Wellington, for 18s. 9d., postage 3d. This counts in either direction, and registers up to 10,000, showing clear figures which are arranged on drums in the usual way. A knob is provided, one revolution of which sets the counter at zero. It was decided to adapt this counter to the winder in such a way that it might instantly be removed at any time for other uses. This is effected as follows:—A brass pinion like that at B is secured by its set-screw and soldered to end of spindle. Then a piece of 3-8in. (outside) brass tube is sawn off 1 1-8in. long. One end of this is cut with acute V-shaped serrations all round, first with a triangular file, then deepened with a hack-saw. The idea of this is to engage at any point with a small pin in the side of the counter spindle. The plain end of this tube is now soldered to the brass pinion, centring it correctly. Fig. 2 shows this. Now take a strip of metal—tin will do—5¼in. long, and width just less than the counter. Turn up ¼in. at X and notch to clear spindle. Put counter in place and solder piece at back with notch to clear setting knob. Now take a block of wood 7-8in. high, 2¾in. long, and width of counter. This is slotted on top with two V's meeting in the centre, to fit a 5-16 square lever L, which is pivoted on a block at back. The block is attached to the tin strip by small screws from underneath, well sunk to give a flush surface. Two strips 3-8 square are now screwed to the platform, and between these the counter, on its holder, will slide. By pushing the lever to the left, the counter is disengaged from the spindle.

All that now remains is to take a 3-8 in. strip of 22's brass about 3½in. long, and bend as shown in diagram 3. When the counter is engaged the lever drops into A and is held, but when the counter is disengaged the lever is raised slightly and rests on B.

The 1½in. perforated meccano wheels are handy to slip on the spindle, one each side of a spool, to which they may be attached by screws. Larger formers for tuning coils may be held by larger flanges attached to these wheels.

Glossary of Wireless Terms

This instalment concludes the glossary of wireless terms quoted from the "Listener's Guide."

WAVE-LENGTH.—Although a station is known by a designated wavelength it actually uses more than one. For instance we speak of a wavelength of 371 metres; but that is the mean or principal one of a group or band of wavelengths actually used. No broadcasting station can transmit on one wavelength. The tuning equipment of the transmitter must be adjusted to permit of all or nearly all the frequencies employed in musical sounds to be transmitted. That means that the radiated energy of a station must swing at least 5000 cycles above and 5000 cycles below the central frequency of the band. There is a definite and fixed relation between frequency and wavelength; the frequency is the number of cycles in a second or the number of times the alternating or vibrating energy of the system varies in a second. Thus if the alternations, vibrations or oscillations in a second amount to 50 as in electric light systems, or 600,000 as in a wireless transmitter, the frequency is known as 50 cycles per second or 600,000 cycles per second respectively. In the latter case the inconveniently long number is shortened to 600 kilocycles (or 600 K.C.)—kilocycles meaning "thousands of cycles.

The wavelength is the distance between corresponding points on two adjacent cycles of change or waves—the crests of the waves for example. As the velocity of radiation is constant at about 300,000,000 metres per second, the wave-length can be ascertained by dividing the frequency into the velocity. Likewise, if the wavelength is known the frequency can be calculated by dividing the wavelength into the velocity. The frequency or wavelength of a transmitter can be measured by an instrument called a wavemeter. Such an instrument called a wavemeter. Such an instrument is a very important item of equipment at every station so that the engineers may observe frequently if their transmissions are on the correct wavelength.

Therefore: (1) Wavelength equals velocity divided by frequency.

(2) Frequency equals velocity divided by wavelength.

For example, to ascertain the frequency of a wave-length of 400 metres, frequency equals 300,000,000/400; results, 750,000 per second.

WAVE-METER.—A calibrated tuned circuit which radiates, either by means of a buzzer or an oscillating valve (known respectively as a Buzzer, Valve-meter and Heterodyne Wave-meter) oscillations of a known frequency or wavelength. When set in action at a predetermined frequency, the receiving set may be tuned to that frequency, merely by adjustment to receive the oscillations of a wave-meter. On the other hand the wave-meter may be used to pick up signals by being placed in close proximity to a receiver and under these conditions the wavelength of the received signals may be measured.

WAVE-TRAP.—An alternative term for an interference eliminator, commonly employed for eliminating interference from a "local" station. The trap is adjusted to the frequency of the signals it is desired to tune out, and absorbs them by by-passing them to earth so that the desired signals can be received without interference from transmissions on a close wavelength. A slight loss of signal strength may result if the design of the wave-trap is such that a nearby powerful transmitter is to be cut out. For ordinary purposes of clearing up selectivity a well-designed wave-trap is a very satisfactory piece of apparatus.

Electric Fittings for Speaker Extensions.

WHERE an output filter or transformer follows the receiver and polarity of connection to the speaker is immaterial, electric light fittings form a very handy system for connecting up speaker leads and extensions, and for the latter ordinary lighting extensions may be pressed into use at any time. There is one point to note, which is that the lamp socket should be attached to the speaker cord, so that it is impossible for anybody to connect the speaker to the lighting system "just to see what it would do." An adapter plug with short leads connects to the set. Extensions or speakers are then rapidly connected with minimum effort.

Fuses for Filament Protection.

WITH the low consumption filament of many modern valves the use of a small torch bulb as a protective fuse in the B negative lead is not safe, owing to the relatively high consumption of the bulb's filament. A safe method of use is to crack the glass of the bulb, which allows air to enter, and greatly lowers the fusing point of the filament. The use of a fine strip of lead tinfoil is cheap and very reliable as a protective fuse. It is wiser to have some kind of fuse in B negative than risk handing out the price of three or four re-place valves.

Regulations Concerning Mains Connections.

A LONDON radio journal of recent date contains new regulations specially framed to cover the use of wireless apparatus connected to the mains. The chief provisions are protection of all terminals from accidental contact, metal cases connected to earth, fuses on both poles of input, earthing of certain receivers only through high-test condensers. All "mains" transformers to be double-wound (which means no auto-transformers), adequate insulation of 1000 volts a.c. test between windings, and high insulation from the mains input terminals.

Care of A Batteries.

IT is important for long battery life to re-charge when the battery is 80 per cent. run down. Always keeping a batter "well up" means long life. If an accidental "short' occurs it will not be harmful if the temperature does not exceed 100 to 110 deg. F., and if the battery is put on charge at once.