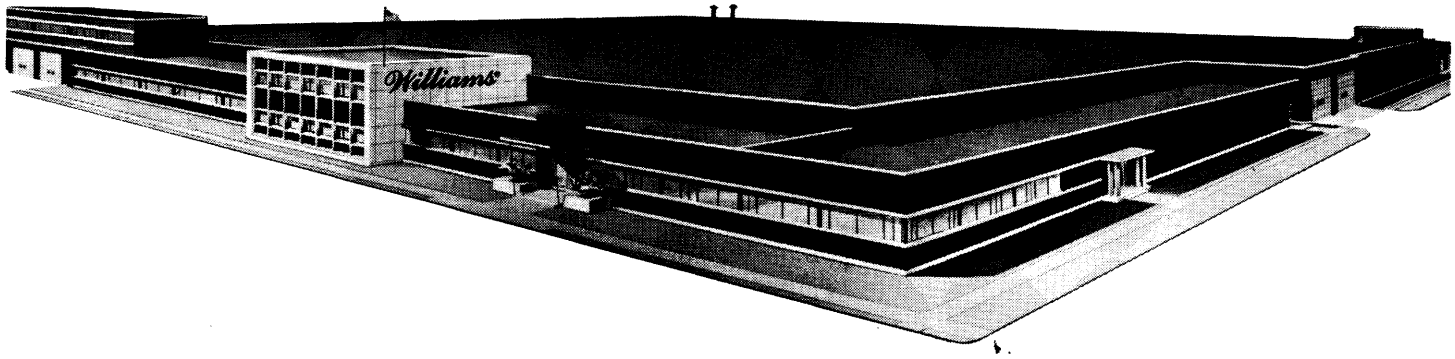
Instruction Manual

for

JIVE TIME



Williams® ELECTRONICS, INC.
SUBSIDIARY OF THE SEEBURG CORPORATION

3401 N. California Ave.
Phone 267-2240

Chicago, Ill. 60618, U.S.A.
Cable Address: Wilcoin

IMPORTANT NOTICE

KINDLY INFORM LOCATIONS THAT THEY CAN TURN DISPLAY LIGHTS ON BY PRESSING LEFT FLIPPER BUTTON. MACHINE CAN STILL BE SHUT OFF BY TAPPING BOTTOM OF CABINET.

MASTER SWITCH (ON-OFF) IS LOCATED UNDERNEATH FRONT PART OF CABINET.

CAUTION!

The playboard on this machine has an improved finish with excellent wearing properties. Do not under any circumstances clean the board with water, water soap solutions or harsh abrasives. Avoid such things as steel wool, kitchen cleansers or abrasive hand soap. Water will weaken the adhering of the paint to the board and abrasives shorten the board life by many thousand plays. A wax base cleaner with negligible abrasive qualities used lightly, but frequently, will extend the board life to its full capabilities.

SERVICEMAN

TO REMOVE BACKGLASS:

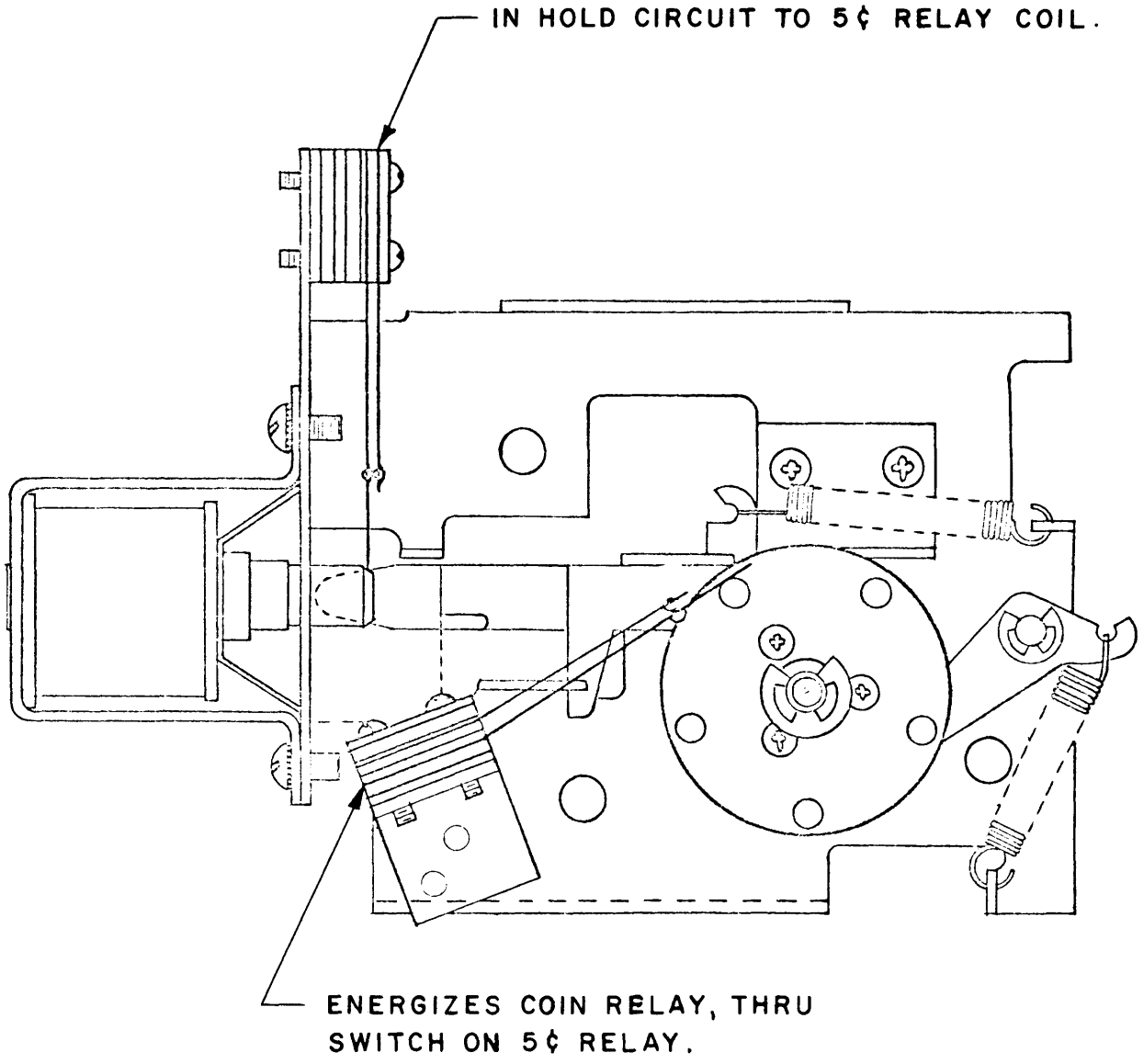
- WITH BACK DOOR OPENED, PULL BACK ON BRACKETS AT INSIDE TOP OF LITE BOX.

- FROM THE FRONT OF GAME, LIFT GLASS UP AND OUT.

ALTERNATOR UNIT

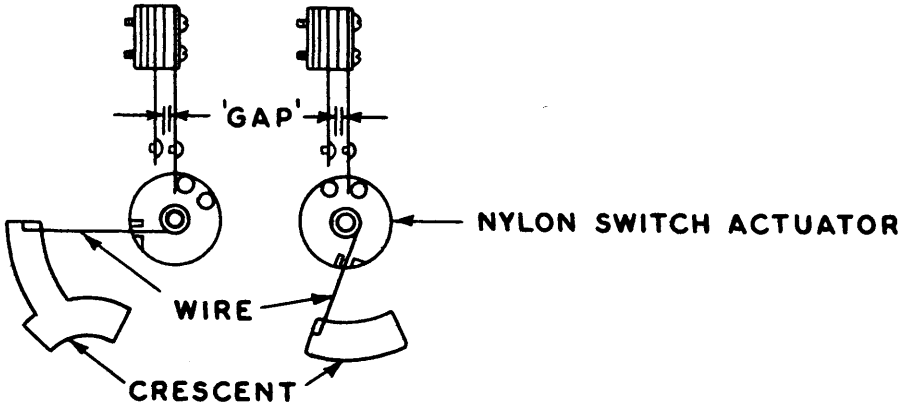
LOCATED ON MECHANISM PANEL.

USED IN CONJUNCTION WITH 5¢ RELAY FOR "2 COINS - 1 PLAY" FEATURE.



INSTRUCTIONS FOR COIN TRIP SWITCH ADJUSTMENT

WIRE SHOULD BE IN CONTACT WITH END OF CRESCENT OPENING WHEN BLADE ADJUSTMENT IS MADE.



Long blade should be in contact with nylon switch actuator and have a maximum overtravel of 1/32.

or

Using a gram gauge, tension of long blade should not exceed 10 grams.

SWITCH ADJUSTMENT

1. For small coins, such as dimes, adjust short blade so that the 'gap' between the silver contacts is .045 to .055.
2. For larger & heavier coins the 'gap' should be .045 to .060.
3. Do not adjust 'gap' closer than .040.

SUGGESTED SCORE CARDS

5 Ball Play 380-1

3 Ball Play 380-2

WARRANTY

THE MOTORS IN ALL NEW WILLIAMS PRODUCTS ARE UN-CONDITIONALLY GUARANTEED FOR 6 MONTHS FROM DATE OF PURCHASE.

ANY DEFECTIVE MOTORS RETURNED DURING THE WARRANTY PERIOD WILL BE REPLACED FREE OF CHARGE BY YOUR WILLIAMS DISTRIBUTOR.

IMPORTANT NOTICE

WHEN ORDERING PARTS ALWAYS SPECIFY NAME OF UNIT, GAME AND SERIAL NUMBER, IN ADDITION TO A CLEAR DESCRIPTION OF THE PART AND PART NUMBER IF POSSIBLE.

UNIT PARTS LIST

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
REPLAY	-----	-----	A-6400	
BALL COUNT	C-6417	C-6520	A-6402-10	
BONUS	C-6417	C-6520	A-6401	SPINNER MOTOR 14A-7846 (50 CYCLE)
NO. MATCH	C-6879	C-6520	A-6401	
SPIN	B-7104	A-7175	-----	
TENS	A-7195	A-6294	3C-7272	SCORE MOTOR 14A-7805 (60 CYCLE) 14A-7806 (50 CYCLE)
HUNDREDS	-----	-----	3C-7272	
THOUSANDS	-----	-----	3C-7272	
10,000	A-7195	A-6294	3C-7272	
100,000	A-7195	A-6294	3C-7272	

"JIVE TIME" COIL CHART

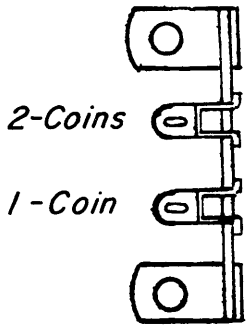
NOTICE:

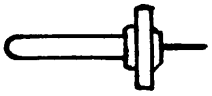
THIS GAME OPERATES ON 24 VOLTS. WHEN ORDERING REPLACEMENT TRANSFORMERS, MOTORS, COILS OR METERS ... MAKE SURE TO SPECIFY CORRECT PART NUMBER.

NUMBER	DESCRIPTION	LOCATION
14 A 7805	SCORE MOTOR - 60 CYCLE	MECH. PANEL
14 A 7806	SCORE MOTOR - 50 CYCLE	MECH. PANEL
14 A 7846	SPIN MOTOR - 50 CYCLE	INSERT
15 A 6771	TRANSFORMER - 60 CYCLE	MECH. PANEL
15 A 6782-1	TRANSFORMER - 50 CYCLE	MECH. PANEL
B 6396	24 VOLT METER	MECH. PANEL
	SOLENOID COILS	
A 22-550	MATCH UNIT STEP UP	INSERT
	BALL COUNT UNIT STEP UP	INSERT
	BALL RELEASE	PLAYFIELD
	BONUS UNIT STEP UP	PLAYFIELD
A 23-600	REPLAY UNIT STEP UP	INSERT
A2-23-750	KNOCKER	CABINET
	LARGE BELL	CABINET
B 26-800	ALTERNATOR UNIT	MECH. PANEL
	BALL COUNT UNIT RESET	INSERT
	SCORE DRUM UNITS ... (5 req'd.)	INSERT
	BONUS UNIT RESET	PLAYFIELD
	REPLAY UNIT RESET	INSERT
G 22-550	JET BUMPERS ... (5 req'd.)	PLAYFIELD
G 23-750	AUTO KICKERS ... (2 req'd.)	PLAYFIELD
	EJECT COILS ... (2 req'd.)	PLAYFIELD
	DOWN LAMP POST	PLAYFIELD
	DOWN MINI POST	PLAYFIELD
FL 21-375/ 28-400	FLIPPERS ... (2 req'd.)	PLAYFIELD
	RELAY COILS	
M1-31-1500	COIN LOCKOUT	DOOR
M 29-1000	GAME TRIP	MECH. PANEL
	GAME OVER TRIP	MECH. PANEL
	UP LAMP POST	PLAYFIELD
	UP MINI POST	PLAYFIELD
M 29-1100	5¢ RELAY	MECH. PANEL
	10¢ RELAY	MECH. PANEL
	25¢ RELAY	MECH. PANEL
	10 POINT RELAY	INSERT
	100 POINT RELAY	INSERT
	NO. 1 BUMPER RELAY	PLAYFIELD
	NO. 2 BUMPER RELAY	PLAYFIELD
	NO. 3 BUMPER RELAY	PLAYFIELD
	POST RELAY	PLAYFIELD
	ADVANCE RELAY	PLAYFIELD
	SPIN RELAY	MECH. PANEL
	BONUS RELAY	PLAYFIELD
	SCORE RELAY	PLAYFIELD
	3,000 RELAY	PLAYFIELD
	DOUBLE BONUS RELAY	PLAYFIELD
	500 POINT RELAY	PLAYFIELD
	1,000 POINT RELAY	INSERT
	10,000 POINT RELAY	INSERT
	SCORE RESET RELAY	INSERT
M 30-1300	NO. 1 DELAY RELAY	INSERT
	NO. 2 DELAY RELAY	INSERT
Z 27-1000	GAME LATCH	MECH. PANEL
	GAME OVER LATCH	MECH. PANEL
	EJECT RELAY	MECH. PANEL
	SPECIAL RELAY	MECH. PANEL
	COIN RELAY	MECH. PANEL
	OUTHOLE RELAY	MECH. PANEL
	RESET RELAY	MECH. PANEL
Z 28-1150	LOCK RELAY	MECH. PANEL
	WEST GATE	PLAYFIELD
	BALL INDEX RELAY	MECH. PANEL
Z 28-1200	ON GREEN RELAY	PLAYFIELD
	ON YELLOW RELAY	PLAYFIELD
XM 27-675	METER COIL	B 6396

ADJUSTMENTS ON MECHANISM PANEL

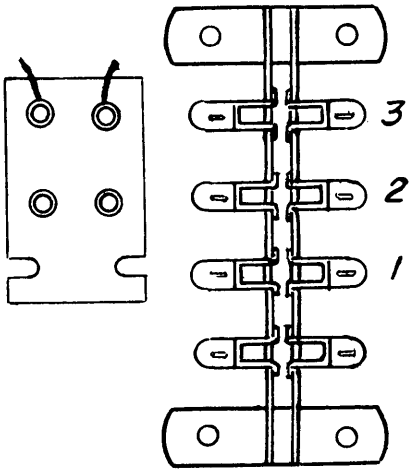
5¢ Adjustment





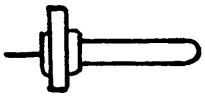
IN "2 COINS FOR 1 PLAY", CIRCUIT TO COIN RELAY PASSES THRU SWITCH ON ALTERNATOR UNIT.

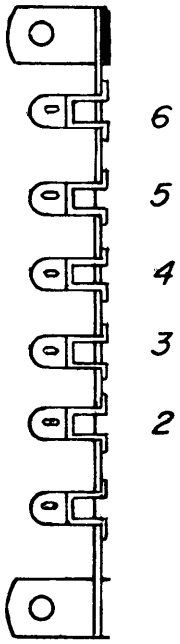
10¢ Adjustment



PROVIDES 1, 2 OR 3 PLAYS FOR ONE COIN.

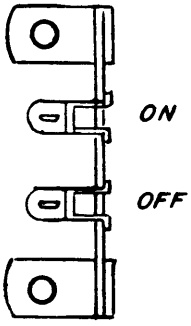
25¢ Adjustment



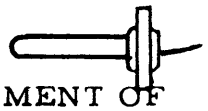


PROVIDES 2, 3, 4, 5 OR 6 PLAYS FOR 25¢.

Motor Service Jack



INSERT PHONE TIP IN 'OFF' POSITION - CAMS CAN BE TURNED BY HAND TO CHECK



ADJUSTMENT OF SWITCHES.

POWER TRANSFORMER:

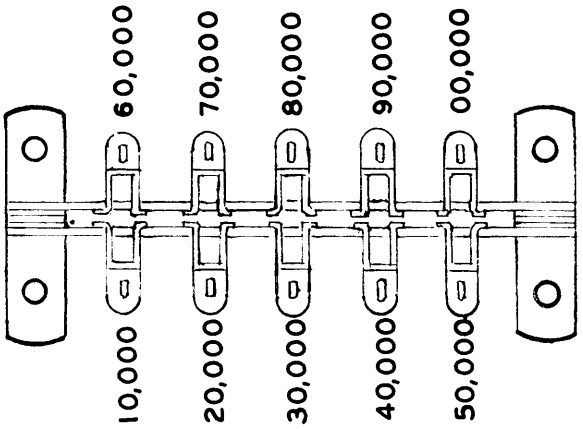
LOCATED ON MECHANISM PANEL, IT IS EQUIPPED WITH A SECONDARY TAP. IF YOUR GAME IS ON LOCATION WITH EXTREMELY LOW LINE VOLTAGE, REMOVE LEAD FROM LUG MARKED 24 VOLTS AND SOLDER TO ALTERNATE LUG MARKED "HIGH". THIS WILL BOOST SECONDARY VOLTAGE APPROXIMATELY 2-3 VOLTS.

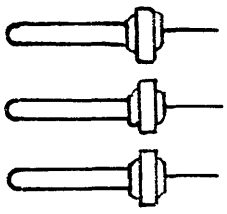
LEG LEVELERS:

ARE PROVIDED FOR TWO PURPOSES - 1ST TO LEVEL GAME ON LOCATION, 2ND TO INCREASE PITCH FOR GAME PERCENTAGING. IF IT IS DESIRED TO SPEED UP PLAY AND DECREASE SCORES, RAISE REAR LEG LEVELERS TO INCREASE PITCH.

ADJUSTMENTS IN BACKBOX

HI-Score Adjustment





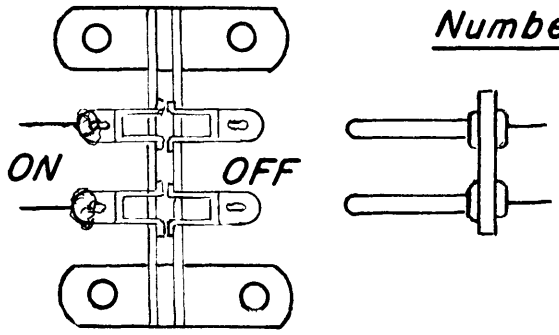
-GREY- (10,000 TO 100,000)

-RED- (110,000 TO 200,000)

-BLUE- (210,000 TO 300,000)

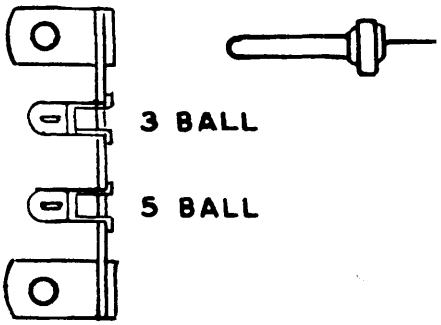
Insert plugs into 10 Point Female at desired positions.
Example:
Grey wire into 10,000 position scores at 10,000.
Blue wire into 00,000 position scores at 300,000.

Number Match Adjustment



In "ON" position, number match lite will appear when game is over. This number will match the last number in point score, on the average, once every ten games.
In "OFF" position, Number Match is inoperative.

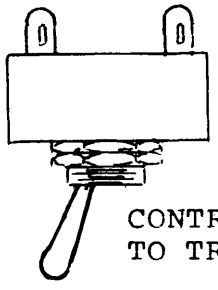
No. of Balls Adjustment



Plug changes 3 to 5 ball play, or vice versa.

MASTER ON-OFF SW.

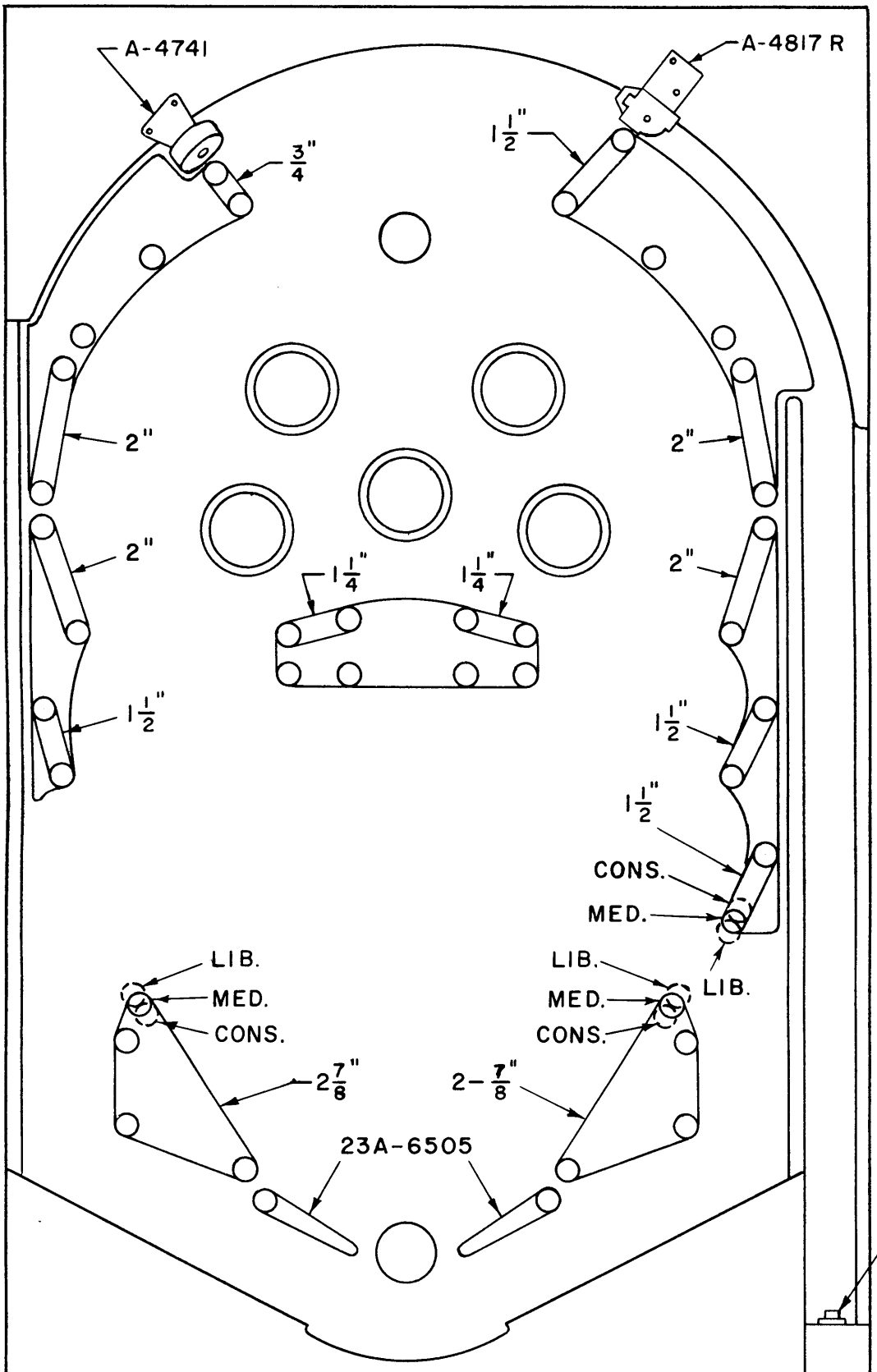
(Located under front of Cabinet)



CONTROLS POWER TO TRANSFORMER

"JIVE TIME" — POST ADJUSTMENT SHEET

TO MAKE GAME MORE "CONSERVATIVE" OR "LIBERAL" — MOVE POSTS 3/16" AS SHOWN IN SKETCH BELOW. SPOTTING HOLES ARE PROVIDED AND CAN BE SEEN ON REMOVAL OF POSTS.



ABBREVIATIONS:

CONS. – CONSERVATIVE
LIB. – LIBERAL
MED. – MEDIUM

RUBBER RING NUMBERS:

23A-6300	5/16"	I.D.
23A-6301	3/4"	I.D.
23A-6303	1 1/4"	I.D.
23A-6304	1 1/2"	I.D.
23A-6305	2"	I.D.
23A-6307	2 7/8	I.D.

A-4741 REBOUND ASS'Y.
A-4817 R BALL GATE ASS'Y.

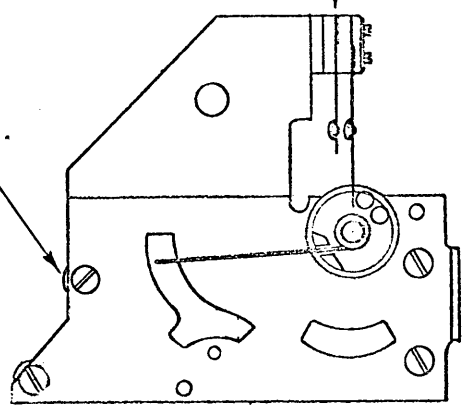
23A-6327 BALL SHOOTER RUBBER TIP

DIMENSIONS INDICATED BY ARROWS ARE FOR SIZES OF RUBBER RINGS.

CONVERTING FROM (10¢-25¢) PLAY TO (2/25¢ - 2/25¢) PLAY

REPLACE 10¢ COIN CHUTE WITH 25¢ COIN CHUTE.
REPLACE 10¢ COIN INSERT PLATE WITH (1A-4215) 25¢ COIN INSERT PLATE.
REPLACE 10¢ IDENTIFICATION PLATE WITH (16C-8640-100) 2 PLAYS-QUARTER.
REPLACE 10¢ COIN SWITCH WITH 25¢ COIN SWITCH (3M-3)

REMOVE MACHINE SCREW AND SPACER IN "COIN TRIP AND SWITCH ASSEMBLY "B-6853, TO ALLOW QUARTER TO PASS THRU.



B-6853 COIN TRIP & SWITCH ASS'Y.

TO CONVERT FROM (5¢ 5¢ - 10¢ - 25¢) TO (2/25¢ - 2/25¢)

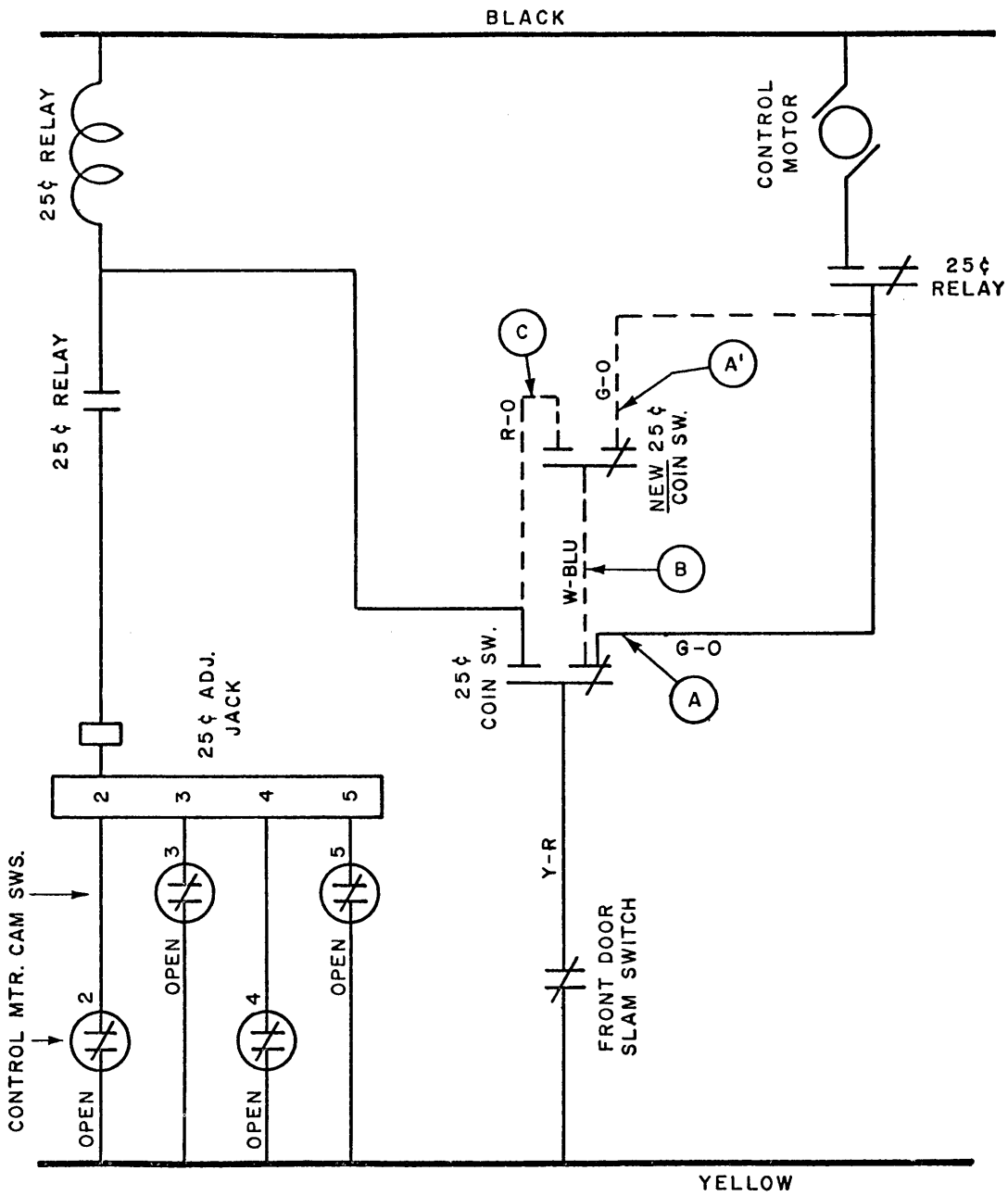
REPLACE (5¢ 5¢) COIN TRIP AND SWITCH ASSEMBLY WITH B-6853 (10¢) COIN TRIP AND SWITCH ASSEMBLY.
REPLACE 5¢ COIN CHUTE WITH 25¢ COIN CHUTE.
REPLACE 5¢ COIN INSERT PLATE WITH (1A-4215) 25¢ COIN INSERT PLATE.
REPLACE 5¢ IDENTIFICATION PLATE WITH (16C-8640-100) 2 PLAYS - QUARTER.
MAKE CHANGES ON B-6853 "COIN TRIP AND SWITCH ASSEMBLY" AS SHOWN ABOVE.
USE PART NO. 16A-8636 (DUMMY COIN ENTRY COVER) ON CENTER CHUTE.

WIRING INSTRUCTIONS

AT ORIGINAL 25¢ COIN SWITCH, UNSOLDER GREEN-ORANGE WIRE (A) AND TAPE IT. REMOVE TAPE FROM WHITE-BLUE WIRE AND SOLDER IN ITS PLACE.

AT NEW 25¢ COIN SWITCH, REMOVE TAPE FROM GREEN-ORANGE, WHITE-BLUE AND RED-ORANGE WIRES AND SOLDER AS SHOWN BY DOTTED LINES (A'), (B) AND (C).

INSERT 25¢ **ADJUSTMENT JACK** INTO "2 PLAYS FOR QUARTER" POSITION.



"JIVE TIME"

WHEN BALL FALLS INTO EITHER ONE OF TWO EJECT HOLES, SPIN RELAY WILL ENERGIZE. SWITCHES ON SPIN RELAY WILL RUN SCORE MOTOR, RUN SPIN MOTOR, AND ENERGIZE EJECT RELAY.

SWITCHES ON EJECT RELAY WILL:

1. RUN SCORE MOTOR.
2. OPEN PULL-IN CIRCUIT TO SPIN RELAY, WHICH DROPS OUT AT CAM SWITCH 5A.
3. ENERGIZE ONE OF SIX RELAYS WHEN ARROW STOPS AND SCORE MOTOR REACHES INDEX POSITION.

NO.1 AND NO.2 DELAY RELAYS ARE USED TO DELAY THE ENERGIZING OF THESE SIX RELAYS.

THE VALUE OF THE ARROW, WHEN IT STOPS, AND THE CORRESPONDING RELAYS THAT ENERGIZE, ARE AS FOLLOWS:

1. "OPEN WEST GATE" ENERGIZES "500" RELAY.
2. "BONUS" ENERGIZES "BONUS" RELAY.
3. "3000" ENERGIZES "3000" RELAY.
4. "10,000" ENERGIZES "SPECIAL" RELAY.
5. "1,000" ENERGIZES "SCORE" RELAY.
6. "DOUBLE BONUS" ENERGIZES "DOUBLE BONUS" RELAY.

THE LONG WIPER FINGER ON THE SPIN UNIT DISC FEEDS THE CIRCUITS TO THESE SIX RELAYS.

THE SHORT WIPER FINGER FEEDS CIRCUITS TO NO.1 AND NO.2 DELAY RELAYS.

EXPLANATIONS OF THE SWITCHES ON THE ABOVE RELAYS CAN BE FOUND IN THE LAST SECTION OF THIS INSTRUCTION MANUAL.

SPIN MOTOR ALIGNMENT

SHORT WIPER FINGER SHOULD BE EXACTLY IN LINE WITH POINT OF ARROW. FOR EXAMPLE:

SET POINT OF ARROW TO CENTER OF ANY DIVIDING LINE. LONG WIPER FINGER SHOULD BRIDGE TWO SEGMENTS EXACTLY 180° FROM POINT OF ARROW.

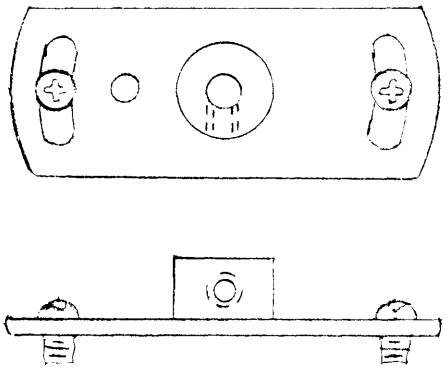
IF ADJUSTMENT IS NECESSARY, LOOSEN TWO 8-32 PHILLIPS SCREWS ON OUTSIDE STUD PLATE, ROTATE WIPER TO POSITION DESCRIBED ABOVE, AND TIGHTEN SCREWS.

SPIN MOTOR DISC AND COLLECTOR RING SHOULD HAVE A LIGHT FILM OF GREASE.

FOR PREMATURE SCORING, THAT IS, MACHINE SCORES BEFORE ARROW STOPS, CHECK SHORT WIPER FINGER FOR PROPER TENSION.

IF MECHINE FAILS TO SCORE AT ALL, AFTER SPIN, CHECK TENSION ON LONG WIPER FINGER AND ALSO FINGER TO COLLECTOR RING.

STUD PLATE



1 GENERAL

NEVER EXPERIMENT with any of the mechanism. Locate any trouble with the aid of Wiring Diagrams or Operating & Servicing Information supplied with the machine, then check for proper adjustment of the units involved before making any changes. Improper adjustment or make-shift repair will only cause serious damage to other parts of the machine or repeated failure of the part.

NOTE: Always look for a possible loose wire, bad connection at a plug and socket, broken or unhooked springs on step-up units, relays, etc., before adjustments are made or wires reconnected.

2. FUSES

IMPORTANT: Never replace fuses with any rating other than specified on the fuse block; this block is located adjacent to the transformer.

3. LUBRICATION

Over-lubrication causes far more trouble in coin operated equipment than under-lubrication. Practically all cases of poor contact on switches and wiper discs are due to oil or grease, or oil vapor, which forms a film or residue on the contacts and will not allow current to pass through. Excess lubricant may also seep into clutches causing them to slip.

IMPORTANT: NEVER USE VASELINE FOR LUBRICATION OF ANY PART OF THE MACHINE. Vaseline is not a true lubricant. It leaves a dirty and gummy residue and it becomes very thick when cold. A special Coin Machine Lubricant is supplied with each machine.

STEP-UP Levers, Ratchets, Cams, Shafts and other sliding or oscillating parts should be very lightly greased with special Coin Machine Lubricant (supplied with machine) not oftener than every six months. The bakelite discs (biscuits) on the Motor Units and Step-up Units will require lubrication with the special Coin Machine Lubricant only after the grease is completely evaporated (3 to 12 months, depending on climate) or when the film of grease becomes dirty. In either event, clean the parts thoroughly with a solvent, then apply an extremely thin coat of the special grease.

Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

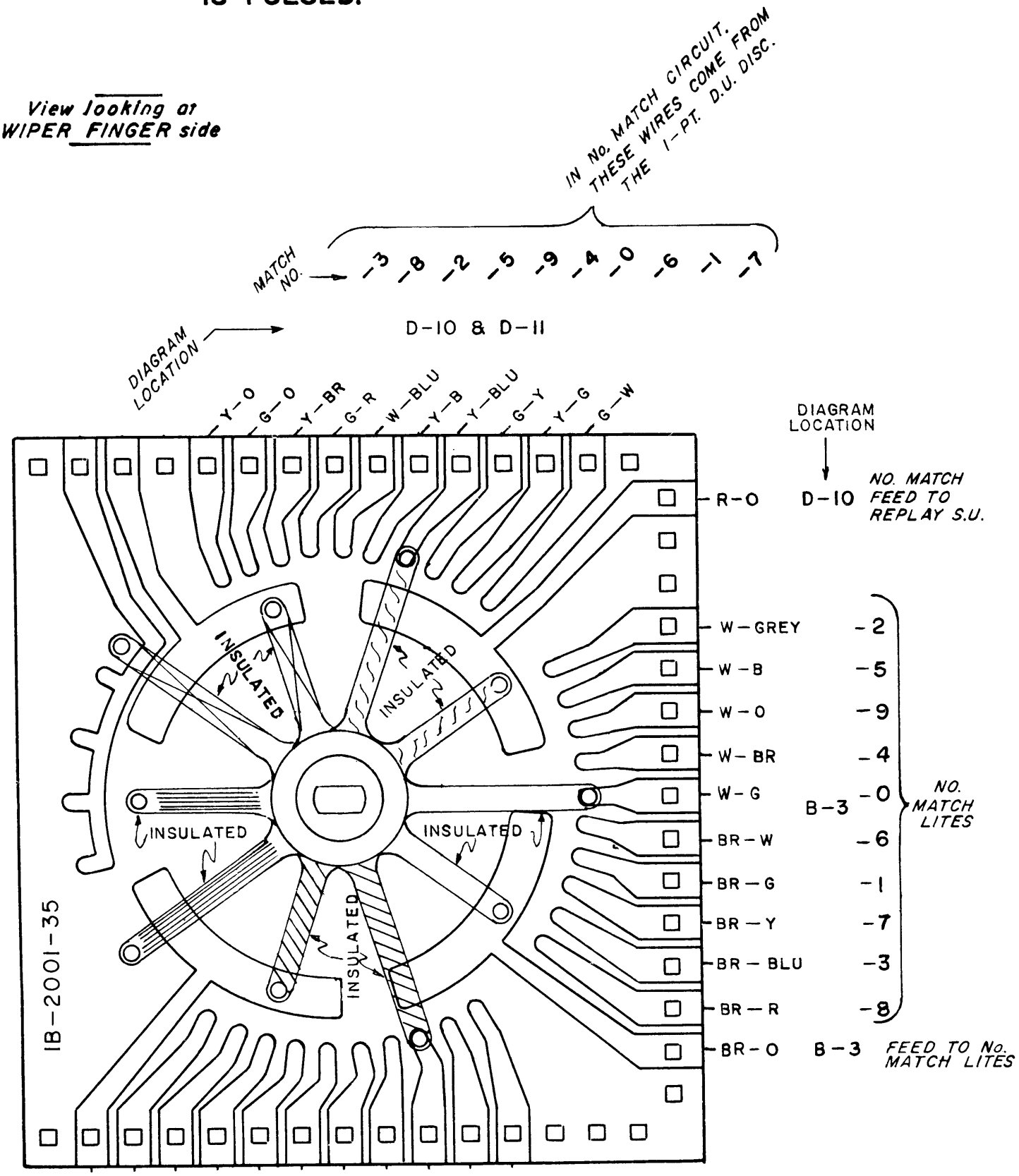
4. RELAY and SWITCH ADJUSTMENT

Where relay adjustments are called for, before bending blades, in all cases, on any machine, make certain that the screws holding the switch stacks are down very tightly. This is suggested because the plastic spacers in the switch stacks have occasionally shrunk by drying out, causing a poor adjustment.

No. MATCH UNIT

THIS UNIT ADVANCES ONE STEP EACH TIME THE TEN POINT RELAY IS PULSED.

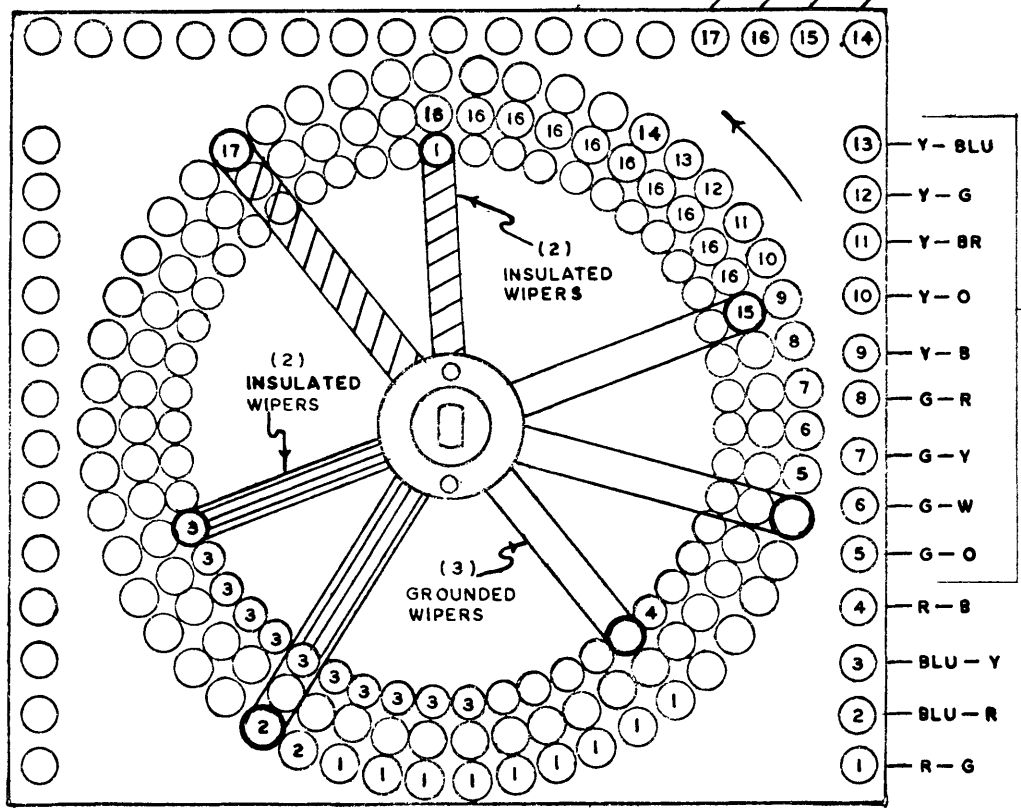
View looking at WIPER FINGER side



BALL COUNT UNIT DISC

DURING RESET CYCLE, THIS UNIT RESETS TO ZERO AND THEN ADVANCES 5 STEPS.
DURING PLAY, IT ADVANCES ONE STEP IF BALL FALLS INTO EJECT POCKET BEFORE "BALL INDEX RELAY" IS ENERGIZED. IT ALSO ADVANCES ONE STEP WHEN BALL MAKES LEFT SIDE ROLLOVER WHILE WEST GATE IS OPEN.

VIEW LOOKING AT WIPER FINGERS SIDE WITH WIPERS IN ZERO POSITION.



17	R-BLU		
16	Y-O		
15	Y-G		
14	BR-B		
13	Y-BLU		NO.9
12	Y-G		NO.8
11	Y-BR		NO.7
10	Y-O	B-2	NO.6
9	Y-B		NO.5
8	G-R		NO.4
7	G-Y		NO.3
6	G-W		NO.2
5	G-O		NO.1
4	R-B	C-10	IN NO. MATCH CIRCUIT, TO REPLAY S.U. COIL.
3	BLU-Y	D-6	FEED TO BLU-R & R-G BELOW.
2	BLU-R	D-6	TO GAME-OVER RELAY (TRIP COIL).
1	R-G	D-6	TO GAME-OVER RELAY (LATCH COIL).

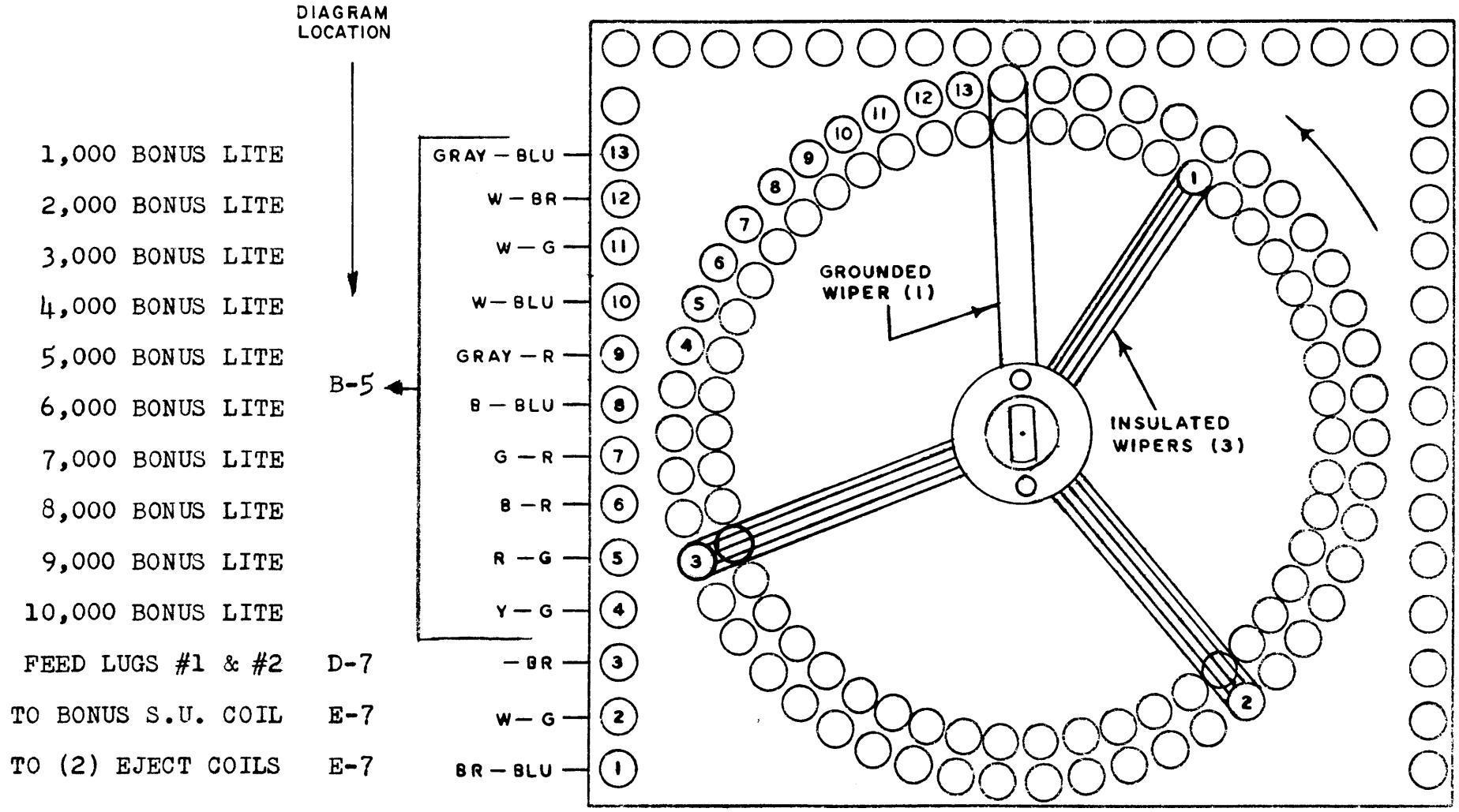
C-5 TO GAME RELAY LATCH COIL.
B-4 TO "TILT"LITE.
B-4 TO "GAME OVER" AND "NO. MATCH"LITES.
B-2 NO.10

"BALLS TO PLAY" LITES

View looking at WIPER FINGERS side with wiper in ZERO position

BONUS S.U. DISC

THIS UNIT ADVANCES ONE STEP EACH TIME THE ADVANCE RELAY IS PULSED. IT RESETS TO ZERO POSITION (ONE STEP AT A TIME) WHEN BONUS RELAY OR DOUBLE BONUS RELAY IS ENERGIZED.

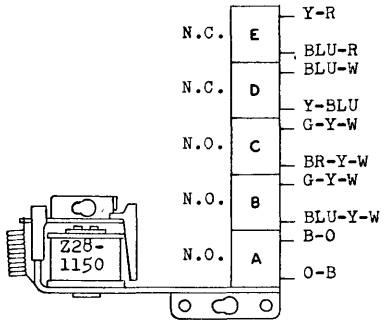


A. C. RELAYS & SWITCHES

(ON MECHANISM PANEL)

LOCK RELAY

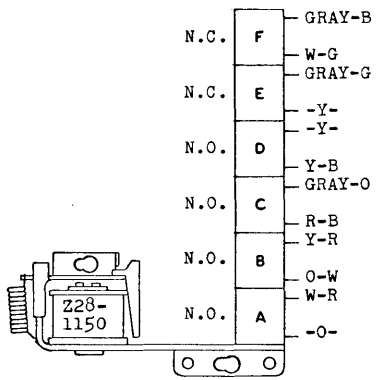
IS ENERGIZED BY 5¢, 10¢, 25¢ OR COIN RELAYS ---ALSO BY LEFT FLIPPER BUTTON.



SWITCH TYPE	DIAGRAM LOCATION	
	C-6	ENERGIZES GAME-OVER RELAY (TRIP COIL).
	D-3	TO RESET RELAY.
	A-1	6 VOLTS FROM TRANSFORMER TO LITES.
	A-1	6 VOLTS FROM TRANSFORMER TO LITES.
	E-4	IN HOLD CIRCUIT TO THIS RELAY.

BALL INDEX RELAY

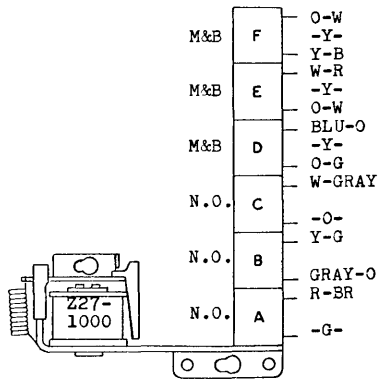
IS ENERGIZED BY 10 POINT, 100 POINT OR 1000 POINT RELAY.



SWITCH TYPE	DIAGRAM LOCATION	
	E-6	OPENS A CIRCUIT TO BALL COUNT S.U. COIL.
	B-5	OPENS CIRCUIT TO TOP EJECT HOLE "SPECIAL" LITE.
	C-11	ENERGIZES GAME RELAY (TRIP COIL).
	C-10	IN NO. MATCH CIRCUIT TO REPLAY S.U. COIL.
	C-6	IN CIRCUIT TO BALL COUNT RESET COIL AND GAME-OVER RELAY (TRIP COIL).
	E-12	IN HOLD CIRCUIT TO THIS RELAY.

OUTHOLE RELAY

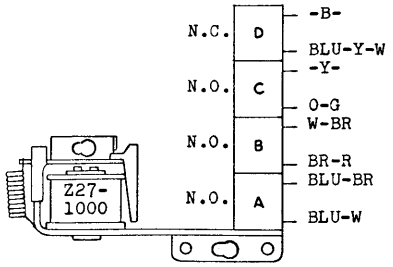
IS ENERGIZED BY OUTHOLE SWITCH.



SWITCH TYPE	DIAGRAM LOCATION	
	C-17 C-11	OPENS HOLD CIRCUIT TO WEST GATE RELAY AND CLOSES TO "DOWN MINI" AND "LAMP POST" COILS.
	C-12 C-6	OPENS HOLD CIRCUIT TO BALL INDEX RELAY AND CLOSES IN SERIES WITH SW.B ON BALL INDEX RELAY.
	C-4 C-13	OPENS HOLD CIRCUIT TO "ON GREEN" AND "ON YELLOW" RELAYS AND CLOSES TO RUN SCORE MOTOR.
	E-12	TO BALL INDEX RELAY.
	C-10	IN SERIES WITH SWITCH C ON BALL INDEX RELAY.
	E-12	IN HOLD CIRCUIT TO THIS RELAY.

RESET RELAY

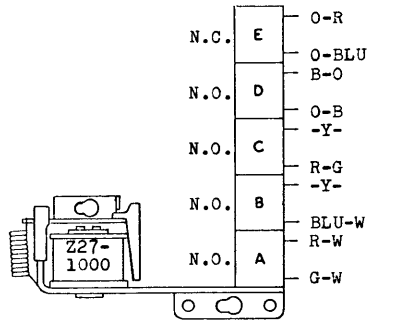
IS ENERGIZED BY SWITCH B ON COIN RELAY.



F-12	OPENS CIRCUIT TO PLAYFIELD SWITCHES.
D-4	RUNS SCORE MOTOR.
E-11	PULSES SCORE RESET RELAY, THRU IMPULSE CAM SWITCH B.
D-3	IN HOLD CIRCUIT TO THIS RELAY.

COIN RELAY

IS ENERGIZED BY COIN SWITCH, 5¢ RELAY OR REPLAY RELAY.

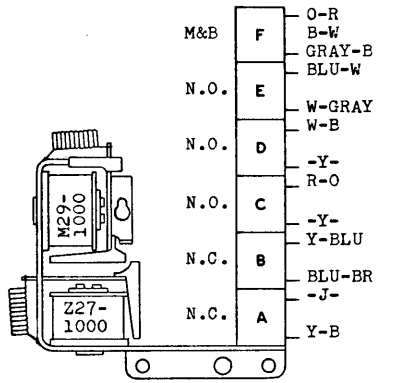


D-4	OPENS CIRCUIT TO KNOCKER COIL.
E-4	ENERGIZES LOCK RELAY.
C-5	IN CIRCUIT TO GAME RELAY AND GAME-OVER RELAY (LATCH COILS), AND TO BALL COUNT S.U. COIL.
C-3	ENERGIZES RESET RELAY.
E-3	IN HOLD CIRCUIT TO THIS RELAY.

GAME RELAY

(INTERLOCK)

LATCH COIL IS ENERGIZED BY COIN RELAY, THRU BALL COUNT UNIT DISC.
TRIP COIL IS ENERGIZED BY BALL INDEX RELAY OR GAME-OVER RELAY.

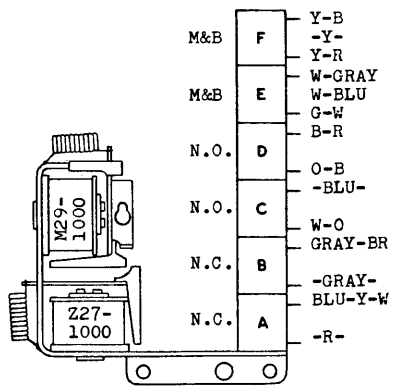


E-6	OPENS TO BALL COUNT STEP-UP AND CLOSES TO BALL COUNT RESET.
D-3	IN CIRCUIT TO COIN RELAY, THRU REPLAY BUTTON SWITCH.
C-3	IN HOLD CIRCUIT TO COIN RELAY (5 BALL PLAY).
C-3	IN HOLD CIRCUIT TO COIN RELAY (3 BALL PLAY).
C-3	IN CIRCUIT TO RESET RELAY.
E-11	TO GAME RELAY (TRIP COIL).

GAME OVER RELAY

(INTERLOCK)

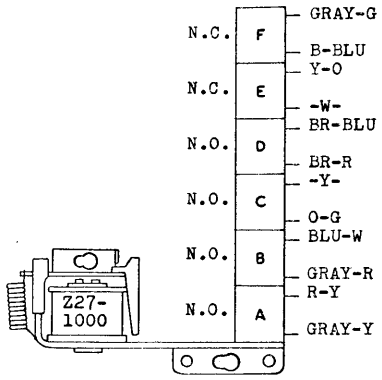
LATCH COIL IS ENERGIZED BY COIN RELAY.
TRIP COIL IS ENERGIZED BY LOCK RELAY OR TILT SWITCHES.



C-6 C-11	OPENS IN CIRCUIT TO GAME-OVER RELAY (TRIP COIL) AND CLOSES TO GAME RELAY (TRIP COIL).
D-12	OPENS IN CIRCUIT TO OUTHOLE RELAY AND CLOSES TO BALL INDEX RELAY.
E-11	ENERGIZES POST RELAY.
A-3	TO "GAME OVER", "TILT" AND "NO. MATCH" LITES.
E-10	IN NO. MATCH CIRCUIT TO REPLAY S.U. COIL.
F-12	IN SERIES WITH SWITCH D ON RESET RELAY.

SPECIAL RELAY

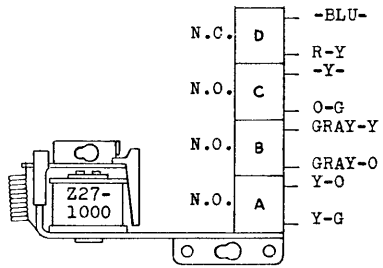
IS ENERGIZED BY SPINNER UNIT DISC, THRU SWITCH B ON EJECT RELAY.



D-8	OPENS CIRCUIT TO 500 RELAY.
E-7	OPENS CIRCUIT TO EJECT RELAY.
D-7	ENERGIZES (2) EJECT COILS AT CAM SWITCH 4D.
C-4	RUNS SCORE MOTOR.
D-14	TO 10,000 POINT RELAY.
D-8	IN SERIES WITH SWITCH 2C ON DOUBLE BONUS RELAY.

EJECT RELAY

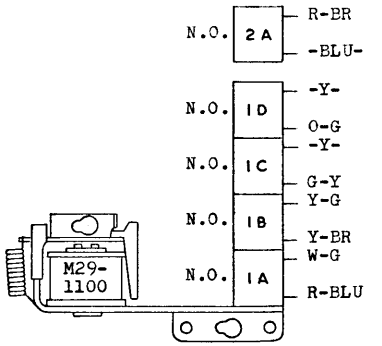
IS ENERGIZED BY SPIN RELAY.



E-7	IN CIRCUIT TO SPIN RELAY.
D-4	RUNS SCORE MOTOR.
E-8	IN SERIES WITH SWITCH 2C ON DOUBLE BONUS RELAY. ALSO IN CIRCUIT TO BONUS AND DOUBLE BONUS RELAYS.
E-7	IN HOLD CIRCUIT TO THIS RELAY.

SPIN RELAY

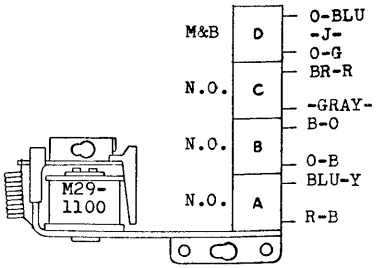
IS ENERGIZED BY EITHER OF (2) EJECT HOLE SWITCHES.



E-7	IN HOLD CIRCUIT TO THIS RELAY.
D-4	RUNS SCORE MOTOR.
C-15	RUNS SPIN MOTOR.
D-7	ENERGIZES EJECT RELAY AT CAM SWITCH 1B.
E-6	IN SERIES WITH SWITCH F ON BALL INDEX RELAY.

10¢ RELAY

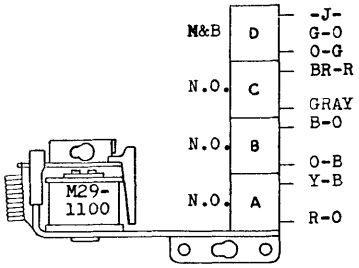
IS ENERGIZED BY 10¢ COIN SWITCH, IF 10¢ ADJUSTMENT JACK IS IN "2 PLAYS" OR "3 PLAYS" POSITION.



D-4	IN CIRCUIT TO KNOCKER COIL---ALSO RUNS SCORE MOTOR.
D-10	PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH B.
E-4	ENERGIZES LOCK RELAY.
E-1	IN HOLD CIRCUIT TO THIS RELAY.

25¢ RELAY

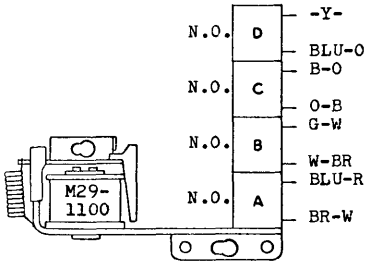
IS ENERGIZED BY 25¢ COIN SWITCH.



C-4	IN CIRCUIT TO KNOCKER COIL---ALSO RUNS SCORE MOTOR.
D-10	PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH B.
E-3	ENERGIZES LOCK RELAY.
E-2	IN HOLD CIRCUIT TO THIS RELAY.

5¢ RELAY

THIS RELAY IS USED ON GAMES WITH "2 COINS FOR 1 PLAY" FEATURE. IT IS ENERGIZED BY 5¢ COIN SWITCH.

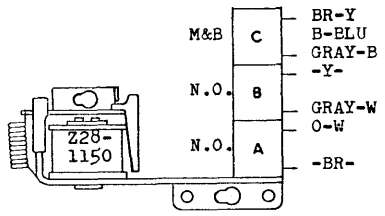


C-1	ENERGIZES ALTERNATOR UNIT COIL.
E-4	ENERGIZES LOCK RELAY.
E-2	ENERGIZES COIN RELAY, THRU SWITCH ON ALTERNATOR UNIT.
D-3	IN HOLD CIRCUIT TO THIS RELAY.

LOCATED ON PLAYFIELD

WEST GATE RELAY

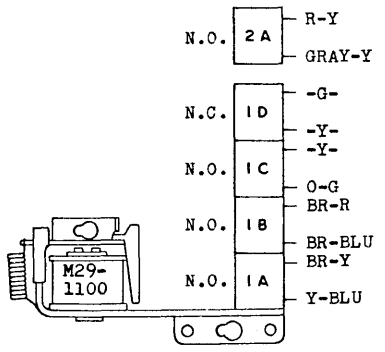
IS ENERGIZED BY 500 RELAY.



D-15	OPENS TO 1000 POINT RELAY, AND CLOSES TO BALL COUNT S.U. COIL.
B-5	TO LEFT SIDE ROLLOVER LITE.
E-17	IN HOLD CIRCUIT TO THIS RELAY.

SCORE RELAY

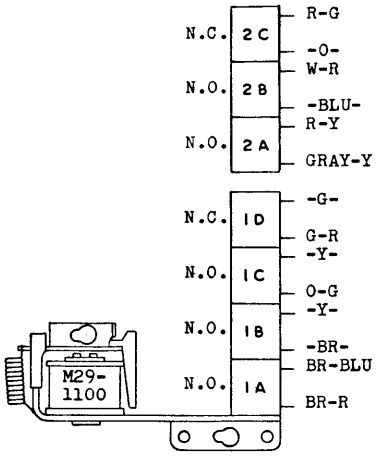
IS ENERGIZED BY SPINNER UNIT DISC, THRU SWITCH B ON EJECT RELAY.



D-8	IN SERIES WITH SWITCH 2C ON DOUBLE BONUS RELAY.
C-7	IN SERIES WITH SWITCH 1D ON 500 RELAY.
C-4	RUNS SCORE MOTOR.
D-7	ENERGIZES (2) EJECT COILS AT CAM SWITCH 4D.
E-14	PULSES 1000 POINT RELAY AT CAM SWITCH 1C.

500 POINT RELAY

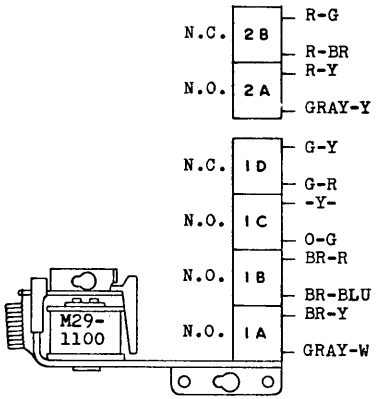
IS ENERGIZED BY SPINNER UNIT DISC, THRU SWITCH B ON EJECT RELAY.



C-8	OPENS CIRCUIT TO SCORE RELAY.
E-14	PULSES 100 POINT RELAY, THRU IMPULSE CAM SWITCH A.
D-8	IN SERIES WITH SWITCH 2C ON DOUBLE BONUS RELAY.
C-7	IN SERIES WITH SWITCH 1D ON 3000 RELAY.
C-4	RUNS SCORE MOTOR.
D-17	ENERGIZES WEST GATE RELAY.
D-7	ENERGIZES (2) EJECT COILS AT CAM SWITCH 4D.

3000 RELAY

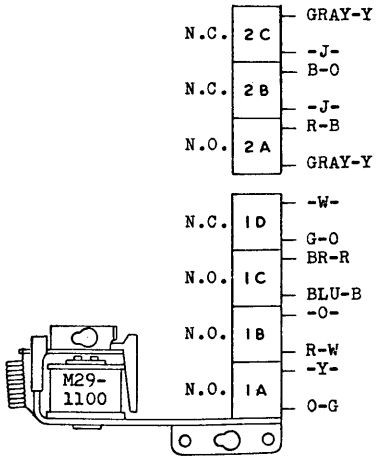
IS ENERGIZED BY SPINNER UNIT DISC, THRU SWITCH B ON EJECT RELAY.



D-8	IN SERIES WITH SWITCH 2C ON 500 POINT RELAY.
D-8	IN SERIES WITH SWITCH 2C ON DOUBLE BONUS RELAY.
D-7	IN SERIES WITH SWITCH 1D ON BONUS RELAY.
D-4	RUNS SCORE MOTOR.
D-7	ENERGIZES (2) EJECT COILS AT CAM SWITCH 4D.
E-14	PULSES 1000 POINT RELAY.

DOUBLE BONUS RELAY

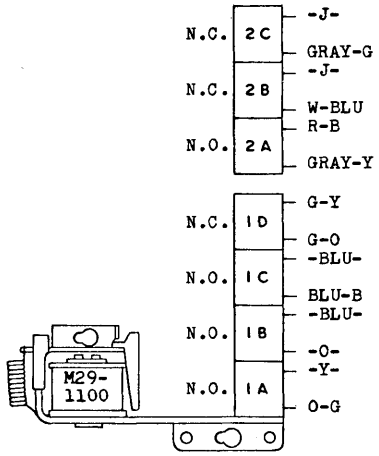
IS ENERGIZED BY SPINNER UNIT DISC, THRU SWITCH B ON EJECT RELAY.



D-8	OPENS CIRCUIT TO SPECIAL, 500, 3000 AND SCORE RELAY.
C-7	OPENS CIRCUIT TO SPIN RELAY.
D-8	IN HOLD CIRCUIT TO THIS RELAY.
E-7	IN SERIES WITH SWITCH E ON SPECIAL RELAY.
D-9	ENERGIZES RESET COIL ON BONUS UNIT AT CAM SWITCH 4D.
D-13	PULSES 1000 POINT RELAY AT CAM SWITCH 2C AND 3D.
D-4	RUNS SCORE MOTOR.

BONUS RELAY

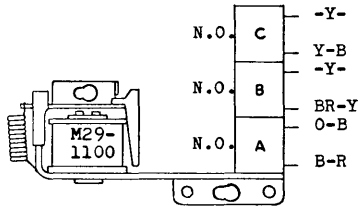
IS ENERGIZED BY SPINNER UNIT DISC, THRU SWITCH B ON EJECT RELAY



D-8	IN SERIES WITH SWITCH 2C ON DOUBLE BONUS RELAY.
D-7	IN SERIES WITH SWITCH 2B ON DOUBLE BONUS RELAY.
D-8	IN HOLD CIRCUIT TO THIS RELAY.
D-7	IN SERIES WITH SWITCH 1D ON DOUBLE BONUS RELAY.
D-8	PULSES RESET COIL ON BONUS UNIT, THRU IMPULSE CAM SW. A.
D-13	PULSES 1000 POINT RELAY, THRU IMPULSE CAM SWITCH A.
C-4	RUNS SCORE MOTOR.

POST RELAY

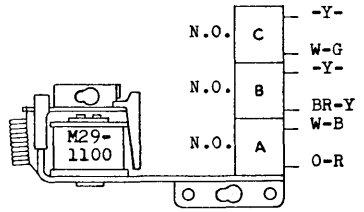
IS ENERGIZED BY LEFT ROLLOVER BUTTON AND BOTTOM RIGHT TARGET.



C-11	ENERGIZES "DOWN LAMP POST" AND "DOWN MINI POST" COILS.
C-14	PULSES 1000 POINT RELAY.
E-11	IN HOLD CIRCUIT TO THIS RELAY.

ADVANCE RELAY

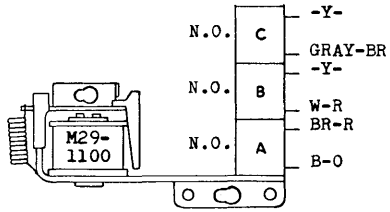
IS ENERGIZED BY TOP TARGETS AND CENTER TARGETS, AS INDICATED ON PLAYFIELD ("ADVANCE BONUS".)



C-7	ENERGIZES BONUS S.U. COIL.
C-13	PULSES 1000 POINT RELAY.
E-12	IN HOLD CIRCUIT TO THIS RELAY.

NO. 3 BUMPER RELAY

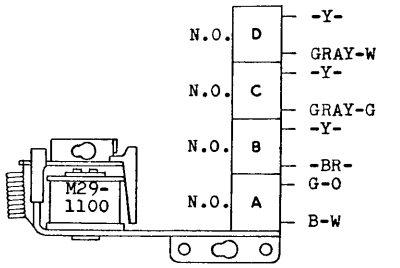
IS ENERGIZED BY CENTER JET BUMPER SWITCH.



C-5	ENERGIZES CENTER JET BUMPER COIL.
C-13	PULSES 100 POINT RELAY.
E-16	IN HOLD CIRCUIT TO THIS RELAY.

NO. 2 BUMPER RELAY

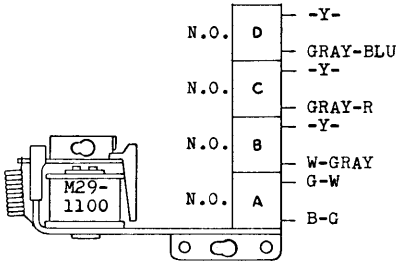
IS ENERGIZED BY LEFT BOTTOM OR RIGHT TOP JET BUMPER SWITCHES.



C-5	ENERGIZES RIGHT TOP JET BUMPER COIL.
C-5	ENERGIZES LEFT BOTTOM JET BUMPER COIL.
C-13	IN SERIES WITH SWITCH C ON "ON YELLOW" RELAY.
E-16	IN HOLD CIRCUIT TO THIS RELAY.

NO. 1 BUMPER RELAY

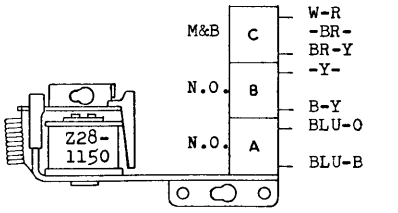
IS ENERGIZED BY LEFT TOP OR RIGHT BOTTOM JET BUMPER SWITCHES.



C-5	ENERGIZES RIGHT BOTTOM JET BUMPER COIL.
C-4	ENERGIZES LEFT TOP JET BUMPER COIL.
C-13	IN SERIES WITH SWITCH C ON "ON GREEN" RELAY.
E-16	IN HOLD CIRCUIT TO THIS RELAY.

ON YELLOW RELAY

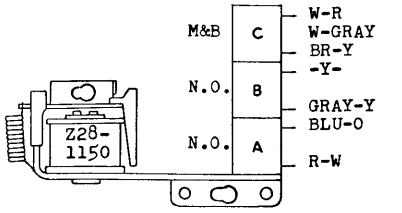
IS ENERGIZED BY RIGHT TOP TARGET, AS INDICATED.



D-13	OPENS TO 100 POINT RELAY AND CLOSES TO 1000 POINT RELAY.
B-5	TO RIGHT TOP AND LEFT BOTTOM JET BUMPER LITES.
E-13	IN HOLD CIRCUIT TO THIS RELAY.

ON GREEN RELAY

IS ENERGIZED BY LEFT TOP TARGET, AS INDICATED.

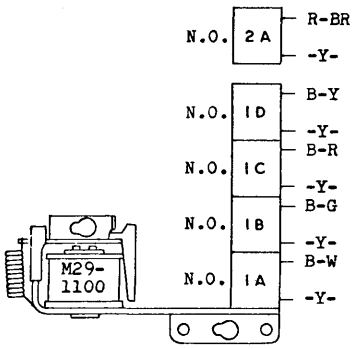


D-13	OPENS TO 100 POINT RELAY AND CLOSES TO 1000 POINT RELAY.
B-5	TO LEFT TOP AND RIGHT BOTTOM JET BUMPER LITES.
E-13	IN HOLD CIRCUIT TO THIS RELAY.

LOCATED IN BACK-BOX

SCORE RESET RELAY

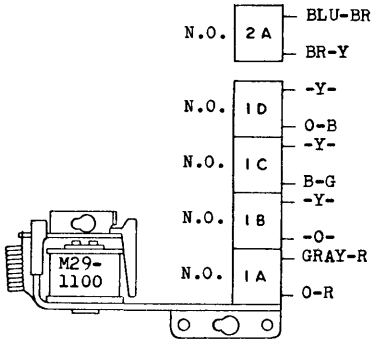
IS PULSED BY IMPULSE CAM SWITCH B, THRU SWITCH ON RESET RELAY.



D-9	PULSES 100 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.
D-9	PULSES 1000 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.
D-9	PULSES 10 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.
D-9	PULSES 10,000 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.
D-9	PULSES 100,000 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

1000 POINT RELAY

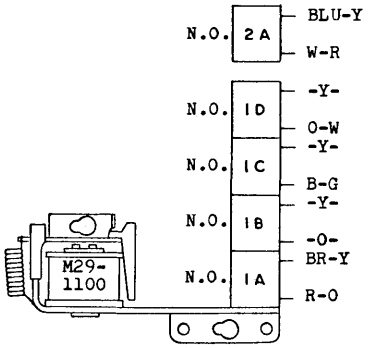
IS PULSED BY SCORE RELAY, 3000 RELAY, BONUS RELAY, DOUBLE BONUS RELAY, AND TARGETS AND ROLLOVERS, AS INDICATED.



E-15	IN HOLD CIRCUIT TO THIS RELAY.
C-9	PULSES 1000 POINT DRUM UNIT.
D-17	ENERGIZES LARGE BELL COIL.
E-12	ENERGIZES BALL INDEX RELAY.
E-15	ENERGIZES 10,000 POINT RELAY, THRU 9TH POSITION SWITCH ON 1000 POINT DRUM UNIT.

100 POINT RELAY

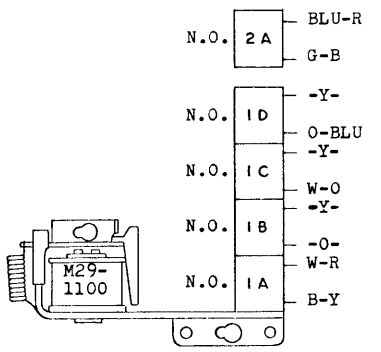
IS PULSED BY 500 RELAY, ADVANCE RELAY AND (3) BUMPER RELAYS AS INDICATED BY JET BUMPERS.



E-15	IN HOLD CIRCUIT TO THIS RELAY.
C-9	PULSES 100 POINT DRUM UNIT.
D-17	ENERGIZES LARGE BELL COIL.
E-12	ENERGIZES BALL INDEX RELAY.
E-15	PULSES 1000 POINT RELAY, THRU 9TH POSITION SWITCH ON 100 POINT DRUM UNIT.

10 POINT RELAY

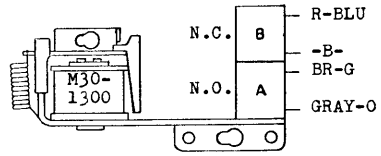
IS PULSED BY KICKER SWS., STANDUP SWS., AND POST RELAY.



E-15	IN HOLD CIRCUIT TO THIS RELAY.
C-9	PULSES 10 POINT DRUM UNIT.
C-17	ENERGIZES NO. MATCH S.U. COIL.
E-12	ENERGIZES BALL INDEX RELAY.
E-15	PULSES 100 POINT RELAY, THRU 9TH POSITION SWITCH ON 10 POINT DRUM UNIT.

NO. 2 DELAY RELAY

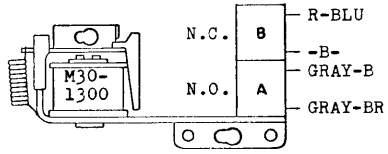
IS ENERGIZED BY WIPER FINGER ON SPIN UNIT DISC.



F-8	IN SERIES WITH SWITCH B ON EJECT RELAY.
E-17	IN HOLD CIRCUIT TO THIS RELAY.

NO. 1 DELAY RELAY

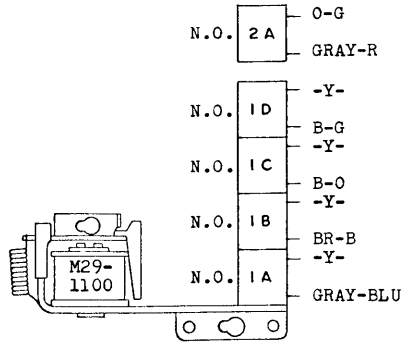
IS ENERGIZED BY WIPER FINGER ON SPIN UNIT DISC.



F-8	IN SERIES WITH SWITCH B ON EJECT RELAY.
E-16	IN HOLD CIRCUIT TO THIS RELAY.

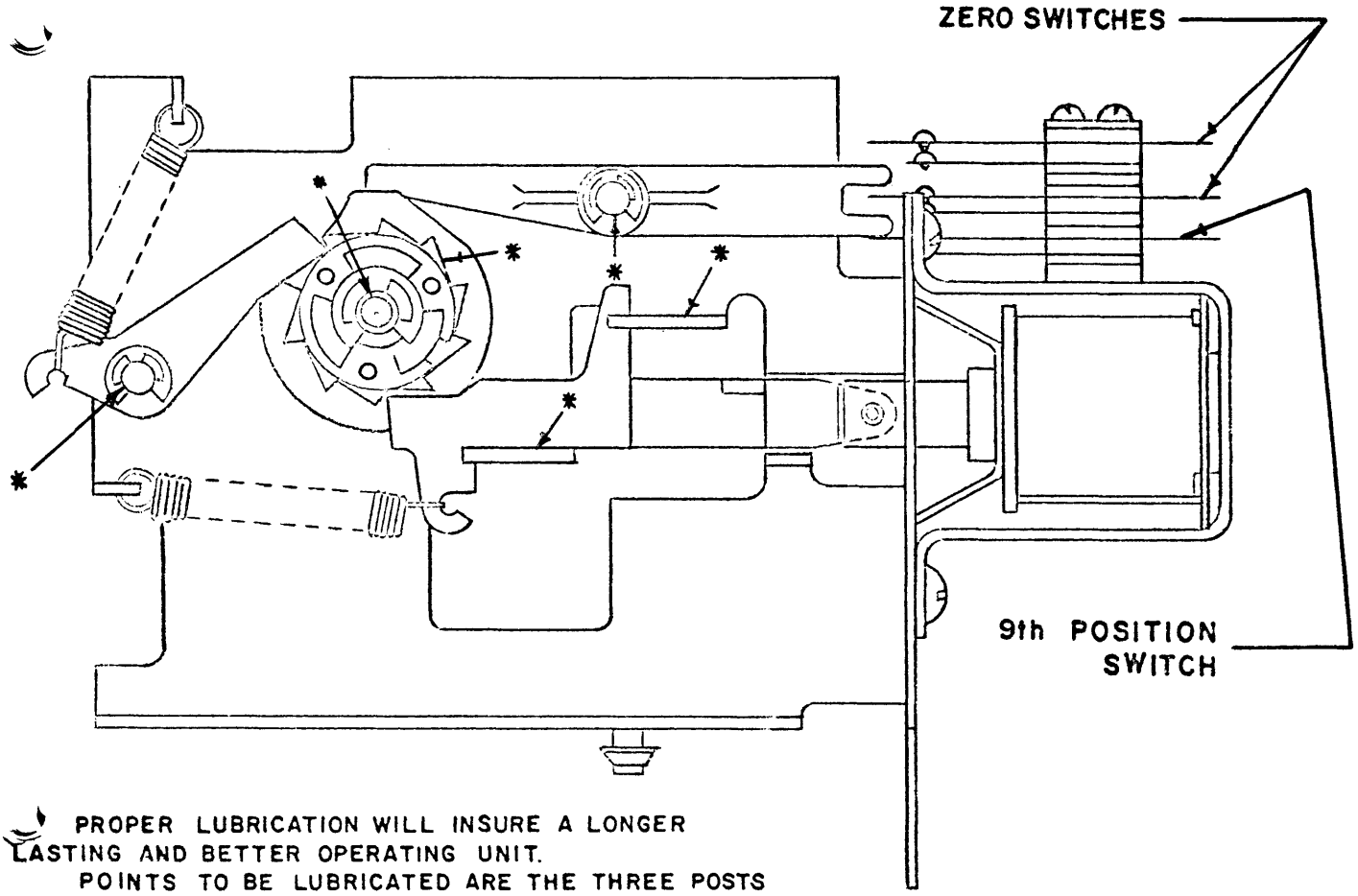
10,000 POINT RELAY

IS ENERGIZED BY "SPECIAL" RELAY AT SCORE MOTOR INDEX CAM SWITCH E.



E-15	IN HOLD CIRCUIT TO THIS RELAY.
D-17	ENERGIZES LARGE BELL COIL.
C-9	PULSES 10,000 POINT DRUM UNIT.
C-11	IN HI-SCORE CIRCUIT TO REPLAY S.U. COIL.
C-10	ENERGIZES 100,000 POINT DRUM UNIT, THRU 9TH POSITION SWITCH ON 10,000 POINT DRUM UNIT.

SCORE DRUM UNIT



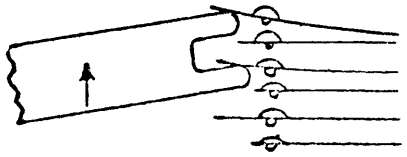
PROPER LUBRICATION WILL INSURE A LONGER LASTING AND BETTER OPERATING UNIT.

POINTS TO BE LUBRICATED ARE THE THREE POSTS ON WHICH THE NYLON PARTS ROTATE, EACH TOOTH OF THE RATCHET, ALSO THE (2) DRIVE PAWL GUIDE SLOTS, INDICATED BY (*).

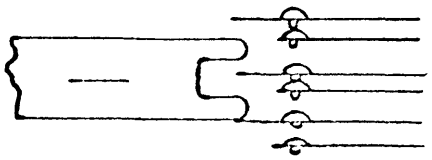
LUBRICATION: DO NOT PUT LUBRICANT ON DRIVE ARMATURE

SWITCH ADJUSTMENT

AT "0" OR INDEX POSITION ALL SWITCHES ARE OPEN AS SHOWN.



AT 1st. TO 8th. POSITION TOP SWITCHES ARE CLOSED – BOTTOM SWITCH REMAINS OPEN.



AT 9th POSITION ALL SWITCHES ARE CLOSED AS SHOWN