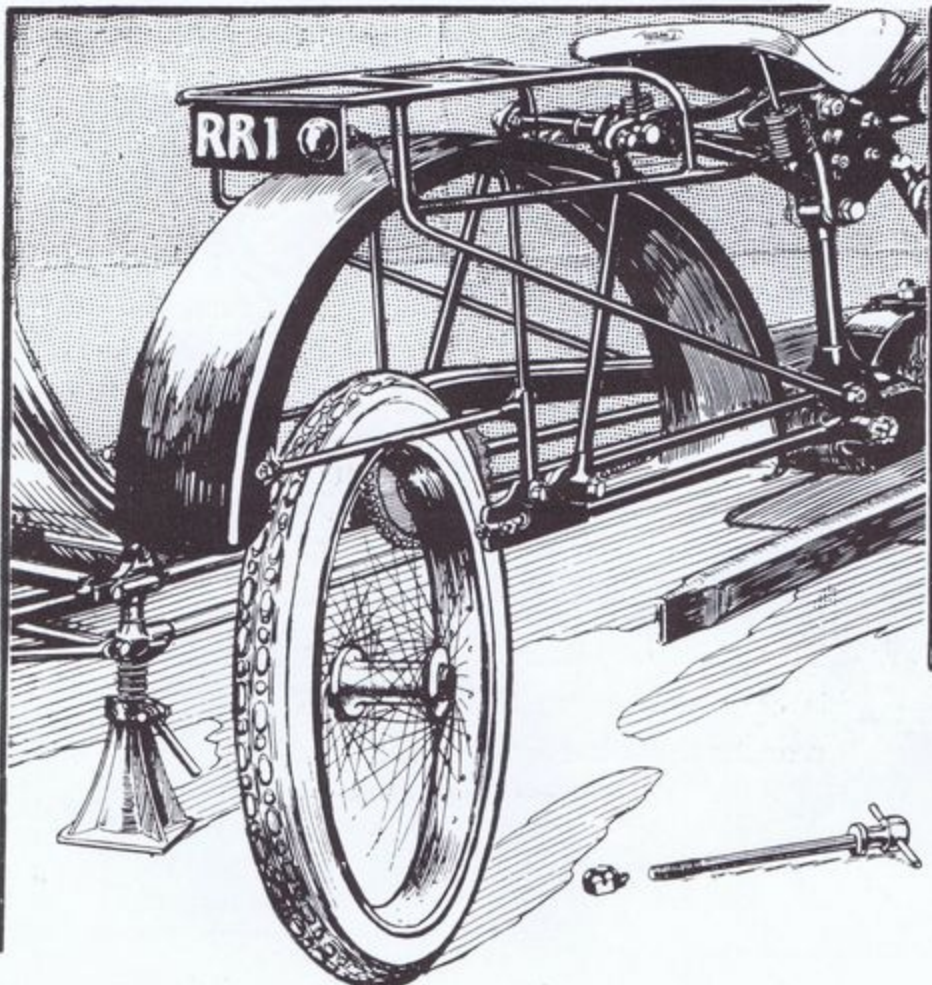
The "Royal Ruby" Patent Suspension is carried out for body also. The eye of rear spring fitted with roller is free to slide in patent insert.



Patent Adjustable
Footboards

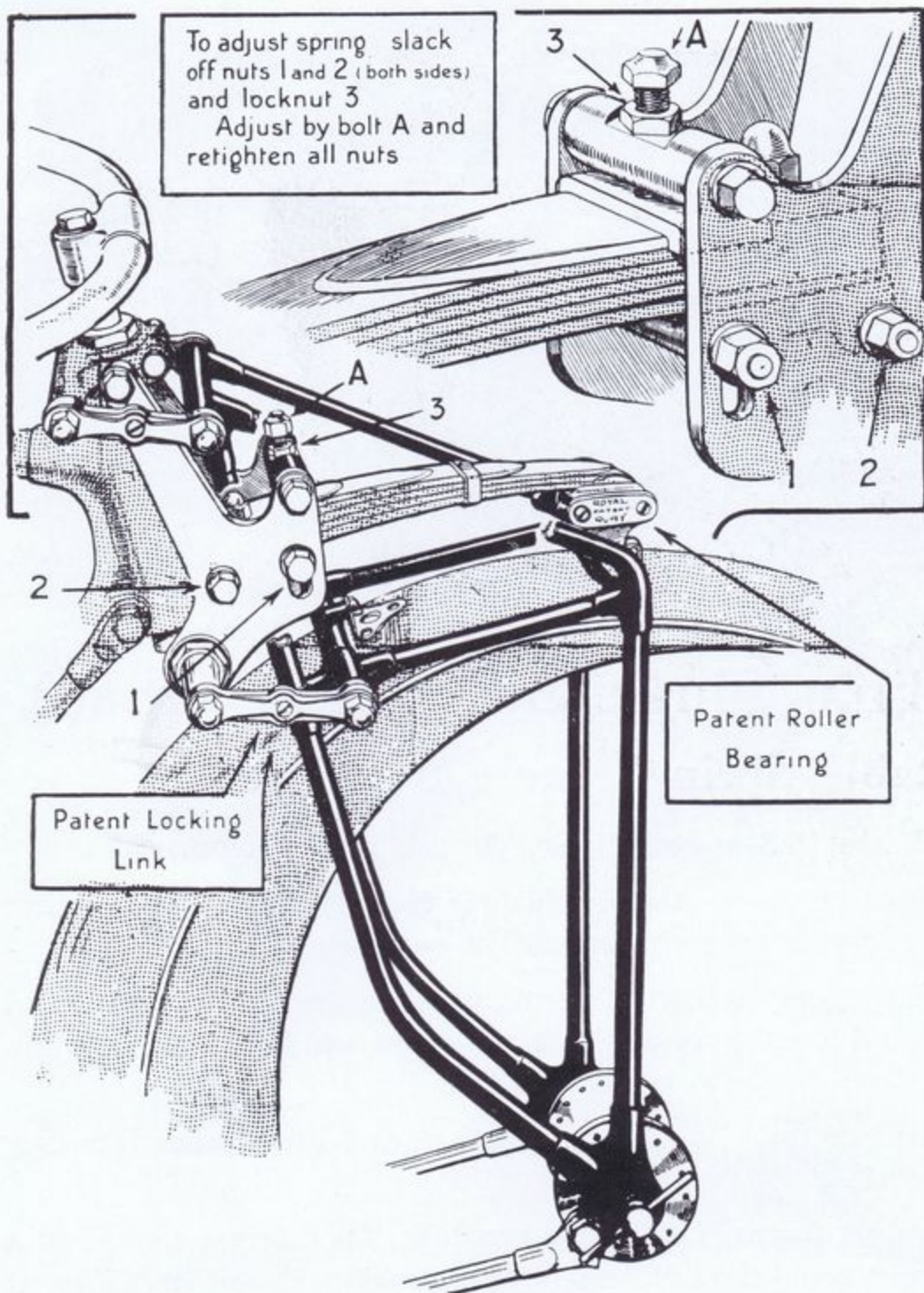
“Royal Ruby” Leg Shields and Undershields, giving ample protection in all weather.

Patent Footboard, adjustable to any rider's requirements.

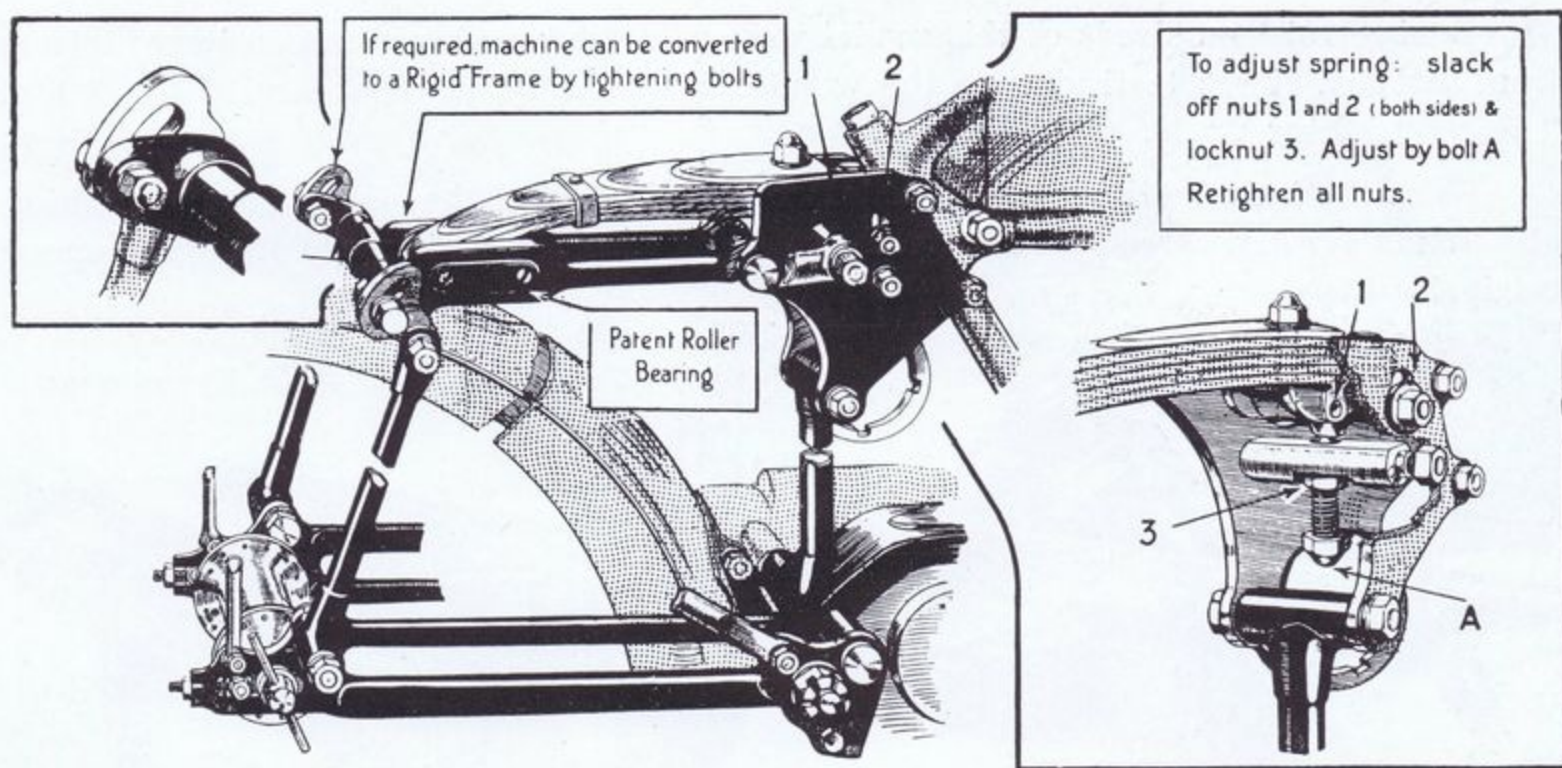


When bolt is withdrawn the distance piece tips back to allow wheel hub to pass out of the frame

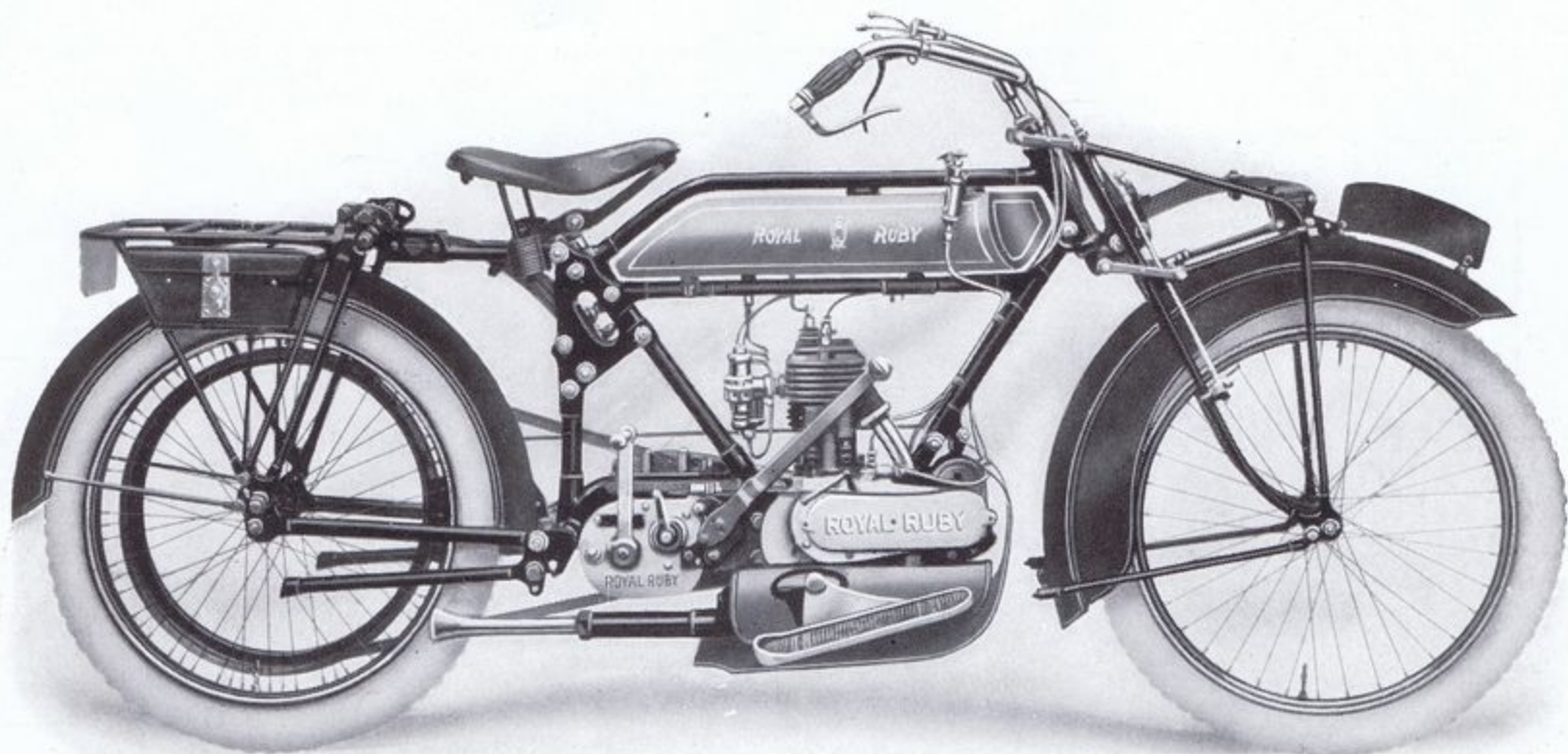
Illustration showing method of removing back wheel. First jack up corner of chassis, then remove wheel spindle; swing link back (as shown dotted), when wheel will be free for removal.



Showing Front Fork and method of suspension. The spring is centrally disposed, and can be adjusted to comply with weight of rider or roughness of road. Fork spindles are secured by dome-headed nuts, which are in turn locked by our Patent Locking Link. Front wheel is removed by withdrawal of spindle. This in no way interferes with adjustment of hub cones, etc.



Showing rear portion and method of suspension. All bearings are long and of large diameter, giving long life.



“Royal Ruby” 3 h.p. Single Cylinder (4-stroke). Patent Adjustable Spring Frame Solo Model.

Fitted with “Royal Ruby” 3-speed Gear, Clutch and Kickstarter.

This illustrates one view of our new model, which is the most up-to-date motor cycle on the market. It is manufactured throughout in our own Works.

The engine, gear, and the patent method of springing have been thoroughly road tested for a considerable time, and found to be absolutely efficient and free from vibration and lateral play.

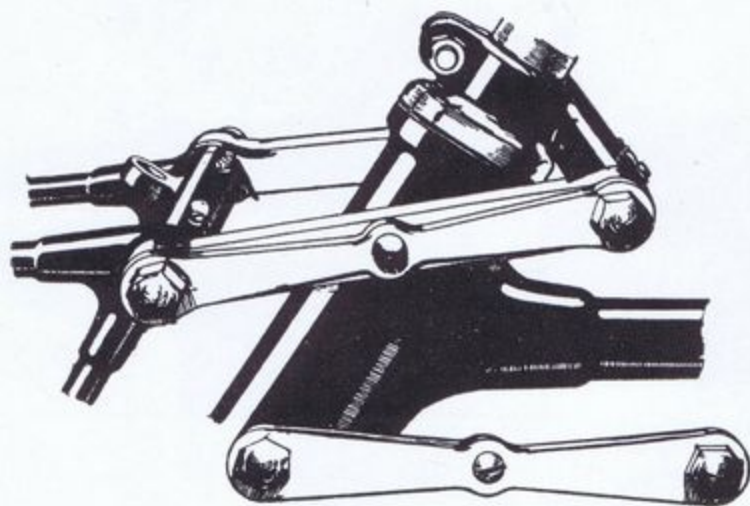
On the following pages will be found a full specification, and illustrations showing all the special features in detail.

There are several outstanding features which we consider absolutely essential on a spring frame, the most important being the adjustment of the springs to suit the different weights of riders and the roughness of the various roads.

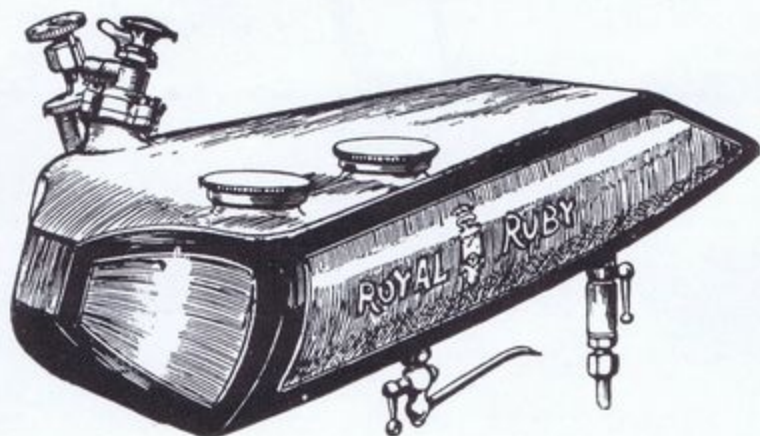
For the rider who puts **comfort** first, the 3 h.p. “Royal Ruby” spring frame model makes an irresistible appeal, comfort and reliability being the outstanding features of our spring frame machine.

During 1920 hundreds of this model were sold, and we have had scores of letters from satisfied riders testifying to the wonderful comfort and reliability of the 3 h.p. “Ruby” Motor Cycle.

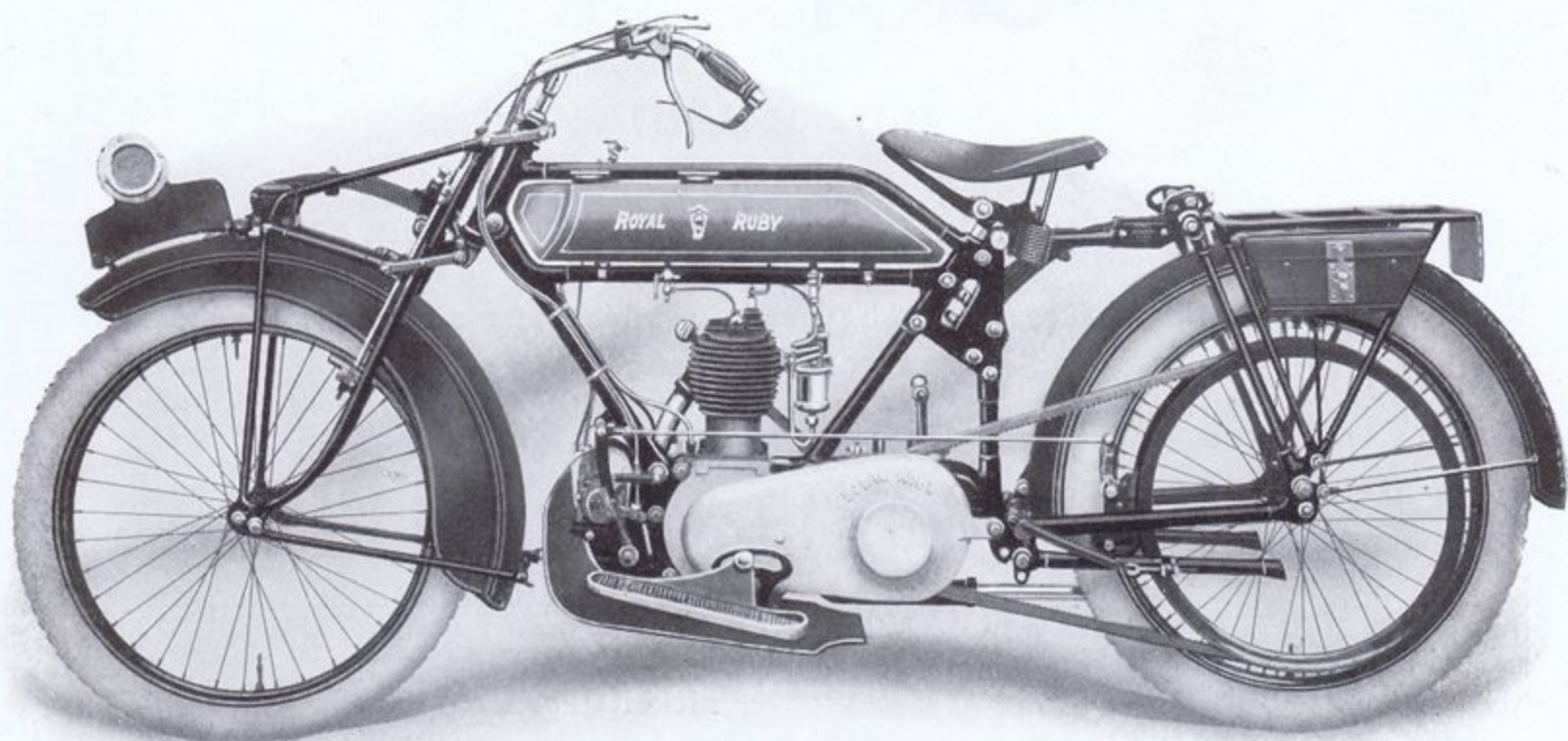
Since the introduction of this model we have increased the size of Engine, and are also fitting our new three-speed Countershaft Gear with Clutch, in place of the two-speed originally fitted.



“Royal Ruby” patent locking plates prevent the link nuts from working loose. These allow us to use dome-headed nuts, which give a good finish without sharp edges.



Registered design tank, splendidly made. The tank tapers from front to rear, and has convex sides, doing away with all sharp corners, looks very pretty, and gives comfort to the rider.



“Royal Ruby” 3 h.p. Single Cylinder (4-stroke).

Patent Adjustable Spring Frame Solo Model.

Fitted with “Royal Ruby” 3-Speed Gear, Clutch and Kickstarter.

SPECIFICATION.

FRAME AND FORK—This unique system of spring suspension is the result of many years’ experience and research, and you will see from the illustration that the whole machine is suspended fore and aft on a pair of laminated springs, which are centrally disposed, and can be adjusted to comply with the weight of the rider. Another ingenious feature is the patented roller bearing for the eye of the spring, used instead of the standard practice of shackles and such contraptions. This design eliminates all possibility of lateral play.

The spring frame can be converted in a few seconds into a rigid one by means of the Royal Ruby patented locking device.

ENGINE—Royal Ruby, 3 h.p. single cylinder, with all the latest improvements, 74.5 m.m. × 86 m.m. 375 c.c.

SILENCER—Royal Ruby patent, which is most efficient.

GEAR—Royal Ruby patent three-speed countershaft, with free engine, kickstarter and cork clutch, handlebar control.

TRANSMISSION—Hans Renold Chain from engine to gear, and Dunlop belt from gear to back wheel.

CHAIN COVER—Fully enclosed, made of aluminium as shown, can be easily and quickly detached.

MAGNETO SHIELD—Going right under the engine, to protect the whole unit.

BRAKES—Front, specially designed, with Bowden control and inverted lever through handlebar. Rear, Royal Ruby, patented parallel action brake, operated by left foot.

CARBURETTOR—A.M.A.C. or B. & B.

MAGNETO—M.L. or B.T.H.

SADDLE—Brooks’ B170, pan seat.

CARRIER—Special design, as shown.

TANK—Registered design, holding 1½ gallons of petrol and 3 pints of oil; large filler caps, fitted with priming tap and also with petrol strainer, and fastened on two supports brazed to frame. Enamelled in black, with ruby colour panels, and lined in gold leaf.

LUBRICATION—Best & Lloyd’s semi-automatic sight feed, with pump.

CONTROL—Ignition, carburettor, valve lift, clutch and front brake by levers on handlebar. Rear brake by foot pedal on left-hand side.

HANDLEBARS—Uprturned as shown, or semi-T.T. optional.

MUDGUARDS—Substantial guards, front 4½ in. wide, with side shields, and rear 6½ in. wide, with beaded edges and sides, quickly detachable, but securely fastened. The front mudguard is fastened by our patent attachments.

FOOTBOARDS—Royal Ruby patent adjustable, made of aluminium.

WHEELS—26 in. × 2½ in., beaded edge, Wedgewood rims, fitted with best quality hubs.

TYRES—26 in. × 2½ in. B.E. Dunlop heavy rubber studded.

TOOLS—Fully-equipped tool roll.

BAGS—One pair specially large pannier bags, as shown.

INFLATOR—Metal.

PRICE.

Motor Cycle, complete with Horn and Lighting Set, beautifully finished in Black Enamel and usual nickel-plated parts

\$90, All on.

Barnstormers.co.nz

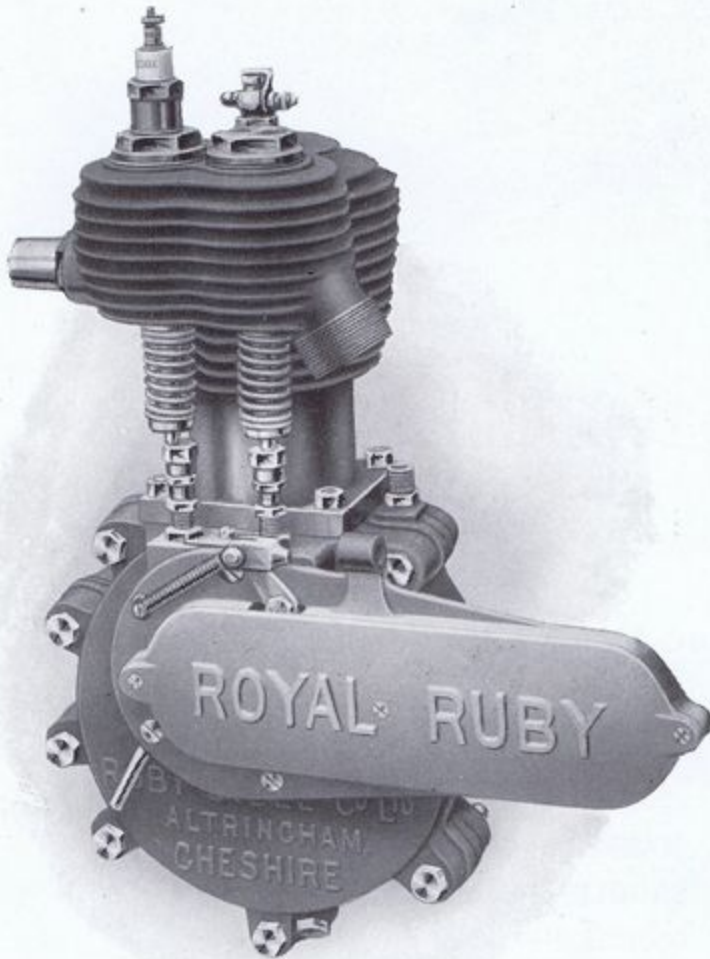
THE "ROYAL RUBY"

3 h.p. Engine

Bore and Stroke.

74.5 × 86 (375 c.c.).

These illustrations show the 3 h.p. engine, which is an example of the best modern practice.



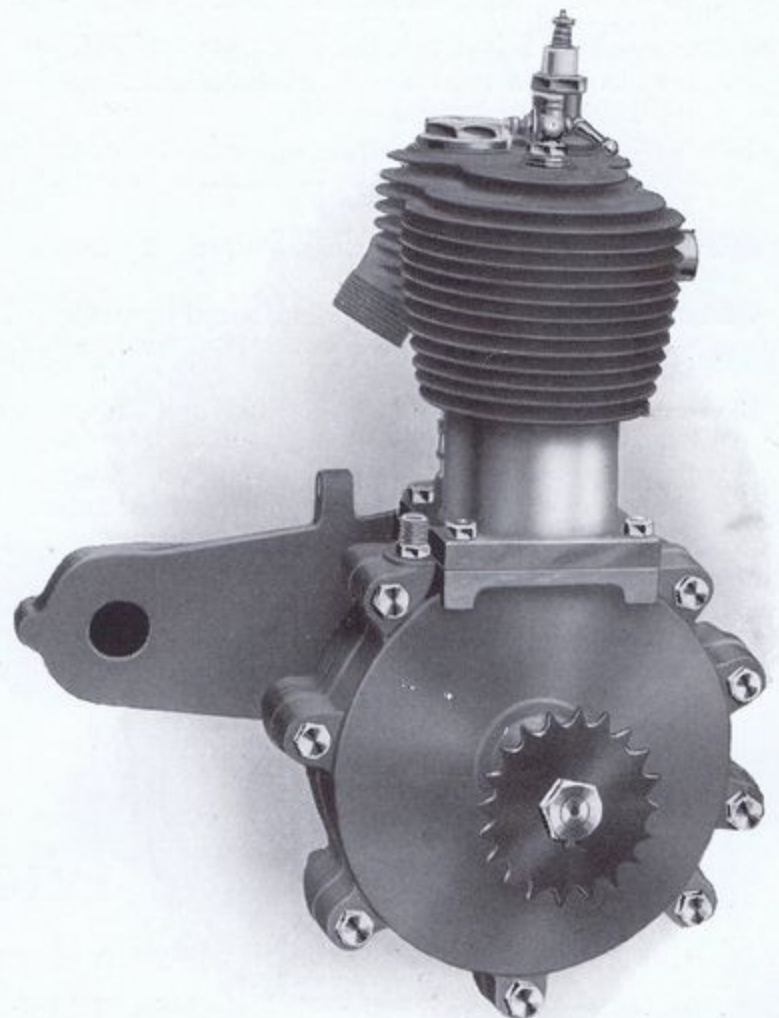
The valves are mechanically operated, are of large diameter, though light in weight, and are made from nickel steel stampings.

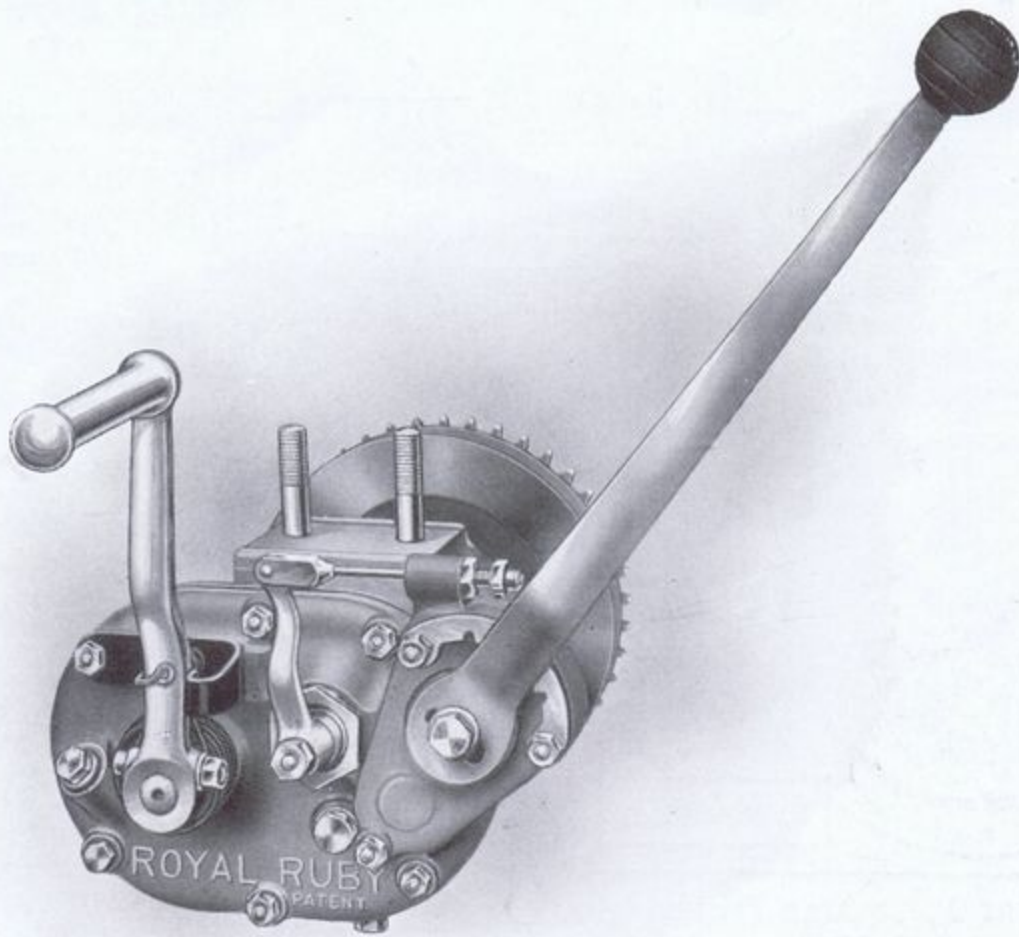
Flywheels of large diameter, correctly proportioned, fitted with hardened steel shafts, ground to fine limits, run in plain phosphor bronze bearings.

The piston has two rings fitted at top, of narrow width, and is fitted with a parallel gudgeon pin, which is securely held in the split small end of connecting rod. By this means a greater area of bearing surface is

provided than by the method where a taper pin is made to oscillate in a short bush in connecting rod. The cylinder is of our own design, and is without doubt the nicest casting, both for design and production, that is being fitted to a motor-cycle engine at the present time.

The magneto is carried in front of engine, on plates fixed to crankcase, and is driven by chain. Adjustment for tension of chain is provided.





The "Royal Ruby" Three-speed Gear-box.

This is our own design, the high and low gear wheels being always in mesh, the middle being a sliding gear, the ratios being approximately 5·8, 8·4, 12·2 to 1, with an engine sprocket having 20 teeth.

The mainshaft of U.B.A.S. runs on double row Skefko ball bearings, is splined to take the sliding dogs, and is ground all over to fine limits.

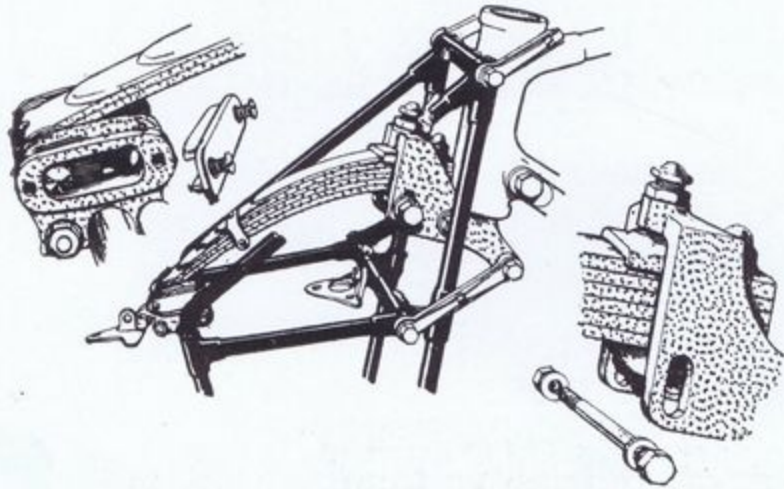
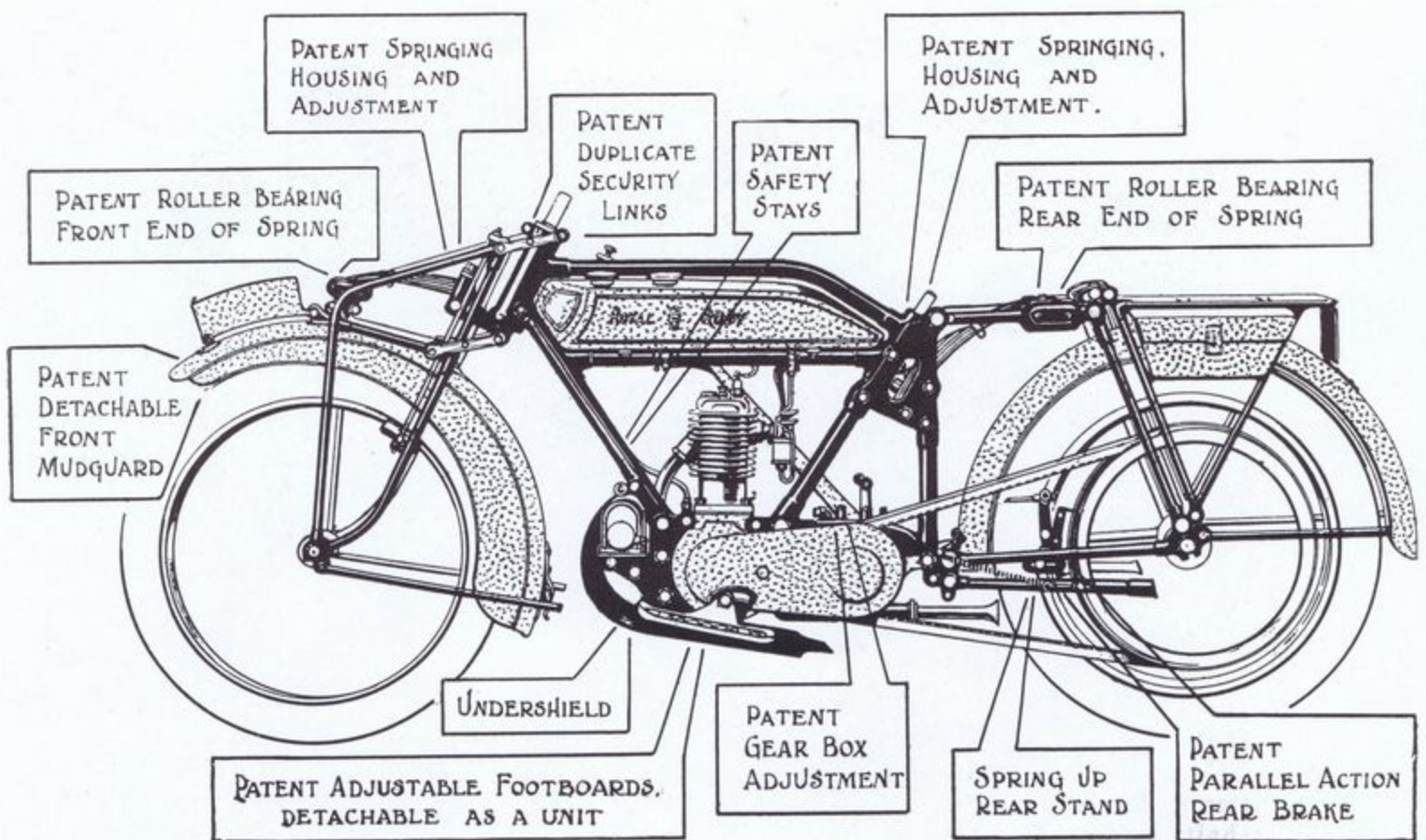
Any end-play in mainshaft thrust bearings can be taken up **from outside**, an adjustment that the merest novice can undertake. To make this adjustment on most gear-boxes entails the removal of the complete box from the frame, then the removal of the end cover of box, and last, but not least, the removal of ball bearings in cover so that suitable packing washers can be inserted to take up the end-play. After this has been done, the box must be re-assembled, a job that no novice can undertake.

To make the adjustment on the "Royal Ruby" gear-box, all that is necessary is to release locknut behind clutch control lever, turn screwed sleeve until the end-play is taken up, re-tighten locknut, and the job is done, taking at most five minutes, while the old method will take more like five hours.

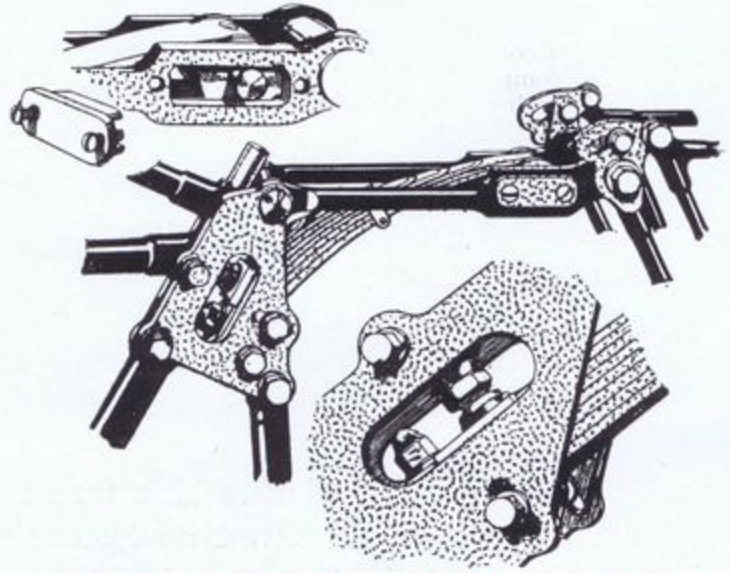
The layshaft is cut from the solid U.B.A.S. bar, and is provided with phosphor bronze bearings running on a hardened and ground spindle. The gear-box is provided with a handlebar controlled clutch of the cork inset type, being very sweet in action ; the necessary pressure between the corks and central sprocket being provided by a large single spring making for easy and quick adjustment.

The drive from engine to gear-box is by a $\frac{1}{2}$ in. \times $\frac{3}{16}$ in. Hans Renold chain. An enclosed kickstarter of the ratchet type, out of mesh when not in action, is provided, while the change-speed control being attached direct to the box, no adjustments are necessary when correcting tension of the driving chain.

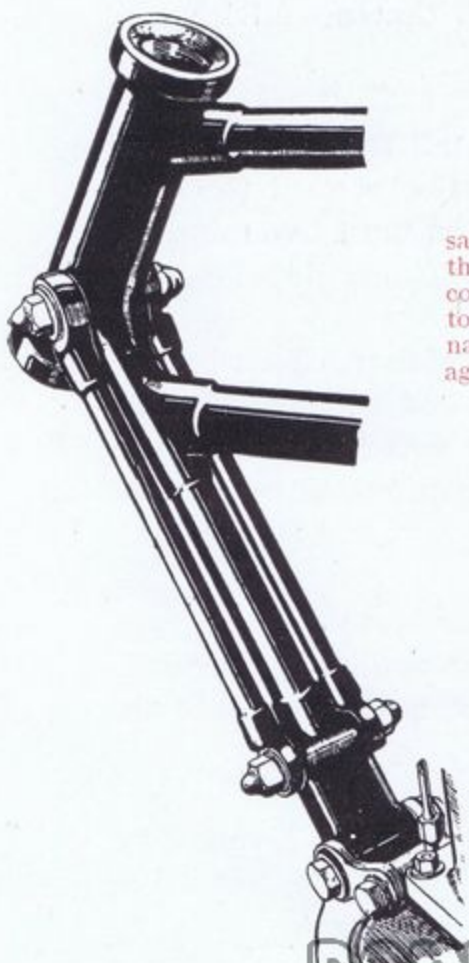
The change-speed control is entirely enclosed, and is spring operated, giving very easy control, and at the same time ensuring that the plunger enters the respective notch without any fuss or hesitation.



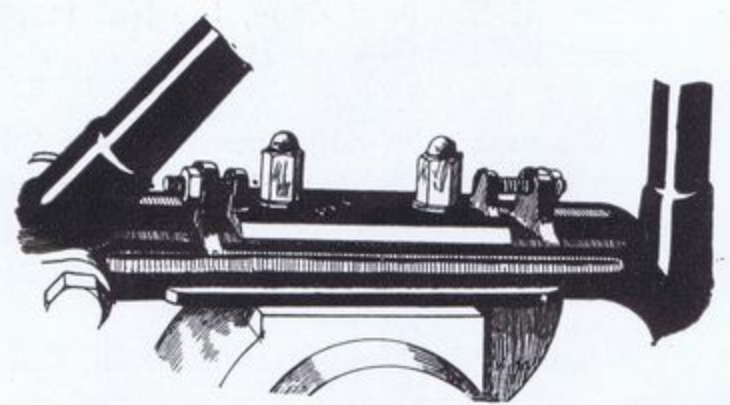
This shows the method of housing the front spring, which, you note, is adjustable, and also illustrates the patent roller bearing for the front of the spring.



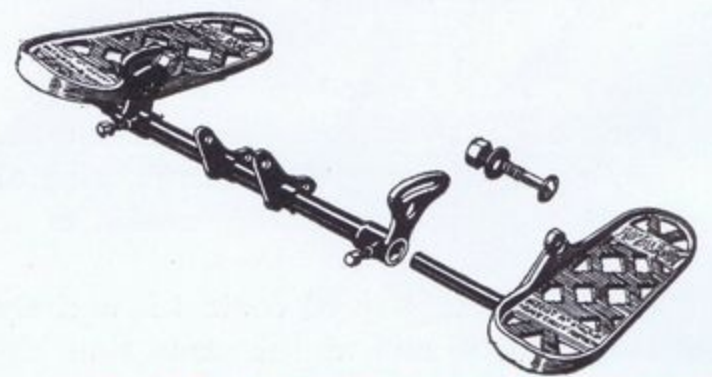
This illustrates the housing of the rear laminated spring, showing the strong side plates to prevent lateral movements, also adjustment of the spring, and the patent roller bearing for the eye of the spring.



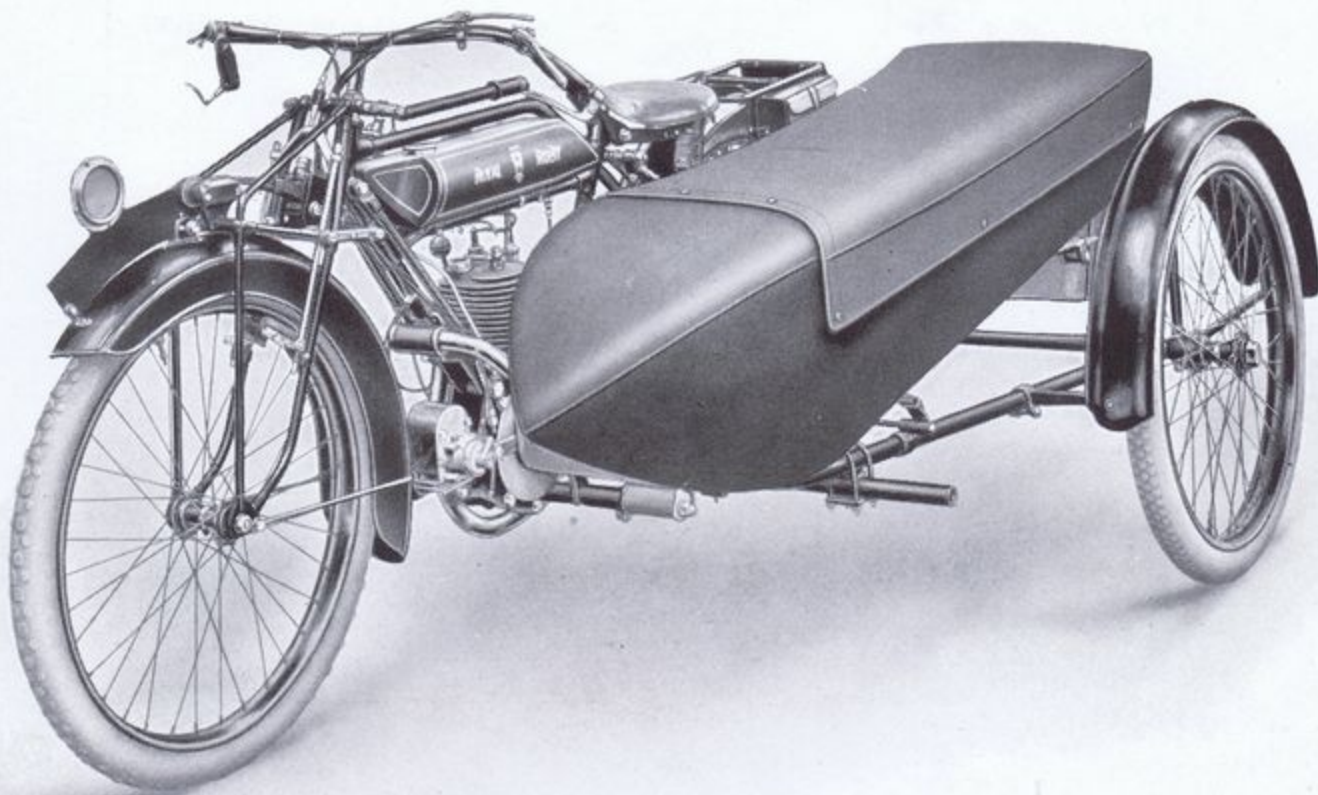
"Royal Ruby" patent safety stays supporting the front down tube, and connecting steering head to the engine lug, eliminates all chance of breakage to the front down tube.



"Royal Ruby" patent adjuster for gear bracket. This enables the chain to be adjusted without holding the gear-box, and can be adjusted to the very finest point desirable.



"Royal Ruby" adjustable footboards, made of aluminum, showing how easily they are detached, and also adjusted to the different positions required to suit the rider.



The "ROYAL RUBY" 2 $\frac{3}{4}$ h.p. Sports Model Combination.

This Motor Cycle is fully described on page 28, but is fitted with "Royal Ruby" 3-Speed Countershaft Gear. The Side-car is splendidly made lightweight, weighing 65 pounds.

SPECIFICATION.

BODY—Is coach-built, with metal front panels, coach painted, upholstered in cloth and fitted with spring back, complete with cushions. Springing is of special type and very efficient.

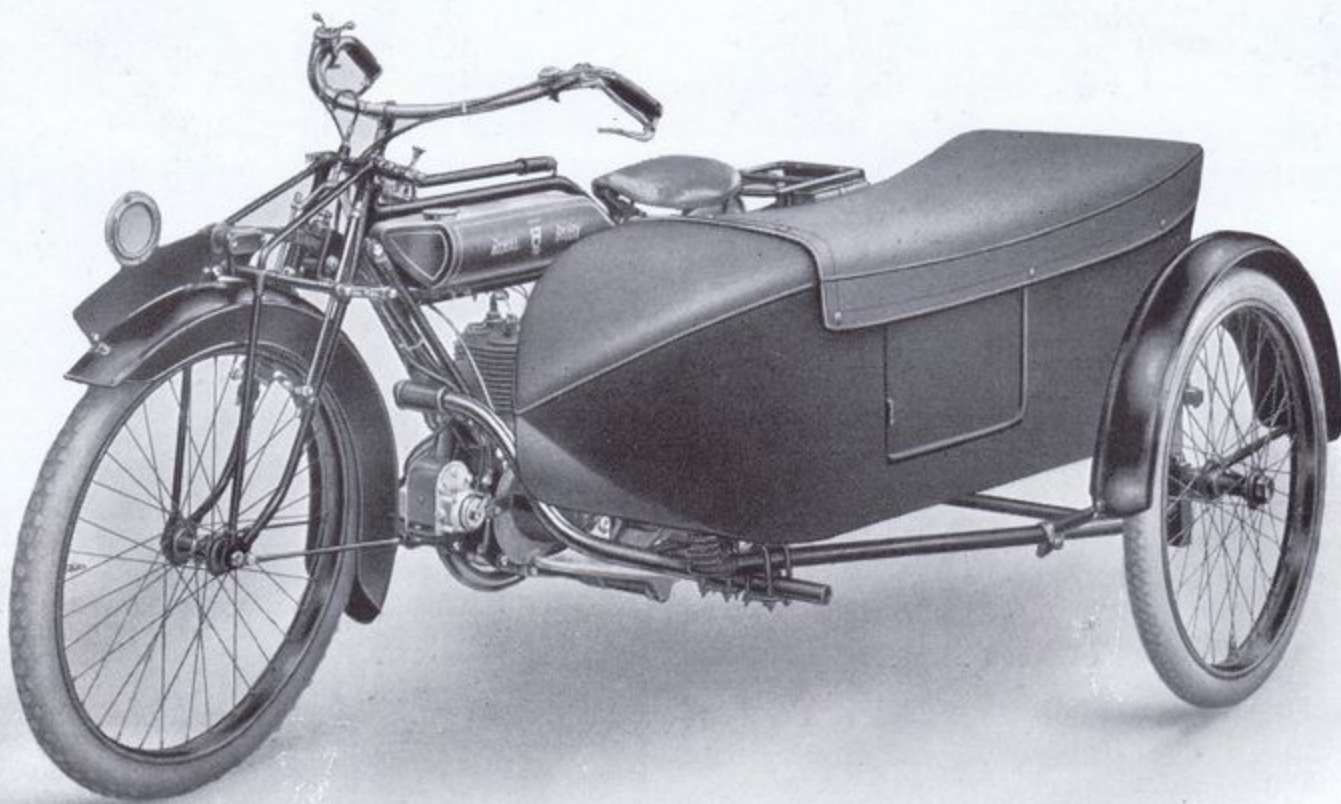
CHASSIS—New design, light, but exceptionally strong, and has three attachments to motor cycle. Enamelled black.

FINISH—Body, ruby colour, to match tank.

PRICE.

Combination complete with cover-all apron, horn, and lighting set.
Dunlop rubber studded tyre, 26 in. \times 2 $\frac{1}{4}$ in. B.E.
If fitted with side-car shown below

£95, All on
2 Guineas extra.



The "ROYAL RUBY" 3 h.p. Touring Model Combination.

A Beautiful Lightweight Side-car, weighing only 73 pounds.

SPECIFICATION.

BODY—Coach-built, with door. Coach-painted, upholstered in leather cloth, with spring back. Loose seat, giving access to locker under seat.

SUSPENSION—Coil springs back and front.

CHASSIS—New design, light, but exceptionally strong. Three attachments to motor cycle. Enamelled black.

MUDGUARD—4-in. blade, with valance rigidly attached to chassis.

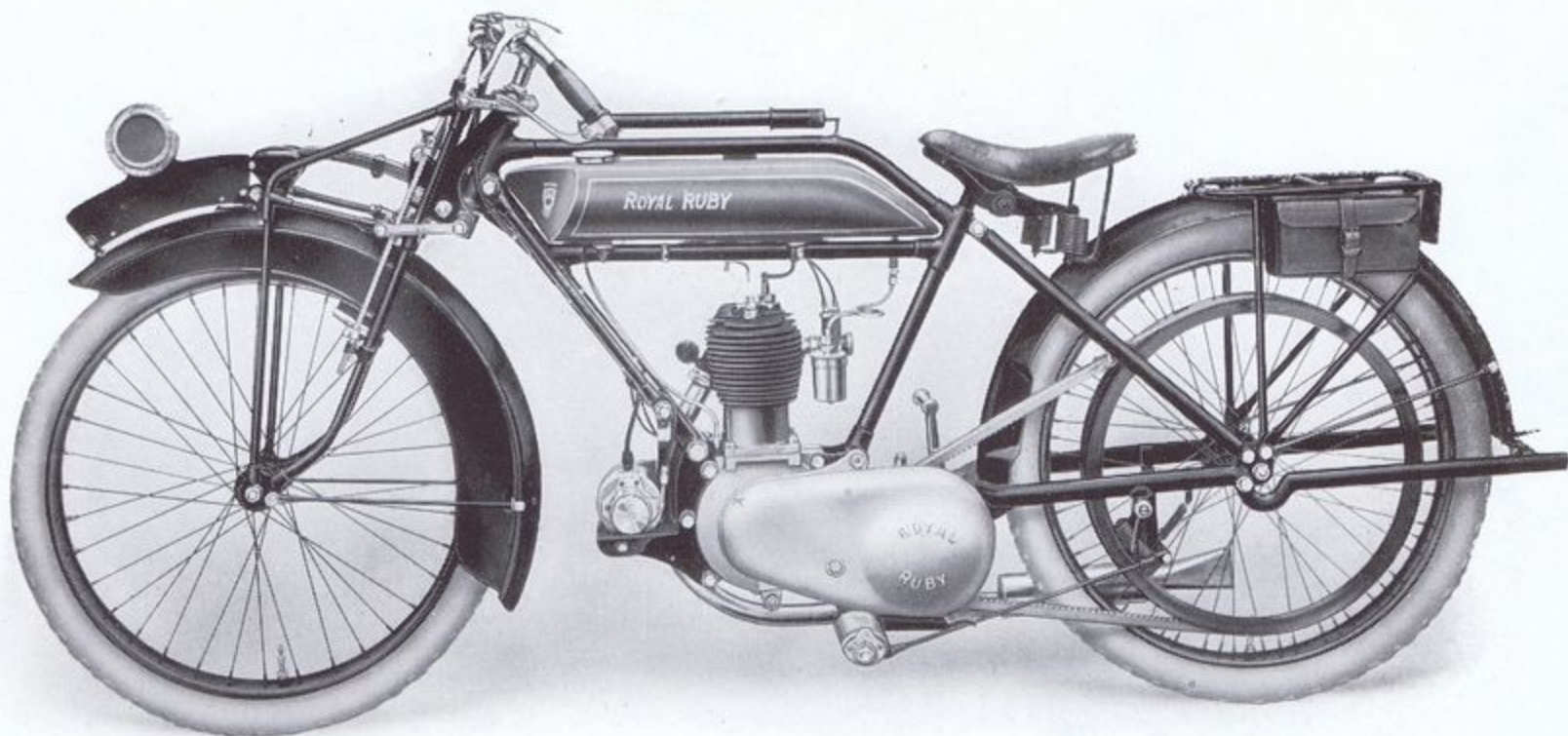
FINISH—Body, ruby colour, to match tank.

PRICE.

Combination complete, with cover-all apron, horn, and lighting set.
Dunlop rubber studded tyre, 26 in. \times 2 $\frac{1}{4}$ in. B.E.
If fitted with Sports side-car

£105, All on
2 Guineas less.

NOTE.—The 3 h.p. combination is fitted with "Royal Ruby" 3-speed countershaft gear, and has rigid frame.



THE "ROYAL RUBY"

2³/₄ h.p. Single Cylinder (4-stroke) Sports Model.

Fitted with "Royal Ruby" 2-speed Gear, Clutch and Kickstarter.

The "Royal Ruby" Sports Model has been introduced to meet the demand for a light, inexpensive sporting solo machine. It is also an ideal Solo Touring Model.

Our new model is fitted with the "Royal Ruby" patent spring fork, two-speed gear, kickstarter and clutch, and the whole machine is manufactured exclusively at our Works, Altrincham.

Riders will find our Sports Model a "go anywhere" machine, fast and economical. The weight is 185 lbs., which brings the machine under the 30s. tax; petrol consumption, approx. 120 miles per gallon.

SPECIFICATION.

FRAME—Low built, soundly constructed and with dropped back, giving low position, made throughout of Royal Ruby fittings and best quality weldless steel tubing. Fitted with Royal Ruby patent safety stays, as shown and described on page 26.

FORKS—Royal Ruby patent adjustable, fitted with laminated spring as shown and described on opposite page.

ENGINE—Royal Ruby 2³/₄ h.p. single cylinder (four-stroke) with all the latest improvements, 74.5 m.m. x 80 m.m., 349 c.c.

MAGNETO—M.L. or B.T.H.

GEAR—Royal Ruby patent two-speed countershaft, with free engine, kickstarter and cork clutch, handlebar control.

CARBURETTOR—A.M.A.C. or B. & B.

TRANSMISSION—Chain from engine to gear, and Dunlop belt from gear to back wheel.

CHAIN COVER—Aluminium, as shown.

BRAKES—Front, specially designed, with Bowden control and inverted lever through handlebar. Rear, operated by foot pedal, fitted with Royal Ruby eccentric adjustment.

SADDLE—Pan seat.

CARRIER—Special design, as shown.

TANK—Registered design, holding 1¹/₂ gallons petrol and 3 pints of oil; large filler caps, fitted with priming tap and petrol strainer and fastened on two supports brazed to frame; enamelled in black, with rich ruby colour panels, and lined in gold leaf.

LUBRICATION—From separate chamber in tank through Best & Lloyd's semi-automatic sight feed with pump.

CONTROL—Ignition, carburettor, valve lift, clutch and front brake by levers on handlebar, rear brake by foot pedal on left-hand side.

HANDLEBARS—Uprturned or semi-T.T. optional.

MUDGUARDS—Substantial. Front 4¹/₂ in. wide, with side shields and rear 5 in. wide, with B.E. and sides. Quickly detachable, but securely fastened.

FOOTREST—With rubber pads as shown.

WHEELS—26 in. x 2¹/₂ in. P.E. rims, well enamelled black all over, and fitted with good quality hubs.

PANNIER BAGS—Metal, with leather front as shown. One each side the carrier.

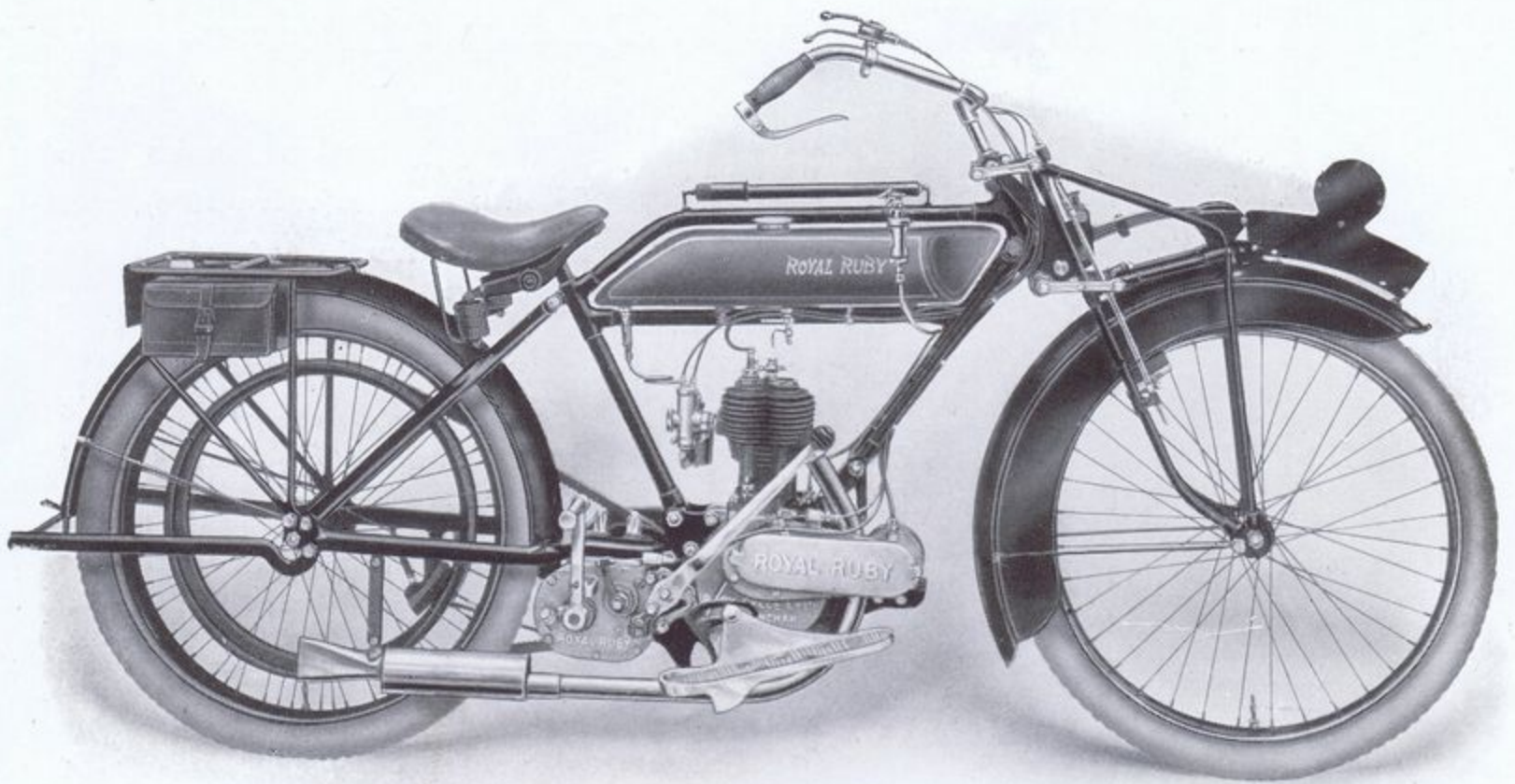
TOOLS—Set of tools in roll.

INFLATOR AND CLIPS—Celluloid inflator with clips.

TYRES—Dunlop, rubber studded, 26 in. x 2¹/₂ in. B.E.

Complete with horn and lighting set, beautifully enamelled black, and bright parts specially well nickel-plated.

PRICE **£70 All on.**
BARNSTORMERS.CO.UK



THE "ROYAL RUBY"

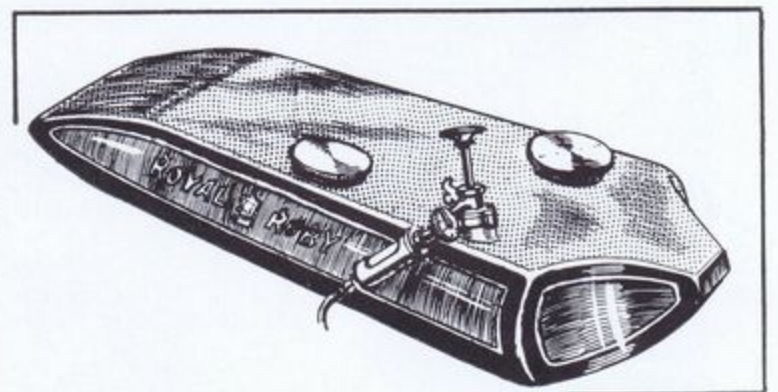
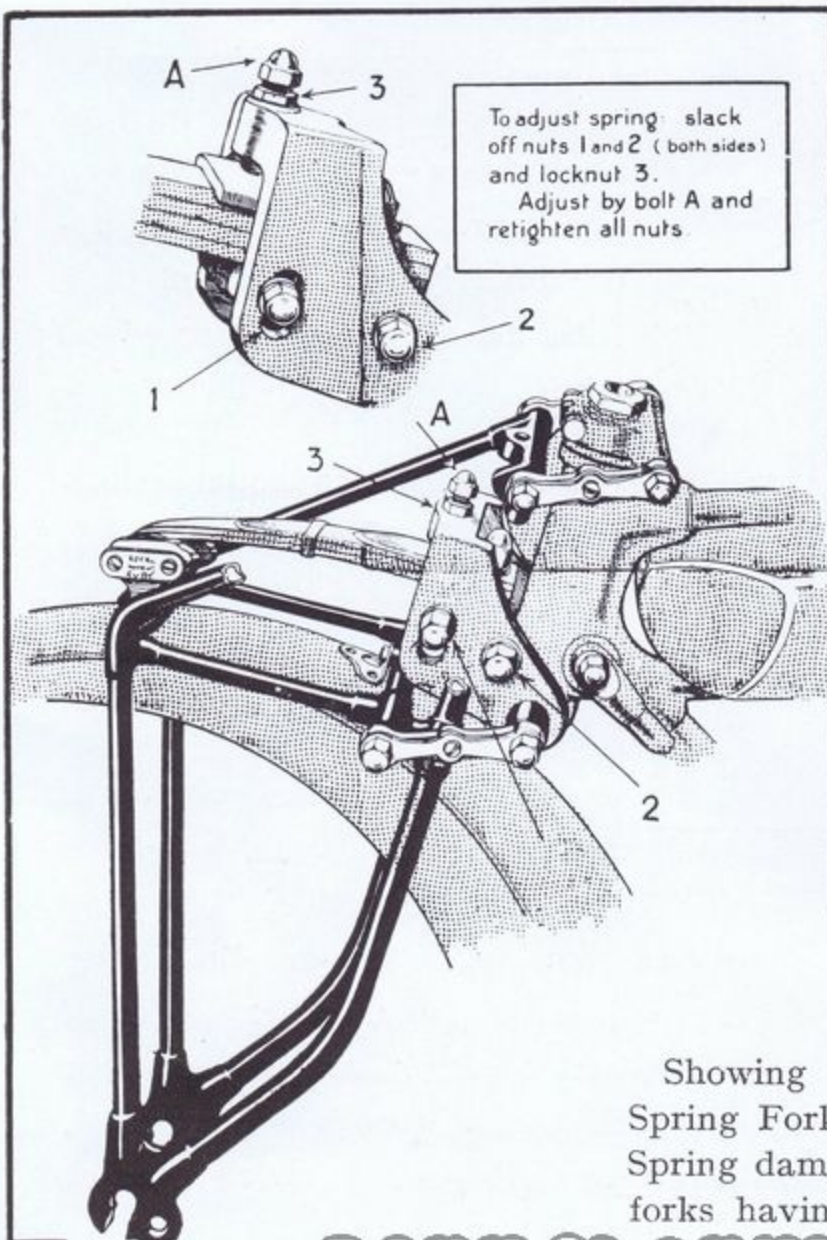
2³/₄ h.p. Single Cylinder (4-Stroke) Touring Model

This is a similar machine to the Sports Model, but is fitted with Upturned Handlebars and "Royal Ruby" Patent Adjustable Footboards.

If fitted with Footrests as Sports Model :

Price £72 All on.

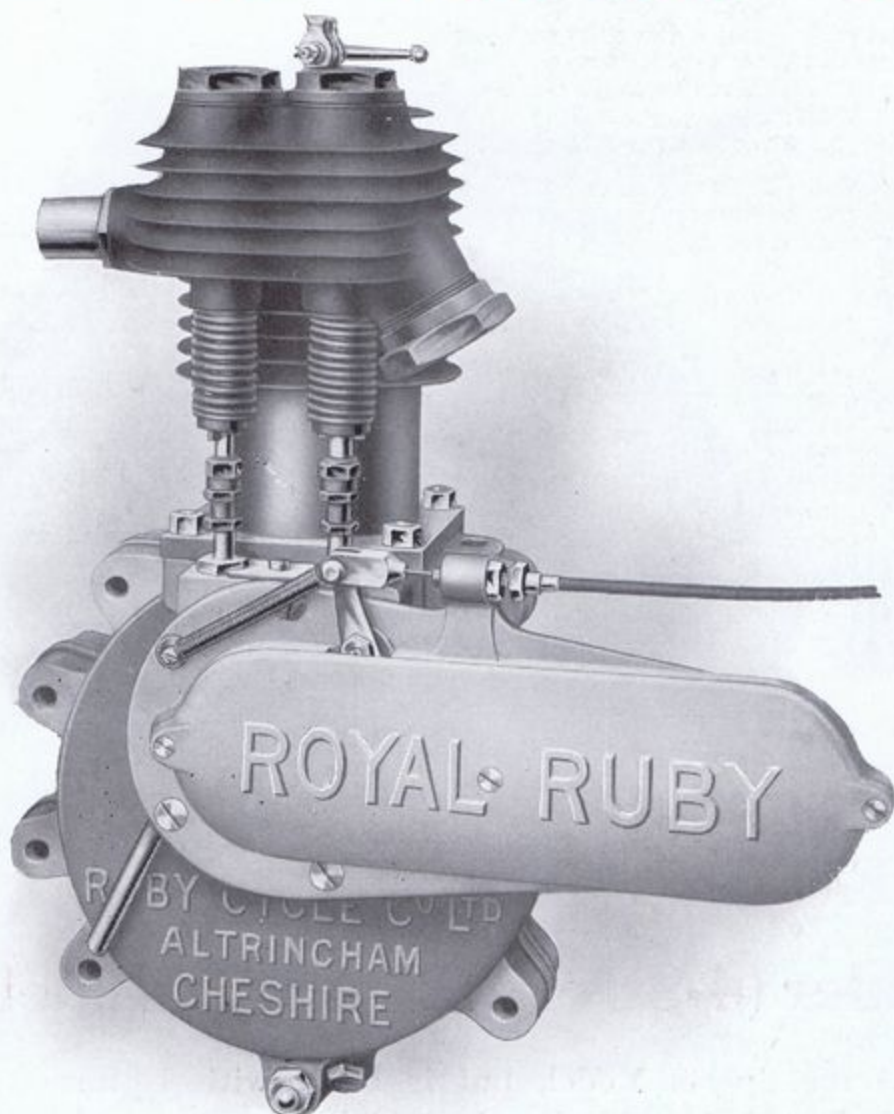
Price £70 All on.



Registered Design Tank, splendidly made. The Tank tapers from front to rear and has convex sides, doing away with all sharp corners, looks very pretty, and gives comfort to the rider.

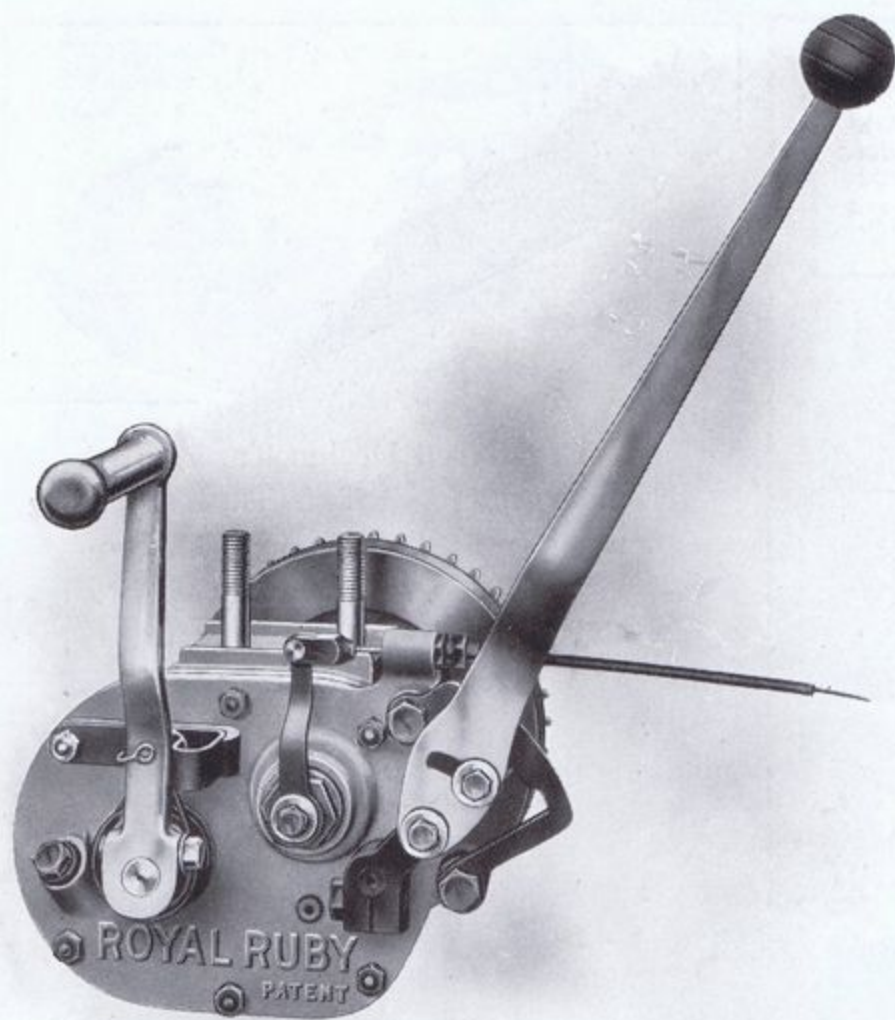
Showing the "Royal Ruby" Patent Adjustable Spring Forks and Method of Adjustment. The Leaf Spring damps out all shocks and is much superior to forks having Coil Springs.

The "Royal Ruby" 2 $\frac{3}{4}$ h.p. Engine.



The illustration shows the 2 $\frac{3}{4}$ h.p. engine (valve side), and is an example of the best modern practice. The valves are mechanically operated, are of large diameter, and are made from the best nickel steel stampings. Flywheels of large diameter, fitted with hardened steel shafts, run in plain phosphor bronze bearings. The piston has two rings, is fitted with a taper gudgeon pin, which works in a phosphor bronze bush in connecting rod. The magneto is carried in front of the engine on plates fixed to crankcase, and is driven by chain. Adjustment for tension of chain is provided.

The "Royal Ruby" Two-speed Gear-box.



This is our own design, and is of the constant mesh type of box giving a direct drive on top gear. The ratios are approximately 5.8 and 10.2 to 1 with an engine sprocket of 20 teeth.

The Mainshaft runs on double-row Skefko ball bearings, is splined to take sliding dogs, and is ground all over to fine limits.

The box is provided with a handlebar controlled clutch of the cork inset type, which is very sweet in action. The drive from engine to gear-box is by $\frac{1}{2}$ in. \times $\frac{3}{16}$ in. roller chain of best quality. An enclosed type of kickstarter is incorporated,

and the change-speed control being attached direct to the gear-box, no adjustment need be made when altering the tension of the driving chain.

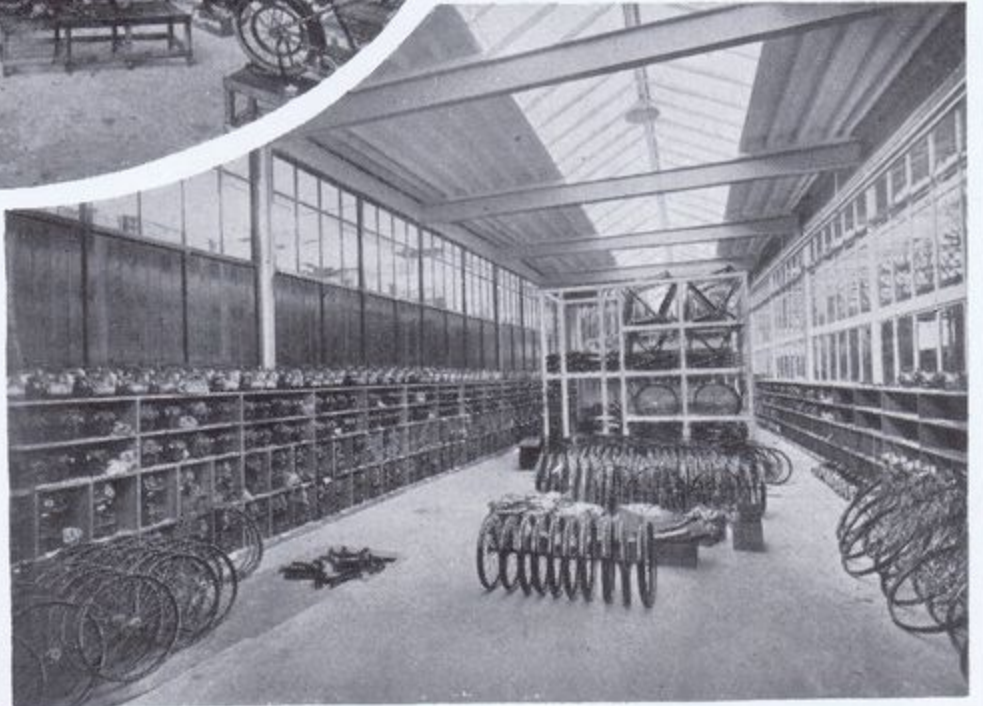


GENERAL OFFICES,
MAIN CORRIDOR

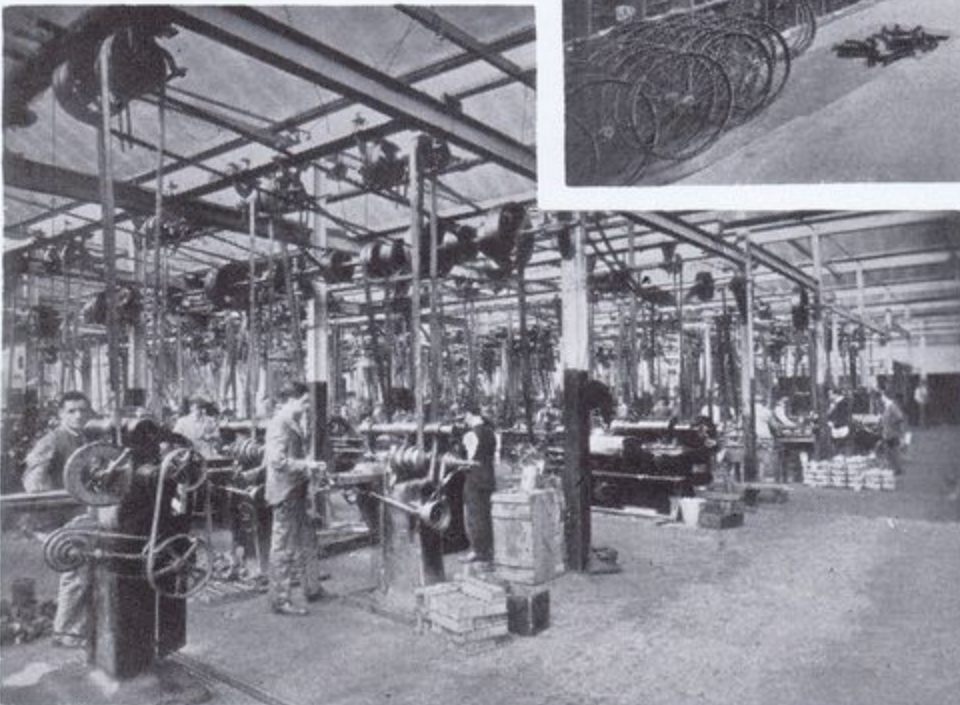
DRAWING OFFICE



GENERAL VIEW
WORKS INTERIOR



BONDED STORES



MACHINE SHOP
GENERAL VIEW

GUARANTEE.

WE give the following guarantee with our motor cycles instead of the guarantee implied by statute, or otherwise, as to the quality or fitness of such machines for the purpose of motor cycling; any such implied guarantee being in all cases excluded. In the case of machines which have been used for "hiring-out" purposes, or from which our trade mark or manufacturing number has been removed, no guarantee of any kind is given, or is to be implied.

We guarantee, subject to the conditions mentioned below, that all precautions which are usual and reasonable have been taken by us to secure excellence of materials and workmanship; but this guarantee is to extend and be in force for three months only from the date of purchase, and damages for which we make ourselves responsible under this guarantee are limited to the free supply of a new part in exchange for the part of the motor cycle which may have proved defective. We do not undertake to replace or refix, or bear the cost of replacing or refixing such new part in the motor cycle.

We undertake, subject to the conditions mentioned below, to make good at any time within three months any defects in these respects. As motor cycles are easily liable to derangement by neglect or misuse, this guarantee does not apply to defects caused by wear and tear, misuse or neglect.

The term "misuse" shall include among others the following acts:—

- I. The attaching of a side-car to the motor cycle in such a manner as to cause damage, or calculated to render the latter unsafe when ridden.
- II. The use of a motor cycle, or of a motor cycle and side-car combined when carrying more persons, or a greater weight, than that for which the machine was designed by the manufacturers.

Any motor cycle sent to us to be plated, enamelled, or repaired, whether the repairs are required for the purpose of making good the defect before referred to or otherwise, will be repaired upon the following conditions, *i.e.*, we guarantee that all precautions which are usual and reasonable have been taken by us to secure excellence of material and workmanship, such guarantee to extend and be in force for three months only from the time such work shall have been executed, and this guarantee is in lieu and in exclusion of any common law or statute warranty, and the damages recoverable are limited to the cost of any further work which may be necessary to amend and make good the work found to be defective.

CONDITIONS OF GUARANTEE.

If a defective part should be found in our motor cycles or in any part, supplied by way of exchange before referred to, it must be sent to us carriage paid, and accompanied by an intimation from the sender that he desires to have it repaired or exchanged free of charge under our guarantee, and he must also furnish us at the same time with the number of the machine, the name of the agent from whom he purchased and the date of the purchase, or the date when the alleged defective part was exchanged, as the case may be.

Failing compliance with the above, no notice will be taken of anything which may arrive, but such articles will lie here at the risk of the senders, and this guarantee, and any implied guarantee, shall not be enforceable.

We guarantee only those machines which are bought either direct from us or from one of our duly authorised agents, and under no other conditions.

We do not guarantee the specialities of other firms, such as tyres, saddles, chains, lamps, etc., or of any component part supplied to the order of the purchaser differing from our standard specification, supplied with our motor cycles, or otherwise.

The term "Agent" is used in a complimentary sense only, and those firms whom we style our agents are not authorised to advertise, incur any debts, or transact any business whatsoever on our account, other than the sale of goods which they may purchase from us; nor are they authorised to give any warranty or to make any representation on our behalf other than those contained in the above guarantee.

TERMS OF BUSINESS.

PAYMENTS—One-third cash with order: balance payable on receipt of intimation that machine is ready, or approved references must be given.

All machines are sold subject to the above guarantee.

CARRIAGE—This in all cases paid by customer. Machines are signed for by the carriers as being received in good condition, and unless otherwise ordered, will be consigned at lowest rates, *i.e.*, consignee's risk. In case of damage, all claims should be made on the carriers.

REPAIRS—When ordering spare parts or replacements, it is advisable, if possible, to send patterns. If this is not convenient, please quote the number of the machine, which will be found stamped on the frame.

All charges for repairs are cash, and repairs cannot leave our works until paid for.

Despatch of parts should be advised by separate post, with full instructions regarding repair.

Customers having no ledger account should not fail to accompany orders with remittance, which must include postage.

FOREIGN AND COLONIAL—All orders from abroad, unless received through Established Agencies or Shipping Houses, must be accompanied by a deposit of not less than one-third of the amount, and credit opened with English Bank or first-class firm, who will pay balance on receipt of Shipping Documents.

DELIVERY is at our Works.

N.B.—The Prices in this List are subject to alteration without notice.

These goods are sold on the condition that they must not be exhibited at any

Exhibition in the British Isles without our written consent.

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