Operating Instructions and Parts Catalog

CONFIDENTIAL: DO NOT LEAVE INSTRUCTIONS IN GAME



IMPORTANT!

Note that this manual is a combination Operating Instructions AND PARTS CATALOG. Part Numbers are marked on the various illustrations and a list of miscellaneous parts appears on the back cover.

FOR QUICKEST SERVICE STATE CORRECT PART NUMBER WHEN ORDERING PARTS



DUDE RANCH amusement-game by Bally

5 balls plus 3 extra balls

EXTRA COINS* MAY BE DEPOSITED

- (1) TO SELECT SECOND CARD
- (2) TO LIGHT SUPER-CARD-PANEL AND THUS QUALIFY
 - (A) TO SCORE 4-IN-LINE SCORE BY LIGHTING 3-IN-LINE ON SUPER-CARD
 - (B) TO SCORE 300
 BY LIGHTING 4 CORNER-NUMBERS ON SUPER-CARD
- (3) TO LIGHT SELECT-A-FEATURE-PANEL
 AND THUS QUALIFY TO PRESS GREEN BUTTON
 TO LIGHT CHOICE OF
 - (A) SUPER-CARD-PANEL
 AND THUS QUALIFY TO SCORE
 AS STATED UNDER (2) ABOVE
 - (B) OR FIRST SUPER-LINE-POINTER
 AND THUS QUALIFY TO SCORE 4-IN-LINE SCORE
 BY LIGHTING 2-IN-LINE IN FIRST SUPER-LINE
 - (C) OR SECOND SUPER-LINE-POINTER
 AND THUS QUALIFY TO SCORE 4-IN-LINE SCORE
 BY LIGHTING 2-IN-LINE IN SECOND SUPER-LINE
- (4) TO LIGHT SELECT-A-LIT-NUMBER PANEL AND THUS QUALIFY
 TO SELECT A LIT "SPOT" NUMBER
- (5) TO LIGHT SELECTABLE "SPOT" NUMBERS
- (6) TO LIGHT CORNERS-PANEL
 AND THUS QUALIFY TO SCORE 200
 BY LIGHTING 4 CORNER-NUMBERS
 ON FIRST CARD OR SECOND CARD
- (7) TO LIGHT STARS
 AND THUS QUALIFY TO "SPOT" 8 AND 23
 BY HITTING STAR ROLL-OVER
 WHEN CORRESPONDING STAR IS LIT
- (8) TO ADVANCE SCORES
- (9) TO OBTAIN EXTRA BALLS

^{*}When replays are registered, Buttons are pressed instead of coins being deposited.

<u>IN-LINE SCORES:</u> Each of 2 Cards on backglass contains 25 numbers, 1 to 25, inclusive, arranged in a square 5 numbers wide by 5 numbers high, not in numerical order.

Super-Card on backglass contains 9 numbers, duplicating numbers on Cards, arranged in a square 3 numbers wide by 3 numbers high, not in numerical order (see SUPER-CARD on page 171).

Playfield contains 25 skill-holes, numbered 1 to 25, arranged in numerical order from top to bottom of playfield (and ball-return-hole through which balls return for free shots).

Object of game is to shoot balls into numbered skill-holes, lighting corresponding numbers on backglass.

- (A) To light 2 adjoining numbers in Super-Line of a <u>selected</u> Card when corresponding Super-Line Pointer is lit (see SELECT-A-FEATURE on Page 171).
- (B) To light 3 adjoining numbers connected by white line -horizontally, vertically or diagonally -- on Super-Card when Super-Card-Panel is lit (see SUPER-CARD on page 171).
- (C) To light 3, 4 or 5 adjoining numbers connected by white line -- horizontally, vertically or diagonally on a selected Card.

In-line scores are listed under ADVANCING SCORES on page 173.

CORNER-SCORES: Further object of game is

- (A) To light 4 corner-numbers of a <u>selected</u> Card when Corners-Panel is lit (see CORNERS-PANEL on page 172), scoring 200**;
- (B) To light 4 corner-numbers of Super-Card when Super-Card Panel is lit (see SUPER-CARD on page 171), scoring 300**.

<u>2-CARDS SELECTIVE PLAY:</u> First coin* deposited selects FIRST Card; second coin* deposited selects SECOND Card.

After a Card is selected, indicated by word FIRST or SECOND lighting above Card, Card remains selected during entire game, regardless of number of coins* deposited.

^{*}When replays are registered, Buttons are pressed instead of coins being deposited

^{**}Only first Corners-Score scored registers

<u>SUPER-CARD</u>: Panel with word SUPER-CARD above Super-Card flashes for each coin* deposited and, at mystery intervals, lights and remains lit during entire game, qualifying player to score in-line scores and corner-score on Super-Card, as described under IN-LINE SCORES and CORNER-SCORES on page 170.

After lighting SUPER-CARD panel, player may deposit additional coins* for other scoring advantages.

SELECTED SUPER-CARD: In addition to lighting SUPER-CARD panel by mystery-flash, player may light SUPER-CARD panel by pressing Green Button when SELECT-A-FEATURE panel is lit, as described under SELECT-A-FEATURE below.

<u>SELECT-A-FEATURE</u>: Arrows above SELECT-A-FEATURE panel flash for each coin* deposited and advance at mystery-intervals. When light advances to fifth arrow, panel lights and remains lit during entire game, inviting player to

SELECT-A-FEATURE
BEFORE SHOOTING THIRD BALL***

FIRST SUPER-LINE OR SECOND SUPER-LINE OR SUPER-CARD

PRESS GREEN BUTTON ON FRONT OF CABINET

Player presses Green Button until desired feature lights, releasing button to hold desired feature -- player's choice of

- (A) SUPER-CARD panel (see SUPER-CARD above) or
- (B) FIRST SUPER-LINE pointer, qualifying player to score 4-in-line score by lighting 2-in-line in First Super-Line (top horizontal line of First Card) or
- (C) SECOND SUPER-LINE pointer, qualifying player to score 4-in-line score by lighting 2-in-line in Second Super-Line (top horizontal line of Second Card)

After lighting SELECT-A-FEATURE panel, player may deposit additional coins* for other scoring advantages.

When SELECT-A-FEATURE panel is lit, player may change selection of feature at will until third ball*** is shot. Feature selected when third ball*** is shot remains selected feature until end of game.

^{*}When replays are registered, Buttons are pressed instead of coins being deposited

^{***}After second ball is shot, panel lights to caution player to SELECT NOW.

<u>SELECT-A-SPOT:</u> Arrows at left of selection-numbers flash for each coin* deposited and advance at mystery-intervals. When light advances to sixth arrow

- (A) Selection-numbers light (see GUARANTEED SELECTIONS below;
- (B) Panel lights and remains lit during entire game, inviting player to

SELECT A LIT NUMBER
BEFORE SHOOTING FOURTH BALL****

TURN KNOB ON CABINET

After lighting scoring-advantages described directly above, player may deposit additional coins* for other scoring-advantages

When SELECT-A-LIT-NUMBER panel is lit, player may change selection of number at will until fourth ball**** is shot. Number selected when fourth ball**** is shot remains selected number until end of game.

GUARANTEED SELECTIONS: First 4 selection-numbers -- 19, 20, 21 and 22 -- always light when sixth arrow lights. At mystery intervals, additional selection numbers -- 15, 16 and 10 -- light with guaranteed first 4 numbers.

EXTRA SELECTIONS: After lighting first group of selection-numbers, player may deposit additional coins* to light additional scoring-advantages.

Each selection-number lighted remains lit during entire game.

After lighting all selection-numbers, player may deposit additional coins* for other scoring advantages.

CORNERS-PANEL: Panel with words FIRST CARD AND SECOND CARD CORNERS SCORE 200 flash for each coin* deposited and, at mystery intervals, lights and remains lit during entire game, qualifying player for corners-score on a selected Card.

After lighting CORNERS-PANEL, player may deposit additional coins* for other scoring-advantages.

<u>SPOTTEM FEATURE:</u> Red Star and Yellow Star on backglass flash for each coin* deposited and, at mystery intervals, light and remain lit.

Each Star Roll-over on playfield spots 8 and 23 when corresponding Star is lit.

GUARANTEED FEATURES: Regardless of number of coins* deposited, each feature, after lighting, remains lit until end of game.

^{*}When replays are registered, Buttons are pressed instead of coins being deposited

^{****}After third ball is shot, panel lights to caution player to SELECT NOW

<u>ADVANCING SCORES</u>*****: Scores**** appear in ranch-scene on backglass, advancing at mystery intervals.

GUARANTEED SCORES*****: Scores***** either advance to a higher bracket or remain as high as on previous coin*, never drop back to a lower bracket, regardless of number of coins* deposited.

After advancing scores to highest bracket, player may deposit additional coins* to light additional scoring-advantages.

EXTRA-BALLS FEATURE: After shooting at least 4 balls, player may press Extra-Balls Button and deposit additional coins* to play for extra balls.

At mystery-intervals, after Extra-Balls Button is pressed, (1st) lights on backglass when coin* is deposited. After (1st) is lit, light advances, at mystery-intervals, to (EXTRA) when Extra-Balls Button is pressed and coin* is deposited. After (1st) (EXTRA) is lit, light advances, at mystery-intervals, to (BALL) when Extra-Balls Button is pressed and coin* is deposited.

When (1st) (EXTRA) (BALL) is completely lit, first extra ball is released to player.

After shooting first extra ball, player may continue to press Extra-Balls Button and deposit additional coins* to light (2nd) (EXTRA) (BALL) in order to receive second extra ball and to light (3rd) (EXTRA) (BALL) in order to receive third extra ball.

GUARANTEED ADVANCE TO EXTRA BALLS: Pointer-lights either advance or remain as far advanced as on previous coin*, never drop back to a less advanced position.

Coins* deposited to play for extra balls do not light other scoring-advantages or to advance scores.

****5-in-line: 96-96-96-100-100-150-200-300

4-in-line: 16-18-20-24-32-36-48-72

3-in-line: 4- 5- 6- 8- 12- 18- 24- 36

^{*}When replays are registered, Buttons are pressed instead of coins being deposited.

INSTALLATION AND OPERATING INSTRUCTIONS

Fasten 4 legs to cabinet with bolts and washers furnished. Place back-box in position. Unlock and open back-door and fasten the back-box to cabinet with bolts and washers furnished. (2 back-door locks are common.)

Plug power line into 110-115 volt 60 cycle <u>Alternating Current only.</u> Turn on power by turning toggle-switch on. Toggle-switch is located on lower left side of back-box.

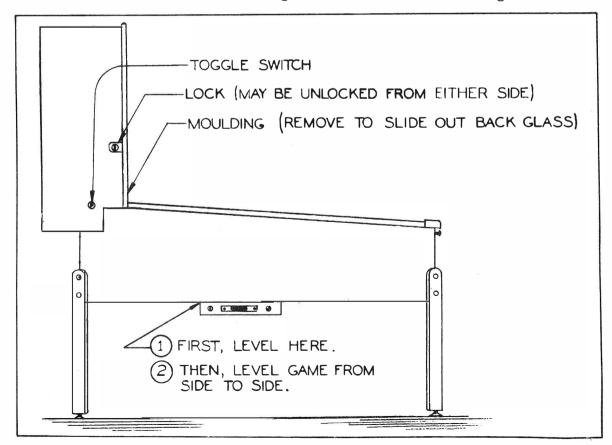
ACCESS TO MECHANISM AND LIGHT BULBS

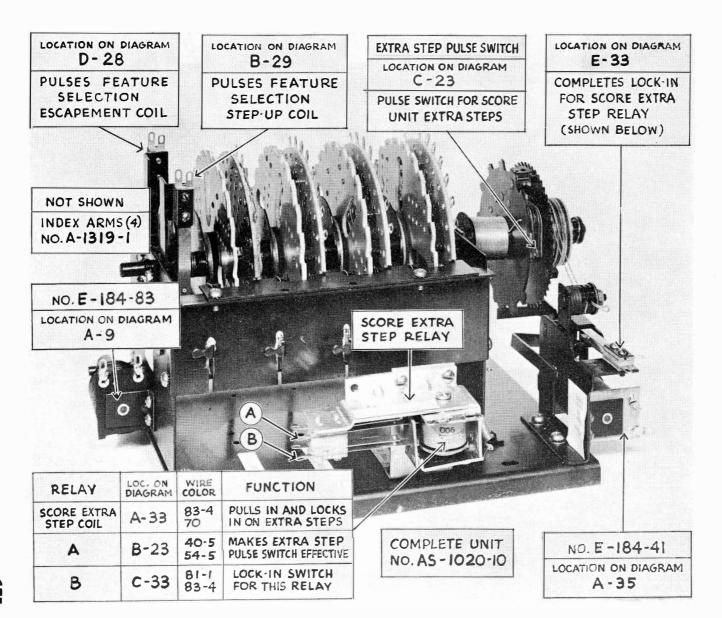
Back-glass may be removed from either side by unlocking side desired and removing upright moulding. (Remove moulding by pulling bottom portion.)

After removing back-glass, access to mechanism may be obtained by raising 2 slide brackets on insert, located on left and right edges of insert. Insert may then be tilted forward for easy accessibility.

BE SURE TO LEVEL GAME

See instructions for leveling below. Place 8 balls in game.





SWITCH "A"
LOCATION ON DIAGRAM
L-24

OPENS 17 VOLT CIRCUIT

SWITCH "B"
LOCATION ON DIAGRAM
L-21

OPENS 6 VOLT

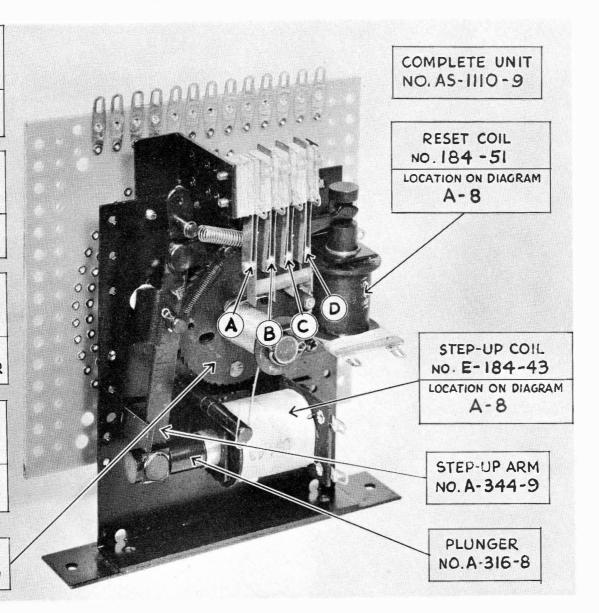
SWITCH"C"
LOCATION ON DIAGRAM
H-1

OPENS CIRCUIT TO CONTROL UNIT MOTOR

SWITCH "D"
LOCATION ON DIAGRAM
E-9

DROPS OUT EXTRA BALL PLAY RELAY

> RATCHET NO.A-463-86



WIPER "A"
LOCATION ON DIAGRAM
H-9

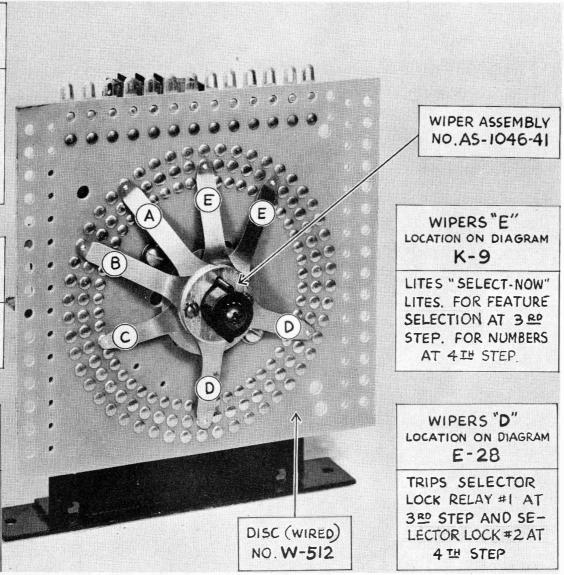
COMPLETES CIRCUIT
TO TIMER STEP-UP
AT 1 ST AND 2 STEP.
COMPLETES CIRCUIT
TO SWITCH ON SELECTOR LOCK TRIP
RELAY AT 3 STEP.

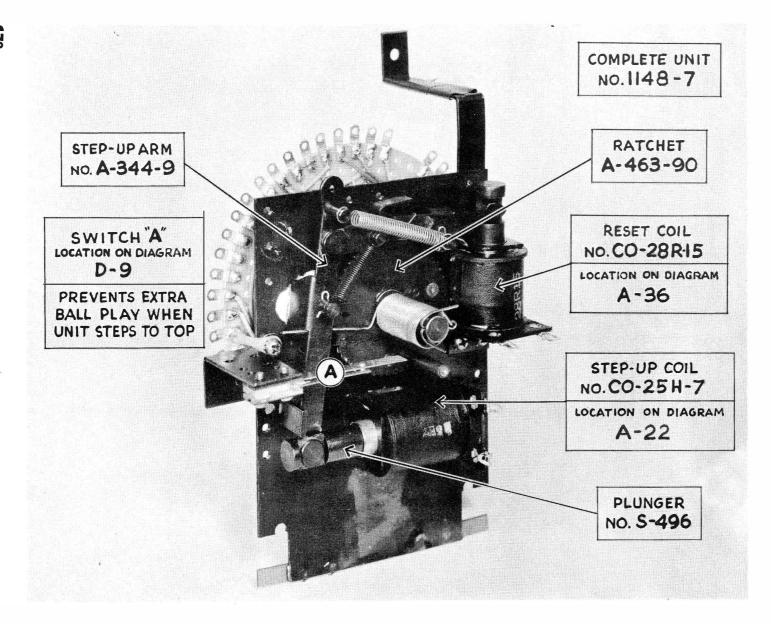
WIPER "B" -LOCATION ON DIAGRAM
H-9

COMPLETES CIRCUIT TO SHUTTER MOTOR AT 2™ STEP

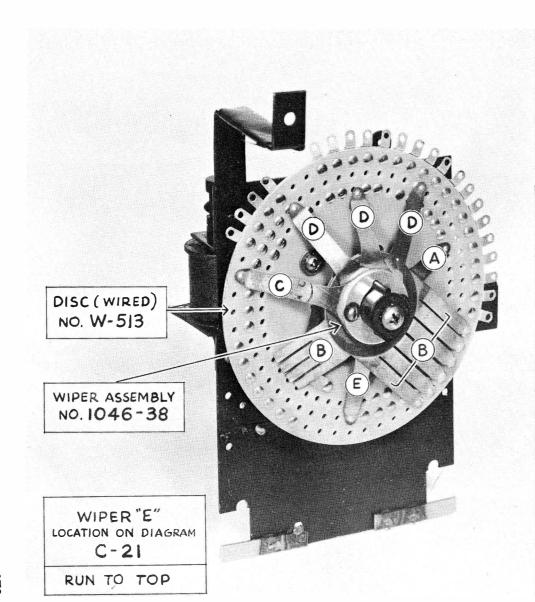
WIPER "C"
LOCATION ON DIAGRAM
D-12

COMPLETES CIRCUIT TO BALL LIFT MOTOR THIS CIRCUIT IS OPEN AT ZERO AND CLOSED THEREAFTER





DUDE RANCH EXTRA BALL UNIT — COIL SIDE



WIPER "A"
LOCATION ON DIAGRAM
C-21

RUN TO 1ST BALL AND RUN TO 2 PM AND 3 PM BALL

WIPERS "B"
LOCATION ON DIAGRAM
K-17

LITES IST, 2ND AND
3ND EXTRA BALL LITES

WIPER "C"
LOCATION ON DIAGRAM
H-12

EXTRA BALL COUNT CIRCUIT TO BALL LIFT MOTOR

WIPERS D' LOCATION ON DIAGRAM C-21

EXTRA BALL SINGLE STEPS SWITCH "A" LOCATION ON DIAGRAM D-33

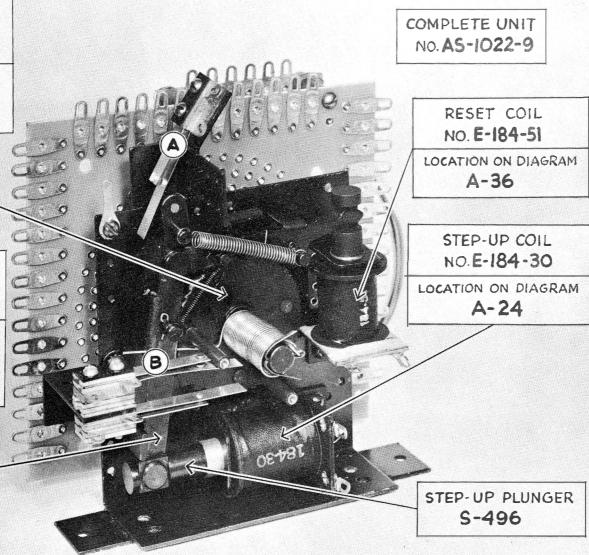
COMPLETES CIRCUIT TO SCORE EXTRA STEP RELAY

RATCHET No. **A-463-95**

SWITCH B' LOCATION ON DIAGRAM
D-33

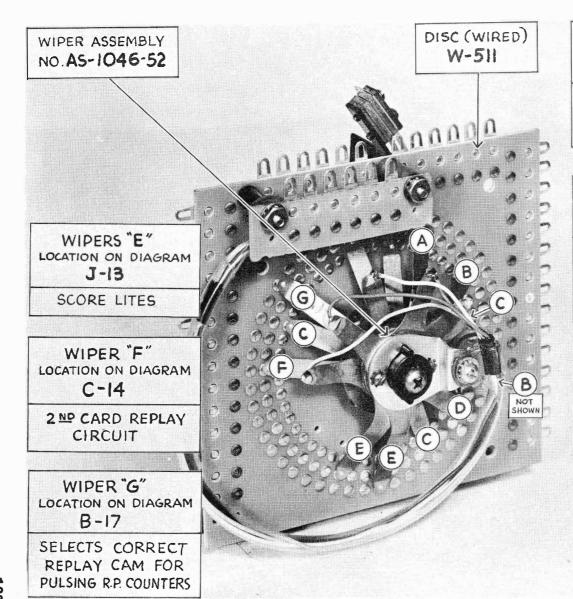
OPEN AT ZERO
COMPLETES EXTRA
STEP CIRCUIT
THEREAFTER

STEP-UP ARM NO.A-344-21



NOTES

NOTES



WIPER "A"
LOCATION ON DIAGRAM
G-16

COMPLETES REPLAY
CIRCUIT FOR
3-IN-LINE SCORES

WIPERS B"
LOCATION ON DIAGRAM
G-18 & G-19

COMPLETES REPLAY CIRCUIT FOR 4-IN-LINE SCORING. ALSO SUPER CARD SCORING

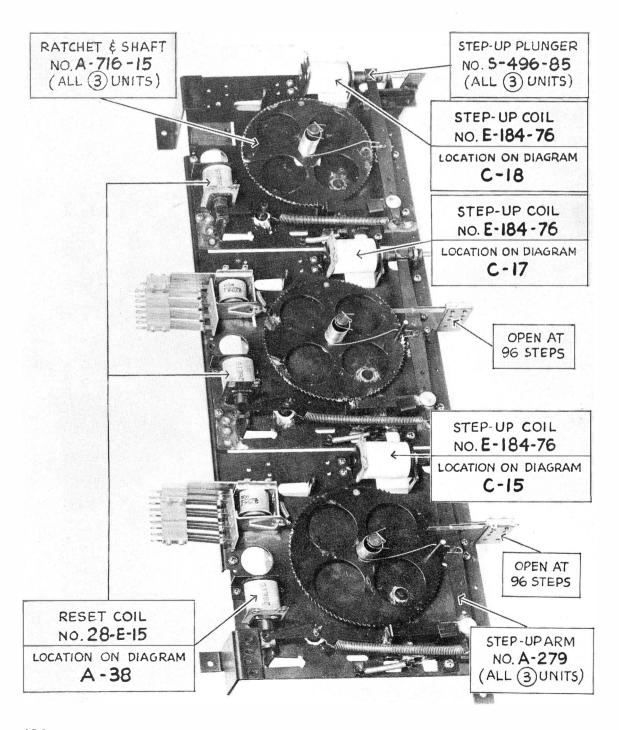
WIPERS "C" LOCATION ON DIAGRAM D-25

SCORE STEPS

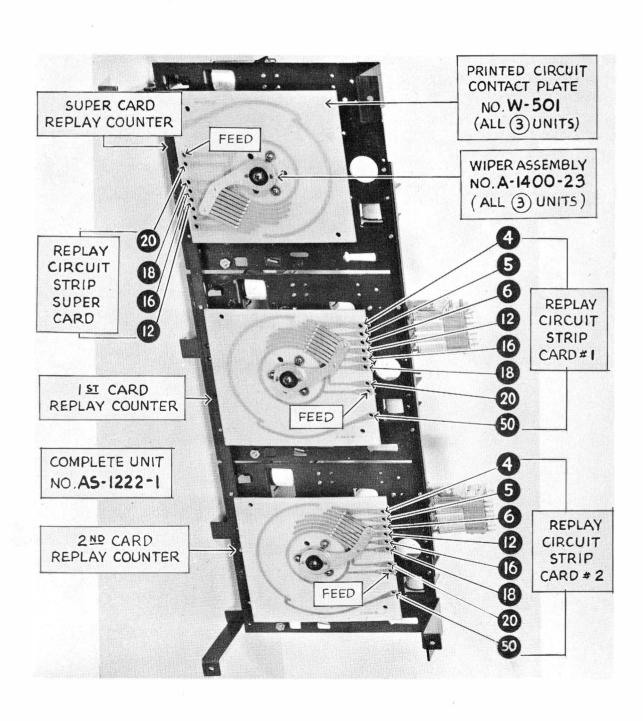
WIPER "D" LOCATION ON DIAGRAM H-24

GAME ADVANTAGE PROPORTIONING

REPLAY COUNTER BANK ASSEMBLY — COIL SIDE



DUDE RANCH REPLAY COUNTER BANK ASSEMBLY — WIPER SIDE



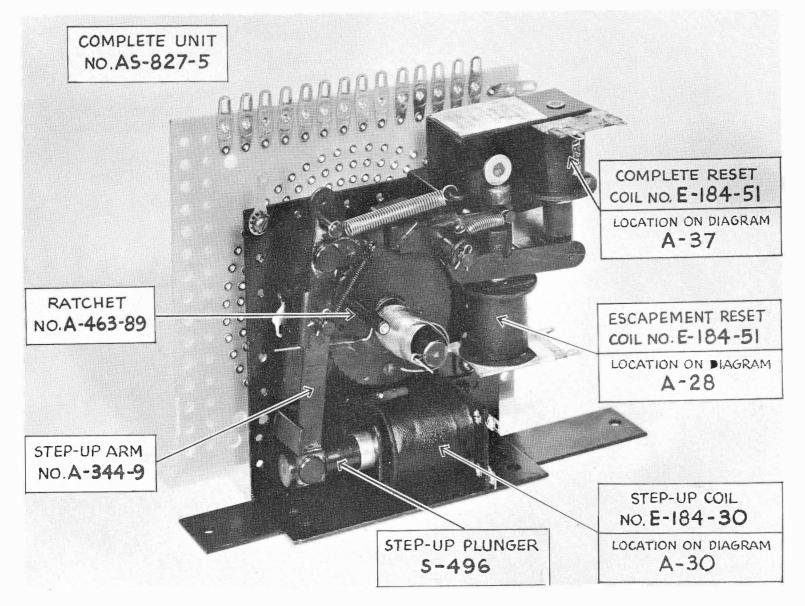
	No. 22 Contraction of the Contra							
	CAM SWITCHES THAT PULSE REPLAY COUNTER STEP COIL#1 OR#2							
	sw. 14A	sw. 14A	sw. 14A	sw.I3A	sw.13A	sw. 12A	SW. IIA	sw.IOA
5 IN LINE	96 X	96	96 X	100 50	50	150	200	300
4IN LINE	16	18	20	24 12	32		48	72 1/2
3 IN LINE	4	5 5	6	8	12	18	24	36

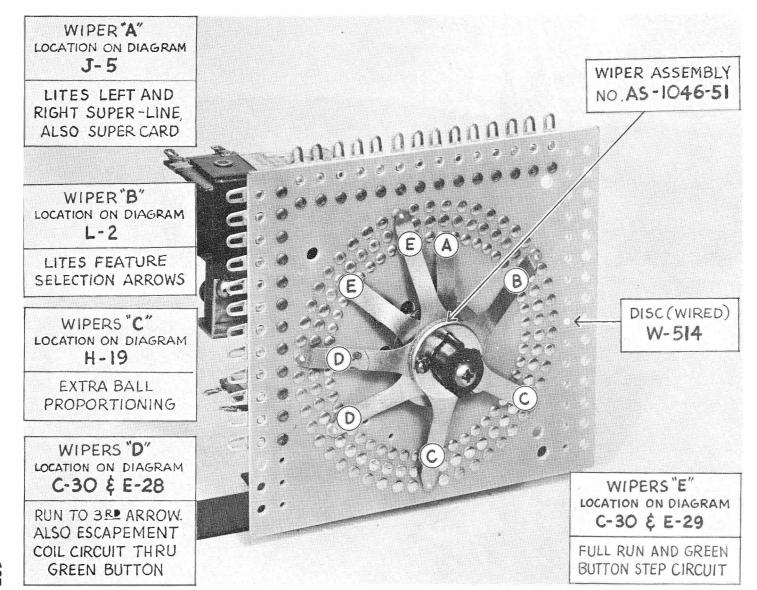
LARGE NUMBERS ARE REPLAY SCORES SHOWN ON BACK GLASS.

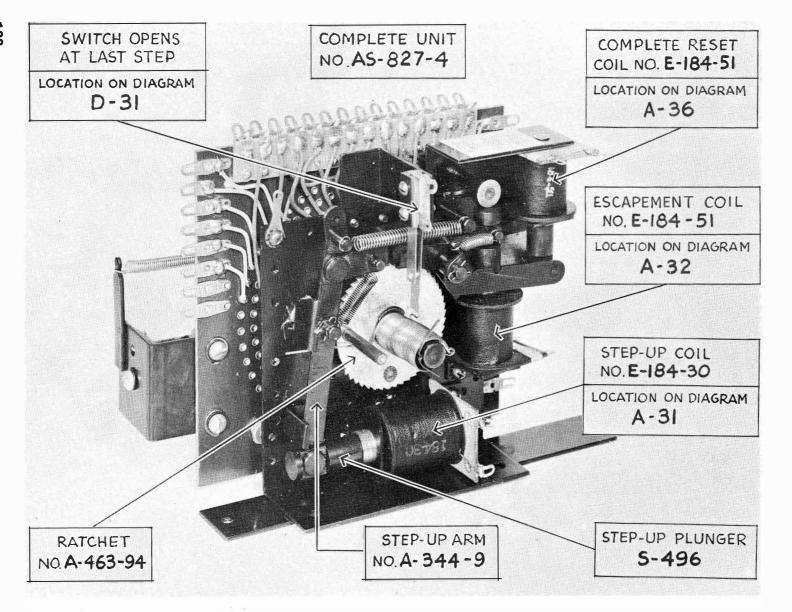
NUMBERS IN SHADED CIRCLES INDICATE WHICH PORTION OF

REPLAY CIRCUIT STRIP (CARD #1 OR #2 OR SUPER CARD) IS EFFEC
TIVE FOR A PARTICULAR REPLAY SCORE.

NOTE: 96 REPLAY SCORE IS EFFECTIVE THRU THE OPEN AT 96 SWITCH.







DUDE RANCH NUMBER SELECTION UNIT — COIL SIDE



LITES "SELECT A LIT NUMBER"

WIPER "B"
LOCATION ON DIAGRAM
C-31

RUN TO #22 LITE

WIPERS "C"
LOCATION ON DIAGRAM
H-20

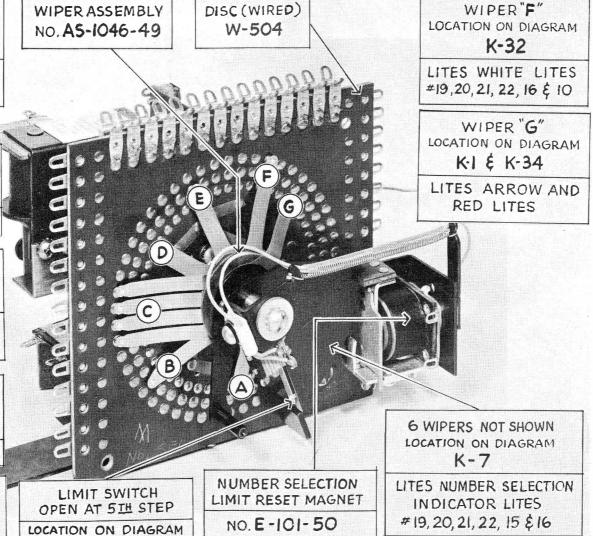
SCORE TO EXTRA
BALL PROPORTIONING

WIPER D"
LOCATION ON DIAGRAM
H-31

POSITIONING WIPER

WIPER "E"
LOCATION ON DIAGRAM
B-32

SINGLE STEPS



COIL ONLY C-2544-23

WIRE NO. 30

G-30

REPLAY REGISTER UNIT

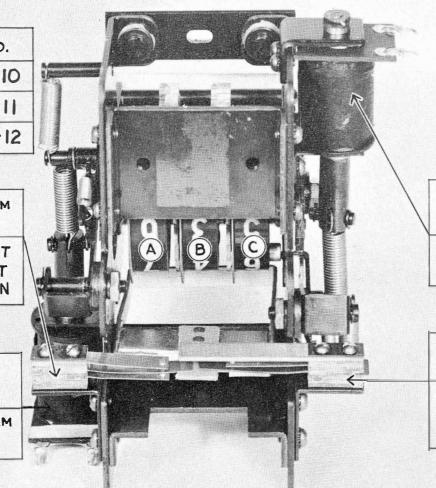
WHEEL	PART NO.
Α	A-1168-10
В	A-1168-11
С	A-1168-12

LOCATION ON DIAGRAM

COMPLETES CIRCUIT TO COIN LOCKOUT COIL OR RED BUTTON

RESET COIL NO. E-184-56

LOCATION ON DIAGRAM
A-7



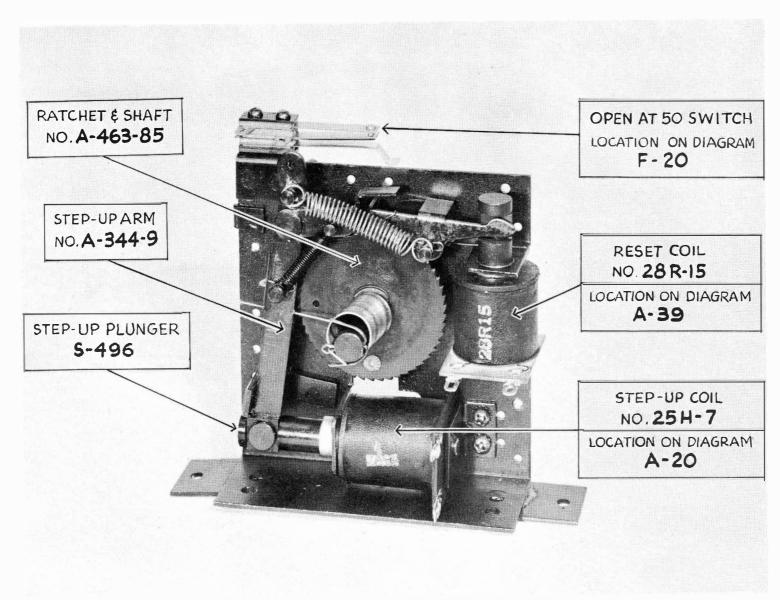
STEP-UP COIL NO.CO-26A-9

LOCATION ON DIAGRAM
A-13

NO. AS-473-13

LOCATION ON DIAGRAM
B-7

OPENS CIRCUIT TO RESET COIL OF THIS UNIT AT ZERO



NOTES

CONTROL UNIT SPOTTING DISC AND WIPERS

WIPERS "A"
LOCATION ON DIAGRAM
E-32

NUMBERS SELECTION STEPS TO #15,16, \$10

WIRE NO. 85-1

WIPER"B" LOCATION ON DIAGRAM E-30

FEATURE SELECTION STEPS AND NUMBER SELECTION RUNS

WIRE NO. 85-1

WIPER "C" LOCATION ON DIAGRAM E-25

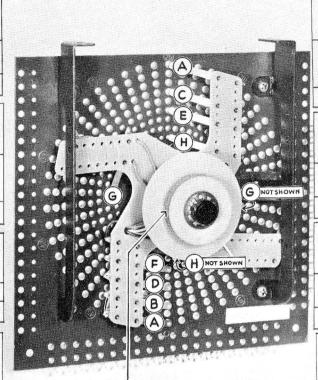
SCORE STEPS

WIRE NO. 75-5

WIPER "D"
LOCATION ON DIAGRAM
E-25

SCORE STEPS

WIRE NO. 75-5



WIPER \$ SLIP RING ASS'Y NO. AS-1034-21 WIPER "E"
LOCATION ON DIAGRAM
C-26

RED AND YELLOW STAR, CORNERS AND SUPER CARD

WIRE NO. 61

WIPER "F"
LOCATION ON DIAGRAM
E-21

EXTRA BALL
STEPS AND RUNS

WIRE NO. 78-6

WIPERS "G" LOCATION ON DIAGRAM K-15 & K-4

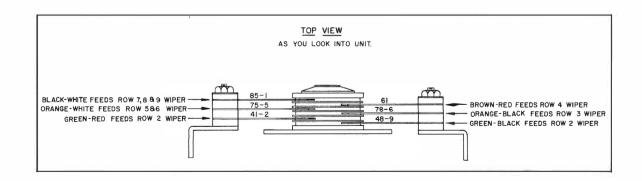
FLASH CIRCUIT FOR GAME ADVANTAGES

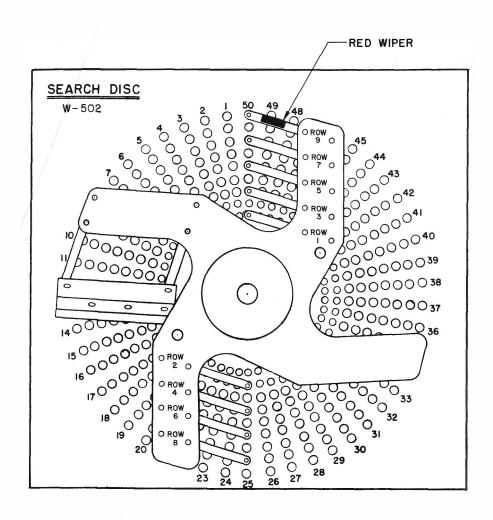
WIRE NO.41-2,48-9

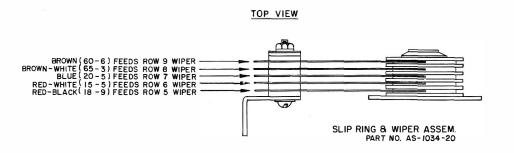
WIPERS "H"
LOCATION ON DIAGRAM
K-17

EXTRA BALL FLASH

WIRE NO. 81-4

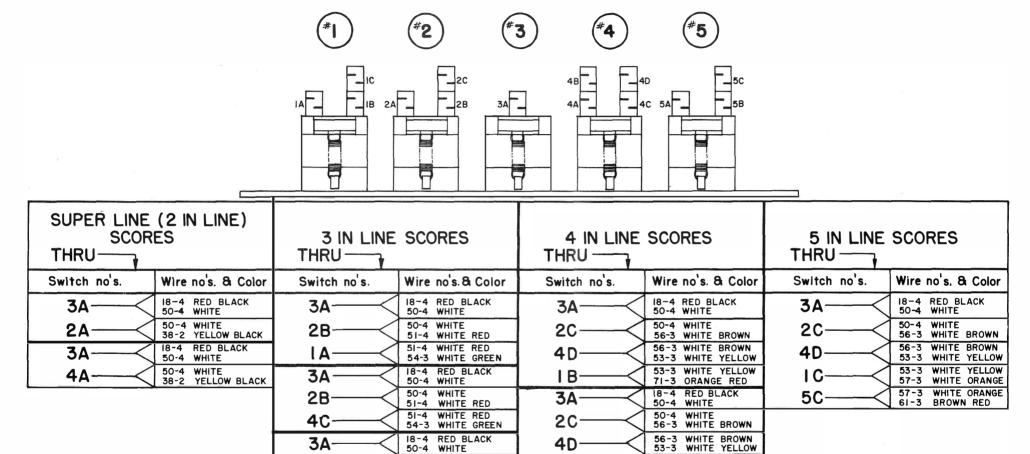






		9	SEARCH I	POSITION	S	
	RED WIPER POSITION	ROW 7 SEARCH RELAY#1	ROW 8 SEARCH RELAY#2	ROW 9 SEARCH RELAY#3	ROW 6 SEARCH RELAY#4	ROW 5 SEARCH RELAY#5
	ı	5.	18	9	25	3
	2	8	22	10	19	7
HORIZONTAL	3	6	1	16	- 11	17
	4	24	21	14	20	13
	5	12	23	2	4	15
	6	5	8	6	24	12
	7	18	22	1	21	23
VERTICAL	8	9	10	16	14	2
	9	25	19	II	20	4
	10	3	7	17	13	15
014001141	- 11	5	22	16	20	15
DIAGONAL	12	3	19	16	21	12
	13					
FIDOT OUDED LINE	14		5	18	9	
FIRST SUPER LINE	15		9	25	3	
CORNERS	16	5	3	15	12	
	17					
	18					
	19					
	20					
	21	9	24	16	12	6
	22	13	19	14	20	25
HORIZONTAL	23	2	18	15	4	17
F1	24	1	22	[]	21	8
	25	10	7	5	23	3
	26	9	13	2		10
	27	24	19	18	22	7
VERTICAL	28	16	14	15	11	5
	29	12	20	4	21	23
	30	6	25	17	8	3
DIAGONAL	31	9	19	15	21	3
DIAGONAL	32	6	20	15	22	10
	33					
COND SLIDED LINE	34		9	24	16	
COND SOFER LINE	35		16	12	6	
CORNERS	36	9	6	3	10	
	37					
	38					
	39					
	40					
		14				
HORIZONTAL	42	<u> </u>				
	44	14				
VERTICAL	45	7		4		
		11			-	
DIAGONAL						
	48	11	10		200	
CORNERS	49	14	11	18	17	
	50					
	VERTICAL DIAGONAL HORIZONTAL VERTICAL DIAGONAL HORIZONTAL VERTICAL DIAGONAL HORIZONTAL	HORIZONTAL HORIZONTAL 1 2 HORIZONTAL 3 4 5 6 7 VERTICAL 8 9 10 11 12 13 14 15 CORNERS 16 17 18 19 20 21 22 HORIZONTAL 23 24 25 26 27 VERTICAL 28 29 30 30 31 32 33 34 34 35 CORNERS 36 37 38 39 40 41 HORIZONTAL 42 43 44 VERTICAL 45 46 47 48	RED ROW 7 SEARCH POSITION RELAY	RED ROW 7 SEARCH SEARCH RELAY#2 RELAY#2 RELAY#2	RED ROW 7 SEARCH RELAY#3 R	RED ROW 7 SEARCH RELAY"S SEARCH RELAY"4 SEARCH RELAY"5 SEARCH RELAY"4 SEARCH RELAY"4

SEARCH RELAYS



5B-

53-3 WHITE YELLOW

71-3 ORANGE RED

50-4 WHITE

WHITE

54-3 WHITE GREEN

WHITE BLUE

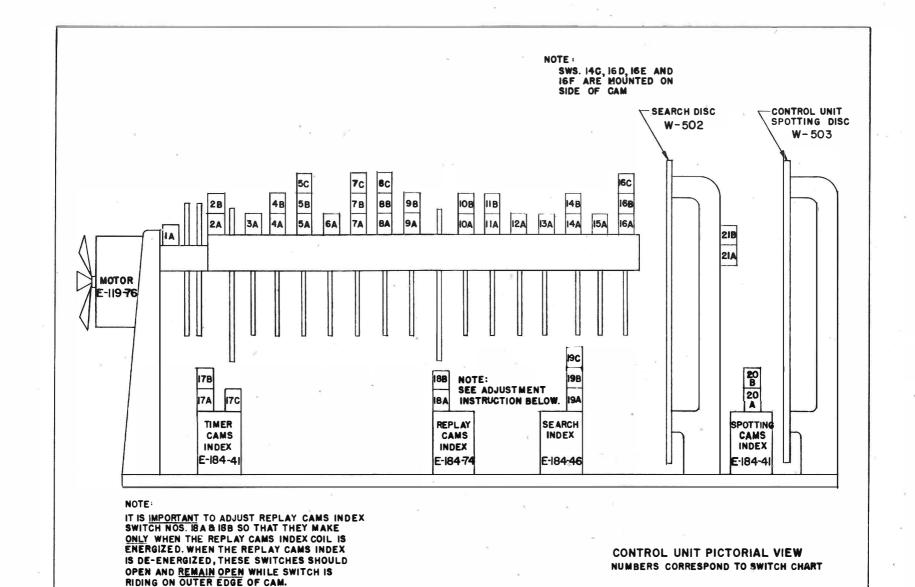
52-3 WHITE BLUE

50-4

52-3

4B-

5A-

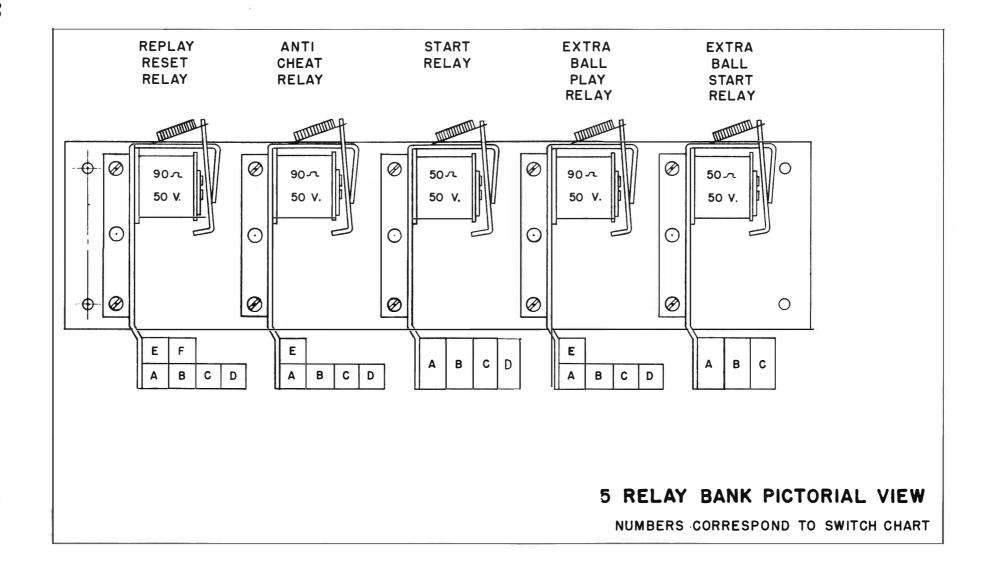


CONTROL UNIT CAM SWITCHES

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

CODE N.C. NORMALLY CLOSED N.O. NORMALLY OPEN
M.B.B. MAKE BEFORE BREAK
S.P.D.T. SINGLE POLE DOUBLE THROW

CAM SWITCH	LOCATION ON Diagram	WIRE NO.	WIRE COLORS	FUNCTION OF SWITCHES		
1A N.O.	F-8	65-2 36-10	Brown-White Yellow-Brown	Energizes timer step-up in ser selection lock trip sw. #2.		
2A N.O.	H-7	30	Yellow	Energizes replay register reset coil and reflex play magnet.		
2B N.C.	F-10	27-5 30 15-2	Blue-Orange Yellow Red-White	Drops out extra ball relay.		
3A N.C.	1-4	83 –3	Black-Yellow	Drops out start, extra ball start relays, acts as safety switch during sp		
4A N.O.	K-15	4 8−2 B1 −4	Green-Black Black-Red	Flashes extra ball lites.		
4B N.O.	C-35	60-5 30	Brown Yellow	Energizes spotting index coil and score extra step index coil.		
		78-4	Orange-8 lack			
5A N.O. 5B "N.O".	G-B B-21	71 - 9 65 - 2 21 - 1	Orange-Red 8rown-White Blue-Red	Energizes timer reset coil during timing cycle. Energizes extra ball unit step-up coil. Steps unit from minus one		
5C N.O.	B-34	63-10	Brown-Yellow Blue-White	position to zero position. Energizes anti-cheat relay if anti-cheat relay is de-energized.		
	270	7B-10	Orange-Black			
6A N.O.	F-24	23 – 7 78 – 8	Blue-Yellow Orange-Black	Opens game advantages during timing cycle of control unit.		
7A N.O.	C-26	83 -8 61	Black-Yellow Brown-Red	Energizes red and yellow star relay; corners and super card relay.		
7B N.O.	B-30	65-4 80-5	Brown-White Black	Energizes feature selection step-up coil.		
7C N.O.	B-31	52 –5 75 –4	White-Blue Orange-White	Energizes number selection step-up.		
8A N.O.	B-22	25-4 63-10	Blue-White Brown-Yellow	Energizes extra ball unit for single steps.		
8B N.O.	C-24	3 8-1 0 54-5	Yellow-Black White-Green	Energizes score unit for single steps.		
8C N.O.	1-6	30 71-2	Yellow Orange-Red	Energizes coin lock magnet during timing cycle.		
9A Alt.	D-23	71 25 <i>-</i> 3	Orange-Red Blue-White	Proportions score extra steps.		
10A N.O.	A-16	93 –8 70	Gray-Yellow Orange	This sw		
10B N.O.	C-20	60 81	Brown Black-Red	This switch effective on corners replay score on super card.		
11A N.O.	A-16	85 ~4 70	Black-White Orange	This switch effective at 8th step of score unit.		
11B N.O.	C-20	74 81	Orange Orange-Green Black-Red	This switch effective on corners replay score on card one or card two.		
12A N.O.	A-17	25-7 70	Blue-White Orange	This switch effective at 7th step of score unit.		
13A N.O.	A-17	81-8 70	B lac k-Red Orange	This switch effective at 5th & 6th step of score unit.		
14A N.O.	A-18	54-8	White-Green	This switch effective at 1st to 4th step of score unit.		
14B N.O.	8-13	70 80-10	Orange Black	Energizes replay register step-up and reflex replay magnet.		
14C N.O.	H-13	3B-4 21-3	Yellow-Black Blue-Red Blue-Orange	Replay lœk in circuit.		
15A N.C.	I-14	93	Blue-Orange Gray-Yellow	Prevents the start of a second replay scoring until the replay cams		
16A N.O.	8-30	• 56-7 85-6	White-Brown Black-White	are indexed. For multiple feature selection steps.		
16B N.O.	B-31	65-4 56-10	Brown-White White-Brown	For multiple leature selection steps.		
16C N.O.	I-31	52-5 14-2	White-Blue ,	For numbers selection escapement coil pulses.		
160 N.O.	8-21	54 – 6 78	White-Green Orange-Black	For extra ball unit multiple steps.		
16E N.O.	C-6	63 –1 0 75 –2	Brown-Yellow Orange-White	Pulse switch for operating replay register reset and replay meter when		
16F N.O.	L = 9	53 -2 20-4	White-Yellow Blue	replay reset relay is energized. Flashes "select now" lights.		
TIMER CAMS	A-10	23-4 80-4	Blue-Yellow Black	Energized by switches on start relay and extra ball relay.		
INDEX COIL	E-8	70 74-2	Orange Orange-Green	Completes lock-in for extra ball play relay during timing cycle.		
178 N.C.	G-5	81 –2 14 – 9	B lac k-Red Red -Green	Opens circuit to coin lock out during timing cycle.		
7 17C N.O.	H-2	71 –2 60–P	Orange-Red Brown (Plastic)	Operates control unit motor.		
RE PLAY CAMS	A-13	20-P 40-4	Blue (Plastic) Green	Energized by switch on search index when a replay is scored.		
INDEX COLL	G-13	70	Orange Blue-Orange	Completes lock-in circuit for search index coil and replay came index		
18B N.O.	1-14	80-10 56-7	Black White-Brown	coil NOTE: See pictorial view above for proper adj. Same as above.		
SEARCH INDEX	A-12	93 70	Gray-Yellow Orange	Energizes when 2, 3, 4 or 5 in line scored.		
COIL 19A N.O.	B-12	80-10 80-10	Black 8lack	Energizes when 2, 3, 4 or 3 in the scored.		
198 N.C.	B -8	40-4 27-2	Green 8 lue - Orange	Opens timer step-up circuit while replays are being scored.		
190 N.C.	1-4	90-9 30	Gray Yellow	Opens start and extra ball start relay circuits while replays are		
SPOTTING	A-35	83 -3 78-4	Black-Yellow Orange-Black	being scored. Energized by cam switch ≸#B.		
INDEX	A-35	78 -4 70 45-2	Orange Black Orange Green-White	Flashes selected numbers, super card corners and super line lights.		
20B N.O.	J-45	45-2 41-2 56-5	Green-Red White-Brown	Flashes scores, extra ball and yellow and red star lights.		
	1,000	148-9	Green-8 lack			
SEARCH WIFER SWITCH 21A 21B N O	F-14	57-6 18-4	White-Orange Red-Black	Energizes replay counter change over relays on replay counters.		
	C-35	78-4 21-9	Orange-Black Blue-Red	Operates scramble magnet.		
21C N.O.	G*-2	20-P 60-P	Blue (Plastic) Brown (Plastic)	Carry thru switch for change relays.		

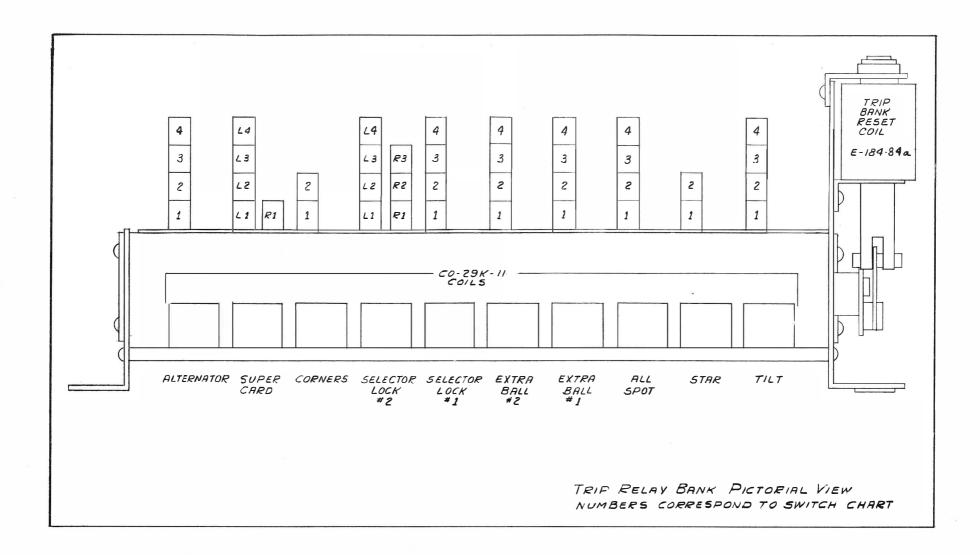


5 RELAY BANK SWITCHES

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

	CODE
N. C	NORMALLY CLOSED
N. O	NORMALLY OPEN
MRR	MAYE DEEADE DOEAN

FER TO PICTORI	AL TIEW AD				S.P.D.T. SINGLE PULE DOUBLE THROW		
RELAY SWITCH	LOCATION ON DIAGRAM	WIRE NO.	WIRE COLORS	FUNC	TION OF SWITCHES		
REPLAY RESET RELAY COIL	A-6	75 - 2 70	Orange~White Orange	Energizes when replays are c	Energizes when replays are cancelled by push button or if anti—cheat relay drops out.		
A S. P. D. T.	C-7	53-2 13-9 27-4	White-Yellow Red-Yellow Blue-Orange	Directs circuit to replay me	eter during replay cancel.		
B N.O.	G-1	60-P 20-P	Brown (Plastic) Blue (Plastic)	Energizes control unit motor	•		
C N.O.	D-6	50-2 75-2	White Orange-White	Lock-in switch for this rela	у.		
D N.C.	E-3	21-6 63-2	Blue-Red Brown-Yellow	Opens start circuit during r	eplay cancel.		
E N.C.	E-5	20-3 25-10	Blue Blue-White	Opens extra ball trip and ex	tra ball start relays during cancel.		
F N.C.	B-7	61-5 41-6	Brown-Red Green-Red	In series with replay meter.			
ANTI-CHEAT RELAY COIL	A-34	25 70	B1 ue-White Orange	Energize thru cam switch #5,	its switches protect replay and light circuits.		
A N.O.	B-34	25 78 - 10	Blue-White Orange-Black	Lock-in switch for this rela	у.		
B N.O.	L-20	54 40	White—Green Green	Opens 6 volt circuit involvi right super line lights.	ng corner, super card, arrow number and left and		
C N.O.	L-24	10-9 10-10	Red Red	Opens 17 volt circuit when this relay drops out.			
D N.O.	B-9	91-2 93-6	Gray—Red Gray—Yellow	Completes circuit to extra ball play relay.			
E N.C.	E-6	75-2 50-2	Orange⊣√hite White	Energizes replay reset relay when this relay drops out.			
START RELAY COIL	A-3	21-6 70	Blu e R ed Orange	Energizes every time a coin is played or when a red or yellow button is pressed.			
A N.C.	C-9	80-2 91-2	Black Gray-Red	Opens circuit to extra ball play relay when this relay is energized.			
B N.C.	F-27	85-1 90-3	Black-White Gray	Opens circuit to number selection and feature selection step-up coil.			
C N.O.	G3	4 8-2 63-2	Green-Black Brown-Yellow	Lcck-in switch for this relay.			
D N.O.	€ -1 0	41-3 13-3	Green-Red Red-Yellow	Completes circuit to timer ca	am index coil,		
EXTRA BALL PLAY RELAY COIL	A-9	93 –6 70	Gray-Yellow Orange	Energizes when yellow button	is pressed.		
A S.P.D.T.	G-4	5 0-2 51-2 63-2	White White-Red Brown-Yellow	Directs circuit to regular st	tart relay or extra ball start relay.		
B S.P.D.T.	F-10	74-2 15-2 41-3	Orange-Green Red-White Green-Red	Breaks timer cams index circ this relay.	uit and also acts as lock-in switch for		
C N.O.	J-22	13-8 30	Red-Yellow Yellow	Lights extra ball light in ba	ack box.		
D N.O.	F-41	51-2 25-10	White—Red Blue—White	Completes circuit to extra ba	all start and extra ball trip relay.		
E N.C.	J-4	45 3 0	Green-White Yellow	Opens flash circuit during ex	xtra ball play."		
EXTRA BALL START RELAY COIL	A5	20–3 70	Blue Orange	Energizes when yellow button	is pressed.		
A N.C.	C-21	78 53-5	Orange-Black White-Yellow	Opens circuit to extra ball step-up coil during spin of control unit.			
B N.O.	D-9	74 -2 80-4	Orange-Green Black	Operates mixer latch coil and timer index coil during extra ball play.			
C N.O.	G5	25-10 48-2	Blue-White Green-Black	Lock-in switch for this rela	у.		

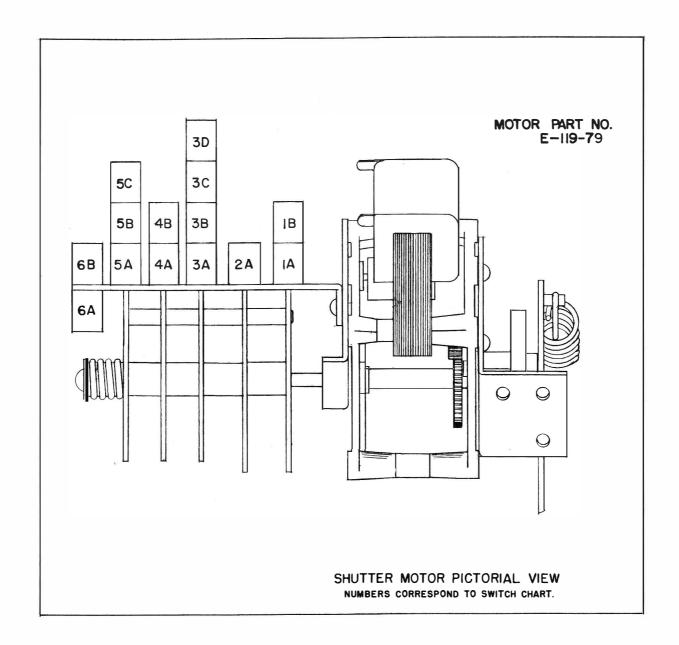


TRIP RELAY BANK CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

CODE

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE NO.	WIRE COLORS	FUNCTION OF SWITCHES	
SUPER CARD TRIP COIL	A-26	14-3 70	Red-Green Orange	Trips when selected or is energized thrucam #7A.	
L1 N.O.	G-17	23-8	Blue-Yellow	Completes replay circuit to score unit disc.	
L2 N.C.	1-19	71-3 31-5	Orange-Red Yellow-Red	Score unit proportioning thru mixer #3 and feature selection disc.	
L3 N. €.	E-20	41-7	Green-Red Green-Black	Completes circuit to corners replay counter, thru search disc and	
L4 N.C.	H-21	50-3 15-6	White Red-White	cam #10B. Score unit proportioning thru mixer #3.	
R1 N.O.	J-5	10-2	Red Brown	Lights super card light.	
		30	Yellow		
CORNERS TRIP	A-26	93 –9 70	Gray-Yellow Orange	Erergized by control unit cam #7A	
1 N.O.	J-5	5 7-2 30	White-Orange Yellow	Lights corners light,	
2 N.O.	E-20	48-3 51-3	Green-Black White-Red	Completes circuit to corners replay counter and search disc.	
SELECTOR LOCK TRIPCOIL #2	A-28	70	Jumper Orange	Trips at 4th step of timer unit.	
11 N.O.	C-9	81-2	B lac k-Red	Completes circuit to extra ball play relay.	
L2 N.C.	B-28	80-2 61-10	Black Brown-Red	Breaks circuit to this trip coil.	
L3 N.O.	D-8	71-4	Jumper To Coil Orange-Red	Completes circuit to timer step-up coil after first ball is shot.	
L4 N.C.	J-9	27-2 45-5	Blue-Orange Green-White	Shuts off "select now" light for selected numbers.	
R1 N.O.	J-35	85-2 30	Black-White	Holds "selected number" light on.	
	J	98-1	Gray-Black		
R2 N.O.	1-15	18-4 56-7	Red-Black White-Brown	Completes replay circuit when this relay is tripped.	
R3 N.C.	I-31	54-6 74-3	White—Green Orange—Green	Completes circuit to number selection unit.	
SELECTOR LOCK TRIPCOIL #1	A –2 7	36-6 70	Yellow-Brown Orange	Trips at 3rd step of timer unit.	
1 N.C.	E-26	36-6 40-6	Yellow-Brown Green	Opens circuit to this relay when tripped also to super card relay.	
2 N.C.	J-8	41-5	Green-Red Red-Black	Shuts off "Select now" light for feature selection.	
3 N.O.	G-9	23-1	Blue-Yellow	Keeps circuit to ball lifter cam switch alive.	
4 N.C.	G-29	43 –2 98–2	Green-Yellow Gray-Black	Opens circuit to green push button when this relay trips.	
EXTRA BALL	A-4	71-7	Orange-Red Blue	Energized by switch on extra ball play relay.	
TRIP COIL #1		70	Orange Blue-Yellow		
LI S. P.D.T.	G-24	23-7 50-10 14-4	White Red-Green	Extra ball proportioning.	
L2 N.C.	F-24	63-8 78-B	Black-Yellow Orange-Black	Breaks circuit to red button advantages.	
L3 S.P.D.T.	H-23	75-10	Orange-White Red-White	Extra ball proportioning.	
		15-6 78-8	Orange-Black		
L4 S.P.D.T.	J-15	56-5 30 60-9	White-Brown Yellow Brown	Directs circuit from score flash to extra ball flash.	
R1 N.O.	H-26	75-10 90-1	Orange-White Gray	Extra ball proportioning.	
EXTRA BALL	A -4	20-3	Blue	Same as extra ball trip ≸1.	
TRIP COIL #2	G-23	70	Orange Red-Yellow	Extra ball proportioning.	
2 S.P.D.T.	F-22	50-6 75-5	White Orange-White	Shuts off score unit steps during extra ball play and completes	
2 0. F.U. 1.	, -22	50-6 45-7	White Green-White	extra ball steps.	
3 N.O.	D-12	91-1 38-3	Gray-Red Yellow-Black	Completes circuit to ball lifter motor when timer unit resets.	
4 S.P.D.T.	E-23	71 30	Orange-Red Yellow	Breaks circuit to score unit step-up coil and completes circuit to step extra ball unit from minus one to zero position.	
		61 –2	Brown-Red		
ALL SPOT TRIP COIL	A -11	Jumper 70	Jumper Orange	Trips when hall rolls over yellow or red roll over providing yellow and red relay is tripped.	
1 N.O.	J-29	30 74-1	Yellow Orange-Green	Lights #23 light when this relay is tripped.	
2 N.C.	B-11	Jumper 85-9	Jum p er Black-White	Opens circuit to this relay when tripped.	
3 N.O.	J-27	30 43-1	Yellow Green-Yellow	Lights #8 light when this relay is tripped.	
4 N.C.	F-22	45-7 78-6	Green-White Orange-Black	Proport ions extra ball steps,	
RED & YE LLOW	A-25	74-10	Orange-Green	Energized by cam switch #7A if spotting disc and mixers are in correct	
STAR TRIP COIL 1 N.O.	C-11	70 75-9	Orange Orange-White	position. Trips all spot relay when red or yellow roll over is actuated.	
2 N.O.	J-15	85-9	Black-White Yellow	Lights red and yellow light.	
		53-6	White		
TILT TRIP COIL	A-12	23 –5 70	Blue-Yellow Orange	Energized by plumb bob.	
1 S.P.D.T.	L-22	81-6 45-8 41-9	Black-Red Green-White Green-Red	Opens 6 volt circuit when this relay trips and lights tilt light.	
2 N.C.	F-1	10 P 60 P	Red (Plastic) Brown (Plastic)	Opens control unit motor circuit when this relay trips.	
3 N.C.	L-25	10-10	Red	Opens 17 volt circuit when this relay trips.	
4 S.P.O.T.	I-10	21 –3	Red Blue –Red	Breaks circuit to ball counting, extra ball and replay circuit.	
		30 91-5	Yellow Gray-Red	Completes circuit to shutter motor when game is tilted.	

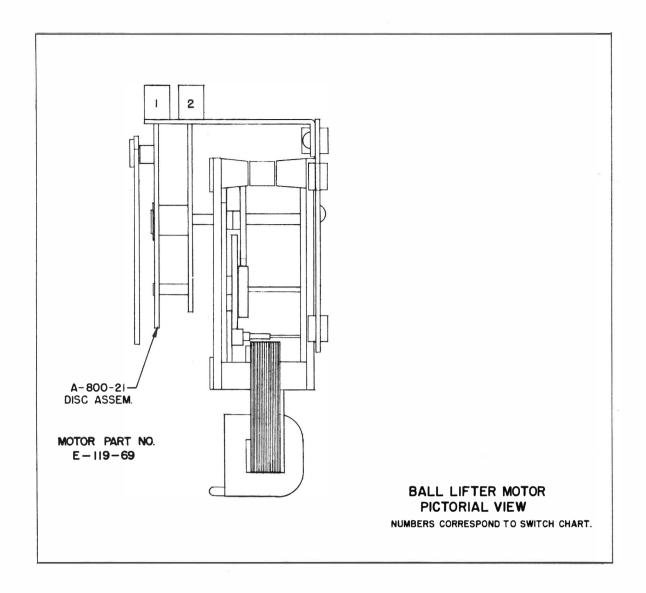


SHUTTER MOTOR CAM SWITCHES

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

CODE
N.C NORMALLY CLOSED
N.O NORMALLY OPEN
M.B.B MAKE BEFORE BREAK
S.P.D.T SINGLE POLE DOUBLE THROW

CAM SWITCH	LOCATION ON DIAGRAM	WIRE NO.	WIRE COLORS	FUNCTION OF SWITCHES	
1A N.C.	I-14	21-3 93	Blue-Red Gray-Yellow	Completes circuit to replay scoring circuit.	
1B N.O.	G-10	20-6 30	Blue Yellow	Carry thru switch for shutter motor.	
2A N.C.	F-12	36-3 31-3	Yellow—Brown Yellow—Red	Completes circuit to ball lift motor. (Closed normally, open during shutter cycle)	
3A N.O.	B-38	83-2 30	Black-Yellow Yellow	Resets the feature selection, the three replay counters and the corners replay counter.	
3B N.O.	1-28	63-3 30	Brown-Yellow Yellow	Resets feature selection escapement coil.	
3C N.O.	I8	71 30	Orange-Red Yellow	Resets timer unit.	
3D N.O.	G-2	70-P 20-P	Orange (Plastic) Blue (Plastic)	Resets trip relay bank.	
4A S.P.D.T.	D-10	80-4 93-3 20-6	Black Red-Yellow Blue	Breaks circuit to shutter motor and makes circuit t_0 timer index coil.	
4B N.O.	G-10	18-3 20-6	Red-Black Blue	(Closed when shutter is open) Completes circuit to shutter motor in series with timer disc.	
5Á N.C.	I-31	21-3 14-2	Blue-Red Red-Green	(Closed when shutter is closed) Completes circuit to selector knob and green button circuit.	
5B N.O.	G-26	90-3 83-8	Gray Black-Yellow	(Open when shutter is closed) keeps number selection and feature selection step-up circuit open.	
5C N.O.	H-10	91-5 18-3	Gray-Red Red-Black	(Open when shutter is closed) Allows shutter to close if game is tilted when shutter is open.	
6A N.O.	C-36	30 98–8	Yellow Gray-Black	(Pulse switch) Resets extra ball, score and numbers selection units.	
6B N.O.	I-32	30 61-7	Yellow Brown-Red	Resets numbers selection escapement coil.	



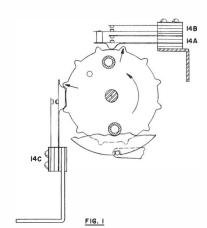
BALL LIFTER MOTOR CAM SWITCHES

FOR POSITION OF SWITCHES
REFER TO PICTORIAL VIEW ABOVE

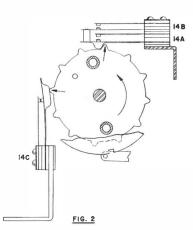
	CODE
	NORMALLY CLOSED
	MAKE BEFORE BREAK
S. P. D. T	SINGLE POLE DOUBLE THROW

RELAY SWITCH OR CAM SWITCH	LOCATION ON DIAGRAM	WIRE NO.	WIRE COLORS	FUNCTION OF SWITCHES
1 N.O.	G-13	30 9 1 –1	Yellow Grey-Red	Carry-over switch for ball lifter motor.
2 N.O.	E-9	43-2 27-3	Green-Yellow Blue-Orange	Energizes timer unit step-up coil.

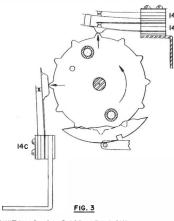
CORRECT ADJUSTMENT FOR CONTROL UNIT CAM SWITCHES 14A, 14B, & 14C.



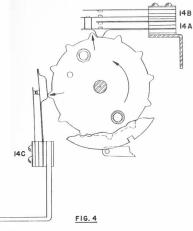
REPLAY CAMS SHOWN IN THEIR NORMAL INDEXED POSITION. SWITCHES 14A, 14B, & 14C ARE OPEN AT THIS TIME. NOTE: ARROWS POINT TO LOBES THAT WILL ACTUATE SWITCHES.



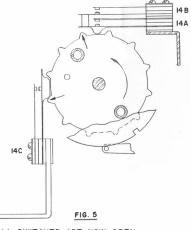
REPLAY CAMS SHOWN STARTING TO ROTATE. THEY ARE NOW OUT OF THEIR INDEX POSITION. SWITCHES 14A, 8 14B ARE STILL OPEN. SWITCH 14C IS NOW CLOSED.



SWITCHES 14A, & 14B ARE NOW CLOSED.
SWITCH 14C IS STILL CLOSED.



SWITCHES 14A, & 14B ARE NOW OPEN AGAIN.
SWITCH 14C IS STILL CLOSED.



ALL SWITCHES ARE NOW OPEN AGAIN, SAME AS IN FIG.1. THIS SEQUENCE IS REPEATED THRUOUT REPLAY SCORING CYCLE.

NOTICE:

THE IMPORTANT PART OF THIS ILLUSTRATION IS TO SHOW THAT SWITCH 14C CLOSES FIRST AND OPENS LAST.

IF AN ADJUSTMENT IS NECESSARY SWITCH 14C CAN BE MOVED UP OR DOWN.

LOOSEN SCREWS THAT HOLD SWITCH, THEN MOVE UP OR DOWN.

MISCELLANEOUS PARTS

PART NO.	NAME OF PART
G-226	Back Glass
M-168-13	Ball 1 1/8"
A-1475	Ball Gate
P-1950-71	Ball Gate Spring Only
C-119-4	Bumper Post - Yellow
C-119-5	Bumper Post - Red
P-1900-10	Cash Box
A-1533	Coin Slide
AS-277-21	Coin Switch Assembly - Complete 5¢
AS-277-22	Coin Switch Assembly - Complete 10¢
E-130-3	Counter 48 Volt
CA-567-10	Front Door Only
CA-664-2	Front Moulding
A-1138-3	Index Arm on Index Coil Assembly - Extra Step Unit
A-1138-6	Index Arm Timing Control Unit
A-1138-6	Index Arm Replay Control Unit
A-1138-7	Index Arm Spotting Control Unit
E-125-2	Lamp #47 Top Panel
E-125-5	Lamp #55 6-8 Volt Bottom Panel & Lite Box
E-125-1	Lamp #58 20 Volt Lite Box
CA-350-1	Leg
C-258-5	Light Shield Post - Top Panel
M-281-6	Lock and Keys - Front Door
M-281-14	Lock and Keys - Back Door, Set
P-2210-8	Plate - Coin Entry 5¢
P-2210-9	Plate - Coin Entry 10¢
R-203	Rebound Rubber Top Panel
M-170	Rebound Spring Double Post Top Panel
E-105-6	Resistor Bottom Panel
R-243	Rubber Ring for Yellow Post
R-243-2	Rubber Ring for Red Post
AS-187-12	Shooter Assembly Complete
A-1540	Shooter Housing Only
A-100-7	Shooter Rod
SP-200-24	Shooter Spring
SP-233	Shooter Spring Outside Barrel
R-108-3	Shooter Tip
M-280-15	Slug Rejector 5¢
M-280-16	Slug Rejector 10¢
E-122-19	Transformer Wine Winer only for Slip Bings
M-412-2	Wire Wiper only for Slip Rings