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2D

June 13th, 1931.
No. 1860.
Published every Wednesday.

How to play Tennis!

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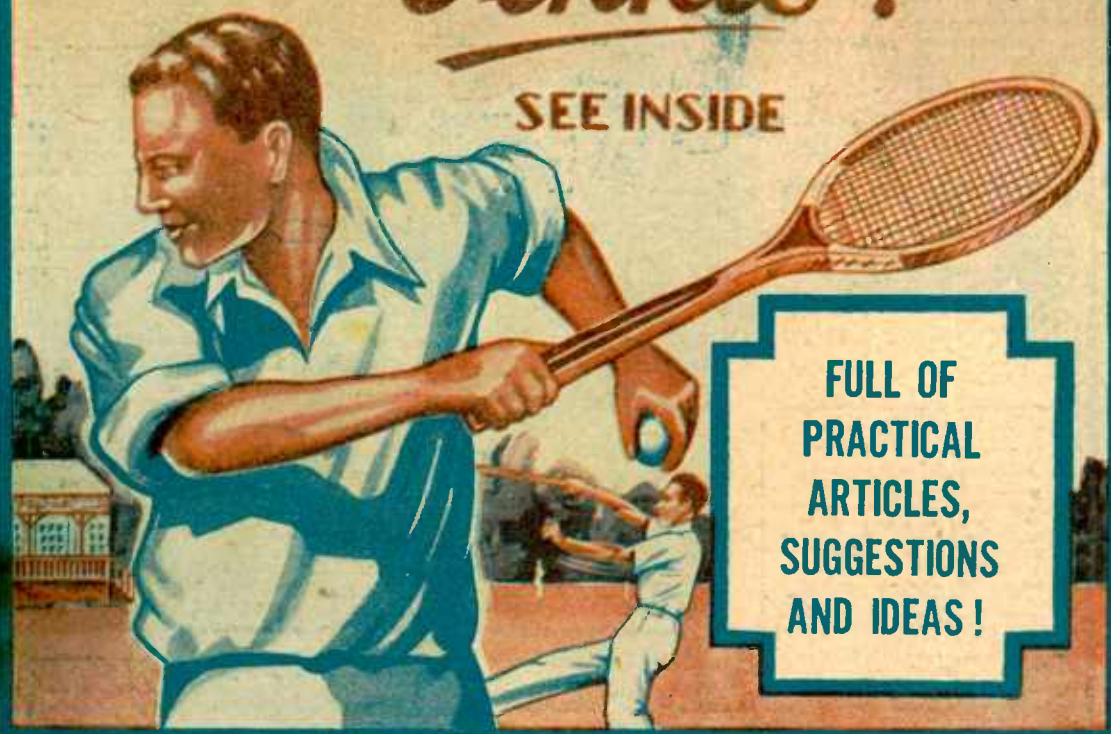

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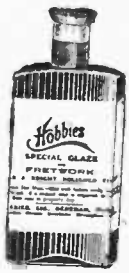

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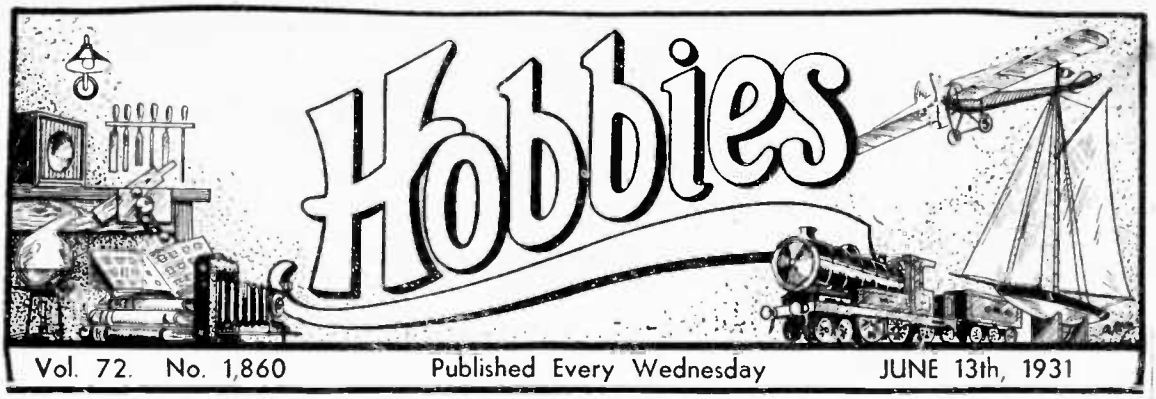
SPECIAL OUTDOOR SPORTS NUMBER!

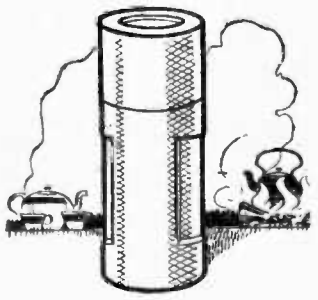


Vol. 72. No. 1,860 Published Every Wednesday JUNE 13th, 1931

THIS WEEK'S CLEVER IDEAS

Protecting the Vacuum Flask.

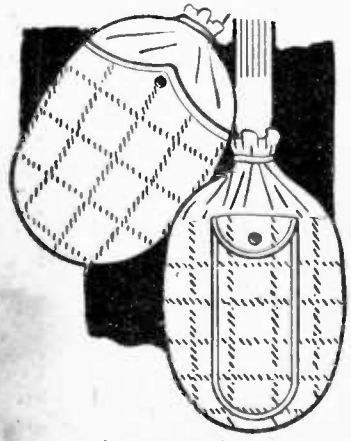
THE vacuum flask is perhaps the handiest acquisition to the picnic outfit, and it also is useful, no matter what outdoor hobby is indulged in. Unfortunately, the glass container is extremely liable to fracture unless adequately packed. Light papier-mache cases to fit flasks are now available which afford additional protection.



A cover for the thermos flask.

A Useful Tennis Accessory.

TENNIS racket covers exist in plenty. An improvement which has been marketed consists of a cover to which a pocket has been added on one side. This pocket holds shoes, socks, and other tennis items, and, on the reverse side, is a container to carry tennis balls. It is certainly a useful accessory for all tennis "fans."



A tennis-racket cover, with pockets for socks, shoes, and tennis balls.

Chromium Plating at Home.

THERE can be no doubt whatever that chromium plating, like cellulose paint, has come to stay. Even silver articles are now being sold chromium plated, and nickel and silver plating are dying industries. Chromium, of course, is quite untarnishable, and maintains its mirror-like surface for ever. Articles so treated thus keep their new appearance. All that is required to remove finger-marks is a damp cloth. Metal polishes must not be used on it. Realizing that chromium plating would save the housewife, the model maker, etc., a vast amount of unnecessary cleaning, an inventor has recently marketed, in 1s. 6d. and 3s. 6d. sizes, home chromium-plating outfits, which will enable the handyman to plate at home such items as door handles, door plates, bathroom taps, ashtrays, fire brasses, fenders, etc. Any amateur can operate the outfit.

The Restafloat Raft.

HOLIDAYS by the sea or river can be made much more pleasurable if you take this raft with you. It enables non-swimmers and children to "rest afloat," as the name implies. There are no valves to leak and no risk of punctures. It cannot become water-logged, neither can it suddenly collapse. It is light in weight, made of light green canvas, filled with a buoyant material, and supported by four strong wooden rods inserted into loops in the canvas. It can be supplied in two sizes 3ft. long and 4ft. long, with or without a paddle.

The Restafloat Raft.

Gramophone Records from the Radio Set.

A NEW device is now on the market which enables gramophone records to be made from the wireless set. It is thus possible to make a record of, say, a broadcast speech by the Prince of Wales, or one of your favourite radio dance bands, merely by connecting the device to the loud speaker terminals of your set and the other part to the gramophone.

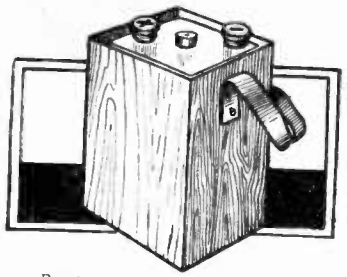
Index for "Hobbies."

WE frequently receive requests from readers for information as to when certain articles appeared in our papers. We wish, therefore, to draw their attention to the fact that a title page and index (fully cross-referenced) is now available, price 4d., by post from the offices of this journal.

NOTES AND NOTIONS from our READERS

Repairing a Cracked Accumulator.

WHEN the glass container of your accumulator gets cracked don't throw it away it can be repaired in the following manner, states M. G. (Eltham). Construct

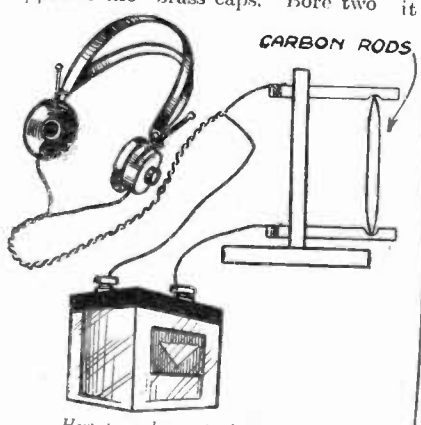


Repairing a cracked accumulator.

a box about ¾in. wider all round than the accumulator. Obtain a quantity of black wax off the top of an old H.T. battery, melt it down and pour a layer into the bottom of the box. Place the accumulator inside the box and fill the space in between the box and accumulator with the black wax and allow it to set. In this way a satisfactory repair is effected.

How to Make a Simple Microphone.

WE are informed by K. C. (Kensington) that an efficient microphone can be made from three bars of carbon, which are easily obtained from old torch batteries. Obtain a baseboard and fix an upright piece of wood to it as shown in the sketch. One of the rods should then be sharpened at both ends and the other two should be hollowed out near the ends opposite the brass caps. Bore two



How to make a simple microphone.

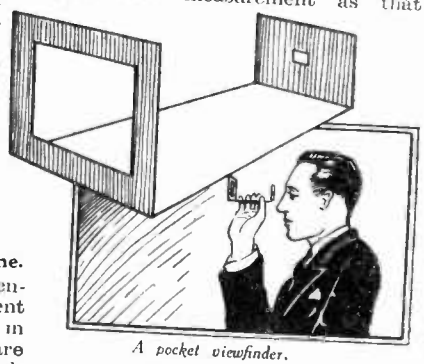
THAT DODGE OF *YOURS!*

Why not pass it on to us? We pay Five Shillings for every item published on this page. Mark your envelope "Notes and Notions." *Every notion sent in MUST be original.*

holes in the upright piece of wood, push the two hollowed rods through the holes and fix the other rod to them as shown. The two horizontal rods are then connected to a battery and headphones.

A Pocket Viewfinder.

THE viewfinder is made of cardboard, and can be folded up and placed in the pocket when not in use. The measurement from the front to the back upright must be the same measurement as that



A pocket viewfinder.

between the lens and the plate of the camera. The large aperture in the front must be the same size as the finished snap, and the hole in the back upright must be the same shape as the larger one, but much smaller. To use the viewfinder hold it up to one eye as shown in the sketch.—J. H. (Essex).

THIS WEEK'S MENTAL NUT.

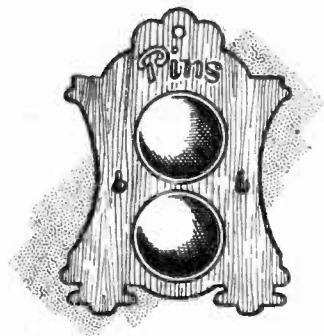
THE odd digits 1, 3, 5, 7 and 9 add up to 25, while the even digits 2, 4, 6 and 8, only add up to 20. Arrange these figures so that the odd ones and the even ones add up alike. Complex and improper fractions and recurring decimals are not allowed.

Answer to last week's problem.

Twenty-six minutes.

A Serviceable Pin-Cushion.

A NOVEL pin-cushion can be made from an old unburstable sponge ball and a piece of fretwood. Fret out the piece of wood to any



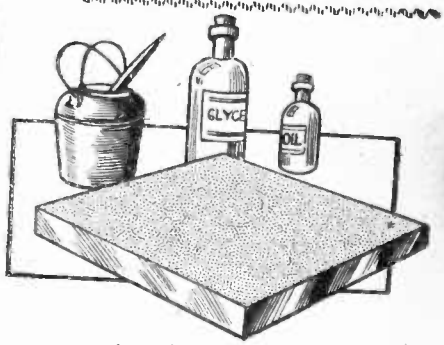
A serviceable pin-cushion.

design you may think fit, cut the ball in two and attach the two halves to the fretwood as shown in the sketch (no address).

A Useful Copying Apparatus.

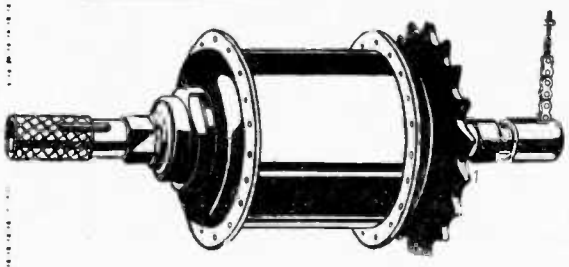
OBTAIN a flat tray or box lid, and fill it with a solution of 3oz. of scotch glue, 8oz. of glycerine and a few drops of cloves. When it has been well mixed together allow it to set.

To make a number of duplicated copies, write the master copy in hectograph ink, press it on to the jelly surface, and rub the back of the paper well. The copies can then be made. To remove the writing from the jelly rub lightly over the surface with a damp sponge.—P. E. (Co. Durham).



A useful copying apparatus.

"HOW IT WORKS" SERIES.



A three-speed gear.

HOW THE THREE-SPEED HUB WORKS

By F. T. Bidlake

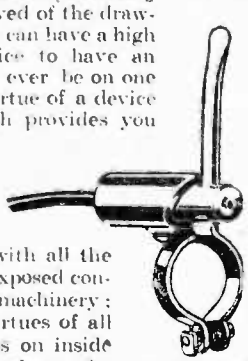
The top tube control.

Many people who ride bicycles have three-speed gears attached, but how many people know how this intricate piece of mechanism works? This article will tell you.

EVERYONE knows that the job of driving a bicycle differs according to conditions of hindrances to be overcome. If the road leans up hill against you, or a gale blows from an unfriendly quarter, or you are feeling feeble and cannot hurry on that account, and cycling seems hard, you want a gear instantly at that very moment suitable for slow travel. So also you may find times of high-speed possibility inviting you to travel fast, and you become relieved of the drawbacks of excessively fast pedalling if you can have a high gear at call. And, of course, it is nice to have an average as a happy mean, and not for ever be on one or other extreme. Hence the special virtue of a device that gives three, rather than one which provides you with two gears.

Many Sizes of Chain Wheels.

There are devices of shifting chains, and many sizes of chain wheels, and methods of getting a change of gear with all the apparatus in the open air, and in the exposed conditions that strongly resemble cruelty to machinery; but without discussing in detail the virtues of all sorts of gears, let us consider what goes on inside the shell of the three-speed hub, where the mechanism is at least hidden away compactly, runs protected in a continuous lush of oil, and does its job just as well as, and even better than, when first devised nearly thirty years ago.



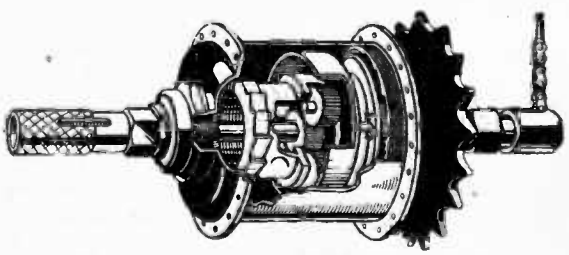
The handle-bar control.

An Improved Variation.

For the modern Sturmey-Archer hub is an improved variation of the original design, and it is increasingly popular, judging from its manufacturers' statistics of sales, and it has climbed to eminence above all rivals, to this noticeable extent that it is the only device obtainable for incorporating in any bicycle, as distinguished from those exclusively made for use on certain cycles only by the proprietors of such cycles. Hence in the evolution, of time, "Sturmey-Archer" and "Three-Speed Hub" have become practically convertible terms.

What Happens Inside the Barrel-Bodied Hub?

We know from the leaflets that if we put the little lever, on the frame (or still better on the handlebar of the bicycle), to its middle position we get exactly the same gear for the bicycle as if the hub were an ordinary one. We are also told that if we release the lever and let the wire slacken altogether, something slides back inside the hub, and we get a high gear, one third bigger than the normal, and correspondingly, if instead of releasing the lever, we push it the other way, pulling the wire a bit further out of the axle, something slides the other way inside the hub, and we are informed that our gear is now lower than the normal by one-fourth. We can easily verify that this is so, for if we make a mark (with a red pencil, say) on a tooth of the chain-sprocket, and tie a thread on the adjacent spoke at the hole in the hub-shell where it is fitted, and then turn the wheel forward by the chain drive (and avoid free wheeling), we shall find that the red mark and the thread keep together when the lever is in middle notch (just as if the hub were empty of all devices), and that when the lever is released and the slide retreats, then the hub well overtakes the chain sprocket, and if you count three forward turns of the sprocket, you will find that exactly four turns of the hub-shell have occurred, bringing the red tooth and the thread on the spoke adjacent to one another again. And in precisely similar fashion, when the lever is pushed over to low gear, and the slide is pulled out a bit from the axle end, you will then, if you count, find that the chain sprocket overtakes the hub-shell, and that the marked tooth and marked spoke become adjacent after the chain sprocket has been



A cut-away of the gear, showing epicyclic gears and free-wheel.

round four times and the hub-shell has been round three times.

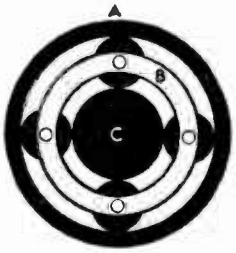


Diagram showing the principle of the epicyclic gear. A and B revolve round C. Hence A travels faster than B. A step down in gearing is obtained by coupling A to the chain wheel, and B to the hub. To raise the gear, B is connected to the chain wheel, and A to the hub. For "normal" the chain wheel and hub are locked together.

High and Low Gear.

This verities the statement that the happening in the hub makes your high gear four-thirds of the normal, which is a one-third rise; and makes your low gear three-fourths of the normal, which is a one-fourth fall. Hence if you have, say, a normal gear of seventy, you have extreme gears of fifty-four and ninety-six. In other words, your selection of chain wheels enables you to have a normal gear, just like a single gear, giving you the equivalent of a 70in. wheel to drive, and the mechanism inside the hub gives you the equivalent of a 54in. wheel, or alternatively the equivalent of a giant 96in. wheel drive. Or, if you are not so confident of your personal strength, you may choose a normal of sixty, and have at call a forty-five and an eighty gear, but however you choose your normal you can only get, by this device, a third more and a quarter less of whatever the chosen normal is.

The Mechanism.

Now what is hidden in the hub? The essential item is a sun-and-planet group of toothed wheels—or pinions, of suitable size. The sun-pinion is a twenty-toothed fixture on the axle of the wheel, which is itself, of course, fixed in the fork ends. It therefore never turns round. There are four planet pinions, each of the same size, and also twenty-toothed like the sun. Their teeth engage with the sun's teeth, and they spin, not on imaginary axes only like heavenly bodies, but on actual bearings housed in a circular cage, or ring. It is only on a first-glance impression that they can be called planets, because they actually mesh in with the sun in toothed contact, and also behave in a non-astronomical manner by their engaging teeth with an outer ring which has sixty teeth on its internal face and resembles nothing seen in the heavens. These four planets are a four-fold edition where a single such planet would do the job theoretically, but it is an advantage practically to have a group sharing the job, and equalizing the strains round the sun and inside the outer circle. That is the only reason why the planets are multiplied in the cage. Now in any such epicyclic train (as the guide-book calls it), if the sun has N teeth and the outer ring has N teeth, the speed ratio of the outer ring to the cage ring running round the fixed sun is N + N to N, which in our case is the sum of 20 + 60 to 60, or four to three. Here then is our secret variable genius in the hub, which we can bring into action in each of two ways, or cut out of action and ignore altogether; and it is the ingenious way which the "solar" system is worked (or short-circuited) that makes the hub a marvel of packed ingenuity, without unmeshing the toothed wheels either by sliding the sun or disturbing the planetary cage.

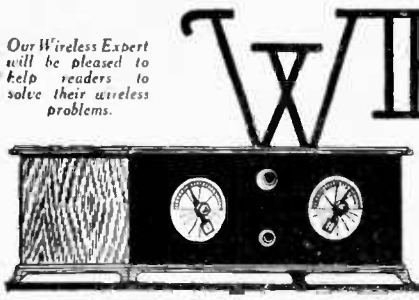
The Chain Drive.

There is, of course, first need to convey the chain drive from the chain sprocket, which is done by a "driver" or collar, which in turn drives a dog-clutch capable of sliding sideways in the driver. The driver rotates at chain-wheel speed, so does the sliding dog-clutch. When the sliding dog-clutch is at full slide its doggy bits bite on bosses on the outside of the planet cage, and drive the cage round at chain-wheel speed. But the planet cage going around its fixed sun, with planet wheels revolving, drives the outer ring a third faster than itself, and this outer ring (through pawls) drives the hub-shell at this greater rate, and the hub-shell (by the spokes) drives the road wheel at this higher rate. This is one way of using the solar system.

If now, by pulling the wire, the sliding dog is drawn as far away as possible, it loses contact with the bosses on the planet cage, and seizes the outer ring, and drives *that*, at the chain-wheel speed, and the outer ring driving the planets (who turn in their cage) cause the cage to go slower than the outer ring, and the cage (in another pawl drive) now turns the hub-shell, at cage speed. Hence for one extreme gear the hub-shell is driven at outer ring speed; for the other extreme gear the hub-shell is driven at cage speed. Intermediately our dog-clutch in its middle attitude short-circuits the planetary system and drives the outer ring direct at chain-wheel speed, the outer ring (by pawls) driving the hub-shell also direct, so that there is no change of speed as between the chain-wheel and the road wheel.

Our Wireless Expert will be pleased to help readers to solve their wireless problems.

WIRELESS

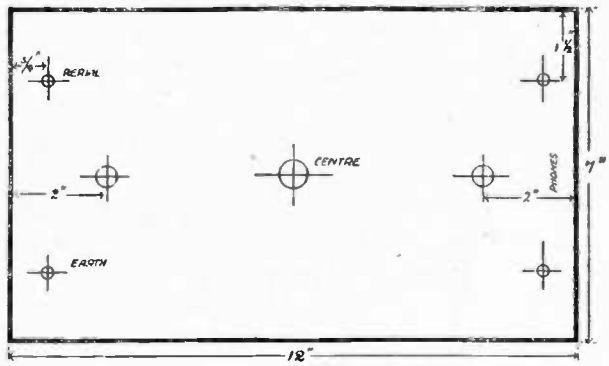


HOBBIES ALL-RANGE ONE-VALVER

By Hobbies Radio Expert

THE receiver described this week is a simple one-valve set, which is so designed that it may be used for reception on all wave-lengths from 20 metres up to 2,000. The actual construction calls for no skill, and it forms an ideal set for the new-comer to wireless.

The first part of the set to receive attention is the panel. This must be marked out carefully to the dimensions given in the diagram and the holes drilled. If components of a different make from those mentioned in the list are employed, the holes may, of course, have to be modified. Next, take the baseboard, which should be of 5-ply wood to prevent warping, and lay the various components upon it in roughly the positions shown in the wiring diagram. Plug a valve in the holder, and then place the baseboard up against the panel and make quite certain that there is sufficient clearance between the various parts. Particular attention should be paid at this point to the variable condenser, as some types are rather deep. When you are quite sure that everything is O.K., proceed to fix the components down with short wood screws. A word of warning may here be given with regard to screwing down wireless parts made from moulded ebonite or bakelite. Unless the holes are countersunk, do not use the ordinary type of countersunk-head wood screw, or you will find the composition will break. For this type of component use round-headed screws.



The panel layout.

Wiring the Set.

Now proceed with the wiring of the set, and do this part of the work methodically, in order that no mistakes will be made. A wire in the wrong place may result in the destruction of a valve, so a little care will perhaps result in the saving of 10s. or so. Take a coil of Glazite or any similar kind of wire, and cut off a length roughly about right for the wire you intend to put in first. Use round-nosed pliers, and make a ring at the end, after having scraped away the insulation. Slip the wire ring over the terminal and find just where to cut off the other end of the wire. Scrape this and make a similar loop. Slip this over the terminal and tighten up the nuts. Do not use pliers for this as it is so easy to strip the thread on the small screws. Finger tightness is quite sufficient.

As soon as a wire has been fixed in its position, cross through the corresponding wire in the diagram for its whole length. By doing this no wire will be left out or put in its wrong position. Note carefully the connections to the coil-holders.

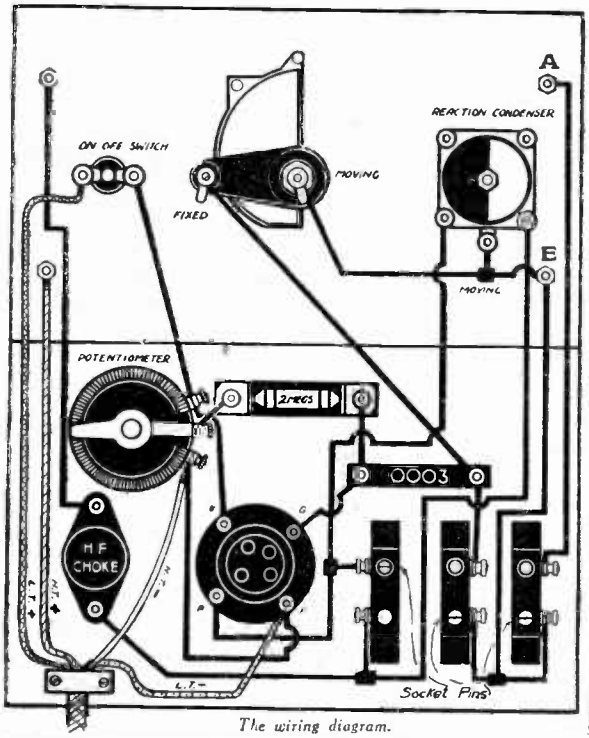
When all these wires are in position take the battery leads and attach these to their respective components, fixing the cord down to the baseboard with a small wooden block having a hollow underneath.

Testing Out the Set.

You are now ready to test the set out, and this is best done on the normal broadcast band. In the left-hand coil-holder plug a No. 35 coil, and in the centre one a No. 60. The other coil should be a No. 50 or 60. The valve should be of the special detector type, and the H.T. battery one of 60 volts. Now, put on the 'phones, connect aerial and earth and with the reaction condenser turned to the left, slowly rotate the dial of the tuning condenser. You should soon hear your local station, and when this is tuned to its maximum the reaction control should be slowly turned to the right. The signals will gradually increase in strength until a loud rushing noise accompanies the signal and then you will hear a "plop." Do not advance the reaction too near this position or your music will be distorted, and you will quite probably interfere with your neighbour's reception. If, on turning the reaction control, the

LIST OF COMPONENTS.

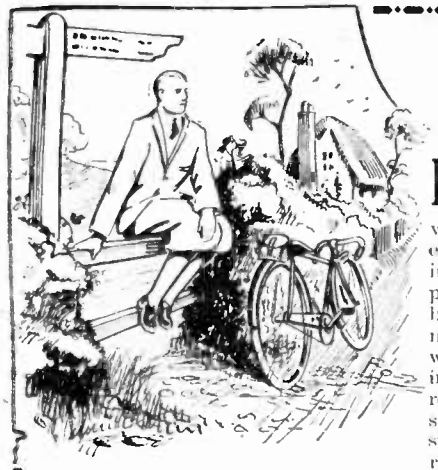
1 panel, 12in. by 7in.
1 baseboard, 13in. by 9in.
1 cabinet to fit.
1 .0005 variable condenser with dials (Ormond No. 4).
1 .0002 differential reaction condenser (J.B., Lissen).
1 .0003 fixed condenser (Dubilier, Lissen, etc.).
1 2 megohm grid leak (Dubilier, Lissen, etc.).
1 holder for same.
1 on-and-off switch (Bulgin, Lotus, etc.).
1 valve-holder (Benjamin, W.B., etc.).
3 coil-holders (Wearite, Lotus, etc.).
1 400 ohms potentiometer (Lissen, Igranic, etc.).
1 H.F. choke (Lissen, Bulgin, etc.).
4 terminals (Belling-Lee).
1 4-way battery cord (Bulgin, etc.).



The wiring diagram.

set suddenly bursts into oscillation without a nice gradual increase in strength, the arm of the potentiometer should be moved round. The exact position for this will depend upon the valve and the value of the H.T., but in general it will be found that when the arm is at the side which is joined to the L.T + wire the set will be most sensitive; while as it is moved round to the negative side the reaction control will become smoother but the sensitivity will fall off.

In order that you may use the set on all wave-lengths you will require a complete set of coils, and these should consist for the broadcast bands of the following: Nos. 35, 50, 60, 75, 100, 150, 250. Instead of a No. 75, another 60 may be used in some cases. For the long-wave stations the centre coil is a No. 250, and the left-hand and right-hand are respectively 100 and 150. For the short waves you will require a set of short-wave coils. These are wound with very thick, bare wire and have only a few turns. They are generally numbered according to the number of turns, and Nos. 2, 4, 6, 8 and 10 will cover the band from about 20 to 100 metres, whilst Nos. 15 and 20, in conjunction with the smaller sizes of the broadcast range, will enable you to cover the gap from 100 metres up to the broadcast band. The largest of the coils should always be in the centre socket, and the other two sizes should be so chosen that the right degree of selectivity and smooth control of reaction will be obtained.



OUR CYCLISTS' CORNER

Conducted by F. T. Bidlake.

EXPERIENCE of the way the modern type of internal expanding hub brakes work may be had without having a wheel rebuilt. The specially constructed or rebuilt wheel naturally provides the most apt form of brake of this type within the hub which is also special. But the device for adaptation is a screw-on drum with band brake fitment. It can be screwed on to the type of wheel known as double cogged, that is a wheel reversible to give two gears. You remove one cog, the idle one, and screw the brake drum on to that. It is not available for front wheels or single-cogged back wheels, or to variable-speed hubs. It is a transition type of limited application, but useful as extending opportunities of finding the characteristics of hub brakes, which are fairly certain in their improved best form some day to win the brake war, and leave rims free to be simply rims and nothing more.

Safety First Congress.

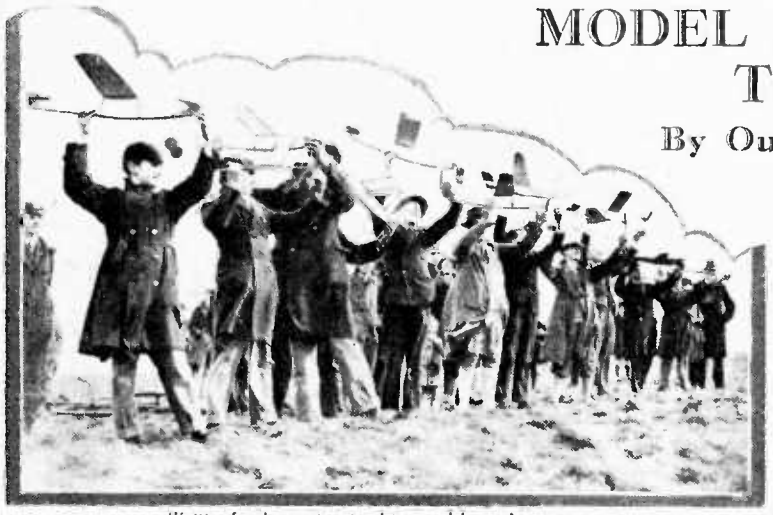
In his address at the Safety First Congress, Mr. C. H. Stancer, the secretary of the Cyclists' Touring Club, emphasized the view that the true test of roadmanship is the ability to avoid collisions, and it is certain that most collisions are avoidable. Unless there is a mechanical failure, the human judgment is at fault, and collisions can almost always be avoided if both users of the road use road sense. It is not enough for one class to take the advice. It takes two to collide, and both need to fulfil the test put forward by Mr. Stancer.

His lecture included a very important reminder; that signalling one's intentions is not enough. A signal is valuable, but it does not ensure security. It is not more than an indication and has no compelling value. If a cyclist holds out a right hand and instantly turns across the path of overtaking traffic to get away on a side turning, he is in great danger lest that overtaking traffic cannot pull up in time.

MODEL AEROPLANE TOPICS

By Our Air Expert

This feature is conducted by the world's acknowledged authority on the subject. He will be pleased to answer any queries on the subject of model aeroplanes.



Waiting for the starting signal in a model aeroplane contest.

THE illustration at the foot of this page shows a very attractive little model which may be flown indoors on wet days. It may be made in half an hour from tissue paper and a piece of cane. Split the cane down with a penknife to the sizes given. In flight it has the appearance of being a gigantic butterfly, and is capable of performing some quite amusing stunts. It is not, of course, a model aeroplane, but a model helicopter of the tractor type. Instead of tissue paper for the wings, odd scraps of proofed silk may be used and as much elastic as the fuselage will stand should also be employed.

* * *

Readers often write to me inquiring how much elastic they should put on their model. The answer cannot accurately be given. But an approximate result is obtained by dividing the total weight of the model by six, the result being the weight of rubber required. It is a simple matter to add or subtract a strand of rubber should the model prove to be under-powered or over-powered.

* * *

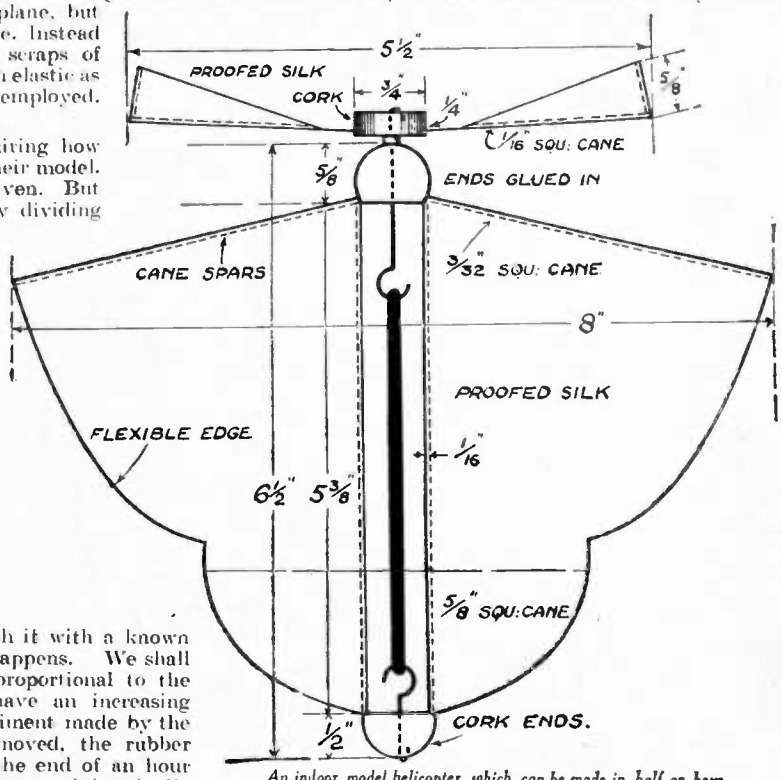
A Hornsey reader wishes to know why it is that some mainplanes are made with the front edge shorter than the rear or trailing edge. This shorter edge tends to prevent the air leaking over the ends, but it is very doubtful whether in model form any advantage accrues.

* * *

An Experiment with Elastic.

Take a piece of elastic and stretch it with a known weight and observe carefully what happens. We shall find that first of all extension is proportional to the weight suspended, but soon we have an increasing increase of extension. In one experiment made by the writer, when the weights were removed, the rubber cord remained $\frac{1}{8}$in. longer, and at the end of an hour recovered itself to the extent of $\frac{1}{16}$in., remaining finally permanently $\frac{1}{16}$in. longer. Length of elastic cord used in this experiment, 8$\frac{1}{2}$in., $\frac{3}{16}$in. thick. The suspended weights were 1oz. up to 64oz.

This shows that we have been able to stretch (distort) a piece of rubber to more than three times its original length, and afterwards it finally returned to almost its original length; not only so, a piece of rubber cord can be stretched to eight or nine times its original length without fracture. Herein lies its supreme advantage over steel or other springs. Weight for weight, more energy can be got or more work be done by stretched (or twisted, or, to speak more correctly, by stretched-twisted) rubber cord than from any form



An indoor model helicopter, which can be made in half an hour from odds and ends. The only tool required is a pocket-knife.

of steel spring. It is true it is stretched-twisted far beyond what is called "elastic limit," and its efficiency falls off, but with care, not so quickly as is commonly supposed. Thus, in spite of this and other drawbacks its advantages far more than counterbalance these.

* * *

Wing-Flapping Models.

Very few wing-flapping model aeroplanes have been made. This is probably due to lack of a suitable mechanism, and accordingly I show a simple mechanism which may be made from a clockwheel and pinion and strips of tin. The gearing consists of a gear and pinion, D, E, a piano wire shaft, B, passing through the pinion. A winding crank is formed into this shaft and hooks for the elastic are formed on to the ends. C is the model aeroplane fuselage, A is the framework, F are bell-cranks to which the wings are attached, O are cranks secured to the gear, K, L, M, and N are distance bushes, G and J are supporting brackets fixed to the fuselage. The wings should be made with a flexible trailing edge so that when the wings flap this edge stimulates the action of a bird's wing.

* * *

Notes on Airscrews.

The width of a propeller blade should be from ¼in. to 1/12in. of the diameter. The pitch for single screw machines should never exceed three times the diameter, when the pitch angle will be nearly 45 degrees. The pitch angle for twin screws should not exceed 60 degrees. Beyond these limits the screw begins to lose efficiency. Carved propellers are much more efficient than bentwood ones, albeit a little heavier. Nevertheless, for racing and duration models, quite satisfactory results are obtained from carefully made bentwood screws. It is interesting to note that many records are held by machines fitted with bentwood screws.

* * *

Covering Wings.

Many sorts of wing covering are available already proofed and ready for use. It is important to use a silk which is not only air-tight, but also water-proof. Readers who wish to do their own proofing should buy yellow Jap silk, which weighs 1½oz. to the square yard and is of close texture. After this has been stretched on to the wing it should be doped with transparent varnish, diluted with turps. The silk of yellow colour is least affected by the action of the varnish.

* * *

Airscrew Pitch.

The pitch of an airscrew has a definite relation to the speed of the model. For instance, if the speed of the model is 15 miles per hour or 22ft. per second, it would be incorrect to fit an airscrew whose pitch, multiplied by the revolution per second, fell short of this distance.

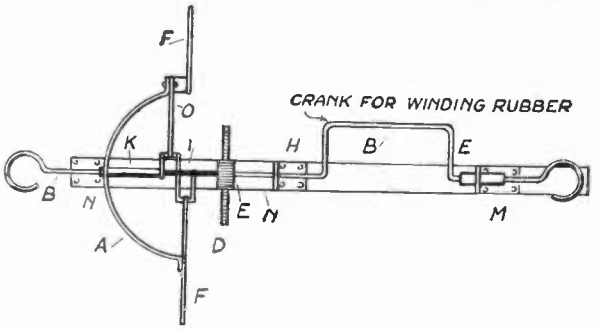
* * *

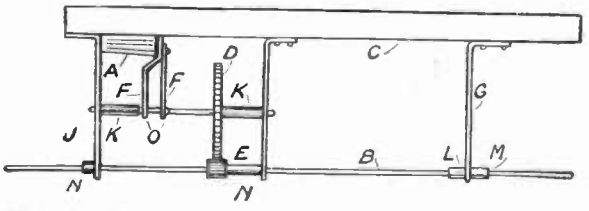
Useful Formulae.

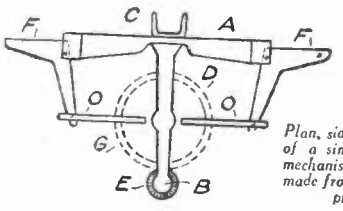
The ratio of the weight of a model aeroplane to the thrust required to fly it is about 1 to 4. The weight of a rubber driven model fuselage should not exceed ½oz. per foot. The loading per square foot should not be more than 8oz. nor less than 4oz.

Electricity for Models.

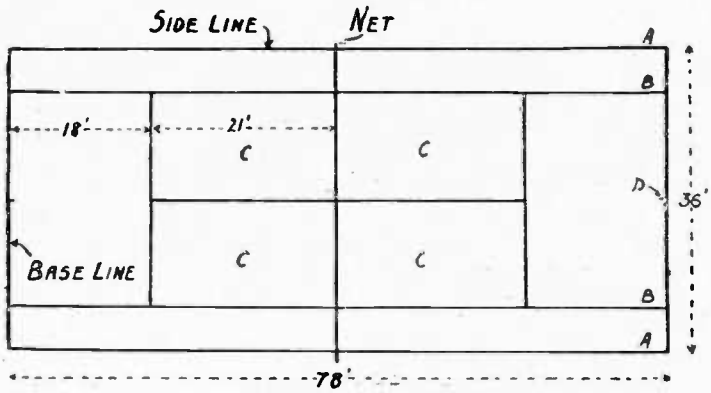
Electricity as a form of motive power for model aeroplanes is quite out of the question, because it develops such a small amount of power for its total weight. The only practicable forms of motive power are elastic, compressed air, super-heated steam, petrol and carbon dioxide. A compressed air engine will, of course, run on carbon dioxide, and *vice versa*, and such engines are quite easy for amateurs to make, but super-heated steam engines and model petrol engines present many difficulties. They are jobs for the skilled mechanic, and are somewhat heavy and necessitate the construction of a fairly large model. They are thus somewhat unwieldy and expensive.







Plan, side, and front views of a simple wing-flapping mechanism. It is easily made from clockwheels and pieces of tin.



The lay-out of the court.

TENNIS FOR BEGINNERS

By "Deuce"

Some interesting facts that will prove of great help to those desirous of taking up the game.

TO excel in any game of physical or intellectual skill it is necessary to practise continually, and training and fitness are more advantageous than exceptional strength.

The two chief assets to the tennis player are speed and anticipation, and only by keeping fit and practising whenever possible can you obtain these two things. For those who have never played tennis before it is necessary to gain some idea of the court on which the game is played.

The Court.

A glance at the diagram should make the lay-out of the court clear. The two lines, marked A and B (often referred to as the "tramlines"), denote the difference between "singles" (when two people are playing) and "doubles" (four people). In a game of singles the size of the court is 78ft. by 27ft., but in doubles a court 36ft. wide is used. The lines bounding the ends and sides of the court are known as base-lines and side-lines respectively. A net 3ft. high is stretched across the middle of the court, and on each side of this the service courts are marked as shown at C.

The "Server."

To commence the game the person who serves must stand outside the base-line, and on the left of the centre line marked D. He must then endeavour to hit the ball over the net so that it drops into the service court on the left of the player. If the first ball is driven into the net or drops outside the service court it is known as a "fault" and the player is allowed another "serve." If this should also be a "fault" the server loses a point, but if it falls into the service court, the ball must be returned over the net by the opposing player to the server. Once the ball is in play the players can hit the ball to any part of the court, until one or the other drives the ball into the net or outside the court. The ball may be hit on the volley (before it touches the ground) or may be allowed to bounce once in their half of the court when it is in play. If the ball bounces twice in the court before it is returned that player loses the point.

Method of Scoring.

When a player wins his first point the score is called 15 for that player, on winning his second point the score is then 30, if he wins a third the score is 40, and a fourth point would make "game" for the player concerned. If both players have won three points each the score is called "deuce," and the game is not completed until either player wins two consecutive points following the score of deuce.

The first player to win six games wins the "set," except when the score is five games to each. Then the set can only be won by the first player who wins two consecutive games, such as 7–5, 9–7, etc. The scoring for "doubles" is exactly the same as in "singles."

How to Serve Correctly.

The first thing for the beginner to do is to practise serving. Grip the racket in the right hand as near to the top of the handle as possible, the balls being held in the left hand. Advance the left foot slightly, and throw one of the balls about 6ft. above the head so that if the ball is allowed to fall to earth it will drop on the left foot. As the ball is descending strike the ball with the racket, keeping the arm holding the racket fully extended. *Do not bend the arm*, as this is considered bad practice. Keep on practising this until you have developed a fast service, because this is a great asset to the tennis player.

The Back-hand Stroke.

This is the most difficult shot to accomplish. To practise this stroke get a friend to throw the balls to the left of your body, and drive them back by bringing your racket across the body, keeping it in a horizontal position. Keep on until you have mastered the stroke to your own satisfaction, otherwise, if you are weak on the back-hand stroke, when playing, your opponent will continually play on it, with disastrous results to your game.

The Fore-hand Drive.

This is quite a simple shot and the beginner should find no difficulty in learning it. The racket is held in a horizontal position when making the stroke, and as it is made on the right-hand side of the body you can put plenty of force into it. When playing you will develop other strokes, which will come to you automatically. So it therefore rests with you whether you play a good game!

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CLUES.

ACROSS.

1. Tool used by gardeners (Example)
3. Donkeys
6. Ourselves
7. Short for Thomas
8. The first number
9. A falsehood
11. An English nobleman
13. River on which Cairo stands
14. Immense bird mentioned in "Sinbad the Sailor."
18. This has spokes, a rim and a hub
20. A favourite child or animal
23. We listen with this
24. Bird which carries messages
26. What an odour does
27. To dig with the elbow
28. These are sold in paint stores

DOWN.

1. Used for drawing straight lines
2. The largest of the five continents
3. Word which concludes a prayer
4. Finished
5. To look at
10. It waits for no man
12. Not high
15. To hew with an axe
16. Used for planing
17. To go in front of
19. Yorkshire city which rhymes with "seeds"
20. To look cautiously
21. An excursion
22. A barking animal
25. Place where travellers stay the night

RULES.

1. Attempts must be on coupons from HOBBIES. 2. Postage stamp value 1½d. must be attached, *by the corner only*, to each coupon. 3. In the event of ties the prize will be equally divided. 4. Employes (or members of their families) of George Newnes, Ltd., or its associated companies are not allowed to compete. 5. The Editor's decision is final in all matters relating to this competition.

YOU MAY SEND ANY NUMBER OF ATTEMPTS

Post your entries to reach us not later than Friday, June 19th, addressed "Hobbies," "Crosswords," Competition Dept., 39, King Street, Covent Garden. W.C.2.

ANOTHER SPECIAL "CROSSWORDS" NEXT WEEK

RESULT—"CHRISTIAN NAMES" PICTURES

117 PRIZES AWARDED TO READERS

Two readers were nearest, with only one mistake, to the official list of solutions published in our last issue, and the First Prize of Four Guineas in goods has been equally divided amongst the following :—

HALL, W., 17, NEWTOWN, THETFORD. TAYLOR, J., 23, MARLBORO' STREET, BURNLEY.

Three competitors submitted sets with two mistakes, and equally share the Second Prize of Two Guineas.

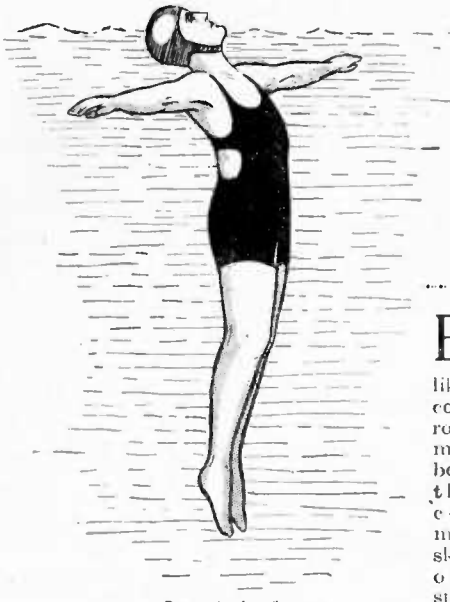
CORRIS, G. A., 17, SALISBURY ROAD, EVERTON.
FOSTER, N., 11A, ASHTON ROAD, SOUTH YARDLEY, BIRMINGHAM.
INGHAM, H., 102, COLLEGE ROAD, DULWICH, S.E.21.

112 entries were received which contained three mistakes, and Consolation Prizes have been awarded to the following readers :—

Adams, L., Inglelene, Pomphlett, Plymouth ; Adde, R., Osokosry, Gladys Ave., Cowplain, Cosham ; Allen, W., 4, The Meads, Luton ; Andrews, L., Belle Vue Cottages, Darton Lane, Mapplewell ; Bailey, H., 6, Regent St., Runcorn ; Barnes, G. E., Junr., 11, Clifton Rd., Canning Town, E.16 ; Bateman, F. J., 19, Burgoyne Rd., Bow, E.3 ; Best, F. T., 80, Queen's Hd. St., N.1 ; Birmingham, G., 6, Sandy Grove, Sandy Lane, West Derby ; Blades, G. S., 111, Canon St., Leicester ; Blair, J. G., Rosemary, Station Rd., Green Island, Co. Antrim ; Bonewell, H. J., 33, Gee St., Coltman St., Hull ; Boyden, G., 3, Park Terrace, Winchmore Hill Rd., N.14 ; Boydon, A., 18, Main Street, Goldthorpe, Nr. Rotherham ; Brookes, C. W., Westhaven, Seafield Rd., Dovercourt ; Buckley, A., 1, Hewitt St., Hightown, Manchester ; Burnap, A., 6, Gratwich Rd., Tilehurst ; Bush, F., 44, Mount Pleasant Rd., Tottenham, N.17 ; Cannon, B., Glencar House, Letterkenny, Co. Donegal ; Catherall, H., 4, Clarks Terrace, Weston Pt., Runcorn ; Challinor, W., Hope Cottage, Jodrell St., Macclesfield ; Clark, S., 112, Histon Rd., Cambridge ; Coleman, G. H., 91, London Rd., Chesterton ; Dale, N., 15, Hibel Rd., Macclesfield ; Dawkins, P., Devon Court, Grand Parade, Leigh-on-Sea ; Day, H., 66, Chamberlain Rd., Lr. Edmonton, N.9 ; Daynes, G., 54, Station Rd., Shalford ; Deacon, N., 112, Village Rd., Aston ; Dougall, A. J., 55, Oakfield Rd., Clapton, E.5 ; Dove, N., 2, Dunstan St., Wavertree ; Dowell, F., 8, Hampton St., Leamington Spa ; Drew, G., 39, Whitstable Rd., Canterbury ; Duckworth, E., 8, Tranmere Rd., Blackpool, S. S. ; Dunn, H., 94, Portmand St., Middlesbrough ; Durose, E. A., 4, Gordon St., Luton ; Edwards, P., 4, Eden Rd., Tunbridge Wells ; Edwards, O., 45, Mwrog St., Ruthin ; Field, H., 1, Pendlestone Rd., Walthamstow, E.17 ; Flewellen, H. J., 58, Goddard Ave., Swindon ; Foster, G., 32, Coney Rd., Bentley, Doncaster ; Frary, I., 56, St. Walsingham ; Gartside, J. H., 4, Houghton St., Royton ; Gatland, R. H., 11, Lawson Rd., Dartford ; Gilbert, L., 30, Baldwin St., Smethwick ; Gillett, F., Howend, Houghton Conquest ; Gold, E., 13, Copnor Rd., Portsmouth ; Graydon, R., 14, Charter St., Oldham ; Guille, J., 3, Sir William Place, Canicher, Guernsey ; Hickling, A. C., 6, Maple Close, Cambridge ; Holmes, A., 2, Ormondroyd Ave., Odsal, Bradford ; Hughes, F. M., 7, Gipsy Lane, Oxford ; Hunter, W., 28, Selbourne Rd., Gillingham ; James, H., Pwllycrochan, Colwyn Bay ; Jones, E., 58, Edward St., Pant-Dowlais ; Jones, H. G., 8, Palamos Rd., Leyton, E.10 ; Keay, J., 2208, Dumbarton Rd., Yoker ; King, N., 24, Oxford St., Edinburgh ; King, J. F., Ballymote, Co. Sligo ; King, P., 5, The Terrace, H.M. Dockyard, Chatham ; Lance, R. G., 99, Park Rd., W. Dulwich, S.E. ; Lane, A. E., 190, Douglas Rd., Acocks Green ; Langtree, F. H., 66, Royal Oak Rd., Woking ; Lorimer, H., 3, Shankston Cres., Cumnock, Ayrshire ; Main, R., 800, Crow Rd., Anniesland, Glasgow ; McCaig, A., 23, Kelvin Terr., Kirkintilloch ; Mellor, N. C., 44, Ovenden Rd., Halifax ; Moore, L., "Leydon," Roman Rd., Ingatestone ; Newman, J. R., 44, Stockmap Rd., Hackney ; Ogley, L., 4, West St., Conisborough, Rotherham ; Oldfield, L., "Harlie," Maple Ave., Macclesfield ; Pittaway, A., 1, Forge Row, Abertillery ; Powell, C., Ongur, Pencae, Swansea ; Ralston, P., 103, Rosalind St., Kirkdale, Liverpool ; Randall, E., No. 7, Station Rd., Tempsford, Sandy ; Rollinson, G., "Garden House," Doncaster Rd., Rotherham ; Rose, A., 106, Caludon Rd., Coventry ; Ryan, P. J., 114, Moseley Rd., Highgate, Birmingham ; Sennett, J., 18, Bankhouse, Pudsey ; Sharpe, G., Market Place, Swineshead, Boston, Lincs ; Sibbald, J., The Lodge, Colinsburgh, Fife ; Skingsley, R., 13, Belle Vue, Upper Bridge Rd., Chelmsford ; Slater, S. G., 8, Albert Place, Exmouth ; Smith, W., 132, Park St., Rotherham ; Somerville, A., "Dundarroch," Lundin Links, Fife ; Spendelow, H. R., Needingworth, Huntingdon ; Stedman, G. R., c/o Frefan Hall, Llanystumdwy, Nr. Criccieth ; Stewart, J., 29, Pitt St., Portobello ; Stone, A., 214, Henley Rd., Ilford ; Storer, S., 25, Belgrave Rd., Nr. Tamworth ; Sutton, S., 164, Stanley Rd., Wakefield ; Sutton, E. J., Sunnyside, Peterchurch, Hereford ; Swan, C., 130, East Trinity Rd., Leith ; Thurgood, T. W., 09, Norwood Rd., Radford ; Troman, R., 537, Bromford Lane, Ward End, Birmingham ; Twyman, W., 104, Woodnesboro Rd., Sandwich ; Veale, A., 13, Well St., Plymouth ; Waite, B., 10, Newells Villas, Misterton ; Walker, T., 20, Beverley Rd., Monkseaton ; Walker, J. M., 13, Brown St., Edinburgh ; Walker, B. G., 33, Rylstone Rd., Eastbourne ; Walmsley, J., 2, School St., New Springs, Wigan ; Walthew, F., Playing Fields, Sth. Yardley, Birmingham ; Waterhouse, F. A., 6, Hill View Gdns., Kingsbury, N.W.9 ; Watson, C., 81, Cleveland St., Guisborough ; Webb, E., 42, Peter St., Canning Town, E.16 ; Wells, W., 5, Rosebery Place, Inverness ; Westgate, F., Murrells Cotts., Harrow Rd., Warlingham ; Whitehouse, E. G., 65, Goosemoor Lane, Erdington ; Williams, K., 3, Abbey Terr., Greenfield, Holywell, N.W. ; Wilson, A., 7, Clifton Ave., Wallsend ; Wright, W. A., 4, Nelson Ave., Wellington Lane, Hull ; Wyatt, L., High St., Warboys, Hunts.

All Prizes will be dispatched to winners in due course.

SPECIAL CROSSWORDS (CASH PRIZES.) See page 328.



Perpendicular floating.

Second article of a series.

LEARNING TO SWIM

By S. G. Hedges

Some useful advice for the beginner by "Hobbies" swimming expert.

EVERY bather would like to become an all-round swimmer. The beginning of this, of course, is moderate skill with one or more strokes. But it is not enough to be able to swim across a stretch of deep water—you will want to "stand still" in it occasionally, and to rest without coming ashore. So then, *treading water* and *floating* should have secondary place in one's swimming programme.

If you have a knowledge of the breast-stroke, treading water will be fairly easy—it will not be very difficult if you have not.

Swim out until you cannot touch bottom, and then allow the legs to drop. When you have reached the perpendicular position required for treading water, you may begin to work the legs again, with a rather quick breast-stroke action. The whole movement is, of course, vertical—the legs draw up, kick out, and close together. There is no gliding pause as in actual breast-stroke, and the drawing up is rather shortened. Together with this kick the arms may perform a gentle paddling just in front of the chest, keeping their palms downward.

An alternative method is to work both legs exactly as when you run upstairs—the soles of the feet, pressing down one after the other, give the necessary constant support. The arms may paddle similarly in this method.

Treading Water.

When treading water is performed as it should be, the head remains steadily above the surface. A good swimmer can even keep his shoulders out. A very good way of testing the strength of your kick is to work your legs alone and hold the arms straight up above your head—it should be fairly easy to stay like this for perhaps half a minute.

Floating should next be studied.

The ideal way of floating is with the body horizontal along the surface, face upwards, and with the arms stretched beyond the head. Not everyone can achieve that, for a great deal depends on one's build. But you should try it. Lie on your back, inflate your chest; slowly sweep the arms round the surface until they are beyond the head, palms upward—and then wait. If you are to be successful, your feet must rise until they are at the surface. This bringing up of the feet is largely a matter of balance: the chest floats readily enough, and the problem is to balance the legs and feet by the head and arms. To do this the arms must be at full stretch and the head must be strained backward.

Do not assume that you are a non-floater because your first few attempts are not successful. This horizontal position is very difficult to acquire, except by the fortunate few who are exceptionally buoyant.

But there is an easier style of floating, which is of the same practical use for resting purposes. In this you do not trouble about raising the legs. Simply inflate the chest; spread the arms in line with the shoulders; lean the head back until only the mouth and nose are clear of the water, and allow the body and legs to hang limply down from the surface.

Life Saving.

Having got thus far in your general swimming development it is time for you to learn something of life-saving methods. A great many fatalities would be averted annually if all bathers had even the most elementary knowledge of what steps to take in an emergency.

It may happen at any time this summer—you may be swimming or strolling near to the sea's edge, when suddenly there may come a shout for help. And you may be the nearest person to the one in danger!

What shall you do?

Supposing you have never given a thought to the matter, and so are caught quite unprepared—how terrible if a tragedy should follow. But supposing you are ready with the knowledge and the ability—how splendid to be able to save a life.

Not always the expert swimmer is of most assistance in a drowning accident. Better be a moderate swimmer, with life-saving ability, than an expert without it.

First of all, whenever you are on a seashore, or at any bathing place, acquaint yourself immediately with the

whereabouts of lifebelts, ropes, boats, and such-like aids. Stage an accident in your mind occasionally and run over just what you would do.

Supposing a bather twenty yards out is taken by cramp and tumbled over by a wave, losing nerve and shrieking for assistance. Well, if the water is not deep, you might wade out and help him to shore.

Should the sea be very rough a human chain might be safer. In case of a heavy backwash you might fix a rope round your waist, and let someone on shore hold the end while you dashed out for the rescue.

But the most common emergency is when a swimmer tires in deep water, or gets carried out from the shallows, and so loses nerve. In such circumstances, especially if you are not a competent swimmer, it may be advisable to fling a cork belt, plank, or anything that will give support until some rescuer can reach the drowning person.

Releases and Towing Methods.

But, providing that you are a moderately strong swimmer, with a fair mastery of back stroke, you may, with a little practice, equip yourself for rescue work in a very short time, by practising the various releases and towing methods with a friend.

The clutch of a drowning man is proverbially dangerous and the would-be rescuer must not be squeamish in effecting his release so that both may get to safety. Often it is possible to swim over the top of the attacker, so that he becomes immersed and in the confusion of swallowing water loses his grip.

To tow a drowning person to safety you should swim on your back, holding him face upwards above you by gripping his arms just above the elbows. In this position you have firm control if he should struggle, and yet can keep his head well above the surface and drag him along, without much hampering your own kick.

If a drowning person is exceedingly violent when you approach him it is sometimes advisable to tread water until he becomes quieter.

A would-be rescuer is often concerned as to whether he should take off his clothes before going out. Except in very short distances the few seconds wasted in getting rid of shoes and coat are always more than saved in the subsequent speed of swimming.

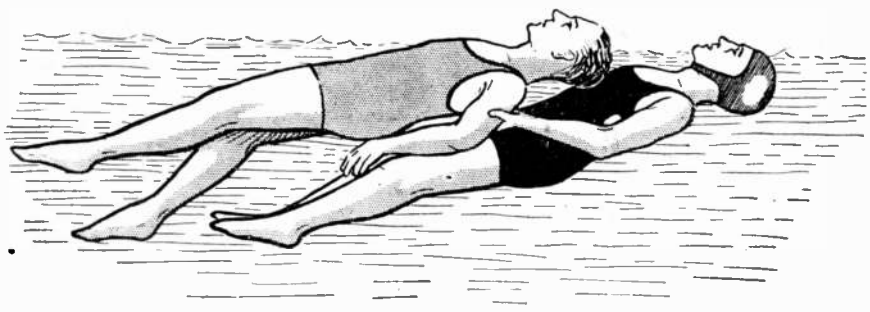
Artificial Respiration.

Sometimes a person needing help remains quite calm, and is able to give assistance to his rescuer. In such a case get him to lie on his back with his hands on your shoulders and his feet beneath your chest. You will then swim breast-stroke and push him in front of you, for both your arms and legs will be free. If he keeps his arms rigid and presses strongly down on your shoulders he will keep afloat quite easily and scarcely hamper you at all. Everything depends on his correct position. See that his legs touch your chest, his chest bulges out of the water in front of your face, and his head is pushed back until his ears are immersed.

Should a person be brought to land unconscious, artificial respiration must immediately be commenced, and a medical man sent for.

Remember, that in any rescue the fraction of a minute may mean the difference between life and death.

In short, therefore—always be ready for a rescue!



A rescue.

A STAMP COLLECTOR'S EMPORIUM.

A RECENTLY introduced section of that well-known stores, Messrs. Selfridge and Co., Ltd., of Oxford Street, W.1, is the finely equipped philatelic section shown in the photograph to the right. It is replete with every conceivable requirement for the stamp collector. Here he may inspect rare as well as current issues, and he will find that the assistants are something more than mere salesmen, for they are each experienced in philately and are able to discuss in an interesting way the world of stamps. The stamp collector will find plenty to interest him in this section, which is an endeavour to give a fresh complexion to the usual stamp emporium. It is modern, light, and the issues have been carefully arranged so that they can be progressively inspected.

GUT casts are often stained for fishing; you can buy them ready dyed in various colours, as mist-blue, sorrel, green, and "camouflaged." But in case you wish to stain clear natural gut yourself, then the following formulas will help you. To obtain a green weed shade, first boil the gut in a solution of alum to get rid of the grease, and then in a solution of indigo with sufficient turmeric to get the exact shade required. Strong green tea will also impart a pretty good green stain if the gut is left to soak in it for some time. Green hues can also be obtained by boiling a piece of green baize in water and immersing the gut in it. A brown shade can be imparted to gut by soaking the cast in coffee; the gut should be put into it whilst it is very hot, and be allowed to remain for some hours till the desired tint is arrived at. An amber or yellow stain is obtained by taking a handful of common barberry tree and steeping it in boiling water. Let the gut remain a couple of hours, and dry in a fairly warm room. Blue-black writing ink will give varying shades of colour according to the length of time that the gut is allowed to soak in it. To make gut a "water colour" take a teaspoonful of red ink, same amount of soot, and about a third of a cupful of water; simmer over a fire for ten minutes; when cold, steep your cast in it until the desired stain is achieved.

Preserving Natural Baits.

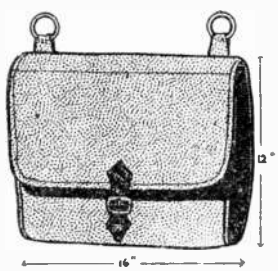
To preserve minnows, loaches, gudgeon, etc., to keep for future use as baits for pike, trout, etc., the best solution is formalin. About a tablespoonful of formalin in a tumbler of water is a good mixture; put your baits in this, and leave for a day or two, then remove and place in a suitable glass bottle or jar in a slightly weaker solution. This will keep them for months in good condition.

Dressing a Silk Line.

There are many methods of dressing a silk line in order to preserve it. Trout lines are generally dressed when bought; but if you should desire to treat an undressed line, try the following: Take a tablespoonful of linseed oil (boiled), beeswax and resin, pieces about the size of a walnut; pulverize the resin and cut the wax into thin slices. Put them together in a jam-jar in boiling water till dissolved, mix with a piece of wood, and put the line in when the mixture is warm. Afterwards hang it up to dry, stretched out in an airy room, and clear off any superfluous liquid by taking a piece of sponge between the finger and thumb and rubbing it along: rag will do if sponge is not available.

A Useful Bag.

You can make a useful fishing bag out of a piece of good waterproof material. A convenient size is about 16in. long by 12in. deep, and it should be fitted with a flap and two buttons and a short strap and buckle. A buckle or a curtain ring attached to each top corner will serve for the shoulder strap attachment. The interior should be divided longitudinally by a third piece, and all the seams should be carefully turned in, double-stitched, and varnished. If one of the interior compartments is lined with rubber material it will be all the better, as after fish have been placed in it the bag can easily be washed out. (See illustration.)



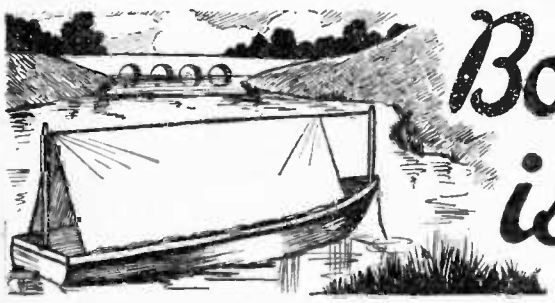
A simple and easily made fishing bag.

Preparing Worms for Fishing.

Worms for hook baits should be well scoured, tough, and lively. They should be procured a few days beforehand and placed in a porous flower-pot in fresh clean moss to scour. Some anglers sprinkle a little milk over the top of the moss. To keep a stock of worms they should be placed in an old tub filled with good leaf-mould and bits of old sacking, with a layer of moss on the top. Inspect the worms periodically and remove any dead ones. The best kinds of worms to keep handy for hook baits are red worms (frequently called cockspur worms), found in decaying vegetable matter, old leaves, and soft soils. Marsh worms and the striped brandlings are also useful.

Curing a Tacky Line.

Sometimes a dressed line becomes tacky or sticky, and is rather more than a nuisance in consequence. One method of dealing with it is as follows. Mix some ordinary whiting in a deep saucer or similar receptacle with cold water until it is of the consistency of thin cream; coil up the line and immerse, leaving it in the mixture for two days or so, taking care that all parts of the line are thoroughly coated with the preparation by turning it occasionally. Hang up the coils to dry, shake off any superfluous whiting, and rub down with a cloth or piece of soft chamois leather.



Boat-Camping is Great Fun!

By A. Sharp

AN interesting and jolly sort of holiday is boat-camping. If you have read—and who has not?—that entertaining book, "Three Men in a Boat," you will doubtless have experienced a desire to emulate Harris and George and their pal, living your holiday in a boat, sleeping on the bosom of the river or beneath the stars. Such a holiday is adventurous and romantic.

A good boat can be hired by the week or fortnight from any of the boatyards on the river. It is advisable to hire a fairly roomy craft, as comfort is essential, whereas speed is of no matter. A likely boat is a pair-oared pleasure skiff, about 18ft. by 4ft. 6in. By removing the middle thwart you have a fairly big space available for sleeping accommodation. All that you require is a mattress to fit this space and the necessary blankets. The tent may be fixed up so that the craft is covered from stem to stern. The method of supporting and erecting the cover is simple enough, either by a light iron framework made to fold into a small compass, or by two short masts, one fixed at the bow thwart, and the other at the after thwart; between these masts and secured to their tops is a light ridge pole, over which the tent cover—which should be of green Willesden canvas—is stretched; this is then fastened down to the ends of the boat and around the sides by strings looping on to hooks at short intervals. A very snug "house" when all is tightened down for the night. In the daytime the canvas is rolled up and the masts taken down.

A Patrol Tent.

Or, if you prefer it, you can take along an ordinary "Bivouac" or patrol tent, and pitch camp on the river bank, after mooring the boat somewhere handy. There is, however, one thing to be remembered; some bank owners object to camping, so that you need to make sure that there is no objection to your pitching a tent on land before you do so; it is not always possible to camp by the river without trespassing on private property; always obtain the necessary permission, rather than risk it.

When camping in the boat itself, which is the greater fun, select a spot well sheltered from the wind, away from the towing-path, and beside a bank low enough and convenient for an easy landing. Secure the craft at *both* ends, with ropes sufficiently long to allow for the boat rising and falling in any swell caused by the passage of motor-craft or river steamer. Always make quite sure that the boat is properly tied up before retiring for the night.

It is a good plan to take along two fairly large wooden boxes. One box you keep for the things needed during the day, and the other for the night things. In the day box you carry stove, fry-pan, kettle, oil, tin-opener, etc., and in the night box, a collapsible lantern, candles, matches in a corked bottle, slippers, etc. Foodstuffs should be procured fresh daily from the village shops on the banks of the stream; it is a nice change to take some of your meals in a café or riverside inn.

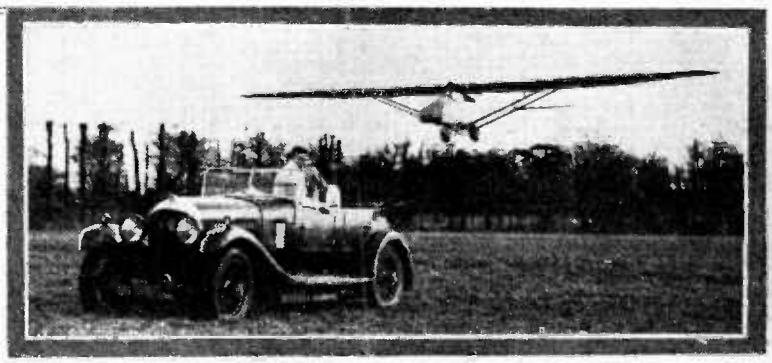
Hints on Clothes, etc.

Boots, well greased, are preferable to shoes when camping on the river, as the meadow grass is wet with dew at early morning and in the evening. When turning in for the night, take off boots and put on a pair of canvas slippers. Boots for boat-camping, by the way, should be stout-soled and strong, for your feet need protection from the stumps and tree-roots with which river-banks abound. It is better to take the trip in easy stages, stopping frequently. Pastimes you can indulge in will include fishing, bathing, swimming, etc., and if one member of the party can play a mandoline you can have music at evening. The early morning swim, followed by a run along the bank to get warmed up, will give you an excellent start for the day.

Almost any navigable river or canal will afford opportunities for boat-camping, providing there is a boatyard where a suitable craft can be hired. Your party should not be too large, three or four at the most to share the cost and to assist in the work of towing and other duties.

FIRST LESSONS IN FLYING

In a demonstration at Hanworth Aerodrome the usual elastic catapult method of launching was dispensed with, and the glider was quite successfully towed off by a car.



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Further pictures will be given in our next two issues.

The first prize will be given to the competitor who sends in the set of four coupons with correct solutions. If no competitor succeeds in finding the correct results the first prize will be given to the sender of the solutions which are most nearly correct, and the other prizes will be awarded on the same principle.

The Editor will not enter into any correspondence relating to the terms of this competition, and his decision will be final.

FOURTH PHILANAGRAM

FIFTH PHILANAGRAM

SPECIAL NOTE!

SEE LAST WEEK'S ISSUE FOR AN EXAMPLE OF PHILANAGRAMS.
THE FINAL (FOURTH) SET WILL APPEAR NEXT WEEK.

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Advertisements are accepted for this column at the rate of 4d. per word, prepaid. Address communications to the Advertisement Manager, "Hobbies," Southampton Street, Strand, London, W.C.2.

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SOME INTERESTING FACTS FOR THE BEGINNER

Conducted by P. L. PEMBERTON.

Mark all envelopes containing stamp queries with the word "Stamps" in the top left-hand corner.

THE perplexities of the beginner in any pursuit are likely to be forgotten by those who have attained a measure of proficiency. I have been reminded of this by certain frequently recurring queries received from readers. In the hope of interesting such young collectors as seem to be in need of a little guidance on these simple matters, I will devote this article to a consideration of some points on which there is apparently a general interest among budding philatelists.

Comparative Rarity.

There seems to be a general belief among non-collectors and young beginners that the older a stamp the more it is worth. Many people seem unable to understand that rarity, and rarity alone, is the touchstone of value. I have so often been asked what makes some stamps valuable as compared with others, that I offer no excuse for labouring a point which most people would regard as self-evident. There is an old proverb which says, "All that is rare is dear; that which is everyday is cheap," and all experience proves the truth of this. Many kinds of stamps have been saved in large quantities and so are common: of other kinds, comparatively few are available, and these are uncommon; their values are graded accordingly, and with the precision of long years of experience swayed by the laws of supply and demand. High up in the scale are varieties that are so uncommonly uncommon that a Crœsus might comb the markets of the world without turning up a specimen. It is true that most of the great rarities date from early days, but not all by any means: there are stamps of quite recent years which were issued in such small quantities that they are exceedingly rare, and others dating from before 1850 which were used in such large numbers that they are exceedingly common.

A French Congo stamp very much off centre and therefore almost unsaleable.

Condition.

Another point on which some collectors seem to require schooling is the importance of "condition." Of the stamps that are sent to the Editor for valuation, quite 75 per cent. are in such poor state as to be quite worthless. I cannot too strongly urge upon collectors the absolute necessity of rejecting every stamp that is not perfect in every respect. Thirty years ago collectors were not so particular, and were content to fill spaces with stamps which to-day would be consigned to the flames without another thought. The demand for perfection has grown with the intensified study of stamps, so that a common stamp in unimpeachable condition is now of more account than a rarity with a chunk out of it. In the case of stamps of high price the slightest defect, such as a thin spot in the paper, a crease, a pinhole, slightly clipped perforations or imperfect centring of the design as regards the perforations (known in the collectors' jargon as "off centre"), reduces the market value by more than a half; and if a stamp has any of these defects in a marked degree it becomes almost unsaleable at any price. In the case of an unperforated stamp, the size of the margins is the prime consideration. Specimens with large equal margins on all sides are worth immeasurably more than stamps cut close, and if the design is the least bit cut into the value drops almost to zero. Old collections generally contain only a very small proportion of perfect stamps, consequently they are almost invariably a source of great disappointment to their owners when they come to sell.

Forgeries.

Young collectors whose purchases are confined to inexpensive stamps have little to fear from counterfeits. The unscrupulous faker generally confines himself to imitating scarce stamps, and though there are exceptions, they are too infrequent to be troublesome to the beginner. Some people have an idea that if a collection has not been added to for fifty years or more all the stamps must be genuine. This is a great fallacy. Forgeries were more rife in the early 'sixties than they have ever been since, and old collections nearly always contain a good sprinkling of those early "fudges." In former days, however, forgeries were very crude. They found a wide market because early collectors were ill-informed: the lithographed presentments of the engraved or typographed stamps which imposed upon our grandfathers, only cause amusement to collectors of to-day. Much greater skill and cunning is required by the modern faker, and it requires a good deal of expert knowledge to detect some of his wares. This, however, as I have said, is a bogey that the beginner need not worry himself about—it is the concern of the advanced collector, who protects himself by exercising care in the acquisition of specimens and the choice of his market.

A fine copy of a Bavarian stamp of 1849 which can still be bought (used) for 3d.

Fig. 1. — Detecting cracks in the blade of the bat by rubbing it with a cloth soaked in linseed oil.

REPAIRING YOUR CRICKET BAT

By W. J. Saunders

Many readers no doubt have a cricket bat which is considered a favourite, and after a few strenuous seasons the blade is apt to develop a weak spot. Here are some useful hints that will make your bat last you another season.

IT is not at all a difficult matter to restore a worn bat, provided, of course, the nature of the trouble is not a broken handle. Should the splice of the bat become broken it is hardly worth while attempting a repair, unless, of course, the blade is in fairly good condition. For the present we will deal with the touching up of the weak spots found in the blade, which, when put right, will make all the difference to its performance, providing, of course, you handle it with something like your old form.

The most common fault is one or more small cracks which develop in the front portion of the blade, which are caused by the constant knocking of the ball. These cracks are often so small that they cannot be seen by merely looking at the bat, so some means of spotting them must be employed. Quite an easy way to detect any small cracks in the blade is as follows.

Detecting Cracks in the Blade.

Obtain a wad of soft cloth and some linseed oil, and well soak the cloth with this. Now well rub the surface of the blade with the linseed wad in the manner illustrated by Fig. 1, sweeping it from end to end in the direction of the grain. This should be repeated two or three times with more oil applied to the wad, and then the bat is put on one side for a few hours. After a suitable interval the bat is taken up, and if there should be any small cracks in the surface they will show up in dark lines. Now these cracks should be attended to without delay, for if the bat is continually in use they will in time develop into a split, which means a little more trouble in repair. As a rule the cracks may be repaired in the following manner :—

Fig. 2.—Closing the crack by driving in a number of wooden pegs.

First of all, make a number of holes about ¼in. deep with a bradawl close to each side of the crack, as shown in Fig. 2. Now get a piece of hard wood, and by means of a sharp pocket-knife shave down some small pegs a little longer than the depth of the holes. Make the pegs so that they taper at the extreme end to just start in the holes. The pegs are driven well into the holes, which is best done by holding a hard wood block on the peg top, and hitting the block with the hammer. When the crack is drawn up in this manner the projecting ends of the pegs are cut off either by means of a sharp wood chisel or a pocket-knife. The repair is finished off by giving it a rub with a piece of fine-grade sandpaper.

Binding the Blade.

Perhaps you have been unfortunate in allowing your bat to develop a split in the blade; then, if so, the repair must be done by means of a binding. The pegs may be inserted close to the split in the manner described, and then the binding is done in the following manner :—

Obtain some fine cord and a piece of beeswax, and well rub a length of the cord with the wax. The cord is easily waxed if the piece of beeswax is allowed to rest in the palm of one hand, and then drawing the cord through the hand over the wax. This should be continued until the cord is well waxed.

The binding is a little tedious if done alone, but if you have a wooden bench vice the bat may be lightly held in this, which will give you both hands free. Commence the binding by laying about three inches of the cord along the back of the blade, as indicated at X, Fig. 3. Now hold this end in position, and start off by binding firmly and evenly round the blade. After a few turns, the end of the cord will be made secure and then you will have both hands to do the remainder of the turns.

Finishing off the Binding.

Do the binding in a thorough manner, taking care to pull the cord quite tightly round the blade, and with each turn close up but do not let any overlap. The binding is finished off in the following manner :—

Cut about six inches of the cord, and form a loop over the binding, as shown at Fig. 4. Now continue the binding for about another half-dozen turns, and then slip the end through the small loop as shown. Next place your hand firmly over the binding, and then pull the end under by pulling the ends of the loop together. Provided you do this by holding the binding quite firmly, the end will be made quite fast underneath. Carefully examine the finished binding, and if there should be any signs of a loose turn, it should be made firm by rubbing it down with the beeswax.

Fig. 3.—Repairing a split by binding the blade.

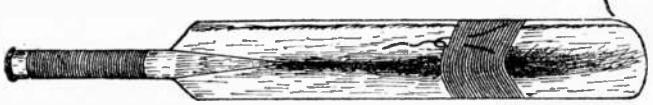
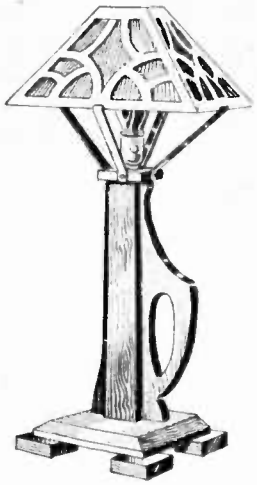


Fig. 4.—How to finish off the binding.



A PORTABLE ELECTRIC LAMP STANDARD

Any handyman can make this stand with a few odd pieces of fretwood and a fretsaw. Here is exactly how to do it.

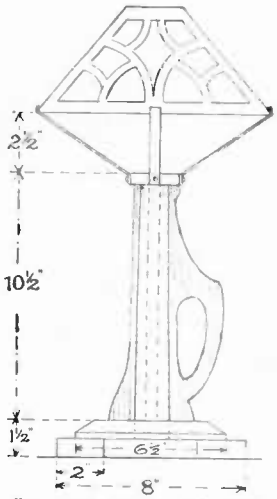


Fig. 1.—A side view with helpful dimensions.

HERE is a simple type of table electric lamp made of wood with a shade of stout cardboard. In making the base cut out a 6½in.-sided square in ¾in. oak and form ¾in. wide chamfers on the four top edges, as shown in Fig. 1. Now draw diagonal lines across the piece and set out the two mortises to take the uprights. These uprights (see Fig. 1) are four in number and when shaped and glued together form the centre standard of the lamp. Each piece is ½in. thick, and the mortises in the base will be thus ½in. apart. Drill a ⅜in. hole in through the centre of the base for the flex to pass through.

Glue four ¾in. thick corner blocks, 2in. square, allowing nearly an inch to project beyond the edges (see Fig. 1).

The Centre Column.

For the centre standard of the lamp (Fig. 2), two pieces A are required, and one each of B and C. Set out the shapes from the dimensions given, noting carefully that the extra projection at the feet of pieces A form the tenons. Cut the shapes with the fretsaw and glue together as shown in Fig. 3. Glue them into the mortises and see they stand properly at right angles to the base. To the top of the standard glue on and screw a piece of ¾in. stuff, 2in. square, with a central hole.

For the shade a sheet of fairly stout card will be required, 19½in. by 17½in. Prepare the pattern for one of the sides on a piece of stiff paper, 10in. by 6in. Set out 1in. squares on half this area and line in the shapes (see Fig. 4). Then trace off the design and transfer it to the other half of the paper by means of carbon paper. Allow an extra ½in. margin on the lower edge, as shown, for turning up later. Cut out the openings and outer shape with a sharp penknife.

Making the Shade.

Lay the large sheet of card flat upon a table and mark out the four sides (Fig. 5), commencing with A placed centrally on the card. It will be found that all the other three sides will fit properly on the sheet by simply moving the templet to fit along the sloping sides. Allow a half-inch margin of card all round and to the long edge of the last section, this being required for gluing. Cut the complete outline, turn up the lower margin and glue to the inside of the shade to give additional strength. Having completed the cutting-out, place the card on a flat table with the line to be bent exactly on the edge. Lay a flat ruler on the top of the card and proceed to bend down the card to the scored line. Glue the flap of the fourth section to the first, keeping the top and bottom quite even. A hole should be drilled in the four sides of the capping piece of the stand and four pieces of light brass or copper strip, cut 5in. long and about ½in. in width (see Fig. 1), fixed by screws. The shade will rest in notches formed in the tops of the supports. The electric bulb fitting will be screwed in the capping and the wire carried up to it through the centre.

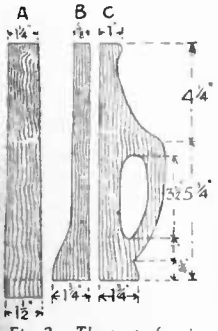


Fig. 2.—The parts forming the central hollow column.

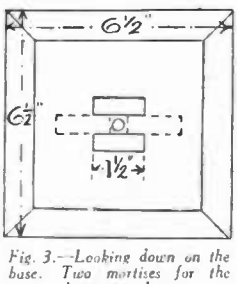


Fig. 3.—Looking down on the base. Two mortises for the column are shown.

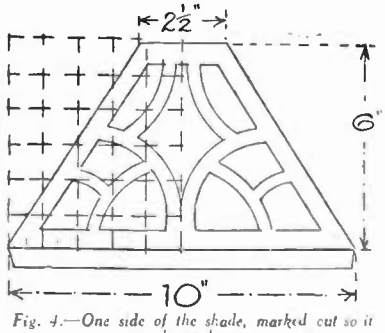


Fig. 4.—One side of the shade, marked out so it can be re-drawn.

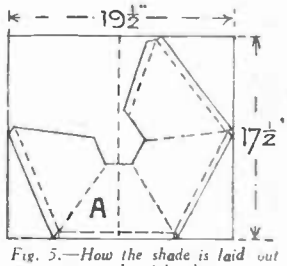
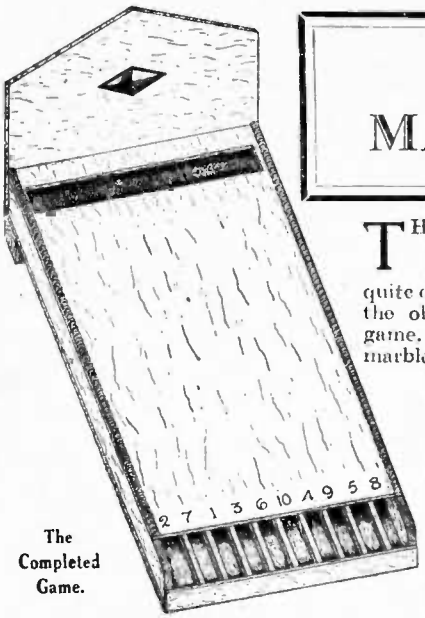


Fig. 5.—How the shade is laid out to get the right shape.

A New Kind of MARBLE ALLEY

A game that is different from the ordinary one you play. It is worth making up as set out here.



The Completed Game.

THE marble alley illustrated is quite different from the older kind of game, where the marble is rolled on a board into holes at the back with a series of spikes in front as hazards. A glance at the illustration will convince the reader that a good deal of fun is to be obtained from the game, since the marble is rolled up the board and disappears in the slot at the back. The score is decided by the marble rolling into one of the divisions and reappearing in the front. You may decide to try for a ten only to be greatly surprised if the marble turns up in division one or two. The alley is quite straightforward to make, and should be undertaken in the following manner:

The Base Board.

Commence by making the bottom piece indicated in Fig. 1. Cut a piece of ¼in. wood 2ft. long by 8in. wide, and take care to get the sides nice and square. On one end of the wood mark a distance of 1in. from either side, and then make marks ¾in. apart between this distance. On the marks thus made, neatly glue nine strips of ¼in. by ½in. stripwood 1ft. 4in. long parallel with the sides and with ½in. width facing upwards, this being clearly shown in Fig. 1. All glue must be removed from the face of the channels thus formed in order to provide a clear way for a small marble to roll.

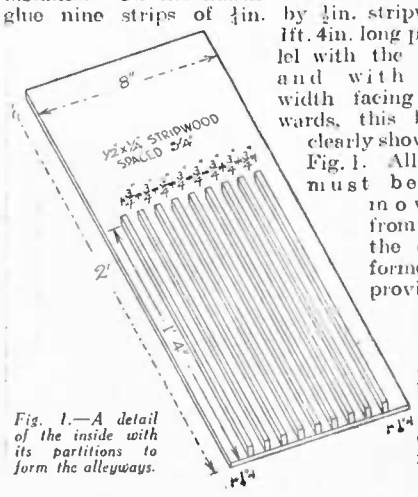


Fig. 1.—A detail of the inside with its partitions to form the alleyways.

Two side pieces are cut from ¼in. by 1in. stripwood, each piece being cut 1ft. 11 13/16in. long with one corner of each rounded off. The sides are fixed on the top edges of the base with glue, taking care to allow a gap of 3/16in. at the end to take the back piece. The front strip required is a piece of ¼in. by ½in. stripwood 8in. long. Fix this neatly to the front with a couple of small nails driven through into the front of the side pieces. Due attention should be paid to the back, which will be all the more pleasing if one of Hobbies wooden ornaments is fixed. First cut a piece of 3/16in. wood 8in. by 6in. and angle one end down to 4¼in. as indicated in Fig. 2. The dotted lines in the centre show the position of the diamond ornament (No. 207) which is a raised diamond, 4in. long by 1¾in. wide. The diamond is fixed in position with glue, and then the completed back is fixed with a few small tacks driven through into the back ends of the side pieces. The top of the alley is illustrated in Fig. 3, and this is cut 1ft. 10in. by 8in., taking care to get the sides square. A distance of 1in. from one end cut an opening 7½in. long by ¾in. wide.

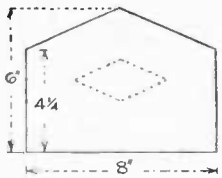


Fig. 2.—The size and shape of the back.

S	I	L	I	C	A	■	I	T	A	L	I	C
C	■	■	C	A	B	I	N	E	T	■	■	O
R	■	A	E	R	O	■	L	E	E	S	■	T
E	B	B	■	D	U	M	A	S	■	E	F	T
W	R	E	N	■	T	A	Y	■	P	A	R	E
S	A	T	I	N	■	R	■	B	O	R	E	R
■	Z	■	H	O	B	B	I	E	S	■	T	■
P	I	P	I	T	■	L	■	G	E	S	S	O
L	E	A	L	■	T	E	A	■	R	E	A	P
A	R	C	■	D	U	S	T	Y	■	A	W	E
Q	■	K	H	A	N	■	O	A	R	S	■	N
U	■	■	I	D	E	A	L	L	Y	■	■	L
E	D	I	T	O	R	■	L	E	E	W	A	Y

This is the correct solution to the Cross Word Puzzle in our Competition Page of April 25th. The name of the winner has already been announced.

The Alleyway Slopes.

Smooth the face of the top with sandpaper, and fix it in position, with the opening at the back, by means of a few tacks on each edge of the sides. The alley is completed by gluing a length of 3/16in. half-round beading along the top edges of the sides, as shown in the finished game. In order to give a slope to allow the marble to roll down with ease, a foot, 8in. long by 1in. thick by ½in. wide, is glued on the bottom at the back. The top edge is cut with a slight taper to allow the foot to bed nicely on the bottom. A coat of stain should be applied, which will add a nice appearance to the finished alley. When playing the game the small marble used should be able to roll down between the stripwood easily.

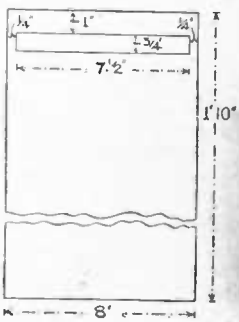
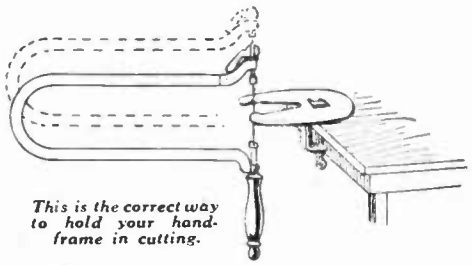


Fig. 3.—The top has a slot cut in to allow the marbles through.

Do you hold your fretsaw correctly?

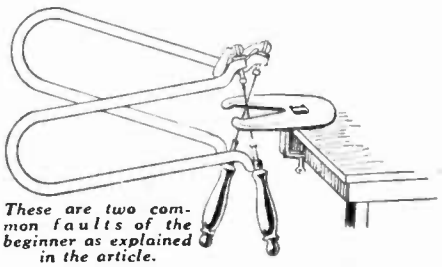
FRETWORK competitions always reveal one of the common faults of the beginner, and it is always easy for the judges to see where a fellow has not been doing his work properly. When you first have a fret-



This is the correct way to hold your hand-frame in cutting.

work handframe, it seems to be heavy at the back, and the steel arms may have a tendency to drop. This may be because you are endeavouring to use a handframe of too large a size. They are obtainable, remember, in various dimensions, from 12in. to 20in. The young beginner should choose a fairly short frame—about 12in. or 14in. is long enough—and get used to holding it correctly before attempting to use a large one. The only occasions, indeed, when the 20in. frames are used is when exceptionally large work is being undertaken, when the parts cut demand a wide sweep.

This, then, is one of the causes of bad cutting—using a frame too large and too heavy. This fault not only tends to make the wrist ache, but is liable, also, to make the frame drop at the back. This throws the sawblade out of upright, and, in consequence, a slanting cut is made in the work. With the frame held correctly, the sawblade runs up and down in a vertical stroke, and cuts the wood the same through all its thickness. If the frame



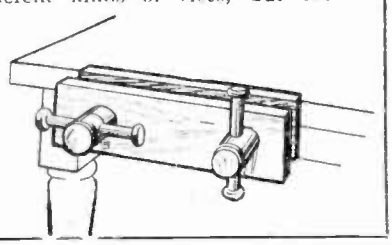
These are two common faults of the beginner as explained in the article.

is sloping backwards, on the other hand, the part of the blade which meets the underside of the wood, makes a cut a little in front of that on the top. In consequence, the cut-out pattern beneath the wood is a little larger.

The FRETWORKER'S A B C *(concluded)*

V VICES

There are many different kinds of vices, but the Bench Vice illustrated is probably the most generally useful. It costs only 2s. 3d., and can be screwed to a bench or table easily. It has a double cramp to get a firm grip of the wood, and is an essential to good work.



W WOODFILLER

Woodfiller must be used to fill the grain of wood before it is polished or stained. It is usually a composition of plaster of paris and turpentine, used in the form of cream. The Hobbies Woodfiller is sold in tins ready for use, and is rubbed into the grain with plenty of elbow-grease, and the superfluous flakes left over wiped away with a cloth.

We could not find suitable requirements beginning with Q, U and Z. Perhaps a clever reader can suggest something applicable.

X XYLONITE

This is a thin composition like stiff celluloid, but with a black polished surface. It is easily cut with the fretsaw, and particularly suitable for small distinctive overlays and ornaments. Supplied in panels 12in. by 6in.

Let Your Editor Help You. Address your letters and queries to The Editor, "Hobbies," Geo. Newnes, Ltd., 8-11, Southampton Street, Strand, London, W.C.2, enclosing a stamped, addressed envelope. All letters and queries must bear the full name and address of the sender.

Our Model Making Competition.

I MENTIONED last week that I had concluded arrangements for another model-making competition, and I may now disclose that the model will be of the White Star Line M.V. *Britannic*. This fine ocean-going liner particularly lends itself to the production of an attractive water-line model. For the best models submitted a motor cycle and hundreds of other prizes will be awarded. The competition is free, and there is nothing to buy. The design from which the model is to be made will be printed in HOBBIES, and next week I will announce the exact issue in which it is to appear. By the way, full instructions will be given in the paper explaining how the model is to be erected.

Another Puzzle Picture Competition.

IN this week's issue the promised Crossword Puzzle appears. Picture Puzzle enthusiasts, however, will be interested to learn that I have already prepared another series of Puzzle Pictures, and these will be published shortly. There will be the same lengthy prize list as before.

Interesting Letters.

AT the risk of being accused of tergiversation (hope you get that word right, Mr. Printer!) I want to repeat that I am awarding books or silver pencils for the most interesting letters I receive each week. The books are to be selected from George Newnes', Ltd., list, should the competitor elect to have a book instead of a silver pencil.

Queries by the Hundred.

QUERIES on almost every conceivable subject continue to arrive at my office. The more the merrier! The purpose of my technical staff is to assist readers out of their difficulties. I want you to feel that there is real service behind HOBBIES. It is forty years since No. 1 of this paper first saw the light of day, and for that period our pages have been designed to instruct the amateur and home mechanic in all the practical arts and crafts as well as in hobbies which are purely aesthetic. I was not, of course, in the editorial chair when No. 1 went out to the public, but my files bear ample testimony to the range of subjects covered. The parents of many of you who read these notes will probably admit that they learned a great deal from this journal, even as you to-day, I hope, are doing. So let your queries continue to pour in. Write to me as often as you can; for I am anxious to continue the personal relationship which now exists between Editor and Reader.

NEXT WEEK.

FREE DESIGN CHART FOR A MODERN WEATHER COTTAGE

MAKING A SUNDIAL

A HOME-MADE BATTERY

AN ÆOLIAN HARP

LEATHER TOOLING

CHEMISTRY FOR AMATEURS

Model Aeroplane Topics—Stamps — Electrics — Model Making—Cycling Notes, Etc.

A Model Hot-Air Engine.

IN next week's issue the promised article on the construction of a model hot-air engine will definitely appear. It has been designed by an expert and I can assure you, works extremely well.

QUERIES AND REPLIES.

Ilford and District Model Railway Club.

Mr. R. L. Riddle, at 1,039, Romford Road, Manor Park, London, E.12, asks us to state that he has started a club under the above title, and would like all local readers interested in the subject of Model Railways to get into touch with him.

White Paste for Canvas Shoes.

J. H. (Bristol) wishes to know how to make white paste for canvas shoes. Scrape pipeclay into a saucer, add a few pieces of oxalic acid and a very small portion of washing blue, and then pour on warm water until the paste is of the required thickness. If a paste of not quite such a dead white is desired, scrape in a little buff-ball after the oxalic acid has dissolved. In using the paste well rub it into the shoes, allow to dry, rub out, and lightly brush.

Making Metal Polish.

Recipes for metal polish are innumerable, L. M. (Worksop), but the following is guaranteed to be satisfactory. In a high-class polish for silver and similar metals the essential ingredients are silica (the abrasive), tin peroxide or putty powder (the polishing medium), and a vehicle such as petrol, etc. The silica and putty powder must be absolutely dry and in a state of chemical fineness or infinite subdivision. Equal quantities are mixed together and then stirred into a warmed mixture of 12oz. solid paraffin (candles), 4oz. of naphthalene (albocarbon), 2oz. of beeswax, 1½pt. of paraffin oil, and 6oz. of turpentine. Make the wax mixture first, and correct its consistency by adding more solids or more liquids as may be required. Test the finished polish, and add more polishing ingredients or more vehicle, until the best results are obtained. For ordinary metals, such as brass and copper, use, instead of the polishing ingredients already mentioned, flour emery, in the proportions of 1 part or 2 parts of emery to 4 parts of the vehicle already given. For liquid polishes, merely increase the proportions of the paraffin oil and turpentine. The maker of metal polishes may find it worth while to experiment with other vehicles, including petrol, turpentine substitute, olein, etc., and with other polishing media, such as tripoli powder, rotten-stone, crocus, etc. A secret of success is to reduce the polishing media to impalpable powder and to wash it, by the principle of levigation, to remove all grit.

Power for Model Aeroplanes.

A model aeroplane requires a quarter of its total weight in propeller thrust to fly it, A. B. (Bournemouth), so that if your model weighs 6oz. you will require 1½oz. propeller thrust. You can measure the propeller thrust by suspending the model on a spring balance, fully winding the elastic and releasing it, noting the difference between the weights registered before and after releasing the airscrew. This difference is, of course, the static thrust. The dynamic thrust, that is to say, the thrust developed when the model is in motion, differs from the static thrust owing to airscrew slip, etc., but the static thrust is a fairly accurate guide.

Cutting Metal with a Fretsaw.

Yes! L. O. (Darlington), it is quite possible to cut sheet brass with a fretsaw. Place a piece of oiled blotting-paper above and below the piece of brass to be cut, and then clamp this between two thin pieces of fretwood, nailing these together. The design to which the sheet brass is to be cut should be drawn or pasted on the wood.

Motor-Cycle Queries.

The smallest motor-cycle made, K. D. (Doncaster), is a French machine of only 75 cubic centimetre capacity. These are not obtainable in England. There are seventy-three different makes of British motor-cycles, and forty-three British dirt tracks.

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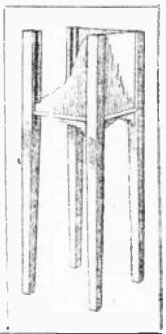

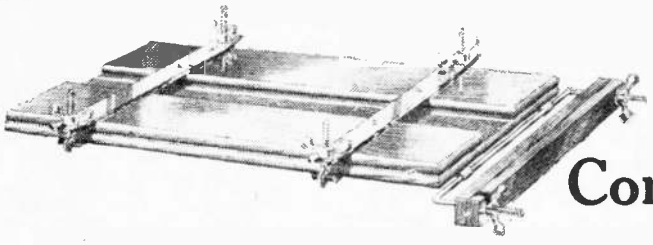

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