Kohler

Microcomputer Controller Operation

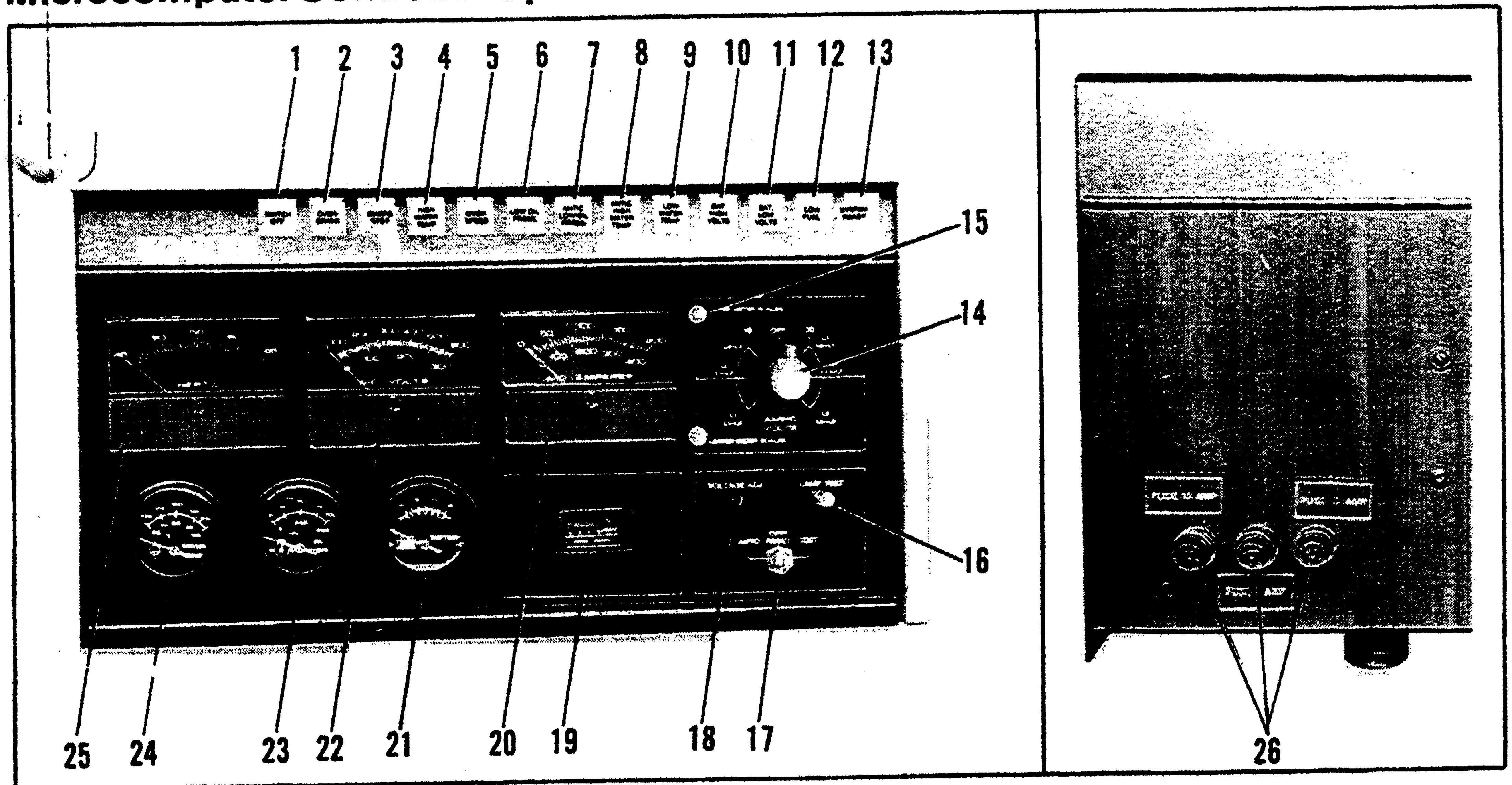

Figure 2-3. Microcomputer Controller

For identification of components, see Figure 2-3; for an explanation of their function refer to the following paragraphs.

Lamps:

1. **Switch Off** – lamp flashes when Generator Master Switch is in OFF/RESET position. Lamp will not light when Generator Master Switch is in AUTO or TEST position.
2. **Overcrank**
   - cranking stops and overcrank lamp will light if engine does not start after 60 seconds of cyclic cranking.
   - lamp will light after 25 seconds of attempted cranking if starter or engine will not turn (locked rotor).
   - lamp will light and engine will stop after starting and 25 seconds running without speed sensor signal (see Microcomputer Controller Troubleshooting – Speed Sensor).

   Overcrank Flashing – lamp will flash if speed sensor fails during a normal run. Engine will keep running.
3. **Emergency Stop** – lamp lights if emergency stop has been made or if overvoltage device (if equipped) has shut down. See "Emergency Stopping" following.
4. **High Water Temperature**—lamp lights if set has shut down due to high engine coolant temperature, and if equipped, low coolant level.
5. **Overspeed**—lamp lights if set shuts down due to overspeed.
6. **Low Oil Pressure**—lamp lights if set shuts down due to loss of engine oil pressure.
7. **Anticipated Low Oil Pressure (if equipped)**—lamp lights if engine oil pressure approaches shutdown level.
8. **Anticipated High Water Temperature (if equipped)** – lamp lights if engine coolant temperature approaches shutdown level.
9. **Low Water Temperature (if equipped)** – lamp lights if optional engine block heater is not working and/or temperature may be too low (below 70°F, 21°C) for 10-second start-up.
10. **Battery High Volts** – lamp lights if battery or charging voltage exceeds 15 volts for 12-volt systems; 30 volts for 24-volt systems (will also light if over voltage occurs due to battery charger malfunction while set is not operating).
11. **Battery Low Volts** – lamp lights if battery or charging voltage drops below 10 volts for 12-volt systems; 20 volts for 24-volt systems (will also light if under voltage occurs due to battery or charger malfunction while set is not operating).
12. **Low Fuel (if equipped)** – lamp lights if fuel tank level approaches empty.
13. **System Ready** – lamp lights when Generator Master Switch is in AUTO or TEST position and system senses NO faults.

Switches:

14. **Selector Switch (Voltmeter-Ammeter)** – selects generator output circuits to be measured. If switched to a point with three circuit lead labels, voltage is measured between the lower two leads and amperage on the upper lead. With switch in OFF position, AC voltmeter and ammeter will not register.
15. **Scale Lamps (upper, lower)** – indicate voltmeter and/or ammeter scales to be read.
16. **Lamp Test** – used to test indicator lamps.

17. **Generator Master Switch** – see "Testing, Starting and Stopping" following.
18. **Voltage Adjustment** – used to fine-adjust generator output voltage.

Meters:

19. **Hourmeter** – records total generator set operating hours for reference in maintenance scheduling.
20. **AC Ammeter** – measures amperage from output leads indicated by selector switch.
21. **DC Voltmeter** – measures voltage of starting battery(ies)/charging system.
22. **AC Voltmeter** – measures voltage across output leads indicated by selector switch.
23. **Oil Pressure** – measures engine oil pressure.
24. **Water Temperature** – measures engine coolant temperature.
25. **Frequency Meter** – measures frequency (Hz) of generator output voltage.
26. **Fuses:**
    - *4-Amp*-protects remote annunciator circuit, lamp circuit board, and alarm horn circuit (if equipped).
    - *1-Amp*-protects control circuit board and control relay coils.
    - *15-Amp*-protects engine DC and primary starting circuits.

NOTE

Earlier models utilize a 3 Amp. fuse to protect remote annunciator and alarm horn circuits. A 4 Amp. fuse protects control and lamp circuit boards and control relay coils.

"TEST" Starting

To start the generator set at the controller, move the Generator Master Switch to the TEST position.

"AUTO" Starting

Move Generator Master Switch to AUTO position to allow start-up by automatic transfer switch or remote start-stop switch connected to controller terminals 3 and 4.

NOTE

The Microcomputer Controller provides up to 60 seconds of cyclic cranking – crank 10 seconds, rest 10 seconds, crank 10 seconds, etc. Three crank/rest cycles, for a total of 60 seconds before overcrank shutdown.

Stopping

1. Disconnect load from generator set and allow it to run unloaded for 5 minutes.

NOTE

Run the generator at no load for 5 minutes prior to stopping to insure adequate cooling of the set.

2. Move Generator Master Switch to OFF/RESET position. Engine will stop.

NOTE

If engine stop is signaled by a remote switch or Automatic Transfer Switch, the generator set will keep running for a cool-down cycle of 5 minutes.

Emergency Stopping

Turn Generator Master Switch to OFF/RESET, or operate remote emergency stop switch (if equipped), for immediate shutdown.

Fault Shut-downs

The generator set will shut down automatically under the following fault conditions:

OVERCRANK: See "Overcrank", preceeding.

HIGH TEMPERATURE: Shutdown occurs 4 seconds after fault. *

CAUTION

High temperature shutdown will not function if proper coolant level is not maintained!

LOW COOLANT LEVEL (if equipped): Shutdown occurs 4 seconds after fault. *

LOW OIL PRESSURE: Shutdown occurs 4 seconds after fault, 5.5 to 10.5 psi (38 to 72 kPa) on diesel models; 11.5 to 18.5 psi (79 to 126kPa) on gasoline models. *

NOTE

* High temperature, low coolant level, and low oil pressure shutdowns will not function within the first 30 seconds after start-up.

CAUTION

Low oil pressure shutdown will not function due to low oil level only! Check for proper oil level at engine.

OVERSPEED: Unit shuts down immediately, if governed frequency exceeds 70 Hz on 60 Hz sets, or 60 Hz on 50 Hz sets.

OVERVOLTAGE: (if equipped) Unit will shut down after approximately one second of 15% or more over nominal voltage. EMERG. STOP lamp will light.

CAUTION

Sensitive equipment may suffer damage in less than one second of an overvoltage condition. On-line equipment requiring faster shutdowns should have its own over-voltage protection.

Resetting

Use the following procedure to restart set after a fault shutdown.

1. Move Generator Master Switch to OFF/RESET position.
2. Disconnect generator set from load with line circuit breaker or automatic transfer switch.
3. Correct cause of fault shutdown. See "Safety Precautions."
4. Move Generator Master Switch to TEST position for start-up.
5. Verify that cause of shutdown has been corrected.
6. Reconnect to load.
7. Move Generator Master Switch to necessary position (AUTO or TEST) for start-up.

Remote Annunciator (Decision Monitor)

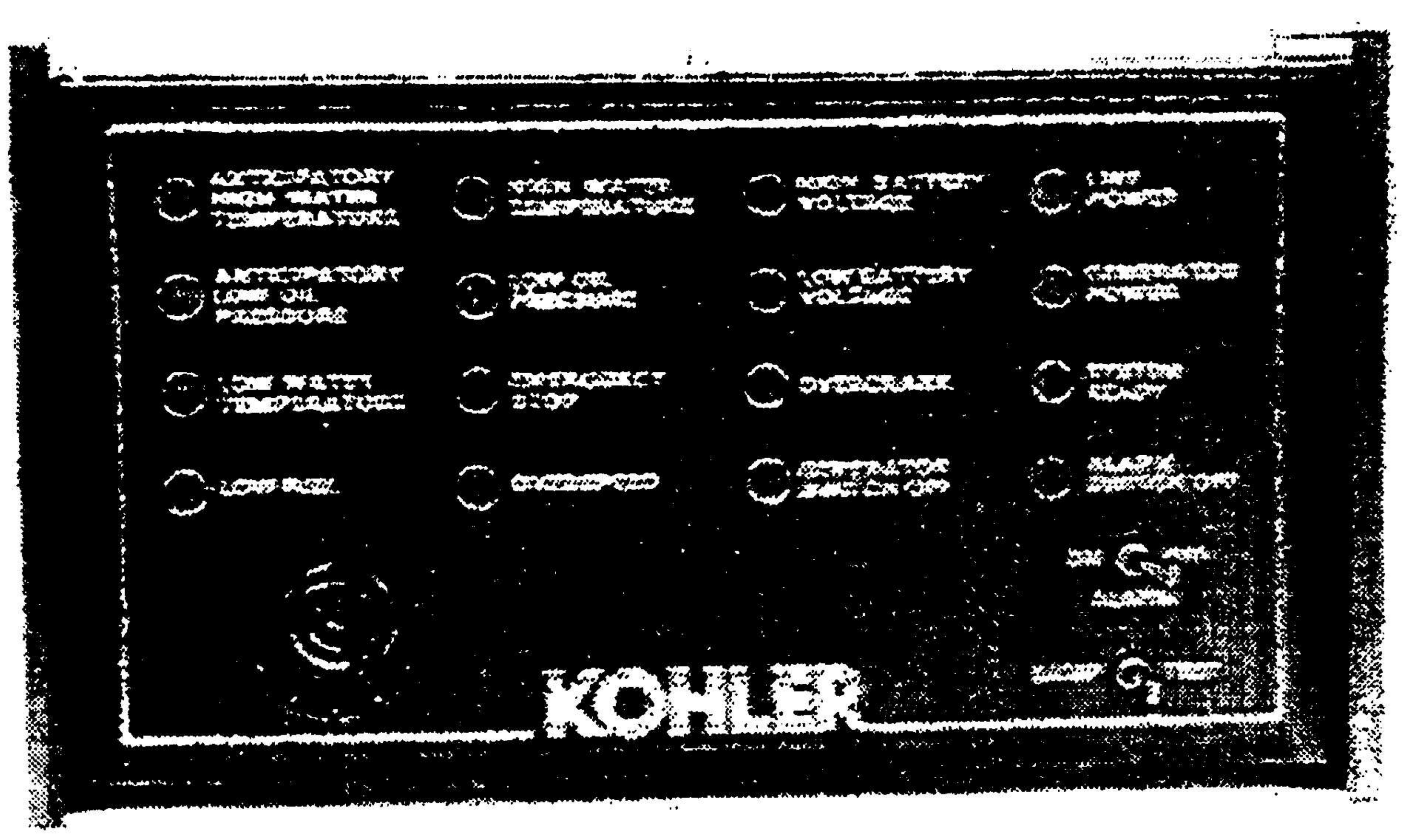

Figure 2-4. Remote Annunciator (Decision Monitor)

An annunciator may be located at a work station remote from the generator set, to allow convenient monitoring of the set's condition. Decision Monitors have the same lamp indicators as the Microcomputer controller, plus the following (see Figure 2-4):

- **Line Power**–indicates commercial utility power in use.
- **Generator Power**–indicates generator power in use.
- **Alarm Switch Off**–indicates ALARM switch in OFF position.
- **Alarm Horn**–sounds if any fault or anticipatory condition occurs.

Alarm Horn (if equipped)

The generator set may be equipped with a unit-mounted alarm horn and alarm switch. The alarm switch may be used to silence the alarm horn while servicing the set (see Figure 2-5).

Figure 2-5. Alarm Horn Switch

Safeguard Breaker (If equipped)

The Safeguard Breaker senses output current on each generator phase, and will shut off the AC voltage regulator in the event of a sustained overload or short circuit. It is not a line circuit breaker, and will not disconnect the generator from the load. See Figure 2-6.

⚠ WARNING

SHOCK HAZARD! Voltage may be induced in load circuits with Safeguard Breaker open. There is a potential danger of electrocution or shock. Use line circuit breaker or transfer switch to disconnect generator from load.

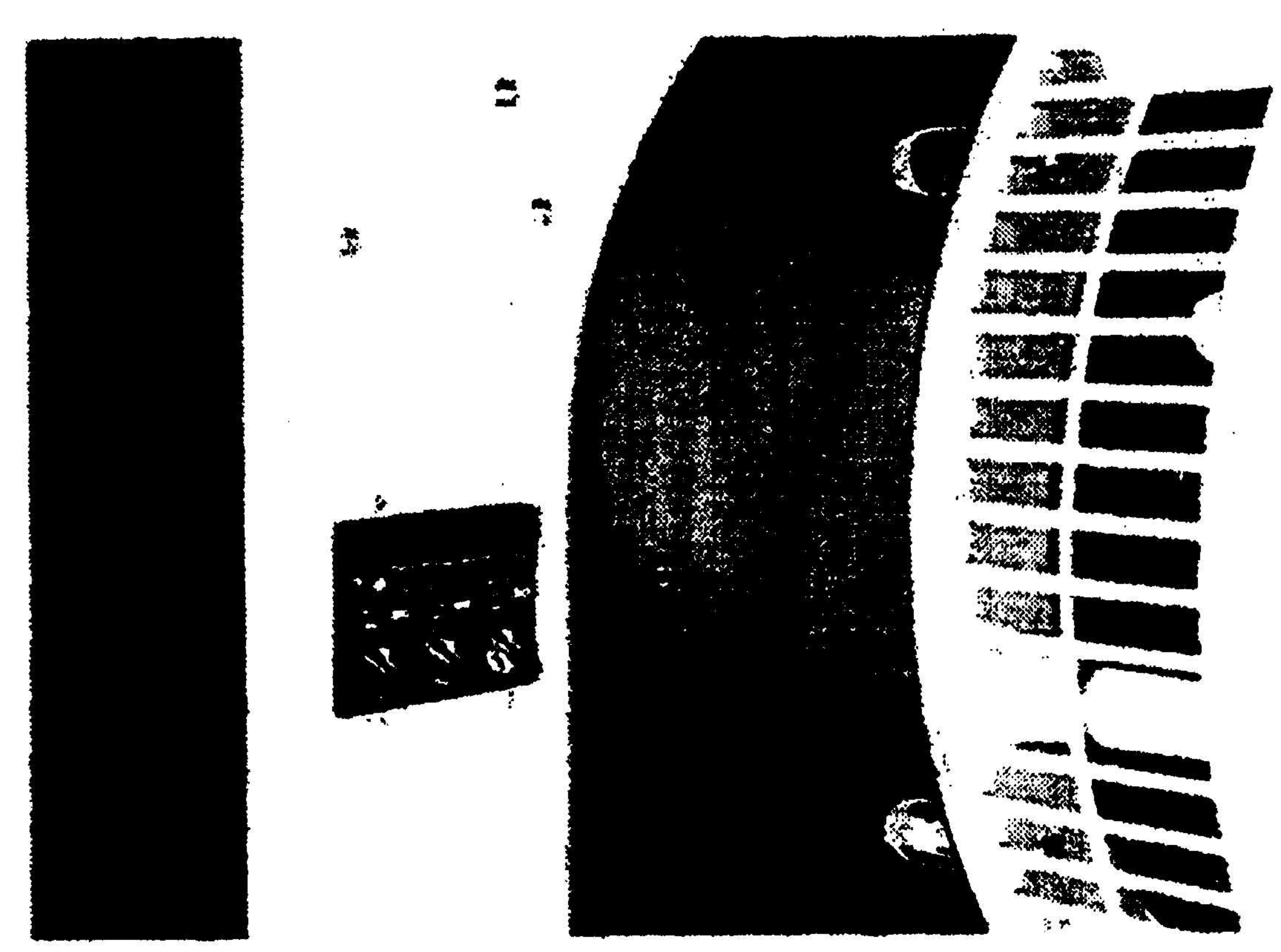

Figure 2-6. Safeguard Breaker