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THIRTY VOLUMES

VOLUME TWENTY-ONE

PRACTICAL AND AVAILABLE MEANS OF DEVELOPING EXACTNESS AND SKILL BOTH MENTALLY AND PHYSICALLY. THE CULTIVATION OF QUICK AND ACCURATE DECISION AND THE GROWTH OF CONSCIOUS POWER AS ESSENTIAL ELEMENTS OF SUCCESS

"Men, my brothers, men the workers, ever reaping something new." TENNYSON.

"Patient training is a necessary ingredient of genius."

"The secret of success is constancy to purpose." DISRAELI.

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VOLUME XXI

MECHANICAL DRAWING

THE object of all forms of drawing, whether it be the picturing of scenes from nature, the portrayal of human form and expression, or merely the production of a plan to guide a workman in his work, is the representation of objects by means of lines, or lines and shades, drawn on plain surfaces. Drawing done with the free hand, without a guide for the pencil or brush, is known as "free-hand" or artistic drawing. Its special object is the production of drawings that shall please the eye and shall show objects, not as they actually are, but as they appear to be. Mechanical drawing, on the other hand, is drawing done by the aid of instruments, to insure the greatest accuracy possible, and its purpose is to represent objects as they are —not as they appear to be.

Much, in fact almost all, mechanical drawing is intended to guide workmen in the execution of work of many different kinds. The construction of all machinery, the erection of houses and bridges, and the building of railways, are all facilitated, and in fact governed, by the use of mechanical drawings. In the construction of machinery, for example, the exact form and size of each part is indicated by mechanical drawings, from which the parts may be made with such accuracy that they may be fitted together without any alteration being required. The value of drawings in all forms of mechanical work needs no further illustration and the prime importance of accuracy in all mechanical drawing must be apparent. Mechanical drawing bears the same relation to all forms of Manual Training and mechanical work that the foundation does to a house, and consequently he who wishes to become a skilled mechanic must understand it thoroughly.

In the series of exercises presented in the following pages, an attempt has been made to present briefly the simplest and most necessary branches of mechanical drawing, in such a way that an instructor will not be necessary to enable the student to comprehend them. For these exercises the student should have the following:—

INSTRUMENTS AND MATERIALS

Drawing-board.
T-Square.
Triangles.

Compasses.
Dividers.
Bow-pen and bow-pencil.
Drawing-pen.
Pencils.
Scale.
Protractor.
Thumb-tacks.
Rubber erasers and sponge rubber.
Paper.
Ink.

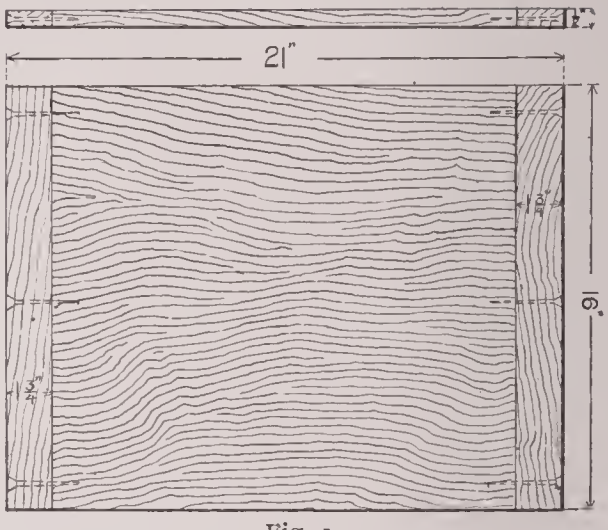


Fig. 1

The drawing-board should be made of some soft wood — preferably white pine, well-seasoned, and straight-grained, and the grain should run lengthwise of the board. It should be free from knots, so that it will easily receive the thumb-tacks used to fasten down the paper. Its surface should be perfectly flat, in order that the paper will lie smooth and close to the board. The edges must be smooth and must form right angles with one another. To prevent the board from warping, it should have strips tongued into the ends, or battens fastened across the underside. If the latter are used, they should fall a little short of the edges of the board, so that if the board shrinks they will not protrude. A convenient size for the board is 16 x 21 inches. (Figs. 1 and 2.)

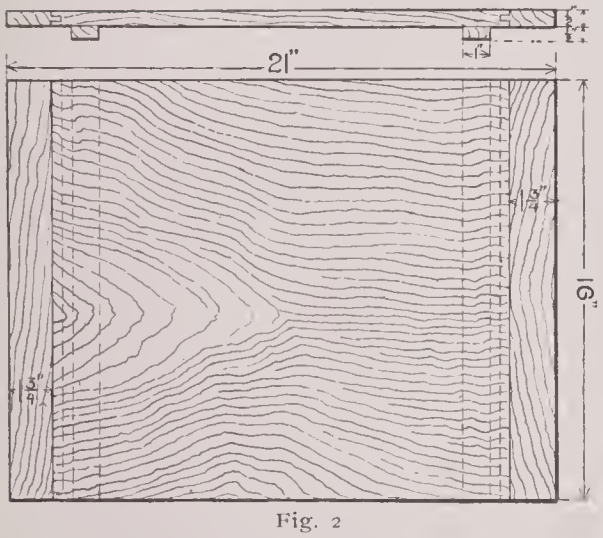


Fig. 2

The T-square may be made of wood, hard rubber, or steel, and should be of the simple pattern shown in Figure 3. The cheapest material is wood and for the use the T-square will receive in this course of lessons, that material will serve as well as any other. The T-square should be provided with a hole at the end of the long piece, or blade, for hanging it up, and when not in use it should always be suspended by the blade.

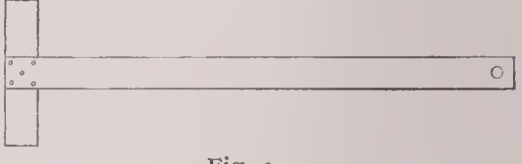


Fig. 3

The T-square is used for drawing horizontal straight lines. In using it the short piece, or head, is placed against the left-hand edge, of the drawing-board as shown in Figure 4, and the upper edge of the blade is brought very near to the point through which the line is to be drawn, so that the straight edge of the blade may be used as a guide for the pencil or drawing-pen. If the edge of the drawing-board is straight, as it should be, all lines drawn in this manner must necessarily be parallel.

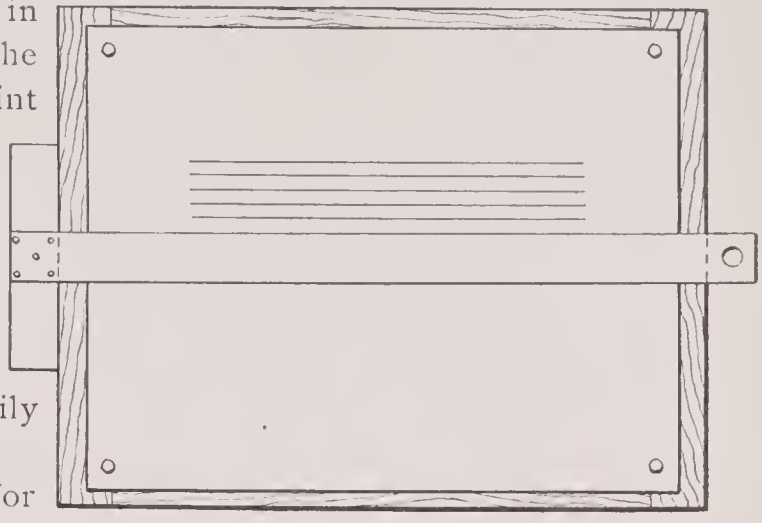


Fig. 4

Only two triangles are required for this course, and these should be of the forms shown in Figure 5. It will be seen that both of these triangles are right-angled triangles, but that, while the acute angles of one are equal and of 45 degrees each, those of the other are unequal, one being an angle of 30 degrees, and the other 60 degrees. These triangles may be made of wood, hard rubber, celluloid, or other material. Celluloid is cheap and makes excellent triangles.

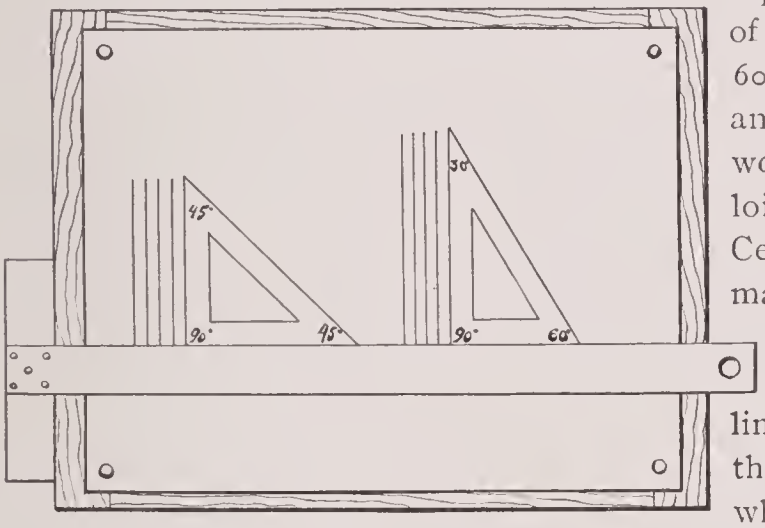


Fig. 5

Triangles are used in making all the straight lines in a drawing except the horizontal lines, which, as you have learned, are drawn with the T-square.

In drawing vertical lines, the T-square is placed in position for drawing horizontal lines, and a triangle is laid with one side against it and another forming a right angle with it, as shown in Figure 5. Both triangle and T-square must be held firmly but lightly with the left hand, so as to keep them from slipping, and the line should be drawn by means of a pencil or drawing-pen held in the right hand, and against the vertical edge of the triangle.

For drawing parallel lines that are neither horizontal nor vertical, the triangles are used, sometimes with the T-square and sometimes without it. When the lines required make angles of 30 degrees, 45 degrees, or 60 degrees, with the horizontal, they may be drawn by placing a triangle with

its longest side, or hypotenuse, in contact with the edge of the blade of the T-square, which is held in the manner described above, and by drawing along one of the shorter sides of the triangle. For drawing other parallel straight lines, the best and simplest way, when the lines are near together, is to place one side of a triangle on the given line, and lay the other triangle with one side in contact with the side of the former triangle, at right angles to the given line, holding it fast with the left hand; then move the first triangle along the side of the second. This is illustrated in Figure 6 in which *ab* represents the given line and *cd* the side of the triangle X, which is laid on the given line. Triangle Y is then placed with its long side in contact with the side *cf* of the triangle X. The triangle X is then slid along the triangle Y until the side *cd* is at the desired distance from the line *ab*, with which it remains parallel. When the side *cd* is in the desired position, both triangles are held firmly with the left hand, and with the right hand the pencil is drawn along the side *cd*. Triangle X is again slid along the side of triangle Y after a line has been drawn, and when the side *cd* is at the proper distance from the line just drawn, another is drawn in similar manner. This operation is repeated until the requisite number of lines has been drawn. If the triangle X should extend too far beyond the triangle Y after a number of lines has been drawn, the triangle X should be held stationary with the left hand and the triangle Y moved along the side of X, with the right hand, until it is in suitable position; then it should again be held firmly with the left hand and the drawing continued as before.

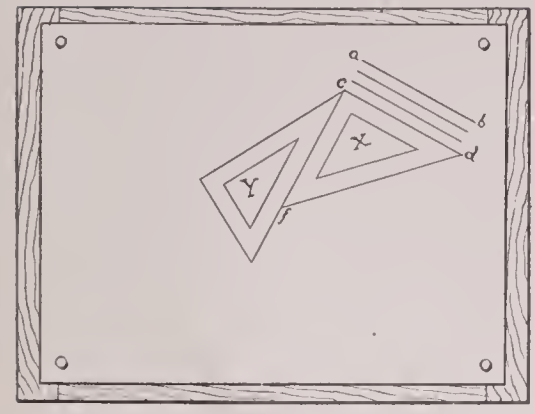


Fig. 6

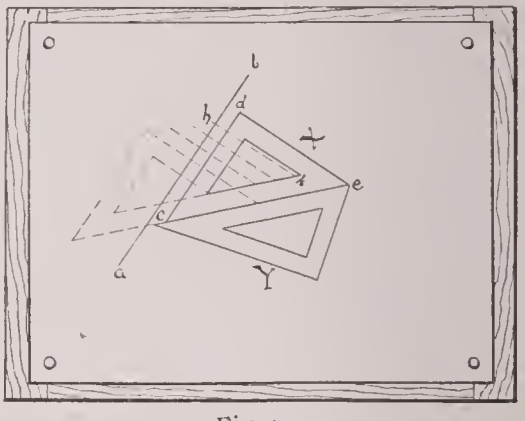


Fig. 7

The method employed for drawing lines perpendicular to a given line that is neither vertical nor horizontal, is very similar to that used in drawing lines parallel to a given line of that kind. In Figure 7 this is illustrated. The triangle X is first placed with the short side *cd* on the given line *ab*, and the triangle Y is then placed with its long side against the long side of the triangle X. The triangle X is then slid along the triangle Y as a guide, until the side *de* lies across the given line *ab*, making right angles with it. Both triangles are then held with the left hand and a line is drawn by passing the

pencil in the right hand along the side *dc*. The successive lines are produced by sliding the triangle X along the long side of triangle Y, and passing the pencil along the side *dc* as it reaches the successive points through which it is desired to draw the lines.

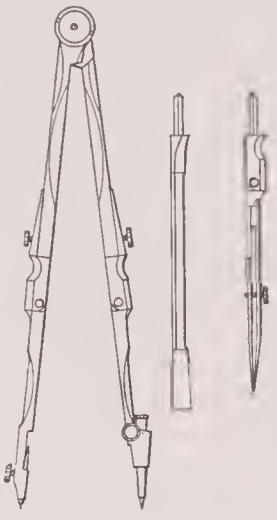


Fig. 8

Next to the T-square and triangles, the compasses are probably more frequently used than any other instrument. They consist of two legs connected by a pivot at the top, and preferably the legs are jointed. Each leg is usually provided with a separable end, which has a reduced portion that fits a socket in the main part of the leg and is clamped therein by means of a small milled-head screw. The object of this is to make it possible by the substitution of different end-pieces to use the same compasses for drawing with lead or ink. The compasses always have one leg terminating in a fine steel point. In the more expensive instruments, this point is a separate bar of steel, which is held by means of a screw-clamp, and, hence, is easily adjusted in position, or removed when no longer serviceable. The other leg of the compasses may be fitted with a similar point at the tip, converting the instrument into dividers, of which more will be said in a later paragraph, but ordinarily it terminates in a drawing-pen or a clamp for holding lead.

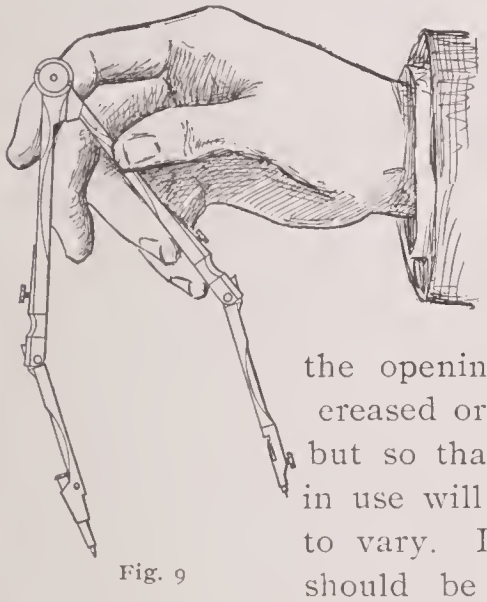


Fig. 9

The pivot joint connecting the two legs of the compasses is so constructed that it can be adjusted to make the opening and closing of the legs easy or difficult, and when the compasses are in use this joint should be so adjusted that the opening between the legs can be readily increased or decreased with the use of only one hand, but so that the pressure upon the instrument while in use will not cause the opening between the legs to vary. In setting the compasses, only one hand should be used, and the instrument should be grasped as shown in Figure 9. The advantage derived from setting the compasses in this way is that it leaves the other hand free to be used at the same time in other ways, and this frequently results in the saving of a considerable amount of time.

When the compasses are in use, the legs should be as nearly vertical as possible to insure the best results, and for this reason the legs of good compasses are jointed. The lower parts of the legs may then be set nearly vertical, notwithstanding the spread of the upper

parts. After the compasses have been set at the desired opening, take them in your hand, as shown in Figure 9, and incline them until the underside of your hand rests upon the paper. In this way you can steady your hand so that you can bring the fine steel point of the compasses exactly to the right place on the drawing. After you have placed the needle-point of the compasses in the proper position, slip your hand up to the top of the instrument and hold it as represented in Figure 10, while drawing the desired circle or arc. In using the compasses, be careful to press lightly on them so as to avoid making large holes in the paper. Ordinarily the needle-point of the compasses is so sharp that no pressure upon it is required; but a little pressure upon the pen or pencil-point is necessary. Another point that you should bear in mind when you are drawing with the compasses, is to incline the top of the instrument a trifle in the direction in which it is moving.

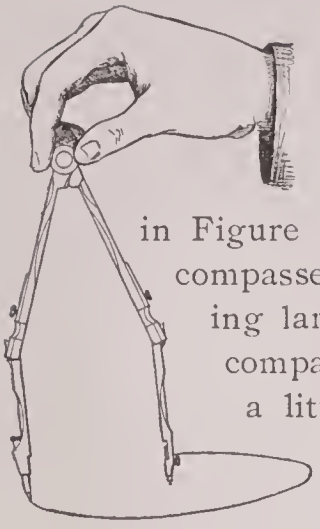


Fig. 10

The dividers may be an instrument entirely distinct from the compasses, or they may be formed from the compasses by replacing the pen or pencil-point with another needle-point. Any one who has much drawing to do will find it best to have dividers that are entirely separate from his compasses, for much time will otherwise be lost in changing the points in order to convert compasses into dividers, and *vice versâ*. Dividers of the pattern shown in Figure 11 are a very good form to use. The uses of dividers in mechanical drawing are found in laying off distances upon the paper and in dividing straight lines or circles into equal parts. When using them for the latter purpose you should hold them at the top between the thumb and forefinger, in the same way that you hold compasses; and step off the spaces by turning the instrument alternately to the right and left. If the line or circle does not divide exactly, vary the distance between the points of the dividers and try again. After several trials you will generally succeed in spacing the line or circle exactly. In using the dividers, you must exercise even greater care than in using compasses, to keep from pressing the divider points into the drawing-paper; for if the points enter the paper, you will find that it is impossible to space accurately, and the paper will be more or less defaced.

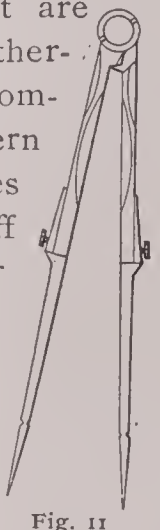


Fig. 11

Fig. 12

The bow-pen and bow-pencil are instruments of convenience rather than of necessity. They serve especially well for describing small

circles and arcs, but, if you are careful, you can do the same work with the compasses. The bow-pen and bow-pencil are shown in Figure 12, and you will understand from the figure that in using either you should hold the handle at the top between the thumb and fore-finger.

The drawing-pen which is shown in Figure 13 is a very important instrument and you should learn how to use it skilfully and how to care for it properly, for failure in either will cause your drawing to have a poor appearance. A good drawing-pen has blades of exactly the same length, and its points are smooth and sharp, so that a fine line may be drawn with them. But, of course, they should not be sharp enough to cut the paper.

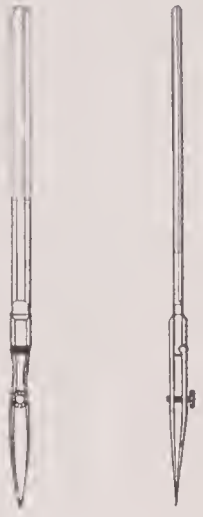


Fig. 13

The drawing-pen is used for drawing all ink lines other than arcs or circles. It should be held as nearly perpendicular to the surface of the paper as possible. In order to keep the pen in the proper position the hand must take the position shown in Figures 14 and 15. At first this is not easy to do, and you will find that it is not always easy to make smooth lines. It is a very simple matter to incline the pen a little and get one of

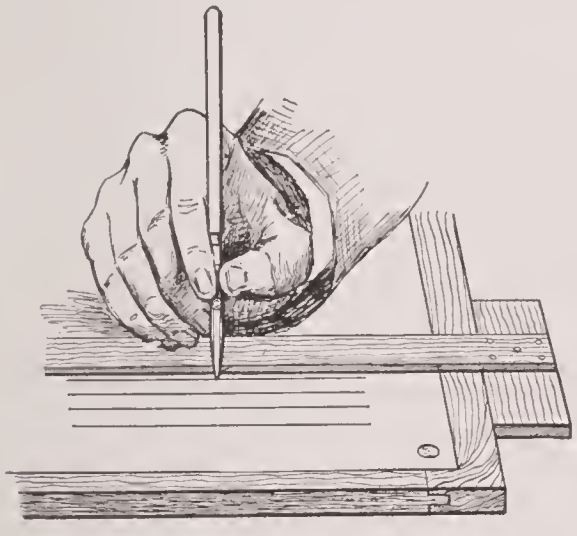


Fig. 14

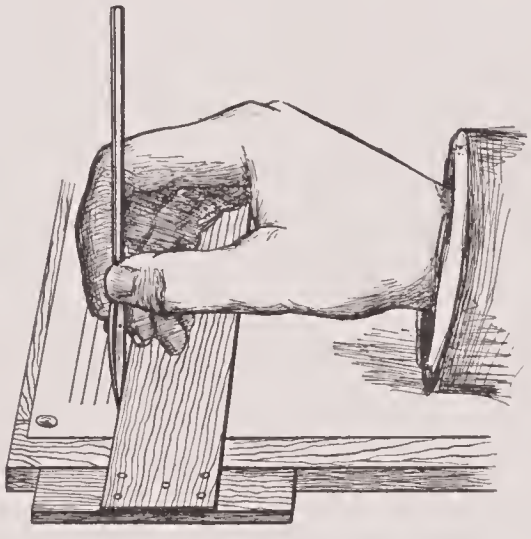


Fig. 15

the blades off the paper, and so cause the line to be ragged at those places where only one blade touches. When both blades rest on the paper, however, a pen that is in good condition will produce smooth, even lines. You will observe that in Figure 15 the hand is shown resting very lightly upon the blade of the T-square, and the drawing-pen is not pressed against the edge of the T-square. It is important that the pen should rest very lightly against the T-square which should serve merely as a guide, not as a support.

Much pressure against the edge of the T-square will cause it to slip, and the drawing will be injured, perhaps ruined.

The width of the line made by the drawing-pen is regulated by means of the screw connecting the blades of the pen. This is also true of the pen-point used in the compasses. When using either, you must be careful to keep the points clean if you want to produce clear, smooth lines. For this purpose, it is well to have a piece of cotton cloth or velvet at hand, and to draw the points of the pen over it from time to time, to remove any ink that has settled there and which may obstruct the flow from the pen to the paper. When the pen is laid down for some minutes, with ink on the blades, the screw should be loosened and the blades spread apart, to prevent the settling of the ink at the points; and when the pen is put away it should first be cleaned carefully, to prevent corrosion of its tips by the ink.

When a drawing-pen becomes dull and no longer makes fine lines, it must be sharpened by rubbing it on a close-grained oilstone. The first step in sharpening is to screw the blades of the pen together, and, holding the pen as you do in drawing, pass it back and forth over the stone, inclining the pen in the direction in which it moves. The object of this operation is to bring the blades of the pen to exactly the same length and to round them nicely at the point. In order to obtain the desired rounding, you will have to change the inclination of the pen constantly during each movement.

After the blades have been brought to the proper length they are, of course, duller than they were at first. To sharpen them, you should separate the blades by means of the screw, and rub one blade at a time to and fro in a straight line over the stone. You should hold the blade at an angle of about 15 degrees with the stone, and should give it a slight twisting motion while rubbing it. All the sharpening should be done on the outside of the blades, and the process must be kept up until the edges are fairly sharp and smooth, but not sharp enough to cut the paper. After the blades have been sharpened sufficiently, the inner surfaces may be rubbed very gently over the stone, to remove any burr or roughness that has been formed there in the sharpening process, and which may interfere with the flow of ink. The whole operation of sharpening must be done with great care, for it is very easy to spoil a pen by careless treatment.

Fig. 16

The pencils used in mechanical drawing are of hard lead —about the HHHH grade. Lead of this grade should also be used in the lead-holding compasses, and the lead of both pencils and compasses should be trimmed to a wedge-like point as shown

in Figure 16. The advantage of a point of this kind over a conical point is that it does not wear away so fast. In sharpening the lead of a pencil, or that for use in the compasses, it is well to grind it to desired form by rubbing it against a fine file, or a piece of fine emery-cloth, fastened on a flat piece of wood.

The flat, chisel-shaped point is in almost universal use for drawing lines, but the draftsman sometimes finds use for a very sharp point of the ordinary conical form, in marking points and laying off measurements upon a drawing. For this reason, it is a good plan to sharpen one end of the drawing-pencil to a flat, wedge-like point, in the manner described, and to sharpen the other to a fine, conical point, by first cutting the wood and lead approximately into the form desired and then finishing by rubbing the lead on fine emery-cloth, or a file.

For obtaining the measurements to be used on your drawings, you will need a scale of the form illustrated in Figure 17. This is one of the simple forms of scale, but it lies flat on the drawing, and the beveled edges serve to bring the lines of division close to the paper, so that the drawing may be accurately measured or distances laid off correctly. The use of the scale cannot be made clear to you until you reach the exercises in which it is necessary to use them.

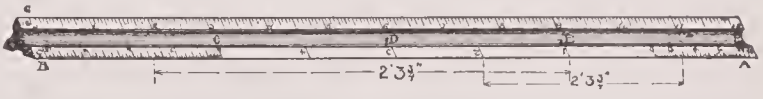


Fig. 17

The instrument shown in Figure 18 is a protractor, and it is used for measuring or laying off angles, or for dividing a circle into a number of equal parts. The outer edge of the protractor is a semi-circle whose center is at O, and it is divided into 360 equal parts, each of which is, therefore, one-half of one degree. When you wish to use the protractor to measure or lay off an angle, you must place it so that the line OB will coincide with the line that forms one side of the angle to be laid off or measured, and the center O will be at the vertex of the angle.

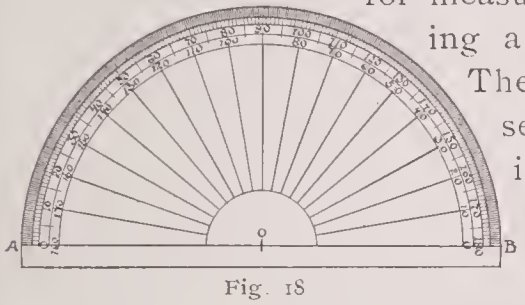


Fig. 18

For example, suppose you desire to lay off an angle of 25 degrees with the line HK, at the point M, Figure 19. Lay the protractor on the paper, with the edge OB coinciding with the line HKO at the point M, then make a mark with a sharp pencil at the 25 degree division on the outer edge of the protractor as indicated at N. A line MXK drawn through M and N will make the required angle of 25 degrees with the line HK.

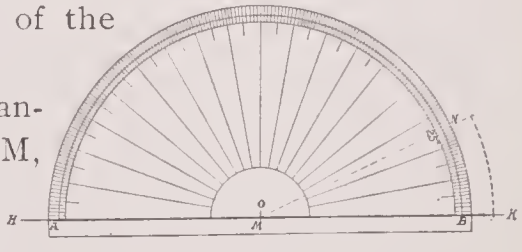


Fig. 19

The best paper to use for mechanical drawing is Whatman's cold pressed white drawing-paper. For the exercises described in the following pages, the demy size, which measures 15 by 20 inches, is the most convenient. This paper bears wetting without injury, its surface is not easily marred by the use of the eraser, and both pencil and ink lines of a sufficient degree of fineness can be made on it without difficulty.

Thumb-tacks are used to fasten the paper securely to the drawing-board, and you should provide yourself with about a dozen of them. They are simply broad-headed tacks, designed to be pressed into the drawing-board with the thumb, and consequently their points are thinner than, and not so long as, those of ordinary tacks.

As there are always a number of lines made during the execution of a finished drawing that must be erased, you should include in your outfit a pencil-eraser of soft rubber, which will not smudge the paper when used, and a rubber ink-eraser. The ink-eraser should contain enough cutting material to erase ink lines easily, but it should be fine, and should not roughen the surface of the drawing-paper enough to make it difficult to draw fine, smooth lines upon it. A piece of the porous material known as sponge or molded rubber is useful in "cleaning up" drawings, for it removes the stains that are often caused by the hands and freshens the surface of the paper without roughening it. Sponge rubber is not necessary, however, for a piece of bread two days old can be used in its stead with excellent results.

The ink used in mechanical drawings is a very important factor, for inferior ink will detract greatly from the good appearance of a drawing. The ink used is always India ink, but it is sold in two forms, the solid, or stick form, and the liquid. Draftsmen who do a great deal of drawing generally use the solid ink, which they prepare freshly every morning by grinding a small quantity of it in a little glass or porcelain dish with some water. The ink prepared in this way varies in quality, and it requires much time to prepare it each day; so, for the work required by the exercises of this course, the liquid ink is recommended as more satisfactory, though it is more expensive. The best brand of liquid drawing-ink is Higgins's Waterproof. This is sold in bottles of convenient size, each of which has attached to the stopper a piece of quill trimmed to a blunt point, and designed for use in supplying the drawing-pen with ink.

PRELIMINARY DIRECTIONS AND EXERCISES

After we have examined our instruments and our materials, and learned their construction and uses, let us take a sheet of drawing-paper and fasten its upper left-hand corner to the corresponding corner of the drawing-board with a thumb-tack. Lay the T-square across the board near the upper edge of the paper, with its head pressed against the left-hand edge of the board, and draw the paper smooth upon the board, with its edge parallel to the edge of the T-square. Taking care not to tear the corner of the paper from beneath the first tack, press a second one into the right-hand upper corner of the sheet. Now draw the sheet carefully and firmly downward, and fasten the lower corners so that the whole sheet lies smooth and will not wrinkle under the T-square or triangles.

Now take the drawing-pencil, sharpened at one end to a flat, chisel-shaped point and at the other to a sharp, round point, and practise drawing light lines, using the T-square and triangles for guides. Hold the pencil with its top tipped a little to the right, and also from the body, so that its very tip will follow the guide; otherwise it may rock to and fro and draw a crooked line, even though the guide be perfectly straight. The tip of the lead should never be wet with the tongue, nor pressed so hard against the paper as to make a crease in it, for either of these habits will make trouble, since it is difficult to erase the lines. The round point of the pencil should be used only to mark points, and lay off measurements from the scale.

Pencil lines should always be drawn from left to right against the T-square or other guide, and should always be of the proper length; that is, they should never run over the point at which they are to meet other lines, unless that point can be found only by the crossing of the lines. If pencil lines are drawn haphazard, and longer than necessary, they will be very apt to mislead when the learner attempts to ink them in.

The pencil-points should always be kept sharp, so that all lines will be fine and all measurements correct. *Accuracy* is the draftsman's very best motto, and *neatness* is just as necessary, else the work will look inaccurate, however careful the measurements may be. It is well, also, to wipe the T-square and triangles with a soft cloth to remove dust, before placing them upon the drawing.

After the pencil drawing is finished, the lines must be "inked in." For this purpose, take the ruling-pen and, holding it to the light, turn the screw so that the blades are open just enough to make a

moderately fine line. Fill the pen by placing the ink between the blades with an ordinary writing-pen, or the quill fastened to the cork of the bottles of liquid ink. Be careful that no ink gets upon the outside of the pen, wiping it if necessary; for if ink touches the edge of the T-square or triangle, it will smear at once, making a blurred, ragged line, and making it impossible to lift the guide from the paper without dragging the ink into a still wider blot, which can never be erased without spoiling the surface of the paper so that a smooth line can no longer be drawn upon it.

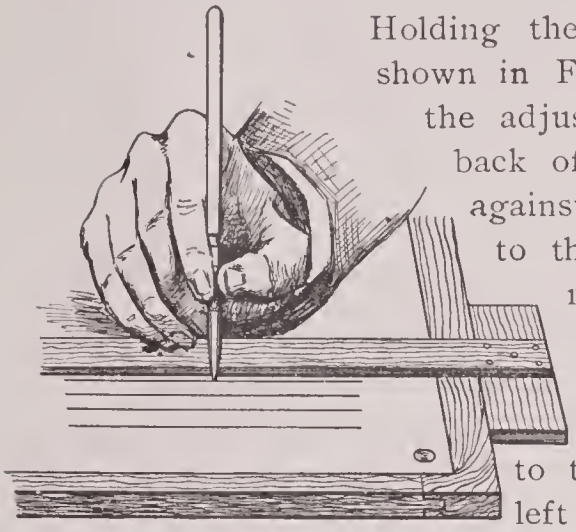


Fig. 20

Holding the pen between the thumb and forefinger, as shown in Figure 20, with the tip of the finger resting on the adjusting screw and the second finger placed just back of the lower blade to support it, place the pen against the T-square or triangle and perpendicular to the paper, so that the tips of both blades will rest squarely upon it; otherwise the line will be uneven and ragged on that side not touched by the tip of the pen-blade. It may sometimes be convenient to tip the top of the pen slightly to the right, since the line is always drawn from left to right, but if the pen be sharpened correctly this will seldom be necessary. The pen should always rest lightly against the T-square or triangle, because if pressed hard against the guide, its blades will be forced together and the lines will be of uneven width.

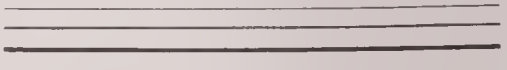


Fig. 21

Before trying to ink a drawing, it will be best to practise by drawing lines of different widths; first fine, then medium, and, lastly, as coarse as the pen will readily draw, as shown in. Figure 21. Some trouble may be found in making the ink flow freely from the pen, especially in drawing fine lines, because the ink rapidly dries near the tips of the blades. If a smooth, unbroken line cannot be started by touching the point of the pen to the tip of the wetted finger, the pen should be wiped out and refilled. The width of the line may be tested by drawing short strokes on the border of the paper, which will be trimmed off from the finished plate.

In drawing very coarse lines, more care must be taken that the ink does not run from between the blades against the guide, particularly if the guide be a curved one. The pen must be full enough to make a line of the desired length, since a broad line rapidly empties it, and it is difficult to "piece out" a line smoothly after refilling the pen.

After having drawn solid lines of different widths, the learner should practise upon dotted lines, broken lines, and broken and dotted lines, as shown in Figure 22; taking pains to make the dots and spaces, or broken lines and spaces, of uniform length, whatever may be the width of the line.

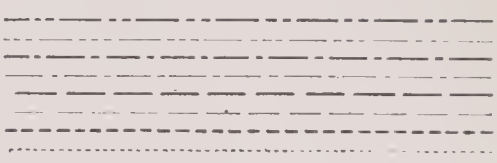


Fig. 22

Now, setting the pen for a moderately fine line, draw a number of such lines parallel and at equal distances apart, using the eye only as a guide in spacing them, as in Figure 23.

Fig. 23

The practice may be further varied by using the T-square and 45-degree triangle to draw parallel lines, as in the three following figures :—

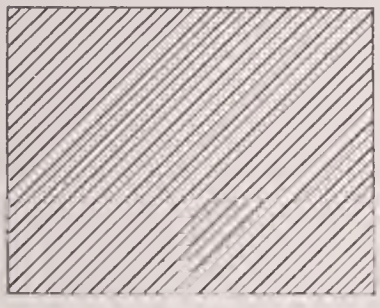


Fig. 24

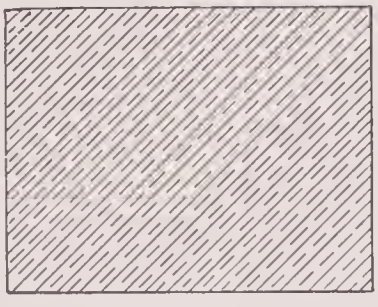


Fig. 25

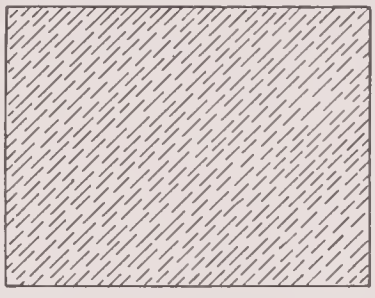


Fig. 26

This manner of lining is often used to represent cut surfaces of metals and other materials, as will be explained further on.

We may next practise with the bow-pen, and compasses, drawing circles of various diameters in both fine and coarse lines, and making them first concentric; that is, all having the same center but different diameters, and drawing the finer lines of smaller diameter, as in Figure 27, making the smallest perhaps one-half inch in diameter, the next three-quarters inch and so on, to as large a circle as the instruments will readily draw.

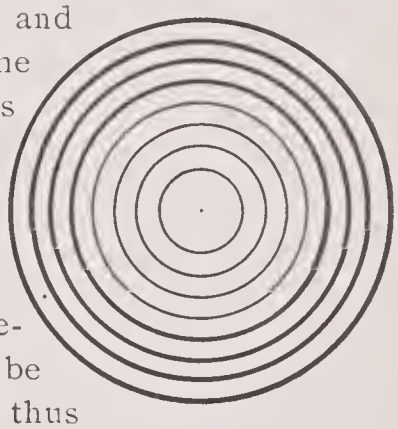


Fig. 27

We should always remember that in placing the needle-point so many times on the same point, great care must be taken not to make a large hole in the drawing-paper, and thus displace the outer circles so that they will no longer be concentric. As the legs of the compasses are gradually opened for each succeeding circle, see that both pen and needle-point are bent inward so that they may be perpendicular to the paper and thus bring both the pen-points squarely upon the paper to avoid ragged lines. Try, also, to adjust the pen-points so that the lines shall increase uniformly in thickness.

Lastly, adjusting the bow-pen to draw a moderately heavy line, draw two semicircles whose centers are on the same horizontal line and about two inches apart. Be careful to draw exactly half a circle, and then with a triangle and ruling-pen join the semicircles with straight lines of the same width. This will give practice in joining straight and curved lines, and this plan should always be followed when inking in drawings; that is, draw all circles and other curved lines first, and finish the inking by drawing the straight lines and joining them to the curved ones, as it can be more neatly done than by attempting to join the curved lines to the straight lines.

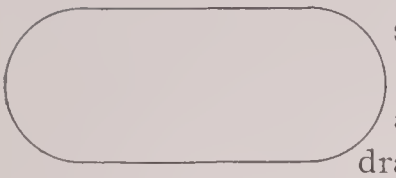


Fig. 28

When the above exercises have been practised enough to make the work accurate and neat, the learner will be ready to ink simple drawings. For this work, use a moderately fine line, but not so fine that the pen will work poorly, or the lines be hard to distinguish from dimension lines, center lines, etc. They should be full lines, except where they indicate hidden parts of the object, which parts should be shown by dotted lines.

Always begin by inking the smaller circles, then the larger circles and other curved lines, and lastly the straight lines. When all curves and circles have been inked, begin at the top of the drawing and, using the T-square, ink all the horizontal straight lines; then, beginning at the left of the drawing, ink all vertical straight lines. If lines of more than one width be used, such as shade lines, which will be explained further on, do not change the adjustment of the pen-blades, but ink all lines of the same width at one setting of the pen; then alter the adjustment and ink those of the other width, otherwise the lines will vary in width on different parts of the drawing and spoil its appearance.

The construction lines, that is, those which determine the size and shape of the object; the center lines, or those which show the centers of holes and of regular or "symmetrical" objects; and the dimension lines, or those which show the size of the object, should be inked last of all, and the ends of dimension lines should bear neat arrowheads, touching the lines between which the dimensions are taken, as in Fig. 29. These arrowheads are best made with a fine writing-pen.

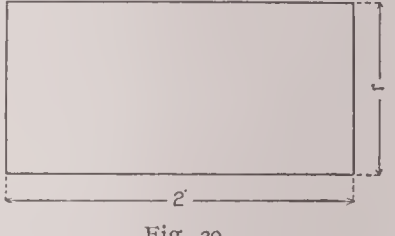


Fig. 29

For inking in, some draftsmen prefer to use triangles of celluloid, or other translucent material, so that the penciled lines can be seen through them and the danger of drawing ink lines beyond the desired points avoided. Such triangles, however, are apt to warp and thus make the work inaccurate.

LETTERING

After the drawing of an object has been finished, the title of the plate, the names of the different figures, etc., should be neatly lettered upon the sheet. Ordinary script writing, however good the penmanship, is never uniform enough to give a finished appearance to a drawing.

In choosing a style of letter for drawings, one should be selected which is neat, easily made, and easily read. Usually, a simple, open letter which can be rapidly made, either "free-hand" or with the drawing instruments, is best. Except on maps, elaborate titles, corner-pieces, and borders should not be attempted.

By remembering three rules, the young draughtsman will soonest learn to become rapid and neat in lettering his drawings. These rules are:—

1. Give all letters a uniform slant.
2. Space correctly.
3. Do not attempt too many styles of letter.

For titles of plates, headings, etc., a Gothic or block letter is most suitable; while, for descriptions of figures and all other lettering in the body of a plate, a simple Italic letter can usually be most rapidly made and, if carefully made, is very neat. With sufficient practice, "round writing" is a very rapid means of lettering, but it requires special pens, should always be written between guide lines, and, until skilled by long practice, the learner would better use some simpler style.

Below are given several styles of alphabets which have been found most useful in lettering mechanical drawings:—

1. Block letter.

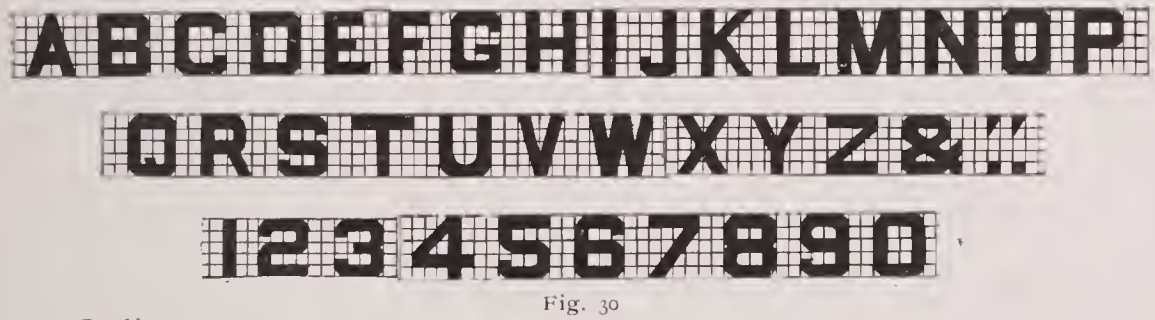


Fig. 30

2. Italic.

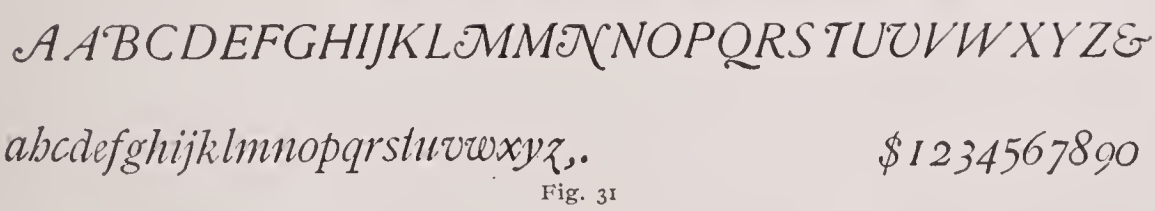


Fig. 31

3. Square.

abcdefghijklmnopqrstuvwxyzææ,.

ABCDEFGHIJKLMNOPQRSTUVWXYZ&ÆŒ $1234567890

Fig. 32

4. Round writing.

abcdefghijklmnopqrstuvwxyz,.

ABCDEFGHIJKLMNOPQRST

UVWXYZ& $1234567890

Fig. 33

In drawing the block letters, it is best, in order to give each letter its correct proportions, to divide the height of the letter into five equal parts and make the widths as follows: All the letters and figures except I, M, and W, and the figure 1, should be four such parts in width, M being five parts, W six parts, and I and 1 but one part. The thickness of all the lines should be one part. A good size for ordinary lettering is five-sixteenths of an inch in height, the greater number of the letters then being one-fourth of an inch wide.

The distance between any two letters in a word should be one space, except when A follows P or F; when V, W, or Y follows L; when J follows F, P, T, V, W, or Y; when T and A, or A, V, W, or Y are side by side. In these cases, the bottom of the A, J or L and top of the other letter should be in the same vertical line.

These letters being made up of straight lines, can all be drawn with the T-square and triangle. Draw six equally-spaced horizontal pencil lines to outline the height of the letters and then, using the triangle, draw the letters with their correct width and spacing in lead-pencil. After all are penciled, ink all the straight lines with the ruling-pen, rounding the corners and filling in the width of the lines with a lettering-pen, for which work a Gillott's No. 303 or Spencerian No. 1 will be suitable.

For all descriptions, Italic, or, if the learner prefers, the square letter, will be most easily and rapidly made. The height of capitals should be three spaces and that of the small letters two spaces. A good size for ordinary lettering is three thirty-seconds and one sixteenth, respectively. Be sure to draw the horizontal guide lines in all cases: and, to make sure that the slant is uniform, draw guide lines with the 60-degree triangle short distances apart across the horizontal lines. (See Fig. 34.)

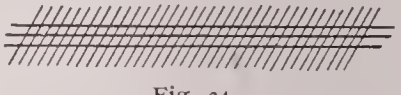


Fig. 34

The main point to be borne in mind is to make the letters *exactly uniform* in height and slant, and this will require considerable time and practice. Do not be discouraged. Even experienced draftsmen require time to do neat lettering,—much more time than for ordinary writing. Pencil all letters first, to train the eye in spacing, and do not hurry, or crowd the letters together. The tendency of all beginners is to fail to space the letters far enough apart. Give plenty of room to each, and make all curved letters smooth and bold.

In the Italic alphabet, attention should be given to the capitals A, M, V, W, X, and Y. These must be so printed that the *general slant* of the letter will be the same as that of the other letters. This may be done by drawing a center line on the common slant and then spacing the bottom of the A, the top of the V, etc., equal distances on each side of the guide line, as is shown on an enlarged scale, Figure 35.

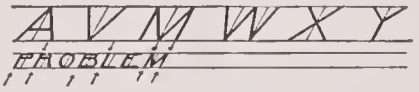


Fig. 35

The small letters h, m, n, and r should have sharp points at the bottom as shown in the alphabet, and n, w, and y should have sharp-pointed tops as there shown.

The square letter, like the block or Gothic letter, can be made almost entirely with the T-square and triangle, after proper guide lines have been drawn, giving the letters a general slant of 60 degrees.

In all cases, where there is more than one line of letters, the space between the lines should not be *less* than the height of the letters themselves; it is usual to make the space just equal to the height of the line of lettering.

GEOMETRICAL CONSTRUCTIONS

As NEARLY all mechanical drawing is based upon geometry, it is necessary that the draftsman be able to draw the simpler geometrical constructions that are almost constantly in use in representing objects. Their construction will at the same time give valuable practice with the instruments.

Since these problems need not be drawn on a large scale, several can be placed on a single sheet of drawing-paper. If a demy size sheet (15 inches x 20 inches) be used, the learner should, after fastening it on the board as directed, draw a pencil outline 14 inches x 19 inches, leaving a margin of about half an inch to be trimmed from the finished plate. One-half inch from the edges of the plate thus outlined, draw a border line, leaving the space within 13 inches x 18 inches. This space can now be divided into six rectangles, each $6\frac{1}{2}$ inches high and 6 inches wide, by drawing a light horizontal pencil line across the center of the

plate, and two vertical lines 6 inches apart and each 5 inches from the end border lines. Use these dividing lines only as guides in locating the figures and erase them when the plate is completed.

Place the number of the plate on the half-inch upper margin, and midway of the length of the plate. Place the description of each figure or problem above the figure, spacing the line one-half inch from the top of the rectangle containing the figure. Use either Italics or square letters, making them $\frac{3}{32}$ inch high, and if more than one line is necessary to describe the figure, make the distance between the lines also $\frac{3}{32}$ inch. Begin each line one-half inch from the left-hand side of the rectangle inclosing the figure.

All construction should be dotted, making dots and spaces each about $\frac{1}{16}$ inch long. All required lines, that is, all lines necessary to complete the figure called for by the problem, should be moderately heavy, solid lines, and all given lines, or lines necessary as a basis for the problem, should be light, solid lines.

PROBLEMS

1. To CONSTRUCT an angle equal to a given angle (Fig. 1):

Draw any two lines, as CA and BA, each $2\frac{1}{2}$ inches long and meeting at A at any angle. Above the angle CAB draw the line A′B′ $2\frac{1}{2}$ inches long. With the compasses opened to a radius A*d*, slightly less than AB, strike the arc *de*, using A as a center. From A′ on the line A′B′, with a radius A′*d*′ equal to A*d*, strike the arc *d*′*e*′ somewhat longer than *de*. Now placing the needle-point of the compasses at *d* measure that part of the arc *de* lying between the lines AB and AC by bringing the pencil-point exactly to the point where arc *de* crosses line AC. Keeping the compass-legs in the same position, now place the needle-point at *d*′ and strike a short arc crossing *d*′*e*′. From the point A′ now draw the line A′C′ $2\frac{1}{2}$ inches long and passing through the intersection (that is, the point of crossing) of the arc *d*′*e*′ and the shorter arc. Then the angle C′A′B′ will equal the angle CAB.

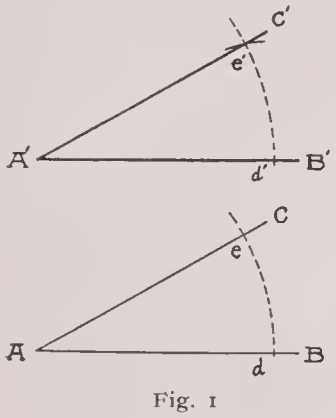


Fig. 1

2. To construct an angle of 60 degrees (Fig. 2):

Draw a horizontal line, as DE, 3 inches long. From a point A, about $\frac{1}{2}$ inch from D, with a radius AB, slightly less than AE, strike an arc BF. With *the same radius*, and B as a center, strike a short arc crossing BF at *e*. From the point A

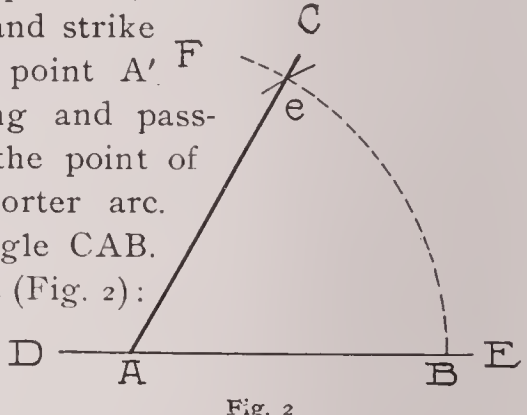


Fig. 2

draw AC $2\frac{1}{2}$ inches long through the intersection of the two arcs Then the angle CAB will be an angle of 60 degrees.

3. To bisect a given angle (Fig. 3):

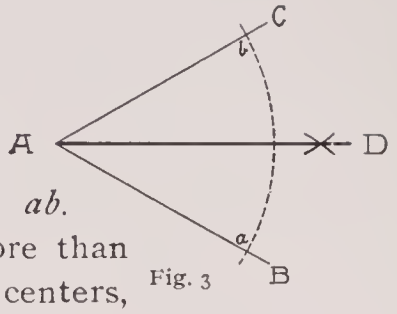


Fig. 3

Let CAB be any angle whose sides are the lines AC and AB, each $2\frac{1}{2}$ inches long. With A as a center and A*a*, slightly less than AB, as a radius, strike the arc *ab*. Now, closing the compasses till the radius is a little more than one-half the arc *ab*, strike short arcs from *a* and *b* as centers, intersecting as at O. From A draw the line AD through the point O; and the angles CAD and DAB will each equal one-half of CAB. In other words, AD bisects the angle CAB.

In constructing this figure, draw the lines AB and AC at such angles that the bisector AD, when drawn, will be nearly horizontal.

4. To bisect a straight line (Fig. 4):

Draw the horizontal line AB, 3 inches long. With the compasses open to a radius slightly greater than one-half of AB, and using A as a center, strike short arcs as at D and E, above and below the line AB. With the same radius, and B as a center, strike arcs intersecting the arcs struck from A. Connect the intersections at D and E with a dotted line, and the point C, where it crosses AB, will be the middle point of AB. The dotted line DE not only bisects AB, but is at right angles, or perpendicular to it.

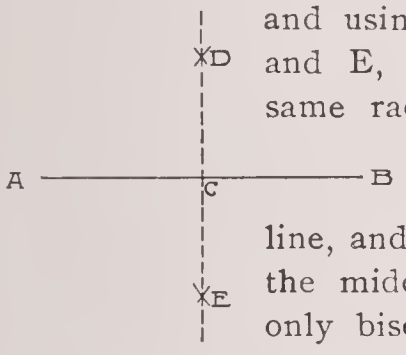


Fig. 4.

5. To draw a perpendicular to a straight line from a point within that line (Fig. 5):

There are two methods of solving this problem, one more convenient when the given point is near the center of the line, and the other when it is near one end of the line.

First case: When the given point is near the center of the line. Draw the line AB 3 inches long and choose the point C near its center. With a radius less than either CA or CB, and the point C as a center, strike short arcs intersecting the line AB at D and E. With a radius greater than one-half of DE, and with first D and then E as centers, strike short arcs intersecting as at F. From C, draw the line CG through the intersection of the arcs at F, which line will then be perpendicular to AB, at the point C.

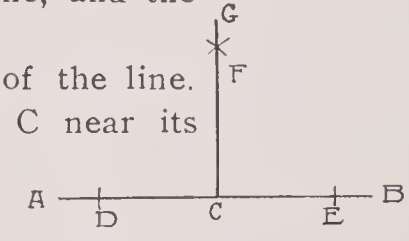


Fig. 5 — First Case

Second case: When the given point is near the end of the line: As before, draw AB 3 inches long and take the point C about $\frac{1}{4}$ inch from one end. With any point, as P, and a radius equal to PC, strike the arc ECD, intersecting AB in E and C and continue it for some

distance above AB. From E, draw the line EPD through the point P till it intersects the arc ECD as at D. Join C with the point of intersection of the line EP, and the arc and the line CD will be perpendicular to the line AB at the point C.

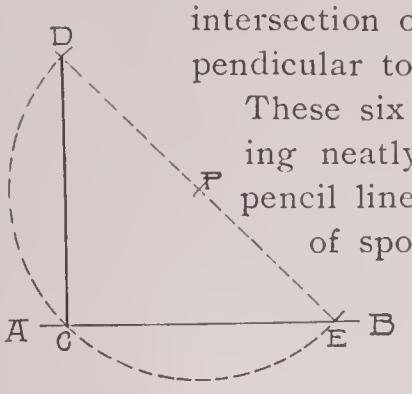


Fig. 5 — Second Case

These six figures will complete a plate, which, after inking, lettering neatly, and inclosing with a border line should have all pencil lines carefully erased and the whole cleaned with a piece of sponge rubber or, what is almost as useful, a slice of stale bread. The sheet should then be trimmed to 14 inches by 19 inches and laid away without rolling.

In giving lengths and directions of lines in the above problems, it must be remembered that they are given only to secure figures of convenient size and location, and to make them easier of construction; since the length and direction do not affect in any way the accuracy of the work or the principle set forth in the problems.

6. To draw a perpendicular to a line from a point outside (Fig. 6):

First case: When the point is nearly over the center of the line. Draw AB 3 inches long and let C be the chosen point outside the line. With C as a center, and a radius greater than the shortest distance to AB, but not so great as to reach beyond either A or B, strike an arc intersecting AB in two points, as D and E. With a radius greater than one-half of DE and using first D and then E as centers, strike short arcs on the side of AB opposite to C and intersecting as at F. Draw a line from C through the intersection of the arcs at F, which line will then be perpendicular to AB, from the point C.

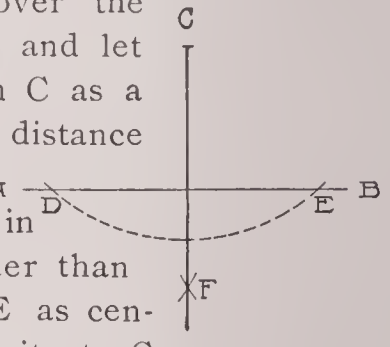


Fig. 6 — First Case

Second case: When the point is nearly over one end of the line. Draw AB 3 inches long and let C be the chosen point outside AB. With any point on the line AB, as P, and a radius equal to PC, strike an arc passing through the point C and extending at least an equal distance on the opposite side of AB. Now, using as a center the point D where the arc intersects AB, and a radius equal to DC, strike short arcs intersecting the first arc at C and E. Join the intersections at C and E with the line CE, which will then be perpendicular to AB from the point C.

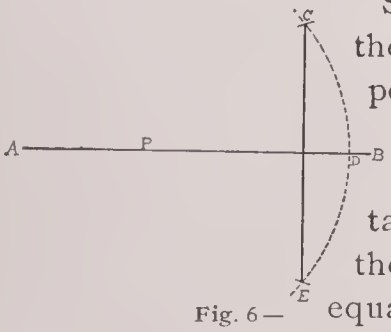


Fig. 6 — Second Case

7. To draw a parallel to a given line from a point outside (Fig. 7):

Draw AB 3 inches long, and with O, the given point outside AB as a center and a radius slightly less than the distance OB, strike an arc intersecting AB as at F. With F as a center and the same

radius, strike an arc passing through O and intersecting AB as at G. Set the compasses to the radius OG, and from G and F as centers strike short arcs intersecting the first arcs at O and E. Through the intersections O and E, draw the line CD 3 inches long, which will then be parallel to AB and pass through the given point O.

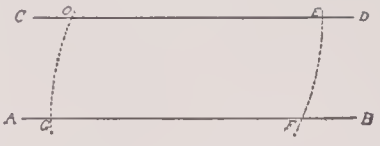


Fig. 7

8. To divide a given line into any number of equal parts (Fig. 8):

Draw AB 3 inches long, and let the problem be to divide it into nine equal parts. Since this cannot be done by divisions found on the scale, draw the line AC from A, and making any convenient angle with AB. Make AC of sufficient length so that nine equal spaces of convenient length, as A–1, 1–2, etc., can be laid off upon it. Join the last point at 9, with the end B of AB by a dotted line, and through the points 8, 7, 6, etc., draw dotted lines parallel to 9–B, using the two triangles in the manner already described. Then will AB be divided into nine equal parts A–1′, 1–2′, etc.

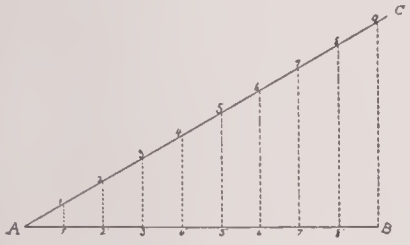


Fig. 8

9. Having given the three sides of a triangle, to construct the triangle (Fig. 9):

Draw the lines DE 3 inches long, FG $2\frac{5}{8}$ inches long, and HI $2\frac{1}{2}$ inches long, as the given sides of the triangle.

Now draw AB equal in length to DE and horizontal. With B as a center, and a radius equal to the line FG, strike an arc as at C. With A as a center and a radius equal to HI, strike another arc intersecting the first. From A and B draw lines to the intersection of the arcs; then will ABC be the required triangle.

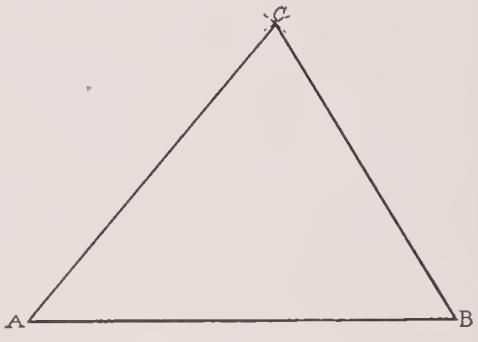


Fig. 9

Of course it makes no difference whether the distance FG is laid off from B or A. It is easy to see that the triangle will be of the same size, but reversed in position; or in geometrical language, "symmetrical," with the triangle as constructed above.

10. Having given two sides and the included angle of a triangle, to construct the triangle (Fig. 10):

Draw the lines DE $3\frac{1}{8}$ inches long, and FG $2\frac{1}{4}$ inches long, and let O be the given angle. Draw the horizontal line AB, equal in length to DE, and at B lay off an angle equal to the angle O, in

the manner shown in problem 1. From B draw BC, equal in length to FG, and making an angle with AB equal to O. Join A and C and ABC will be the required triangle.

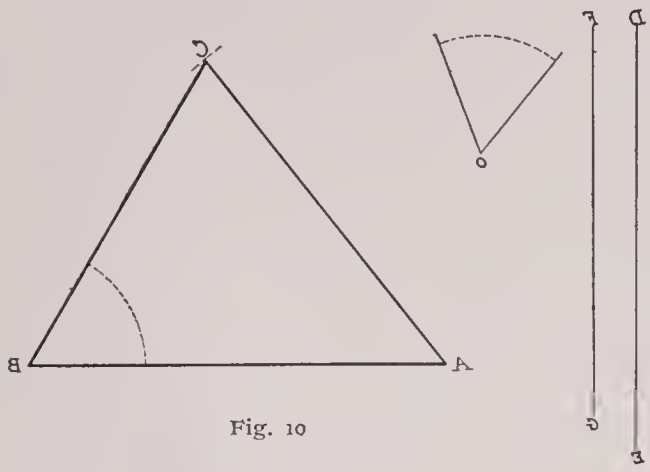


Fig. 10

Problems 6 to 10 furnish figures for a second plate which should be lettered and finished in a manner similar to Plate I.

11. To find the center of a given arc, having given its radius (Fig. 11):

AB is the given arc whose radius CD is 2 inches. From any two points in the arc, as E,F, which, for the sake of greater accuracy should be a considerable distance apart, and with a radius equal to CD, strike arcs intersecting as at O. O is then the center from which AB was struck.

In constructing this problem, the arc AB cannot be struck with the compasses without at once locating the center O, but the construction at once proves that O may be found in this manner, even though the arc were traced with a circular guide and its center not known.

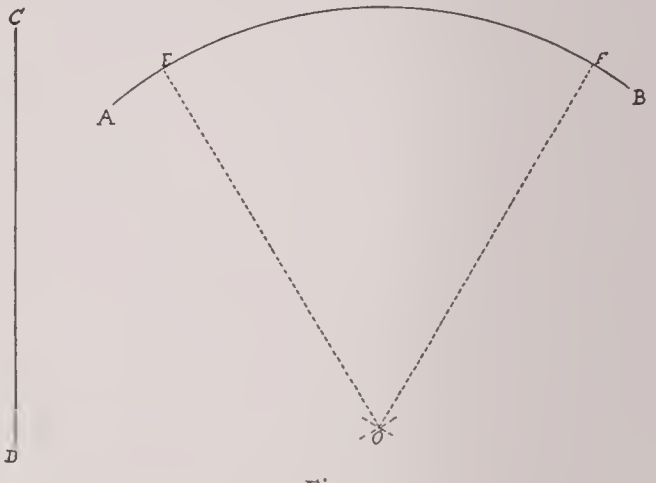


Fig. 11

The dotted lines EO and FO may be omitted if the learner prefers.

12. To pass a circle through three points not in the same straight line (Fig. 12):

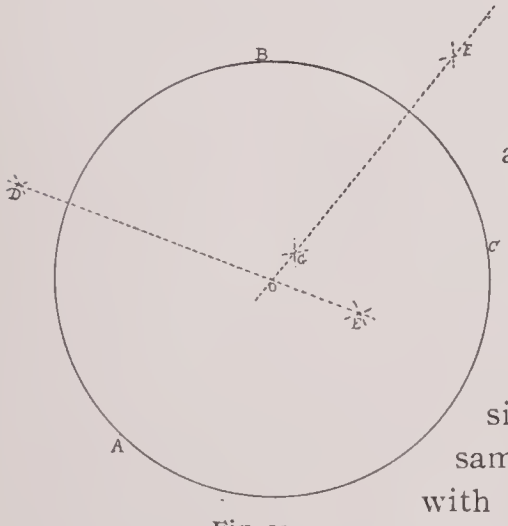


Fig. 12

Choose the three points A, B, and C in such a manner that the circle when completed will not be too large; for it is easy to see that the more nearly the points approach the same straight line, the larger must be the circle which shall pass through all.

With A and B as centers, and any raidus greater than one-half AB, strike intersecting arcs on both sides of the imaginary line joining them. In the same manner, strike intersecting arcs from B and C, with a radius greater than one-half BC. Draw dotted lines through the intersections at D and E; also through those at F and G, and if necessary, prolong one or both of these lines until they intersect, as at O. From O as a center, with a

radius OA (or OB or OC), draw a circle which will pass through the two other points.

13. To draw a tangent to a circle at a given point in the circumference (Fig. 13):

A tangent to a circle or other curve is a line which touches the curve at a single point without crossing it.

Let O be the center of a circle 3 inches in diameter, and P the point at which it is required to draw the tangent. Through O and P, draw a dotted line and prolong this line outside the circle a distance, PQ, equal to the radius of the circle. Now bisect the line OQ in the manner shown in problem 4. This bisector will pass through P, and be tangent to the circle at that point.

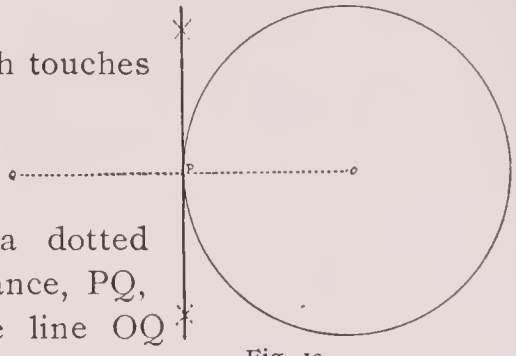


Fig. 13

This problem may also be constructed by making OQ of indefinite length, and then drawing a perpendicular to it at the point P, as in problem 5, but the method shown is somewhat shorter.

14. To draw two tangents to a circle from a point without (Fig. 14):

Let O be the center of a circle $2\frac{1}{2}$ inches in diameter, and P the point without from which tangents are to be drawn. Join O and P by a dotted line and bisect this line in the manner before described. From A, the middle point of OP, as a center, with a radius equal to AO, strike the arc BOC, intersecting the circumference of the circle at B and C. Lines drawn from P through B and C will be the required tangents.

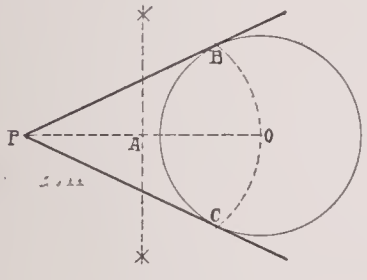


Fig. 14

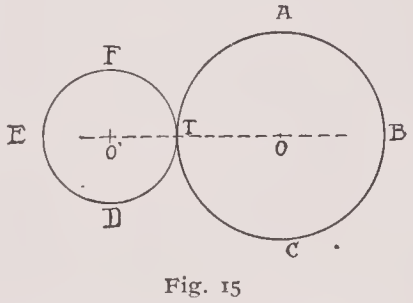


Fig. 15

15. To draw two circles of known radii, tangent to each other externally (Fig. 15):

Let ABC be one of the given circles whose radius is 1 inch, and let T be the point of tangency. From O, the center of ABC, draw the dotted line OT and prolong it outside ABC. Let the radius of the second circle be $\frac{5}{8}$ inch, and from T lay off this radius on the prolongation of OT. Then O′ will be the center of the second circle DEF, which when drawn from O′, with the radius O′T, will be tangent to ABC at T.

16. To draw two circles of known radii, tangent to each other internally (Fig. 16):

Let the radii of the two circles be $1\frac{1}{2}$ inches and $\frac{7}{8}$ inch. Construct this problem like the preceding one, except that the radius of the smaller circle must be laid off from T toward O, so that O′ lies within the circle ABC.

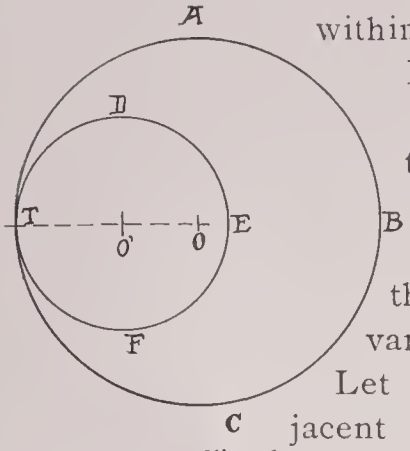


Fig. 16

Problems 11 to 16 furnish figures for a third plate.

17. To draw a parallelogram, when adjacent sides and the included angle are given (Fig. 17):

A parallelogram is a four-sided figure whose opposite sides are parallel and equal. For this reason, it is only the adjacent sides (those which join end to end) which can vary in length.

Let AB, $2\frac{3}{4}$ inches long, and CD, $1\frac{3}{4}$ inches long, be the adjacent sides, and O the angle included between them. Draw EF equal to AB. At E lay off an angle equal to O. From E draw EG equal to CD and making an angle with EF equal to the angle O. From G, with a radius equal to EF (or AB), strike a short arc as at H. From F, with a radius equal to EG (or CD), strike an arc intersecting the arc struck from G. Join G and F with the intersection at H and thus complete the required parallelogram.

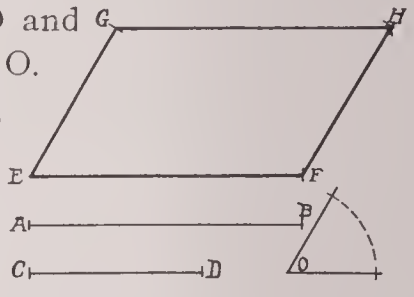


Fig. 17

18. To inscribe a square in a given circle (Fig. 18):

Draw the circle ACBD 3 inches in diameter. With the T-square and 45-degree triangle, draw the diameters AB and CD at right angles to each other and each at 45 degrees to the horizontal. Join the ends of these diameters and the inscribed figure ACBD is the required square.

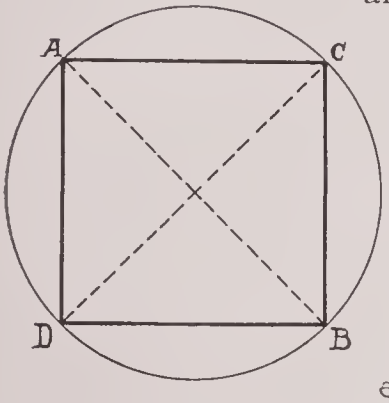


Fig. 18

19. To inscribe a pentagon in a given circle (Fig. 19):

A regular pentagon is a figure with five equal sides and angles. Draw the circle EFGH 3 inches in diameter; also the two diameters AB and CD at right angles to each other. Bisect one radius, as OA, at K. With K as a center and a radius equal to KC, strike the arc CI intersecting AB. With C as a center and a radius equal to CI, strike short arcs intersecting the circumference at E and H. With the same radius, and E and H as centers, strike other arcs across the circumference at F and G. Measure FG to see that it equals (as it should) the radii just used, as CE, EF, etc. Join the points C, E, F, G, and H and the figure will be the required pentagon.

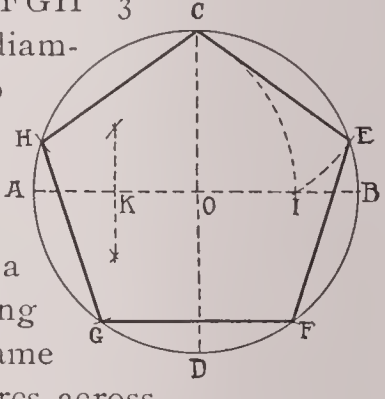


Fig. 19

20. To inscribe a regular hexagon in a given circle (Fig. 20):

A regular hexagon is a six-sided figure with equal sides and angles. Draw the circle ABC, etc. 3 inches in diameter. The radius

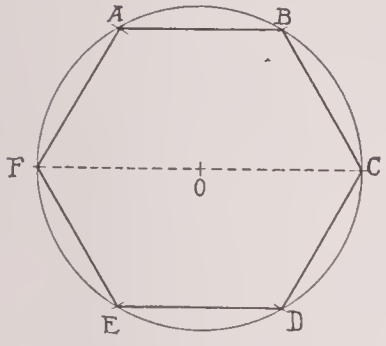


Fig. 20

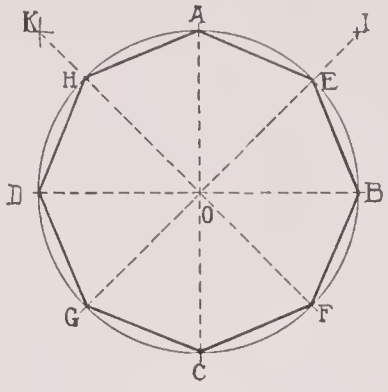


Fig. 21

of any circle is equal to one side of the inscribed hexagon, so that with the radius OC, for example, the divisions CD, DE, etc., can be stepped off around the entire circumference. It is shortest, however, to draw a horizontal diameter, as FC, and with C and F as centers, strike short arcs on each side, as at B and D, E and A. Join the points thus found and the figure ABCDEF is the required hexagon.

There is no convenient method of drawing a regular heptagon (seven-sided figure), and it seldom is used in mechanical constructions.

21. To inscribe a regular octagon in a given circle (Fig. 21):

A regular octagon is an eight-sided figure with equal sides and angles, and it will be at once seen that it may be drawn by beginning as for the inscribed square (problem 18), and bisecting each of the angles.

Draw the circle ABCD 3 inches in diameter, and the diameters AC and BD at right angles. Bisect the angle AOB by short arcs struck at I, as in problem 3. In the same manner bisect AOD, as at K. By drawing dotted lines from I and K through O, the opposite angles, DOC and BOC, are also bisected. Join the points AE, EB, etc., and the inscribed figure will be a regular octagon. The diameters AC, EG, etc., may all be drawn through O by means of the T-square and 45-degree triangle, if preferred.

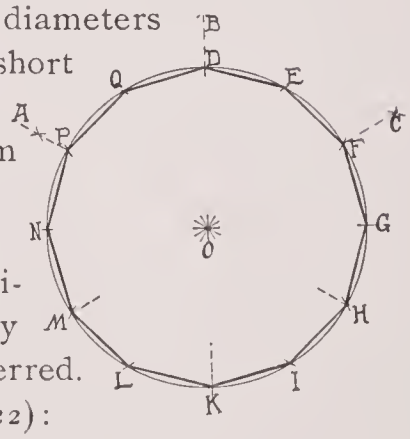


Fig. 22

22. To inscribe a regular dodecagon in a circle (Fig. 22):

A dodecagon is a twelve-sided figure. Draw a circle 3 inches in diameter, and mark six points on the circumference as for a regular hexagon (problem 20). Bisect three adjacent arcs as at A, B, and C, and prolong the bisectors across the center, thus bisecting the opposite arcs.

Join in succession the twelve points thus found and the inscribed figure will be a regular dodecagon.

Problems 17 to 22 furnish figures for a fourth plate.

23. To draw an ellipse, the major axis and distance between the *foci* being given (Fig. 23):

An ellipse is a curved figure, such that if we take a point in the curve and measure the sum of the distance from this point to two points within, called the *foci*, we shall find this sum the same for any and all points in the curve.

To draw a perfect ellipse 3 inches long, draw AB 2 inches long, and place a pin upright in the drawing-board at each end of AB. Double a strong thread, silk is best, and tie a knot in the doubled thread so that the loop will be exactly $2\frac{1}{2}$ inches long. This may require a few trials. Place the looped thread over the pins, and with the pencil-point draw the string straight, as at C. Then pass the pencil around, as is shown by the arrow, keeping the thread always taut. The curve traced by the pencil will be a perfect ellipse. The pencil curve may be inked in by using an irregular curve.

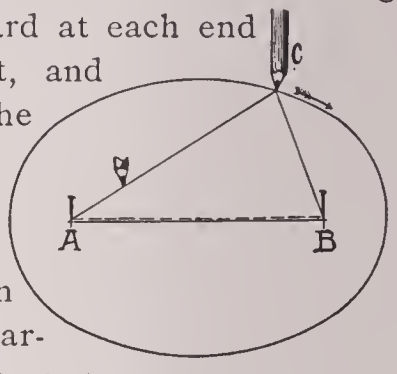


Fig. 23

If we draw a circle on cardboard, then cut it out and hold it squarely before the eyes, it appears circular; but if we tip it in any direction, so that one edge approaches the eye, it is no longer circular in appearance, but elliptical. We see by this that an ellipse may be any shape between a true circle and a straight line. The method shown in problem 23 is not a convenient one, and is given only because it traces a perfect ellipse and shows its properties. There are several methods of drawing an ellipse almost correctly, but the most convenient is that in which the curve is made up of arcs of circles, smoothly joined.

24. To draw an ellipse by means of circulár arcs (Fig. 24):

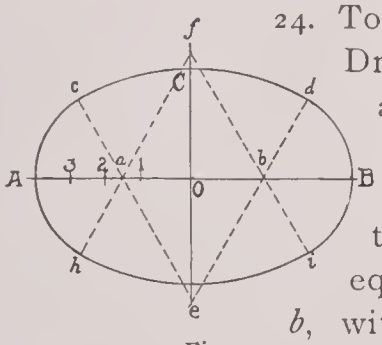


Fig. 24

Draw AB, the major axis, 3 inches long, and CD, the minor axis, 2 inches long and at right angles to AB at its center. From B lay off B1, equal to CD, and divide 1A into three equal parts. This can be most easily done by trial, with the dividers. From O lay off O*b* and O*a* each equal to two of the three parts just found. From *a* and *b*, with a*b* as a radius, strike intersecting arcs at *e* and *f*. From *f* and *e* draw dotted lines through *a* and *b*, prolonging them some distance, as to *c*, *d*, *h* and *i*. From *e*, with a radius *e*C, draw the arc *c*C*d*, and from *f*, in like manner, the arc *h*D*i*. From B, with a radius B*d*, strike a short arc across BA, which will inter-

sect very near *b*. From this last intersection as a center, draw the arc *d*B*i*. In a similar way, find the center for and draw the arc *c*A*h*. These four arcs complete the required ellipse. This curve is often used in projection drawing, isometric, and perspective, all of which will be explained further on.

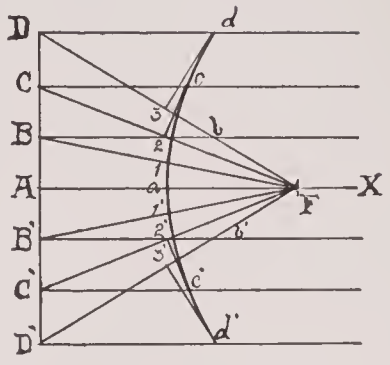


Fig. 25

25. To draw a parabola (Fig. 25):

A parabola is the curve made by a stone thrown into the air in any direction except straight upward. It is also the curve of reflectors which throw a parallel beam of light.

Draw a vertical line DD′ $2\frac{1}{4}$ inches long, and at right angles to its middle point draw AX of any convenient length. At equal distances each side of A, draw parallels to AX, as at B, C, D, B′, C′, D′. On AX choose a point F as the "focus" of the parabola. Bisect FA, as at *a*, for the middle point of the curve. Draw also FB, FC, ED, etc., and bisect each with a perpendicular, as at 1, 2, 3, etc., prolonging each perpendicular till it intersects the horizontal line nearest it. Through these last intersections, as *b*, *c*, *d*, *b*′, *c*′, *d*′, trace a portion of the required parabola, which may be made of any length, by the same method.

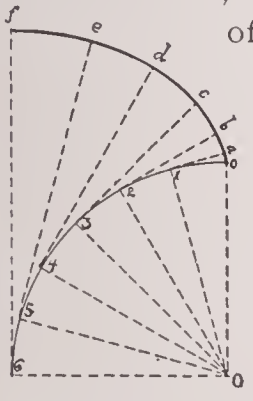


Fig. 26

26. To draw an involute (Fig. 26):

An involute is the curve traced by the end of a thread unwound from a spool, if the thread be held straight while unwinding. It is most used in laying out the curves of the teeth of gears, as will be explained in drawings of machines further on.

As the curve may be made of any length, like the parabola, we will construct but a small portion of it.

Draw a quarter of a circle with a radius of 2 inches. Divide this "quadrant" into any number of equal arcs 0–1, 1–2, etc., six being a convenient number, and draw the radii O*o*, O1, etc. At the end of each radius draw a tangent, as 1*a*, 2*b*, etc. On 1*a* lay off from 1 a distance equal to the arc 1–0; on 2*b* lay off from 2, double that distance; on 3*c*, treble that distance, etc. Then through *oabcdef* draw the required involute.

27. To draw a helix of given diameter and pitch (Fig. 27):

This problem will require two spaces on the fifth and last plate of problems. Use the two right-hand rectangles. A helix is the curve of a screw-thread, a coiled spring, or a winding staircase, and its pitch is the vertical distance between any two corresponding points of the curve, as *a*′ and *a*″.

Draw a semicircle, 3 inches in diameter, and divide it into equal parts, say six. With T-square and triangles, draw vertical dotted lines upward from the points of division of the semicircle, those at the sides being $5\frac{1}{2}$ inches long.

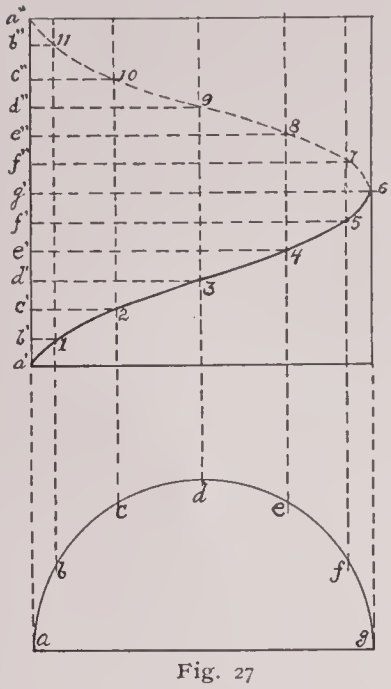


Fig. 27

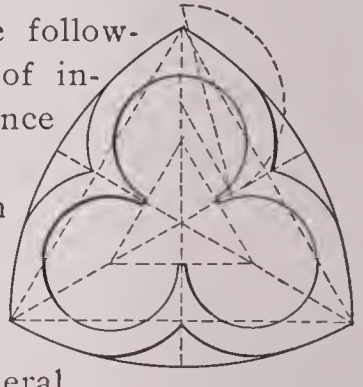
Taking the pitch of the helix equal to its diameter, 3 inches, lay off on the left-hand vertical line a distance $a'a''$, 3 inches long, and divide it into 12 equal parts (each $\frac{1}{4}$ inch). From $b'c'$, etc. draw horizontal dotted lines till they intersect the vertical lines drawn from b,c, etc.

Through the points of intersection, 1,2,3, etc., draw the helix, dotting in the upper half where the curve appears to pass to the opposite side of the cylinder around which it winds. It is unnecessary to draw a complete circle beneath the helix, as the points on the lower half are directly beneath those on the upper half, when divided into the same number of parts.

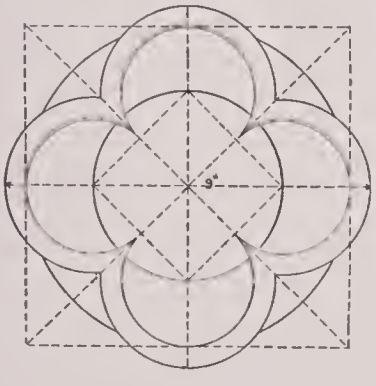
THE DRAWING OF EASY, ARTISTIC DESIGNS

It must not be thought from the preceding problems that all drawing with instruments is tedious and mathematical, for much of it, especially architectural drawing, shows many beautiful designs and constructions drawn wholly with instruments.

A few figures of this sort are given in the following plates to give further practice in the use of instruments and to show how pleasing in appearance a purely mechanical drawing can be made.



The first design is called a trefoil, and is often used for ornamental window-frames in the gables of churches and similar buildings. The dotted lines show that its general outline is based upon an equilateral triangle. Only the radius of the outside arcs is given, the learner to find the other dimensions by comparison, or he may exercise his ingenuity in modifying the design. The dotted lines should not be inked, but erased from the finished drawing.

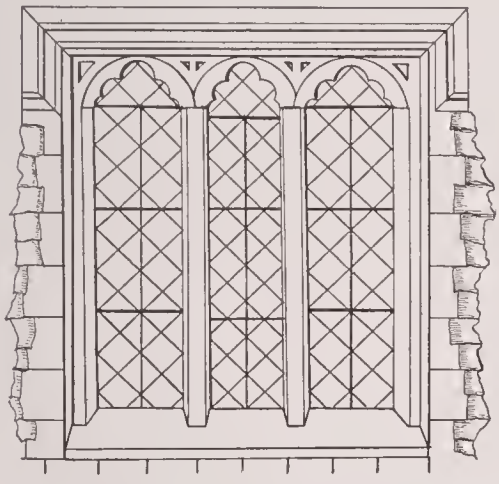


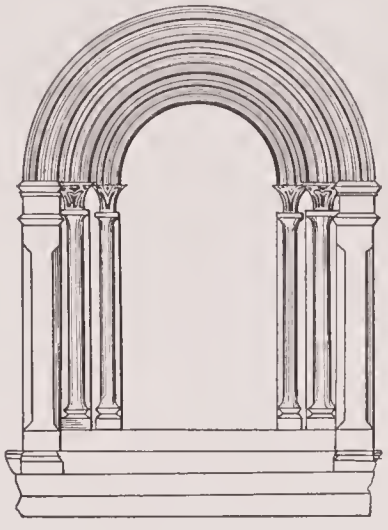
The next figure is also a window-frame design, called a quatrefoil. It should be of the same size in outside dimensions and finished in the same manner, differing only in having four series of curves and being based upon a square.

These two figures will be sufficient for a plate.

The next plate consists of drawings of a latticed window and an arched doorway.

The window should be drawn 6 inches wide and $6\frac{1}{4}$ inches high, the other dimensions being in the same proportions. This figure will afford good practice in the use of the 45-degree triangle and in drawing lines of different widths. It should be first penciled in complete,

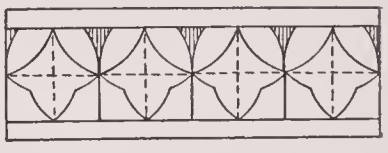


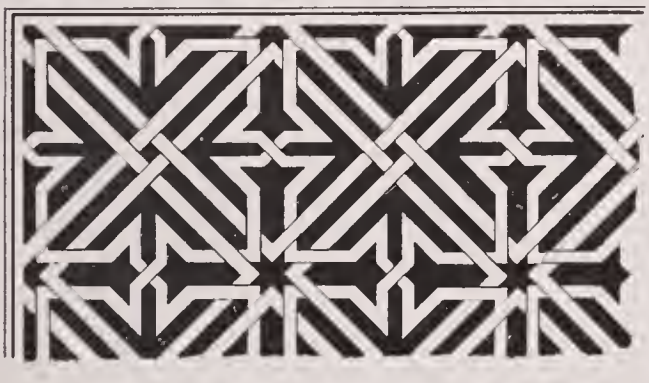


and then, if no errors have been made in construction, inked with T-square, triangle, and compasses. The rough stonework at the sides may be inked free-hand, with a fine writing-pen.

The drawing of the arched doorway affords practice in drawing a large number of circles from the same center. Great care will need to be taken in order not to tear the drawing paper with the needle-point of the compasses. This figure also gives further practice in drawing curved lines of varying widths with the compasses.

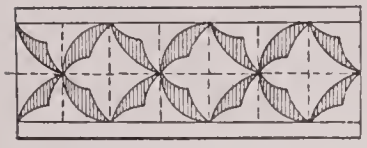
The broken lines at the right and left of the steps show that they may be continued to either side as far as may be necessary.



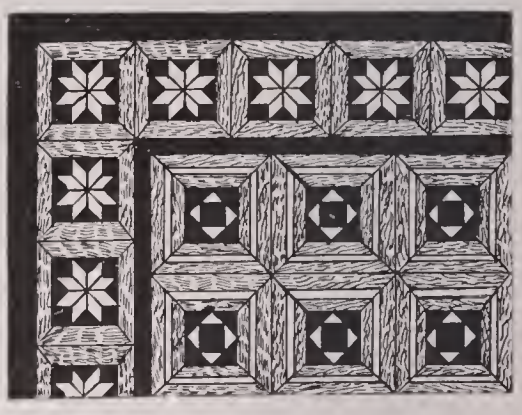


The next sheet of architectural designs shows two forms of trefoil molding, or border, and two of marquetry, or inlaying. Place the first molding, or upright trefoil, at the upper left-hand corner of the plate, and below it the interlaced marquetry design. In drawing the latter, great care must be taken to guard against blotting when filling in the solid black. Each

solid figure should be outlined with the ruling-pen and filled in with an ordinary writing-pen, or a very small camel's-hair brush.



At the right-hand side of the plate, draw the second trefoil design for the upper figure, taking care to place it at the same height as the first. In lining the shaded portions of this design, be careful to make the lines perfectly uniform in width and spacing.

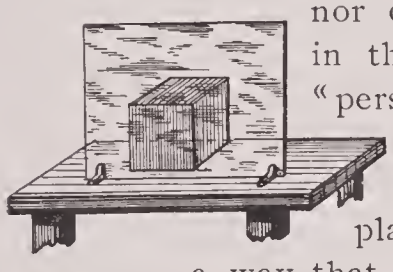


The last figure on this plate shows how pleasing a design may be made by artistically arranging triangles with squares and other quadrilateral figures formed of straight lines only. It affords good practice with T-square and triangles, in inking solid areas, and in shading by broken lines.

WORKING DRAWINGS—PROJECTIONS

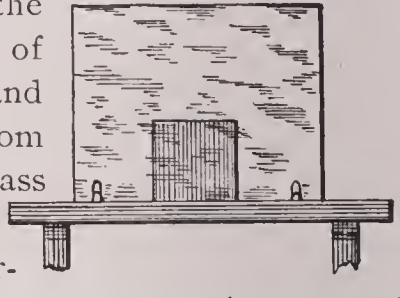
A WORKING drawing is one which will give to a workman all the knowledge of an object necessary to construct it.

For example, a photograph may tell a workman exactly what a finished object looks like, but it would be almost useless as a guide to the making of another like it, since it shows no dimensions, nor does it show of equal length in the picture lines which in the object itself are really equal. The photograph is a "perspective" view — a method of drawing which will be explained further on.



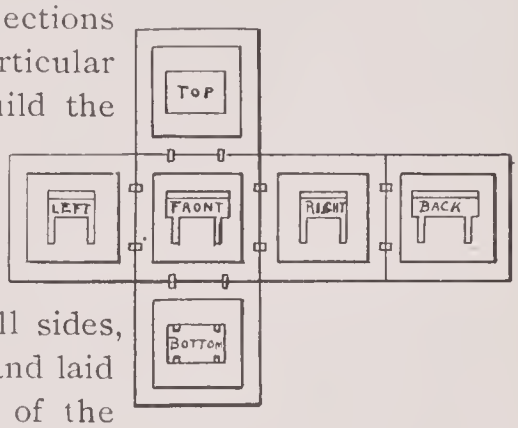
The working drawing, then, must represent upon a plane surface the true form and size of an object, in such a way that it can be correctly built from the drawing alone, without any spoken or written directions.

If we place a cube upon a table and look at it from such a point as to see three of its faces, the image upon the eye is a perspective. If we then place a pane of ground glass upright in front of the cube and mark upon the glass where the ray of light from each visible corner of the cube seems to pass through it, we should, by joining these points by straight lines, have upon the glass a perspective drawing of the cube which, for purposes of making, would be as useless as a photograph.



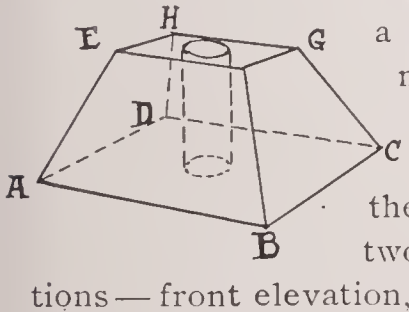
However, if we have placed the pane of glass parallel to the front face of the cube and then move the eye until it, too, is directly before both glass and cube, we shall see a square outline in which each dimension of the cube has its correct proportions. If we imagine the eye moved back to a very great distance, the rays which pass to it from the four visible corners of the cube will pierce the glass perpendicular to its surface, and the apparent image on the glass will have not only the correct shape, but the correct size as well. This image, formed by lines supposed to fall perpendicularly upon an imaginary transparent plane, is called a projection; sometimes an "orthographic projection."

If, now, we were to place another pane directly above the cube, and a third at one side of it, and receive projections upon them, we should have three views (in this particular case all alike), from which any workman could build the cube without any further explanation.



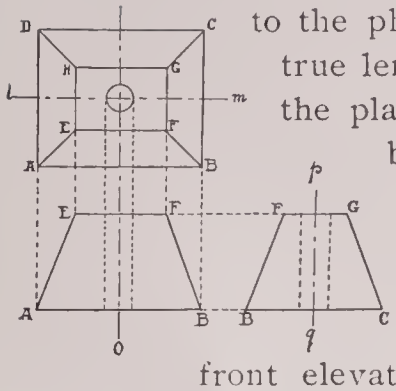
In more complex objects, it is sometimes necessary to use more than three views. Let us suppose, for this purpose, that our object, a table, is suspended in a glass case which surrounds it on all sides, and which is so hinged that it can be opened out and laid flat like a sheet of paper. If the different surfaces of the table are parallel to the glass sides, and we place our eye on each side in succession, we shall see the front side from in front, the top from above, the bottom from below, the right from the right, etc. When the glass case is opened out, it will then give the correct arrangement of projections upon the sheet; that is, the front view or "front elevation" will occupy the center, the "top plan" will appear above it, the right end-view at the right, etc. If a back view, or "rear elevation," is necessary, it should be placed at the right of the right end-view, and if a bottom view, below the front elevation. With this arrangement, the position alone tells at once the point from which the view was taken.

From what has already been said, let us try to make a working drawing of such a piece as is here represented, a spacing block, which is a frustum of a pyramid with a hole through its middle.



If we consider the face EAB the front, then GCB will be the right end; and, since the front and back views are alike, and also the two end-views, we shall need but three projections — front elevation, plan, and one end-view — to completely represent the object. Arranging these three views in the way already

described, we have the working drawing here shown in which each part of the object appears with its proper dimensions, or in such a manner that those dimensions may be readily found. For example, all lines except the corners of the pyramid (as EA, etc.) are parallel to the planes upon which they are projected, and appear in their true length; the diameter of the central hole is clearly shown in the plan, and even the length of any corner line may be found by computation, if for any reason it is desired. It would not be necessary, in the construction of the object, for the vertical height will answer the purpose equally well.

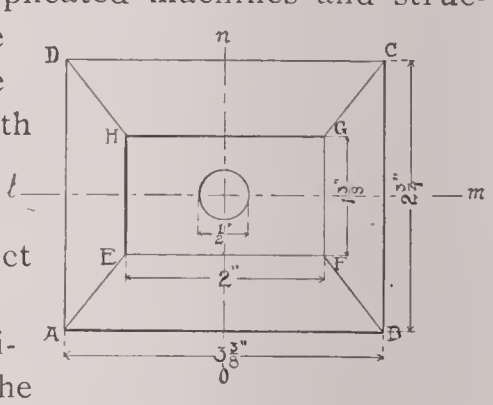


In the actual construction of such a drawing, first draw the broken center lines *lm*, *no*, and *pq*. In the front elevation, lay off on *no* the height of the frustum, and on each side of the center line, at the base lay off one-half of the length of AB, also the radius of the central hole. At the top of the frustum, lay off one-half of EF, on each side of the center line. Draw the lines AB, EF, EA, and FB, and the dotted lines representing the outlines of the central hole, and the front elevation is completed.

In the plan, draw a circle representing the central hole, using the intersection of *lm* and *no* as a center. Lay off on each side of *lm*, one-half of DA, HE, GF, and CB, having first found the location of these lines with reference to *no*, by "projecting up" the lengths of AB and EF from the elevation, as will be readily understood.

In the same manner, the height of the end view may be found by extending by dotted lines the lines EF and AB of the front elevation. The lengths of FG and BC being the same in the end view as in the plan, one-half of each may be laid off from the center line *pq*, also the radius of the central hole, and the end view, or "side elevation" as it is sometimes called, completed in the same manner as the front elevation. Our first *working drawing* is now ready to ink.

In making drawings of large and complicated machines and structures, it is, of course, impossible to make every view of the object as large as the object itself; therefore they are made with each dimension of the drawing one-half, one-quarter, one-eighth, etc., as large as the corresponding dimensions of the object itself.



In order to indicate this, the actual dimensions of the *object* are given upon the drawing, and the *scale* of the drawing is given below. For example, the plan view of the pyramid shown in the previous working drawing is here redrawn and dimension lines added, the scale being one-

half size; that is, each line in the drawing is one-half as long as the corresponding line of the object is to be made, while the sizes given on the dimension lines are the same as they are to be made in the object.

When the scale is "half-size," a dimension of one foot in the object will be represented in the drawing by a line six inches long; hence the drawing is lettered: Scale, 6″ = 1 ft. In like manner, when the scale is "quarter-size," it is expressed thus: Scale, 3″ = 1 ft.

For convenience in making scale drawings, scales are made on which distances of one inch, one and one-half inches, three inches, etc., are divided into twelve equal parts, and each of these twelve parts is again divided into halves, quarters, etc., so that the reduced dimensions can be read directly from them, as readily as from a full-sized scale.

It is the practice of the best shops never to "scale" a drawing; that is, never to measure on a drawing a line whose dimension is not given. This is because a workman is more apt to make an error in measurement than is a skilled draftsman, and also because most drawings are copied by a photographic process called "blue printing," in which the print shrinks slightly on account of being wet to develop it. For these reasons, the draftsman should use extreme care to place upon his drawings, in plain figures, every dimension necessary for the accurate construction of the object represented.

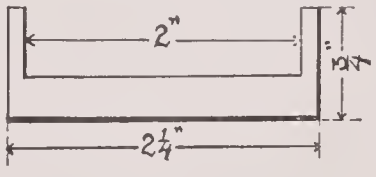


Fig. 75

Dimension lines should be light, solid lines, extending between the points measured from; and their ends should be marked by arrow-heads, thus: Figure 75. Dimensions should never be marked on a line of the drawing itself, but to one side; the points between which the measurement is taken being joined to the arrow-points of the dimension line by short dotted lines, as shown in the lower part of the figure.

All figures should be very plainly written, and when fractions of an inch are used, the line separating numerator and denominator should always be horizontal, thus: $\frac{1}{16}$ inches. If slanted thus: $^{1}/_{16}$ inches, it may be mistaken for $1\frac{1}{16}$ inches, and costly errors be made in the shops.

Fig. 77

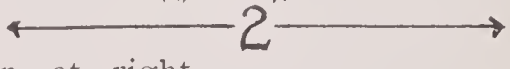


Fig. 76

Dimension figures should always be written at right angles to the dimension line, thus: Figure 76, and never thus: Figure 77. Dimensions should be given in inches only, up to 24 inches, since a workman usually measures with a two-foot rule. Larger dimensions should be given in feet and inches, thus: 7 feet 8 inches. When very small dimensions must be given, and there is not sufficient room to write the figures across the line,

the arrow-points may be faced inward and the dimension written at one side, thus: Figure 78. The arrow-points should be uniform in length and slant; about 30 degrees. For practice in projection drawing, two plates of figures, affording practice in the rules just given, are here inserted. Neatness and accuracy should be the motto, as with the geometrical constructions; especial pains being taken with the lettering and the figures of the dimensions. Before trimming the plate, the young draftsman should go carefully over each figure and ask himself: "Have I shown enough in my drawing so that I or a workman could make each object represented, without any further instruction than my drawing gives?"

Fig. 78

Figure 1 of the first plate shows three views of a rectangular prism. Figure 2 shows corresponding views of a triangular prism, or wedge. Notice that but for the plan, Figure 2 could not be distinguished from Figure 1. Figure 3 represents a triangular prism of a different shape. Here the end elevation makes clear the difference in shape.

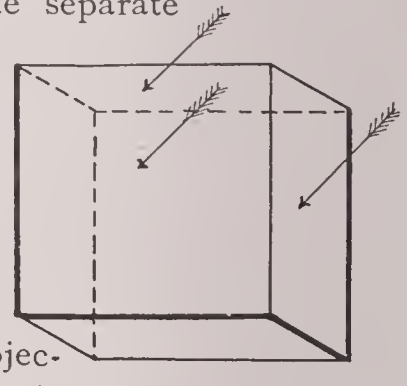
Figure 4 shows plan and front elevation of a cylinder. Two views represent this object as fully as three, since the side elevation will of course be exactly like the front. Figure 5 represents a hexagonal prism and Figure 6 a hexagonal nut.

Figure 1 of the second plate represents in side elevation a blow-off cock for a boiler. This one view would not be sufficient to enable a workman to construct the object.

Figure 2 shows three views of a bolt or pin with a split cotter, and Figure 3 a side elevation of a plate coupling for two lengths of shafting, fastened together by six bolts having hexagonal heads and nuts.

SHADE LINES AND SURFACE SHADING

Shade lines are lines used to give a clearer and more finished appearance to a drawing. They always indicate separate planes, one of which is in the light and the other in the shadow.



When drawing, a draftsman usually arranges the light so as to fall over his left shoulder upon the drawing, and in determining shade lines the light is always considered to strike the object from the left and above, at an angle of 45 degrees to each plane of projection. For example, on the cube shown above there are three lighted surfaces and three in shadow; so that on the edges of the three visible planes there will appear four shade lines.

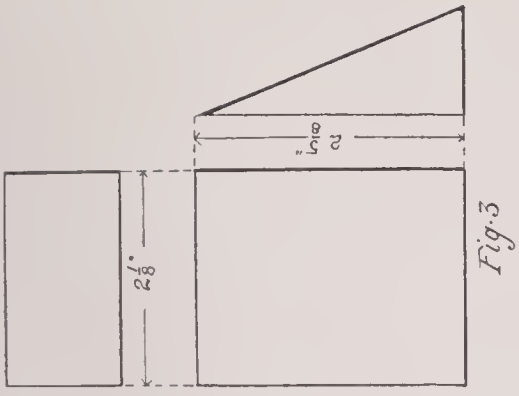


Fig. 3

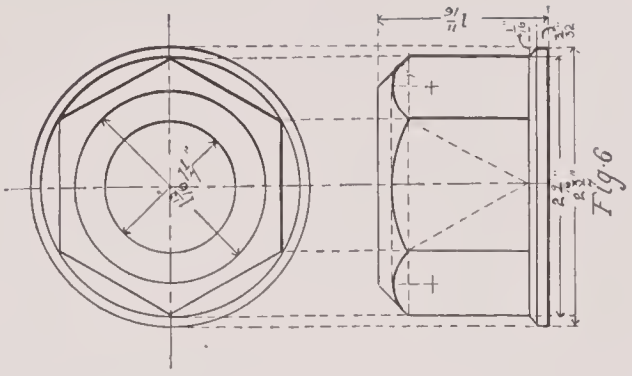


Fig. 6

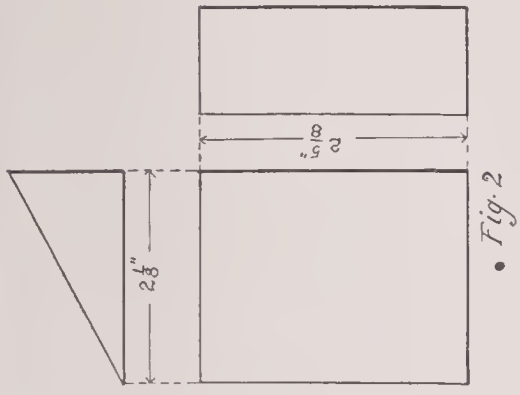


Fig. 2

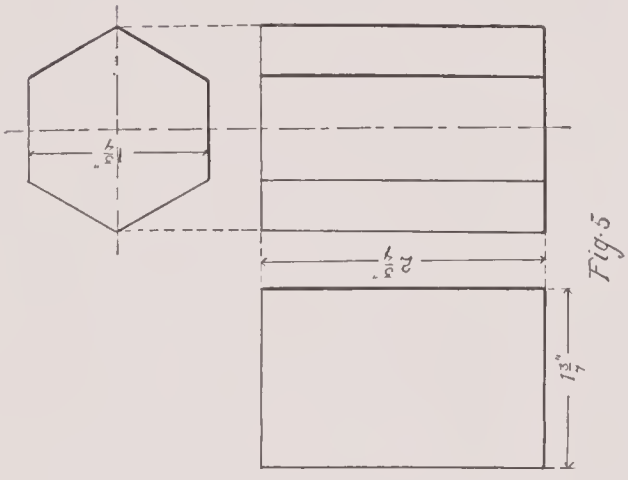


Fig. 5

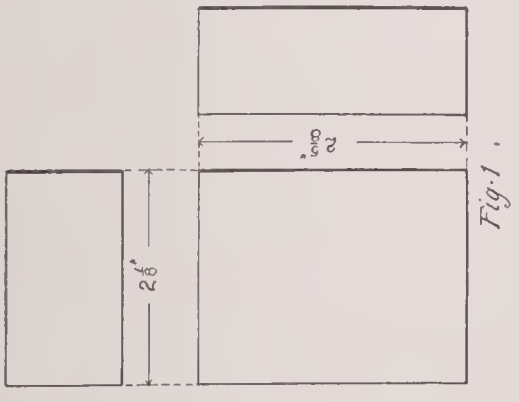


Fig. 1

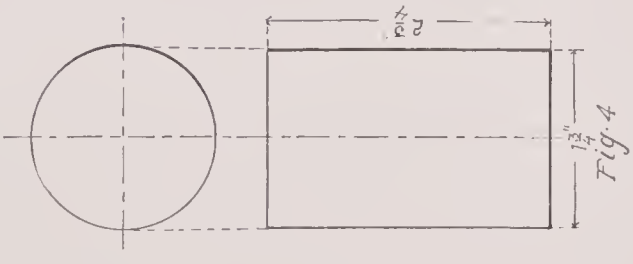


Fig. 4

PLATE I

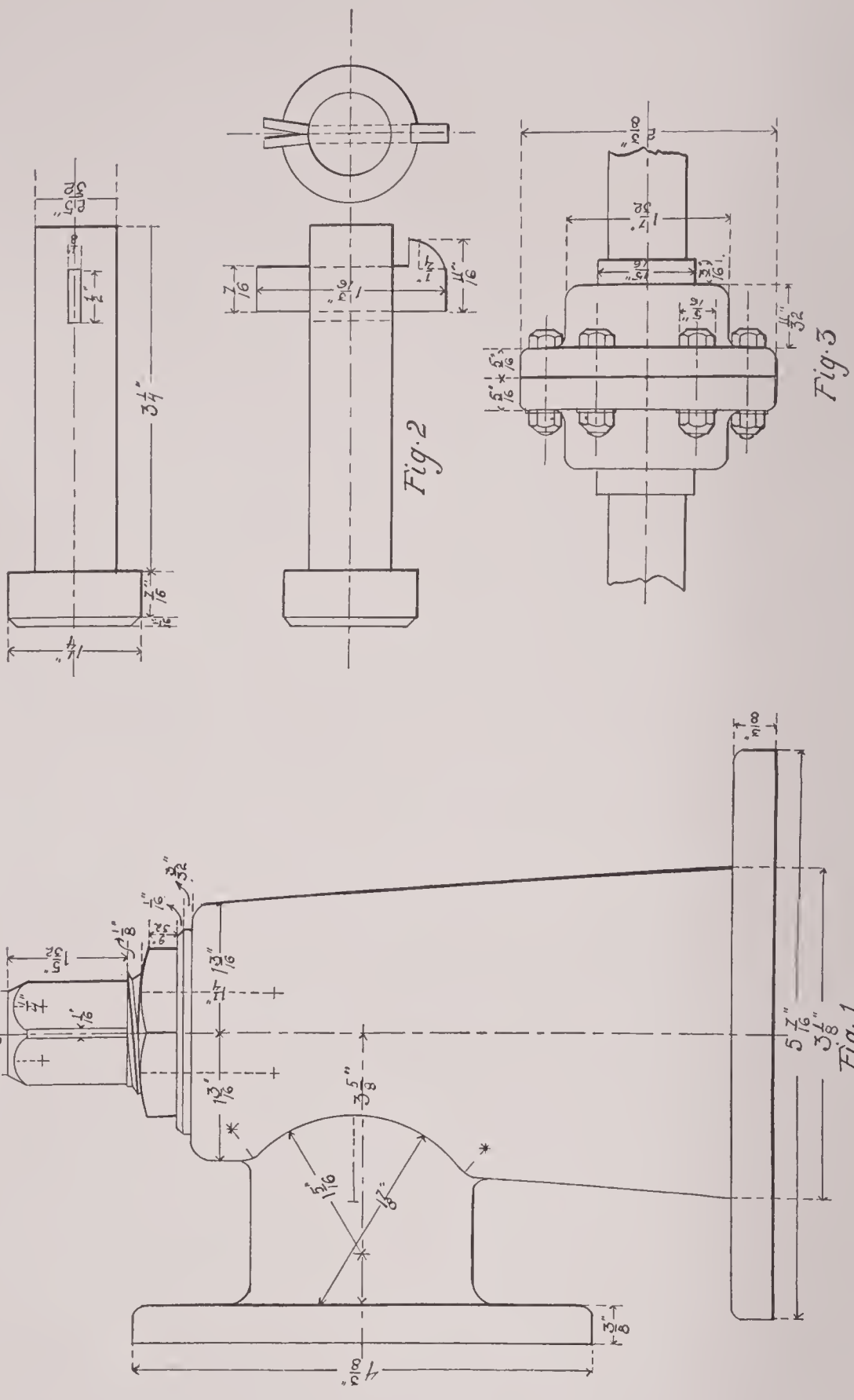
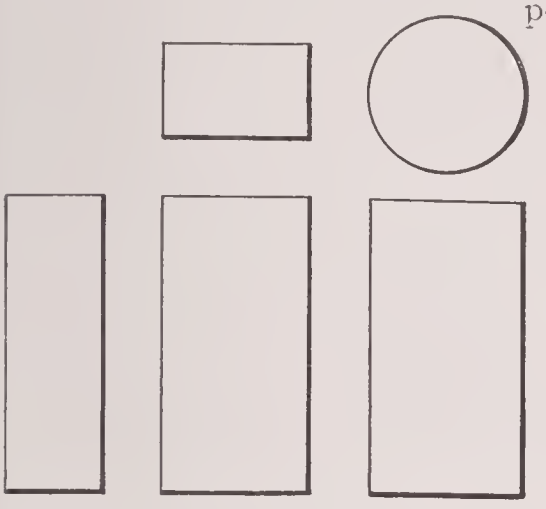


PLATE II

According to this theory, we should have the three projections of a cube shaded as shown in the margin, but some of the best draftsmen simplify the rule for shading by placing shade lines at the right side and bottom of all projecting parts in each view; thus considering each plane separate and not as folded back from a position surrounding the object.

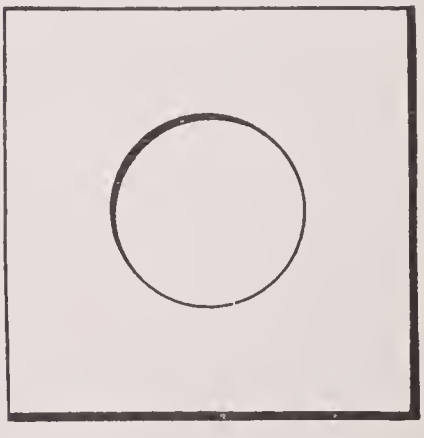
The practice last described, even though not theoretically correct, is more easy to apply, and it will be the one followed hereafter. Besides, it gives to each view a more natural appearance than when shaded as would be required by theory. In shading a cylinder, it is usual to shade the right and bottom, although the line or "element" of the cylinder which separates the lighted from the shaded portion is not at the right-hand side: neither would a shade line be required the entire width of the base.



The rules for shade lines will be best remembered by means of a few examples: —

The three views of a rectangular prism are to be shade-lined as in the margin, at the right and bottom of each view.

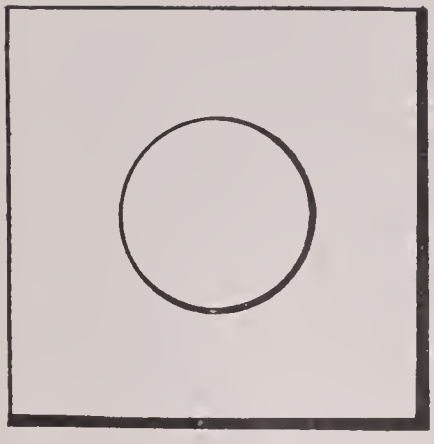
In shade-lining a cylinder, the right and bottom of the elevation are shaded, as explained above. In the plan, first draw the circle light; then, without changing the radius or adjustment of the pen-points, move the needle-point to a new center downward and toward the right at an angle of 45 degrees, and draw a semicircle which will thicken the circumference most at the lower right-hand side (what corresponds to southeast on a map), and vanishes into the light line at the upper right-hand and lower left-hand sides.



In shade-lining a circular opening, the line separating the lighted and shaded surfaces is, of course, at the opposite side of the circle, and for this reason, the upper left-hand (northwest) side of the circle is shaded.

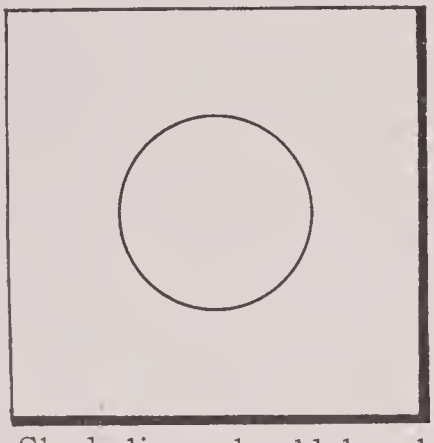
By comparing the figure at the bottom of this page and that at the top of page 4008, it will be noticed at once that the first represents a square object with a circular hole through it; for example, a square nut, while the second has, instead of a hole, a circular boss or projection.

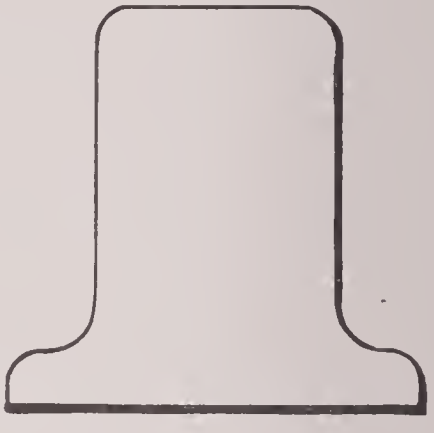
If the circle were not shaded at all, as in the third figure, it would indicate that the circular hole was filled by a separate piece even, or "flush," with the surface of the outer square.



When an arc joins two straight lines, one a shade line and the other not, it should gradually decrease in width from the shaded to the unshaded line, which may be done by shifting the needle point of the compasses as in shade-lining circles. In this case, however, the center should be shifted either horizontally or vertically, and not at an angle of 45 degrees, as will be seen in the marginal figure representing the pedestal of a machine.

Since drawings should never be scaled, it matters very little whether the added thickness of the shade line is inside or outside the measured dimensions of the drawing. Many draftsmen use no shade lines in drawings of parts of machines, adding them only in views of assembled machines.

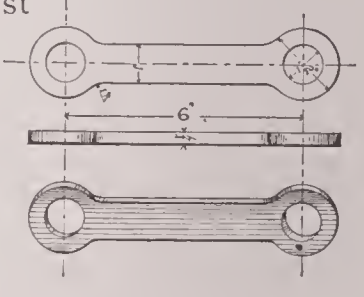




Shade lines should be about double the width of other lines of the drawing and should always be full lines. Never attempt to shade dotted lines.

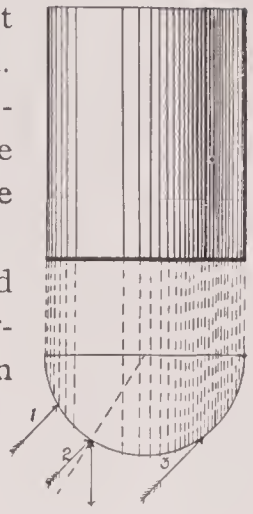
SURFACE SHADING

VERY little need be said of surface shading, since it is less and less used by the best draftsmen. Perhaps the best direction is: — "Don't." But where it seems desirable to shade a surface, for the sake of greater clearness, it should never be done free-hand. For plane surfaces, use fine, parallel lines, increasing the distance between them on that portion of the surface supposed to be most highly lighted.

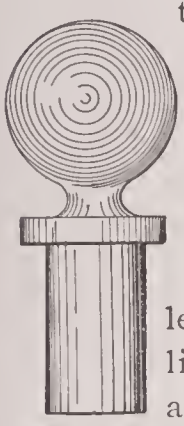


In line-shading cylindrical surfaces, the spacing of the lines may be to some degree found by drawing a half plan of the cylinder,

dividing its semi-circumference into equal parts and projecting these points upon the elevation. The most highly lighted part of the cylinder will be that indicated by the arrow 1, but it will not appear so, since the light striking it is reflected directly back. The part appearing lightest is indicated by the arrow 2, because at that point the light is reflected directly toward the eye. The darkest part of the cylinder is indicated by the arrow 3.

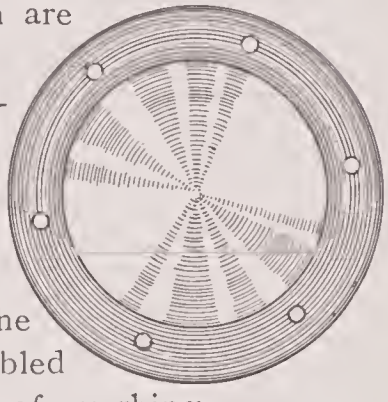


Now, while the spacing of the shade lines is readily found in the manner shown, their width is not so readily determined, and will always be a matter of practice and taste with the draftsman himself.



A sphere is shaded by circles — concentric with each other but eccentric to the outline of the sphere, the center of the shade circles being located at the lightest part of the sphere. The innermost shade lines are usually not complete circles.

Polished disks are shaded by short arcs decreasing in length toward the center. The ends of the arcs may be limited by means of penciled radial lines, which are afterward erased.

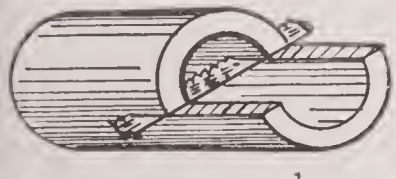


Fine examples of shading may be found in trade catalogues, and by noticing the actual effect of light in photographs and half-tones of machinery, or upon the machines themselves, much more natural and artistic effects may be produced than by following any set rules.

It is to be remembered that shading adds nothing to the accuracy of a drawing, and it is best used only in assembled machines, to help those unaccustomed to the reading of working drawings more readily to understand the object represented.

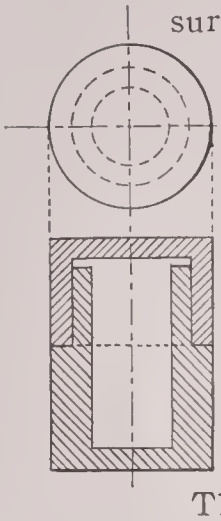
SECTIONS

It often happens that all the possible outside views of an object fail to show enough to enable a workman to build it. Whenever it is necessary to show the inside structure of machines, etc., the thickness of metal, or the kind of material used, it is best shown by considering the object cut across, as by a saw, on any plane convenient to best show what is desired.



For example, if we had merely an elevation and plan of a short piece of pipe, it might be difficult to tell, in an unshaded drawing,

whether the object was hollow or filled with a core of some different material. If cut, however, the empty pipe shows only the outer wall in section, while the inner hollow will, of course, show no roughened surface.



The usual way of showing a section is by means of parallel lines, drawn usually at an angle of 45 degrees, though if many parts are shown touching each other, the 30-degree and 60-degree triangles may also be used, for no two parts in contact should be section-lined in the same direction, else they might be mistaken for a single piece.

In the present figure, it is easy to see by means of two views only, that the object represented is a circular box with a tight-fitting cover.

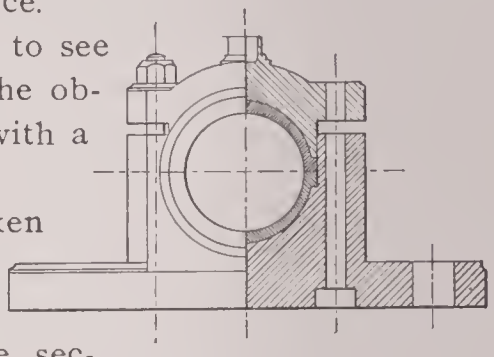


Fig. 94

The plane on which a section is taken should always be indicated by a dot and dash line, lettered or numbered, thus: A — · — · — · — · — · — B, and the section itself should be lettered thus: Section on AB.

Much time is often saved where the two sides of an object are alike, by drawing one side in elevation and the other in section, thus Figure 94.

In this figure is also seen the manner in which different metals may be represented in section. For this purpose a system of section-lining is used which is represented in the following figures, Figure 95.

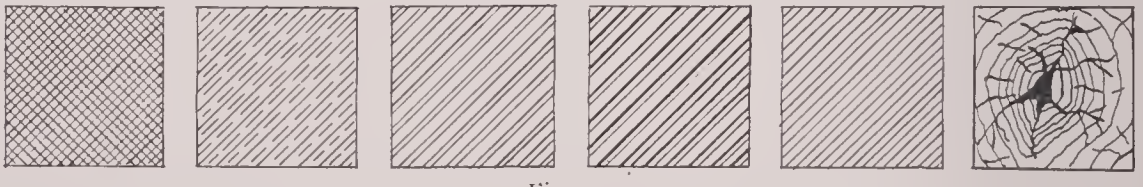
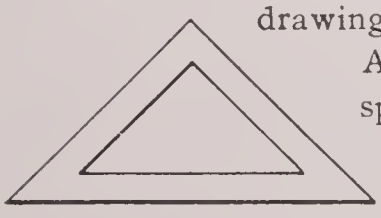


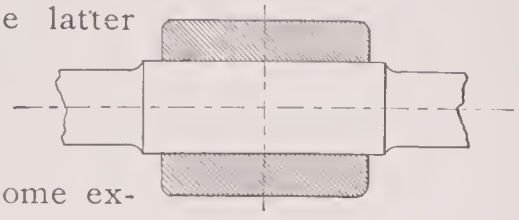
Fig. 95

Formerly, most finished drawings were tinted with water colors to show the material used for each part, but as this could not be reproduced in blue prints, the system of lining has taken its place. Tinting is now little used except in mapping and finished architectural drawings.



A convenient and easily made arrangement for section line spacing is a small triangular piece of thin wood fitted in the opening of the 45 degree triangle, leaving just enough space at one side so that the triangle may be moved sidewise the distance between two section-lines. With a little practice, the inner triangle may be held with one finger, the 45 degree triangle moved against it to draw a section-line, the inner triangle again

moved to the opposite side of the space, and the outer again shifted against it, thus spacing the section-lines equally by a step-by-step movement of the two triangles. To look well, section-lining, or "cross hatching," as it is sometimes called, should be perfectly uniform in spacing and thickness of lines, and the latter should not be too light.



Although in drawing a sectional view, we assume that the object is cut on a certain plane and all in front of that plane removed, there are some exceptions, in ordinary practice. For example, when a pulley, coupling, or machine frame is shown in section parallel to the center of shaft, or through the center of bolts or other fastenings, the shaft and fastenings themselves are not sectioned.

DRAWING ELEMENTS AND DETAILS OF MACHINES

We are now prepared to make working drawings of machines; but in this work it is best to learn first how to draw rapidly and well those parts or details which are common to all kinds of machinery. Among the most common details are bolts and screws, and since it would take unnecessarily long to show each screw-thread as a true helix, it is usual to employ some easy, common, and "conventional" way, understood by all draftsmen and workmen, of showing these often repeated parts.

Figures 1 to 8 (Page 4012) show methods of drawing different kinds of screw-threads, or of representing simply that a part is threaded.

Figure 1 represents a "single" square thread, the diameter being $1\frac{1}{2}$ inches and the pitch $\frac{3}{8}$ inch. By a single thread is meant that but one helix winds round the bolt. This thread will be easily drawn after noticing that its depth is equal to its width, and that the top of the thread on one side the bolt is opposite the bottom on the opposite side. The dotted lines near the top show the hidden portion of one turn of the thread. Of course, the edges of the thread are straight from side to side, instead of being parts of a true helix.

Figure 2 is similar to Figure 1, except that the thread is a double one, two helixes being wound side by side around the bolt. This brings the top of a thread on one side opposite the top of the next thread on the other side of the bolt.

Figure 3 represents a single V thread, the angle of which is 60 degrees. The pitch is $\frac{1}{7}$-inch, or, as it is usually expressed, 7 threads to the inch. In drawing the thread, draw the outlines of the bolt $1\frac{1}{4}$ inches apart, and then opening the dividers to $\frac{1}{7}$-inch (which

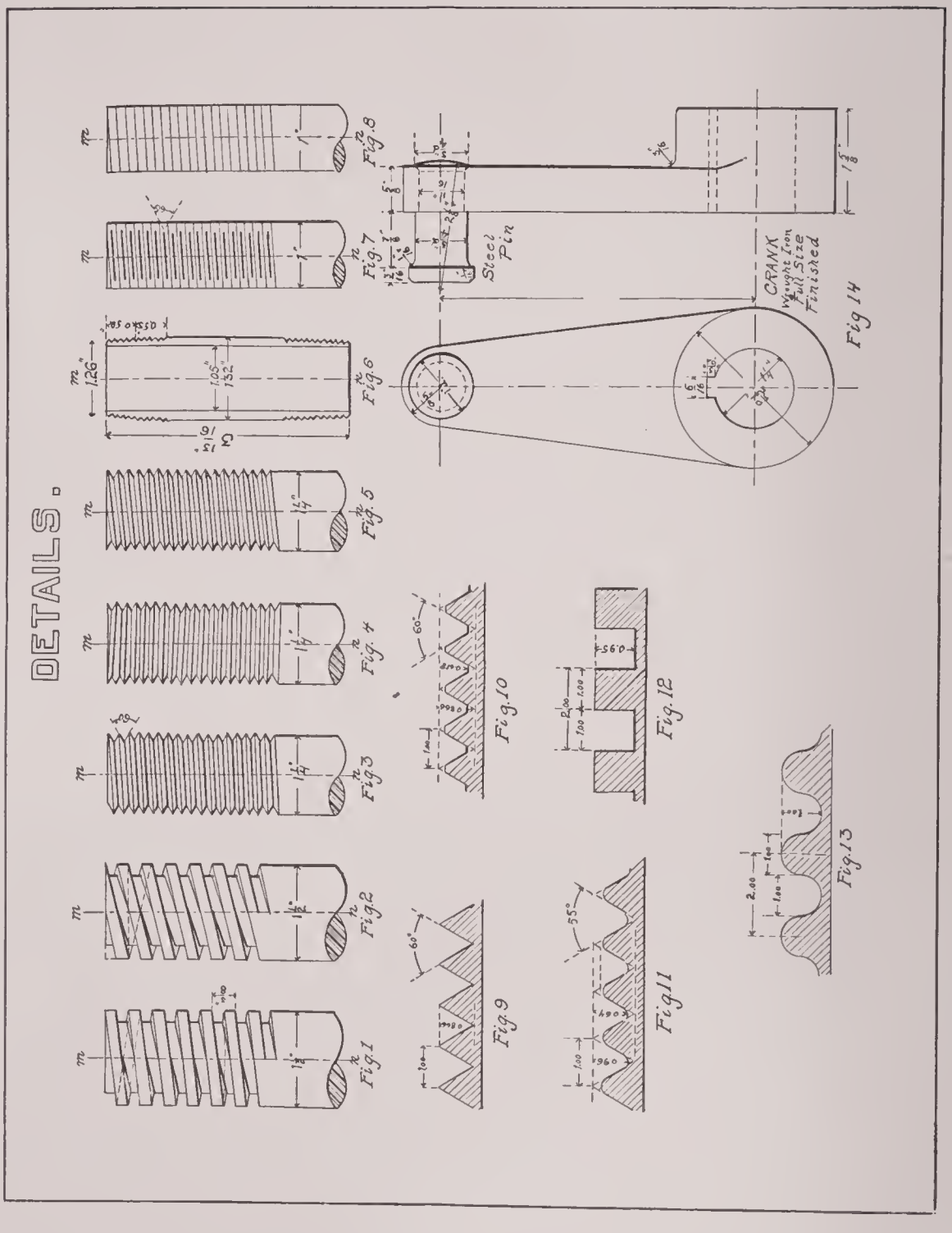

DETAILS.
Fig. 1
Fig. 2
Fig. 3
Fig. 4
Fig. 5
Fig. 6
Fig. 7
Fig. 8
Fig. 9
Fig. 10
Fig. 11
Fig. 12
Fig. 13
Fig. 14
Steel Pin
CRANK
Wrought Iron
Full Size
Finished

PLATE III

may be found by trial), step off the points for the tops of the threads on each side, taking care that the top of the V on one side is horizontally opposite the bottom on the other side. Now with the T-square and 30-degree triangle, draw short, parallel lines from each spaced point toward the center of the bolt. By reversing the triangle and drawing short lines to intersect the first, the sides of the thread will be outlined. Join the tops of these V's on opposite sides with heavy, or shaded lines, and the bottoms by lighter lines.

All the threads described thus far are "right-hand"; that is, the nut is screwed on by a right-hand turn, in the direction of the hands of a clock. In drawing the V thread of Figure 3, care must be taken to make it right-handed, and a single thread, as in this way only is it distinguished from the "left-hand" thread of Figure 4, and the double V thread of Figure 5.

Figure 6 is a longitudinal (lengthwise) section of a short piece of threaded brass pipe. Such a piece is usually called a nipple, and it will be noticed that the thread tapers so that when screwed into another fitting, or "made up" as it is termed, the thread gradually tightens so that steam or water will not leak along it. Piping is sized by its inside, instead of its outside, diameter, and is always slightly over the size by which it is known, so that the article represented by Figure 6 would be known as a 1-inch brass nipple. The *real* inside and outside diameters are usually given in manufacturer's tables. The material is shown by the section-lines.

Figures 7 and 8 are still more rapid ways of representing screw-threads. Unless the need for haste is very urgent, Figure 7 is to be preferred.

Figure 9 is a section of a V thread showing its proportions. Its angle is 60 degrees and its depth 866-thousandths of the pitch; that is, if the pitch were 1 inch, the depth would be 0.866 inch.

Figure 10 shows a modified form of V thread known as the Franklin Institute, or United States standard thread. The angle is the same as the V thread, but $\frac{1}{8}$ of the height of the thread is removed from both top and bottom, leaving its height about 65-hundredths of the pitch. This form of thread has almost entirely replaced the V thread in the United States.

Figure 11 shows the English standard thread, known as the Whitworth. Its angle is 55 degrees and the top and bottom are rounded instead of flat, as in the United States standard.

Figures 12 and 13 show the proportions of the square thread and of a special form of round thread often used in screw-presses where a very strong thread is required.

Figure 14 shows front and side elevations of an engine crank, with shouldered pin riveted in and a key-way cut in the hub. The distance

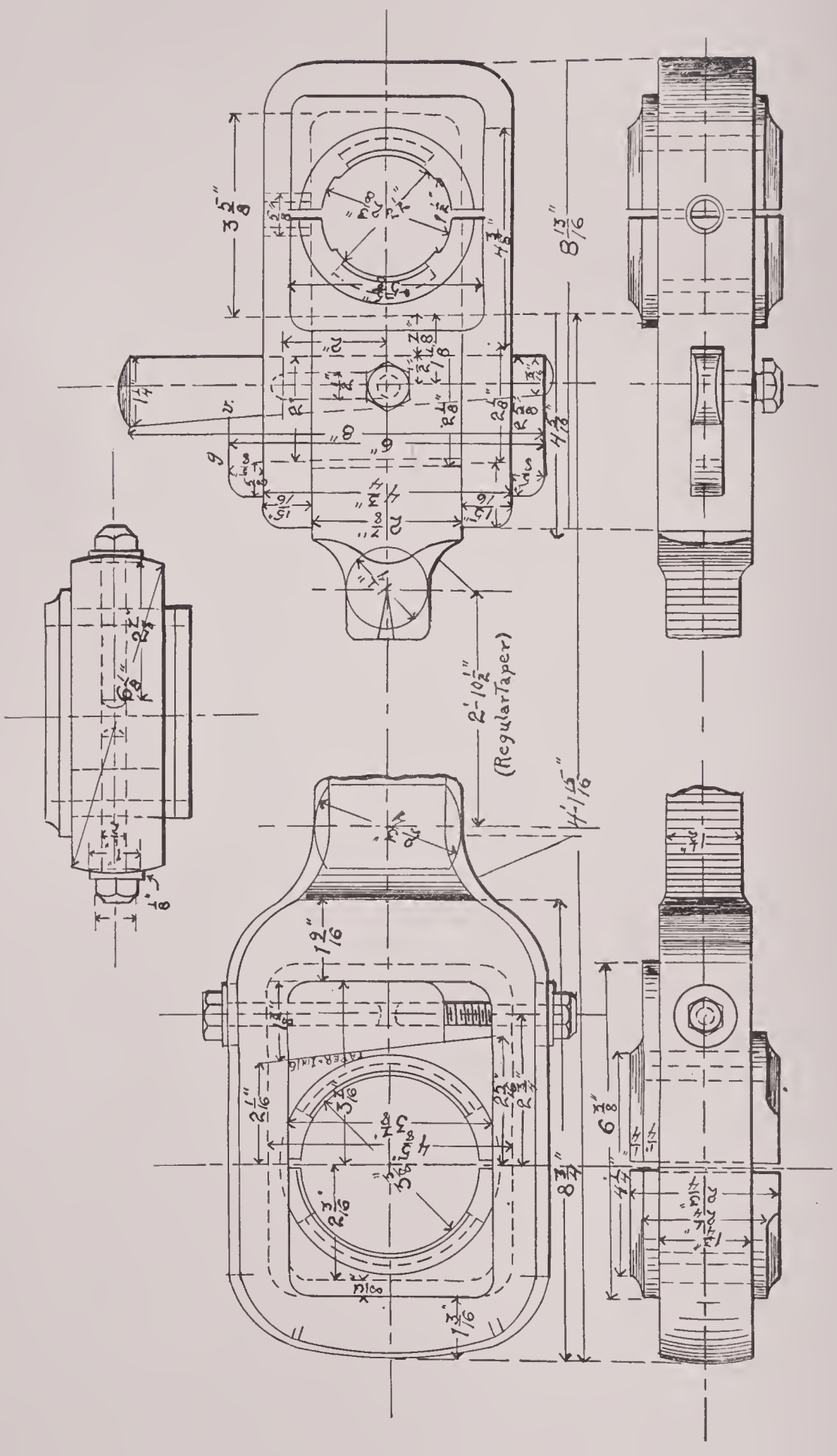


PLATE IV

between the center of the pin and center of the hub, $4\frac{7}{8}$ inches, is the radius of the circle through which the pin turns. The diameter of thi circle is called the "throw" of the crank.

The figures of the next plate show three views of the connecting-rod of a steam-engine. The smaller end is fastened to the wrist-pin of the cross-head and is called a "strap-end," on account of the U-shaped strap passing over its end and holding the brasses in place. The other end, cut from the solid forging, is called a "box-end."

Since the plate is too short to show the whole length of the rod, it is shown broken, the distance between the two ends is given, and the cross-section at these two points is shown cross-hatched. The end view is also shown out of its true position. This plate gives excellent practice in joining curves and straight lines, inserting dimensions, shade-lining, section-lining, and surface-shading.

PLATE V shows a half-elevation and a section on the diameter of a large band-wheel with eight arms. Draw center lines first, and draw both views together, so that points found by measurement in one may be projected upon the other. The center lines of the arms are easily laid out from the center with the 45 degree triangle.

The shaded ellipse on the vertical arm shows the cross-section at that point in a manner similar to the two sections of the connecting-rod in the previous plate. The hub and arms are "cored" when the wheel is cast, the hub being cored larger in the center so that it need not be bored its entire length. It also has two key-ways. The holes shown in the arms are necessary to support the cores, and are "reinforced" inside so that the arms need not be weakened at these points.

The face of the pulley is "crowned," or made higher in the center than at the edges, to prevent the belt from running toward either side, while the wheel is in motion. This explains why the elevation is outlined by two semicircles drawn close together.

This plate shows front and side elevations, a vertical central section, and a section of the arm of a spur gear-wheel having fifty-four teeth. The dotted circle midway of the length of the teeth is called the "pitch circle," and is one of the two circles, which seem to roll upon each other when two gears are "in mesh," or one driving the other. Upon this circle is laid off the "pitch" of the teeth which, like the pitch of a thread, is the distance from a point on one tooth to a similar or corresponding point on the tooth next to it.

As has already been explained, the curve of a gear-tooth is usually an involute, though other curves are sometimes used; but since it would take too much time to draw this curve for each tooth, the teeth are laid out as nearly as possible with arcs of circles, as indicated by the dotted arcs at *p*, *o*, etc. If necessary, the true curve of

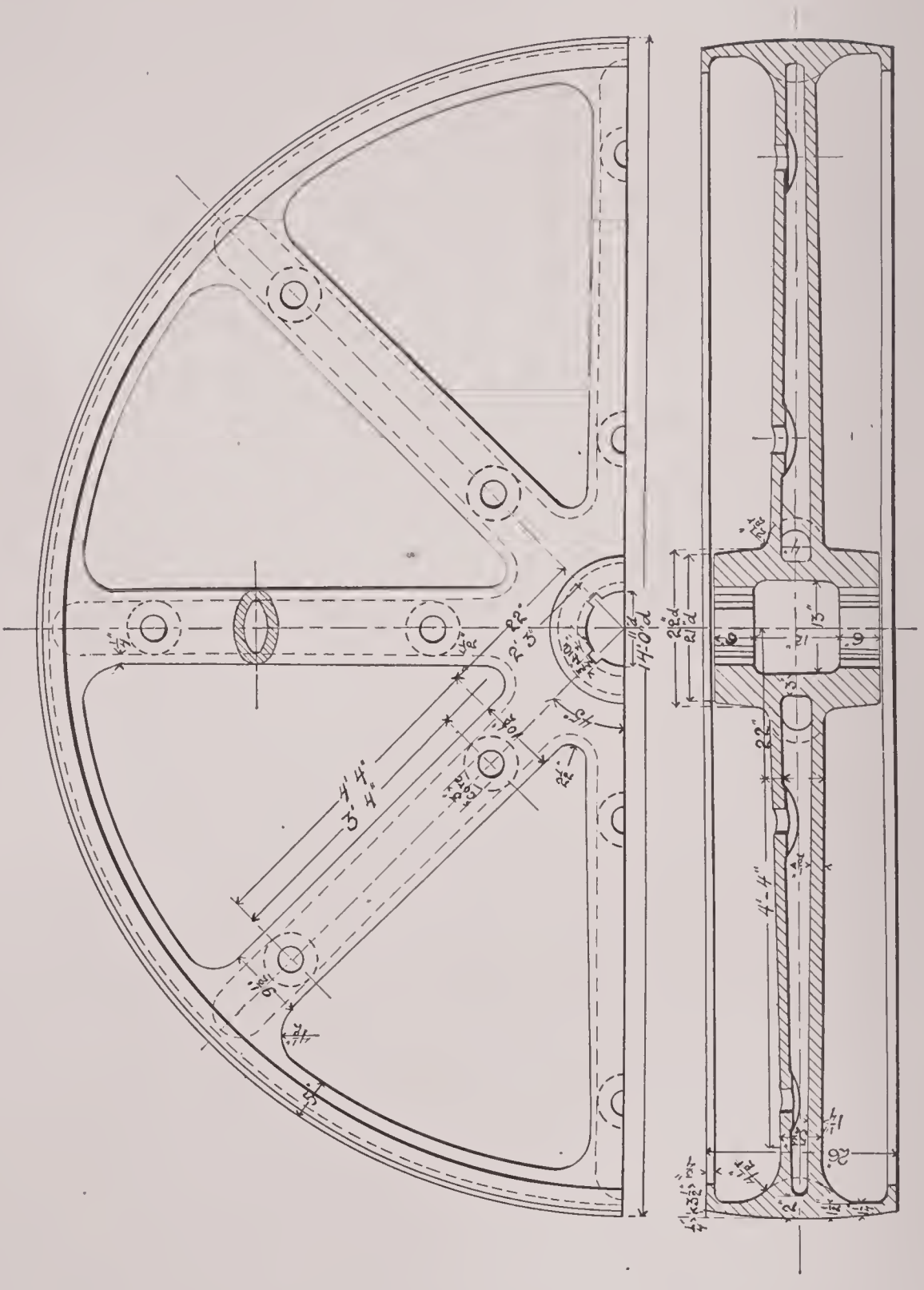


PLATE V

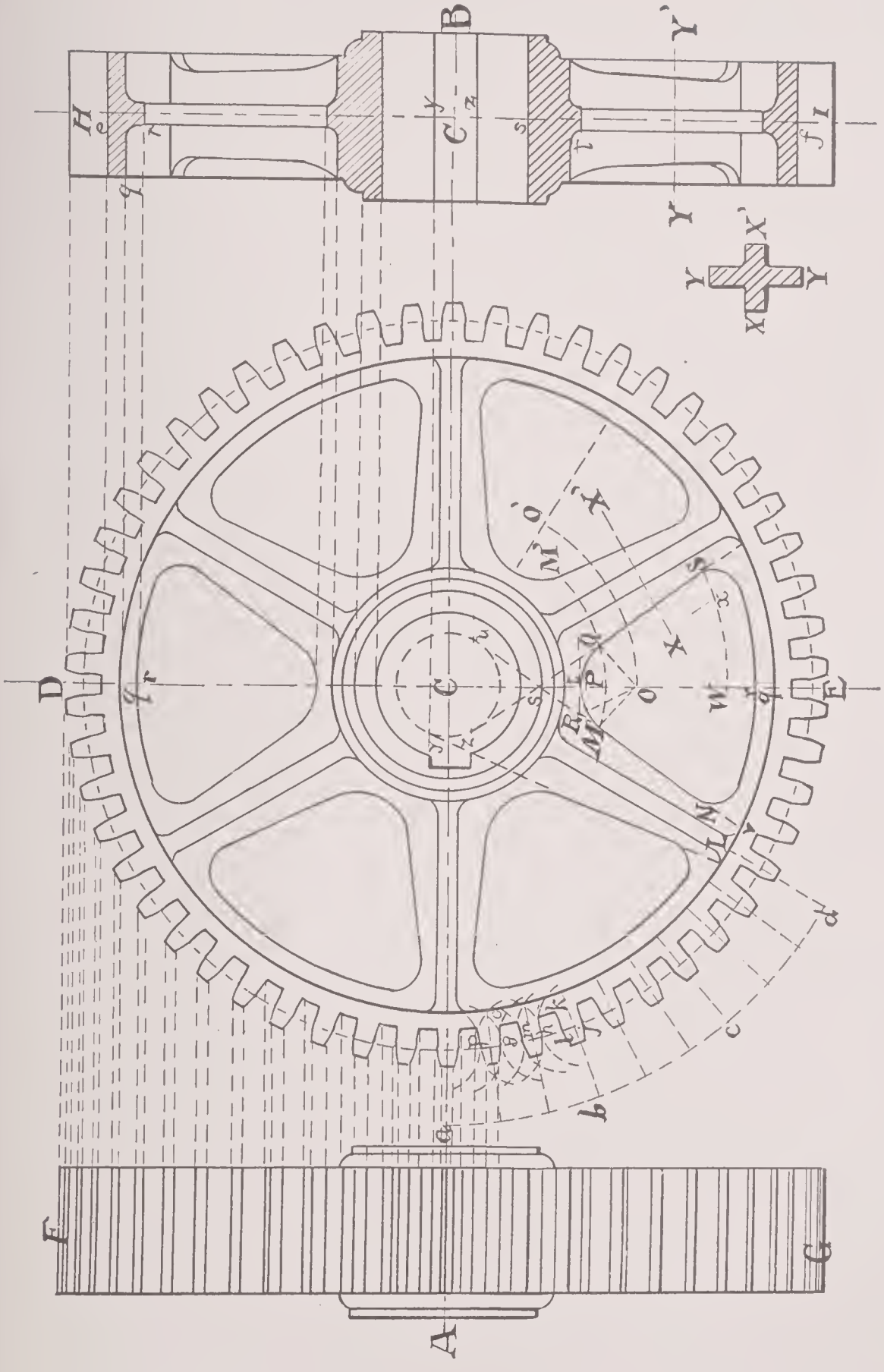
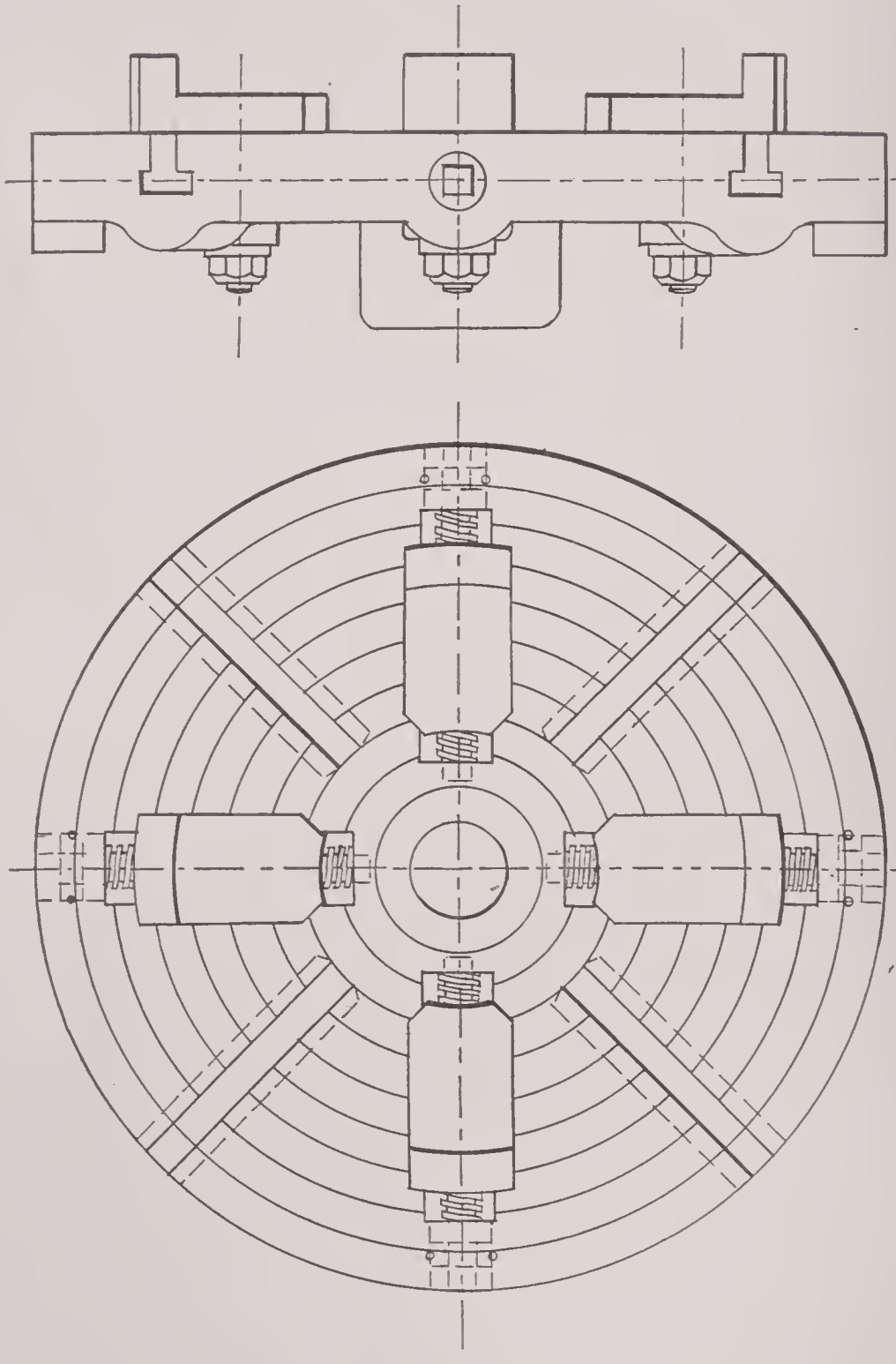


PLATE VI



SIDE ELEVATION.

FRONT ELEVATION.

SCALE 3 INCHES = 1 FOOT.

PLATE VII

a single tooth is drawn full size for the use of the workman, and the others drawn by arcs whose radii are equal to the pitch of the tooth itself. That part of the tooth curve outside the pitch circle is called the "face," and that within, the "flank" of the tooth.

Having stepped off the pitch circle into fifty-four equal parts with the dividers, take each point as a center, and, with the pitch as a radius, draw the curves of the face of the teeth, limiting the height by the circle which shows the extreme diameter of the wheel.

In the same manner, swinging the pencil-point to the opposite side of the center, draw the flank curves of each tooth and limit its depth by a second circle inside the pitch circle. If the whole depth of the tooth be divided into seven parts, the outer, or "addendum" circle should be three of these parts from the pitch circle, and the inner, or "root" circle should be four parts from the pitch circle, so that when two gears are in mesh, there will be a clearance between the tops of the teeth of one wheel and the roots of those of the other wheel, equal to one-seventh of the height of the teeth.

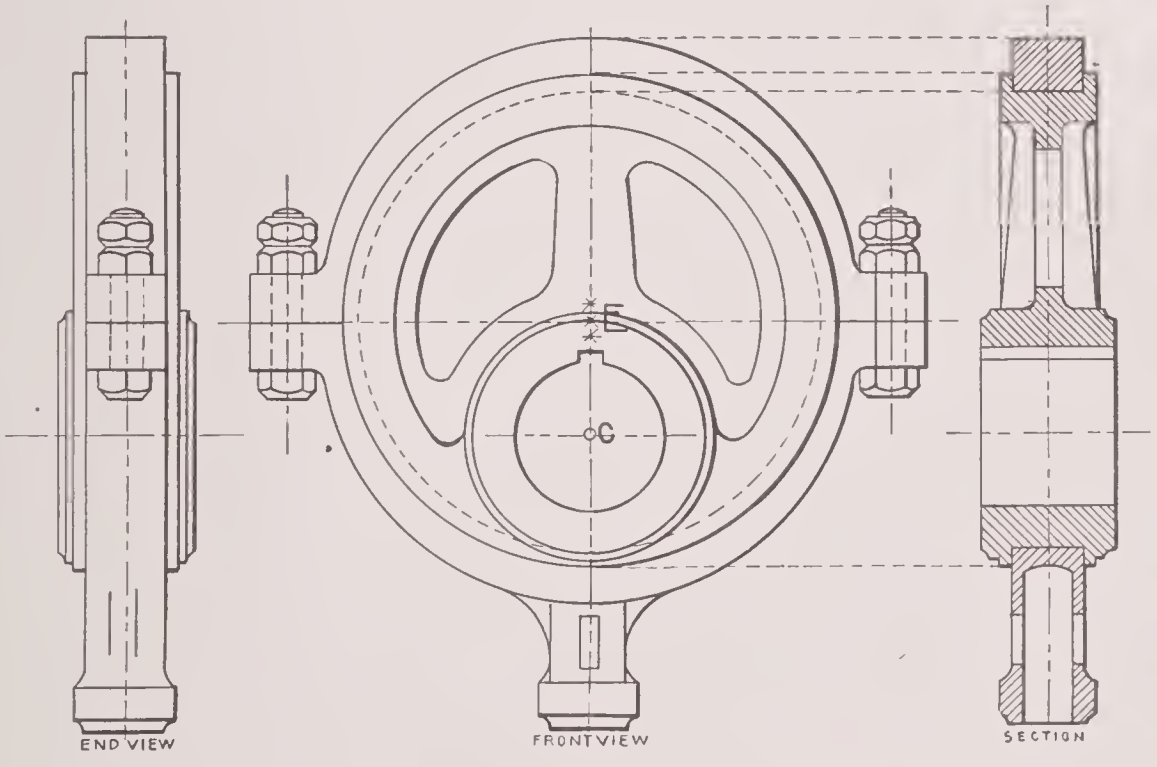


Fig. 103

The center lines of the six arms of this gear are easily found with the T-square and the 60-degree triangle, and after the front elevation has been completed, the side elevation and section are easily drawn, by drawing center lines and projecting most of the necessary measurements from the front elevation, as shown by the dotted lines.

PLATE VII represents front and side elevations of a four-jawed lathe-chuck. It is known as an "independent" chuck because each

jaw may be moved independently of the others. The slots between the jaws are T-shaped, as shown in the side elevation, so that bolt-heads may be slid into them for additional fastening means, when the object to be turned cannot be seeurely held by the jaws.

The concentric cireles on the front of the ehuck are traced by a sharp-pointed tool, when the chuck is made, as a guide for setting all the jaws at equal distances from the center, when a circular object, like a pulley, is to be held and turned or bored. These cireles should not be shaded.

Figure 103 shows front and side elevations and central section of an eecentric and its strap, whieh is the means generally used for moving the valves of a steam-engine. An eccentric may be considered a crank whose pin is so large that it completely surrounds the crank shaft itself, C being the eenter of the shaft and E the eenter of the eccentric. Then the distance EC would be one-half the throw of the eecentrie. The portion surrounding the eeceentrie, and fastened by bolts having double or "loek" nuts, is called the strap, the lower end having a soeket in whieh is fastened the eeceentrie-rod, whieh drives the engine valve.

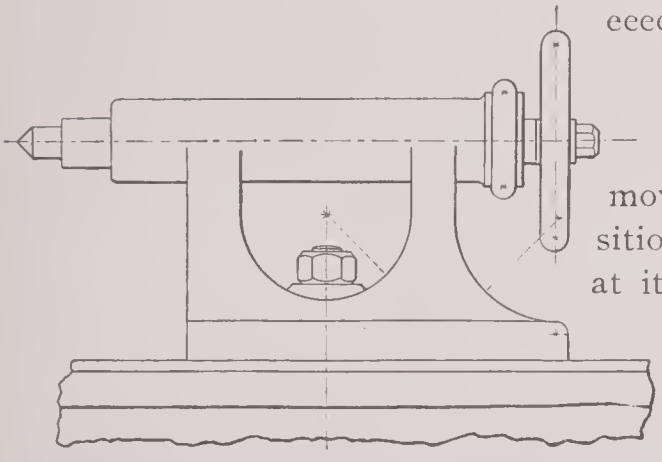


Fig. 104

Figure 104 shows a side elevation of the foot-stoek of a lathe, and a portion of the "ways" or bed of the lathe on which it moves. The foot-stoek is fastened in any position on the bed by means of the nut shown at its base. The pointed "eenter" at the left supports one end of the work being turned, and this center is adjusted by a serew, hidden in the upper, eylindrical part of the stoek, and turned by the hand-wheel shown at the right.

If desired, the student may add to the finished appearance of the drawing by eylinder-shading the eenter, barrel, and hand-wheel of the foot-stock.

INTERSECTIONS OF SOLIDS—PATTERNS

It sometimes happens that two parts of an object must be fitted together at an angle, or the end of one placed in the side of the other, and it becomes neeessary to draw the eurve whieh represents the joint. This eurve may be very irregular in appearance, but it can always be found by finding a number of points along it and then tracing the curve through these points.

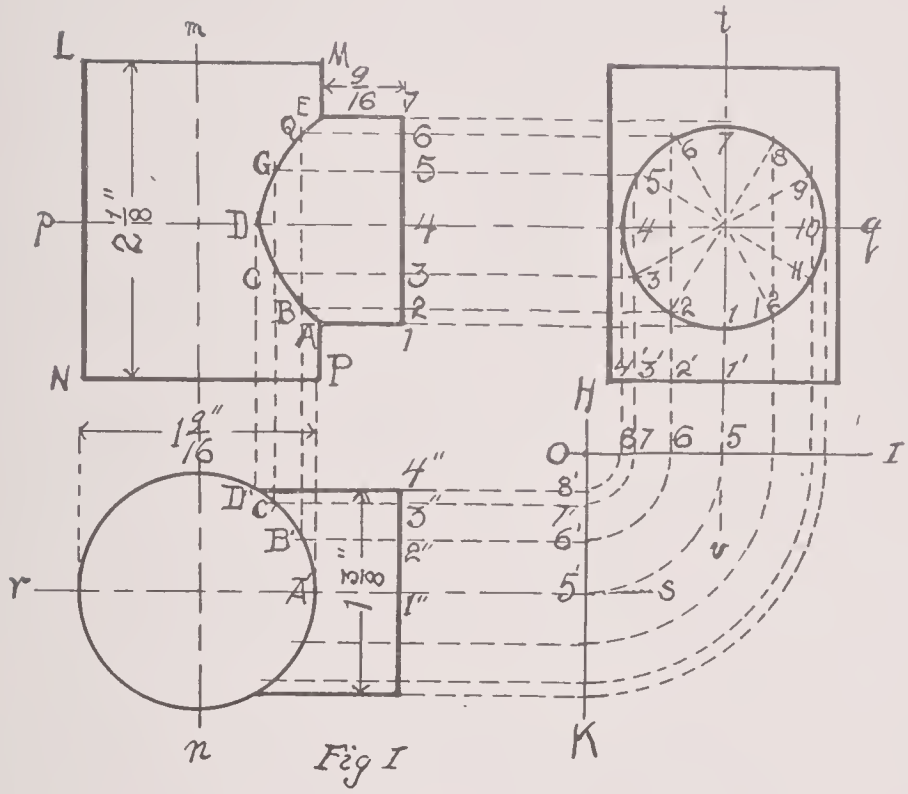

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Fig I

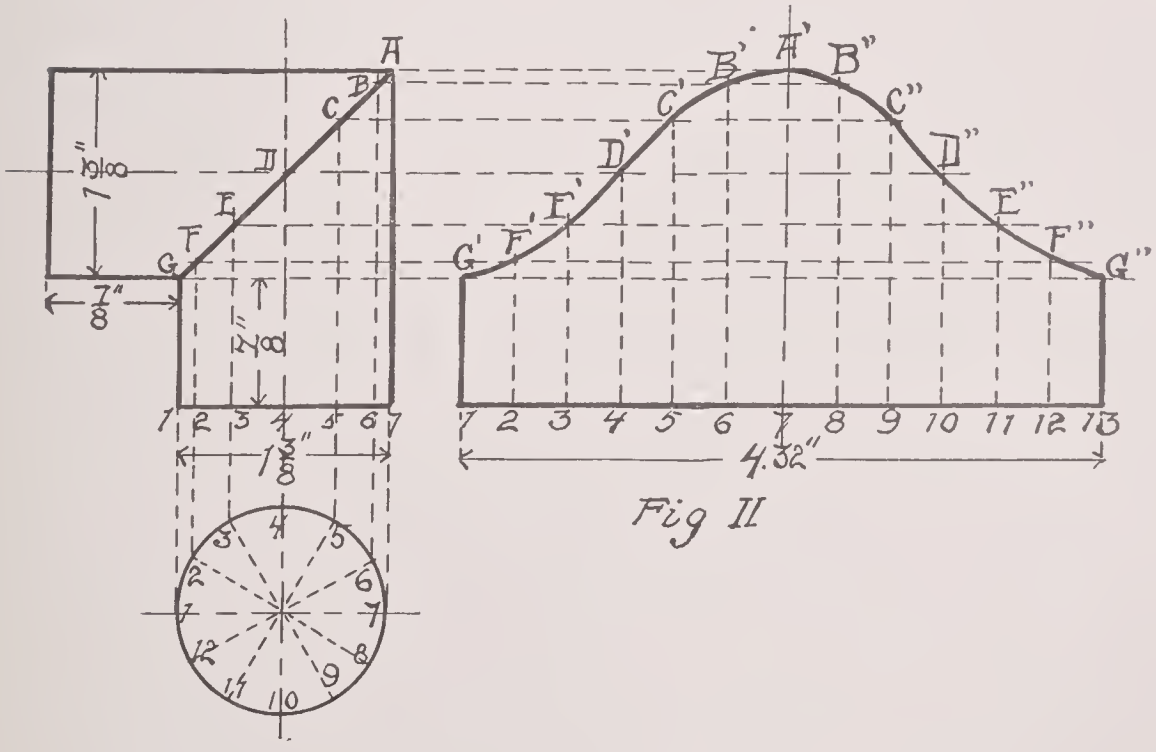
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Fig II

Let us take as an easy example, the curve of intersection of two cylinders of unequal size, one joined to the other at right angles, as in the case of a tee for gas and water-pipes. Drawing first the two elevations (excepting the curve of intersection), as in the first figure of the plate, we divide the circle representing the end view of the smaller pipe into any number of equal parts — say twelve. If we project these points of division horizontally across to the other elevation, we see that we shall have one set of lines in the intersection curve in which the required points must lie.

Now drawing the plan, as will be seen in Plate VIII, Page 4021, we project the points 1, 2, etc., downward upon a line OI, parallel to the base-line of the side elevation. Through O, which may be any convenient point at one side of the elevation above, we draw a second line, OK, at right angles to OI and parallel to the outline of the plan. Next draw O8′, O7′, etc., equal to O8, O7, etc., which can be most easily done by taking O as a center and striking arcs around the quadrant. From 8′, 7′, etc., project horizontally to the points D′, C′, etc., and then project these points successively upward till they meet the horizontal projections from the corresponding points in the side elevation.

Let us now trace the projection of one particular point, as 2 in the side elevation. We know that in the front elevation it must be at exactly the same height, or somewhere along the line 2B. In the plan, we know it must appear directly below its position in the side elevation, and if the plan were drawn below this elevation it would appear as at 2″, the same distance from the center line *vs* that it is from *tv*. Now swinging the plan view beneath the *front* elevation, as indicated by the dotted arcs, we see that 2 (or 2″) is distant from the center line *mn* of the larger pipe, as at B′, and projecting upward from B′ along an "element" of the larger pipe until we intersect the horizontal line 2B, we find B to be one of the points in the curve of intersection. We may reason in the same way in finding the points C, D, G, etc., and when we have located them, in turn, we can trace the entire curve of intersection, ABCDGQE, through the points thus found.

If the two cylinders be of the same size, as in the second figure, the problem is much simpler, as the intersection curve then becomes a straight line, in side elevation.

Let us suppose now that our two cylinders are the two parts of a square stovepipe elbow, and let us try to draw a pattern of the piece of sheet iron necessary to make each half of the elbow. As before, draw a portion of the circular plan below and divide the circle into twelve parts. Suppose that the seam of the pipe is on the

line G1 of the elevation. We know then that the length of the required piece of sheet iron must be equal to the circumference of the pipe, and that its width at *each* end will be equal to the line G1. We then draw a horizontal line at the right of the line 1-7 of the elevation, at the same height, and step off upon it the twelve divisions of the circular plan. At each end we draw vertical lines upward until they meet the line G′G″ projected horizontally from G. In the same manner, we project upward from the intermediate points 2, 3, 4, etc., on the straight line, and also from the points 1, 2, etc., of the circular plan, till the dotted lines from the latter meet the diagonal line GA of the elevation. From F, E, D, etc., we project horizontally until the lines intersect the vertical lines from 2, 3, 4, etc., of the "developed" circumference. Then the points G′, F′, E′, D′, C′, B′, A′, B″, C″, D″, E″, F″, G″ outline the curve of the upper end of the pattern. The pattern of the other half of the elbow will, of course, be exactly similar.

SIMPLE MACHINERY

The following figures show some examples of simple machine drawings: —

Plate IX, Page 4024, is a side elevation of a drilling-machine having a ribbed cast-iron frame, and a pair of bevel gears for driving the drill-spindle. Lay off distances from dotted center lines, which should be drawn first. Notice that all lines of the tooth edges of the pair of gears may be drawn from a common point, O.

Plate X, Page 4025, shows side and front elevations of a combined punching and shearing-machine. The side elevation shows the main driving-shaft, with fast and loose pulleys, fly-wheel with a heavy rim for giving the machine steady motion, and on this, and the upper driven shaft as well, what is called a shrouded pinion; that is, a small gear-wheel having a web at one side to strengthen the teeth when the gear is liable to receive shocks, as in such machines as that here shown. The front elevation shows the punch and shear located at opposite sides, and the manner in which the main frame is reinforced to bear the heavy strain of severing metal.

Figure 105, Page 4026, shows side and elevations of an "engine" lathe, a large lathe in which the cutting tool is held and guided entirely by the machine itself. The upper half of the headstock is shown in section. and the dotted cone below it represents a series of hidden gears by which the tool may be fed more or less rapidly.

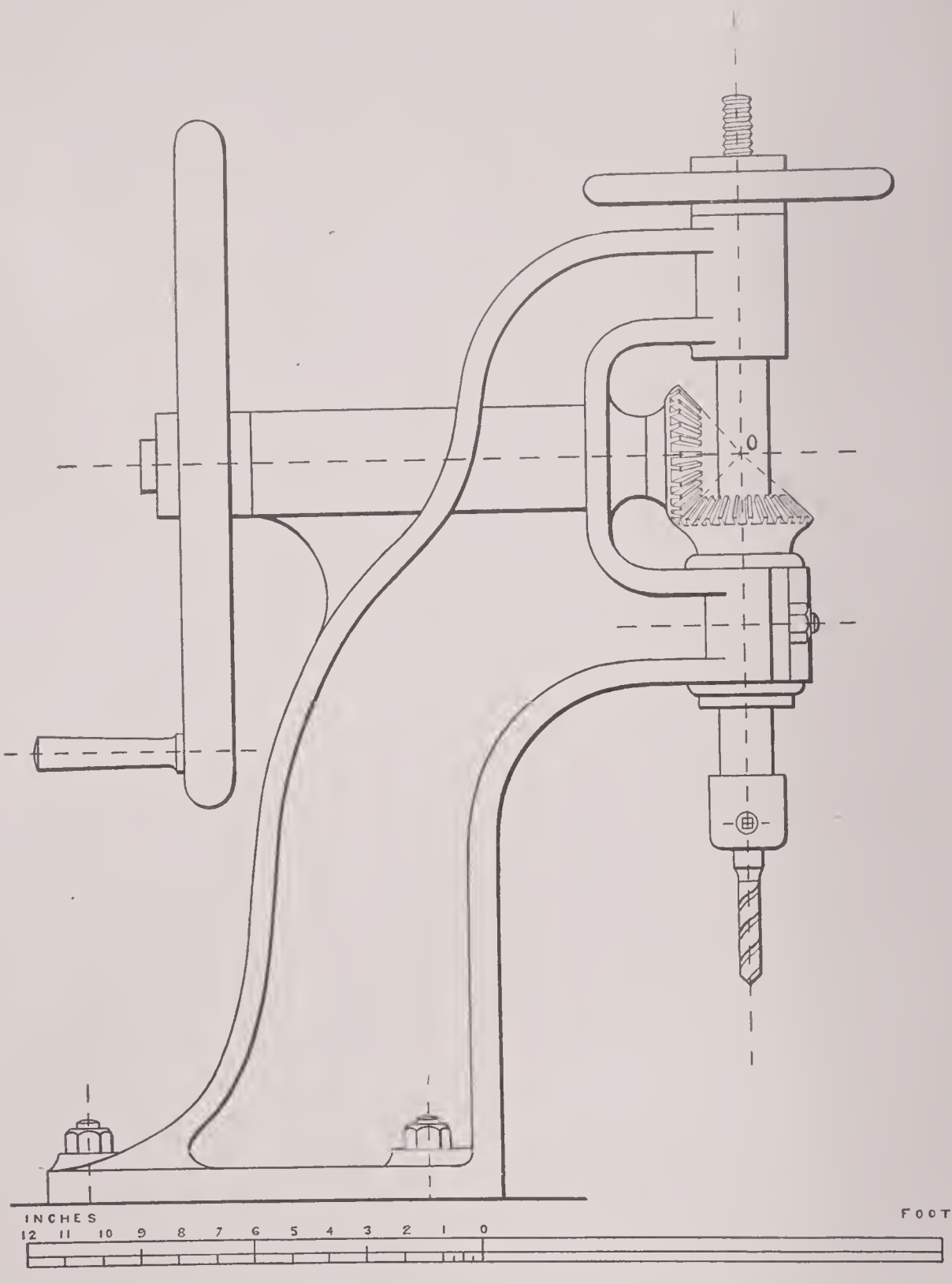


PLATE IX

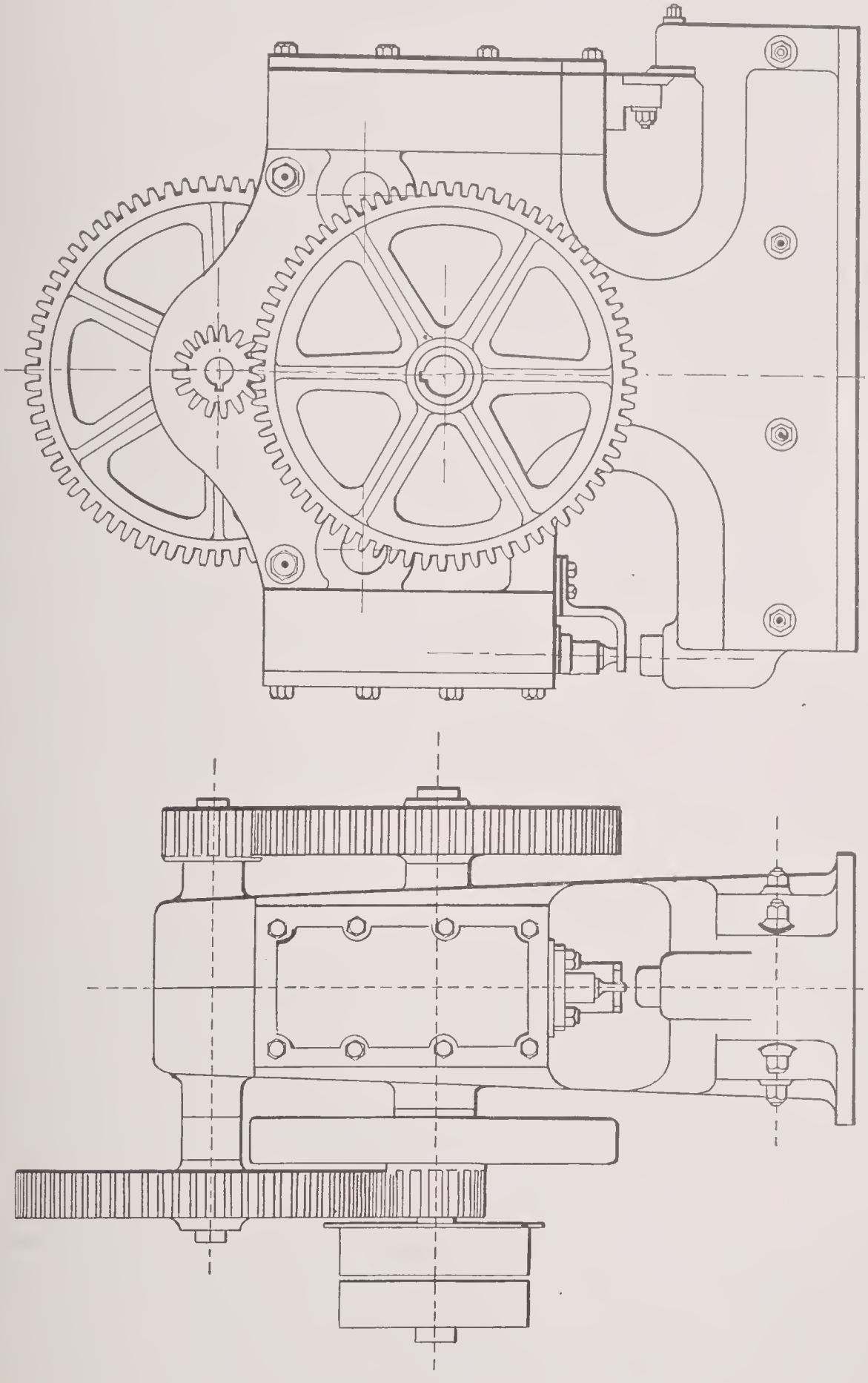


PLATE V

One set of legs is enlarged into a hollow pedestal with a door and inner shelves for holding tools used about the lathe.

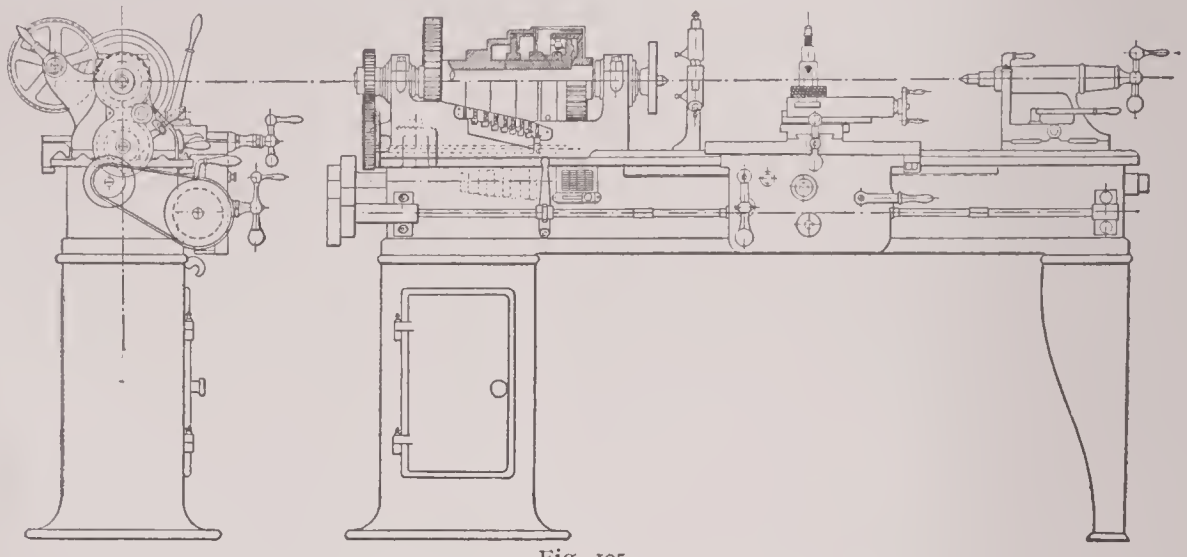


Fig. 105

Figure 106, below, represents a vertical section of a "key-seating" machine, having an upright pedestal and table for supporting pul-

Fig. 106

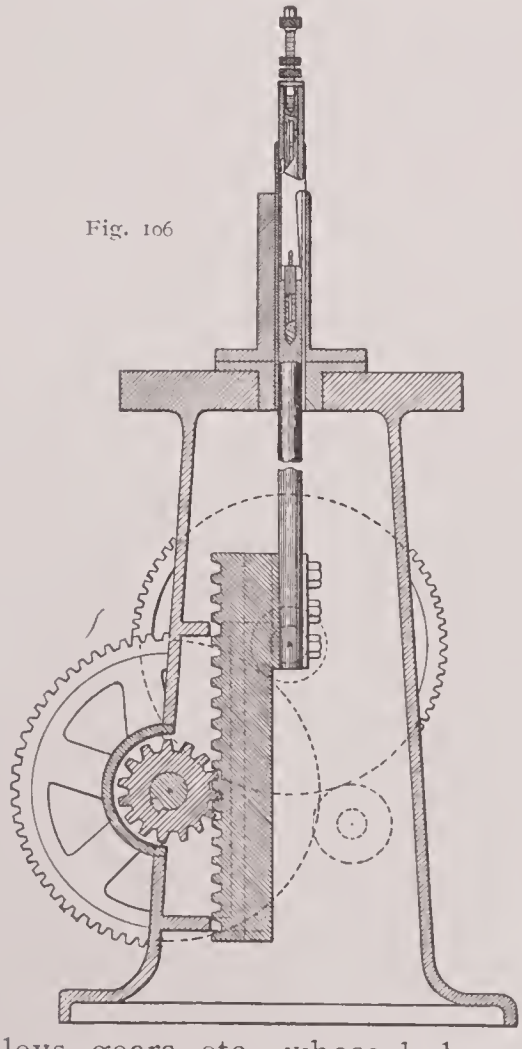
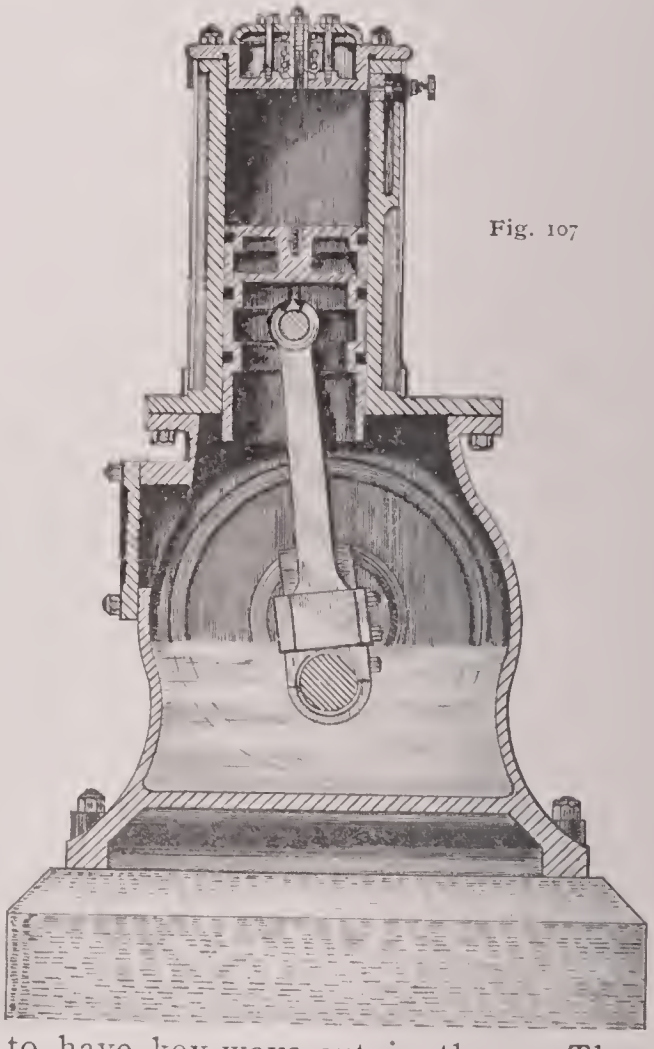


Fig. 107



leys, gears, etc., whose hubs are to have key-ways cut in them. The vertical shaft carries at its upper end a cutting tool which is moved

up and down by the "rack," or toothed bar, and the gear-wheels shown. The machine, of course, has proper means to reverse the motion of the gears.

Figure 107 shows a vertical section of a single-acting trunk-engine. The piston receives steam on one side only and is made very long to prevent steam from leaking past it. There is no piston-rod, the connecting-rod being fastened directly to the piston at one end and to the crank at the other. The crank is in a closed chamber filled with oil and water, into which it dips at every revolution.

This figure gives excellent practice in surface-shading, for the purpose of making the drawing easy to read by those unfamiliar with mechanical drawings.

PERSPECTIVE

Perspective drawing is the art of representing on a plane, objects as they actually appear to the eye from a given point. In perspective, several planes, lines, and points, must be considered and their names and uses carefully memorized.

In the figure (108), ABIK, a vertical, transparent plane directly before the observer, is called the *picture-plane;* the plane EFGH, a horizontal plane upon which the observer is supposed to stand, is called the *ground-plane*, and the line AB, where the ground-plane and picture-plane meet, is called the *ground-line.*

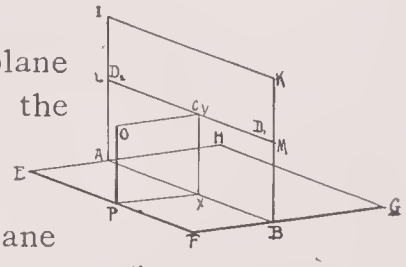


Fig. 108

The point P in front of the picture-plane where the observer is supposed to stand, is called the *station point*, and the point O at the height of the eye above the station point is called the *view point* or *point of sight.* The point CV, on the picture-plane directly opposite the point of sight, is called the *center of vision*, and is the foot of a perpendicular line projected from the eye upon the picture-plane. The line LM, parallel to the ground-line and at the height of the eye above the ground-plane, is called the *horizontal line* or *horizon.* The points D1 D2 on the horizon, as far from CV on either side as O is distant from the picture-plane, are called *distance points. Vanishing points* are points where parallel lines of an object which are *not* also parallel to the picture-plane *seem* to meet and disappear from sight.

The point of sight should be carefully chosen, and should vary for objects which are greatly different in size, but should, of course, never be changed in any one drawing. It should always be far enough from the picture-plane to enable the whole object to be plainly seen, remembering that the *visual angle*, or angle included be-

tween two rays drawn from the extreme sides of the object to the eye, should never be much more than 60 degrees, for clear sight. A line vanishes when its near end is at the eye and the far end cannot be seen. A line, then, vanishes to a point. In like manner, a plane vanishes to a line.

We should remember, however, that lines parallel to the picture-plane do not vanish but *appear* parallel in the picture; neither do planes parallel to the picture-plane vanish; but lines perpendicular to the picture-plane vanish at the center of vision.

Let us now attempt to represent in perspective the simplest object, a line which we will assume to be vertical, 3 feet long, 3 feet to the right of the observer, and 3 feet behind the picture-plane. The upper figure shows this perspective problem and the necessary planes in space, the observer's eye at O, and ours as those of bystanders at some distance to the right. (Fig. 109.)

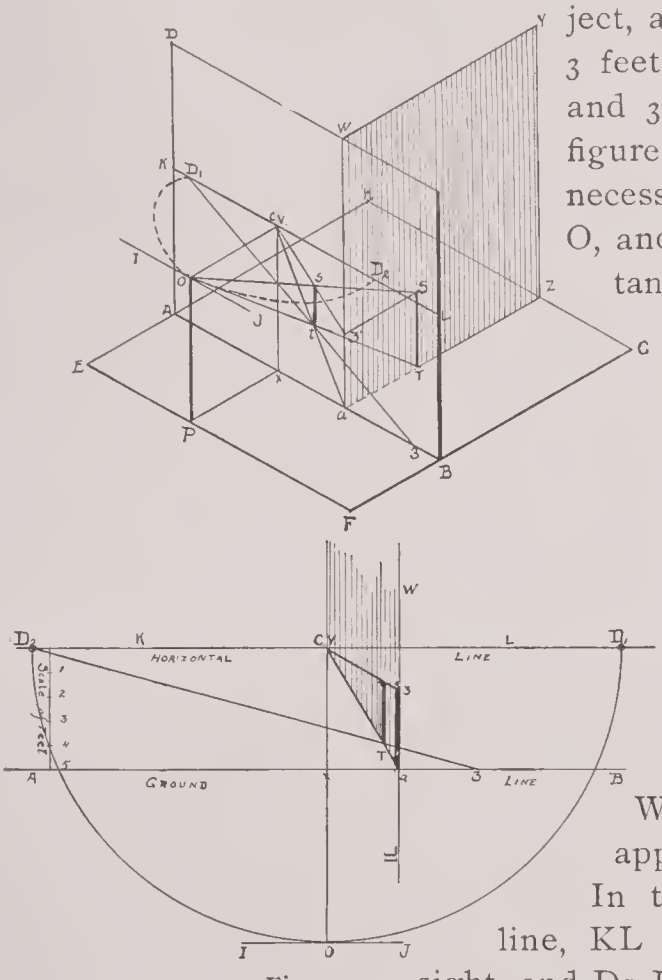


Fig. 109

The line we wish to represent is ST, in a shaded plane *a*WYZ, behind and perpendicular to the picture-plane, and the distances X*a*, *a*3′, and *a*T we have assumed to be each 3 feet. If we but draw the lines SO and TO, the points *s* and *t* where they pierce the picture-plane will mark the ends of the *perspective* of ST.

In choosing our point of sight, let us take it 12 feet in front of the picture-plane and 5 feet above the ground-plane. We will now lay out the sheet as it actually appears, taking a scale of $\frac{1}{4}''$ to the foot.

In the lower figure, AB is again the ground-line, KL the horizon 5 feet above it, O the point of sight, and D1 D2 the distance points. Lay off X*a* equal to 3 feet, and from *a* lay off *a*3′ also equal to 3 feet. Join *a* and 3′ with CV and we know that since *a*3′ represents a line 3 feet long *against* the picture-plane, our line ST must lie somewhere in the shaded plane and between the lines *a*CV and 3′CV, which is the limit of vision. To find the foot of the line, lay off *a*3 on the ground-line to the right of *a* and join 3 with D2. Where this line intersects *a*CV will be the end T of the line ST, and by drawing the line upward from this point till it intersects 3′CV, we have the perspective of ST in the position assumed.

Using the same scale and distances for the point of sight for this and the succeeding figures, let us now represent in perspective, three

horizontal lines, each 6 feet long and lying 4 feet apart, all lying on the ground-plane and the nearest lying against the picture-plane (Fig. 110.) It is plain to see that the first line will appear in its true length, like an ordinary projection, since it is itself a trace on the picture-plane along the ground-line, being also in the ground-plane. We have only, then, to lay off 3 feet on each side of X, as at *a* and *b* and draw *ab* for our first line. Join *a* and *b* with CV.

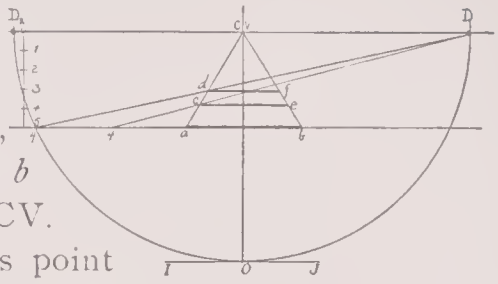


Fig. 110

From *a*, lay off 4 feet toward the left and join this point 4 with D1. Where this line intersects *a*CV, is one extremity of the second parallel line *cc*. We may find the other by laying off 4 feet from *b* toward the right, and joining the point so found with D2; but this is not necessary, since from *c* we may draw *ce* parallel to *ab* till it intersects *b*CV.

For the third line, lay off 4 feet to the left of 4 (or 8 feet to the left of *a*) and join this last point to D1, thus locating *d* and the line *df* as *cc* was located.

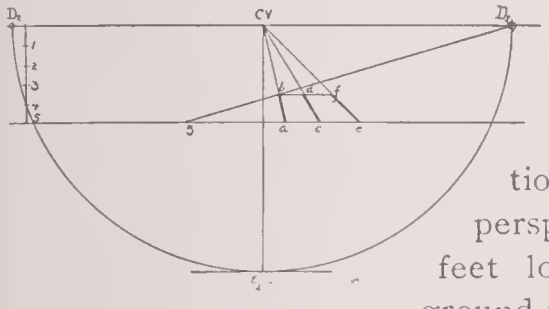


Fig. 111

Without changing scale, or location of the eye, let us represent in perspective three parallel lines, each 5 feet long and 2 feet apart, lying in the ground-plane perpendicular to the picture-plane, their nearer ends in the picture-plane and the nearest of the lines 1 foot to the right of the observer. (Fig. 111.)

From X, lay off X*a* equal to 1 foot, *ac* and *ce* each equal to 2 feet. Join *a*, *c*, and *e* with CV. We have now only to locate the farther extremity of the lines which is done by laying off X5 equal to 5 feet and drawing 5D1. From *b*, the intersection of 5D1 with *a*CV, we draw *bdf* parallel to the ground-line, and *ab*, *cd*, and *ef*, are the required perspectives.

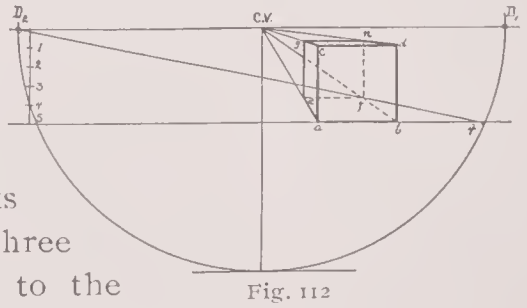


Fig. 112

To draw the perspective of a cube, 4 feet on each edge, (Fig. 112) on the ground-plane, with its front face in the picture-plane, the nearer edge three feet to the right of the observer. Lay off *xa* to the right equal to 3 feet, and from *a* draw the square *abdc* 4 feet square, representing that face of the cube lying in the picture-plane. Join these four points with CV. Lay off *b*4 equal to 4 feet and toward the right. Join 4 with D2, thus locating *f*. Draw *fe* dotted and parallel to *ab*. Draw *fh* and *eg*, vertical till they intersect *d*C.V. and *c*CV, respectively. Join *g* and *h* and the perspective is completed.

To draw the perspective of a circle 5 feet in diameter, lying in the ground-plane, its nearer edge touching the picture-plane. First inclose the circle in a square, drawing diameters at right angles and diagonals to the square, as shown in the plan below and at the right, thus locating a number of points, say eight, which correspond in both square and circle. Draw the square in perspective according to the principles already explained, and having found the location of the eight points in the perspective of the square, trace through them the perspective of the circle. This perspective will be found to be an ellipse, as was explained in the construction of that figure among the geometrical problems. (Fig. 113.)

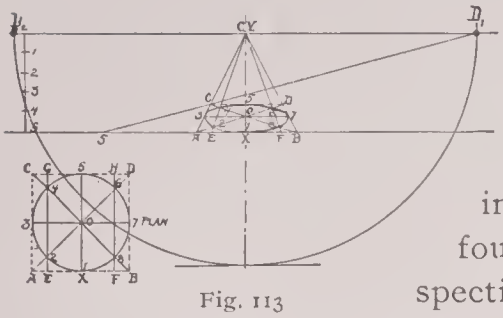


Fig. 113

As was explained in our lessons on working drawings, a perspective view is of no value in constructing an object except to give at a glance its general appearance as does a photograph; yet it is much used by architects in giving an idea of completed buildings, such as could not be gained by elevations alone. It will also be plain that every artist with brush or pencil almost unconsciously applies the rules of perspective in making sketches and canvases which delight the eye by "holding the mirror up to nature."

Thus closely, then, does our exact science of mechanical drawing approach that of the artist whose work is completed when he finishes the picture which delights the eye. His picture is the end of his work; ours is only means to an end — the construction of machines, edifices, and other structures, which may not only please the eye, but render the work of mankind less laborious and its leisure hours more comfortable.

OCCUPATIONS FOR WOMEN

(4031)

WOMEN AS PHYSICIANS

By ANITA NEWCOMB McGEE, M.D.
Lately Acting Surgeon, U. S. Army, in charge Army Nurse Corps

THE woman who takes up the practice of medicine should be equipped not merely with good health and intelligence, but also with an education above the average, and with means of supporting herself for a number of years. By reason of these conditions, and owing also to the peculiar character of the work required, it is a mistake for any woman to attempt to enter this profession unless she has a genuine liking for it; or to remain in it for one moment after it has ceased to interest her.

It should not be forgotten in this connection that in the broad field of general medicine and surgery, women were, in former times, almost unknown. The pioneer in America was Elizabeth Blackwell, who was born in England in 1821, became a school teacher in this country, and, after several rebuffs, was finally permitted to study medicine at Geneva, New York. After clinical work in Paris, and London, she established herself in New York City in 1851, and later started a dispensary and hospital for women, with which a medical college for women was afterward connected. Dr. Blackwell, however, returned to England, leaving in America her sister, Emily Blackwell, who graduated from the Western Reserve University Medical Department, at Cleveland, Ohio, in 1854, and who still lives in New York. The extraordinary difficulties which were met, and overcome, by these and other leaders in their profession, make them worthy the eternal gratitude of the sex.

In order to keep pace with the advance of medical science, the standards of medical training, and consequently of admission to medical colleges, have been rapidly growing higher during the entire past century. At the present time, medical colleges of the highest grade require a college degree, or its equivalent, as a prerequisite for admission. Thorough training in the natural sciences, especially in chemistry, biology, and physics, is of untold advantage to the physician, and, therefore, a student who is able to take a college course with special reference to these branches, should not fail to do so. A knowledge of French, German, and elementary Latin, is also important. When a candidate for admission to a medical college is not a graduate of some

recognized college, or normal school, entrance examinations in English, Latin, arithmetic, physics, and sometimes other branches, are required.

The course of instruction in all colleges of high standing now covers four years, not including summer vacations, which are four or five months in duration. In addition to lectures, recitations, and demonstrations, the medical student is required to spend many hours daily in laboratory work, so that she shall acquire a practical knowledge of chemistry, physiology, histology, pathology, bacteriology, and pharmacology. Of course, work in the dissecting-room is also required at the outset. and later, attendance on a large number of clinics, including medical, and surgical, work, in both hospital and dispensary. At the end of each year, written, and oral, examinations are held and when all are passed, the student receives her well-earned degree.

Twenty-one is the minimum age required for graduation, but it is far the wiser plan for a student to take ample time for preliminary work, and, incidentally, to acquire a greater maturity in her own development before beginning medicine. It now commonly happens that men enter college at eighteen, enter medical college at twenty-two, and after that, spend two years in hospital work, as a part of their training, so that they are twenty-eight years of age before they begin private practice. As two years not infrequently pass before a physician's income equals his expenses, it will be seen that under the most favorable circumstances of training, a person who enters this field cannot depend upon his profession for support until he reaches the age of about thirty years. Of course, some who entered a medical college with low standards,—one whose course covered but three years,—and who went directly from that to private practice, under exceptionally favorable auspices, have been able to support themselves from the age of twenty-two; but, on the other hand, the period of dependence may be indefinitely prolonged by delay in beginning the study, and by prolonging the period of post-graduate work in the hospitals. Women sometimes study nursing preliminary to undertaking a medical course; the knowledge thus gained is of great advantage to them, although training schools for nurses prefer, as a rule, not to accept applicants who enter with the intention of afterward becoming physicians. Some women have earned money during vacations, by nursing, and in other ways; this has, of course, helped them materially.

Almost all the homeopathic, and all the eclectic, medical schools, of the United States are coeducational, as are also a majority of the regular medical schools. In the years 1898–99 the statistics of the Bureau of Education report six hundred and eighty women as study-

ing in regular coeducational schools; three hundred and eighty-three in regular schools for women only; forty-eight in eclectic, and three hundred and fifteen in homeopathic schools. The choice between a one-sex college and a coeducational college is one which must be made in accordance with the inclination of the individual student. Since, however, the post-graduate education of women as obtained in their practical medical work must be coeducational — inasmuch as they must work side by side, and in competition, with men — it would seem that coeducational schools should, other things being equal, be preferred.

One of the leading medical colleges for women in this country is established at Philadelphia. This institution was founded in 1850, and in 1898–99 it had ten professors, twenty-one other instructors, and one hundred and forty-eight students; of the latter, twenty had previously received A.B. or S.B. degrees. The Woman's Hospital attached to this institution is well equipped and managed, and the college ranks very high. Another college for women only is that of Chicago, established in 1870 and having twenty-five professors, twenty assistants, and seventy-nine students.

It should be borne in mind that a medical college is a very expensive institution; some indication of the value of the instruction received may be obtained, in a general way, by inquiry as to the expense of the course. Of course this rule is valueless in state, or other specially endowed, institutions. For example, the fees for the four years' course in a Western medical college are only $300. This college suffers, however, under the disadvantage of being in a small town, so that the clinical material cannot be as large as that in a great city. A Southern college offers a four years' course for the remarkably low fee of $90, and had in 1898–99 one hundred and forty-one male and seven female students.

There is an important difference in various institutions regarding the opportunities offered to the graduates for hospital appointments or the position of resident physician. Information on this point can be obtained by securing circulars from different colleges. It is the poorest sort of economy for a woman of first-class intelligence to enter any but a first-class school, for, although she can overcome much by thorough study of books and patients, she will find it impossible to supply the lack of adequate laboratory experience, and of training in the best clinical methods.

On completing their training, a few women enter the missionary field, and a few others are able to secure permanent appointments in asylums for the insane, in colleges or schools for girls, and in other institutions; but the great majority seek to establish themselves in private practice. If one is free to select a location, and is both will-

ing and able to act the part of a pioneer, the greatest promise is held out in parts of the country where there are comparatively few woman physicians. To succeed in these localities, however, a woman must be possessed, above all things, of tact, of "grit," and of the essential *savoir-faire* befitting the community which she selects, for on these things will depend the continuance or the abatement of the coldness which she must anticipate at the outset. Women of less venturesome disposition will prefer to settle in the large cities, where a woman doctor is no longer a novelty, and where opposition from physicians of the other sex has been overcome or is discreetly concealed. Country practice, with its exposure to weather, and the remoteness from fellow-workers, has seldom been undertaken. Woman physicians are probably more prominent in Philadelphia than in any other city, a fact which may be attributed largely to the existence of the excellent woman's college there.

A most important factor in selecting a location in which to establish oneself as a physician, is the medical law of the state. In some, a diploma from a recognized medical college is sufficient for registration, while in others, an examination must be passed. Other things being equal, a state with high medical standards, and one where the proportion of physicians to the population is not excessive, should be chosen.

The income to be derived from the practice of medicine is something which cannot be estimated in advance. The very few at the top of the profession may earn from ten to twenty-five thousand dollars a year, but many, not so well equipped, can earn little above their expenses; many others abandon private practice entirely, to seek fields of labor for which they are better fitted.

The most advantageous conditions for entering private practice are generally found where the new physician has a father, or other colleague, in the profession, who recommends her, and who makes her, to a greater or less extent, his assistant. Of course, this is rarely possible, but it will be found that under any condition, the power of making friends is a necessary requisite to success. For practical purposes, the ability to convince other people that one can do a thing is perhaps quite as valuable as the actual capacity for doing it. To prove this, it is only necessary to point to the quacks, whose success depends not at all on their real knowledge, but on their ability to impress people with their assumed knowledge. In spite of this fact, any woman who wishes to hold an honorable position in her profession must realize that to maintain a permanent reputation she must never do less than her best. Medicine is a profession making such rapid strides that perpetual study is absolutely necessary to prevent

a practitioner from falling into ruts, and, in consequence, being left hopelessly behind in the competition with younger men or women. The medical journals, and the best of the new books, must of course be read, medical meetings be participated in, and visits to hospitals be undertaken as often as possible. The necessity for intercourse with fellow-workers is nowhere more urgently felt than in the practice of surgery. The great surgeons are improving their work every day, and any woman who attempts surgical work must make occasional visits to their operating-rooms a regular part of her program.

Another important matter is the location of the office, which should be carefully chosen in order to avoid unnecessary changes. It is usually best to establish a physician's office in a residence district, conveniently accessible to the class of patients that is desired; it is advisable to live in the house. Side streets are to be avoided, as the name at the office door constitutes practically the only form of advertising (if it may be called such) that is considered legitimate.

It seems hardly necessary at the present day to utter any warning against the adoption of methods savoring of quackery, but it may not be amiss to lay stress on the importance of every woman physician joining the organizations established to maintain the ethical standard of the profession. If in regular practice, she should, at the earliest day possible, become a member of the local association, and also of the American Medical Association. On the other hand, the scientific medical societies will prove valuable to her, by reason of the opportunity they afford for learning from others, and for making herself known to her fellow-practitioners.

In obtaining, and keeping, a foothold, personal appearance cannot be neglected, yet the dress, however rich it may become, should never be frivolous, or lead to a suspicion of lack of neatness in the care of the person. The same attention must be given to the appearance of the office, which should always look bright, tasteful, and tidy.

Most woman physicians will be called upon, more especially, to treat the diseases peculiar to their sex, but it is the part of wisdom to adopt the universal advice of the profession, and that is not to announce any specialty until after several years of general practice. A limitation to a practice which is almost, if not quite, carried on in an office during regular hours, has manifold advantages, but it is necessarily limited to the few, for the great majority of successful physicians' lives are full of calls on time, and strength, and of extraordinary demands at an hour when ordinary mortals are deep in their sleep-preparation for the labor of the coming day. The life of a physician is not an easy one, nor one which offers, without incessant effort, even a living income.

One of the factors which must never be forgotten in adopting this career, is the great responsibility which must be undertaken. Mistakes in every-day matters, or mistakes involving only money, may be forgotten, or atoned for, but the possibility of a mistake involving life and death carries with it a constant responsibility which is equaled in no other profession. For this reason, a woman physician must have a thorough confidence in herself—must be self-reliant, resourceful, and able mentally to stand alone.

PROFESSIONAL NURSES

A long time ago, nursing was a calling carried on mainly by religious sisterhoods. Then came the days of "Sairy Gamp" and her kind, when nursing was a trade, undertaken for the money to be made from it. Now it has become a profession, which can be entered only after long years of training.

The first requisite for a successful nurse is perfect health, for without it she could not even pass the ordeal of the training school. The second essential requisite is an upright character that is both gentle and firm; a spirit of loving-kindness and patience, and an endless supply of tact. No nurse should permit a mistaken zeal to result in injury to her own constitution, yet if she feels no genuine devotion to the afflicted and helpless, her work will become a dreary routine of drudgery to herself, and a source of merely mechanical good to her patients.

Training schools usually require each applicant to have a good common school education, and some knowledge of household work. It is desirable that the age should be between twenty-one and thirty-five years. When a woman possessed of these requisites decides to enter the profession of nursing, her first task is the selection of a school. Practically, every hospital in the United States has such a school attached to it, and the future success of the nurse depends largely on a wise choice. The reports of the Bureau of Education will offer some assistance here, as will articles in the periodicals devoted to the interests of the profession.

Unless nursing is undertaken with some especial object in view, it is very desirable to select a general hospital containing over fifty beds, where experience in medical, surgical, gynecological, and obstetrical, cases is offered, and which is located in a city. New York is the headquarters of trained nursing, and has a large number of first-class schools. Speaking generally, it may be said that while there are good schools to be found everywhere, there are few west of Chicago or south of Washington that are as well organized and equipped as the best of those in the Eastern States. To study at a great city hospital is often an advantage, if one looks forward to institutional work; but preparation for private nursing is best obtained where the care of private rooms is a part of the course. It may also be noted that many of the leading schools have raised the time of residence from two to three years, and that they do not send pupils to nurse in private houses. A capable, ambitious woman will make a great mistake if she does not seek the best training obtainable.

Having decided upon a hospital, the applicant writes to its superintendent, or superintendent of nurses. The great majority of would-be nurses are rejected at once, but those who prove their fitness are appointed as vacancies occur. All hospitals require a probationary period, usually of one to three months, during which the general care of wards, dusting, sweeping, bed-making, and other simple duties are taught. If the probationer acquits herself well, she is accepted as a pupil-nurse, and now dons the uniform prescribed by the school. This is always a wash material, the apron and cap being white, and the dress generally blue, or blue and white.

The working-day usually consists of twelve hours, with two for personal rest or recreation, in the afternoon. Some of the best schools, however, have adopted the eight-hour system. Sometimes graduate nurses are employed as head nurses of wards, but this work is usually done by senior pupils, who instruct the juniors in the care of patients,—the administration of medicines; record, and chart, keeping; and all the other details which have to be acquired. The training of eye and fingers in the detection of symptoms is learned by practice, while deftness in surgical dressing, and in the handling of instruments, comes with experience in the operating room and surgical wards.

In addition to the practical work and training, which is conducted under the direction of the superintendent of nurses, lectures are given by physicians, and recitations and examinations are held; the amount of such work as a rule being greater, the higher the standard of the school. As this study has to be carried on after many hours of physical labor, the test of training is often severe.

In acquiring any profession, the question of expense is generally of importance, but the trained nurse learns her profession while actually supporting herself thereby. In other words, hospitals give lodging, board, laundry, and medical care to their pupil-nurses, and usually pay them a fixed sum for the purchase of clothes and text-books. Five to ten dollars a month is the common amount. Asylums for the insane pay fifteen dollars and upward, while a few schools give a bonus on graduation, but nothing during the course. If nurses entered a hospital merely to learn their profession, and to leave as soon as that was accomplished, no such liberal inducements could be offered to them. But the hospital expects its nurses to work for it, and a pupil, is, for example, expected to make beds for years, although she may have learned in a day the proper way of doing it.

When the last examinations have been passed, and the time stipulated has been served, the pupil receives her diploma and enters the field of independent activity. The first necessity to that great majority who seek private practice is a connection with a good registry. This means that the name must be entered on a list at a central office, which has a telephone, and to which physicians and patients apply for nurses. Each nurse secures a lodging located where a message can promptly reach her, and then awaits her turn to be called. Some registries are maintained in connection with club houses for nurses, others are at hospitals, and sometimes they are privately kept by a few friends who have become well established in their profession.

The first duty of a nurse is as the doctor's assistant, carrying out his orders, and being strictly accountable to him for her own actions, and for her patient's welfare in his absence. Besides those duties calling her special knowledge into play, she must be prepared to perform many which are commonly considered menial, and to do them well, and willingly. These include cleaning the sick-room, cooking for the patient, and sometimes a little washing or sewing. But the nurse does not eat with the servants of the establishment; she is served alone, or takes her meals with the family. She is subject to call in the night, but if the case is so critical as to require unceasing attention, a second nurse ought, of course, to be employed.

The usual compensation of a graduate nurse in a city is twenty to twenty-five dollars a week. More than this is paid in New York to highly qualified women, and less is accepted by those who are lacking in training, or in the personal qualities so necessary to success. Besides the money, a nurse receives her board in the house of the patient, and should have time every day for taking outdoor exercise. The salary of a nurse is comparatively large, but her expenses are not light. Her room rent, and registry fees, must be met, and

her meals procured, while unemployed. She must dress well for the street, and also be amply supplied with white uniforms for duty wear.

The most important factor in estimating the real income of a nurse is the length of the time she is unemployed. It is impracticable here to name an average, as the strong and popular nurse may often go from one case to another, and have no time to rest unless she takes a summer vacation; while her less favored sister will spend half or two-thirds of her time in waiting. The working life of a private nurse, however, is short, as the nervous strain is so great as to wear her out, usually, in from ten to twenty years. Even if she remains well, she finds that in the overcrowded state of the profession, which is already felt in some cities, a preference is given to the younger woman, who is fresher from her training in the newest methods. As thousands of nurses, in ever increasing numbers, are graduated from our hospitals every year, this competition will before long become a serious matter.

Another factor which may come to the fore in the future, is the male nurse. The latter is being trained in a few exclusively male schools, and in some which accept both sexes, the number having reached approximately one man to every nine women, graduated annually. Most of the male nurses, however, have been trained in asylums for the insane, and they do not as a rule possess the refinement, or the reliability, of the woman nurse.

A variety of private work for which a demand is arising is "hourly nursing," which means that the nurse lives at home, and visits several patients each day, remaining long enough to attend to a surgical dressing, give some treatment, or to perform other services for those who do not require constant attention. In New York, ten dollars a week is a usual charge for an hour's visit a day. District nursing is similar to this, but only indigent cases are visited, and the nurse is employed by some charity organization. The district nurse is expected to care for all degrees of illness, and to teach some relative, or friend, of the patient how to care for him in her absence; she must also try to inculcate hygienic principles whenever possible. To many nurses, this district work, and that done in nurses' settlements, is most congenial and gratifying. Every nurse likes to see the good effects of her labors, and there is so much to be taught to the poor that, hard as the work is, she feels well repaid in seeing the improvement she has wrought.

Although the main body of nurses is engaged in private work, there is an important minority who are otherwise occupied. Some hospitals, asylums, and similar institutions, employ graduates as head nurses, matrons, etc., at salaries of twenty-five or thirty dollars a

month, with board, lodging, and laundry. Expert surgical nurses sometimes receive forty or fifty dollars. Although this remuneration appears very small compared with that of a private nurse, the absence of outside expenses, the certainty of employment without intermission, the fixed hours, and the absence of the occasional excessive strain, and responsibility, makes it easy to keep such positions filled.

There are, of course, a variety of minor openings of which a few nurses avail themselves, such as services in a doctor's office, entering the Indian service, maintaining a private hospital or sanitarium, supplying delicacies for the sick, etc., but most of these require some special ability, means, or influence.

Since April, 1898, the Army has opened a new field for graduate women nurses. In September, 1898, about thirteen hundred were serving in the Army, and the number in 1899, and 1900, was between two hundred and two hundred and fifty. Their pay is forty dollars a month, with board, lodging, and traveling expenses, ten dollars additional being allowed for service outside of the United States. Chief nurses, promoted to executive positions for ability shown in the service, receive salaries ranging as high as seventy-five dollars a month.

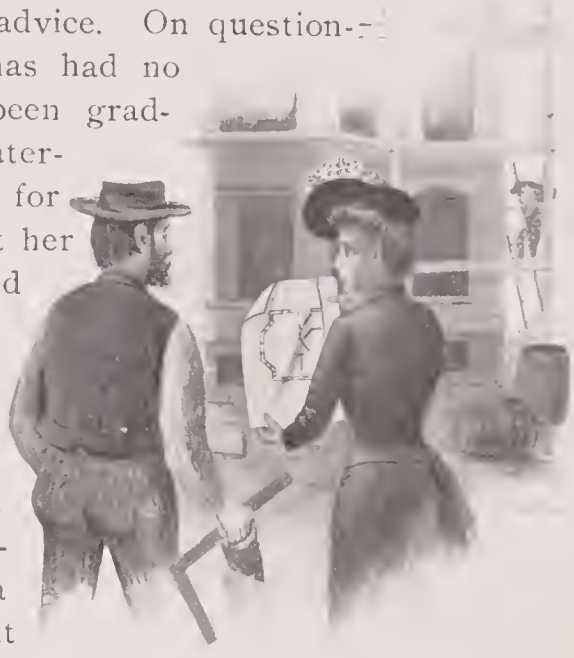
Outside of this Army work, the most responsible institutional position commonly held by nurses is that of superintendent of a training school. A few hospitals have nurses as superintendents of the whole institution, and some large ones employ assistant superintendents of nurses. To attain the grades in a hospital of repute, a woman must have a good general education, and have been graduated from a first-class training school, where she gave evidence of possessing executive ability. The head of a training school is responsible for all the nursing department, both the care of the patients, on the one hand, and the teaching of the pupils, on the other, but the details of her duties and responsibilities vary greatly in different institutions. She usually receives between fifty and one hundred and twenty-five dollars a month, with two rooms, board, and laundry, and is a person of great importance to the welfare of the hospital with which she is connected.

Such is the career of a nurse. It means hard work, repaid by the satisfaction of good deeds, well done.

WOMEN AS ARCHITECTS

By JOSEPHINE WRIGHT CHAPMAN

AMONG all the branches of work into which women have entered, there is none that shows so small a percentage of really successful members as that of architecture. Almost every day some young man or woman who wishes to make a beginning in the architectural profession, comes to my office for advice. On questioning the young woman, I usually find that she has had no technical training in this branch; she has just been graduated from a high school, has perhaps studied water-color painting or drawing, and, having a taste for such work, has decided that architecture will suit her very well, until the time when she shall be called upon to leave the building of homes to preside over a home of her own. And just here, I feel sure, is one great cause of the failure of women in any business. Every woman, whether she admits it to herself or not, expects to enter, at one time or another, into matrimony, and the business or profession which she chooses serves as a bridge to connect the period of girlhood with that of wifehood. There is not the earnestness of purpose, the grim determination to succeed, that is felt by a man in the same position. It is his life-work, and matrimony only increases his energy.



In the case of the young man entering architecture, he has probably had the excellent training of the Massachusetts Institute of Technology, or some other technical school; sometimes he is a carpenter's son, who has worked for his father, has an ambition to advance in his studies, and who, not having the means for a technical education, hopes to enter an office and intends to study at one of the many good evening schools which the city provides.

When I question the girl as to her ideas, her answer may be: "Oh, no; I never could be an architect. I only thought I might be able to do drafting or to make the water-color pictures of the outside of the houses." I always discourage such girls, for architecture means far more than making pretty water-color sketches, and I advise them to take up interior decoration, stained-glass designing, or some similar art.

The lack of seriousness among these girls is shown in the case of a young woman who came to me not long since determined to study architecture. In the course of my conversation with her, it developed that she was soon to go abroad, and as music did not interest her, and it was the fad to study something while across the water, she had hit upon architecture as being the profession least studied by women, and therefore that which would cause the greatest sensation among her friends.

Although artistic ability is perhaps of more importance in architecture than is the knowledge of mechanics, nevertheless, it is very necessary to have the mechanical knowledge. One should also have an idea of the different materials employed in a building, their manufacture or their preparation for the building, their durability, and so on. Now a boy is naturally more inclined to mechanics than is a girl. Take a boy of twelve years and, by questioning, you will find he understands far more of mechanical devices and their workings than does the average grown woman. Boys are much more observant than girls in such matters, and I attribute this to the fact that the girl's mind is occupied with observing the fashions in clothes, the style of hair dressing, and such trivial femininities. The lower schools, in many cities, are in part at fault in this, for while they give to the boy mechanical drawing and carpentry work, the girl is taught to cook and sew. A boy is, by nature, physically stronger than a girl, and this gives him another advantage over his sister architect. Although no manual labor is required, yet a certain amount of physical endurance is necessary. It is very trying for a girl to lean over a drawing board and reach as a man does, especially if she wears the corsets and tight sleeves which fashion requires. An architect is also obliged to be out in all kinds of weather, to attend to the duties of superintending buildings, and he must keep appointments, rain or shine. This leads to the much discussed subject of the dress of the business woman. A woman architect may wear, in business hours, a comfortable tailor-made gown of the sensible storm length now so commonly worn. It may be as fashionable as one pleases, provided the tailor effect remains. There is no excuse for a girl being mannish in dress, any more than there is for her being masculine in her actions.

In meeting men in business, too, a girl is often put in a trying position. I know of no business or profession where one is brought in contact with so many different classes of men as is the case in architecture. Beginning with the client and going through the grades from contractor to laborer, almost every sort and condition of man is represented, and to deal with these different natures requires a great

deal of tact. A woman, in this, as in other business dealings, must learn to meet men on their own ground.

Another cause of failure of woman architects is the economical streak possessed by almost every woman. Women are prone to economize. Where a man would rent a good office and conduct his business in a businesslike atmosphere, a woman fancies it is just as well to do what she can at home and thus save office expenses. This is a great mistake. To save money, one must spend money.

In my own experience of the last four years, I have always carried out this principle. I have a large drafting-room, private office, and waiting-room; and I aim to have the most convenient arrangements for drafting and for filing away papers and plans. I also find that a telephone is most necessary. I employ a stenographer, and as many draftsmen as my work requires, for I feel confident that an architect, to be successful, cannot afford to spend her time in doing the work which a draftsman can do as well. She should have her time to devote to designing, superintendence, and other more important work. In my office, I employ girls, when I find that they are able to do the work, but I fully appreciate that a man in my place would hesitate to ask a girl to perform the many menial duties which he would require of a boy in the same position, and this is the reason why men object to employing women in their offices. I require the same services of a girl, not only because it is the best training for her, but because I cannot employ a girl unless she is willing to do the work of a boy in the same position.

I have stated many reasons why it is difficult for a woman to succeed in architecture, but, of course, as judicial people are inclined to remark, "there is much to be said on either side." In many ways the girl has the advantage. Whereas man is born with a mechanical instinct, woman is born with a housewifely one; and even if her tastes run in other channels, her ideas on the requirements of a house are far more practical than those of a man. Take, for example, a linen closet: how few men would stop to think of the width of a sheet when folded, or the length of a pillowcase. The arrangement of shelves and closets and the little conveniences of a house make a great difference to the housekeeper.

Women, too, are more patient than men in small matters. The little details of buildings, which bore a man, are interesting to a woman; and she is willing to spend more time, and to work more conscientiously, over such things than is he; as, for instance, in preparing plans and specifications for estimates. A woman will take the trouble carefully to designate, in these, the different materials to be used, so that at a glance the contractor can easily figure the cost of

the building, and, consequently, can give a lower figure, as he is not obliged to add an amount to cover uncertainties.

When one has finally surmounted the obstacles in the path leading to success, there is no profession which is so interesting or so varied in its aspects as this. Although I have passed through many trying situations, and have had many obstacles in my path, I have never for a moment regretted that I chose architecture as a profession. I should advise a young woman contemplating entering the profession to obtain, as a preparation, a good technical education, studying especially free-hand drawing, and at the same time visiting and observing the buildings which are going up about her. Her school education finished, let her enter the office of the best architect of whom she knows, and start on the same ground as a boy apprentice; receiving little pay at first, but exercising a keen observation and keeping her mind receptive to what goes on about her.

WOMEN AS LAWYERS

ACCORDING to the census of the United States for the year 1890, there was a total of 89,422 lawyers in this country, of which number but 208 were women. An average of not more than one member of each class in the law schools of this country is a woman; and not more than twenty-five are admitted to the bar of the courts of the country each year. Yet, notwithstanding these figures, women have made enviable progress in the profession whenever they have chosen it as a career. This is a most conclusive argument that there is plenty of room at the top of the ladder, in the study of law, for those who are ambitious. There are to-day thirteen women who have been admitted to practice at the bar of the Supreme Court of the United States, and every city has its quota of feminine legal lights.

The foundation for the practice of any profession is a sound education, and for the bar, the demand for this requisite is especially insistent. True, there are many eminent examples of men who have gone to the front with no collegiate training, but they are of a past generation, and the members of the bar to-day are men and women, who have secured their education in the colleges and universities of the country. After the ordinary college course, a special course is necessary in a school of law, and for this latter, at least three years are required, making a total of seven years at college. Presuming the aspirant to have been at school for twelve years, from the age of six, before entering college, a total of nineteen years at school are necessary before the student is capable of passing the examination for admittance to the bar, and she will be twenty-five years of age. This is considered youthful in the learned professions, for renown seldom comes before middle age.

Practice of the law is constant study; there are thousands of books upon the subject, and new ones are constantly being printed; and with a large share of these the lawyer must be fairly familiar, while of many of them he, or she, must have an intimate knowledge. Heretofore the woman practitioner has had to contend with the assumption of superiority by men, but this is rapidly giving way to the respect that she has forced from him by virtue of her abilities, and to-day she may rise in any court open to her, and present her argument of a case with every assurance that she will receive the same treatment that is accorded to her brothers in the law. A former assistant attorney-general of the state of Montana was a woman who

ran for the higher office against her husband, the latter winning the election, and appointing her to the office which she held with honor.

The difficulties in the way of the woman practitioner having been set forth, something of the pleasant side is timely. She will find that her clients will be largely women; a woman will talk to another in affairs of a personal nature more freely than she will to a man. Yet this limitation of her practice to her own sex will be by no means absolute, and she will have a goodly number of male clients. Many female members of the bar are frequently associated with men in cases in which the men do the work in court, and the women the office work. Criminal cases are not naturally a woman's selection, yet there are instances of women making first-class criminal lawyers, arguing their cases before a jury, and securing acquittal for their clients.

Probate work for women is coming to be their special field, and in some cities where there is a goodly proportion of women at the bar, almost half the wills are drawn by them. One young woman, recently graduated from a prominent law school, but not admitted to the bar, made three thousand dollars in her first year of practice of this branch, using her father's name, and his office, for her labors. She has since become a member of the bar, and her income is growing with each year.

There being so few women in the profession, and the sentiment in their favor growing with each year, it follows that there is no better field for the ambitious, educated woman, than the law. This is, however, always providing that she has a natural aptitude for study, for she will not make a success of it if this is not the case.

An eminent woman member of the bar of the Supreme Court of the United States holds that a woman's place is not in business unless she is forced there by necessity; that she should make the home, and that the bread-winning should be left entirely to the man; but she also says that if a woman is compelled to earn her own living, and is an educated woman, fitted for the profession, she can do no better than to study and practise law. To a studious woman it holds a charm not to be found in any other work.

Law is a science carefully adjusted to meet every requirement of justice in the category of human disagreement; it is based upon reason, and administered by logic; its principles to-day are the same as those existing in the time of Solomon, and it develops with the requirements of the times in which it exists.

If the woman who has a desire to follow the profession of law wishes, she may with wisdom study with a view to employing her knowledge in a law office as clerk and stenographer, but she will find that

she will wish soon to branch out into a full-fledged lawyer on her own account, when she has mastered the minor technicalities of the science. Her woman friends will consult her on affairs of business, and of the heart, and she will find that the information she is giving freely can be turned to account as a producer of money. This will be her incentive, and she will not long be content to work for anyone but herself.

The expense of a legal education is not great. A hundred dollars a year will pay for the tuition at a good school and for the books required. This is not in excess of the charges at other schools, and the student passing the final examination may at once gain admittance to the bar and begin practice. If the woman has a man friend, or relative, who is a practitioner, she will find it to her advantage to take up business quarters in his office, for although she has the theoretical education, she will have to secure much of the practical before she will gain the confidence that is essential to success. The rest depends upon herself and her abilities.

IS THE NEWSPAPER OFFICE THE PLACE FOR A GIRL?

By EDWARD WILLIAM BOK

IT IS, perhaps, natural that the first desire of a girl should be to "write for the papers" when, by a reversal of circumstances in her father's home, it is necessary for her to earn some money. It sounds easy; the work is "genteel," and the girl feels that either the collegiate or social opportunities she has enjoyed will make her services of some value to a newspaper. At least, it seems the means nearest at hand. The girl knows nothing of the nature of a newspaper office or of what newspaper work really means. Her knowledge is confined to seeing the newspaper as it has come into her father's home.

The parents, however, have heard diverse reports of the influences which exist in newspaper offices, and they do not feel altogether sure as to the wisdom of allowing their daughter to enter one, keenly though they feel the necessity of her help. And from this state of uncertainty have no doubt been born the scores of letters which each year come to my notice, all asking the same question: "Will you tell us something about the average newspaper office as a place for a young girl to work?" No doubt many parents to whom I replied have felt that my answers were very unsatisfactory. But, as a matter of fact, I have never believed that this was a question which could be satisfactorily decided from any single opinion. I felt that it was rather a question for the women already in the newspaper offices, who had seen service of from three to ten years each, and for the men who are editors of newspapers, and who are fathers, to decide. Their opinions would, at least, be born of practical experience and observation.

Accordingly, some time ago I addressed a personal letter to fifty of the leading newspaper women of this country, asking them to answer for me, frankly and without reserve, with the assurance that their names would not be used, the same question which hundreds of parents had put to us:—

"If you had a young daughter, desirous, or forced, to go into the outer world, would you, from your experience as a newspaper woman, approve of her working in a daily newspaper office? If not, why not? And under what, if any, circumstances or conditions would you sanction it?"

Forty-two of the fifty answered the questions. Of these, twenty were married women — the majority, mothers. All were perfectly frank and fearless in their answers. Of the forty-two, three answered in the affirmative. The others, thirty-nine, replied in the negative. Naturally, many will ask: What objections did they advance? A few are here given: —

One of the most prominent of all the writers said: —

"My objections to a newspaper career for a girl would be two: First, and this applies to a man as well as a woman — its lack of permanence. As a career, it is absolutely uncertain. Second, and this is paramount — its harmful effect upon a girl's health. I scarcely know a woman who has been engaged in newspaper work who has not broken down, at least temporarily. The work has, first, that difficult element of subjectiveness rather than objectiveness; and, second, it has great irregularity of living, with a nervous strain which is almost constant. In fact, I believe that the successful newspaper woman has to break down, for she succeeds only in proportion to her possession of that quick responsiveness and nervous energy that we all know is a part of the mental outfit of the successful newspaper man as well as woman."

Here is the ethical side, rather than the moral: —

"If she were a girl under twenty-five, unless her character was strong and formed, so that she was able to preserve the right proportion in her view of her daily life, a newspaper office would tend to dissipate many of her wholesome illusions. To a sensitive, carefully nurtured girl, the profession would entail many disagreeable duties. I think every high-minded girl is equal to protecting such high-mindedness, and that she elevates the profession more than it lowers her, but I think she does it at continual cost."

This comes from a mother of daughters, who has served twenty years in newspaper work: —

"It is not because I think that companionship with men in an office is dangerous to a young girl in a moral sense that I oppose such conditions, but because of the circumstances of carelessness in manner, thought, and action, which are almost inevitably the resultant behavior of the men in an office, and particularly in a newspaper office, toward their constant companions, be they men or women. To a young girl, this carelessness of manner is unwholesome, leading her to attribute to all men this lack of courtesy on the part of some."

A successful newspaper woman, herself married, says: —

"For a young girl, I consider a newspaper office the most appalling moral eye-opener imaginable. Naturally, where all subjects are published, they are to a great degree discussed, and a woman must hear things that no amount of chivalry from her masculine co-workers can prevent. That *bon camaraderie*, which a woman of the world understands and can cope with, is often the undoing of the young girl, who grows flippant and unwomanly in her desire to be regarded favorably by members of the staff."

Another element in the life is pointed out here: —

"It is the freedom which the work gives that is bad. With practically no definite hours, and a stipulation only that 'copy' shall be in in time for to-morrow's edition, there comes a dreadful sense of freedom which unconsciously deteriorates into all sorts of license of language and behavior, the combination that makes the world believe all newspaper women to be 'Bohemians.'"

One of the cleverest women in the newspaper field says: —

"No, no! a young girl gets too close to the Tree of Knowledge in our business. Not that I believe a girl should remain ignorant all of her life, but I want my daughter, if she must learn the world, to learn it in any other way than that forced upon her by coming in contact with those votaries of sin who make it most attractive, and, to all appearances, least lacking in wrong."

Two actual "assignments" are here given from the life of one of the best-known American newspaper women, but who has since left the profession: —

"Let me just lay my first two 'assignments' before mothers, and they will answer the question, I think, for me. They are actual, too. The very first day I went to work on a newspaper I was sent to interview a chorus girl. I found her living at the most expensive hotel in the city; surrounded by every evidence of luxury; she drove to the theater in her own brougham. Yet her salary was sixteen dollars a week. My salary depended upon the hard work I did, and averaged eleven dollars a week. Was that calculated to impress upon me the value of hard work? I was just as pretty as, perhaps a little prettier than, that chorus girl. The next day I interviewed a great statesman — a man known all over the world as brilliant, witty, and wonderfully attractive to women. This man was cynical. He treated me courteously enough, yet every woman will understand when I say that, as a mere girl, he gazed at me in such a way that the blushes came to my cheek and I felt that I was not quite as ignorant as I was before. Are such experiences — and I had scores like them — calculated to keep a girl sweet and modest?"

From a very pretty and capable college girl, who has been a successful reporter for several years, come these words: —

"A newspaper office certainly tends to make a woman too independent, too free, too broad. It establishes her on a footing with men that is not wholesome; it gives her opportunities for freedom that are not uplifting. She may not become unwomanly, but less womanly she does grow. Her life becomes without conventionality, and that is not wise for any girl. The life does not tend to make her delicate or entirely refined. It makes her overcome, every day, obstacles that tend to harden her; to lessen her illusions about gentleness and the personal self-respect needed."

A newspaper woman with years of wide experience says: —

"We hear a great deal about men and women becoming each other's natural companions in the outer world; that it is no longer mere sex-feeling which draws them together, but a common interest in the great social problems that each is trying to solve. I heard one woman say on the platform not long ago that men were 'throwing off the fetters of physical grossness, the tyrant love of rule and misrule,' and that 'women were emancipating themselves from the vanity and pettiness that have so long enslaved them.' I had to smile sadly at these words. This woman believed every word she said, no doubt, but she talked from theory. I had been in that world she spoke of; she had not. And take my word for it, that, in spite of all the march of progress pictured so rosily, men are still men, and women are still women. And just as long as they remain so, there is an absolute danger for any girl in the intimate, free-and-easy life of a newspaper office — a life from which social restraints are in a very great measure removed."

But I fancy I have quoted enough from the letters along this line. It will be seen that none is radical. The statements are conservative. as is likely to be the case where statements are based on experience. Rather than give more of the same tenor, I will give extracts from the letters of the three writers who answered affirmatively: —

From a long and varied experience is this written: —

"I would have no objection to my daughter entering the office of a reputable paper that does not sacrifice everything to sensation. The associations in such an office are pleasant and helpful, and the men are uniformly courteous and respectful to a girl who, in turn, is self-respecting, gracious, and, above all, womanly. I should insist, however, that her duties be well defined, and that she take none upon herself that would lessen her self-respect. It is in her power to do this, for if an editor finds that a girl is steadfast in her determination, and if she has proven that she can do the better class of work so well that he prefers to trust it to

her rather than to another, she will find no difficulty in making herself so busy that she has no time even to have the other work suggested to her."

This also is from a woman who "ought to know": —

"If a girl has brains, health, great strength of character, and clearness of head, I should say: 'Yes.' But all these are essentials. Reserve and dignity form the armor of the successful newspaper woman. She must expect from her men associates none of the courtesies of the drawing-room, and she must make them understand from the first that they may expect from her only the perfectly cool, professional manner a business woman should wear. Let her drop this, and she cheapens and lowers herself at once. A newspaper office is a busy place, where there is no time for nonsense, flirtations, or 'affairs.' Newspaper men prefer to respect their woman associate if she will let them. And if they do respect her, they will offer her no attentions she should not accept, say nothing she should not hear, and offer her no 'assignment' she cannot undertake. A bright woman, with good health and uncompromising self-respect, can find a splendid field of work in journalism."

The third opinion comes likewise from a newspaper woman of reputation and experience: —

"My best education and happiest experiences have come to me through my newspaper work, and I should be proud to see my daughter a modern newspaper woman of the best type — that is, a lady, governed by the same inbred laws which govern a lady under all circumstances, one who holds her pen in a womanly, that is to say, in a reverent, fashion, and who remembers that truth and kindliness are not alien to clever writing."

Then I wrote to fifty newspaper men, — all editors-in-chief, and managing editors who employ girls and women, — and asked them the same question. I selected the editors of the fifty most reputable newspapers in the country. Thirty replied — the majority fathers — and in each case was the answer most decided in the negative.

One, who employs twenty women on his staff, says: —

"I would rather see my daughter starve than that she should have ever heard or seen what the women on my staff have been compelled to hear and see."

From an editor at the head of one of the largest dailies: —

"No, a million times no, and no words I can command can make my objections appear strong enough."

An editor whose name is respected wherever known, says: —

"In my eighteen years of experience in this office, I have never yet seen a girl enter the newspaper field but that I have noticed a steady decline in that innate sense of refinement, gentleness, and womanliness, with

which she entered it, and we are extremely careful, too, in the surroundings of our women and their 'assignments.' Yet they lose something — what, I cannot say in words."

Another editor emphasizes the same point: —

"You may ask, 'Is there nothing good in Nazareth?' Oh, yes, there are women who have been strong enough to resist temptation in whatever form it may appear. But even they, I notice, have lost a little of their sweetness, a little of their womanliness, and a something — an intangible something that I cannot explain, but which I saw only the other day on the face of a woman who, five years ago, was the daintiest, the prettiest, and the most womanly creature that ever started out on the hard path of the reporter."

One of the leading editors of the West sent this reason: —

"I have been so impressed that girls have no place on the staff of a newspaper, that within six months I have cut down the number of woman editors and reporters from twelve to two, and these latter leave us next month. Entirely aside from the loss to themselves which the life entailed, I found they disorganized our reportorial force, the men often covertly doing the work assigned to the women, and the women turning the 'copy' in. This may have been gallantry, but it was not business."

From an editor of high standing came this: —

"Young womanhood is too sweet and sacred a thing to couple with the life of careless manner, hasty talk, and unconventional action, that seems inevitable in a newspaper office."

An editor of an important paper sends a few statistics: —

"I am recalling eighteen really capable girls that I have employed during the past two years: Four got married and each was glad to leave the work; six broke down in health and were not allowed to return to the work; two are now in a sanitarium; two got to be so 'swagger' that they could not fitly represent a paper of our standing, and the four others are with us now. There is a story of fourteen out of eighteen — all nice, capable girls."

Another editor writes, and with his words I will end: —

"It 'depends upon the girl,' it is said. And it does. But so much depends upon her, she is asked to carry so much, she is required to be so everlastingly on the defensive, that there isn't one girl in twenty who can safely steer across all the rocks she meets. And even if she does, I do not see how it is worth her while. We are supposed to pay our women better than any other paper in New York City: yet of the lot, the highest paid receives only forty-two dollars a week. She is generally credited as getting one hundred dollars a week, but, actually, she gets what I say, since I pay her each Friday. And hers is an unusual success."

I have tried to give, in these extracts, the most salient points in the seventy odd letters before me — the points differing as widely as possible so that the various phases of newspaper life, as it applies to a woman, might be touched upon. The opinions come from the best known women and men in the profession; the writers, workers, and editors, who stand highest in the newspaper world of to-day. And as opinions of that authoritative class, I present them to the girls who wish to work in newspaper offices, and to their parents who ask whether such an office is the place for a girl. It has seemed to me to be the most honest and most effective way to answer the questions which have come to us.

The practical side of Journalism and Reporting is fully treated in Volume VI of this Library.

QUALIFICATIONS OF A GOOD STENOGRAPHER

A good stenographer should have a thorough mastery of many other things besides the art of writing shorthand. Speed in writing is an essential condition of good work, but is only one of several conditions which are equally essential. There is nothing more discouraging to a hurried man of business, or to an author, than to engage a stenographer who does not know how to spell words of more than two syllables, who does not know how to punctuate, and who has no idea of the formation of sentences.

Taking up the question of speed, there is a great difference in the requirements for a clerk or secretary and those for a reporter of public speeches and proceedings in court. The speed of stenographers may be divided for convenience into four grades, although the differences are only questions of degree. A beginner should be able to write at least seventy-five words a minute without feeling hurried, and should seek a position in a business house where the letters are simple, and relate to a single subject, rather than a position where literary knowledge is likely to be required. The most discouraging step in learning stenography is the attainment of this speed of seventy-five words a minute. It requires not merely knowledge of the characters, but instant knowledge. There is not time, when one is taking dictation, to stop to think what is the proper curve for *f* or *st*. Constant practice, combined with intelligent study, is the only means of attaining this readiness. Some teachers advertise to teach shorthand in a few weeks. All such claims are more or less misleading. The principles can be learned in that time, but proficiency, even up to seventy-five or one hundred words a minute, can hardly be attained without pretty constant practice for six months or longer.

After seventy-five words a minute can be written with ease, a higher speed comes rapidly with practice, and with the study of word signs and phrases. When a speed of one hundred words can be attained without difficulty, the stenographer may properly be classed in the second grade, when he or she is competent for most classes of office work. A business man or author will usually be content with this speed in dictating letters and articles, unless he is one of those persons,—entirely ignorant of shorthand,—who imagine that any person bearing the title of stenographer can write at the greatest speed attainable by human utterance.

When a stenographer can write one hundred words a minute without difficulty, he may begin to think of entering the ranks of stenographic reporters. For newspaper work, the speed of one hundred words will serve many purposes in reporting. It will not insure verbatim reporting in all cases, but will come pretty close to it. Many public speakers do not exceed one hundred words a minute, and those who go beyond an average of one hundred and twenty-five words, take their place among rapid speakers. The reporter who is capable of writing one hundred and twenty-five words without difficulty is pretty well qualified for newspaper work and for reporting public meetings. When it comes to court work, however, a stenographer writing only one hundred and twenty-five words a minute will break down, and make a bad mess for the judges and attorneys who rely upon his report.

The reason for requiring high capacity in a court reporter is not merely that he must catch every word and put it down legibly without fail, but because here conversation is much more rapid than in public speaking. A reporter capable of writing one hundred and twenty-five to one hundred and fifty words, and who has been reporting only formal addresses, will be astonished at his incompetence when he attempts to *report a running conversation between two people.*

Competent court reporters must be able to write one hundred and fifty words a minute, without effort. While this speed is a fair test of competence for court work, the best reporters, upon whom the greatest reliance is placed by great corporations and other valuable employers, can usually, under the spur of necessity, go considerably beyond one hundred and fifty words. Some can even write two hundred and fifty or three hundred words. The beginner, however, who has attained one hundred words, need not despair at the contemplation of this high speed. It is not so much a question of speed, between one hundred and twenty-five and one hundred and seventy-five words, as it is a question of brief phrase signs. Some of these are contained in the books, but others will be framed by the intelligent stenographer for himself, according to the nature of his work. Some increase in actual speed of movement is necessary, even for expert stenographers, in order to attain a speed of two hundred and fifty words a minute, and it is rarely that this rate is required for any great length of time. In seeking to increase speed of movement, care should be taken to avoid becoming "flustered." Long, sprawling characters, written with breathless effort, will not give such good results in number of words written as will small characters, more deliberately recorded.

All that has been said about speed is subject to the condition that every word written must be easily read. Many beginners in short-

hand make the mistake of writing under severe nervous pressure, in order to attain high speed, with the result of finding themselves unable to read their notes after they are written. Such a stenographer is worse than useless to the business man or author. He has lost the entire time employed in dictation, and has nothing to show for it. The beginner might as well resign her position, as to appeal to the person who has dictated the letter to fill frequent gaps in her capacity for reading her notes. This may be done occasionally for a single word or phrase, but if done often, is likely to convince her employer that he needs a new secretary. It is much better for a stenographer who has an intelligent employer to ask him to moderate his speed in dictation, than to put down notes which cannot be read, or to skip along, catching only a part of what is dictated. Blunders which have cost much money have been made in business houses by stenographers who followed the latter plan, and trusted to luck to make the letter convey the meaning which was intended.

One of the reasons why some stenographers are unable to read their notes is their unwillingness to go to the trouble of trying to read them when they are practising. It is not necessary to read everything one takes in practice, but enough should be read to satisfy the student that he or she can read with absolute accuracy every word that has been written. Proper practice in reading is as important as in writing. Both in business and in court proceedings, the stenographer is often called upon to read a portion of what has been written. The competent stenographer should be able to do this without nervousness or hesitation.

A stenographer fully equipped in what may be called the mechanical details — ability to write rapidly and to read correctly — will achieve but little success if he or she does not possess a thorough English education. This involves not merely the correct spelling of ordinary words, but a knowledge of words which are somewhat technical. It cannot be expected that every stenographer shall be familiar with geometry, medicine, geology, chemistry, finance, and the higher mathematics, but the more he knows about them the better he is equipped. It is very discouraging to an employer having serious literary work to do, to find a stenographer who never seems to have heard the ordinary words of business and of polite literature, or who sees no relation between the subject discussed and the words used. A type of this sort of shorthand writer was the young lady who in writing out an article on the stock market, substituted for "watered trust stocks" the charming sylvan phrase, "watered cress stalks."

As shorthand writing depends upon the ear, mistakes cannot always be avoided. The great difference, in such matters, between a com-

petent and an incompetent stenographer, is not so much delicacy of hearing as good judgment. A beginner with good judgment will soon learn what her employers are writing about, and will not make nonsense out of an article on the stock market by introducing something having no relation to the subject-matter, simply because it "sounded like it." In the case just stated, the error in hearing was excusable, but the stolid writing out of a phrase so irrelevant showed lack of intelligence and judgment. Lack of technical knowledge can soon be corrected in a stenographer having a liberal English education and possessed of good judgment. The words used will be understood, and will soon become familiar. It is a great mistake, however, for girls who have barely learned the rudiments of English to start out as stenographers, unless they take care to get places where the letters are simple and of uniform character, and where literary correctness is not especially sought.

A young girl with a meager English education, lacking the knowledge of ordinary words which are used in business and in social circles, will make a failure of shorthand work, whatever speed she may have attained.

It may be said that the education of a stenographer is like that of a lawyer — the more things he knows, the better equipped he is for his work. Sound judgment is more essential, however, beyond a certain point, than is mere technical knowledge. A stenographer who has good judgment will soon be able to make himself appreciated in a business office by relieving his employer of many routine duties. He will become so capable that a sentence of general instructions as to the nature of a reply will enable him to compose the reply in proper form, of his own motion. A thorough acquaintance with the business may fit him in time to become a valued assistant in some work other than the mere transcribing of business letters.

Intelligence and good judgment are especially necessary for the reporting stenographer and the court reporter. In reporting public addresses for the newspapers, or for any other purpose, a stenographer who is sure of his ground may properly correct trifling grammatical errors made by *ex tempore* speakers. His object should be to present what the speaker meant to say, rather than to photograph the infelicities of grammar and construction which may have dropped from his lips under the nervous pressure of offhand speaking. The stenographer should be careful, however, not to undertake such corrections upon a scanty knowledge of the subject, or to attempt to force his own forms of expression upon the speaker. Amendments of this character cannot be recommended to young stenographers, except in the case of the most obvious grammatical

errors, where the correction of a word will prevent the use of an awkward expression. Writers of greater age and experience may go farther in polishing up speeches, but must be governed to a large extent by their knowledge of the speaker. Some speakers who lack literary culture, and who are conscious of the fact, are grateful for very considerable corrections; others, who are satisfied with their own literary attainments, whether they are good or bad, are sensitive to changes.

It need hardly be said that neatness in work, thorough care of the machine, if a typewriter is used, and absolute discretion in regard to what occurs in the office, are vital requirements in a good stenographer employed as a clerk or secretary. The relations of a stenographer to his employer will necessarily place him in possession of much knowledge of the business and of the personal relations of the latter which are known to few other persons or to none. This knowledge should be treated as sacredly confidential, as it would be by a physician or a lawyer. It should not under any circumstances be made the subject of gossip, even within the family circle. Secrecy need not be carried to an absurd point, in discussing the nature and amount of one's work, but anything which the employer might prefer should not become generally known — should not find its way outside of the office through the stenographer. This is preëminently true of anything which might cause social scandal. If matters come to the knowledge of the stenographer which he regards as improper, it is neither his duty nor his right to make them a subject of gossip. If he is asked to do anything which is contrary to his conscientious convictions of duty, he should give up his place; but this should not operate as a release from the obligation of shutting his eyes and keeping his lips closed regarding office secrets.

WOMEN IN GOVERNMENT EMPLOY

THERE are eight great governmental departments in Washington: The State, Treasury, War, Justice, Post-office, Navy, Interior, and Agricultural; and, besides these, seventeen bureaus of lesser importance. So many people are employed in these departments, that were they all to be transported suddenly to the broad prairies of one of the western states, they would number enough to make a flourishing little city of themselves. In round figures, Uncle Sam employs twenty-five thousand of his sons and daughters to carry on the business of the government at the capital; and out of these, ten thousand are his daughters.

It is a comparatively recent innovation for women to occupy government positions. Before the Civil War, such a thing was unheard of. Sometimes, when the work was very pressing in the Patent Office, copying was given to women to do in their own homes, but even this was unusual. When General Spinner, who served with such distinguished honor as United States treasurer, from 1861 to 1875, came into office, he found himself hampered for want of help. The young men of the country were in the army and navy, and the business of the Treasury was in arrears. When he was a banker, he had learned that his daughter could be of much assistance to him in his bank; so in this dilemma for workmen at the Treasury, he determined to fill the vacant places with women. At that time, the legal tender notes were trimmed by hand with long shears which, with one stroke, cut across a sheet of four notes. Young men had been doing this work, and it was there that General Spinner wanted to substitute women. To demonstrate the feasibility of the plan, he made the experiment of engaging a young woman — Miss Jennie Douglas. He gave her a pair of the big, unwieldy shears, and set her to trimming the legal tenders. The very first day she proved the wisdom of his plan, cutting more neatly and more swiftly than any of the men trimmers, and settling the question unalterably in favor of her sex. Shortly afterward, seven other women trimmers were engaged, and the next year the number was doubled.

Steadily, since then, women have been proving their fitness for government positions, until now there is scarcely a division in any of the departments where they are not occupying places of trust. The Treasury was the first to open its doors, and has always had a larger proportion of female clerks than any other department. Of its present force of four thousand six hundred and sixty-two people, two

thousand and six are women, a rating far higher than the general average. These two thousand and six women range in age from sixty-five years (although there are but few so old), down to girls of eighteen; and it might be added, also, that there are not many so young. The highest-paid woman is a clerk in the Internal Revenue division, who receives eighteen hundred dollars annually. Next to her, in point of salary, are twenty-eight women who draw sixteen hundred each, and two who are paid fifteen hundred; there are ninety-six who receive fourteen hundred, two at thirteen hundred, and two hundred and six whose annual pay is twelve hundred dollars. The salaries of the remaining sixteen hundred and sixty-one range from that amount down to two hundred and forty dollars, which is paid to each of the one hundred and forty charwomen, who keep the marble halls and handsomely furnished rooms in immaculate condition. They all work side by side with men, doing the same work, as a general thing, and doing it as well.

Women with Brains in Their Fingers.—In the Redemption division of the Treasury, the women are doing a work that has won for them a world-wide reputation for expertness. All paper money, of whatever description, that has ever been issued by the United States Government, must be returned to the Redemption division, when it becomes mutilated or worn out, and Uncle Sam generously gives brand new bills for those that are not injured beyond recognition. When such money is returned to this division. it is examined for counterfeits, or other frauds, passed on by the clerks in charge, and then canceled and destroyed. It frequently happens that money which has been chewed up by animals; money that has been burned to a charred and blackened crisp; and money that has been buried with the dead until it has become offensive in the extreme, is sent in for redemption. Such money is examined by a committee of three women, who are among the oldest female employees in the service: Mrs. L. E. Rosenberg, Mrs. W. A. Leonard, and Mrs. A. E. Brown. The last named is the burnt-money expert; Mrs. Rosenberg looks after the mutilated notes; and Mrs. Leonard detects the "green goods" bills which are so warily slipped in with the true ones to be redeemed.

The proficiency that has been attained by these women is marvelous. Every bill that was ever issued by the government is familiar to them, and the very touch often determines the denomination of a note that is injured beyond determination in any other way. All of the fifty women who hold positions in this division are exceedingly skilful, as of necessity they must be. Millions of dollars pass through their hands annually, and each package bears the name and number of the examiner; if a mistake is made, the amount of it is charged

back to the one who made it, and deducted from her salary. In consequence of this system, mistakes are of rare occurence, but the responsibility is stupendous; and, within the past dozen or fifteen years, twenty-two of the clerks engaged in this division — both men and women — have had their reason unbalanced, and have become either temporarily or hopelessly insane.

Judgment That Is Unerring. — The Interior Department employs the next largest number of persons, and under that name are the Patent and Land offices, the Pension, Educational, and Indian, bureaus, the Geological Survey, and several other similar branches, in all of which there are about a thousand woman clerks. In the Indian Bureau, Miss Estelle Reel, of Wyoming, is the superintendent of the Indian schools, and receives a higher salary than any other woman in the government service. Miss Helen F. Shedd, of New York, the private secretary to the commissioner of patents, stands next to Miss Reel with reference to salary, receiving eighteen hundred dollars.

The experts in these offices are found among the examiners, inspectors, and draftsmen. There are five woman examiners in the Patent Office, and they attained their positions through the hardest of competitive examinations. These examinations occur annually, and are given by number, in order that the sex of the applicant may not be known. They include a comprehensive knowledge of the sciences and patent law. These women sit at their desks all day long, examining into the intricacies of every kind of machinery, electrical appliances, trade marks and designs, engineering, and so forth, and their trained judgment is as unerring as that of the men who sit at the desks opposite them. Miss Sarah Noyes, of Connecticut, is the oldest in the service of woman examiners, and her work is in electrical appliances. Her twenty years' experience has made her an accepted authority in all matters pertaining to this department.

In the War and Navy departments, there is a smaller per cent. of women than in any other, and the salaries, generally speaking, are not so high. This may be explained by the fact that so many of these positions fall naturally to men and officers who have served in the army and navy. The Post-office Department has about a thousand persons on its pay-rolls; less than a third of these are women, but their salaries average well. Sixteen hundred dollars is the highest remuneration, and there are ten women who receive this sum; nineteen others are paid fourteen hundred, while thirty-nine receive twelve hundred annually.

The "Blind Readers." — The Post-office Department is one of the most interesting divisions, and in it are employed two of the

most brilliant experts in government employ. This division is the Dead-letter office. In one corner of the big room, at two desks forming a hollow square near a window, sit these experts, who are without doubt the two greatest decipherers of chirography in the world. They are Mrs. Patty Lyle Collins, of Mississippi, and Miss Caroline Childs, of Nebraska. Every letter, the address of which is illegible to any local postmaster, is sent to the dead letter office, and as many as eighteen hundred to two thousand per day are turned over to Mrs. Collins and Miss Childs. It is a remarkable fact that, without being opened, eighty-seven per cent. of them are correctly readdressed and forwarded to the parties for whom they were intended. Letters are received here whose illegibility beggars description, and letters come without any address whatsoever; there are letters with only the street and town; and letters addressed with phonetic spelling; and letters in which the association of ideas causes the sender to write "Fish City, Massachusetts," when Gloucester is meant. The ability of Mrs. Collins and her assistant to see what was in the mind of the writer — but assuredly not in the address on the envelope — has won for them the title of "the blind readers," a title they certainly deserve. It may be inferred that both are blessed with an unusual amount of woman's intuition; but, added to that, is a marvelous memory, which has been taught to retain everything it sees or hears, and an almost inexhaustible supply of general knowledge. Of course, they have directories and books of reference to assist them, but their long experience is the secret of their proficiency and success.

At the Agricultural Department, in the southern part of the city, and at the Bureau of Public Printing, on the east side, fully twenty-five hundred women are employed. In the former place, the salaries paid are about what they are in the Post-office, while in the Printing Office the women work — as the men do — by the hour, and their wages vary according to their dexterity. In the Department of Justice are only a few women typewriters and stenographers, and while the State Department has fewer employees than almost any other, yet a fair percentage of these is women. This is an exceedingly desirable bureau with which to be connected, as the work is of a high class and is of itself educative. The secretary or chief clerk, Miss Mary Greer, of Washington, has earned her present high position by her own unaided efforts and decided executive ability.

Order from a Chaos of Correspondence.— For several years, a part of the work of the Department of State had been running behind, and when Mr. Day became Secretary, its unrecorded correspondence was piled several feet high in a storage closet, and he advised that the "Book Typewriter" system be adopted for recording it. He asked the

company to send up one of its best clerks to demonstrate the practicability of the plan. Miss Greer, who was then in its employ, was detailed for that work and in a few days she not only convinced the department of the feasibility of the plan, but also that she was just the person to reduce to order the chaos of correspondence. She was offered the position and accepted it, and in a few months had brought the correspondence up to date, and has kept it there ever since.

Downstairs, in the same building, is another young woman who is an expert, Miss Maud Stalnaker, in the Division of Consular Reports. Miss Stalnaker was educated in Paris and in Germany, and has a good command of French, German, Italian, and Spanish. A year or so ago, when a special examination for translator was held by the Civil Service commission, she and three men took it. Miss Stalnaker was the only one of the four who passed. Her sex, however, kept her from being appointed to the translator's position, and she was given her present place as a compromise. In this, her knowledge of the languages comes into play in editing the consular reports and in watching the foreign exchanges.

Invaluable Translators.— The highest-paid women translators are in the Bureau of American Republics. This bureau manages the business relations between the South and Central American republics and the United States, and expert translators are in demand. There are seven young women employed here, and two of them, Miss Kirk and Miss McNaughton, translate six different languages and receive salaries of twenty-five hundred dollars per year. They are both unusually gifted and have remarkable powers of concentration. Miss McNaughton was one of the translators for the Peace Commission in Paris, and Miss Kirk is said to be one of the finest translators of Portuguese in the United States.

It is often asked what prospect there is for a young woman to secure a good paying position in the departments at Washington, and I repeated the question the other day to the head of one of the bureaus. "A government position means a humdrum existence," said he, "and women find it more irksome than men. In the higher positions, they are not as well paid as men, for the reason that they do not give themselves the time to fit themselves for those positions,— not because they are women. There will always be places for excellent scientists, cataloguers, linguists,— experts of various kinds, regardless of whether they are women or men. There are hundreds of people of mediocre ability and attainments who want positions in the government service, hundreds more than there are places for, but it is true there, as it is in all other vocations of life, that there is plenty of room at the top.

ADVICE TO DRAMATIC ASPIRANTS

By ANNIE RUSSELL

I HAVE been asked to express myself regarding the stage as a vocation for the average young woman, not the especially gifted, but the girl who holds, say, a normal school diploma, is fairly good-looking, healthful, ambitious, reputable, and the owner of a reasonable amount of sound, common sense,— just the kind of girl, in short, who, if she did not adopt the stage as a means of livelihood, would make an excellent typewriter, a trustworthy saleswoman, or a good little housewife.

Now it is impossible to forecast that which might or might not happen to such a young woman, in the event of her obtaining a footing on "the boards." The dramatic profession is one of surprises, and the only thing I can do, therefore, is to indicate the qualities which an aspirant to histrionic honors should possess, and add a word or two regarding those aspects of professional life that constitute its drawbacks.

First, then, the would-be actress must have a well-proportioned form, and a face that, if not precisely beautiful, should at least be mobile and pleasing. If she is not thus blessed, she may as well abandon her intention. Nothing will compensate her for a lack of physical attractions.

Next, she must possess temperament,— the receptive faculty that readily responds to impressions of the eye, ear, or mind. The emotional side of her nature should be well developed, and completely under control. The faculty of imitation is greatly to be desired. This can be cultivated, provided it exists to a reasonable degree in the first instance. Lastly, she must have magnetism,— that mysterious something which is as indefinable as it is actual. Without it, she cannot hope to rise above mediocrity. Just what this much-disputed charm is, I am not prepared to say. It may be the outcome of a well-balanced development of the other essentials, or it may be outside and independent of these. But it is an actuality, nevertheless, and I need not add that the successful women of the stage are those who have it in a greater or less degree. Here, again, direct work on the stage is needed, to prove whether the novice is or is not blessed with it.

Given all these, the next thing needed is opportunity. In this connection, I would strongly advise our hypothetical young woman to begin her life on the stage at the very foot of the ladder. If she is content to do this, she will at least be in a position to test her abilities. I went on the stage when I was eight years of age, and any measure of success that I may have achieved is based on the humble work of those earlier years.

Having obtained her footing, that which follows will depend upon herself. To the qualities that I have enumerated she must add a capacity for work, a persistent belief in her future, and a determination not to be overcome by set-backs.

The so-called temptations of the stage exist, it is true, but surely in no greater degree than they do in the store, the office, or the workroom. The girl who goes out into the world must realize that the safeguards of home life are no longer possible to her. The rest remains with herself. Virtue is not a matter of environment. The lives of scores of our actresses are a sufficient refutation of the ancient superstitions regarding the alleged evil influences of the stage.

Would I recommend the stage as a vocation for our average young woman? My reply would depend upon her individuality. Speaking for myself, I can only say that the longer I am in the profession, the more I realize its possibilities, and the more I love it. Perhaps this will serve as an answer to this last query.

PRIVATE SECRETARIES

IN THE archives of the past, shrouded in the mists of antiquity, may be found suggestions that women were the transcribers of the records of those remote periods. The skill of women in handling the implements of writing seems to have been recognized, to some extent, even in the early ages, and it may not be far wrong to suppose that this was the beginning, or at least the foreshadowing, of the employment of women as assistants in the lines of work requiring legible penmanship, and, later, when correspondence had become a necessary element of business and social life, as private secretaries.

A private secretary, as the term indicates, holds a position of trust. This position may be with the head of a business house, with a professional man or woman, with a person of wealth, or with a man in official life. In a general way, the duty of the incumbent in any one of these positions is the care of the correspondence. Each line of work, however, has its special requirements.

In the office of the head of a business house, a private secretary is expected to become closely acquainted with the details of the business that is carried on under her employer's direction. This enables her to classify the mail daily, to refer each letter to its proper department, and to arrange all memoranda brought to her by the heads of the different departments, in answer to the letters referred to them. This knowledge of detail also makes it possible for her, with the aid of a single word or sentence, indicating the general tone of the reply, to answer a large portion of each day's correspondence without more definite dictation. In this way she relieves her employer of a great amount of labor.

In addition to these duties, the private secretary in many offices is required to meet the numerous callers who seek an interview with the head of the firm. Few busy men have time to grant a hearing to every one who comes to see them during business hours, but it is important that they should know the object of each caller. This the private secretary ascertains, and presents to her employer in as brief a form as possible. In a position with a professional man or woman, the duties are similar. A knowledge of stenography and typewriting is almost always necessary, and experience in keeping accounts is sometimes expected. Occasionally, some technical knowledge of the particular profession is desired.

A private secretary to a woman of wealth and social position, may be required, besides doing her work as correspondent, to keep her employer's visiting lists, her charity accounts, and a list of her social engagements and obligations. A woman well versed in formal etiquette, and with a wide social acquaintance, would be especially valuable in a position of this kind.

An official secretary has only the care of the correspondence. This is almost always heavy, as hundreds of letters are received daily. All of these must be answered, a great amount of data must be collected, and many of the letters require personally dictated replies.

In general, this occupation seems to be a natural and an attractive one. The work, while it may be difficult and at times laborious, is usually done amidst pleasant surroundings and under favorable conditions. The hours, though not always defined, or closely adhered to, are seldom of unreasonable length. The demand for women for private secretaries has increased in recent years. It was formerly thought that women could not adapt themselves to the requirements of a business office. They were supposed to lack the qualities essential to success along practical lines. A deeply-rooted belief also existed that women were unable to keep a secret, and for this reason were unfitted to hold positions of trust. Experience, however, has modified these prejudices to a great extent, and there are to-day no more trustworthy employees in any line of work than the women who hold positions as private secretaries.

The salaries paid to private secretaries vary in different cities and in different positions. An income of from seven hundred to nine hundred dollars a year might reasonably be expected by a competent secretary.

To the woman who wishes to become a private secretary, a good practical education, especially in the English branches, is absolutely essential. If this is supplemented by a knowledge of stenography and type-writing, her services will be considered more valuable, and she will probably be able more easily to find an opening. After preparation, the first step might be to seek employment as stenographer in some business office. The training and the experience there gained would help to determine the fitness of the worker for the desired advancement, and would aid materially in securing the higher position.

OFFICE COPYING

BEFORE the advent of the type-writing machine, office copying was unquestionably a more distinctive vocation than it is now, and the work was done by both men and women. One of the chief qualifications at that time was rapid, legible penmanship. Notwithstanding the revolution brought about by the perfection of the type-writer, however, the occupation of office copying retains a sufficient number of distinctive characteristics to entitle it to a classification by itself.

The phrase "work of a mechanical or routine nature," must be interpreted as meaning only such work as the addressing of envelopes, which is purely mechanical. It is not easy, however, to draw the line between work that is routine and that which is not. In office copying, the subject now under consideration, there is very little work that does not call for some degree of technical knowledge on the part of the clerk of the business with which the copying is associated. In a pension attorney's office, for illustration, while there will be a certain amount of mechanical work, most of the duties of the clerk will involve discrimination and original thought. All papers relating to a given "claim" are kept in a folder. On this folder appears the number of the claim, and the claimant's name; and then, in allotted spaces, a digest of the claimant's letter of application, action taken, etc., etc. Each digest must contain all the salient points of a perhaps long and rambling letter, and the task of selection, and discrimination, is a part of the copyist's work. After long experience, the copyist may be required, because of the knowledge he has acquired in connection with a claim, to assist, personally, in its settlement. It may be held that here the work has passed beyond the bounds of mechanical copying, and so it has, but it is still "routine" in its nature, and the illustration brings out the point we wish to make, namely, that office copying, in modern usage, practically does not exist, except in connection with the technical work of a business. The time was when the field of simple mechanical copying was not so limited, but since the advent of addressing machines, and book-type-writers, now used in county recorders' offices for copying deeds, mortgages, and other documents, this class of work has become, very largely, a thing of the past.

The requirements which an office copyist is compelled to meet may be gleaned from what has already been said. A good, native intelli-

gence, a natural aptitude for determining what is valuable and pertinent, a good idea of order and punctuality, are, of course, the first essentials. Any bright woman with a good common school education need not hesitate to take up the work. Naturally, she will have to begin at the foot of the ladder, as the saying is, with small duties and small pay. The higher grade work, with better pay, will come with experience and faithful service.

It is difficult to speak definitely regarding the remuneration of copyist clerks. Everything depends upon the experience and technical knowledge possessed. The range may be placed at from three to eighteen dollars a week, the average being perhaps about nine dollars. Those beginning at the bottom, addressing envelopes, say, cannot hope for a salary greater than three dollars a week. Experiments have proven that in large cities, a single advertisement in a daily paper, offering three dollars, and even less, for this kind of work, will be responded to by a great number of applicants. However, those intending to take up the work should not be daunted by this, for ability, and faithful service, will open up the way to the higher positions. An honorable and fairly good livelihood usually crowns intelligent, well-directed effort in this field.

COPYISTS FOR LITERARY PEOPLE

Two conditions have contributed to the opening of this comparatively new, but remunerative, occupation for young women. One of these is the notoriously illegible chirography of literary people, and the other, the almost universal rule of the publishers that manuscripts shall be type-written. The employment of a copyist by the writers of books, and of stories, has thus become necessary, and women have generally been chosen for such positions.

In this work, however, much more than mere ability to operate a type-writer machine is essential. The copyist must have a fair education; she must be able to correctly spell, punctuate, capitalize, and paragraph the "copy." Not the least important of the requirements is that she must have a faculty for reading obscure handwriting, a qualification that many educated persons do not possess.

Few authors are able to transcribe their thoughts, with their own hands, directly upon a writing machine; and an equally small number find it impossible to record them, satisfactorily, by dictation. There is a sympathy between the brain and the hand that moves the pen, which is lacking when the machine, or the voice, is used in composition.

There are many women employed in the large cities as copyists for literary writers, who work for two, or more, authors at the same time, such an arrangement being possible when the volume of manuscript prepared daily by the writers is not unusually large. For example, the copyist will be occupied in one study in the morning, and in another in the afternoon, and if she is exceptionally industrious she may also find occupation for her evenings.

The publishing houses also employ large numbers of women for this class of work. Some well-known authors whose manuscripts are desirable under any conditions or circumstances, and who do not care to employ copyists, are permitted to send their "copy" to the publisher just as it comes from their own hands. It is then type-written by one of the women employed for the purpose. This is done to minimize the inevitable errors of the composing-room.

It is a fact generally recognized by authors that a type-written manuscript is much more likely to receive consideration from a pub-

lisher than is one written by hand, regardless of the respective merits of the two. The women who do this copying receive a higher compensation than is paid for ordinary type-writing, and they undoubtedly earn it. The work is pleasant, however, and such positions are sometimes the stepping stones to better ones.

A young woman desiring to enter upon this class of work, and possessing the requisite qualifications, might secure a start by making personal application to some large publishing house, by advertising in the newspapers, or by obtaining letters of introduction to some writer whose influence might be used in her behalf.

SCHOOL TEACHING

To be thoroughly fitted for school teaching means, ordinarily, the completion of a High school course, and from one to three or four years' work in the Normal school. It is sometimes possible to omit the Normal course, and even that of the High school, by successfully taking a general examination. This implies special private training in what are generally known as "teachers' preparatory schools." This training may be, and often is, quite as thorough as to essentials, but there is no denying the better general equipment acquired through the High school course, and the special ability to impart knowledge, derived from the Normal school work.

The underlying idea of education in America to-day is to make the elementary training very general, leaving specialization to the higher educational institutions. For this reason, teachers of the elements are called upon to teach such a variety of subjects as to make the possession of a broad basis of general knowledge almost imperative. Certainly, conspicuous success in the profession cannot be hoped for without such attainment. While, therefore, much of the work of preparation necessary to secure this basis of general knowledge may be avoided in the way indicated, it still must be patent that, to those expecting to make teaching a life work, and who hope to become leaders in the field, the work of the High school, and of the Normal school, is practically indispensable. The ideal training is that of a college, or university, education, followed by a training in the practical work of teaching that now obtains in our High schools, the teachers of which are usually drawn from colleges and universities.

So much for intellectual requirements. As regards physical requirements, the exactions of teaching are equally great. No woman deficient in strength and vitality should for a moment consider herself adapted to the work. The strongest constitution is taxed to the utmost. The mere presence of forty-five young people in the same room is a sufficient tax upon the strength of ordinary women. Add to this the care and worry incident to maintaining order, and to directing the work of these young people, and you have a task surpassing in wear and tear of body and nerves, that of almost any other occupation to which women are eligible. Nor is the work entirely confined to the schoolroom. In comparatively few cases is a teacher able to

prevent the schoolroom duties from encroaching upon time which should be spent in rest and recreation, at home. Lessons are to be prepared, compositions to be read, examination papers corrected, and reports filled out, so that the five or six hours of work in the schoolroom are extended to ten, and perhaps twelve, hours. The average teacher is not able to avoid these extra duties, and those taking up the work of teaching will, sooner or later, have to become reconciled to it. Our concluding advice in this connection is: Do not take up the work of teaching unless you are physically robust; and, once you take it up, endeavor in all possible ways to conserve your strength while at work; and while not at work, to abandon as completely as possible all thought of the schoolroom and its duties. The two or three months' vacation should be given up entirely to rest and recreation.

School-teaching as an occupation cannot be said to offer much in the way of remuneration. It is a well-known fact that teachers, and especially women teachers, are underpaid. The yearly salary ranges from a minimum of perhaps three hundred dollars to a maximum of ten, eleven, and possibly twelve, hundred dollars. The salaries for teachers vary of course in different states, and in different cities within a state. Probably the salaries of the great majority of women teachers range from six hundred to nine hundred dollars. This, speaking generally, is for ten months' work, and as the two months' vacation must usually, through necessity, be given up to rest, and recuperation for the coming year's work, it is scarcely possible for teachers to augment their earnings by labor during the months the schools are closed. The salary for the year is usually paid in ten equal payments, which necessitates laying aside a sufficient amount to cover the expenses of the months of enforced idleness. The salaries attached to supervisory positions, such as principalships, and superintendencies, are of course greater, ranging perhaps from twelve to twenty-five hundred dollars. But as has been pointed out, these positions are only in exceptional cases open to women. Seventy-five dollars a month, with two months of leave, with pay, during the year, is perhaps what the average successful woman teacher may expect to obtain in the way of remuneration.

The responsibility resting upon the shoulders of the school-teacher is very great. Children are quick to see any discrepancy between precept and action, and no teacher who does not live what she teaches can hope to exert a proper influence upon the character of her scholars. She lives constantly under the white light of public scrutiny, and no moral shortcoming can long remain undiscovered. Given true instincts and high ideals, however, this part of the requirements will prove no obstacle in her pathway.

THE NURSERY GOVERNESS

I am indebted to my father for living, but to my teacher for living well.
—ALEXANDER THE GREAT.

THE woman who selects as an employment the training of youthful minds and bodies, places herself under a twofold obligation—first, to the child, whose future life she may influence in a marked degree; secondly, to the parent who intrusts to her a charge so sacred. She should remember that next to the mother stands the teacher and nurse. The comfort and the happiness of her small charges are largely dependent upon her own actions, and between them and herself there should be a mutual sympathy and the clearest comprehension.

In order to achieve success as a nursery governess, much depends upon the woman's personality. She must be refined in taste, gentle in manner, and possessed of a high moral sense. She must have adequate knowledge of the laws that govern the child's physical, mental, and spiritual, development. She must possess a genuine love for children, and must be able to attract and to hold them. She should possess a fair education, and be quick to note the individual character of her charges.

The responsible duties of a nursery governess are, therefore, varied and numerous. She is not only expected to instruct the children in the rudiments of reading, writing, spelling, geography, and arithmetic, but she regulates their diet, and their hours for sleeping, and looks after them in illness. When she has the entire charge of the nursery, and the mother is unable to pay her more than a daily visit, it is desirable that she should possess some knowledge of the diseases of childhood, and of the simple remedies that may be useful before a medical attendant can be procured, or when such attendance is not considered necessary.

The training of the child's character is also a part of the duty of the nursery governess. Truthfulness, purity of thought, docility, and obedience, are qualities that must be awakened in the little one's soul. Only the teacher who possesses such attributes herself can successfully cultivate them in others. "If she would teach truth, she must be true, if she would teach honesty, she must be honest!" Childish minds are quick in detecting the slightest imposition, and quick to resent it.

Not only is it well for the governess to study the character of her charges, but she should mark, and faithfully report to the parent, the defects she observes in their dispositions; so that by united efforts, any evil propensity may be checked, or eradicated. Most children have some fault, of which they should be broken, but, little good is ever accomplished by harshness. Kindness, perseverance, and patience, on the part of the nurse or governess are here of the utmost importance.

Punishment, as far as possible, should be avoided, yet indulgence, and flattery, should be equally shunned.

Children are often irritating and unreasonable, but the governess must not give way to irritability. She must ever be gentle, self-forgetful, and considerate, yet must rule her charges with firm dignity.

In every occupation for women there arises the question of remuneration. In that of the nursery governess it would naturally vary according to the wealth and to the position of the employer, and also to the assistance given in the nursery by the mistress herself, or by the under nursemaid. Thirty to forty dollars per month is the average salary paid for this service, although under certain conditions, it is sometimes much higher.

The nursery governess differs from the ordinary governess in that she rarely, if ever, lodges apart from the house of her employer. Her room and meals are usually as good as the home affords, for she eats with her charges, and, as a rule, sleeps near them.

The hours are long, but the work should not be hard, and a regular systematic regard for the laws of health, of rest, and of occupation, will profit both the governess and those in her care.

Above all, let the girl or woman who desires to become the guide of little children, be sure that she is possessed of three qualities: an equable disposition, a patient, sympathetic heart, and an interest in, and a love for, her work.

Let her put heart into her work. Let her not look upon it simply as a means of earning money. If she can inwardly believe herself possessed of all these qualities and capable of many sacrifices, then she need not fear to attempt the work before her.

KINDERGARTEN TEACHING

PRACTICALLY all that was said regarding the general subject of school-teaching, applies with equal force to kindergarten work. In this work, however, men play an even smaller part than in school-teaching generally. Where men engage at all in the work, it is on the theoretical, rather than on the practical, side of teaching. The reason for this is almost wholly a financial one, the salaries paid to kindergarten teachers being too small to induce men of even mediocre abilities to enter upon the work. Even the salaries of the directors of kindergarten teachers, are not large enough to attract men. The result is, therefore, that the field is left entirely to women.

The work of preparation for this field of teaching is almost analogous to that set forth under the general head of school-teaching. While the work is apparently simple, the method of teaching is such as to exact as complete an equipment of knowledge as is required of the teachers of grammar grades. The aim of kindergarten work is principally to stimulate observation in children, and to enable them to trace relationships between cause and effect in the various activities of life which surround them. To do this successfully, means that the teacher herself must have a thorough insight into life, and nature — an insight that is not acquired except as the result of a broad general education, and of a special training, corresponding to the normal school work of teachers in the higher grades. This special training is obtained in kindergarten training schools, the time involved corresponding in general to that of a normal school course. As with normal school work, the time spent in this special preparation may be cut down to a year, but this can be done only with detriment to the equipment, and therefore to the chances of successfully prosecuting the work.

Teaching in all its forms requires a great amount of preparation, and those choosing the kindergarten branch, as requiring less preparation than does the teaching of the higher grades, will quickly discover that they have erred. The minimum requirements in this direction may be taken as the completion of a high school course, and three years of special work in the kindergarten training school.

In one respect, the physical requirements of kindergarten work are not so severe as are the requirements in the higher grades. To a greater extent, the work of the kindergarten teachers is limited to the hours actually spent in the school-room. Then, too, each kindergarten teacher has an assistant on whom devolves much of the work of maintaining order. It is true that, the children being younger than grammar school children, a greater amount of individual care, and instruction, is necessary, and that, therefore, the kindergarten teacher is obliged to "give out more of herself," as the saying is, than do the teachers of the higher grades. Still, for the reasons given, the work of the kindergarten schools is probably less trying, physically, than that in the grammar schools.

As stated before, the salaries of the kindergarten teachers are very low, the range being probably from four hundred to seven hundred and twenty dollars a year. The work is usually begun at the minimum rate, the salary increasing a certain stipulated amount with each year's service. The assistants receive, ordinarily, three hundred dollars a year. In the cases of both teacher and assistant, the salary is usually for ten months' work. For those taking up an occupation simply as a means of gaining a livelihood, kindergarten work has but little to offer. To be successful in the work, a teacher's thoughts and energies must be centered in it. It cannot be taken up, and laid down, like the pen of a copyist; it must be lived, it must become, veritably, a part of the teacher. No one, therefore, not willing to devote every mental quality and attainment to the work, and to make sacrifices, both physical and financial, should entertain any idea of becoming a kindergarten worker.

MUSIC-TEACHERS

MUSIC-TEACHING as an occupation seems to have a certain charm for a girl who looks forward to supporting herself by her own efforts. If she has musical taste, and talent for imparting knowledge, her thoughts often turn naturally in this direction. The work of music-teaching will demand natural gifts, thorough study, and close application; with these qualities, success in the work may be looked forward to with a fair degree of confidence.

After her decision is made, the young woman should decide whether she will teach vocal or instrumental music, and if the latter, what instrument shall be her specialty.

If vocal music is selected, a girl would do well to consult the best master of singing within her reach, who will tell her whether her voice has enough promise in sweetness and purity of tone, not necessarily in strength, to warrant the outlay of money, and of hard work, necessary to prepare herself for this line of work. "A good ear," that almost indefinable sense of perception of different tones, is important to the student or teacher of both vocal and instrumental music.

The selection of an instructor, or of a college, modified as it must be to some extent by the question of expense, is an important step. As in most studies, the best instruction that can be obtained is usually the cheapest in the end. A teacher who is known to be doing thorough, conscientious work, who inspires students to earnest efforts to develop the best in themselves, rather than to secure brilliant effects, is the most to be trusted, particularly with the voice.

A course in a good college or conservatory of music is held by many to be preferable to instruction wholly by private teachers. But a beginning might well be made before entering such a school. The expense of an entire college course might be lessened by a preliminary period of study at home, under a good teacher. In this way, a thorough knowledge of the rudiments could be acquired, and a foundation be laid for advanced college work. The length of a course varies in different conservatories, most of them requiring three or four years' study.

A student of singing is usually required to study the piano, and harmony. And she may learn counterpoint, and composition, if she is studying instrumental music, and wishes to become a master of her art. But piano, and harmony, and thorough work in sight reading, are valuable to those who intend to become teachers. All this may be learned

from private instructors, but the student would miss the assistance and the inspiration of class instruction and work, and also the many opportunities — offered to the pupils of a musical college — to hear the best music.

Whether a course in this country, or in one of the foreign universities, be the more valuable, is a disputed question. Thousands of women are to-day teaching both vocal and instrumental music thoroughly, and successfully, who obtained their education wholly in this country. There are many who occasionally spend a year in study abroad after having established themselves in their work here. These are usually the more progressive teachers, who believe that the ideal teacher never stands still; that if she does not gain new knowledge from experience and from study, she soon falls back into a grade of work that is mere drudgery, and lifeless routine, beneficial neither to herself nor to her pupils.

But practical considerations of expense govern largely the choice of many girls who study with the purpose of earning their living as teachers. The apparent additional cost of a course in music in Germany, France, or Italy, must often decide the question in favor of home instruction. Yet it is possible to live abroad, in a comfortable way, at a moderate cost. The price of music lessons, and the tuition in the schools, are apt to exceed the prices for the same instruction in this country.

The student at home, if she avail herself of the best that her instructors can give, and if she is willing to go through as much of the drudgery of practice as is required by foreign teachers, would no doubt be well equipped for her profession. On the other hand, a course abroad offers advantages to the earnest student, that are not always to be secured in this country. The culture gained by travel through other countries, and by contact with unfamiliar ways and customs, would be added to the special training in music, and any teacher will find that general culture and a broad education are of great assistance when her work actually begins.

Furthermore, the atmosphere of a foreign music center is tense with musical thought and feeling. Great musicians and composers are constantly giving their best to vast audiences of enthusiastic listeners. The student is awakened and stimulated, and, though sometimes discouraged, is usually inspired to do her best. The finest concerts are given at an extremely low price of admission, particularly to the pupils of the schools, a nominal fee of ten or fifteen cents admitting the pupil to the best that are given. And the opportunity to hear men and women who are masters of music, in vocal or instrumental work, is considered an education in itself.

After graduation from college or conservatory, or after the completion of a course with private teachers, comes the vital question of securing pupils, or a position in some school. To solve this question with success, requires patience, tact, and business energy. Work that is worth while seldom comes to those who wait for it without exerting themselves.

The smaller cities or towns are considered by some to offer the most promising field to the beginner who wishes to give private lessons. A woman whose home is in one of these smaller centers, might commence work in her own circle of acquaintances. Perhaps a series of recitals would best prove to the public, as well as to her friends, that her musical ability is genuine, and her preparation thorough. In a small place, a teacher could become well known in a short time, and she would have the advantage of less competition than in a large city.

In the large cities it is difficult, in this occupation, as in many others, to gain a footing. The competition is great, but experience shows that it is not by any means impossible for the teacher who is thorough to secure pupils. There is said to be a mass of useless material afloat in the musical market. This, however, may not always be the result of lack of musical ability in the teachers themselves. Some are careless in their work, some do not have business methods, others are without the essential element of "born fitness" for teaching. These disadvantages, however, are met and overcome by many beginners. Classes are formed, pupils are secured, and, possibly, schools are ultimately established.

If a position in a school is considered more desirable, it can sometimes be secured through an educational bureau, which usually includes a branch for music teachers. By the payment of a fee, or by an agreement to pay a certain percentage of the first salary, a satisfactory opening may be found through an agency of this kind. These educational bureaus simply try to bring demand and supply in touch with each other, and if the student has good credentials from college or teachers, and is prepared to go to any part of the country where there may be an opening, an application to such a bureau may settle the question of a beginning in her profession.

After the position, or employment, is secured, the real work of the teacher begins. Difficult conditions and serious problems may be met. Pupils are often trying, and parents may be exacting. Schools may require a great amount of work in return for a small compensation. The attitude of a teacher toward the disagreeable side of her occupation determines to a great extent the wisdom of her choice of a profession. If she is wise she will avoid extremes and fault-find-

ing. She will practise the fine art of adaptation, and cultivate sympathy and patience with human nature; especially in teaching children must infinite pains be taken.

A teacher imparts much to her pupils by her example. The genuine teacher, who will put her best into her instruction, will hardly fail to secure good results, gratifying to herself and to her patrons.

There are few occupations for women in which compensation varies more than in music-teaching. At the present time, women are earning salaries in this line of work, which range from very substantial incomes to an almost starvation wage. Private lessons in both vocal and instrumental music are given at prices ranging from twenty-five cents to five dollars a lesson. There are a great many competent teachers who are making a good living by giving lessons at two or three dollars each. The schools usually pay salaries varying from a few hundred to a thousand dollars a year.

In the smaller towns, it might prove to be best for a teacher to modify her prices to meet whatever conditions exist, for money in a small place is worth more than in a large city, for the reason that living expenses are usually less.

The necessity for adaptation to different localities and situations is, perhaps, a good test of a woman's business ability.

According to the views of many successful teachers of music, business habits are of more value than is actual musical skill. And they hold this opinion in spite of the fact that they thoroughly appreciate skill and training. It may be an extreme view, but experience shows, in many cases, that the teacher who is practical succeeds, and that the more she regards her work as a business, the more rapid is her advancement.

A departure from ordinary methods sometimes produces very satisfactory results. In one instance, a woman with a thorough knowledge of the piano, who was not only a musician but a teacher, opened classes for beginners, and taught them with profit both to herself and to her pupils. She had had some experience in kindergarten work, and she brought to her aid a blackboard and sets of noiseless keyboards. She taught only beginners, and limited each class to a certain number of pupils. The names of new applicants she placed upon a waiting list until a class could be formed. This enabled her to teach the children at a very reasonable price for each one, and also made it possible to keep each class with her for two hours daily. In this way all practising was done under her eye, and the usual faults of beginners who practise by themselves could be corrected. Working together stimulated the children to do their best, and aroused their interest and kept it from flagging. In this way, too,

the musical ability of each child could be ascertained for the benefit of the parents, enabling them to decide whether further education along musical lines would be advisable. This venture, which proved satisfactory and profitable, was made almost in the shadow of a conservatory of music of excellent standing, where pupils of all grades were taught.

The experience of this teacher, however, shows that practical business ability, and original methods, may well be combined with musical skill and with the power to teach. And those who have this power and skill deserve a high rank in their profession, for the teaching of children is no simple task. It has been said that a music-teacher who can interest a child, and who can make of him a player or a singer, can command any price she chooses to ask — that a gold mine lies at her door. However this may be, it can be said without exaggeration that a genuine teacher, who has fitted herself by earnest and thorough practice for her work, and who can impart by precept, and by example, both the spirit and the letter of what she herself has learned, need have little fear that sooner or later she will succeed.

WOMEN AS INVENTORS

Women as inventors seem to be just as successful in this line as men. Men acquainted with the field say that fully seventy-five per cent. of the patents taken out by women in the last five years are yielding profitable returns. The woman who invented satchel-bottomed paper bags, for instance, had an offer of $20,000 for the patent before she left Washington. A simple glove-buttoner is bringing to the woman inventor an income of $5,000 a year. A woman clerk in a department store invented a parcel delivery system which netted substantial returns. One New England milliner, herself an inventor, enjoys the right to several patents that represent the ingenuity of the women operatives in her employ. She shares profits with the inventors, and one of the devices first put in operation in this factory brings in $20,000 a year.

It often happens that a woman employee, from familiarity with the machinery or business methods in use, thinks out some time and labor-saving scheme. She shows the model to the manager of her department. He tells the firm of its merits, and they arrange with the employee for the exclusive use of the invention. The employee goes on quietly with her work in the store or mill. The public never hears of her, but success has been a stimulus, and she keeps on the lookout for further inventive opportunity.

Much of woman's present activity in inventions is ascribed to the better educational facilities now obtainable. The college standard in high and popular courses in sloyd and manual training has taught women to use their hands as well as brains. Notwithstanding this, a large proportion of the more successful women inventors are those who have had only medium or limited educational advantages, but have been daily toilers in the various lines of industry. A Rhode Island woman invented an improved buttonhole-cutting machine that measures the distance between the buttonholes automatically, with much profit and convenience to garment-makers. A lock with three thousand combinations is a woman's invention; also a letter box for the outside of homes, that shows a signal when there is a letter inside for the postman to collect, an invention now in general use. A woman has just perfected a valuable apparatus for removing wool from skins, by electricity, showing that women are quick to adapt the modern facilities of the age to practical purpose.

The woman inventor must never lose sight of practicality if she would succeed. Other women brain-workers may at times indulge in dreaming and theorizing, but the woman inventor, however high her flights of fancy, must always come back to the practical. Many women's inventions are submitted to the patent office, accompanied by elaborate models, but so conspicuously lacking in some vital principle as to be unavailing. A good many are rejected on the score of absurdity, but, according to official testimony, the women aspirants do not differ from the men in this respect. Many women submit practical specifications and fail to score success not from lack of originality, but because the inventor was ignorant of previous patents covering the same point. No matter how brilliant an inventor's idea may seem, he is advised to search thoroughly the patent office records before making a model. Some women have taken out five or six patents for widely different purposes. A California woman whose first invention, in early youth, was a corset, has lately patented several inventions relating to reservoirs and irrigation.

The Northwest, the Middle, and the Eastern States have produced the most active women inventors. The South has yielded the fewest number, but the Southern women who have entered the field at all have been financially successful. Two important aids to agriculture were the invention of an Alabama woman. A working woman in North Carolina succeeded with a culinary invention. A Florida matron patented a useful car-heating apparatus. A Texas woman invented a novel folding tent, and another Southern woman a finger-exercising device of value to musicians. A Western widow patented a method of desulphurizing ores, another invented a composition solder of use to metal workers.

Women inventors from the big cities have almost invariably patented articles pertaining to the elegance of dress and house furnishings. Those from the country districts and villages have been active in the way of dress drafting patterns, novel devices for adjusting portières and curtains, and patents useful in the manufacture of artistic goods. Many facilities for clerical use have been patented by city women, such as safety envelops, improved typewriting appliances, copy holders, letter openers, etc. Most of these women were employed at some time as clerks in business offices and felt the lack of conveniences which they afterward supplied.

A number of women school-teachers are successful inventors, and have patented educational systems and devices, also kindergarten implements, erasers, school bags, and book rests. Women from the small towns in Wisconsin, Minnesota, Dakota, and Illinois, have been prolific

in inventing household conveniences, washing and cleaning apparatus, facilities for sanitation, garment bindings, shield fastenings, and dress improvements. New England women have brought out attachments and improvements that have to do with saddles, harnesses, and vehicles; also the needs of barn and garden. They have invented butter workers, plumbing appliances, brushes for cleaning, and fire kindling compositions, toys, games, puzzles, and amusement knick-knacks. A considerable proportion of the fakir's goods, novelties, and trick pastimes, sold on the streets, were originated by women. They promptly sell the patent right to the proprietors of news agencies, who include such small gear in their stationers' and confectioners' supplies. A fair proportion of the specialty goods inventors and makers are women. Many whose trade-marks are registered at the patent office have made fortunes, either through shrewdness in putting their wares on the market or because of the worth of the article. These inventions include patent medicines, complexion soaps and wafers, hair ointments and restorers, and an infinity of health and toilet knick-knacks found at the drug shops.

The first woman to take out a patent in America was Mrs. Mary E. Kies, who, in 1809, invented a process for weaving straw with silk or thread. During the next twenty-five years only fifteen patents were granted to women. In the next twenty-five years thirty-five patents were granted, and it was not until after the Civil War that there was any marked increase in the number of women inventors. There were one hundred and fifty-two models of women's inventions exhibited at the Atlanta exposition, and since then the patent office has had a specially classified list of women's inventions prepared for public inspection.

It has been said that a Georgia woman achieves success wherever she goes, and Miss Jennie McIntosh, daughter of Judge McIntosh, of the United States Court, in Florida, is no exception to the rule. A native of Savannah, Georgia, Miss McIntosh first went to work as amanuensis to a New York firm engaged in the business of transporting tallow. Her active brain and quick eye soon saw where an improvement could be made in the company's methods. She invented an automatic device for draining off the water which accumulated in the tallow-tank cars, and for her invention she received ten thousand dollars in cash and thirty thousand dollars in the company's stock, then worth twenty-five cents on the dollar. When the stock had run up to one hundred and fifty dollars, she disposed of her shares, and is now the possessor of a handsome fortune.

Women have invented many ingenious and valuable devices appertaining to the work of the household. One of the most successful

machines for washing clothes — of which hundreds have been patented, most of them valueless — was invented by a woman. A dish-washing machine, to lighten the drudgery of the housekeeper, is the work of a woman's brain. Strange as it may seem, this device does its work rapidly and thoroughly, with fewer casualties to the dishes than those which result from hand work. Hundreds of appliances for use in the kitchen, the laundry, and other departments of "housework," have been produced, or improved, by the inventive genius of woman. There have been hundreds of others, in the various spheres of activity in which women are employed. A person of quick perception who operates a machine, discovers its defects, and often devises an improvement which greatly increases the facility and correctness of its work. Similarly, one who, day after day, repeats a process of labor that may have been handed down through many generations, finds a way by which, with simple mechanical aid, the burden of toil is lightened. In this field much has already been accomplished by women, and much more is being done, as their faculties are sharpened and quickened by their closer contact with the actualities of life.

DENTISTRY AS A VOCATION FOR WOMEN

Any young woman possessing intelligence, good health, and a liking for the work, may become successful in the field of dentistry. The preparation for this vocation consists of a good general education supplemented by a course of study in some first-class dental school or college. Schools of dentistry are to be found in every leading city of America. The usual course is of three years' duration, and the cost of tuition, instruments, and other matters, exclusive of living expenses, will approximate $1,400 for the course. It should be remembered, however, that a considerable portion of this sum goes to pay for instruments that will furnish almost the entire outfit of an office when the student becomes a practitioner. In fact, with a student's supply of instruments on hand, the immediate cost of furnishing a dentist's office, on a modest scale, becomes insignificant.

Regarding the college course, the studies of the first two years are much like those taken up during the first years of a medical college course. Physiology, anatomy, and pathology, are entered into rather thoroughly.

After securing the desired college diploma, the next step to be considered is the establishment of a practice. The future success of the

woman dentist depends almost wholly upon the way in which she goes about this important matter. She should make it a point to utilize the good-will of her social acquaintance, especially if the cost of living for the first year or so is to her an important item. By securing patronage among her acquaintances, at the start, she can feel assured that if her work is thorough, it will not be many months until her practice is assured. One bright woman dentist who has achieved much success, acknowledges that during the first twelve months of her professional life she had but six customers. She was a stranger in the city where she had opened an office. During the second year her work proved more profitable, and within the third year she was looking forward complacently toward a yearly income of $3,000, over and above business expenses. This woman earnestly advises others of her sex to enter the field of dentistry.

It is her happy boast that she has never turned out a piece of finished work which was not thorough, and that she has never charged excessive prices; she is also proud of the fact that she possesses a goodly male patronage. In her opinion, men requiring the services of a dentist are inclined to favor the woman expert because of her superior delicacy of touch. The work on children's teeth is especially within her province.

TELEGRAPHY

TELEGRAPHY was one of the first vocations in which women entered into competition with men, and, as such, is worthy of careful consideration on the part of the young woman who contemplates a professional career. In common with other occupations requiring a course of preparation and study, it has difficulties and drawbacks which should not be lost sight of in estimating its attractions and advantages. The work is not especially arduous, except, perhaps, in the largest offices, and the salaries paid are equal to the average of those received by women in other than what may be termed the strictly educational professions.

The number of women operators has increased enormously within late years, but this has not had the effect of driving an equal number of men out of the service, as is often asserted. On the contrary, there has been a corresponding increase in the number of male operators, which has resulted from the extension of telegraphic facilities necessary to keep pace with the public demand.

Before the invention of the duplex, quadruplex, and Wheatstone systems, when there were only a few wires between even the largest cities, the number of operators was necessarily limited to the corresponding number of single wires. As each operator was compelled to handle a very large amount of business daily, and as all operators were required to be expert in their work, very few women were employed at that time. To-day, if the business on a wire becomes too heavy for one operator to handle, the circuit can be duplexed or quadruplexed, thus multiplying its capacity, and bringing into service four, or eight; operators, instead of two. When the work is distributed in this way, the public is more promptly served than would be possible by even the most expert transmission on a single wire, while at the same time the operators are not required to exhibit phenomenal speed.

For the transmission of commercial messages, or long dispatches over a "through circuit," the operator must be able to endure a protracted physical and mental strain. The sending of dispatches over a line several thousands, or even hundreds, of miles in length requires the expenditure of a considerable amount of muscular energy. This does not mean mere physical strength, but rather sufficient endurance to enable him to withstand a tension of far more than ordinary severity.

Women are not physically qualified for this class of telegraphic work, which, by the way, commands the highest remuneration. In order to cause the Morse characters to pass intelligently over a very long wire, it is necessary for the operator to hold the key in an exceedingly firm grasp. Every dot, and every dash, must be formed with equal firmness, not merely for a minute, or for an hour, but on circuits for eight or nine hours at a stretch. It has frequently happened that all the wires between New York and Chicago were prostrated by a storm. In order to reëstablish communication under such circumstances, it has occasionally been necessary to connect a wire running from New York to Washington with one extending from the latter point to Atlanta, thence to New Orleans, from that city to St. Louis, and so on to Chicago. Such a circuit approximates 3,000 miles in length, and only an operator of exceptional powers of endurance has ever been able to send messages so great a distance in a satisfactory manner. As may be imagined, the sustained tension involves a severe nervous strain, to which some of the most expert short-line operators have been unequal.

If it is not convenient for a young woman to take a course in some institution where telegraphy is taught, she should enlist the services of the operator at her home office, as an instructor. After she has become familiar with the Morse alphabet, the manner of making, with the key, the dots and dashes representing the various characters, she must learn how to distinguish the same characters when she hears the sounder ticking them from a key operated by some one else. It is much more difficult for a beginner to learn to receive than to send, and nothing but practice will bring proficiency in either.

While it is not necessary for a telegrapher to be an electrician, she should study those fundamental principles that are applied to telegraphy. She should learn why the closing and opening of the key, by which the sounds are produced, charges the wire with electricity, and discharges the current from it, with each alternate movement. She should become familiar with the reason why the wet limb of a tree coming in contact with a wire will cause the current to escape from the wire to the tree, and thence to the ground, or why, when one wire crosses, or comes in contact with, another, the utility of both is destroyed until the contact is removed. Then, too, she should know the constituent elements of a chemical battery, especially if she expects to find employment in a country office.

The question of practice is the most difficult one to be met by the beginner who studies at home. There are automatic instruments and others, for beginners, but in the absence of some one with whom to

practise, they are generally of little utility. The better way is to obtain the permission of some local manager, to enter his office as a student, agreeing to perform some minor service, such as making out the daily and monthly reports, in consideration of the opportunity for practice. In this way the beginner will gain actual experience while acquiring proficiency.

In former years, the students sent out as graduates from telegraphic institutions were not held in high favor by managers, but their services are more in demand since it has been found that only experience in actual work is required, to make them the equals of the self-educated operator.

While the young woman is acquiring proficiency as a telegrapher, she should keep pace with her progress in that direction by practising on the typewriter, the use of that instrument having become an essential feature of the work. The managers of large offices will not employ an operator who cannot transcribe the messages as they come over the wire. It is much easier to learn to transcribe messages on the typewriter at the same time that ability to read the characters is being acquired, than it is afterward. In the latter case, the movement of the fingers over the keyboard takes the attention from the sounder, while, if learned together, the copying and the receiving of the message seem to occur as the result of the same brain impulse.

If a young woman seeks employment as a telegrapher merely incidental to the carrying out of some project, or as preliminary to the pursuit of a more lucrative vocation, it will be hardly necessary for her to gain a technical knowledge of the various branches. If, however, she expects to continue the work, and wishes to become as expert as possible, she should perfect herself in the use of the "code," a kind of shorthand method by which dispatches are now sent and received. The code is a system of scientific abbreviations of words, and combinations of letters, and by its use, expert operators have been able to attain a speed of eighty, or even one hundred, words a minute. The student, however, who can work at a speed of twenty to thirty words a minute will soon be able to find employment. The latter speed, indeed, if maintained for any length of time, would entitle her to consideration as giving promise of becoming an expert operator.

There is a fascination about the sending, and the receiving, of messages that is felt by all telegraphers, and especially by women. Even to those who have been in the service many years, there is more or less of the mystic in being able to hold converse with others who may be hundreds of miles away. Every operator gives some

distinguishing characteristics to his method of transmission, and, with her keen perception, a woman soon learns to recognize the touch of each of her fellow workers. This is done involuntarily, and is as natural as noting the difference in the sound of the voice, or in the style of the chirography, of various persons. Managers explain the lower wages paid to telegraphers at the present time by stating that the supply of labor exceeds the demand; in other words, that there are more operators than there are wires. This excess involves perpetual competition for employment which, while it may raise the standard of efficiency, has a tendency to lower the scale of wages.

Male operators are, as a rule, better paid than women, even in cases where the latter are equally efficient, and perform as much service. This is generally due to the fact that the men have families to support, while the younger women, at least, have the protection of homes, and are often willing to work more cheaply on that account. In country offices, or in small towns, the salary of a woman operator ranges from thirty to forty-five dollars a month. The average in the main office in a large city is much higher; a few receive only about forty dollars a month, but there are some whose pay is as much as eighty dollars. The latter, however, are chiefs or assistants. The average salary may be said to be about fifty dollars a month.

A few exceptionally expert women operators have found employment in brokers' offices, where the hours are short and the wages far above the average, and where the chief essentials are accuracy and speed. Most of the messages coming over the wire are in cipher or figure, and a single error might mean the loss of many thousands of dollars. As a rule these positions are filled by men, but the number of women occupying them is gradually increasing. The average pay for both men and women in this work is about twenty-five dollars a week.

THE WRITING OF ADVERTISEMENTS

One of the newest fields open to women, and one in which they should find few obstacles to success, is the writing of advertisements, or "Ad. Writing" as it is briefly termed. As yet, however, few women have entered this domain of wage-earning, for the reason that they have had little opportunity to acquire knowledge concerning it, but, as most of the business colleges and correspondence schools have added the subject to their list of studies, it is not unlikely that women will ultimately earn good incomes, by assisting business men to call public attention in the most effective manner to their bargains.

The writing of advertisements became a separate and distinct vocation some twenty odd years ago, when one of the leading merchants of this country started a column of chatty discussions of the bargains he had to offer, in each of the daily newspapers in his city. For this work he employed one of the brightest editors of a leading journal. The text of the article was printed in large, clear type, and invariably began with the weather prediction for the day.

If rain prevailed, or was threatened, there would always be something in the first part of the article about the bargains in umbrellas, mackintoshes, rubber boots and shoes, and other seasonable materials. On bright days, the principal part of the discussion would be of such goods as were suited to the conditions. So attractively were the articles written, that many persons who had no intention of making purchases read them simply because they were interesting. It was not long before this pioneer in the field of advertisement writing was receiving a salary of ten thousand dollars a year.

Soon after this innovation was introduced, other merchants found it necessary to do something of a similar character, not only in order to increase their trade, but to hold that already gained. Then the originator of the idea increased his space to two columns, one of which was devoted to schedules of prices. An enterprising soap manufacturer made the next advance, by engaging an entire page of advertising space in each of the papers of his city, and filling the pages with cleverly written paragraphs describing the merits of his product.

All this proved so profitable to the advertisers, that men in all branches of business seemed to vie with each other in the extent and attractiveness of their advertisements. At the present time, full-page

advertisements are common. As the business men could not devote their own time to preparing these elaborate productions, and as their employees had no special training in that line, it became necessary to engage the services of persons of peculiar qualifications for the work. It has thus come to pass that a new school of writers has been developed within a comparatively recent period.

Success, however, with either men or women, whatever their preparation or experience may have been, depends in this, as in other vocations, on their being able to comprehend, and to meet, the requirements of the business.

To the end that women who may aspire to enter this field may understand some of its features, a description of the manner in which the advertising is managed in a great department store will be of value. The work is carried on by a regularly organized bureau, of which the chief advertisement writer is the head. Every day, each of the heads of the departments furnishes to the advertising bureau a list of bargains for the day following. These are classified by the chief writer, who decides in which of the newspapers the respective bargains shall be advertised. Articles that would be purchased only by people of wealth are not advertised, of course, in papers whose circulation is chiefly among those of humble circumstances, and the reverse of this observation is equally true. The preparation of so many different advertisements, therefore, requires a corps of assistants, whose work is under the direct supervision of the chief advertisement writer.

The chief, having a thorough understanding of the nature of the bargains offered, and knowing exactly those which the firm wishes to make most prominent, is able to instruct his assistants as to the article which should be "featured"; in other words, put in the largest type, and in the most striking positions. The chief himself, as a rule, writes the "reading matter" announcements which are at the head of each advertisement.

To enable the writer to "display" the various bargains with an appropriate kind of type, each newspaper furnishes him with a type schedule. The men in a composing-room know the different fonts of type by their technical names, and there are many hundreds of varieties. It is unnecessary for the writer of advertisements to commit these names to memory, since for his convenience the fonts are numbered. But some general knowledge of the different types is necessary.

The foregoing has reference only to the construction of advertisements for merchants and manufacturers. There is another class of advertisement writing that is much easier, but which requires some

special talent — that is, the "reading notices," such as are used by many of the patent medicine firms. Everybody is familiar with that form of article which begins with the narrative of some thrilling adventure, and ends with a recommendation of somebody's sure cure for rheumatism, or other ailment. This is what is termed a "reading notice."

Then there are the short, pithy paragraphs which, while apparently perpetrating a jest, or expressing an epigram, in reality commend some universal remedy for the ills to which human flesh is heir.

One of the most profitable forms of advertisement writing is that which is expressed in poetry, or rather in rhyme. A stanza of four lines having a certain jingle to it, is sometimes worth more to the writer than a column of reading matter would be. There are a number of firms who use this form very largely, and who offer liberal terms for acceptable productions.

Should a young woman desire to enter this field of advertisement writing, her best plan would be either to secure employment in some advertisement writer's bureau, or to take a course of instruction in a school of journalism. If neither of these resources is available, she might find it profitable to study the advertisements in the daily papers, with the assistance of a type schedule obtained from some printer, and then to try to construct a better advertisement than the one she sees.

There is one thing that aspirants for employment as writers of advertisements must observe first of all, and that is that while condensation is required in every branch of commercial writing, it is one of the most important of all considerations in the construction of advertisements. Advertising space in magazines and papers is paid for by the line, and it is evident, therefore, that as much as possible must be condensed into a given space, in order that the advertiser may realize the greatest benefit from his outlay.

WOMEN AND ADVERTISING

A CALLING WHICH AFFORDS OPPORTUNITY FOR TACT AND ARTISTIC TASTE, AND GIVES GOOD RESULTS

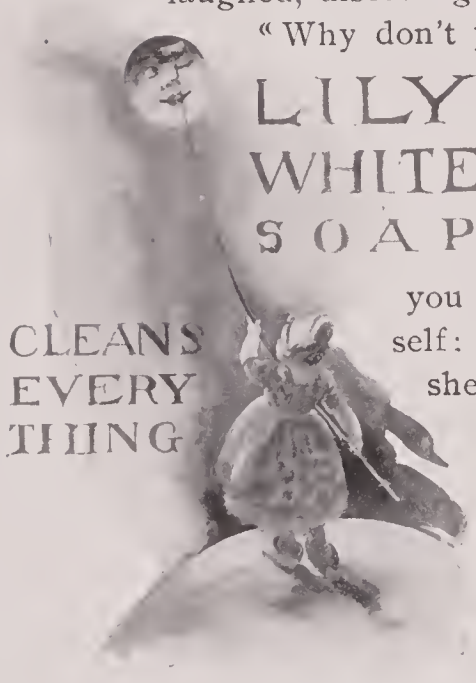
By H. C. CANDEE

Two women met on a crowded street corner.

"What are you doing now?" asked the prosperous one.

"Looking for a job," replied the other; and, although she laughed, discouragement was loading her heart.

"Why don't you try advertising? That's what I'm doing."



"I will if you will tell me how."

"Go directly to a magazine and beard the lion in his den. Tell the business manager you wish to solicit advertisements for his magazine, and do your best to impress him with your ability. If you persuade him against his will, he will say to himself: 'That is a bright woman; if she can persuade me, she can persuade others.'"

The woman looking for a "job" did as her friend suggested, and applied to the manager of a certain monthly magazine. She was given the names of two firms to visit, and, equipped with statistics as to the circulation of the magazine and its rates, she started on her errand. She returned with an order from both firms, which so pleased her employer that she was put on a salary of twelve dollars a week.

After a time, her employer remunerated her on a percentage instead of a fixed salary. This, of course, made her ambitious to earn as much as possible, and, by concentrating all her powers of argument and persuasion, she succeeded in earning $115 the first month. Sometimes, men were crusty and repellent, sometimes oversuave, and in various ways they tried to make bargains too favorable to themselves; but the agent soon learned how to stand her ground against the determination of some, and the shrewdness of others, preserving all the while a keen good nature, which was her best defense. She ultimately associated herself with a magazine which makes a specialty of advertisements, and is now earning $5,000 a year, more or less, according to the fluctuations of trade.

An Attractive Field for Women.— This is not a fictitious case, but is an exposition of what has actually been accomplished, and of what is open to women of reasonable intelligence and good manners. Advertising, as a field of occupation for women, offers many opportunities, but is not a business that may be entered by a woman of slow wit or indolent habit, for it throws her into contact with shrewd men of business who are intolerant of inferior capability. The business, in its several branches, is successfully carried on by girls and older women, and is one of the few in which there is opportunity for advancement, with satisfactory compensation. Most occupations for women without investment of capital, limit the salary to a few hundred dollars a year, but a clever advertising agent can make as much as five or six thousand.

The easiest way to begin is to attempt soliciting, on a percentage, for magazines, which pay from ten to fifty per cent., on advertisements secured. The most successful solicitors are those who are fertile in ideas, and can tempt patrons with novel suggestions as to the manner of wording or illustrating their advertisements. The work of the solicitor is interesting and active, and develops considerable assurance, but good health is a requisite, for the work, although not hard, is constant, and requires perpetual running about from one business house to another. Should she be amenable to flattery, there is danger from that source, which she must realize and avoid with stoicism.

No untrained woman would be able to step at once into a position of advertising agent for a large concern, but she must approach it by gradual preparation, first soliciting advertisements for periodicals and assisting in their composition. This will give her not only experience, but also a valuable acquaintance which, if she prove her ability, will lead to the desired advancement.

PHOTOGRAPHY

A WOMAN who has had even a partial training in the principles of art — drawing, composition, and color — possesses, already, the basis of success in photography. Formerly the chemistry of photography was a bugbear, involving unpleasant labor, and untidy hands. All that has been changed. The chemistry of modern photography is simple, clean, and fascinating.

The young woman who desires to study photography, with a view to future professional work, would do well to offer her services to a local photographer, agreeing with him to assume the drudgery of the studio in return for practical instruction. She will have little difficulty in making such an agreement. In a day she can learn to make, paste, trim, mount, and spot, prints; she can also be of service in the reception-room. By observation and practice she should be able to understand within a few days the developing of the negative, and the making of prints. Retouching will also be a part of her education that is easily learned.

It is in the operating-room that a woman has the fullest opportunity for displaying her qualifications for photographic work. Posing and lighting the subject call for a discriminating taste, and she must be quick to note facial defects, and to minimize them. She should possess also inexhaustible patience, and an affable, not a gushing, manner.

Assuming that she knows how to make a photograph that will please the patrons of the studio, the woman is ready to turn her knowledge and skill to the best account. She may be unable to open a studio of her own, and must, therefore, secure employment in a studio already established. Her compensation will vary from seven to twenty dollars a week, according to her value to the business.

If she is a good operator, she could command, in a large town, at least fifteen dollars a week. The operation of developing, retouching, printing, etc., is chiefly mechanical, but in the operating-room, a woman has an opportunity to become a specialist. Many large studios have woman operators who attend exclusively to the posing of women and children. A woman operator is generally more successful with small children than a man can hope to be.

It is easy to see, therefore, that a woman operator who has tact, address, and technical skill, may expect to be unusually successful with the camera. Photographers have found this to be the case, and

are employing women operators whenever they find them equal to the requirements of the place.

If a woman knows how to make photographs, and has any capital, she should consider the matter of opening a studio of her own. The investment need not be large. The lens and the camera are the most expensive items of her outfit. A reception-room, arranged with a woman's good taste, should be as attractive as she can afford to make it—pictures on the walls, some easy-chairs, a table, and a rug on the floor. A dressing-room, with a long mirror, and toilet accessories, is a necessary adjunct. Three hundred dollars will buy all that is absolutely necessary at the outset. If she has confidence in her skill, and in her business ability, the young woman starting out in business can easily borrow this sum. Satisfactory references as to her character, and her standing in the community, will induce a stock-house to furnish the photographic equipment, a chattel mortgage note being taken in payment.

No one should advise a woman to open a studio unless she is able to do the work of the operating-room herself. A woman who can put individuality into her work, so that her unsigned picture will be recognized as the product of her own studio and that of no other, can build up a successful business with a high class of patronage. She should not make the mistake of doing cheap work. It never pays. Fine cabinet photographs ought never to be made for less than five dollars a dozen—six or seven dollars is better. For a large head, on a plate 8 x 10 or 10 x 12 inches in size, the price should be from one to four dollars for each print; and for an original sitting, no order should be accepted that will return less than five dollars. Of course, the quality of the pictures delivered must justify these prices. Experience has shown that people will pay proportionately more for good work than they will for a cheaper article. Then there is a certain class of patrons who are suspicious of the quality of an article unless the price is high. Make fewer pictures, and get more money for them, is a safe motto with which to start; in the end you will have more business than you could attract by "bargain prices."

Several women in America have built up a successful business, and achieved no little fame, as photographers. Among them are Mrs. Gertrude Kasebier, of New York; Miss Mathilde Weil, of Philadelphia, and Miss Frances Benjamin Johnston, of Washington. About ten years ago Miss Johnston was engaged in "killing time." She had studied art a little; then some one gave her an amateur camera. She became interested in photography, and set out to master the art. She has a charming studio in the grounds of her home, far from the business part of the city, and here presidents, cabinet officers, diplo-

mats, poets, painters, and musicians, go to be photographed. Miss Johnston makes good pictures, and receives large prices for them. What she has done, other women can do as well. Patience, persistence, and judicious personal advertising, were factors in Miss Johnston's success.

A woman who engages in photography for a livelihood, should not confine herself to work under the skylight. There is a large field for expert photographers in making pictures of people in their homes. Such portraits are usually better likenesses than those made in the studio, for the subject is at ease amid familiar surroundings. Children are more easily photographed at home.

It pays the photographer to make a series of well-selected views of beautiful, familiar, or historic spots about the town. Daintily printed and mounted, these are readily salable at holiday seasons, and to some extent, throughout the year.

In the line of photographic work there are many other avenues of revenue. The main thing is to give your pictures an individuality, and a tone that will advertise the maker as an artist. A business of this sort, in the hands of a capable woman, should yield a net income, yearly, of from one thousand to five thousand dollars, according to the population which may be expected to furnish patrons.

PROOF-READING

EXCEPT in the smaller printing establishments where the service of but one person is needed, the ability of a woman proof-reader is rated on the same basis as that of a man. The preference for a man in the smaller places is attributable only to his willingness to lend a hand, when necessary, in the other work of the office. In general, however, the woman proof-readers earn, and receive, the same remuneration as do men of equal ability.

The salary paid to women proof-readers throughout the United States is usually from 25 to 40 per cent. higher than that received by their sisters in the composing-room.

The price for service demanded, and received, by all women proof-readers who are members of typographical unions, is 58 cents an hour. Men readers receive the same pay. Regular work at that price would mean $24.00 per week, and while there are doubtless many women proof-readers who earn and receive this amount, it would be an exaggeration to quote it as an average. Probably $14.00 would be nearer to the average weekly wage.

There are two sensible and practical ways of learning to read proof. One way is to acquire the rudiments of the work by serving an apprenticeship as a compositor, or typesetter, and the other way is to act for a few months as a "copyholder."

The former plan is considered by many successful women readers as much the better. The great majority of them began in that way, and the practical knowledge of printing thus gained has proved of great advantage to them in their work of proof-reading. One of the brightest of women readers admitted recently that she had learned printing as a typesetter in a small office in Missouri, where after four years of service as a compositor, she was placed in charge of the proof-reading department. Here she found that her knowledge of type and of typesetting had given her a wider knowledge of her work than that possessed by the readers under her.

The reader, or corrector, of printer's proof, is a necessity in all publishing establishments; this is owing to the fact that typesetting, whether done mechanically or by the old-fashioned method, is not infallible. Neither is the writer of the article. In other words, about

every article put into type for newspaper, book, or pamphlet, purposes, or even for small job work, requires revision. It is never accurate as it first comes from the hands of the printers.

From the publisher's standpoint, it is a disgrace to send out a newspaper bearing evidence of careless typesetting, that is with inverted letters, wrong type, or some other typographical error. It is much worse, however, for a publishing house to place upon the market an article of more lasting literature,—a book, for instance,—which is marred by such errors.

Many women proof-readers have had experience in both newspaper and book work, as well as in legal printing. A good education is a requisite to success in every branch of proof-reading. The woman with the best education, and the largest fund of general information, will secure the best-paying positions.

The beginner who starts out as a "copyholder," sometimes receives a small salary; sometimes no remuneration is given for six months.

TYPESETTING

To the girl or woman who possesses a thorough grammar school education, who is quick of thought, and nimble of finger, there is yet a fair field in the work of setting type by hand.

So far as the work of printing the great daily papers of the country is concerned, typesetting by hand is practically a matter of the past. The linotype, a machine operated by one person, can *make type* from hot metal and "set it up" ready for the stereotype, as fast as four persons can set type by hand. Of course, there are yet many typesetters, or compositors as they are termed, employed on the greater daily papers, but their number is decreasing, and their work is mainly confined to the setting of advertisements.

However, with so many thousands of newspapers,—daily and weekly,—published throughout the country, many of which cannot afford to own the linotype, there must, necessarily, be a great demand for experts in hand composition.

To one who has spent several years in newspaper, and other, publishing plants, it seems that there is as much opportunity for a woman in the field of "hand printing" as there is in the line of stenography. An ordinarily bright girl should learn in six months

to set type fast enough to earn from $4 to $6 per week, and at the end of another year, to make her services worth from $8 to $12 a week.

A girl or woman desirous of learning typesetting will have no difficulty in finding an opening. In almost every town and city in the country there are publishing establishments of some kind. An application for an opportunity to learn, made to the publisher or foreman of a printing house, will probably bring the desired result.

No young woman, however, will really enjoy her experience as an apprentice. Nevertheless she could not acquire in any other way so much useful rudimentary knowledge in connection with her chosen work.

In the offices of many of the smaller daily papers throughout the United States, young women compositors have acquired a knowledge of newspaper work which has proved of much service to them. Some have become reporters, and in a number of instances, have risen to editorial positions. In one city of 100,000 population, the city editors of two papers, one a leading morning journal, the other an afternoon paper, are young women who have graduated from the typesetting case. If the novice in the work of typesetting can choose the establishment in which to begin her labors, it is advisable for her to select a newspaper office.

On entering a composing-room for the first day's work, she will probably be introduced to an experienced compositor of her own sex, and a case will be given to her from which to learn. Her instructor will then explain to her the difference in the appearance of a few kinds of type in use in the office. Later on, she learns how to "distribute" the type, that she has set up so laboriously, piece by piece, in the "stick" which she has held in her left hand.

In the thousands of job printing offices, there are almost always positions open for good compositors, male or female. These places are not always permanent, but they are more likely, for several reasons, to offer permanent work to the woman printer than to the man.

PIANO-TUNING

PIANO-TUNING is one of the most remunerative occupations for women. At the present time, it is also one of the least crowded, for it was only a comparatively few years ago that women first took up this line of work with the practical purpose of making it a means of self-support. At least, this is true in our own country. Abroad, especially in England, a large number of women are employed as piano tuners, and the work is regarded there as coming quite as much within the capacity of women as of men.

A piano player is inclined to regard the tuning of the instrument as a merely mechanical art, requiring very little musical skill on the part of the tuner. It is true that the training necessary to make a good performer is not at all necessary for one who wishes to become a tuner, yet the one who tunes the piano must have quite as accurate an ear for harmony, and as true a perception of concord as has the player himself. Without a good ear, it would be useless to attempt the work.

Piano-tuning may be learned at school, of a private instructor, or from books. Only a few American music schools, however, have opened classes in tuning, but to these classes women are admitted on the same footing as are men, and receive the same instruction. Much of the work done in the school is the tuning of the piano in actual use by the students, and in this way the most valuable practice is assured. It is said that in some manufactories, a tuner from a good school is preferred to one trained at the works, for the reason that the practice on old pianos is considered better training than that gained in tuning new instruments.

While a course at a school is an advantage both in learning, and in securing work afterward, it is not always attainable, owing to the distance of such a school from one's home, and possibly because of the larger expense involved. The next best method would be to take private lessons with a practical tuner. In this way, a woman can gain a good working knowledge of tuning, and, with close application, can fit herself in a short time to undertake work on her own account. To attempt to learn the art from the printed manuals pretending to teach

it, would be the most difficult method of all, and of little practical value.

The objection of lack of physical strength has been urged against women in this line of work. Good health is, of course, as much to be desired in this as in other occupations, but no more muscular or nervous strength is needed for piano-tuning than for typewriting, dressmaking, or school-teaching. Women are also said to lack the mechanical ingenuity necessary for such work, but for many years they have proved themselves skilful workers with machinery in factories and in shops, where fully as much ingenuity is required. This opposition is no more than that met by women in entering any new occupation.

After preparation, a good piano-tuner is reasonably sure of constant employment. When the steady increase in the sale of musical instruments is considered, it is clear that the demand for this class of work will be virtually unlimited. A position with a piano house would be a most favorable opening, as it would insure a regular salary. If such a place could not be secured, a woman could build up a business for herself. Judicious advertising would bring good results. Business cards left with friends, and at the music stores where she is known, would help a woman to make a beginning. Prompt attention to orders, courtesy, and careful work, would secure permanent customers who would pay well for good service.

Perhaps the best outlook at the present time is in the small towns throughout the country, or even in country homes, where it is difficult to obtain the services of a good tuner at any price. A woman willing to travel through these smaller places, visiting each at certain times, would, without doubt, find more work at good prices than she could possibly attend to, and her income would be limited only by her ability to accomplish all of the work secured.

LIBRARIANS

Among the vocations which are open to women is that of employment in public libraries, as librarian, or assistant thereto. The value of good literature is more and more recognized, and freedom of access to it by the multitude who cannot, or do not, buy books, is a potent factor in the betterment of mankind. Already a free public library is deemed one of the essentials in every town. Public sentiment demands libraries, and gives abundant evidence of its willingness to sustain them. We are justified in the presumption that there will be a constantly increasing need of persons who are skilled in their management.

In the light of experience, it may fairly be said that a woman, when suitably equipped by taste, education, and training, is in the largest measure adapted to manage a library, and to serve its patrons satisfactorily. A "bookish" atmosphere is congenial to her. Its refining influence is felt by all who are brought within it. A love of order is inherent in woman, to a greater degree than in man, and in the library she finds abundant opportunity for its exercise. It is not easy to imagine a place where disorder and lack of system are more fatal to success.

Not all women would make good librarians; no more would all men. This, like many other vocations, requires a certain fitness by nature and training. There are few, however, who may not prepare themselves for a proper discharge of its duties. A woman possessed of average intelligence, and tact, with the natural graces of heart, mind, and manner, that are characteristic of the sex, needs but to add thereto a fair knowledge of books and authors, and of the technical duties of the position. It is by no means necessary that she should know it all at the start, but she must possess some information along the indicated line. With her daily work, this knowledge will increase with surprising rapidity. Upon her ability to answer the many questions that will be asked, to connect books with their authors, and authors with their books, and to generally familiarize herself with her work, will largely depend her success.

In the libraries of the country, taken as a whole, many more women than men are employed. It has been found that, other things being equal, they are better suited to such positions. It is no doubt

true that men will continue to be at the head of the great libraries, but for the subordinate stations, and to manage the smaller libraries, the call is for women. In the lesser cities, and the towns, by far the greater number of libraries are managed, and most successfully, entirely by women. They also have charge of many of the libraries at our institutions of learning.

In most places, libraries are established, and conducted, upon a scale corresponding to the size and resources of the cities or towns in which they are situated. Often they are begun in a small way, and grow, as means for their support are provided. In such cases, one librarian is sufficient; and for this grade of libraries, women are employed almost exclusively. With the growth of a library, and its patronage, there is a proportionate increase of labor, and compensation. One trained person can do the work for a library of from 5,000 to 8,000 volumes, but when the numbers are increased to 10,000, more assistance is needed, at least during the hours when the demand for books is greatest.

Well established libraries are usually open to the public from eight to ten hours during each week-day; the smaller ones, from four to six hours. For those having a steady patronage, the time is divided between forenoon, afternoon, and evening,—two or three hours each. The custom of opening the library in the evening is almost universal. It is an obvious necessity, for the accommodation of the large number of people in every town who are employed during the day, and who would, otherwise, be deprived of its use. Evening service of this kind must interfere, to a large extent, with the social pleasures and duties of the librarian—a point that should be duly considered by the young woman contemplating such work.

There is a growing demand that libraries should be open to their patrons during certain hours on Sunday. There is much discussion of the matter in the press, in the pulpit, on the platform, and in municipal legislative bodies. A few libraries have already yielded to the public desire, and the experiment is watched with interest. Both sides of the question present a field for argument, but there are strong indications that the "ayes" will increase, until the opening of libraries on Sunday will be a common and popular custom.

In every well-appointed library there is a reading-room for the convenience of patrons, and especially for those who wish to consult books of reference. Such volumes are not for circulation, and may not be taken from the building. Cyclopedias, lexicons, biographical and other dictionaries, books of quotations, atlases, and other volumes of similar character, are invaluable to those in quest of specific information. A good collection of reference works is an important feature

of a library. For use in the reading-room, there are also such magazines and other periodical literature as may be provided. The librarian should exercise a careful supervision of the reading-room, and enforce a strict observance of all rules regarding order. Thoughtless young persons are too apt to make it a place for visiting, and social gossip; and if unchecked, they seriously disturb and annoy others who are there for reading or study. In all of these matters, the librarian must, of course, set the example. The proprieties indispensable to such a place must not be overlooked or forgotten. The first duty of a librarian is to keep everything in the best possible order. This cannot be too strongly impressed. Every book has its place, designated upon its label, and must be kept there. A volume out of its place is lost. All books returned by patrons should, at the earliest moment, be put where they belong. If this rule is strictly observed, a book that is called for may be quickly found, unless it has been drawn, and not returned. Scarcely less in importance, the librarian must keep, in books provided for the purpose, a careful and correct record of the drawing and the returning of all books. A rule requiring that a book shall not be kept beyond a certain time, usually two weeks, must be carefully observed, to prevent loss. Many persons who draw books are careless of their return, and it is the custom to impose a small fine, or penalty, for the retention of books beyond the limit. It is customary to notify the laggards, by mail, or otherwise, and to do this is part of the work of the librarian. With a good system, all this is easy; without system, it is impossible.

How shall a woman prepare herself to fill acceptably the position of librarian? A young woman who reads, and who keeps fairly abreast of current literature, upon reaching maturity is already well started. If she has the vocation of librarian in view, she will take special pains to become informed, and to remember what she reads, and learns. She will find a trained memory an invaluable assistant. If she is favored by daily association with persons of literary culture, this will be to her advantage. She may thus acquire much by simple absorption, and really without effort. But when she has gained a knowledge of books, and of those who make them, she still needs to know something of the practical management of a growing library.

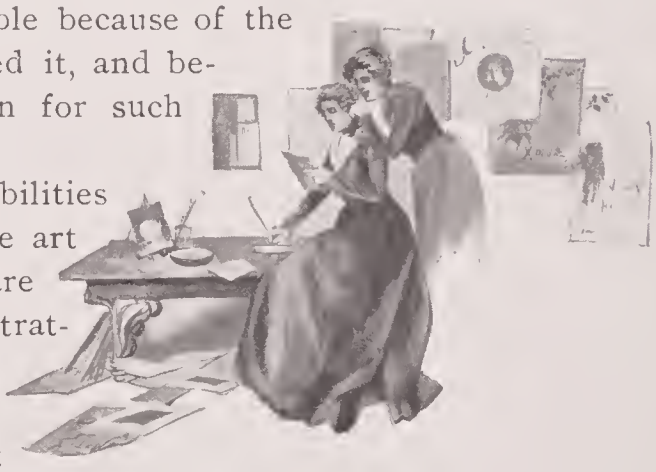
In most of the business and technical schools, library work is recognized as a distinct vocation, for which preparation is necessary, and a course of special instruction, with reference thereto, is given. The principal features of this are: the proper classification of books under a score or more of different heads; the most approved system of cataloguing, with periodical additions by the purchase of new publications; a system of recording books drawn, and returned. All

these points are practical, and essential. Some learn more quickly and more thoroughly than others, but there are few who cannot master the art sufficiently to achieve success.

The compensation paid to women employed in libraries is generally in fair proportion to the service required. In many cases, where there is a peculiar aptitude for the work, with the added acquirements, the salaries are generous. The range is wide, between $30 and $125 per month. In a few cases, the latter figure is exceeded. Of course, very much larger sums, reaching $3,000 and even $5,000 per year, are paid to the men who are the executive heads of the great libraries of the country. These positions can be attained only through many years of service and study, and, as already said, are likely to be filled by men. But there is an ever-growing demand for women to conduct the smaller libraries, and to fill secondary positions in the larger ones. Salaries of from $40 to $75 per month are frequent, and constantly becoming more numerous.

ILLUSTRATING

PUBLISHERS often comment upon the fact that comparatively few women have taken up as an occupation the work of illustrating books, magazines, and periodicals. The scarcity of women in this field is regarded as the more remarkable because of the success achieved by those who have entered it, and because of the liberality of the remuneration for such work.



There can be no question as to the capabilities of women for this vocation. Every year the art schools send out scores of students who are thoroughly competent to do superior illustrating work, and there are scores of others who have acquired proficiency under private instructors; yet the fact remains that what would seem to be one of the most congenial and most profitable of all the occupations for which women are best fitted by nature, is to a very large extent neglected by them.

It was a publisher who said, in discussing the subject, that women artists are inclined to permit their ambition to get the better of their judgment; that as soon as they leave the art school, or studio, they conceive the idea of doing something, at once, to astound the world.

In such reverence do they hold the divinity of their art, that they regard as sacrilege the mere suggestion that their heaven-sent gifts might be turned in the direction of keeping the wolf from the door. They wish to paint a great picture; yes, and sell it for a great price; but the money received in that way would be accepted as a tribute to art, a mere token of appreciation, and not by any means as compensation. All of this, however, may as truthfully be said of the young artist; and the attitude is far from being an unworthy one.

Some of the great publishing houses employ a corps of illustrators, but, as a rule, most of the illustrating work is done "on the outside," as it is called in publishers' parlance. Magazines, and other illustrated periodicals, offer the best field for the illustrator, and but few of these publications retain a special staff of artists. The work is given to the artist best qualified for its interpretation. Many publications solicit original work from artists, and for such work pay good prices. In sending a drawing to a magazine, or paper, care should be taken to ascertain, as far as possible, the nature of the work usually to be found in the publication in question. Do not send humorous drawings to a paper that publishes only serious matter; or an illustrated poem, or decorative page, to the magazine that never uses such matter. This may seem like superfluous advice, but every editor of an illustrated periodical will confirm the assertion that a large proportion of the matter sent to him is at total variance with the nature of his publication. Half an hour spent, now and then, in looking over the current magazines, in the nearest stationer's shop, will be of great value to the aspiring illustrator — giving her not only an idea of what other artists are doing, but enabling her to choose, more wisely, a market for her own work.

The time will come, no doubt, when women artists will distinguish themselves in the illustrating field, as they have in directions of less promise. At all events, the opportunities are many, and the rewards of success far beyond those of the average vocation for women. But success can come only through thorough training in drawing.

DESIGNING BOOK COVERS

THE designing of book covers has come to be recognized as a distinct branch of art. Publishers and booksellers, always having in view the practical side of their business, are fully cognizant of the value of the outward appearance of their volumes. It is a well-known fact that while many persons buy a book only for the sake of its contents, caring nothing about the cover, thousands of others will be attracted by a tastefully decorated binding. This applies especially to holiday books, of which a very large majority are purchased by women.

In former years, the designing of book covers was a branch of art wholly monopolized by men, and, as a matter of fact, the number of men still engaged in it, largely exceeds that of the women who have taken up the work. Although there are a few woman artists in the large cities who devote their talents exclusively to the designing of book covers, the number is not sufficiently large to justify the classification of this work as a distinct vocation. This is true, notwithstanding the fact that some of the largest publishing houses give permanent employment to one or more cover designers. Most of the establishments, however, keep a list of artists, and when a design is required, the work is assigned to that one who is believed to be best qualified to fill the order. Because of this arrangement, it frequently happens that some one artist will receive the orders of several houses, and the work is thus unevenly distributed.

There is no regular scale of remuneration for cover designing, its establishment being rendered impracticable by the number of considerations that affect the price paid for each piece of work. The character of the design, the extent to which it is elaborated, the merit of the completed product, and the standard of requirement fixed by each individual publisher, must vary greatly in different cases, and allowance could not be made for these variations on a set wage scale. While there are artists of both sexes regularly employed as cover designers, who earn from two thousand to five thousand dollars a year, there are many others who take up the work only as an incidental means of adding to their income, and who, of course, are paid for each design, according to the valuation placed upon it by the publisher.

Any woman possessed of artistic taste, and creative talent, together with a thorough technical training in drawing and color work, may find an opportunity to enter the field of cover designing. Having acquired in an art school the necessary technical knowledge, and being possessed of what she considers the required amount of skill, the aspirant should apply to a publisher for work. In seeking her first employment, she will usually be requested to submit a few specimens of her handiwork. If she should be so fortunate as to make a favorable impression with these, she will probably soon have an order assigned to her, and, having once made a beginning, her future success will depend largely on herself.

The designing of covers for magazines, and periodicals, is another branch of the work furnishing employment to many artists. Any one having a liking for cover designing, and acquiring skill in it, should not hesitate to submit designs to the various publishers. Originality of conception, and exceptional perfection of execution, will be recognized, and work of this character is always in demand.

DESIGNERS OF WALL-PAPERS, TEXTILE FABRICS, AND SILVERWARE

A TALENT for designing, when trained for practical application, may become a highly desirable possession. The demand for new and novel designs is unfailing, and the prices paid for such work are usually high. The larger manufacturers, as a rule, retain a staff of designers in their own establishments, but they also buy largely from artists who work independently. In all designing, an ability to draw well, and the possession of a creative talent, are of first importance. It is not enough that you should be able to copy, or to adapt, other designs; you must be able to produce new ideas. In order to achieve the best results in designing, it is also advisable to know, to some extent, the processes by which the goods for which your designs are intended, are manufactured.

Competition is constantly becoming keener. Art institutions are turning out skilled artists every year, and, in consequence, manufacturers are becoming more critical and exacting than they were ten years ago.

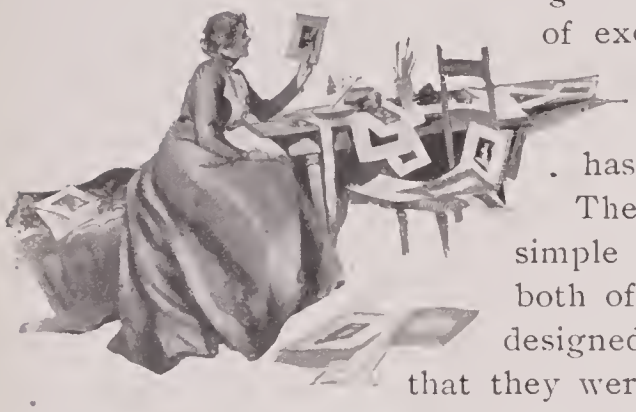
It would be well, however, to think seriously before deciding to devote your time and your money to the study of designing. The work calls for peculiar talent and ability, and pays only when you have become a skilled artist. In other words, in the field of designing there is small opportunity for mediocre talent and acquirements.

There are many branches of designing from which to choose. Besides the wall-paper, silverware, and silk manufacture, there is a constant demand for the best designs among publishers who want new book-covers; printers who must have new designs for "tailpieces," and quaint letters; even the maker of stoves must have novelties. And to the list may be added the products of the porcelain, and china, maker; the furniture maker; the carpet-weaver; the oilcloth maker; indeed, many manufactured articles call for the work of the designer.

There are many woman designers who earn large salaries. And it may be added that the best positions are held by men or women who understand the mechanical side of the manufacture.

DESIGNING AND PAINTING CHRISTMAS, NEW YEAR, AND EASTER CARDS

THE individual who is responsible for the origin of the Christmas card idea, conferred, without realizing it, a blessing upon a very large number of women; so also did those other persons who extended the idea to include New Year, and Easter, cards. The designing, and painting, of these cards as a vocation was virtually due, in the beginning, to the adoption by society of the custom of exchanging such reminders during the holiday seasons. Unlike most fads, however, this one extended far beyond its original confines and has become an established custom.



The original Christmas card was an exceedingly simple affair. It was intended to serve two purposes, both of which were commendable. Primarily, it was designed as a means of reminding absent friends that they were not forgotten, at a time when tokens of remembrance are most dear. The second consideration was that it proved an inexpensive medium for the expression of good-will between persons who could not with propriety exchange more costly mementos. The cards serve these purposes still, but the original idea has been developed to an almost marvelous extent.

Many hundreds of women, by whom the work is done almost exclusively, find in the designing, and painting, of holiday cards a congenial and profitable occupation. It is an employment, moreover, that continues throughout the year, not being confined, as might be supposed, to the holiday season. When it is remembered that there are thousands of different designs among the holiday cards, some of which are very elaborate, it will be understood that the work of production must be carried on long in advance of the season for which the mementos are to be used.

Many professional artists devote their entire time to this employment, while others work at it fitfully; but the professionals by no means monopolize the field. As the holiday season draws near, and the demand for designs increases, there are scores of amateurs who devote their talents to the earning of pin-money in this way.

The variety of holiday cards is almost limitless, both as to design and expense. There are cheap printed cards that can be bought for

a few cents, and there are hand-painted ones, in oil or water-colors, that only the possessor of wealth can afford to buy. The demand for hand-painted cards has become one of the features of the holiday trade. It would be almost impossible, however, to meet this demand by supplying originals to each purchaser. It has been found necessary, therefore, when a design has been submitted that is likely to become popular, to employ a number of minor artists in the making of copies. These copies can be executed rapidly, and large numbers can be produced in this way. These are distributed among the stores in such a way as to give to the purchaser the impression that he is the possessor of an original. Many of the designs for the cheap printed cards, of which there is an enormous variety, are made by woman artists, scores of whom earn good incomes by this branch of the work. The more expensive of the hand-painted cards are cherished as souvenirs; they serve as ornaments, as well as a reminder of the sender. The price paid to the artist depends to a large extent upon herself. If the work is done for a dealer by whom she is regularly employed, the price may be fixed by agreement, but when it is done for an individual she may name her own price.

The number and variety of Christmas cards exceed those for either New Year or Easter, owing to the wider scope for original conception, and the more extensive demand. But some exceedingly elaborate and beautiful Easter cards have been produced, and the fact that they have found a ready sale is proof that it is worth the while of an artist who has no more profitable work in hand, to devote some of her time to such productions.

One of the attractions of this kind of work is that the artist can do it in her own home as well as in a studio. Then, too, the amount of her income depends largely upon her industry, assuming, of course, that her ability is such as to insure acceptable execution. The field is wide, and is an open one. The dealers care little, if anything, for the fame of the artist, except, of course, when some special work has been ordered, and are always ready to buy any specimen that recommends itself by its originality of conception and its perfection of execution.

MINIATURE PAINTERS

DURING the past ten years, the art of miniature painting has been extensively revived, and a few women are deriving large incomes, and no little fame, from their work in this direction. It is needless to say that in order to achieve success in any large measure, a miniature painter must have a thorough art training. For the painting of a really good miniature, a high degree of technical skill and artistic judgment is indispensable. As a rule, not less than one hundred dollars is paid for a miniature, while the finest of this work usually commands much greater prices.

There is one method of miniature painting, which if less artistic in its results, is not wholly devoid of merit, and which enables one to secure a miniature at a comparatively low price. For this work the aid of photography is required. Instead of original drawing on the ivory, a faintly printed photographic image is produced, on the ivory or porcelain, and this in itself constitutes the preliminary work of "drawing." The colors are then applied and the completed miniature is mounted in a gold frame, or in a brooch. As some of these miniatures are no larger than a silver dime, the colorist must have an exceptionally delicate touch, and the use of the magnifying glass is indispensable.

Orders for work of this kind are usually taken by photographers and jewelers, to whom an ordinary photograph is furnished, with information as to the color of eyes, hair, and complexion. The work is sometimes given out by the photographer direct to the artist, but as a rule it is intrusted to firms that make a specialty of photographic reproduction. Young women do nearly all of the work of this character for such firms, and one of the largest of these concerns pays its miniature artists from seven to twelve dollars a week, according to the skill and rapidity with which they produce the work.

CRAYON PORTRAITURE

IN MAKING crayon portraits, two entirely different methods are used. One is that of free-hand drawing, which is the more difficult, as it is the unaided work of the artist; the other is simply the finishing with crayon of an outline portrait made by photographic enlargement,—a method which, it may easily be seen, demands far less artistic talent than does the other. In the former method, the work is usually done on a warm-toned, English crayon-paper, the uneven texture of which helps the artist to produce a portrait that is lifelike in its expression, and possessed of a soft, delicate transparency in its shadows. This last is more especially true in a drawing from life, as here the artist is at liberty to arrange the light according to his own ideas of the requirements of his subject.

The other method of producing portraits in crayon is by finishing photographic enlargements. These were formerly made with the aid of the sun, and were called Solar prints; they are now made exclusively by powerful electric light. When a cabinet photograph is thus enlarged, the finest retouching on it becomes coarse, and the work of the artist, or finisher, is to make the portrait "smooth"—that is, to reproduce all that has been lost by the process of photographic enlargement. This process of enlargement is used also in producing water-color, India ink, and pastel portraits, and is the means by which the vast majority of the good, bad or indifferent portraits are now produced.

The artists who make portraits in crayon may be divided into three classes. The first of these make a specialty of free-hand work only, and refuse to recognize in their pursuit any element of a purely business nature. Each artist has his individual sitters, and even if he were so inclined, he could not work for the photographers, as the latter encourage their patrons to have portraits made by photographic enlargement. This is a subject on which the artist and the photographer never could agree, owing to the difference of opinion held by each as to the merits of the respective methods. The prices paid for free-hand portraits vary greatly, but a general estimate may be

formed from the fact that there are many woman artists in our large cities who receive prices ranging from twenty-five dollars to one hundred dollars each, for crayon heads.

The second class of crayon artists is composed of those who finish photographic enlargements for photographers, agents, and the trade generally. This is plainly a good grade of work, since it is used by all leading photographers, many of whom prefer, for certain reasons, to have it done by women. As the artists are paid in proportion to the amount of work done, and not according to the time occupied, it may readily be seen that rapid work is not a necessity. Prices for finishing depend largely on size, and upon the grade of the work, and range from five dollars to twenty dollars for each piece.

The third class comprises those artists who are employed in the copying houses, of which many are to be found in our large cities. These establishments receive their orders through agents who canvass in adjacent towns and suburbs. The majority of the finishers employed are women, and they receive the same compensation as do the men.

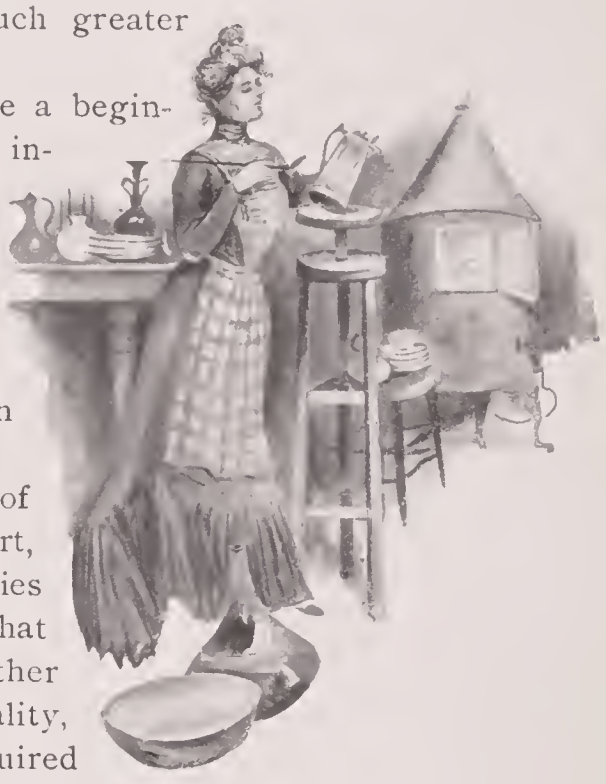
The work is divided into four or five grades of finished enlargements, there being little or no free-hand work furnished by these houses. Nearly all the portraits are finished with a machine called an "air-brush," which is an air pump operated by foot-power, and fitted with a spray attachment. A solution of alcohol and lampblack is sprayed against the photographic enlargement, and in the hands of a skilful operator the air-brush produces a smooth, soft, effective portrait.

In the lower grades of work,— as might be supposed,— the remuneration depends upon the quantity of work, rather than upon its quality. The operators earn from six to eighteen dollars a week, though the average is nearer six dollars than eighteen.

Within the past ten years the field of crayon portraiture has suffered greatly through the sale, by unscrupulous persons, of so-called crayon portraits. By their misrepresentations, these people have succeeded in substituting for crayon work the cheap photographic enlargements. The latter are absolutely worthless — not only do they lack in merit, but they are so manufactured that, through the action of the light, the print must shortly fade from the paper. People are now beginning to put a correct valuation upon this class of work, however, and the demand for genuine crayon portraits is being correspondingly increased.

CHINA-PAINTING

THE largest field for the painter on china is in the great cities of the East, and in certain of the Western cities, notably Chicago and Denver. The average skilled woman can earn from $20 to $30 a week by teaching, and from the sale of her work. In New York City, where the price of good lessons in this branch of art is high, there are several women earning much greater incomes.



The experienced painter on china will advise a beginner in the work to take a thorough course of instruction, with the best teacher to be secured. The cost of such a course, covering instruction and materials, need not exceed $150. But the matter of expense will depend upon various circumstances. After the first twelve months of study, the clever pupil should be able to earn something by means of her handiwork.

But no woman should take up the study of painting on china with a view to self-support, unless she feels convinced that her talent lies decidedly in this direction. The field is one that offers small reward to mediocrity. On the other hand, she who possesses talent and originality, and who has acquired the technical skill required for the best expression of her ideas, cannot but meet with success.

The new pupil who understands the rudiments of drawing, receives whatever further instruction in this direction may be necessary, and afterward learns the use of the colors and the details of the process of "burning" or "firing" the china—the method by which the design is made permanent.

The most satisfactory outlook for the future of china-painting, as a means of employment, is that which shows the increasing appreciation of the home-product, to the exclusion of the foreign importations. In the past, foreign goods have been much favored. The cost of a skilled decorator's labor was so low in Asiatic countries, and the import duty so light, comparatively, that competition in sale of similar goods, decorated in modern American style by home artists, was fruitless. The novelty of goods from the countries mentioned is fast disappearing, however, and to-day the originality and beauty in the best of the home productions is very generally recognized.

THE TRAVELING SALESWOMAN

WHAT is known in the commercial world as a "drummer" is the man or woman who travels from place to place, selling goods for the wholesale establishments to the retailer. The work is arduous, but the income to be derived from it may be brought to a high figure by a capable salesman. Women have only within recent years undertaken to earn a livelihood in this field, for, owing to the constant traveling involved, and because the work seems in other ways to call especially for the services of men, it has been left almost entirely in their hands. Gradually, however, women have entered the field, and to the surprise of the merchants, they have proved most efficient drummers, not only in the lines of fancy goods, but for almost every commodity on the market.

Selling goods to the retailers is much the same the world over, and experience in this field is the best of teachers. The work demands peculiar qualifications for its successful conduct; but it is a field which few people enter unless prompted by these very qualities. In other words, it is an employment offering little attraction to those not fitted to meet its demands. Its difficulties are too apparent; indeed, they are likely to assume exaggerated proportions in the eyes of the inexperienced young man or woman looking about for a start in business.

BUYERS FOR DEPARTMENT STORES

EVERY large store in the country employs several women in the capacity of buyers. It is the duty of a buyer to select the stock for one, or for several, of the departments in the house she represents. This work involves traveling abroad, or to the manufacturing places in her own country. The position is a responsible one, and one that commands a good salary. The higher-salaried buyers are mainly connected with the great department houses of the large cities. Of course, the expense of travel is borne by the firm.

In the less pretentious houses, the woman buyer is generally in charge of two or more departments, and when not traveling, daily superintends the selling of goods in these departments. As in other lines of employment, the best way for a woman to secure a knowledge of buying is to spend some time behind the counter. The successful woman buyer has almost invariably commenced in this way, and has thus gained much valuable information regarding the goods sold, not only in her own department but throughout the store. The kind of goods that sold quickest, and the proportionate demand for every article, became of special interest to her. Showing an aptitude for detail beyond that possessed by other saleswomen, it was only natural that her employer should one day place her in charge of a special department; and, as head of this department, she became also the buyer for it.

Securing a position as buyer, without first learning to sell goods behind the counter, is practically impossible, unless the applicant is especially recommended from the counting-room.

A woman buyer going to New York in the interest of her firm, must visit a number of wholesale houses, for the purpose of examining recent importations and native manufactures. She must know, when informed as to the price of certain goods, whether they can be sold by her employers at a profitable figure.

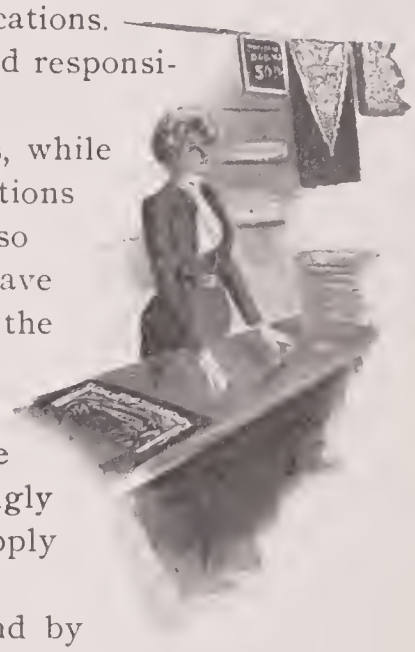
It is the buyer that makes or breaks the department store. Commercial acumen, therefore, is all-important. Her position is to be at-

tained only by long years of experience. The employee who works for the interest of her employer, and not merely for the money she earns, is the one who eventually gets to the top, for buyers command large salaries.

The first thing to be considered by the buyer is the class of people whose patronage is solicited. Goods must be either the best, or of medium grade, or the cheapest. She must have judgment of what the public will like, and knowledge of human nature to estimate how well people will like it, and for how long a time it will be popular. She must know the market, and keep her eyes open to the stock after it is bought. She must see that no other store undersells hers. She must see that stock is not allowed to accumulate, and that it is not permitted to get shopworn. She must see that attention is attracted to it, that the advertiser does it justice, that too much help is not employed in her department, and that the salesman pushes his goods sufficiently. She must watch a thousand different things, for the cash account tells the story. There is no going back of the figures. If these show losses to the firm, the firm holds the buyer responsible, This last is the situation in a nutshell. The successful buyer is, therefore, a person with an eagle eye and an alert sense, so that nothing escapes her. She must continually guard against the day of reckoning.

SHOP CLERKS

THE female employees in one of the great modern department stores range from the cash girl, who receives two or three dollars a week, to the buyer for the firm, whose salary, in some instances, reaches several thousand dollars a year. The cash girl may never rise to the position of buyer, but there is no reason why she should not, if she possesses, or can acquire, the necessary qualifications. At any rate, she will not lose by it if she fixes that high and responsible position as the goal of her ambition.



Some of the expert buyers for the great establishments, while they have not begun as cash girls, have risen from positions as clerks. As a rule, the cash girls begin their work at so early an age that it is impossible that they should have been able to acquire the education which is requisite in the higher positions. This knowledge could, of course, be acquired by attending night schools, but the average cash girl, or shop clerk, is either too weary at the end of the day's labor to be capable of further effort, or is too strongly inclined to spend her evenings in recreation, to care to apply herself to study.

When the cash girl has proved by her punctuality, and by the exercise of keen wit, alertness, energy, and fidelity, that she is worthy of advancement, she is promoted to the work of wrapping parcels, for which she receives slightly increased wages. Her next step upward is to a clerk's place behind the counter, where her pay will be five or six dollars a week. In the course of time this may be increased to as much as eight dollars. But not all of the clerks begin as cash girls. Some of them enter a store after leaving the grammar school, being impelled to do so by a desire to earn an independent livelihood; or, more often, because of a necessity for doing something toward the family support. There are few, indeed, who seek such employment with the fixed object of making it a serious lifework. The work of a cash girl, or saleswoman, is little less than drudgery, at best, and the remuneration is small. It is doubtful if the average earnings of the girls employed behind the counters of the largest stores will exceed six dollars a week. There are, of course, some who are better paid, but it is only those who have attracted the attention of their employers by the manner in which they make

sales, by their courteous treatment of customers, and by their mastery of the details of the business in their respective departments.

If a girl goes into a store with the serious intention of making her services of value to her employers, she will find that there are opportunities for advancement. After some years of close attention to business, she may be placed in charge of one of the departments, with the details of which she is familiar. In a position of that kind, she will no longer receive wages,—her compensation will have acquired the dignity of being called a salary. This will range from fifteen to thirty dollars a week, according to length of service, special fitness, and the extent of her employer's appreciation.

The next step upward will be to a position known as "head of stock," where the salary will be from fifteen hundred to twenty-five hundred dollars a year. She will now have practical charge of the goods in two or more departments. She must know, to the smallest item, just what materials are on hand, must be able to select those which are suitable to be sent to the bargain counters, and must know just what may be needed to keep the stock up to the standard. It is her duty to be able to report to her employer whether the sales show a certain line of goods to be popular with the public, or whether they are likely to remain on the shelves until they become shopworn.

It is her experience as head of stock that qualifies her for the best-paid position in the employ of the firm, that of buyer. If she is fortunate enough to gain this promotion, she may receive anywhere from twenty-five hundred to ten thousand dollars a year. There are young women who have begun their experience as buyers at the minimum salary in one establishment, and have been offered the maximum for their services by a rival house.

The woman who holds one of these positions must know as much about the business as does her employer, and sometimes more. She must be able to look far into the future, and must possess unerring foresight and judgment, as to the fabrics and fashions that will become popular. She will probably have to make two or more trips to Europe every year, and her purchases for the firm will often amount to tens of thousands of dollars. An error of judgment on her part, would mean a serious loss to her employer, and perhaps the sacrifice of her own position. She must know values to such a nicety as to be able to figure closely as to the probable profits on any purchase. As she will have to deal with shrewd business men, she will need to exercise all her wit to avoid being imposed upon.

One of the most important features of the buyer's work when at the home establishment, is to keep watch of the stock, not only of all the departments for which she does the buying, but of that in cor-

responding departments in rival stores. If one store is marking down certain materials, the other must do the same thing in order to hold its trade.

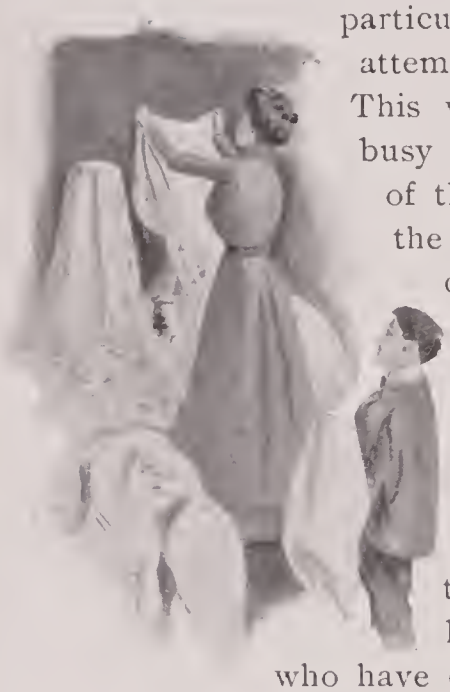
There are buyers who have not risen from clerkships, but they are few in number. In some cases, young women of education and refinement, who have been thrown upon their own resources, have found it possible to utilize their good taste and their knowledge of what women like, to the advantage of the merchants, and to their own financial profit. Before their employment as buyers, they have had to go through preliminary training in the business details.

As has been said, while the wages paid to clerks are small, there is scope in the great store for the ambition of any girl who enters upon the work seriously, and with an earnest desire to succeed.

These observations apply mainly to the great department stores. In the smaller establishments, the wages are about the same, but the opportunities for advancement are fewer, since the employer is generally his own head of stock and buyer.

WINDOW-DRESSERS

THE work of trimming show windows with samples of the goods for sale in the store, has become a distinct vocation. At the outset, the persons selected for this employment were men, exclusively. Most of them had had years of experience, behind the counters, perhaps, and were familiar with the materials which the merchant particularly desired should be attractively displayed. The first attempts at making these displays were unquestionably crude. This was due to the fact that the work was done by the busy salesmen, who were permitted to devote only a portion of their time to it. After a while, it became evident that the prime qualifications for success in arranging the window exhibits were taste and a certain regard for artistic effect. Then some merchant made the happy discovery that one of his saleswomen possessed these qualifications in a marked degree; and, gradually, it has become the custom to employ for this work, men and women who devote to it their entire time and attention.

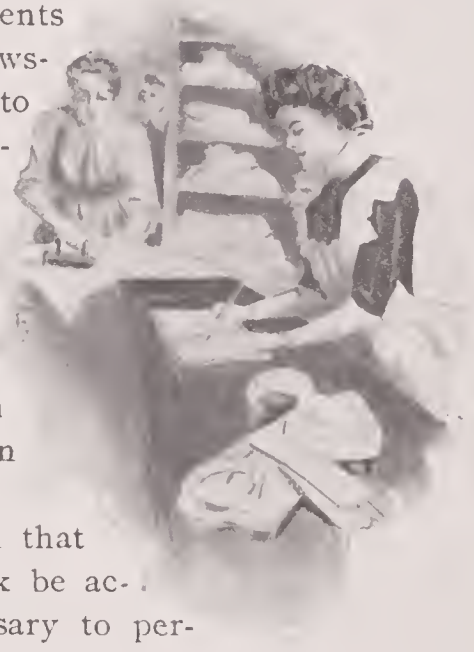


While it is not essential that a woman who aspires to earn her living as a window-dresser should receive her training as a shop-girl, or clerk, nearly all of those who have entered upon the vocation have begun in some humble employment in a store, and have demonstrated their fitness for the work, as opportunities offered. There have been, however, a few notable exceptions.

As has been said, the prime qualifications for this work are good taste and an artistic sense of the harmonious arrangement of colors and fabrics. To these should be added ingenuity in producing new or novel effects. It would probably be well for any woman aspiring to such employment, even if she possesses the requisite qualifications, to gain a preliminary experience behind the counter of a store. She will in that way familiarize herself with the goods and their decorative possibilities, and will be able to invent combinations for display purposes that will be sure to please her employers.

CONDUCTING A LAUNDRY

TO ESTABLISH a laundry, equipped with modern machinery, a capital of several hundred dollars is needed. After securing the necessary offices and machinery for the conduct of the work, every effort possible must be made to secure a large and desirable patronage. If the laundry is in a large city or town, advertising is best done through the medium of cards and neatly printed circulars, which should be sent by mail to the residents within the available districts In smaller towns, newspaper advertising may be profitable; also house to house canvassing. The proprietors of successful laundries frequently include among their expenses the hiring of agents who call in person upon the residents to solicit their patronage, and who establish agencies in small shops, where the clothes may be left for collection by the laundry wagons. This, of course, applies only to a business conducted upon an extensive scale, either in a large city, or in a town where suburban patronage may be expected.



Before entering the laundry field, it is essential that a very thorough knowledge of the details of the work be acquired — not that the proprietor will find it necessary to personally assist in the washing and ironing of clothes, but because she must be able to intelligently supervise the work from start to finish. The larger the amount of work undertaken, the greater the amount of detail involved.

A prime factor in the successful management of a laundry is unvarying promptness in the collection and in the delivery of clothes. If it is not possible to begin business with the improved machinery to turn out ordinary work rapidly, a sensible plan would be to cater for high-class hand-work.

PLAIN AND FANCY SEWING

THERE was a time when plain sewing on underwear brought at least a fair return; but the manufacture of garments in factories, by machinery, has revolutionized the conditions attending the making of ordinary goods. In a factory where ladies' and children's underwear is produced, there is a machine which cuts a hundred thicknesses of cloth to a pattern at one stroke of the die. The putting together of the garments is done by girls who operate machines moved by steam power. They receive from fifty to ninety cents a day for their work. The garments thus made can be sold at comparatively low prices.

There are other kinds of work that involve more or less hand work. Manufacturers who produce goods of this character cut and assemble the pieces of garments, and send them out by the thousand, through the country districts, where the wives and daughters of farmers, and residents of the small towns and villages, do the sewing. The work is delivered to them, and taken from the door, completed, at stated intervals. The sewing is done at odd moments, or in the evening, and as the work is paid for in cash, it is eagerly sought for. Yet the women who do this work make only four or five cents an hour. A year's work may not net more than twenty or thirty dollars, but it is "clear gain" to the country woman, who values her time lightly, and who seldom sees "ready money" with which to buy the ribbons and knick-knacks that she desires as much as does her city sister.

Against such conditions as these, the woman who attempts to make a living from plain sewing alone must compete. She will probably have to work twelve hours a day in order to make five or six dollars a week. She must buy a machine; and a good one will cost her forty dollars, at least.

There is a ray of light for the needlewoman who can build up a line of patronage among people of means, those who are fastidious

about their wearing apparel, and who will not wear factory-made goods. One woman earns a fair living by making shirts for men. A bright woman can make a man's shirts exactly right,— exactly as he wants them,— and she will take more pains with them than does the professional manufacturer of shirts. A man will cheerfully recommend to his friends a woman who can do his sewing as he wants it done, and it is possible for him to solicit, and to obtain, privately, enough business to keep her busily occupied. In a household where the wife must earn a part of the money that goes to support the family, there is a fairly satisfactory field in this work. Of course it is not intended to imply that shirt-making is the only phase of the work that is profitable; there is much work to be had from women of large means. Many of the latter, being fastidious in the matter of their shirt-waists, rarely purchase these dainty articles of apparel "ready-made," but order them from the most skilful manufacturer or seamstress available. For the making of a really satisfactory shirt-waist, four or five dollars is considered a modest price.

Fancy sewing is a term that may be made to include many articles of luxury. Embroidery and other sorts of fancy work are now, to a certain degree, fashionable occupations, even among women of wealth, and the market for outside work is correspondingly smaller than it was. But there is occasionally an outfit of dainty baby-clothes to be made, the "baby-basket" to be fitted up with its satin linings, or an elaborate trousseau to be prepared, on which much fine work with the needle must be done. In a large city, a woman might make a speciality of this, and work of a kindred character, and receive a fair remuneration. She will need to have enterprise, and must not be afraid of soliciting work. It is well to place a high value on one's own product, and to solicit work as one conferring a favor on the person approached, rather than as one seeking a favor.

In the article on women's Exchanges, will be found a suggestion as to the sale of fancy needlework not made to order. To make, and to offer, such work for sale in the stores is not likely to result in satisfactory returns; a woman who brings needlework to sell is presumed to be desperately in need of ready money, and a ridiculously low price is offered for it, in the belief that between a pittance and nothing, the pittance will be chosen.

In general, no woman is advised to undertake either plain or fancy sewing as a sole means of livelihood, if there is any other occupation for which she has adaptability, and in which she can make a market for her labor.

MILLINERY

In order to succeed in the millinery business, a woman should possess much natural taste, not only in the matter of color, but in the selecting and combining of fabrics. She must also be willing to begin at the foot of the ladder—to learn thoroughly every detail of the work—so that she may not only know how to make a hat herself, but be able, as the business becomes more extended, to direct her assistants and her apprentices.

Beginning at the foot of the ladder, usually means serving an apprenticeship in a first-class millinery establishment. At the start, it is probable that very low wages will be received, but as the apprentice acquires skill in one or more branches of the work, she receives better remuneration. Later on, when she has learned the business thoroughly, she may open an establishment of her own, or seek a position with some successful firm. An expert trimmer can command $25 a week in any large city, and there are numerous instances of women receiving $40 a week. It must be understood, however, that the receivers of such salaries have not only mastered the details of millinery work, but that they possess artistic taste.

In case one does not wish to serve an apprenticeship in learning the millinery business, it is possible to-day to take a course of training in a school devoted to such instruction. Here a series of lessons is given to pupils in large classes. The pupil in one of these millinery classes must furnish her own materials for practice. The course of instruction includes training in wiring, binding, facings of all kinds; the making of bows, rosettes, wire and buckram frames; the trimming of bonnets, and small hats, and the details of black silk, and crêpe, work.

There are schools in which a pupil is charged a certain amount for being taught whatever she may wish to know regarding the art of making and trimming hats. There is no limit as to the time of attendance. Materials are furnished gratis, and, if possible, positions are found for the graduates. Most schools will attempt to place their pupils where small salaries are paid at the start. Young women who are apt in learning the details of the work, often secure salaries of from $6 to $8 a week immediately after a six months' course of instruction. The majority of pupils will not be worth so much. Probably $4 a week will be paid to them at the start. What a woman earns afterward depends upon her own enterprise and ability. If especially fitted

for the vocation, it will not be many years before she is commanding $25 a week. Twelve dollars would be average wages.

The millinery department of a large store offers desirable positions to expert workers. The seasons are short for most women makers of hats, but many assistants are kept in this department of the large stores during the entire year.

Another way to gain success as a milliner is to build up a home trade. A woman capable of turning out good work may, with the aid of two or three friends who will recommend her assistance to others, gradually build up a very desirable home patronage.

To the average graduate of a millinery school, it would be advantageous to work in some shop for a month or two without pay. Such experience will be invaluable to her, since, through it, she acquires a knowledge of details to be gained in no other way.

The woman building up a home trade, should, if it is possible, do the shopping for her customers. She will thus soon learn what they like, and can at the same time broaden her own ideas. By registering at all stores where she intends to shop, a discount of from 6 to 10 per cent. will be allowed to her.

Going out to work by the day is another way in which a milliner may earn money. From $2 to $4 per day is paid, according to a woman's ability. Many women prefer to purchase materials for the making of their hats, and to use up old materials. By having a practical milliner come to the house by the day, a larger number of hats can be made from the expenditure of a fixed sum than if ready-made hats are purchased. The hours for work in going out by the day are from 9 to 5.

Having taken up millinery as a means of self-support, no woman should become discouraged. With every new season, there are new things for even the most expert to learn, but perseverance will tell, and success will come.

KEEPING A LODGING-HOUSE

IN ORDER to start a lodging-house business, a woman should possess sufficient money to meet the expense of completely furnishing the selected house, and to cover several months' rent. The business is peculiar to the cities and to the larger towns, and its success in individual cases, depends almost wholly upon a judicious selection of town and neighborhood. This matter of selection is governed by various circumstances, and should be very thoroughly considered, from every point of view, by the one who contemplates the establishment of a lodging-house. Advertising is of assistance in the effort to secure lodgers, but the woman is fortunate who can fill her house without resorting to the newspaper columns. This is frequently achieved through the recommendation of friends and acquaintances.

When dealing with strangers, great care should be exercised in the matter of references. Upon this point it is impossible to be too particular, for the presence of undesirable people in your house, even for a short time, will go far toward the undoing of your best efforts. It is customary, not only to furnish references as to the desirability of your house, but to exact references from strangers seeking quarters with you. The same good business methods that should characterize the conduct of other occupations must also be adopted, if you would succeed in the management of a lodging-house

THE CARE OF THE HAIR

IN MANY hair-dressing establishments, other features of a kindred nature are combined with the treatment of the hair—wig-making, for instance, the preparation of cosmetics, and the sale of toilet articles, or hair ornaments. It is not uncommon to find the business of massaging and manicuring combined with that of caring for the hair. In this country, these establishments employ women almost exclusively, training them thoroughly to shampoo, dry-brush, treat, and arrange, the hair. This work may be done either at the hair-dressing parlors or at the house of the customer, and it is usually so arranged as to be regulated, and paid for, by a series of tickets made to cover a course of treatment. The price varies from ten to fifteen dollars for a dozen tickets.

To a woman about to take up the care of the hair as an occupation, the first important question will be, How can I learn the art? There are two ways in which this may be accomplished. First, she may go to New York or to Paris, to take lessons in one of the classes established for instruction in such work. But as this would be practicable only in exceptional cases, the usual method of procedure is to serve an apprenticeship of several months' duration in some home establishment.

Most hair-dressers will tell you that a girl must have natural qualifications for the work if she expects to be successful. But, except in the arrangement of the hair, which, obviously requires taste and style for its successful accomplishment, there is no reason why the young woman of average intelligence should not become skilful in the work.

While it is necessary to understand the structure, and the growth, of the hair, the diseases of the scalp, and their treatment, it is only practice that brings the thorough skill and knowledge indispensable to the best achievement. Formerly, skill in the arrangement of the hair into an elaborate coiffure was all that was considered necessary in the art of hair-dressing; to-day, the changing of gray hair to its natural color, without the aid of dye, the restoration of hair to the prematurely bald, the cure of scalp diseases, and the transplanting of vital tissues, have brought the care of the hair within the domain of science. Special treatment of this class, however, is not included among the duties of the ordinary hair-dresser.

Many women have found it profitable, after acquiring the necessary knowledge and skill in this line of work, to avoid connection with the regular establishments, and to confine themselves to the formation of a class of customers or patrons of their own. These customers are visited at their homes, once or twice a week, or oftener if desired. Different customers will require different treatment, but ordinarily the work of the expert is simply the good care of the hair. Shampooing is done when necessary, brushing and massaging of the scalp, and the applying of a tonic when it is needed. The treatments last an hour, and the charges are from fifty cents to a dollar and a half for each visit. It is, however, only in the larger cities that the latter price can be commanded. It is scarcely possible for a hair-specialist who goes to the houses of her customers, to fill more than six or seven appointments in one day, unless she works in the evenings. Going to and from houses consumes time, and this should be considered in her charges. Slackness in her work, untidiness of dress or person, a too great volubility, are all faults especially to be avoided. A pleasant manner, gentle touch, and respectful demeanor, are greatly to be recommended. There is a certain magnetism that is often exerted by one who treats the hair, and the hour of her visit may be one of the most pleasant to the patroness. Naturally much depends upon the personality of the woman who undertakes so intimate an employment as hair-dressing, and she will find that conscientious work, and an agreeable manner, are the best qualifications it is possible to possess.

CO-OPERATION WITH BUTCHERS AND GREENGROCERS

BY CO-OPERATION with the butcher and the greengrocers of her neighborhood, an enterprising woman may, with good management, add very substantially to her income; and this without neglect of her household duties, or to the exclusion of another line of work. The greengrocers, carrying throughout the greater part of the year, large supplies of fresh fruit and vegetables, are unable, even with the best management, to avoid the losses that attend, to a greater or less degree, the handling of a perishable stock.

There are various circumstances that may interfere with the daily sale of such stock, and the proprietor of the shop frequently finds himself at night with a large supply of wilting vegetables or fruits on hand which will be wholly useless on the morrow. By arrangement

with one or more of these stores, the woman who understands thoroughly the art of preserving and pickling, can secure the privilege of utilizing this surplus stock, to the advantage of both the grocer and herself. The crates of berries, plums, cherries, currants, and other small fruits, which so frequently go to waste in hot weather, can be sent for each night, or as often as may be necessary, or convenient. The fruit is made at once into jams, marmalades, jellies, and preserves, put into attractive glasses and jars and returned to the shop for exhibition, and for sale. The grocer makes an effort on his part to sell the goods, and, of course, is entitled to a share of the proceeds. In conducting an enterprise of this kind, almost everything depends upon the quality of the preserved goods. It must be equal, and if possible, superior, to that of the regular lines of such goods carried by the grocers. An effort should also be made to achieve a measure of individuality in the display of the jellies and preserves, by securing odd, and pretty, receptacles to hold them. Most women buyers are attracted by a novelty in this line, and will often buy an article that they really do not need, or want, simply because it is so daintily packed for the market.

In addition to utilizing the greengrocer's oversupply of fruit, there is much to be done with the vegetables, in the way of various pickles, catsups, and sauces. The details of this work should be carried out in the way indicated for the handling of the fruit.

Properly approached on this subject of co-operation, any grocer will gladly give the proposition his attention. And when he finds that you are in earnest, and that you really make it possible for him to reimburse himself, in part, or perhaps wholly, for the losses he sustains in the carrying of perishable stock, he will lend to the enterprise his very best assistance and encouragement.

In addition to this line of work, a few women have found it profitable to make a similar arrangement with the butcher of their neighborhood, for the utilization of waste meat. The odds and ends of fresh meat, the bones, the fat, and the tallow, can be turned into salable goods, by the hands of a clever woman. Soup stock is the best-paying article in this line. Fresh, rich stock, in substantial glass or earthenware jars, returned to the butcher shop once or twice during the week, will soon find customers among the regular patrons of the shop. Here, as in the matter of the fruit products, everything depends upon the quality, and the dainty packing, of the goods.

FLOWERS

GARDENING seems to belong naturally to woman's sphere. The fragile character of the plants demands the care of the tenderest of hands, and their sometimes slow growth requires a high degree of patience on the part of the gardener. In the bright, brisk air of the early morning, or in the warmth of noonday sunlight, surrounded by a profusion of richness of tint and form, a woman should find health and enjoyment; while from the sale of her products she should receive a substantial income. Profits from the sale of flowers are good, and, if the garden be carefully managed, reasonably sure.

If the garden is to be started from the seed, the outlay of money required is very small. The making of the beds, and whatever other heavy work may be necessary, should be done by a man who can be hired at a small daily remuneration. The seed should be planted in boxes, in the house, early in March, or in a cold frame out of doors, a little later. This refers to gardening in middle and northern America. In the far southern states, flowers are grown out of doors throughout the year. The seeds should be purchased from reliable dealers. At the start, procure a number of shallow boxes, about three or four inches deep, and not too large to be easily handled when filled. Bore, or burn with a hot iron, a number of holes in the bottom of each box, for drainage, otherwise the soil will sour and mold. At the bottom of the boxes should be placed a layer of charcoal or fine cinders, upon which should be placed finely pulverized soil, composed of equal parts of leaf-mold, mellow garden soil, and fine sand. The evening before the planting, these boxes should be placed in a large tub of water, not so that the water touches the soil, but in a way that will permit the moisture to strike through it. The next morning the soil will be ready to receive the seeds.

Large seeds should be soaked over night, and must be planted an inch deep and an inch apart. Smaller seeds, like those of the aster, phlox, and zinnia, should be planted half an inch deep and set in rows; while the still smaller seeds, those of the cosmos, petunia, and pansy, should simply be strewn over the surface of the bed and covered with a sifting of fine soil. After planting the seed, put the boxes in a warm place and cover them with glass, paper, or flannel. The covering should be raised from time to time to admit the air, but do not expose the soil to the full glare of the sun. Should the

earth become dry, moisten it by setting the boxes in tubs of water as before directed.

When the shoots from the seed appear, the covering should be removed. Moisten from time to time with an atomizer, but never when the boxes are exposed to the rays of the sun. When the shoots begin to put forth leaves, transplanting should be commenced. New soil should be used for this purpose. Each plant should be placed in a hole by itself, care being taken to cover the root with soft earth. Keep the plants away from the light for a week, and then place them under the cold frame. As the weather becomes warmer, they may be taken from under the frame and placed in the beds. Choose a cloudy or a rainy day for this operation and handle the small plants with tenderness.

Instead of raising plants from the seed, they may be purchased ready for transplanting; this means, however, additional cost and the likelihood of their becoming damaged before you get them into the ground. Some gardeners, however, are unsuccessful in raising from the seed, and if you find that you are of this number, it will be better to try the young plants. The former method is, of course, more professional.

As the cool weather approaches, the plants should be taken up and removed to the hothouse. Place them in large tubs, or troughs, with holes bored in the bottom. Never water the blooms. A pot with a finely perforated nozzle should be used to water the foliage and roots.

Flowers bring higher prices from October to June than during the remainder of the year. In growing for the market, always have a bountiful supply of roses. The popularity of the rose is perennial. Watch for changes in the public's fancies, and raise in abundance whatever may be the reigning flower for the season. Violets, cosmos, narcissus, sweet peas, and carnations, are always in demand.

A man should be employed to do the heavy gardening and to solicit custom. With a little advertising in the city papers, much patronage can usually be secured; or, if this proves unsuccessful, a small establishment may be opened in town. Many florists do not grow their own flowers, but depend upon gardeners for their supply. It is well, if possible to do so, to negotiate with one florist only, contracting to sell to him your entire product. The demands of his trade should then be catered to with scrupulous care.

You will find, however, that you will soon become known as a gardener, and that you will have frequent calls from town for freshly-cut flowers. Of course, there is more profit in this method of selling, as the producer, instead of the florist, gets the benefit of the margin

between the wholesale and the retail price. This class of custom should, therefore, be cultivated. Never spare pains to arrange artistically the flowers sold to customers. Asparagus is by far the prettiest and the most convenient trimming for bouquets, but fine ferns may also be used with good effect. Smilax is a pleasing adjunct to cut-flowers.

Among those plants which flower first in the year, and before May, are the mezeron pink, winter aconite, hellebore, snowdrop, crocus, pansy, and violet, in frames.

Among the May and June bloomers are currant, azalea, bush honeysuckle, Japan quince, lilac, flowering plum, almond, early spiræa, viburnum, tamarisk, calcanthus, deutzia, mock-orange or syringa, rose, wiegelia, clematis, tulip, hyacinth, narcissus, peony, columbine, lily-of-the-valley, garden pink, hepatica, creeping phlox, herbaceous spiræa, violet, crown imperial, bleeding-heart, Oriental poppy, lychnis, periwinkle.

Summer and early autumn bloomers are monk's-hood, milfoil, Japan anemone, golden-spurred columbine, campanula, sweet-william, plantain-lily, day-lily, and spiderwort.

In fall and winter may be expected chrysanthemums and hellebore while the box and other evergreens, burning-bush, barberry, waxberry, and witch-hazel, are most attractive during these seasons.

PROFESSIONAL SHOPPING

It has been asserted that all women are exceedingly fond of shopping, and some writers have declared that the pursuit is one that amounts almost to a passion. It may be true that all women at some period of their lives take a great deal of pleasure in selecting, and purchasing, those things that are needed in their homes, but it is equally true that a very large number, particularly those who have grown old, or who are possessed of small means, shrink from the trials and the vexations, which must be encountered in the crowded stores.

Professional shopping is the natural outgrowth of these latter conditions, together with certain others that are equally simple. Most of the women who follow the vocation are possessed of taste, refinement, and a certain amount of business tact. In most cases, they have suffered financial reverses, and are compelled to earn their own living as best they may.

A woman who enters upon the vocation of professional shopper, must be infinitely tactful. She must study the tastes of her patrons, and, even if her own ideas differ from theirs, she must either gratify them, guide them into more correct channels, or expect to fail in her undertaking. She must remember that what one woman regards as ideally perfect, may be looked upon by another as hideous or grotesque. It is the patron, not the shopper, who must be pleased. The taste of the professional shopper, in a majority of instances, however, is deferred to by the patron, who comes to know that one who has made the subject a special study, is better qualified to judge than one to whom shopping has been an occasional incident.

The experience of one young woman who is earning a good income as a professional shopper, may be given as a fair illustration of the class as a whole. As a girl, she was noted for her excellent taste in dress, as well as for her tact in securing bargains. She was not rich, but was in good circumstances, and had received a fair education. When the reverses came that made it necessary for her to earn her own living, she carefully summed up her qualifications for a business career. She could sing, and play, but not well enough to teach these accomplishments. She had a smattering of three or four languages, but she at once discarded the idea of teaching something in which her short-

comings would be so apparent. She was almost in despair, until one of her friends suggested that she become a professional shopper. At first she was inclined to scoff at the idea, but there was nothing else that she felt she could do as well, and, after more or less protracted deliberation, she decided to make the venture.

Her first step was to have some cards engraved, announcing that she was prepared, for a reasonable consideration, to relieve members of her sex from the burden of shopping. She then called on an elderly lady of wealth whom she knew, and asked for her patronage. The lady was glad to have her services, and was so pleased with the result of her first commission, that she went out of her way to recommend the girl to others. While a clientele was being built up in her own town, the young woman tried the experiment of advertising in a suburban newspaper, offering her services as a shopper to those living out of town, who might find it inconvenient to come into the city to make their purchases, and who, thereby, were likely to lose the advantage of desirable bargains. As a result of the first advertisement, she received more than a dozen orders.

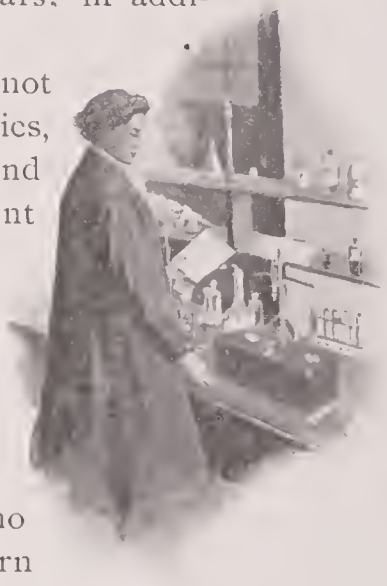
That particular young woman now has an office, and gives employment to four other professional shoppers. Her charges are reasonable, as they necessarily should be, inasmuch as she can, in a single visit to a department store, fill the orders of a large number of patrons. She had not been in business as a professional shopper very long, moreover, when the shopkeepers discovered that her custom was exceedingly desirable, and that they could afford to pay her a commission to patronize them. At the present time, the young woman receives a commission from the patrons for whom she buys, as well as from the merchants at whose stores she makes the purchases. Her commission from the former is twenty-five cents on each order, whether it be large or small; and from the latter, it is five per cent. on the total amount of the purchase.

There are now numbers of professional shoppers in all of the large cities, and as a rule, they earn fair incomes. There are, however, unpleasant features connected with this, as with all other employments. Occasionally, a patron will be exasperatingly ill-tempered, will find fault with everything the shopper does, and may even refuse to accept the purchased materials. Under such circumstances, the shopper must preserve her equanimity, lest she lose her patron altogether. Those who have tact enough to succeed as professional shoppers, however, generally have the accompanying characteristic of patience.

Any young woman who has the requisite qualifications to become a successful professional shopper, can enter the field by following the method adopted by the girl to whom particular reference has been made.

CHEMISTRY

CHEMISTRY is a pursuit with which it is not safe to trifle. A little learning is a dangerous thing. The subject should be mastered or let alone. The best way to master it is to take a course which embraces that study, in one of the leading colleges or universities. Such a course will cover a period of four years, in addition to the preparatory study first needed for entering.



This university course will include many branches not essential to a knowledge of chemistry, but some, like physics, cannot be dispensed with. A good knowledge of French and German is required, owing to the fact that the most recent scientific books and pamphlets are not accessible through translations.

After mastering the subject, there are many, and widely divergent, branches of practical work open to the chemist. A good occupation for a woman is that of drug clerk. This demands familiarity with chemistry and *materia medica*, and a general knowledge of botany. One who has had a complete theoretical course may easily learn pharmacy and dispensing in the drug store itself,—pharmacy having been termed the "cookery" side of the drug business.

A position in a chemical manufacturing house, such as supplies the drug trade, has decided advantages. The salary is good from the very first, there are opportunities for practical improvement, and the position furnishes a good stepping-stone for further advancement.

Government positions offer excellent facilities for continued research in the mysteries of the material world. To one who loves to teach, the high schools of the land furnish the proper sphere. First-class woman teachers of physics and chemistry are receiving almost the same remuneration as do male teachers.

ARTIFICIAL FLOWER-MAKING

As a profession for women, artificial flower-making can scarcely be said to hold out the encouragement that is to be met with in other lines of effort, but, at the same time, this work may be brought to such perfection that there will be a demand for a special line turned out by the true artist. Just as long as women wear headgear demanding ornamentation, just so long will continue the demand for the artifices that are a factor in beautifying that adjunct of the toilet.

A course in one of the practical schools is the best way in which to acquire a knowledge of flower-making. The materials ordinarily used in the making of flowers are silks and velvets; though the commoner varieties of cloth go into the making of the cheaper grades. Then there is the rubber for the stem; the beads, wire, paint, dye, and a hundred other things that are found necessary if the whole gamut of the artificial flower-maker is to be followed. It has never been discovered just how many varieties of flowers adorn the hats of women, but there are many wonderful creations of the maker, that outvie anything that Nature has had the temerity to produce.

It is the firm belief of those who are well informed on the matter, that a factory for the manufacture of artificial flowers, judiciously managed and operated by women, would be a paying venture, and if a millinery establishment were added to this, the investment would prove a bonanza to the owner. Such an enterprise would naturally require the investment of considerable capital, and there would be many difficulties to meet and overcome.

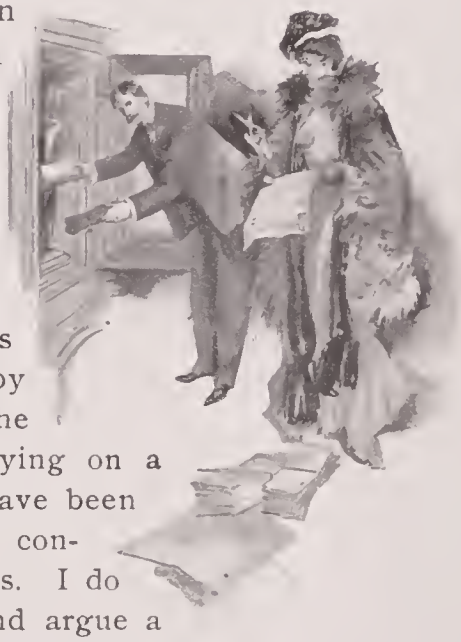
Not very long since, all artificial flowers were imported into this country from France, and the most of them came from the city of Paris. The growth of all lines of manufacture in America has done away with this, and now there are more flowers made for the home trade in the city of New York than are imported. Even a large proportion of the most expensive sorts are home-made, and all of them rank, even in the highest classes, with the imported flowers. A start may be made, as in all things, on a small scale, and if the work is good, there will be sufficient demand for it to counteract the competition that is sure to begin when the great manufacturers learn that a rival is in the field. A careful canvass with samples among the high-class milliners, would be an effective way in which to begin, and if the work is good, and the prices in conformity with those current, the

result will always be found satisfactory. People in trade are ever on the alert for good materials at low prices, and the reward for furnishing these things is certain. In few instances where this manufacture of the material and the finished article has been tried, have failures been noted, and then only because the operators were not up to the requirements of the entire business.

Bearing in mind all that is necessary to success in any line of work, women should have more than a fair chance of succeeding in the making of flowers, and in the manufacture of hats and bonnets.

ARE WOMEN SUCCESSFUL IN TRADE AND FINANCE?

SIMULTANEOUSLY, four women in New York City failed in business, not long ago. The fact that they should all have gone into bankruptcy at the same time, though each had been conducting her business separately, aroused a discussion as to whether or not women in business are successful, and, if so, why? Most of the women who have contributed to the accompanying symposium are in trade, and their ventures have been crowned with success. What they have to say on the question is therefore most timely.



A woman prominent in the anti-suffrage movement has this to say about "Woman's Success in Business":—

"Women have been successful in business ventures which cater to women's needs. If a woman is forced by circumstances to support herself, let her work along the lines of those women who have built up and are carrying on a business that is essentially a womanly one. Women have been successful lawyers, physicians, and architects, when they confined themselves to the womanly part of these professions. I do not think a woman should go into the criminal courts and argue a case. I am certain no woman should be a surgeon. Her physical make-up is not such as would permit her to perform surgical operations successfully. I think a woman could attend to the interior details of a house much better than could a man, but I do not think her capable of planning and carrying out successfully any large building.

"In my opinion, women have been successful as college presidents, teachers, and along all lines of educational work. Women should be on the school boards, not through election, but because they are best fitted

for the place. I do not wish to be understood as saying that a woman should not enter business life, but if she must, let her choose her profession and trade in woman's field, not man's.

"A woman does wrong to enter into competition with men, unless driven to it by necessity. When she does, she invariably takes the means of livelihood from some man with a family depending upon him. When God created woman, He gave her peculiar attributes. He made her loving, more patient, more self-sacrificing, and gave her greater powers of endurance than He gave to the other sex. He made her to be man's helpmeet. He placed her on a higher moral plane; and standing where her Creator placed her, her influence over the men of her family transcends any other. Therefore, why try to invest her with powers other than those with which she is endowed by God?"

Mrs. Russell Sage says "Woman, when designed by her Creator, was never intended for business. God made her to be a home-maker and home-keeper, not a wage earner. She may take up business life from necessity, but never from choice.

"All a woman's early training tends to fit her for wifehood and motherhood, through which qualities she becomes the home influence, but in no case is she trained for financial and commercial life. Therefore, if from unforeseen circumstances she is thrown out into the world to earn her livelihood, she is seriously handicapped.

"The self-abnegation and trustfulness of woman are great stumbling blocks in her path to financial success, and it has always seemed a pity to me that men should lose the better part of woman in what she is trying to do outside of her natural functions.

"In saying this, I do not wish to be misunderstood. I do not belittle woman's capabilities, for I am firmly convinced that, notwithstanding her many disadvantages, when she is put to it, she is man's equal, if not his superior. Were a woman trained as a man is, she could easily take her stand side by side with him in the financial and commercial world, but I pray I may be spared that sight.

"The better part of woman, as God made her, is so essentially feminine and dependent that it grieves me to see the growing tendency of the age toward welcoming her into the arena of business life. To be a successful business woman she must have a man's brain; and in gaining this, she ofttimes loses her womanly charms and characteristics. I am so thoroughly old-fashioned, myself, that I shudder to see a woman enter the lists against men, and yet I know in many cases she is driven to it against her will. If she must go into business life, if this is to be the future of the coming woman, then it is the duty of mothers and fathers to train her for such a life as that for which they train her brothers."

Rosalie Loew, lawyer, says: "From my observation, I believe that many women lawyers have achieved success from the financial or commercial point of view. I have observed also one or two unfitted for the work, and these are not successful. There is no profession, I believe, in which merit is more the measure of success than in this one, where there is a more certain expression of the survival of the fittest. It is not necessary to refer to the rules, for I believe that women have neither advantage nor disadvantage in legal work by reason of their sex. Certainly, if there is any changed position, it is a disadvantage, because of prejudice. I have never consciously met this prejudice, and do not believe it exists, but I have heard other women lawyers complain of it.

"At least one woman in New York City has achieved success as a patent lawyer. A few are doing well in general practice. Several are part of the machinery of large offices; many are doing brief and office work of the very best and most valuable kind, for husband or brother. In short, there is no room in this noble profession for feminine or masculine incapacity; but ability and character will inevitably find their place, and meet that appreciation which brings financial success."

Julia W. C. Carroll, shirt-waist maker, says: "Of course I think woman in business is a success. It has been both my experience and my observation that women who apply themselves earnestly, make money, but it is not on the financial side that they oftenest fail or suffer loss. It is on the side of personal sacrifice.

"My serious views on 'Women and Business,' if worth listening to, are soon told, but I must add the opinion of a successful man, whose views on business must be of more value than mine; for, though I am grateful to my customers for the success that has come to me, I cannot but concede superiority in commercial matters to the other sex, even though necessity demands that some of us must do for ourselves. I, for one, am only too pleased to put the superiority on a pair of broader shoulders than mine, for the average woman who succeeds in business does so for different reasons than do men.

"The successful commercial man is usually able to take a broad, comprehensive view of matters, which, however, does not allow minute details to escape. If he sell blankets, he buys sheep wholesale, clips the fleece, refines the wool, and manufactures it into blankets. When the blanket is ready to sell, your man knows not only what it has cost him to make it, but what per cent. of that cost is represented by raw wool, how much by the cost of the labor, how much by the pro-

portionate share of his rent, heat, light, interest on his investment, etc.; how much for dye, for wear and tear, and for the thousand and one other details that go to swell his expense account.

"Women, on the other hand, business women who succeed, usually do so because of their inventive faculties, imagination, and adaptability. They are able to turn these qualities to sufficient account to be able to pay less attention to the methods which bring success to men."

Helen Harmon-Brown, milliner, says: "'Women,' said Rousseau, 'have or ought to have, but little liberty; they are apt to indulge themselves excessively in what is allowed them. Addicted in everything to extremes, they are even more transported at their diversions than boys.'

"With what scorn would this statement of long ago be received by the twentieth century woman; and yet how truly has Rousseau gauged the secret of the success of this same scornful modern woman!

"In this day of 'untrammeled womanhood' to say that 'woman ought to have little liberty!' Whatever my sentiments, I should hardly dare, in the face of the storm it would raise, to express myself in favor of such a statement. Let me therefore ask the patience of your readers while I quote further: 'They are apt to indulge themselves excessively in what is allowed them.'

"My limited experience of four years in a distinctly feminine business hardly warrants an expression of my views on the broad subject of women's business ability, but it seems to me that the ability to go to extremes in everything, and to throw themselves heart and soul into their chosen vocation, is just the trait that will eventually enable them to succeed. The present conditions, which compel women to go out of their natural sphere, may or may not be the result of their own actions. Certainly these conditions exist, and for the present must be endured or overcome by women unused by previous training to any struggle.

"How is this done by the successful woman of to-day? Much in the same way as by the successful man, except that the woman never stops work night or day. The really earnest woman plods, and as a result succeeds, but at what cost?

"It has been asked: 'Can a woman succeed in business without the assistance of a man?'

"To this I would answer, 'It is possible, and has been done.' But at the same time I would like to lay special stress upon the fact that if a woman does do this, she is most unusual and is doing more than the ordinary man.

"What young man starting a business venture does it entirely unaided by the advice of a more experienced man? Would he not be looked upon as foolhardy if he did? Why, then, should a woman be considered inferior in business ability if she so far follows the example of the 'sterner sex'?

"With no business training, no hereditary training of thought, and with all of her experience gained by her mistakes, is it not remarkable that there are any successful business women from the leisure class?

"The great lack among women with whom I have come in contact seems to be executive ability; and this is well expressed in the following quotation from a recent magazine article: —

"'The whole gain of our civilization, and of woman's highest welfare, lies in making the present need bend to the future requirements, in accepting present loss for future gain, in taking long and longer chances. Women need surely to study these duties more scientifically, more as a whole, instead of this daily whittling away of their lives over the separate parts. The great object of life is life — restful, strong, beneficent — and we women who desire earnestly "the best things" for ourselves and our households must do less plodding and more planning; less sacrificing and more intelligent contriving; we must have less guess-work and more accurate knowledge. We need to gird ourselves daily for a climb to the "thinking levels," where we may feel the cool breath of heaven and receive inspiration from the larger view.'

"This paragraph, though referring more especially to the household, applies equally to business women, whose 'household' includes many strange natures, and whose opportunities for work may give them a wider range of influence."

The Misses Tucker and Babcock, florists, say: "The fact that four women have been cited as having gone into bankruptcy, seems a slight foundation for a discussion of woman's fitness for business life. These women, for instance, had, not improbably, undertaken to carry on enterprises which circumstances had thrown on their hands, and which were, possibly, in unprosperous conditions when taken up.

"Surely there are cases innumerable of other women in trade who successfully conduct the business left to them by the death of husband or father, relying only on their native common sense to manage affairs for which they were never educated, in addition to the burdens they are expected to shoulder as a matter of course.

"The many milliners and dressmakers who have made money must have had excellent business ability, for most have started from very

small beginnings. It can hardly be asserted that in business for which women have been fitted or prepared they fail more often than men.

"When a woman fails, in the new lines into which circumstances have forced her of late years, to successfully compete with man, it is, perhaps, because she attempts the impossible. The difficulties she contends with are many — more than those of a man in the same circumstances. Compared to the man, the woman is like a pioneer who clears the lands, hews the logs, and builds the house with rough tools, and with the materials found at hand. The man, on the other hand, has been properly taught to first draw his plans, using the accumulated result of civilization, and works with a cleared lot, prepared lumber, and associated labor.

"A highly cultivated, intellectual woman starts in business without education or experience in the work she undertakes, and with little or no capital to invest. She is averse to recognizing her limitations, and tries to hold on to social and home duties, while competing with men on their own ground, and under difficulties which men rarely have to face.

"If she is working for an employer, her hours are of reasonable length, and she can take a proper amount of recreation; but, if she is her own mistress, her hours are practically without end, her meals are hurried and insufficient, and every thought is so concentrated on the struggle for existence that recreation and repose are lost sight of until a case of 'nervous prostration' teaches her that her brother's methods are more practical than hers, and that it pays literally to spend a reasonable amount of time and money for amusement and appetizing food.

"If the time ever comes when women are trained to the work they undertake, instead of starting on a capital of 'intuition and pluck' as so many have done — and successfully, too — they will learn to systematize their work and their play, and will leave such phrases as 'I haven't time!' and 'I'm rushed to death!' to those who make a business of society."

K. C. Budd, architect, says: "The chief difficulty of women in business is that they are seldom properly trained in the beginning. From the seamstress, whose work is more or less inefficient, as contrasted with that of her brother, the tailor, up through all the grades, this defect is found. Unfortunately, she herself is seldom conscious of this failing. She blames the world for owing her a living, yet failing to pay her as well as it does a man, and continues to tantalize her employer with her unworkmanlike ways. The education and training calculated to give her systematic ways, and a clear under-

standing of her own powers and limitations, will be of value in any condition of life.

"Kipling paints her in the 'Eathen.' Let a woman once realize that she must be 'gettin' rid of doin' things rather more or less;' let her resolve that, whether it is possible or not, she will do it. As each day begins, she will feel that the 'Master of all good workmen has set her to work anew,' forcing her work to a higher standard, nearer to that artistic ideal when—

"'Each for the joy of the working and each in his separate star
Shall paint the thing as he sees it, for the God of things as they are.'

And the world will certainly be the richer for her existence, whether she herself succeeds or fails in making a fortune."

Floride Green, photographer, says: "If success means the ability to support herself, woman has answered the question; if it means providing for those dependent on her, she has succeeded at that again and again; if it means building up a commercial business, she has certainly accomplished that. Few women go into business until forced by necessity, and that usually means a start without capital. With this handicap, business after business, entirely owned, managed, and carried on by women, has been built up and has grown.

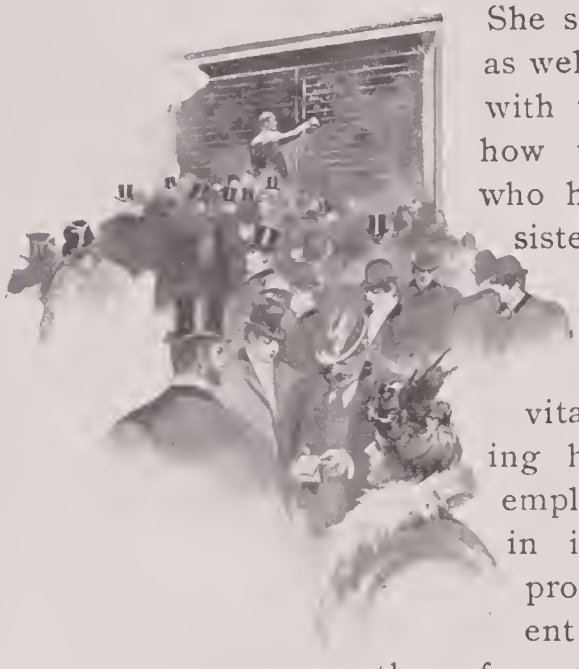
"To me, no work seems so well adapted to women as photography, and no woman is so well adapted to photography as the American woman, for she is the blending of many nations. To be a successful photographer, she must have the determination of the English, the cleanliness of the Hollander, the chic of the French, the discrimination between light and shades of the Italian, the love of lines of beauty of the old Greek, and the commercial instinct of the American.

"For some years, I was the only woman who had a studio in New York. Now, besides Mrs. Kasebier and the Misses Selby, there are several others who are doing as much work and as good work as the men whose studios they took. In Washington, no one is more of a success than Miss Frances B. Johnston, and in London, none outranks Miss Alice Hughes."

THE AMERICAN BUSINESS WOMAN

By CHARLES A. CONANT

THE conditions of to-day, especially in cities and towns, are very different from those of a half century or a generation ago, when life was more simple in its organization. It is of the first importance that every woman, whatever her present condition or future prospects, should know something of the simple rules of business. She should know the value of money, how to keep it as well as how to get it, how to deal with banks, and with trust companies, how to make investments, and how to protect herself against plausible swindlers who have wrecked the fortunes of so many of her sister women.



Knowledge of business methods is almost equally necessary for the poor woman and for the rich woman. For the poor woman, it is a vital aid in making her way in the world,—in making her services useful where she is employed, in employing her earnings to the best advantage, and in investing her savings in the safest and most profitable manner. For the woman of independent wealth, even if she is surrounded to-day by the safeguards of family, there may come a time when the management of her fortune will demand some of her own attention. Cases in which relatives or friends who were trusted, or at least supposed to be faithful, have taken advantage of ignorance and indifference, have been too numerous to justify either man or woman in neglecting their business relations. The man or woman who seeks a life of ease, social diversion, or literary culture, can, perhaps, safely intrust many details of his or her business affairs to others; but some degree of supervision should be exercised over one's affairs, and such supervision should be supported and directed by intelligent knowledge of investments, bookkeeping methods, and the laws of property.

The practical woman, moreover, however great her wealth, and however little time she cares to waste upon its management, will find a knowledge of business methods of the highest importance in making herself useful in the world through her charities. The difference

between a knowledge of business methods and of the character of investments, and ignorance of these subjects, on the part of women, has often, in enterprises of charity and philanthropy, made the difference between success and failure. Failure in cases where a profit is expected, cannot be excused upon the ground that some good has been done. Enterprises of such character are subject to the law of competition. What is beneficial to the community will prove profitable by attracting patronage, and that which is employed in a wrong direction will prove its comparative lack of value by its lack of appeal to popular wants.

In the articles which follow, will be set forth what are the legal relations of the business woman, whether married, widowed, or maiden; how she should keep her bank accounts; how she should deal with trust companies, and savings banks; how she should make investments, and how she should seek to protect them against fraud, and loss. It may be stated as a preliminary requisite for the success of the business woman, that she should know the amount of both her income and her outgo, and that she should be systematic in her record of them. Education in business methods should begin in girlhood. Many a woman would have been saved much humiliation and suffering, if she had been taught at school some of the rudiments of bookkeeping, banking, and investments, even at the expense of more ornamental branches of learning, too often forgotten after leaving school. No budget of money received and spent is too modest to warrant one in neglecting to keep a small cash account. The child, as soon as he or she appreciates the value of money, and is allowed to earn and to spend it, should be furnished with a small book ruled for dates, items of income and expenditure, and dollars and cents, and should be told to enter on one side the money he receives, and on the other, the money he spends. Even if these first entries are limited to twenty-five cents, for helping to weed the potatoes or for washing the dishes, and the expenditures amount to only a few pennies for candy or marbles, the opening of an account will lay the foundation for system in one's methods, and for keeping a true balance between receipts and expenditures in later life. There may be occasions when unusual traits of miserliness in the child may suggest a different policy; but for the great majority of children, it is well that their training in the hard realities of the struggle for bread should go at least as far as a knowledge that one should keep his expenditures within his income. It will be easy, with a small account of this character, to encourage saving in order that a favorable and growing balance may always be found upon the credit side of the account. Then, when these savings amount to a few dollars, the child

may well be introduced at the savings bank, and stimulated to feel pride in keeping his or her own bank account.

For the more mature woman, and the mother, system in money matters will be not only useful to herself but of great assistance to the father and bread-winner, in meeting the demands of family life. Several separate accounts may perhaps be profitably kept by the wife in the family. A separate account of all expenses in the conduct of the household will throw light on necessary retrenchments, or on possible opportunities for larger expenditure, and will at the same time constitute a useful record as to the date of expenditure. A separate account of personal expenses is advisable for each member of the family. If the wife is fortunate enough to have a fixed allowance, one side of her account will exhibit the amount she receives month by month, and the other side will show for what she has spent it. The system of keeping the household and personal accounts separate will aid her also in retaining for her personal use all of her allowance, and in reimbursing herself on this account for any expenditures for household purposes which she may make, in emergency, from her personal funds. An account of personal expenses can be kept, even where there is no fixed allowance to the wife. She should enter each separate sum given to her by her husband, or received from her own fortune, if she is fortunate enough to have independent resources.

For the woman of considerable property, it is especially desirable that there should be a systematic record of what she has, of what she receives in income, and of what she pays out for the expenses of maintaining the property. These matters will sometimes be in the charge of a lawyer, agent, or steward, but this should not prevent the woman from keeping in her own hands some memorandum which will afford exact knowledge of her income, from what it is derived, and how it is spent. Each separate piece of property should be considered by itself, with a view to determine its earning powers, and whether it is worth keeping or will better be changed for something else.

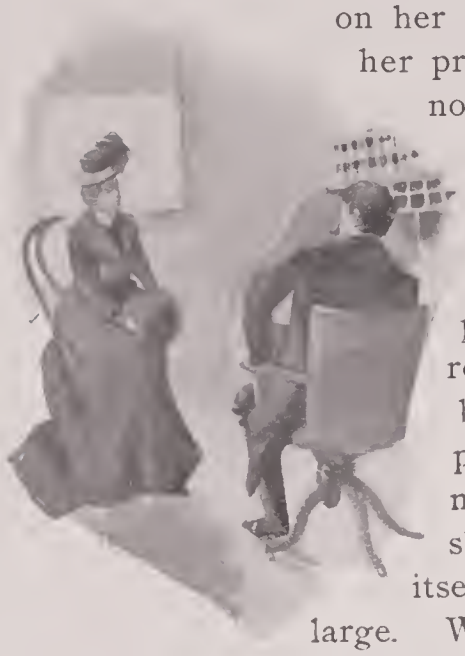
It is advisable that the women of wealth, as well as persons of moderate means, should save something from their incomes. It is not necessary to repeat here all of the reasons given by moralists and philanthropists as to why even the poorest should seek to lay aside a small part of their income for emergencies, and for investments which may enable them to live more comfortably in later life. It is often thought that the woman of wealth can afford to spend all of her income. This, however, is far from being the case in the usual sense of the word "income." All men and women having property which they desire to maintain, should at least set aside a certain percentage each year to cover the decline in its value. This is what is called

a "sinking fund," in a mill or factory, where great miscalculations would be made, if the machinery were treated as retaining full value for many years and dividends were consequently paid without deduction upon the net business done. It would be suddenly discovered some day that the old machinery had lost its value, and that nearly the whole capital, which was counted upon to provide the income, had disappeared. Men or women are likely to find themselves in the same position,— and often the discovery will come as a sudden shock,— if they undertake to spend every penny paid over to them for rentals, or as the income from investments. The discovery that a house needs thorough repairing in order to keep it in condition for renting, the announcement that a railway has suspended the payment of dividends, or the rise of prices in proportion to a fixed income, will all present problems that will be especially troublesome to a woman, if she is accustomed to spend every penny received from her investments.

Even where the property is itself of a high quality, accidents often occur which deprive it for a time of income-paying power. A house which has paid a good rental may stand vacant for several months, or even for years. A railway which is earning large dividends may suspend them in order to use its entire earnings for extension. In such cases as these, the person who is accustomed to spend her entire income, will, when she finds her dividends reduced, feel the pinch of poverty. It would be much better to live upon a scale well within one's income, and to accumulate a surplus fund, as banks and insurance companies do, to tide over periods of impaired resources. There are also emergencies in life which call for special expenditure that should not be disregarded. Illness, with its attendant large bills; marriage, with the expense of a *trousseau;* death, with its sad charges, are likely to make demands which are embarrassing, even for the person of wealth, if she is accustomed to employ all of her income in the ordinary expenses of living, dressing, and entertaining. Such expenses can be met from one's principal, but this impairs the income for the entire future, and creates a condition of poverty very different from that which necessitates the expenditure of a part of one's surplus, saved from the income of previous years.

Careful calculations should be made in advance as to probable income, and expenditures should be kept well within it. Where a woman of means manages her property through an agent, she should enter on the debtor side of the account each check which she receives from him. Whether the records regarding investments are kept wholly by the agent or are kept by the owner of the property, they should be separate from the personal account. The checks received from the agent usually represent the net income from property, after deducting expenses, and might

properly be entered on the debtor side of the account. When the record of property is kept by the woman herself, however, she should make, on her books, formal transfers from the account dealing with her property in investments to her personal account. It will not be necessary to keep separate bank accounts, or two separate sums of money in one's hands, if the two book accounts are properly kept and balanced. For instance, a woman receiving $50 in cash for rental, could take it directly to the dressmaker to pay a bill, provided she credited her property account with the receipt of the rental, transferred the amount of the books from one account to the other, and charged her personal account with the expenditure for the dressmaker's bill. It is the books, in other words, which should be kept separate,—not necessarily the money itself or the bank accounts, where the amounts are not large. Where the properties are extensive, it may be desirable to keep a separate bank account, and to draw checks between one account and the other in order to maintain the distinction. The method of beginning an account at a bank, and information in regard to carrying it on, will be set forth hereafter. Care should be taken in dealing with checks not to make duplicate entries of a single item. If, for instance, a check is entered as a receipt, it should not be again entered as a receipt when it is deposited in the bank, and its proceeds are received in cash. The bank account should be carefully kept in itself, but so far as it is related to the property and to personal accounts, the credits at the bank may be treated as cash and not separately entered.



While the business woman should have a knowledge of her property, how it is invested, what returns it yields, and how property is managed, it by no means follows that she should undertake to attend to all of her business herself. It is much better to employ an agent for the renting of houses, to employ a trustworthy broker for dealing in stocks, to retain a lawyer for drawing important papers or meeting legal difficulties, and to employ a trust company or a banker for a variety of business operations. The woman who undertakes to do all of these things herself will meet many obstacles and be subject to many petty deceptions and frauds which are not often attempted in dealings with experienced agents. The real estate agent knows all of the tricks of tenants, and knows the laws which govern rentals. The business woman, while it is desirable that she should know some of these things, could hardly expect to know them as well as does the agent. The same rule will apply to other transactions. Where

the services of a competent agent can be obtained at small charge, he should be employed in transactions of a technical nature. There are cases in which a woman is able to make a specialty of some of these occupations. If she owns many houses, and wishes to give much of her time to their care and supervision, as a means of filling her life, such action may be justified, but in that case she must take the place of the agent in technical knowledge, and must be prepared for mistakes at first, for careful study of details, and much consumption of time. For the woman of independent resources, even where they are small, the modest charges made by competent and trustworthy agents will be more than offset by the protection they will afford against blunders, and the greater the freedom she will enjoy for her family and social life.

There are many classes of investments which will be urged, with plausible reasoning, upon women with money. Many of them have merit, but some involve more care than do others, and some are more subject to business fluctuations. The woman who receives property suddenly, however,— whether through the death of her husband or by inheritance from some distant relative,— usually finds it already in the form of investments. She must then determine whether any of them are so unsatisfactory, unsafe, or troublesome, as to require their change into another form. Even where they are not altogether the best possible investments, it is likely to be found that a change will involve a greater sacrifice than the acceptance of what can be earned from the investments as they are. The management of real estate, and the principles in dealing in securities, will be discussed in future chapters, but a word may be said here of investments of a general character, which involve little risk or care for the investor.

One of the best investments for a woman having money that she wishes to save and increase, is to put it in the form of life insurance in one of the notably strong and great companies. If she is healthy and still comparatively young, the insurance may be upon her own life as profitably as upon that of any other; but if advanced in years, or of poor health or weak constitution, the insurance should be upon the life of husband, son, or daughter, or upon that of some other near relative. Whatever life is insured, she is to be named in the policy as the beneficiary. In taking life insurance for an investment, it is better to take a policy maturing in ten, fifteen, or twenty years, if the life insured should last so long, than to take a policy payable at death only. Yet, upon a policy payable only after the death of the person whose life is insured, the company is always ready to redeem the insurance upon perfectly fair terms, so that no serious mistake can be made, whatever form of policy is taken. One of the

advantages of putting money into life insurance is the certainty of being able to draw it out, after the first two or three years, upon terms the justice of which, in any particular case, is calculated with mathematical accuracy. Nothing else in business equals the nicety with which the true value of a life policy is ascertained, when a settlement of it is to be made, either before or after maturity.

If a woman investing in life insurance has the means to take a paid-up policy on the life insured, that is the best policy to take. But she should not too greatly reduce the amount of insurance merely to enable her to pay the whole premium at once. For should the life insured terminate much earlier than the average of such lives, the paid-up policy will have cost much more than if the premium had been a yearly one. If she has not money enough to take a paid-up policy, or prefers the chances of an annual premium, she can pay in advance as many years as her means permit, and the company will allow her interest on the advanced payments, and return the excess, if the insured life ends before the advance payments are exhausted.

Life insurance may be taken on the life of debtors, business partners, agents, trustees, or upon the life of other persons whose death would cause loss to the persons seeking the insurance. Under such circumstances, the client may insure the life of a lawyer; a litigant, or prospective litigant, the life of a witness whose testimony could not be replaced by that of others; a person supplying funds for the development of an invention, the life of the inventor; or the financial backer of any lawful enterprise, the life of a person upon whom the success of that enterprise depends. Any person seeking to insure the life of another, must have what is called an insurable interest in the life of that other person; that is, a good, substantial reason for desiring the life of that person to continue. For instance, a person having the possession, use, and profit, of real estate or personal property during the lifetime of another, may insure the life of that person, as an offset to the loss which the death of that person will necessarily occasion when it occurs.

Life insurance is almost entirely effected through agents of the companies. Such agents are very numerous, exceedingly persistent, and given to much exaggeration of the merits of their own companies and systems, with excessive depreciation of their rivals. Nevertheless, an applicant for insurance who listens and says nothing will find agents helpful in determining the best kind of policy to fit the particular case. Some companies are better than others, but all in the first rank are good enough for anybody.

Life insurance policies are good securities for loans. When the loan is desired on the security of a policy insuring the borrower's own

life, it can probably be obtained from the company itself on better terms than would be granted by an outside lender.

A system of life insurance based on assessments determined by the actual number of deaths among the insured, instead of a fixed premium based on the average death rate, has been very popular, because comparatively cheap; but it has failed under the severe test of long and actual experience, causing great loss, anxiety, and misery. While some of the assessment companies have broken down under bad or unfaithful management, others have fared as badly, though managed with great skill and fidelity; thus proving that the system is unsound under the very best of circumstances. These remarks do not apply to the weekly payment system known as industrial insurance, when worked by large and sound companies whose premium rates are fixed conformably to the principles for fixing annual premiums. Industrial insurance is more costly than is annual premium insurance, but the small weekly payment is hardly ever missed, and wonderfully lightens the always heavy burden of the poor when death comes to the insured.

Savings banks pay but small rates of interest, but when well established, well reputed, and well managed, are good and convenient means of investment. That form of savings bank known as a building association, which is actually a land bank, since its loans are made only upon real estate security, pays a higher rate of interest than does the ordinary savings bank. But the large, and general fall in the interest rate upon real estate loans, and the increased attractions and facilities offered to mortgage borrowers by other kinds of lenders, have cut largely into the field of building associations, and their importance has much declined. For those to whom, whether as investors or borrowers, the inducement and habit of making regular payments at short intervals are profitable, building associations still have their uses; but dealings with them should always be based upon a sufficient knowledge of how, and by whom, they are managed. For this reason, investments with, and borrowings from, a building association situated away from home are not to be commended.

Associations or companies formed to purchase land, to build upon it, and then to sell it off in houses and lots, often come to the attention of a woman having moderate amounts of money in lump sums, or able to make monthly payments for a considerable period. These are not safe investments for inexperienced persons, since the land is usually charged to the shareholders at a material advance upon its actual cost or value, and the expenses of management for a company or association, are generally much larger than where an individual is managing the employment of his or her own capital. The like

caution applies to investments in distant mining or other enterprises, in which shares are sold for small payments outright, or for a small payment down, and periodical payments thereafter. Any person who looks for large profits under the management of others must take large risks. This is apparently not true of well-established corporations, such as banks or insurance, trust or manufacturing companies; but the shares of such companies command a price that leaves only a moderate profit to the investor.

A good form of investment is a first mortgage, to the amount of not over seventy per cent. upon the well-ascertained value of productive or improving real estate. Here the lender must be sure that the title is good; that everybody concerned in the title is included in the mortgage, and that there are no unredeemed tax sales attaching to the property. The buildings forming part of the security are to be kept insured under control of the lender; all taxes due are to be paid at the time of the mortgage, and the lender should yearly ascertain from the tax officers the state of the taxes upon the property; for taxes have precedence over mortgages. If there is repeated difficulty in obtaining the quarterly, half-yearly, or yearly, payments of interest due upon the mortgage, the lender should not too long delay an enforcement of the terms of the mortgage.

Second mortgages habitually carry high rates of interest, but are unsafe for any but those who make a specialty of dealing with them. The holder of a second mortgage must keep informed of the state of the first mortgage, and be prepared to take it off the hands of its holder, lest the second mortgage be cut out by foreclosure of the first.

Chattel mortgages, which are mortgages on movable property left in possession of the borrower, are also unsafe investments for inexperienced persons, who are liable to find their money and security lost, and nothing left but the worthless paper on which the mortgage is written. To lend money on jewelry or other costly property deposited with the lender may be safe, but to take pledges for profit is to engage in the business of a pawnbroker, a trade requiring a license and subject to special regulations by law.

A precaution that should invariably be observed by a business woman in managing her affairs, is the taking and keeping of receipts for money paid. The preservation of receipts will often avoid dispute where mistakes have been made by tradesmen, and will always afford protection against a fraudulent attempt to collect money that has been once paid. Merchants usually send in their accounts on printed bill-heads, which should be receipted by their signature, or by that of a responsible agent, when the account is paid. In other cases, where

the person receiving the money is not a merchant or does not do sufficient business to have the proper stationery, the person paying the money should have blank receipts for signature. A form of these receipts is printed herewith. The receipt should give the date of the payment, the name of the person from whom the money is received, and the nature of the account upon which the money has been paid. The receipt presented shows that Mary Maloney rendered services to Mrs. Jane R. Smith, for which she received full payment up to the date of the receipt. Mrs. Smith appears to have filled out the body

Cripple Creek, Col., Dec. 22, 19....

Received from Jane R. Smith

Eighteen Dollars

in full for domestic service from Nov. 10, 1900

$ 18.00

Mary Maloney

of the receipt, leaving only the signature to be affixed by Miss Maloney. A person signing such a receipt should examine it to see that it sets forth correctly the amount received, the date, and the purpose of the payment. The use of checks in making payments affords some of the safeguards of a receipt, since a check cannot be collected without its presentation to the bank upon which it is drawn. The bank holds it subject to the order of the drawer, who can use it, if necessary, as evidence that a disputed payment has been made.

One of the warnings in regard to business which cannot be too strongly impressed upon women is that they should firmly refuse their endorsement for notes made by others. A person desiring to borrow of a bank often asks the endorsement of some friend, upon the representation that it is merely a formality, and that in order to comply with the requirements of the bank, two signatures shall be attached to the note. An endorsement of this character makes the endorser liable for the whole amount of the note in case the maker is unable or refuses to pay it. The endorser is legally liable and is

not permitted to prove against an innocent holder of the note that he or she received no consideration for assuming the obligation. The fact of endorsement is presumptive evidence that there was consideration, and the courts will not waive this presumption, to the injury of the bank or whoever may hold the note. While persons ignorant of business methods, and without large resources, might seek endorsements of this character innocently, it is rather a subject of suspicion than otherwise when they are sought by men in business. It indicates that their credit at the bank is not strong, and that if a note is accepted with the endorsement which would not be accepted without it, the bank looks to the strength of the endorser rather than to that of the maker of the note. A person endorsing a note for a friend, with whom he or she is not carrying on such business operations as naturally involve mutual endorsements, should consider that he has loaned the entire amount of the note, and that the chances of getting it back depend entirely on the willingness and ability of his friend to pay it. Careless endorsements for friends have wrecked many business men, and even large banks. It was endorsements of this character that brought William McKinley to the brink of penury some years ago, and led some of his admirers to raise a fund to protect him from ruin.

A promissory note is defined by Chancellor Kent as "a written promise, by one person to another, for the payment of money, at a specified time, absolutely, and at all events." These conditions demand special attention, because each embodies points of law which have been the subject of many judicial decisions. A note which does not conform substantially to these requirements is not a good note. It may be worth something as evidence of a contract in a court of law, but it is not a negotiable instrument, surrounded by the safeguards which the laws and the courts have created for such instruments. The note must be a promise for the payment of money. A promise to pay something else is not a note within the meaning of commercial law. The note must provide for payment at a specified time, which can be ascertained with certainty. A note that is uncertain in this respect, as provision for payment upon the death or marriage of another, or upon some combination of circumstances, is not a good note. The payment, moreover, must not be promised conditionally, but absolutely at the time, and for the amount, specified. Commercial notes are surrounded by certain safeguards of law, because it is desirable that they shall be easily transferable. It is largely for this reason that an endorsement upon a note binds the endorser, if there is no obvious evidence of bad faith upon the face of the transaction, when it is held by an innocent third party. To require the holder of a note to make

inquiry as to the consideration for the endorsements, would destroy its value as a transferable instrument and greatly fetter business transactions.

This statement of the character of a note will make it clear how persons unfamiliar with business are sometimes swindled by accepting notes that bring in outside matters, depriving them of their certainty of payment, and making them void as commercial paper.

An illustration of a note of this character is here shown. This note does not provide for absolute payment at a date named, but only upon some contingency which it would not be in the power of a third

$ 10 00 Evansville, Ind., July 12, 1900

Sixty days after date I promise to pay

to the order of Benjamin Small, Agent

Ten 100 Dollars

at in case such amount has been collected as commission upon sales

Value Received Hezekiah Green

No. Due

party, taking the note in ordinary course of business, to ascertain. Such notes are not good legal documents, but they are sometimes given to persons ignorant of business methods, with objects more or less fraudulent. A person receiving a note should examine it carefully, to see if it contains matter foreign to the promise to pay money at a fixed date and place, and without condition.

THE ELEMENTS OF MONEY AND BANKING

It is important to every young man or woman to have some knowledge of the mechanism by which business is done, and of certain rules and practices which touch all phases of business life. Among these are the functions of money, the principles of banking, the manner of doing business with banks and trust companies, and the methods of dealing in securities.

The character and functions of money have been the subject of much controversy, but, among careful students, there is to-day very general agreement upon the fundamental principles of monetary science. Metallic money is a commodity, as is wheat, or clothes, or shoes. When industry began to be specialized,—that is, when one man devoted his whole time to producing a single class of articles,—exchange became necessary. But barter, which is the direct exchange of what one man produces for what another man produces, involved many difficulties.

One man who made woolen shirts might desire a pair of oars, but the boat-builder might already possess a sufficient supply of woolen shirts. The fact that another man who made bows and arrows wanted woolen shirts would not help the matter much for the man who wanted the oars. These conditions introduced such complications into exchanges, that by degrees people came to accept in exchange for their own goods those articles which were most generally desired, in the hope of exchanging these most desired articles for anything else which they might happen to want. The most desired articles became a sort of intermediary between all other articles, because they could most easily be exchanged for all others.

The metals gradually took their place ahead of other articles as the intermediary in exchange, because they represented large value in small compass, did not involve expense for keeping, like cattle or sheep, which were at first used for money among agricultural tribes, and did not lose their qualities by the lapse of time. Silver and gold in time came to take the place of other metals among the more advanced nations, because they combined in the highest degree the qualities already mentioned, and were most convenient for transportation from place to place. If gold has superseded silver among the richest nations, it is chiefly for this reason,—that a given quantity can be put in a smaller place, can be transported for less money, and represents the article most eagerly sought by all men. It is for these reasons the most economical and the most efficient money in a wealthy society.

This explanation of the origin of money is reduced to its simplest elements, and naturally suits many of the steps in the slow process of evolution by which production by each man for all his needs gave place to the complex organization of modern industry, in which each man produces everything for exchange, and almost nothing for his own immediate use. The fundamental principle in regard to money is that it is a commodity, like other articles whose value rests upon the demand for it in relation to the supply. Fashion or law may modify in some respects the demand, and therefore affect the value of money, but law does not often prevail over the natural tendencies

of men to use what is most convenient and efficient as a tool for doing any sort of work. Silver and gold are the most efficient tools for making exchanges, and they cannot well be superseded by artificial efforts to impress their qualities upon paper or something else which does not possess them.

Silver and gold are useful chiefly as an intermediary between other things. These other things are largely articles which render direct service,—food for the stomach, clothes for the body, houses for shelter. Silver and gold have uses for ornamentation, but their use as money is as an implement for exchanging other things. There is need only for a sufficient supply of implements for such exchanges. Piling up the implements needlessly would be equivalent to piling up threshing machines where there were already enough for the work to be done, or like duplicating the supply of railway cars when those already available carried all the freight. The piling up of great quantities of silver and gold would not add to the world's real wealth. This principle was understood even among the ancients, who portrayed it by the fable of Midas, who desired that everything he touched might turn to gold. His prayer was granted, and he died in agony because the food which was served to him turned to gold at his touch, and even the water with which he sought to slake his thirst, turned into a solid golden mass when it passed his lips.

The moral of this fable is the modest part played by money in the transactions of daily life. There is need for enough money to carry on business, but an excess beyond this amount is only waste. What people really mean when they say they want more money, is that they want more wealth,—more houses to rent, goods to sell, stocks from which to draw dividends; that they may in turn acquire for themselves, not great stacks of metal, but more of other things that they desire,—fine dinners, good wines, handsome clothes, beautiful pictures, and valuable books. There is hardly a limit in human nature to the demand for these things, but this desire should not be confused with the desire for money. The reason for the confusion is that the possession of more money means for the individual command over more of other things, while the supply of money in the world remains the same; but if every individual had his supply of money doubled by the doubling of the world's supply, he would be no better off than before. He would find that every one who had anything to sell was asking twice as much as before. The process of readjustment to new conditions, if the supply of money were doubled, would enrich some and injure others, but it would enrich most those who were the sharpest speculators upon uncertain conditions and upon the ignorance or honesty of their fellow men.

It has been said that the law cannot give value to paper as money. A paper promise to pay money can be made acceptable, however, with or without law, if people can be convinced that the promise is to be kept. It is such promises to pay money on demand, made by people who are able to fulfill their promises, that contribute a large share to the convenience of modern business transactions. Under this head, come the manifold developments of the modern banking system. It is essential to the young man and woman who go forth to battle with life, that they should understand how this system originated, why it exists, and how it contributes to carry on the great mass of transactions which make up the business of to-day. A knowledge of banking methods is as necessary for the business woman as for the business man. It is necessary for any woman who has a money allowance of sufficient dignity to permit her to keep a bank account, and it may be valuable even for the woman who has relied upon her male friends in such matters, in case she should be suddenly thrown upon her own resources.

A true knowledge of banking rules, and the reason for their existence, is best obtained by a preliminary study of the purposes and functions of banking. These functions are a natural evolution from the use of money. Banks were born of the needs of business, and their functions have extended with the growth and the volume of business, and with its extension over new fields. Banks are as necessary to the conduct of modern business as is the water supply or the gas or electric lighting plant to the modern town. Every one in the community, even the man who has no direct business with banks, benefits by the extension of banking, because of the stimulus which it gives to all forms of business. Manufacturing would come to a halt if the manufacturer could not get his notes discounted and borrow currency from the bank to pay wages to his men. Money could not be transmitted from one city to another except at heavy cost, and savings could not be put at the command of those capable of turning them to use. A bank provides circulation and vitality to the business community, much as the heart and veins provide circulation and vitality for the human body.

A bank is created to perform for manufacturers, merchants, and all members of the community, a special service in supplying money when it is needed, in taking care of it when it is not needed, in prompting the economical and efficient use of money, and in increasing its power through credit. The loans made by commercial banks

are not generally loans to help people who need money for personal expenses. They are loans made in connection with business transactions. A manufacturer, for instance, starts out in business with a capital of $50,000. He buys raw material to the value of $30,000. He then has a fund of $20,000 with which to pay wages while working his raw materials into goods. When this money is exhausted, if he could not get help from the bank, he would be compelled to suspend operations and to wait until his goods were sold and paid for. When he sells his goods to a jobber or retailer, however, he finds the latter anxious to get an extension of time for payment until he, in his turn, has sold the goods to the final purchaser. If there were no banking systems to aid him, the manufacturer would be compelled to refuse this accommodation or to suspend work, leaving his employees idle until he received some money and was able again to purchase raw material and to pay wages. The bank, however, is willing to advance money to him upon the note of the jobber or retailer to whom he has sold the goods. The bank has a store of money for this purpose, which has been intrusted to it by depositors, and it also has the power to issue its own credit in the form of bank notes. When the manufacturer, therefore, presents the note of the jobber to the bank, the bank is willing for a small compensation to lend to the manufacturer the money needed to keep on buying his raw material and to pay his wages until the note is due. The note is given by the jobber or retailer, payable on a certain date, usually not longer than three months after the sale. The jobber or retailer, as the result of his sales, has the money when the note comes due. He receives notice from the bank that the bank holds the note, or he may receive this notice from another bank in his own city, to which the note has been sent for collection. If he is unable for any reason to pay the note, the man who sent it to the bank, the manufacturer, is bound to make it good. Thus the bank has a promise of at least two business men to pay the money when it is due. By this means, the entire mechanism of production, and the buying and selling of goods, is kept in steady operation instead of being subjected to a series of "fits and starts" through the delays which the manufacturer or merchant would otherwise suffer in turning their goods at once into money.

The operation of the banking system in aiding the community in business transactions will perhaps be made clearer by taking the case of the country storekeeper. He usually trusts the farmer for goods until the latter's crops are harvested; and this he could not do unless he was able, in turn, to secure credit. So he says to his farmer purchasers, "Give me your notes for three or four months, to come due when the crop is sold. I will take the notes to the bank, and with

your name and my name on them, I can get money to make my purchases in New Orleans or New York. If it was not for the bank, I could not trust you, for I could not keep up my line of goods without making you pay cash. The bank here helps me in getting money for your notes, and the bank in New York helps the people of whom I buy the goods to give me credit." Thus, the banking system bridges over periods of scarcity between crops. The farmer, instead of waiting until he has sold his crops for cash, obtains seed and tools when he needs them. He is trusted for them, or gives his notes to be paid later. The storekeeper, in his turn, instead of waiting until the farmer has cash with which to pay for his purchases, sells seed and tools to him at the proper time, and takes a note which is as good as cash at the bank. It is obvious that the abolition of the bank, or the suspension of its functions, would throw the community into the same state of paralysis as would the cutting off the water supply or the lighting service.

The question may be asked whether it is wise to encourage the lending of money and the use of credit,— whether the farmer and the manufacturer ought not to earn their money before spending it? The answer to this question is that the wisdom of the loan depends upon its use. The lending of money to a spendthrift, who is living beyond his income, is what is called in political economy a consumptive or non-productive loan. It was because many loans prior to the organization of modern machine industry were of this character that the Catholic Church discouraged money lending and denied the legitimacy of interest, leaving the banking business of the Middle Ages in the hands of the Jews. All lending at interest was called usury. But the growing needs of commerce found a way for getting around even the mandates of the church. As it was admittedly proper to make a charge for the transportation of money, a system of fictitious bills of exchange, drawn in one place upon another, was devised, and the charge for the transfer was made large enough to cover a liberal interest rate. As in many cases the transfer of the money never took place, bills of this character, which were only the cover for a direct loan, came to be called "dry exchange." Thus the wedge was driven deep into the wall of the old prohibition against interest, because business loans had come to be productive. This is the basis of modern banking,— that nearly all the loans made are for industrial purposes. The money is put to uses which return it again with a profit, instead of swallowing it up for non-productive purposes. When this use of money came to be the rule and not the exception, the church gradually relaxed the rules against usury. Between 1822 and 1838 these rules became a dead letter in consequence of several

decisions of the Holy See, that, pending a final reconsideration of the whole matter, confessors must not harass their penitents on the score of the sin of usury.

It is possible for large business houses to do their own banking, to some extent, and this is what was done in the beginning of organized industry. The first bankers were the jewelers and goldsmiths. They were capable of judging better than anybody else regarding the quality of coin and metal brought to them, and they had vaults for its safe keeping. They gradually discovered that they could afford, without risk, to lend a part of the large sums intrusted to them, because all of them would not be called for by their owners at one time. There was some distrust of the new system at first, and Sir Dudley North, an eminent English economist of the seventeenth century, expressed great disgust at being followed about the exchange by goldsmiths, who begged to have the honor of serving him. When his friends asked him where he kept his cash, he answered tartly: "Where should I keep it but in my own house?"

The goldsmiths who were most successful in attracting deposits, gradually made this the chief part of their business. Then it was found that instead of lending gold and silver it was more convenient for them to issue a note entitling the holder to gold and silver if he desired it. It was in the nature of a transfer order, but passed freely from hand to hand and became the basis of the modern bank note. The first bank notes of this character were not printed in full, like the bank notes of to-day, but were partly written, like the modern check. It was found that when the notes were issued by a firm of well-known character, they were generally accepted as readily as money would be, and were not presented for payment in coin except in final settlements, or for sending the coin abroad. In many cases, the holder of a note would himself deposit it with the banker to his own credit. The banker would then cancel the note, and by this operation extinguish the original debt, but would create a new debt to the depositor by entering the deposit on his books.

The simple explanation of the origin of banking indicates some of its benefits to the community. The use of money was economized, and such money as there was, was made more useful to the community. This latter result was due to the fact that money was no longer locked up in strong boxes, as Sir Dudley North kept his, but could be loaned to men who were sending ships to India, building mills, and employing labor. Thus the money, instead of lying idle, was put to its greatest use. Being put to use, it was possible to make a charge for its use, which is called interest. It became possible, also, by means of branch banks, to send the money from places where

there was more of it than was needed to communities where there was not as much as was needed. In Scotland, branch banks were sometimes established in poor districts, with the view of obtaining a future profit from the prosperity which it was known the bank would introduce.

Having given this brief explanation of the origin and purpose of money and banking systems, it will be well to describe the kinds of money in use in the United States, with the circumstances in which they originated, and the distinctions between their character and use.

The basis of the American money system is gold coin. This has been the case since January, 1, 1879, when the government began paying gold for its paper notes. The law was somewhat doubtful, in language, however, until the act known as the Gold Standard law was passed by Congress on March 14, 1900. This law declared:—

"That the dollar consisting of twenty-five and eight-tenths grains of gold, nine-tenths fine, as established by section 351, of the Revised Statutes of the United States, shall be the standard unit of value, and all forms of money issued or coined by the United States shall be maintained at a parity of value with this standard, and it shall be the duty of the Secretary of the Treasury to maintain such parity."

The meaning of this law, with the other sections which carry it into force, is that the money of the United States shall always be kept equal to gold. This was not the case from 1862 to 1879. It was thought necessary during the Civil War for the government to issue paper money, which was not to be redeemed until after the war. Such money would not be accepted as equal to gold, because it could not be exchanged for gold. The people who had gold, therefore, refused to part with it except for a larger amount of paper. The paper changed greatly in value from time to time. The influences which governed its value were partly the quantity which might be in circulation, and partly the probability that it would be paid some time in gold. This probability was increased or decreased in the public mind according to the victories or defeats of the Northern armies. The use of paper in this way, depending upon a promise of redemption whose fulfillment was uncertain, resulted in great changes in prices, and made business transactions uncertain. When the war was over, therefore, and it was no longer necessary to spend so much money for the army and navy, measures were taken from time to time to bring the paper money back to its value in gold. Its value rose from year to year, and an act was passed in 1875 providing for getting together a gold fund in the Treasury and for the payment of gold for paper on, and after, January 1, 1879. The result was that paper came nearer and nearer to gold in value until a few days before the New Year of 1879, when there was no longer any difference between them.

Gold, therefore, is the standard of value of American money. But there are not less than eight other kinds of money in use in the United States. What these kinds are and the amounts in circulation, and in the Treasury, on November 1, 1900, may be learned from the following table: —

MONEY IN THE UNITED STATES, NOV. 1, 1900 — HELD IN TREASURY AS ASSETS OF THE GOVERNMENT

KIND OF MONEY	HELD IN TREASURY AS ASSETS OF THE GOVERNMENT	MONEY IN CIRCULATION
Gold Coin (including Bullion in Treasury)	$242,670,175	$521,761,263
Gold Certificates	.....	215,595,969
Standard Silver Dollars	5,220,948	73,479,469
Silver Certificates	.. ..	421,380,745
Subsidiary Silver	5,641,098	81,035,187
Treasury Notes of 1890	84,540	65,478,460
United States Notes	11,605,955	333,295,061
Currency Certificates, Act of June 8, 1872	.....	1,780,000
National Bank Notes	6,318,390	325,375,258
TOTAL	$271,541,106	$2,139,181,412

This table shows that gold coin and bullion make up nearly half of the money supply of the United States. The total amount of gold is obtained by adding together the gold coin in the Treasury, the gold coin in circulation, and the gold certificates, making $1,080,027,407. The gold certificates are issued only against deposits of gold coin in the Treasury. The coin is not stated in the table, in order to avoid duplication, since the coin cannot be paid out while the certificates are in circulation. About $450,000,000, or more than forty per cent. of the gold, is actually held in the Treasury. Examination of the bank reports for September 5, 1900, shows that additional gold to the amount of $197,140,172 was then in the vaults of the national banks, without counting what may have been in state and private banks. Gold coin does not circulate freely in ordinary business. The American people have become accustomed to paper money, and they consider it more convenient to carry large amounts in paper than in gold. The gold certificates were issued for this reason. They entitle their holder to the amount of gold promised by the certificate. The lowest denomination of gold certificates is $20. They do not find their way largely into general circulation, but large certificates, for

$1,000, or more, are much used by the New York banks in settlements with each other and with the branch of the United States Treasury in New York. A large part of the gold money in the country remains in the Treasury and in the banks, as a guaranty of their ability to pay gold when required.

The standard silver dollars were coined under two laws of 1878 and 1890, requiring the Treasury to make purchases of silver bullion for this purpose. It was thought by the supporters of the gold standard that these regular purchases of silver by the government—amounting to a minimum of two million ounces per month under the law of 1878, and to $4,500,000 per month under the law of 1890—were introducing into the circulation too large an element of silver in proportion to gold. A law was accordingly passed November 1, 1893, suspending further purchases of silver, and none is now coined (1901) except the remnants of what was then on hand.

The silver certificates are like the gold certificates,—representatives of the coin, which entitle the holder to coin if he desires it. The subsidiary silver consists of the dimes, quarters, and halves, which are used for small change. They are coined out of bullion purchased by the Treasury, and the entire amount in the country is limited, by the law of 1900, to $100,000,000.

The Treasury notes of 1890 were issued in purchase of silver bullion, and the whole amount issued was $155,931,002. They were redeemable, like silver certificates, in silver dollars, but they have been canceled when redeemed in this way. This has greatly reduced the amount outstanding, and the law of March 14, 1900, directed that they should all be retired and canceled when received into the Treasury. The silver dollars for which they are exchanged take their place in the circulation, and these silver dollars may be deposited in the Treasury in exchange for silver certificates. The entire process is for the purpose of simplifying the currency and having only one form of paper secured by silver, instead of two forms.

The United States notes are the paper money which was issued to carry on the Civil War. The amount authorized was $450,000,000. Congress directed their gradual retirement by a law of 1866, but later laws forbade the Secretary of the Treasury to retire more of them, and directed him to pay them out and to keep them in circulation whenever they were received into the Treasury. The amount outstanding, when the last law of this sort was passed in 1878, was $346,681,016, and at this amount they have since remained.

The currency certificates are simply the evidence that United States notes have been deposited in the Treasury for safe keeping. These certificates were issued for the convenience of the banks in dealing

with large amounts of money. Their issue was suspended by the act of March 14, 1900, and they will soon disappear from circulation.

The national bank notes are issued by the banks, and a full description of their character is more complicated than that of some of the other forms of money. Bank-notes are issued in most countries upon the general credit of the banks. The safeguards required are usually that the bank shall keep a certain percentage of its outstanding notes covered by coin, and that the remainder shall be secured by its general resources. This has been found to be a safe system in European countries, because the notes are issued there in most cases by a single large bank, which does the entire banking business of the country so far as the issuing of notes is concerned. Such banks are the Bank of France, the Imperial Bank of Germany, the Austro-Hungarian Bank, and the Imperial Bank of Russia. The Bank of France, on October 25, 1900, had 4,022,608,955 francs ($800,000,000) in notes in circulation and a gold reserve of 2,292,888,026 francs ($440,000,000).

A different system of security for the notes was, for a variety of reasons, adopted in the United States. The United States has no bank possessing exclusive privileges, but permits any body of five citizens of good standing, and under certain prescribed rules, to found a national bank. This in itself affords some reason for requiring greater safeguards than would be necessary where there is only one bank, which is subject to the constant scrutiny of the banking and business community. The form of security adopted in the United States, however, was the outgrowth of the needs of the government in the Civil War. The government had to borrow great sums of money to carry on the war. The issue of paper money injured the credit of the nation, and it was difficult to sell at a proper price the bonds which were issued for the purpose of borrowing money. It was accordingly decided to make a market for the bonds, by authorizing banks to use them as security for the issue of circulating notes. The national banking system was established, with the privileges of note issue which it involved, for the purpose of inducing the banks to buy the bonds. The system did not at first prove very attractive to capitalists. A new and more effective plan was then adopted to compel purchases of the bonds and the issue of national bank notes. A tax of ten per cent. a year was laid upon the circulation of the existing banks that were chartered under state laws. The result of this tax was to drive the state banks to give up their circulation or to reorganize as national banks. They could not afford to pay ten per cent. a year for the privilege of keeping their notes in circulation, for this was much more than they could earn by lending them. They accordingly entered the national system in many

cases, the bonds were sold to them in large quantities, and the bank-notes were issued upon the bonds.

The notes were profitable when capital was scarce and the rates for money were high, and the bonds were selling for no more than their face value in paper money. When the war closed, however, the bonds rose rapidly in value, partly because of the better credit of the government, and partly because the rates of interest paid on the bonds were higher than could be earned with equal safety by lending money in other ways. This caused a premium on the bonds. That is, it became necessary to pay something more than $100 for a bond of $100 paying five or six per cent. interest. The bank was only authorized to issue notes upon the bond to the amount of ninety per cent. of its face value. If the bond went to a price of $134, as has actually occurred with some of the four-per-cent. bonds, the banker would have to invest this amount in gold, or money equal to gold, in order to get circulating notes to the amount of $90. He would, in other words, get notes to lend equal to only two-thirds of the money with which he bought the bonds, and which he might otherwise have lent directly. He got the interest on the bonds in addition to the amount earned by lending the notes, but the two amounts combined came for a time to be equal to little more than the amount which he could earn by lending the money directly, and sometimes to less than this amount. This led the banks to reduce their circulation until it fell as low as $125,000,000 in 1891.

Other bond issues led to the increase of the bank-note currency later on, but it was not until the act of March 14, 1900, that there was a considerable increase, within a short time, in the amount of notes issued. This law authorized the issue of notes to the full face value of the bonds, instead of ninety per cent., and authorized the issue of bonds paying only two per cent. interest. These bonds had the advantage that they could be bought at a premium which was very small, and therefore did not require a large investment of money above their face value. These provisions led to an increase of the bank-note circulation from $249,434,278 on March 1, 1900, to $328,335,973 on October 1, 1900.

The currency of the United States, therefore, consists of nine different forms of money: Two — the Treasury notes of 1890 and the currency certificates — are in process of rapid retirement. Two other kinds — the gold certificates and the silver certificates — are the paper representatives of metal. The remaining forms are gold coin, silver coin, subsidiary silver, United States Government notes, and national bank notes. It is doubtful if any greater simplification could be introduced into the currency, unless by the entire abolition of the

United States notes and the issue of national bank notes upon a form of security different from that now required. Many financiers and students have advocated this step, but it has encountered much opposition, and will not be adopted until it is well understood.

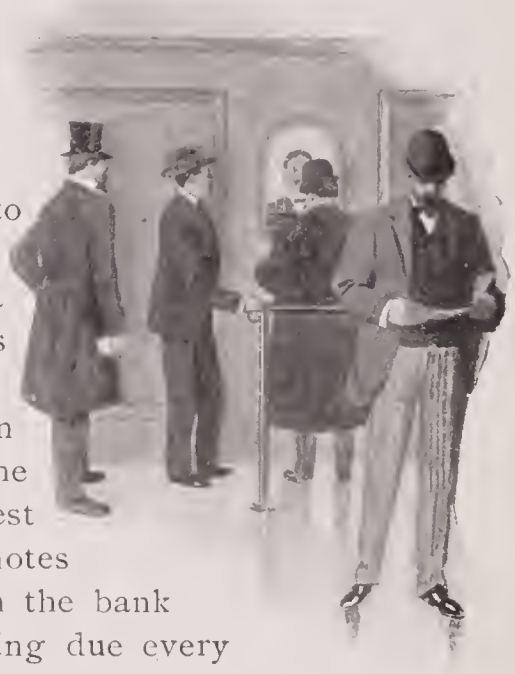
A bank-note differs from government paper money in the sense that it is a promise of the bank to pay money on the demand of the holder of the note. The money that is promised is, in most cases, silver or gold coin, but in the United States, it may be government paper money. The knowledge that a bank-note is only a certificate of indebtedness, and not strictly money in itself, may be important in a good many relations of life, as well as in the discussion of abstract monetary problems. It will at least prevent such a ludicrous mistake as was made by a crowd of Irish peasants, near the close of the last century, who sought to bring vengeance against the Beresford Bank in Dublin, because Mr. Beresford had been an active supporter of the British crown. They got together a lot of notes of the bank and made a bonfire of them, under the impression that they were burning up Mr. Beresford's money and bringing about the ruin of the bank. On the contrary, they were destroying the promises of the bank to pay money, and the bank was better off by every shilling of the notes thus destroyed.

The question: What constitutes legal tender? is often important in business transactions which become the subject of legal controversy. The law makes certain forms of money legal tender in payment of debt, and does not give this function to other forms of money. Gold coin, silver coin, and United States notes, are legal tender for debts. Gold and silver certificates, and national bank notes, are not legal tender between private individuals, although usually accepted in ordinary transactions. Subsidiary silver is legal tender only for amounts of $10 A creditor may refuse to receive gold or silver certificates or bank-notes in payment of a debt, and the debtor would be obliged to prove that he had offered legal tender money in payment. What constitutes legal tender and what does not is of little importance in business transactions while all forms of money are equal to one another, but it would become of importance in case any discredit should be cast upon any form. This happened with the issue of government paper money during the Civil War, and out of it grew the legal tender cases, which were the subject of much controversy. There was grave doubt whether Congress had the power to impair the value of contracts, by making government paper money a tender where gold and silver coin had formerly been the only legal form of money. The Supreme Court finally decided, however, that the Government of the United States had the right to issue paper money and to make it a legal tender for all debts.

Having described the different forms of money in use in the United States, it remains to point out a function of banking which has become more important, in some respects, within the present generation, than the loaning of money or the issue of bank-notes. This is the use of credit. The function of a bank in making business transactions easy and convenient has already been referred to. This function consists chiefly in converting forms of credit which would not serve readily as substitutes for money, into forms which can be used for nearly all the purposes of coin or currency. When the manufacturer receives from the jobber or retailer a note in payment of the goods sold to him, that note is a form of credit. It is not a form, however, which the manufacturer can use readily as money. He cannot pay it to his hands in wages, partly because the note is not broken up into the proper sums, and partly because, even if it were thus broken up, employees could not readily pass such notes as money in buying their groceries and clothes at the shops. It is the business of the bank to take this note, which is a title to wealth, and to put it into a form which will make it useful. In the infancy of banking, the easiest way of doing this was by the issue of bank notes. The progress of popular education in the use of banks has gradually diminished the importance of the bank note and other forms of currency, and has increased the importance of bank accounts.

The great volume of obligations of banks does not consist in the notes they issue, but in the deposits which they hold. The two obligations are of substantially the same character. The difference consists in the fact that the man who has a deposit has a check-book, which contains blank notes upon the bank, which he can fill in at his pleasure, up to the limit of his deposit. It is a safer and more convenient form of credit in many respects than if the bank gave him its notes in return for his deposit of currency, or than the promissory notes of his customers. The bank makes its loans in the same way. When the officers consent to loan a man $10,000, they do not usually hand him the currency. They simply transfer to his credit on their books the amount loaned. If he needs the entire sum at once to make a single payment, he can draw a check which will entitle the person in whose favor it is drawn to take the money from the bank. But in the great majority of cases, he draws parts of the amount from time to time, as the necessity arises. His checks upon this account are offset, so far as the resources of the bank are concerned, by deposits from other people. It may even happen that the man in whose favor he draws his check will deposit it at the same bank. The result in that case will be that the net liabilities of the bank to depositors will not change, but the liabilities will be transferred from one patron to another.

The business of the banks is chiefly with business men engaged in manufacturing or selling goods. Their loans to such persons are usually secured by commercial paper, in the form of promises to pay definite amounts on set dates. There is another form of security, however, which has grown in importance in recent years. This is the deposit with the bank of transferable stocks and bonds issued by governments, railways, banks, and manufacturing corporations. In such cases, the bank can afford to be comparatively indifferent to the solvency of the borrower, because in case of his default, they have simply to sell the securities to protect themselves from loss. The principal item on the side of the assets of a bank, besides its cash reserve, consists of its loans and discounts. These are the notes of business men and the securities pledged for loans. It might seem at first that these are doubtful resources to form the chief wealth of the bank, but in fact, they are the best resource there is, except coin and currency. These notes are coming due every two or three months. When the bank has a considerable number of them, some are coming due every day. The bank loans only to men of character and good credit, so that it is able to rely upon a steady stream of money, or its equivalent, through the payment of these notes from day to day. This inflowing stream permits it to maintain an outflowing current in the form of new loans and advances. The business of this sort done by the national banks of the United States is classified as loans and discounts.



The term "discounts" refers especially to the notes of business men, from which the discount is deducted when they are accepted and the money is advanced by the bank. Discount is the charge made by the banks for putting money or its equivalent at the immediate command of the man who sells the note, while the bank awaits its maturity before being able to collect the amount from the maker of the note. Discount is a form of interest, but it is calculated in a slightly different way. In its origin, it is an outgrowth of the hostility of the early church to direct loans of money at interest. Sales of goods were made, to be paid for at some future date, and the seller would then make a discount for payment in cash. This natural trade arrangement, in the face of canonical prohibitions against interest, is one of the best proofs that men will not lend money, any more than any other article, without getting in return a part of its product. The system of discount adopted by banks is to calculate the interest on the principal amount to be discounted, and to deduct this amount from the principal.

The balance left by the deduction is then paid to the borrower or transferred to his credit. This method of calculation differs from the true discount by a small proportion, and adds to the profit of the bank.

The term "loans" is used loosely in the United States to cover all forms of money-lending by banks. So far as it is distinct from discounts, it refers to the loans which are secured by the pledge of stocks and bonds. Loans of this character are generally known in European banks by the name of "advances," meaning that the money has been advanced upon a security which the owner can reclaim by repaying the money.

The remarkable feature of modern banking is the growth of the deposits intrusted to the care of the banks, and of the loans and discounts, while the issue of printed bank-notes has increased but little. The authority to issue bank-notes under favorable conditions is necessary in countries which are not well supplied with banks, these not having a large fund of surplus capital; but in the great centers of business, money and currency in printed form have come to play a small part in comparison with bank accounts, checks, and similar forms of credit. At the New York Clearing House, transactions amounting to $54,695,030,382 were settled in the year ending September 30, 1900, by the transfer between the banks of only $2,730,441,810 in various forms of currency. An illustration showing how rapidly loans and deposits have grown under the national banking system, in comparison with the issue of bank notes, is afforded in the table which follows. The table illustrates at the same time the remarkable growth of the national banking system since its foundation, and of the banking business of the country.

NATIONAL BANK STATISTICS

DATE	LOANS AND DISCOUNTS	INDIVIDUAL DEPOSITS	CIRCULATION OUTSTANDING
January 4, 1864	$ 10,666,095	$ 19,450,492	$ 30,155
January 2, 1865	166,448,718	183,479,636	66,769,375
January 22, 1870	688,875,203	546,236,881	292,838,935
March 1, 1875	956,485,939	674,735,879	324,525,349
February 21, 1880	974,295,360	848,926,599	320,303,874
March 10, 1885	1,232,327,453	996,501,647	274,054,157
February 28, 1890	1,844,978,433	1,479,986,027	123,862,282
March 5, 1895	1,965,375,368	1,667,843,286	169,755,091
February 28, 1896	1,966,211,736	1,648,092,868	187,217,372
March 9, 1897	1,898,009,291	1,669,219,961	202,655,403
February 18, 1898	2,152,171,680	1,982,660,933	184,106,322
February 4, 1899	2,299,041,947	2,232,193,156	203,636,184
February 13, 1900	2,481,579,945	2,481,847,033	204,912,546

The significant fact about these figures is the great increase in deposits in proportion to circulation. The first years shown in the table were those when the national banking system was getting a footing, and before it had absorbed most of the banking business of the country. The comparisons of the greatest significance are those of the last twenty years. It appears that within this time the bank-note circulation has actually decreased by one-third, while deposits have increased threefold The movement of the bank-note circulation is not a fair index of the quantity of currency in the country, because of the peculiar conditions under which bank-notes are issued. The amount of money in circulation, however, in the United States increased from $973,382,228 on July 1, 1880, to $2,139,181,412 on November 1, 1900. The growth of deposits in the national banks, therefore, has been threefold, while the increase in the money supply has been but little more than twofold. Credit has thus taken the place of money to a large extent, but the growing wealth of the country has enabled it to acquire such an increased supply of money as is needed for the convenience of transactions.

KEEPING A BANK ACCOUNT

What has been explained in the preceding section regarding the kinds of money in use, and the mechanism and use of banking, affords a background against which can be sketched, more intelligently than would otherwise be the case, the every-day relations of the business and professional man and woman with banks. It is now proper to take up these every-day relations, and to show how to establish and keep a bank account, how to make deposits, to draw checks, and to transmit money to distant places. A study of these rules will prevent the ludicrous mistakes so often attributed by the humorous papers to women in their business relations. Two or three of these old anecdotes regarding women having business with banks will illustrate the popular opinion, which the business woman of to-day will be able to correct by a better knowledge of banking methods.

According to one of these stories, a young woman was presented by her father with a handsome bank deposit and a book of checks, as a Christmas present. She drew checks with great freedom, until she received a note from the teller of the bank asking her to call. He explained to her as delicately as possible that her account was overdrawn and should be made good. She paid the small balance, but seemed to think the fault lay with the bank rather than herself. "Don't let it happen again!" was the warning she gave the teller as

she caught up her perfumed skirts and moved majestically to the door.

Another young woman in a similar position could not be made to understand why she had overdrawn her account, when she had not used all the blank checks in her book. Still another, when notified that her account was overdrawn, is credited with having promptly made it good by drawing a check upon the same account.

There are several advantages in keeping a bank account, even when the amounts dealt in are not large. A bank does not desire to keep an account upon which a great many checks are drawn for amounts under one dollar, or for only two or three dollars; but banks outside of the Wall Street district of New York and other financial centers do not object to carrying a modest account, where checks for $10 and upward frequently appear. There is no objection in such cases to drawing checks occasionally for smaller amounts, which are to be sent by mail, or when there are special reasons for drawing them, but very small amounts should, when practicable, be paid in currency. The advice is sometimes given that the bank book shall be made a complete account of one's receipts and expenditures. It is hardly practicable to make it supersede the cash account, but if this is desired, all receipts, whether in currency or checks, should be deposited in the bank, and if currency is needed for small payments, the entire amount required for several such payments can be drawn upon a single check in favor of the owner of the account. The keeping of a bank account in itself tends to inform women as to business methods and the reasons for them. It leads to system and care in business transactions, and in giving one's signature to propositions which involve money.

Care should be taken in the choice of a bank to select one of old and established reputation, and one which pursues conservative methods of business. Inquiry among reputable men should result in proper information upon this point, but the inquiry should not be limited to a single person, since he might have an interest in some new and speculative bank, and therefore be biased in his judgment. There can be no benefit to the owner of a modest bank account in dealing with a bank that is engaged in promoting doubtful enterprises, or in taking large risks, however profitable its policies may appear to its directors and shareholders. A bank that goes out of its way to solicit deposits or to offer special inducements for them, is to be distrusted by a careful business woman. These statements apply strictly to commercial banks, which do not usually pay interest upon deposits,

and which allow deposits to be drawn by check without notice. There are other classes of banks, doing a proper and safe business, which pay interest when deposits are left with them for fixed terms. Their uses and benefits will be considered later. It is better in every-day transactions to employ a commercial bank which does not pay interest on deposits but which does not object to carrying a modest account. If a business woman has considerable sums of money, which she desires to keep in banks instead of investing in property or securities, she may properly keep these sums, which she is not likely to require for some months, in a savings bank or trust company, where interest will be paid, and, at the same time, keep a few hundred dollars, or a few thousands, according to the state of her fortune and the magnitude of her dealings, in commercial banks where she can increase or decrease the amount at pleasure.

What was said about banks in the preceding section relates largely to the national banks of the United States. The national banks enjoy some advantages in respect to security and standing over other banks, because they are incorporated under a law that enforces uniform rules throughout the United States. The mere fact that an institution is a national bank, even if it is a small one, in a remote locality, gives it a somewhat better and more definite standing in the financial centers than if it is only a state, or a private, bank. National banks cannot be organized with a less capital than $25,000, and could not be organized, previous to March 14, 1900, with a less capital than $50,000. State banks, in some of the states, on the other hand, may be organized with a capital as low as $5,000. While such a small bank may be carefully and safely conducted, there is a degree of security in size alone that is of some importance. A large bank is more likely to be conducted by men of large affairs and wide experience than is one whose owners and officers control only small sums of money. The element of age in a bank is also an important proof of its solidity. New banks are often founded by groups of wealthy capitalists, who attract large business through the influence of their names. This influence is legitimate, and these banks are often successful, but it should be borne in mind that prominent names are often used improperly by unscrupulous persons, and that the fact that a man of great wealth is a shareholder in a bank, does not place his fortune at the command of a bank in case of failure, except to the extent of the number of shares for which he has subscribed.

The security of state banks depends upon state laws, which cannot be set forth here in detail. Some of the states have excellent laws, and the state banks are among the strongest and most efficient of

their institutions. This is the case even in the City of New York, where there are also the strongest of the national banks. The other states where the state banks do a large volume of business are Pennsylvania, Virginia, Georgia, Kentucky, Ohio, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Nebraska, Kansas, and California. The private banks are also numerous in the states of the middle West, but the majority are institutions of small capital. Upon the whole, therefore, the preference in choosing a depository for any considerable sum of money, should usually be given to a national bank.

There is some advantage in choosing a national bank for keeping one's account, even if it should prove no stronger than a state bank, and though both should fail under substantially the same conditions. The affairs of the national bank would be administered by Federal law, which in this respect has been reduced to a more exact science than have some of the state banking laws. It was ascertained by Comptroller Dawes, in 1898, that banks which had failed under the national banking system, from its foundation, had, upon the average, paid dividends of about 75 per cent. This is considerably more than the average dividends paid by state, and private, banks. Some current ideas regarding bank failures, however, are much exaggerated. The average ratio of losses by failure amount to less than one-quarter of one per cent. of the deposits of all the banks under the national system. A failure now and then occurs in which the depositors lose heavily, but in many cases their chief loss results from the inconvenience of being deprived of the use of their money while the affairs of the failed bank are being adjusted. While some banks have paid less than the average of 75 per cent. found by Comptroller Dawes, others that have failed have paid more, or have even paid all of their depositors in full. The capital of a bank and its surplus fund are a sort of guaranty for the payment of the deposits. It often happens that this fund is visited with loss to the shareholders of the bank, while the depositors escape with little loss or none.

It is prudent for a woman who has several hundreds, or thousands, of dollars on hand, to distribute her deposits among two or more banks, differing as much as possible in the character of their business, and, if practicable, in their location. The maintenance of a certain sum in a savings bank or trust company will prevent risking all one's eggs in one basket, because in case of failure of the bank where one's current account is kept, a draft can readily be made upon the funds in other institutions. Something regarding the resources of a bank may be ascertained from its balance sheet, showing the proportion of cash on hand and the ratio of capital and cash deposits. A bank is justified, in loaning as much of its resources as can be

invested with safety; the rules for determining the limit of safety, however, are so complicated, and differ so much under different conditions, that they cannot well be set forth here in detail. It may be stated as a general rule that greater care should be exercised in choosing a bank in the newer states, where banks are under stronger temptation to lend upon speculative enterprises, than in the older states, where commercial banking has been reduced to a more exact science, and where, in any case, business risks are less.

The first requisite for doing business with a bank is to be authorized to open an account. In order to have the account accepted, it is usually necessary to secure an introduction to some officer of the bank. Some American banks accept deposit accounts without introduction, or guarantees for the depositor, but they will not usually pay money without the identification of the person asking payment. The banks of Great Britain, and of other countries of Europe, are much more particular in accepting an account. They usually require a person to be introduced by a reputable patron, and to present satisfactory references. Any person of standing known to bank officers can present and identify a person desiring to open an account at an American bank, but presentation by some patron of the bank is usually more graceful than that secured through an outsider. After introduction, the person desiring to open the account is introduced to the receiving teller, who gives him a "pass book," on which are to be entered the amounts of his deposits. He is then introduced to the paying teller and requested to write his signature in the "Signature Book." This book is kept for reference for the purpose of comparing the signature with those on checks, in order to determine whether the latter are genuine or not. If the intending patron has brought money or checks with him to deposit, they are properly entered on his pass book, and he is then free to draw checks against the amount.

A check is a written order upon a bank, directing the payment of a sum of money to the person named in the check, from funds at the bank to the credit of the maker of the check. A person who opens a bank account should obtain at the bank some blank checks or a book of checks. A check-book is preferred by the systematic man and woman of business, because it enables them more conveniently to keep track of their dealings with the bank. The check-book, besides containing the blank checks, has ruled paper at the side of the checks which remains in the book when the check is torn out. The paper next to each check is known as the "stub." Upon it should be entered not only the amount of the checks drawn, but the deposits made. Some persons rely entirely upon the bank to keep their account, but it is much safer and more systematic to carefully enter deposits, to add

them to the amount previously on deposit, and to deduct the amount of the checks which are drawn. The account of the depositor will then correspond exactly with the account kept against him at the bank, if both are correct, except in the case of certain charges made by the bank for doing business. These charges are small, and when a settlement is made with the bank, the depositor can easily determine, even without getting the details of them, whether any serious mistake has been made in his account.

The cut on the adjoining page shows specimen checks drawn on the National City Bank of New York, now the largest bank in the United States, with entries of deposits on the stubs. The parts in script are those which are filled in by the maker of the check when he draws it for the purpose of making a payment or for obtaining money for his own use. The name of the person in whose favor the check is drawn should be plainly written, and in some cases his residence should be given. The signature should also be as plain as possible, especially when the check is likely to pass through other banks than that where the account is kept.

The signature adopted by a woman who has an account of her own should ordinarily be distinctive. The best form is to write her Christian name followed by her family name,— "Jane R. Smith," not "Mrs. Thomas A. Smith." The latter signature might be mistaken for "Mr. Thomas A. Smith." In order to avoid successful forgeries based upon the study of personal letters, it may be desirable for a person having a large deposit to arrange with her banker to sign checks in a slightly different form from that used in social correspondence, but this precaution is hardly necessary in the case of a modest deposit. When the check is in favor of a particular fund, the official relation to the fund of the person in whose favor it is drawn should usually appear, as "Pay to Henry R. Tompkins, City Treasurer." In this case, a check payable to Mr. Tompkins personally, could not be so readily proved to have been paid to him as could the former, and it might, in any event, require more labor on his part in order to transfer the amount to the proper fund. This is as far as the specifications regarding the destination of the proceeds of a check should be carried. Checks sometimes specify that they are "in full of my account," or they contain other qualifications which it is no part of the duty of a bank officer to pass upon. Such checks are a source of annoyance to bank officers, and are often, and very properly, refused.

Checks drawn in favor of third parties should set forth the name of the person or corporation in a form in which it is usually employed by them, unless the drawer of the check has information that a different form is required or preferred. The owner of a bank

92

Brought forward 20,682.87
1,171.09
19,511.78

52 WALL STREET

No. 92 New York, *November 10,* 1900.

THE NATIONAL CITY BANK,

Pay to the Order of *William Royer, City Treas.*

Eleven hundred and seventy-one 09/100 Dollars.

The Emma Barton Endowment School,
by Clara Innis, Treas.

$ *1,171.09*

93

Balance 400.00
50.00
350.00

52 WALL STREET

No. 93 New York, *November 18.* 1900.

THE NATIONAL CITY BANK,

Pay to the Order of *Self*

Fifty Dollars.

$ *50.00*

Jane R. Smith.

account will often have occasion to draw money for his own use. In such cases he must fill out a check in substantially the same form as for a third party, and affix to it his signature. In filling in the name of the payee,—the person to whom the check is to be paid,—he has the choice of several forms. One of the best is to make the check payable to "self." This is a complete identification and the check cannot be paid to any other person. In adopting this form, he should cross out the words "to order of" so as to avoid the necessity of writing his endorsement in addition to his original signature. That is, the check should be made directly payable to "self" rather than "to order of self," as would be desirable if it were to be paid to the order of any other person. A check to bearer is usually written only when some trusty messenger is employed, and even then identification of the messenger is often required in American banks. The rule is different in English banking institutions, where the law authorizes the payment of a check to any person presenting it, without identification. A check to bearer should be written only just before its presentation at the bank, and it should not be employed where it is likely to pass through several hands. Such a check can be collected by any one into whose hands it falls, without such fraudulent writings or signatures as would be required if it were payable to the order of some particular person.

The amount for which the check is drawn should appear twice,—written in words and in figures. The wavering lines drawn before and after the amount of the check are for the purpose of preventing its being changed. If the check was simply for $50, and the entire space before the "Fifty" was left blank, it would be easy for a swindler to write in the words "One hundred and" and to pass the check in this form through innocent hands, or even to collect it at the bank on which it was drawn. This possibility of raised checks is guarded against by perforations, and in several other ways, where they are issued by banks or large business houses; but for the person with a modest bank account, ordinary caution in filling in the checks is likely to afford a sufficient safeguard.

Let us now take up the case of receiving a check in payment for some service rendered. An amusing, though somewhat apocryphal, story is told of William D. Howells, the eminent author, in regard to his first check.* He, not knowing what to do with it, asked a friend, and the friend took him to a bank and had an account

*A note from the present writer to Mr. Howells regarding this story brought the response: "I am sorry, for your sake, to say that the story in question is mostly a joyous fake."

opened in favor of Mr. Howells. The author felt very proud that he had a bank account, but presently it occurred to him that he would like to make some use of the money. He sought his friend again, and rather sheepishly inquired: "After you've got money into a bank, how do you get it out again?" It has already been explained how money is drawn from the bank by means of checks. It remains to set forth, however, what to do when one receives a check. The process is simple, but has several variations. If it is desired to use the money at once, and an account is already established at the bank, it is only necessary to endorse the check, and to present it to the paying teller. He may hand over the amount at once, if he is satisfied of the value of the check, and with the soundness of the person's account who presents it. A bank has a right, however, to refuse to pay a check until it has been collected. That is, if it is drawn upon a deposit in a Boston bank and is presented to a New York bank, the latter has the right to take time to send the check to the Boston bank for payment before advancing money for it. This right is likely to be exercised against a person with a small account, especially if he presents an unusually large check, or in case the check is drawn upon a bank at a considerable distance. In such a case, all that the owner of a check can do is to wait the necessary time for it to be sent to the issuing bank, or perhaps to a center where checks are cleared, and for notice to come back to the bank that the check has been accepted and paid. The owner of the check is entitled to ask a receipt for it from the teller of the bank where he leaves it for collection.

The simpler method, in case one already has a deposit account, and when there is any doubt of having the check paid in cash at once by the teller, is to deposit it to one's credit. This is done by endorsing it, and filling out a slip, stating the amount and the name of the person making the deposit and presenting it to the receiving teller. He enters the deposit on the pass book and the depositor is enabled to draw against it when he thinks a sufficient time has passed for its collection. If he has other funds in the bank sufficient to cover his current drafts, he will not be compelled to give any further thought to whether the check has been collected or not. He will be promptly notified in case there is any failure to collect the check, or any irregularity connected with it, but in dealing with reputable people, the chances are small that any such irregularity will occur.

Clerical errors are sometimes made in filling out checks, which leave them incomplete or inconsistent. The latter occurs when the amount written in words, called "the body of the check," differs from that in figures. In such cases, the rule of law is to pay the amount

in the body of the check, rather than that expressed in figures. Many banks make it a rule to pay only the smaller amount, whether expressed in figures or fully written out. If the difference between the two is considerable, it is best to return the check to its maker for correction, without even presenting it to the bank.

A point of law which it is well to bear in mind is that checks should be presented at once for collection in order to hold the parties. The maker of a check is liable for the amount at any time, if his position has not been changed by bankruptcy or some other legal event, but if the presentation of the check is unduly delayed, he may have overdrawn or closed his account, putting the holder of the check to much trouble to make recovery. The bank, in closing the account, would have no knowledge of outstanding checks which were not certified. An endorser, moreover, who might be held for the check if it was presented promptly, is not liable if there is negligence in notifying him that he is to be held. No difficulty of this sort is likely to arise in legitimate transactions with persons who are trustworthy, but a check may sometimes fail of payment because the maker does not keep an accurate record of his account with the bank and has carelessly overdrawn it. Some persons and corporations in transmitting checks make the request that they be deposited for collection at once. This is in order that their account may correspond with the record of the bank, and may not be confused by the appearance of dilatory checks after they have asked for a statement of account from their banker.

The endorsement of a check usually consists in writing upon its back, by the last holder, a name or words which will transfer it to another. A check may pass through several hands before being presented for collection to the bank upon which it is drawn, but it finally returns to this bank and is paid, if there is sufficient money to the credit of the person who drew it. The endorsement may be either "in blank" or "to order." An endorsement in blank is made by simply writing the name of the last holder upon the back. The name should be written across the back of the check sufficiently far from the end so that it cannot be torn off without mutilating the check, but so as to allow reasonable room for additional endorsements. An endorsement in blank is less safe than endorsement to order, because a check endorsed in blank may be endorsed and collected by any person into whose hands it falls. An endorsement to order is a direction to "pay to the order of ————————." This requires the signature of the person named in the endorsement and his identification if he undertakes the collection of the check. Endorsement in blank is usually sufficient in depositing checks for collection with

a bank, but endorsement to order is safer if the check is to be transmitted by mail or through several hands. Endorsement may be limited by such instruction as "for deposit only." Such a direction relieves the bank from obligation to meet protest in case the check cannot be collected. While protest may be desirable in some cases, it involves formalities and expenses which the owner of the check may prefer to avoid, if satisfied that such proceedings will accomplish nothing toward recovering the amount of the check.

The pass book which the depositor holds should be left with the bank every now and then to be settled. The bookkeeper will then enter all the checks which have been drawn (with the charges for their collection, if such charges are made), and will strike a balance between these debits against the depositor and the credits in his favor arising from the checks and money which he has deposited. If the depositor has kept his own account on the stubs of his check-book, he will then be able to make a comparison and to ascertain whether any error has been made by the bank or himself. While the chances of error by the bank are small, errors sometimes occur, and he should be equally frank in bringing them to the attention of the bank officers, whether they are made in his favor or against him. Most textbooks for business men recommend the presentation of books for settlement every month, but several months may safely be allowed to pass if the account is small and the number of checks drawn is not large.

We have dealt thus far with a simple deposit account at a bank. But suppose one wishes to borrow from the bank. This cannot readily be done by small depositors upon their own account alone, except by pledging security. A man or a woman who owns a government bond, the bond of a first-class railway which is paying dividends, or some manufacturing stock of recognized value, can, by leaving the bond as security, obtain at least a part of its face value from the bank as a loan. The bank does not consider it necessary in such cases to call for any explanation of the borrower's means or of his ability to pay. The possession of even a small amount of such securities is, therefore, convenient in obtaining ready money. The money can be obtained temporarily without selling the security, and the security draws interest in favor of the owner while in the keeping of the bank. It is necessary, however, that securities offered for this purpose to a bank should be of a high character, and should be quoted on the stock exchanges. There are great quantities of worthless or doubtful mining stocks, and shares in undeveloped manufacturing enterprises, which would not be accepted by a well-conducted bank as security for a loan. Securities of this character sometimes

have real value, but are not much known outside of the locality where they are issued. If they are known by the banks in that locality to be valuable, such banks might in some cases make loans upon them, but well-conducted banks are cautious about making loans upon large amounts of local securities, where any doubt is involved of the success of the enterprises, and of their continued ability to pay interest or dividends.

The person who has not securities to intrust to the bank as the pledge for a loan, will find difficulty in borrowing except as a part of mercantile transactions. If he is engaged in manufacturing or selling goods, he may be able to obtain notes from those to whom he sells. Such notes may be accepted and discounted at the bank, if the bank is convinced of the honesty and good business judgment of the borrower, as well as those of the maker of the note. The borrower will be relied upon to make the note good in case the maker fails to do so. Loans of this character are not made in the United States on so small a scale and to such small traders as in Europe. The Bank of France accepts the notes of small merchants, running as low as $1 or $2. The Bank of France is not, however, the first judge in most of these cases of the value of the paper. It is accepted by private bankers or by the joint stock banks, whose agents know the standing of the merchants making the notes. These banks intrust the collection to the Bank of France, because that bank employs a large force of collectors or runners, who make the rounds of the shops, from day to day, presenting these notes for payment. The Bank of France looks to the bank that first accepts the paper to make it good in case of loss. The losses are few and small, however, and it might be beneficial to small merchants in the United States if such a system could be introduced here. In several European countries, loans are made by the banks to the farmers upon the security of a mutual guaranty. The farmers of a given locality will come together to form an association, the members of which will guarantee to the bank, payment of the loans made to the individual members. The association, of course, passes upon the amount which each of its members seeks to borrow from the bank, and exercises a rigid scrutiny of its own upon the business and integrity of its members. The Russian Government has established a general system for loans of this character to agricultural syndicates, which are doing much to develop the farming interests of the country, and the last charter of the Bank of France, granted in 1897, set aside a fund of about $3,000,000 for inaugurating a similar system of syndicate loans to farmers in France.

TRUST COMPANIES AND SAVINGS BANKS

Trust companies have come to play a large part in modern finance, and will be found more useful, in many cases, to the woman who has property, than will be the commercial banks. She will probably need to use both institutions, but there are several things which will be done for her by the trust company that are not done by the banks. Trust companies are a development of the great variety of financial functions now imposed upon capitalists and financiers, as the result of the growing volume of money seeking investment, the great number of securities to be issued and distributed, and the many estates to be managed.

A trust company usually abstains in the main from the business of a commercial bank, both in respect to carrying active deposit accounts and in respect to making short-term loans. The two classes of business go together, because a bank which lends its money for short terms can easily recover it for the purpose of meeting drafts by depositors, while a bank which lends large sums for long terms is not in so good a position for meeting frequent demands upon running accounts by its customers. The trust company, therefore, usually pays interest upon deposits, and sometimes pays a higher rate for a deposit of a year or more than for one of six months or three months. Trust companies are required in New York to pay at least two per cent. on deposits, while commercial banks usually pay no interest except by special arrangement with large depositors. The trust company does not expeet its depositors to draw frequently on their accounts. In some cases, a distinct agreement is made that the money shall be left with the company for a definite period, and a certificate of deposit is given rather than a check-book. The New York trust companies do not now impose formal restrictions upon their depositors as to the time of leaving their money on deposit, but they hold large amounts which they know are not likely to be called for. They do, practically, an ordinary banking business, issuing check-books which permit their depositors to draw when convenience requires. Trust companies, however, do not usually care for very "active" accounts, involving large daily transactions in checks.

The trust company usually carries but a small cash reserve in its own vaults, because there are not likely to be as many large and unexpected demands upon its cash as in the case of a commercial bank. A considerable part of its cash is often intrusted to a bank, either by agreement for the temporary use of the bank in its loans, or simply as a running account, like that of individual depositors. The depos-

itor in the trust company who desires to withdraw a part of his deposit is often paid in such cases by check upon the bank where the trust company keeps its cash. A check of this character does not require certification in ordinary cases, because the signature of the cashier of the trust company to the check carries as much weight as would the signature of the cashier of the bank to a certification. If certification of a trust company check is required, it must be obtained from the bank upon which the check is drawn. The trust company in that case is relegated to the position of an individual who goes to his banker for the certification.

The trust companies are regarded in some quarters as the rivals of the commercial banks. They are rivals within certain limits, where they accept running accounts and permit checks to be drawn upon them. They have many privileges under state law, particularly in the small amount of reserve required, which are not granted to commercial banks. It will presently appear, however, that most of their business is of a character which the banks could not assume in any event, and that they occupy a field which is exclusively their own. They aid the banks, to a certain extent, by making large deposits with them which otherwise would not probably be available at all. The trust companies are able to transfer to the banks, funds deposited with them on time, which, under the conditions imposed upon the trust companies, the banks could not accept directly from depositors. Thus the resources of the commercial banks for making loans are increased, and the whole amount of capital in the community is transferred into a form which makes it available for the business for which it is best adapted.

The essential purpose of trust companies is what their name implies,—to manage trusts. They receive money which is not likely to be put to immediate use by its owners, pay interest on it, and find uses for it. A woman having an independent fortune in money, for which she cannot find a safe investment, may deposit it with a trust company and draw interest upon it regularly, without reducing the principal and without giving herself any serious care in regard to it. The objection to doing this upon a large scale is the low rate of interest paid by trust companies. Other safe investments can usually be found which will pay four per cent., while the trust company may pay but two per cent. The trust company will be found useful as the temporary custodian of money which is awaiting investment. Instead of lying idle and earning no interest for several months, it will at least earn two per cent., and the owner will be enabled to feel that she can afford to spend more time looking about for a safe investment than if her money were earning nothing.

The services of trust companies go much beyond the receiving and lending of money. They are incorporated to perform all classes of trusts relating to business and financial operations. The management of estates is now falling largely into their hands and being taken away from individual trustees. There is an obvious advantage in this, because of the greater security derived from a strong corporation than from one or two individual trustees. The cases are so numerous in which men of high standing have proved recreant to trust and have swallowed up in speculation or fast living the savings of widows and orphans, that the advantage of having the guaranty of a great corporation behind a trust is obvious. An officer of the corporation may steal or speculate, but this will not impair the obligation of the corporation upon the trusts which have been confided to it. Only in case the stealings go so far as to eat up the capital and surplus of the trust company and to drive it into bankruptcy, is there risk of loss by the persons intrusting commissions to its care. It is desirable that the prudent man or woman should study carefully the reputations of the companies to which they intrust their means, and that if they own large amounts of securities they should insist on the verification of the securities from time to time; but as between the individual trustee, however eminent, and a reputable corporation, the corporation is greatly to be preferred.

If any class of persons is suffering seriously from the competition of the trust companies, it is probably the individual attorney, rather than the commercial bank. Many of those important functions heretofore intrusted to the attorney, in executing wills, distributing estates, transferring real estate, and acting as trustee, in money matters, for minor children, are now assumed by trust companies, and are carried out according to an organized system. The trust company has other advantages besides its greater safety. Doing business to some extent upon a wholesale rather than upon a retail plan, and having officers and clerks each devoted to some specialty, it is able to perform given services with greater promptness and efficiency, and at lower cost. It has a recognized standing in banking and business circles, which permits negotiations in regard to securities and money matters to be carried on, without presenting guaranty of responsibility on each separate occasion, thereby saving time and expense. The corporation, moreover, is a permanent body, subject to the limitations of state laws. Sickness and incapacity do not, as often happens with the individual trustee, prevent an ordinary performance of its functions. It is not surprising, therefore, that the trust companies have lately been encroaching much upon the field of the attorneys, and that their business and methods are unpopular with some members of the legal profession.

A deposit with a trust company may be opened in substantially the same manner as with a commercial bank. An introduction may be obtained from some responsible friend or some patron of the bank, but an introduction by an outsider may be dispensed with, if a deposit is to be made and not drawn against for some time. The trust company is less under the necessity of guarding against fraudulent checks than is the bank, because it handles comparatively few checks. The certificate of deposit is a substitute for the pass book given by the commercial bank. Care should be taken in the custody of a certificate of deposit, but the trust company will exercise at least the usual precautions against paying money upon a certificate which has been lost or stolen. Some of these certificates of deposits contain blank receipts on the back, which are filled in for the amount drawn, when only parts of the deposit are drawn, and signed by the depositor. A receipt is also required in the company's book, in order to guard against the claims which might be set up in case of the loss or erasure of the certificate.

A certificate of deposit is not always the most convenient form of acknowledgment from a trust company. The owner of it is put to more inconvenience if he loses it, than if he simply has an account, in his favor and an ordinary pass book. "Time" certificates of deposit were formerly issued in some cases, which provided for leaving the money with the bank for a fixed term, as six months or two years. The issue of such certificates has been practically abandoned since the passage of the law of June 13, 1898, imposing a stamp tax of two cents for each $100 on any "certificate of deposit, drawing interest, or order for the payment of any sum of money, otherwise than at sight or on demand." As this charge would amount to as much as $2 on a certificate for $10,000, and as most of the banks are willing to pay the money of their depositors on demand, most of the certificates now issued are demand certificates and do not fall under the heavy rate of taxation just named.

One of the duties which may be profitably confided to a trust company, by a woman who does not deal largely in stock exchange securities through brokers, is the buying and selling of her securities. The trust company has its own broker, who is likely to be more trustworthy than some who might be brought to the attention of the individual investor, and is likely to be honest with the trust company, even in cases where he might not be honest with individuals. If a woman holding government bonds, for instance, desired to sell them, and to buy railway stock, she could request the company to make the transaction for her. They would follow her instructions, either to do it at once, without regard to the prices, or to sell the

bonds when they were high and to buy the stocks when they were low. If requested, they would doubtless arrange to buy the stocks before selling the bonds, if the conditions of the market made such a transaction more profitable. A woman desiring to speculate would probably find it more convenient to put herself in direct communication with a broker, but for limited transactions for investment, the trust company could be counted upon to perform the transactions with safety and honesty, and to relieve the investor from all inquiry and worry as to the business details.

This matter of dealing in securities is one of the most important functions of trust companies,—not so much buying and selling from day to day in the market as in the financing of new enterprises. The stock and bonds of a new corporation are often placed in the custody of a trust company pending their distribution. Money received in large amounts while reorganization plans are being carried out is safely disposed of in the same manner. These transactions were formerly intrusted to individual attorneys, who were usually of high standing, but the guaranty of the trust company gives greater certainty of safety and sound business methods than do those of any individual. Trust companies thus far have been confined chiefly to the Northeastern States. There were 290 reporting to the Comptroller of the Currency in 1900, of which 269 were north of the Potomac and east of Ohio. New York had 59, with aggregate capital of $48,250,000, and Pennsylvania 97, with aggregate capital of $39,809,778. Massachusetts, Rhode Island, New Jersey, and the District of Columbia, are the other Eastern communities having the strongest trust companies, but there are several in Minnesota, Indiana, and Kentucky. The combined capital of the trust companies in the United States in 1900 was $126,930,845, and their total resources were $1,330,160,343. The banks of the states northeast of the Potomac had all but $11,405,419 of those resources and all but $4,666,532 of the deposits, which amounted in all to $1,028,232,407.

SAFE DEPOSIT COMPANIES

Another class of institutions, somewhat related to banking, but doing a business like that of the old goldsmiths, in guarding valuables, is the safe deposit company. Safe deposit vaults are often conducted by loan and trust companies as an incident of their busi-

ness, but some of them are entirely independent of other forms of banking. A safe deposit company is the incorporated custodian of valuables. It keeps vaults for the express purpose of storing such valuables of all classes,—legal documents, jewelry, plate, and even clothing and furniture. Such boxes vary in price, according to their size and to the location of the company. A small box, capable of holding a few deeds, bonds, and other important documents, can be rented by the year for $3 or $5, but a higher rate may be charged in a locality where real estate rentals are high. Larger boxes cost more in proportion, and many companies have separate buildings, removed from the small boxes, where furniture may be stored and clothing be kept in cold storage.

The special benefit of a safe deposit company is the security which it affords. This is guarded by law in the larger states, where such companies are most numerous. Under the terms of the agreement which may be made with the depositor, they are liable for the entire value of the property deposited with them. Independently of legal liability, however, they take the precautions against loss by fire, and theft, which could not well be taken by the private individual, however large his resources. He might keep a strong box or a fire-proof safe, but the very existence of these safeguards would be a temptation and an invitation to thieves. The trust companies not only employ all the latest and most improved devices in locks, bolts, bars, and fire-proof walls, but they keep a body of trustworthy guards constantly on duty. A raid by thieves upon a safe deposit company would hardly be practicable. It would require the connivance of many employees, the blindness of the regular police, and the penetration of many time-locks and other safeguards, which even an employee cannot tamper with except at stated times, and under the scrutiny of others.

The process of hiring a box from a safe deposit company is simple and direct. An introduction from some responsible person is usually required, simply as evidence that the applicant is respectable, and has no sinister motives. The applicant receives a schedule of the charges for boxes of different sizes, and will be shown such boxes by the officials. Payment is usually made in advance, the address of the subscriber is taken, instructions are given in regard to obtaining admittance,—including, perhaps, an introduction to the officer in charge of the vaults,—and a key to the deposit boxes is furnished. These keys are of such form that a depositor cannot open his box without the coöperation of an officer of the company, and the officer of the company, on his part, cannot open it without the use of the key of the depositor. Passwords for admission are sometimes given, which should be kept a secret by the holder of the box.

SAVINGS BANKS

The business woman can make profitable use of the savings banks, both for herself and for her children. These banks are convenient for many persons of small means, who may not find it necessary to keep an account in a commercial bank or to deal with a trust company. Savings banks in most of the larger states, particularly in the Northeast, are well protected against loss and unwise management by the state laws governing their creation and management. They are conducted largely in the interest of their depositors, being governed by trustees who do not expect to make money, as shareholders, from the business of the banks. This is the character of the savings banks of all the New England States, New York, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, Ohio, Indiana, and Wisconsin. There are stock savings banks in a number of Southern States and in Ohio, Minnesota, and Iowa. The bulk of the savings are in the mutual savings banks. Out of the total savings deposits in 1899 of $2,179,468,229, the amount in the mutual banks was $1,960,709,131. The growth of savings deposits is one of the best evidences of the increase in the wealth of the country and in the improvement in the condition of the masses of the people. How rapid this growth has been within the past half century may be judged from the following table:—

Conditions of Savings Banks of the United States

Years	Number of Banks	Number of Depositors	Deposits	Average Due Each Depositor
1850	108	251,354	$ 43,431,130	172.78
1860	278	693,870	149,277,504	215.13
1870	517	1,630,846	549,874,358	377.17
1880	629	2,335,582	819,897,425	350.71
1890	921	4,258,893	1,524,844,506	358.03
1895	1,017	4,875,519	1,810,597,023	371.36
1899	987	5,687,818	2,230,366,954	392.13
1900	1,002	5,875,456	2,384,770,849	405.89

If the nearly six million depositors in 1900 were each the head of a family, the accounts would represent about thirty millions of the population. As a matter of fact, wives and children often have their

own deposits in the states where the savings banks are popular, so that perhaps not more than fifteen millions, or twenty millions, of the population are represented by the deposits in the savings banks. If all the states had well-developed savings bank systems, on the other hand, the number of accounts and the amounts of the deposits would make a much more striking showing. As the figures stand, the number of depositors has been multiplied by more than three within thirty years, by more than two within twenty years, and by about forty per cent. within the last ten years. The amounts deposited per capita have not grown materially since 1872, which shows that the banks are used chiefly by those of small means.

The savings banks of New York, with deposits amounting to more than one-third of those in the entire United States, afford an illustration of the laws that govern prudent savings bank systems. A savings bank can be established in New York only after public announcement by advertisement, and thorough examination by the superintendent of banking, in regard to the need for the bank at the place proposed, and as to the responsibility and character of the thirteen persons proposing to form the bank. If the superintendent of banking is not satisfied that the establishment of a savings bank is expedient and desirable, and that such a bank will afford benefits in the locality not afforded by existing banks, he is required to give notice to the county clerk of the county where the bank is proposed, that he refuses to issue a certificate. The board of trustees of a savings bank is not allowed to consist of less than thirteen. They elect the officers of the bank, but no trustee is allowed to have any interest in the gains or profits of the bank, nor to receive payment for his services, except such compensation for actual services as may be voted by the majority of the board. No trustee or officer is authorized to borrow any of the funds of the bank, or to use such funds except in pursuance of its legitimate business.

The savings banks are allowed to limit the amount which any one person or society may deposit, and they may refuse to receive deposits. The aggregate amount to the credit of any one individual or society is limited by law to $3,000, except in the case of deposits arising from judicial sales, or trust funds, or interest allowed to the depositor. Some banks discourage large deposits by paying a lower rate of interest on that portion of an account in excess of $500 or $1,000. The investments of savings banks are also carefully restricted by law. They are allowed to invest in the bonds of the United States; in the stocks or bonds of New York; in the stocks or bonds of any state of the United States which has not within ten years defaulted in the payment of its debts; in the stocks or bonds of any city, county, town,

or village, meeting certain tests, and issued in conformity with law; and in bonds and mortgages on unencumbered real estate worth at least twice the amount loaned. If the loan is on unimproved property, the amount shall not be more than forty per cent. of its actual value, and such loans shall be made only upon a report of a committee of trustees who shall certify, in writing, to the value of the premises.

Savings banks are permitted to deposit money temporarily in banks or trust companies, but in New York, the attorney-general is authorized to begin proceedings, upon the recommendation of the superintendent of banking, against a savings bank which keeps an undue proportion of its money permanently on deposit in this way, instead of seeking the investments required by law. The facts given show something of the safeguards thrown by the more conservative states around the savings bank system, and justify a considerable degree of confidence in the use of the banks. The laws of other states are similar to those of New York, but may require investigation by a prudent depositor in the newer states.

The wisdom of keeping money in savings banks depends in a large measure upon the length of time which the money is to be left on deposit. Savings banks have taken pains to discourage short-time deposits and the frequent withdrawal of money. While trust companies often pay interest upon deposits from the day after they are received, savings banks pursue a plan by which the money may remain for several months on deposit without drawing any interest if it is then withdrawn. At certain regular periods of the year, usually not oftener than once a quarter, and in many cases only twice a year, the directors and officers of the bank declare a dividend, which is equivalent to a payment of interest. The by-laws usually provide for the payment of interest only on such sums as have been on deposit during the entire period of time between two regular interest days. Thus, if the interest days were January 1 and July 1, the depositor who turned in his money on December 31 would draw interest for almost the entire period, but if he turned it in on January 15, he would get no interest until the following January, when he would receive it from July 1 to the close of the year. If he deposited the money on January 15 and withdrew it on December 15 it would not fall within either of the interest periods and the bank would get the use of the money for eleven months without paying any interest.

The purpose of these regulations, as stated, is to discourage short-term accounts, and to enable the bank to invest its resources in bonds and mortgages, instead of keeping a large cash reserve. The thrifty owner of money ought to carefully consider the rules of the savings bank, and the dates on which interest would accrue, before deciding

upon a deposit. If the amount involved is large, it might pay to keep it in a trust company for two or three months, until just before the beginning of an interest period at the savings bank. It would not be worth while, however, to employ the savings bank with the expectation of earning interest, if the deposit were not substantially certain to remain over the entire interest period. These warnings apply, of course, only to the earnings of interest. There may be cases where it is desirable to intrust the money for safe keeping to the savings bank, where the amounts do not justify opening an account at a commercial bank, and where there are no trust companies, even though no interest is earned.

The deposit of money for short terms in savings banks is discouraged to some extent by the rules regarding the withdrawal of deposits. It is not difficult to open an account at a savings bank in somewhat the same manner as at a commercial bank. Information is required in regard to age, names of parents, husband, and children, in order to aid the bank in paying the money to the proper parties in case of death of the depositor. Otherwise, the signing of the signature book, and the receipts of a pass book for entering deposits, are similar to the process pursued at a commercial bank. The pass books of savings banks contain columns for the entry of interest and for withdrawals. Checks are not issued by savings banks. The banks prefer that depositors shall call in person when they desire to withdraw money. It is sufficient to state orally the amount desired. The withdrawal is then entered on the pass book, and the bank is protected by a receipt which the depositor signs for the money. The money is then counted out, and the pass book, containing an entry of the withdrawal, as well as the previous deposits and dividends declared, is returned to the depositor. At large banks, the presentation of the pass book and the request for the money may be required at a different window from that where the money is actually paid out. When sending a messenger to withdraw a savings deposit, it is advisable to send a written order for the money, with specific authority to the messenger to sign for it.

Savings banks usually have printed in their pass books a by-law requiring notice of thirty to sixty days for the withdrawal of deposits. It may be prudent, if the amount to be withdrawn is large, to give notice of intended withdrawal, in order to enable the bank to have the money on hand in desired denominations, but less than thirty days is usually sufficient for such a notice. The by-law is to protect the bank against runs, in emergencies, and it is not availed of by well-conducted banks under ordinary circumstances.