

If therefore C'' be a known current, an unknown current C'_x can be found.

The practical method of working is as follows: The galvanometer is placed with its coils east and west, so that the needle is at right angles to the coils. The needle is then set vibrating, under the influence of the Earth's magnetism alone, and the number of vibrations in a given time are counted, from which t can be deduced. The currents C'_x and C'' are then successively passed through the galvanometer, and the times t' and t'' are found as above.

Accurate results cannot be expected by this method, owing to the effects of polarization.

MEASUREMENT OF THE FUSING CURRENT OF A FINE WIRE.

241. The strength of the current necessary to fuse a given fine wire is required when calculating the battery power necessary to fire wire fuzes, and can be found as follows:

Some of the wire is placed in the clips of a thermo-galvanometer, and a battery,* capable of fusing the wire, is connected so that the current can pass through the Firing resistance coils, and through the wire. Let r_b be the resistance unplugged when the wire is just fused, and r_p the resistance of the wire at the point of fusion, then

$$C_x = \frac{P}{r_b + r_p + \rho + r_c}$$

If r_p , ρ and P are not known, they can be found as explained in §§ 215, 221 and 231 or 233.

MEASUREMENT OF THE FIRING CURRENT OF A WIRE FUZE.

242. The *firing current* of a fuze can be found in the same way as the fusing current of a fine wire, and the same formula is applicable. Not to waste fuzes, a high resistance can be unplugged in the first instance, after which the resistance in circuit can gradually be reduced until the fuze is fired; but in this case it is necessary to use Grove's cells, or some other constant element, to avoid the effects of polarization. The resistance r_p of the wire-bridge† can be estimated from its resistance when cold by allowing for the increase of temperature. The temperature at which the fuze is fired can be taken at about 600° Fahr.

MEASUREMENT OF CAPACITY.

243. The capacity of a conductor can be measured by comparison with the capacity of a known condenser.

*Or the time required for, say 10 vibrations, can be observed.

†Of Grove cells, if possible.