

INSTRUCTION
BOOK



LA Models

MONROE
ADDING-CALCULATOR

MONROE CALCULATING MACHINE COMPANY, INC

INSTRUCTION BOOK

Monroe Adding-Calculator

LA-1 or Series 0-Models

MONROE CALCULATING MACHINE COMPANY, INC.



MONROE

CALCULATING MACHINE COMPANY, INC.

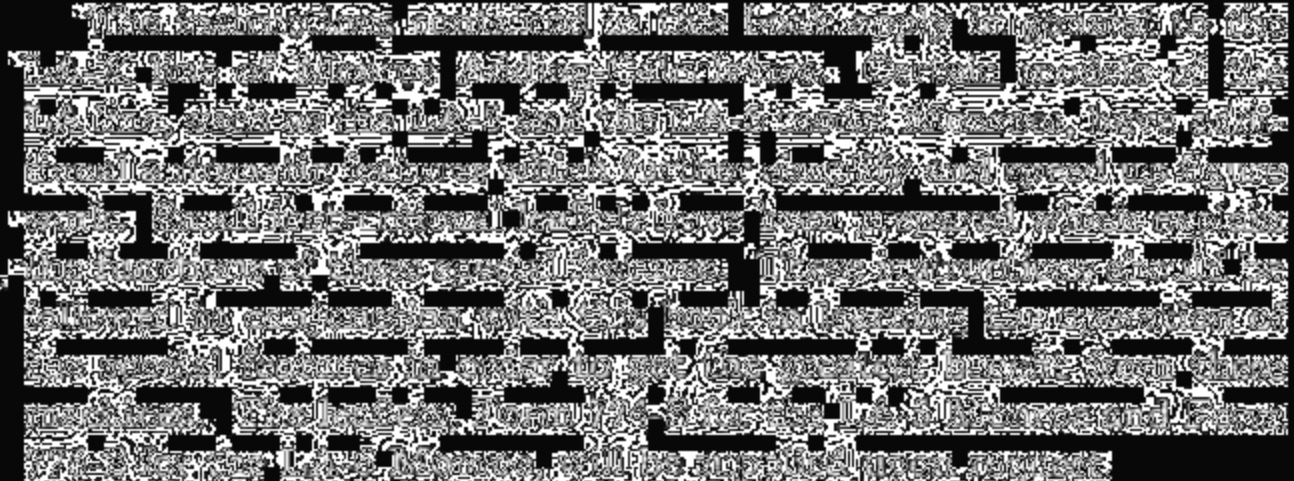
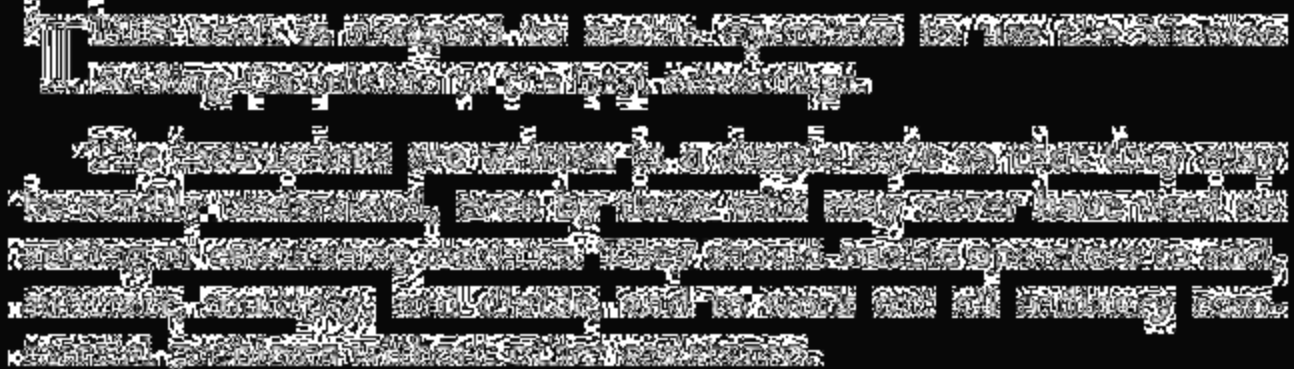
BRIDGE PLAZA, NEW JERSEY

MONROE CALCULATING MACHINE COMPANY, INC. 1000 BROADWAY, NEW YORK, N. Y. 10001



2

3



Winter Operation

The winter operation should be carried out following the instructions in order to ensure the operation of the machine. The use of the machine and the maintenance of the engine should be carried out according to the instructions.

The instructions should be read carefully for the safe and correct use of the machine. The instructions should be read before the first use of the machine.

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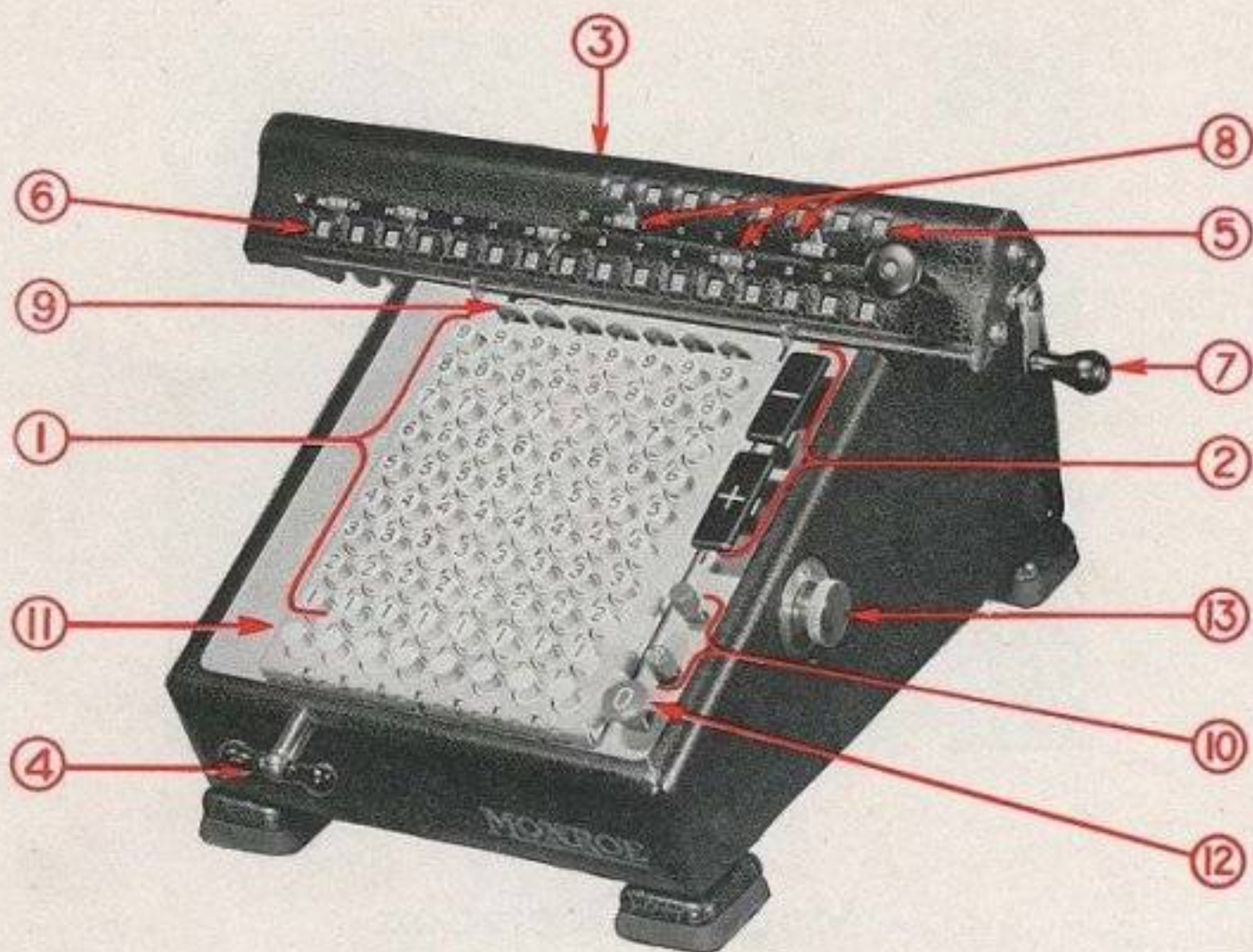


Figure 1

Monroe Adding-Calculator Model LA 160-X

- | | |
|-------------------------|--|
| 1 Keyboard | 8 Decimal Markers on Dials |
| 2 Plus and Minus Bars | 9 Decimal Markers on Keyboard |
| 3 Carriage | 10 Repeat and Non-Repeat Keys |
| 4 Carriage Shift Lever | 11 Individual Column Release
or Zero Keys |
| 5 Upper Dials | 12 Master Clear Key |
| 6 Lower Dials | 13 Crank Hole Cover |
| 7 Dials Clear-out Crank | |

WORLD ENLIGHTENMENT BOO WORLD ENLIGHTENMENT BOO

The World Enlightenment Boo is a collection of stories and poems that explore the meaning of life and the human condition. It is a journey of discovery and self-discovery, a quest for truth and understanding. The stories are set in a world where the boundaries between the real and the imaginary are blurred, and the characters are faced with challenges that test their strength and resolve. The poems are a reflection of the human experience, capturing the beauty and the pain of life. The book is a treasure trove of wisdom and inspiration, a guide to a more meaningful and fulfilling life. It is a work of art that will stay with you long after you have finished reading it.

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...the

(6) **Upper Deck**

The upper deck

(7) **Lower Deck**

The lower deck

(8) **Deck Overhead**

The deck overhead

(9) **Deck Monitor**

The deck monitor

(10) **Deck Monitor Keypad**

The deck monitor keypad

... ..

(11) **Deck Monitor Keypad**

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III. Individual Control Release or Zeta

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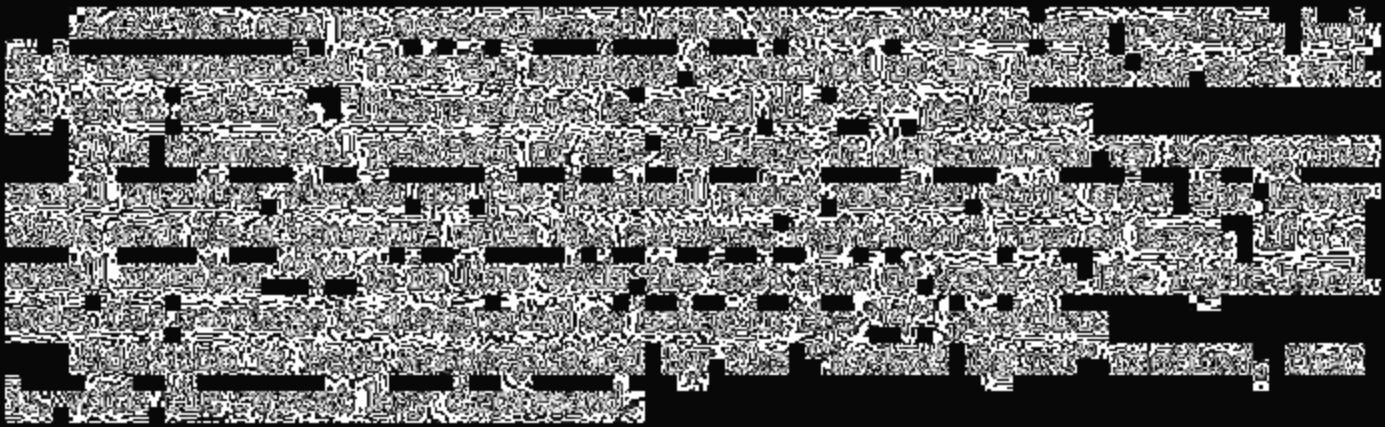
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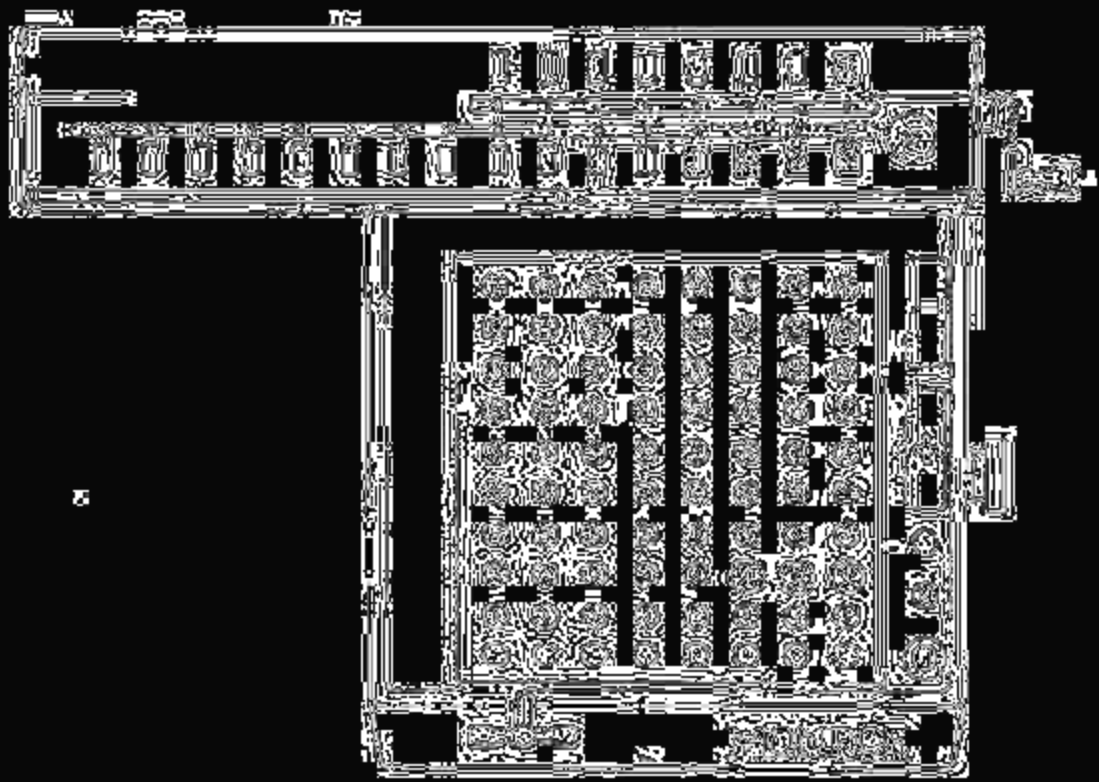
Architectural Plan of the Temple of Isis at Philae

Architectural Plan of the Temple of Isis at Philae, showing the main structure and the adjacent colonnade.

Plan of the Temple



Plan of the Colonnade



Plan of the Colonnade

Figure 1

100

Figure 1 shows the results of the first set of experiments. The data is presented in a series of horizontal bars, each representing a different condition. The bars are arranged in a grid-like pattern, with the first row containing the most bars and subsequent rows containing fewer. The bars vary in length and are accompanied by small numerical values and symbols.

Figure 2

Figure 2 displays the results of the second set of experiments. Similar to Figure 1, it consists of multiple horizontal bars of varying lengths, arranged in a grid. The bars are accompanied by numerical values and symbols, indicating the results of the experiments under different conditions.

Figure 3

Figure 3 shows the results of the third set of experiments. The data is presented as a series of horizontal bars, with the first row having the most bars and subsequent rows having fewer. The bars are accompanied by numerical values and symbols.

Figure 4

Figure 4 displays the results of the fourth set of experiments. It consists of multiple horizontal bars of varying lengths, arranged in a grid. The bars are accompanied by numerical values and symbols.

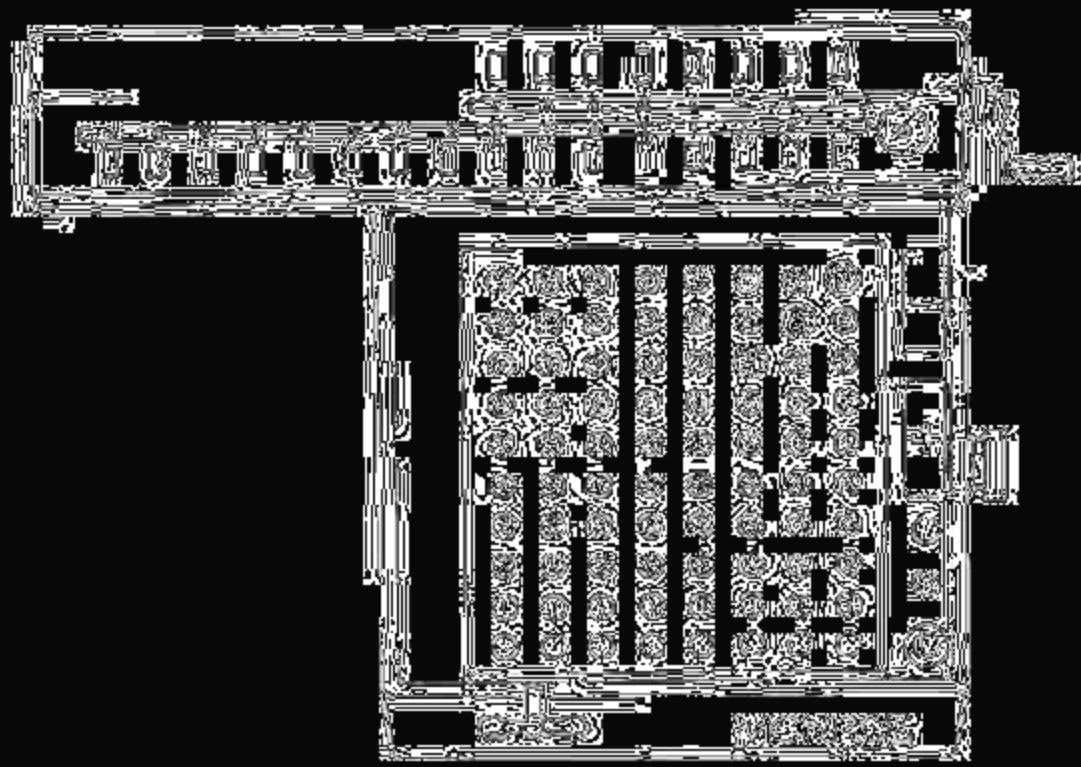


Figure 5

Figure 6

1. The first part of the book, which is the most important, is the history of the church. It begins with the early church and the apostles, and goes on to the present day. The author discusses the growth of the church and the changes that have taken place over the centuries.

2. The second part of the book is a study of the church's doctrine. The author discusses the basic beliefs of the church and the development of these beliefs over time. He also examines the different branches of the church and their teachings.

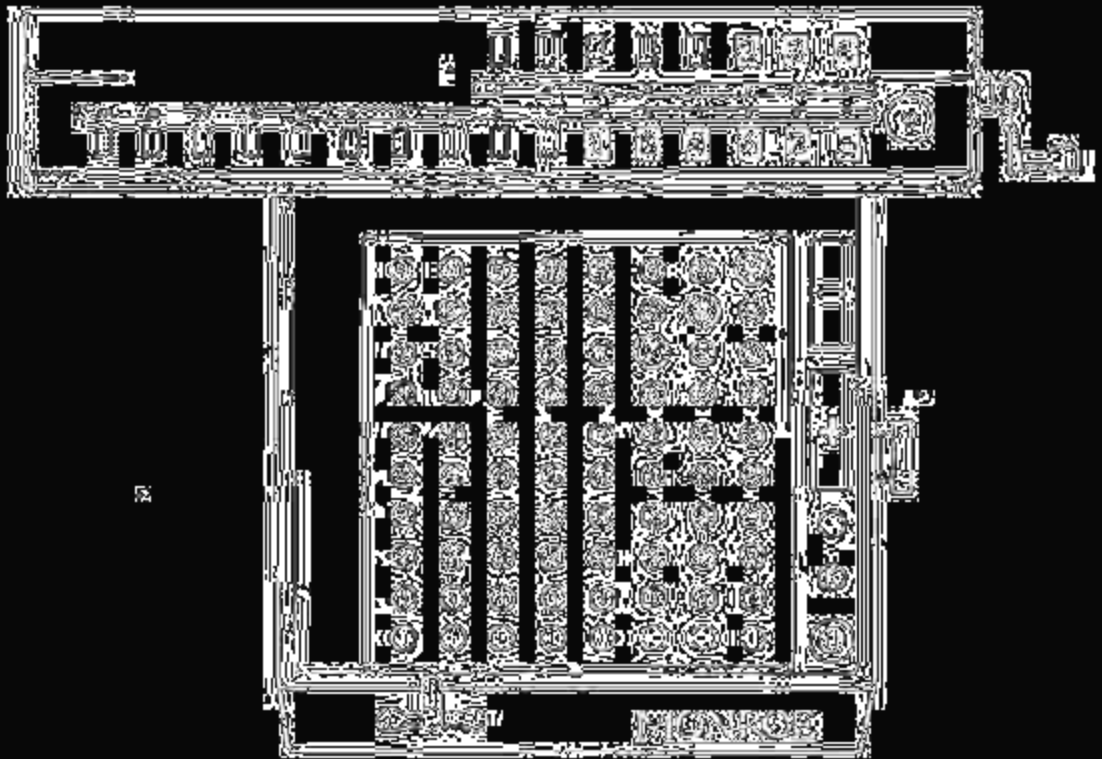
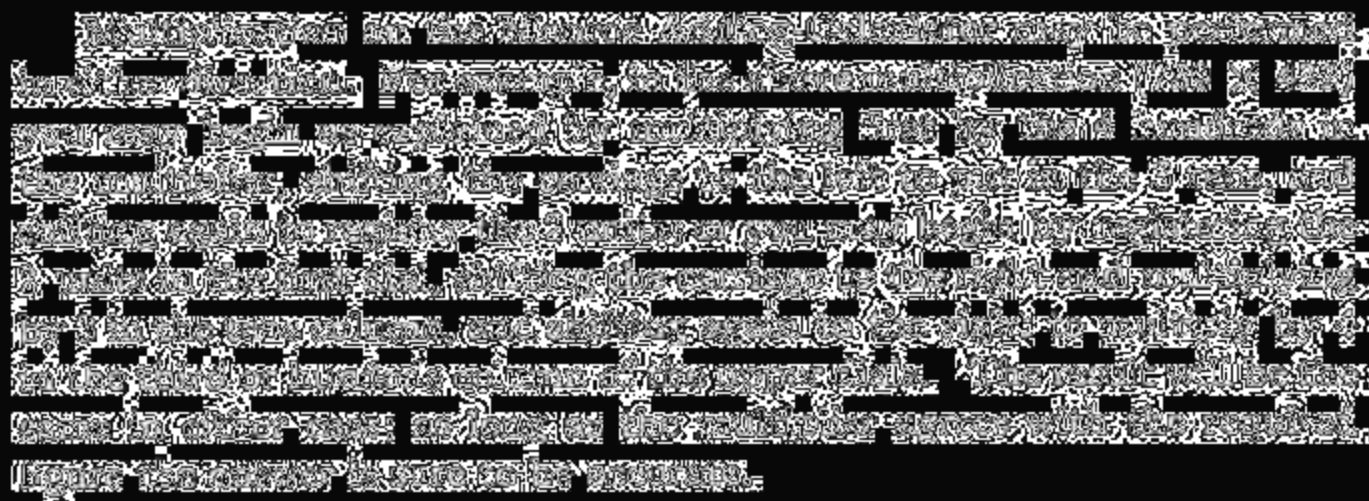
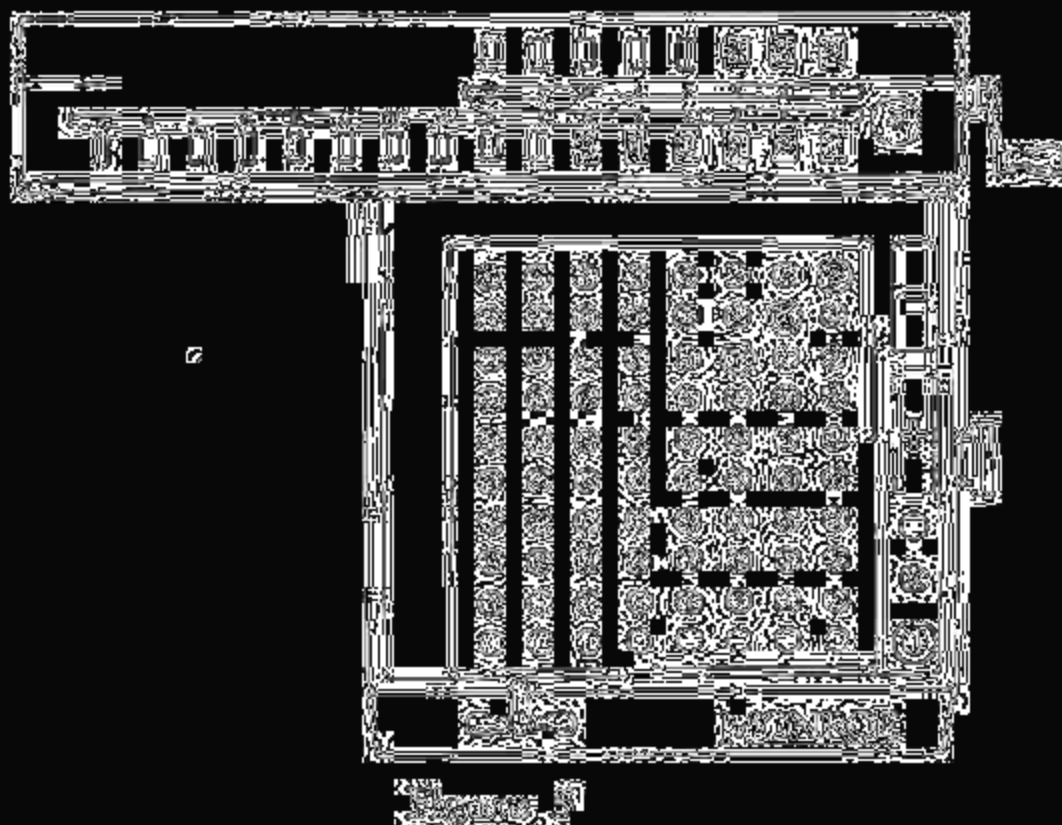


Figure 1

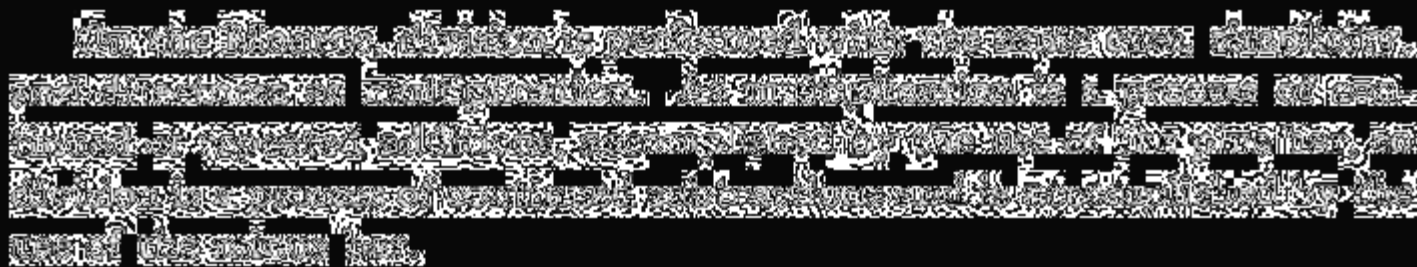
3. The third part of the book is a study of the church's liturgy. The author discusses the different forms of worship and the changes that have taken place over time. He also examines the role of the priest and the deacon in the liturgy.

Church Architecture

The church is a building of great beauty and grandeur. It is a place where people come to worship and to find comfort in their lives. The architecture of the church is a reflection of its history and its doctrine.



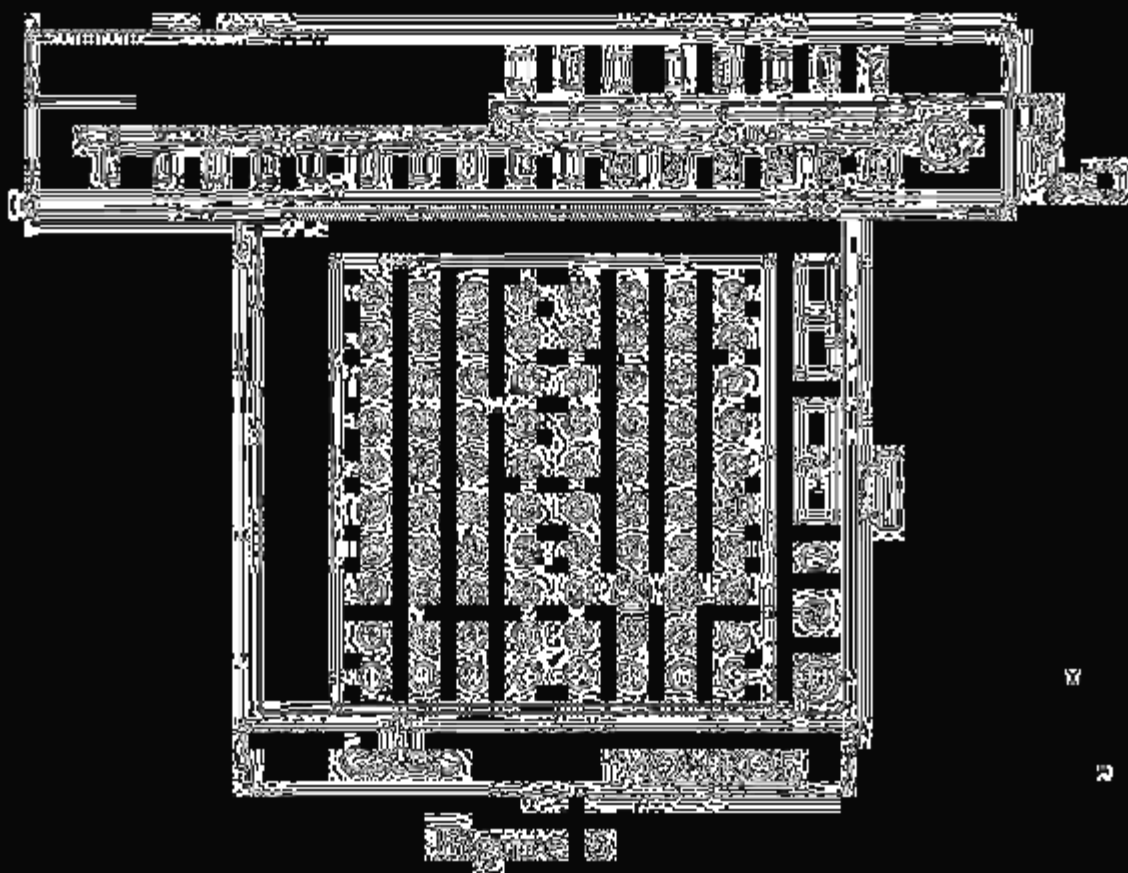
Section



Section



52



53



54



Step 5—Continue this operation, shifting the carriage and depressing minus and plus bars. At the completion of the problem the quotient, **2132**, will appear in the upper dials and the remainder, 23, will appear in the lower dials. The machine at this point appears as shown in Figure 7.

Illustration of all steps—The figures as they appear on the machine at the end of each step are as follows:

	<i>First Step</i>	<i>Second Step</i>	<i>Third Step</i>	<i>Fourth Step</i>
<i>Upper Dials</i>	0000 2 000	0000 21 00	0000 213 0	0000 2132
<i>Lower Dials</i>	00029591	00007191	00000471	00000023
<i>Keyboard</i>	00000224	00000224	00000224	00000224

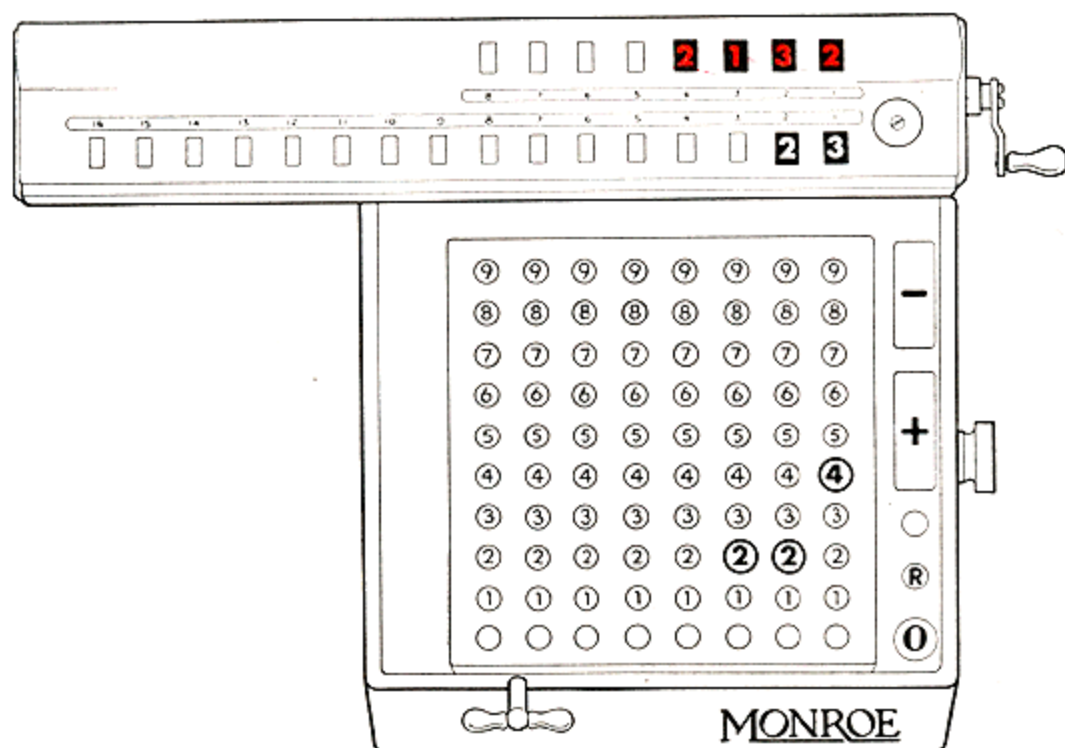


Figure 7

The whole operation requires but a few seconds and is simple and automatic on either hand or electric models.

In operating a hand machine, if at any stage of the division too many backward turns of the crank are made, equivalent to minus bar depressions, a row of nines appears to the left of the dividend and a bell rings, instantly indicating that an over-division has been made.

To correct, merely turn the crank forward, restoring all the figures as they appeared prior to the over-division. When this point is reached the bell rings again, indicating that the correction has been made. An advantage of this second bell signal is this: in fast operation the operator might over-divide more than one extra turn of the crank. The second bell tells the operator when to stop the forward correcting turn of the crank regardless of how many turns may be necessary. The operator need not watch the machine to determine this.

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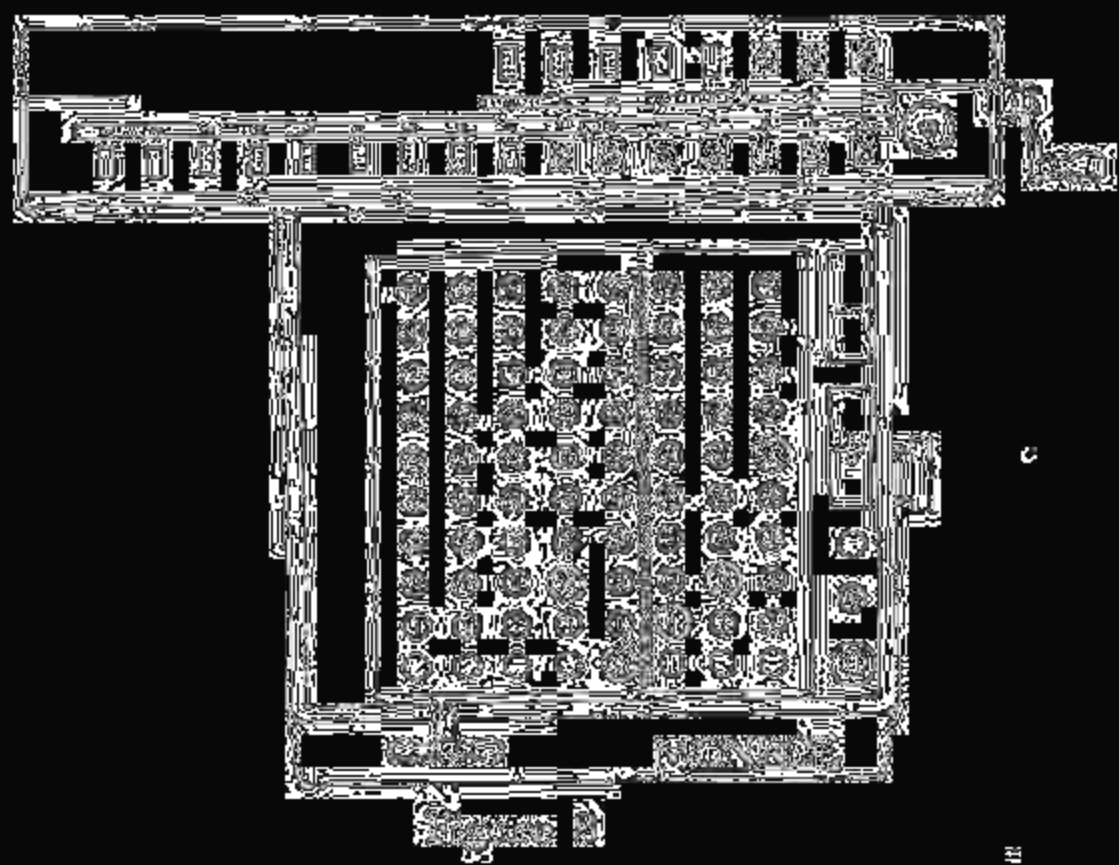
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Discussion of [REDACTED]

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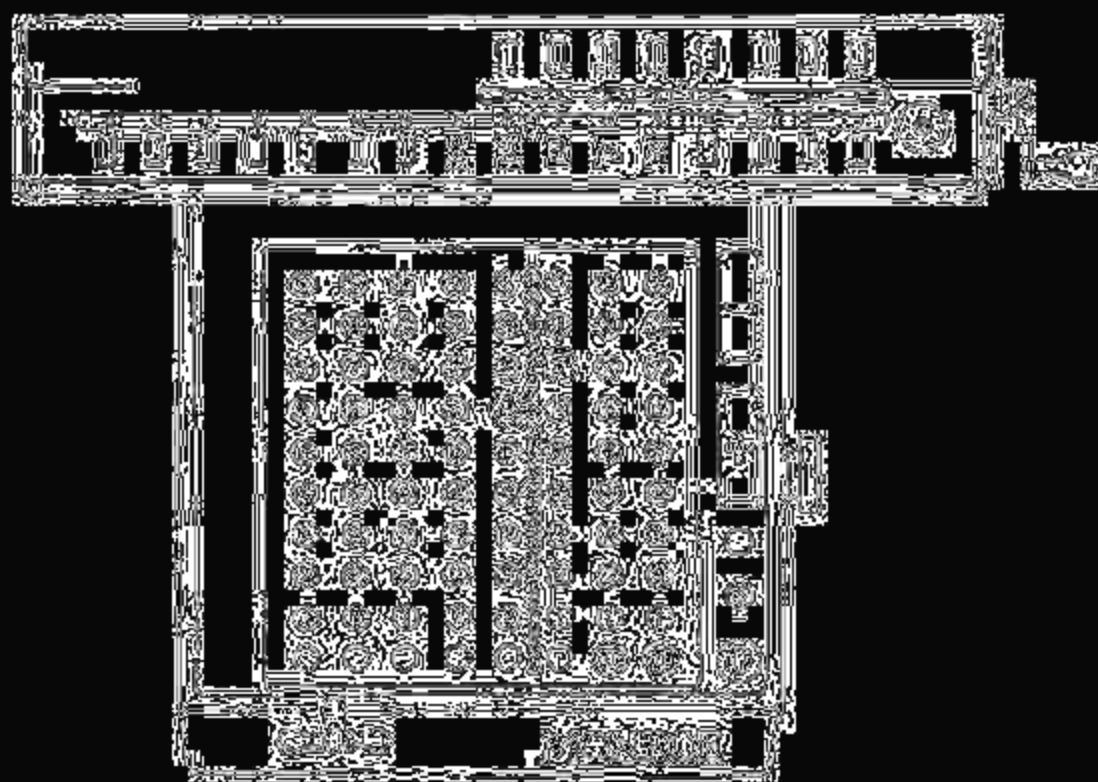
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13

Figure 13



14



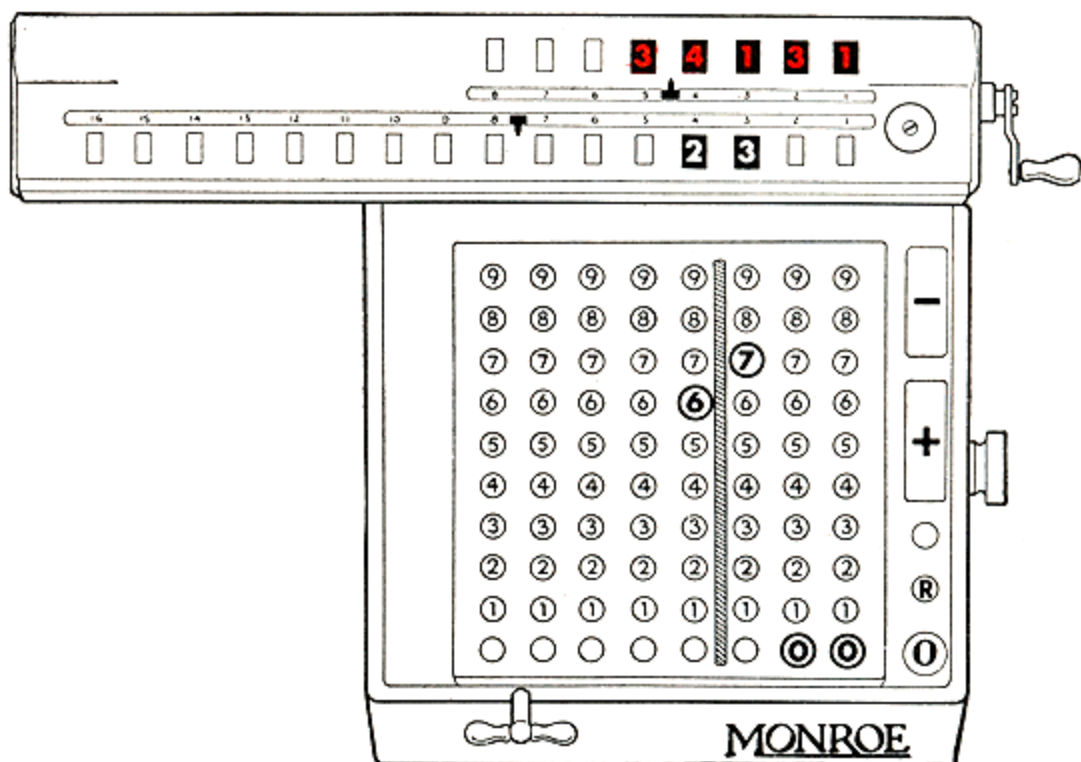


Figure 10

As in all problems of division on the Monroe, after the figures have been set up the operation is entirely automatic and it is really not necessary for the operator to watch the machine until the completion of the division when the final answer is secured.

Take another problem:

$$\text{Example: } 20.621 \div 6.41356 = 3.21522$$

Method

Decimals: Upper Dials 6
 Keyboard 5
 Lower Dials 11

Step 1—The quotient in this example is to be carried out five decimal places. Therefore the upper dials decimal marker is set at 6, one more than the required 5 places.

Step 2—Since the divisor has 5 decimal places, we turn the keyboard marker over at 5. This makes it necessary that the lower dials decimal marker be set at 11, because $6 + 5 = 11$.

Step 3—Set 20.621 on the keyboard as 20.62100. Add into the lower dials with carriage in "7" position.

Step 4—Clear the keyboard and upper dials as previously described by means of the master clear key and minus bar. Set 6.41356 on the keyboard and with carriage in "7" position start the division as indicated in Figure 11.

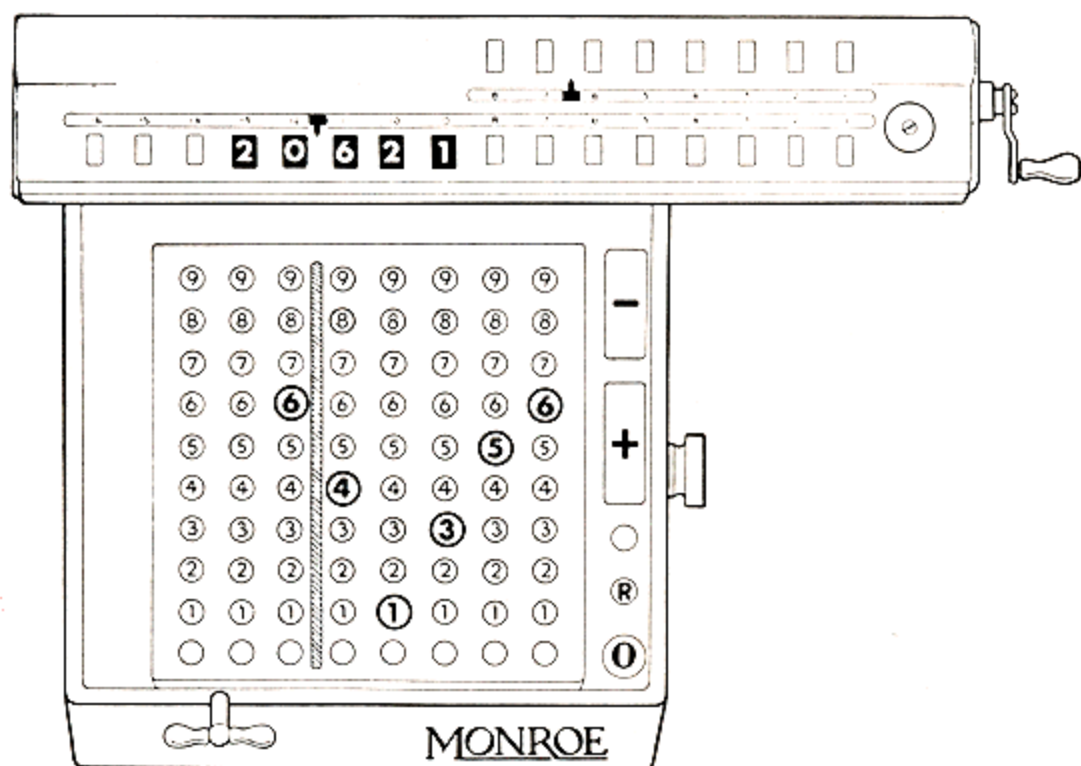


Figure 11

Step 5—Proceed with the division in the regular way. The final result will appear as in Figure 12.

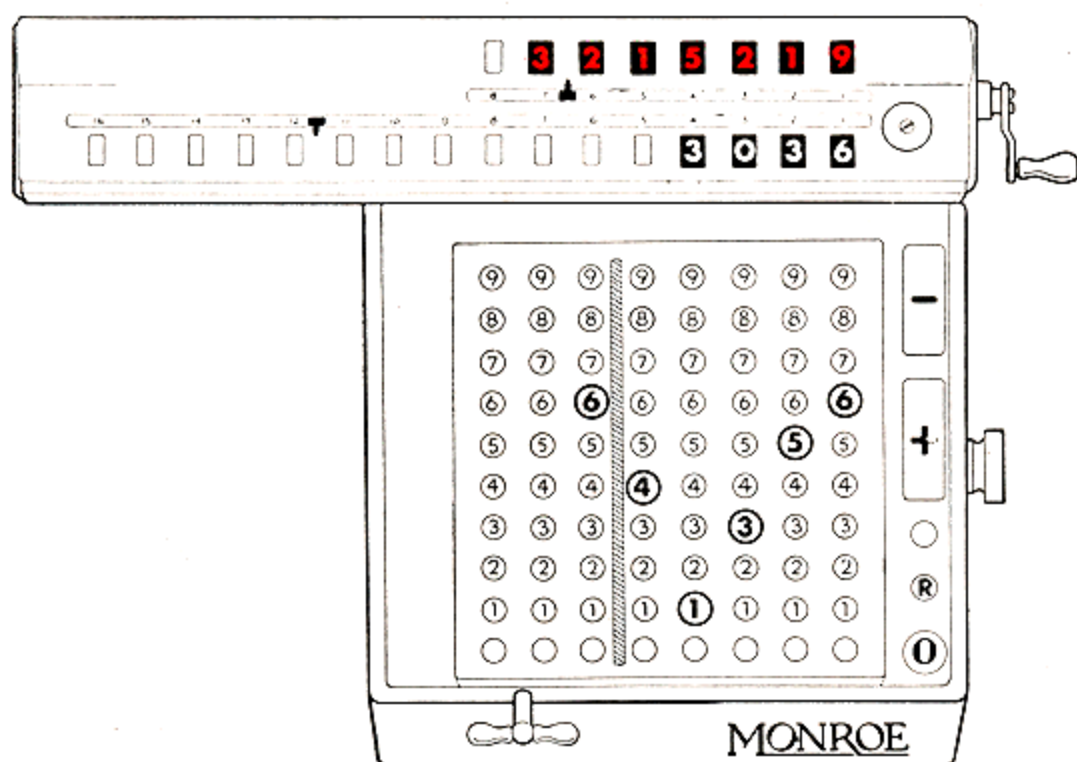


Figure 12

Step 6—The example shown in Figure 12 illustrates the advantage of setting the upper dials decimal marker at one place more than the number of places required for the quotient. In the first upper dial or the sixth place is a 9. Therefore the quotient should be read as 3.21522 and not 3.21521, which would have been the incomplete quotient if the upper dials decimal had been set at 5 places instead of at 6.

Special Applications: Railroads, Street Cars, and Streetcar Operations

The simplicity of the method and the flexibility of every operating system are the chief characteristics of the method.

These are the main reasons why the method is so successful. It is a simple method, and it is a flexible method. It is a method that can be applied to any situation, and it is a method that can be applied to any situation.

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Winter Street Cars

Operation of Street Cars in Winter

The operation of street cars in winter is a problem that has long troubled the transit authorities. The problem is that the street cars are often delayed or stopped by the snow and ice on the tracks.

The solution is to use a special method of operation. This method involves the use of special equipment and special techniques. The result is that the street cars can operate smoothly and efficiently even in the most difficult winter conditions.

Transferring Passengers from Street Cars

The transfer of passengers from street cars to other modes of transport is a problem that has long troubled the transit authorities. The problem is that the street cars are often crowded and the transfer is often difficult.

[REDACTED]

b6

Witness Statement

[REDACTED]

b6

Witness Statement

[REDACTED]

Witness Statement

[REDACTED]

[REDACTED]

Witness

[REDACTED]



Step 2—Then move the carriage to the left two places so that it is in the “1” position. With the minus bar subtract twice. The answer, 424908, will then appear in the lower dials. In the upper dials will be 202, i.e., 200 less 2. See Figure 13.

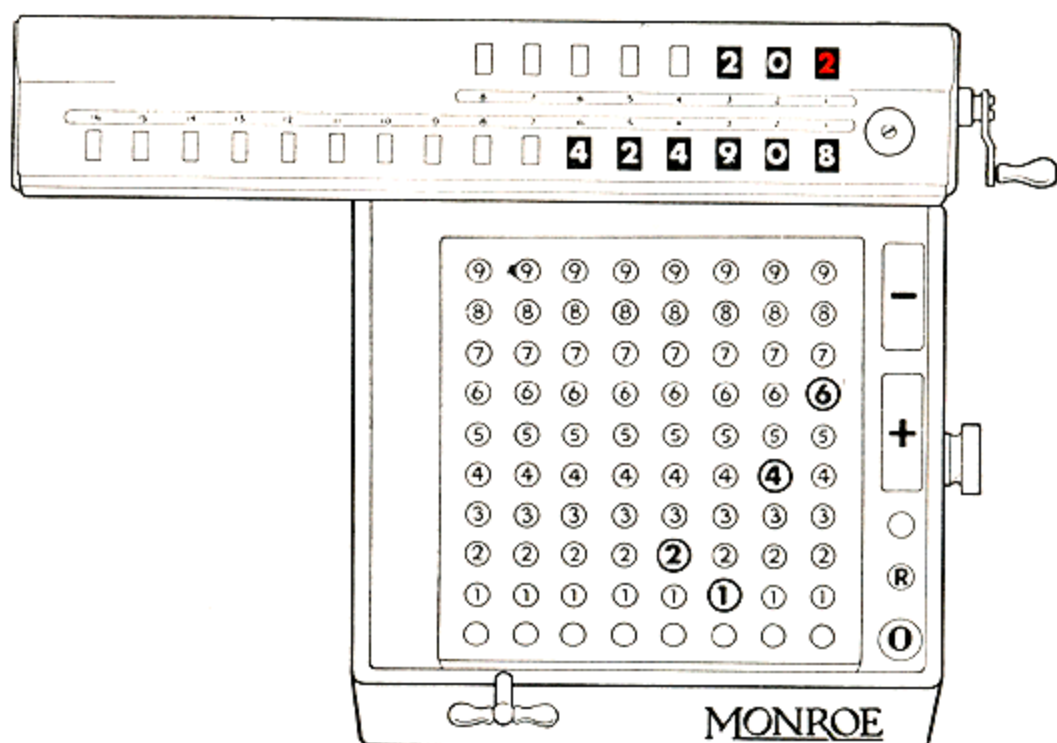


Figure 13

Solving this problem by short cut multiplication required only four revolutions of the machine, whereas the long method of multiplication would take eighteen revolutions. The total of the digits in the upper dials gives the exact number of machine revolutions by short cut or $2 + 2 = 4$, and the total of the actual digits in the multiplier, $1 + 9 + 8 = 18$, gives the number of machine revolutions required if the problem were handled by the long method.

The operator should practice this method of shortening all multiplications. For example, instead of multiplying by 88, multiply by 100 and take off 12, showing the multiplier in the upper dials as 112. Instead of multiplying by 2192, show this multiplier in the upper dials as 2212.

A little practice will enable the operator to become quite proficient in speeding up all multiplications by using short cuts such as these:

<i>Multiplier</i>		<i>Upper Dials</i>		<i>Revolutions Saved</i>
283	=	323	=	5
408	=	412	=	5
827	=	1233	=	8
2791	=	3211	=	12
5987	=	6013	=	19

1

2

3

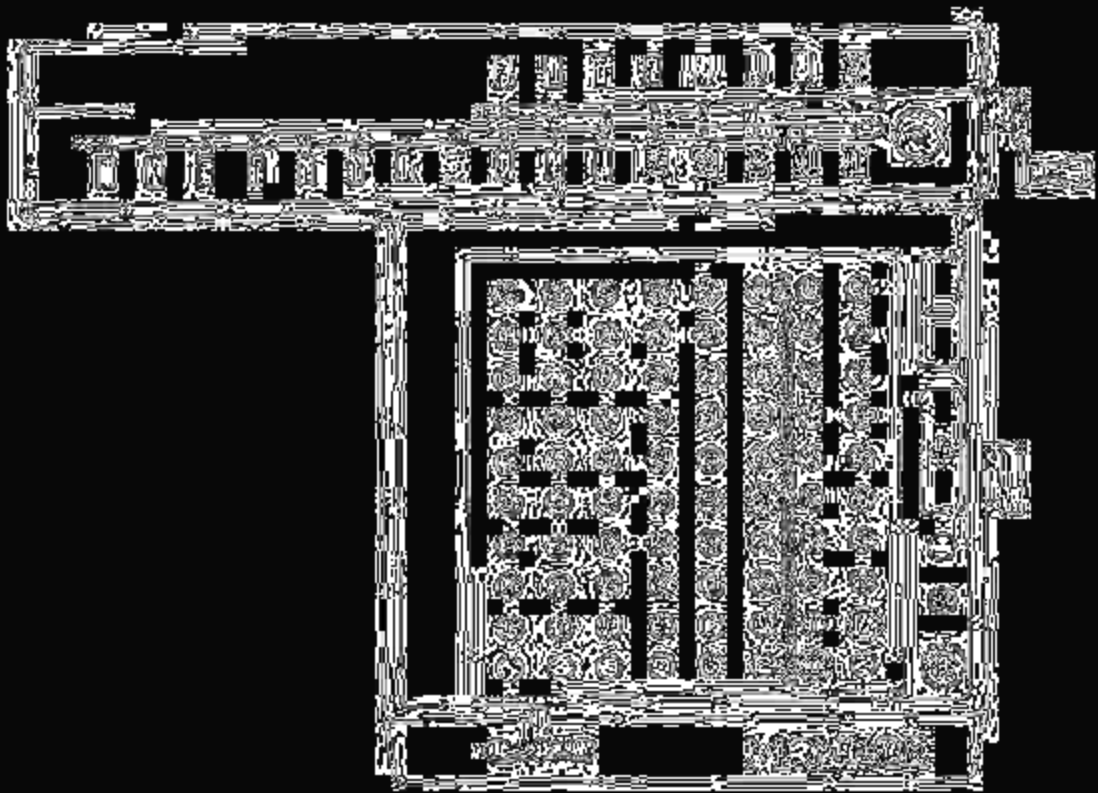
4

5

6

7

8



10

11

Discounts

Subtractive Multiplication

Example: 456 lbs. Copper @ \$.22½ lb. less 12½% = \$89.78

Method

Decimals: Upper Dials 3
Keyboard 3
Lower Dials 6

Step 1—Set 456.000 on keyboard. Multiply by .225. Lower dials show gross amount of invoice, 102.60.

Step 2—With carriage in “3” position, clear keyboard and upper dials only. Copy to keyboard amount in lower dials, 102.60.

Step 3—With minus bar multiply by 1. Then move carriage one place to the left and with minus bar multiply by 2. Move again to left and with minus bar multiply by 5.

Step 4—Upper dials show in red .125, rate of discount, lower dials show 89.775000 or \$89.78, net of invoice, and keyboard shows 102.60, gross of invoice. See Figure 15.

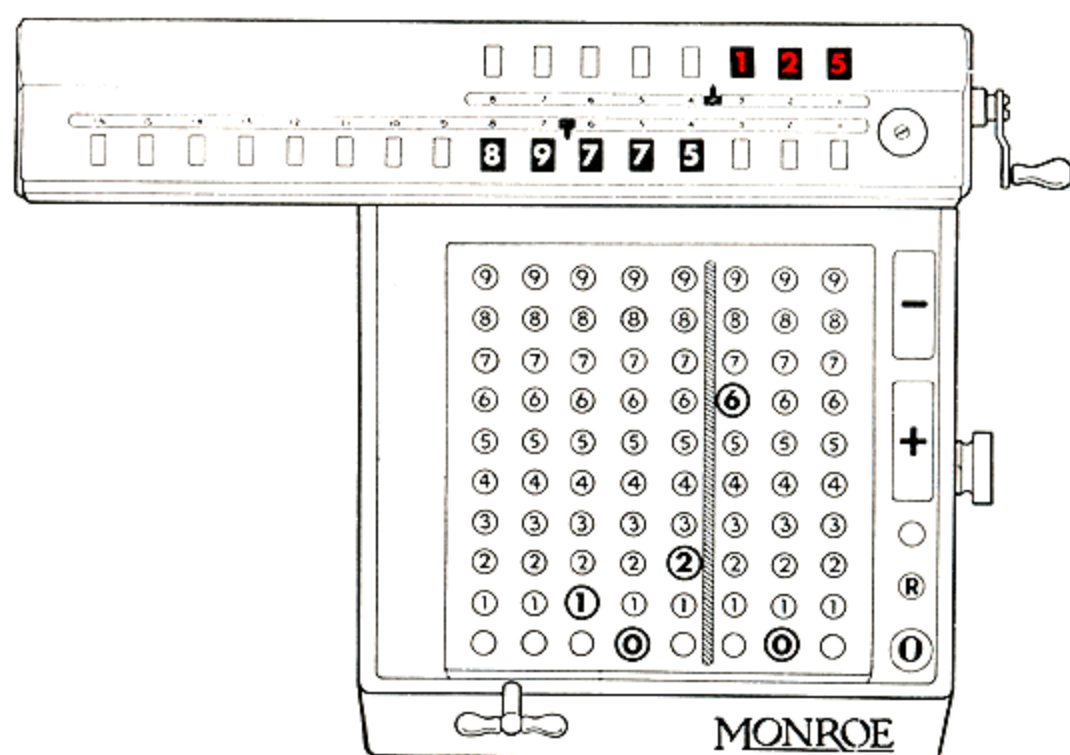


Figure 15

This process of taking off a discount is actually combined subtraction and multiplication.

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[REDACTED]

[REDACTED]

[REDACTED]

6

5

[REDACTED]

4



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

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Method

Decimals: Same as in previous example.

Step 1—You will note in each of the above examples there is an amount which is immediately preceded by the word “of.” It is a rule when figuring what per cent one amount is of another amount, that the divisor is always the “of” amount or the amount preceded by the word “of.”

Step 2—Therefore, the divisors and dividends for these examples, together with the results in the upper dials, appear in the machine as follows:

<i>Lower Dials Dividend</i>		<i>Keyboard Divisor</i>		<i>Upper Dials Quotient</i>
275.8500000	÷	355.25	=	.77649
325.4500000	÷	256.75	=	1.26757
12.8500000	÷	175.45	=	.07324

Practical Use of Percentages

Percentages are used in business generally for the purpose of making comparisons of amounts, one amount being taken as a standard of 100% and the other amounts being converted on this basis to a percentage figure, the percentage showing the ratio of difference between the amounts. In determining increases or decreases in amounts of sales, expenses, profits, etc., the relation of one amount to another is more readily comprehended when comparisons are made by means of percentage figures.

The following examples illustrate the application of the Monroe Adding-Calculator to the various forms of this type of figure work so common to accounting and statistical work in all modern business.

Increase and Percentage of Increase

In this problem the amount of increase as well as the percentage of increase is desired.

Example: Find increase and percentage of increase that:

	<i>Increase</i>	<i>% Increase</i>
\$2963.40 is of \$1582.61	\$1380.79	87.25

Method

Decimals: Upper Dials 5
Keyboard 2
Lower Dials 7

Step 1—With carriage in “6” position set 2963.40 on the right of the keyboard. Depress plus bar once.

Step 2—Move carriage to “5” position and with plus bar and “build-up” division (see pages 35-36) add and shift carriage when necessary until the lower dials amount is as close to 435.75 as possible.

Step 3—Upon completion dividend in lower dials will be 435.7501140 and upper dials will show percentage of increase in black, .17885 or 17.89%.

Percentage of Decrease—Percentage Only

If the percentage of decrease only is desired, the subtraction operation is eliminated.

Example: Find the percentage of decrease that this year is of last year.

<i>Last Year</i>	<i>This Year</i>	<i>% Decrease</i>
2361.50	1257.65	46.74

Method **Decimals:** Same as in previous example.

Step 1—Always set on keyboard last year’s figure — in this case, 2361.50. With carriage in “6” position depress plus bar once. Clear 1 in upper dials.

Step 2—Move carriage to “5” position and with minus bar and subtractive division subtract and shift the carriage when necessary until the lower dials amount is as close to 1257.65 as possible.

Step 3—Upon completion dividend in lower dials will be 1257.6404400 and upper dials will show percentage of decrease in red, .46744 or 46.74%.

Reciprocals

When the same divisor is used a number of times, division is shortened by multiplying each dividend by the reciprocal of the divisor. In other words, dividing one number by another is the same as multiplying that number by the reciprocal of the divisor.

Definition of a Reciprocal

The reciprocal of a number is 1 divided by that number. For example, 1 divided by 5 equals .2, and .2 is therefore the reciprocal of 5. Multiplying any number by .2 gives the same result that would be secured in dividing that number by 5, because 5 and .2 are reciprocals of each other.

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In the above example the amounts with an * were secured by prorating. We found the relationship of total sales to total expense by dividing the latter by the former. The result was 3. Then we multiplied the sales for each department by 3 and secured the prorated amount of expense for each department.

This type of figure work is very common to all business. The proration can be either a dollars and cents proration or it can be based upon percentage or a combination of both.

Example: Railroad Proration

<i>Division</i>	<i>Mileage</i>	<i>Total Receipts</i>	<i>% Due Each</i>	<i>Amount Due Each</i>
A	423		.526775	\$5101.684
B	234		.291407	2822.204
C	146		.181818	1760.862
Total	<u>803</u>	<u>\$9684.75</u>	<u>1.000000</u>	<u>\$9684.750</u>

Note: Red figures are calculated figures.

Method Decimals: Upper Dials 0
Keyboard 8
Lower Dials 8

Step 1—First add the mileages to secure total mileage, 803.

Step 2—As previously described under Reciprocals, find the reciprocal for 803 which is .00124533.

Step 3—Set .00124533 on the keyboard and multiply by 423, mileage for Division A. Result in lower dials is .526775 or 52.6775% due Division A. Do not clear keyboard or dials.

Step 4—With plus and minus bars change 423 in upper dials to mileage for Division B. Result is .291407.

Step 5—Continue same routine for Division C. Having secured these percentages it is necessary to prorate the total receipts, 9684.75, on the basis of these percentages.

Step 6—Change decimal set-up to: Upper Dials 6
Keyboard 2
Lower Dials 8

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