INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

NO LOAD TAP CHANGER
TYPE WSB-4

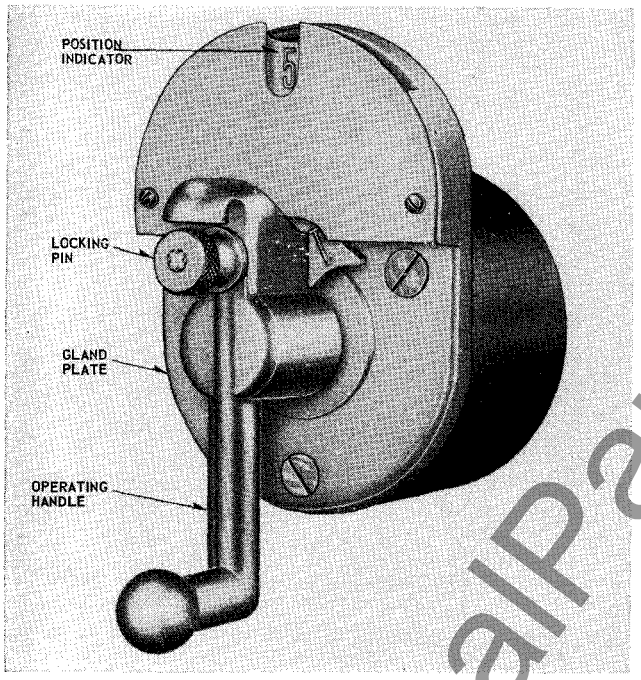

FIG. 1. Operating Mechanism and Position Indicator

THE TYPE WSB-4 TAP CHANGER provides an adequate and convenient method for changing transformer tap connections from outside the transformer case. The tap changer is mounted under oil in the transformer case and is intended for operation only when the transformer is disconnected from the line.

Important. No-load tap changers must not be operated with the transformer energized; the transformer must not be energized unless the tap changer is locked on an operating position (see transformer nameplate).

The Type WSB-4 Tap Changers are made in a variety of sizes and arrangements to meet voltage and current requirements. When more than one tap changer deck is operated from a single mechanism, the individual decks are mounted axially with a MICARTA® shaft passing through each deck. The stationary contacts, with provision on the opposite end for connecting the leads, are through type studs mounted in a thermoset plastic base, and are arranged on a radius equal to that of the moving contacts. Good connections are assured by silver plated wiping contact surfaces, and by either high pressure indentation or swaging of the stud onto the tap leads. See Fig. 2.

INSTALLATION

Tap changers are usually shipped mounted on the core and coil assembly and connected to the external operating mechanism. Hence, when shipment of the core and coil assembly is made separately from the tank and fittings, it is necessary to make the connection of the tap changer drive shaft to the external operating mechanism on assembly in the field.

Before pinning the shaft, when installing a new tap changer, it is essential that the position indicated by the external position indicator agree with the actual position of the tap changer contacts. See Figs. 1 and 4.

The position of the contacts is indicated on the internal operating mechanism. A match mark on the Geneva gear bracket lines up with the position number on the internal Geneva gear corresponding with the actual position of the contacts

Another match mark is located on the side of the bracket near the Geneva pinion on the centerline for the Geneva pinion shaft bearing. When this match mark is in line with a match mark on the Geneva pinion, the Geneva pinion is in the center of the locked on "On-Position" zone of the mechanism.

The external operating mechanism is connected to the tap changer drive shaft through a shaft and slip joint. This slip joint plus universal joints permit tank expansion and slight shaft misalignment without hindrance to operation. When a tap changer or external operating mechanism is installed in the field, a check of the slip joint for free operation should be made (see Fig. 4).

OPERATION

One tap change requires one complete revolution of the external operating handle which is connected to the shaft assembly for transfer into the transformer case through an oil-and-gastight stuffing gland. A position indicator is geared to the

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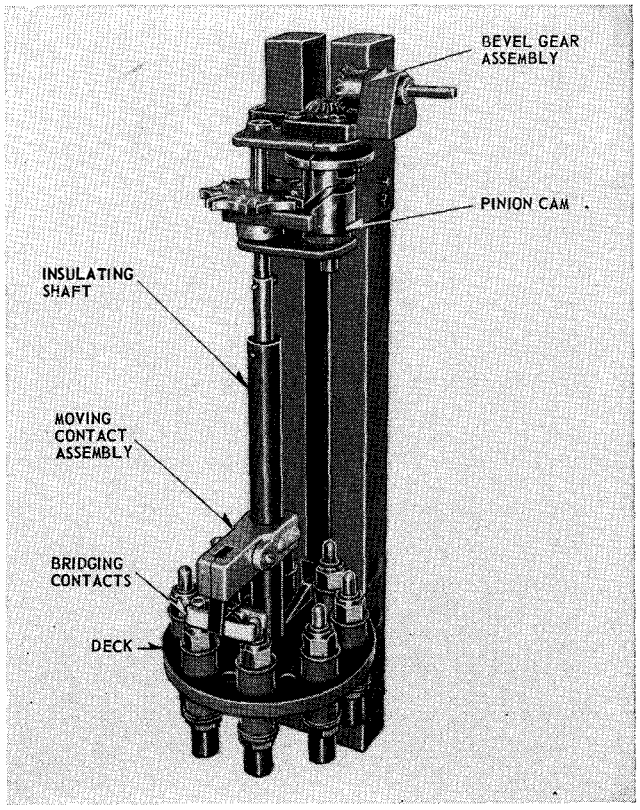

FIG. 2. Single Deck WSB-4 Tap Changer

operating handle and provision is made for locking the mechanism on each position by Geneva gears.

Motion of the tap changer operating handle is transmitted through the shaft assembly to the ninety degree Geneva gearing in the internal tap changer housing. This gearing provides the motion which lifts the moving contacts and rotates them to a new tap position. Cam action in the gearing maintains a closed circuit condition through forty-five degrees of rotation of the operating shaft, thus eliminating the need for extreme accuracy in pinning the handle to the operating shaft in cases of field assembly. A Geneva gear locking arrangement in the tap changer mechanism locks the MICARTA shaft against rotation, except when the contacts are lifted to change position.

Silver plated copper bridging contacts which move around the circle of fixed contacts provide a connection between any two adjacent contact points. The bridging contacts are spring loaded and supported from an overhead assembly. This assembly is attached to the micarta shaft which passes through the center of each deck.

The connection diagram of the five position WSB-4 tap changer is shown in Fig. 3. For this Tap Changer the studs are bolted to the molded deck. When less than the standard number of six taps and five positions are supplied, a stop is provided on the external operating mechanism to prevent operating the tap changer on unconnected positions.

An 8 stud 7 position tap changer deck is shown in Fig. 5. Here again, a stop prevents operations on other than the positions intended.

MAINTENANCE

The WSB-4 tap changer is designed to operate without maintenance; however, the moving and/or stationary contacts may be removed for replacement or repair in case of minor damage. Unit replacement is recommended in case of breakdown.

Replacement WSB-4 tap changers will be supplied with leads installed in the studs by high pressure indentation. This eliminates any need for brazing on the tap changer studs and also provides sufficient cables to compensate for that cable which is cut off in removing the old tap changer.

When a tap changer must be replaced, the leads should be cut off as close to the tap changer as conveniently possible to make available ample cable for splicing to the new tap changer.

It is desirable to make the brazed connection as far as possible from both the tap changer and the coil to prevent excessive heating of either the coil or the tap changer.

Refer to Installation on page 1 for further instructions.

RENEWAL PARTS

Order renewal parts from the nearest Westinghouse office. Include a complete description of the part wanted along with the data on the nameplate attached to the transformer tank wall.

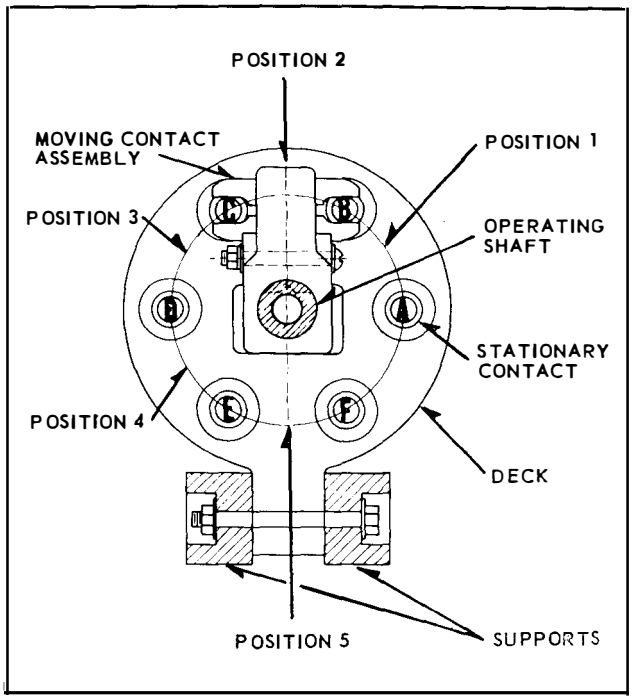

FIG. 3. Connection Diagram for WSB-4 Tap Changer with 6 Terminal Deck

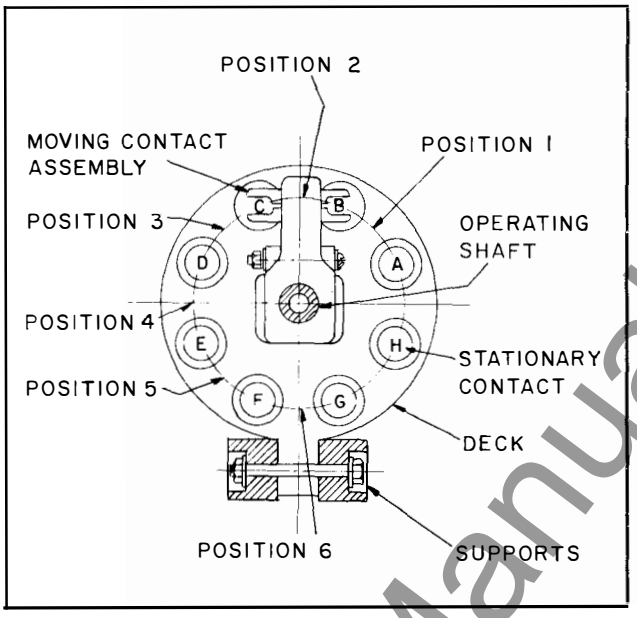

Fig. 4. Connection Diagram for WSB-4 Tap Changer with 8 Terminal Deck

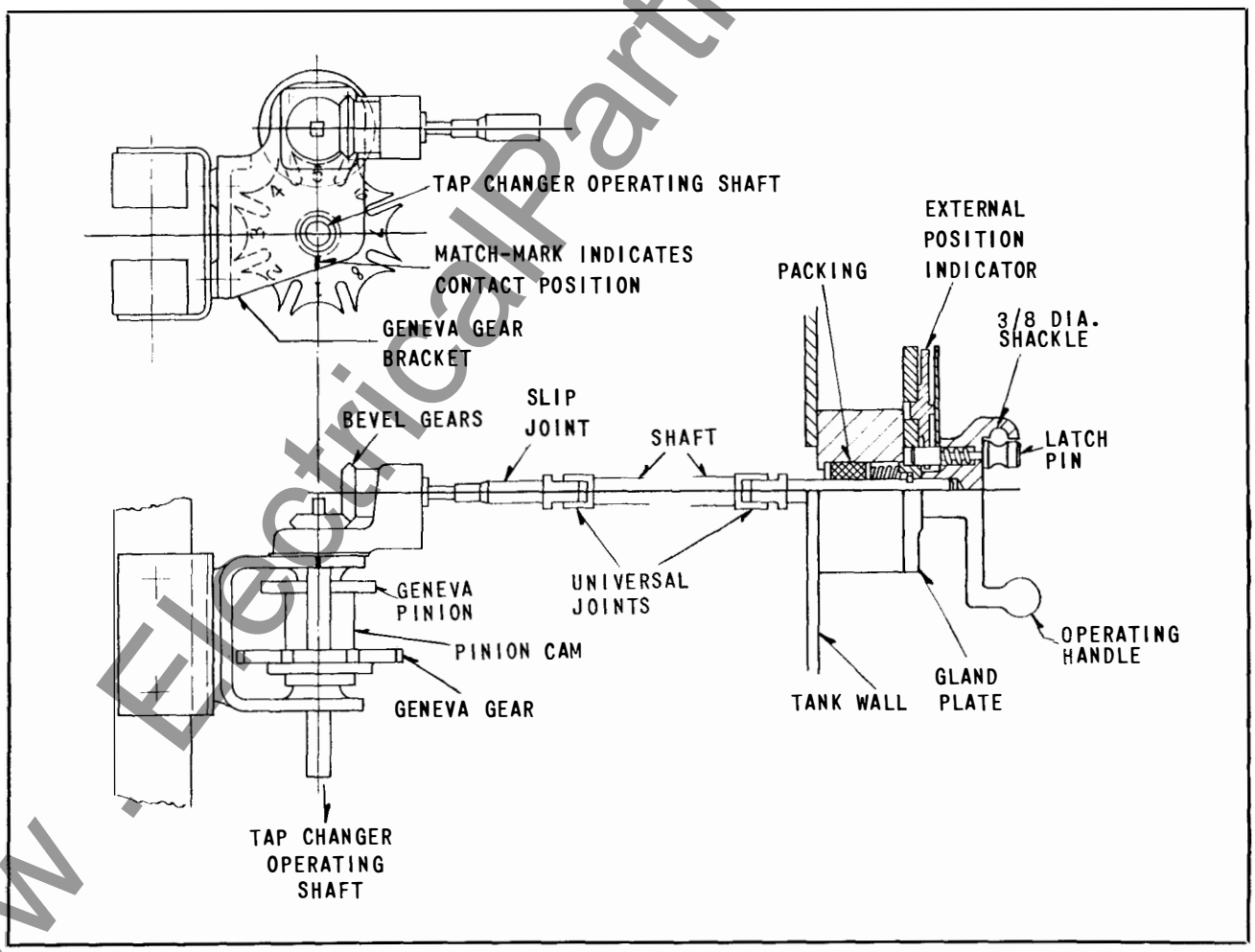

FIG. 5. Outline of Type WSB-4 No-Load Tap Changer Operating Mechanisms Mounted on Transformer (In Top View, Looking Down, Tap Changer is on Position One)

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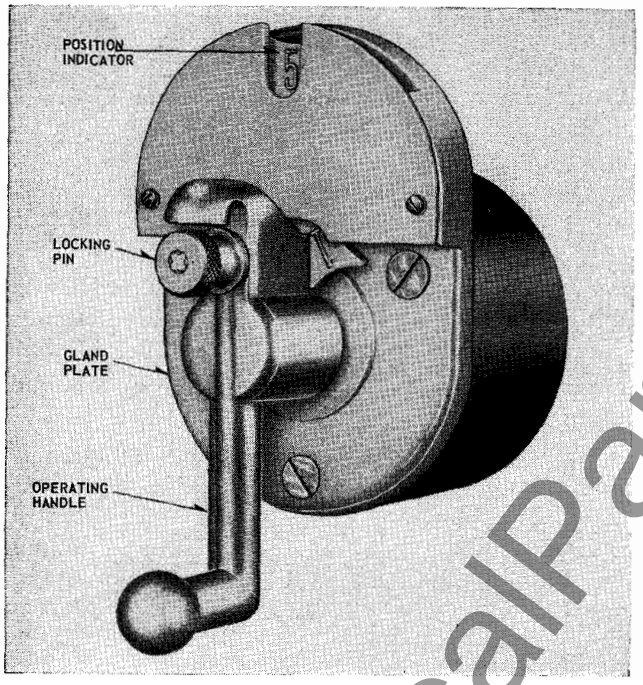

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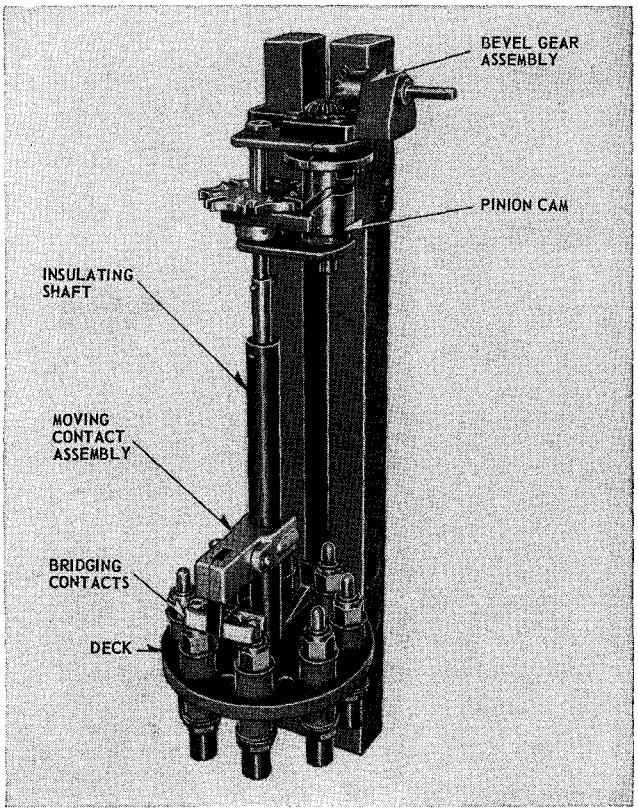

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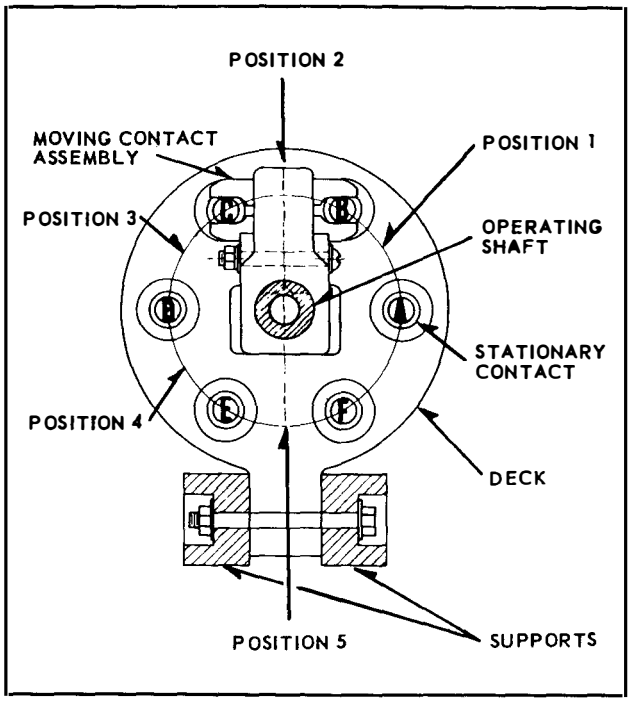

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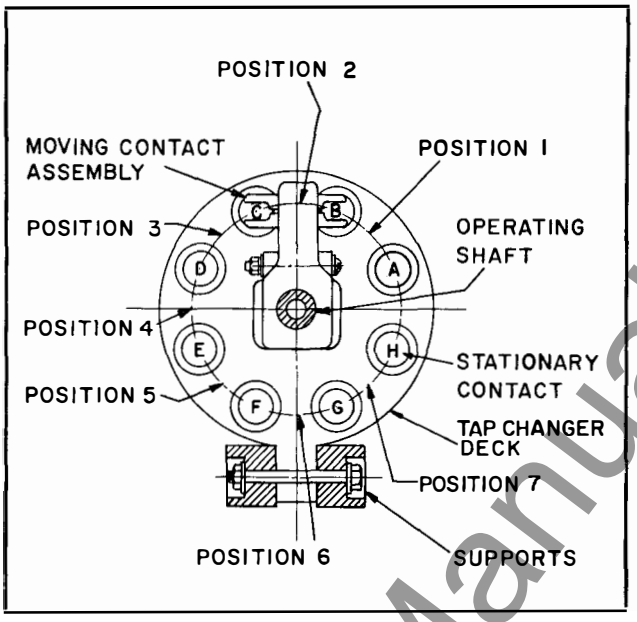
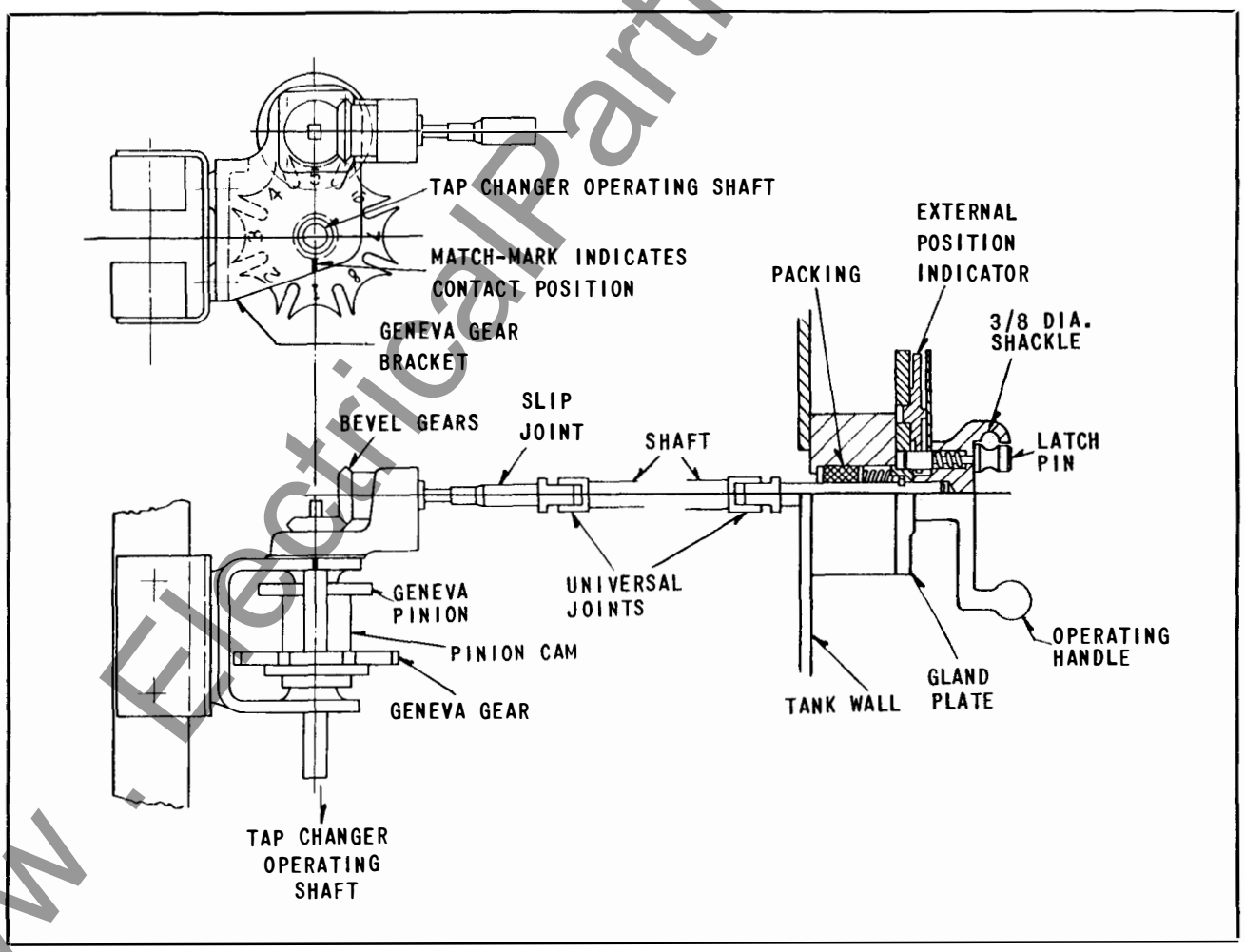


Fig. 4. Connection Diagram for WSB-4 Tap Changer with 8 Terminal Deck



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