

MACHINE METHODS OF ACCOUNTING

THE INTERNATIONAL AUTOMATIC CARRIAGE

(Type 921)

THE International Automatic Carriage is one of the most important recent developments in the Electric Accounting Machine Method. Its primary purpose is to facilitate the preparation of documentary records on continuous forms. Invoices, bills, premium notices, checks, remittance statements, and many other similar accounting records are produced automatically on a machine equipped with this type of carriage.

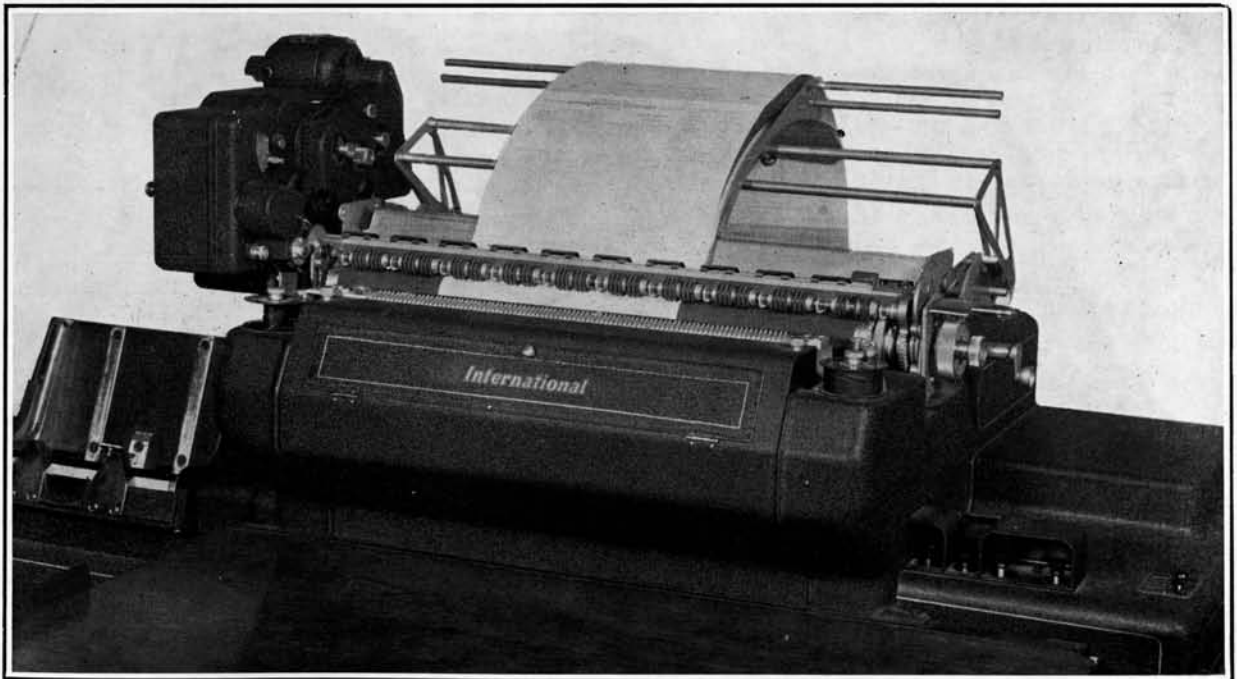
The International Automatic Carriage is a special motor-driven carriage which may be attached to the Numerical or the Alphabetic Electric Accounting Machines. It performs the functions of a standard carriage and in addition provides for the following automatic functions:

1. Single Item Ejection, or the spacing—other than single, double, or triple—of paper or continuous forms between listed items.

2. Form-to-Form Ejection, or the automatic ejection from a predetermined last printing line of one form to the first printing line of the following form. The carriage may also be set so that the ejection from one form to another may take place when a control change occurs before the last printing line. In such a case, the ejection is to the first line to be printed on the succeeding sheet.

3. Predetermined Total Skip, or the printing of a total in a predetermined position on each form, regardless of the number of previously printed items.

4. Automatic Ejection with Head Spacing, which is a feature of the Automatic Carriages on Alphabetic Accounting Machines only. This operation permits the automatic preparation of complete bills—printing the heading in its prop-



er location, spacing automatically to the body, printing the body, and then automatically ejecting this bill and bringing the next one into the desired position. This operation is illustrated in the next section.

Two models of the Automatic Carriage, both identical in function and operation, are available. They differ only in their respective sheet-length capacities and ejection speeds. These models are:

Model 12: This carriage will eject a form from $\frac{1}{2}$ inch to 12 inches in length.

Model 18: This carriage will eject a form from $\frac{1}{2}$ inch to 18 inches in length.

Both models will accommodate a sheet of paper up to 20 inches in width.

Continuous forms are best adapted to the Automatic Carriage, although single sheets may be used. When single sheets are used, they must be inserted manually. All continuous form lengths must be in multiples of $\frac{1}{6}$ of an inch.

The Model 12 Carriage is equipped with short-feeding and medium-feeding speeds. The short-feeding speed may be used on forms up to and including $3\frac{2}{3}$ inches in length. The medium speed is used for forms beyond that length.

The Model 18 Carriage is also equipped with two feeding speeds which are supplied in either of two combinations; short and long, or medium and long. If the short—long-feeding combination is provided, short-feeding speed may be used for forms up to and including $3\frac{2}{3}$ inches in length and long-feeding speed for forms beyond that length. If the medium—long combination is provided, medium-feeding speed may be used for forms up to and including $8\frac{1}{2}$ inches in length and long-feeding speed for forms beyond that length.

The approximate number of ejections a minute on the various feed speeds is:

Short—105
Medium— $52\frac{1}{2}$
Long— $26\frac{1}{4}$

The line spacing is standard. There are six spaces to the inch, with a selection of:

Single line space of $\frac{1}{6}$ of an inch.
Double line space of $\frac{1}{3}$ of an inch.
Triple line space of $\frac{1}{2}$ of an inch.

All line spacing is accomplished at an approximate speed of 265 operations a minute.

SPECIMEN MANUFACTURING COMPANY					
DEDUCTION REGISTER					
DEPT.	CLOCK NO.	NATURE	KIND	WHEN	DEDUCTIONS
14	265	2	1	5	100
26	300	2	1	5	25
1	320	2	1	5	50
1	355	2	1	5	50
14	380	2	1	5	100
1	415	2	1	5	50
1	430	2	1	5	25
4	445	2	1	5	50
14	470	2	1	5	25
14	475	2	1	5	25
2	480	2	1	5	25
26	490	2	1	5	100
2	525	2	1	5	50
2	530	2	1	5	50
16	545	2	1	5	100
12	590	2	1	5	25
28	640	2	1	5	25
26	650	2	1	5	25
14	680	2	1	5	100
2	695	2	1	5	25
2	725	2	1	5	25
SPECIMEN MANUFACTURING COMPANY,					
DEDUCTION REGISTER					
DEPT.	CLOCK NO.	NATURE	KIND	WHEN	DEDUCTIONS
1	730	2	1	5	50
12	740	2	1	5	25
23	760	2	1	5	100
3	775	2	1	5	25
					2350*
SPECIMEN MANUFACTURING COMPANY					
DEDUCTION REGISTER					
DEPT.	CLOCK NO.	NATURE	KIND	WHEN	DEDUCTIONS
14	15	5	9	3	500
12	130	5	9	3	500
12	215	5	9	3	500
14	265	5	9	3	500
14	380	5	9	3	500
2	435	5	9	3	500
16	500	5	9	3	500
3	620	5	9	3	1000
2	725	5	9	3	1000
					5500*

Simplicity of Operation

Form-to-Form Ejection

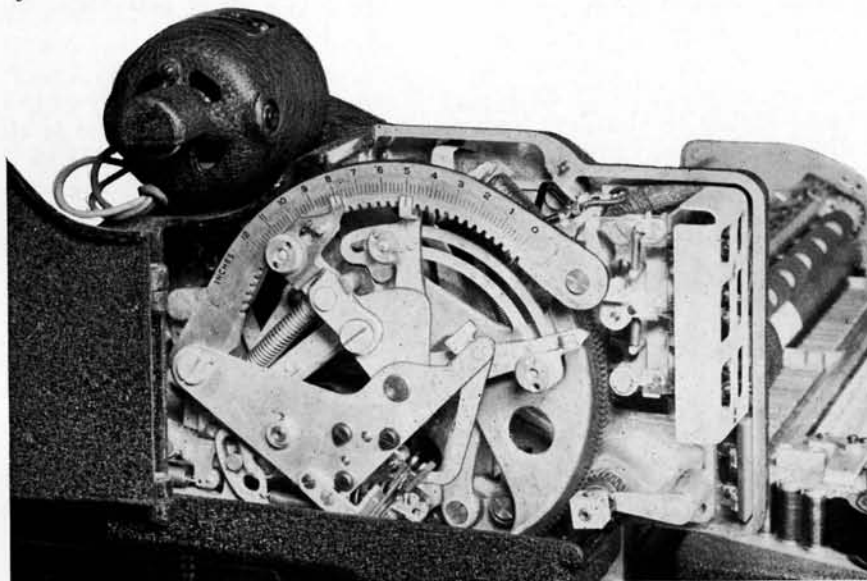
This operation is similar to the preparation of reports on individual sheets. The insertion of sheets after the first in this application is eliminated because continuous forms are used. The spacing between forms is performed automatically.

The report illustrated is a Deduction Register. Any operation that requires several sheets, such as Payroll Listings, Voucher Registers, or Sales Register and Proof Sheets would be applicable.

Settings

1. Turn the Eject Clutch Button to the right

- (clockwise). Push the Manual Clutch Trip Lever to engage the ejection clutch.
2. Set the Sheet Length Arm for the overall length of the sheet (8 inches). Close door and press the manual eject lever.
3. Set the Sheet Stop Arm for the last printing line, measured from the first printing line (5 inches).
4. Set the Heading Stop Arm as far forward as possible, as it is not used.
5. Medium Speed must be engaged for this size form. Rotate the Interlocking Knob to *Medium* and pull the Medium Gear Shift Button OUT, turning the Motor Knob if necessary to mesh the gears.



Control Arm Settings

OFF ↑ Single Item Eject ON	OFF ↑ Major Eject ON	OFF ↑ Intermediate Eject ON	OFF ↓ Minor Eject ON	LONG ↑ Single Item Eject SHORT	OFF Auto Start From Carriage ↓ ON	OFF Carriage Motor ↓ ON
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Automatic Carriage Switch Settings on the Numerical Accounting Machine

ON Predeter. Total ↓ OFF	ON Heading Error ↓ OFF	LIST ↑ Automatic Carriage TAB	ON Major Eject ↓ OFF	ON Intermediate Eject ↓ OFF	ON ↑ Minor Eject OFF	ON Single Item Eject ↓ OFF	SHORT Single Item Eject ↓ LONG	ON Heading Control ↓ OFF	ON Single Sheet Stop ↓ OFF
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Automatic Carriage Switch Settings on the Alphabetic Accounting Machine

Billing

Arranging the Automatic Carriage for a Billing Application on an Alphabetic Accounting Machine is a simple procedure.

For this operation, it is necessary only to insert the first bill to the first line of printing in the heading, and if the settings described below are made, all printing and spacing will take place automatically.

The plugboard wiring is standard except for Head Space and Head Card.

For normal operation all heading cards should have a common X punching in some column not X punched on the detail cards. When this column is wired from the Add Brushes to the Head Card hub, a circuit is set up which eliminates all control test and group indication circuits, places the eject class of control under control of the Heading Error Switch, and causes the Accounting Machine to list the first body card.

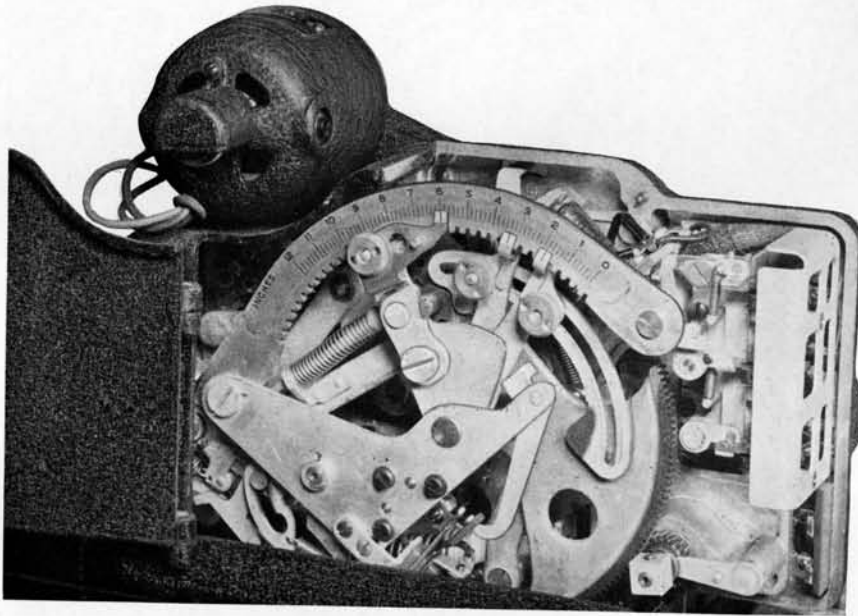
In order to set up spacing to the first body line, the last heading card must contain an X punch in some column other than that used for

the common X punching. When this column is wired from the Add Brush to the Head Space hub, a circuit is set up which not only causes spacing to the Heading Stop Arm but also sets up group indication for the following card feed cycles.

For this illustration, the cards are listed with Minor Control on Customer Number.

Settings

1. Turn the Eject Clutch Button to the right (clockwise). By pushing the Manual Clutch Trip Lever, the ejection clutch will be engaged.
2. Set the Sheet Length Arm for the overall length of the sheet (6 inches).
3. Close door and press the manual eject lever.
4. Set the Sheet Stop Arm for the last printing line of the body of the bill. The actual setting on the scale is the distance from the first heading line to the last body line printing ($3\frac{1}{2}$ inches).



Control Arm Settings

ON ↑	ON ↑	LIST ↑	ON	ON	ON ↑	ON	SHORT	ON ↑	ON
Predefe. Total	Heading Error	Automatic Carriage	Major Eject	Intermediate Eject	Minor Eject	Single Item Eject	Single Item Eject	Heading Control	Single Sheet Stop
OFF	OFF	TAB	↓ OFF	↓ OFF	OFF	↓ OFF	↓ LONG	OFF	↓ OFF

Automatic Carriage Switch Settings on the Alphabetic Accounting Machine

REPRESENTATIVE COMPANY				FOR CUSTOMER'S USE ONLY	
ANY CITY, STATE				Register No.	Vendor No.
CARRON COPIES		INVOICE NUMBER		Times Appraised	Price Appraised
1. Shipping Dept. 2. Sales Dept. 3. Salesman		4. Original Bill of Lading 5. Shipping Order 6. Bill of Lading Memo		F. O. B. Checked	Collection Checked
CUSTOMER'S ORDER NO.		ORDER DATE	HOW SHIPPED	Invoice DATE	
2084A		10 18 37	EXP	10 22 37	
SOLD TO ECONOMY AUTO SUPPLY CO 1434 SPRINGFIELD AVE SUMMIT N J					
QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT	
20	GL	PENNSOWN MOTOR OIL	58	1160	
8	EA	GOODTOWN CORDS 525 X 19	1030	8240	
2	EA	GOODTOWN CORDS 600 X 21	1426	2852	
2	EA	GOODTOWN CORDS 700 X 15	1850	3700	
4	DZ	TOW ROPES 12 FT	310	1240	
1	DZ	TOW CABLES	505	505	
10	BT	RUBBER CEMENT	5	50	
8	PT	DU TUCH ENAMEL	54	432	
				18179*	

REPRESENTATIVE COMPANY				FOR CUSTOMER'S USE ONLY	
ANY CITY, STATE				Register No.	Vendor No.
CARRON COPIES		INVOICE NUMBER		Times Appraised	Price Appraised
1. Shipping Dept. 2. Sales Dept. 3. Salesman		4. Original Bill of Lading 5. Shipping Order 6. Bill of Lading Memo		F. O. B. Checked	Collection Checked
CUSTOMER'S ORDER NO.		ORDER DATE	HOW SHIPPED	Invoice DATE	
91905X		10 19 37	FRT	10 22 37	
SOLD TO MR H E SMART SMARTS AUTO SERVICE 122A E 24 ST NEW YORK N Y					
QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT	
20	GL	PENNSOWN MOTOR OIL	58	1160	
8	EA	GOODTOWN CORDS 525 X 19	1030	8240	
2	EA	GOODTOWN CORDS 700 X 15	1850	3700	
4	DZ	TOW ROPES 12 FT	310	1240	
1	DZ	TOW CABLES	505	505	
8	PT	DU TUCH ENAMEL	54	432	
1	EA	PAINT SPRAY GUN	41	41	
25	EA	PAINT BRUSHES	15	375	
5	QT	FINECOTE ENAMEL	119	595	
8	PT	FABRO FABRIC FIXER	29	232	
				18584*	

REPRESENTATIVE COMPANY				FOR CUSTOMER'S USE ONLY	
ANY CITY, STATE				Register No.	Vendor No.
CARRON COPIES		INVOICE NUMBER		Times Appraised	Price Appraised
1. Shipping Dept. 2. Sales Dept. 3. Salesman		4. Original Bill of Lading 5. Shipping Order 6. Bill of Lading Memo		F. O. B. Checked	Collection Checked
CUSTOMER'S ORDER NO.		ORDER DATE	HOW SHIPPED	Invoice DATE	
SOLD TO					
QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT	
48	EA	WHISK BROOMS	15	720	
12	EA	SPOKE BRUSHES	12	144	
10	DZ	SPARK PLUGS	120	1200	
				18584*	

REPRESENTATIVE COMPANY				FOR CUSTOMER'S USE ONLY	
ANY CITY, STATE				Register No.	Vendor No.
CARRON COPIES		INVOICE NUMBER		Times Appraised	Price Appraised
1. Shipping Dept. 2. Sales Dept. 3. Salesman		4. Original Bill of Lading 5. Shipping Order 6. Bill of Lading Memo		F. O. B. Checked	Collection Checked
CUSTOMER'S ORDER NO.		ORDER DATE	HOW SHIPPED	Invoice DATE	
463E0		10 18 37	PP	10 22 37	
SOLD TO REGULAR AUTO STORE 1624 N STATE ST CHICAGO ILL					
QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT	
1	EA	PAINT SPRAY GUN	41	41	
25	EA	PAINT BRUSHES	15	375	
5	QT	FINECOTE ENAMEL	119	595	
				1011*	

5. Set the Heading Stop Arm for the first body line printing, measured from the first heading line (1 $\frac{5}{8}$ inches).

6. For the length of bill illustrated (6 inches), Medium Speed must be engaged. Rotate the Interlocking Knob to *Medium* and pull the Medium Gear Shift Button OUT, turning the Motor Knob if necessary to mesh the gears.

Functions

The following paragraphs present a description of the major functions of the International Automatic Carriage. In each case, the function is defined and illustrated, and operating instructions are briefly noted. Detail procedures for setting the carriage controls are presented in a later section of this booklet.

Standard Carriage Operation

In order to use the Automatic Carriage as a standard carriage, it is necessary only to turn all carriage control switches OFF and to pull OUT the Eject Clutch Button. Space Control Arm settings should be disregarded. The Carriage Motor Switch, on Numerical Accounting Machines only, must be left ON.

Single Item Ejection

Single Item Ejection is the term applied to the spacing of the paper other than the standard single, double, or triple distances between *listed* items. At each list cycle of the machine, a single line is printed, the form is ejected, and the next form or line is positioned for printing.

The Single Item Ejection feature used in the printing of forms 3 $\frac{2}{3}$ inches or less in length does not affect the speed of Accounting Machines which list at a speed of 75, 80, or 100 cards a minute. The speed of ejection of short forms is equal to, or greater than, the listing speed of the Accounting Machine. The carriage will, therefore, always have the next form in position to be printed by the time the type bars are actuated. The above is not true of machines that list at 120 cards a minute. In this case the listing speed is greater than the ejection speed and it is necessary to reduce the listing speed in order to obtain the maximum production. This is accomplished by the installation of a special circuit and switch.

When using bills or forms longer than 3 $\frac{2}{3}$ inches, medium- or long-feed speed will be required. The Accounting Machine will then stop between each listing because of the longer ejection time.

The carriage can be arranged for Single Item Ejection by setting the Sheet Length Control

PRESENTED TO PAYMASTER SIGNATURE

THE NATIONAL MANUFACTURING CO.
BROADWAY, NEW YORK

PAY VOUCHER

NUMBER	NAME	DATE	AMOUNT DUE
1962	JOHN JONES	1 12	25.22

THIS VOUCHER MUST BE SIGNED AND PRESENTED TO PAYMASTER SIGNATURE

THE NATIONAL MANUFACTURING CO.
BROADWAY, NEW YORK

PAY VOUCHER

NUMBER	NAME	DATE	AMOUNT DUE
1963	AMOS BROWN	1 12	28.14

THIS VOUCHER MUST BE SIGNED AND PRESENTED TO PAYMASTER SIGNATURE

THE NATIONAL MANUFACTURING CO.
BROADWAY, NEW YORK

PAY VOUCHER

NUMBER	NAME	DATE	AMOUNT DUE
1964	RICHARD DOE	1 12	18.47

THIS VOUCHER MUST BE SIGNED AND PRESENTED TO PAYMASTER SIGNATURE

Single Item Ejection

COST ANALYSIS				
JOB NUMBER	DRAW. NO.	OPER. NO.	AMOUNT	
142 1500	4340	2301	796500	
142 1500	3277	2311	65890	
142 1500	6354	2321	1557850	
			6653375*	

Totals, in this case, cause ejection.

COST ANALYSIS				
JOB NUMBER	DRAW. NO.	OPER. NO.	AMOUNT	
157 2527	1125	1510	875500	
157 2527	1256	1511	157850	
157 2527	1453	1512	3478675	
157 2527	2358	1513	79500	
157 2527	2378	1514	765950	
157 2527	3008	1515	1347860	
157 2527	3056	1516	65450	
157 2527	4530	1517	785000	
157 2527	5688	1518	3786750	
157 2527	6754	1519	22550	
			11365085*	

A total appearing directly following a last-line stop is printed on the same form before ejection takes place.

Controlled Form to Form Ejection

COST ANALYSIS				
JOB NUMBER	DRAW. NO.	OPER. NO.	AMOUNT	
142 1500	6274	2201	5465	
142 1500	3192	2211	13450	
142 1500	8416	2221	45075	
142 1500	1598	2231	1050400	
142 1500	1655	2241	345760	
142 1500	4234	2251	5680	
142 1500	4567	2261	190850	
142 1500	8543	2271	35855	
142 1500	2243	2281	2465600	
142 1500	7870	2291	75000	

Last-line stop effects ejection.

COST ANALYSIS				
JOB NUMBER	DRAW. NO.	OPER. NO.	AMOUNT	
142 1500	4340	2301	796500	
142 1500	3277	2311	65890	
142 1500	6354	2321	1557850	
			6653375*	
157 2527	1125	1510	875500	
157 2527	1256	1511	157850	
157 2527	1453	1512	3478675	
157 2527	2358	1513	79500	
157 2527	2378	1514	765950	
157 2527	3008	1515	1347860	

Totals, in this case, do not effect ejection.

Form to Form Ejection

NATIONAL MANUFACTURING CO. NEW YORK				
SOLD TO				
EUREKA POWER CORP 420 HUNTINGTON ROAD DUANSBURGH NEW YORK				
DATE		DESCRIPTION	UNIT PRICE	AMOUNT
5 11	12	MOTOR GENERATOR XXX2	4620	55440
5 11	6	MOTOR GENERATOR X27A	5950	35700
5 11	6	X27A GENERATOR BASE	625	3750
5 11	12	DRIVE SHAFT BEARING	113	1356
5 14	12	CONNECTING ROD 2A25	126	1512
5 14	8	AMMETER CASE 100 AMP	59	472
5 16	7	DUPLEX VOLTMETER	994	6958
5 26	19	TRANSFORMER K775	350	6650
5 26	21	TRANSFORMER K225	190	3990
			115828*	

Control change causes eject.

NATIONAL MANUFACTURING CO. NEW YORK				
SOLD TO				
BAMLEY SALVAGE CO JONESTOWN IDAHO				
DATE	QUANT.	DESCRIPTION	UNIT PRICE	AMOUNT
5 12	6	DUPLEX VOLTMETER	994	5964
5 12	12	ARVIN AMMETER 45 AMP	620	7440
5 12	3	MOTOR GENERATOR X27A	5950	17850
5 12	10	MOTOR GENERATOR X45	2000	20000
5 12	4	TRANSFORMER K775	350	1400
5 16	12	TRANSFORMER K225	190	2280
5 16	5	DUPLEX VOLTMETER	994	11928
5 24	8	X27A GENERATOR BASE	625	3125
5 24	8	10 HP MOTOR	5000	40000
5 24	10	MOTOR BASE ROD	210	2100
5 24	12	PANEL BOARD	1424	17088
			127175*	

Automatic Ejection with Head Spacing

Arm, placing the Single Item Eject Switch ON, and setting the Single Item Eject (Long-Short) Switch according to the size of the form used.

Eject on List Cycles When Listing Several Items

When a group of two or more items are listed on a form $3\frac{2}{3}$ inches or less in length, and no totals are desired, the speed of the ejecting operation may be increased so that the Accounting Machine will not stop between forms. This operation is accomplished by wiring the "Plug to C of X-Distributor or Counters Plus" hubs to the "Heading Card" hubs and placing the Heading Error Eject Switch ON. An Automatic Control must be wired for the listed groups and the Eject Switch turned ON for that class of control.

The special plugging will cause the control on the Accounting Machine to be inoperative for totals. The change in eject class of control will cause the ejection.

Straight Form-to-Form Ejection

For this operation, the carriage is arranged to eject automatically from a predetermined last printed line of one form to a predetermined first printing line of the next form, as illustrated.

Items and totals are printed continuously until the predetermined last line of each sheet is reached. At this point, the sheet is ejected automatically and the next sheet is positioned at the first line for continuation of the printing. If the last printed item on a sheet happens to be the last of a control group, the carriage does not eject the sheet until the particular control group-totals have been printed.

To perform this type of form-to-form ejection, the Eject Clutch Button is engaged, the Sheet Length Control Arm is set for the overall length, the Sheet Stop Control Arm is set for the last printing line on the sheet, and the Heading Stop Control Arm is set to the front, off the scale.

Controlled Form-to-Form Ejection

When utilizing Controlled Form-to-Form Ejection, items are printed continuously until a set control change occurs, causing an automatic ejection to the first printing line of a new sheet. Any one of the three classes of totals (Major, Intermediate, or Minor) can be used to effect this type of ejection, but only one can be used at a time. If the last printing line of a sheet is reached before a control change occurs, the carriage operation is the same as that illustrated for Straight Form-to-Form Ejection.

For this type of operation, the carriage is arranged to perform exactly as outlined in the previous section. In addition, it is arranged

to eject to a new form at every *set* control change, as illustrated.

The Eject Switch must be turned ON for the eject class of control.

Predetermined Total Skip

When the Predetermined Total Switch is ON, the total of the eject class of control (except minor when tabulating) will be printed in a predetermined position on a bill or form, regardless of the number of previously listed items or totals. The position of the Predetermined Total Printing on the form is determined by the setting of the Sheet Stop Arm and is one space, single, double or triple, according to the setting of the space control lever, beyond the setting of this arm.

If a control change occurs at the same time the over-flow position is reached, ejection is delayed until the total or totals are printed.

Automatic Ejection With Head Spacing

On Alphabetic Accounting Machines, the Automatic Carriage can be set to line-space automatically from the last printed line of the heading to a predetermined first printing line in the body of the form, regardless of the number of heading cards printed.

Automatic line-spacing starts after the last card of the heading is printed and continues until the first body line is reached. All heading cards must be provided with a common X and the last of these must have an additional X punched in a different column to cause the carriage to start line-spacing.

In order to arrange the carriage for head-spacing, it is necessary to plug the hubs labelled Head Card and Head Space, to set the Body Line Adjustment, and to turn the Heading Control Switch ON. These controls are in addition to those previously enumerated for Form-to-Form Ejection.

Heading Error Control

This feature makes it possible to control between the heading cards and the detail cards to insure that the heading cards are used with their correct group of detail cards.

When using heading cards, the minor (or minor and intermediate) control punching used in the body of the form may be excluded from the heading cards. For such cases the common Head Card X punching is used to eliminate the control test for all controls except the eject class of control. If the eject class of control is punched in the heading cards, the Heading Error Control makes it possible to control between the heading cards and the detail cards to insure that the heading cards are used with their correct group of detail cards.

In the event of a discrepancy between the heading cards and the detail cards, the bill will be ejected after the heading cards have been printed. A new bill will be fed into position and automatically spaced to the first printing line of the body. The information from the detail cards is then printed in the body of the second bill, without a heading. Both of these bills may be saved by completing them later either in the Accounting Machine or on a typewriter.

The Heading Error Control will also detect any heading cards which may have been erroneously included in the heading group.

When using the Heading Error Control, it is necessary that the eject class of control be

punched in the heading cards. The plugging is the same as that for head spacing. The Heading Error Switch must be turned ON to make this feature operative.

Single-Sheet Ejection

Single sheets may be handled in this carriage in the same manner as continuous forms, except that they must be hand-fed. They may be drawn into a predetermined first printing line, may be automatically spaced after heading cards have printed, and may be automatically ejected from the carriage after a control change or a last-line stop. The Accounting Machine can be set to stop automatically after either type of sheet ejection.

Features

The major features of the Automatic Carriage of a mechanical nature may be identified by reference to the accompanying photographs.

The following paragraphs present a description of the illustrated features and explain briefly their purpose on the Automatic Carriage.

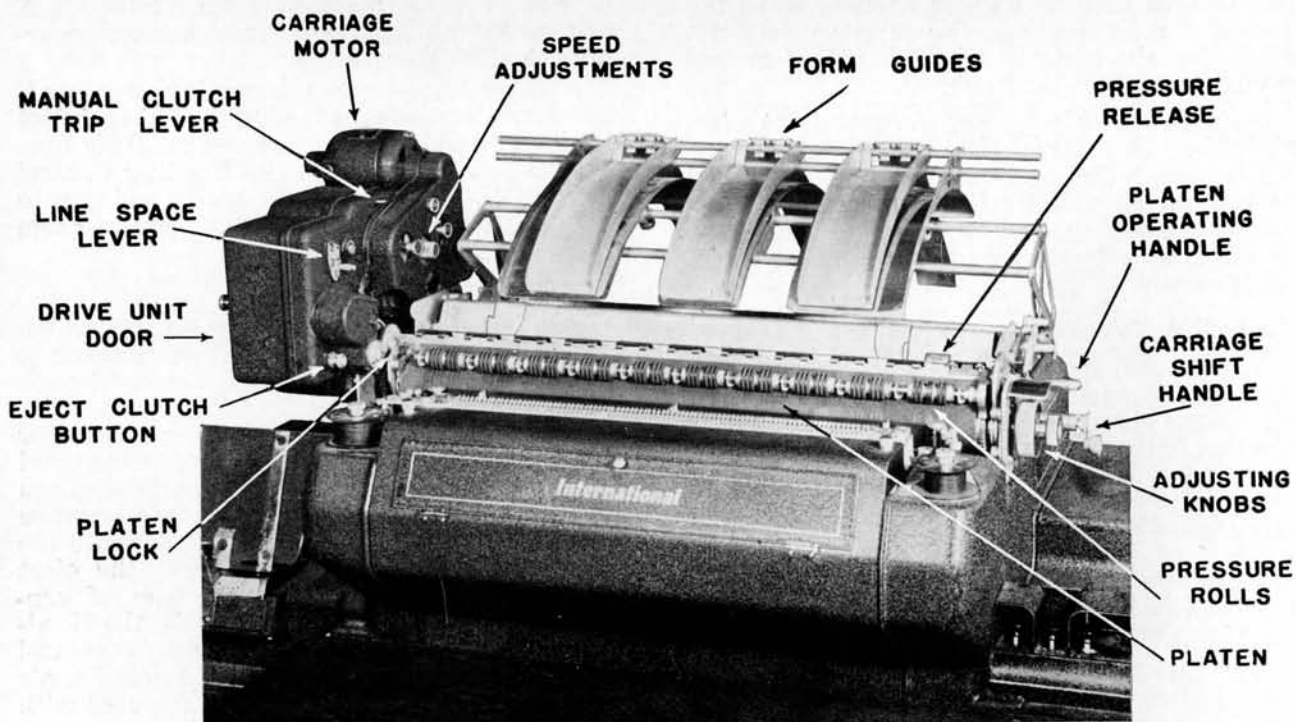
Carriage Motor

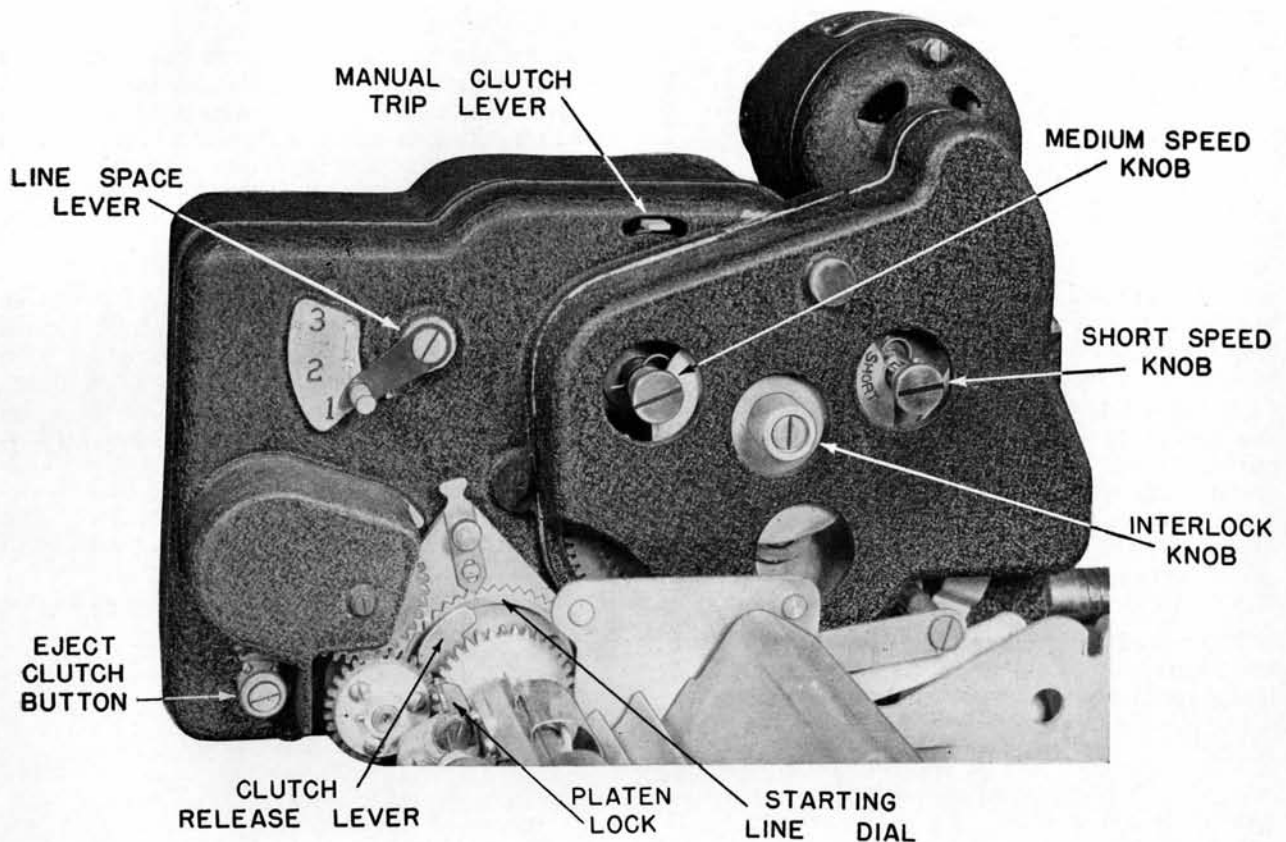
The Carriage Motor, which is mounted at the left of, and moves with the carriage, supplies the power for all carriage operations. There is no mechanical connection between the carriage and the Accounting Machine.

Manual Clutch Trip Lever

This lever is provided for manual control of the carriage operations—either line-spacing or ejection—and is located on the right side of the mechanism housing. It is used to return the carriage mechanism to normal after making a change in sheet length adjustment before setting the Sheet Stop and the Heading Stop Control Arms.

The lever rests normally in a central position. When moved to the front it will cause an ejection to take place, provided the Eject Clutch





Button is IN. When moved to the rear it will cause the carriage to line-space. The line-spacing may be continued manually for any length of sheet if the Eject Clutch Button is in a disengaged position. If the Eject Clutch Button is in an engaged position the line-spacing may be continued manually only to a point where the feed sector is all the way forward. Thereupon an ejection must be made to restore the mechanism to normal before further line-spacing can be resumed.

Line-Space Lever

A Line-Space Lever is located on the right side of the mechanism housing for adjusting the spacing of the carriage. The lever may be set for single, double, or triple spacing:—single, six lines to the inch; double, three; and triple, two. Line-spacing may be used alone or in combination with various other operations.

When starting a report, the first printed item will be on the space to which the carriage is set when the paper is inserted.

Drive Unit Door

Located on the left side of the mechanism

housing is a door which must be opened for inspection of the operating mechanism and for setting the space control arms. When this door is open, the motor will not run.

Note: Always keep the door closed when the Accounting Machine and the carriage are in operation, to allow the carriage to perform its function while the Accounting Machine is operating.

Starting Line Dial

After a form has been gripped by the pressure rolls, the platen is turned back into operating position, thus drawing the form in and around the platen. The distance of this "draw in" on single sheets can be predetermined by setting the Starting Line Dial. This distance may be set, in sixths of an inch, from 1 inch to $4\frac{5}{6}$ inches. This feature plays no part in continuous-form work except that it may be used for starting the first form of a strip.

Eject Clutch Button

The Eject Clutch Button is located on the right side, lower front, of the mechanism housing. Its purpose is to place the space control

arms and ejection mechanism under control of the carriage motor when it is engaged, and to set the carriage for line spacing without ejection when it is out or disengaged.

Speed Adjustment

The Model 12 Carriage is provided with two ejection speeds. One is effective when short forms (up to and including $3\frac{2}{3}$ inches in length) are to be ejected (*Short* speed), and the other is used when longer forms (up to and including 12 inches) are to be handled (*Medium* speed). The *Short* speed is a high-eject speed and the *Medium* speed is a medium-eject speed.

For forms longer than 12 inches (handled by the Model 18 Carriage) a third speed is required. This speed is designated as a *Long* speed or slow-eject speed. The Model 18 Carriage is available in either of two speed combinations—*Short* and *Long*, or *Medium* and *Long*—but is not available with all three speeds in one combination.

The speed adjustment consists of two gear shift buttons (by means of which either speed is engaged) and an interlock cam which makes it impossible to engage both speeds at the same time.

Motor Knob

A knob which allows the mechanism to be operated manually is attached to the left end of the motor shaft. It is necessary at times, when making a speed adjustment change, to turn the mechanism a bit so the gears will mesh. This is accomplished by turning the Motor Knob in either direction.

Adjustable Locating Arms

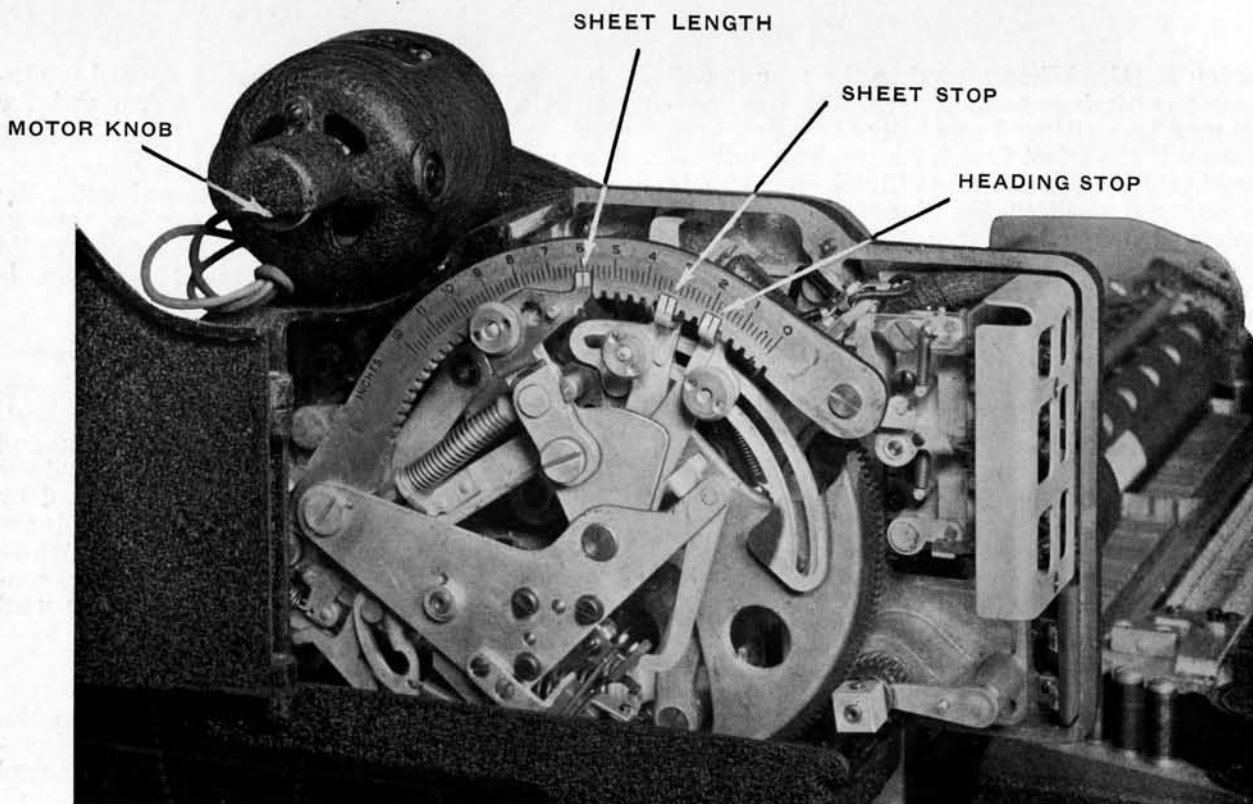
Three adjustable arms are provided to enable the operator to set the carriage sheet length and body printing location to correspond with the paper or continuous forms being used. These arms are located inside the door at the left end of the device. Each arm is equipped with a pointer that rests on a graduated scale. This scale is divided into 12 inches or 18 inches, depending upon the model of the carriage. Each inch division is sub-divided into six parts, each representing a line space.

The Adjustable Locating Arms are as shown in the illustration:

Sheet Length or First Printing Line

Sheet Stop or Last Printing Line

Heading Stop or First Body Line



The Sheet Length Arm controls the length of ejection and should be set first. After this is set and an ejection cycle taken to restore the mechanism, the Sheet Stop Arm is adjusted to locate the last printing line. This arm causes the carriage to automatically eject the form when the last line, as determined by the setting of the arm, is printed.

The Heading Stop Arm determines the location of the first body line. When Heading Cards are not used, it is set on "O" or off the scale.

When using double or triple spacing, the Sheet Stop and Heading Stop Arms should be set in multiples of two or three index points respectively.

Platen

The platen as supplied with the carriage, is a standard rubber platen. A hard rubber platen is available for multiple copy printing. Special platens, furnished by continuous form manufacturers, can also be installed at the factory or in the field.

Platen Lock

A Platen Lock with operating handle is supplied for use when considerable printing on each line is required. Its purpose is to prevent platen vibration under heavy type-blow loads. To make the lock operative, the handle is pulled toward the operator. The release is obtained by pressing the operating lever away from the operator. The lever must be in the released position to raise the platen for paper insertion.

Clutch Release Lever

This lever is located between the starting line dial and the left end of the platen. It is used to disengage the platen roll clutch when it is desired to turn the platen roll backward by means of the large knurled knob at the right end of the platen. The Clutch Release Lever is moved to the right to disengage the platen from its driving mechanism.

It is not necessary to release the clutch when using the small knurled knob to turn the platen backward.

Pressure Rolls

The Pressure Rolls grip the forms at the point shown in the diagram, when the platen is in its operating position. When turned over for paper insertion, the Pressure Rolls are directly in line with the paper guides, and the turn of a single notch on the main Platen Knob causes the paper to be gripped.

Pressure Release

A lever is provided for the purpose of releasing the pressure on the Pressure Rolls whenever it is desired to readjust sheets or continuous forms.

Adjusting Knobs

The platen is equipped with two knurled knobs, located on its right end, which are used to rotate the platen. The large knob is used to rotate it in a forward direction one complete space or more at a time. The small knob furnishes a vernier adjustment when it is desired to move the platen roll a fraction of a space to improve registration. This knob may be used for adjustment when the carriage is in operation. It is also used to turn the platen backward.

Platen Operating Handle

The Automatic Carriage is equipped with a "Turnover" type of paper inserting mechanism. This mechanism facilitates the initial manual insertion of continuous forms by making it unnecessary to thread the paper around the platen.

The handle for operating the Turnover mechanism is located at the right end of the carriage. A hand rest is provided in front of the handle above the Platen Knob to aid in raising the Platen Operating Handle. To insert the paper the handle is rotated toward the operator. This brings the Pressure Rolls to the back where they can grip the paper. The paper may then be placed in the platen chute and the platen advanced one notch manually. The handle is then rotated back to its normal position and the platen roll will draw the paper into the correct head-spacing distance determined by the setting of the Starting Line Dial.

Carriage Shift Handle

The lateral movement of the Automatic Carriage, when installed on the Type 285 Numerical Accounting Machine or the Type 405 Alphabetic Accounting Machine, in relation to the print banks, is $5\frac{3}{8}$ inches. The lateral movement when installed on the Type 297 Numerical Accounting Machine is $\frac{1}{2}$ inch. To shift the carriage, the Carriage Shift Lever is pushed slightly to the left and rotated in the desired direction. This lateral movement may be made while the machine is in operation to correct vertical alignment of printing.

Form Guides and Racks

Adjustable form guides and feeding and stacking racks for continuous forms are supplied with the carriage when specified.

Operating Controls

Each of the operations of the Automatic Carriage is subject to control by either electrical switches or mechanical levers.

Manual Clutch Trip Lever

This lever is provided for manual control of carriage operations. It is used primarily for the emergency ejection of a sheet, or for returning the carriage Sheet Length Adjustment.

When the lever is momentarily pulled forward, the form in the carriage is ejected and a new sheet is fed into initial printing position, provided the Eject Clutch Button is IN. When the lever is pushed back, the carriage will line-space continuously until the lever is released.

Eject Clutch Button

Ejection may be prevented by pulling the Eject Clutch Button OUT. It can be locked in this position by turning it to the left (counterclockwise) as far as possible.

Normal form-ejection is resumed by turning the Eject Clutch Button to the right (clockwise) as far as possible, and pulling the Manual Clutch Trip Lever forward until engagement, effecting if necessary, a manual ejection to complete an eject cycle which may have started as a result of line-spacing after engagement.

Sheet Length Adjustment

Adjustment controls for sheet-length, last printing line, and first body line are located inside the drive unit. Access to them is had by opening the door on the left side of the drive unit. The carriage will not operate while this door is open. As indicated in the illustration, the zero line on the sector "Y" represents the first printing line on each sheet, from which point the other adjustments are set. In other words, automatic operation is begun from the first printing line on the first sheet of a continuous form, after that first line has been located either manually or by the Starting Line Dial.

Arm "A" is the Sheet Length Adjustment. Its setting is shown by the location of its indicator on the scale. It is set for the exact length (depth) of the sheet in inches but actually determines the distance between the first printing lines of successive sheets.

The Sheet Length Adjustment is changed as follows:

- 1—Loosen clamp nut "D" several turns, using the special wrench furnished for this purpose.
- 2—Insert the pinion end of this wrench in

hole "X", turning it slightly if necessary to mesh it properly with the teeth on the large sector "Y".

- 3—Press the wrench inward lightly and at the same time rotate it in the direction required to move the index to the proper point on the scale.
- 4—Remove the wrench and tighten clamp nut "D".
- 5—Close drive unit door; and pull Manual Clutch Trip forward to return sector "Z" to its stop position.

Each time this Sheet Length Adjustment is changed, the Speed Adjustment should be checked. The carriage will not operate when adjusted for sheets longer than $3\frac{2}{3}$ inches if the Speed Adjustment is set for short sheets, and vice versa. The Model 18 Carriage, equipped with *Long-Medium* speeds, will not operate when adjusted for forms longer than $8\frac{1}{2}$ inches if the Speed Adjustment is set for medium-length sheets.

Last Printing Line Adjustment

Arm "B" shows the distance from the first printing line to the last normal printing line, inclusive. When the carriage is set for double or triple spacing, this indicator must be set for an even multiple of two or three line-spaces, respectively. Also, when control listing, or tabulating with more than one control (since one or two additional total lines may be required after the last normal printing line), the indicator should be set with this possibility in mind.

The Last Printing Line Adjustment should be made only after the proper Sheet Length Adjustment has been completed. It is set as follows:

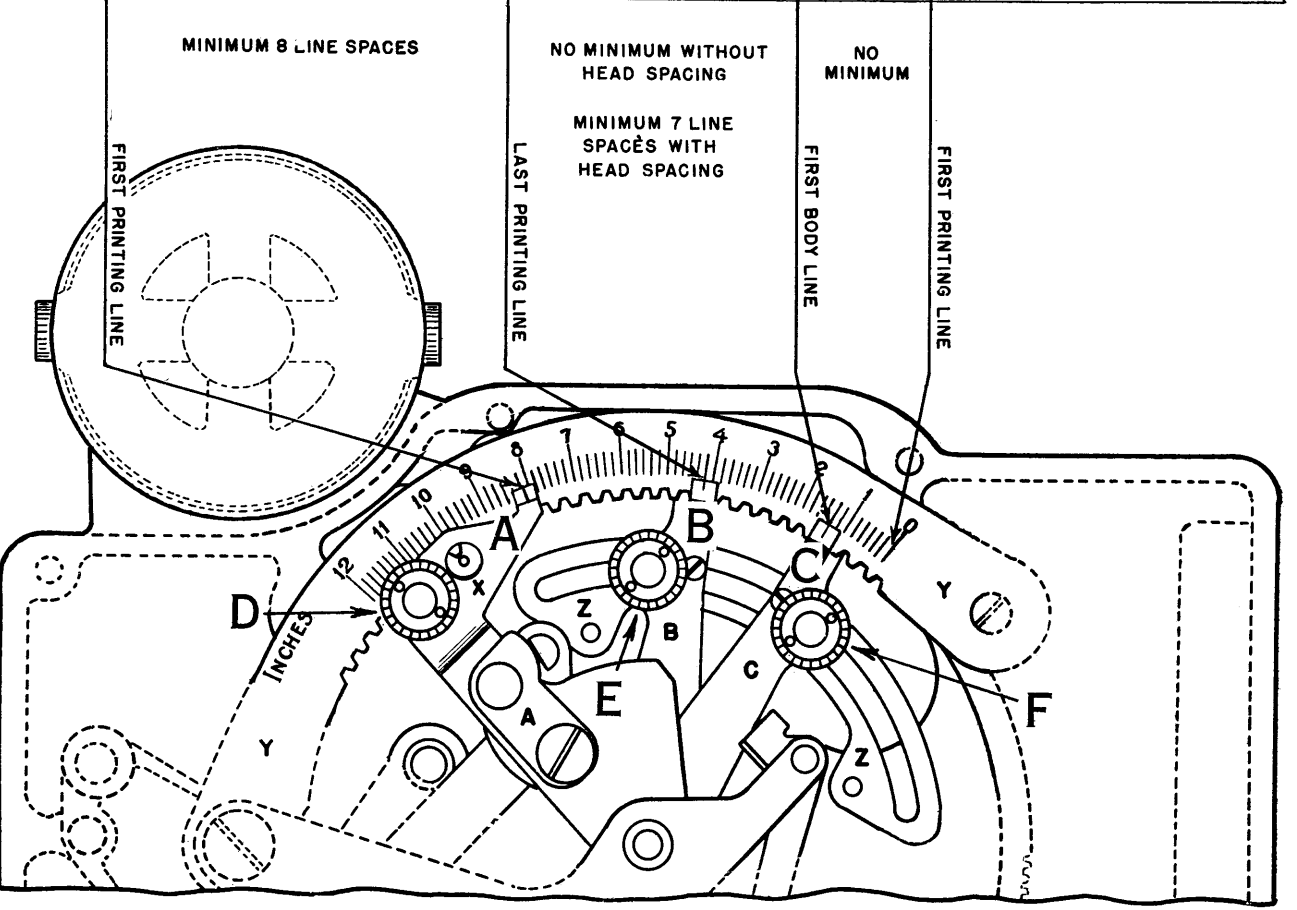
- 1—Trip the Manual Clutch Trip Lever to cause ejection and restore the mechanism to its proper position.
- 2—Loosen clamp nut "E" by means of wrench.
- 3—Move arm "B" until its index is set at the correct distance from zero (first printing line).
- 4—Tighten clamp nut "E".

For Single Item Ejection, arm "B" should be moved to the right as far as possible in sector "Z".

First Body Line Adjustment

Arm "C" is the First Body Line Adjustment. It is normally positioned at "O," or off the index, when Heading Cards are not being used.

DATE	QUANT.	DESCRIPTION	UNIT PRICE	AMOUNT
12	6	DUPLEX VOLT METER 45 AMP	99.4	596.4
12	12	ARVIN AMMETER X27A	62.0	744.0
12	3	MOTOR GENERATOR X45	595.0	1785.0
12	10	TRANSFORMER K775	200.0	2000.0
12	4	TRANSFORMER K225	350.0	1400.0
12	12	DUPLEX VOLT METER BASE	190.0	2280.0
12	5	X27A GENERATOR BASE	99.4	497.0
12	8	10 HP MOTOR	625.0	5000.0
12	10	MOTOR BOARD ROD	21.0	210.0
12	12	PANEL BOARD	14.24	170.88
12	12	CONNECTING ROD 2A25	12.6	151.2
12	12	DRIVE SHAFT BEARING	11.5	138.0
12	8	AMMETER CASE 100 AMP	5.9	47.2
12	12	MOTOR GENERATOR CASE XXX2	46.20	554.40
12	1	MOTOR GENERATOR CASE	62.0	62.0
12	2	DUPLEX MOTOR 2 HP	211.7	423.4
12	10	MOTOR GENERATOR X45	200.0	2000.0
				21276.4*



FOR CUSTOMER'S USE ONLY
 REGISTER NO. _____ MACHINE NO. _____
 TOTAL APPROVED _____
 CALCULATION CHECKED _____
 TRANSPORTATION _____
 FREIGHT BILL NO. _____ AMOUNT _____
 DATE RECEIVED _____
 DATE SHIPPED _____
 DATE DELIVERED _____
 DATE APPROVED AND SHIPPED _____
 TOTAL _____
 APPROVED _____

FOR CUSTOMER'S USE ONLY
 REGISTER NO. _____ MACHINE NO. _____
 TOTAL APPROVED _____
 CALCULATION CHECKED _____
 TRANSPORTATION _____
 FREIGHT BILL NO. _____ AMOUNT _____
 DATE RECEIVED _____
 DATE SHIPPED _____
 DATE DELIVERED _____
 DATE APPROVED AND SHIPPED _____
 TOTAL _____
 APPROVED _____

SOLD TO THE NATIONAL MANUFACTURING CO.
 100 MAIN STREET, NEW YORK, N. Y.

SOLD TO WESTON INDUSTRIES INC.
 256 WEST MAIN STREET
 MEMPHIS IDAHO

AUTOMATIC CARRIAGE OPERATING CHART		WITHOUT EJECTION	WITH EJECTION					
			WITHOUT HEAD SPACING		WITH HEAD SPACING		SINGLE ITEM	
			CONTINUOUS FORMS	SINGLE SHEETS	CONTINUOUS FORMS	SINGLE SHEETS	FORMS 3 2/3" OR LESS IN LENGTH	FORMS 3 5/6" OR OVER IN LENGTH
ALPHABETIC ACCOUNTING MACHINE TYPE 405	SINGLE SHEET STOP	OFF	OFF	ON	OFF	ON	OFF	OFF
	HEADING CONTROL	OFF	OFF	OFF	ON	ON	OFF	OFF
	SINGLE ITEM EJECT LONG SHORT	LONG	LONG	LONG	LONG	LONG	SHORT	LONG
	SINGLE ITEM EJECT ON OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
	CONTROL EJECT SWITCHES MINOR INTERM. MAJOR	OFF	★	★	★	★	OFF	OFF
	HEADING ERROR	OFF	OFF	OFF	SEE SWITCHES		OFF	OFF
	PREDETERMINED TOTAL	OFF	SEE SWITCHES				OFF	OFF
	HEAD CARD X HUB	○	○	○	PLUG	PLUG	○	○
	HEAD SPACE X HUB	○	○	○	PLUG	PLUG	○	○
AUTOMATIC CARRIAGE	EJECT CLUTCH BUTTON	OUT	IN	IN	IN	IN	IN	IN
	SPEED ADJUSTMENT	○	‡	‡	‡	‡	SHORT	‡
	SHEET LENGTH ADJUSTMENT	○	SET AS REQUIRED					
	LAST LINE ADJUSTMENT	○	SET AS REQUIRED				EXTREME RIGHT	
	FIRST BODY LINE ADJUSTMENT	○	EXTREME RIGHT	SET AS REQUIRED		EXTREME RIGHT		
	STARTING LINE DIAL		SET IF AND AS REQUIRED					
NUMERICAL ACCOUNTING MACHINE TYPE 285 & 297	CARRIAGE MOTOR SWITCH	ON	ON	ON			ON	ON
	CONTROL EJECT MINOR INTERM. MAJOR	OFF	★	★			OFF	OFF
	SINGLE ITEM EJECT ON OFF	OFF	OFF	OFF			ON	ON
	SINGLE ITEM EJECT LONG SHORT	LONG	LONG	LONG			SHORT	LONG
	AUTO START FROM CARRIAGE	OFF	ON	OFF			OFF	ON

★ MAJOR, INTERMEDIATE OR MINOR EJECT SWITCH "ON" IF AND AS REQUIRED
‡ SET TO AGREE WITH SHEET LENGTH

When printing heading and body separately, arm "C" is set to indicate the distance from the first heading line to the first body line, inclusive. If the carriage is set for double or triple spacing, this distance must be a multiple of double or triple line-spaces, respectively.

The First Body Line Adjustment should be made only after the proper Sheet Length Adjustment has been completed. It is set as follows:

- 1—Make certain that a manual ejection has been taken since the last change in the Sheet Length Adjustment was made.
- 2—Loosen clamp nut "F", by means of wrench.
- 3—Move Arm "C" until its indicator is set on the index at the correct distance from zero if heading cards are being used.
- 4—Tighten clamp nut "F".

Speed Adjustment

The Speed Adjustment consists of two Gear

Shift Buttons, by means of which either speed is engaged, and an Interlock which makes it impossible to engage both speeds at the same time.

As an example of the manner in which the Speed Adjustment is changed, *Medium* speed is disengaged and *Short* speed engaged as follows:

- 1—Turn Carriage Motor OFF.
- 2—Press Medium Gear Shift Button IN.
- 3—Rotate Interlock Knob until the word *Short* appears in the other opening.
- 4—Pull the Short Gear Shift Button OUT, turning the Motor Knob, if necessary, to mesh the gears.

Starting Line Dial

The Starting Line Dial is set by loosening the locking screw, raising the locking lever, and turning the dial until the scale reading indicated by the locking lever is equal to the required distance from the top of the sheet to the starting line, inclusive.

Switches

Numerical Machines Only

Carriage Motor Switch

The Carriage Motor must be running continuously while the carriage is in operation. On Numerical Accounting Machines a Carriage Motor Switch is provided to turn this motor ON and OFF. On Alphabetic Accounting Machines no special switch is provided, the Carriage Motor being turned ON and OFF with the main power switch of the machine.

Automatic Start from Carriage Switch

This switch when ON puts the restarting of the Accounting Machine under the control of the carriage, making it impossible to obtain an automatic start until the carriage has completed the eject cycle.

Common to Numerical and Alphabetic

Minor, Intermediate, and Major Eject Switches

Three switches are provided, either of which, when turned to the ON position, completes a circuit to obtain an automatic ejection after that particular type of control change.

Single-Item Eject Switch

This switch, when ON, will cause a single-item ejection at every list cycle. It is used in every case of such ejection, regardless of the speed or length of ejection.

Single-Item Eject Switch—Long and Short

When ejecting after every single item, this switch should be set to agree with the Speed Adjustment being used.

Alphabetic Machines Only

Single-Sheet Stop Switch

The purpose of this switch, when turned ON, is to stop the Accounting Machine after every ejection cycle in single-sheet operations. After inserting the succeeding sheet, it is necessary to use the Manual Start Key on the Accounting Machine to continue normal operations.

Heading Control Switch

The Heading Control Switch is turned ON for all carriage operations involving heading cards. Its function is to cause line-spacing over the heading portion of second sheets.

Heading Error Switch

When this switch is ON a break in the eject class of control between heading and detail cards will cause an ejection without taking a total.

Predetermined Total Switch

This switch is turned ON to cause the machine to print the eject class of total on a predetermined line on the form.

