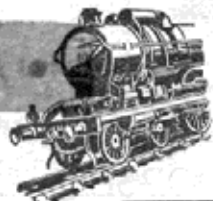


A2

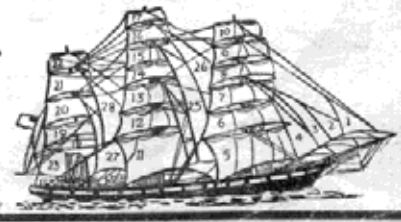


EVERYDAY  
THINGS YOU WANT  
TO KNOW



- SHIPS —
- TRAINS —
- AEROPLANES —
- TELEPHONES —
- CARS —

Published by  
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W.C.2



To—  
**THE FELLOW WHO OBSERVES!**

**H**AVE you ever been for a walk with someone who is a trained observer? If you have you will know how really enjoyable such an outing can be.

Lord Baden Powell, the Chief Scout, is a grand observer. To go for a half-hour's walk with him is to fill every one of the 1,800 seconds with something of interest. Have you noticed how in his writings he describes the things he has seen so accurately and vividly?

It is because he has trained his powers of observation and has developed a habit of finding out the meaning of the everyday things with which he comes in contact. In this way he has acquired great knowledge. And, what is more, he has developed his memory so that he does not readily forget the things he has learned.

I advise you to make a habit of discovering the meanings of things, for it will help you to follow in the Chief's footsteps. If, for instance, you come across a peculiar sign that you have never seen before, make a rough sketch of it, and then go on asking people until you find someone who can tell you what it means.

In this little book, of a size made specially to fit your pocket, you are given a collection of useful information about things you will come across day by day in your travels.

F. HAYDN DIMMOCK,  
Editor, *The Scout*.

# RAILWAYS

## THE RAILWAY SIGNALING SYSTEM

ALTHOUGH colour-light signals are now coming into use on some of the busier sections of our railways, the majority of the systems are still signalled by the familiar semaphore type of signal, and it is interesting to know just what these signals mean.

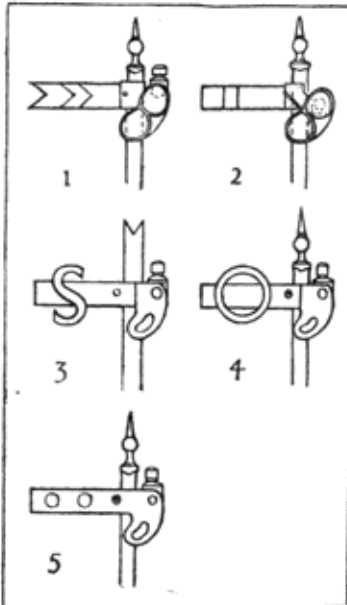
No. 1 in the diagram is the Distant Signal, and is a *caution* signal only. It is the first signal to be reached by a train approaching a signal box, and has a fish-tailed arm which distinguishes it from all other signals.

It informs the driver as to the state of the line ahead, and is the only signal which can be passed when its arm is in the horizontal ("on") position. If the "Distant" is off, then the driver can continue at his usual speed, but if it is on, then he must begin to slow up, for he knows that the next signal will be against him.

No. 2 in the diagram is the type of signal used as a Home, Starting, or Advanced Starting signal, all of which are "Stop" signals.

The Home signal must not be passed when at danger, and it serves to stop a train clear of junctions with other lines, and also clear of any train in the next section of line ahead.

The Starting signal controls the entrance of a train into the



next section of line ahead, and is placed in such a position that any shunting, etc., can be carried out without having to pass it.

Sometimes an Advanced Starting signal is placed about a train's length ahead of the Starting signal. This is for cases such as where there is a cross-over track or other points ahead of the Starting signal.

No. 3, as can be told from the "S" on its arm, is a Shunting signal, No. 4 is used for sidings, and No. 5 is a Backing signal.

#### TESTING THE NEW LOCO.

**H**AVE you ever seen a locomotive with its front boxed in like the one in the sketch?



When a new railway engine has been built, it has to undergo test runs pulling a load, and various measurements are taken recording the engine's performance at all speeds.

In connection with these tests, engineers have to ride on the front footplate of the loco, so it is boxed in to protect them, and assist in their making accurate records.

#### HOW THE TRACK IS LAID.

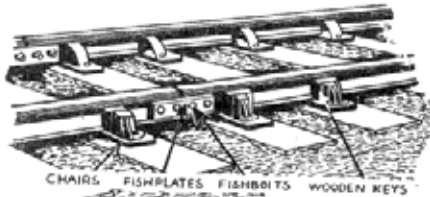
**T**HE diagram on this page will show you in detail how a railway track is laid down.

The sleepers are usually of seasoned and creosoted pine wood. Underneath each chair is a pad of felt, not visible in the sketch.

Rails are made of rolled steel, and each length of rail weighs about 12

cwt. At each place where the lengths of rail are joined, a space of about a quarter of an inch is left between the rails to allow for the expansion of the metal.

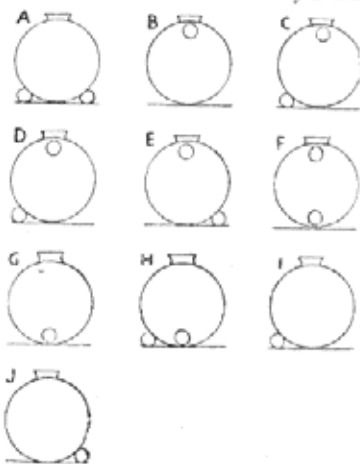
The wooden keys marked are used for wedging the rails in place in the chairs.



## WHAT THE LOCO HEADLAMPS MEAN

**A** SPECIAL series of engine headlights is in use on all railway routes except the Southern, by which the arrangement of lamps indicates to a signalman the character of the train approaching him.

The picture shows the different arrangements of lamps, and here are the classes of trains to which they refer :



- A. Express Passenger.
- B. Ordinary Passenger, and mixed trains.
- C. (or as D) Livestock or perishable traffic trains (coaching stock), and express freight trains (stock fitted with vacuum brake).
- D. (or as C) Trains of empty coaching stock.
- E. Livestock or perishable traffic trains (goods stock), and freight trains (Class A).
- F. Express livestock and freight trains (Class B).
- G. Light engines.
- H. Freight trains : through loads to destination.
- I. Freight trains : stopping intermediately.
- J. Ordinary freight trains.

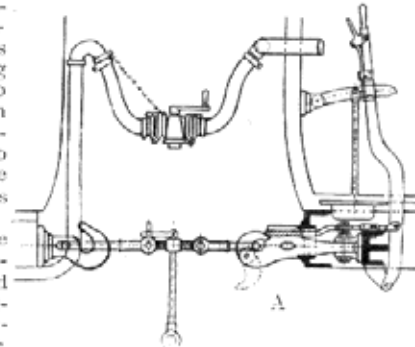
### THE "SLIP-COACH."

WHEN certain coaches in a train have to be "slipped" during a journey, they are naturally made to form the rear portion of the train, and are attached to the main part in the manner shown in the diagram.

On nearing the place where the slip is to be made, the engine driver gives a warning to a guard who rides in the front carriage of the section to be slipped.

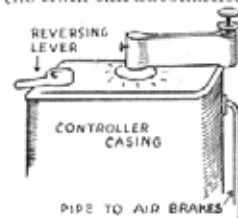
The guard disconnects the communication cord, and pulls back a lever causing the sliding bar (A) to drop. The vacuum brake and train-heating pipes are also disconnected, and the two ends of the pipes automatically seal up.

The speed of the slipped coaches is reduced slightly, and they run into the platform, the guard applying the automatic brake.



### THE DEAD MAN'S HANDLE.

THIS ingenious safety device is a familiar and necessary apparatus in many electric trains. It ensures that in cases where there is only one man in the driver's cab—the motorman—the train can automatically be brought to a standstill should he be taken ill.



The controller handle is provided with a spring top, which the driver must keep pressed down. Directly the handle is allowed to rise, the current is interrupted and the brakes applied.

This device thus provides a wide margin of safety, as any faintness or other illness would cause the driver to release his pressure.

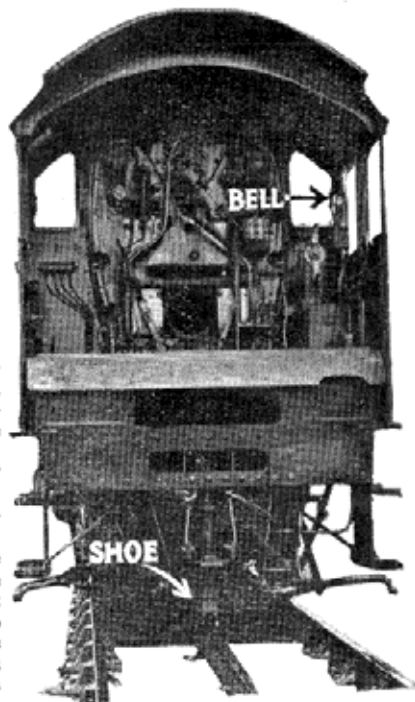
## This is How They Make Accidents Impossible.

A SYSTEM of automatic train control has been in operation on the G.W.R. for some time now which is designed to make accidents in the way of collisions almost impossible.

To prevent the Distant signals (which warn him to slow up) being missed by the engine driver, the automatic system gives him *audible* signals in the cab of the loco corresponding to the position of the ordinary signals.

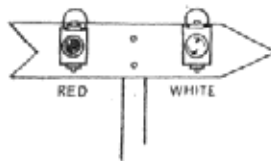
A ramp or third rail is fitted between the ordinary rails some distance ahead of the Distant signal, and is connected electrically with the signal-box controlling the signal. On the engine there is a bell, an automatic braking attachment and a siren, all of which are connected to a "shoe" fitted underneath the engine. When the engine is travelling at speed it must pass over the ramp before the signal is reached. As it does so the "shoe" makes contact with the ramp.

If the Distant signal is off, the bell in the cab rings, but if the signal shows danger, then the siren first sounds a warning, while if the driver does not slow up, the brakes are automatically applied.



*The Automatic Signalling Apparatus.*

### DRIVERS—GO SLOW!



A BOARD shaped as in the sketch may sometimes be seen by the side of railway lines.

It is used to warn engine drivers that men are working on the line about half a mile ahead, and consequently they must reduce speed to within ten miles an hour.

The two lamps, one red and the other white, are lit at night.

### FINDING THE TRAIN SPEED.

IT is very interesting, and sometimes very handy, to be able to tell the speed at which the train you are in is travelling. Here is a simple way of calculating it:

You have all noticed the little distance posts which are set along the line every quarter of a mile, showing the distance from the London terminus of the railway. If you measure the number of seconds the train takes to pass from one post to the next ( $\frac{1}{4}$  mile), and then divide this number into 900, you will have the speed of the train in miles per hour.

For instance, if the train takes 15 seconds to travel the  $\frac{1}{4}$ -mile, then the speed of the train is  $\frac{900}{15}$ , or 60 m.p.h.

$\frac{900}{15}$ .

### FEED-WATER HEATING.

YOU will probably see several locos about nowadays like the one in the sketch, which has a sort of "hump" on top of it. They are mostly to be seen on the L.N.E.R.

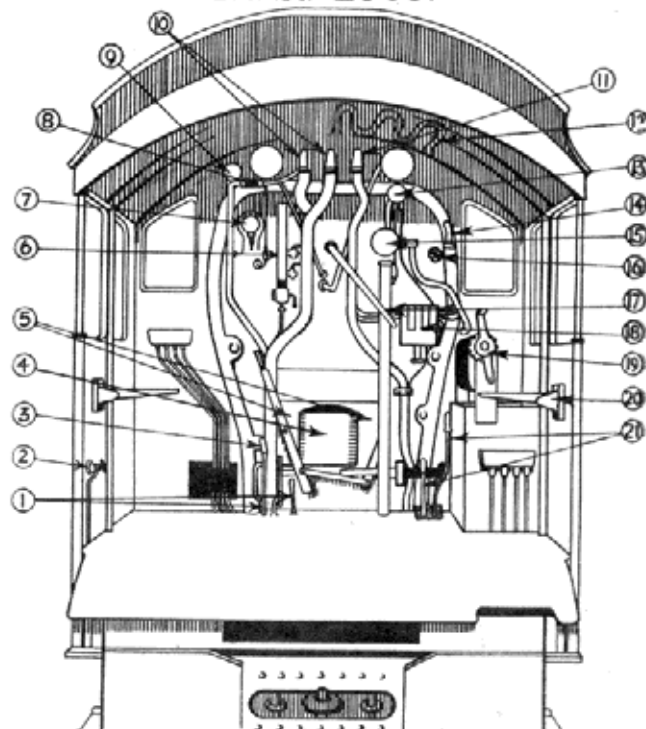


This hump is used for a new process called Feed-water Heating. In ordinary engines, *cold* water is fed into the boiler, but in the hump engines the cold water is mixed with the hot exhaust steam (which in ordinary locos is wasted), and the steam condenses in the hump and gives heat to the cold water.

In this way partially-heated water is pumped into the boiler, with a consequent saving in coal-consumption.

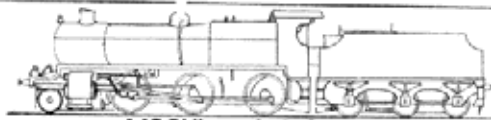


CAB AND CONTROLS OF A "CASTLE"  
G.W.R. LOCO.

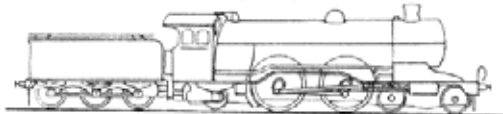


- 1, Damper Controls; 2, Coal Watering Cock; 3, Exhaust Injector Control; 4, Flap Plate; 5, Firchole Doors; 6, Water Gauge; 7, Steam-heating Pressure Gauge; 8, Steam-heating Valve; 9, Boiler Steam Pressure Gauge; 10, Exhaust Injector Live Steam Cocks; 11, Right-hand Injector (Steam); 12, Condensing Pipes for Lubricator; 13, Vacuum Gauge; 14, Ejector Steam Valve; 15, Ejector Air Valve; 16, Blower Valve; 17, Regulator Handle; 18, Lubricator; 19, Reversing Handle; 20, Tip-up Seat; 21, Sanding Gear Levers.

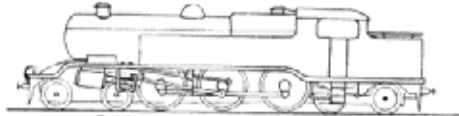
HOW LOCO. WHEEL ARRANGEMENTS ARE NAMED.



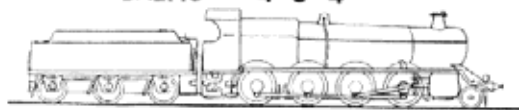
MOGUL 2-6-0



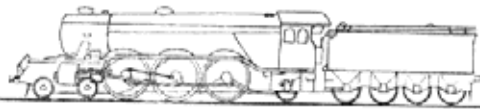
ATLANTIC 4-4-2



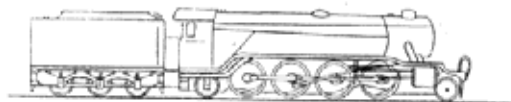
BALTIC 4-6-4



CONSOLIDATION 2-8-0



PACIFIC 4-6-2



MIKADO 2-8-2



AN ARTICULATED LOCO 4-4-2-2-4-4

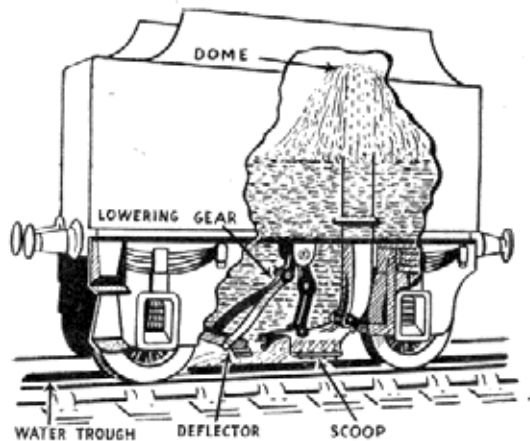
## Here's How the Loco Can— PICK UP WATER AT FULL SPEED

ON most of the big non-stop railway runs water troughs have been laid down at various intervals along the line in between the rails. This is so that the engine can pick up water while the train is travelling at full speed.

In the diagram you can see the apparatus which enables this to be done.

The troughs are laid on an absolutely level stretch of track from quarter to half a mile in length, and they hold about 6,000 gallons to the quarter-mile.

When the engine approaches the trough, the fireman lowers the scoop by means of a screw gear seen in the diagram. Just before the trough begins, the line dips slightly, so that the scoop is made to cut into the water.



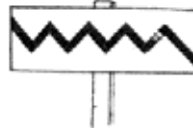
The water rushes up the pipe, which is hinged to the scoop, and, meeting the dome at the top of the pipe, is flung down into the tank. It is obvious at once that no water can be forced up the pipe unless the train is travelling very fast—in fact, a minimum

speed of 40 m.p.h. is necessary for picking up any water.

An indicator warns the fireman when the tank is full, and he must then lift the scoop immediately, or the overflow may flood the footplate.

The "Deflector" shown in the diagram is placed there for the purpose of directing the water straight into the scoop, so that as little as possible is spilt from the trough.

The fireman is warned of the approach of a water trough by a white board bearing a black zigzag line (as in the illustration) which is set up by the side of the track.



#### HOW THE SLIDING DOORS WORK.

**I**F you have travelled on the Underground Railways you will have seen the sliding doors of the trains which open and shut seemingly of their own accord.

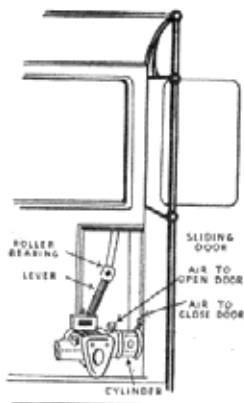
By the diagram you can see how these robot doors are operated. If you get into the last coach of a "Tube" train, you will find that when the train stops, the guard, who rides in this coach, presses a button on a control panel.

This closes a switch and allows an electric current to work a valve which lets air under pressure to go into a cylinder. The air moves a piston rod, which turns a pinion, and this moves the arm which opens the doors.

When the train is ready to proceed, the guard presses another button, and the doors are closed after the same manner.

An electric signal tells the guard when each door is securely closed, and only when every door has registered its "shut" signal can the guard press a third button on the switchboard and signal the driver to proceed.

The mechanism of this driver's signal will not operate until all the doors are shut, so there is no danger of the train starting with the doors open.



## THE SEA

### TELLING THE TIME AT SEA.

ON ships each twelve hours is divided into three watches of four hours each, each watch being divided into eight half-hours by bells. The watches are as follows:

*Noon to Midnight:*

Afternoon watch (noon to 4 p.m.)

Dog Watches (4 p.m. to 8 p.m.)

First watch (8 p.m. to midnight)

*Midnight to noon:*

Middle watch (midnight to 4 a.m.)

Morning watch (4 a.m. to 8 a.m.)

Forenoon watch (8 a.m. to noon)



A ship's day commences at noon, and there are seven watches. The "dog watches," made by dividing the watch between 4 p.m. and 8 p.m. into two, make the seven watches.

The reason for this is so that the watch which is on duty in the forenoon one day has the afternoon next day, and the men who have four hours' rest one night have eight hours' the next. It stands to reason that if this change were not made, it would affect the health of the men, as there would be one section of the crew which always had the unpopular "Middle Watch" from midnight to 4 a.m.

In the ordinary course of events one bell strikes at half-an-hour after the change of watch, two bells an hour after, and so on up to eight bells. The Dog Watches differ, however, the half-hours from 4 p.m. to 6 p.m. being marked by one bell, two bells, three bells and four bells. Then from 6.30 p.m. onwards the order is one bell, two bells, three bells, eight bells.

One bell in the afternoon watch is 12.30 p.m., two bells is 1.0 p.m., three bells is 1.30 p.m., and so on, up to eight bells, when the next watch starts. A single bell is struck a quarter of an hour before eight bells in order to give the watch below warning that it is their turn to come on deck.

Many Sea Scout Troops have a ship's bell hung in their headquarters and keep ship's time on it, and there is no reason why Land Scouts should not do so as well. One point to remember is that the strokes on the bell are given in pairs. For instance, eight bells is struck in this fashion: one-two, three-four, five-six, seven-eight, with a slightly longer interval between the pairs. When there is an odd number of bells, the odd one is sounded last.

#### HOW'S THE TIDE?

WHEN you are by the sea, you may often want to know the state of the tide—whether it is flowing or ebbing, or how many hours it is since high or low tide. These few hints may help you.

You will know which direction is up-coast and which is down-coast, and hence a study of anchored vessels near by will tell you the direction of the current. A vessel riding at anchor will swing head to the current, and will therefore show you whether the tide is coming in or going out.

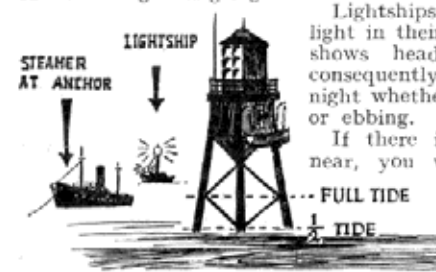
Lightships have a fixed white light in their bows which always shows head to current, and consequently you can tell at night whether the tide is flowing or ebbing.

If there is a pile lighthouse near, you will see a diamond shape between the piles and underneath the more solid part of the structure. This

is a tide-gauge, and is visible at great distances.

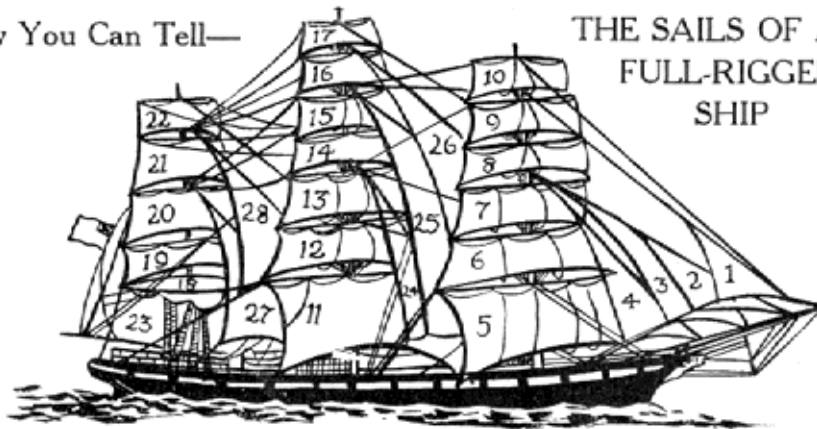
When the water is up to the half-line of the diamond shape it is full tide. If the surface of the water is just touching the lowermost tip of the diamond it is half-tide. The distance between half-tide and low-tide is, of course, the same as the distance between full-tide and half-tide, and this you can easily judge.

The tide takes six hours to drop from full to low and six hours to rise from low to full. Thus you can estimate fairly accurately how many hours the tide has fallen or risen, and how many hours to go before the return.



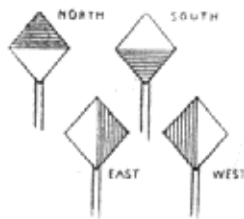
How You Can Tell—

### THE SAILS OF A FULL-RIGGED SHIP



- |                                |                                   |                                |
|--------------------------------|-----------------------------------|--------------------------------|
| 1. Flying jib.                 | 10. Fore royal.                   | 20. Upper mizen topsail.       |
| 2. Outer jib.                  | 11. Main sail, or main course.    | 21. Mizen topgallant sail.     |
| 3. Inner jib.                  | 12. Lower main topsail.           | 22. Mizen royal.               |
| 4. Fore topmast staysail.      | 13. Upper main topsail.           | 23. Spanker or Driver.         |
| 5. Fore sail or fore course.   | 14. Lower main topgallant sail.   | 24. Main topmast staysail.     |
| 6. Lower fore topsail.         | 15. Upper main topgallant sail.   | 25. Main topgallant staysail.  |
| 7. Upper fore topsail.         | 16. Main royal.                   | 26. Main royal staysail.       |
| 8. Lower fore topgallant sail. | 17. Main skysail.                 | 27. Mizen topmast staysail.    |
| 9. Upper fore topgallant sail. | 18. Cross-jack (here brailed up). | 28. Mizen topgallant staysail. |
|                                | 19. Lower mizen topsail.          |                                |

### COMPASS BEACONS.



THE diamond-shaped figures which you see in the picture, called "Compass Beacons," are to be seen at places which are dangerous to the sailor.

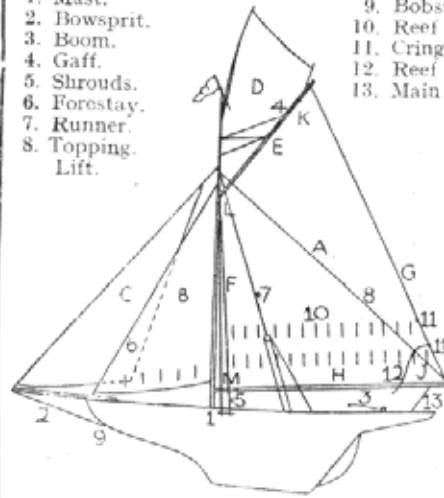
They are frames covered with canvas attached to a staff and coloured black and white, as shown. The first one signifies that it is safest for vessels to pass on the northward side of the dangerous

spot and the other three indicate that the south, east, and west sides respectively are the safest.

### THE RIGGING OF A CUTTER.

1. Mast.
2. Bowsprit.
3. Boom.
4. Gaff.
5. Shrouds.
6. Forestay.
7. Runner.
8. Topping.
9. Lift.

9. Bobstay.
10. Reef Points.
11. Cringles.
12. Reef Pennant.
13. Main Sheet.



- A. Mainsail.
- B. Foresail.
- C. Jib.
- D. Gaff Top-sail.
- E. Head.
- F. Luff.
- G. Leach.
- H. Foot.
- J. Clew.
- K. Peak.
- L. Throat.
- M. Tack.



## SOME SAILING SHIPS' RIGS THAT YOU CAN EASILY RECOGNISE

SAILING vessels are still common sights round the British Isles, and every fellow should pride himself on his ability to spot and identify the different types. By studying the silhouettes here you will be able to recognise almost any rig you are likely to see round our shores.

Of course, the local fishing-boats' rigs vary a lot; they have various names, such as Yorkshire Cobble, Plymouth Hooker, Thames Bawley, but they are either luggers, ketches, yawls, sloops or ketches, whatever their local name.

All sailing-craft are divided into two main classes—the square rig and the fore-and-aft rig craft. Square-riggers, usually called "windjammers," are a fast disappearing type, but the few survivors include the barquentine, barque, and full-rigged ship. They are mostly owned by Scandinavian companies, but sometimes call at British ports with cargoes of grain from Australia.

Fore-and-aft rigs are much more common, and are divided into five main classes. They can be defined by the number and size of their masts and the set of their sails.

Sloops and cutters both have a single mast, but sloops have only one head-sail (a triangular sail set in front of the mast). Yawls and ketches have two masts, in each case the forward



mast being the larger. The mizzen (aftermost) mast in a yawl, however, is much smaller than in a ketch, and this is the main difference. The old definition used to be that the mizzen mast of a yawl was set aft of the rudder post and that of a ketch forward.

Nowadays, many boats have a wheel instead of a tiller; the proportion of the masts decides the rig.

Schooners are not so commonly seen as the previously mentioned rigs, but there are still a number about. They can be recognised by the fact that the fore-mast is only slightly smaller than the one immediately after it.

Schooners may have anything up to six masts; in fact, one American boat had seven; but two and three masts are the rule round the British Isles. Although many schooners have square topsails, this does not make them square-riggers, as the majority of their sail area is aft of the masts.

It will be seen that the lugger is really a ketch, and the sprit-sail barge a yawl, only the cut of the sails is different.

Barques are square-rigged on the fore- and main-masts, barquentines on the fore-mast only, and ships are square-rigged on all three masts. A four-masted barque is square-rigged on all masts except the mizzen.

#### CONES GIVE GALE WARNINGS.

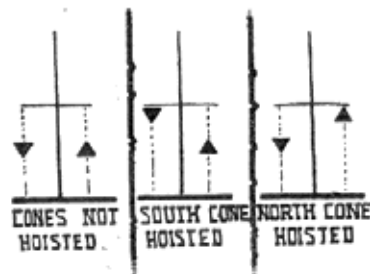
**I**N most important seaport towns you will see big black cones which are hung at the yard-arms of flagstuffs on piers and harbour walls so that they are visible to all outgoing seamen.

These cones are hoisted as a sign that there is likely to be a gale, the direction of the winds being indicated by the positions of the cones on the yard-arm. The "north" cone has its apex

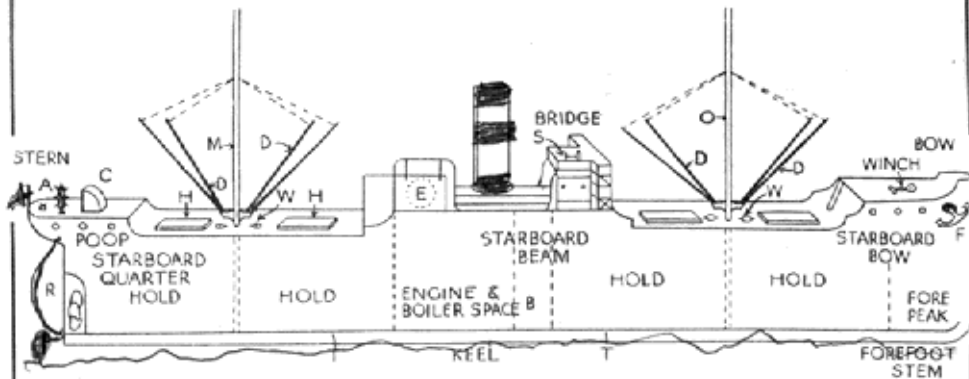
uppermost, and the "south" cone has its apex downwards.

If a gale is expected from the south-west, the south cone will be hoisted on the western yard-arm. Or if a north-east gale is expected, the north cone will be hung on the eastern yard-arm.

At night time small lights are fixed to each corner of the cones.



## STEAMSHIP NAMES THAT YOU SHOULD KNOW



- |                   |                         |
|-------------------|-------------------------|
| A. Handwheel.     | M. Mainmast.            |
| B. Coal Bunker.   | O. Foremast.            |
| C. Companion.     | P. Propeller.           |
| D. Derrick.       | R. Rudder.              |
| E. Donkey Engine. | S. Steamwheel.          |
| F. Forecastle.    | T. Water Ballast Tanks. |
| H. Hatch.         | W. Winch.               |

#### NO ROOM!

A SIGNAL which is readily understood by the North Sea fishing fleet is very often employed by fishermen there.



Sometimes the fleet encounters vast shoals of herrings, and if a boat finds it cannot take in all the catch a basket is hoisted to the mast-head as a signal to the rest of the fleet.

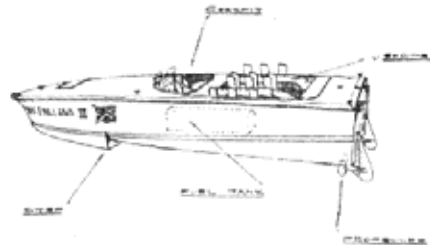
The less fortunate boats proceed to the spot and haul in the "superfluous" nets of fish, retaining the fish as their own property and restoring the nets to their original owner.

### THE SPEED BOAT WITH A SURF-BOARD

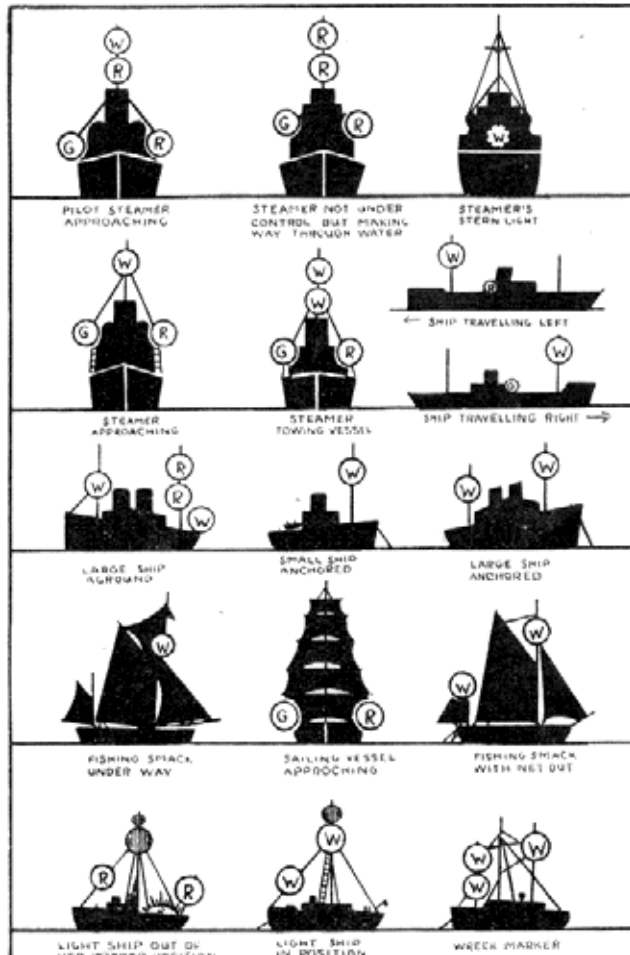
#### SPEED SECRET OF MISS ENGLAND III.

**M**ISS ENGLAND III, Lord Wakefield's famous speed boat, is really a hydroplane touching the water in two places, under the step and at the stern.

The "step" was invented by an English clergyman sixty years ago. The bottom of the hull is not in one continuous sweep, but the line is cut roughly halfway to form the forward step, so that the bottom of the boat looks like a loaf of bread with half a slice cut off.



When travelling slowly, terrific power is needed to drive the boat through the water, but as speed is gained she is gradually lifted higher and higher by the resistance of the water, until she planes over the surface like a surf-board.



WHAT SHIPS' LIGHTS MEAN. C = Green, R = Red, W = White.

The  
PLIMSOLL  
LINE—

*FW—Fresh Water; IS—Indian Summer; S—Summer; W—Winter; WNA—Winter North Atlantic.*

Every British merchant vessel is required by the Board of Trade to carry a Plimsoll mark or Plimsoll line painted on both sides of the hull to show to what depth she may be loaded.

The actual mark is a circular disc of 12 ins. diameter, with a horizontal line 18 ins. long passing through it, indicating the load line assumed by Lloyd's Register. This is the summer load line of a vessel in salt water. The scale forward of it shows to what depth a vessel may be loaded in fresh water and in salt water in different oceans during different seasons. A ship cannot be loaded so heavily in rough winter weather as when mild summer conditions prevail.

#### WHAT'S THE BROOM FOR?

**I**F ever you see a broom tied to the masthead of a boat, it does not mean that someone has been playing a practical joke, but that the owner of the boat wishes to sell his craft.

It is not certain where or why this practice originated, but there are two feasible explanations. One is that a broom at the masthead attracts people's attention much more than a "For sale" notice would. Even people who did not know what the sign meant might, out of curiosity, ask the owner, and learning that the boat was for sale might be prevailed upon to buy it.

The other explanation is that in the old days when not many people could read a written sign, "For Sale" would convey nothing to them. So the owner of the boat, who himself was also probably unable to write, would hoist the broom to show that he meant to make a clean sweep of his boat, sails, oars and gear. The sign, being a fairly obvious one, was therefore kept in use even when everyone could read.





## Things Sailors Say

# “SEA SLANGUAGE”

THE Navy has a language almost entirely its own, and employs more nicknames than any other of the Services. Most of these explain themselves, but some are so old that it is hard to trace their origin. Here are a few unofficial titles by which the ship's officers are known :

CAPTAIN.—“The Skipper,” “The Owner,” or “The Old Man.”

COMMANDER.—“The Bloke” (by the sailors of the Lower Deck).

FIRST LIEUTENANT.—“Jimmy the One” or “Number One.”

GUNNERY LIEUTENANT.—“Gunnery Jack” or “Guns.”

TORPEDO LIEUTENANT.—“Torps.”

NAVIGATING LIEUTENANT.—“The Pilot.”

PAYMASTER.—“The Pay,” formerly called “The Purser,” hence he is

“The Pusser” to the Lower Deck.

CHAPLAIN.—“The Padre,” or “Holy Joe” (Lower Deck).

The various ratings are as follows: Carpenter—“Chips,” Gunner—“Wads” or “Blue Light,” Stokers—“Clinker Knockers,” Bluejackets—“Flat-feet” or “Matloes” (from the French *matelot*—a sailor), Boatswain—“Tommy Pipes,” Ship's Police—“Crusheers,” Master-at-Arms—“Jawnty,” Signalmen—“Bunting Tossers,” Sick Bay Stewards—“Poultice Mixers,” Wireless Ratings—“Sparks,” Marines—“Jollies” or “Leathernecks,” Blue Marines—“Bullocks,” Red Marines—“Turkeys.”

Some nicknames in the Navy are inseparable from certain surnames, unless, of course, the owner of the name has some characteristic or does something to warrant being “re-christened.” For instance, practically every Clark in the Navy is “Nobby,” Green is “Shiner,” England is “Nutty,” Giles is “Farmer,” Miller is “Dusty,” Martin is “Pincher,” Gentry is “Dewbin” and Watson is “Chumpy.”

Midshipmen are known as “snotties” in the Navy. The officers and men of the Service say that the reason for this name is that after the first few weeks at sea the midshipmen nearly always lose all their handkerchiefs, and the buttons on their sleeves are put there to stop the wearers wiping their noses on them. Although this is vigorously denied by all midshipmen,

the use of the name is common among themselves, and they would rather admit to the above explanation of it than be called "middies" by well-meaning old ladies and such.

"Monkey's Island" is the name given to the uppermost tier of a large vessel's bridge. The name was originally Monkey Island, or small island, as the word monkey used to be used as a diminutive among seafarers, in the same way that a monkey jacket is a small jacket. Midshipmen, however, seeing their superior officers up there, called it "Monkey's Island."

Now for some real sailor slang, starting with that most important article, food.

Years ago the men of the Merchant Service, and the Navy too, for that matter, had to put up with very coarse food, and it is only natural that a number of uncomplimentary nicknames should be given both to the food and to the one responsible for preparing it. Nowadays, even when the food in ships is as good as any, a number of nicknames are still in use.

Roast meat and potatoes is known as "schooner on the rocks" in the Navy, while roast meat is just "burnt offering." Canned meat used to be looked upon with suspicion by all seamen, and was duly christened "Harriet Lane" or "Fanny Adams," in memory of two women who were brutally murdered and cut up and put into trunks to avoid discovery.

Salt beef was always known as "salt horse." Tinned sausages are known as "bangers" in the Navy, and the untinned variety as "growlers." "Grog" is a sailor's term for rum. Up to the middle of the eighteenth century, rum was issued neat to the men of His Majesty's ships, but the watering of it was introduced by an Admiral Vernon. He always wore a cloak made of a material known as "grogam," so he was nicknamed "Old Grog," and the watered rum named after him.

The cook was invariably the most unpopular man aboard in the old windjammer days, and was usually known as "Slushy" or "the Doctor," this latter being a complimentary term. To call a man "the son of a sea-cook" was considered the greatest insult.

When a sailor is about to have a sleep he says that he is going to have a "caulk." If a man quarrels with his friend in the Navy, it is said that he has "parted brass rags" with his "raggie," as men working together polishing the same piece of brass may be supposed to be friends and "part brass rags" when a dispute arises. Having a second helping of food is known in nautical circles as "going round the buoy again."



## NAUTICAL TERMS YOU'LL WANT TO KNOW

Some Sea  
Technicalities



- AI.**—The highest grade in Lloyd's Register of Shipping.
- A.B.**—Able (bodied) seaman.
- ABAFT.**—Behind. Astern of.
- ABEAM.**—In a line at right angles to the ship's length; side by side.
- A COCKBILL.**—An anchor when hanging by only the ring; also the position of the yards when set at an angle with the deck.
- ALL IN THE WIND.**—Said of a sailing boat sailing too close to the wind and causing the sails to shake.
- ALL-A-TAUT.**—When a ship is completely fitted and everything is in place.
- AVAST.**—To hold fast. "Avast heaving" means stop heaving but hang on.
- BAKE POLES.**—No sail set.
- BATTEN DOWN.**—The hatches are kept covered with tarpaulins or gratings, and these are secured by means of battens. Hence the term "Batten down hatches."
- BEAM.**—Greatest width of a vessel.
- BENEAPED OR NEAPED.**—A ship is said to be beneaped when the tide does not rise high enough to float her.
- BINNACLE.**—The stand for the ship's compass.
- BILGE.**—The round of a ship's bottom.
- BLUE PETER.**—A blue flag with a white centre. When hoisted at the masthead it means that the ship is about to sail.
- CAT'S PAW.**—The ripple on the water made by a light breeze.
- CHECK.**—To ease a rope out. To stop progress.
- COAMINGS.**—Raised edge round the hatchways.
- COMPANION-WAY.**—Staircase leading below.
- DEAD LIGHT.**—Covering to open ports. Also fitted to side lights to prevent internal lights of a ship from showing outboard.
- DEAD WATER.**—The water close to stern of moving vessel.
- DERRICKS.**—These are booms attached to the mast, and serve the purpose of cranes for handling cargo.

**DODGER.**—Strip of canvas along the bridge of a steamer to protect the officer on watch from rain, sleet, etc.

**DONKEY ENGINE.**—Small engine for working windlasses, etc.

**DRAUGHT.**—Depth of a ship below the water-line.

**DRIVE.**—A ship "drives" when her anchors will not hold.

**FENDER.**—"Bumpers" of rope or wood to prevent scraping of vessel coming alongside a wharf or another vessel.

**FISHING A SPAR.**—To strengthen it by firmly lashing a smaller spar to it.

**FLARE.**—The overhang of a ship's upperworks forward.

**FLOTSAM.**—The cargo of a wreck that floats about.

**FREEBOARD.**—Height of a vessel's side above the water-line.

**GALLEY.**—The cook-house.

**GARBOARD STRAKE.**—Plates laid immediately next to the keel.

**GO ABOUT.**—To tack.

**GUNWALE.**—The upper edge of a ship or boat's side. (Pronounced "gunnel").

**HALYARDS.**—Ropes used for hoisting sails, yards, or flags.

**HANDSOMELY.**—Slowly and with care.

**HAWSE PIPES.**—Ports in bows through which the cables pass.

**HULL DOWN.**—This is said of a ship when only the masts or funnel are visible above the horizon, the hull being out of sight.

**JETSON.**—Cargo "jettisoned" or thrown overboard to lighten ship.

**JURY MAST.**—A mast temporarily erected in place of one which has been carried away.

**KEELHAUL.**—An ancient punishment at sea, which consisted of hauling a man under the ship's bottom with ropes made fast to the yardarms.

**KEELSON.**—The upper part of the keel inside a vessel.

**LAND FALL.**—Finding land when at sea. If land is sighted at the point calculated, the ship is said to make a good land-fall.

**LEEWARD.**—The direction in which the wind is blowing. The sheltered side of a vessel.

**LIST.**—When a vessel heels permanently to one side she is said to have a list.

**MARLINE SPIKE.**—A pointed steel tool used for making seizings and wire splicing. Not to be confused with a fid, which is a tapered piece of hardwood used for splicing rope.

**NEAPED OR BENEAPED.**—When the tide does not rise high enough to float a ship, she is said to be beneaped. A "neap tide" is one that does not rise or fall very much.

OFFING.—To seaward.

O.S.—Ordinary seaman.

PAINTER.—A light line used for securing a boat.

PORT.—Left-hand side of a ship as one looks forward.

PORTS.—Any openings in the ship's sides.

RATLINES.—Short lengths of small rope secured across the rigging to form a ladder.

SCUPPERS.—Openings along the edge of the deck for draining off seas that come inboard.

SHEER.—The rise of a ship's deck at the bow and stern above the midship portion.

SIDELIGHTS.—Lights, red for port and green for starboard, which all vessels, barring certain fishing craft, must carry when under way.

SOLDIER'S WIND.—A following wind that enables the ship to cover distances without tacking.

SOUNDING.—To find the depth of water under a ship by means of the lead line.

SPLICE THE MAIN BRACE.—To issue an extra allowance of rum (grog).

STARBOARD.—The right-hand side of a ship, as one looks forward.

THOLEPINS.—Wooden pins inserted in the gunwale of a boat for the oars to rest in. Metal crutches are more common.

THWARFS.—Seats in a boat, placed athwart ship.

In the stern, where they do not run across, they are called benches.

TUMBLE HOME.—Opposite of flare; the narrowing of the distance between the sides as they approach the deck.

UNDER WAY.—Moving through the water.

UNSHIP.—To remove.

UP AND DOWN.—Vertically. When the cable is vertically taut from the ship to the anchor it is said to be up and down.

WAIST.—The middle part of the upper deck.

WAKE.—The track left by a vessel in motion.

WATERBORNE.—Floating.

WEATHER SIDE.—Side on which wind blows. Windward.

YAW.—A ship is said to yaw about when she does not steer a steady course and her head moves from one side to another.



*Don't say "Up in the front" to the Skipper;  
he may not like it!*

## THE AIR

# HERE'S HOW AN AEROPLANE FLIES



**T**HE sketch on next page gives a simple illustration of the methods of operation of the controls of an aeroplane.

The flying of a 'plane is very simple, everything being done by three levers :

(1) The control column, or joy-stick, is connected to two other controls, the ailerons and the elevators. The ailerons are movable flaps set along the rear or trailing edges of the wings, while the elevators form one of the two main parts of the tail unit.

The joystick is kept in a central and upright position for flying the machine level. If it is pulled backward, the elevators are raised and the machine begins to climb. If the stick is pushed forward, the elevators are lowered and the 'plane dives.

Moving the stick to right or left brings the ailerons into action, causing raisings and lowerings of the wings, termed "banking."

(2) The rudder bar is on the floor of the cockpit, and is operated by the feet. The bar is connected with the rudder, which is the second of the two main parts of the tail unit.

Veering of the aeroplane to right or left off its course is corrected by putting on left or right rudder respectively, and this is done by moving the left or right foot slightly forward on the rudder bar.

(3) The throttle control is generally placed on the left-hand side of the cockpit in British machines. It is connected to the carburetter of the engine, and thus governs the speed of the 'plane.

### TAKING-OFF AND LANDING.

Before the take-off, the chocks are removed from under the wheels, and the machine is taxied into the wind, correct direction being kept by means of the rudder. The joy-stick is held forward very slightly until flying speed is reached. Then the stick is eased back, and the machine rises into the air.

When about to land, the pilot approaches the 'drome heading into the wind, and comes down in a glide until about 20 feet off the ground. Then the glide is arrested by pulling the stick back a little, while, when just off the ground, the joy-stick is pulled back still further so that the wheels and tail skid touch the ground simultaneously when the 'plane lands.

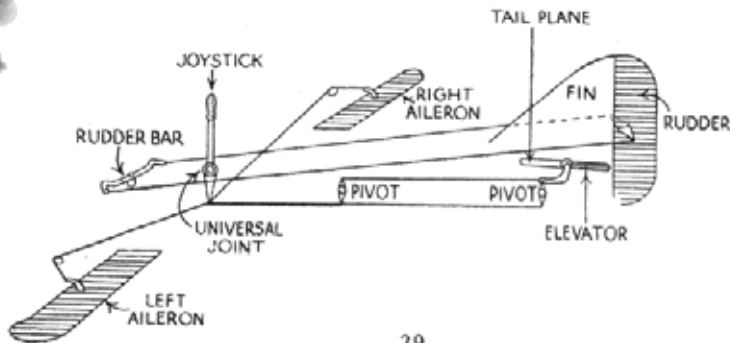
### THE 'PLANE'S INSTRUMENTS.

Of the various instruments with which a 'plane is fitted, the airspeed indicator, revolution indicator, altimeter, oil pressure gauge, oil thermometer, and compass are self-explanatory.

A turn-and-bank indicator which shows the exact angle of the 'plane when banking, is also fitted, for it is an absolutely essential instrument when flying in bad weather or in clouds.

A tail trimming gear, now included among the instruments of most aeroplanes, holds the elevators permanently in the position required for a long, steady climb or dive, so that the pilot need not retain his grip on the joy-stick over long periods.

Nowadays, of course, 'planes are being equipped with devices which can keep them on a given course, and, with the coming of retractable undercarriages, machines equipped with them have to have a warning apparatus fitted so that the pilot does not land with the wheels "tucked up."





## When an Aeroplane Lands

# GROUND HELPS for AIRMEN

HERE are a few hints on how to help airmen with their machines when on the ground:

When you are helping to handle an aeroplane on the ground, remember that the machine must only be man-handled by the strongest parts. Careless handling causes such serious injuries that makers sometimes paint "Lift Here" on special parts of the fuselage, while Continental builders sometimes put spikes on parts of the machine which

ought not to be held when it is being moved on the ground.

Here are some rules for handling a plane: Pull or push the machine by placing your hands at the base of an interplane strut; lift the tail by placing the hands under the bases of strut (visible through the fabric). Lift a wing by making a leap-frog back under the point where a strut is socketed into a spar.

If ever you have to peg a machine down in the open, see that the propeller, engine and cockpit are covered. Raise the tail on to a block and see that you have large chocks before and behind the wheels. A rope is taken over the fuselage near the tail and pegged down at each side, a pad being laid on the fuselage to prevent the rope doing damage.

Slack ropes go over each wing, the lower one in the case of biplanes, and are pegged in front and behind. A taut rope passing over the propeller shaft and pegged to the ground completes the job. The nose of the machine should point up-wind.

### TO GET AN "A" LICENCE—

You must demonstrate your ability to fly an aeroplane to your instructor's satisfaction, and have done at least three hours' solo flying. Fairly simple flying tests, such as describing figures of eight, and landing have to be carried through. A medical examination is necessary, and the last test is to show a knowledge of the International Air Traffic regulations, in which you are examined verbally by an Air Ministry or Aero Club official.

## INTERNATIONAL CIVIL AIRCRAFT REGISTRATION MARKS

**How to tell the Nationality of a  
Machine from its Markings.**



- |                       |                      |
|-----------------------|----------------------|
| G. Great Britain.     | CS. Portugal.        |
| F. France.            | XT. China.           |
| PH. Holland.          | K. Finland.          |
| I. Italy.             | YI. Iraq.            |
| J. Japan.             | C. Bolivia. Cuba.    |
| J. Denmark.           | PP. Brazil.          |
| R. Russia.            | OK. Czecho-Slovakia. |
| VII. Australia.       | L. Guatemala.        |
| VP. South Africa.     | E. Ecuador. Estonia. |
| VI. India.            | X. Honduras.         |
| ZK. New Zealand.      | Z. Lithuania.        |
| CF. Canada.           | A. Nicaragua.        |
| EI. Irish Free State. | OB. Peru.            |
| CV. Rumania.          | HS. Siam.            |
| OO. Belgium.          | UN. Yugo-Slavia.     |
| SE. Sweden.           |                      |
| SP. Poland.           |                      |
| <b>SX.</b> Greece.    |                      |
| HA. Hungary.          |                      |
| EC. Spain.            |                      |
| YL. Latvia.           |                      |
| SU. Egypt.            |                      |

All the above have the initial letter given, followed by combinations of letters, four after single-, three after double-letter national markings, as :—

G—AAAA.

PH—AAA.

These four national markings are followed by *numbers* instead of letters, as :—

D—2345.

NC—2345.

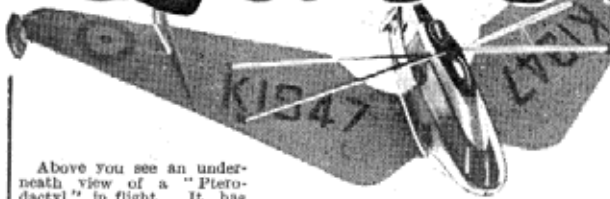
D. Germany.

NC. United States of America.

A. Austria.

CH. Switzerland.

# Queer



Above you see an underneath view of a "Pterodactyl" in flight. It has scarcely any fuselage protruding beyond the wings, the landing wheels are set tandem-fashion and it cannot stall or spin.



**PADDLE-PLANE.**—On the left is the result of the latest attempt to find an alternative to the airscrew type of aeroplane—the "Rohrbach Paddle-Plane." The paddles revolve round the centre axle, which is driven by an interior motor. This machine cannot stall, has an excellent forward view and is able to hover.



**FLYING TRIANGLE.**—The machine on the left looks like some flying geometrical instrument. Known as the "Flying Triangle," it has the advantages of being stall-proof and is easily handled.



# Planes!



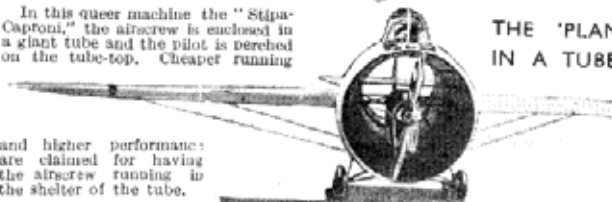
SKYCAR (Above).—With the passengers' cabin in the nose and the airscrew revolving in an open framework at the rear, this is the "Stout Sky-car," designed as an aerial runabout.



UGLY DUCK LING (Left).—It is hard to tell which way this machine is going for it has a small wing set in the nose of the fuselage. Known as the "Focke-Wulf Ente," it is easily handled, and the cabin is very quiet. It cannot stall or spin.

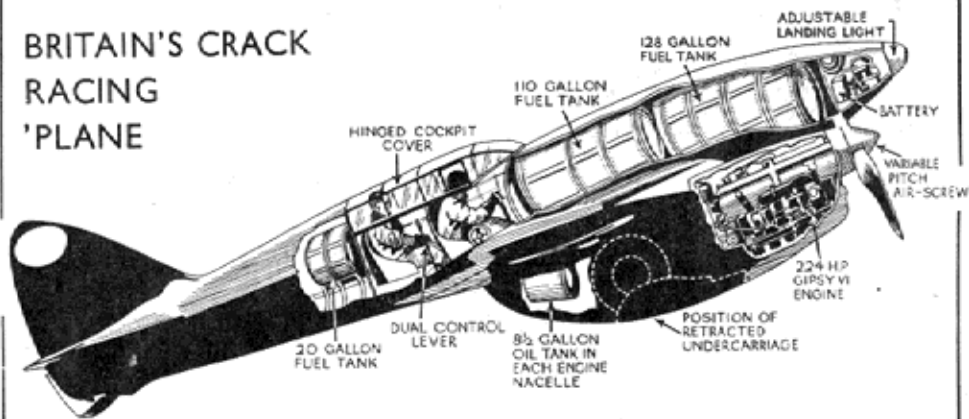
In this queer machine the "Stipa-Caproni," the airscrew is enclosed in a glass tube and the pilot is perched on the tube-top. Cheaper running

and higher performance are claimed for having the airscrew running in the shelter of the tube.



THE 'PLANE IN A TUBE

## BRITAIN'S CRACK RACING 'PLANE



Here you see a cut-away diagram of the famous De Havilland *Comet* machine of the type which won the Mildenhall-Melbourne Air Race. The *Comet* piloted by C. W. A. Scott and T. Campbell Black reached Melbourne in 70 hours 59 minutes, and other *Comet* achievements include record flights from England to Baghdad and Australia, and from Australia to England. The *Comet* can also be used as a high-speed mailplane, and it will possibly be put into service on certain routes.

This is How They Write—  
“ADVERTS”  
in the SKY!

THERE are quite a number of snags about the writing of sky advertisements, and only highly-trained pilots can hope to make a success of it.

The advertising message has to be written backwards from right to left, and as the wind quickly scatters the smoke message, it has to be written out by a 'plane whose speed is never less than 100 m.p.h.

A skywritten message varies in length from five to ten miles, and generally can be read over an area of a hundred square miles.

The “message” itself is written out when the machine is flying at a height of two or three miles. Actually, the pilot counts to himself, so that he shall fly a long enough period on a straight stroke.

The smoke is quite harmless, and it has no smell. You may have thought that the skywriting 'planes sometimes pass through the smoke trail, but actually they do not.

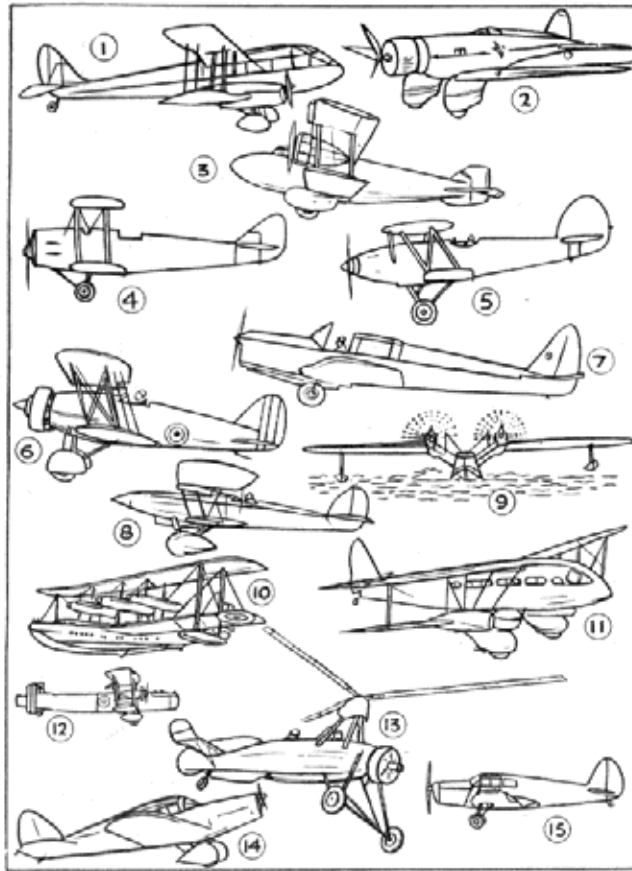
The smoke chemicals are carried in tanks up in the nose of the machine, and the smoke is created by passing the chemicals through into a mixing chamber. From the mixing chamber the smoke is passed along a pipe which runs along the starboard side of the fuselage.

The smoke is allowed to escape at a point as nearly in the centre of the slipstream as possible, and there is little effect on the smoke by the racing slipstream.

**Aeroplane** “hangars” get their name in this way: In the country districts of France, carts and farm implements are housed in barn-like structures with a roof and open sides. These buildings are known as “hangars,” and when in France very early flights were made the aeroplane sheds were dubbed “hangars,” which they very closely resembled. In due course England came to accept the French name.

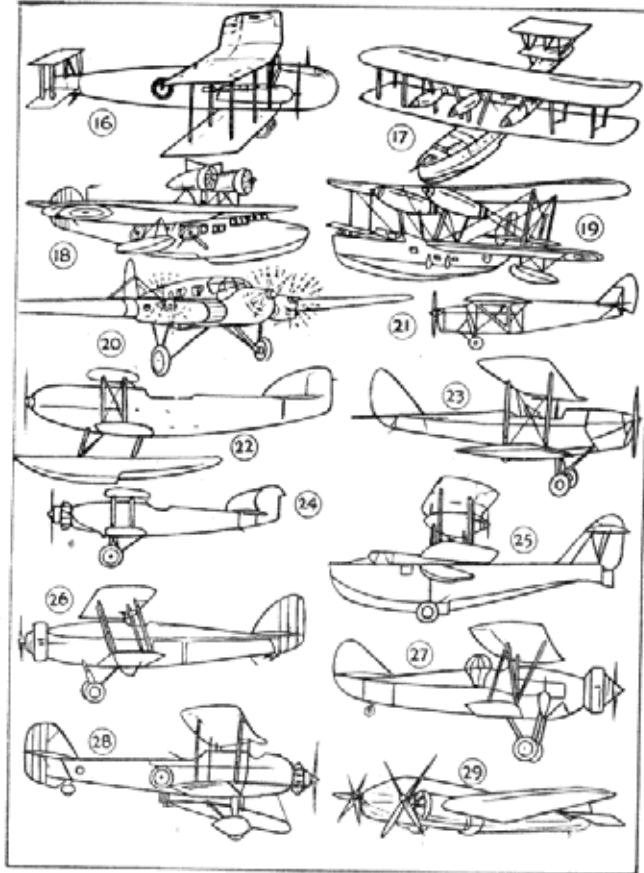


TYPES OF AIRCRAFT.



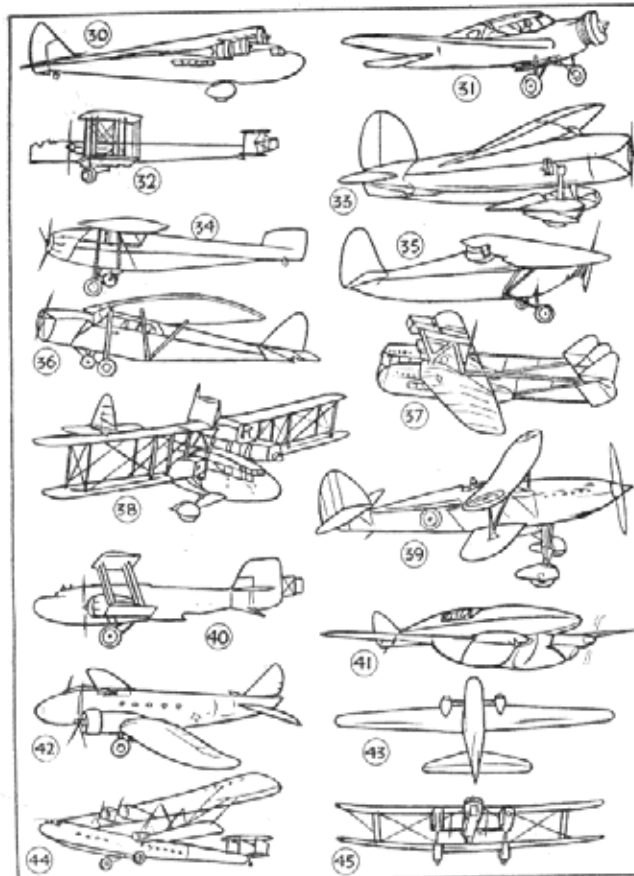
1.—H. D. Dragon; 2.—Northrop Gamma; 3.—Boulton and Paul Mailplane  
 4.—D. H. Moth; 5.—Osprey; 6.—Gloster Gauntlet; 7.—Comper Mouse; 8.—  
 Fairey Fox; 9.—Short R. 24/31; 10.—Short R. 6/25; 11.—D.H.86; 12.—Pegasus  
 Vannock; 13.—C.30.P Autogyro; 14.—Percival Gull; 15.—Klemm Eagle

TYPES OF AIRCRAFT.



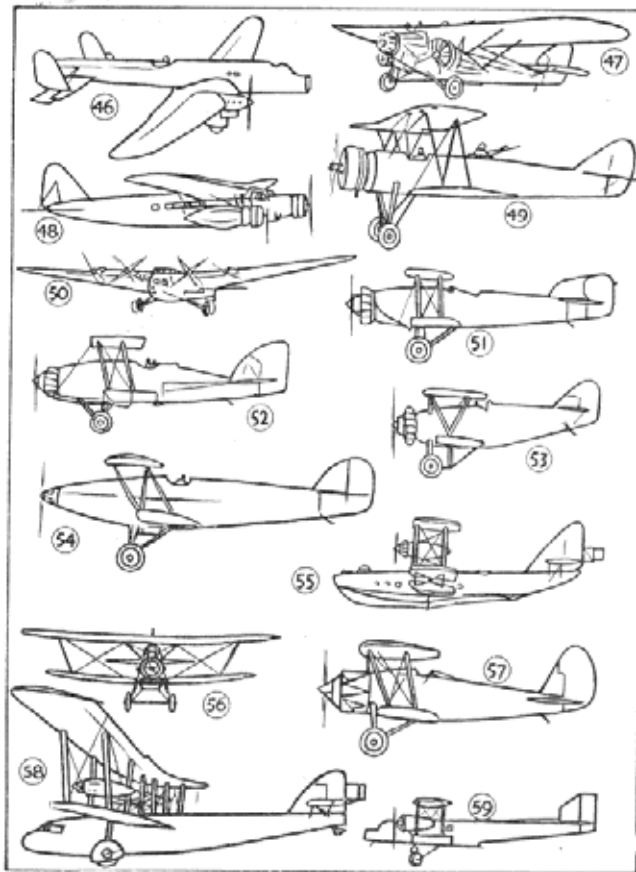
16.—Victoria; 17.—Blackburn Perth; 18.—Savo Cloud; 19.—Supermarine Seana;  
 20.—Spartan Cruiser; 21.—D. H. Leopard Moth; 22.—HIF; 23.—D. H. Moth  
 Major; 24.—Seal; 25.—Seagull V; 26.—Westland Wallace; 27.—Bristol 120;  
 28.—Vildebeest; 29.—Monospar S. T.

TYPES OF AIRCRAFT.



30.—Atalanta; 31.—Airspeed Courier; 32.—Virginia IX and X; 33.—Lockhead Vega; 34.—Desoutter M.K.1; 35.—Comper Swift; 36.—Puss Moth; 37.—Savoia S.66; 38.—Airspeed Ferry; 39.—Super Fury; 40.—Sidastrand; 41.—D. H. Comet; 42.—Boeing Transport; 43.—Douglas Transport; 44.—Hannibal; 45.—H. P. erford.

TYPES OF AIRCRAFT.



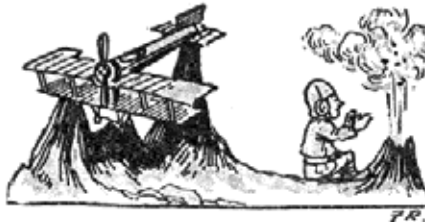
46.—Falrey Night Bomber; 47.—Westland Wessex; 48.—Fokker F.XX; 49.—Avro 626; 50.—Junkers G 38; 51.—Gordon; 52.—Wapiti IIA; 53.—Siskin IIA; 54.—Fury; 55.—Rangoon; 56.—Hawker Nimrod; 57.—Bulldog II; 58.—Scylla; 59.—Hinaidi.

### INTERFERENCE WITH AIRCRAFT WRECKAGE.

**T**HE Air Ministry desires to call the attention of the general public to the great difficulties which have sometimes been caused by private persons thoughtlessly removing parts of damaged aircraft.

It is of the greatest importance that the causes of accidents to aircraft should be ascertained. Whenever a serious accident is reported the Air Ministry Inspector of Accidents proceeds with the least possible delay to the scene of the accident to examine the crashed machine, and it is essential for his purposes that the wreckage should not have been disturbed more than is necessary to set the occupants free and to prevent any immediate risk of damage to persons or property. During the interval, therefore, before the arrival of the inspector, you are earnestly requested to abstain from any interference with a wrecked aircraft, except for these emergency purposes. The police already have instructions on the whole matter, and interference with wreckage is definitely prohibited by law.

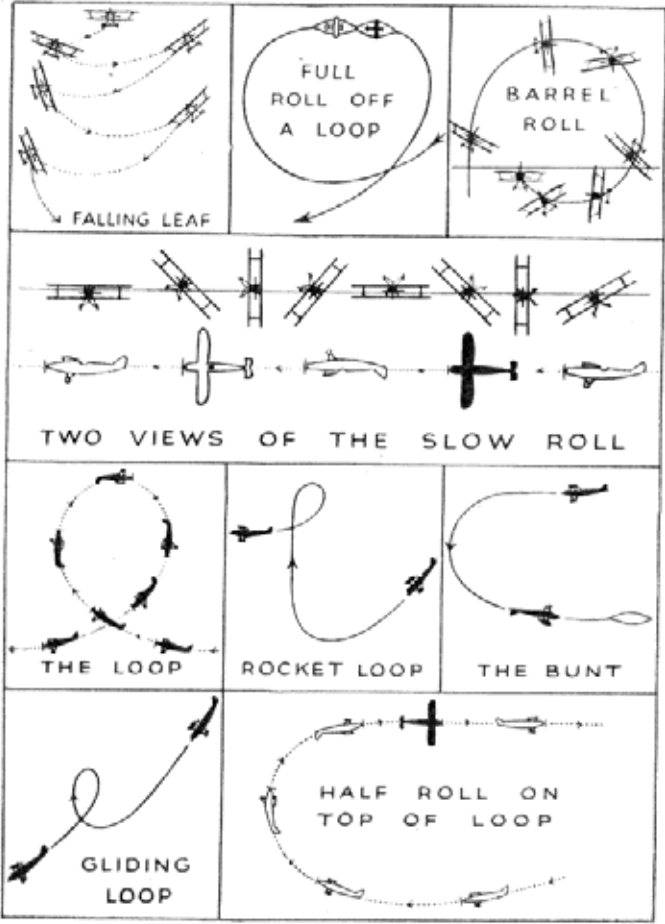
*After the crash, leave the airman's bus where it landed!*

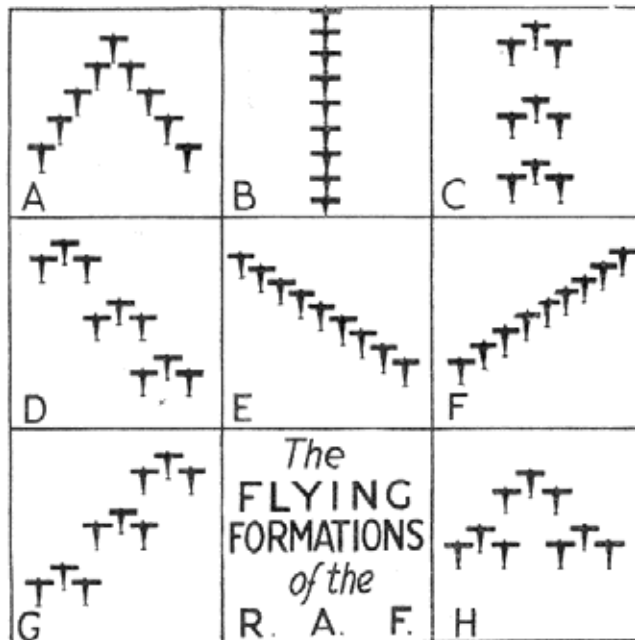


A further point of great importance is that broken pieces of the aircraft (for example, a part of a propeller) may be found some distance away. It will be of the utmost assistance if the finding of such pieces is immediately reported to the police, or to the Inspector of Accidents.

Although breaches of the law have occurred, the Air Ministry feels sure that no one would wish to retain a broken part of an aircraft in these circumstances for whatever purpose, even though it is an apparently insignificant item, once it has been pointed out that it may be essential to the authorities for tracing the cause of the accident. In a recent case a broadcast appeal for missing parts was made and three members of the public went to much trouble in reporting the finding of certain bits of metal. This enabled the Air Ministry to establish the cause of the accident in question beyond doubt.







A—Squadron Vee; B—Squadron in line astern; C—Flights astern; D—Flights in echelon to starboard; E—Squadron in echelon to starboard; F—Squadron in echelon to port; G—Flights in echelon to port; H—Squadron formation.

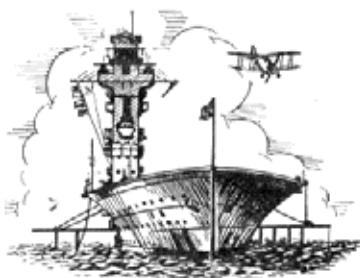
IT is easier to fly the Atlantic from America to England for the following reasons: The earth revolves from west to east carrying with it a belt of air. Cold air from the North Pole is constantly rushing towards the Equator to take the place of warm air which rises there.

So there is a wind over the Atlantic blowing almost continually in a westerly direction, especially in summer. So a plane starting from America has the wind with it almost the whole way across.

Starting over in America, "behind the wind," a pilot can take off when the wind has no fog in it; whereas a pilot on this side is apt to fly into a fog.

### FLYING OFF A FLOATING DROME.

OF all the jobs in aviation, that of pilots working from aircraft carriers is probably the trickiest. The pilot bringing his machine on to a carrier's deck has before him a landing space of about 90 feet by 400 feet. This small space is 70 feet above sea level



and may be pitching and rolling dangerously.

In addition, the landing space may be moving away from the in-coming 'plane, for the carrier is usually steaming ahead all the time.

Before the take-off the vessel steams up into the wind, thin jets of steam rising forward indicating when the right direction is being taken. A 'plane is brought up to the deck level on an electric lift. There the engine is started up, and at an order mechanics lying flat on the deck beneath the wings pull the chocks from the wheels.

After a very short forward run, the 'plane takes the air, for the air speed along the deck is increased by the carrier's forward motion.

Landings are very tricky. On receiving the landing signal the pilot knows the carrier is now steaming up into the wind. If the wind speed is 10 knots then the ship will have to travel at about 15 knots in order to produce a sufficient air speed on the deck for landing.

The aeroplane is brought down to 500 feet and directly astern of the carrier.

Correcting the effect of the numerous eddies and bumps in the air, the pilot brings the machine in over the stern of the carrier at a height of about five feet. The speed is as low as is possible with full control.

Now the engine is throttled right back and the pilot concentrates on keeping the machine dead in line with the deck until the landing party of seamen have taken charge of the machine.

These at once fold up the wings, wheel the machine to the lift which sinks down to the hangar below. Again the machine is wheeled off the lift, which now returns to the deck.



## AIR

**AILERONS.**—Small flaps on the trailing edges of the wings. By moving the joy-

stick sideways the pilot causes the ailerons to move and tilt the 'plane, as, for example, when banking on a curve.

**AIRBORNE.**—In flight.

**AIR SPEED.**—The speed at which the machine is moving through the air. Not to be confused with the actual speed across the ground. Thus, if a 'plane that can land at 40 m.p.h. comes in facing a 10 m.p.h. headwind, the ground speed of the 'plane need only be 30 m.p.h. to affect a safe landing.

**BAIL OUT.**—To jump overboard from an aeroplane preparatory to making a parachute descent.

**BLIMP.**—The name given to a small dirigible much used in the War for "spotting" submarines.

**BORROW TIME.**—When anyone has made a successful parachute descent from a doomed 'plane, he is said to "borrow time," as by all rights he should have been killed when his machine "conked."

**CATERPILLAR CLUB.**—Every pilot who has to abandon his 'plane in mid-air and make a parachute leap automatically qualifies for membership of the Caterpillar Club—if he lands alive, that is. The club badge is a golden tie-pin in the form of a caterpillar. The Chief Caterpillar is Col. Lindbergh, who has "bailed out" four times.

**CEILING.**—The maximum height at which a particular aeroplane can fly. On reaching its "ceiling" a machine finds it impossible to climb any higher because of the thinness of the air.

**CHINESE ACR.**—Sarcastic name given by pilots to the type of three-point landing in which a machine lands on one wheel, a wingtip and a propeller blade tip.

**CHORD.**—See Figure 1.

**COME UNSTUCK.**—Usually refers to flying boats, which are said to "come unstuck" at the moment they leave the water and become airborne.

# TERMS



**CRATE.**—Name given to the aeroplane as a whole, particularly during the Great War.

**DIHEDRAL.**—The angle a wing makes in relation to the horizontal when viewed from the front or rear.

**FLYING SPEED.**—The speed which a machine must maintain so as to keep in the air. When a machine drops below flying speed it will stall. This speed is rarely below 40 m.p.h., but varies with different types of machines and under certain conditions. It is naturally greater in a heavily laden 'plane than in a light one.

**GEORGE.**—R.A.F. nickname for the automatic pilot apparatus.

**GLIDING ANGLE.**—This often refers to the minimum angle to the ground at which a 'plane with its motor "dead" can fly without stalling.

**INCIDENCE.**—See Fig. 1.

**SET DOWN.**—To land.

**SPATS.**—Nickname for streamlined shields now often fitted over landing wheels of machines without retractable landing gear.



**STAGGER.**—Planes are said to be "staggered" when their front edges are not in the same vertical line. When the top plane projects beyond the lower plane, as is usually seen, this is called "forward stagger."

**STALL.**—When a 'plane loses flying speed it stalls by attempting to fall groundwards.

**WINDSTOCKING.**—The long, sausage-like wind indicator seen flying on aerodromes.

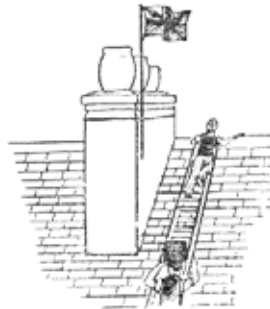
**ZOOM.**—To rocket upwards under power, usually after first building up speed by diving and then suddenly pulling up the nose past the normal climbing angle.

## THINGS SEEN AS YOU PASS ALONG

### LONDON THIS WAY.

**I**F you happen to get landed in an unknown part of the country, with no signposts or other means of finding your whereabouts available, you can always get a rough idea from the nearest telegraph pole.

You will notice the arms on the pole, to which the insulators are attached, and you will find that, on the main London roads, these arms are always on the side of the pole facing towards London. This is a rough but safe guide in an emergency.



### WHY THE FLAG IS FLOWN.

**O**CCASIONALLY you may notice a flag being flown from the chimney stack of a house during construction.

This is an old custom among builders which is now dying out but it is still kept up to some extent. A Union Jack was lashed to the chimney stack of a new building as soon as the chimney pots were on.

### CORKS WARN BIRDS.

**G**LANCING up at the telegraph wires themselves, you will often notice a series of corks attached to them at various intervals.

These have been placed there to serve as a warning to birds by indicating the presence of wires otherwise invisible to them. For it had been found that the birds, unaware of their existence, often dashed themselves to death against the wires.

### UNDERGROUND WIRES.

**S**NOW and high winds play havoc with a telegraph system, so in many cases wires have been run underground. To denote their position, small square iron plates with the letters "G.R." and the crown on them are set up directly above where the wires run. Numbers on the plates indicate the depth of the cables below the ground.

#### THE MISSING BRICKS.

**P**ERHAPS you have noticed at some time a wall having several neat holes near the bottom. Here the builder has deliberately left out several bricks, because the earth on one side of the wall is higher than on the other.

Hence rain and water is likely to get into and lodge behind the brickwork and in time destroy it, so these "weeping holes," as they are called, are left there to let the water run off.

#### HYDRANTS.

**A**T frequent points along the roads there have been installed fire hydrants, from which water may be obtained quickly in case of fire. Of course, any hindrance or delay in finding these hydrants is a very serious handicap to firemen, so various signs have been prepared, which may be seen at intervals along any road.

The signs are made in blue and white—either a white letter on a blue background, or a blue letter on a white background. A letter "H" in a diamond or square-shaped panel signifies that there is a hydrant immediately below the sign, or if it is at any distance from the sign, that distance is marked in feet on the panel.

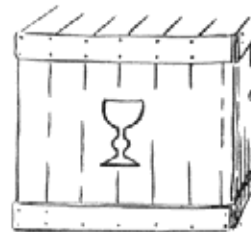
If the "H" is in an oval panel, it signifies that the hydrant is situated on the opposite side of the road to the sign. The sign "F P" which you may have seen sometimes, stands for "Fire Plug," and is mostly to be seen in rural areas where it serves the same purpose as the hydrant.

#### THE "GOBLET" SIGN.

**I**F you have seen packing cases of goods from abroad, you may have seen the rough outline of a goblet on one side of a case.

This sign indicates that the proper side for the case to stand on is that side which runs parallel to the base of the goblet (as in the sketch).

The sign is universally understood by all who handle packing cases in no matter what country, so it is invaluable in international transport.



#### BRIDGE UNDER REPAIR.



A TRUSS of hay or straw may sometimes be seen hanging from the arch of a bridge. This is a sign that the bridge is undergoing repair and that river users must navigate that particular arch with care.

This method of warning may seem a little crude, but it is well understood by bargemen.

#### ON THE CURB STONE.

A BROAD arrow mark may often be seen chiselled on the curb stone edging the pavements of a road. This indicates the adjacent opening of a water main.

It is very useful in snowy weather, etc., when the roads are choked with slush. Then the pavements are usually fairly clear, and the covered mains and sewers can be easily located by means of the broad arrow sign, without having to clear the entire road.

#### SEMI-PRIVATE ROADS.

"MELBOURNE AVENUE—UNADOPTED." This is a familiar sign in towns where district councils exist. The plates bearing the "Unadopted" signs are to be seen on the corners of houses and walls like ordinary road name plates.

The word "Unadopted" means that the road is more or less private, and is not kept in repair by the council. It may be lighted and kept clean by the council's men, but even then the actual paving is the responsibility of the private owner or landlord.

#### CHIMNEYS.

THE broad-brimmed stone and iron cappings one sees on the chimney-stacks in manufacturing districts are not for mere ornamentation.

On the opposite side of the stack to that on which the wind is blowing a partial vacuum is formed, and the smoke issuing from the chimney would belch out in huge gusts down the side of the chimney for some distance were it not for the brim of the cap blocking the way.



## The Miller Signals with THE WINDMILL SEMAPHORE

**D**ID you know that the sails of a windmill can be, and often have been, used for signalling?

In the old days when smuggling was a flourishing concern round these coasts, a windmill near the sea was often used by millers who were in league with the smugglers as a means of signalling to them.

If the miller knew that the coast was clear, he would set the sails of his windmill in the form of a St. Andrew's Cross, that is, like an X. If there were likely to be excise officers in the vicinity, and it was dangerous for the smugglers to land their goods, the miller would set the sails in the shape of a St. George's Cross (the upright cross.)

Incidentally, the mill was an excellent hiding place for the smuggled goods, as the kegs of brandy, tobacco, or silks, could be easily concealed among the flour sacks until such time as the persons concerned could dispose of them.

Nowadays the upright sign is a sign of mourning or any other trouble at the mill. If this position is adopted for only a few minutes, however, it may mean that the miller is about to grind.

When the sails are set as a St. Andrew's Cross it either means that the miller has finished his work for the day, or is taking a holiday. The sails of old mills no longer in use are always set in this position.

### THE "BEEHIVE" WARNING.

**I**N coal-mining districts you may come across brick erections somewhat like beehives in shape.



These are built over the mouths of old mine shafts to prevent unsuspecting people and animals from falling down them.

Many of the fields in these districts have disused mines beneath them so warnings are very necessary.



### NEON SIGNS.

**T**HE Neon signs which now decorate and advertise a large number of theatres and shops are, of course, made possible by the use of Neon gas, which is obtained as a by-product during the manufacture of liquid air.

Neon gas has the property of "ionisation" i.e., of easily splitting up into its positive and negative constituents when an electric current is applied. It is when this ionisation takes place that the gas emits the glow which is made use of in the Neon tubes.

Pure Neon light (produced simply by passing a current of about 14,000 volts through the gas) is a rich orange-red colour. Mercury vapour turns it blue, while by mixing the gas with other gases and vapours an almost unlimited range of colours can be obtained.



### WAR OFFICE PROPERTY.

**A** STONE similar to the illustration may be seen at different places on our coasts. Not far off you will find a fort or battery, and the stone forms the boundary of the War Office property.

"W.D." stands for War Department.

### NOTICED THIS ABOUT PILLAR BOXES?

**I**N many pillar boxes, especially recently erected ones, the slot is very often not directly facing the footpath, as might be expected.

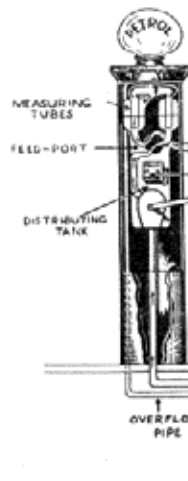
This is because the Post Office now has a rule that the slot must face the nearest permanent light (such as a street lamp or a shop lit up at night). Consequently the slot has often to be at an angle to the footway.

### "BY APPOINTMENT . . ."

**H**AVE you noticed the use of the Royal Arms and the words "By Appointment" on certain tradesmen's announcements and vans? This is a privilege granted to those firms which supply goods to a Royal Household, and must not be used by anyone else.

The firms so to supply goods are selected by the Master of the Household, and each receives a Warrant of Appointment. Warrant-holders have a special society of their own to safeguard the privileges they enjoy.

## HOW THE PETROL PUMP WORKS



**T**HE diagram shows a simple type of petrol pump "with its coat off."

When petrol is to be supplied to a car, the operator of the pump sets the indicator at zero and then commences to work the handle. As each gallon passes to the car the indicator automatically records it.

The turning of the handle draws up petrol from the storage tank through a pipe into the distributing tank, whence it passes into the measuring tubes.

These are controlled by the feed-port which, when it is turned in one direction, allows petrol to flow into one measuring tube, while

it flows out of the other into the supply pipe which leads to the car.

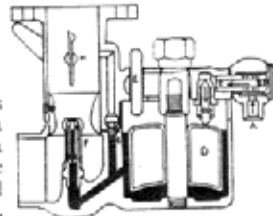
In its reverse position the feed port allows the first tube to empty while the other refills.

Any overflowing petrol runs back into the storage tank by way of the overflow pipe shown in the diagram.

### CARBURETTOR OF A CAR.

- |                   |                      |
|-------------------|----------------------|
| A. Petrol Inlet.  | B. Filter.           |
| C. Valve Needle.  | D. Float.            |
| E. Tickler.       | F. Main Jet.         |
| G. Auxiliary jet. | H. Throttle Spindle. |

The petrol from the tank flows into the float chamber through a needle valve, the float keeping a constant level of petrol. When the engine is started, petrol is sucked up through the jets and vaporised, the vapour passing to the cylinders.

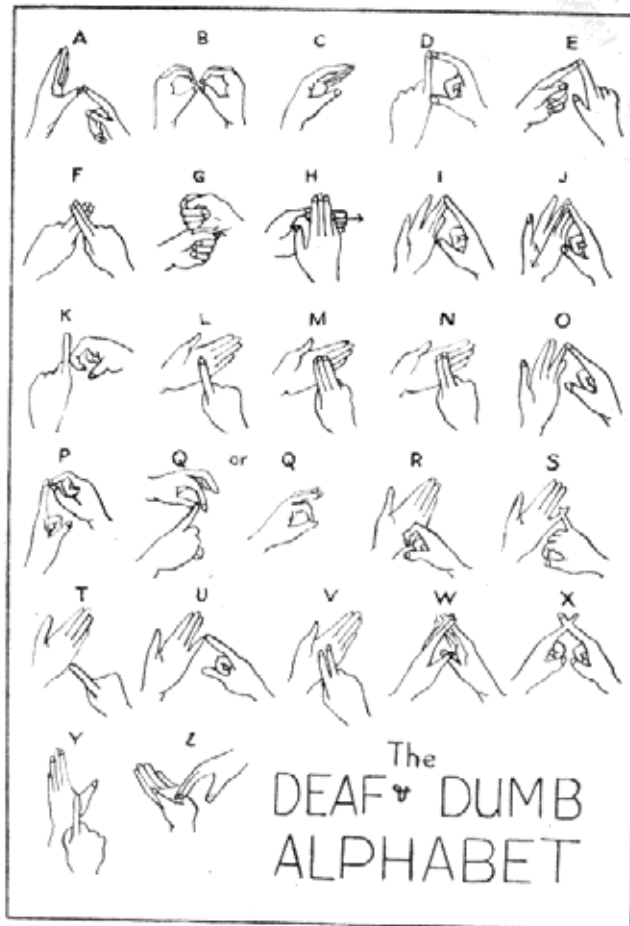


## THE BRAILLE SYSTEM

All Braille Signs consist of symbols formed by using combinations of dots in the form:  $1 \cdot \cdot 4$   
 $2 \cdot \cdot 5$   
 The Numbers facilitate reference to symbols  $3 \cdot \cdot 6$

1st LINE	A	B	C	D	E	F	G	H	I	J
2nd LINE	K	L	M	N	O	P	Q	R	S	T
3rd LINE	U	V	X	Y	Z	and	for	of	the	with
4th LINE	ch	gh	sh	th	wh	ed	er	ou	ow	W
5th LINE	ea	be	con	dis	en	!	( )	"	'n	"
6th LINE	Fraction-line sign		Numerat sign		Poetry sign	Apostrophe		Hyphen		
7th LINE	st		ing		ble	ar		com		

The Braille Signs for all first ten letters are compiled in the form of dots Nos. 1, 2, 4 and 5. To these are added dot No. 3, to give the next ten symbols; and by adding dots 3 and 6 to the first line, the rest of the alphabet, except W, is formed. The position of W is explained by the fact that Braille is of French origin and W does not occur in the French alphabet.



*Learn this and you can carry on a "silent" chat with a friend.*



## MYSTERY FREAKS OF LIGHT.

### St. Elmo's Fire :

**T**HIS is a poetical name for the brilliant, glowing flames which are often seen dancing at the ends of spars or mastheads, and were formerly much dreaded by sailors.

But it is really quite a harmless phenomenon, and usually occurs during a thunder-storm, being simply a luminous discharge of atmospheric electricity. The "fire" sometimes rings the head of a sailor working aloft or streams from the tips of his fingers.

*St. Elmo's Fire.*

### Phosphorescence of the Sea :

**T**HE remarkable luminous appearance which the sea takes on on some warm summer nights is due to a tiny jelly-like creature, about 1/25 of an inch in diameter, called Noctiluca, myriads of which are found floating on the surface.

The cause of the peculiar form of light which these creatures emit is still a mystery, but it is supposed that salt is necessary for its production, as no luminous creatures are found in fresh water.

### The Glow-worm :

**T**HE "glow" emitted by these insects (really beetles) is of a somewhat similar nature, though of different formation, to the phosphorescence from dead fish. A fermentation in the blood cell acts on a substance called luciferin, and this produces the strange light.

### The Will-o'-the-Wisp :

**T**HIS is an uncertain light which may sometimes be seen dancing over churchyards and marshy places. No one really knows how it is produced, and chemists are continually experimenting to discover its nature.

It is thought that it is formed by the mixing of marsh gas, which is given off decaying vegetable matter, with phosphoretted hydrogen, a gas which ignites instantly. But this theory has not been definitely proved.

## WHAT DO YOU WANT TO KNOW ABOUT ARCHITECTURE ?

**O**UR country is rich in lovely old buildings, whilst many modern buildings are interesting and attractive when once one knows something of architecture.

There are four principal styles in English architecture :

Saxon (before 1066).

Norman (1066-1175).

Gothic (1150-1570).

Renaissance (Since 1550).

In the following pages examples of these different periods are shown and you will be able to decide the period of churches, castles and other old buildings you encounter in your travels.

You will notice that Saxon buildings have round arches and long and short stones at the angles. In Norman buildings the arches are semi-circular and massive pillars stand on a square base.

Gothic architecture can be distinguished by the presence of the pointed arch. This type of architecture is further divided into three phases : Early English, Decorated and Perpendicular.

The Early English windows are narrow and lancet-like in shape and the pillars are either circular or octagonal. Decorated, which came later, has the lights (or windows) separated by vertical bars of stone, while the Perpendicular phase has horizontal bars dividing the windows into panels. The arches of this phase are flatter.

The Renaissance style was a copy of Greek and Roman architecture.

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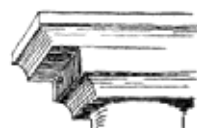
NOW TURN TO PAGES 56-59

FOR EXAMPLES OF ARCHITECTURE.

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# SAXON ARCHITECTURE

*Earls Barton,  
Northamptonshire*



*Cap from REPTON*



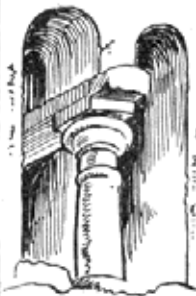
*Caps from  
S<sup>t</sup> BENETS  
Cambridge*



*Window, DEERHURST*



*Impost from  
CORHAMPTON*



*Doorway  
EARLS BARTON*



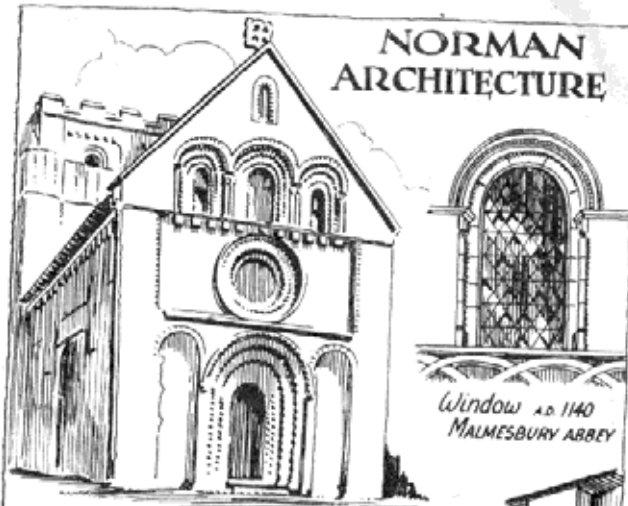
*Caps from  
SOMPTING*



*Doorway  
MONKWEARMOUTH  
Durham.*



# NORMAN ARCHITECTURE

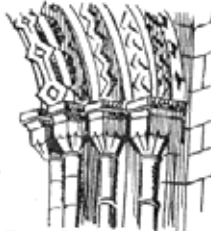


Window A.D. 1140  
MALMESBURY ABBEY

Iffley Church, nr OXFORD



Iffley Church, Doorway

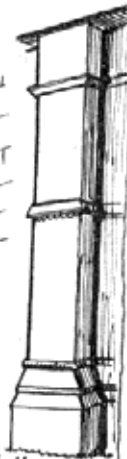


Chancel Arch, Walsoken  
NORFOLK

Stone Carvings



Buttress  
FOUNTAINS ABBEY  
A.D. 1170



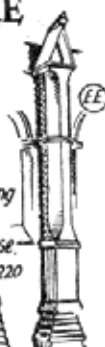
# GOTHIC ARCHITECTURE

## BUTTRESSES

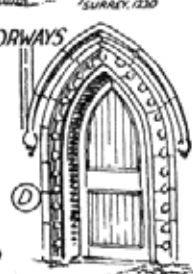
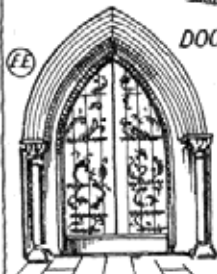
Early English (EE)

Decorated (D)

Perpendicular (P)



## WINDOWS



## DOORWAYS

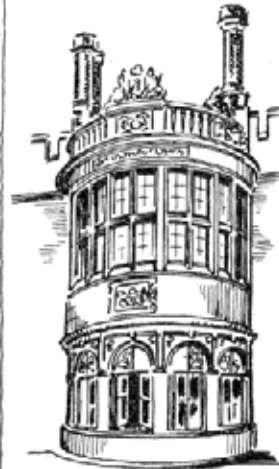
# RENAISSANCE ARCHITECTURE



Window, BY KENT  
HORSE GUARDS, LONDON



Doorway, at WARDOUR CASTLE,  
WILTSHIRE.



Bay Window  
HINCHINGBROOKE  
HALL



Circular window  
ST MARTINS, LONDON



Dormer window  
THORPE HALL



Doorway

## The Mechanism of the AUTOMATIC TELEPHONE

**B**Y now everyone is familiar with the automatic telephone system, by which the caller does not request an operator to complete the connection required, but himself performs certain mechanical operations on the dial, to which other apparatus at the exchange responds.

It is extremely useful and very necessary to know how to use the dial telephone, and here is a simple explanation :

Supposing you wished to put through a call to a number 2368. First lift the receiver, and then in due course you will hear a continuous purring sound, called the "Dialling tone," which signifies that the apparatus is ready to work. When you hear the tone, and not before, you begin dialling your number.

Now, in London it is necessary first to dial the first three letters of the exchange required, but in the provinces this is not necessary as all numbers in a town are on one exchange.

Now for the actual number : 2368. Place your finger in the finger plate hole marked " 2 " and pull the finger plate round in a clockwise direction as far as it will go. Remove the finger, let the finger plate return to its normal position, and then repeat the operation, placing the finger in holes " 3 " "6," and " 8," respectively.

As soon as the process of automatic selection is completed, you will hear a low-pitched " Ringing tone," and will eventually be answered by the person at the required number.

Should you hear a succession of short high-pitched notes, you will know that the line is engaged, while if for any other reason the dialled number is not available, you will hear a *continuous* high-pitched note—the " Number Unobtainable tone."

On the termination of the call, you should replace the telephone receiver promptly, in order that the automatic apparatus may be released in readiness for further calls.

In areas where five-figure numbers exist, the operation of dialling is exactly the same, five figures being dialled instead of four.

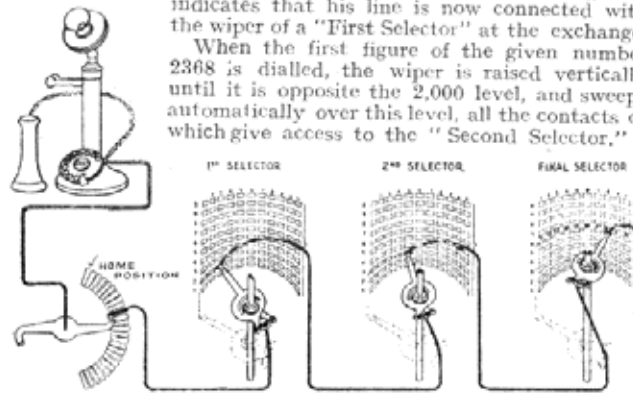
### HOW THE MECHANISM WORKS.

**H**ERE is a more detailed explanation of the process by which a call between two persons is established :

Connection with the lines required is made through contacts arranged in the form of an arc, ten contacts on each of ten levels arranged one above the other. Thus a selector gives access to a hundred lines. The selection of any one of these lines is made by a "wiper," to which the caller's line becomes connected.

Thus when the caller has lifted his receiver, the dialling tone indicates that his line is now connected with the wiper of a "First Selector" at the exchange.

When the first figure of the given number 2368 is dialled, the wiper is raised vertically until it is opposite the 2,000 level, and sweeps automatically over this level, all the contacts of which give access to the "Second Selector."



*How the selectors work.*

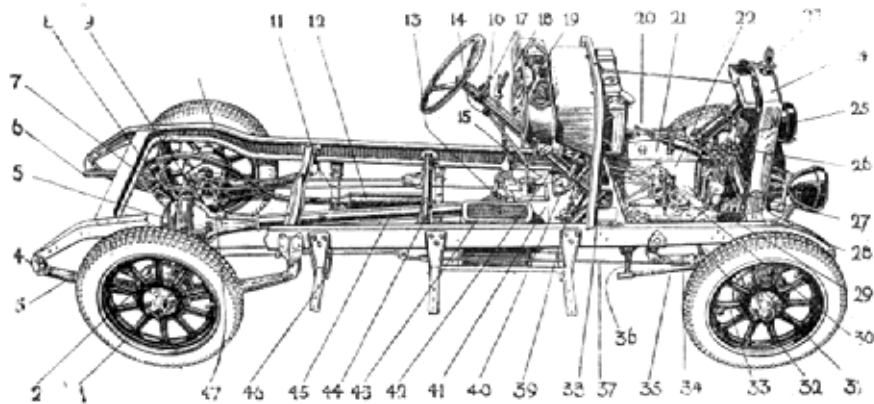
When the second figure (3) is dialled, the wiper of the Second Selector is raised to and swept along the 300 level, leading to a Final Selector.

Dialling the third figure (6) causes the wiper of the Final Selector to be raised to the 60 level, but it does not move horizontally until the last figure (8) is dialled, whereupon the wiper sweeps round to the eighth contact of the 60 level.

The selecting process is now completed, and the called person's telephone bell will now be rung automatically. The circuit will be ready for conversation as soon as he answers.



## THE MOTOR-CAR WITHOUT ITS BODY



- 1.—Detachable Artillery Wheels; 2.—Rear Brake Drum; 3.—Semi-Elliptic Rear Springs; 4.—Spring Shackles; 5.—Rear Axle Housing Cover; 6.—Exhaust Tail Pipe; 7.—Shock Absorber; 8.—Rear Axle Casing; 9.—Brake Camshaft; 10.—Chassis Main Frame; 11.—Rear Brake Rods; 12.—Silencer; 13.—Universal Joint; 14.—Gear Lever; 15.—Dynamotor; 16.—Mixture Control; 17.—Magneto Control; 18.—Hand Brake Lever; 19.—Instrument Panel; 20.—Sparking Plugs; 21.—Detachable Cylinder Head; 22.—Engine Cylinder Block; 23.—Odometer; 24.—Radiator; 25.—Cooling Fan; 26.—High Tension Cable; 27.—Magneto; 28.—Dumb Irons; 29.—Oil Filler; 30.—Carburettor; 31.—Front Brake Drum; 32.—Track Rod; 33.—Steering Arm; 34.—Semi-Elliptic Front Springs; 35.—Steering Drag Link; 36.—Steering Drop Arm; 37.—Front Brake Rod; 38.—Steel Dash; 39.—Brake Pedal; 40.—Accelerator Pedal; 41.—Gear Box; 42.—Clutch Pedal; 43.—Battery; 44.—Brake Cross Shaft; 45.—Torque Tube; 46.—Running Board Supports; 47.—Differential Casing.

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