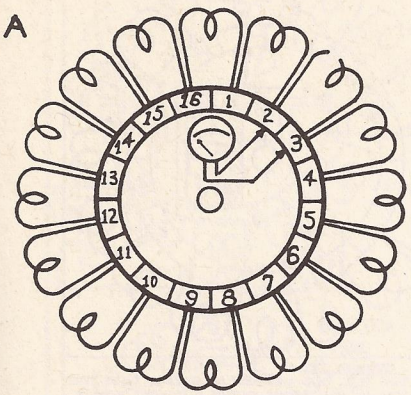
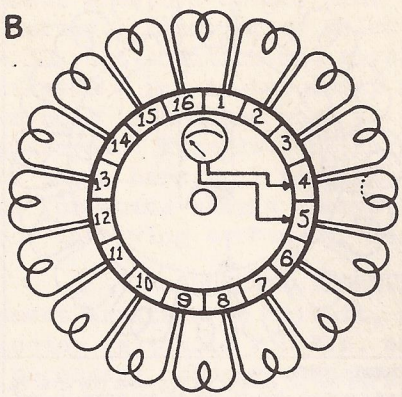
ARMATURE GROWLER TESTS

A



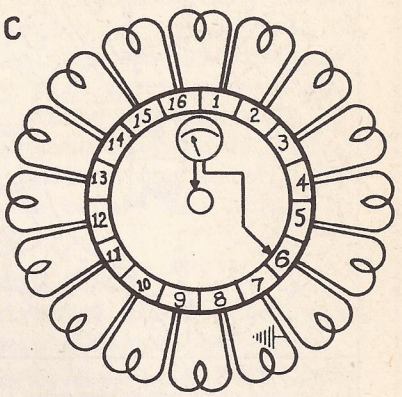
TROUBLE: OPEN COIL
THIS DEFECT SHOWS ITSELF ON THE OPERATING MACHINE BY EXCESSIVE SPARKING AT THE BRUSHES AND BURNING OF THE BARS ATTACHED TO THE COIL. WHEN TESTED ON THE GROWLER, THE METER READING BETWEEN BARS 1 AND 2 WILL BE ZERO. IF THE OPEN IS DUE TO POOR SOLDERING AT THE COMMUTATOR, RESOLDER. IF CAUSED BY AN OPEN IN THE COIL ITSELF, DISCONNECT THE LEADS, INSULATE THE ENDS, AND CONNECT A JUMPER FROM BAR 1 TO BAR 2.

B



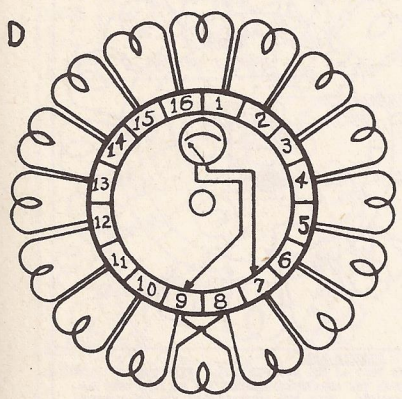
TROUBLE: SHORTED COIL
WHEN THE MACHINE IS IN OPERATION, A SHORTED COIL IS INDICATED BY THE EXCESSIVE HEAT IT GENERATES. WHILE OTHER COILS ON THE ARMATURE MAINTAIN A NORMAL TEMPERATURE, THE SHORTED COIL BECOMES SO HOT THAT IT BURNS THE INSULATION FROM THE WINDING. ON THE GROWLER, THE METER READING BETWEEN BARS 4 AND 5 WILL BE LOW OR ZERO. A HACKSAW BLADE WILL VIBRATE OVER THE SLOTS IN WHICH THE SHORTED COIL LIES.

C



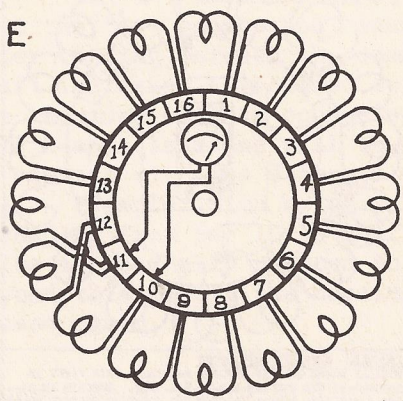
TROUBLE: GROUNDED COIL
A GROUNDED COIL WILL USUALLY GIVE NO INDICATION DURING OPERATION UNLESS THE FRAME OF THE UNIT BE UNGROUNDED; IN THIS CASE, A SHOCK MAY BE FELT WHEN TOUCHING THE FRAME. TWO GROUNDS ON THE ARMATURE PRODUCE A SHORT-CIRCUIT. ON THE GROWLER, A METER READING IS TAKEN BETWEEN THE COMMUTATOR BARS AND THE SHAFT. THE READING BECOMES LESS AS THE SHORTED BAR IS APPROACHED AND IS MINIMUM WHEN CONTACTED.

D



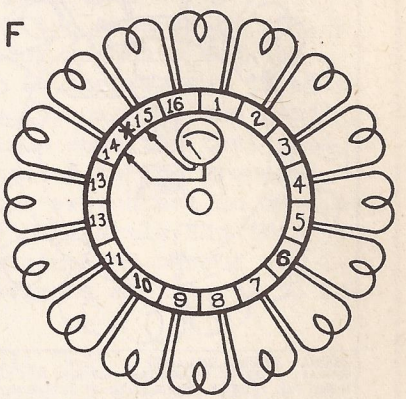
TROUBLE: REVERSED COIL LEADS
IN OPERATION, THIS DEFECT WOULD CREATE UNBALANCE IN THE ARMATURE CIRCUIT WITH THE RESULT THAT CIRCULATING CURRENTS WOULD FLOW AND TEND TO CAUSE OVERHEATING. ON THE GROWLER, MAKE A 1 TO 3 BAR TEST. WHEN TESTING BETWEEN BARS 7 AND 9, THE READING WOULD BE ZERO AND THE SAME READING WOULD BE OBTAINED BETWEEN BARS 8 AND 10. THIS WOULD INDICATE THAT THE LEADS OF THE COIL ATTACHED TO BARS 8 AND 9 ARE REVERSED.

E



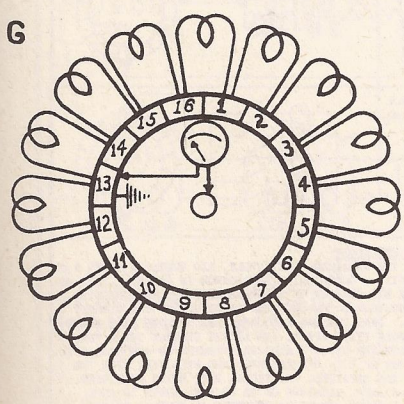
TROUBLE: REVERSED COIL LOOPS
THIS FAULT, WHICH USUALLY OCCURS IN A REWOUND MACHINE, MAY PRODUCE SPARKING AT THE BRUSHES DURING OPERATION. WHEN TESTED ON THE GROWLER, THE METER WILL SHOW A DOUBLE READING BETWEEN BARS 10 AND 11, A NORMAL READING ON 11 AND 12, AND A DOUBLE READING ON 12 AND 13. TO REMEDY, UNSOLDER LOOPS ON 11 AND 12 AND REVERSE THEM. HACKSAW WILL GIVE NO INDICATION OF THIS FAULT.

F



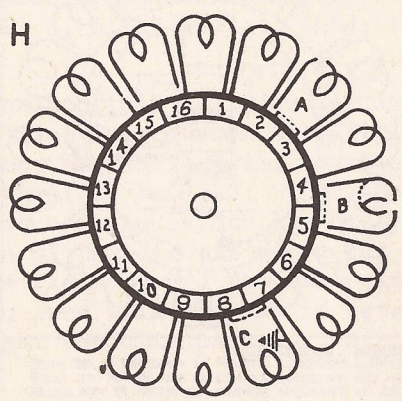
TROUBLE: SHORTED BARS
INDICATION DURING OPERATION IS OVERHEATING OF COIL ATTACHED TO BARS 14 AND 15 AND POSSIBLE SPARKING AT THE BRUSHES. ON GROWLER HACKSAW BLADE WILL VIBRATE OVER SLOTS CONTAINING COIL CONNECTED TO SHORTED BARS, AND METER READING BETWEEN 14 AND 15 WILL BE ZERO. REMEDY: REMOVE SHORT FROM BARS OR DISCONNECT COIL AND INSTALL A JUMPER FROM 14 TO 15.

G

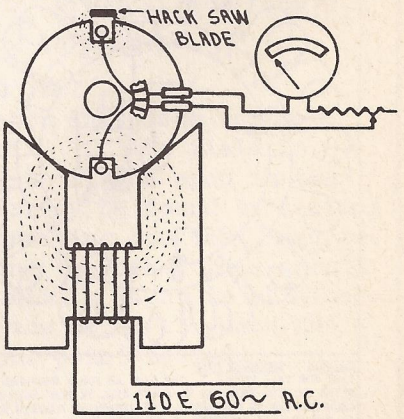


TROUBLE: GROUNDED BARS
IF THERE ARE NO OTHER GROUNDS ON THE MACHINE, THE FAULT WILL NOT AFFECT THE OPERATION OF THE MACHINE AT ALL. IF OTHER GROUNDS ARE PRESENT, SEVERE FLASHING AT THE BRUSHES WILL USUALLY OCCUR. THE TEST PROCEDURE IS THE SAME AS EMPLOYED IN DIAGRAM "C". TO DETERMINE IF GROUND IS COIL OR BAR, DISCONNECT WIRES FROM BAR 13 AND THEN TEST BAR FOR GROUND. REMEDY: REINSULATE BAR.

H



THIS SKETCH SHOWS HOW THE DIFFERENT FAULTS ABOVE LISTED ARE REMEDIED. THE LETTERS ON THE SKETCH REFER TO DIAGRAMS ABOVE IN WHICH THE FAULT IS GIVEN DETAILED TREATMENT. "A" SHOWS REMEDY FOR OPEN COIL, "B" FOR SHORTED COIL, "C" FOR GROUNDED COIL. DOTTED LINES BETWEEN BARS REPRESENT JUMPERS. NOTE THAT WITH A SHORTED COIL IT IS ESSENTIAL THAT THE COIL ITSELF BE CUT AS SHOWN IN "B" TO REMOVE THE SHORT CIRCUIT.



THE PURPOSE OF A GROWLER IS TO PRODUCE AN ALTERNATING MAGNETIC FIELD WHICH, CUTTING BACK AND FORTH THROUGH THE ARMATURE COILS, INDUCES IN THEM A LOW VOLTAGE MEASURABLE AT THE COMMUTATOR BARS WITH AN A.C. MILLIVOLTMETER. THE RESISTANCE "R" IS USED TO ADJUST THE READING TO APPROXIMATELY MIDSCALE. WHEN A SHORTED COIL IS PLACED BETWEEN THE GROWLER JAWS, THE HEAVY CURRENT SET UP IN THE COIL CAUSES PERIODIC MAGNETIZATION OF THE SLOT IN WHICH THE COIL LIES, RESULTING IN THE HACKSAW BLADE HELD NEAR THE SLOT BEING ALTERNATELY ATTRACTED AND RELEASED.