

American Telephone and Telegraph Company

BELL SYSTEM PRACTICES  
Teletypewriter and Manual  
Telegraph Station and PBX  
Installation and Maintenance

SECTION P36.910  
Issue A, 10-25-50  
Long Lines Department  
Provisional  
Dist. Class. 602.02AC

NO. 15 TELETYPEWRITER

LINE FEED COUNTER

INSTALLATION AND MAINTENANCE

1. GENERAL

1.01 This section provides information for furnishing an arrangement for counting the number of line feed combinations transmitted by a 15-type sending and receiving teletypewriter.

1.02 The arrangement consists essentially of a TP92996 electric impulse counter normally employed on 15-type perforator-transmitters and two sets of contacts so arranged that the operation of the line feed key lever will first operate a snap action switch and as the key is further depressed will allow the sending cam sleeve to rotate thereby operating the cam pulsing contacts, thus completing a circuit through the counter magnets of the indicator. When a predetermined number of line feed combinations have been recorded and the indicator lamp lighted, the indicator can be reset and the lamp extinguished by depressing a push button located at the right hand end of the keyboard.

2. MATERIAL REQUIREMENTS

2.01 The material required for this line feed counter arrangement consists of the following:

- 1 - TP92996 Electric Impulse Counter Assembly
- 2 - M4N Cords (3 Feet)
- 1 - Jones S-304CCT Socket
- 1 - Jones P-304CCT Plug
- 2 - TP34-4 Nuts (No. 10-32 Hex.) for Steel Tables or
- 2 - P-21019 (No. 10-1/2" R.H.W. Screws) for Wooden Tables
- 1 - TP92204 Cable Clamp
- 1 - TP94248 Cable Clamp
- 2 - TP74059 Screws (No. 6-40 x 7/32 Hex.)
- 2 - TP1269 Screws (No. 6-40 x 1/2 Fil.)
- 4 - TP33-237 Screws (No. 2-56 x 7/16 Fil.)
- 2 - TP33-85 Screws (No. 2-56 x 3/8 Fil.)
- 2 - TP3606 Nuts (No. 6-40 Hex.)
- 2 - TP34-11 Nuts (No. 2-56 Hex.)
- 2 - TP2191 Lock Washers
- 1 - TP119862 Clamp Plate
- 1 - TP119857 Cam Pulsing Contact Assembly
- 1 - TP117258 Push Button Switch
- 1 - TP119465 Switch
- 1 - TP119860 Switch Mounting Bracket
- 1 - TP119488 Switch Operating Bracket
- 1 - S-5612 (for reference purposes only)

### 3. MODIFICATION OF IMPULSE COUNTER

3.01 If the TP92996 impulse counter is received wired, check that the wiring agrees with that shown in Figure 8, otherwise, wire it in accordance with this figure.

### 4. INSTALLATION

4.01 Drill holes in the keyboard frame as follows:

(a) Two holes .166 inch in diameter as shown in Figure 1 for mounting the TP117258 push button switch; one hole 9/16 inch in diameter for the M4N cord, and two No. 6-40 tap holes for the TP94248 and TP92204 cable clamps.

(b) One hole 9/16 inch in diameter as shown in Figure 2 for the M4N cord.

- 4.02 Attach the TP119857 cam pulsing contact assembly to the front of the transmitter assembly using the two existing TP6746 screws for mounting. (See Figure 4)
- 4.03 Mount the TP117258 push button switch on the right hand side of the keyboard by means of the two TP1269 screws and TP3606 nuts, using the two .116 inch holes drilled per Paragraph 4.01 (a). The switch will extend toward the rear.
- 4.04 Assemble the TP119465 snap switch, the TP119488 actuator and bracket on the TP119860 switch mounting plate using the TP119862 clamp plate and the two TP33-237 screws as shown in Figure 3. Install this assembly on the bottom side of the keyboard so that it is at the right between the spring plate and the selector bar assembly and so that the switch will be actuated by the line feed key lever. Fasten to the keyboard with the existing right hand TP74986 key lever spring bracket mounting screw.
- 4.05 Remove the outside rubber covering of one M4N cord for a distance of about two feet to make the individual conductors accessible. Route the free conductors through the existing hole in the right end of the keyboard frame  $3\text{-}3/8$  inches from the front edge terminate the green wire at the restore switch; route the remaining wires through hole A (shown in Figure 2) bring the red and the white wires up through hole B (shown in Figure 1), around the transmitter assembly and terminate the red wire on slip connector 53 and the white wire on slip connector 52. The black wire (which was left inside the keyboard) should be terminated at the TP119465 snap switch. Add three straps as shown in Figure 7 and complete the wiring of the keyboard in accordance with this figure. Dress the wires and add the TP94248 and TP92204 cable clamps at points shown in Figure 1.
- 4.06 Splice the second M4N cord to the TP83443 cable (part of the impulse counter assembly) as shown in Figure 7.

4.07 Cut the M4N cords so that about one foot of each cord extends beyond the keyboard and the impulse counter and connect the Jones fittings as shown in the wiring diagram.

4.08 Mount the impulse counter on the right edge of the table top near the front as pictured in Figure 3.

## 5. ADJUSTMENTS

5.01 Standard 15-type keyboard adjustments plus the following new adjustments will apply.

5.02 The CAM FOLLOWER should ride centrally on the cam and the contact points should be in alignment with each other. Figures 4 and 5.

(a) To adjust, loosen the contact spring assembly mounting screws and position the assembly. Tighten the mounting screws.

5.03 With the transmitter shaft in the stop position the CAM FOLLOWER should be on the high part of the cam just before it drops into the indent. Figure 4.

(a) To adjust, position the contact bracket by means of its mounting screws.

5.04 When the CAM FOLLOWER is on the high part of its cam, there shall be from .010 inch to .020 inch clearance between the contact points. Figure 4.

(a) To adjust, bend the contact spring stiffener.

5.05 With the CAM FOLLOWER on the high part of its cam, hook an eight ounce scale under the lower contact spring at the contact and pull vertically upward. It should require one to two ounces to start the lower contact spring moving away from its stiffener. Figure 4.

(a) To adjust, bend the lower contact spring. Re-check adjustment 5.04.

5.06 Rotate the transmitting cam until the CAM FOLLOWER falls into the indent of its cam. Hook an eight ounce scale under the upper contact spring at the contact and pull vertically upward. It should require a pull of 3-1/2 to 4-1/2 ounces to separate the contact points. Figure 5.

(a) To adjust, bend the upper contact spring.

Note: When the TP92225 filter assembly is used there should be some clearance between the filter and the contact pile-up mounting screws. To adjust, take up play in the filter mounting bracket holes.

5.07 With the LOCK LOOP held against the backstop screw there should be .020 inch to .060 inch clearance between the lock loop roller and the lock loop cam when the transmitting cam sleeve is rotated to make this clearance a minimum. Figure 6.

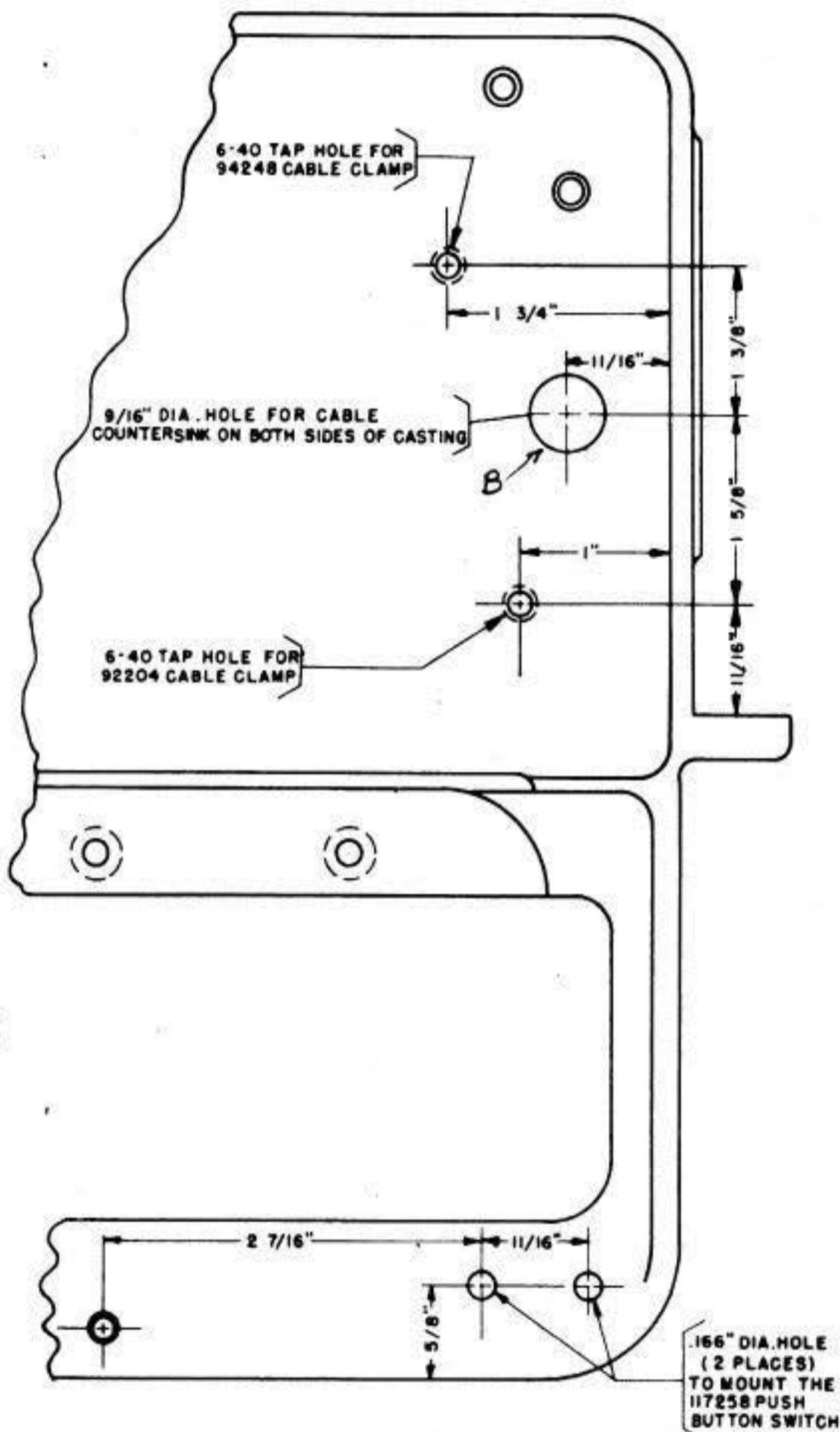
(a) To adjust, reposition the backstop screw.

5.08 Rotate the transmitting cam shaft to its stop position and depress the line feed key lever. The SNAP ACTION SWITCH should be actuated just before the transmitting cam clutch is tripped.

(a) To adjust, loosen the TP119862 plate and position the switch by means of its lower mounting holes. Tighten the plate. Make certain that the key lever strikes at approximately the center of the high portion of the switch actuator. Figure 3. (Replace the TP74590 keyboard plate if it was found necessary to remove it for this adjustment.)

5.09 Make adjustments on the counter in accordance with standard instructions so that the lamp will light on the particular line feed operation specified in the Service Order.

Note: It will be desirable to employ a test lamp in making contact adjustments.



(KEYBOARD-TOP VIEW)

FIGURE 4

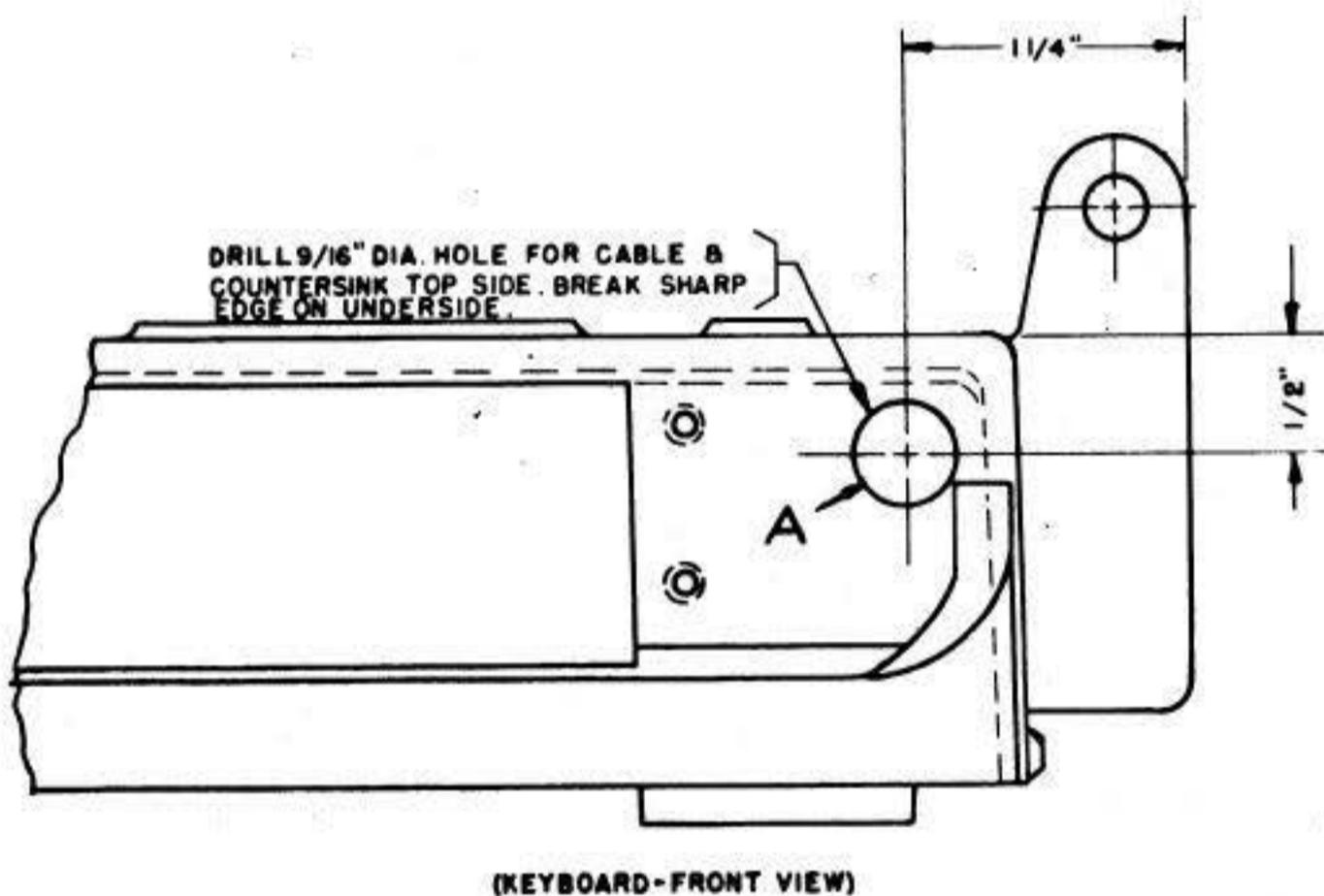
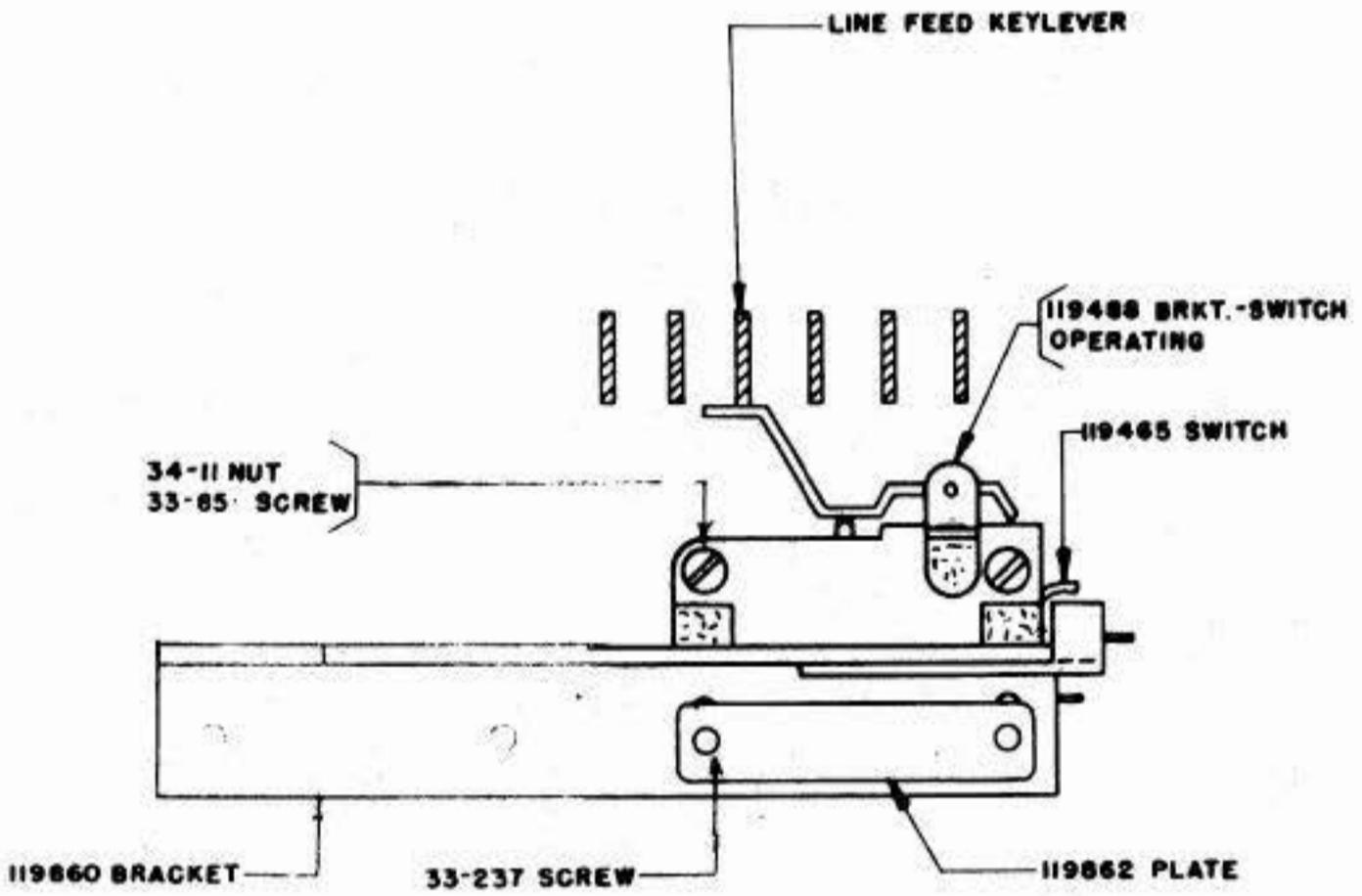


FIGURE 2



SWITCH ASSEMBLY  
REAR VIEW - KEYBOARD

FIGURE 3

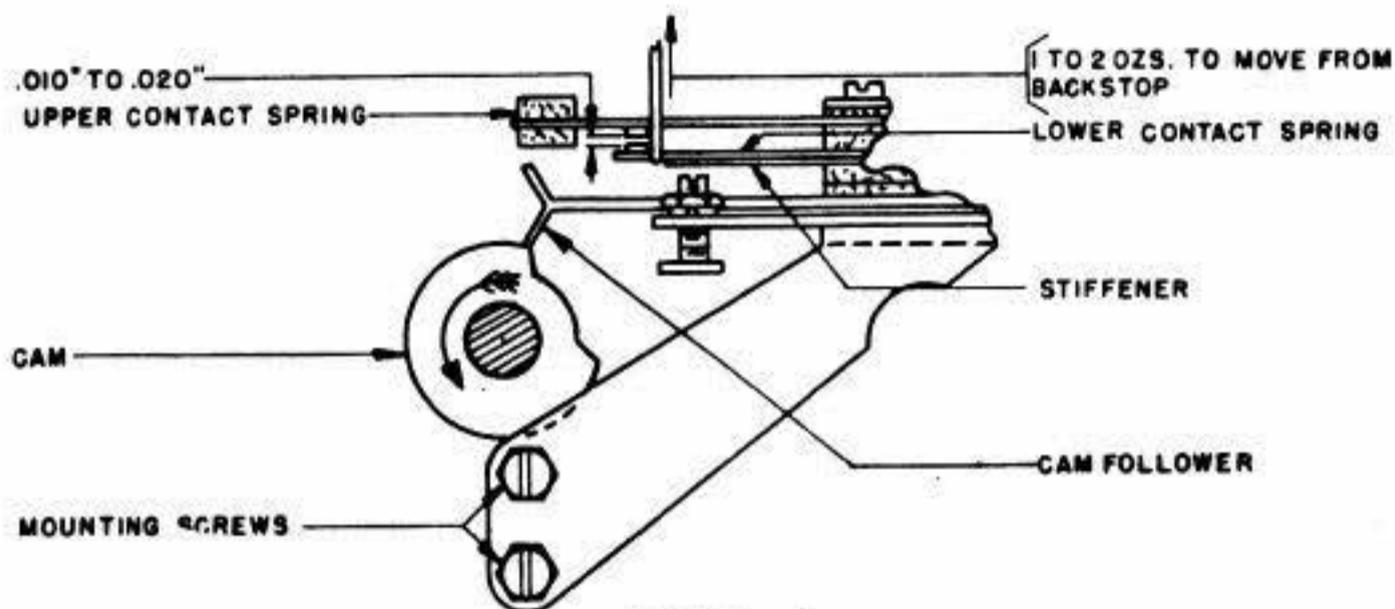


FIGURE 4

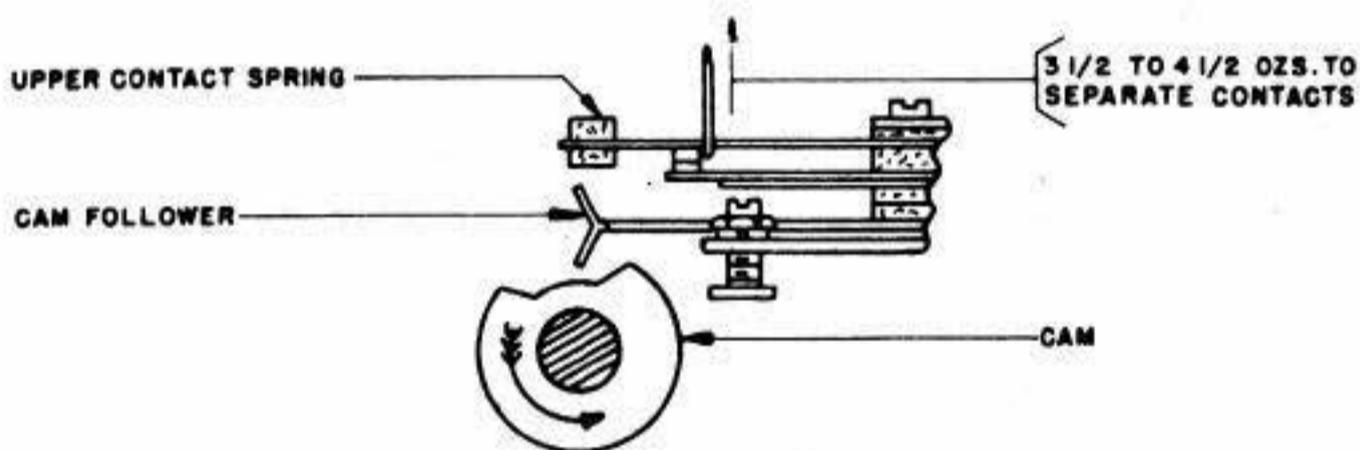


FIGURE 5

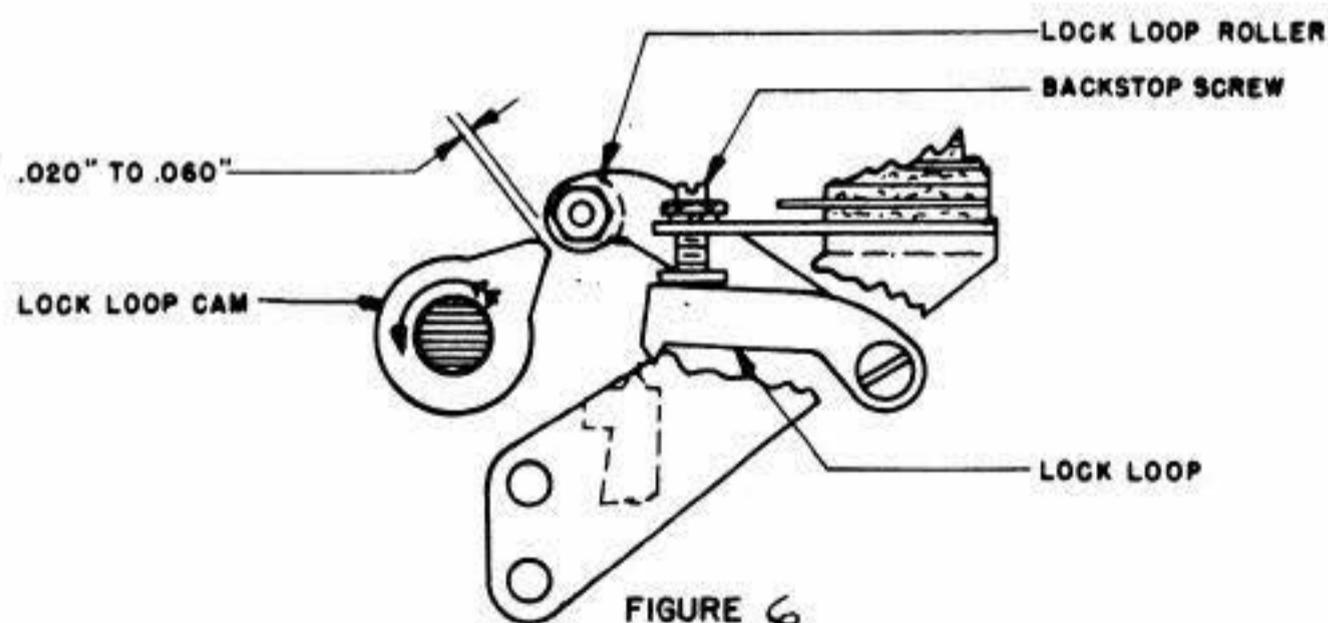
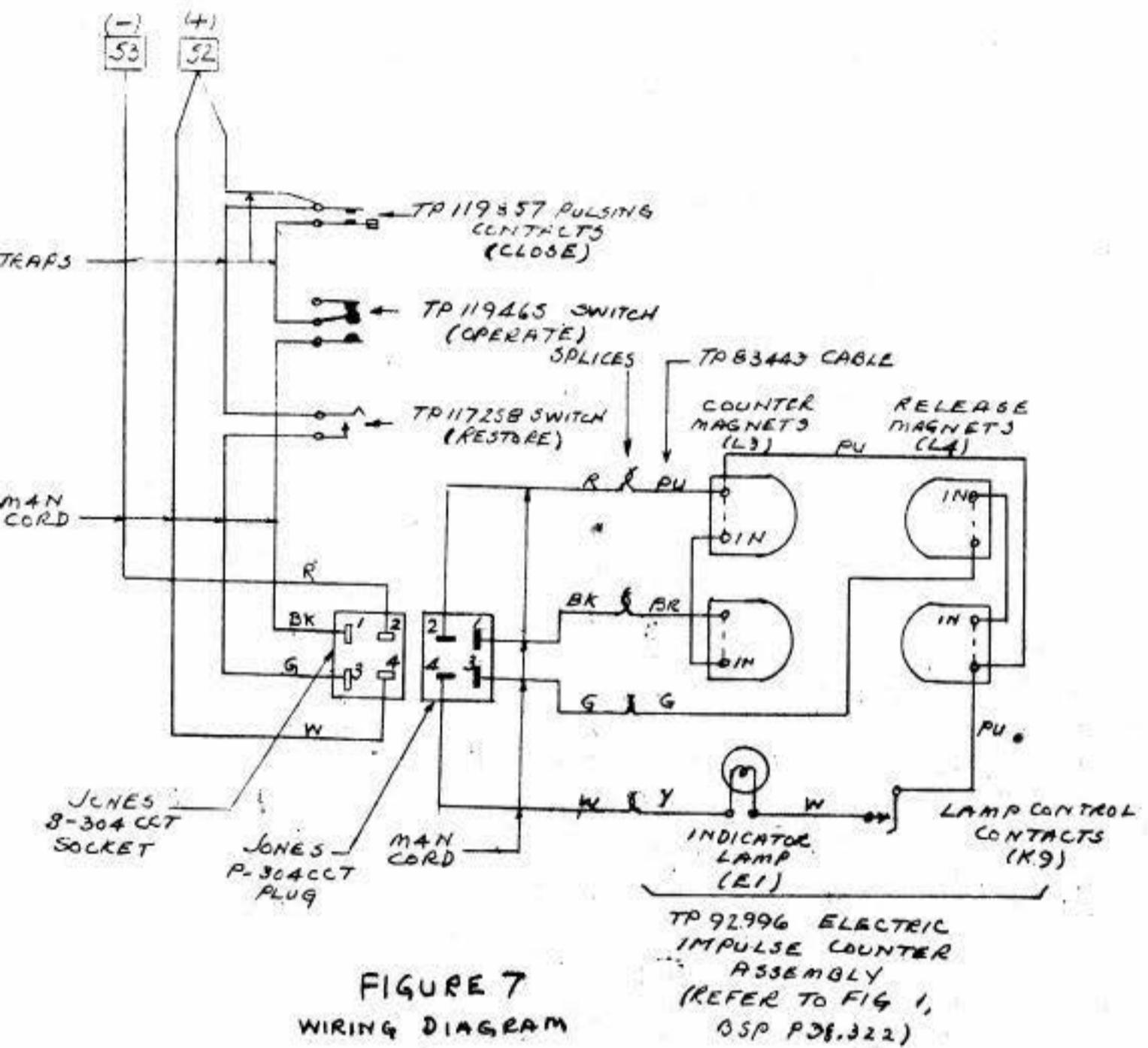


FIGURE 6



#10- $\frac{1}{2}$ " R.H.W. SCREWS  
FOR WOODEN TABLES  
TP 1245 SCREW, TP 2382  
WASHER, TP 34-A NUT FOR  
STEEL TABLES

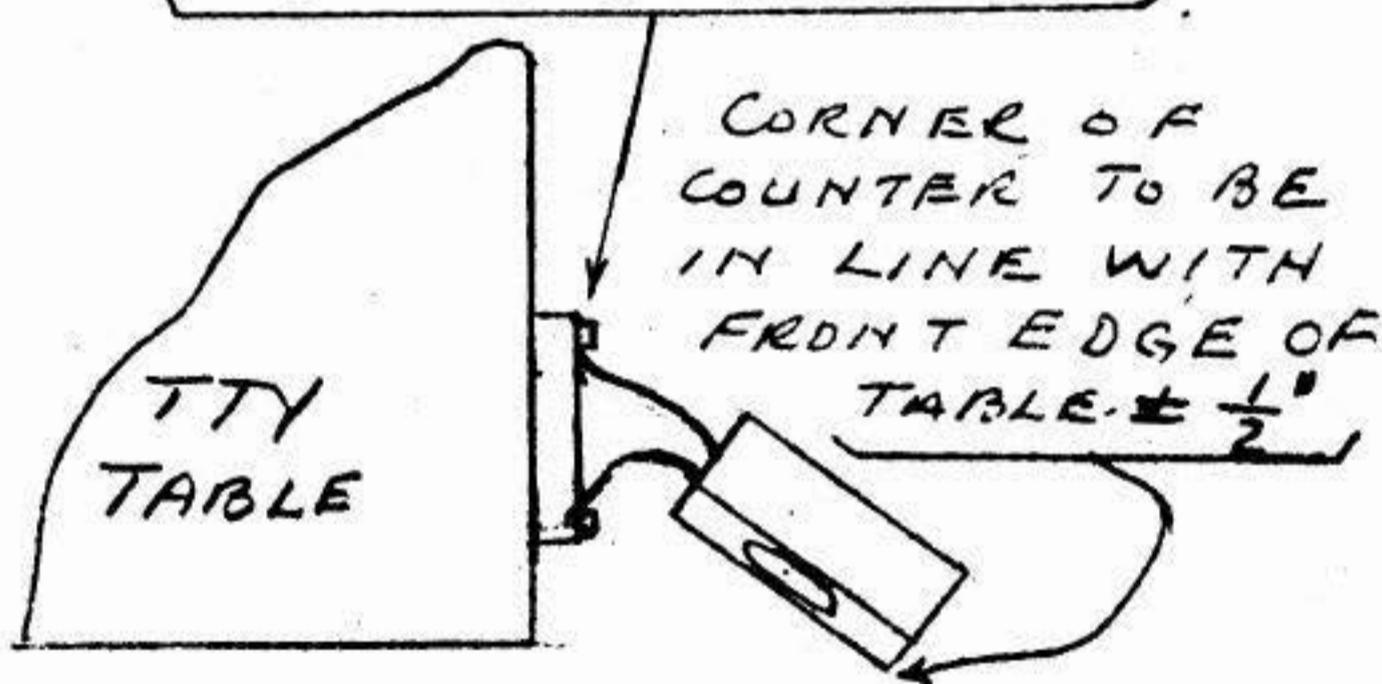


FIGURE 8  
MOUNTING OF  
IMPULSE COUNTER