

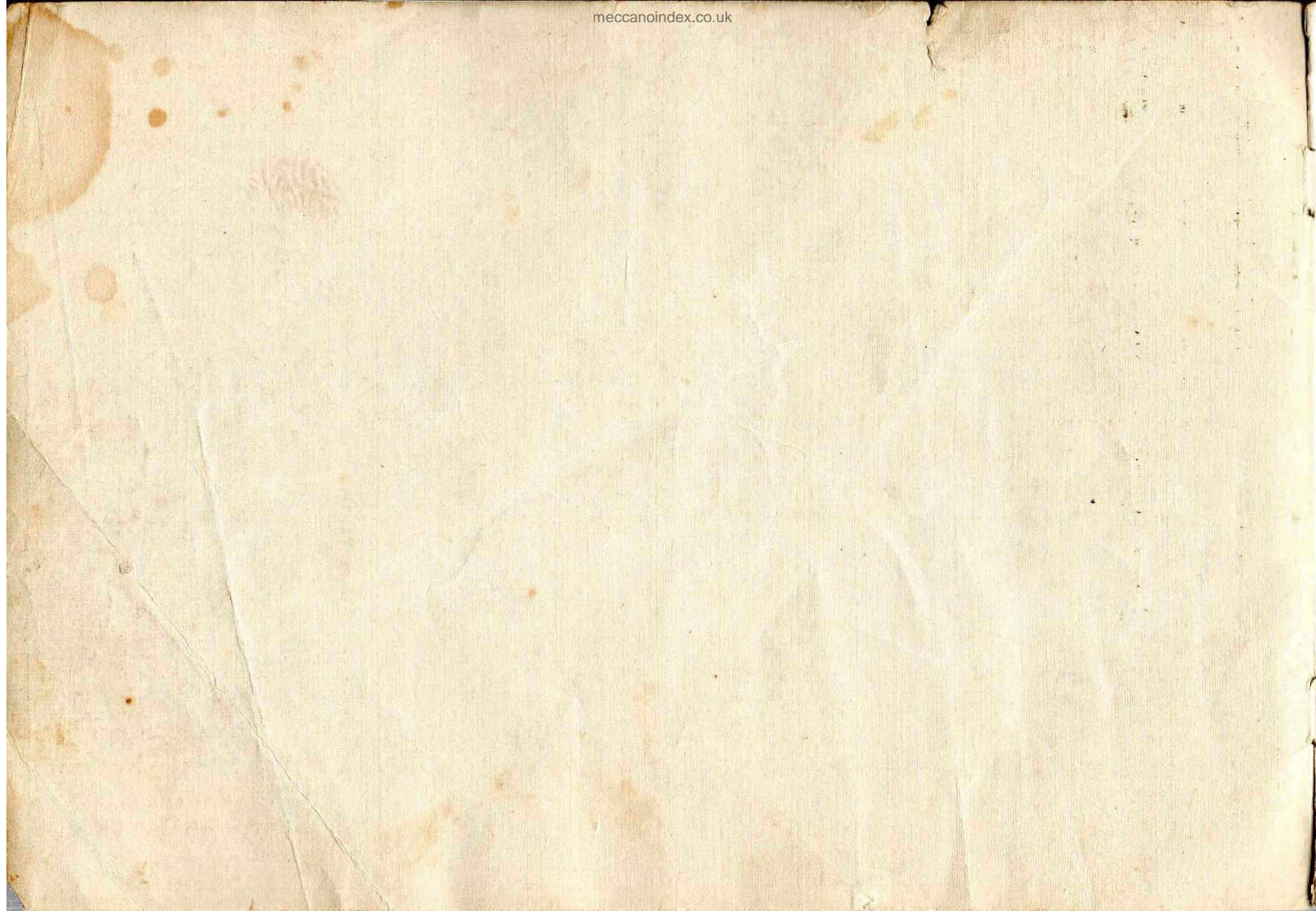
*The*  
***Meccanograph***  
*Manual of Instructions*

PRICE 25 CENTS

MECCANO CO., Inc.  
71 West 23rd St., N. Y.

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# INTRODUCTION

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## THE MECCANOGRAPH

Of the many thousands of models which Meccano builds none has attracted so much attention or excited so much interest as the Meccanograph. Many Meccano models interest young people only, but this is a model which has a charm for everyone. The Meccanograph is a machine which will make all the beautiful designs shown in this book and many, many thousands of others, of equal beauty. The way in which they are made is by making one of the simple adjustments to the machine which we shall describe later, pinning a sheet of paper down, fixing a pen or pencil in position, and turning the handle. Of course, as in all things, the more study and care you give it, the more beautiful and charming the design you will get, but the boy or girl does not exist who cannot instantly make designs with the Meccanograph, and the man or woman does not exist who cannot spend many hours of pleasure in producing exquisite and delicate designs with it.

## HOW THE MECCANOGRAPH IS MADE

The Meccanograph is made entirely from Meccano parts, and any boy who knows his Meccano will put it together in a few minutes. You will find a table of the parts required on Page 3, along with complete instructions for building the machine.

The beauty of many of the Meccanograph designs is greatly enhanced by the use of coloured inks, particularly where combination designs are made, or the spaces in the designs may be very artistically



filled in with colour. This, of course, develops any latent artistic ability, especially in children. A more serious application of the machine is the designing of doilies, crochet work, embroidery, etc., or for designing patterns for pottery, for decorative glass, etc. Such a machine, specially made, would cost hundreds of dollars, and even then it would probably not be so effective as the Meccanograph, the cost of which is trifling.

It is the standardization of the Meccano system which makes this and other machines possible, the equidistant holes, the design and dimensions of the parts, and its complete system of interchangeability. The accuracy with which the various parts are made is another important feature, without which the designs shown in this Manual could not be produced.

### HINTS TO MECCANO DESIGNERS

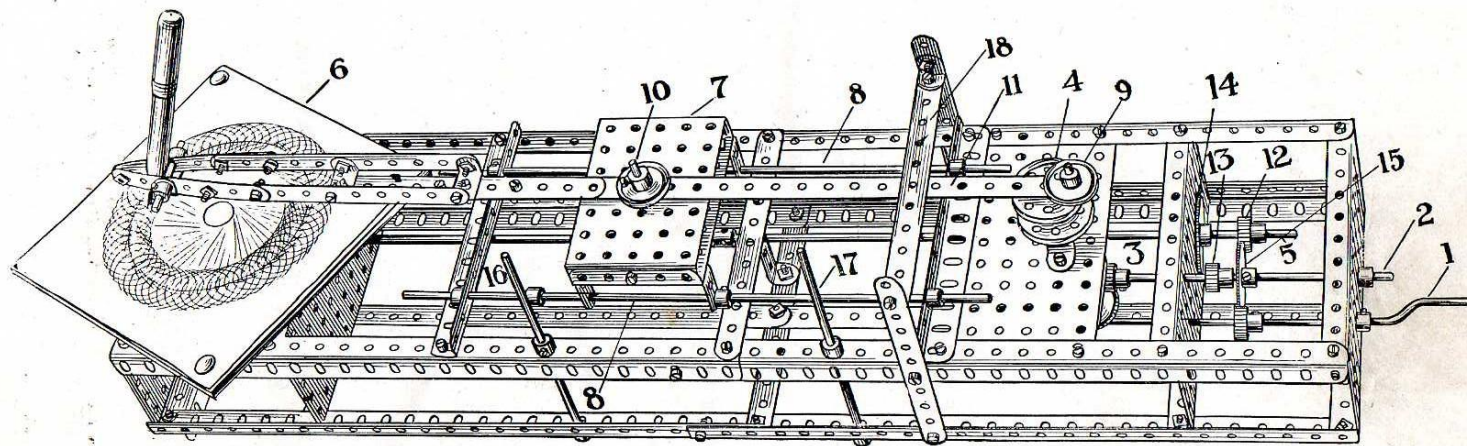
You can, of course, make your designs with a lead pencil, but the drawback of this is that the pencil wears blunt, and the line gets thicker as you go along. The best method is to use a fountain pen with a fine hard nib. You can use any coloured ink, but it should be clear writing fluid with no sediment. The holder in the machine is designed to take the pen at a natural angle for writing, and if you adjust it properly with the point resting lightly on the paper, there will be no wobble or side movement.

Oil all the working parts before starting, and see that the carriage moves very easily along the rods, otherwise you will not get even designs.

The best paper to use is one of good quality, with a smooth, hard surface.



# THE MECCANOGRAPH



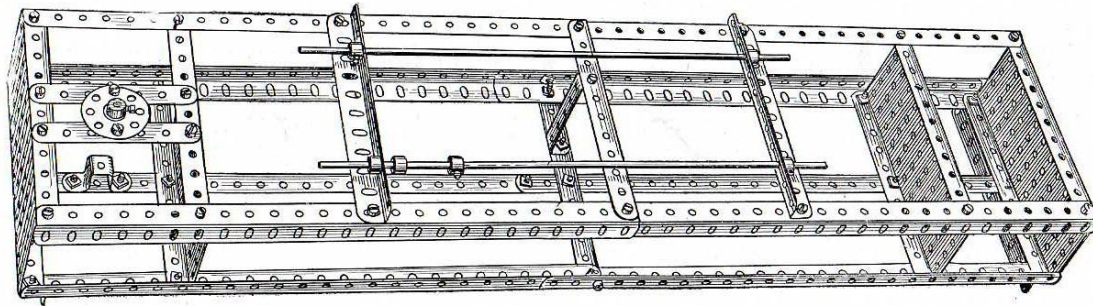
## PARTS REQUIRED TO BUILD THE MODEL

4 of No. 1	3 of No. 11	1 of No. 16	2 of No. 24	1 of No. 28	5 of No. 52
9 " " 2	2 " " 12	3 " " 17	2 " " 25	1 " " 32	2 " " 53
4 " " 3	4 " " 13	1 " " 19	2 " " 26	71 " " 37	18 " " 59
8 " " 8	3 " " 14	2 " " 21	1 " " 27	2 " " 45	1 " " 60
4 " " 9	1 " " 15a	2 " " 22	2 " " 27a	2 " " 46	2 " " 63



## HOW TO BUILD

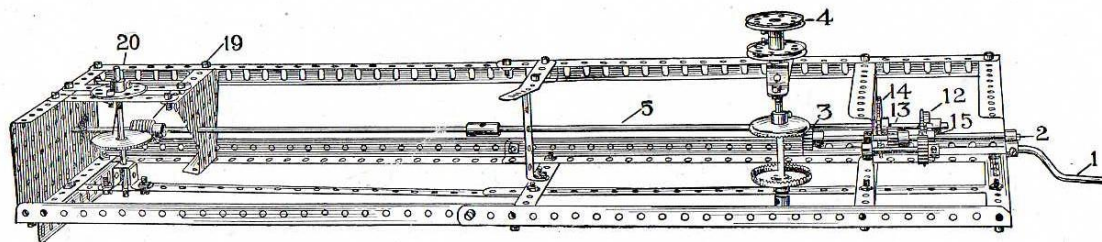
**FRAMEWORK**—We have here illustrated the framework, which should be built first. No difficulty will be found as the figure shows clearly every detail. After this has been accomplished the large rectangular plate supporting the crown head should be bolted in position. Then proceed to attach the uprights supporting the bridge 18 to the sides of the framework.



**GEARING**—The crank handle 1 is geared by a  $\frac{3}{4}$ -inch pinion (25 teeth) and a  $1\frac{1}{2}$ -inch gear wheel 15 (50 teeth) to a shaft 2. At the end of this shaft is secured a  $\frac{1}{2}$ -inch pinion (20 teeth) 3 engaging a large contrate wheel on a  $4\frac{1}{2}$ -inch vertical spindle operating the crown head 4. The gear (56 teeth) 14 and pinion (20 teeth) 13 are also included in the model, the functions of these being explained later. The shaft 5, which is also geared by a  $\frac{3}{4}$ -inch pinion 12 (25 teeth) to the gear wheel 15 rotates the table 6 by means of a worm wheel 19 engaging a 56 tooth wheel 20 on a 3-inch vertical spindle (see opposite page).



**CROWN HEAD**—The crown head 4 is formed of two  $1\frac{1}{2}$ -inch pulley wheels adjusted so that the holes of the top wheel are opposite to those of the bottom wheel to permit of the crown head pin passing through both of them. A collar and set screw is placed between the lower wheel and the double bent strip, so that the top of the crown head may be in adjustment with the arm 11.



**TABLE**—The table can be conveniently made out of thin wood, such as a cigar box lid, cut to the required dimensions, 5 inches square. It has a bush wheel screwed on the under side, and is secured on the upright spindle by the set screw of this wheel.

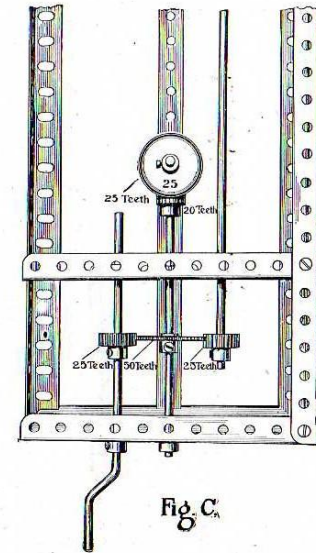
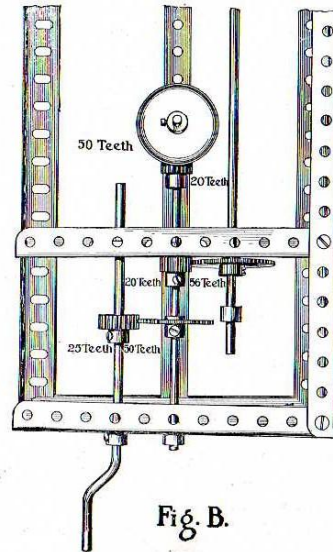
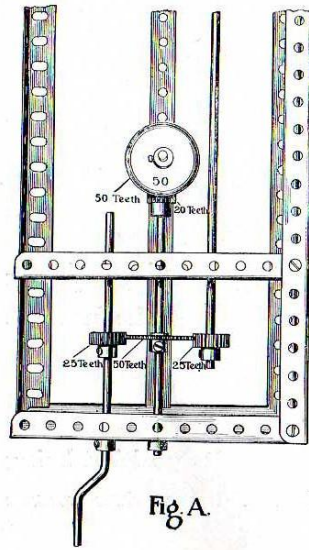
**CARRIAGE**—The carriage 7 slides along the rods 8, or is secured to them by collars and set screws, its position being decided by the adjustment of the arm 11 according to the designs to be produced (see transverse movement).



**ARM**—The arm 11 is formed of two  $12\frac{1}{2}$ -inch strips bolted together on which a  $5\frac{1}{2}$ -inch strip overlapped 7 holes is fastened. The holder is connected to this  $5\frac{1}{2}$ -inch strip by means of double brackets. The near end of the arm 11 slides between two  $5\frac{1}{2}$ -inch strips 18, which are spaced with washers to permit a free movement. To overcome any slack movement of the arm when working, thin rubber bands are passed around it and connected with upright rods 16 and 17. Care should be taken to see that all parts of the model work smoothly, and that no jolting takes place, otherwise the lines of the design will be uneven.

### HOW TO OPERATE

**GEARING**—To produce the designs various combinations of gearing are necessary. These are here illustrated, and will be referred to by letters as follows: Fig. A, Fig. B, Fig. C. Combined with these gearings, it is also necessary to have either a slideable movement, or a transverse movement of the arm 11.





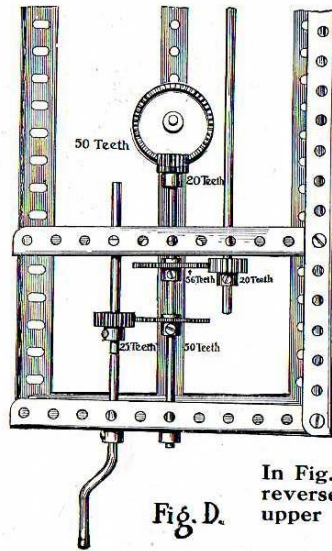


Fig. D.

In Fig. D the contrate wheel is reversed, the teeth being on the upper side as in the illustration.

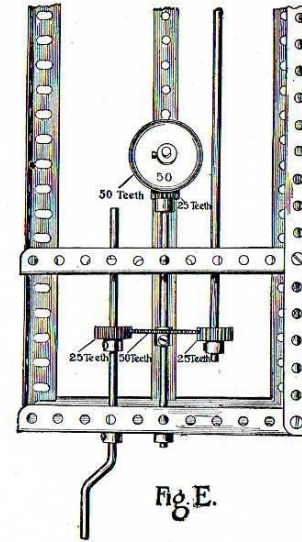


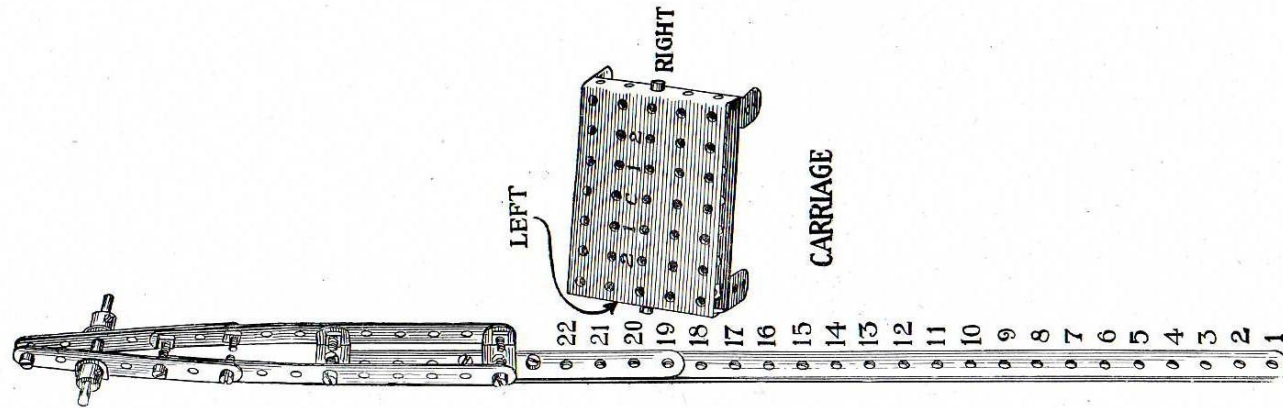
Fig. E.

**SLIDEABLE MOVEMENT**—The slideable movement requires the carriage 7 to slide along the rods 8, whilst the near end of the arm 11 is secured by the pin 9 in the hole according to the formula.

**TRANSVERSE MOVEMENT**—The transverse movement requires the carriage to be secured to the rods 8 by collars and set screws, whilst the arm is moved transversely by the operation of the pins in crown head. The position of the carriage is regulated by the number of the holes given in the formula for the particular design. First attach the arm to the carriage by putting the pin through the required hole in the arm, move the carriage until the given hole (near end of the arm) is at the centre hole of the bridge 18, then fasten the carriage as above.

**CARRIAGE**—In the following illustration the transverse holes are numbered from the centre to the right, and to the left, for the purpose of arranging a formula. No change in the design is effected by inserting the pin 10 in any of the central longitudinal holes for a slideable movement; but for a transverse movement both the longitudinal and transverse holes affect the design. It is not necessary to change the position of the carriage each time, provided that the number of the arm holes is within the range of the carriage holes. It is very important to observe this when two movements are necessary to complete a design.





**ARM**— In this illustration the holes are also numbered for use in the Formula.

**THE PEN**— A fountain pen should be used and should not protrude through the holder further than to touch the paper lightly. After being placed in position it should be gripped by screwing up the end nut and bolt. It is to be noted that a double bracket is threaded on to the small rod to keep the pen in position.

**CROWN HEAD**— In a slideable movement only one pin (2-inch rod) is required to pivotally secure the arm to the crown head and this may be inserted in any hole at the commencement of a design, but if it is desired to change the pin in the same design to another hole, it is to be moved clockwise and the number of the hole to which the pin is to be changed should be counted from, and to include, the one from which the design was first commenced. In a transverse movement several pins may be required to be inserted in the crown head for one operation, and in such cases will be represented in the formula as H 1, 3, 5, or as the case may be. The number of the holes in which these pins are to be inserted are to be counted from the first pin. When such an expression as H 1-3 occurs in the formula of a design made by the slideable movement, it means that after the first part has been made with the crown head pin in hole 1 of the crown head (any hole you commence with is hole 1), the pin is then removed into hole 3 and the second part of the design completed.



**FORMULA—** Having described the functions of the various elements, we will now proceed to state the manner of producing designs as follows: S. A. 5-16.

This means that the design is produced by a sliding movement with Fig. A gearing, and the crown head pin 9 placed through the fifth hole of the arm, and the carriage pin 10 in the sixteenth hole of the arm. When it is required to move the arm one hole to the right of the centre hole of the carriage to produce another design it will be described as follows: S. A. 5-16 R. 1

or if to the left: S. A. 5-16 L. 1

A transverse design will be described in the following manner: T. A. 10-16 H. 1

This means that the carriage requires to be secured on the rods 8, with the hole 10 of the arm immediately at the centre hole of the bridge 18, and the carriage pin 10 inserted in hole 16, and a pin secured by a collar and set screw in hole 1 of the crown head to cause the arm to move transversely. (Any hole you commence with is hole 1.)

**CIRCLES—** These may be formed to any size within the limits of the paper by inserting pin 9 through the arm and central hole of the bridge, and pin 10 through the arm and necessary hole in the carriage, or by clamping the arm between the bridge by means of a nut and bolt at the side of the arm. The arm is to be perfectly rigid, and the circle is produced by merely turning the handle, which will cause the table to revolve.

**RUBBER BANDS—** When a slideable movement is to be produced, the rubber bands should be placed round the arm both before and behind the carriage to give uniformity of design, but when a transverse movement is being produced they should be placed around the arm behind the carriage.

**LETTER FORMULA—** S—Slideable Movement

T—Transverse Movement

A—Combination of gearing, Fig. A. (See gearing

B—Combination of gearing, Fig. B. illustrations)

C—Combination of gearing, Fig. C.

D—Combination of gearing, Fig D.

E—Combination of gearing, Fig. E.

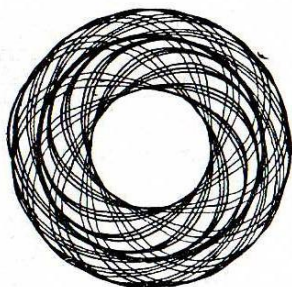
H—Crown Head

R—Right of Central hole (see Formula)

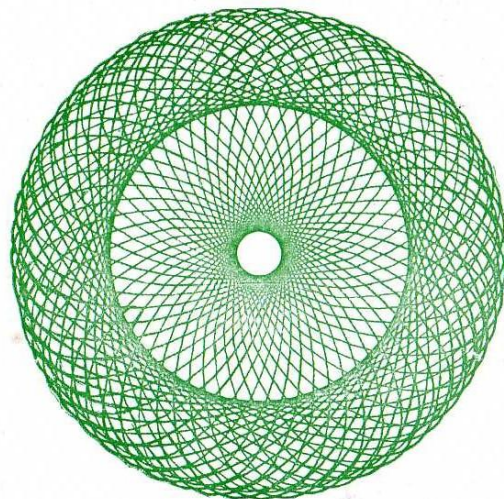
L—Left of Central hole

Rev.—Indicating revolutions

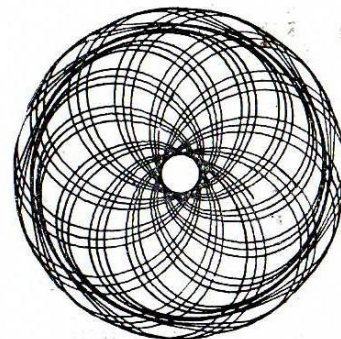




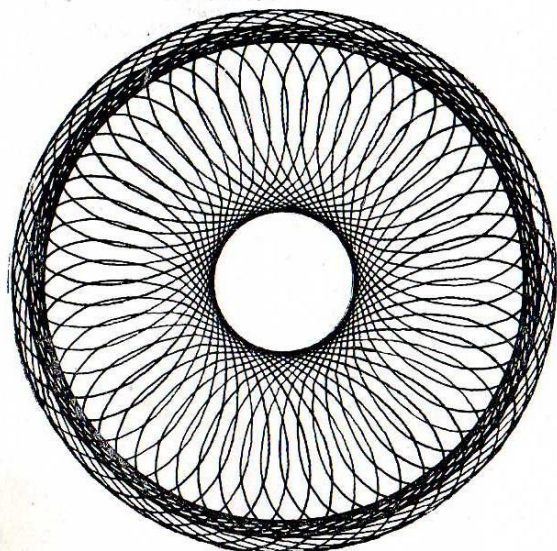
S. A.  
No. 1. 5-19 Rev. 3



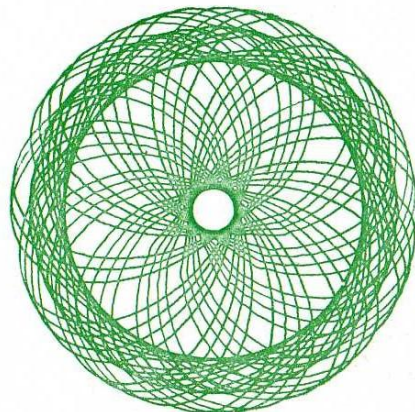
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No. 2. 6-15



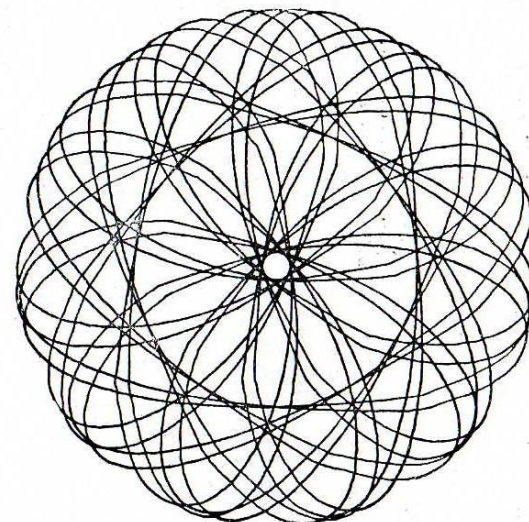
S. A.  
No. 3. 6-20 Rev. 3



S. A.  
No. 4. 7-17

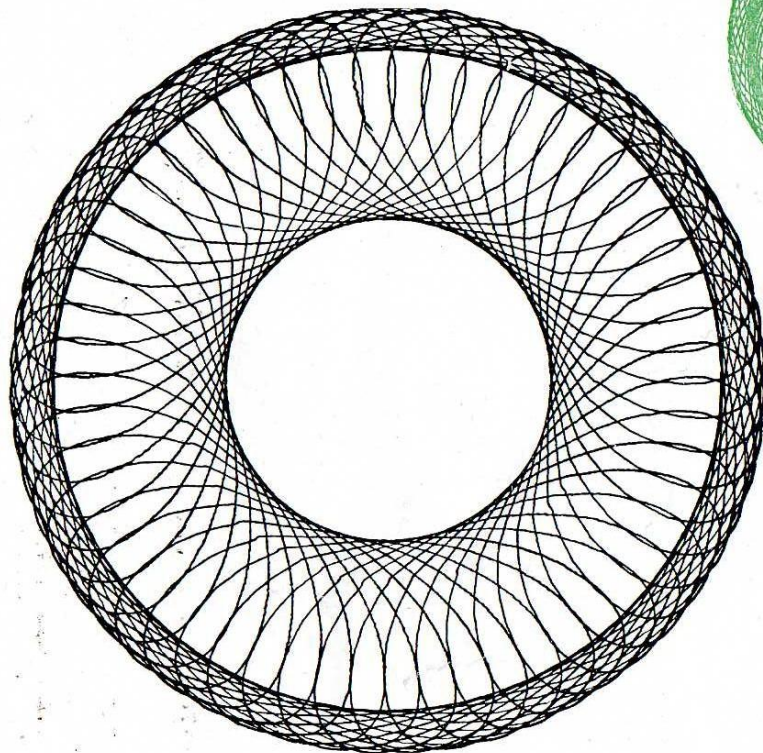


S. A.  
No. 5. 6-17 Rev. 4

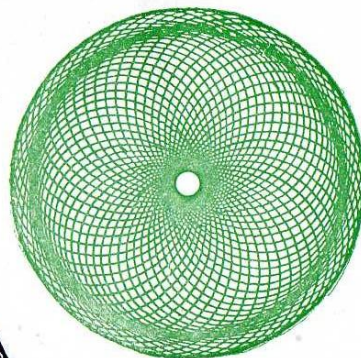


S. A.  
No. 6. 6-14 Rev. 2

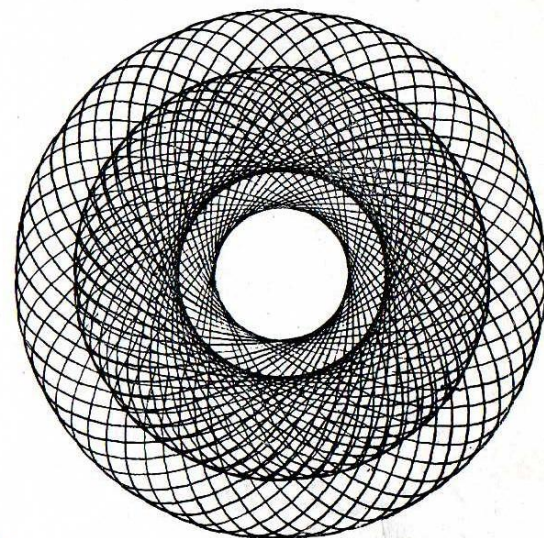




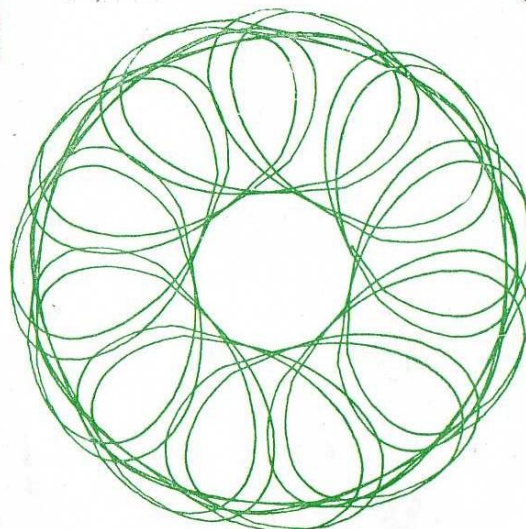
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No. 7. 8-16



S. A.  
No. 9. 6-20

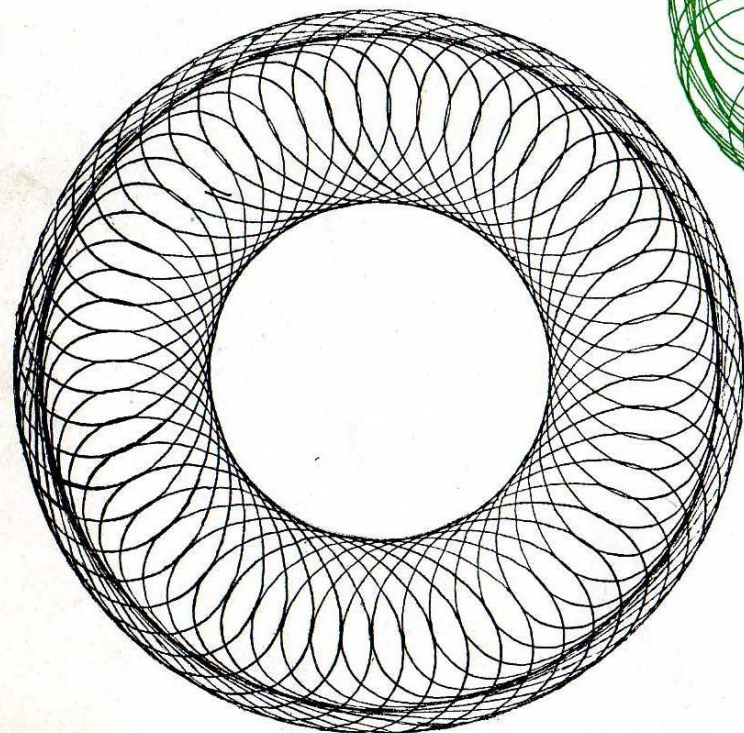


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No. 10. 5-14

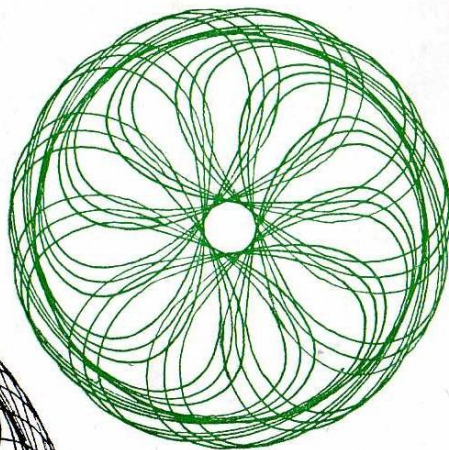


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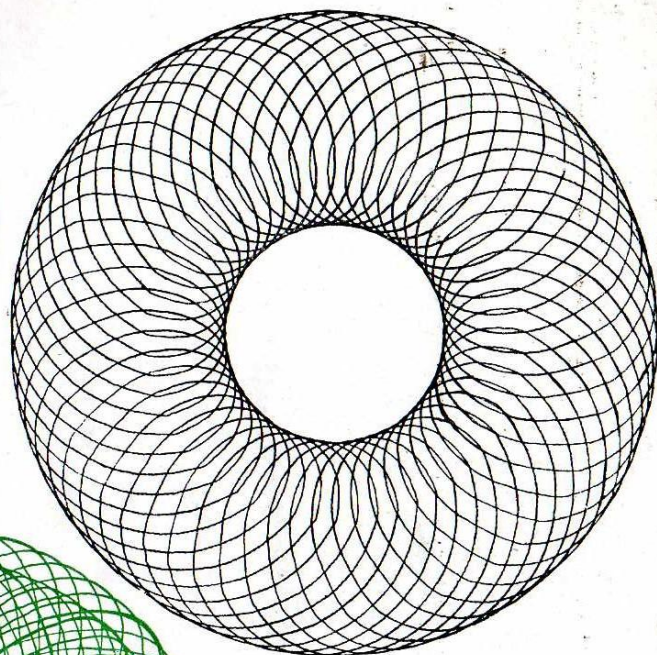




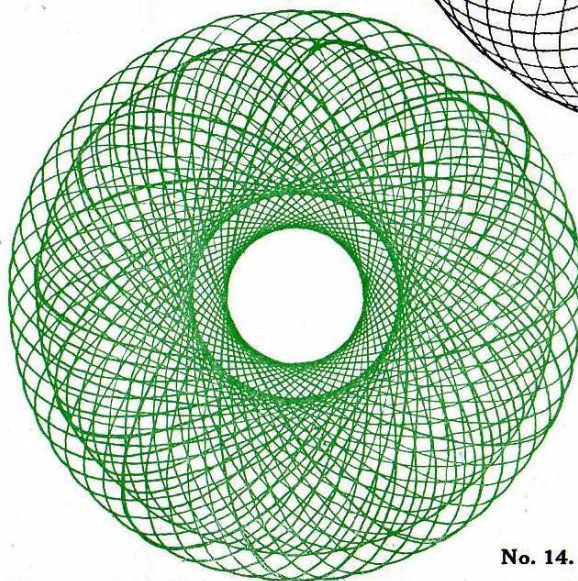
S. A.  
No. 12. 8-18



S. A.  
No. 11. 4-16 Rev. 3



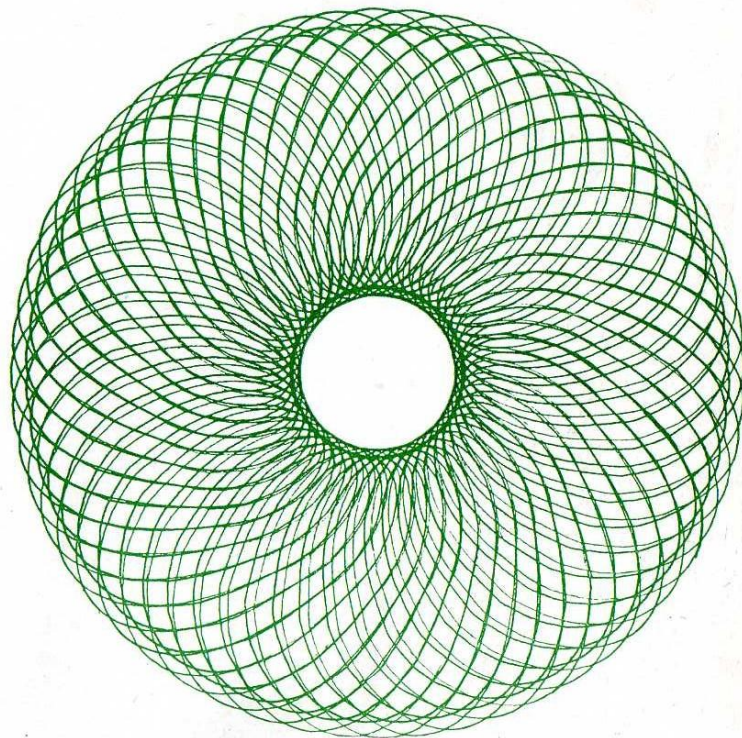
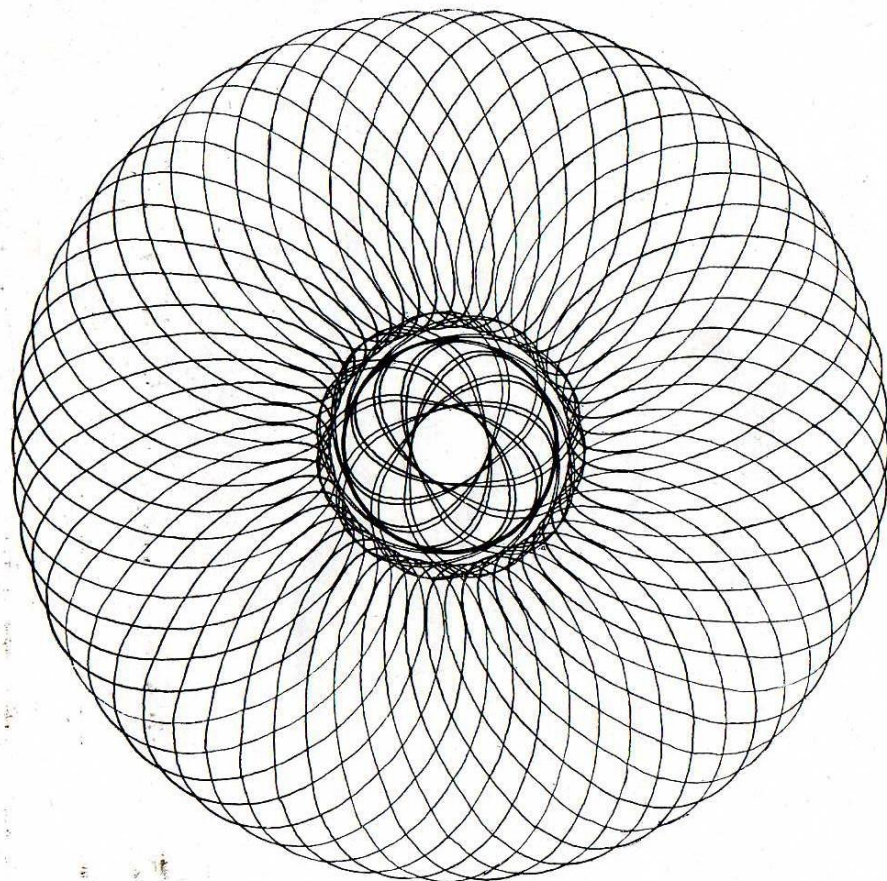
S. A.  
No. 13. 5-13



S. A.  
No. 14. 5-20  
1 L.

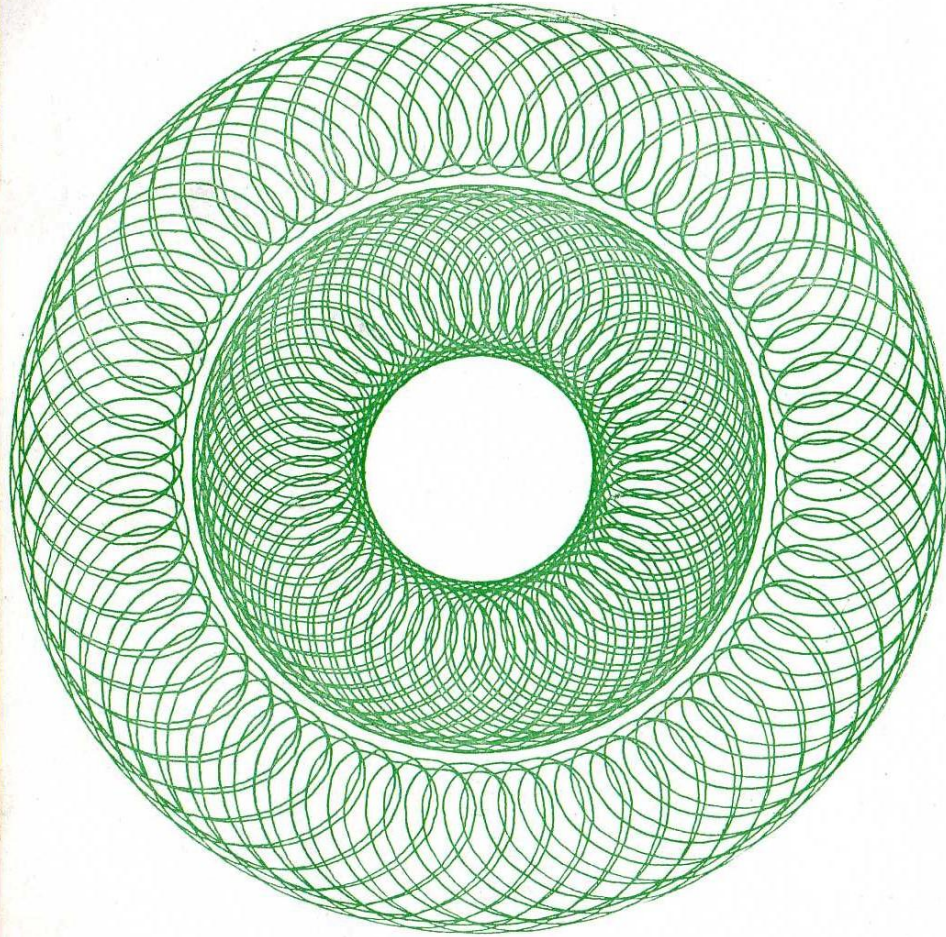


S. A.  
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5-18 2 Rev.



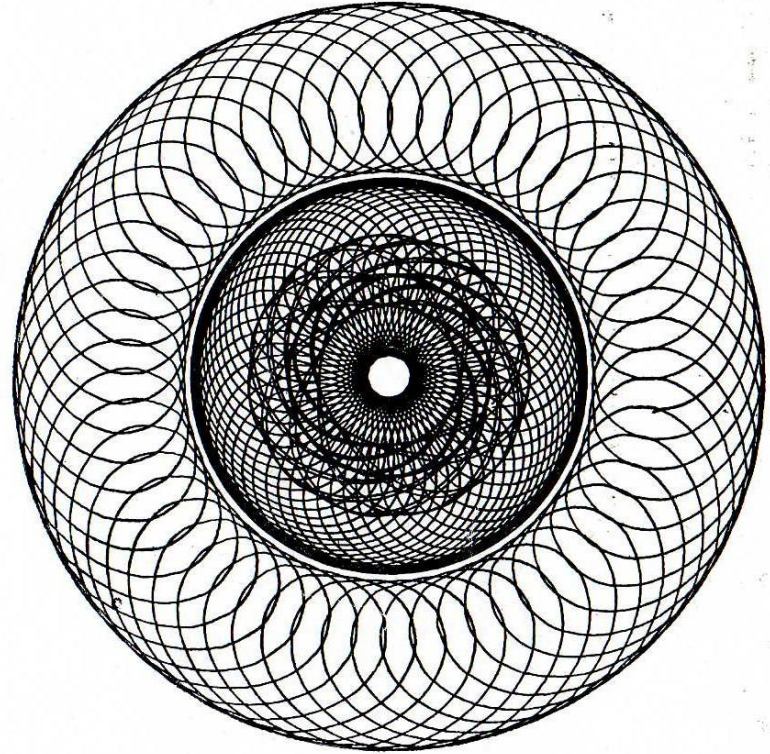
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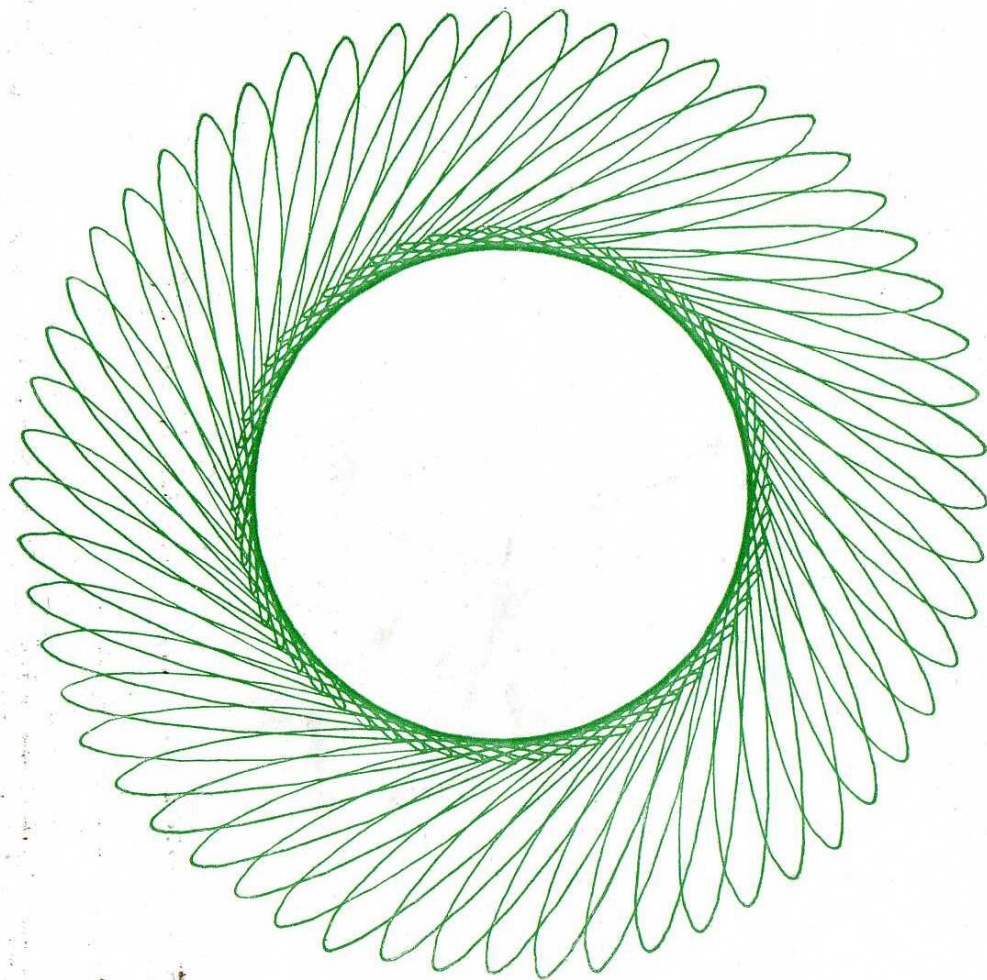


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3-20 H. 1-8

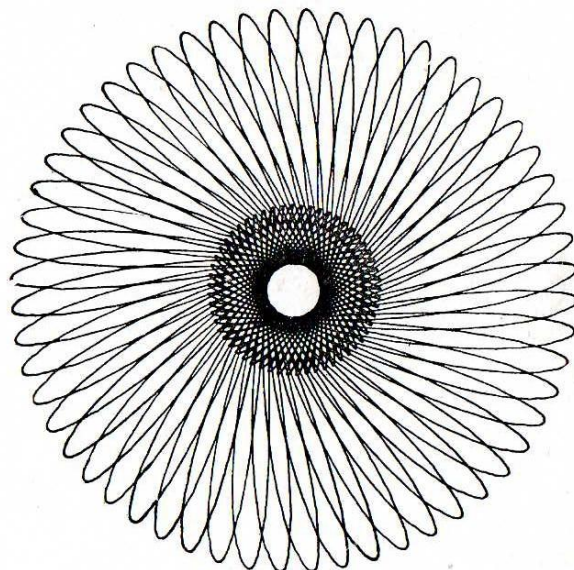
S. A.  
No. 19. 2-18  
4-18  
5-19 Rev. 2



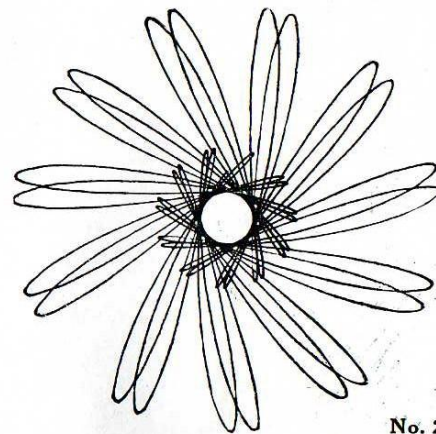




T. A.  
No. 23. 13-16 H. 1

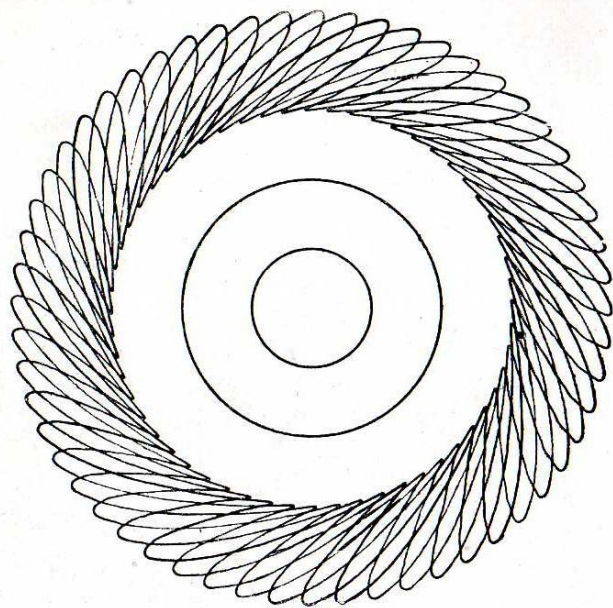


T. A.  
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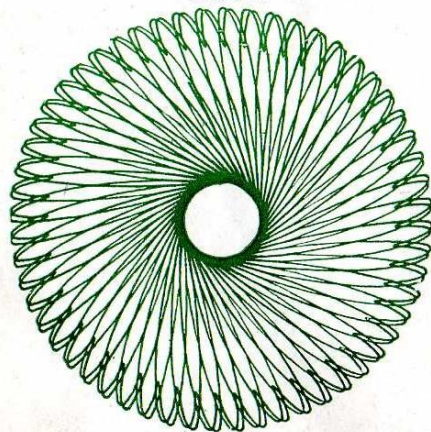


T. A.  
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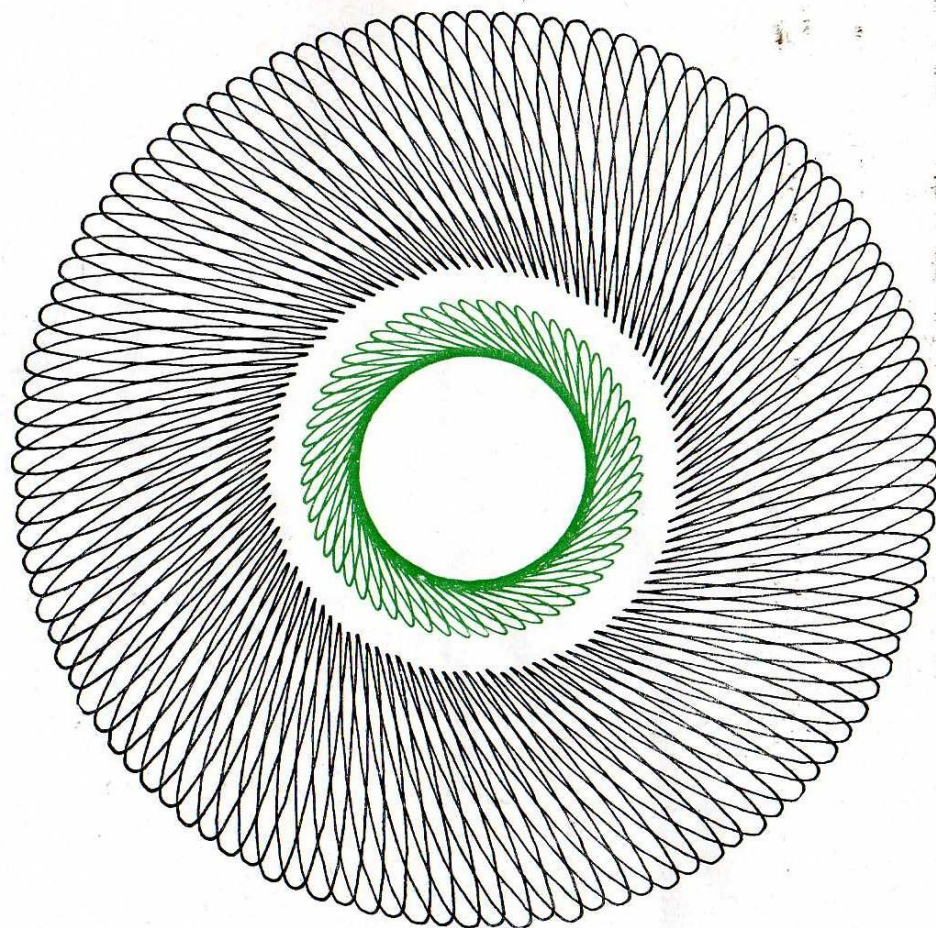




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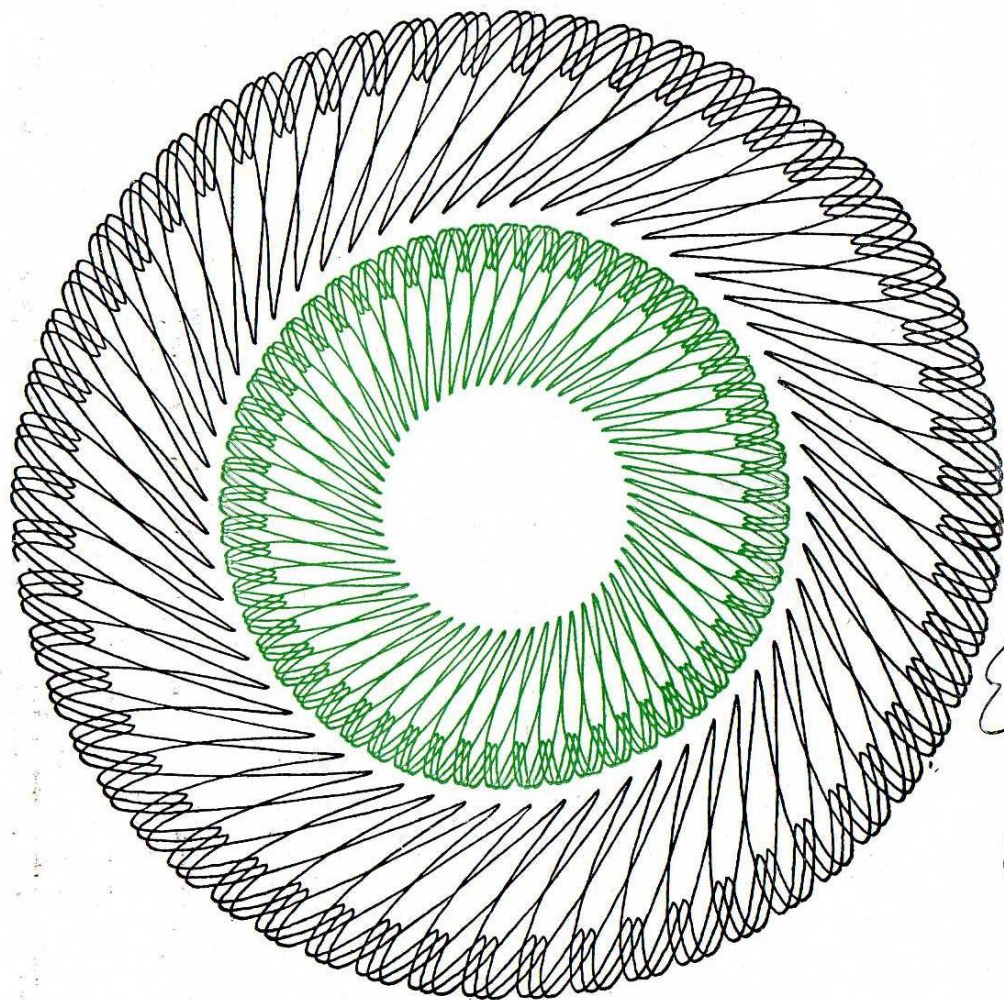


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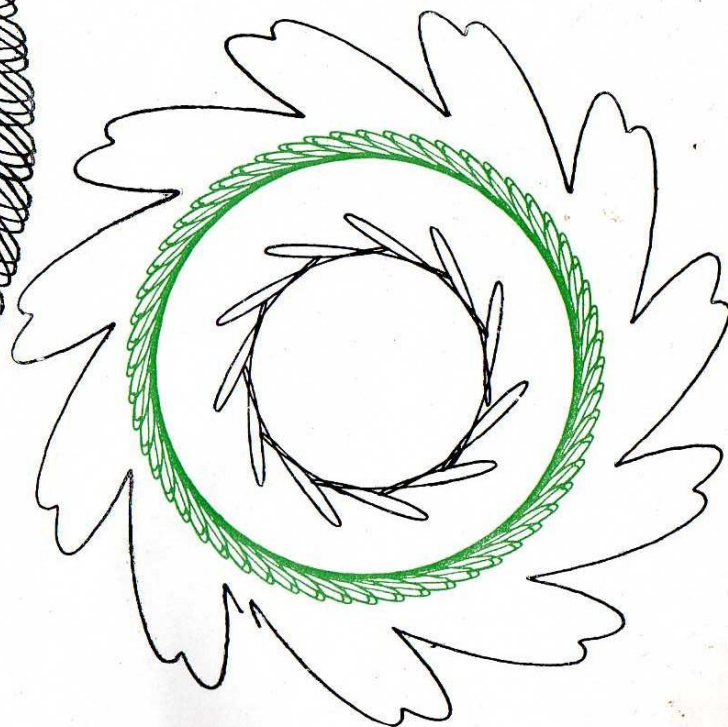
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9-21 H. 1



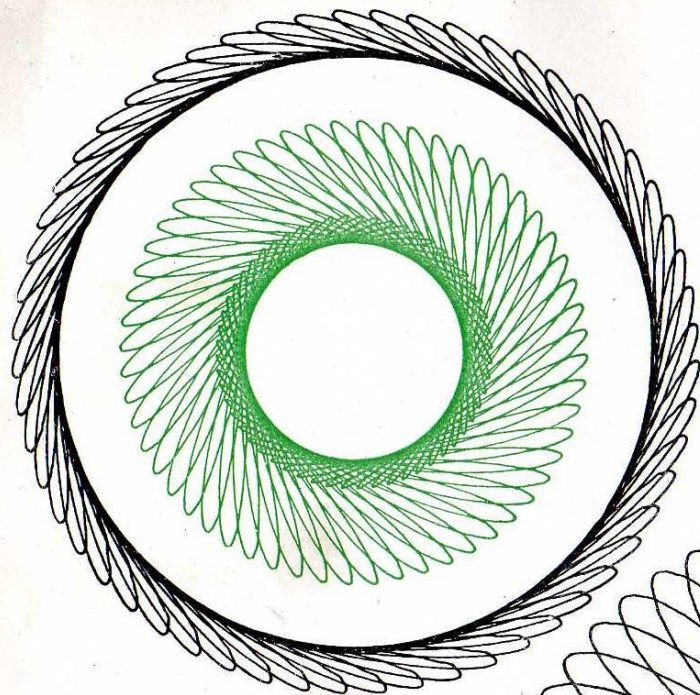


T. A.  
No. 26. 13-16 H. 1 3-6  
11-17 H. 1 3-6

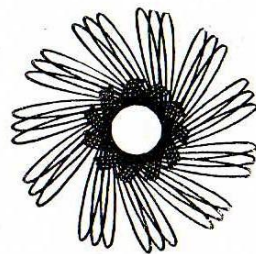
T. A.  
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8-21 H. 1-3  
9-22 H. 1 Rev. 1



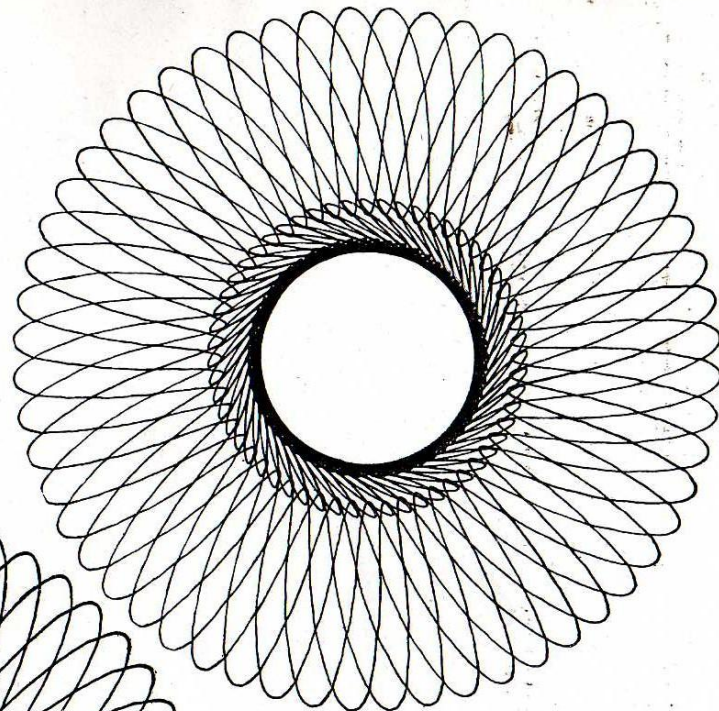




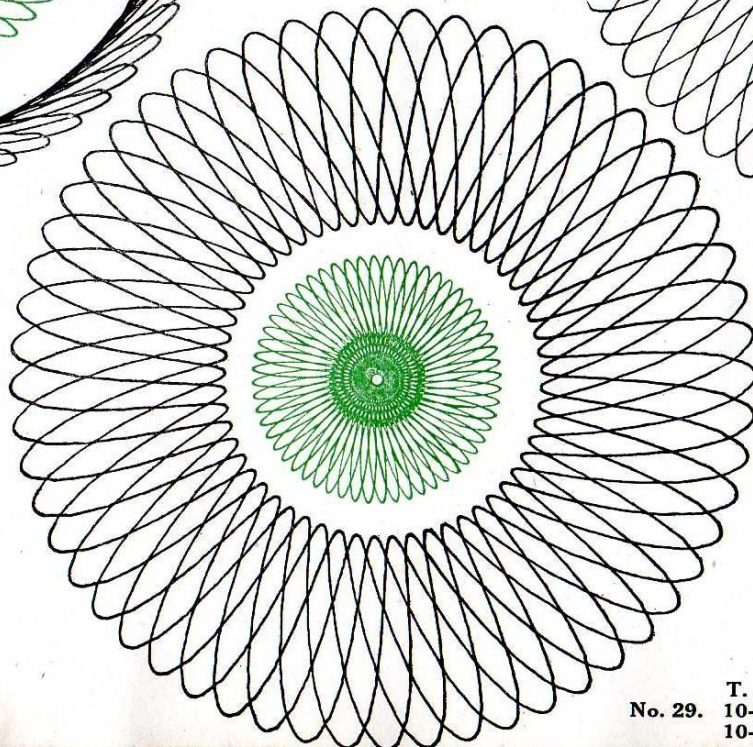
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7-17 H. 1  
9-17 H. 1



No. 31. T. A.  
10-22  
H. 1 Rev. 3

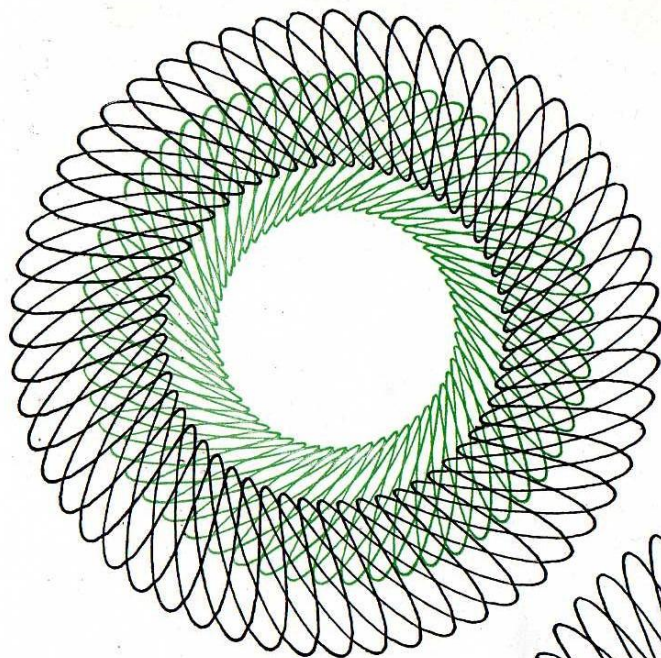


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9-21 H. 1



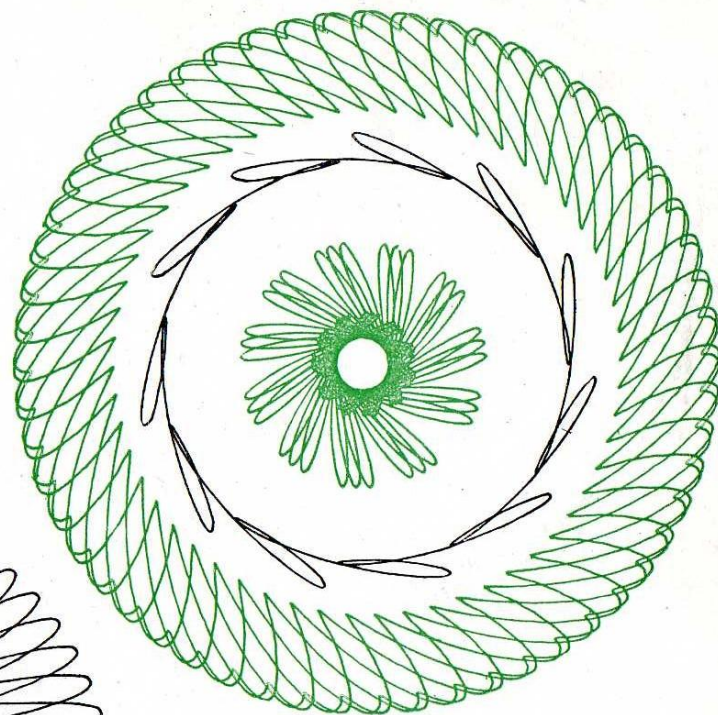
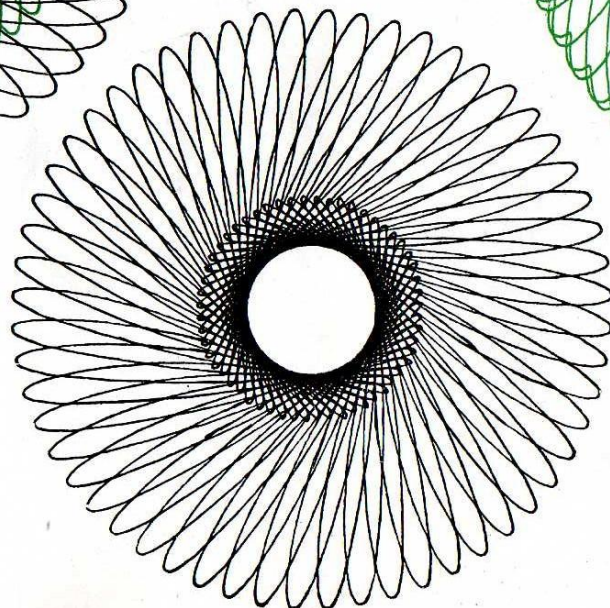
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10-22 H. 1





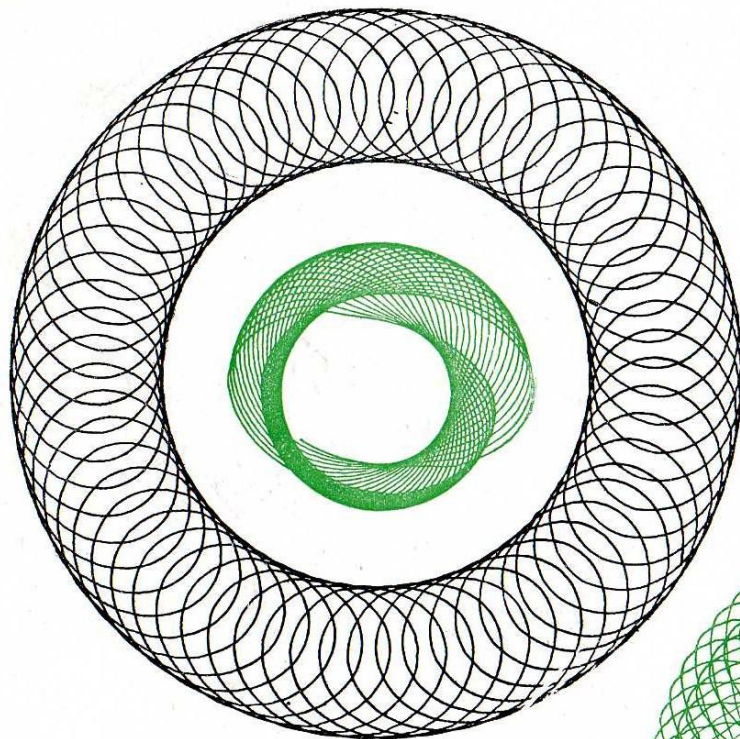
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9-21 L. 1 H. 1

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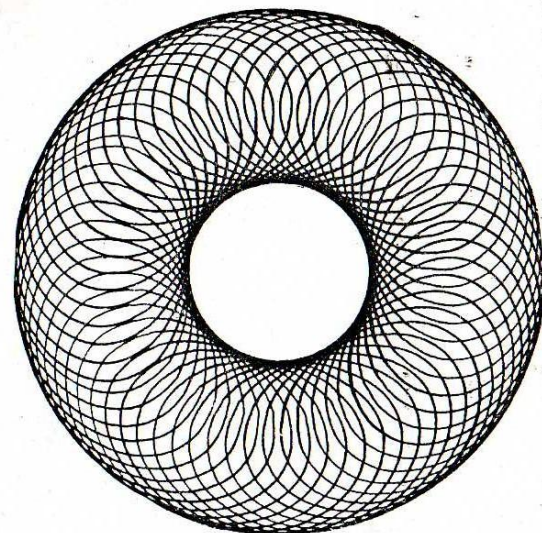


T. A.  
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8-21 H. 1 Rev. 1  
10-22 H. 1 Rev. 3

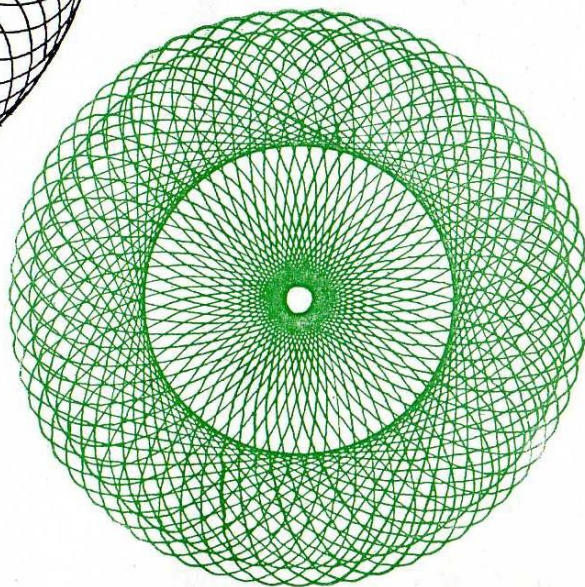




No. 36. S. B.  
5-18  
2-18

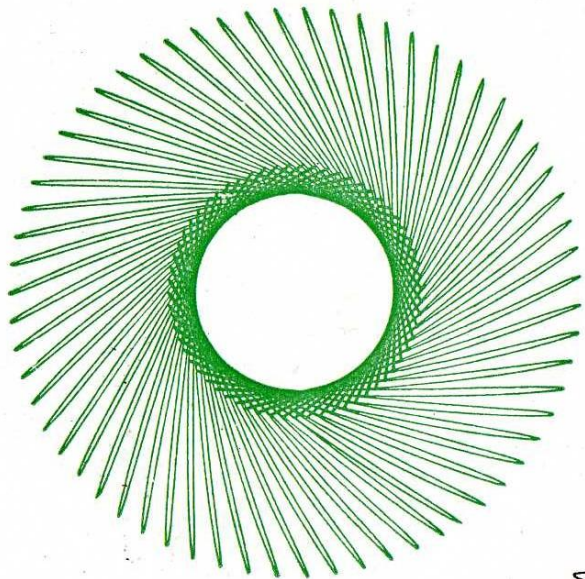


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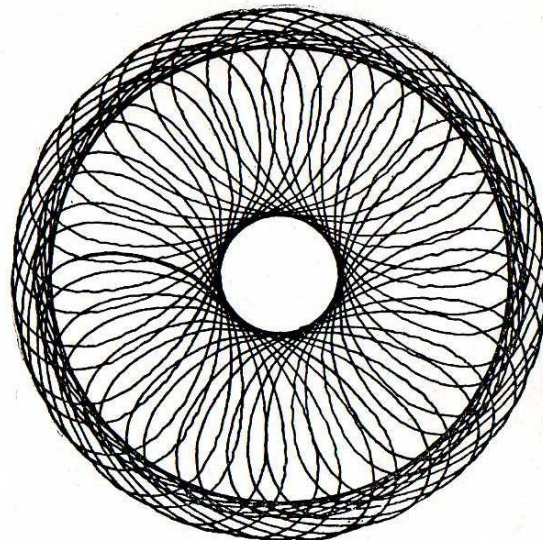


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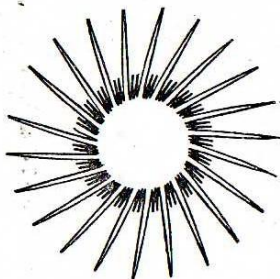




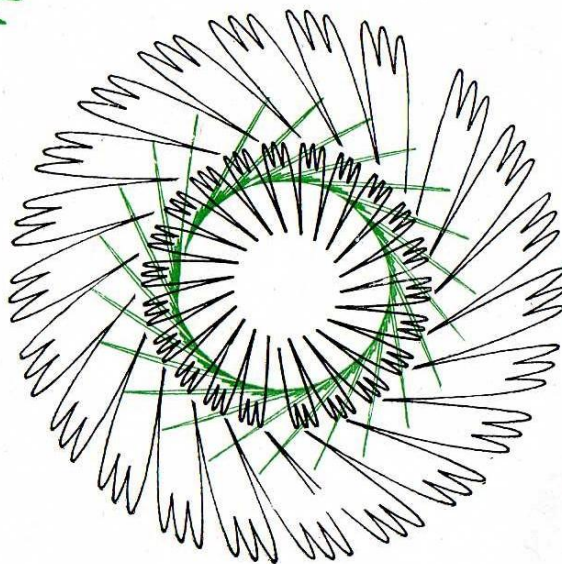
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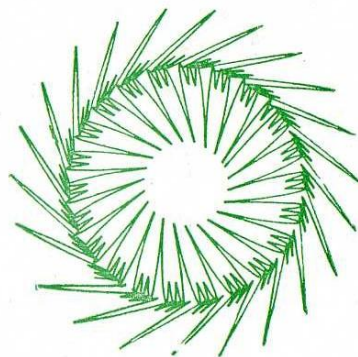
S. C.  
No. 41. 7-17



T. C.  
No. 42. 10-21 H. 1-3-5  
Rev. 1

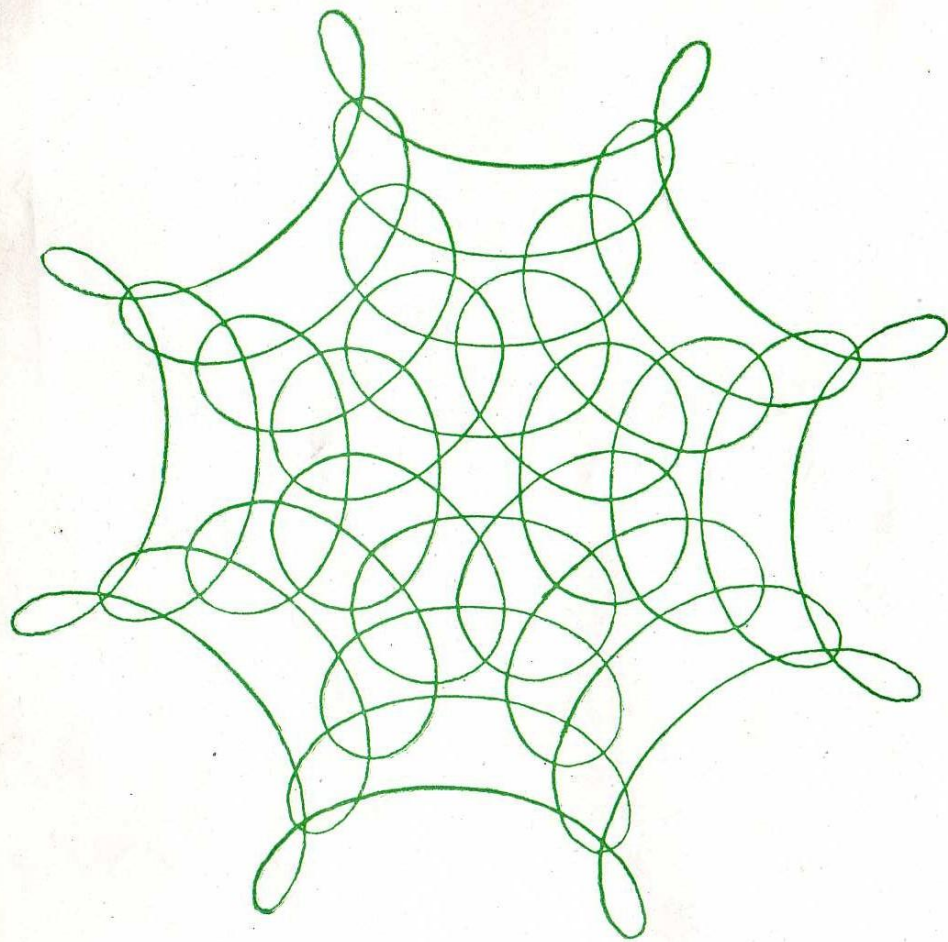


T. C.  
No. 43. 9-16 H. 1-3-5  
9-16 H. 1-3-5 R. 1  
10-21 H. 1-3-5

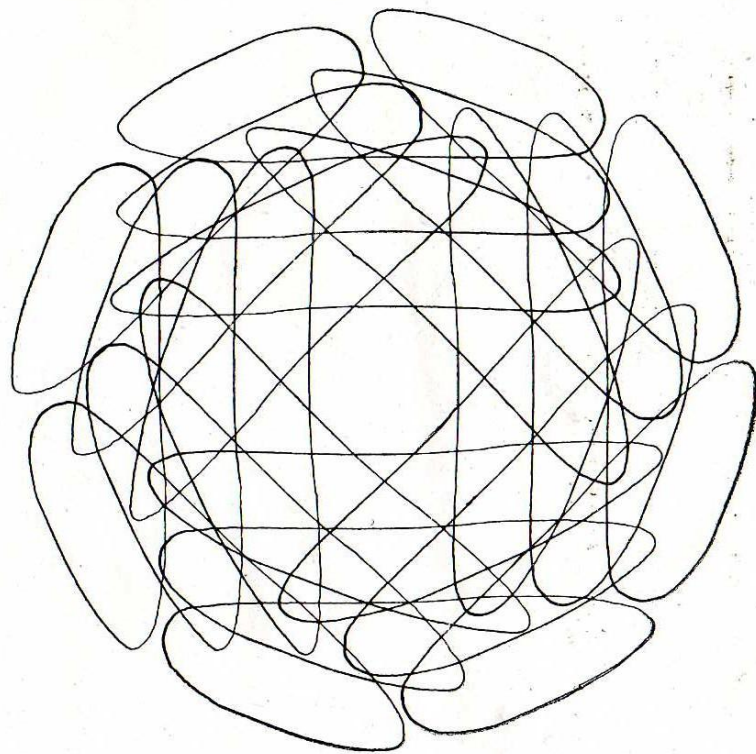


T. C.  
No. 44. 9-21 R. 1 H. 1-3-5  
10-21 H. 1-3-5



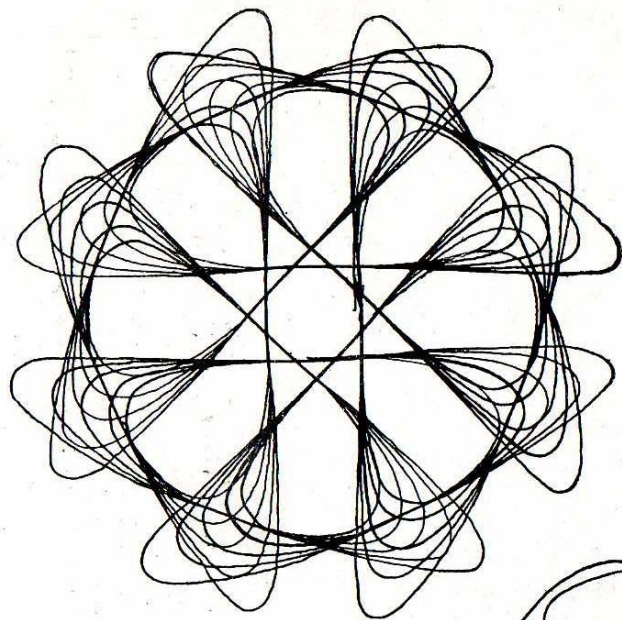


No. 45. S. D.  
1-20  
2-20  
3-20  
4-20

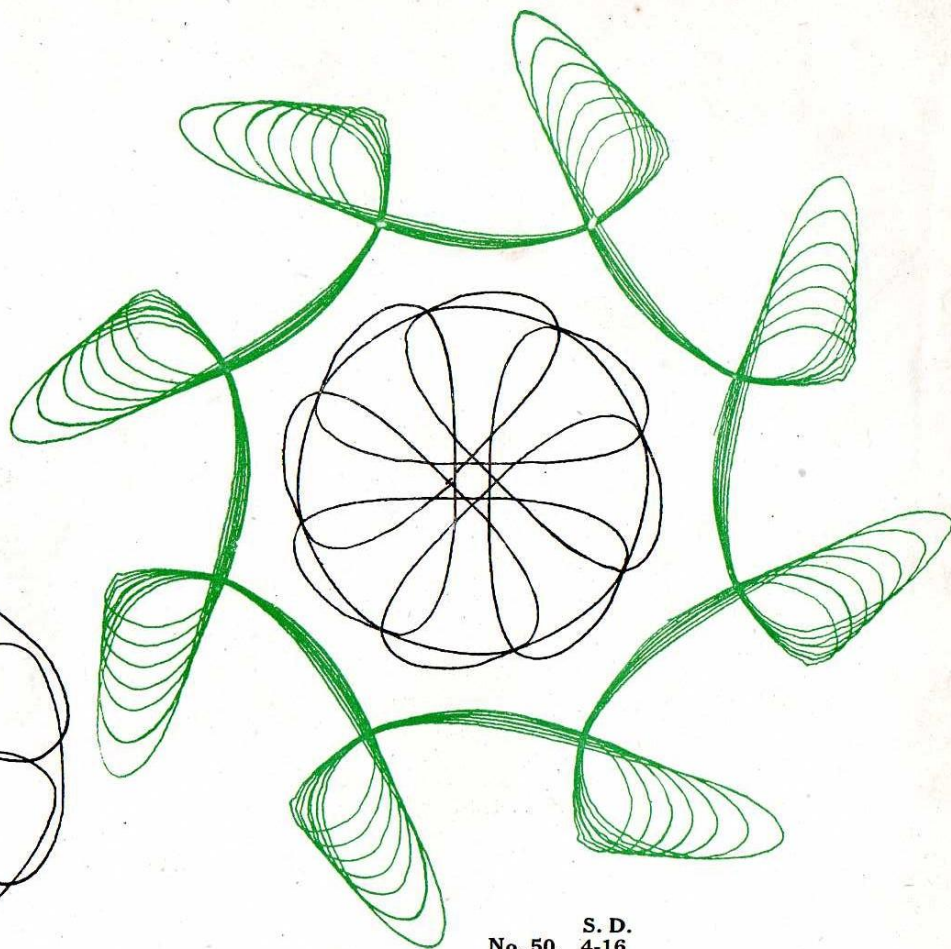


No. 46. S. D.  
2-12  
3-12  
4-12

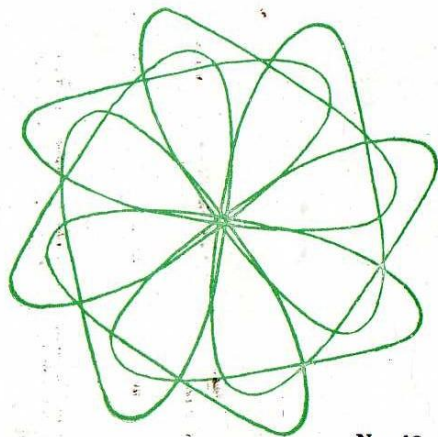




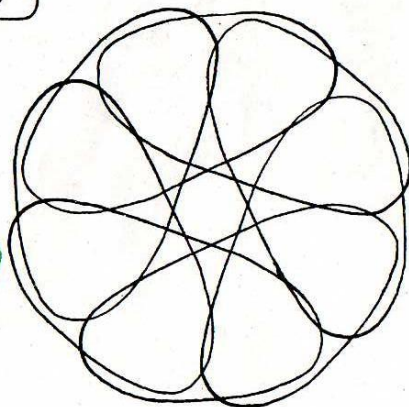
No. 47. S. D.  
4-12  
4-13  
4-14  
4-15  
4-16



No. 50. S. D.  
4-16  
2-15 L. 1  
2-16 L. 1  
2-17 L. 1  
2-18 L. 1  
2-19 L. 1  
2-20 L. 1  
2-21 L. 1

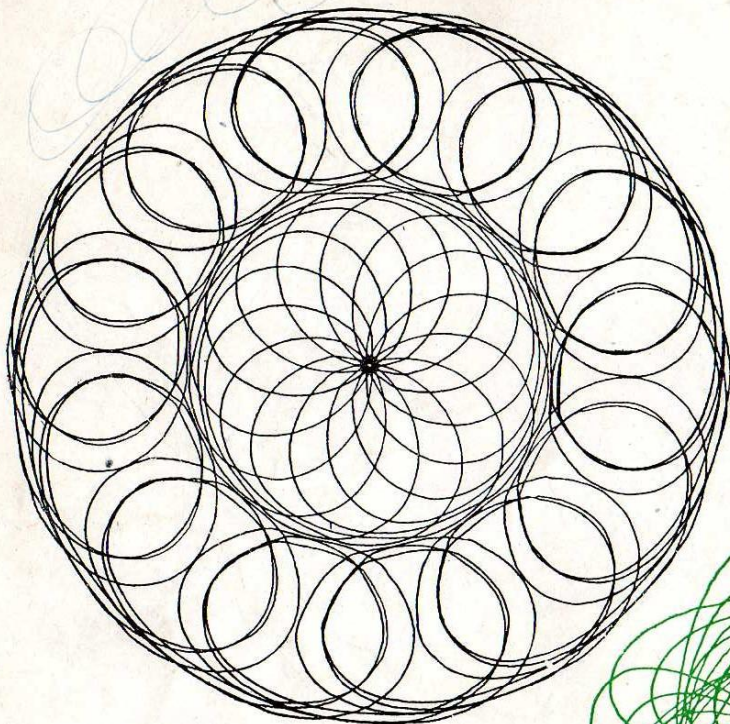


No. 48. S. D.  
6-16



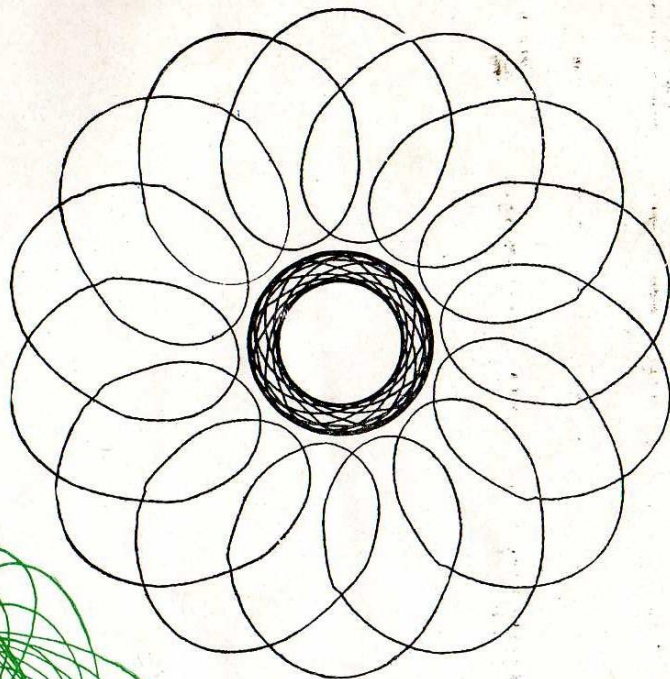
No. 49. S. D.  
4-16



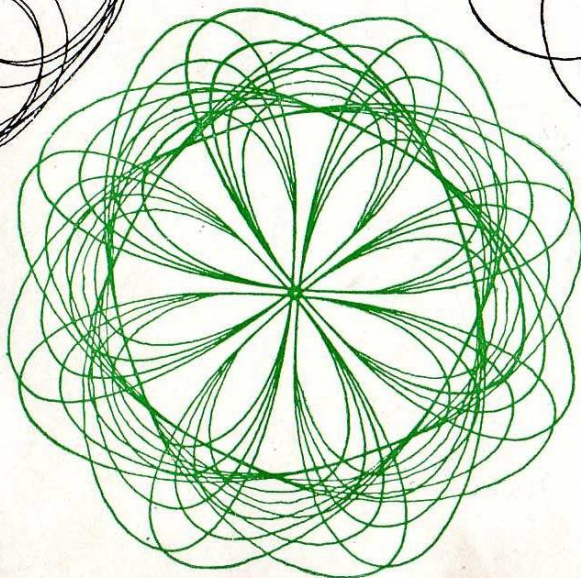


No. 51. S. E.  
6-20  
8-20 H. 1-2-7

No. 52. S. E.  
4-12  
4-13  
4-14  
4-15



No. 53. S. E.  
6-20 L. 1  
5-22









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*The*  
***Meccanograph***  
*Manual of Instructions*