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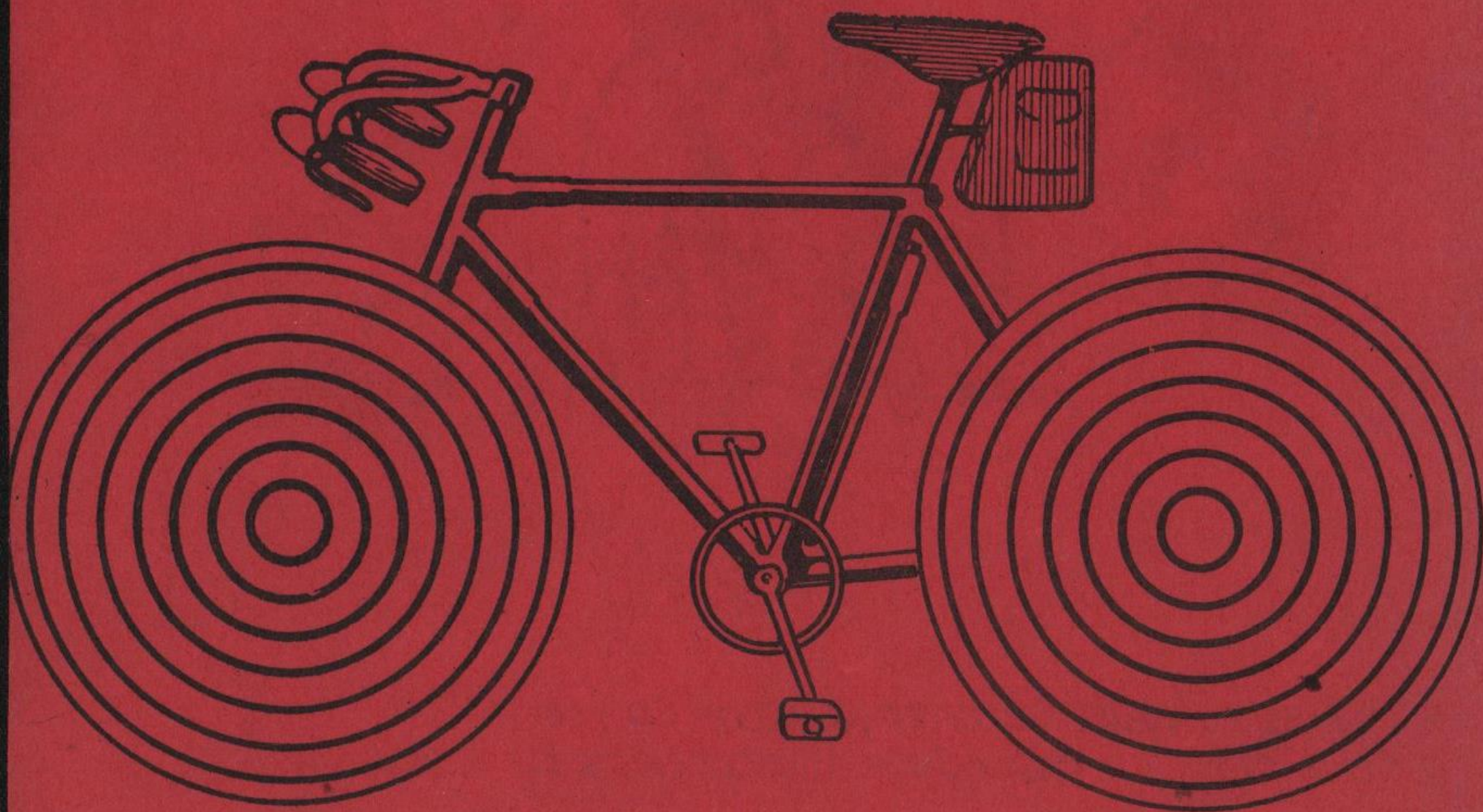
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PEACE NEWS

5 Caledonian Road, London N 1.



from Peace News, 10 August 1973

5p

Phil Reardon

the PEDAL-POWER POCKET BOOK and KERB-SIDE COMPANION

Do you know —
with this book, a few
tools and a dash of
imagination you can
recycle a cycle.....

Where there's a
wheel there's a way



Cycling re

Cycling re

Cycling re

Cycling re

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Cycling



Bikes are sensible, simple, intimate, often beautiful machines. And they're fun! They have been acclaimed very widely lately, and more and more people are acquiring and riding them. Whilst they may not be the complete answer to the car, they are certainly more practical, a heck of a lot cheaper and more conducive to health.

But this isn't so much another paean of praise for push-bikes; rather it's a practical guide to how they work, how to build or re-build them and keep them running sweetly.

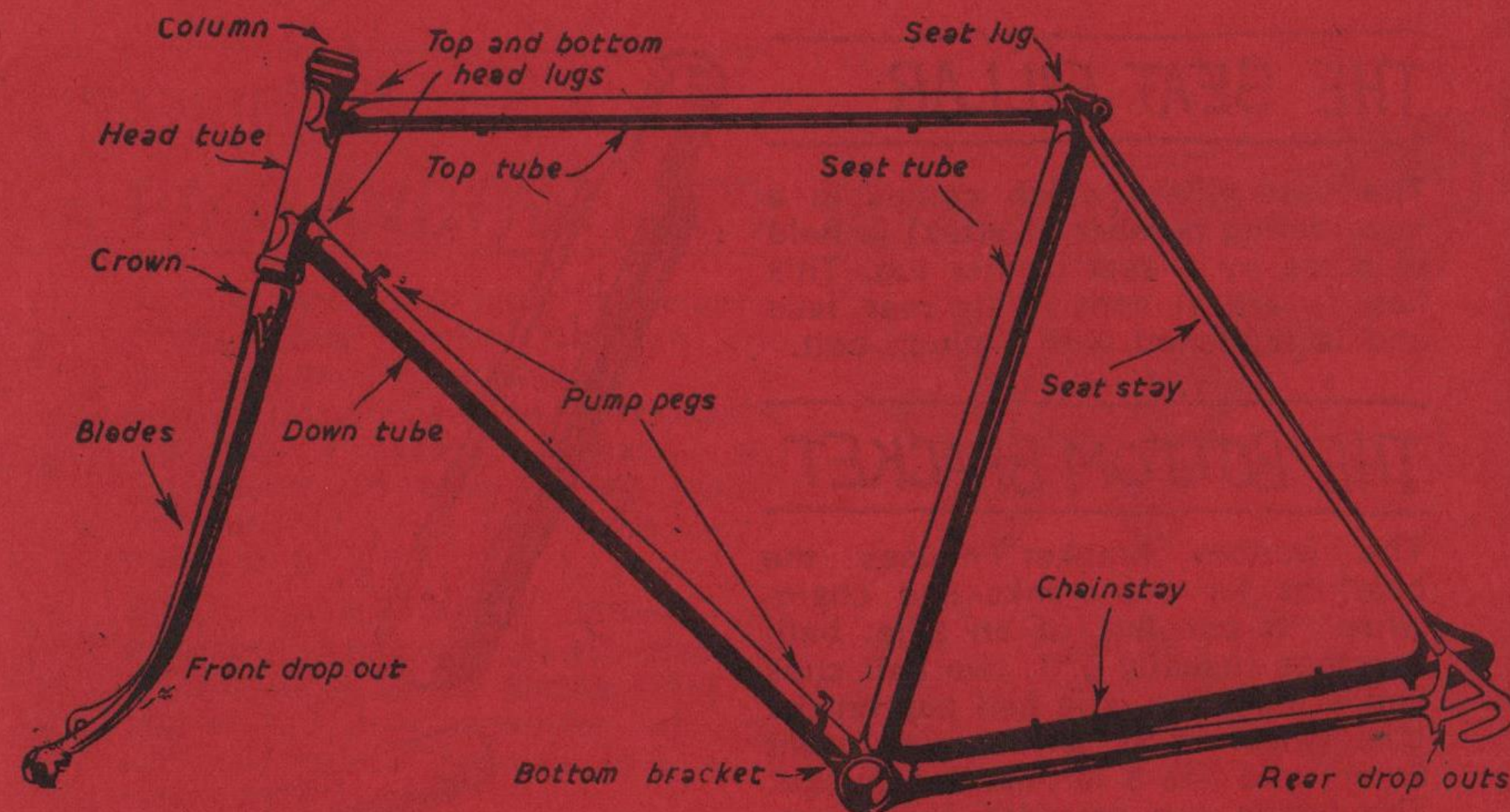
An "alternative consumers' guide" to sources of second-hand cycles has been deliberately omitted; two recent listings appear in Time Out (July 26) and edition number eight of the excellent Country Bizarre (20p, inc postage from 19 Danesmoor, Ruscote, Banbury). A sad result of listings like this is the tendency towards inflated prices. If anyone is into second-hand bicycles in your neighbourhood, you'll find them by keeping your ear close to the ground.

It's amazing how many old rusting cycles or cycle parts are stashed away in garages and garden sheds—just waiting to be reclaimed and recycled. A door-to-door collection in a few streets can produce a wealth of bicycle parts; and cycles built a decade or two ago were built better than they are today.

If you're getting together cycle recycling, it's good to form a workshop with a group of people. Components can be stock-piled for future use, equipment and experiences can be shared.

The information in this booklet is based on run-of-the-mill machines—specialised lightweight bikes are a world apart; if you're into those realms, you won't need this! A comparatively recent innovation is the "small-wheeled" type of bike: while it is not dealt with specifically here (not many of them have been abandoned yet), the principle is the same—they just look different!

Bikes really don't need a lot of maintenance, but minor problems do have a way of turning into major ones if not attended to. A well-put-together, well-tended bike is a real friend.



THE FRAME

- Almost all frames look something like the one above—varying from manufacturer to manufacturer only in small details; the quality of the tubing, the fanciness of the lugs, the type of rear drop-outs and the quantity of brazed-on fittings.

Most mass-produced frames are made by brazing the steel tubes into pressed or malleable cast-lugs or by a process known as sifbronze welding.

A good guide to the quality of a brazed frame is the construction of the lugs—cutaway (or "feathered") lugs allow the brazing metal to flow into the joint more quickly, and when light gauge tubing is being worked, this helps obviate "burning" the tube ends which would make them brittle. Also, as newly-made joints cool, the lug contracts faster than the tube and, if it was plain and rigid, it would "pinch" the tubing.

Sifbronze welding is carried out at higher temperatures than brazing and only the extreme tube ends are heated, so there is little possibility of burning; lugs can be done away

with altogether and heavier gauge tubing can be used.

A more recent innovation is electrical welding by the amalgam process. The two tubes used to make a joint are lightly held together in a jig. An electric current is passed through which melts the tubes at the joint, due to the high local resistance there. As the tubes melt, welding pressure is applied.

If you spot a small transfer on your frame with the legend "Reynolds 531 Double Butted Tubing", you've got a good 'un—the tubes are greater in diameter at both ends for added strength.

Fork blades are produced in three sections—oval, round and "D" section—all being circular in section at the lower end. Good quality frames have separate ends brazed into the fork blades but the cheaper pressed-out end is quite satisfactory. The fork crown is normally either of forged box or double plate construction.

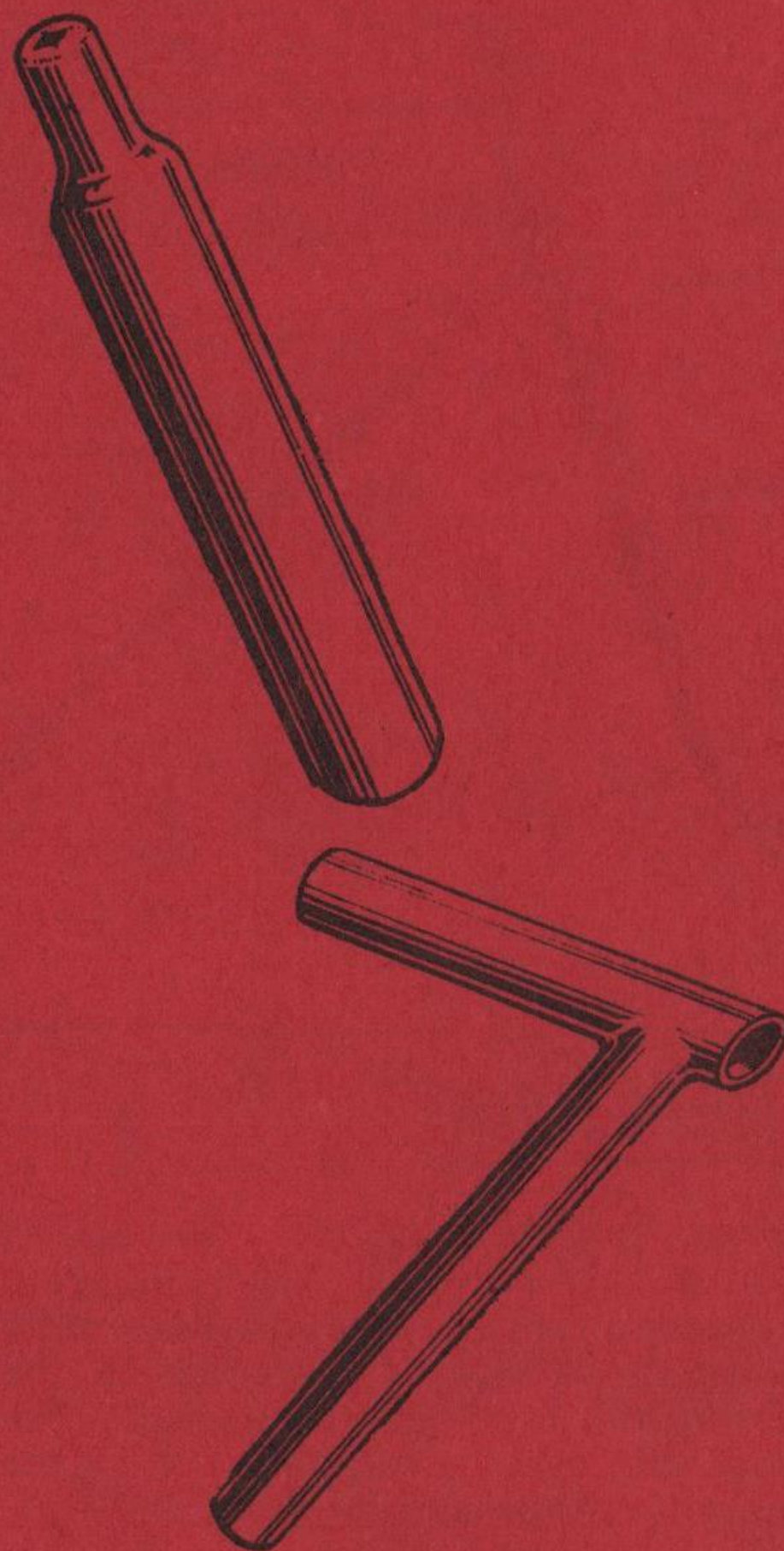
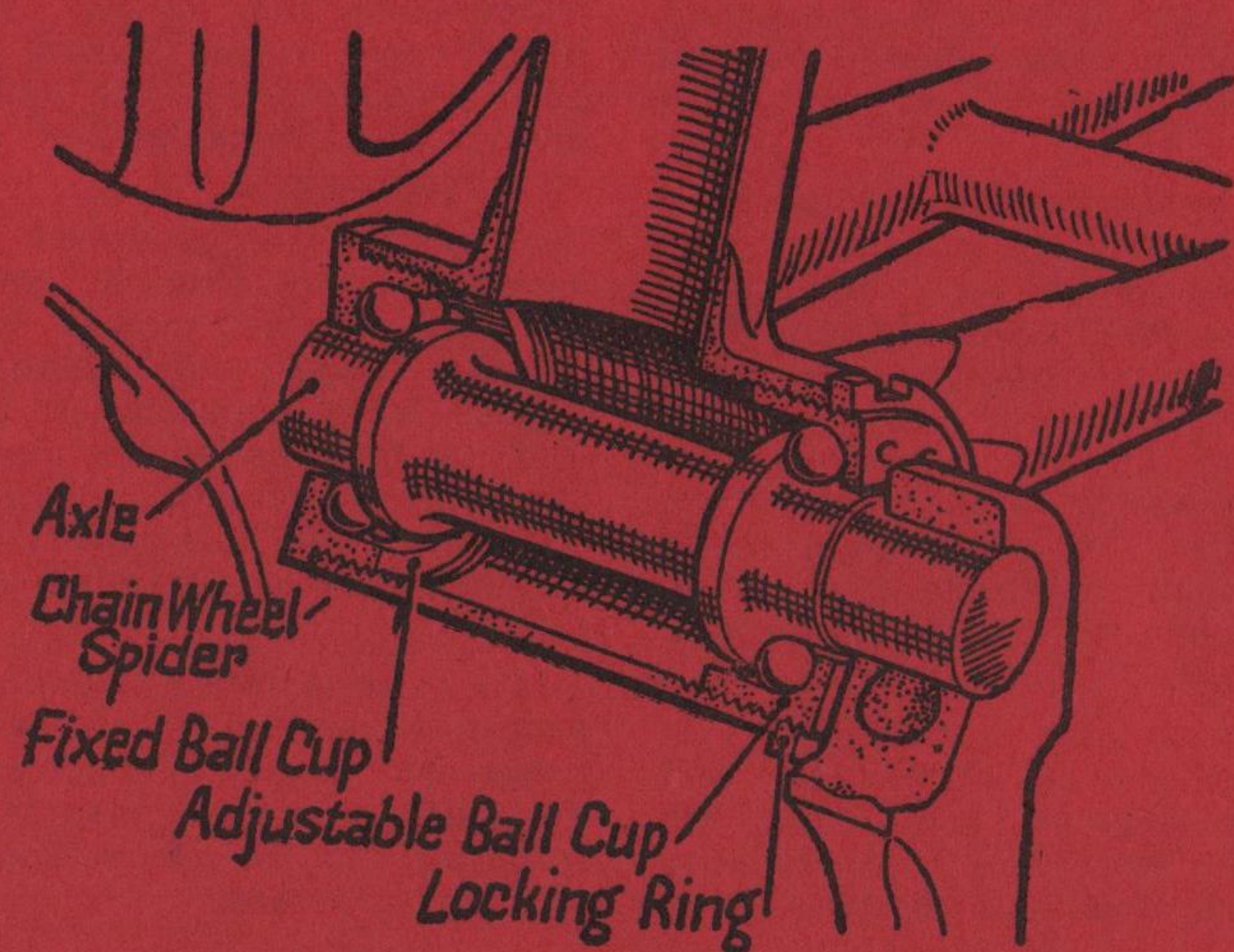
The size of a frame is measured in seat tube length; this is usually between 21" and 23". A good guide to the frame size you need is to subtract 9½" to 10" from your inside leg measurement.

THE SEAT PILLAR

The seat pillar (which comes in a bewildering number of sizes) is held in place by a seat cluster lug. This has a vertical split in its rear face and is tightened with a pinch bolt.

THE BOTTOM BRACKET

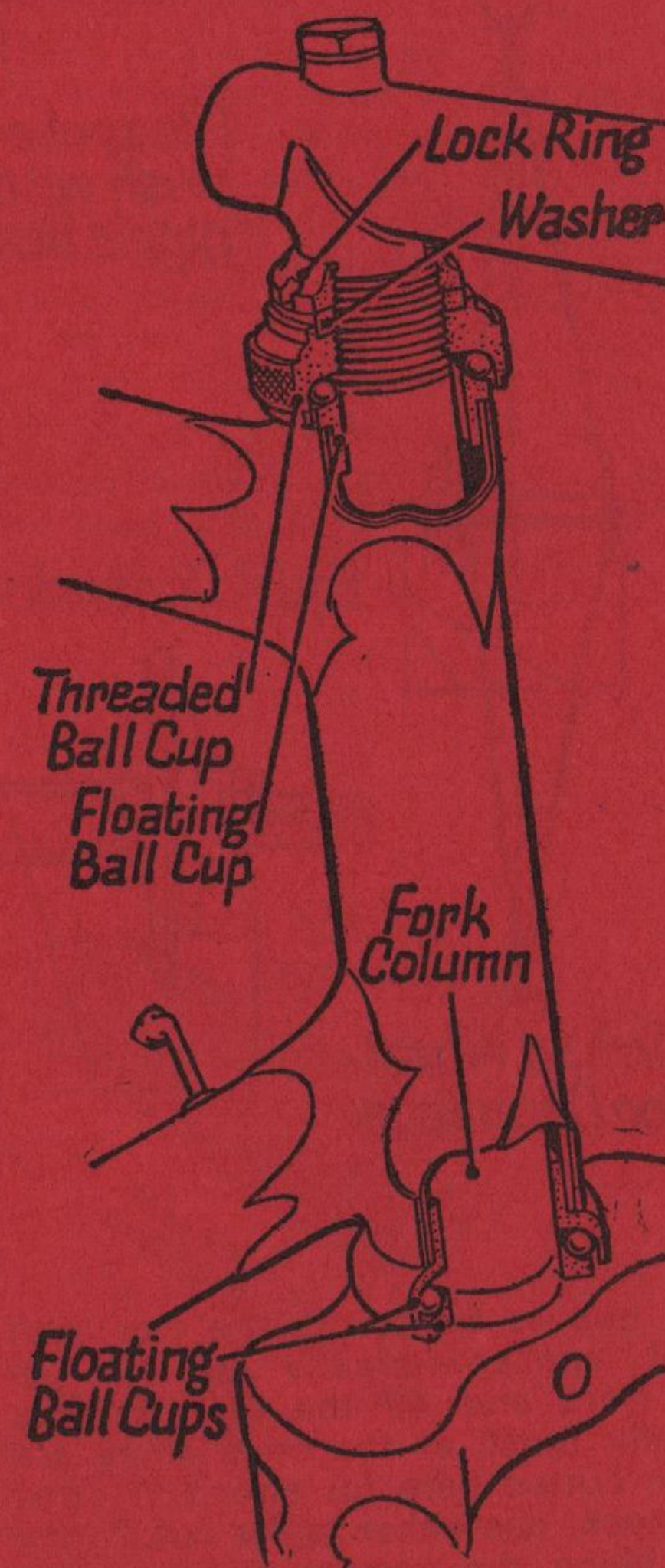
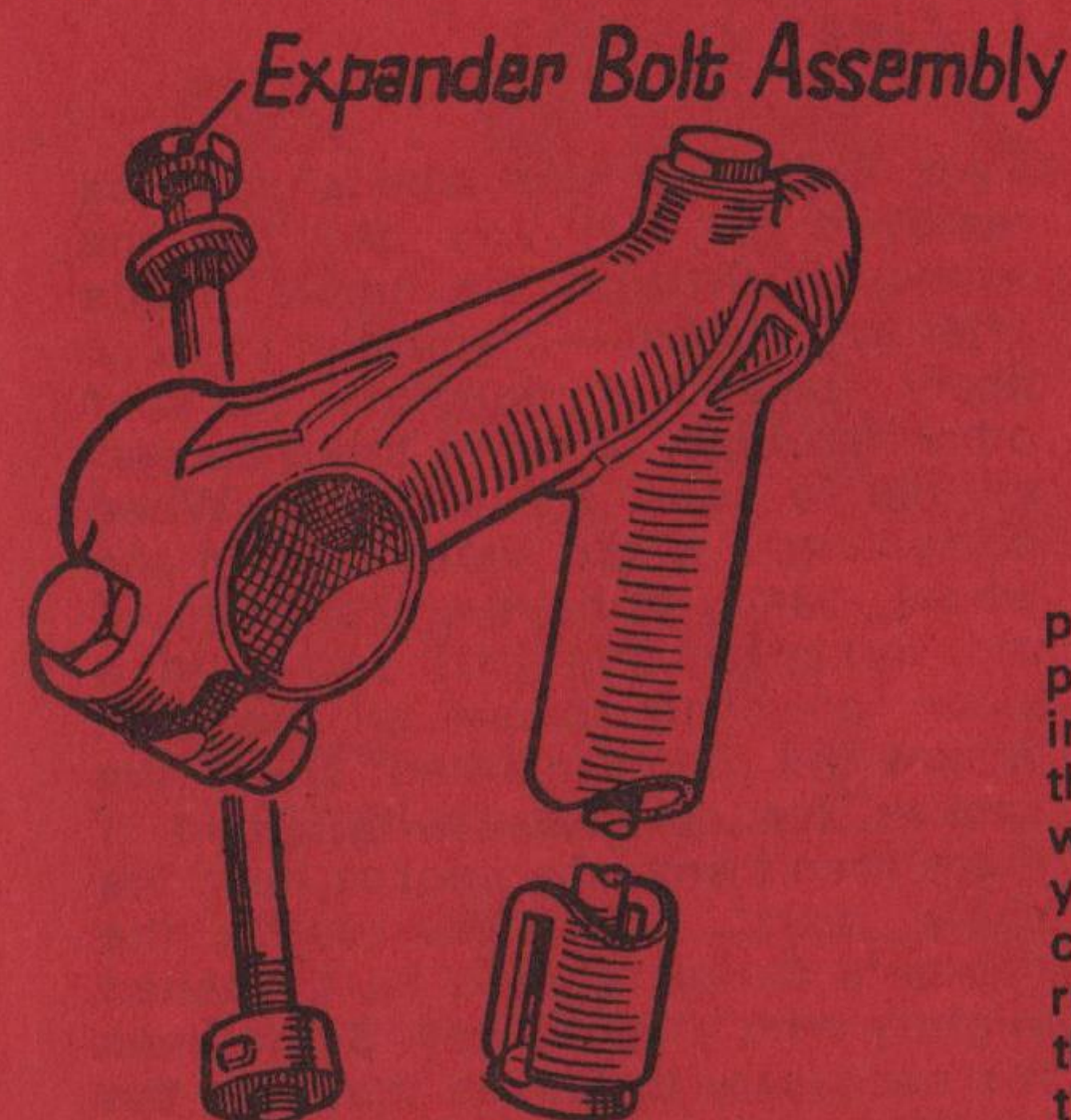
The bottom bracket houses the bearings for the cranks and chain-wheel. It consists of an axle, ball-bearings (usually $\frac{1}{2}$ "), two ball cups and a lock ring. The ball cup on the chainwheel side is screwed right home, and has a left-handed thread. The inside cup provides for adjustment and is fitted with a lock ring. You'll know when the whole caboodle is adjusted correctly when you can detect only a suspicion of play in the cranks. Wear will show up by the pitting of the cones on the axle or the ball cups. Pitted balls should also be replaced—use grease or vaseline. Bottom bracket components are not by any means standardised, when replacing parts try to make sure they are identical.



THE STEERING HEAD

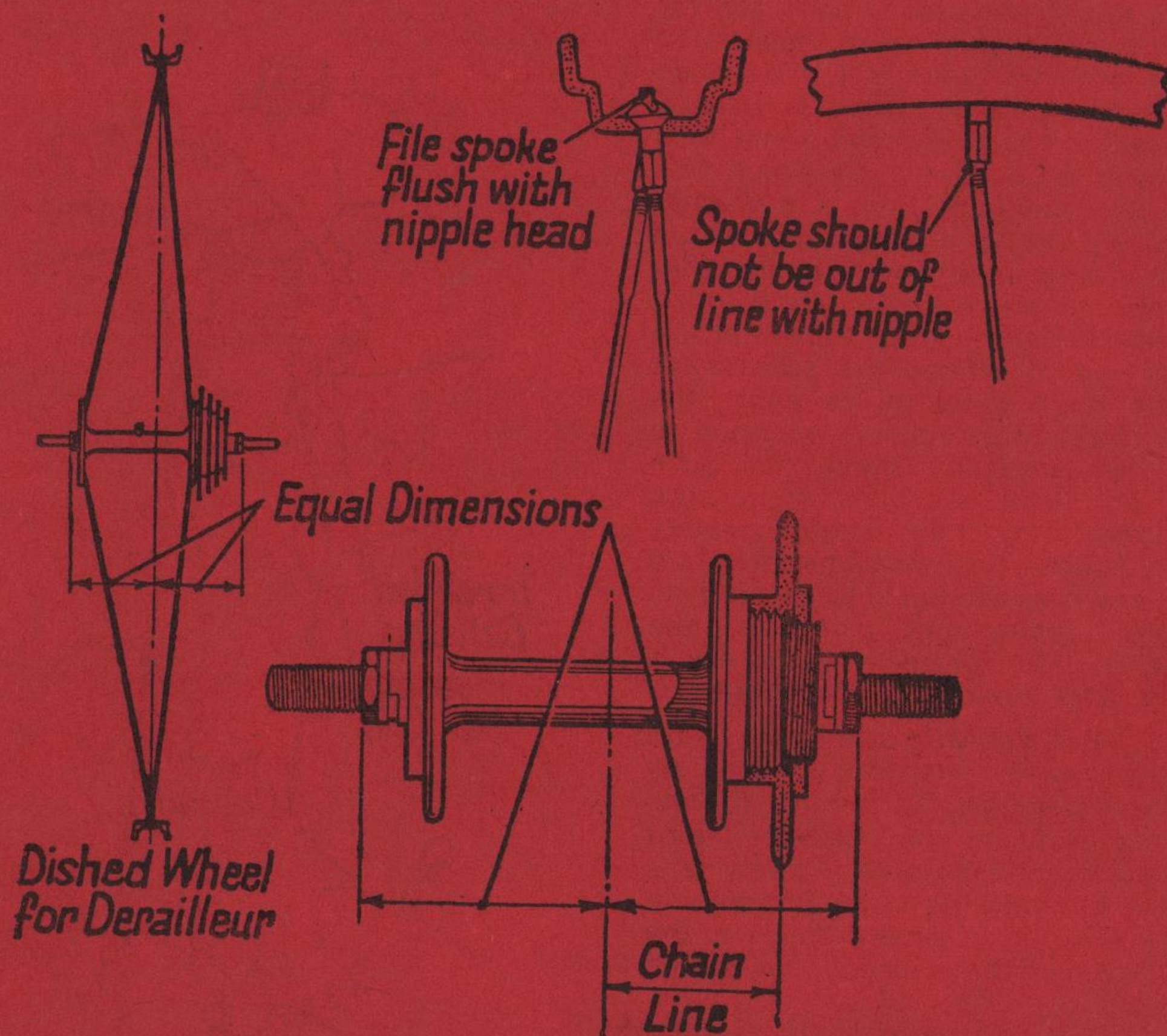
The steering head provides ballraces at its upper and lower ends for the front forks. Each bearing consists of a row of balls (usually $\frac{1}{8}$ ") between two races. The top race is usually screwed to the fork column and thus provides adjustment. Between this race and the lock ring is a washer which should have a small projection on it, riding in a groove in the fork column, to prevent it rotating when you're tightening the lock nut. A good way of testing the adjustment of the head races is to apply the front brake and rock the machine to and fro—any play should be quite apparent. (There should be no fork shudder and they should rotate freely.) Signs of wear same as before and again great care is needed to ensure replacement parts are the same as the original—there are a plethora of headset parts about.

Most handlebar extensions are secured within the fork column by an expander bolt. To remove the extension, loosen the expander bolt about $\frac{1}{8}$ " and then give it a few taps with a hammer (with an intervening piece of wood to save damage to the bolt head). This releases the wedge



pressure* (the lower bolt has small projections on either side which sit in two grooves in the lower part of the extension) and the unit can be withdrawn. Grease the thing before you replace it—the inside of the fork column is usually well-coated with rust, which if allowed to unite with the extension, will make removal tiresome.

THE WHEELS



The hub is built into the rim with steel spokes—usually 32 or 36 the front and 40 the rear. Spokes usually break at the ends (they are often butted here for strength) or at the neck, due either to the hub flange not being the correct thickness for it, or the wheel being unevenly tensioned. The wheel is spoked tangentially to take the driving loads.

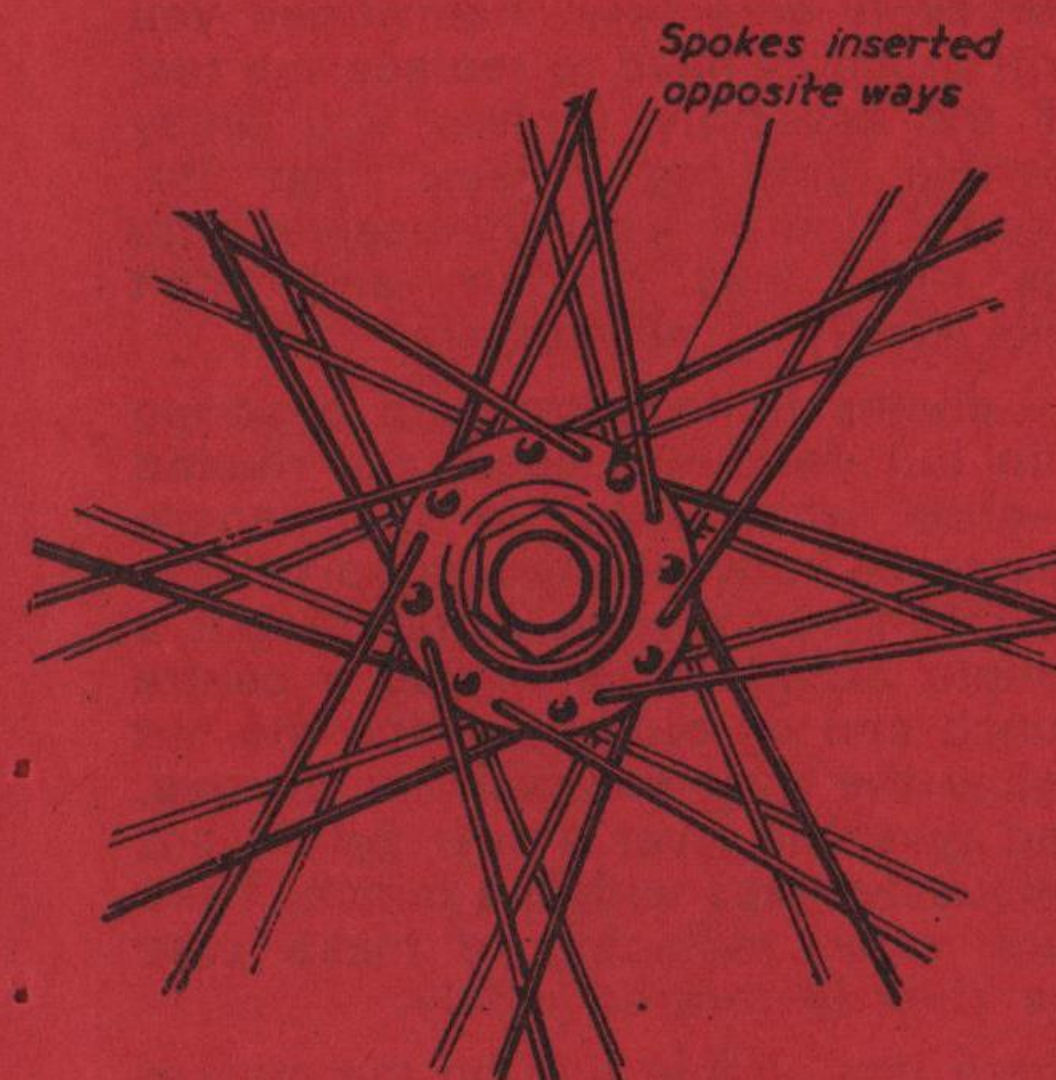
Wheel-building is a tricky business and should probably be left to your friendly local cycle shop but most people can master trueing jobs and spoke replacement. Spokes can be bought singly and a spoke key costs only a few pence.

Tyre, tube and rim tape should be removed so that you can file the spokes flush with the nipple heads after adjustment—if you don't you're likely to add a puncture to your other troubles. A small three-cornered file is ideal for this job. When correcting a slight wobble, spin the wheel (handy to have a spare pair of old forks for this job) and hold a piece of chalk close to the rim. Where the rim is marked, check the spokes for obvious faults. Then if there aren't any, the spokes near the chalk mark, but anchored on the opposite flange, should be tightened slightly with a spoke key. Sometimes it's necessary to loosen those on the chalked side.

Each spoke should produce roughly the same note when plucked.

A wheel should not have its spokes drum tight—heavy road shocks will soon cause breakages if they are.

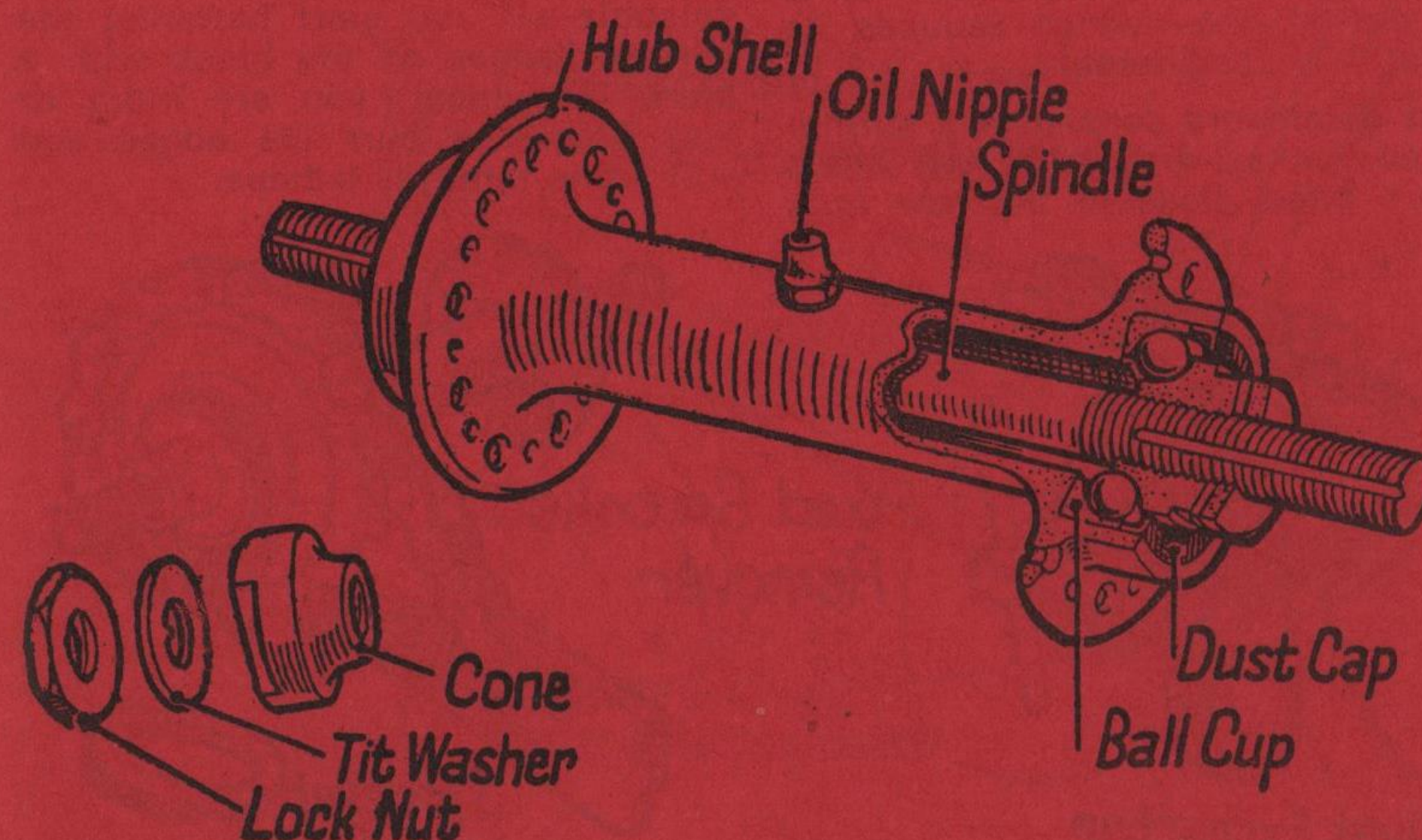
Rims are built to take tyres of 26", 27" and 28" diameter and rim cross sections vary to take different tyre sizes, which usually come in $1\frac{3}{8}$ ", $1\frac{1}{2}$ ", or $1\frac{1}{4}$ " sections. Spokes should enter the rim at as near a right angle as possible.



The wheel spindle is threaded at each end to take the cones, lock nuts, and track nut. The ball cups are pressed into the hub shell and it normally isn't a good idea to try to remove them when dismantling the hub. $\frac{1}{4}$ " ball size is usual. Most spindles are grooved to take tit washers between the cones and lock nuts. Also make sure the spindle is straight—if you have the bearings correctly adjusted, with just a trace of play at one point, but they are either stiff or slack at one point when revolving, most likely the spindle is bent.

Rear hubs are produced to take either single or multiple freewheels (when a multiple freewheel for a derailleur is used, the wheel is dished to accommodate it) or fixed sprockets. Hubs for fixed sprockets—the ones that ensure you keep pedalling furiously when going down hill!—have right- and left-hand threads so you can fix a locking ring. Sprockets for a multiple freewheel are screwed onto a long sleeve, which is itself screwed onto the hub, and can easily be altered.

Always keep tyres blown up hard—this makes for a longer tread life.



GEARS

If you don't want to ride with either just a single freewheel or fixed wheel, your choice lies between a three- (or four-) speed hub gear or a derailleur. The great advantages of a three-speed are that all the working parts are enclosed inside the hub and the chain never has to run out of line. The great disadvantage is that, if the thing goes wrong, it's so complex it is almost impossible to repair on the open road—and to describe in detail here, the space required could almost fill this pamphlet. However, Sturmey-Archer (about the only manufacturer of these devices in this country) issues very detailed instruction booklets which most cycle shops should let you have. A saving grace of the three-speed is that if things do go awry, once all tension is removed from the gear-change cable the gearing should revert to "medium". The derailleur is lighter and easily serviced. Used in conjunction with a double chain-ring, 10 (or with a highfalutin' six-speed rear block) even 12 gears are possible. Main disadvantages are that the chain has to run in a fairly oily state and collects grit; and most often has to run out of line—which reduces its useful life considerably.

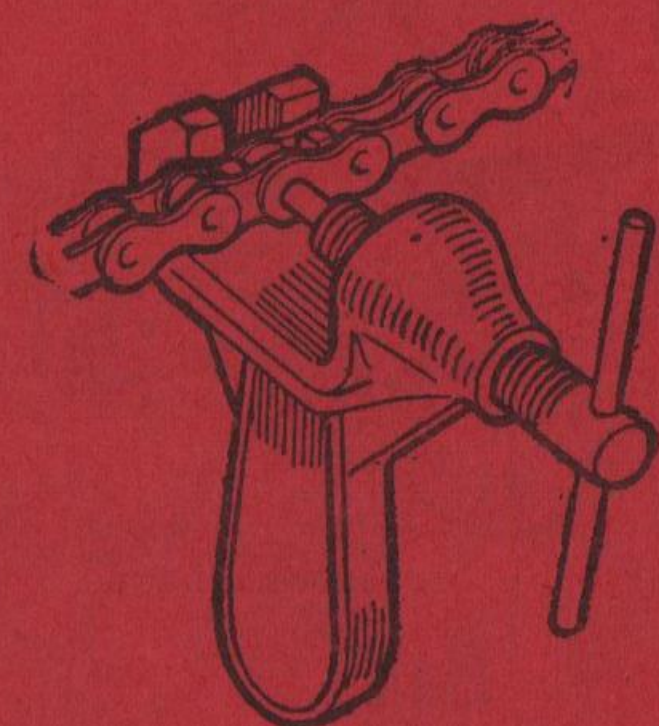
Most derailleurs consist of a spring-loaded jockey arm with two chain rollers fitted close to the rear hub.

The jockey arm keeps the chain taut, and at the same time can be moved laterally by a control lever to guide the chain from one sprocket to another. Chains for derailleurs usually come in $3/32"$ and are obviously longer than those for a freewheel or three-speed, which can be either $3/32"$ or $1/8"$; both are $1/2"$ in pitch. Chain, chainring and sprocket sizes *must* match up.

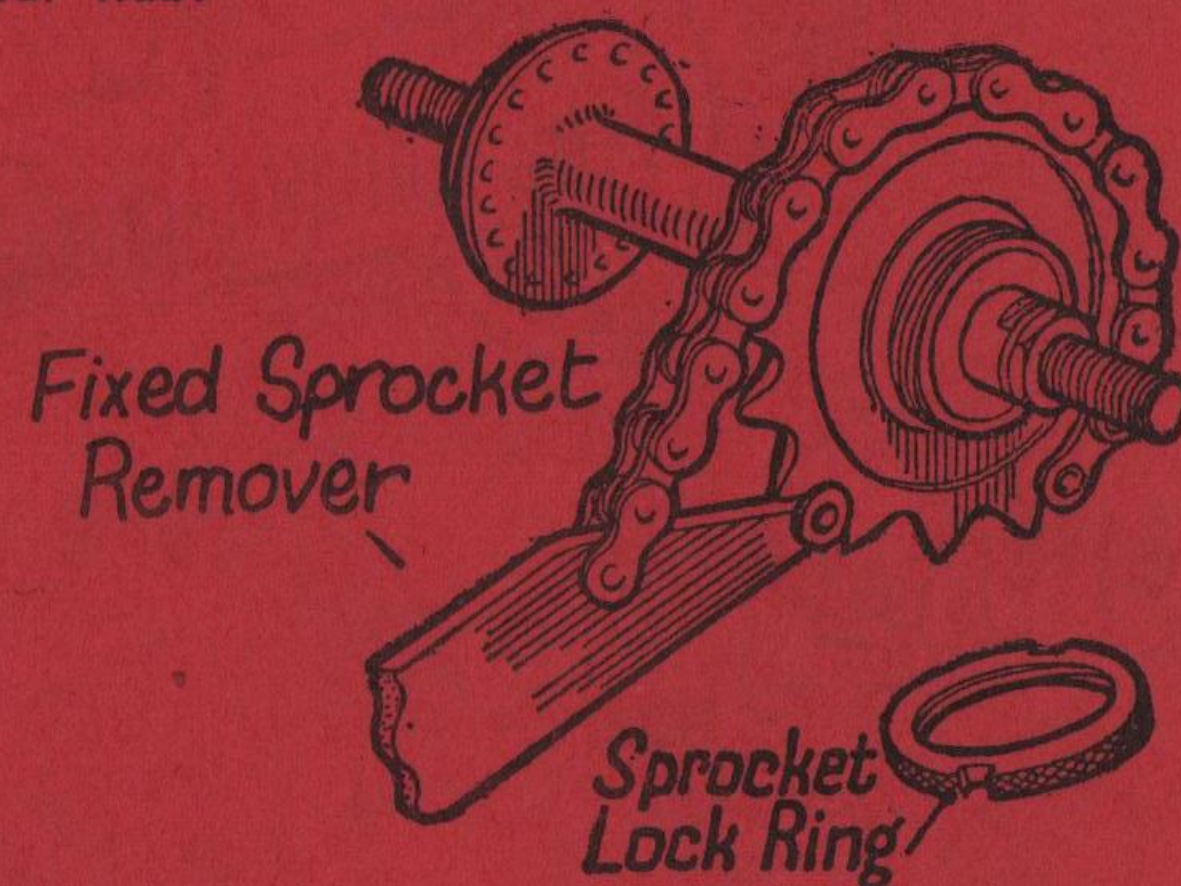
And a sad note on this marrying-up business—if you fit new rear sprockets or a new chainwheel, you will probably have to replace the rest of the assembly (unless you enjoy 'orrible grinding noises, that is). Chains kind of wear themselves into the rings they run on—and don't take kindly to newcomers!

$1/8"$ chains fit together with a spring clip but derailleur gears are riveted—clips would foul in the narrow clearance between the rear sprockets. You can buy a rivet extractor but a simple expedient is to use a centre punch and an old nut. Place the nut below the rivet you want to remove, and give the rivet a few gentle but persuasive taps with the punch. Take care when replacing to make sure the rivet is centred nicely.

There is a simple tool on the market for removing freewheels and it's invaluable—if you start battering the narrow flanges of the block with a blunt instrument, you are more or less bound to burr the edges and will make removal tedious.



Rivet Extractor



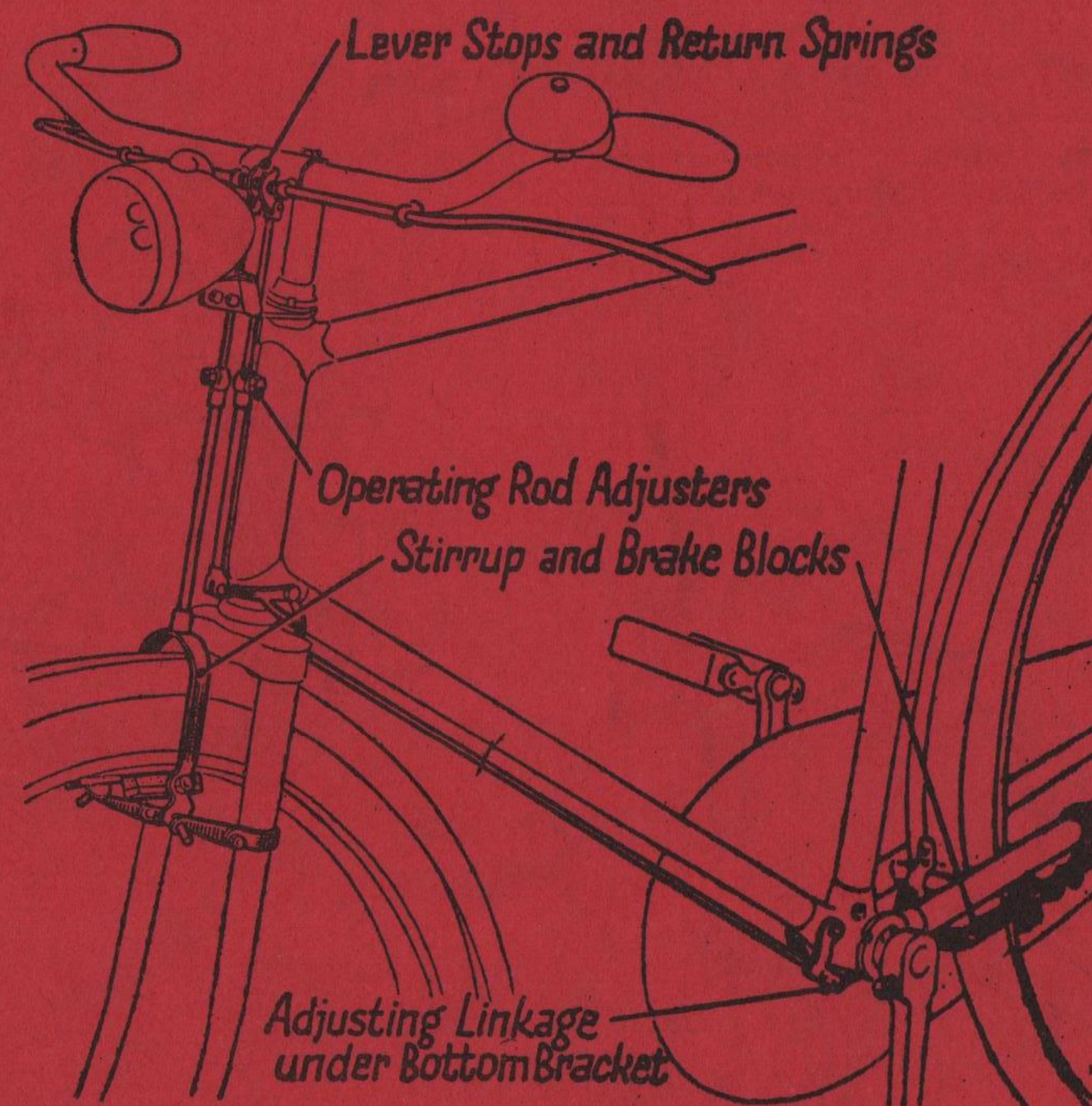
Fixed Sprocket Remover

Sprocket Lock Ring

ROD OR STIRRUP BRAKES

There are some hub brakes and back-pedal brakes around still but the two main categories are rod-operated stirrup-type and cable brakes. I've always been rather fond of the good old rod brakes; so simple, hardly anything to go wrong

and pretty direct transmission of force. The brake blocks on this type of brake come into contact with the inside of the rim. The main point of adjustment is the locking nut on the head tube brake rod. It is, of course, necessary to disconnect the brakes here when removing handlebars from a machine with rod brakes. Guide clips attached to the forks or chainstays provide floating anchorage and can be adjusted with great accuracy. Worn blocks can be extracted from the shoes and replaced.

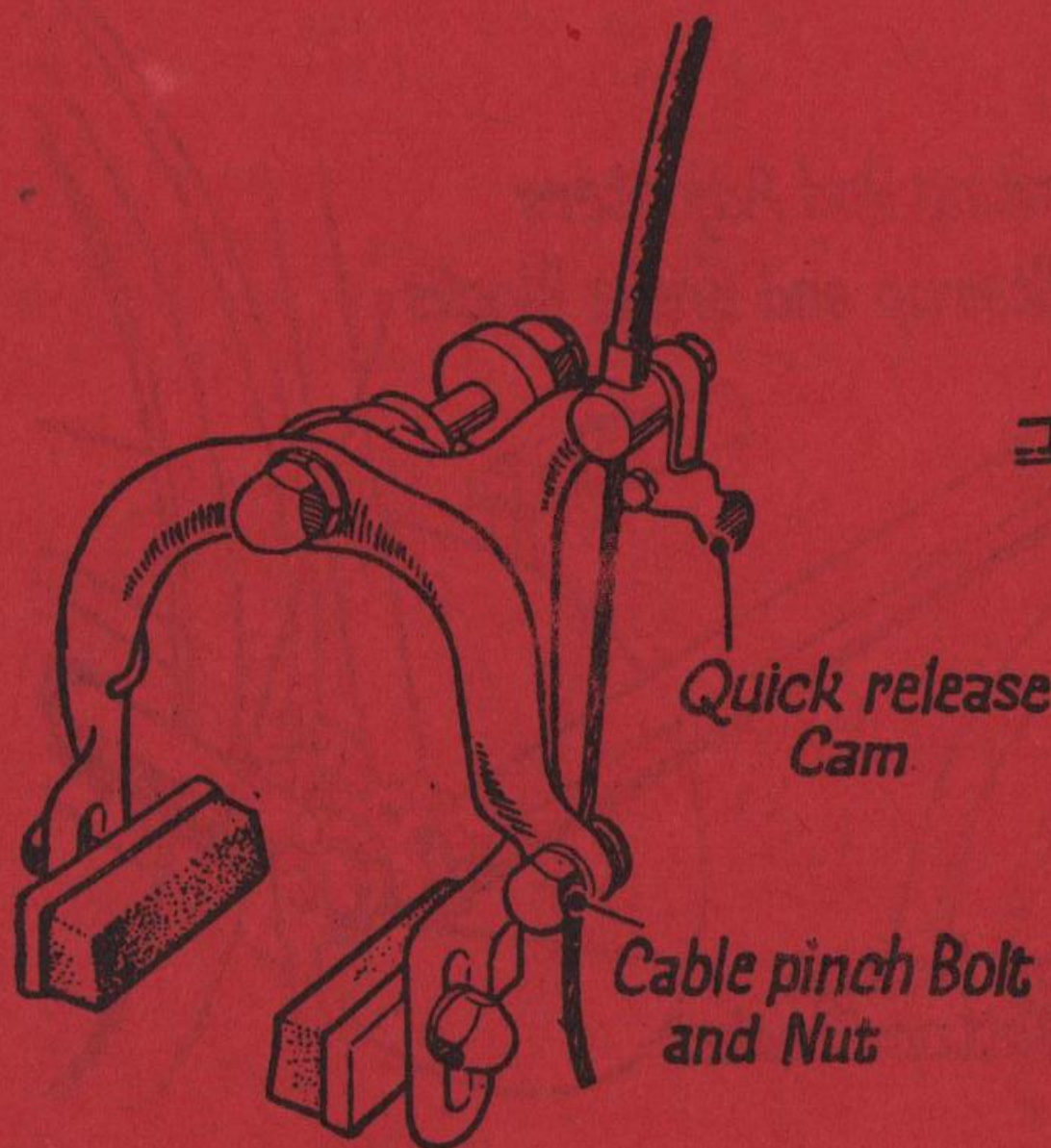
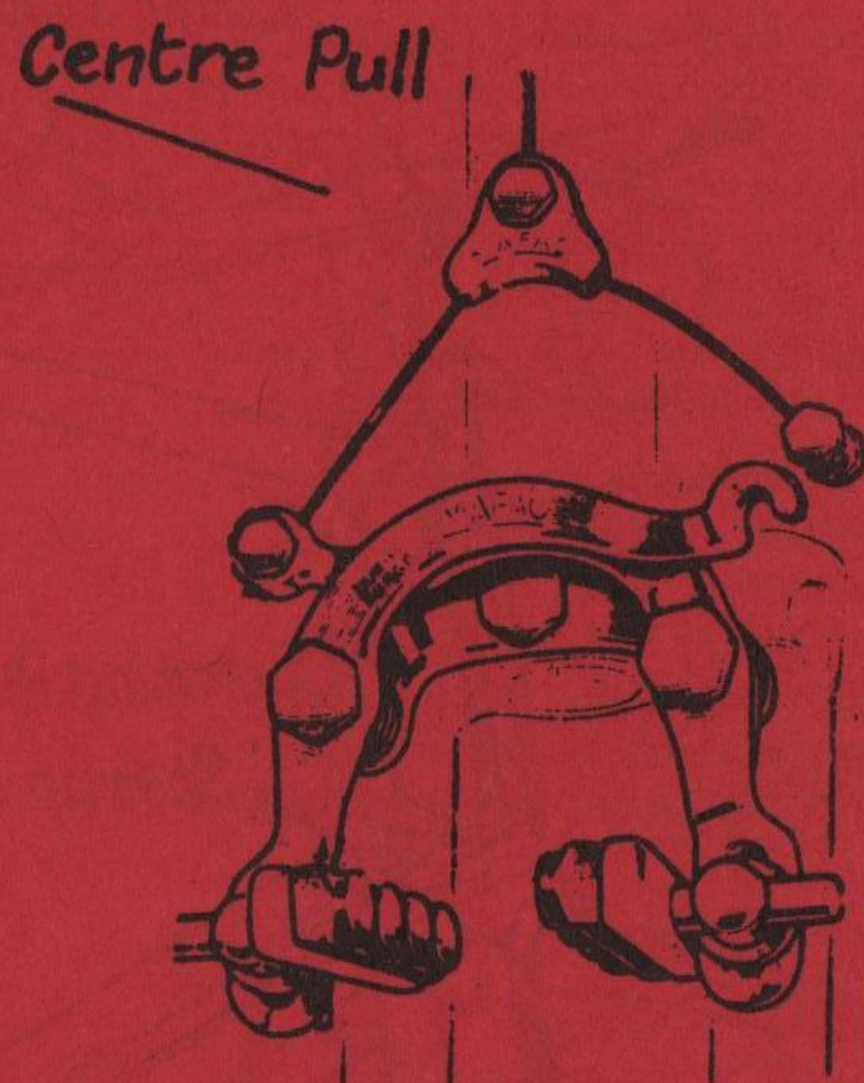
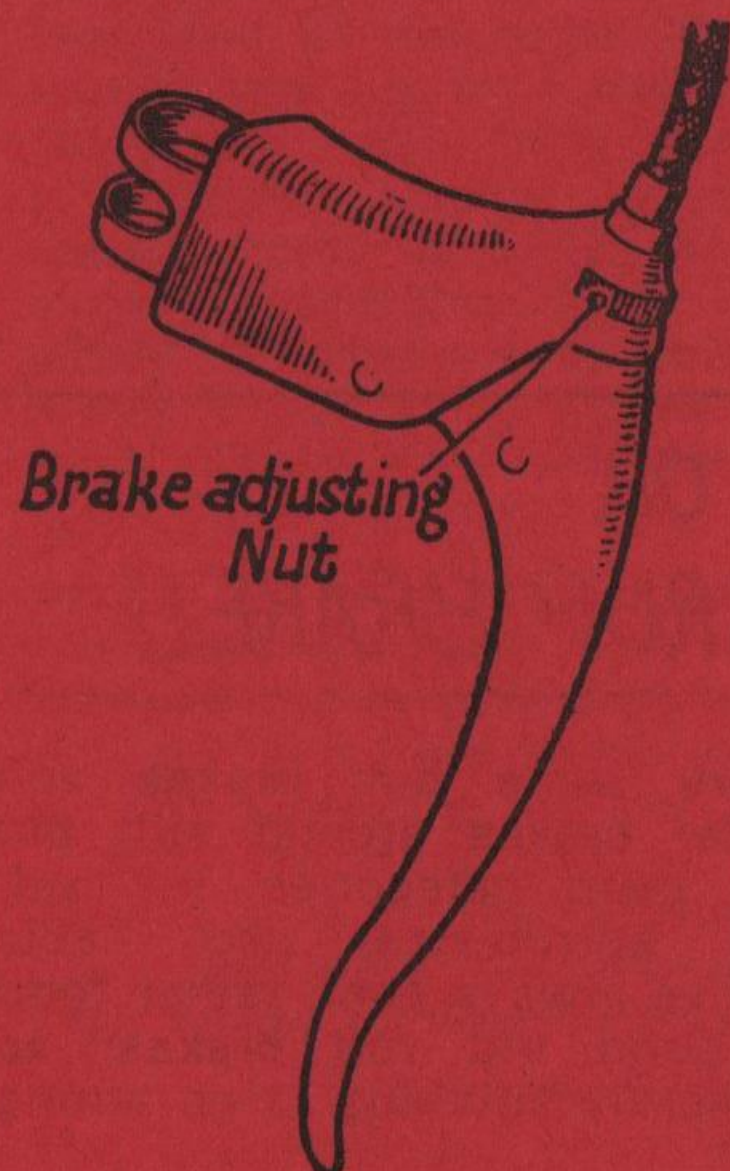


CABLE BRAKES

Cable brakes make contact with the side of the rim and are operated by a spun wire cable which travels inside a flexible coiled-wire tube, which is usually sheathed in plastic. Some cables have a nipple soldered to the end which attaches to the brake assembly. Others thread through a drilled-out bolt, tightening against the operating arm. If the inner cable becomes frayed, replace it. Could cause havoc and is murder to thread back through the outer casing. Cables do have a tendency to stretch and should be checked periodically.

And a cautionary note on both kinds of brakes—make sure the blocks are fitted so that the wheel forces them *into* the shoes (one end of the shoe is blocked, the other isn't) otherwise the block may fly away when you apply the brake!

Important things, brakes—should always be kept working well.



PEDALS

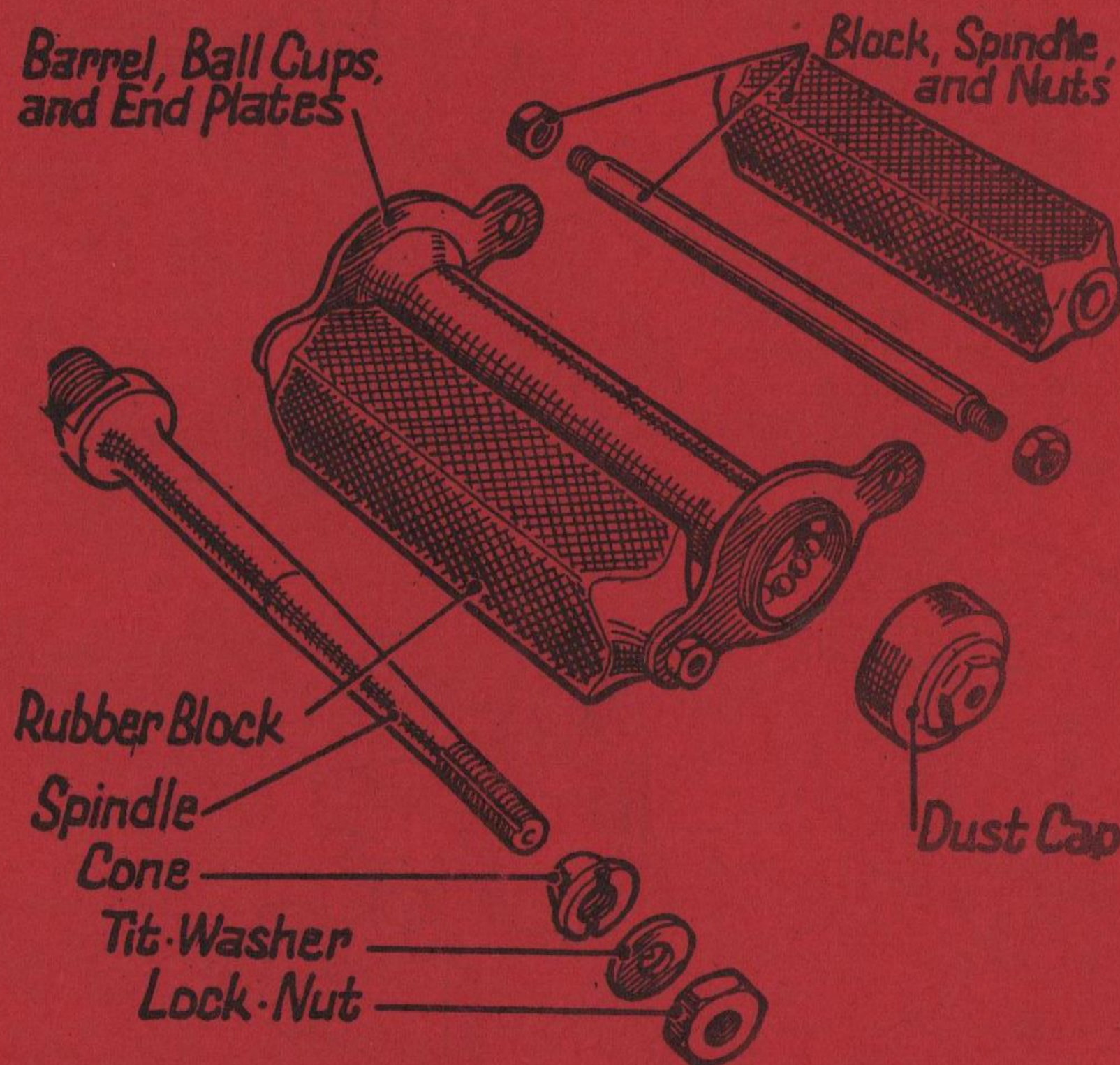
Come in all-metal or metal and rubber construction. Try and find types that provide for replaceable parts; there's a disturbing trend towards the manufacture of pedals turning on nylon bearings which can't be replaced. This means the whole pedal has to be abandoned when the bearing wears out.

If you've read this far, you will have sussed out the principles of ball-bearings, cones, spindles and lock-

ing nuts. The illustration is fairly self-explanatory.

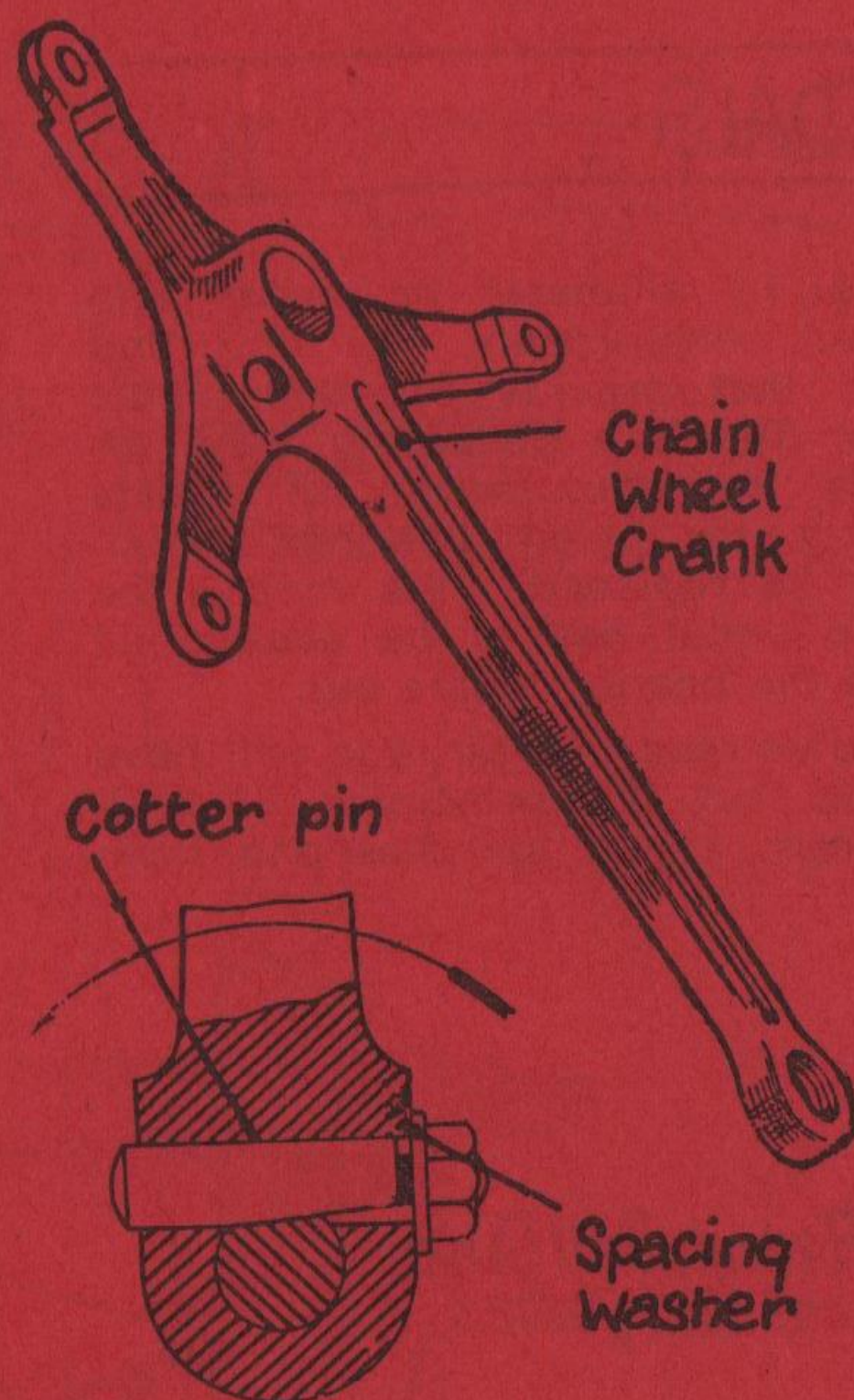
There is a special pedal spanner on the market which is well worth getting hold of—thin, extra long and made from hardened steel. When fitting pedals, start very gently—to avoid cross threading inside the crank. Most pedals are marked with a small "L" or "R", indicating whether they should be screwed into the left or right hand crank.

Riding is made a lot easier by using the toes and front of your foot on the pedal. You kind of develop an "ankling" motion.



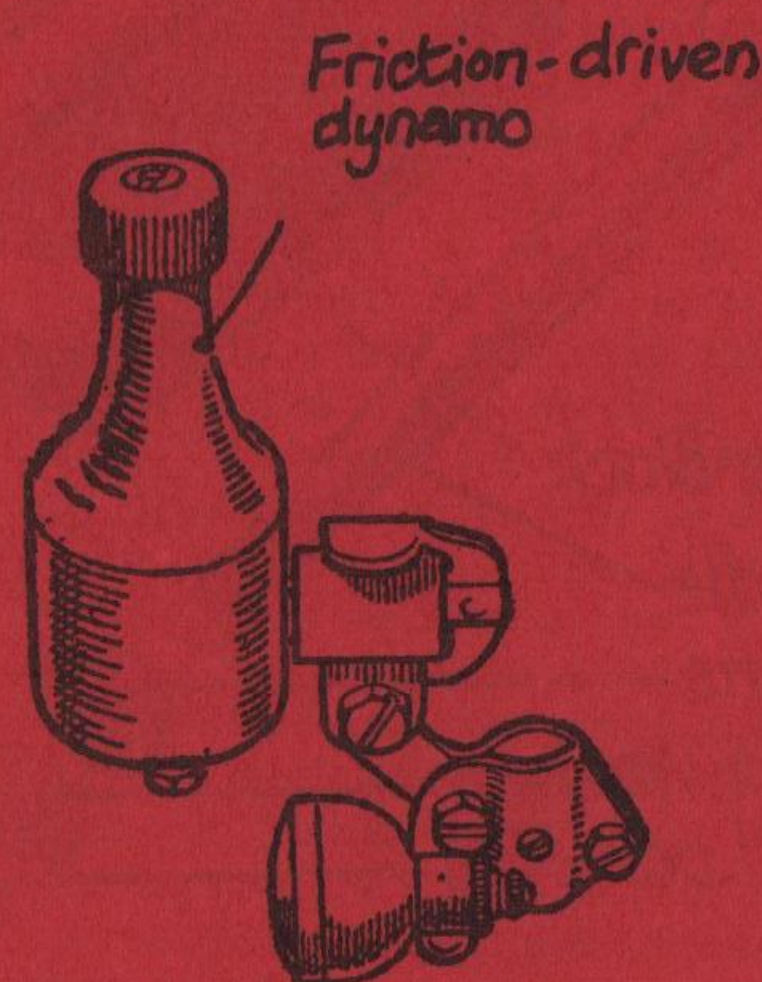
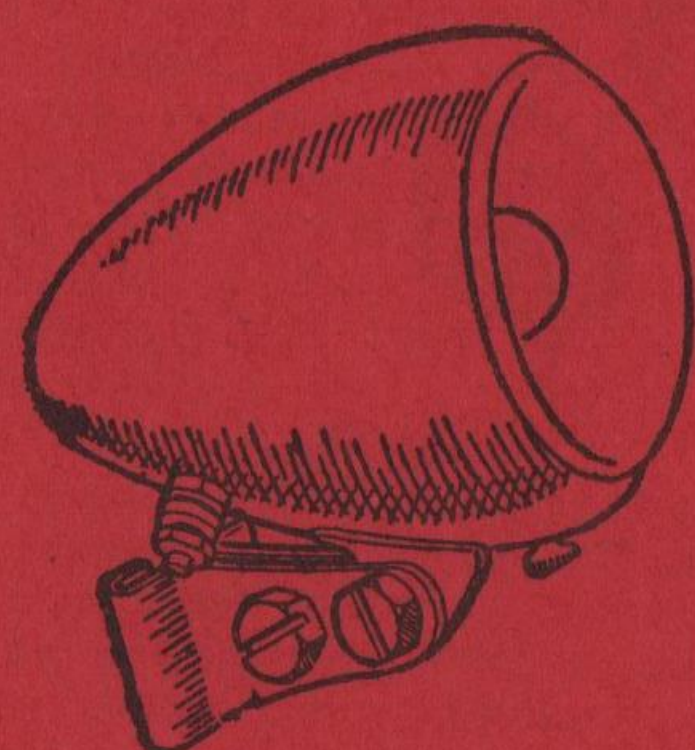
CRANKS

Crank are secured to the bottom bracket axle by cotter pins. The head of the cotter pin should lead the crank, with the nut and washer on the trailing side. When removing or replacing the pins, *always* support the crank. Many a bottom bracket has been bent or broken by failure to do this. And cotter pins shouldn't be bashed into position. Always place a piece of wood between the pinhead and the hammerhead. After the nut has been tightened, give it another tap and then take up the slack. If it doesn't go right home, a little filing job on its flat face should fix it. There's a good deal of satisfaction in a snugly fitting cotter pin. You can always fit packing washers. When removing a cotter pin, undo the nut until it's flush with the top of the threaded portion, tap down (again using the trusty piece of wood), remove the nut and gently finish the process—this way you avoid cross-threading problems.



LIGHTS

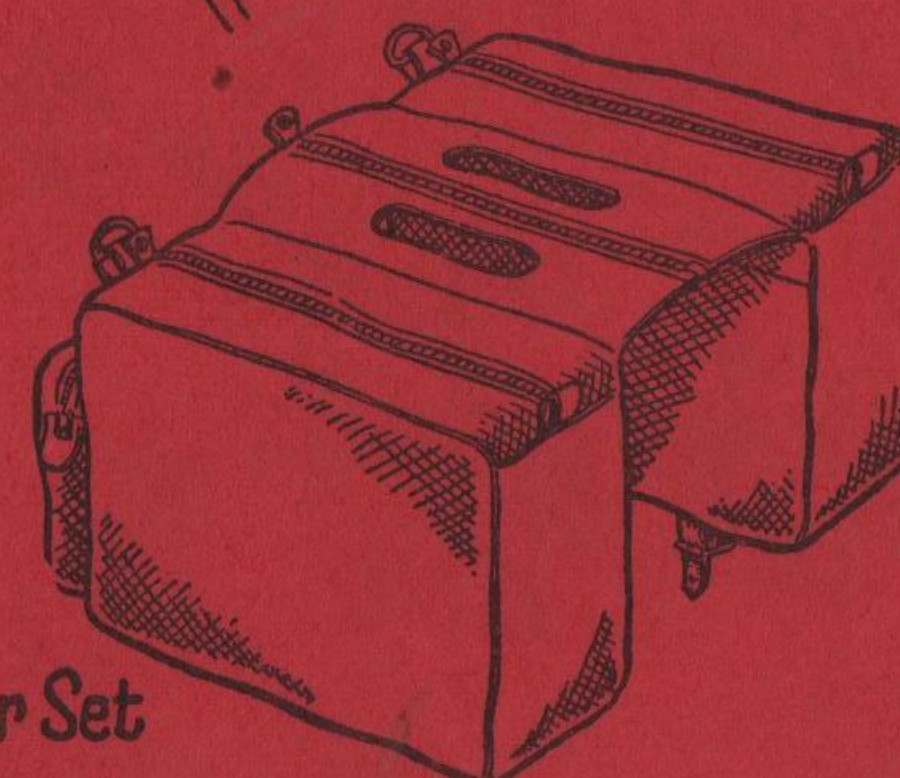
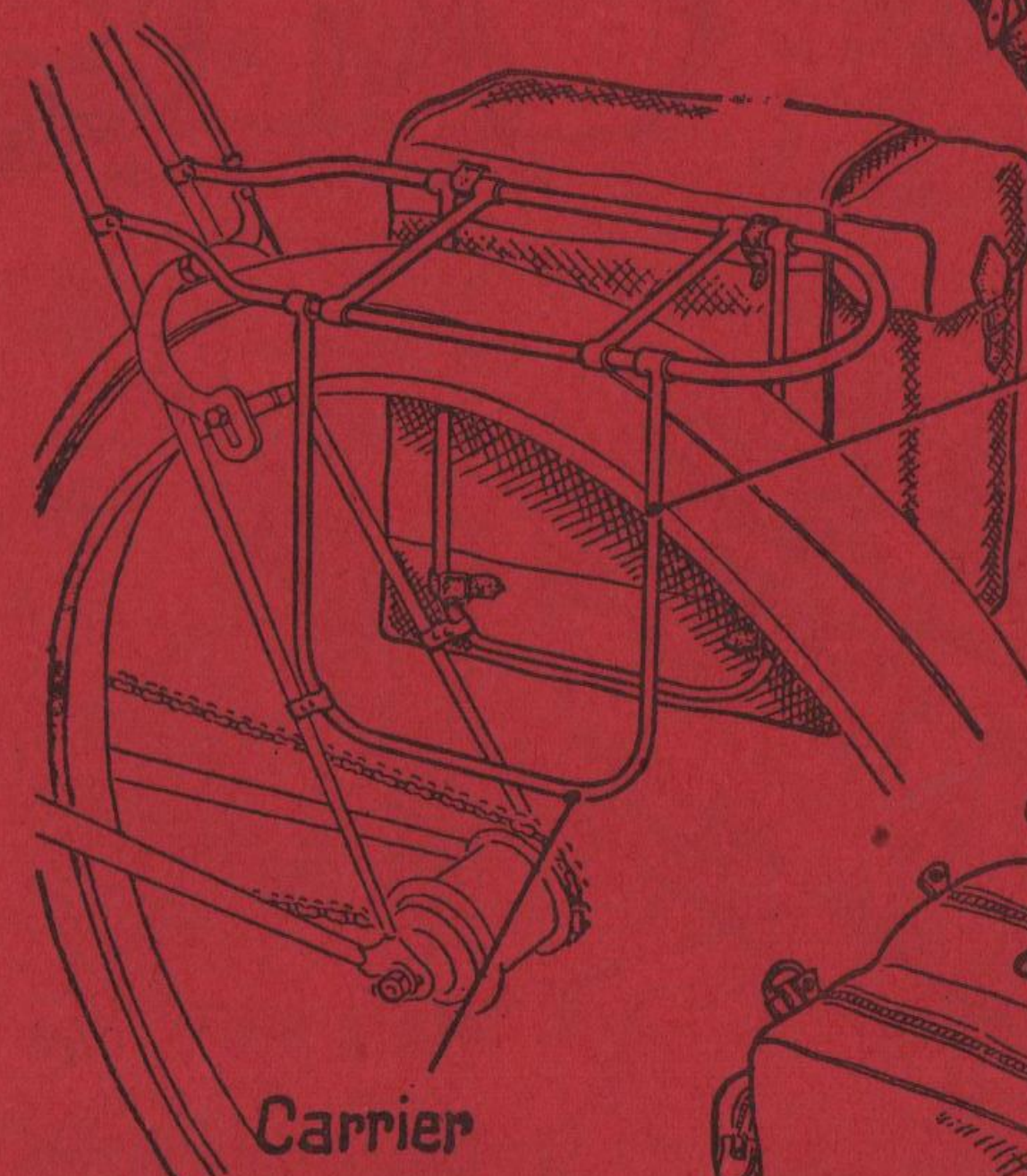
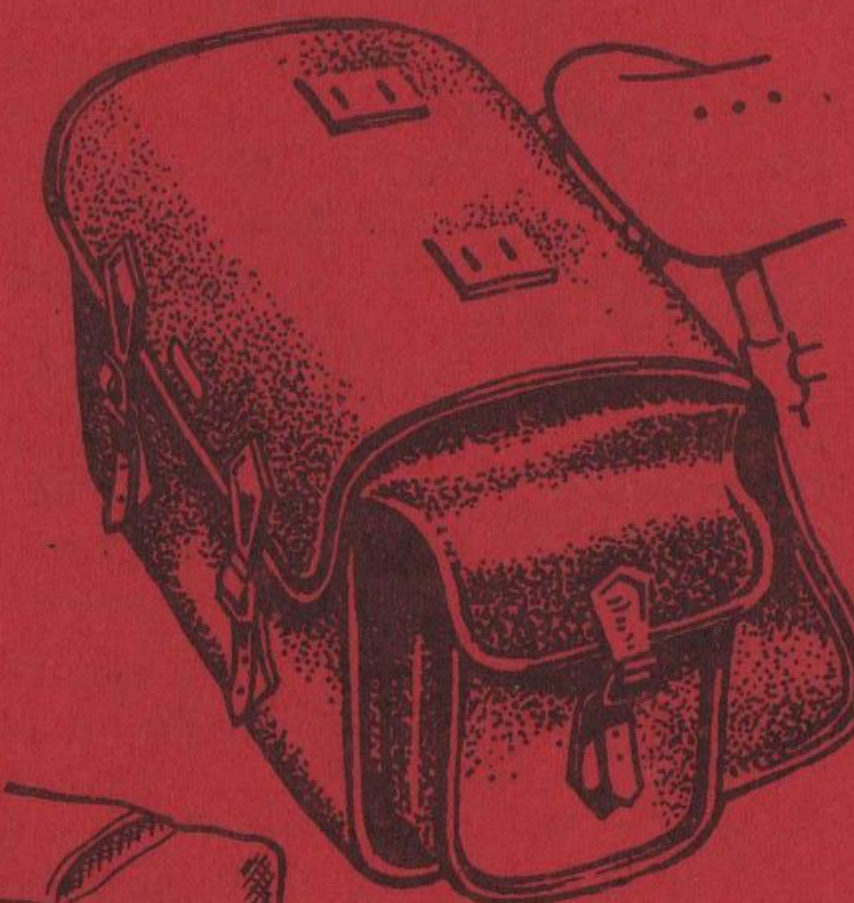
Three types — the hub-mounted and tyre-friction-driven dynamo and battery-powered lamps. Two advantages of the dynamo — no battery to corrode, and the lights can't be ripped off so easily!



SADDLES, BAGS AND PANNIERS

Saddles are very much a personal thing. Once you've "broken one in", you tend to stick to it! Lots of plastic models around these days, but they *do* make you sweat — the old custom of covering the saddle with an old beret may have something to it!

Stout canvas, strong thread and a nimble needle are all you need to make repairs to old saddle bags — and with a little ingenuity, why not run up a pair of panniers to fit on a rear carrier?

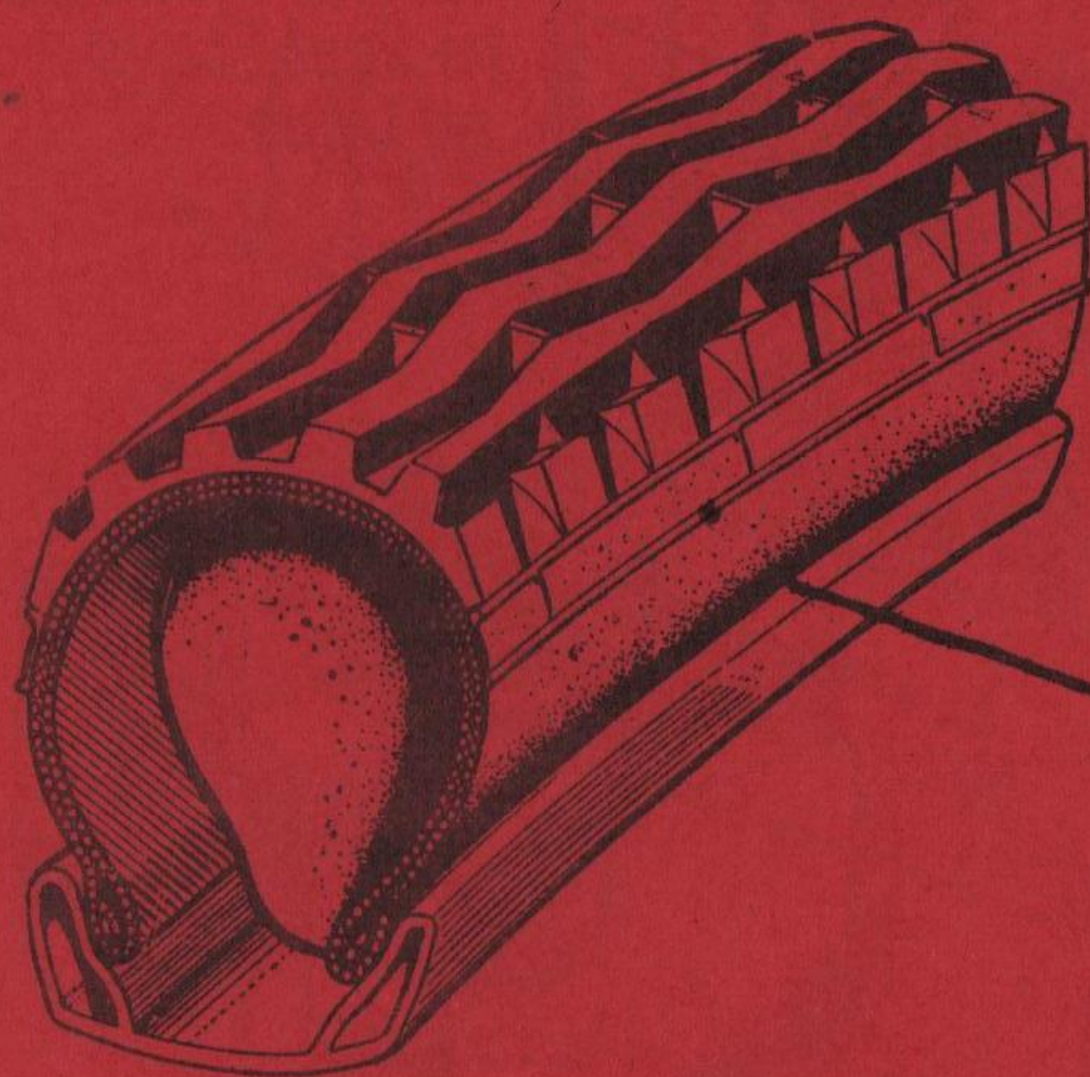
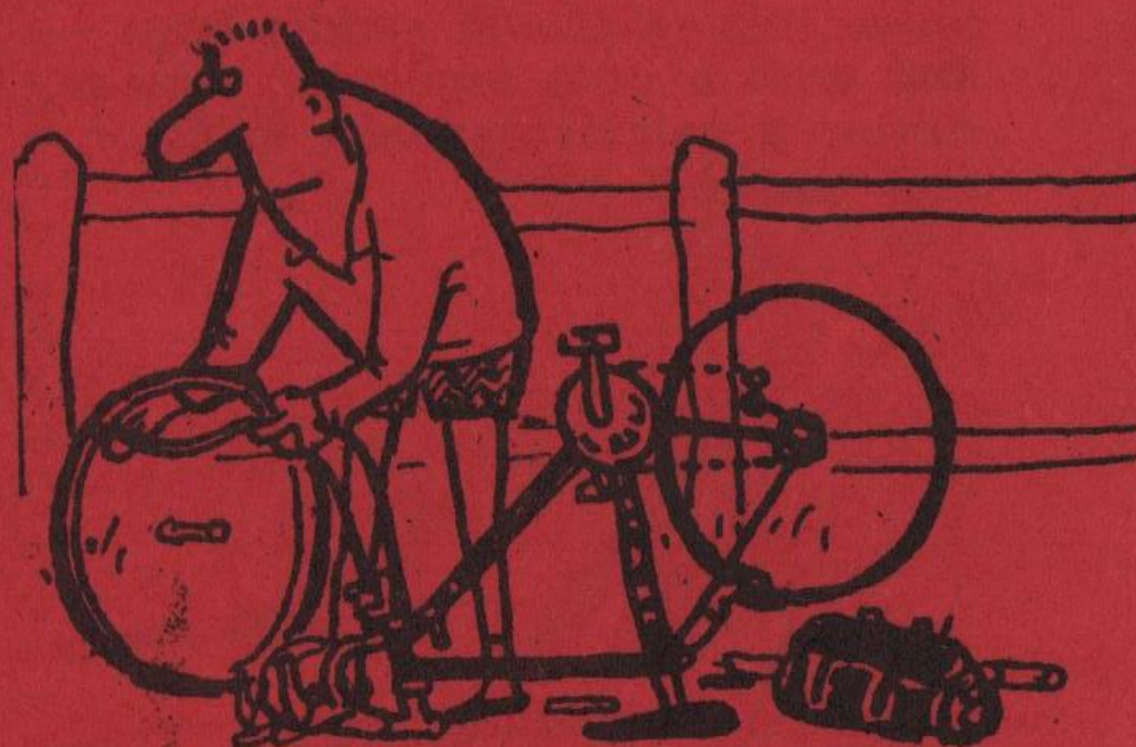


PUNCTURES

First check the valve — some have a tendency to work loose. OK — so you've got a puncture: slacken off the valve before unseating one side of the tyre with tyre levers (old spoon handles make a handy substitute). If you know where the puncture is, you need only lift a few inches of the cover; if you don't, take the tube out and give it the immersion test. If the tell-tale stream of bubbles don't show up, it probably means the tube is so old and porous it should be laid to rest. Once you've found the hole, mark it. Clean the area around it with sandpaper, smear on a thin layer of solution and leave till tacky. Remove the thin patch cover and apply the patch firmly. Dust the job over with French chalk so it won't stick to the inside of the tyre.

Always check the inside of the tyre to see if the offending flint, glass or nail is still there. If it is, remove it and patch up the inside of the tyre with a strip of canvas and the

outside with stopping solution. If there's nothing there, it could mean a spoke head is sticking up and must be filed flush. Another common cause of punctures is the pinching of the tube between tyre and rim in assembly. A way to avoid this is to only put a few pump-strokes of air into the tube at first and then ease the tyre all round before you fully pump it up. Patches on the outside of a split tyre are worse than useless.



Make sure the tube isn't pinched here

A SHORT HOMILY ON TOOLS

Monkey-wrenches, pincers and pliers are anathema! They chew up nuts like nobody's business, splitting the chrome, encouraging rust and leave a shape of nut that no subsequent spanner will take to. Cycle tools are so cheap, it's worth getting a set. Most of the nuts on a cycle are accommodated by a very practical "dumbbell" type of universal spanner on sale at almost all cycle shops for about 15p. And one more cautionary note on nuts and spanners — some continental nuts are subtly different from their British counterparts. The temptation is to use a size larger spanner; don't!

You'll probably get the thing done up OK — but when it comes to *undoing* — the faces of the nut will be burred over and it'll stick like old boots!

It's always handy to have a basic toolkit on the cycle. Larger, or more sophisticated tools should be shared. If you're getting a cycle co-op together, it could be a good idea to get hold of a big old bench vice, and a grease gun and maybe a paint spraying unit. If you're storing bike bits, try to strip the machine down and keep similar components together — saves a lot of hassles! Happy cycling!



Thanks to Wells Gardner, Darton + Co for permission to reproduce illustrations by R.J. Way