time the motor will have run up to full speed, the setting screws on the stirrup crossbar trip a pair of release catches, and allow the spring-biased moving contacts to operate. These break the circuit of the star contactor and energise the delta contactor. A fifth pair of contacts on the delta contactor completes a circuit in the power-supply cabinet, lighting the 'motor-alternator running' indicator lamps on the engineer's panel, on the lamp panel above the monitor and on the power-supply cabinet, and also enables the 'heaters on' push buttons on the desk and in the power-supply cabinet to take effect (see fig. 2.3.).

7. The 'stop' button on the starter simply breaks the connection between the contactors and the main supply. The same effect is achieved if the over-current relay (Allen West type SC) operates. Each armature of this relay is equipped with a delay device consisting of a perforated piston moving in an oil-filled dashpot, and a restraining device to prevent operation on surges. The trip current is set by adjusting the position of the dashpot relative to a graduated scale, the correct setting in this application being 36A, approximately 1.25 times full load current. The motor-alternator is not switched off from the control desk. It can, however, be switched off remotely by opening the isolator on the power-supply cabinet, the fourth pair contacts on this isolator being in the hold-on circuit of the line contactor.

## UNREGULATED SUPPLIES

8. Fig. 2.2 shows the routing of the unregulated supplies to the power-supply cabinet, computing cabinet and desk. The isolator, which is operated by a push button on the right-hand end of the power-supply cabinet, cuts off power to all parts of the equipment except the clock above the desk; it also switches off the motor-alternator set, (see fig. 2.1), which cannot then be switched on locally while work is proceeding on the power-supply and computing cabinets. It should be noted, however, that the line to the motor-alternator switch on the desk through terminals DE, 486, 172 and PL1/X (fig. 2.1) remains live when the isolator in the power-supply cabinet is opened, unless the isolator in the star-delta starter is opened as well. The three phases of the main are suppressed in the power-supply cabinet by series chokes and shunt capacitors connected to neutral; the neutral line is suppressed by a series choke and a shunt capacitor to the earthed case of the suppressor. All the capacitors in the suppressor are fused.

9. When the isolator in the power-supply cabinet has been closed, power is available for the switching circuits and the control amplifier and field regulators, and three positions of the voltmeter switch, SW1, in the power-supply cabinet are brought into circuit. It will be seen from fig. 2.3 that, when the switching circuits are energised, the 'AC supply' lamp on the power-supply cabinet and the 'mains on' lamp (ILP7) on the lamp panel above the monitor are lighted; the fan alarm relays and bias alarm relay RL13 relays in the computing cabinet are energised, and also relay RL9 in bay 2, which controls the heater-switching and 'drum-write' circuits. The fans, one in the left-hand bay of the power-supply cabinets and two in each bay of the computing cabinet do not come on until contactor CR1 (fig. 2.2) closes, i.e., until one of the 'heaters on' buttons is pressed. Contacts CR1 also completes the circuit feeding field power to the DC exciter. Single-phase fans are used, phase A of the main being used in bay 1, phase B in bay 2, and phase C in bay 3.