MULTIPLE COLUMN SELECTOR

Description:

The Horizontal Sorter may be equipped with a Multiple Column Selection Device which has two distinct uses:

1. Multiple column selection will permit selecting from a file of cards those cards which are punched with a predetermined alphabetical, numerical or combination indication within any ten adjacent columns. In a single run, selected cards of the desired classification will fall in the "Reject" pocket while the remaining cards will be deposited in the "12" pocket of the sorting machine. The sequence of the unselected cards will not be disturbed.

By means of this device it is possible to select all the cards for a specified branch, agent, product, date, part number, or other class of data.

2. Zero elimination permits greater speed in the completion of either alphabetical or numerical sorting operations, through the automatic rejection of cards which require no further sorting.

The unit is mounted under the feed hopper and consists of the following: Ten switches controlling ten positions of selection, one switch to control "0" elimination, two switches for operating control, a ten-position demountable brush assembly, transfer unit, plugboard, selecting commutator, four commutators, two resistances and three additional relays.

One to ten columns inclusive may be handled for either selection or "0" elimination.

Plugboard Arrangement Fig. 1

There are three different groups of plughubs on the plug board.

Group 1—Consists of 10 double hubs, under a general heading "Brushes," marked "Zone Punching." These hubs represent brush positions and are plugged for the 0, 11, and 12 for alphabetic selection.

Group 2—Consists of 10 double hubs, under the same general heading "Brushes," marked "Lower Punching." They represent the brush positions and are plugged for 9 through 12 for numeric selection and 9 through 1 for alphabetic selection.

Group 3—Consists of 12 single hubs marked 9-12 and are called "Selector" hubs. These hubs represent the 12 positions on the card. One single hub designated S C is the Sorting Common hub which is used for sorting or counting common information from more than one column.

(1) Multiple Column Selection of Numeric Punching
Sort Selection Switch—Select
Zero Elimination Switch—Sort
Brush Selection for Sorting Switches—Select

Plug from hubs marked "Lower Punching" to hubs marked "Selector," corresponding to numerical figures being selected. In brush positions being used, insert a two-way plug from the lower row of hubs marked "Zone Punching" to the upper row of hubs marked "Lower Punching" as designated by heading "Common for Numeric."

(2) Multiple Column Selection of Alphabetical Punching
Sort Select Switch—Select
Zero Elimination Switch—Sort
Brush Selection for Sorting Switches—Select

Plug from hubs marked "Lower Punching" to hubs marked "Selector" for numeric part of alphabet character. Plug from hubs marked "Zone Punching" to hubs marked "Selector" for Zone part of alphabet character.

(3) Zero Elimination
Sort Select Switch—Sort
Zero Elimination Switch—"0" Elimination
Brush Selection for Sorting—
"Sort" in position corresponding to units position of field being sorted.

In the same field, column positions to the left of the units position should be plugged from hubs marked "Lower Punching" to "zero" hub of "Selector" plughubs. It will be necessary to common these columns by plugging from the upper row of "Zone Punching" hubs to the lower row of "Lower Punching" hubs.

At the end of each sort, it will be necessary to turn the "Brush Selection for Sorting Switch" for the next column to its "Sort" position. For example, after sorting the units position it will be necessary to turn the tens position switch "Sort" etc.

(4) The sorting common plugboard hub was provided to permit sorting on any of the brushes with the brush selection for sorting switches set to the select side in order to select a common digit from one or a multiple number of columns. A typical problem would be to sort out a multiple number of columns in which a 5 may be perforated.

CIRCUIT DESCRIPTION

Multiple Column Selection

The following description illustrates the manner in which the machine performs when selecting a card perforated with the two digit number 54 from a file of cards.

First card punched 53. The following circuits are effective. At 5 brush reading time, a circuit is complete from main line fuse, main line switch, to one side of start key contact, commutator No. 2, to one side of MCS commutator No. 1, zero elimination switch, contact roll common brush, contact roll, selection brush No. 2, one leg of selection switch set to select, closed side of transfer points, plugboard, plugwire, No. 5 hub of selection, No. 5 brush, No. 5 sector of selection commutator, common brush feeding individual sectors, MCS No. 1 relay coil, MCS R No. 1, 1 a fuse, main line switch to main line fuse. Energizing MCS No. 1 will complete the following holding circuit which is effective for the entire reading portion of the card under control of MCS commutator No. 2. From the main line fuse, main line switch, to one side of start key contact, No. 2 MCS commutator, gooseneck of the brush relay, gooseneck of MCS relay No. 2, normal open points of MCS relay No. 1, coil of MCS relay No. 1, MCS-R No. 1, 1 a fuse, main line switch to main line fuse. At three time the following circuit is complete: From main line fuse, main line switch, to one side of start key contact, No. 2 MCS commutator, one side of No. 1 MCS commutator, zero elimination switch, contact roll common brush, contact roll, No. 1 select brush, select side of No. 1 select switch, normal closed side of No. 1 transfer contact, plugboard, plugwire to No. 4 selection plughub, commutator selection brush No. 4, selection commutator which at this time is not making on a sector but connects this selection brush with the common selection commutator brush No. 13 which completes a circuit to MCS relay coils No. 2 and 3, MCS R No. 2, 1 a fuse, main line switch to main line fuse. A similar holding circuit is effective for MCS relay coils No. 2 and 3 as for MCS relay coil No. 1.

The effect of energizing MCS relay No. 1 for a 5 reading which is a selected figure in this example was to transfer the No. 1 relay points and disconnect a circuit to the No. 3 and 4 MCS commutator. However, since this card was likewise punched with a 3 which is not a selected figure in the example, the energization of MCS relays No. 2 and 3 completes the following circuit to the brush relay and sorting magnets so as to sort the card not selected into the 12 pocket. From main line fuse, main line switch, one side of start key contact, MCS commutator No. 2, gooseneck of brush relay, gooseneck of MCS relay No. 2, armature of MCS relay No. 2, MCS commutator No. 3, MCS commutator No. 4, brush relay coil, resistance, sort magnets, 1 a fuse, main line switch to main line fuse. From the above it is obvious that any card perforated with one or more columns in disagreement with the selected digits plugged will cause MCS relays No. 2 and 3 to pick up and cause this card to sort into the twelve pocket.

A card punched 54 in passing through the machine would have completed a circuit to MCS relay coil No. 1 twice, once for the five perforation and once for the four perforation as the brush readings on the selecting commutator agreed with the digits plugged. When such agreement occurs, no circuit to MCS relays No. 2 and 3 will be effective and since MCS relay points No. 1 are transferred, the brush relay and sorting magnets are not energized; consequently, the card will be deposited into the reject pocket.

Groups of numbers may also be selected within certain limitations. All cards between 1 and 9, 10 and 99, 100 and 999, etc., may be selected with one passage of the cards. It is not possible to select between two numbers such as 256 to 375, as the controlling digit is always the column to the left of the digit of the highest order. When selecting all cards between 1 and 9 the controlling digit would be the tens position; for selecting all cards from 10 to 99 the controlling digit is the hundreds position, etc.

ZERO ELIMINATION

Zero elimination may be accomplished in conjunction with standard sorting operations. The object of zero elimination is to enable an operator to start a tabulation prior to the completion of a sort. Set switches as illustrated under Plugging and Switch Set-up No. 3. Example: Zero elimination on a four digit number.

The first sort would be on the units column. Cards punched 1 to 9 inclusive in the units position will sort in the 1 to 9 pockets. The following circuit will result: From main line fuse, main line switch, one side of start key contact, MCS commutator No. 2, MCS commutator No. 1, contact roll common brush, contact roll, select brush No. 1, brush selection for sorting switches No. 1 set to sort, brush selection sorting switches No. 2, 3 and 4 set to select, standard commutator segment brush, segment, commutator common brush, sort select switch No. 2-R, brush relay coil, resistances, sorting magnets, 1 a fuse, main line switch to main line fuse.

Zero elimination has little or no function on the first sort, as the only possible elimination on this sort on this example would be if the card were punched with four zeros. This card would reject as MCS commutator No. 1 breaks between 1 and 0, thereby rendering the contact roll inoperative for 0, 11 and 12 sensings. Had a zero been punched in the units position and a significant digit been punched in any one of the other three columns, this card would sort in the zero pocket. The circuit is as follows: From main line fuse, main line switch, one side of start key contact, MCS commutator No. 2, MCS commutator No. 1, contact roll brush common, contact roll, select brush, brush selection for sorting switch set to select in any of the three columns where a significant digit appears, transfer points closed side, plugboard, plugwire to "0" selection hub, selection commutator, brush 13, MCS relay coils No. 2 and 3, MCS R No. 2, 1 a fuse, main line switch to main line fuse.

Energizing MCS No. 2 relay will establish a holding circuit for relay coils MCS No. 2 and 3 through MCS commutator No. 2 as previously described under multiple column selection.

Energizing MCS relay No. 3 will close its points which are wired to shunt around MCS commutator No. 1, which will render the contact roll operative to sort on 0. Therefore, a card perforated 0600 would be sorted in the zero pocket.

Sorting on the tens columns will cause cards punched 0001, 0002 to 0009 inclusive to reject and enable an operator to remove these cards to start a tabulation.

Sorting on the hundreds column will cause cards punched 0010, 0011 to 0099 inclusive to reject, thereby permitting continuous flow of cards to the tabulator prior to the completion of the sorting operation.

For each column sorted the brush selection for sorting switch must be thrown from the select side to the sort side, thereby disconnecting the switch of the lower order.

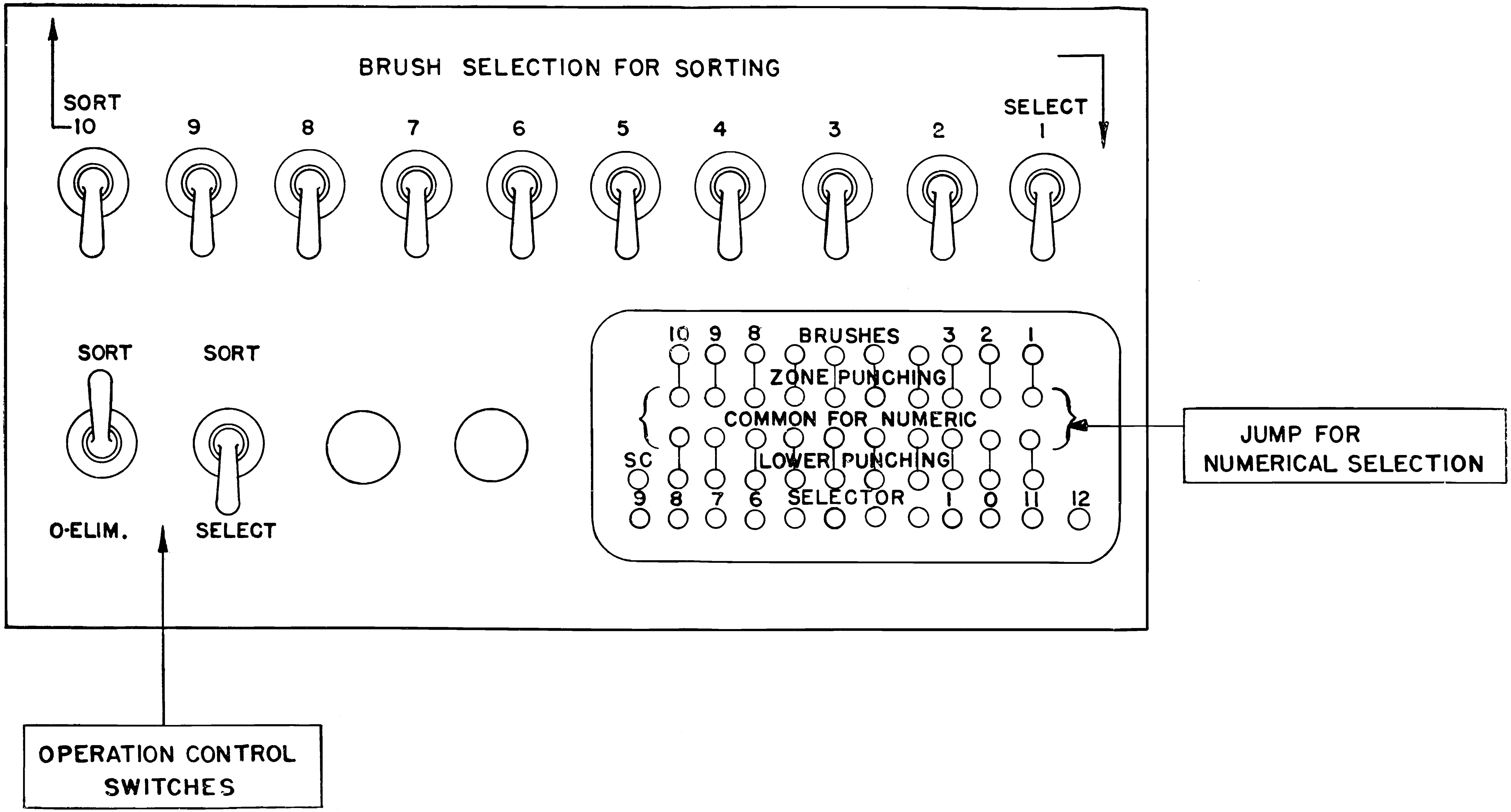
ALPHABETICAL MULTIPLE COLUMN SELECTION

Selection of alphabetical characters is accomplished in the same manner as for numerical selection. A mechanical cam actuated set of 10 transfer points is provided to separate the numerical zone punchings from the alphabetical zone punchings.

It is apparent from the description of numerical selection that as long as the punchings agreed with the selection hubs plugged in each of the respective columns that only MCS relay No. 1 was energized and the circuit to commutator No. 4 was broken so that the cards were rejected. A difference in punching in any one of the columns selected energized MCS relays No. 2 and 3, which in turn completed a circuit to MCS commutators No. 3 and 4 which energized the sorting magnet at 12 and caused these cards to be separated from the remainder of the group.

The circuits for alphabetic multiple column selection are identical to those for numerical, the only difference being that alphabetical selection each column is sensed twice for agreement.

FIG. I


BRUSH SELECTION FOR SORTING
SORT
SELECT
10
9
8
7
6
5
4
3
2
1
SORT
O-ELIM.
SORT
SELECT
BRUSHES
ZONE PUNCHING
COMMON FOR NUMERIC
LOWER PUNCHING
SC
SELECTOR
9
8
7
6
1
0
11
12
JUMP FOR NUMERICAL SELECTION
OPERATION CONTROL SWITCHES

SELECTING COMMUTATOR

FIG. 2

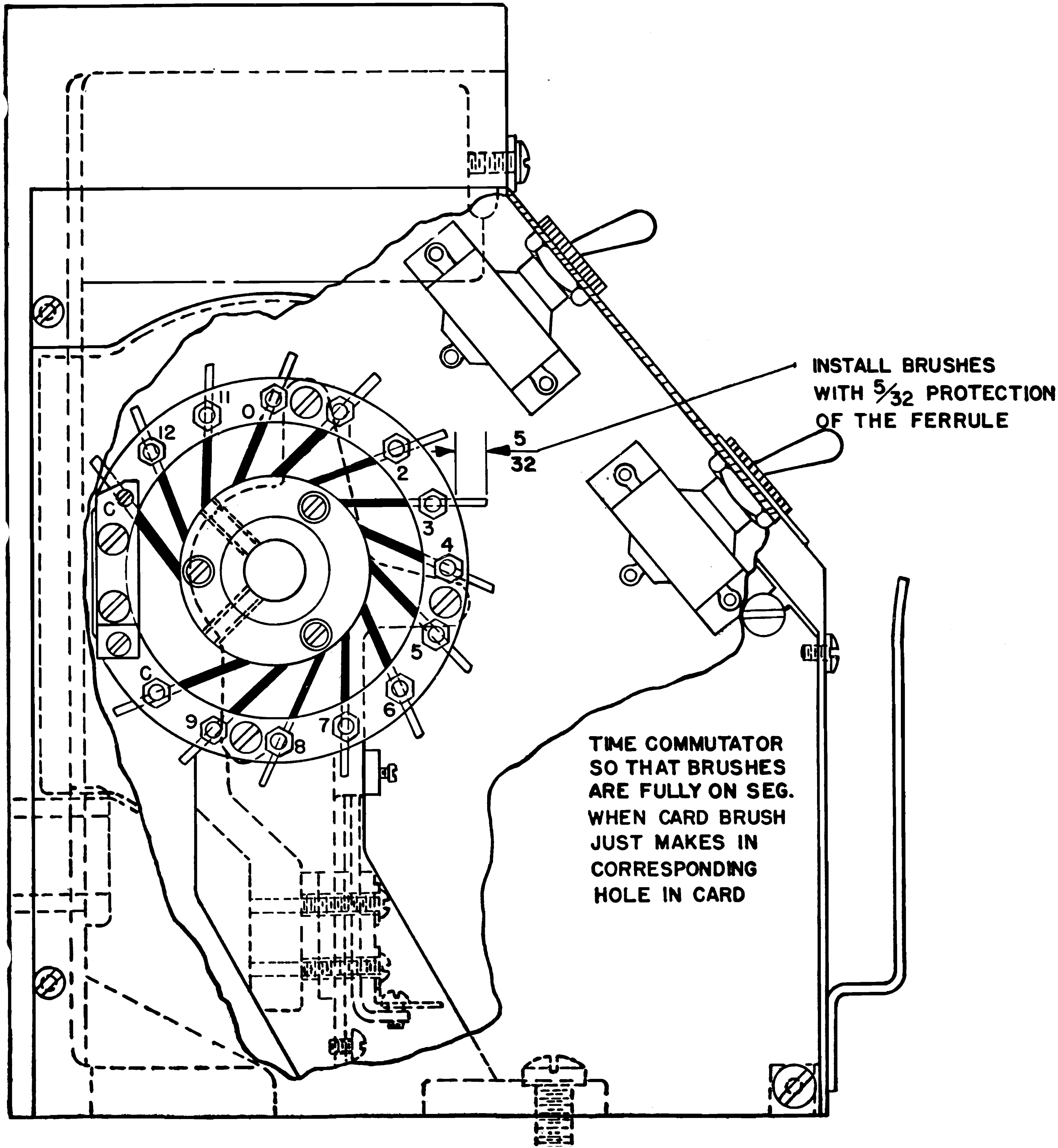
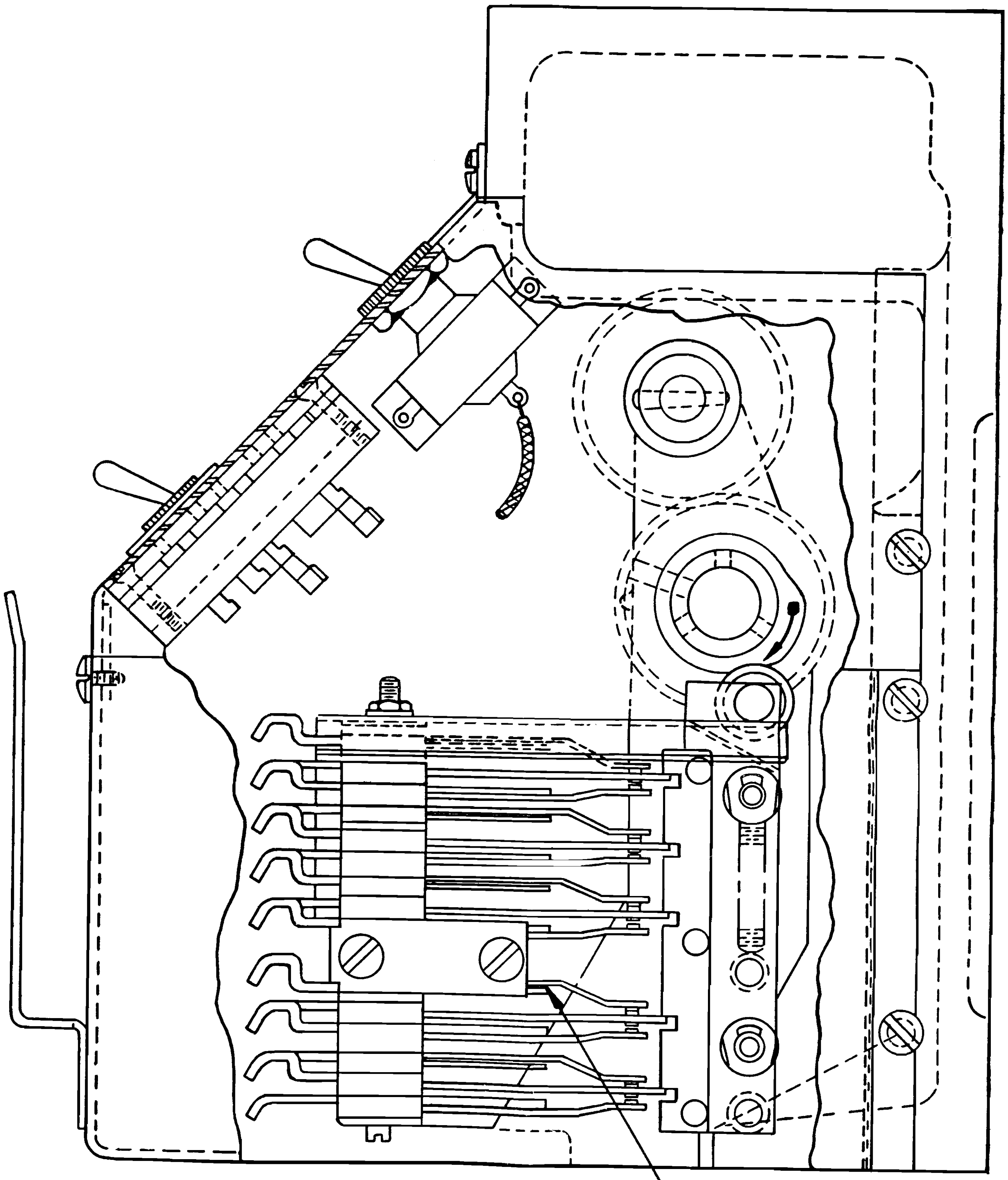


FIG. 3



WITH ROLLER ON LOW DWELL OF CAM ADJUST LOWER STRAPS FOR .030 CLEARANCE BETWEEN LOWER POINTS WHEN CENTER STRAP RESTS IN TOP OF SLOT IN OPERATING PLATE.

WITH ROLLER ON HIGH PORTION OF CAM ADJUST UPPER STRAPS FOR .030 CLEARANCE BETWEEN UPPER POINTS.

CENTER STRAP TO HAVE SUFFICIENT TENSION TO RAISE NORMAL CLOSED SIDE OFF BRASS SUPPORT .010

FIG:4

RES.	110 V	220 V
M.C.R. #1	1300 Ω	3000 Ω
M.C.R. #2	1000 Ω	2000 Ω